Jabatan Pembangunan Kemahiran
Kementerian Sumber Manusia, Malaysia

STANDARD KEMAHIRAN PEKERJAAN KEBANGSAAN
(*NATIONAL OCCUPATIONAL SKILLS STANDARD*)

F410-001-2:2019

BUILDING CONSTRUCTION OPERATION
OPERASI PEMBINAAN BANGUNAN

LEVEL 2

Department of Skills Development (DSD)
Federal Government Administrative Centre
62530 PUTRAJAYA, MALAYSIA

NATIONAL OCCUPATIONAL SKILLS STANDARD

BUILDING CONSTRUCTION OPERATION

OPERASI PEMBINAAN BANGUNAN

LEVEL 2

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Abbreviation

1.	3R	Reduce, Reuse and Recycle
2.	CIDB	Construction Industry Development Board
3.	DOE	Department of Environment
4.	DOSH	Department of Occupational Safety & Health
5.	DPC	Damp Proof Course
6.	DPM	Damp Proof Membrane
7.	DSD	Department of Skills Development
8.	Exmet	Expended Metal
9.	IBS	Industrialised Building System
10.	MSC	Malaysian Skills Certificate
11.	NOSS	National Occupational Skills Standard
12.	NSDC	National Skills Development Council
13.	OAS	Occupational Area Structure
14.	OS	Occupational Structure
15.	OSHA	Occupational Safety and Health Act
16.	PPE	Personal Protection Equipment
17.	SDC	Standard Development Committee
18.	SOP	Standard Operating Procedure
19.	STC	Standard Technical Committee
20.	STEC	Standard Technical Evaluation Committee
21.	TEM	Tools, Equipment, Materials
22.	M&E	Mechanical and Electrical

Glossary

1.	Pre-fabricated reinforcement mesh	Reinforcement in mesh shape that fabricated at factory (e.g. BRC).
2.	Building Construction Tradesman	A tradesman or tradesperson refers to a worker who specializes in a particular occupation that requires work experience, on-the-job training, and often formal vocational education. Among the most common construction trades are those of carpenter, plasterer, ironworker, mason etc.
3.	Construction Personnel Card (CIDB)	An integrated program that involves the registration and accreditation of construction personnel to enhance safety levels at construction work sites.
4.	Roof trusses	A series of triangles - a stable geometric shape that is difficult to distort under load. Regardless of its overall size and shape, all the chords and webs of a truss will form triangles.
5.	Expended Metal	Refers to expended metal brickworks reinforcement.

Acknowledgement

The Director General of DSD would like to extend his gratitude to the organisations and individuals who have been involved in developing this Standard including:

i. National Skills Development Council (NSDC)
ii. Standard Technical Committee (STC)
iii. Standard Technical Evaluation Committee (STEC)
iv. Standard Development Committee (SDC)
v. Facilitator
vi. Secretariat
vii. Construction Industrial Development Board (CIDB)

STANDARD PRACTICE

NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR:

BUILDING CONSTRUCTION OPERATION

LEVEL 2

1. Introduction

1.1. Occupation Overview

Construction industry has evolved and transformed from conventional method to Industrialised Building System (IBS). Initiative should be carried out to set the standards for skilled construction personnel. This initiative leads to develop highly skill construction personnel and provide opportunities for locals, thus reducing the reliance on low skilled labour.

The Eleventh Malaysia Plan (RMK11) 2016-2020, strategic shifts have been formulated to elevate the labour market efficiency. The aims are to; i) improve labour market legislation and information, ii) improve the productivity, wage structure and job quality, and iii) improve the effectiveness in managing low-skilled workers.

The derived demand construction industry, recorded a double digit average annual growth rate of 11.1% during the Tenth Malaysia Plan (RMK10), faster than the overall economy which grew by 6.3%. In 2018, the construction sector is forecasted to contribute 7.3% to the GDP supported by strong growth in civil engineering and non-residential subsectors (see Figure 1).

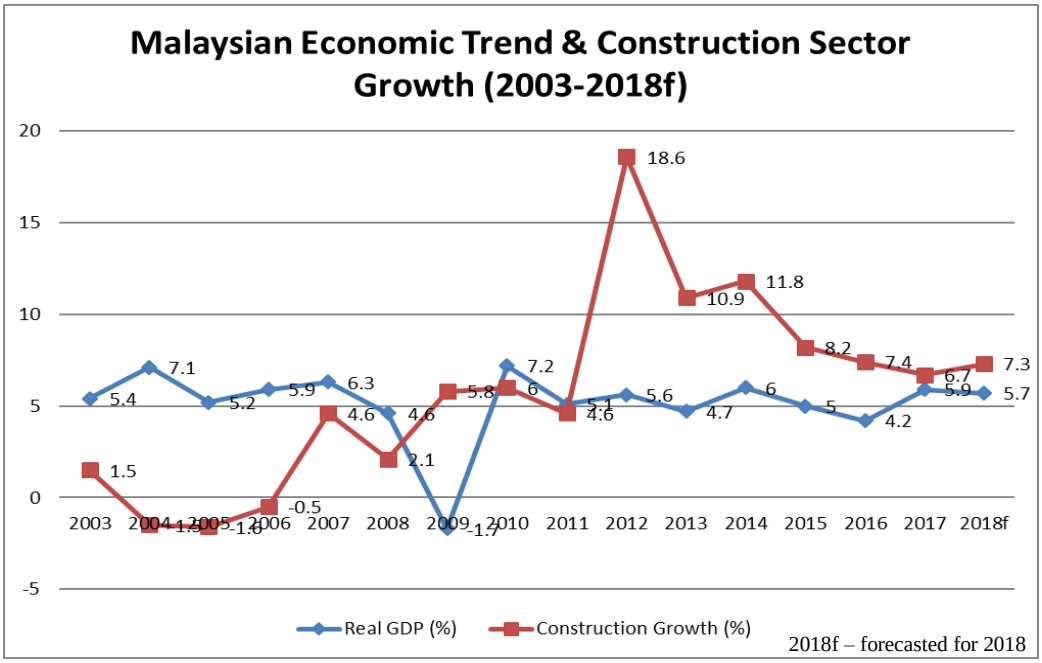


Figure 1: Malaysian Economic Trend & Construction Sector Growth (2003-2018f) (Bank Negara Malaysia, 2018)

For a period from 2015 to 2017, a total of 16,532 construction projects, valued at RM411.2 billion were awarded (CIDB, 2017). Private sector projects contributed RM223.5 billion, or 54.4% from the total value of the projects, while the remaining RM187.7 billion was contributed by public sector.

Apart, there are four categories of construction in Malaysia namely; residential, non-residential, social amenities, and infrastructure (see Table 1) (CIDB, 2011). They were representing a different kind of constructed facilities which has been clustered by their end usage. Construction activities being monitored closely by several government agencies such as Bank Negara Malaysia (BNM) and CIDB in order to measure the nation's economic stability and construction performances among others.

Table 1: Types of Construction in Malaysia According to Categories (CIDB, 2011)

No.	Categories	Construction Products
1	Residential	Quarters, terrace house, semi-detached house, bungalow, flat, condominium, apartment, townhouse, and dormitory.
2	Non-Residential	Shop houses, shop office, business complex, exhibition centre, petrol station, storehouse, warehouse, factory and industrial plant, workshop, and storage tank.
3	Social amenities	Hospital, clinic, medical laboratory, medical treatment centre, higher learning institution, school, education and training centre, and kindergarten.
4	Infrastructure	Reservoir, water pipeline, oil & gas pipeline, water tank, oil & gas tank, chemical tank, water treatment plant, airport, railway or train station, bus station, taxi station, harbour, jetty, road, highway, railway track, rail, traffic light, bridge and tunnel, and hangar.

There are five (5) levels of construction personnel namely, Building Construction Tradesman, Building Construction Foreman, Building Construction Supervisor, Building Construction Site Manager and Construction Project Manager.

Main responsibilities for Building Construction Tradesman and Foreman are; i) foundation preparation, ii) formwork preparation, iii) reinforcement work, iv) concreting work, v) roofing system installation, vi) door & window installation, vii) wall construction/ installation, and viii) wall, floor and ceiling finishing. Therefore, the personnel able to qualify and competent in the building construction operation. This also will help them to be recognized globally.

1.2. Rationale of NOSS Development

This is a review of the NOSS entitled Building Constructor Level 1 & Level 2 (B-010-1 & B-010-2), Building Construction Supervisor Level 3 (B-010-3), Residential Building Construction Level 3 (BC-030-3:2013), Non-Residential Building Construction Level 2 (F410-001-2:2016) and Non-Residential Building Construction Site Supervision Level 3 (F410-001-2:2016). Previously, the NOSS for Building Constructor Level 1 until Level 3 was developed as an old NOSS Format and it should have reviewed to follow the current format of NOSS development. Meanwhile for the NOSS residential and non-residential needs to harmonise and merge because of the similar work scope as a main competency after developing that two areas. All this NOSS also reviewed to anticipate

technology changes (e.g.: IBS system) in this industry as well as to replace the previous NOSS.

In the light of continuous economic development in the Building & Construction Industry, the demand for skilled personnel has increased thus the development programs for skilled manpower is timely. By going through the mechanism provided by the Skills Training system in Malaysia, one of the important steps is to develop this NOSS.

1.3. Rationale of Occupational Structure and Occupational Area Structure

Focus group discussions among practitioners discovered there are existing occupations from building construction pillar starting level 1 until level 3 classified under the Malaysia Standard Industry Classification (MSIC) in the section of construction (F), group of construction of buildings (410) and area of building construction. The job title identified is the common used from the operational that cover the building construction career path from lower level until the higher level which specified each job competencies which include knowledge, skills and attitude.

Based on the findings from the workshop, the main scope of work and responsibility generated by both occupations at level 1 and level 2 mostly similar from each other to become a holistic competency and differs at level 3 that have their own responsibility to archive that level. The competency of level 1 and 2 (Tradesman and Foreman) is to perform and implement building construction work covers all areas and trade. While for level 3 (Supervisor) is responsible to supervise, coordinate, administer and some elements of monitoring, inspection and verification during starting until completion of building construction work.

The Building Construction Operation level 2 personnel are consistent with the alignment of competency definition at level 2 recognised by Department of Skills Development (DSD) as the personnel needs to be competent in performing a significant range of varied work activities, performed in a variety of contexts. Some of the activities are routine which include preventive/routine maintenance and non-routine which include corrective maintenance and required individual responsibility and autonomy.

1.4. Regulatory / Statutory Body Requirements Related to Occupation

i) Construction Industry Development Board (CIDB)
   - *Lembaga Pembangunan Industri Pembinaan Malaysia* Act 1994 (Act 520)

ii) Department of Safety & Health
   - OSHA 1994 (Act 514)
   - FMA 1967 (Act 139)

iii) Department of Environment
   - Environmental Quality Act 1974

iv) Local authorities (e.g. Local Council, TNB, BOMBA, IWK, etc.)
   - Town and Country Planning Act 1976 (Act 172)
   - Street, Drainage and Building Act 1974 (Act 133)
   - Uniform Building By-Laws 1984

1.5. Occupational Pre-Requisite

The minimum requirements for those interested to undertake the job or career in this area are as follows: -

i) CIDB's Construction Personnel Card *(Kad Pendaftaran Personel Binaan)*; and
ii) Physically fit.

1.6. General Training Pre-Requisite For Malaysian Skills Certification System

The minimum requirements for those interested to enrol in this course are as follows: -

i) Be able to calculate (basic), read and write in Bahasa Malaysia and/ or English and/ or other languages; and
ii) Physically fit.

2. Occupational Structure (OS)

Section	(F) Construction
Group	(410) Construction of Buildings
Area	Building Construction
Level 5	Construction Project Manager
Level 4	Building Construction Site Manager
Level 3	Building Construction Supervisor
Level 2	Building Construction Foreman
Level 1	Building Construction Tradesman

Figure 2: Occupational Structure

3. Occupational Area Structure (OAS)

Section	(F) Construction
Group	(410) Construction of Buildings
Area	Building Construction
Level 5	Construction Project Management
Level 4	Building Construction Site Management
Level 3	Building Construction Operation Supervision
Level 2	Building Construction Operation
Level 1	Embedded to L2

Figure 3: Occupational Area Structure

4. Definition of Competency Levels

The NOSS is developed for various occupational areas. 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 may award, to any person upon conforming to the Standards the following skills qualifications as stipulated under the National Skills Development Act 2006 (Act 652):

5.1. Malaysian Skills Certificate (MSC)
5.2. Statements of Achievement

6. Occupational Competencies

The Building Construction Operation Level 2 personnel is competent in performing the following core competencies:

6.1. Site Building Construction Preparation
6.2. Building Formwork Work
6.3. Building Reinforcement Work
6.4. Building Concreting Work
6.5. Building Roof System Work
6.6. Building Steel Framing Installation
6.7. Building Precast Concrete Installation
6.8. Building Door & Window Installation
6.9. Building Wall Work
6.10. Building Wall & Floor Finishing
6.11. Building Ceiling Finishing

7. Work Conditions

Generally, the personnel work in normal working hours depending on organisation nature of business. They may require working extra hours to fulfil internal and external requirements. They also may be needed to work in shift to accommodate work requirements. All personnel need to have valid CIDB's Construction Personnel Card and use/ wear appropriate attire (Personal Protective Equipment) during the commencement of their jobs. They may work individually or in group in a hazardous and unpredictable working environment. They must physical fit due to nature of job in building construction.

8. Employment Prospects

There is excellent prospect in private sectors due to shortage of hands-on expert in Building Construction Operation. In public sector there are lacking of professional and well experience Building Construction Operation. This area has a very good job market potential abroad for skilled personnel due to shortage of such highly skilled personnel in this region.

Other related occupations with respect to employment opportunities are:

8.1 Building Construction Supplier/ Distributor
8.2 Building Construction Instructor/ Trainer
8.3 Building Construction Consultant

Other related industries with respect to employment opportunities are:

8.4 Entrepreneurship
8.5 Education
8.6 Consultation

9. Up Skilling Opportunities

The person who has completed in Building Construction Operation competencies may proceed further training for up skilling opportunities to improve their skills, knowledge, career path and professional recognition.

9.1. Training for advancement

i) Building Operation Maintenance
ii) Construction Safety & Health
iii) Working at Height
iv) Confine Space
v) Scaffolding
vi) Machine Operator
vii) Permit to Work (PTW)

9.2. Industrial Recognition

i) CIDB recognition with specific competency unit / job scope

10. Organisation Reference for Sources of Additional Information

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

10.1. Public Work Department
Menara Kerja Raya (Block G),
Ibu Pejabat JKR,
Jalan Sultan Salahuddin,
50580 Kuala Lumpur
Tel : 03 – 8000 8000
Website : www.jkr.gov.my
E-mail : komunikasi@jkr.gov.my

10.2. Department of Occupational Safety and Health (DOSH)
Ministry of Human Resource
Level 5, Block D4, Complex D,
Federal Government Administrative Centre,
62530 Putrajaya
Tel : 03-8886 5343
Fax : 03-8889 2443
Website : www.dosh.gov.my

10.3. Construction Industry Development Board (CIDB)
Level 10, Menara Dato Onn,
Pusat Dagangan Dunia Putra,
No 45, Jalan Tun Ismail, 50480 Kuala Lumpur
Tel : 03 – 4047 7000
Website : www.cidb.gov.my
E-mail : info@cidb.gov.my

10.4. Master Builders Association Malaysia (MBAM)
No. 2, Jalan 2/109E, Desa Business Park,
58100 Kuala Lumpur,
Malaysia
Tel : 03-7984 8636
Fax : 03-7982 6811
Website : mbam.org.my

10.5. *Bahagian Pembangunan Kontraktor & Usahawan* (BPKU)
c/o Ministry of Entrepreneur Development
Level 5, Menara Block, Menara Usahawan,
No 18, Persiaran Perdana, Precinct 2,
62652 Putrajaya
Tel : 03-8880 5202
Fax : 03-8880 5204

10.6. *Persatuan Pemerkasaan Pembangunan Kemahiran & Kompetensi Malaysia* (PPPKKM) (PPM-031-10-19052016)
No. 14-2, Jalan Matahari U5/AB, Section U5,
40150 Bandar Pinggiran Subang,
Selangor
Tel : 03-5886 2105
E-mail : kompetensimalaysia@gmail.com

10.7. Department of Environment (DOE)
Ministry of Energy, Technology, Science, Environment & Climate Change
Level 1-4, Podium 2 & 3,
Wisma Sumber Asli,
No. 25, Persiaran Perdana, Precinct 4,
62574 Putrajaya
Tel : 03-8871 2000
Fax : 03-8888 9987
Website : www.doe.gov.my

10.8. SIRIM Berhad
No.1, Persiaran Dato' Menteri,
Section 2,
P.O.Box 7035,
40700 Shah Alam
Tel : 03-5544 6400
Fax : 03-5544 6694
Website : www.sirim.my

10.9. Malaysia Productivity Corporation (MPC)
Lorong Produktiviti, Jalan Sultan,
46200 Petaling Jaya,
Selangor
Tel : 03-7955 7266
Fax : 03-7957 8068
Website : www.mpc.gov.my

11. Standard Technical Evaluation Committee

NO	NAME	POSITION & ORGANISATION
1.	Ir. Dr. Mohd Fairuz Ab Rahman	Factory & Machinery Examiner Building Construction Safety Division Department of Occupational Safety and Health
2.	Noor Azian Hashim	Manager Unit of Training Infrastructure Development Skills Competency Development Division CIDB Malaysia
3.	Datuk Ir Hj Wan Nazri bin Hj Wan Aria	Chief Executive Officer Civil & Structural Consulting Engineers Gruppe Consultant
4.	Mohamad Zulkurnain Bin Abdul Rahman	Project Director Engineering Construction & Environment MRCB Builders Sdn Bhd

12. Standard Development Committee

BUILDING CONSTRUCTION OPERATION

LEVEL 2

NO	NAME	POSITION & ORGANISATION
1.	Dr. Hairuddin Mohammad	Lecturer/ Researcher Center for Diploma Studies (CeDS) Department of Civil Engineering Universiti Tun Hussein Onn Malaysia (UTHM)
2.	Ahmad Nazrul bin Ahmad Kamal	Engineer Construction Technology Sector Industrialised Building System (IBS) Division CIDB Malaysia
3.	Mohd Dhiya Hafreez bin Kamil	Construction Manager Dasacon Sdn Bhd
4.	Mohd Syarafi Rohseli	Manager HPR Constructor Malaysia Sdn Bhd
5.	Razali Ahmed Zaman	Project Manager Proven Construction & Development Sdn Bhd
6.	Sazali bin Ismail	Senior Manager MRCB
7.	Badrol Hisham bin Zainordin	Lecturer Civil Department IKTBN Bachok
8.	Ridzal Shah bin Radzuan	Lecturer Civil Department Giatmara Malaysia
9.	Wan Nurul Huda binti Wan Yusof	Lecturer Civil Department ILP Kota Bharu
10.	Faradiva binti Zainal	Executive Director Budi Prisma Sdn Bhd
11.	Dr. Siva A/L Rabindarang	Head Department Civil Engineering Technology Vocational College Slim River
12.	Sahat bin Amin	Senior Project Manager MSR Consultant & Resources
FACILITATOR		
1.	Syazwani binti Azmi	Department of Skills Development (DSD)
2.	Jefrizain bin Abdul Rasid	Department of Skills Development (DSD)

STANDARD CONTENT

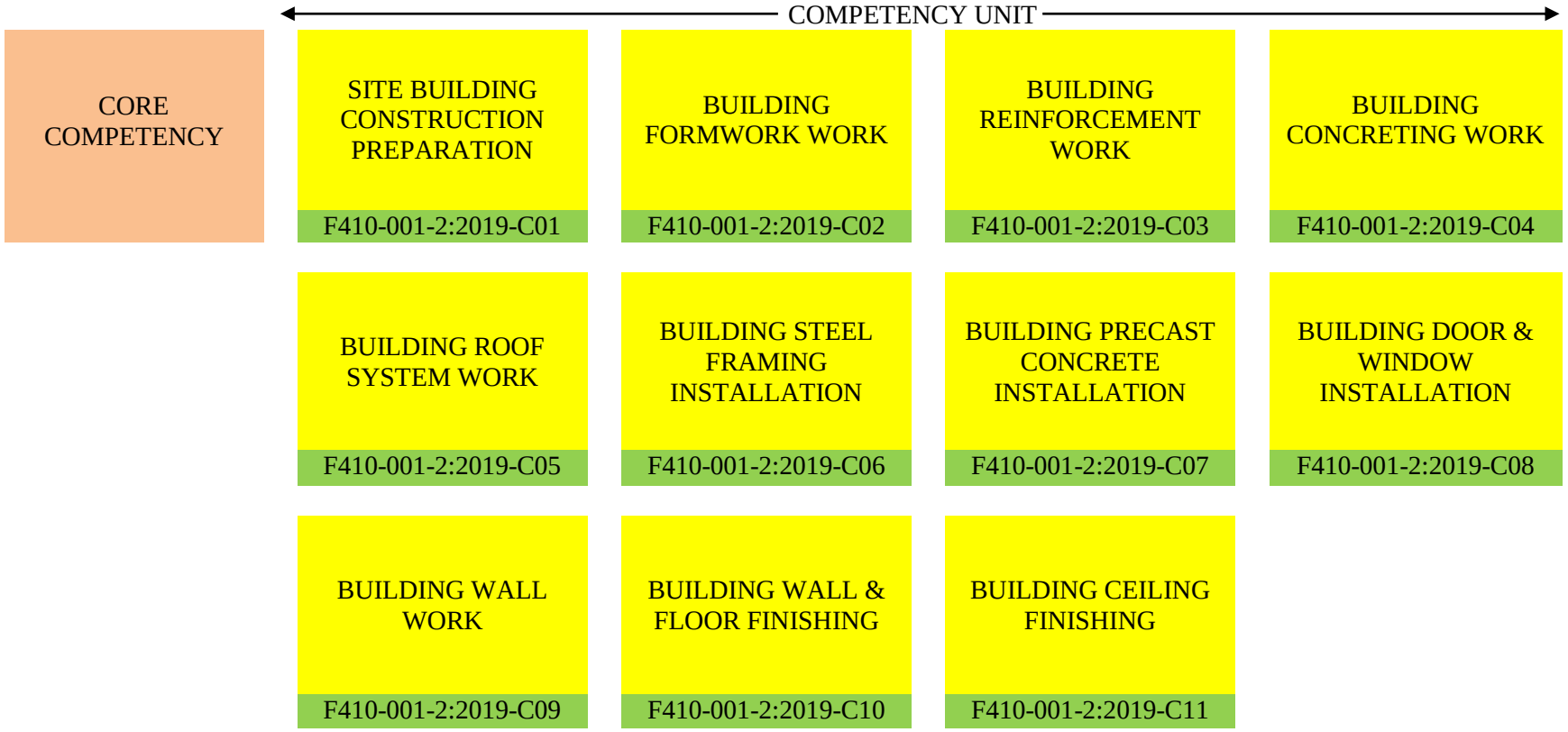
NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR:

BUILDING CONSTRUCTION OPERATION

LEVEL 2

13. Competency Profile Chart (CPC)

SECTION	(F) CONSTRUCTION		
GROUP	(410) CONSTRUCTION OF BUILDINGS		
AREA	BUILDING CONSTRUCTION		
NOSS TITLE	BUILDING CONSTRUCTION OPERATION		
NOSS LEVEL	TWO (2)	NOSS CODE	F410-001-2:2019



14. Competency Profile (CP)

SECTION	(F) Construction		
GROUP	(410) Construction of Buildings		
AREA	Building Construction		
NOSS TITLE	Building Construction Operation		
NOSS LEVEL	Two (2)	NOSS CODE	F410-001-2:2019

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
1. Site Building Construction Preparation F410-001-2:2019-C01	Site Building Construction Preparation describes the activities of clearing away the trees, debris, rubbish, etc., relocating obstructions and levelling the platform area from building site, doing whatever rough grading that is necessary, and staking the house location in preparation for installation of the footings and foundation. A competent person in this CU shall be able to build site hoarding, prepare temporary building, perform site clearing, prepare silt trap and wash through and prepare perimeter drain. The outcome of this competency is the land/site is prepared and qualified for any and all construction works in accordance to the construction drawing.	1. Build site hoarding	1.1 The approved construction drawing and specifications (site layout and hoarding detail) from superior obtained. 1.2 The hoarding location, design, and types of material identified in accordance with approved construction drawing and specifications. 1.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 1.4 The work area pegged and cleared in accordance with approved construction drawing and specifications. 1.5 The location and depth of excavation for pole point excavated in accordance with approved drawing and specification. 1.6 Hoarding post installed in accordance with approved drawing and specification. 1.7 Site hoarding frame, cover, and support installed in accordance with approved drawing and specification.

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			1.8 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 1.9 Tools and equipment cleaned and kept in accordance with superior instruction. 1.10 Excess materials stored at designated area in accordance with superior instruction.
		2. Prepare temporary building	2.1 The approved construction drawing and specifications (site layout and temporary building) from superior obtained. 2.2 The temporary building location, design, types, and materials identified in accordance with approved construction drawing and specifications. 2.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 2.4 The work area pegged and cleared in accordance with approved construction drawing and specifications. 2.5 Temporary building base constructed at the location, levelled base, and dimension in accordance with approved construction drawing and specifications. 2.6 Temporary building constructed on designated base level, referring to temporary building types, and

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			dimension in accordance with approved construction drawing and specifications. 2.7 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 2.8 Tools and equipment cleaned and kept in accordance with superior instruction. 2.9 Excess materials stored at designated area in accordance with superior instruction
		3. Perform site clearing	3.1 The approved construction drawing and specifications (site layout) from superior obtained. 3.2 Site boundary identified in accordance with superior instruction. 3.3 Site clearing methods identified in accordance with superior instruction. 3.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 3.5 The work area cleared in accordance with superior instruction. 3.6 Site/ construction waste disposed in accordance with superior instruction.
		4. Prepare silt trap and wash through	4.1 The approved construction drawing and specifications (silt trap and wash through) from superior obtained. 4.2 The silt trap and wash through location, design, types, and materials identified in accordance with approved construction drawing and

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			specifications. 4.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 4.4 Silt trap and wash through constructed at the location, levelled base, and dimension in accordance with approved construction drawing and specifications. 4.5 Construction debris cleared and transferred to designated area in accordance with construction procedures. 4.6 Tools and equipment cleaned and kept in accordance with superior instruction. 4.7 Excess materials stored at designated area in accordance with superior instruction.
		5. Prepare perimeter drain	5.1 The approved construction drawing and specifications (perimeter drain) from superior obtained. 5.2 Perimeter drain location, gradient, size, types, and materials identified in accordance with approved construction drawing and specifications. 5.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 5.4 Perimeter drain installed at the excavated location, levelled base, and dimension in accordance with approved construction drawing and

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			specifications. 5.5 Construction debris cleared and transferred to designated area in accordance with construction procedures. 5.6 Tools and equipment cleaned and kept in accordance with superior instruction. 5.7 Excess materials stored at designated area in accordance with superior instruction.
2. Building Formwork Work F410-001-2:2019-C02	Building Formwork Work describes as a mould including all supporting structures, used to shape and support the concrete until it attains sufficient strength to carry its own weight. A competent person in this CU shall be able to perform foundation formwork, perform column formwork, perform beam formwork, perform slab formwork, perform wall formwork, and perform staircase formwork. The outcome of this competency is a stable formwork fabricated and installed to be able to withstand all types of dead and live loads in the correct position in accordance with construction drawing.	1. Perform foundation formwork	1.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 1.2 The foundation formwork location, design, types, and materials identified in accordance with approved construction drawing and specifications. 1.3 Approved material, methods, types, and dimension of formwork prepared in accordance with approved construction drawing and specifications. 1.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 1.5 Clean and functioning formwork tools and equipment prepared. 1.6 Flat, clean, and free from defect of formwork material prepared. 1.7 The work area cleared and alignment (horizontal and vertical) marked in

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			accordance with approved construction drawing and specifications. 1.8 Foundation formwork fabricated referring to material and size in accordance with approved construction drawing and specifications. 1.9 Foundation formwork and prop installed referring to alignment (horizontal and vertical), tightness, rigidity, and stability in accordance with approved construction drawing and specifications. 1.10 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 1.11 Tools and equipment cleaned and kept in accordance with superior instruction. 1.12 Excess materials stored at designated area in accordance with superior instruction. 1.13 Foundation formwork dismantled without shock or vibration in accordance with standard specification for building works.
		2. Perform column formwork	2.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 2.2 The column formwork location, design, types, and materials identified

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			in accordance with approved construction drawing and specifications. 2.3 Approved material, methods, types, and dimension of formwork prepared in accordance with approved construction drawing and specifications. 2.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 2.5 Clean and functioning formwork tools and equipment prepared. 2.6 Flat, clean, and free from defect of formwork material prepared. 2.7 The work area cleared and alignment (horizontal and vertical) marked in accordance with approved construction drawing and specifications. 2.8 Column formwork fabricated referring to material and size in accordance with approved construction drawing and specifications. 2.9 Column formwork and prop installed after reinforcement works completed referring to alignment (horizontal and vertical), tightness, rigidity, and stability in accordance with approved construction drawing and specifications. 2.10 Construction debris cleaned and transferred to designated area in

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			accordance with construction procedures. 2.11 Tools and equipment cleaned and kept in accordance with superior instruction. 2.12 Excess materials stored at designated area in accordance with superior instruction. 2.13 Column formwork dismantled without shock or vibration in accordance with standard specification for building works.
		3. Perform beam formwork	3.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 3.2 The beam formwork location, design, types, and materials identified in accordance with approved construction drawing and specifications. 3.3 Approved material, methods, types, and dimension of formwork prepared in accordance with approved construction drawing and specifications. 3.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 3.5 Clean and functioning formwork tools and equipment prepared. 3.6 Flat, clean, and free from defect of formwork material prepared. 3.7 The work area cleared and alignment

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			(horizontal and vertical) marked in accordance with approved construction drawing and specifications. 3.8 Beam formwork fabricated referring to material and size in accordance with approved construction drawing and specifications. 3.9 Beam formwork and prop installed (for upper beam) referring to alignment (horizontal and vertical), tightness, rigidity, and stability in accordance with approved construction drawing and specifications. 3.10 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 3.11 Tools and equipment cleaned and kept in accordance with superior instruction. 3.12 Excess materials stored at designated area in accordance with superior instruction. 3.13 Beam formwork dismantled without shock or vibration in accordance with standard specification for building works.
		4. Perform slab formwork	4.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 4.2 The slab formwork location, design,

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			types, and materials identified in accordance with approved construction drawing and specifications. 4.3 Approved material, methods, types, and dimension of formwork prepared in accordance with approved construction drawing and specifications. 4.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 4.5 Clean and functioning formwork tools and equipment prepared. 4.6 Flat, clean, and free from defect of formwork material prepared. 4.7 The work area cleared and alignment (horizontal and vertical) marked in accordance with approved construction drawing and specifications. 4.8 Slab formwork fabricated referring to material and size in accordance with approved construction drawing and specifications. 4.9 Slab formwork and prop installed (for upper slab) referring to alignment (horizontal and vertical), tightness, rigidity, and stability in accordance with approved construction drawing and specifications. 4.10 Construction debris cleaned and transferred to designated area in accordance with construction

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			procedures. 4.11 Tools and equipment cleaned and kept in accordance with superior instruction. 4.12 Excess materials stored at designated area in accordance with superior instruction. 4.13 Slab formwork dismantled without shock or vibration in accordance with standard specification for building works.
		5. Perform wall formwork	5.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 5.2 The wall formwork location, design, types, and materials identified in accordance with approved construction drawing and specifications. 5.3 Approved material, methods, types, and dimension of formwork prepared in accordance with approved construction drawing and specifications. 5.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 5.5 Clean and functioning formwork tools and equipment prepared. 5.6 Flat, clean, and free from defect of formwork material prepared. 5.7 The work area cleared and alignment (horizontal and vertical) marked in

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			accordance with approved construction drawing and specifications. 5.8 Wall formwork fabricated referring to material and size in accordance with approved construction drawing and specifications. 5.9 Wall formwork, prop, and tie rod (if necessary) installed after reinforcement works completed referring to alignment (horizontal and vertical), tightness, rigidity, and stability in accordance with approved construction drawing and specifications. 5.10 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 5.11 Tools and equipment cleaned and kept in accordance with superior instruction. 5.12 Excess materials stored at designated area in accordance with superior instruction. 5.13 Wall formwork dismantled without shock or vibration in accordance with standard specification for building works.
		6. Perform staircase formwork	6.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 6.2 The staircase formwork location,

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			design, types, and materials identified in accordance with approved construction drawing and specifications. 6.3 Approved material, methods, types, and dimension of formwork prepared in accordance with approved construction drawing and specifications. 6.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 6.5 Clean and functioning formwork tools and equipment prepared. 6.6 Flat, clean, and free from defect of formwork material prepared. 6.7 The work area cleared and alignment (horizontal and vertical) marked in accordance with approved construction drawing and specifications. 6.8 Staircase formwork fabricated referring to material and size in accordance with approved construction drawing and specifications. 6.9 Staircase formwork and prop installed (for upper slab) referring to alignment (horizontal and vertical), dimensions (tread, riser, and platform), tightness, rigidity, and stability in accordance with approved construction drawing and specifications.

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			6.10 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 6.11 Tools and equipment cleaned and kept in accordance with superior instruction. 6.12 Excess materials stored at designated area in accordance with superior instruction. 6.13 Staircase formwork dismantled without shock or vibration in accordance with standard specification for building works.
3. Building Reinforcement Work F410-001-2:2019-C03	Building Reinforcement Work describes one of the key structural elements in building construction that needs to be able to withstand substantial stress. A competent person in this CU shall be able to perform foundation reinforcement, perform column reinforcement, perform beam reinforcement, perform slab reinforcement, perform wall reinforcement, and perform staircase reinforcement. The outcome of this competency is stable reinforcement produced to help withstand the concrete and resist the applied stress in accordance with construction drawing.	1. Perform foundation reinforcement	1.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 1.2 The foundation reinforcement location, sizes, length, shape, types, and position identified in accordance with approved construction drawing and specifications. 1.3 Approved methods and types of foundation reinforcement prepared in accordance with approved construction drawing and specifications. 1.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 1.5 Clean and functioning foundation reinforcement tools, equipment, and material prepared.

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			1.6 Reinforcement bent and length fabricated in accordance with approved construction drawing and specifications. 1.7 Reinforcement secured and lapped (if necessary) against displacement using binding wire. 1.8 Fabricated reinforcement and spacer blocks horizontally referring to location, sizes, length, shape, types, and position installed in accordance with approved construction drawing and specifications. 1.9 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 1.10 Tools and equipment cleaned and kept in accordance with superior instruction. 1.11 Excess materials stored at designated area in accordance with superior instruction.
		2. Perform column reinforcement	2.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 2.2 The column reinforcement location, sizes, length, shape, types, and position identified in accordance with approved construction drawing and specifications. 2.3 Approved methods and types of column reinforcement prepared in

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			accordance with approved construction drawing and specifications. 2.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 2.5 Clean and functioning column reinforcement tools, equipment, and material prepared. 2.6 Reinforcement bent and length fabricated in accordance with approved construction drawing and specifications. 2.7 Reinforcement secured and lapped (if necessary) against displacement using binding wire. 2.8 Fabricated reinforcement and spacer blocks installed vertically referring to location, sizes, length, shape, types, and position in accordance with approved construction drawing and specifications. 2.9 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 2.10 Tools and equipment cleaned and kept in accordance with superior instruction. 2.11 Excess materials stored at designated area in accordance with superior instruction.

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		3. Perform beam reinforcement	3.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 3.2 The beam reinforcement location, sizes, length, shape, types, and position identified in accordance with approved construction drawing and specifications. 3.3 Approved methods and types of beam reinforcement prepared in accordance with approved construction drawing and specifications. 3.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 3.5 Clean and functioning beam reinforcement tools, equipment, and material prepared. 3.6 Reinforcement bent and length fabricated in accordance with approved construction drawing and specifications. 3.7 Reinforcement secured and lapped (if necessary) against displacement using binding wire. 3.8 Fabricated reinforcement and spacer blocks installed horizontally referring to location, sizes, length, shape, types, and position in accordance with approved construction drawing and specifications. 3.9 Construction debris cleaned and transferred to designated area in

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			accordance with construction procedures. 3.10 Tools and equipment cleaned and kept in accordance with superior instruction. 3.11 Excess materials stored at designated area in accordance with superior instruction.
		4. Perform slab reinforcement	4.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 4.2 The slab reinforcement location, sizes, length, shape, types, and position identified in accordance with approved construction drawing and specifications. 4.3 Approved methods and types of slab reinforcement prepared in accordance with approved construction drawing and specifications. 4.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 4.5 Clean and functioning slab reinforcement tools, equipment, and material prepared. 4.6 Reinforcement bent and length fabricated in accordance with approved construction drawing and specifications. 4.7 Reinforcement secured and lapped (if necessary) against displacement using binding wire.

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			4.8 Fabricated reinforcement and spacer blocks installed horizontally referring to location, sizes, length, shape, types, and position in accordance with approved construction drawing and specifications. 4.9 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 4.10 Tools and equipment cleaned and kept in accordance with superior instruction. 4.11 Excess materials stored at designated area in accordance with superior instruction.
		5. Perform wall reinforcement	5.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 5.2 The wall reinforcement location, sizes, length, shape, types, and position identified in accordance with approved construction drawing and specifications. 5.3 Approved methods and types of wall reinforcement prepared in accordance with approved construction drawing and specifications. 5.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 5.5 Clean and functioning slab reinforcement tools, equipment, and

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			material prepared. 5.6 Reinforcement bent and length fabricated in accordance with approved construction drawing and specifications. 5.7 Reinforcement secured and lapped (if necessary) against displacement using binding wire. 5.8 Fabricated reinforcement and spacer blocks installed referring to location, sizes, length, shape, types, and position in accordance with approved construction drawing and specifications. 5.9 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 5.10 Tools and equipment cleaned and kept in accordance with superior instruction. 5.11 Excess materials stored at designated area in accordance with superior instruction.
		6. Perform staircase reinforcement	6.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 6.2 The staircase reinforcement location, sizes, length, shape, types, and position identified in accordance with approved construction drawing and specifications. 6.3 Approved methods and types of

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			staircase reinforcement prepared in accordance with approved construction drawing and specifications. 6.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 6.5 Clean and functioning staircase reinforcement tools, equipment, and material prepared. 6.6 Reinforcement bent and length fabricated in accordance with approved construction drawing and specifications. 6.7 Reinforcement secured and lapped (if necessary) against displacement using binding wire. 6.8 Fabricated reinforcement and spacer blocks installed referring to location, sizes, length, shape, types, and position in accordance with approved construction drawing and specifications. 6.9 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 6.10 Tools and equipment cleaned and kept in accordance with superior instruction. 6.11 Excess materials stored at designated area in accordance with superior instruction.

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4. Building Concreting Work F410-001-2:2019-C04	Building Concreting Work describes substance used for building, which is made by mixing together cement, sand, small stones, and water. It ensures that the mix will compactly fill all the interstices between the reinforcement rods as well as between the reinforcement rods and the formwork in order to achieve the required strength, impermeability to water, and frost resistance of the concrete. A competent person in this CU shall be able to perform foundation concreting, perform column concreting, perform beam concreting, perform slab concreting, perform wall concreting, and perform staircase concreting. The outcome of this competency is top grade and high quality concrete produced to ensure the structural integrity is intact in accordance with construction drawing.	1. Perform foundation concreting	1.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 1.2 The foundation concreting location, grades, material, and methods identified in accordance with approved construction drawing and specifications. 1.3 Clean and functioning concreting tools, equipment, and material prepared. 1.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 1.5 The work area cleared in accordance with standard specifications for building works. 1.6 Lean concrete poured evenly in accordance with standard specifications for building works. 1.7 Concrete poured and compacted in layer evenly in accordance with standard specifications for building works. 1.8 Concrete surface horizontally levelled referring to height in accordance with approved construction drawing and specifications. 1.9 Construction debris cleaned and transferred to designated area in accordance with construction procedures.

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			1.10 Tools and equipment cleaned and kept in accordance with superior instruction. 1.11 Excess materials stored at designated area in accordance with superior instruction. 1.12 Method of concrete curing identified in accordance with superior instruction. 1.13 Curing of concreting surface executed with standard specifications for building works.
		2. Perform column concreting	2.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 2.2 The column concreting location, grades, material, and methods identified in accordance with approved construction drawing and specifications. 2.3 Clean and functioning concreting tools, equipment, and material prepared. 2.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 2.5 The work area cleared in accordance with standard specifications for building works. 2.6 Fully secured working platform prepared in accordance with superior instruction. 2.7 Concrete poured and compacted in

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			layer evenly in accordance with standard specifications for building works. 2.8 Concrete surface horizontally levelled referring to height in accordance with approved construction drawing and specifications. 2.9 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 2.10 Tools and equipment cleaned and kept in accordance with superior instruction. 2.11 Excess materials stored at designated area in accordance with superior instruction. 2.12 Method of concrete curing identified in accordance with superior instruction. 2.13 Curing of concreting surface executed with standard specifications for building works.
		3. Perform beam concreting	3.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 3.2 The beam concreting location, grades, material, and methods identified in accordance with approved construction drawing and specifications. 3.3 Clean and functioning concreting

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			tools, equipment, and material prepared. 3.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 3.5 The work area cleared in accordance with standard specifications for building works. 3.6 Lean concrete poured evenly at ground beam in accordance with standard specifications for building works. 3.7 Concrete poured and compacted in layer evenly at ground beam and roof beam in accordance with standard specifications for building works. 3.8 Concrete poured and compacted in layer evenly at upper level simultaneously with slab in accordance with standard specifications for building works. 3.9 Concrete surface horizontally levelled referring to height in accordance with approved construction drawing and specifications. 3.10 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 3.11 Tools and equipment cleaned and kept in accordance with superior instruction. 3.12 Excess materials stored at designated

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			area in accordance with superior instruction. 3.13 Method of concrete curing identified in accordance with superior instruction. 3.14 Curing of concreting surface executed with standard specifications for building works.
		4. Perform slab concreting	4.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 4.2 The slab concreting location, grades, material, and methods identified in accordance with approved construction drawing and specifications. 4.3 Clean and functioning concreting tools, equipment, and material prepared. 4.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 4.5 The work area cleared in accordance with standard specifications for building works. 4.6 Lean concrete poured evenly at ground floor slab in accordance with standard specifications for building works. 4.7 Damp Proof Course (DPC) laid at ground floor slab in accordance with standard specifications for building works.

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			4.8 Concrete poured and compacted in layer evenly at ground slab in accordance with standard specifications for building works. 4.9 Concrete poured and compacted in layer evenly at upper level simultaneously with beam in accordance with standard specifications for building works. 4.10 Concrete surface horizontally levelled referring to height in accordance with approved construction drawing and specifications. 4.11 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 4.12 Tools and equipment cleaned and kept in accordance with superior instruction. 4.13 Excess materials stored at designated area in accordance with superior instruction. 4.14 Method of concrete curing identified in accordance with superior instruction. 4.15 Curing of concreting surface executed with standard specifications for building works.
		5. Perform wall concreting	5.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained.

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			5.2 The wall concreting location, grades, material, and methods identified in accordance with approved construction drawing and specifications. 5.3 Clean and functioning concreting tools, equipment, and material prepared. 5.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 5.5 The work area cleared in accordance with standard specifications for building works. 5.6 Fully secured working platform prepared in accordance with superior instruction. 5.7 Concrete poured and compacted in layer evenly in accordance with standard specifications for building works. 5.8 Concrete surface horizontally levelled referring to height in accordance with approved construction drawing and specifications. 5.9 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 5.10 Tools and equipment cleaned and kept in accordance with superior instruction. 5.11 Excess materials stored at designated

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			area in accordance with superior instruction. 5.12 Method of concrete curing identified in accordance with superior instruction. 5.13 Curing concreting surface executed with standard specifications for building works.
		6. Perform staircase concreting	6.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 6.2 The staircase concreting location, grades, material, and methods identified in accordance with approved construction drawing and specifications. 6.3 Clean and functioning concreting tools, equipment, and material prepared. 6.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 6.5 The work area cleared in accordance with standard specifications for building works. 6.6 Concrete poured and compacted in layer evenly at staircase in accordance with standard specifications for building works. 6.7 Concrete surface horizontally levelled referring to height in accordance with approved construction drawing and

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			specifications. 6.8 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 6.9 Tools and equipment cleaned and kept in accordance with superior instruction. 6.10 Excess materials stored at designated area in accordance with superior instruction. 6.11 Method of concrete curing identified in accordance with superior instruction. 6.12 Curing of concreting surface executed with standard specifications for building works.
5. Building Roof System Work F410-001-2:2019-C05	Building Roof System Work describes part of a building envelope. It is the covering on the uppermost part of a building or shelter that provides protection from animals and weather, notably rain, but also heat, wind and sunlight. A competent person in this CU shall be able to install roof truss (timber), install roof truss (steel), install roof finishing (metal deck), and install roof finishing (roof tile). The outcome of this competency is assemble roof system installed, components designed to weather proof,	1. Install roof truss (timber)	1.1 The approved construction building roofing system drawings and specifications obtained from superior. 1.2 The roof truss location, system design, types of material, and methods identified in accordance with approved construction drawing and specification. 1.3 The suitable tools, equipment selected and materials prepared in accordance with work requirement and manufacturer specifications. 1.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 1.5 The work area cleared in accordance with standard specifications for

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	and to insulate the roof of a building in accordance with construction drawing.		building works. 1.6 The roof truss system installed, aligned, pitching degree, anchored, and level checked in accordance with roofing shop drawings and manufacturer method of installation manual. 1.7 The installation works executed in accordance to Safety Procedure. 1.8 All tools and equipment cleaned and kept, stored at designated location identified by Superior. 1.9 Excess of materials are stored in accordance with site operation procedure.
		2. Install roof truss (steel)	2.1 The approved construction building roofing truss system drawings and specifications obtained from superior. 2.2 The roof truss location, system design, types of material, and methods identified in accordance with approved construction drawing and specification. 2.3 The suitable tools, equipment selected and materials identified are in accordance with work requirement and manufacturer specifications. 2.4 The suitable PPE, access platform, and hoisting equipment selected and used accordance with company SOP and DOSH requirements. 2.5 The work area cleared in accordance with standard operation for building works.

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			2.6 The roof truss pre-cut component members are marked, position arranged, assembled and tightened using fasteners in accordance to manufacturer specification and assembly manual drawings. 2.7 The roof truss system hoisted up in accordance with manufacturer recommended material handling procedure and to be positioned at the designated location. 2.8 The roof truss system positioned, aligned, secured, braced, and anchored in accordance with roofing shop drawings and manufacturer method of installation manual. 2.9 The batten system positioned, aligned, secured, braced, and anchored to receive roof cover in accordance with roof truss shop drawings and manufacturer method of installation manual. 2.10 The installation works executed in accordance to Safety Procedure. 2.11 All tools and equipment cleaned and kept, stored at designated location identified by Superior. 2.12 Excess of materials are stored in accordance with site operation procedure.
		3. Install roof finishing (metal deck)	3.1 The approved construction building roofing system drawings and specifications obtained from superior. 3.2 The roof cover location, design, types

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			of material, and methods identified in accordance with approved construction drawing and specification. 3.3 The suitable tools, equipment selected and materials identified are in accordance with work requirement and manufacturer specifications. 3.4 The suitable PPE selected and used accordance with company SOP and DOSH requirements. 3.5 The work area cleared in accordance with standard specifications for building works. 3.6 The roof cover hoisted in accordance with manufacturer recommended material handling procedure. 3.7 The roof cover positioned, laid in sequence, aligned, lapped, secured and fastened on top of batten in accordance with construction drawings and manufacturer method of installation manual. 3.8 The installation works executed in accordance with Safety Procedure. 3.9 All tools and equipment cleaned and kept, stored at designated location identified by Superior. 3.10 Excess of materials are stored in accordance with site operation procedure.
		4. Install roof finishing (roof tile)	4.1 The approved construction building roofing system drawings and specifications obtained from superior.

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			4.2 The roof cover location, design, types of material, and methods identified in accordance with approved construction drawing and specification. 4.3 The suitable tools, equipment selected and materials identified are in accordance with work requirement and manufacturer specifications. 4.4 The suitable PPE selected and used accordance with company SOP and DOSH requirements. 4.5 The work area cleared in accordance with standard operation for building works. 4.6 The roof tiles hoisted up and positioned at the designated location in accordance with manufacturer recommended material handling procedure. 4.7 The roof tiles positioned, laid in sequence, aligned, lapped, secured and fastened on top of batten in accordance with roofing shop drawings and manufacturer method of installation manual. 4.8 The installation works executed in accordance with Safety Procedure. 4.9 All tools and equipment cleaned and kept, stored at designated location identified by Superior. 4.10 Excess of materials are stored in accordance with site operation procedure.

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6. Building Steel Framing Installation F410-001-2:2019-C06	Building Steel Framing Installation describes erecting and fixing load bearing structure framing that consists of the assembly of steel load bearing structure framing components on site. The processes involve erecting, lifting and placing beam components into position, then connecting them together. A competent person in this CU shall be able to install steel column, install steel beam, install steel framing wall, and install steel floor joist. The outcome of this competency is the load bearing structure framing are erected and fixed based on construction drawing and the IBS structure integrity meet the determined specification.	1. Install steel column	1.1 The fabrication drawings and installation manual obtained from superior. 1.2 The column size, dimension, types and quantity of column parts & accessories identified in accordance with approved construction drawings and shop drawing. 1.3 Installation tools and equipment prepared in accordance with manufacturer recommendation. 1.4 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 1.5 The work area cleared in accordance with standard specifications for building works. 1.6 Column component parts & accessories assembled in accordance with installation manual. 1.7 Column hoisted to designated grid or position and complied to alignment, squareness and dimension of column in accordance with approved construction drawings and installation manual. 1.8 The steel column component marked, position aligned, secured and tightened using fasteners in accordance to manufacturer specification and assembly manual drawings. 1.9 The steel column location, system design, types of material, and

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			methods identified in accordance with approved construction drawing and specification. 1.10 The steel column installed vertically, squareness, levelled, and anchored in accordance with shop drawings and manufacturer method of installation manual. 1.11 The installation works executed in accordance with Safety Procedure. 1.12 All tools and equipment cleaned and kept, stored at designated location identified by Superior. 1.13 Excess of materials are stored in accordance with site operation procedure.
		2. Install steel beam	2.1 The fabrication drawings and installation manual obtained from superior. 2.2 The steel beam design, types of material, size, dimension and thickness identified based on approved construction drawings. 2.3 The suitable tools, equipment selected and materials identified are in accordance with work requirement and manufacturer specifications. 2.4 The suitable PPE selected and used accordance with company SOP and OSHA requirements. 2.5 The steel beam installed horizontally, squareness, levelled, and anchored in accordance with shop drawings and manufacturer method of installation

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			manual. 2.6 The installation works executed in accordance to safety procedure. 2.7 All tools and equipment cleaned and kept, stored at designated location identified. 2.8 Excess of materials are stored in accordance with site operation procedure.
		3. Install steel framing wall	3.1 The fabrication drawings and installation manual obtained from superior. 3.2 The steel framing wall size, dimension and thickness identified based on approved construction drawings. 3.3 The steel framing wall component marked, position arranged, assembled and secured using stiching fasteners in accordance to manufacturer specification and assembly manual drawings. 3.4 The steel framing wall location, system design, types of material, and methods identified in accordance with approved construction drawing and specification. 3.5 The suitable tools, equipment selected and materials identified are in accordance with work requirement and manufacturer specifications. 3.6 The suitable PPE selected and used accordance with company SOP and DOSH requirements.

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			3.7 The steel framing wall positioned, aligned, squareness, secured, braced, and anchored to floor slab in accordance with wall frame shop drawings and manufacturer method of installation manual. 3.8 The installation works executed in accordance to safety procedure. 3.9 All tools and equipment cleaned and kept, stored at designated location identified. 3.10 Excess of materials are stored in accordance with site operation procedure.
		4. Install steel floor joist	4.1 The approved construction building floor joist system drawings and specifications obtained from superior. 4.2 The floor joist location, system design, types of material, and methods identified in accordance with approved construction drawing and specification. 4.3 The suitable tools, equipment selected and materials identified are in accordance with work requirement and manufacturer specifications. 4.4 The suitable PPE selected and used accordance with company SOP and DOSH requirements. 4.5 The floor joist component members are marked, position arranged, assembled and tightened using fasteners in accordance to manufacturer specification and

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			assembly manual drawings. 4.6 The floor joist system hoisted up in accordance with manufacturer recommended material handling procedure and to be positioned at the designated location. 4.7 The floor joist system positioned, aligned, secured, braced, and anchored in accordance with roofing shop drawings and manufacturer method of installation manual. 4.8 The installation works executed in accordance to safety procedure. 4.9 All tools and equipment cleaned and kept, stored at designated location identified. 4.10 Excess of materials are stored in accordance with site operation procedure.
7. Building Precast Concrete Installation F410-001-2:2019-C07	Building Precast Concrete Installation describes the competencies required to install precast concrete column, beam, slab, wall panel, and staircase in building construction. A competent person in this CU shall be able to install precast concrete column, install precast concrete beam, install precast concrete slab, install precast concrete wall panel, and install precast concrete staircase. The outcome of this competency is the	1. Install precast concrete column	1.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 1.2 The precast concrete column location, sizes, and types identified in accordance with approved construction drawing and specifications. 1.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 1.4 Clean and functioning precast concrete column tools, equipment, and material prepared.

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	safety and accuracy of precast concrete column, beam, slab, wall panel, and staircase installation complied into the required position and orientation in accordance with method statement.		1.5 The work area cleared in accordance with standard specifications for building works. 1.6 Unloading area cleaned and obstruction cleared to avoid accidents and damage to the precast concrete components. 1.7 Precast concrete column unloaded using lifting equipment as per method statement and stacked in accordance with installation work sequence. 1.8 Control line and column installation location outline marked accurately as per layout drawing and job instruction. 1.9 Starter bar position and alignment checked and rectified to within specified tolerance to prevent any obstruction during installation. 1.10 Receiving floor surface adjusted to required level marking by placing levelling pads at the centre of the column. 1.11 Adjustable props fixed to precast column prior to hoisting for installation. 1.12 Precast column lifted to required position and props bolted onto existing floor for support. 1.13 Column alignment and verticality achieved by adjusting the adjustable props and checked using bubble level. 1.14 Minor touch-up works performed on

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			precast concrete column in accordance with job instructions procedure and safety requirements. 1.15 Installation tools and equipment used in accordance with operating. 1.16 Formwork prepared at the joints to cover gaps and prevent leakage. 1.17 High strength non shrink grout prepared in accordance with method statement. 1.18 Corrugated duct filled with non-shrink grout to ensure no leakage. 1.19 Grout cube sample prepared for testing in accordance with job instruction and method statement. 1.20 Adjustable props removed and stored at designated areas for future use in accordance with standard procedures upon clearance from superior. 1.21 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 1.22 Tools and equipment cleaned and kept in accordance with superior instruction. 1.23 Excess materials stored at designated area in accordance with superior instruction.
		2. Install precast concrete beam	2.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 2.2 The precast concrete beam location,

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			sizes, and types identified in accordance with approved construction drawing and specifications. 2.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 2.4 Clean and functioning precast concrete beam tools, equipment, and material prepared. 2.5 The work area cleared in accordance with standard specifications for building works. 2.6 Unloading area cleaned and obstruction cleared to avoid accidents and damage to the precast concrete components. 2.7 Precast concrete beams unloaded using lifting equipment as per method statement and stacked in accordance with installation work sequence. 2.8 Neoprene pads placed on receiving surface of the corbel for columns with corbel to avoid direct impact and for levelling purposes. 2.9 Precast beam lifted and adjusted to the designated position and orientation with the use of lifting equipment and temporary props for support (if required) as per method statement and design requirements. 2.10 Minor touch-up works performed on precast concrete beams in accordance with job instruction.

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			2.11 High strength non shrink grout prepared in accordance with method statement. 2.12 Corrugated ducts filled with non-shrink grout to fill up the gaps. 2.13 Installation tools and equipment used in accordance with operating procedure and safety requirements. 2.14 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 2.15 Tools and equipment cleaned and kept in accordance with superior instruction. 2.16 Excess materials stored at designated area in accordance with superior instruction.
		3. Install precast concrete slab	3.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 3.2 The precast concrete slab location, sizes, and types identified in accordance with approved construction drawing and specifications. 3.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 3.4 Clean and functioning precast concrete slab tools, equipment, and material prepared. 3.5 The work area cleared in accordance

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			with standard specifications for building works. 3.6 Unloading area cleaned and obstruction cleared to avoid accidents and damage to the precast concrete components. 3.7 Precast concrete slabs unloaded using lifting equipment as per method statement and stacked in accordance with installation work sequence. 3.8 Rubber strip placed on beam prior to installation to avoid direct impact and for levelling purposes. 3.9 Temporary props fixed to support slab in accordance with design requirements. 3.10 Precast slab lifted and adjusted to the designated position and orientation as per method statement. 3.11 Minor touch-up works performed on precast concrete slab in accordance with job instruction. 3.12 Shear-key grout mixture prepared in accordance with method statement. 3.13 Joints filled with shear-key grout to ensure no leakage. 3.14 Installation tools and equipment used in accordance with operating procedure and safety requirements. 3.15 Temporary props removed from beams and slabs, and stored at designated areas for future use in accordance with standard procedures upon clearance from superior.

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			3.16 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 3.17 Tools and equipment cleaned and kept in accordance with superior instruction. 3.18 Excess materials stored at designated area in accordance with superior instruction.
		4. Install precast concrete wall panel	4.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 4.2 The precast concrete wall panel location, sizes, and types identified in accordance with approved construction drawing and specifications. 4.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 4.4 Clean and functioning precast concrete wall panel tools, equipment, and material prepared. 4.5 The work area cleared in accordance with standard specifications for building works. 4.6 Unloading area cleaned and obstruction cleared to avoid accidents and damage to the precast concrete components 4.7 Precast concrete wall panel unloaded using lifting equipment as per method

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			statement and stacked in accordance with installation work sequence 4.8 Control line and wall panel installation location outline marked accurately as per layout drawing and job instruction 4.9 Starter bar position and alignment checked and rectified to within specified tolerance to prevent any obstruction during installation 4.10 Receiving floor surface adjusted to required level marking 4.11 Adjustable props fixed to precast wall panel prior to hoisting for installation 4.12 Precast wall panel lifted to required position and props bolted onto existing floor for support 4.13 Wall panel alignment and verticality achieved by adjusting the adjustable props and checked using bubble level 4.14 Minor touch-up works performed on precast concrete wall panel in accordance with job instruction 4.15 Installation tools and equipment used in accordance with operating procedure and safety requirements 4.16 Formwork prepared at the joints to cover gaps and prevent leakage 4.17 High strength non shrink grout prepared in accordance with method statement 4.18 Corrugated duct filled with non-shrink grout to ensure no leakage 4.19 Grout cube sample prepared for

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			testing in accordance with job instruction and method statement 4.20 Adjustable props removed and stored at designated areas for future use in accordance with standard procedures upon clearance from superior 4.21 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 4.22 Tools and equipment cleaned and kept in accordance with superior instruction. 4.23 Excess materials stored at designated area in accordance with superior instruction.
		5. Install precast concrete staircase	5.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 5.2 The precast concrete staircase location, sizes, and types identified in accordance with approved construction drawing and specifications. 5.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 5.4 Clean and functioning precast concrete staircase tools, equipment, and material prepared. 5.5 The work area cleared in accordance with standard specifications for building works.

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			5.6 Unloading area cleaned and obstruction cleared to avoid accidents and damage to the precast concrete components. 5.7 Precast concrete staircase unloaded using lifting equipment as per method statement and stacked in accordance with installation work sequence. 5.8 Spacing between support checked to ensure sufficient space for staircase installation. 5.9 Rubber strips placed on receiving surface of the supports. 5.10 Staircase or flights lifted and adjusted to the designated location as per method statement. 5.11 High strength non shrink grout prepared in accordance with method statement (for staircase installation). 5.12 Dowel bar joints filled securely with non-shrink grout to ensure no gaps (for staircase installation). 5.13 Minor touch-up works performed on precast concrete staircase in accordance with job instruction. 5.14 Installation tools and equipment used in accordance with operating procedure and safety requirements. 5.15 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 5.16 Tools and equipment cleaned and kept in accordance with superior

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			instruction. 5.17 Excess materials stored at designated area in accordance with superior instruction.
8. Building Door & Window Installation F410-001-2:2019-C08	Building Door & Window Installation describes the process of installing both the door and window which are moveable structure which a door is used to open and close and entrance or opening, typically consisting of a panel that swings on hinges or that slides or spins inside a space while a window is an opening in a wall, door, roof or vehicle that allows the passage of light and, if not closed or sealed, air and sound. A competent person in this CU shall be able to install door frame, install window frame, install door leaf, and install window leaf. The outcome of this competency is doors and windows with the right dimension, verticality, strength, durability and squareness installed and painted as per specification in construction drawing.	1. Install door frame	1.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 1.2 The door frame location, dimension, opening, grades, material, and methods identified in accordance with approved construction drawing and specifications. 1.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 1.4 Clean and functioning door frame installation tools, equipment, and material prepared. 1.5 The work area cleared in accordance with standard specifications for building works. 1.6 Door frame installation executed referring to squareness, verticality, strengthens and durability of frame in accordance with approved construction drawing and specifications. 1.7 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 1.8 Tools and equipment cleaned and kept in accordance with superior

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			instruction. 1.9 Excess materials stored at designated area in accordance with superior instruction.
		2. Install window frame	2.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 2.2 The window frame location, dimension, opening, grades, material, and methods identified in accordance with approved construction drawing and specifications. 2.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 2.4 Clean and functioning window frame installation tools, equipment, and material prepared. 2.5 The work area cleared in accordance with standard specifications for building works. 2.6 Window frame installation executed referring to squareness, verticality, strength and durability of frame in accordance with approved construction drawing and specifications. 2.7 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 2.8 Tools and equipment cleaned and kept in accordance with superior

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			instruction. 2.9 Excess materials stored at designated area in accordance with superior instruction.
		3. Install door leaf	3.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 3.2 The door leaf location, dimension, opening, grades, material, and methods identified in accordance with approved construction drawing and specifications. 3.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 3.4 Clean and functioning door leaf installation tools, equipment, and material prepared. 3.5 The work area cleared in accordance with standard specifications for building works. 3.6 Door leaf installation executed referring to squareness, verticality, strength and durability in accordance with approved construction drawing and specifications. 3.7 Ironmongery point set and drilled through in accordance with approved construction drawing and specifications. 3.8 Ironmongery installed referring to point and types of ironmongery in accordance with approved

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			construction drawing and specifications. 3.9 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 3.10 Tools and equipment cleaned and kept in accordance with superior instruction. 3.11 Excess materials stored at designated area in accordance with superior instruction.
		4. Install window leaf	4.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 4.2 The window leaf location, dimension, opening, grades, material, and methods identified in accordance with approved construction drawing and specifications. 4.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 4.4 Clean and functioning window leaf installation tools, equipment, and material prepared. 4.5 The work area cleared in accordance with standard specifications for building works. 4.6 Window leaf installation executed referring to squareness, verticality, strength and durability in accordance

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			with approved construction drawing and specifications. 4.7 Ironmongery point set and riveted/ screwed in accordance with approved construction drawing and specifications. 4.8 Ironmongery installed referring to point and types of ironmongery in accordance with approved construction drawing and specifications. 4.9 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 4.10 Tools and equipment cleaned and kept in accordance with superior instruction. 4.11 Excess materials stored at designated area in accordance with superior instruction.
9. Building Wall Work F410-001-2:2019-C09	Building Wall Work describes an upright structure of masonry, wood, plaster, or other building material serving to enclose, divide, or protect an area, especially a vertical construction forming an inner partition or exterior siding of a building. A competent person in this CU shall be able to perform laying brickwork, perform laying blockwork, install concrete panel, install glass panel, and perform drywall work.	1. Perform laying brickwork	1.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 1.2 The laying brickwork location, sizes, material, and methods identified in accordance with approved construction drawing and specifications. 1.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 1.4 Clean and functioning brickwork

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	The outcome of this competency is wall with the right dimension, strength and squareness installed/ constructed as per specification in construction drawing.		tools, equipment, and material prepared. 1.5 The work area cleared in accordance with standard specifications for building. 1.6 Visible brickwork location marked in accordance with approved construction drawing and specifications. 1.7 Damp proof membrane (DPM) laid in accordance with standard specifications for building works. 1.8 Bricks erected and bedded in mortar, and mesh reinforcement (exmet) applied in the mortar joints at 2nd and every 4th course of brick layer in accordance with standard specifications for building works. 1.9 The mortar between brick raked for fair face finishing in accordance with standard specifications for building works. 1.10 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 1.11 Tools and equipment cleaned and kept in accordance with superior instruction. 1.12 Excess materials stored at designated area in accordance with superior instruction.

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
		2. Perform laying blockwork	2.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 2.2 The laying blockwork location, sizes, material, and methods identified in accordance with approved construction drawing and specifications. 2.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 2.4 Clean and functioning blockwork tools, equipment, and material prepared. 2.5 The work area cleared in accordance with standard specifications for building works. 2.6 Visible blockwork location marked in accordance with approved construction drawing and specifications. 2.7 Damp proof membrane (DPM) laid in accordance with standard specifications for building works. 2.8 Block erected and bedded in mortar/ adhesive, and mesh reinforcement (exmet) applied in the mortar joints at 2nd and every 4th course of block layer in accordance with standard specifications for building works. 2.9 Steel link provided at blockwork junction in accordance with approved construction drawing and

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			specifications. 2.10 Steel bars provided and concreted at designated blockwork's hollow in accordance with approved construction drawing and specifications. 2.11 The mortar between block raked for fair face finishing in accordance with standard specifications for building works. 2.12 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 2.13 Tools and equipment cleaned and kept in accordance with superior instruction. 2.14 Excess materials stored at designated area in accordance with superior instruction.
		3. Install concrete panel	3.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 3.2 The concrete panel location, sizes, material, and methods identified in accordance with approved construction drawing and specifications. 3.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 3.4 Clean and functioning concrete panel tools, equipment, and material

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			prepared. 3.5 The work area cleared in accordance with standard specifications for building works. 3.6 Visible concrete panel location marked in accordance with approved construction drawing and specifications. 3.7 Starter bar installed at designated point in accordance with approved construction drawing and specifications. 3.8 Damp proof membrane (DPM) laid in accordance with standard specifications for building works. 3.9 Concrete panel erected vertically and prop installed in accordance approved with construction drawing and specifications. 3.10 Joint grouted referring to gap between panel to panel and panel to floor in accordance with approved construction drawing and specifications. 3.11 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 3.12 Tools and equipment cleaned and kept in accordance with superior instruction. 3.13 Excess materials stored at designated area in accordance with superior instruction.

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
		4. Install glass panel	4.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 4.2 The glass panel location, sizes, material, and methods identified in accordance with approved construction drawing and specifications. 4.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 4.4 Clean and functioning glass panel tools, equipment, and material prepared. 4.5 The work area cleared in accordance with standard specifications for building works. 4.6 Visible glass panel location marked in accordance with approved construction drawing and specifications. 4.7 Frame panel prepared in accordance with manufacturer specifications. 4.8 Glass panel erected vertically and prop installed in accordance with approved construction drawing and specifications. 4.9 Joint sealed referring to gap between panel to panel and panel to other building surface in accordance with approved construction drawing and specifications. 4.10 Construction debris cleaned and

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			transferred to designated area in accordance with construction procedures. 4.11 Tools and equipment cleaned and kept in accordance with superior instruction. 4.12 Excess materials stored at designated area in accordance with superior instruction.
		5. Perform drywall work	5.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 5.2 The drywall works location, sizes, material, and methods identified in accordance with approved construction drawing and specifications. 5.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 5.4 Clean and functioning drywall works tools, equipment, and material prepared. 5.5 The work area cleared in accordance with standard specifications for building works. 5.6 Visible drywall works location marked in accordance with approved construction drawing and specifications. 5.7 Drywall frame panel and horizontal bracing prepared, and prop installed

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			in accordance with manufacturer specifications. 5.8 Drywall panel erected, fastened, and secured in accordance with approved construction drawing and specifications. 5.9 Joint sealed referring to gap between panel to panel and panel to other building surface in accordance with approved construction drawing and specifications. 5.10 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 5.11 Tools and equipment cleaned and kept in accordance with superior instruction. 5.12 Excess materials stored at designated area in accordance with superior instruction.
10. Building Wall & Floor Finishing F410-001-2:2019-C10	Building Wall & Floor Finishing describes a fine job in building construction process and forms the beauty of a building. It functions as to protect/ cover the basic work, produce a flat surface and neatly and provide comfort and safety. A competent person in this CU shall be able to perform plastering work, perform rendering work, perform tiling work, and perform painting work.	1. Perform plastering work	1.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 1.2 The plastering works location, thickness, material, and methods identified in accordance with approved construction drawing and specifications. 1.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements.

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
	The outcome of this competency is wall plastering and floor rendering executed as per specification in construction drawing.		1.4 Clean and functioning plastering works tools, equipment, and material prepared. 1.5 The work area cleared in accordance with standard specifications for building works. 1.6 Plastering marking referring to location and thickness in accordance with approved construction drawing and specifications. 1.7 Building services hole (socket, pipe) sealed in accordance with approved construction drawing and specifications. 1.8 Plastering work executed from top to bottom in accordance with standard specifications for building works. 1.9 1st layer plastering work executed for coarse surface and 2nd layer for smooth surface in accordance with standard specifications for building works. 1.10 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 1.11 Tools and equipment cleaned and kept in accordance with superior instruction. 1.12 Excess materials stored at designated area in accordance with superior instruction.

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
		2. Perform rendering work	2.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 2.2 The rendering works location, thickness, material, and methods identified in accordance with approved construction drawing and specifications. 2.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 2.4 Clean and functioning rendering works tools, equipment, and material prepared. 2.5 The work area cleared in accordance with standard specifications for building works. 2.6 Rendering marking referring to location, thickness and levelness in accordance with approved construction drawing and specifications. 2.7 Building services hole (socket, pipe) sealed in accordance with approved construction drawing and specifications. 2.8 Rendering work executed and access to work area considered referring to working convenience. 2.9 1st layer rendering work executed for coarse surface and 2nd layer for smooth surface in accordance with standard specifications for building

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			works. 2.10 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 2.11 Tools and equipment cleaned and kept in accordance with superior instruction. 2.12 Excess materials stored at designated area in accordance with superior instruction.
		3. Perform tiling work	3.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 3.2 The tiling works location, type, size, colour, pattern of tiles, material, and methods identified in accordance with approved construction drawing and specifications. 3.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 3.4 Clean and functioning tiling works tools, equipment, and material prepared. 3.5 The work area cleared in accordance with standard specifications for building works. 3.6 Tiling marking referring to alignment (horizontal and vertical) of tile in accordance with approved construction drawing and specifications.

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			3.7 Tile cut referring to building services point (socket, pipe) in accordance with approved construction drawing and specifications. 3.8 Tiling work executed and access to work area considered referring to working convenience. 3.9 Finishing applied for tile jointing and edge in accordance with installation practices. 3.10 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 3.11 Tools and equipment cleaned and kept in accordance with superior instruction. 3.12 Excess materials stored at designated area in accordance with superior instruction.
		4. Perform painting work	4.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 4.2 The painting works location, type, colour code, and methods identified in accordance with approved construction drawing and specifications. 4.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 4.4 Clean and functioning painting works tools, equipment, and material

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			prepared. 4.5 The work area cleared in accordance with standard specifications for building works. 4.6 Surface for painting prepared referring to type of material surface (e.g. timber and metal) in accordance with standard specifications for building works. 4.7 Painting work executed referring to three layer (undercoat, primer coat and finish coat) in accordance with manufacturer specifications. 4.8 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 4.9 Tools and equipment cleaned and kept in accordance with superior instruction. 4.10 Excess materials stored at designated area in accordance with superior instruction.
11. Building Ceiling Finishing F410-001-2:2019-C11	Building Ceiling Finishing describes an overhead interior surface that covers the upper limits of a room. It is not generally considered a structural element, but a finished surface concealing the underside of the roof structure or the floor of a storey above. The most common type of ceiling is the suspended ceiling, which is suspender from structural elements above. Pipework or ducts can be run in	1. Perform plaster ceiling work	1.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 1.2 The plaster ceiling works location, types, pattern, sizes and methods identified in accordance with approved construction drawing and specifications. 1.3 The suitable PPE selected and used in

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
	the gap above the ceiling, and insulation and fireproofing material can be placed here. A competent person in this CU shall be able to perform plaster ceiling work, perform suspended ceiling work, and perform non-suspended ceiling work. The outcome of this competency is various types of ceiling with the right squareness and evenness installed as per specification in construction drawing.		accordance with company SOP and DOSH requirements. 1.4 Clean and functioning plaster ceiling works tools, equipment, and material prepared. 1.5 The work area cleared in accordance with standard specifications for building works. 1.6 Plaster ceiling marking levelled horizontally in accordance with approved construction drawing and specifications. 1.7 Ceiling frame/ hanger installed and secured referring to level marked in accordance with approved construction drawing and specifications. 1.8 Ceiling board installed and secured at ceiling frame/ hanger in accordance with approved construction drawing and specifications. 1.9 Joint sealed referring to hole, and gap between panel to panel and panel to other building surface in accordance with approved construction drawing and specifications. 1.10 Opening for building services prepared at designated location in accordance with approved construction drawing and specifications. 1.11 Skim coat plastered evenly in accordance with superior instruction. 1.12 Construction debris cleaned and

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			transferred to designated area in accordance with construction procedures. 1.13 Tools and equipment cleaned and kept in accordance with superior instruction. 1.14 Excess materials stored at designated area in accordance with superior instruction.
		2. Perform suspended ceiling work	2.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 2.2 The suspended ceiling works location, types, pattern, sizes and methods identified in accordance with approved construction drawing and specifications. 2.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 2.4 Clean and functioning suspended ceiling works tools, equipment, and material prepared. 2.5 The work area cleared in accordance with standard specifications for building works. 2.6 Suspended ceiling marking levelled horizontally in accordance with approved construction drawing and specifications. 2.7 Ceiling frame/ hanger installed and secured referring to level marked in

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			accordance with approved construction drawing and specifications. 2.8 Ceiling board installed at ceiling frame/ hanger in accordance with approved construction drawing and specifications. 2.9 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 2.10 Tools and equipment cleaned and kept in accordance with superior instruction. 2.11 Excess materials stored at designated area in accordance with superior instruction.
		3. Perform non-suspended ceiling work	3.1 The approved construction drawing and specifications (structure drawing and floor plan layout) from superior obtained. 3.2 The non-suspended ceiling works location, types, pattern, sizes and methods identified in accordance with approved construction drawing and specifications. 3.3 The suitable PPE selected and used in accordance with company SOP and DOSH requirements. 3.4 Clean and functioning non-suspended ceiling works tools, equipment, and material prepared. 3.5 The work area cleared in accordance

CU TITLE & CU CODE	CU DESCRIPTOR	WORK ACTIVITIES	PERFORMANCE CRITERIA
			with standard specifications for building works. 3.6 Non-suspended ceiling marking levelled horizontally in accordance with approved construction drawing and specifications. 3.7 Ceiling frame installed and secured referring to level marked in accordance with approved construction drawing and specifications. 3.8 Ceiling board fixed at ceiling frame in accordance with approved construction drawing and specifications. 3.9 Construction debris cleaned and transferred to designated area in accordance with construction procedures. 3.10 Tools and equipment cleaned and kept in accordance with superior instruction. 3.11 Excess materials stored at designated area in accordance with superior instruction.

CURRICULUM OF COMPETENCY UNIT

NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR:

BUILDING CONSTRUCTION OPERATION

LEVEL 2

15. Curriculum of Competency Unit

15.1. Site Building Construction Preparation

SECTION	(F) Construction		
GROUP	(410) Construction of Buildings		
AREA	Building Construction		
NOSS TITLE	Building Construction Operation		
COMPETENCY UNIT TITLE	Site Building Construction Preparation		
LEARNING OUTCOMES	The outcome of this competency unit is the land/site is prepared and qualified for any and all construction works in accordance to the construction drawing. Upon completion of this competency unit, trainees shall be able to: 1. Build site hoarding 2. Prepare temporary building 3. Perform site clearing 4. Prepare silt trap and wash through 5. Prepare perimeter drain		
TRAINING PRE-REQUISITE (SPECIFIC)	Not Available		
CU CODE	F410-001-2:2019-C01	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Build site hoarding	1.1 Content of the drawing and specification: • Project title • Symbol • Layout • Location • Types of site hoarding • List of specification 1.2 Type of hoarding: • Metal • Timber	1.1 Obtain site hoarding drawing and specifications 1.2 Identify hoarding location 1.3 Identify hoarding material/ types 1.4 Clear work area 1.5 Excavate hoarding pole point 1.6 Install site hoarding frame 1.7 Install hoarding	<u>ATTITUDE</u> • Diligent, patient, and meticulous in carrying out hoarding installation work <u>SAFETY</u> • Adhere to safety requirement • Wear proper PPE <u>ENVIRONMENT</u>	1.1 Understanding of construction drawing and specification listed out and explained. 1.2 The hoarding location, design, and types of material listed out and explained. 1.3 The work area pegged and cleared were demonstrated. 1.4 The location and depth of excavation for pole point excavated were demonstrated. 1.5 Hoarding post erected is demonstrated.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Plywood 1.3 Authority bodies requirements on hoarding installation: • Size • Height • Position/ location 1.4 Types of construction debris 1.5 Types of cleaning tools and equipment 1.6 Hoarding installation sequence: • Measure • Mark post distance • Excavate/Dig hole • Erect post • Assemble frame members • Install panels and support 1.7 Hoarding installation quality: • Alignment (horizontal and verticality) • Strength • Durability • Jointing 1.8 Safety requirements (PPE) • Types of PPE (Reflected vest,	support 1.8 Install hoarding cover 1.9 Clean work area	• Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	1.6 Site hoarding frame, cover, and support installed were demonstrated. 1.7 Construction debris cleaned and transferred to designated area were listed out and explained. 1.8 Tools and equipment cleaned and kept were listed out and explained. 1.9 Excess materials stored at designated area listed out and explained.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	Safety boots, Hard head, Hand Glove, Goggle) • Usage of PPE			
2. Prepare temporary building	2.1 Content of the drawing and specification: • Project title • Symbol • Layout • Location • Types of temporary building • List of specification 2.2 Types of general existing site condition 2.3 Types of clearing tools, equipment, and materials 2.4 Types of building base materials 2.5 Types of building base tools and equipment 2.6 Building base process: • Measure • Marking • Alignment • Construct 2.7 Types of construction debris 2.8 Types of cleaning tools and equipment 2.9 Tools and equipment storing procedures	2.1 Obtain drawing and specifications 2.2 Identify location of temporary building 2.3 Identify types of temporary building 2.4 Clear work area 2.5 Construct temporary building base 2.6 Construct temporary building 2.7 Clean work area	<u>ATTITUDE</u> • Diligent, patient, and meticulous in carrying out temporary building work <u>SAFETY</u> • Adhere to safety requirement • Wear proper PPE <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	2.1 Understanding of construction drawing and specification listed out and explained. 2.2 The temporary building location, design, types, and materials listed out and explained. 2.3 The work area pegged and cleared were demonstrated. 2.4 Temporary building base at the location with levelled base and given dimension were demonstrated. 2.5 Referring to temporary building types and dimension, temporary building constructed on designated base level is demonstrated. 2.6 Construction debris cleaned and transferred to designated area were listed out and explained. 2.7 Tools and equipment cleaned and kept were listed out and explained. 2.8 Excess materials stored at designated area were listed out and explained.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	2.10 Safety requirements (PPE) • Types of PPE (Reflected vest, Safety boots, Hard head, Hand Glove, Goggle) • Usage of PPE			
3. Perform site clearing	3.1 Content of the drawing and specification: • Project title • Symbol • Layout • Location 3.2 Types and functions of tools: • Measuring tape • Marking tools (spray paint, barricade tape, wood / steel peg) • Hand tools and equipment 3.3 Definition of site clearance works in project construction specification 3.4 Site clearance works activities: • Site clearance • Cart away debris • Top soil stripping 3.5 Safety requirements	3.1 Obtain drawing and specification 3.2 Identify site boundary 3.3 Identify site clearing methods 3.4 Clear site 3.5 Dispose site/ construction waste	ATTITUDE • Diligent, patient, and meticulous in carrying out temporary building work SAFETY • Adhere to safety requirement • Wear proper PPE ENVIRONMENT • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	3.1 The approved construction drawing and specifications (site layout) explained. 3.2 Definition of site clearance works in project construction specification listed out and explained. 3.3 Site boundary identified is demonstrated. 3.4 Site clearing methods identified were listed out and explained. 3.5 The work area cleared demonstrated. 3.6 Site/ construction waste disposed is demonstrated.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	(PPE) • Types of PPE (Reflected vest, Safety boots, Hard head, Hand Glove, Goggle) • Usage of PPE			
4. Prepare silt trap and wash through	4.1 Content of the silt trap and wash through drawing: • Project title • Symbol • Layout • Location 4.2 Types of silt trap 4.3 Types of wash through 4.4 Building silt trap and wash through process: • Measure • Marking • Dimension • Alignment • Construct 4.5 Types of construction debris 4.6 Types of cleaning tools and equipment 4.7 Tools and equipment storing procedures 4.8 Safety requirements (PPE) • Types of PPE (Reflected vest, Safety boots, Hard	4.1 Obtain drawing and specification 4.2 Identify silt trap and wash through location 4.3 Construct silt trap and wash through 4.4 Clean work area	ATTITUDE • Diligent, patient, and meticulous in carrying out silt trap and wash through work SAFETY • Adhere to safety requirement • Wear proper PPE ENVIRONMENT • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	4.1 The approved construction drawing and specifications (silt trap and wash through) were listed out and explained. 4.2 The silt trap and wash through location, design, types, and materials identified listed out and explained. 4.3 Silt trap and wash through constructed at the location, levelled base, and dimension were explained. 4.4 Construction debris cleared and transferred to designated area were explained. 4.5 Tools and equipment cleaned and kept were demonstrated. 4.6 Excess materials stored at designated area were demonstrated.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	head, Hand Glove, Goggle) • Usage of PPE			
5. Prepare perimeter drain	5.1 Content of the perimeter drain drawing: • Project title • Symbol • Layout • Location 5.2 Gradient, size, types, and materials of perimeter drain 5.3 Building perimeter drain process: • Measure • Marking • Dimension • Alignment • Excavate • Install 5.4 Types of construction debris 5.5 Types of cleaning tools and equipment 5.6 Tools and equipment storing procedures 5.7 Safety requirements (PPE) • Types of PPE (Reflected vest, Safety boots, Hard head, Hand Glove,	5.1 Obtain drawing and specification 5.2 Identify perimeter drain location 5.3 Construct perimeter drain 5.4 Clean work area	<u>ATTITUDE</u> • Diligent, patient, and meticulous in carrying out perimeter drain <u>SAFETY</u> • Adhere to safety requirement • Wear proper PPE <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	5.1 The approved construction drawing and specifications (perimeter drain) were listed out and explained. 5.2 Perimeter drain location, gradient, size, types, and materials identified were listed out and explained. 5.3 Perimeter drain installed at the excavated location, levelled base, and dimension demonstrated. 5.4 Construction debris cleared and transferred to designated area demonstrated. 5.5 Tools and equipment cleaned and kept demonstrated. 5.6 Excess materials stored at designated area demonstrated.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	Goggle) • Usage of PPE			

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

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15.2. Building Formwork Work

SECTION	(F) Construction		
GROUP	(410) Construction of Buildings		
AREA	Building Construction		
NOSS TITLE	Building Construction Operation		
COMPETENCY UNIT TITLE	Building Formwork Work		
LEARNING OUTCOMES	The outcome of this competency unit is a stable formwork fabricated and installed to be able to withstand all types of dead and live loads in the correct position in accordance with construction drawing. Upon completion of this competency unit, trainees shall be able to: 1. Perform foundation formwork 2. Perform column formwork 3. Perform beam formwork 4. Perform slab formwork 5. Perform wall formwork 6. Perform staircase formwork		
TRAINING PRE-REQUISITE (SPECIFIC)	Not Available		
CU CODE	F410-001-2:2019-C02	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Perform foundation formwork	1.1 Content of the drawing and specification: • Layout • Location • Specification 1.2 Types of formwork materials: • Timber • Plastic • Steel 1.3 Formwork installation	1.1 Obtain drawing and specification 1.2 Identify formwork location 1.3 Identify formwork requirements 1.4 Prepare formwork tools and equipment 1.5 Prepare formwork material 1.6 Clear work area 1.7 Execute setting out	<u>ATTITUDE</u> • Meticulous and precise in interpreting structural construction drawing • Meticulous and precise in setting up foundation / pile cap formwork • Systematic in setting up foundation / pile cap formwork • Time conscious in	1.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 1.2 Purpose and function of column formwork listed out and explained 1.3 The foundation formwork location, design, types, and materials identified were listed out and explained

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	and dismantle method 1.4 Handling of formwork 1.5 Types of foundation: • Shallow foundation (Pad, Strip, Raft) • Deep foundation (Piling) 1.6 Purpose and function of foundation 1.7 Types and functions of tools, materials and equipment for foundation formwork: • Cutting tools • Measuring tool • Hand tools 1.8 Foundation formwork process: • Measure • Cut • Assemble • Marking • Alignment • Install • Dismantle 1.9 Safety requirements (PPE) • Types of PPE (Reflected vest, Safety boots, Hard head, Hand Glove, Goggle) • Usage of PPE	1.8 Fabricate formwork 1.9 Install formwork and prop/ support 1.10 Align formwork 1.11 Clean work area 1.12 Dismantle formwork and prop/ support	completing task <u>SAFETY</u> • Alert to foundation / pile cap formwork hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	1.4 Approved material, methods, types, and dimension of formwork prepared were listed out and explained 1.5 Clean and functioning formwork tools and equipment prepared were demonstrated 1.6 Flat, clean, and free from defect of formwork material prepared were demonstrated 1.7 The work area cleared and alignment (horizontal and vertical) marked were demonstrated 1.8 Foundation formwork fabricated referring to material and size were demonstrated 1.9 Foundation formwork and prop installed referring to alignment (horizontal and vertical), tightness, rigidity, and stability were demonstrated 1.10 Construction debris cleaned and transferred to designated area were demonstrated 1.11 Tools and equipment cleaned and kept were demonstrated 1.12 Excess materials stored at designated area were demonstrated 1.13 Foundation formwork dismantled without shock or vibration were demonstrated 1.14 3R's (Reduce, Reuse and

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				Recycle) concept applied
2. Perform column formwork	2.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 2.2 Types of column formwork 2.3 Purpose and function of column formwork 2.4 Types and functions of tools, materials and equipment for column formwork: • Cutting tools • Measuring tool • Hand tools 2.5 Column formwork process: • Measure • Cut • Assemble • Marking • Alignment • Install • Dismantle 2.6 Safety requirements (PPE) • Types of PPE (Reflected vest, Safety boots, Hard	2.1 Obtain drawing and specification 2.2 Identify formwork location 2.3 Identify formwork requirements 2.4 Prepare formwork tools and equipment 2.5 Prepare formwork material 2.6 Clear work area 2.7 Execute setting out 2.8 Fabricate formwork 2.9 Install formwork and prop/ support 2.10 Align formwork 2.11 Clean work area 2.12 Dismantle formwork and prop/ support	<u>ATTITUDE</u> • Meticulous and precise in setting up column formwork • Systematic in setting up column formwork • Time and cost conscious in completing task <u>SAFETY</u> • Alert to column formwork hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	2.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 2.2 Purpose and function of column formwork listed out and explained 2.3 The column formwork location, design, types, and materials identified were listed out and explained 2.4 Approved material, methods, types, and dimension of formwork prepared were listed out and explained 2.5 Clean and functioning formwork tools and equipment prepared were demonstrated 2.6 Flat, clean, and free from defect of formwork material prepared were demonstrated 2.7 The work area cleared and alignment (horizontal and vertical) marked were demonstrated 2.8 Column formwork fabricated referring to material and size were demonstrated 2.9 Column formwork and prop installed after reinforcement works completed referring to

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	head, Hand Glove, Goggle) • Usage of PPE			alignment (horizontal and vertical), tightness, rigidity, and stability were demonstrated 2.10 Construction debris cleaned and transferred to designated area were demonstrated 2.11 Tools and equipment cleaned and kept were demonstrated 2.12 Excess materials stored at designated area were demonstrated 2.13 Column formwork dismantled without shock or vibration were demonstrated 2.14 3R's (Reduce, Reuse and Recycle) concept applied
3. Perform beam formwork	3.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 3.2 Types of beam formwork 3.3 Purpose and function of beam formwork 3.4 Types and functions of tools, materials and equipment for beam formwork: • Cutting tools • Measuring tool • Hand tools	3.1 Obtain drawing and specification 3.2 Identify formwork location 3.3 Identify formwork requirements 3.4 Prepare formwork tools and equipment 3.5 Prepare formwork material 3.6 Clear work area 3.7 Execute setting out 3.8 Fabricate formwork 3.9 Install formwork and prop/ support 3.10 Align formwork 3.11 Clean work area	<u>ATTITUDE</u> • Meticulous and precise in setting up beam formwork • Systematic in setting up beam formwork • Time and cost conscious in completing task <u>SAFETY</u> • Alert to beam formwork hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u>	3.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 3.2 Purpose and function of beam formwork listed out and explained 3.3 The beam formwork location, design, types, and materials identified were listed out and explained 3.4 Approved material, methods, types, and dimension of formwork prepared were listed out and explained 3.5 Clean and functioning

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	3.5 Beam formwork process: • Measure • Cut • Assemble • Marking • Alignment • Install • Dismantle 3.6 Safety requirements (PPE) • Types of PPE (Reflected vest, Safety boots, Hard head, Hand Glove, Goggle) • Usage of PPE	3.12 Dismantle formwork and prop/ support	• Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	formwork tools and equipment prepared were demonstrated 3.6 Flat, clean, and free from defect of formwork material prepared were demonstrated 3.7 The work area cleared and alignment (horizontal and vertical) marked were demonstrated 3.8 Beam formwork fabricated referring to material and size were demonstrated 3.9 Beam formwork and prop installed (for upper beam) referring to alignment (horizontal and vertical), tightness, rigidity, and stability were demonstrated 3.10 Construction debris cleaned and transferred to designated area were demonstrated 3.11 Tools and equipment cleaned and kept were demonstrated 3.12 Excess materials stored at designated area were demonstrated 3.13 Beam formwork dismantled without shock or vibration were demonstrated 3.14 3R's (Reduce, Reuse and Recycle) concept applied

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
4. Perform slab formwork	4.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 4.2 Types of slab formwork 4.3 Purpose and function of slab formwork 4.4 Types and functions of tools, materials and equipment for slab formwork: • Cutting tools • Measuring tool • Hand tools 4.5 Slab formwork process: • Measure • Cut • Assemble • Marking • Alignment • Install • Dismantle	4.1 Obtain drawing and specification 4.2 Identify formwork location 4.3 Identify formwork requirements 4.4 Prepare formwork tools and equipment 4.5 Prepare formwork material 4.6 Clear work area 4.7 Execute setting out 4.8 Fabricate formwork 4.9 Install formwork and prop/ support 4.10 Align formwork 4.11 Clean work area 4.12 Dismantle formwork and prop/ support	<u>ATTITUDE</u> • Meticulous and precise in setting up slab formwork • Systematic in setting up slab formwork • Time and cost conscious in completing task <u>SAFETY</u> • Alert to slab formwork hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	4.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 4.2 Purpose and function of slab formwork listed out and explained 4.3 The slab formwork location, design, types, and materials identified were listed out and explained 4.4 Approved material, methods, types, and dimension of formwork prepared were listed out and explained 4.5 Clean and functioning formwork tools and equipment prepared were demonstrated 4.6 Flat, clean, and free from defect of formwork material prepared were demonstrated 4.7 The work area cleared and alignment (horizontal and vertical) marked were demonstrated 4.8 Slab formwork fabricated referring to material and size were demonstrated 4.9 Slab formwork and prop installed (for upper slab) referring to alignment (horizontal and vertical), tightness, rigidity, and stability

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				were demonstrated 4.10 Construction debris cleaned and transferred to designated area were demonstrated 4.11 Tools and equipment cleaned and kept were demonstrated 4.12 Excess materials stored at designated area were demonstrated 4.13 Slab formwork dismantled without shock or vibration were demonstrated 4.14 3R's (Reduce, Reuse and Recycle) concept applied
5. Perform wall formwork	5.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 5.2 Types of wall formwork 5.3 Purpose and function of wall formwork 5.4 Types and functions of tools, materials, and equipment for wall formwork: • Cutting tools • Measuring tool • Hand tools 5.5 Wall formwork process: • Measure	5.1 Obtain drawing and specification 5.2 Identify formwork location 5.3 Identify formwork requirements 5.4 Prepare formwork tools and equipment 5.5 Prepare formwork material 5.6 Clear work area 5.7 Execute setting out 5.8 Fabricate formwork 5.9 Install formwork and prop/ support 5.10 Align formwork 5.11 Clean work area 5.12 Dismantle formwork and prop/ support	<u>ATTITUDE</u> • Meticulous and precise in setting up wall formwork • Systematic in setting up wall formwork • Time and cost conscious in completing task <u>SAFETY</u> • Alert to wall formwork hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements	5.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 5.2 Purpose and function of wall formwork listed out and explained 5.3 The wall formwork location, design, types, and materials identified were listed out and explained 5.4 Approved material, methods, types, and dimension of formwork prepared were listed out and explained 5.5 Clean and functioning formwork tools and equipment prepared were demonstrated 5.6 Flat, clean, and free from defect

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Cut • Assemble • Marking • Alignment • Install • Dismantle		• Adhere to 3R's (Reduce, Reuse and Recycle) practices	of formwork material prepared were demonstrated 5.7 The work area cleared and alignment (horizontal and vertical) marked were demonstrated 5.8 Wall formwork fabricated referring to material and size were demonstrated 5.9 Wall formwork, prop, and tie rod (if necessary) installed after reinforcement works completed referring to alignment (horizontal and vertical), tightness, rigidity, and stability were demonstrated 5.10 Construction debris cleaned and transferred to designated area were demonstrated 5.11 Tools and equipment cleaned and kept were demonstrated 5.12 Excess materials stored at designated area were demonstrated 5.12 Wall formwork dismantled without shock or vibration were demonstrated 5.13 3R's (Reduce, Reuse and Recycle) concept applied

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
6. Perform staircase formwork	6.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 6.2 Types of staircase formwork 6.3 Purpose and function of staircase formwork 6.4 Types and functions of tools, materials and equipment for staircase formwork: • Cutting tools • Measuring tool • Hand tools 6.5 Staircase formwork process: • Measure • Cut • Assemble • Marking • Alignment • Install • Dismantle	6.1 Obtain drawing and specification 6.2 Identify formwork location 6.3 Identify formwork requirements 6.4 Prepare formwork tools and equipment 6.5 Prepare formwork material 6.6 Clear work area 6.7 Execute setting out 6.8 Fabricate formwork 6.9 Install formwork and prop/ support 6.10 Align formwork 6.11 Clean work area 6.12 Dismantle formwork and prop/ support	ATTITUDE • Meticulous and precise in setting up staircase formwork • Systematic in setting up staircase formwork • Time and cost conscious in completing task SAFETY • Alert to staircase formwork hazard • Adhere to DOSH requirements ENVIRONMENT • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	6.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 6.2 Purpose and function of staircase formwork listed out and explained 6.3 The staircase formwork location, design, types, and materials identified were listed out and explained 6.4 Approved material, methods, types, and dimension of formwork prepared were listed out and explained 6.5 Clean and functioning formwork tools and equipment prepared were demonstrated 6.6 Flat, clean, and free from defect of formwork material prepared were demonstrated 6.7 The work area cleared and alignment (horizontal and vertical) marked were demonstrated 6.8 Staircase formwork fabricated referring to material and size were demonstrated 6.9 Staircase formwork and prop installed (for upper slab) referring to alignment (horizontal and vertical), dimensions (tread, riser, and

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				platform), tightness, rigidity, and stability were demonstrated 6.10 Construction debris cleaned and transferred to designated area were demonstrated 6.11 Tools and equipment cleaned and kept were demonstrated 6.12 Excess materials stored at designated area were demonstrated 6.13 Staircase formwork dismantled without shock or vibration were demonstrated 6.14 3R's (Reduce, Reuse and Recycle) concept applied

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

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15.3. Building Reinforcement Work

SECTION	(F) Construction		
GROUP	(410) Construction of Buildings		
AREA	Building Construction		
NOSS TITLE	Building Construction Operation		
COMPETENCY UNIT TITLE	Building Reinforcement Work		
LEARNING OUTCOMES	The outcome of this competency unit is stable reinforcement produced to help withstand the concrete and resist the applied stress in accordance with construction drawing. Upon completion of this competency unit, trainees shall be able to: 1. Perform foundation reinforcement 2. Perform column reinforcement 3. Perform beam reinforcement 4. Perform slab reinforcement 5. Perform wall reinforcement 6. Perform staircase reinforcement		
TRAINING PRE-REQUISITE (SPECIFIC)	Not Available		
CU CODE	F410-001-2:2019-C03	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Perform foundation reinforcement	1.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 1.2 Understanding of structural drawing 1.3 Purpose and function of reinforcement 1.4 Types of reinforcement:	1.1 Obtain drawing and specification 1.2 Identify reinforcement location 1.3 Identify reinforcement requirements 1.4 Prepare reinforcement tools and equipment 1.5 Fabricate (cut and form) reinforcement 1.6 Install fabricated reinforcement and spacer blocks	ATTITUDE • Meticulous and precise in interpreting structural drawing • Meticulous in fabricating of reinforcement bar • Systematic in fabricating reinforcement bar work • Time and cost conscious in completing task	1.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 1.2 Purpose and function of reinforcement listed out and explained 1.3 The foundation reinforcement location, sizes, length, shape, types, and position identified were listed out and explained 1.4 Approved methods and types of

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• High Yield Steel (Y, T, H) • Mild Steel (R) • Pre-fabricated reinforcement mesh 1.5 Fabrication and installation method 1.6 Purpose of cleaning reinforcement bar (rust / oil free) 1.7 Reinforcement fabrication process: • Cut • Bend • Tied • Placed reinforcement bar 1.8 Purpose of spacers and fastener installation 1.9 Types of spacer which includes: • Plastic • Steels • Concrete 1.10 Types of fastener: • Timber • Wire • Steel bar	1.7 Clean work area	<u>SAFETY</u> • Alert to reinforcement bar hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	foundation reinforcement prepared were listed out and explained 1.5 Clean and functioning foundation reinforcement tools, equipment, and material prepared were listed out, explained and demonstrated 1.6 Reinforcement bent and length fabricated were demonstrated 1.7 Reinforcement secured and lapped against displacement using binding wire were demonstrated 1.8 Type and purpose of spacers installation listed out and explained 1.9 Fabricated reinforcement and spacer blocks horizontally referring to location, sizes, length, shape, types, and position installed were demonstrated 1.10 Construction debris cleaned and transferred to designated area were demonstrated 1.11 Tools and equipment cleaned and kept were demonstrated 1.12 Excess materials stored at designated area were demonstrated

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
2. Perform column reinforcement	2.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 2.2 Understanding of structural drawing 2.3 Purpose and function of reinforcement 2.4 Types of reinforcement: • High Yield Steel (Y, T, H) • Mild Steel (R) 2.5 Fabrication and installation method 2.6 Purpose of cleaning reinforcement bar (rust / oil free) 2.7 Reinforcement fabrication process: • Cut • Bend • Tied • Placed reinforcement bar 2.8 Purpose of spacers and fastener installation 2.9 Types of spacer which includes: • Plastic • Steels • Concrete	2.1 Obtain drawing and specification 2.2 Identify reinforcement location 2.3 Identify reinforcement requirements 2.4 Prepare reinforcement tools and equipment 2.5 Fabricate (cut and form) reinforcement 2.6 Install fabricated reinforcement and spacer 2.7 Clean work area	ATTITUDE • Meticulous and precise in interpreting structural drawing • Meticulous in fabricating of reinforcement bar • Systematic in fabricating reinforcement bar work • Time and cost conscious in completing task SAFETY • Alert to reinforcement bar hazard • Adhere to DOSH requirements ENVIRONMENT • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	2.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 2.2 Purpose and function of reinforcement listed out and explained 2.3 The column reinforcement location, sizes, length, shape, types, and position identified were listed out and explained 2.4 Approved methods and types of column reinforcement prepared were listed out and explained 2.5 Clean and functioning column reinforcement tools, equipment, and material prepared were listed out, explained and demonstrated 2.6 Reinforcement bent and length fabricated were demonstrated 2.7 Reinforcement secured and lapped against displacement using binding wire were demonstrated 2.8 Type and purpose of spacers installation listed out and explained 2.9 Fabricated reinforcement and spacer blocks installed vertically referring to location, sizes, length, shape, types, and position were demonstrated

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	2.10 Types of fastener: • Timber • Wire • Steel bar			2.10 Construction debris cleaned and transferred to designated area were demonstrated 2.11 Tools and equipment cleaned and kept were demonstrated 2.12 Excess materials stored at designated area were demonstrated
3. Perform beam reinforcement	3.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 3.2 Understanding of structural drawing 3.3 Purpose and function of reinforcement 3.4 Types of reinforcement: • High Yield Steel (Y, T, H) • Mild Steel (R) 3.5 Fabrication and installation method 3.6 Purpose of cleaning reinforcement bar (rust / oil free) 3.7 Reinforcement fabrication process: • Cut • Bend • Tied • Placed	3.1 Obtain drawing and specification 3.2 Identify reinforcement location 3.3 Identify reinforcement requirements 3.4 Prepare reinforcement tools and equipment 3.5 Fabricate (cut and form) reinforcement 3.6 Install fabricated reinforcement and spacer 3.7 Clean work area	<u>ATTITUDE</u> • Meticulous and precise in interpreting structural drawing • Meticulous in fabricating of reinforcement bar • Systematic in fabricating reinforcement bar work • Time and cost conscious in completing task <u>SAFETY</u> • Alert to reinforcement bar hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and	3.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 3.2 Purpose and function of reinforcement listed out and explained 3.3 The beam reinforcement location, sizes, length, shape, types, and position identified were listed out and explained 3.4 Approved methods and types of beam reinforcement prepared in accordance were listed out and explained 3.5 Clean and functioning beam reinforcement tools, equipment, and material prepared were listed out, explained and demonstrated 3.6 Reinforcement bent and length fabricated were demonstrated 3.7 Reinforcement secured and lapped against displacement using binding wire were

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	reinforcement bar 3.8 Purpose of spacers and fastener installation 3.9 Types of spacer which includes: • Plastic • Steels • Concrete 3.10 Types of fastener: • Timber • Wire • Steel bar		Recycle) practices	demonstrated 3.8 Type and purpose of spacers installation listed out and explained 3.9 Fabricated reinforcement and spacer blocks installed horizontally referring to location, sizes, length, shape, types, and position were demonstrated 3.10 Construction debris cleaned and transferred to designated area were demonstrated 3.11 Tools and equipment cleaned and kept in accordance with superior instruction. 3.12 Excess materials stored at designated area in accordance with superior instruction.
4. Perform slab reinforcement	4.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 4.2 Understanding of structural drawing 4.3 Purpose and function of reinforcement 4.4 Types of reinforcement: • High Yield Steel (Y, T, H)	4.1 Obtain drawing and specification 4.2 Identify reinforcement location 4.3 Identify reinforcement requirements 4.4 Prepare reinforcement tools and equipment 4.5 Fabricate (cut and form) reinforcement 4.6 Install fabricated reinforcement and spacer 4.7 Clean work area	<u>ATTITUDE</u> • Meticulous and precise in interpreting structural drawing • Meticulous in fabricating of reinforcement bar • Systematic in fabricating reinforcement bar work • Time and cost conscious in completing task	4.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 4.2 Purpose and function of reinforcement listed out and explained 4.3 The slab reinforcement location, sizes, length, shape, types, and position identified were listed out, explained and demonstrated 4.4 Approved methods and types of

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Mild Steel (R) 4.5 Fabrication and installation method 4.6 Purpose of cleaning reinforcement bar (rust / oil free) 4.7 Reinforcement fabrication process: • Cut • Bend • Tied • Placed reinforcement bar 4.8 Purpose of spacers and fastener installation 4.9 Types of spacer: • Plastic • Steels • Concrete 4.10 Types of fastener: • Timber • Wire • Steel bar		<u>SAFETY</u> • Alert to reinforcement bar hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	slab reinforcement prepared were listed out and explained 4.5 Clean and functioning slab reinforcement tools, equipment, and material prepared were listed out, explained and demonstrated 4.6 Reinforcement bent and length fabricated were demonstrated 4.7 Reinforcement secured and lapped against displacement using binding wire were demonstrated 4.8 Type and purpose of spacers installation listed out and explained 4.9 Fabricated reinforcement and spacer blocks installed horizontally referring to location, sizes, length, shape, types, and position were demonstrated 4.10 Construction debris cleaned and transferred to designated area were demonstrated 4.11 Tools and equipment cleaned and kept were demonstrated 4.12 Excess materials stored at designated area were demonstrated

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
5. Perform wall reinforcement	5.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 5.2 Understanding of structural drawing 5.3 Purpose and function of reinforcement 5.4 Types of reinforcement: • High Yield Steel (Y, T, H) • Mild Steel (R) • Pre-fabricated reinforcement mesh 5.5 Fabrication and installation method 5.6 Purpose of cleaning reinforcement bar (rust / oil free) 5.7 Reinforcement fabrication process: • Cut • Bend • Tied • Placed reinforcement bar 5.8 Purpose of spacers and fastener installation 5.9 Types of spacer which includes: • Plastic	5.1 Obtain drawing and specification 5.2 Identify reinforcement location 5.3 Identify reinforcement requirements 5.4 Prepare reinforcement tools and equipment 5.5 Fabricate (cut and form) reinforcement 5.6 Install fabricated reinforcement and spacer 5.7 Clean work area	ATTITUDE • Meticulous and precise in interpreting structural drawing • Meticulous in fabricating of reinforcement bar • Systematic in fabricating reinforcement bar work • Time and cost conscious in completing task SAFETY • Alert to reinforcement bar hazard • Adhere to DOSH requirements ENVIRONMENT • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	5.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 5.2 Purpose and function of reinforcement listed out and explained 5.3 The wall reinforcement location, sizes, length, shape, types, and position identified were listed out, explained and demonstrated 5.4 Approved methods and types of wall reinforcement prepared were listed out and explained 5.5 Clean and functioning slab reinforcement tools, equipment, and material prepared were listed out, explained and demonstrated 5.6 Reinforcement bent and length fabricated were demonstrated 5.7 Reinforcement secured and lapped against displacement using binding wire were demonstrated 5.8 Type and purpose of spacers installation listed out and explained 5.9 Fabricated reinforcement and spacer blocks installed referring to location, sizes, length, shape, types, and position were

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Steels • Concrete 5.10 Types of fastener: • Timber • Wire • Steel bar			demonstrated 5.10 Construction debris cleaned and transferred to designated area were demonstrated 5.11 Tools and equipment cleaned and kept were demonstrated 5.12 Excess materials stored at designated area were demonstrated
6. Perform staircase reinforcement	6.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 6.2 Understanding of structural drawing 6.3 Purpose and function of reinforcement 6.4 Types of reinforcement: • High Yield Steel (Y, T, H) • Mild Steel (R) • Pre-fabricated reinforcement mesh 6.5 Fabrication and installation method 6.6 Purpose of cleaning reinforcement bar (rust / oil free) 6.7 Reinforcement fabrication process:	6.1 Obtain drawing and specification 6.2 Identify reinforcement location 6.3 Identify reinforcement requirements 6.4 Prepare reinforcement tools and equipment 6.5 Fabricate (cut and form) reinforcement 6.6 Install fabricated reinforcement and spacer 6.7 Clean work area	<u>ATTITUDE</u> • Meticulous and precise in interpreting structural drawing • Meticulous in fabricating of reinforcement bar • Systematic in fabricating reinforcement bar work • Time and cost conscious in completing task <u>SAFETY</u> • Alert to reinforcement bar hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements	6.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 6.2 Purpose and function of reinforcement listed out and explained 6.3 The staircase reinforcement location, sizes, length, shape, types, and position identified were listed out, explained and demonstrated 6.4 Approved methods and types of staircase reinforcement prepared were listed out and explained 6.5 Clean and functioning staircase reinforcement tools, equipment, and material prepared were listed out, explained and demonstrated 6.6 Reinforcement bent and length fabricated were demonstrated

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Cut • Bend • Tied • Placed reinforcement bar 6.8 Purpose of spacers and fastener installation 6.9 Types of spacer which includes: • Plastic • Steels • Concrete 6.10 Types of fastener: • Timber • Wire • Steel bar		• Adhere to 3R's (Reduce, Reuse and Recycle) practices	6.7 Reinforcement secured and lapped against displacement using binding wire were demonstrated 6.8 Type and purpose of spacers installation listed out and explained 6.9 Fabricated reinforcement and spacer blocks installed referring to location, sizes, length, shape, types, and position were demonstrated 6.10 Construction debris cleaned and transferred to designated area were demonstrated 6.11 Tools and equipment cleaned and kept were demonstrated 6.12 Excess materials stored at designated area were demonstrated

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

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2	Ching, Francis D.K. 2008. Building Construction Illustrated. New Jersey : John Wiley & Sons Inc., 2008. ISBN 978-0-470-08781-7.
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15.4. Building Concreting Work

SECTION	(F) Construction		
GROUP	(410) Construction of Buildings		
AREA	Building Construction		
NOSS TITLE	Building Construction Operation		
COMPETENCY UNIT TITLE	Building Concreting Work		
LEARNING OUTCOMES	The outcome of this competency unit is top grade and high quality concrete produced to ensure the structural integrity is intact in accordance with construction drawing. Upon completion of this competency unit, trainees shall be able to: 1. Perform foundation concreting 2. Perform column concreting 3. Perform beam concreting 4. Perform slab concreting 5. Perform wall concreting 6. Perform staircase concreting		
TRAINING PRE-REQUISITE (SPECIFIC)	Not Available		
CU CODE	F410-001-2:2019-C04	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Perform foundation concreting	1.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 1.2 Understanding of concrete ingredient (which includes: - Cement, Fine & coarse aggregate, Water and water cement ratio) 1.3 Concrete mix ratio and grade	1.1 Obtain drawing and specification 1.2 Identify concreting location 1.3 Identify concreting requirements 1.4 Prepare concreting tools and equipment 1.5 Clear work area 1.6 Execute concreting works 1.7 Level concreting surface 1.8 Clean work area	<u>ATTITUDE</u> • Meticulous and precise in interpreting structural drawing • Systematic in performing concrete mixing work • Systematic in performing concrete pouring work • Time and cost conscious in completing task	1.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 1.2 Understanding of concrete ingredient listed out and explained 1.3 Concrete mix ratio and grade listed out and explained 1.4 The foundation concreting location, grades, material, and methods identified were listed out and explained

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	1.4 Types of concrete mix: • Ready mix • Site mix (which includes: - Hand, Mixer) 1.5 Types and functions of tools and equipment for mixing on site: • Shovel • Wheelbarrow • Measurement box • Mixer 1.6 Slump test (workability test) 1.7 Cube test (strength test) 1.8 Location of concrete pouring area 1.9 Concrete handling: • Hand carry • Wheelbarrow • Pump • Crane 1.10 Purpose of cleanliness at pouring space 1.11 Purpose of concrete compaction / consolidation 1.12 Purpose of concrete curing process 1.13 Types of curing agent / method which includes: - • Water (which	1.9 Execute curing concreting surface	• Awareness on M&E services <u>SAFETY</u> • Alert to concrete mixing hazard • Alert to concrete pouring work hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	1.5 Clean and functioning concreting tools, equipment, and material prepared listed out, and demonstrated 1.6 The work area cleared were demonstrated 1.7 Lean concrete poured evenly were demonstrated 1.8 Mixing of concrete according to ratio demonstrated 1.9 Slump test (workability test) were described, prepared and demonstrated 1.10 Cube sampling (strength test) were described, prepared and demonstrated 1.11 Concrete poured and compacted in layer evenly were demonstrated 1.12 Concrete surface horizontally levelled referring to height were demonstrated 1.13 Construction debris cleaned and transferred to designated area were demonstrated 1.14 Tools and equipment cleaned and kept were demonstrated 1.15 Excess materials stored at designated area were demonstrated 1.16 Method of concrete curing identified were listed out and explained 1.17 Curing of concreting surface

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	includes: - Direct water spray, Gunny sack) • Chemical spray • Plastic cover			executed were demonstrated 1.18 3R's (Reduce, Reuse and Recycle) concept applied
2. Perform column concreting	2.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 2.2 Understanding of concrete ingredient (which includes: - Cement, Fine & coarse aggregate, Water and water cement ratio) 2.3 Concrete mix ratio and grade 2.4 Types of concrete mix: • Ready mix • Site mix (which includes: - Hand, Mixer) 2.5 Types and functions of tools and equipment for mixing on site: • Shovel • Wheelbarrow • Measurement box • Mixer 2.6 Slump test (workability test)	2.1 Obtain drawing and specification 2.2 Identify concreting location 2.3 Identify concreting requirements 2.4 Prepare concreting tools and equipment 2.5 Clear work area 2.6 Execute concreting works 2.7 Level concreting surface 2.8 Clean work area 2.9 Execute curing concreting surface	<u>ATTITUDE</u> • Meticulous and precise in interpreting structural drawing • Systematic in performing concrete mixing work • Systematic in performing concrete pouring work • Time and cost conscious in completing task • Awareness on M&E services <u>SAFETY</u> • Alert to concrete mixing hazard • Alert to concrete pouring work hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements	2.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 2.2 Understanding of concrete ingredient listed out and explained 2.3 Concrete mix ratio and grade listed out and explained 2.4 The column concreting location, grades, material, and methods identified were listed out and explained 2.5 Clean and functioning concreting tools, equipment, and material prepared listed out, and demonstrated 2.6 The work area cleared were demonstrated 2.7 Fully secured working platform prepared were demonstrated 2.8 Mixing of concrete according to ratio demonstrated 2.9 Slump test (workability test) were described, prepared and demonstrated 2.10 Cube sampling (strength test) were described, prepared and

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	2.7 Cube test (strength test) 2.8 Location of concrete pouring area 2.9 Concrete handling: • Hand carry • Wheelbarrow • Pump • Crane 2.10 Purpose of cleanliness at pouring space 2.11 Purpose of concrete compaction / consolidation 2.12 Purpose of concrete curing process 2.13 Types of curing agent / method which includes: • Water (which includes: - Direct water spray, Gunny sack) • Chemical spray • Plastic cover		• Adhere to 3R's (Reduce, Reuse and Recycle) practices	demonstrated 2.11 Concrete poured and compacted in layer evenly were demonstrated 2.12 Concrete surface horizontally levelled referring to height were demonstrated 2.13 Construction debris cleaned and transferred to designated area were demonstrated 2.14 Tools and equipment cleaned and kept were demonstrated 2.15 Excess materials stored at designated area were demonstrated 2.16 Method of concrete curing identified were listed out and explained 2.17 Curing of concreting surface executed were demonstrated 2.18 3R's (Reduce, Reuse and Recycle) concept applied
3. Perform beam concreting	3.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 3.2 Understanding of concrete ingredient (which includes: -	3.1 Obtain drawing and specification 3.2 Identify concreting location 3.3 Identify concreting requirements 3.4 Prepare concreting tools and equipment 3.5 Clear work area	<u>ATTITUDE</u> • Meticulous and precise in interpreting structural drawing • Systematic in performing concrete mixing work • Systematic in performing concrete	3.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 3.2 Understanding of concrete ingredient listed out and explained 3.3 Concrete mix ratio and grade

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	Cement, Fine & coarse aggregate, Water and water cement ratio) 3.3 Concrete mix ratio and grade 3.4 Types of concrete mix: • Ready mix • Site mix (which includes: - Hand, Mixer) 3.5 Types and functions of tools and equipment for mixing on site: • Shovel • Wheelbarrow • Measurement box • Mixer 3.6 Slump test (workability test) 3.7 Cube test (strength test) 3.8 Location of concrete pouring area 3.9 Concrete handling: • Hand carry • Wheelbarrow • Pump • Crane 3.10 Purpose of cleanliness at pouring space 3.11 Purpose of concrete compaction / consolidation 3.12 Purpose of concrete	3.6 Execute concreting works 3.7 Level concreting surface 3.8 Clean work area 3.9 Execute curing concreting surface	pouring work • Time and cost conscious in completing task • Awareness on M&E services <u>SAFETY</u> • Alert to concrete mixing hazard • Alert to concrete pouring work hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	listed out and explained 3.4 The beam concreting location, grades, material, and methods identified were listed out and explained 3.5 Clean and functioning concreting tools, equipment, and material prepared listed out, and demonstrated 3.6 The work area cleared were demonstrated 3.7 Mixing of concrete according to ratio demonstrated 3.8 Slump test (workability test) described, prepared and demonstrated 3.9 Cube sampling (strength test) were described, prepared and demonstrated 3.10 Lean concrete poured evenly were demonstrated 3.11 Concrete poured and compacted in layer evenly at ground beam and roof beam were demonstrated 3.12 Concrete poured and compacted in layer evenly at upper level simultaneously with slab were demonstrated 3.13 Concrete surface horizontally levelled referring to height were demonstrated 3.14 Construction debris cleaned and transferred to designated area

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	curing process 3.13 Types of curing agent / method which includes: • Water (which includes: - Direct water spray, Gunny sack) • Chemical spray • Plastic cover			were demonstrated 3.15 Tools and equipment cleaned and kept were demonstrated 3.16 Excess materials stored at designated area were demonstrated 3.17 Method of concrete curing identified were listed out and explained 3.18 Curing of concreting surface executed were demonstrated 3.19 Reuse, Recycle & Reduce (3R) concept applied
4. Perform slab concreting	4.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 4.2 Understanding of concrete ingredient (which includes: - Cement, Fine & coarse aggregate, Water and water cement ratio) 4.3 Concrete mix ratio and grade 4.4 Types of concrete mix: • Ready mix • Site mix (which includes: - Hand, Mixer) 4.5 Types and functions of tools and equipment	4.1 Obtain drawing and specification 4.2 Identify concreting location 4.3 Identify concreting requirements 4.4 Prepare concreting tools and equipment 4.5 Clear work area 4.6 Execute concreting works 4.7 Level concreting surface 4.8 Clean work area 4.9 Execute curing concreting surface	<u>ATTITUDE</u> • Meticulous and precise in interpreting structural drawing • Systematic in performing concrete mixing work • Systematic in performing concrete pouring work • Time and cost conscious in completing task • Awareness on M&E services <u>SAFETY</u> • Alert to concrete mixing hazard • Alert to concrete pouring work hazard	4.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 4.2 Understanding of concrete ingredient listed out and explained 4.3 Concrete mix ratio and grade listed out and explained 4.4 The slab concreting location, grades, material, and methods identified were listed out and explained 4.5 Clean and functioning concreting tools, equipment, and material prepared listed out, and demonstrated 4.6 The work area cleared were demonstrated 4.7 Lean concrete poured evenly

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	for mixing on site: • Shovel • Wheelbarrow • Measurement box • Mixer 4.6 Slump test (workability test) 4.7 Cube test (strength test) 4.8 Location of concrete pouring area 4.9 Concrete handling: • Hand carry • Wheelbarrow • Pump • Crane 4.10 Purpose of cleanliness at pouring space 4.11 Purpose of concrete compaction / consolidation 4.12 Purpose of concrete curing process 4.13 Types of curing agent / method which includes: • Water (which includes: - Direct water spray, Gunny sack) • Chemical spray • Plastic cover		• Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	were demonstrated 4.8 Damp Proof Course (DPC) laid were demonstrated 4.9 Mixing of concrete according to ratio demonstrated 4.10 Slump test (workability test) were described, prepared and demonstrated 4.11 Cube sampling (strength test) were described, prepared and demonstrated 4.12 Concrete poured and compacted in layer evenly at ground slab were demonstrated 4.13 Concrete poured and compacted in layer evenly at upper level simultaneously with beam were demonstrated 4.14 Concrete surface horizontally levelled referring to height were demonstrated 4.15 Construction debris cleaned and transferred to designated area were demonstrated 4.16 Tools and equipment cleaned and kept were demonstrated 4.17 Excess materials stored at designated area were demonstrated 4.18 Method of concrete curing identified were listed out and explained 4.19 Curing of concreting surface executed were demonstrated

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				4.20 3R's (Reduce, Reuse and Recycle) concept applied
5. Perform wall concreting	5.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 5.2 Understanding of concrete ingredient (which includes: - Cement, Fine & coarse aggregate, Water and water cement ratio) 5.3 Concrete mix ratio and grade 5.4 Types of concrete mix: • Ready mix • Site mix (which includes: - Hand, Mixer) 5.5 Types and functions of tools and equipment for mixing on site: • Shovel • Wheelbarrow • Measurement box • Mixer 5.6 Slump test (workability test) 5.7 Cube test (strength test) 5.8 Location of concrete	5.1 Obtain drawing and specification 5.2 Identify concreting location 5.3 Identify concreting requirements 5.4 Prepare concreting tools and equipment 5.5 Clear work area 5.6 Execute concreting works 5.7 Level concreting surface 5.8 Clean work area 5.9 Execute curing concreting surface	<u>ATTITUDE</u> • Meticulous and precise in interpreting structural drawing • Systematic in performing concrete mixing work • Systematic in performing concrete pouring work • Time and cost conscious in completing task • Awareness on M&E services <u>SAFETY</u> • Alert to concrete mixing hazard • Alert to concrete pouring work hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	5.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 5.2 Understanding of concrete ingredient listed out and explained 5.3 Concrete mix ratio and grade listed out and explained 5.4 The wall concreting location, grades, material, and methods identified were listed out and explained 5.5 Clean and functioning concreting tools, equipment, and material prepared listed out, and demonstrated 5.6 The work area cleared were demonstrated 5.7 Fully secured working platform prepared were demonstrated 5.8 Mixing of concrete according to ratio demonstrated 5.9 Slump test (workability test) were described, prepared and demonstrated 5.10 Cube sampling (strength test) were described, prepared and demonstrated 5.11 Concrete poured and compacted in layer evenly simultaneously

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	pouring area 5.9 Concrete handling: • Hand carry • Wheelbarrow • Pump • Crane 5.10 Purpose of cleanliness at pouring space 5.11 Purpose of concrete compaction / consolidation 5.12 Purpose of concrete curing process 5.13 Types of curing agent / method which includes: • Water (which includes: - Direct water spray, Gunny sack) • Chemical spray • Plastic cover			with beam were demonstrated 5.12 Concrete surface horizontally levelled referring to height were demonstrated 5.13 Construction debris cleaned and transferred to designated area were demonstrated 5.14 Tools and equipment cleaned and kept were demonstrated 5.15 Excess materials stored at designated area were demonstrated 5.16 Method of concrete curing identified were listed out and explained 5.17 Curing of concreting surface executed were demonstrated 5.18 3R's (Reduce, Reuse and Recycle) concept applied
6. Perform staircase concreting	6.1 Content of structural drawing: • Propose project title • Symbols / colour • Layout and location • Specification 6.2 Understanding of concrete ingredient (which includes: - Cement, Fine & coarse aggregate, Water and water cement ratio)	6.1 Obtain drawing and specification 6.2 Identify concreting location 6.3 Identify concreting requirements 6.4 Prepare concreting tools and equipment 6.5 Clear work area 6.6 Execute concreting works 6.7 Level concreting	<u>ATTITUDE</u> • Meticulous and precise in interpreting structural drawing • Systematic in performing concrete mixing work • Systematic in performing concrete pouring work • Time and cost conscious in	6.1 The approved construction drawing and specifications (structure drawing and floor plan layout) were listed out and explained 6.2 Understanding of concrete ingredient listed out and explained 6.3 Concrete mix ratio and grade listed out and explained 6.4 The wall concreting location, grades, material, and methods

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	6.3 Concrete mix ratio and grade 6.4 Types of concrete mix: • Ready mix • Site mix (which includes: - Hand, Mixer) 6.5 Types and functions of tools and equipment for mixing on site: • Shovel • Wheelbarrow • Measurement box • Mixer 6.6 Slump test (workability test) 6.7 Cube test (strength test) 6.8 Location of concrete pouring area 6.9 Concrete handling: • Hand carry • Wheelbarrow • Pump • Crane 6.10 Purpose of cleanliness at pouring space 6.11 Purpose of concrete compaction / consolidation 6.12 Purpose of concrete curing process 6.13 Types of curing agent / method which	surface 6.8 Clean work area 6.9 Execute curing concreting surface	completing task <u>SAFETY</u> • Alert to concrete mixing hazard • Alert to concrete pouring work hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	identified were listed out and explained 6.5 Clean and functioning concreting tools, equipment, and material prepared listed out, and demonstrated 6.6 The work area cleared were demonstrated 6.7 Fully secured working platform prepared were demonstrated 6.8 Mixing of concrete according to ratio demonstrated 6.9 Slump test (workability test) were described, prepared and demonstrated 6.10 Cube sampling (strength test) were described, prepared and demonstrated 6.11 Concrete poured and compacted in layer evenly were demonstrated 6.12 Concrete surface horizontally levelled referring to height were demonstrated 6.13 Construction debris cleaned and transferred to designated area were demonstrated 6.14 Tools and equipment cleaned and kept were demonstrated 6.15 Excess materials stored at designated area were demonstrated 6.16 Method of concrete curing identified were listed out and

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	includes: • Water (which includes: - Direct water spray, Gunny sack) • Chemical spray • Plastic cover			explained 6.17 Curing of concreting surface executed were demonstrated 6.18 3R's (Reduce, Reuse and Recycle) concept applied

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

References for Learning Material Development

1 Badron, Jahiman. 2007. Teknologi Binaan Bangunan. Petaling Jaya : IBS Buku, 2007. ISBN 9679502414.
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15.5. Building Roof System Work

SECTION	(F) Construction		
GROUP	(410) Construction of Buildings		
AREA	Building Construction		
NOSS TITLE	Building Construction Operation		
COMPETENCY UNIT TITLE	Building Roof System Work		
LEARNING OUTCOMES	The outcome of this competency unit is assemble roof system installed, components designed to weather proof, and to insulate the roof of a building in accordance with construction drawing. Upon completion of this competency unit, trainees shall be able to: 1. Install roof truss (timber) 2. Install roof truss (steel) 3. Install roof finishing (metal deck) 4. Install roof finishing (roof tile)		
TRAINING PRE-REQUISITE (SPECIFIC)	Not Available		
CU CODE	F410-001-2:2019-C05	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Install roof truss (timber)	1.1 Timber Roof Truss System • Types of system • Types of anchorage • Method Statement Installation Manual 1.2 Occupational safety & health for working on construction site 1.3 Types of drawings • Layout drawing • Details drawing/Shops drawing	1.1 Interpret construction drawing, specification and manufacturer Method of Statement Installation 1.2 Identify roof truss (timber) location 1.3 Identify roof truss (timber) requirements 1.4 Prepare roof truss (timber) tools and equipment 1.5 Identify PPE, access platform, and hoisting equipment	ATTITUDE • Meticulous and details in interpreting drawings • Alert and attentive to danger working environment SAFETY • Adhere to DOSH requirements ENVIRONMENT • Adhere to housekeeping site procedure requirements	1.1 Content of fabrication drawings and installation manual explained. 1.2 The roof truss location, system design, types of material, and methods determined and described. 1.3 The suitable tools, equipment selected and materials determined and prepared. 1.4 The suitable PPE, access platform, and hoisting equipment determined and adhered to DOSH requirements. 1.5 The determined work space

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	1.4 Drawing content • Project information • Drawing number and revision • Symbols and references	1.6 Clear work area 1.7 Execute anchorage installation 1.8 Execute trusses installation 1.9 Clean work area		area cleared. 1.6 The roof truss system installed, aligned, pitching degree, anchored, and level checked based on manufacturer method of installation manual. 1.7 The installation works executed and adhered to DOSH requirements. 1.8 All tools and equipment cleaned and kept, stored at designated location. 1.9 Excess of materials cleared from work area, and stored at determined designated place.
2. Install roof truss (steel)	2.1 Steel Roof Truss System • Types of system • Types of members, bracing, batten, anchorage • Method Statement Installation Manual 2.2 Occupational safety & health for working on construction site 2.3 Types of drawings • Layout drawing • Details drawing/Shops drawing 2.4 Drawing content • Project information • Drawing number	2.1 Interpret drawing and specification 2.2 Identify roof truss (steel) location 2.3 Identify roof truss (steel) requirements 2.4 Prepare roof truss (steel) tools and equipment 2.5 Identify PPE, access platform, and hoisting equipment 2.6 Clear work area 2.7 Execute anchorage installation 2.8 Execute trusses installation 2.9 Clean work area	ATTITUDE • Meticulous and details in interpreting drawings • Alert and attentive to danger working environment SAFETY • Adhere to DOSH requirements ENVIRONMENT • Adhere to housekeeping site procedure requirements	2.1 The approved construction Building Roofing Truss System drawings and specifications interpreted and explained. 2.2 The roof truss location, system design, types of material, and methods determined and described. 2.3 The suitable tools, equipment selected and materials determined and prepared. 2.4 The suitable PPE, access platform, and hoisting equipment determined and adhered to DOSH requirements. 2.5 The determined work space area cleared. 2.6 The roof truss pre-cut component members marked,

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	and revision • Symbols and references			position arranged, assembled, and tightened with fasteners. 2.7 The roof truss system hoisted and positioned at the designated location. 2.8 The roof truss system positioned, aligned, secured, braced, and anchored. 2.9 The batten system positioned, aligned, secured, braced, and anchored to receive roof cover. 2.10 The installation works executed and adhered to DOSH requirements. 2.11 All tools and equipment cleaned and kept, stored at designated location. 2.12 The excess of materials cleared from work area and stored.
3. Install roof finishing (metal deck)	3.1 Types of roof system 3.2 Content of installation manual • Installation method statement • List of roof structure component and typical connection details • Roof structure assembly procedures • Inspection checklist 3.3 Content of construction	3.1 Interpret drawing and specification 3.2 Identify roof finishing (metal deck) location 3.3 Identify roof finishing (metal deck) requirements 3.4 Prepare roof finishing (metal deck) tools and equipment 3.5 Clear work area 3.6 Fix insulation blanket 3.7 Erect roof finishing (metal deck) 3.8 Clean work area	<u>ATTITUDE</u> • Accurate when fixing roof structure • Focus and attentive in executing installation works • Alert and attentive to danger working environment <u>SAFETY</u> • Adhere to DOSH requirements <u>ENVIRONMENT</u>	3.1 The approved construction Building Roofing System drawings and specifications interpreted and explained. 3.2 The roof cover location, design, types of material, and methods determined and described. 3.3 The suitable tools, equipment and materials determined and prepared. 3.4 The suitable PPE determined and adhered to DOSH requirements. 3.5 The determined work space area cleared.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	drawing • Construction Layout (Position of roof structure, Quantity of roof structure) • Details drawing/Shops drawing (Size of roof structure, Number and types of connection, Dimension, Thickness) 3.4 Procedure of assembling roof structure 3.5 Procedure to check assembled roof structure component specification • Angle • Dimension of roof structure 3.6 Procedure to update checklist		• Adhere to housekeeping site procedure requirements	3.6 The roof cover hoisted and positioned at the designated location determined. 3.7 The roof cover positioned, laid in sequence, aligned, lapped, secured and fastened on top of batten determined. 3.8 The installation works determined adhered to DOSH requirements. 3.9 All tools and equipment cleaned, kept, stored at designated location. 3.10 The excess of materials cleared from work area and stored.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
4. Install roof finishing (roof tile)	4.1 Types of roof covering 4.2 Types of roof insulation which include: • Aluminium foil • Styrofoam 4.3 Purpose of roofing insulation which include: • Heat prevention • Sound prevention 4.4 Types and functions of tools and equipment which include: • Hand tools • Measuring tools • Cutting tools	4.1 Interpret drawing and specification 4.2 Identify roof finishing (roof tile) location 4.3 Identify roof finishing (roof tile) requirements 4.4 Prepare roof finishing (roof tile) tools and equipment 4.5 Clear work area 4.6 Fix insulation blanket 4.7 Erect roof finishing (roof tile) 4.8 Clean work area	ATTITUDE • Accurate when fixing roof structure • Focus and attentive in executing installation works • Alert and attentive to danger working environment SAFETY • Adhere to DOSH requirements ENVIRONMENT • Adhere to housekeeping site procedure requirements	4.1 The approved construction Building Roofing System drawings and specifications interpreted and explained. 4.2 The roof cover location, design, types of material, and methods determined and described. 4.3 The suitable tools, equipment selected and materials determined and prepared. 4.4 The suitable PPE selected determined adhered to DOSH requirements. 4.5 The determined work space area cleared. 4.6 The roof tiles hoisted up and positioned at the designated location. 4.7 The roof tiles positioned, laid in sequence, aligned, lapped, secured and fastened on top of batten determined. 4.8 The installation works executed and adhered to DOSH requirements. 4.9 All tools and equipment cleaned, kept, stored at designated location. 4.10 The excess of materials cleared from work area and stored.

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

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15.6. Building Steel Framing Installation

SECTION	(F) Construction		
GROUP	(410) Construction of Buildings		
AREA	Building Construction		
NOSS TITLE	Building Construction Operation		
COMPETENCY UNIT TITLE	Building Steel Framing Installation		
LEARNING OUTCOMES	The outcome of this competency unit is the load bearing structure framing are erected and fixed based on construction drawing and the IBS structure integrity meet the determined specification. Upon completion of this competency unit, trainees shall be able to: 1. Install steel column 2. Install steel beam 3. Install steel framing wall 4. Install steel floor joist		
TRAINING PRE-REQUISITE (SPECIFIC)	Not Available		
CU CODE	F410-001-2:2019-C06	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Install steel column	1.1 IBS system • Types of IBS system • Advantages of IBS system 1.2 Types of IBS steel structure members • C channel • U channel • I-section • H-section • Hollow Section (Circular, Square, Rectangular)	1.1 Interpret drawing and specification 1.2 Identify steel column location 1.3 Identify steel column requirements 1.4 Identify component assembly requirements 1.5 Prepare steel column tools and equipment 1.6 Clear work area 1.7 Assemble column component 1.8 Hoist equipment & machinery	ATTITUDE • Accurate when install structure • Focus and attentive in executing installation works • Alert and attentive to danger working environment SAFETY • Adhere to DOSH requirements	1.1 Content of fabrication drawings and installation manual interpreted and explained. 1.2 Steel column requirements including dimension, sizes, types and quantity of column parts & accessories identified and described based on construction drawings and shop drawing. 1.3 Steel column component assembly requirements identified and described based on installation manual and shop drawings.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	1.3 Types of drawings • Layout drawing • Details drawing/Shops drawing 1.4 Drawing content • Project information • Drawing number and revision • Symbols and references 1.5 Content of installation manual • Installation method statement • List of column component and typical connection details • Column assembly procedures • Inspection checklist 1.6 Content of construction drawing • Construction Layout (Position of column, Quantity of column) • Details drawing/Shops drawing (Size of column, Number and types of connection,	1.9 Carry out setting out 1.10 Place steel column into position 1.11 Fix steel column 1.12 Clean work area	<u>ENVIRONMENT</u> • Adhere to housekeeping site procedure requirements	1.4 Installation tools and equipment including hand tools, power tools and hoisting equipment determined and prepared. 1.5 The determined work space area cleared. 1.6 Type of component defect listed and set aside. 1.7 Column component parts & accessories assembled based on installation manual. 1.8 Column hoisted to designated grid or position and complied to alignment, squareness and dimension of column. 1.9 Measurement and marking of column installation carried out based on setting out procedure and construction drawing specifications. 1.10 Pre-installed stud or column base plate measurement, position and alignment complied based on construction drawings. 1.11 Base plate based on marking area fixed and complied to alignment and level of fixed base plate. 1.12 The steel column installed vertically, squareness, levelled, and anchored based on shop drawings and manufacturer method of installation manual.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	Dimension Thickness) 1.7 Types of column installation method • Prefabricated column installation • Pre-cut column component installation 1.8 Types of column installation tools and equipment • Hand tools • Power tools • Hoisting tools 1.9 Procedure to check tools, equipment and machinery functionality 1.10 Procedure of assembling column 1.11 Types of component defect • Dented • Rust • Twisted • Dimensional defect • Punctured through • Straightness 1.12 Procedure to check assembled column component specification • Alignment			1.13 All tools and equipment cleaned and kept, stored at designated location. 1.14 Excess of materials cleared from work area, and stored at determined designated place.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Squareness • Dimension of column 1.13 Procedure to update checklist 1.14 Setting out works for column erection • Grid alignment • Marking of column position 1.15 Cold Formed column erection procedure • Column positioning and orientation • Column erection • Column propping fixing			
2. Install steel beam	2.1 IBS system • Types of IBS system • Advantages of IBS system 2.2 Types of IBS steel structure members • C channel • U channel • I-section • H-section • Hollow Section (Circular, Square, Rectangular) 2.3 Types of drawings • Layout drawing	2.1 Interpret drawing and specification 2.2 Identify steel beam location 2.3 Identify steel beam requirements 2.4 Identify component assembly requirements 2.5 Prepare steel beam tools and equipment 2.6 Clear work area 2.7 Hoist equipment & machinery 2.8 Carry out setting out 2.9 Place steel beam into position 2.10 Fix steel beam	<u>ATTITUDE</u> • Accurate when fixing structure • Focus and attentive in executing installation works • Alert and attentive to danger working environment <u>SAFETY</u> • Adhere to DOSH requirements <u>ENVIRONMENT</u>	2.1 Content of fabrication drawings and installation manual interpreted and explained. 2.2 Steel beam requirements including dimension, sizes and quantity of beam parts & accessories identified and described based on construction drawings and installation manual. 2.3 Component assembly requirements for beam identified and described based on installation manual and construction drawings. 2.4 Beam installation tools and equipment including hand tools,

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Details drawing/Shops drawing 2.4 Drawing content • Project information • Drawing number and revision • Symbols and references 2.5 Content of installation manual • Installation method statement • List of beam component and typical connection details • Beam assembly procedures • Inspection checklist 2.6 Content of construction drawing • Construction Layout (Position of beam, Quantity of beam) • Details drawing/Shops drawing (Size of beam, Number and types of connection, Dimension Thickness) 2.7 Types of beam	2.11 Clean work area	• Adhere to housekeeping site procedure requirements	power tools and hoisting equipment determined and prepared. 2.5 The determined work space area cleared. 2.6 Beam component parts & accessories assembled based on installation manual. 2.7 Beam hoisted to designated grid or position and complied to alignment, squareness and dimension of beam. 2.8 Measurement and marking of beam installation carried out based on setting out procedure and construction drawing specifications. 2.9 Pre-installed stud or beam base plate measurement, position and alignment complied based on construction drawings. 2.10 Base plate based on marking area anchored, bolted and complied to alignment and level of fixed base plate. 2.11 All tools and equipment cleaned and kept, stored at designated location. 2.12 Excess of materials cleared from work area, and stored at determined designated place.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	installation method • Prefabricated beam installation • Pre-cut beam component installation 2.8 Types of beam installation tools and equipment • Hand tools • Power tools • Hoisting tools 2.9 Procedure to check tools, equipment and machinery functionality 2.10 Procedure of assembling beam 2.11 Setting out works for beam erection • Grid alignment • Marking of column position 2.12 Cold Formed beam erection procedure • Beam positioning and orientation • Beam erection • Beam propping fixing			

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
3. Install steel framing wall	3.1 IBS system • Types of IBS system • Advantages of IBS system 3.2 Types of IBS steel structure members • C channel • U channel • I-section • H-section • Hollow Section (Circular, Square, Rectangular) 3.3 Types of drawings • Layout drawing • Details drawing/Shops drawing 3.4 Drawing content • Project information • Drawing number and revision • Symbols and references 3.5 Content of installation manual • Installation method statement • List of steel wall frame component and typical connection details	3.1 Interpret drawing and specification 3.2 Identify steel wall frame location 3.3 Identify component assembly requirements 3.4 Prepare steel wall frame tools and equipment 3.5 Clear work area 3.6 Assemble column component 3.7 Hoist equipment & machinery 3.8 Carry out setting out 3.9 Place steel wall frame into position 3.10 Fix steel wall frame 3.11 Clean work area	<u>ATTITUDE</u> • Accurate when fixing steel wall framing structure • Focus and attentive in executing installation works • Alert and attentive to danger working environment <u>SAFETY</u> • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to housekeeping site procedure requirements	3.1 Content of fabrication drawings and installation manual interpreted and explained. 3.2 Steel wall frame requirements including dimension, sizes and quantity of steel wall framing parts & accessories identified and described based on construction drawings and installation manual. 3.3 Component assembly requirements for steel wall framing identified and described based on installation manual and construction drawings. 3.4 Steel wall framing installation tools and equipment including hand tools, power tools and hoisting equipment determined and prepared. 3.5 The determined work space area cleared. 3.6 Steel wall framing system & accessories assembled based on installation manual. 3.7 Steel wall framing hoisted to designated grid or position and complied to alignment, squareness and dimension of steel wall framing. 3.8 Measurement and marking of steel wall framing installation carried out based on setting out

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Steel wall frame assembly procedures • Inspection checklist 3.6 Content of construction drawing • Construction Layout (Position of steel wall frame, Quantity of steel wall frame) • Details drawing/Shops drawing (Size of steel wall frame, Number and types of connection, Dimension Thickness) 3.7 Types of Steel Wall Frame installation method • Pre-cut Steel Wall Frame member assembly • Pre-cut Steel Wall Frame panel installation 3.8 Types of Steel Wall Frame installation tools and equipment • Hand tools • Power tools • Hoisting tools			procedure and construction drawing specifications. 3.9 Pre-installed stud or steel wall framing measurement, position and alignment complied based on construction drawings. 3.10 Steel wall framing component arranged, aligned, stitched, secured and bolted on platform based on construction drawings. 3.11 All tools and equipment cleaned and kept, stored at designated location. 3.12 Excess of materials cleared from work area, and stored at determined designated place.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	3.9 Types of component defect • Dented • Rust • Twisted • Dimensional defect • Punctured through • Straightness 3.10 Setting out works for steel wall frame erection • Grid alignment • Marking of column position 3.11 Cold formed column erection procedure • Column positioning and orientation • Column erection • Column propping fixing			
4. Install steel floor joist	4.1 IBS system • Types of IBS system • Advantages of IBS system 4.2 Types of IBS steel structure members • C channel • U channel • H-section • Hollow Section	4.1 Interpret drawing and specification 4.2 Identify steel floor joist location 4.3 Identify steel floor joist requirements 4.4 Identify component assembly requirements 4.5 Prepare steel floor joist tools and equipment 4.6 Clear work area 4.7 Hoist equipment &	<u>ATTITUDE</u> • Accurate when fixing steel wall framing structure • Focus and attentive in executing installation works • Alert and attentive to danger working environment	4.1 Content of fabrication drawings and installation manual interpreted and explained. 4.2 Steel floor joist requirements including dimension, sizes and quantity of floor joist parts & accessories identified and described based on construction drawings and installation manual. 4.3 Component assembly requirements for floor joist

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	(Circular, Square, Rectangular) 4.3 Types of drawings • Layout drawing • Details drawing/Shops drawing 4.4 Drawing content • Project information • Drawing number and revision • Symbols and references 4.5 Content of installation manual • Installation method statement • List of steel floor joist component and typical connection details • Steel floor joist assembly procedures • Inspection checklist 4.6 Content of construction drawing • Construction Layout (Position of steel floor joist, Quantity of steel floor joist) • Details drawing/Shops	machinery 4.8 Carry out setting out 4.9 Place steel floor joist into position 4.10 Fix steel floor joist 4.11 Clean work area	<u>SAFETY</u> • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to housekeeping site procedure requirements	identified and described based on installation manual and construction drawings. 4.4 Floor joist installation tools and equipment including hand tools, power tools and hoisting equipment determined and prepared. 4.5 The determined work space area cleared. 4.6 Floor joist component parts & accessories assembled based on installation manual. 4.7 Floor joist hoisted to designated grid or position and complied to alignment, squareness and dimension of floor joist. 4.8 Measurement and marking of floor joist installation carried out based on setting out procedure and construction drawing specifications. 4.9 Pre-installed stud or steel floor joist measurement, position and alignment complied based on construction drawings. 4.10 Steel floor joist component arranged, aligned, stitched, secured and bolted on platform based on construction drawings. 4.11 All tools and equipment cleaned and kept, stored at designated location. 4.12 Excess of materials cleared

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	drawing (Size of steel floor joist, Number and types of connection, Dimension Thickness) 4.7 Types of steel floor joist installation method • Prefabricated steel floor joist installation • Pre-cut steel floor joist component installation 4.8 Types of steel floor joist installation tools and equipment • Hand tools • Power tools • Hoisting tools 4.9 Procedure to check tools, equipment and machinery functionality 4.10 Procedure of assembling steel floor joist 4.11 Types of component defect • Dented • Rust • Twisted • Dimensional defect			from work area, and stored at determined designated place.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Punctured through • Straightness 4.12 Setting out works for steel floor joist erection • Grid alignment • Marking of column position 4.13 Cold formed steel floor joist erection procedure • Steel floor joist positioning and orientation • Steel floor joist erection • Steel floor joist propping fixing			

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

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15.7. Building Precast Concrete Installation

SECTION	(F) Construction		
GROUP	(410) Construction of Buildings		
AREA	Building Construction		
NOSS TITLE	Building Construction Operation		
COMPETENCY UNIT TITLE	Building Precast Concrete Installation		
LEARNING OUTCOMES	The outcome of this competency unit is the safety and accuracy of precast concrete column, beam, slab, wall panel, and staircase installation complied into the required position and orientation in accordance with method statement. Upon completion of this competency unit, trainees shall be able to: 1. Install precast concrete column 2. Install precast concrete beam 3. Install precast concrete slab 4. Install precast concrete wall panel 5. Install precast concrete staircase		
TRAINING PRE-REQUISITE (SPECIFIC)	Not Available		
CU CODE	F410-001-2:2019-C07	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Install precast concrete column	1.1 Content of the drawing and specification • Propose project title • Symbol / colour • Layout and location • Specification of precast concrete column installation	1.1 Obtain drawing and specification 1.2 Identify precast concrete column location 1.3 Identify precast concrete column requirements 1.4 Prepare precast concrete column tools and equipment 1.5 Clear work area 1.6 Execute precast	<u>ATTITUDE</u> • Comply with job instructions • Pay attention to details • Willing to work odd hours • Demonstrate good teamwork • Take pride in quality work <u>SAFETY</u>	1.1 The approved construction drawing and specification (structure drawing and floor plan layout) were listed out and explained. 1.2 Purpose and function of precast concrete column listed out and explained. 1.3 Material, methods, types and dimension of precast concrete column described and identified. 1.4 Precast concrete column tools

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
		concrete column unloading activities 1.7 Carry out precast concrete column setting out 1.8 Place precast column into position 1.9 Carry out precast concrete column grout joint 1.10 Remove adjustable props 1.11 Clean work area	• Wear PPE according to job task • Handle tools, equipment and materials according to workplace and safety procedures • Unload components using lifting equipment in a safe manner according to method statement • Ensure no obstruction at the unloading and installation area • Adhere to construction site workplace safety requirements <u>ENVIRONMENT</u> • Maintain workplace cleanliness • Practise 3R (reduce, reuse, recycle) • Dispose waste at designated areas	and equipment checked to ensure in good working condition. 1.5 Unloading area cleaned and obstruction cleared. 1.6 Precast concrete column unloaded using lifting equipment as per method statement and stacked according to installation work sequence. 1.7 Starter bar position and alignment checked and rectified to prevent any obstruction to prevent any. 1.8 Control line and column installation location outline marked accurately as per layout drawing and job instruction. 1.9 Receiving floor surface adjusted to required level marking by placing levelling pads at the centre of the column. 1.10 Adjustable props fixed to precast column prior to hoisting for installation. 1.11 Precast column lifted to required position and props bolted onto existing floor for support. 1.12 Column alignment and vertically achieved by adjusting the adjustable props and

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				checked using bubble level. 1.13 Minor touch – up work performed on precast concrete column according to job instruction. 1.14 Formwork prepared at the joints to cover gaps and prevent leakage. 1.15 High strength non shrink grout prepared according to method statement. 1.16 Duct filled with non-shrink grout to ensure no leakage. 1.17 Grout cube sample prepared for testing according to job instruction and method statement. 1.18 Adjustable props removed and stored at designated areas for future use according to standard procedures upon clearance from superior. 1.19 Personal and workplace safety adhered according to DOSH requirements. 1.20 Work areas maintained in a clean and safe manner according to workplace procedures.
2. Install precast concrete beam	2.1 Content of the drawing and specification • Propose project title • Symbol / colour • Layout and location	2.1 Obtain drawing and specification 2.2 Identify precast concrete beam location 2.3 Identify precast	<u>ATTITUDE</u> • Comply with job instructions • Pay attention to details • Willing to work odd	2.1 The approved construction drawing and specification (structure drawing and floor plan layout) were listed out and explained.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	• Specification of precast concrete beam installation	concrete beam requirements 2.4 Prepare precast concrete beam tools and equipment 2.5 Clear work area 2.6 Execute precast concrete beam unloading activities 2.7 Place precast beam into position 2.8 Carry out precast concrete grout joint 2.9 Clean work area	hours • Demonstrate good teamwork • Take pride in quality work <u>SAFETY</u> • Wear PPE according to job task • Handle tools, equipment and materials according to workplace and safety procedures • Unload components using lifting equipment in a safe manner according to method statement • Ensure no obstruction at the unloading and installation area • Adhere to construction site workplace safety requirements <u>ENVIRONMENT</u> • Maintain workplace cleanliness • Practise 3R (reduce, reuse, recycle)	2.2 Purpose and function of precast concrete beam listed out and explained. 2.3 Material, methods, types and dimension of precast concrete beam described and identified. 2.4 Precast concrete beam tools and equipment checked to ensure in good working condition. 2.5 Unloading area cleaned and obstruction cleared. 2.6 Precast concrete beams unloaded using lifting equipment as per method statement and stacked according to installation work sequence. 2.7 Pads (e.g. Neoprene) placed on receiving surface of the corbel for columns with corbel to avoid direct impact and for levelling purposes. 2.8 Precast beam lifted and adjusted to the designated position and orientation with the use of lifting equipment and temporary props for support (if required) as per method statement and design requirements. 2.9 Minor touch-up works performed on precast concrete beams according to job instruction.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
			• Dispose waste at designated areas	2.10 High strength non shrink grout prepared according to method statement. 2.11 Ducts filled with non-shrink grout to fill up the gaps. 2.12 Installation tools and equipment used according to operating procedure and safety requirements. 2.13 Workplace and personal safety maintained according to DOSH requirements. 2.14 Work areas maintained in a clean and safe manner according to workplace procedures.
3. Install precast concrete slab	3.1 Content of the drawing and specification • Propose project title • Symbol / colour • Layout and location • Specification of precast concrete slab installation	3.1 Obtain drawing and specification 3.2 Identify precast concrete slab location 3.3 Identify precast concrete slab requirements 3.4 Prepare precast concrete slab tools and equipment 3.5 Clear work area 3.6 Execute precast concrete slab unloading 3.7 Carry out precast concrete slab setting out 3.8 Place precast slab into	<u>ATTITUDE</u> • Comply with job instructions • Pay attention to details • Willing to work odd hours • Demonstrate good teamwork • Complete work in an accurate manner <u>SAFETY</u> • Wear PPE according to job task • Handle tools, equipment and materials according to	3.1 The approved construction drawing and specification (structure drawing and floor plan layout) were listed out and explained. 3.2 Purpose and function of precast concrete slab listed out and explained. 3.3 Material, methods, types and dimension of precast concrete slab described and identified. 3.4 Precast concrete slab tools and equipment checked to ensure in good working condition. 3.5 Unloading area cleaned and obstruction cleared. 3.6 Precast concrete slabs unloaded

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
		position 3.9 Grout joint 3.10 Remove adjustable props 3.11 Clean work area	workplace and safety procedures • Ensure no obstruction at the work area • Adhere to construction site workplace safety requirements <u>ENVIRONMENT</u> • Maintain workplace cleanliness • Practise 3R (reduce, reuse, recycle) • Dispose waste at designated areas	using lifting equipment as per method statement and stacked according to installation work sequence. 3.7 Rubber strip placed on beam prior to installation to avoid direct impact and for levelling purposes. 3.8 Temporary props fixed to support slab according to design requirements. 3.9 Precast slab lifted and adjusted to the designated position and orientation as per method statement. 3.10 Minor touch-up works performed on precast concrete slab according to job instruction. 3.11 Shear-key grout mixture prepared according to method statement. 3.12 Joints filled with shear-key grout to ensure no leakage. 3.13 Installation tools and equipment used according to operating procedure and safety requirements. 3.14 Temporary props removed from beams and slabs, and stored at designated areas for future use according to standard procedures upon clearance from superior.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				3.15 Safety requirements adhered as per DOSH requirements. 3.16 Work areas maintained in a clean and safe manner according to workplace procedures.
4. Install precast concrete wall panel	4.1 Content of the drawing and specification • Propose project title • Symbol / colour • Layout and location • Specification of precast concrete wall panel installation	4.1 Obtain drawing and specification 4.2 Identify precast concrete wall panel location 4.3 Identify precast concrete wall panel requirements 4.4 Prepare precast concrete wall panel tools and equipment 4.5 Clear work area 4.6 Execute precast concrete wall panel unloading 4.7 Carry out precast concrete wall panel setting out 4.8 Place precast wall panel into position 4.9 Grout joint 4.10 Remove adjustable props 4.11 Clean work area	<u>ATTITUDE</u> • Comply with job instructions • Pay attention to details • Willing to work odd hours • Demonstrate good teamwork • Take pride in quality work <u>SAFETY</u> • Wear PPE according to job task • Handle tools, equipment and materials according to workplace and safety procedures • Ensure no obstruction at the unloading and installation area • Adhere to construction site workplace safety requirements <u>ENVIRONMENT</u>	4.1 The approved construction drawing and specification (structure drawing and floor plan layout) were listed out and explained. 4.2 Purpose and function of precast concrete wall panel listed out and explained. 4.3 Material, methods, types and dimension of precast concrete wall panel described and identified. 4.4 Precast concrete wall panel tools and equipment checked to ensure in good working condition. 4.5 Unloading area cleaned and obstruction cleared. 4.6 Precast concrete wall panel unloaded using lifting equipment as per method statement and stacked according to installation work sequence. 4.7 Starter bar position and alignment checked and rectified to within specified tolerance to prevent any obstruction during

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
			• Maintain workplace cleanliness • Practise 3R (reduce, reuse, recycle) • Dispose waste at designated areas	installation. 4.8 Control line and wall panel installation location outline marked accurately as per layout drawing and job instruction. 4.9 Receiving floor surface adjusted to required level marking. 4.10 Adjustable props fixed to precast wall panel prior to hoisting for installation. 4.11 Precast wall panel lifted to required position and props bolted onto existing floor for support. 4.12 Wall panel alignment and verticality achieved by adjusting the adjustable props and checked using bubble level. 4.13 Minor touch-up works performed on precast concrete wall panel according to job instruction. 4.14 Formwork prepared at the joints to cover gaps and prevent leakage. 4.15 High strength non shrink grout prepared according to method statement. 4.16 Duct filled with non-shrink grout to ensure no leakage. 4.17 Grout cube sample prepared for testing according to job instruction and method

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				statement. 4.18 Adjustable props removed and stored at designated areas for future use according to standard procedures upon clearance from superior. 4.19 Safety requirements adhered as per DOSH requirements. 4.20 Work areas maintained in a clean and safe manner according to workplace procedures.
5. Install precast concrete staircase	5.1 Content of the drawing and specification • Propose project title • Symbol / colour • Layout and location • Specification of precast concrete staircase installation	5.1 Obtain drawing and specification 5.2 Identify precast concrete staircase location 5.3 Identify precast concrete staircase requirements 5.4 Prepare precast concrete staircase tools and equipment 5.5 Clear work area 5.6 Execute precast concrete staircase unloading 5.7 Carry out precast concrete staircase setting out 5.8 Place precast staircase into position 5.9 Grout joint 5.10 Clean work area	<u>ATTITUDE</u> • Comply with job instructions • Pay attention to details • Willing to work odd hours • Demonstrate good teamwork • Take pride in quality work <u>SAFETY</u> • Wear PPE according to job task • Handle tools, equipment and materials according to workplace and safety procedures • Ensure no obstruction at the unloading and	5.1 The approved construction drawing and specification (structure drawing and floor plan layout) were listed out and explained. 5.2 Purpose and function of precast concrete staircase listed out and explained. 5.3 Material, methods, types and dimension of precast concrete beam described and identified. 5.4 Precast concrete staircase tools and equipment checked to ensure in good working condition. 5.5 Unloading area cleaned and obstruction cleared. 5.6 Spacing between support checked to ensure sufficient space for staircase installation. 5.7 Rubber strips placed on receiving surface of the

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
			installation area • Adhere to construction site workplace safety requirements <u>ENVIRONMENT</u> • Maintain workplace cleanliness • Practise 3R (reduce, reuse, recycle) • Dispose waste at designated areas	supports. 5.8 Staircase or flights lifted and adjusted to the designated location as per method statement. 5.9 High strength non shrink grout prepared according to method statement. 5.10 Dowel bar joints filled securely with non-shrink grout to ensure no gaps. 5.11 Minor touch-up works performed on precast concrete staircase according to job instruction. 5.12 Installation tools and equipment used according to operating procedure and safety requirements. 5.13 Workplace and personal safety maintained according to DOSH requirements. 5.14 Work areas maintained in a clean and safe manner according to workplace procedures.

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

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15.8. Building Door & Window Installation

SECTION	(F) Construction		
GROUP	(410) Construction of Buildings		
AREA	Building Construction		
NOSS TITLE	Building Construction Operation		
COMPETENCY UNIT TITLE	Building Door & Window Installation		
LEARNING OUTCOMES	The outcome of this competency unit is doors and windows with the right dimension, verticality, strength, durability and squareness installed and painted as per specification in construction drawing. Upon completion of this competency unit, trainees shall be able to: 1. Install door frame 2. Install window frame 3. Install door leaf 4. Install window leaf		
TRAINING PRE-REQUISITE (SPECIFIC)	Not Available		
CU CODE	F410-001-2:2019-C08	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Install door frame	1.1 Understanding of architectural drawing 1.2 Type of door frame 1.3 Type of paints 1.4 Types of painting tools and their applications 1.5 Carpentry work on fixing door frame 1.6 Frame levelling 1.7 Type of lintel, formwork and reinforcement 1.8 Type of concrete mix	1.1 Obtain drawing and specification 1.2 Identify door frame location 1.3 Identify door frame requirements 1.4 Prepare door frame tools and equipment 1.5 Clear work area 1.6 Execute door frame installation 1.7 Clean work area	ATTITUDE • Responsibility • Cooperate among colleagues SAFETY • Wear complete safety attire and gear ENVIRONMENT • Maintain workplace cleanliness	1.1 The approved construction drawing and specifications (structure drawing and floor plan layout) obtained. 1.2 The door frame location, dimension, opening, grades, material, and methods identified and described. 1.3 Types of paint and carpentry work tools, materials and equipment listed out and explained. 1.4 The work area cleared. 1.5 Formwork and reinforcement

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
			• Practise 3R (reduce, reuse, recycle) • Dispose waste at designated areas	prepared to make lintel. 1.6 High strength non shrink grout prepared based on method statement. 1.7 Adjustable props removed and stored at designated areas for future use based on standard procedures. 1.8 Concrete work for lintel prepared. 1.9 Construction debris cleaned and transferred to designated area. 1.10 Tools and equipment cleaned and kept.
2. Install window frame	2.1 Understanding of architectural drawing 2.2 Type of frame 2.3 Type of paints 2.4 Types of painting tools and their applications 2.5 Carpentry work on fixing window frame 2.6 Frame levelling 2.7 Type of lintel, formwork and reinforcement 2.8 Type of concrete mix	2.1 Obtain drawing and specification 2.2 Identify window frame location 2.3 Identify window frame requirements 2.4 Prepare window frame tools and equipment 2.5 Clear work area 2.6 Execute window frame installation 2.7 Clean work area	<u>ATTITUDE</u> • Responsibility • Cooperate among colleagues <u>SAFETY</u> • Wear complete safety attire and gear <u>ENVIRONMENT</u> • Maintain workplace cleanliness • Practise 3R (reduce, reuse, recycle) • Dispose waste at designated areas	2.1 The approved construction drawing and specifications (structure drawing and floor plan layout) obtained. 2.2 The window frame location, dimension, opening, grades, material, and methods identified and described. 2.3 Types of paint and carpentry work tools, materials and equipment listed out and explained. 2.4 The work area cleared. 2.5 Formwork and reinforcement prepared to make lintel. 2.6 High strength non shrink grout prepared based on method statement. 2.7 Adjustable props removed and

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				stored at designated areas for future use based on standard procedures. 2.8 Concrete work for lintel prepared. 2.9 Construction debris cleaned and transferred to designated area. 2.10 Tools and equipment cleaned and kept.
3. Install door leaf	3.1 Understanding of architectural drawing 3.2 Type of door leaf 3.3 Type of paints 3.4 Types of painting tools and their applications 3.5 Carpentry work on fixing door leaf 3.6 Frame levelling	3.1 Obtain drawing and specification 3.2 Identify door leaf location 3.3 Identify door leaf requirements 3.4 Prepare door leaf tools and equipment 3.5 Clear work area 3.6 Execute door leaf installation 3.7 Install ironmongery 3.8 Clean work area	<u>ATTITUDE</u> • Responsibility • Cooperate among colleagues <u>SAFETY</u> • Wear complete safety attire and gear <u>ENVIRONMENT</u> • Maintain workplace cleanliness • Practise 3R (reduce, reuse, recycle) • Dispose waste at designated areas	3.1 The approved construction drawing and specifications (structure drawing and floor plan layout) obtained. 3.2 The door leaf location, dimension, opening, grades, material, and methods identified and described. 3.3 Types of paint and carpentry work tools, materials and equipment listed out and explained. 3.4 The work area cleared. 3.5 Door leaf installation executed referring to squareness, verticality, strength and durability. 3.6 Ironmongery point set and drilled through. 3.7 Ironmongery installed referring to point and types of ironmongery. 3.8 Construction debris cleaned and transferred to designated area.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				3.9 Tools and equipment cleaned and kept.
4. Install window leaf	4.1 Understanding of architectural drawing 4.2 Type of window leaf 4.3 Type of paints 4.4 Types of painting tools and their applications 4.5 Carpentry work on fixing window leaf 4.6 Frame levelling	4.1 Obtain drawing and specification 4.2 Identify window leaf location 4.3 Identify window leaf requirements 4.4 Prepare window leaf tools and equipment 4.5 Clear work area 4.6 Execute window leaf installation 4.7 Install ironmongery 4.8 Clean work area	<u>ATTITUDE</u> • Responsibility • Cooperate among colleagues <u>SAFETY</u> • Wear complete safety attire and gear <u>ENVIRONMENT</u> • Maintain workplace cleanliness • Practise 3R (reduce, reuse, recycle) • Dispose waste at designated areas	4.1 The approved construction drawing and specifications (structure drawing and floor plan layout) obtained. 4.2 The window leaf location, dimension, opening, grades, material, and methods identified and described. 4.3 Types of paint and carpentry work tools, materials and equipment listed out and explained. 4.4 The work area cleared. 4.5 Window leaf installation executed referring to squareness, verticality, strength and durability. 4.6 Ironmongery point set and riveted/ screwed. 4.7 Ironmongery installed referring to point and types of ironmongery. 4.8 The work area cleared. 4.9 Window leaf installation executed referring to squareness, verticality, strength and durability. 4.10 Ironmongery point set and riveted/ screwed. 4.11 Ironmongery installed referring to point and types of

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
				ironmongery. 4.12 Construction debris cleaned and transferred to designated area. 4.13 Tools and equipment cleaned and kept. 4.14 Excess materials stored at designated area.

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

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15.9. Building Wall Work

SECTION	(F) Construction		
GROUP	(410) Construction of Buildings		
AREA	Building Construction		
NOSS TITLE	Building Construction Operation		
COMPETENCY UNIT TITLE	Building Wall Work		
LEARNING OUTCOMES	The outcome of this competency unit is wall with the right dimension, strength and squareness installed/ constructed as per specification in construction drawing. Upon completion of this competency unit, trainees shall be able to: 1. Perform laying brickwork 2. Perform laying blockwork 3. Install concrete panel 4. Install glass panel 5. Perform drywall work		
TRAINING PRE-REQUISITE (SPECIFIC)	Not Available		
CU CODE	F410-001-2:2019-C09	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Perform laying brickwork	1.1 Work preparation • Interpretation of layout floor plan • Tools requirement • Materials requirement • Equipment requirement • Checklist (format) • Utilities preparation 1.2 Understanding of construction/ shop drawing	1.1 Obtain drawing and specification 1.2 Identify brickwork location 1.3 Identify brickwork requirements 1.4 Prepare brickwork tools and equipment 1.5 Clear work area 1.6 Mark brickwork location 1.7 Lay damp proof membrane (DPM) 1.8 Lay concrete mortar	<u>ATTITUDE</u> • Meticulous and precise in interpreting approved construction / shop drawing s • Time and cost conscious in completing task • Awareness on M&E services <u>SAFETY</u> • Wear PPE when	1.1 Work preparation of laying brickwork described and explained. 1.2 Understanding of construction/ shop drawing listed out and explained. 1.3 Types of brick, sizes and material listed and explained. 1.4 Brickwork tools and equipment described and prepared. 1.5 Method of laying brickworks listed out, explained and demonstrated. 1.6 Purpose and construction of

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	1.3 Types of brick, sizes and material 1.4 Method of laying brickworks 1.5 Purpose of brickwork marking 1.6 Purpose and construction of brickworks by laying exmet for every four layer. 1.7 Understanding and purposes of DPM 1.8 Wall dimensions and alignment 1.9 Types and functions of tools and equipment for wall alignment set up which includes: • L angle square • String • Spirit level • Plumb bob • Hand tools • Laser measurement 1.10 Line marking • method • instrument (measuring) • marking tools (chalk, laser) • angle setting 1.11 Mortar mix proportion (water, cement and	1.9 Execute laying brickwork 1.10 Clean work area	performing task • Aware of dangerous material is working area <u>ENVIRONMENT</u> • Avoid environmental pollution. • Proper waste disposal	laying brickwork by using exmet listed out and explained. 1.7 Purpose of DPM explained and DPM secured before laying brickwork. 1.8 Safety requirements listed and complied firmly. 1.9 Base course set out. 1.10 Levelling tool application utilised correctly. 1.11 Level tolerance as per span tolerance distance checked accurately. 1.12 Vertically line established accurately. 1.13 Installed floor levelness checked accurately 1.14 Setting out marked accurately to construction drawing. 1.15 Construction debris cleaned and transferred to designated area. 1.16 Tools and equipment cleaned and kept. 1.17 Excess materials stored at designated area.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	sand) 1.12 Base course installation • Type of bonding • Installation method • Levelling (horizontal, vertical) • Squareness			
2. Perform laying blockwork	2.1 Work preparation • Interpretation of layout floor plan • Tools requirement • Materials requirement • Equipment requirement • Checklist (format) • Utilities preparation 2.2 Understanding of construction/ shop drawing 2.3 Types of block, sizes and material 2.4 Method of laying blockworks 2.5 Purpose of blockwork marking 2.6 Purpose and construction of blockworks by laying exmet for every four layer. 2.7 Wall dimensions and	2.1 Obtain drawing and specification 2.2 Identify blockwork location 2.3 Identify blockwork requirements 2.4 Prepare blockwork tools and equipment 2.5 Clear work area 2.6 Mark blockwork location 2.7 Lay damp proof membrane (DPM) 2.8 Lay concrete mortar and adhesive 2.9 Execute laying blockwork 2.10 Clean work area	<u>ATTITUDE</u> • Careful in setting our base course preparation • Calculate materials requirement is details and ensure correctness • Ensure setting out prepared precisely • Awareness on M&E services <u>SAFETY</u> • Wear PPE when performing task • Aware of dangerous material is working area <u>ENVIRONMENT</u> • Avoid environmental pollution. • Proper waste disposal	2.1 Work preparation of laying blockwork described and explained. 2.2 Understanding of construction/ shop drawing listed out and explained. 2.3 Types of block, sizes and material listed and explained. 2.4 Blockwork tools and equipment described and prepared. 2.5 Method of laying blockworks listed out, explained and demonstrated. 2.6 Purpose and construction of lying blockwork by using exmet listed out and explained. 2.7 Safety requirements listed and complied firmly. 2.8 Base course set out. 2.9 Levelling tool application utilised correctly. 2.10 Level tolerance as per span tolerance distance checked accurately. 2.11 Vertically line established

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	alignment 2.8 Floor level preparation • Mock-up • Structural floor level • Allowable level difference according type of blockwork 2.9 Line marking • method • instrument (measuring) • marking tools (chalk, laser) • angle setting 2.10 Dry setting out • Point to point • Block placement • Joint gapping • Door/ window opening 2.11 Mortar mix proportion (water, cement and sand) 2.12 Damp Proof Course/ Damp Proof Material preparation • Type of Damp Proof Course (bituminous etc.) • Measurement (width, length) 2.13 Jointing material			accurately. 2.12 Installed floor levelness checked accurately 2.13 Setting out marked accurately to construction drawing. 2.14 Construction debris cleaned and transferred to designated area. 2.15 Tools and equipment cleaned and kept. 2.16 Excess materials stored at designated area.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	(adhesive / mortar) • Mix ratio • Thickness (range according to type of block) 2.14 Base course installation • Type of bonding • Installation method • Levelling (horizontal, vertical) • Squareness			
3. Install concrete panel	3.1 Jointing material (adhesive / mortar) • Mix ratio • Thickness (as per manufacturer spec) 3.2 Starter bar setting • Check spec (size, quantity, condition, length) • Location (according to drawing & specification) 3.3 Coursing level installation • Type of bonding • Installation method • Plumb (vertical) and Level (horizontal) base on manufacturer spec • Vertical and	3.1 Obtain drawing and specification 3.2 Identify concrete panel location 3.3 Identify concrete panel requirements 3.4 Prepare concrete panel tools and equipment 3.5 Clear work area 3.6 Mark concrete panel location 3.7 Install starter bar 3.8 Lay damp proof membrane (DPM) 3.9 Execute concrete panel installation with prop 3.10 Grout joint 3.11 Clean work area	<u>ATTITUDE</u> • Strictly comply to manufacturer specification and installation methods • Details in comprehending the working instruction • Strictly comply to work schedule and progress • Awareness on M&E services <u>SAFETY</u> • Wear PPE when performing task • Aware of dangerous material is working area <u>ENVIRONMENT</u> • Avoid environmental pollution.	3.1 Understanding of construction/ shop drawing listed out and explained. 3.2 Concrete panel location and requirements described and identified. 3.3 Concrete panel tools and equipment described and explained. 3.4 Concrete panel location marked. 3.5 Starter bar setting described and installed. 3.6 Jointing material mixed according to drawing and specification. 3.7 Damp proof membrane (DPM) laid accurately. 3.8 Concrete panel (plumb and level) installed and propped. 3.9 High strength non shrink grout prepared according to method

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	horizontal reinforcement		• Proper waste disposal	statement. 3.10 Duct filled with non-shrink grout to ensure no leakage. 3.11 Construction debris cleaned and transferred to designated area. 3.12 Tools and equipment cleaned and kept.
4. Install glass panel	4.1 Jointing material (adhesive/ rubber strip) which includes: - thickness (range according to type of panel) 4.2 Coursing level installation • Type of bonding • Installation method • Squareness 4.3 Door and window opening • Door and window schedule • Floor plan • Elevation drawing • Opening location marking • Degree corner of window frame • Lintel installation top of window/ door frame	4.1 Obtain drawing and specification 4.2 Identify glass panel location 4.3 Identify glass panel requirements 4.4 Prepare glass panel tools and equipment 4.5 Clear work area 4.6 Mark glass panel location 4.7 Execute glass panel installation 4.8 Seal joint 4.9 Clean work area	<u>ATTITUDE</u> • Strictly comply to manufacturer specification and installation methods • Details in comprehending the working instruction • Strictly comply to work schedule and progress <u>SAFETY</u> • Wear PPE when performing task • Aware of dangerous material is working area <u>ENVIRONMENT</u> • Avoid environmental pollution. • Proper waste disposal	4.1 Understanding of construction/ shop drawing listed out and explained. 4.2 Glass panel location and requirements described and identified. 4.3 Glass panel tools and equipment described and explained. 4.4 Glass panel location marked. 4.5 Glass panel (plumb and level) installed. 4.6 Jointing material applied according to drawing and specification. 4.7 Construction debris cleaned and transferred to designated area. 4.8 Tools and equipment cleaned and kept.

5. Perform drywall work	5.1 Understanding of construction / shop drawing 5.2 Method of installation 5.3 Purpose and construction of frame 5.4 Purpose of wall alignment 5.5 Wall dimensions and alignment 5.6 Types and functions of tools and equipment for wall alignment set up which includes • L angle square • String • Spirit level • Plum bob • Hand tools • Laser measurement	5.1 Obtain drawing and specification 5.2 Identify drywall work location 5.3 Identify drywall work requirements 5.4 Prepare drywall work tools and equipment 5.5 Clear work area 5.6 Mark drywall work location 5.7 Erect drywall frame 5.8 Execute drywall work installation 5.9 Seal joint 5.10 Clean work area	ATTITUDE • Meticulous and precise in setting up wall alignment • Systematic in setting up wall alignment work • Time and cost conscious in completing task • Awareness on M&E services SAFETY • Alert to wall alignment hazard • Adhere to DOSH requirements ENVIRONMENT • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	5.1 Understanding of construction/ shop drawing listed out and explained. 5.2 Drywall work location and requirements described and identified. 5.3 Drywall work tools and equipment described and explained. 5.4 Method of installation listed out and explained. 5.5 Purpose and construction of stiffener listed out and explained. 5.6 Wall dimensions and alignment listed out and explained. 5.7 Carrying out of wall marking level demonstrated. 5.8 Drywall work location marked. 5.9 Drywall frame panel and horizontal bracing prepared, and prop installed in accordance with manufacturer specifications. 5.10 Drywall panel erected, fastened, and secured in accordance with approved construction drawing and specifications. 5.11 Joint sealed referring to gap between panel to panel and panel to other building surface. 5.12 Construction debris cleaned and transferred to designated area. 5.13 Tools and equipment cleaned and kept.

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

References for Learning Material Development

1 Badron, Jahiman. 2007. Teknologi Binaan Bangunan. Petaling Jaya : IBS Buku, 2007. ISBN 9679502414.
2 Ching, Francis D.K. 2008. Building Construction Illustrated. New Jersey : John Wiley & Sons Inc., 2008. ISBN 978-0-470-08781-7.
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5 Emmitt, Stephen and Gorse, Christopher A. 2014. Barry's Advanced Construction of Building. United Kingdom : John Wiley & Sons, Ltd., 2014. ISBN 978-1-118-87071-6.
6 McKay, W. B. 2015. Building Construction. London : Routledge, 2015. ISBN 978-1-873394-72-4.
7 Mohamed, Ab. Hamid. 2002. Asas Ukur Kejuruteraan. Skudai : Universiti Teknologi Malaysia, 2002. ISBN 983-52-0199-4.
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9 Tong, Tan Boon. 1992. Teknologi Binaan Bangunan. Kuala Lumpur : Dewan Bahasa dan Pustaka, Kementerian Pendidikan, 1992. ISBN 9789836213709.

15.10. Building Wall & Floor Finishing

SECTION	(F) Construction		
GROUP	(410) Construction of Buildings		
AREA	Building Construction		
NOSS TITLE	Building Construction Operation		
COMPETENCY UNIT TITLE	Building Wall & Floor Finishing		
LEARNING OUTCOMES	The outcome of this competency unit is wall plastering and floor rendering executed as per specification in construction drawing. Upon completion of this competency unit, trainees shall be able to: 1. Perform plastering work 2. Perform rendering work 3. Perform tiling work 4. Perform painting work		
TRAINING PRE-REQUISITE (SPECIFIC)	Not Available		
CU CODE	F410-001-2:2019-C10	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Perform plastering work	1.1 Types and functions of materials, tools and equipment for wall plastering which includes • Cement mortar • Trowel • Wood trowel • Sponge • Hand tools • Spirit level • Corner bead / clincher • Laser measurement	1.1 Obtain drawing and specification 1.2 Identify plastering work location 1.3 Identify plastering work requirements 1.4 Prepare plastering work tools and equipment 1.5 Clear work area 1.6 Set plastering marking 1.7 Execute plastering work 1.8 Clean work area	ATTITUDE • Meticulous and precise in performing wall plastering work • Systematic in performing wall plastering work • Time and cost conscious in completing task SAFETY • Alert to wall plastering work hazard	1.1 Understanding of construction drawing listed out and explained. 1.2 Plastering work location and requirements described and identified. 1.3 Plastering work material, tools and equipment described and explained. 1.4 Purpose of plaster marking listed out and explained. 1.5 Plastering dimension, vertical, horizontal and squareness listed out and explained. 1.6 Setting of plaster marking for

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	1.2 Purpose of plaster marking 1.3 Plastering dimension, vertical, horizontal and squareness		• Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	thickness and flatness demonstrated. 1.7 Execution of wall plastering demonstrated. 1.8 Construction debris cleaned and transferred to designated area. 1.9 Tools and equipment cleaned and kept.
2. Perform rendering work	2.1 Types and functions of materials, tools and equipment for floor rendering which includes: • Cement mortar • Trowel • Wood trowel • Hand tools • Spirit level • Laser measurement 2.2 Purpose of floor rendering marking 2.3 Floor rendering dimension, horizontal and squareness	2.1 Obtain drawing and specification 2.2 Identify rendering work location 2.3 Identify rendering work requirements 2.4 Prepare rendering work tools and equipment 2.5 Clear work area 2.6 Set rendering marking 2.7 Execute rendering work 2.8 Clean work area	<u>ATTITUDE</u> • Meticulous and precise in performing floor rendering work • Systematic in performing floor rendering work • Time and cost conscious in completing task <u>SAFETY</u> • Alert to floor rendering work hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and	2.1 Understanding of construction drawing listed out and explained. 2.2 Rendering work location and requirements described and identified. 2.3 Rendering work material, tools and equipment described and explained. 2.4 Purpose of rendering marking listed out and explained. 2.5 Rendering dimension, vertical, horizontal and squareness listed out and explained. 2.6 Setting of rendering marking for thickness and flatness demonstrated. 2.7 Execution of floor rendering demonstrated. 2.8 Construction debris cleaned and transferred to designated area. 2.9 Tools and equipment cleaned and kept.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
			Recycle) practices	
3. Perform tiling work	3.1 Types of tiling which includes: • Wall (which includes: - Tiling, Wallpaper, Acoustic wall, Timber strip wall) • Floor (which includes: - Tiling, Vinyl, Terrazzo, Carpet, Pebble wash, Concrete imprint, Parquet, Timber strip, Paver, Skirting) 3.2 Purpose of tiling marking	3.1 Obtain drawing and specification 3.2 Identify tiling work location 3.3 Identify tiling work requirements 3.4 Prepare tiling work tools and equipment 3.5 Clear work area 3.6 Set tiling marking 3.7 Execute tiling work 3.8 Clean work area	ATTITUDE • Meticulous and precise in performing other finishing installation • Systematic in performing other finishing installation work • Time and cost conscious in completing task SAFETY • Alert to other finishing installation hazard • Adhere to DOSH requirements ENVIRONMENT • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	3.1 Understanding of construction drawing listed out and explained. 3.2 Tiling work location, type, size, colour, pattern of tiles, material, and methods described and identified. 3.3 Tiling work tools and equipment described and explained. 3.4 Types of tiling listed out and explained. 3.5 Purpose of tiling marking listed out and explained. 3.6 Tiling marking referring to alignment (horizontal and vertical) of tile. 3.7 Tile cut referring to building services point (socket, pipe). 3.8 Execution of tiling work demonstrated. 3.9 Finishing applied for tile jointing and edge. 3.10 Construction debris cleaned and transferred to designated area. 3.11 Tools and equipment cleaned and kept.

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
4. Perform painting work	4.1 Purpose of three layer (undercoat, primer coat and finish coat) 4.2 Types of paint which includes: • Oil base • Water base 4.3 Types and functions of tools and equipment which includes: - • Roller • Spray • Scrapper • Sand paper • Brush	4.1 Obtain drawing and specification 4.2 Identify painting work location 4.3 Identify painting work requirements 4.4 Prepare painting work tools and equipment 4.5 Clear work area 4.6 Execute painting work 4.7 Clean work area	<u>ATTITUDE</u> • Meticulous and precise in performing painting work • Systematic in performing painting work • Time and cost conscious in completing task <u>SAFETY</u> • Alert to painting work hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	4.1 Understanding of construction drawing listed out and explained. 4.2 Painting work location, type, colour code, and methods described and identified. 4.3 Painting work tools and equipment described and explained. 4.4 Purpose of three layer (undercoat, primer coat and finish coat) listed out and explained. 4.5 Types of paint listed out and explained. 4.6 Surface for painting prepared referring to type of material surface (e.g. timber and metal) 4.7 Application of three layer (undercoat, primer coat and finish coat) demonstrated 4.8 Construction debris cleaned and transferred to designated area. 4.9 Tools and equipment cleaned and kept.

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

References for Learning Material Development

1	Badron, Jahiman. 2007. Teknologi Binaan Bangunan. Petaling Jaya : IBS Buku, 2007. ISBN 9679502414.
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15.11. Building Ceiling Finishing

SECTION	(F) Construction		
GROUP	(410) Construction of Buildings		
AREA	Building Construction		
NOSS TITLE	Building Construction Operation		
COMPETENCY UNIT TITLE	Building Ceiling Finishing		
LEARNING OUTCOMES	The outcome of this competency unit is various types of ceiling with the right squareness and evenness installed as per specification in construction drawing. Upon completion of this competency unit, trainees shall be able to: 1. Perform plaster ceiling work 2. Perform suspended ceiling work 3. Perform non-suspended ceiling work		
TRAINING PRE-REQUISITE (SPECIFIC)	Not Available		
CU CODE	F410-001-2:2019-C11	NOSS LEVEL	Two (2)

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
1. Perform plaster ceiling work	1.1 Types and functions of materials, tools and equipment for plaster ceiling which includes: • Laser measurement • Filler • Trowel • Plaster ceiling board • Hanger • Hand tools 1.2 Purpose of plaster ceiling marking 1.3 Plaster ceiling dimension, vertical,	1.1 Obtain drawing and specification 1.2 Identify plaster ceiling work location 1.3 Identify plaster ceiling requirements 1.4 Prepare plaster ceiling tools and equipment 1.5 Clear work area 1.6 Level marking 1.7 Install frame 1.8 Install ceiling board 1.9 Seal joint 1.10 Prepare opening building services 1.11 Plaster skim coat	<u>ATTITUDE</u> • Meticulous and precise in installing plaster ceiling work • Systematic in installing plaster ceiling work • Time and cost conscious in completing task <u>SAFETY</u> • Alert to plaster ceiling hazard • Adhere to DOSH requirements	1.1 Understanding of construction drawing listed out and explained. 1.2 Plaster ceiling work location, types, pattern, sizes and methods described and identified. 1.3 Plaster ceiling work tools and equipment described and explained. 1.4 Purpose of plaster ceiling marking listed out and explained. 1.5 Plaster ceiling dimension, vertical, horizontal and squareness listed out and

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	horizontal and squareness	1.12 Clean work area	ENVIRONMENT • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	explained. 1.6 Plaster ceiling marking levelled horizontally. 1.7 Ceiling frame/ hanger installed and secured referring to level marked. 1.8 Ceiling board installed and secured at ceiling frame/ hanger. 1.9 Cutting of ceiling demonstrated (if required). 1.10 Joint sealed referring to hole, and gap between panel to panel and panel to other building surface. 1.11 Opening for building services prepared at designated location. 1.12 Skim coat plastered evenly. 1.13 Construction debris cleaned and transferred to designated area. 1.14 Tools and equipment cleaned and kept.
2. Perform suspended ceiling work	2.1 Types and functions of materials, tools and equipment for suspended ceiling which includes: • Laser measurement • Ceiling-T • Ceiling board • Hanger • Hand tools 2.2 Purpose of suspended ceiling marking	2.1 Obtain drawing and specification 2.2 Identify suspended ceiling work location 2.3 Identify suspended ceiling requirements 2.4 Prepare suspended ceiling tools and equipment 2.5 Clear work area 2.6 Level marking 2.7 Install frame	ATTITUDE • Meticulous and precise in installing suspended ceiling work • Systematic in installing suspended ceiling work • Time and cost conscious in completing task SAFETY • Alert to suspended	2.1 Understanding of construction drawing listed out and explained. 2.2 Suspended ceiling work location, types, pattern, sizes and methods described and identified. 2.3 Suspended ceiling work tools and equipment described and explained. 2.4 Purpose of suspended ceiling marking listed out and

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	2.3 Suspended ceiling dimension, vertical, horizontal and squareness	2.8 Install ceiling board 2.9 Clean work area	ceiling hazard • Adhere to DOSH requirements <u>ENVIRONMENT</u> • Adhere to Department Of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	explained. 2.5 Suspended ceiling dimension, vertical, horizontal and squareness listed out and explained. 2.6 Suspended ceiling marking levelled horizontally. 2.7 Ceiling frame/ hanger installed and secured referring to level marked. 2.8 Ceiling board installed at ceiling frame/ hanger. 2.9 Cutting of ceiling demonstrated (if required). 2.10 Construction debris cleaned and transferred to designated area. 2.11 Tools and equipment cleaned and kept.
3. Perform non-suspended ceiling work	3.1 Types and functions of materials, tools and equipment for non-suspended ceiling which includes: • Laser measurement • Ceiling bead • Ceiling board • Timber frame • Hand tools 3.2 Purpose of non-suspended ceiling marking 3.3 Non-suspended ceiling dimension, vertical, horizontal and	3.1 Obtain drawing and specification 3.2 Identify non-suspended ceiling work location 3.3 Identify non-suspended ceiling requirements 3.4 Prepare non-suspended Level marking 3.5 Install frame 3.6 Fix ceiling board 3.7 Clean work area	<u>ATTITUDE</u> • Meticulous and precise in installing non-suspended ceiling work • Systematic in installing non-suspended ceiling work • Time and cost conscious in completing task <u>SAFETY</u> • Alert to non-suspended ceiling hazard • Adhere to DOSH requirements	3.1 Understanding of construction drawing listed out and explained. 3.2 Non-suspended ceiling work location, types, pattern, sizes and methods described and identified. 3.3 Non-suspended ceiling work tools and equipment described and explained. 3.4 Purpose of non-suspended ceiling marking listed out and explained. 3.5 Non-suspended ceiling dimension, vertical, horizontal and squareness listed out and

WORK ACTIVITIES	RELATED KNOWLEDGE	RELATED SKILLS	ATTITUDE/ SAFETY/ ENVIRONMENT	ASSESSMENT CRITERIA
	squareness		ENVIRONMENT • Adhere to Department of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	explained. 3.6 Non-suspended ceiling marking levelled horizontally. 3.7 Ceiling frame installed and secured referring to level marked. 3.8 Ceiling board fixed at ceiling frame. 3.9 Cutting of ceiling demonstrated (if required). 3.10 Construction debris cleaned and transferred to designated area. 3.11 Tools and equipment cleaned and kept.

Employability Skills

Core Abilities

- Please refer NCS- Core Abilities latest edition.

Social Values & Social Skills

- Please refer Handbook on Social Skills and Social Values in Technical Education and Vocational Training.

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16. Delivery Mode

The following are the **recommended** training delivery modes: -

KNOWLEDGE	SKILL
• Lecture • Group discussion • E-learning, self-paced • E-learning, facilitate • Case study or Problem based learning (PBL) • Self-paced learning, non-electronic • One-on-one tutorial • Shop talk • Seminar	• Demonstration • Simulation • Project • Scenario based training (SBT) • Role play • Coaching • Observation • Mentoring

Skills training and skills assessment of trainees should be implemented in accordance with TEM requirements and actual situation.

17. Tools, Equipment and Materials (TEM)

BUILDING CONSTRUCTION OPERATION

LEVEL 2

CU No.	CU CODE	COMPETENCY UNIT TITLE
CU1	F410-001-2:2019-C01	Site Building Construction Preparation
CU2	F410-001-2:2019-C02	Building Formwork Work
CU3	F410-001-2:2019-C03	Building Reinforcement Work
CU4	F410-001-2:2019-C04	Building Concreting Work
CU5	F410-001-2:2019-C05	Building Roof System Work
CU6	F410-001-2:2019-C06	Building Steel Framing Installation
CU7	F410-001-2:2019-C07	Building Precast Concrete Installation
CU8	F410-001-2:2019-C08	Building Door & Window Installation
CU9	F410-001-2:2019-C09	Building Wall Work
CU10	F410-001-2:2019-C10	Building Wall & Floor Finishing
CU11	F410-001-2:2019-C11	Building Ceiling Finishing

* Items listed refer to TEM's **minimum requirement** for skills delivery only.

NO.	ITEM*	RATIO (TEM : Trainees or AR = As Required)										
		CU1	CU2	CU3	CU4	CU5	CU6	CU7	CU8	CU9	CU10	CU11
A. Tools												
1	Trowel	1:1									1:1	1:1
2	Pointing Trowel	1:1										
3	Notch Trowel	1:1										
4	Hammer	1:1										
5	Club Hammer	1:1										
6	Rubber Mallet	1:1										
7	Measuring Tape	1:1										
8	Builder Square	1:3										
9	Laser Measurement	1:10								1:10	1:10	1:10

10	Carpentry Pencils	1:1										
11	Utility Knife	1:1										
12	Pliers	1:1										
13	Line Level	1:1										
14	Spirit Level	1:1					1:1			1:1	1:1	
15	Drill	1:5			1:5	1:5	1:5	1:5	1:5	1:5	1:5	1:5
16	Circular Saw		1:10									
17	Plumb Bob	1:1	1:1				1:1	1:1		1:1		
18	Chisel	1:1				1:1			1:1			
19	Screwdrivers	1:1										
20	Socket Wrench Set						1:5	1:5				
21	Bolt Cutter			1:10								
22	Measuring Tape		1:1		1:1	1:1				1:1		
23	Hand Tools Set		1:1			1:1	1:1	1:1		1:1	1:1	1:1
24	Bar Bending Tool			1:1								
25	Shovel				1:1							
26	Metal Sheet Cutter					1:1						
27	Chain Block						1:5					
28	Hose Water Level		1:10		1:10	1:10		1:10	1:10	1:10		
29	Wood Trowel										1:1	
30	Personal protective equipment (PPE) (safety gloves, safety boots, safety helmet, safety vest, harness and belt, ear plug, mask, goggles)	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1	1:1
B. Equipment												
1	Step Ladders	1:5	1:5	1:5	1:5	1:5	1:5	1:5	1:5	1:5	1:5	1:5
2	Mixer				1:25							
3	Wheelbarrow				1:5							
4	Air Compressor										1:25	
5	Spray Gun										1:10	
6	Scaffolding		1:5	1:5	1:5	1:5	1:5	1:5		1:5	1:5	1:5
C. Materials												

1	Chalk Line	AR										
2	Timber		AR									
3	Plastic		AR									
4	Steel		AR									
5	Sample of Contract Document		1:5	1:5	1:5	1:5			1:5	1:5	1:5	1:5
6	Sample of Construction Drawing/ Shop Drawing		1:5	1:5		1:5			1:5	1:5	1:5	1:5
7	Reinforcement Bar			AR								
8	Spacer			AR								
9	Reinforcement Wire			AR								
10	Damp Proof Membrane (DPM)				AR							
11	Cement				AR							
12	Curing Agent				AR							
13	Fine & Coarse Aggregate				AR							
14	Plastic Cover				AR							
15	Water				AR							
16	Light Gauge Steel Roof Trusses					AR						
17	Timber Roof Truss					AR						
18	Metal Deck					AR						
19	Roof Tile					AR						
20	Aluminium Foil					AR						
21	Gutter					AR						
22	Rain Water Down Pipe					AR						
23	Sound Insulation					AR						
24	Fastener					AR						
25	Steel Batten					AR						
26	Timber Batten					AR						
27	Manual Installation					1:25						
28	Fastener						AR					
29	Light Gauge Members Set						AR					
30	C Channel						AR					
31	Hollow Section						AR					
32	Precast Concrete Columns							AR				
33	Precast Concrete Beam							AR				

34	Precast Concrete Slab							AR				
35	Precast Concrete Wall Panel							AR				
36	Sample of Job Instructions							1:5				
37	Sample of Method Statement							1:5				
38	Sample of Installation Checklist							1:5				
39	Sample of Layout Drawing							1:5				
40	Levelling Plates							AR				
41	Bolts and Nuts							AR				
42	Line Marking Materials (water resistant ink, thread)							AR				
43	Grouting materials							AR				
44	Adjustable props							AR				
45	Brooms							AR				
46	Scoop							AR				
47	Water Jet							AR				
48	Cleaning Agents							AR				
49	Waste Disposal Bags							AR				
50	Door and Window Frames								1:5			
51	Door Leaf and Window Louvers								1:5			
52	Ironmongeries								AR			
53	Hinges								AR			
54	Door Stopper								AR			
55	Door Closer								AR			
56	Latch								AR			
57	Roller								AR			
58	Spray								AR			
59	Scrapper								AR			
60	Sand Paper								AR			
61	Brush								AR			
62	Brick wall materials									AR		
63	Masonry wall materials									AR		
64	Dry wall materials									AR		
65	IBS wall materials									AR		
66	Glass wall materials									AR		

67	Dowel bar									AR		
68	Exmet									AR		
69	String									AR		
70	Sponge										AR	
71	Cement mortar										AR	
72	Wall finishing materials										AR	
73	Floor finishing materials										AR	
74	Paint										AR	
75	Roller										AR	
76	Scrapper										AR	
77	Sand paper										AR	
78	Brush										AR	
79	Plaster ceiling materials											AR
80	Other suspended ceiling materials											AR
81	Non-suspended ceiling materials											AR
82	Ceiling bead											AR
83	Ceiling board											AR
84	Ceiling-T											AR
85	Filler											AR
86	Hanger											AR
87	Plaster ceiling board											AR
88	Timber frame											AR

18. Competency Weightage

The following table shows the percentage of training priorities based on consensus made by the Standard Development Committee (SDC).

BUILDING CONSTRUCTION OPERATION

LEVEL 2

CU CODE	COMPETENCY UNIT TITLE	COMPETENCY UNIT WEIGHTAGE	WORK ACTIVITIES	WORK ACTIVITIES WEIGHTAGE
F410-001-2:2019-C01	Site Building Construction Preparation	5%	Build site hoarding	20%
			Prepare temporary building	20%
			Perform site clearing	20%
			Prepare silt trap and wash through	20%
			Prepare perimeter drain	20%
F410-001-2:2019-C02	Building Formwork Work	10%	Perform foundation formwork	17%
			Perform column formwork	17%
			Perform beam formwork	17%
			Perform slab formwork	17%
			Perform wall formwork	17%
			Perform staircase formwork	17%
F410-001-2:2019-C03	Building Reinforcement Work	10%	Perform foundation reinforcement	17%
			Perform column reinforcement	17%
			Perform beam reinforcement	17%
			Perform slab reinforcement	17%
			Perform wall reinforcement	17%
			Perform staircase reinforcement	17%
F410-001-2:2019-C04	Building Concreting Work	10%	Perform foundation concreting	17%
			Perform column concreting	17%
			Perform beam concreting	17%
			Perform slab concreting	17%
			Perform wall concreting	17%
			Perform staircase concreting	17%

F410-001-2:2019-C05	Building Roof System Work	15%	Install roof truss (timber)	30%
			Install roof truss (steel)	30%
			Install roof finishing (metal deck)	20%
			Install roof finishing (roof tile)	20%
F410-001-2:2019-C06	Building Steel Framing Installation	12%	Install steel column	25%
			Install steel beam	25%
			Install steel framing wall	25%
			Install steel floor joist	25%
F410-001-2:2019-C07	Building Precast Concrete Installation	5%	Install precast concrete column	20%
			Install precast concrete beam	20%
			Install precast concrete slab	20%
			Install precast concrete wall panel	20%
			Install precast concrete staircase	20%
F410-001-2:2019-C08	Building Door & Window Installation	5%	Install door frame	20%
			Install window frame	20%
			Install door leaf	30%
			Install window leaf	30%
F410-001-2:2019-C09	Building Wall Work	10%	Perform laying brickwork	30%
			Perform laying blockwork	30%
			Install concrete panel	10%
			Install glass panel	15%
			Perform drywall work	15%
F410-001-2:2019-C10	Building Wall & Floor Finishing	8%	Perform plastering work	30%
			Perform rendering work	30%
			Perform tiling work	30%
			Perform painting work	10%
F410-001-2:2019-C11	Building Ceiling Finishing	10%	Perform plaster ceiling work	40%
			Perform suspended ceiling work	20%
			Perform non-suspended ceiling work	40%
TOTAL PERCENTAGE (CORE COMPETENCY)		100%		
			CORE ABILITY	80 hours

Sample Calculation for Summary of Training Hours

The following table shows the nominal training hours based on recommendations made by the Standard Development Committee (SDC). For purpose of Malaysian Skills Certification through accredited centre training, the program duration is subject to Malaysian Skills Certification System.

BUILDING CONSTRUCTION OPERATION

LEVEL 2

CU CODE	COMPETENCY UNIT TITLE	WORK ACTIVITY	WORK ACTIVITY TRAINING DURATION (HOURS)		TRAINING DURATION (HOURS)	SKILLS CREDIT
			KNOWLEDGE	SKILLS		
F410-001-2:2019-C01	Site Building Construction Preparation	Build site hoarding	3	9	60	6
		Prepare temporary building	3	9		
		Perform site clearing	3	9		
		Prepare silt trap and wash through	3	9		
		Prepare perimeter drain	3	9		
F410-001-2:2019-C02	Building Formwork Work	Perform foundation formwork	4	15	110	11
		Perform column formwork	4	15		
		Perform beam formwork	3	15		
		Perform slab formwork	3	15		
		Perform wall formwork	3	15		
		Perform staircase formwork	3	15		
F410-001-2:2019-C03	Building Reinforcement Work	Perform foundation reinforcement	6	13	110	11
		Perform column reinforcement	6	13		
		Perform beam reinforcement	5	13		
		Perform slab reinforcement	5	13		
		Perform wall reinforcement	5	13		
		Perform staircase	5	13		

		reinforcement				
F410-001-2:2019-C04	Building Concreting Work	Perform foundation concreting	6	13	110	11
		Perform column concreting	6	13		
		Perform beam concreting	5	13		
		Perform slab concreting	5	13		
		Perform wall concreting	5	13		
		Perform staircase concreting	5	13		
F410-001-2:2019-C05	Building Roof System Work	Install roof truss (timber)	15	35	170	17
		Install roof truss (steel)	15	35		
		Install roof finishing (metal deck)	10	25		
		Install roof finishing (roof tile)	10	25		
F410-001-2:2019-C06	Building Steel Framing Installation	Install steel column	10	24	130	13
		Install steel beam	9	23		
		Install steel framing wall	9	23		
		Install steel floor joist	9	23		
F410-001-2:2019-C07	Building Precast Concrete Installation	Install precast concrete column	3	9	60	6
		Install precast concrete beam	3	9		
		Install precast concrete slab	3	9		
		Install precast concrete wall panel	3	9		
		Install precast concrete staircase	3	9		

F410-001-2:2019-C08	Building Door & Window Installation	Install door frame	3	10	60	6
		Install window frame	3	10		
		Install door leaf	5	12		
		Install window leaf	5	12		
F410-001-2:2019-C09	Building Wall Work	Perform laying brickwork	10	24	110	11
		Perform laying blockwork	10	24		
		Install concrete panel	2	8		
		Install glass panel	4	12		
		Perform drywall work	4	12		
F410-001-2:2019-C10	Building Wall & Floor Finishing	Perform plastering work	8	19	90	9
		Perform rendering work	8	19		
		Perform tiling work	8	19		
		Perform painting work	3	6		
F410-001-2:2019-C11	Building Ceiling Finishing	Perform plaster ceiling work	11	31	110	11
		Perform suspended ceiling work	8	18		
		Perform non-suspended ceiling work	11	31		
TOTAL HOURS (CORE COMPETENCY)			304	816	1120	112
TOTAL HOURS OF COMPETENCY UNIT					1120	
CORE ABILITY					80	

The sample calculations performed are based on table in section 18 for delivery of level 2 training program at 1120 hours excluding delivery of core abilities.