STANDARD KEMAHIRAN PEKERJAAN KEBANGSAAN
(NATIONAL OCCUPATIONAL SKILLS STANDARD)

F433-002-2:2017

IBS METAL DOOR & WINDOW FRAME INSTALLATION

LEVEL 2

JPK

JABATAN PEMBANGUNAN KEMAHIRAN
KEMENTERIAN SUMBER MANUSIA, MALAYSIA

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JABATAN PEMBANGUNAN KEMAHIRAN
KEMENTERIAN SUMBER MANUSIA
MALAYSIA

CONSTRUCTION INDUSTRY DEVELOPMENT BOARD (CIDB)

Department of Skills Development (DSD)
Ministry of Human Resources
62530 PUTRAJAYA, MALAYSIA

STANDARD KEMAHIRAN PEKERJAAN KEBANGSAAN
(NATIONAL OCCUPATIONAL SKILLS STANDARD)

FOR

IBS METAL DOOR & WINDOW FRAME INSTALLATION
LEVEL 2

TABLE OF CONTENTS

ABBREVIATION

CIDB	Construction Industry Development Board
CP	Competency Profile
CPC	Competency Profile Chart
CU	Competency Unit
DKM	Diploma Kemahiran Malaysia
DLKM	Diploma Lanjutan Kemahiran Malaysia
DOSH	Department of Occupational Safety and Health
IBS	Industrialised Building System
NIOSH	National Institute Of Occupational Safety And Health
NOSS	National Occupational Skills Standard
OAS	Occupational Area Structure
OS	Occupational Structure
OSHA	Occupational Safety And Health Administration
PC	Penyata Pencapaian
SKM	Sijil Kemahiran Malaysia
STEC	Standard Technical Evaluation Committee

STANDARD PRACTICE

NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR;

IBS METAL DOOR & WINDOW FRAME INSTALLATION

LEVEL 2

1. Introduction

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Industrialised Building System (IBS) Metal door & window frame installation is defined under specialized construction activities under construction sector. IBS Metal door & window frame installation works describe the activities in fitting metal door & window frame onto a specific opening according to its specifications. This task normally being carried out after the completion of foundation preparation, formwork preparation, reinforcement work, concreting work and roofing system installation in a construction project.

The IBS term used in this standard is referring to a construction process that utilizes techniques, products, components, or building systems that involve prefabricated components and on-site installation.

This standard covers for the metal frame only, which include materials such as alloy, galvanised metal and aluminium. These are the materials that are currently widely being used in door & window frame fabrications due to its specifications and characteristics.

The Malaysian construction sector is set to continue expanding in 2016 as new projects; foreign investment and increased outlooks among construction firms stimulate the industry. The outlook for the construction sector in 2016 remains positive, thanks to continuous list of government jobs including the 118-storey skyscraper development Warisan Merdeka and the affordable housing project under the PR1MA initiative will drive construction activities despite the weakened ringgit and rising cost of construction[1]. The value of construction work done grew by 11.7 per cent year-on-year basis to record RM30.4 billion in the second quarter 2016[2].

In the light of continuous economic development in the construction sector, 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.

Construction Industry Development Board (CIDB) required any person that to enter in construction work sites must hold valid CIDB Green Card. CIDB Green Card is an integrated program that involves the registration and accreditation of construction personnel to enhance safety levels at construction work sites. This program is to ensure that construction workers are aware of the importance a safe and healthy working place; to provide a basic knowledge on safety and health at the construction work site and to inform construction workers of the legal requirements in relation to

[1] 7th Malaysian Construction Summit 2016, CIDB Malaysia

[2] Quarterly Construction Statistics, Second Quarter 2016, Department of Statistics Malaysia

safety and health. Construction personnel will automatically covered by a special insurance scheme that insure the construction personnel against death and accidents.

Pre-requisites:

Based on the workshop findings, it is decided that the minimum requirements for those interested to enrol in this course are as follows:

i) Able to calculate, read and write in Bahasa Malaysia and/or English;
ii) Full interest in metal door & window frame installation; and
iii) Medically and physically fit to meet the high demands of this particular job scope.

2. Occupational Structure (OS)

SECTOR	(F) CONSTRUCTION																		
SUB-SECTOR	(41) CONSTRUCTION OF BUILDINGS																	(43) SPECIALISED CONSTRUCTION ACTIVITIES	
Job Area	INDUSTRIALISED BUILDING SYSTEM (IBS)																		
	Metal Roof Trusses System				Steel Structure System					Reusable Formwork System	Precast Concrete System					Lightweight Panel (Non-Structural) System	Blockwork System	Metal Door & Window Frame	
	Steel	Aluminum	Zincalume	Galvanised Iron	Column	Beam	Load Bearing Wall Framing	Floor Joist	Roof Structure	N/A	Column	Beam	Slab	Wall Panel	Staircase	Slab/Wall		Metal Door Frame	Metal Window Frame
Level 5	IBS Construction Project Manager																		
Level 4	IBS Construction Site Manager																		
Level 3	Mild Steel Trusses Supervisor		Lightweight Trusses Supervisor		IBS Steel Structure Installation Supervisor					Building Construction Site Supervisor	Precast Concrete Installation Supervisor					Lightweight Panel (Non-Structural) System Supervisor	Blockwork System Supervisor	Metal Door and Window Frame Supervisor	
Level 2	Mild Steel Trusses Installer		Lightweight Trusses Installer		IBS Steel Structure Installer					Building Construction Site Leader	Precast Concrete Installer					Lightweight Panel (Non-Structural) System Installer	Blockwork System Installer	Metal Door and Window Frame Installer	
Level 1	Not applicable				Not applicable					Not applicable	Not applicable					Not applicable	General Worker	General Worker	

Figure 1.1: Occupational Structure for IBS Metal Door & Window Frame Installation Personnel

3. Occupational Area Structure (OAS)

SECTOR	(F) CONSTRUCTION																		
SUB-SECTOR	(41) CONSTRUCTION OF BUILDINGS																	(43) SPECIALISED CONSTRUCTION ACTIVITIES	
Job Area	INDUSTRIALISED BUILDING SYSTEM (IBS)																		
	Metal Roof Trusses System				Steel Structure System					Reusable Formwork System	Precast Concrete System					Lightweight Panel (Non-Structural) System	Blockwork System	Metal Framing (Door & Window System)	
	Steel (BC-IBS-0)	Aluminum	Zincalume	Galvanised Iron	Column	Beam	Load Bearing Wall Framing	Floor Joist	Roof Structure	N/A	Column	Beam	Slab	Wall Panel	Staircase	Slab/Wall		Metal Door Frame	Metal Window Frame
Level 5	IBS Construction Project Management																		
Level 4	IBS Construction Project Implementation																		
Level 3	IBS Metal Roof Trusses Installation Supervision (Mild Steel)	IBS Metal Roof Trusses Installation Supervision (Lightweight)			IBS Steel Structure Installation Supervision					IBS Reusable Formwork Installation Supervision	IBS Precast Concrete Installation Supervision					IBS Lightweight Panel Installation Supervision	IBS Blockwork Installation Supervision	IBS Metal Door and Window Frame Installation Supervision	
Level 2	IBS Metal Roof Trusses Installation Operation (Mild Steel)	IBS Metal Roof Trusses Installation Operation (Lightweight)			IBS Steel Structure Installation					IBS Reusable Formwork System Installation	IBS Precast Concrete Installation					IBS Lightweight Panel Installation	IBS Blockwork Installation	IBS Metal Door and Window Frame Installation	
Level 1	Not applicable				Not applicable					Not applicable	Embedded to Level 2					Embedded to Level 2	Embedded to Level 2	Embedded to Level 2	

Figure 1.2: Occupational Area Structure for IBS Metal Door & Window Frame Installation

IBS metal door & window frame installation works normally requires workers to perform a significant range of varied work activities, carried out in a variety of contexts in fulfilling all the requirements from client, consultant, authority and contractor.

Based of discussion among the industry experts, the job scope and competency required for Level 1 and Level 2 are the same; hence competency for Level 1 can be embedded to Level 2. Competency for Level 3 is more to quality inspection and supervisory.

4. Definition of Competency Levels

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

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

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

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

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

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

5. Award of Certificate

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

- Malaysia Skills Certificate / Sijil Kemahiran Malaysia (SKM) Level 1, 2 or 3
- Malaysia Skills Diploma / Diploma Kemahiran Malaysia (DKM) Level 4
- Malaysia Skills Advanced Diploma / Diploma Lanjutan Kemahiran Malaysia (DLKM) Level 5
- Statement of Achievement / Penyata Pencapaian (PC)

6. Job Competencies

The IBS Metal Door & Window Frame Installation Level 2 personnel is competent in performing the following core competencies:-

b. IBS Metal Door Frame Installation
c. IBS Metal Window Frame Installation
d. IBS Metal Door & Window Frame Rectification

7. Work Conditions

Generally, an IBS Metal Door & Window Frame Installation (Level 2) personnel work in normal working hours from morning to evening depending on company's nature of business. They may require working extra hours to fulfil project requirements. They also may be needed to work in shift to accommodate work requirements. All personnel need to have valid CIDB Green Card and use / wear appropriate attire (Personal Protective Equipment) during the commencement of their jobs. They may work individually or group in a hazardous and hot environment. They must physical fit due to nature of job in construction field.

8. Employment Prospects

The employment prospects for IBS Metal Door & Window Frame Installation (Level 2) personnel are very huge due the industry grows in the positive trend. Currently, the industry has shortage of skilled personnel and heavily depending on foreign workers. This scenario should be different in the future once the competent workforces from this training enter the job market. They may be employed at any construction project or they can be an entrepreneur in small building renovation work projects.

9. Career Advancement

To become IBS Metal Door & Window Frame Installation (Level 2) personnel, the person must first gain knowledge and competency as a general worker through on-the job training. Employers may require a high school certificate or skills certificate for general worker position. After these personnel have gained experience and becomes highly skilled and knowledgeable, the person may be eligible for a promotion to become a supervisor in IBS Metal Door & Window Frame Installation area. The amount of time to be promoted depends on a number of variables, including the availability of a job opening and the competitive nature between workers for the leadership role. The person is likely to succeed if he or she understands general construction practices along with having a good technical ability.

10. Sources of Additional Information

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

a. Kementerian Kerja Raya
Tingkat 6, Blok B Kompleks Kerja Raya,
Jalan Sultan Salahuddin,
50580 Kuala Lumpur
Phone : 03 – 8000 8000
E-mail : pro@kkr.gov.my

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

c. Jabatan Bomba dan Penyelamat Malaysia
Lebuh Wawasan, Presint 7,
62250 Putrajaya
Phone : 03 – 8892 7600
E-mail : korporat@bomba.gov.my

d. National Institute Of Occupational Safety And Health (NIOSH)
1, Jalan 15/K, Section 15,
43650 Bandar Baru Bangi,
Selangor, Malaysia
Phone : 03 – 8000 8000
E-mail : general@niosh.com.my

11. 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; especially members of Standard Technical Evaluation Committee (STEC) for validating this document.

NO	NAME	ORGANISATION
1.	Prof Madya Sr. Dr. Mohammad Fadhil Mohammad	Centre of Study for Quantity Surveying Faculty of Architecture, Planning and Surveying University Technology Mara
2.	Dr Ir Ng Soon Ching	Universiti Tunku Abdul Rahman Sg Long Campus
3.	Mohd Idrus Din	CIDB, Pusat IDB
4.	Yuanti Mohamed	CIDB, Pusat IDB

12. NOSS Development Committee Members

IBS METAL DOOR & WINDOW FRAME INSTALLATION

LEVEL 2

STANDARD DEVELOPMENT COMMITTEE (SDC)		
1.	Abid Zamrin bin Ariffin	Project Manager WZR Property Sdn. Bhd.
2.	Haruddin Jusoh	Construction Manager WZR Property Sdn. Bhd.
3.	Mohamad Hafiz Shamsudin	Site Supervisor Dasafbina Enterprise
4.	Mohamad Harith bin Abdul Fadil	Senior Site Safety Supervisor WZR Property Sdn. Bhd.
5.	Dr. Mohd Fadhlillah Mahmood	Managing Director Wira Kerjaya Sdn. Bhd.
6.	Mohd Mufaradzi Matsom	Trainer Pembinaan Reka Cipta Enterprise
7.	Mohd Sofian bin Abd Jalil	Ketua Unit Pembangunan Modul Furniture Industry Technology Centre (FITEC) MARA
8.	Rosimi bin Mahmood	Trainer Akademi Binaan Malaysia Wilayah Tengah
9.	Ruth Chai Mei Hui	QA Manager Thung Hing Metal Industry Sdn. Bhd.
10.	Wang Chee Leong	Site Manager Top Form Renovation & Construction Sdn. Bhd.
11.	Yusri Abdul Wahab	Managing Director Isas Smart Resources Sdn. Bhd.
FACILITATOR		
1.	Ahmad Ramdan bin M Yusof	Facilitator Jumantara Timur Sdn. Bhd.

STANDARD CONTENT

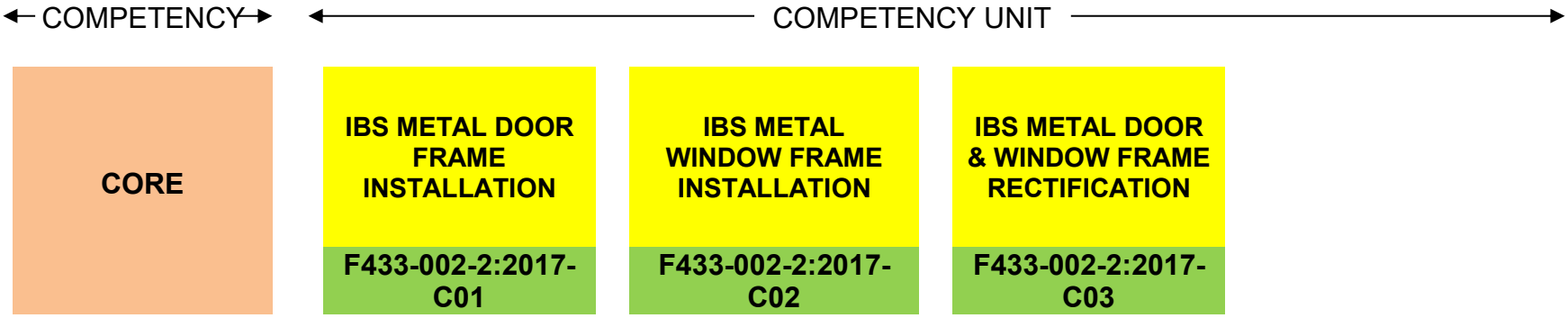
NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR;

IBS METAL DOOR & WINDOW FRAME INSTALLATION

LEVEL 2

13. Competency Profile Chart (CPC)

SECTOR	**(F) CONSTRUCTION**		
SUB SECTOR	**(43) SPECIALIZED CONSTRUCTION ACTIVITIES**		
JOB AREA	**IBS METAL DOOR & WINDOW FRAME**		
NOSS TITLE	**IBS METAL DOOR & WINDOW FRAME INSTALLATION**		
JOB LEVEL	**2 (TWO)**	**NOSS CODE**	**F433-002-2:2017**



14. Competency Profile (CP)

SECTOR	**(F) CONSTRUCTION**		
SUB SECTOR	**(43) SPECIALIZED CONSTRUCTION ACTIVITIES**		
JOB AREA	**IBS METAL DOOR & WINDOW FRAME**		
NOSS TITLE	**IBS METAL DOOR & WINDOW FRAME INSTALLATION**		
JOB LEVEL	**2 (TWO)**	**NOSS CODE**	**F433-002-2:2017**

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
1. IBS Metal Door Frame Installation	F433-002-2:2017-C01	IBS metal door frame installation describes the competency in the process of fitting metal door frame onto specific location in a building. A competent person in this CU shall be able to identify metal door frame installation requirements, carry out metal door frame handling, carry out work area preparation, confirm opening readiness, install metal door frame, check	1. Identify metal door frame installation requirements	1.1 Metal door frame installation works determined according to work instructions, drawings, types of wall and type of door 1.2 Metal door frame size & product profiles determined according to work instructions and drawings (including door schedule) 1.3 Type of metal door frame determined according to work

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		installed metal door frame and wall condition and carry out housekeeping works. The outcome of this competency is to install metal door frame with the right frame squareness, verticality, height, alignment, supports and fixes in accordance with frame manufacturer specifications, work instructions and drawings.		instructions and drawings 1.4 Type of metal door frame material determined according to work instructions and drawings 1.5 Metal door frame installation time frame determined according to work instructions
			2. Carry out metal door frame handling	2.1 Site store for metal door frame located on site 2.2 Metal door frame collected from store and transferred to dedicated location according to work instructions and label 2.3 Metal door frame handling procedure applied accordingly to avoid damage 2.4 Metal door frame stacked according to stacking method and procedure to avoid damage 2.5 Metal door frame

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				handled without damage
			3. Carry out work area preparation	3.1 Work area organised according to 5S (Sort, Set in Order, Shine, Standardize, Sustain) method to ensure work area clean, efficient and safe 3.2 Work area arranged according to Occupational Safety and Health Act (OSHA) requirements and work flow 3.3 Proper lighting set when required
			4. Confirm opening readiness	4.1 Opening position, size and verticality checked according to drawings 4.2 Opening conditions checked to ensure free from damage 4.3 Type of metal door frame confirmed according to drawings and label 4.4 Lintels checked and

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				complied with engineer's requirements
			5. Install metal door frame	5.1 Suitable Personal Protective Equipment (PPE) used properly according to OSHA requirements 5.2 Suitable installation tools, equipment and materials selected and functionality check performed according to work instruction and manufacturer specifications 5.3 Door accessories and leaf opening direction determined to avoid installation fault 5.4 Metal door frame confirmed free from any damage 5.5 Metal door frame set onto opening appropriately 5.6 Joist, supports and fixes set appropriately to ensure metal door frame alignment &

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				dimension is correct 5.7 Finishing works carried out according to metal door frame and opening conditions
			6. Check installed metal door frame and wall condition	6.1 Metal door frame squareness, alignment, height, verticality, supports and fixes checked according to frame manufacturer specification 6.2 Installed metal door frame confirmed free from defects/non conformities
			7. Carry out housekeeping works	7.1 Concrete spills and debris cleared from work area and dumped according to work instruction 7.2 Tools and equipment cleaned and stored according to work procedure and manufacturer specifications 7.3 Remaining materials

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				gathered and stored at designated storage location
2. IBS Metal Window Frame Installation	F433-002-2:2017-C02	IBS metal window frame installation describes the competency in the process of fitting metal window frame onto specific location in a building. A competent person in this CU shall be able to identify metal window frame installation requirements, carry out metal window frame handling, carry out work area preparation, confirm opening readiness, install metal window frame, check installed metal window frame and wall condition and carry out housekeeping works.	1. Identify metal window frame installation requirements	1.1 Metal window frame installation works determined according to work instructions, drawings, types of wall and type of window 1.2 Metal window frame size & product profiles determined according to work instructions and drawings (including window schedule) 1.3 Type of metal window frame material determined according to work instructions and drawings 1.4 Metal window frame installation time frame determined according to work instructions

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		The outcome of this competency is to install metal window frame with the right frame squareness, verticality, alignment, height, supports and fixes in accordance with frame manufacturer specifications, work instructions and drawings.	2. Carry out metal window frame handling	2.1 Site store for metal window frame located on site 2.2 Metal window frame collected from store and transferred to dedicated location according to work instructions and label 2.3 Metal window frame handling procedure applied accordingly to avoid damage 2.4 Metal window frame stacked according to stacking method and procedure to avoid damage 2.5 Metal window frame handled without damage
			3. Carry out work area preparation	3.1 Work area organised according to 5S (Sort, Set in Order, Shine, Standardize, Sustain) method to ensure work area clean, efficient and safe 3.2 Work area arranged according to

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				Occupational Safety and Health Act (OSHA) requirements and work flow 3.3 Proper lighting and work platform set when required
			4. Confirm opening readiness	4.1 Opening position, size and verticality checked according to drawings 4.2 Opening conditions checked to ensure free from damage 4.3 Type of metal window frame confirmed according to drawings and label 4.4 Lintels checked and complied with engineer's requirements
			5. Install metal window frame	5.1 Suitable Personal Protective Equipment (PPE) used properly according to OSHA requirements 5.2 Suitable installation tools, equipment and materials selected and

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				functionality check performed according to work instruction and manufacturer specifications 5.3 Window accessories and leaf opening direction determined to avoid installation fault 5.4 Metal window frame confirmed free from any damage 5.5 Metal window frame and sub frame set onto opening appropriately 5.6 Joist, supports and fixes set appropriately to ensure metal window frame alignment & dimension are correct 5.7 Finishing works carried out according to metal window frame and opening conditions
			6. Check installed metal window frame and wall condition	6.1 Metal window frame squareness, verticality, height, supports and fixes checked according to frame

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				manufacturer specification 6.2 Installed metal window frame confirmed free from defects/non conformities
			7. Carry out housekeeping works	7.1 Concrete spills and debris cleared from work area and dumped according to work instruction 7.2 Tools and equipment cleaned and stored according to work procedure and manufacturer specifications 7.3 Remaining materials gathered and stored at designated storage location
3. IBS Metal Door & Window Frame Rectification	F433-002-2:2017-C03	IBS metal door & window frame rectification describes the competency in the process of repairing and replacing damage installed metal door & window frame.	1. Identify metal door & window frame rectification works requirements	1.1 Metal door & window frame defects determined according to work instructions and frame conditions 1.2 Metal door & window frame rectification method determined

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		A competent person in this CU shall be able to identify metal door & window frame restoration works requirements, carry out metal door & window frame rectification works preparation, carry out work area preparation, rectify damage metal door & window frame, check rectified metal door & window frame and wall condition and carry out housekeeping works. The outcome of this competency is to fix installed metal door & window frame with the right methods in accordance with frame manufacturer specifications, work instructions and drawings. The personnel who aspires to be competent in this competency must in prior have the following competencies:-		according to work instructions and frame damage 1.3 Metal door & window frame rectification time frame determined according to work instructions
			2. Carry out metal door & window frame rectification works preparation	2.1 Suitable rectification tools and equipment selected and functionality check performed according to work instruction and manufacturer specifications 2.2 Suitable rectification materials prepared according to work instruction and frame damage
			3. Carry out work area preparation	3.1 Work area organised according to 5S (Sort, Set in Order, Shine, Standardize, Sustain) method to ensure work area clean, efficient and safe 3.2 Work area arranged

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
		i. Metal Door Frame Installation, and ii. Metal Window Frame Installation		according to Occupational Safety and Health Act (OSHA) requirements and work flow 3.3 Proper lighting and work platform set when required
			4. Rectify damage metal door & window frame	4.1 Suitable Personal Protective Equipment (PPE) used properly according to OSHA requirements 4.2 Damage metal door & window frame dismantling procedure followed to avoid further damage 4.3 Method of repairing metal door & window frame applied according to frame restoration requirements 4.4 Replaced metal door & window frame confirmed free from any damage 4.5 Supports, braces and fixes set appropriately

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				to ensure metal door & window frame alignment & dimension are correct 4.6 Finishing works carried out according to metal door & window frame and opening conditions
			5. Check rectified metal door & window frame and wall condition	5.1 Metal door & window frame squareness, alignment, verticality, supports and fixes checked according to frame manufacturer specification 5.2 Rectified metal door & window frame confirmed free from defects/non conformities
			6. Carry out housekeeping works	6.1 Concrete spills and debris cleared from work area and dumped according to work instruction 6.2 Tools and equipment cleaned and stored according to work procedure and

CU Title	CU Code	CU Descriptor	Work Activities	Performance Criteria
				manufacturer specifications 6.3 Remaining materials gathered and stored at designated storage location

CURRICULUM

NATIONAL OCCUPATIONAL SKILLS STANDARD (NOSS) FOR;

IBS METAL DOOR & WINDOW FRAME INSTALLATION

LEVEL 2

15. Curriculum of Competency Unit (CoCU)

SECTOR	**(F) CONSTRUCTION**						
SUB SECTOR	**(43) SPECIALIZED CONSTRUCTION ACTIVITIES**						
JOB AREA	**IBS METAL DOOR & WINDOW FRAME**						
NOSS TITLE	**IBS METAL DOOR & WINDOW FRAME INSTALLATION**						
COMPETENCY UNIT TITLE	**IBS METAL DOOR FRAME INSTALLATION**						
PRE-REQUISITE (If applicable)	-						
LEARNING OUTCOME	The person who is competent in this CU shall be able to install metal door frame with the right frame squareness, verticality, alignment, height, supports and fixes in accordance with frame manufacturer specifications, work instructions and drawings. Upon completion of this competency units, trainees will be able to:- 1. Identify metal door frame installation requirements 2. Carry out metal door frame handling 3. Carry out work area preparation 4. Confirm opening readiness 5. Install metal door frame 6. Check installed metal door frame and wall condition 7. Carry out housekeeping works						
COMPETENCY UNIT ID	F433-002-2:2017-C01	**LEVEL**	2	**TRAINING DURATION**	240	**SKILL CREDIT**	24

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
1. Identify metal door frame installation requirements	1.1 Work instructions 1.2 Type of drawings, which include: • Structural drawing • Architectural drawing (including Door Schedule) • Shop drawing 1.3 Types of wall, which include: • Brick wall • Block wall • Reinforced Concrete (RC) wall • Other types of wall 1.4 Types of door, which include: • Sliding • Folding • Swing 1.5 Type of door leaf/panel, which include:	1.1 Interpret work instructions 1.2 Refer drawings 1.3 Determine types of wall 1.4 Determine types of door opening 1.5 Determine types of door 1.6 Confirm metal door frame size & product profiles 1.7 Determine type of metal door frame 1.8 Confirm type of metal door frame material	Attitude • Meticulous and precise in interpreting work instruction and drawings	Related Knowledge 14 Related Skill 34	Related Knowledge Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar Related Skill Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	1.1 Work instruction explained 1.2 Type of drawing listed and explained 1.3 Type of wall listed out and explained 1.4 Type of door opening listed out and explained 1.5 Type of door listed out and explained 1.6 Type of metal door frame listed out and explained 1.7 Metal door frame specifications explained 1.8 Type of metal door frame material listed out and explained 1.9 Metal door frame size &

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Flush • Glass 1.6 Types of metal door frame: • Normal • Fire resistant 1.7 Metal door frame specifications, which include: • Size & Handing • Material, profiles and thickness • Finishes • Hinges 1.8 Type of metal door frame material, which include: • Alloy • Iron • Aluminium					product profiles measured
2. Carry out metal door frame handling	2.1 Site store location 2.2 Metal door frame handling procedure,	2.1 Determine metal door frame material 2.2 Determine site store location	<u>Attitude</u> • Meticulous and precise in handling metal door	<u>Related Knowledge</u> 11	<u>Related Knowledge</u> Lecture, Group Discussion, E-Learning, Case	2.1 Metal door frame handling procedure explained 2.2 Metal door

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	which include: • Method • Machine 2.3 Metal door frame stacking method	2.3 Collect and transfer metal door frame from site store to dedicated work area 2.4 Apply metal door frame handling procedure 2.5 Apply metal door frame stacking method	frame • Organise own tasks • Time and cost conscious in completing task <u>Safety</u> • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace	<u>Related Skill</u> 25	Study, Problem Based Learning (PBL) or Seminar <u>Related Skill</u> Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	frame stacking method explained 2.3 Correct metal door frame handling procedure demonstrated 2.4 Correct metal door frame stacking method demonstrated
3. Carry out work area preparation	3.1 Work area location • Level • Area 3.2 Occupational Safety and Health Act (OSHA) 3.3 5S method: • Sort • Set in Order • Shine • Standardize	3.1 Determine work area location 3.2 Ensure work area is clean and safe 3.3 Ensure proper lighting when required 3.4 Ensure work area comply to Occupational Safety and	<u>Attitude</u> • Meticulous and precise in preparing work area • Time and cost conscious in completing task <u>Safety</u> • Adhere to DOSH safety	<u>Related Knowledge</u> 4 <u>Related Skill</u> 8	<u>Related Knowledge</u> Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar <u>Related Skill</u> Demonstration,	3.1 Related act under Occupational Safety and Health Act (OSHA) determined and explained 3.2 5S method listed out and explained 3.3 Work area kept clean and safe

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Sustain	Health Act (OSHA) 3.5 Apply 5S method	requirements • Alert to hazards and risks in workplace		Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	
4. Confirm opening readiness	4.1 Measurement tools usage and application 4.2 Opening size and verticality checking method 4.3 Function of lintels	4.1 Refer to structural drawing 4.2 Check opening size and verticality 4.3 Ensure type of metal door frame 4.4 Ensure lintels installation	<u>Attitude</u> • Meticulous and precise in confirming opening readiness • Time and cost conscious in completing task <u>Safety</u> • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace	<u>Related Knowledge</u> 4 <u>Related Skill</u> 8	<u>Related Knowledge</u> Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar <u>Related Skill</u> Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	4.1 Measurement tools usage and application explained 4.2 Function of lintels explained 4.3 Checking of opening size and verticality demonstrated

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
5. Install metal door frame	5.1 Installation tools & equipment, which include: • Hand tools (Hand-drills, hammer, grinder etc.) • Ladder • Spirit Level • Laser levelling machine • Plumb bob • Measuring tape • Air Compressor • Grouting spray nozzle 5.2 Installation materials, which include: • Fixes (fishtail, wire anchor, wallplugs) • Nails • Thread • Temporary fix in place	5.1 Determine installation tools & equipment 5.2 Determine installation materials 5.3 Determine door accessories 5.4 Determine door leaf opening direction 5.5 Check metal door frame for any defect 5.6 Determine metal door frame high 5.7 Set up metal door frame 5.8 Set up supports and bracing 5.9 Set fixes onto metal door frame 5.10 Check metal door frame alignment & dimension	<u>Attitude</u> • Meticulous and precise in installing metal door frame • Time and cost conscious in completing task <u>Safety</u> • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace <u>Environment</u> • Adhere to Department Of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices	<u>Related Knowledge</u> 25 <u>Related Skill</u> 59	<u>Related Knowledge</u> Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar <u>Related Skill</u> Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	5.1 Installation tools & equipment listed out and its usage explained 5.2 Installation materials listed out and explained 5.3 Door accessories listed out and explained 5.4 Metal door frame defect listed out and explained 5.5 Metal door frame height and level transfer explained 5.6 Checking of any defect on metal door frame demonstrated 5.7 Installation method of metal door

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	supports and bracing • Polyurethane foam 5.3 Door accessories, which include: • Hinges • Lock set • Strike plate • Door handle • Door closer • Door latch • Floor spring 5.4 Metal door frame defect, which include: • Dented frame • Scratch • Paint/coat peel off 5.5 Metal door frame height and level transfer 5.6 Metal door frame installation method 5.7 Supports and	5.11 Carry out finishing works				frame demonstrated 5.8 Setting up supports and bracing method demonstrated 5.9 Checking on metal door frame alignment & dimension demonstrated 5.10 Metal door frame finishing works demonstrated

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	bracing set up method 5.8 Fixes set up method 5.9 Metal door frame alignment & dimension checking method 5.10 Metal door frame installation finishing works					
6. Check installed metal door frame and wall condition	6.1 Metal door frame checking method 6.2 Metal door frame condition 6.3 Type of installation defects, which include: • Cracked wall • Non parallel surface	6.1 Ensure metal door frame squareness, verticality, height, alignment, supports and fixes 6.2 Ensure installed metal door frame free from defects 6.3 Ensure wall free from defects	<u>Attitude</u> • Meticulous and precise in checking installed metal door frame • Integrity in checking own works <u>Safety</u> • Adhere to DOSH safety requirements • Alert to hazards and risks in	<u>Related Knowledge</u> 7 <u>Related Skill</u> 17	<u>Related Knowledge</u> Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar <u>Related Skill</u> Demonstration, Simulation, Project, Scenario Based Training	6.1 Type of installation defects listed out and explained 6.2 Criteria on metal door frame checking explained 6.3 Checking on installed metal door frame and wall demonstrated

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
			workplace		(SBT), Coaching, Observation or Mentoring	
7. Carry out housekeeping works	7.1 Cleaning tools and equipment 7.2 Category of waste, which include: • Construction waste • Domestic waste 7.3 3R's definition: • Reduce • Reuse • Recycle	7.1 Clean work area from concrete spills, debris & etc. 7.2 Dump concrete spills, debris at designated area 7.3 Clean and store tools and equipment 7.4 Gather and store remaining materials 7.5 Segregate waste materials accordingly 7.6 Apply 5S method	<u>Attitude</u> • Meticulous and precise in cleaning work area • Time and cost conscious in completing task <u>Safety</u> • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace <u>Environment</u> • Adhere to Department	<u>Related Knowledge</u> 7 <u>Related Skill</u> 17	<u>Related Knowledge</u> Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar <u>Related Skill</u> Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	7.1 Category of waste listed out and explained 7.2 3R's listed out and explained 7.3 Proper usage of cleaning tools and equipment demonstrated 7.4 Proper handling of waste material demonstrated

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
			Of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices			

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
01.01 Identify and gather information. 01.02 Document information procedures or processes. 02.01 Interpret and follow manuals, instructions and SOP's. 02.02 Follow telephone/telecommunication procedures. 02.03 Communicate clearly. 02.05 Read/Interpret flowcharts and pictorial information. 03.01 Apply cultural requirement to the workplace. 03.02 Demonstrate integrity and apply practical practices. 03.03 Accept responsibility for own work and work area. 03.04 Seek and act constructively upon feedback about work performance. 03.05 Demonstrate safety skills. 03.06 Respond appropriately to people and situations. 03.07 Resolve interpersonal conflicts. 06.01 Understand systems. 06.02 Comply with and follow chain of command. 06.03 Identify and highlight problems. 06.04 Adapt competencies to new situations/systems. 01.04 Analyse information. 03.08 Develop and maintain a cooperation within work group. 04.01 Organize own work activities. 04.02 Set and revise own objectives and goals. 04.03 Organize and maintain own workplace. 04.04 Apply problem solving strategies. 04.05 Demonstrate initiative and flexibility.	1 Communication skills 2 Conceptual skills 3 Interpersonal skills 4 Learning skills 5 Leadership skills 6 Multitasking and prioritising 7 Self-discipline 8 Teamwork

Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1 Metal door frame with fixes	1:5
2 Structural drawing	1:5
3 Architectural drawing (including Door Schedule)	1:5
4 Shop drawing	1:5
5 Hand tools	
• Hand-drills	As required
• Hammer	As required
• Grinder	As required
6 Measuring and testing tools	
• Measuring tape	1:5
• Plumb bob	1:5
• Spirit level	1:5
• Water level	1:5
7 5 steps aluminium ladder	1:5
8 Air Compressor	1:20
9 Grouting spray nozzle	1:5
10 Support and bracing (1” x 2” x 10’ wood)	As required
11 Metal door frame installation materials	
• Fixes	As required
• Nails	As required
• Thread	As required
• Support and bracing (1” x 2” x 10’ wood)	As required
• Polyurethane foam	As required

References for Learning Material Development

1 Badron, Jahiman. 2007. Teknologi Binaan Bangunan. Petaling Jaya : IBS Buku, 2007. ISBN 9679502414.
2 Chudley, R. and Greeno, R. 2006. Building Construction Handbook (6th Edition). United Kingdom : Butterworth-Heinemann, 2006. ISBN 978-0-7506-6822-4.
3 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.
4 Emmitt, Stephen and Gorse, Christopher A. 2010. Barry's Introduction to Construction of Buildings. United Kingdom : Wiley-Blackwell Publication, 2010. ISBN 978-1-4051-8854-8.

16. Curriculum of Competency Unit (CoCU)

SECTOR	**(F) Construction**						
SUB SECTOR	**(43) Specialized Construction Activities**						
JOB AREA	**IBS Metal Door & Window Frame**						
NOSS TITLE	**IBS Metal Door & Window Frame Installation**						
COMPETENCY UNIT TITLE	**IBS Metal Window Frame Installation**						
LEARNING OUTCOME	The person who is competent in this CU shall be able to install metal window frame with the right frame squareness, verticality, alignment, height, supports and fixes in accordance with frame manufacturer specifications, work instructions and drawings. Upon completion of this competency units, trainees will be able to:- 1. Identify metal window frame installation requirements 2. Carry out metal window frame handling 3. Carry out work area preparation 4. Confirm opening readiness 5. Install metal window frame 6. Check installed metal window frame and wall condition 7. Carry out housekeeping works						
PRE-REQUISITE (if applicable)							
COMPETENCY UNIT ID	F433-002-2:2017-C02	**LEVEL**	2	**TRAINING DURATION**	240	**SKILL CREDIT**	24

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
1. Identify metal window frame installation requirements	1.1 Work instructions 1.2 Type of drawings, which include: • Structural drawing • Architectural drawing	1.1 Interpret work instructions 1.2 Refer drawings 1.3 Determine types of wall 1.4 Determine types of window 1.5 Confirm metal	Attitude • Meticulous and precise in interpreting work instruction and drawings	Related Knowledge 14 Related Skill 34	Related Knowledge Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar	1.1 Work instruction explained 1.2 Type of drawing listed and explained 1.3 Type of wall listed out and explained

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	(including Window Schedule) • Shop drawing 1.3 Types of wall, which include: • Brick wall • Block wall • Reinforced Concrete (RC) wall • Other types of wall 1.4 Types of window, which include: • Sliding • Swing • Adjustable louvres 1.5 Metal window frame specifications, which include: • Size • product profiles • Thickness 1.6 Type of metal window frame	window frame size & product profiles 1.6 Determine type of metal window frame 1.7 Confirm type of metal window frame material			<u>Related Skill</u> Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	1.4 Type of window listed out and explained 1.5 Type of metal window frame listed out and explained 1.6 Metal window frame specifications explained 1.7 Type of metal window frame material listed out and explained 1.8 Metal window frame size & product profiles measured

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	material, which include: • Alloy • Iron • Aluminium					
2. Carry out metal window frame handling	2.1 Site store location 2.2 Metal window frame handling procedure • Method • Machine 2.3 Metal window frame stacking method	2.1 Determine metal window frame material 2.2 Determine site store location 2.3 Collect and transfer metal window frame from site store to dedicated work area 2.4 Apply metal window frame handling procedure 2.5 Apply metal window frame stacking method	<u>Attitude</u> • Meticulous and precise in handling metal window frame • Organise own tasks • Time and cost conscious in completing task <u>Safety</u> • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace	<u>Related Knowledge</u> 11 <u>Related Skill</u> 25	<u>Related Knowledge</u> Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar <u>Related Skill</u> Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	2.1 Metal window frame handling procedure explained 2.2 Metal window frame stacking method explained 2.3 Correct metal window frame handling procedure demonstrated 2.4 Correct metal window frame stacking method demonstrated

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
3. Carry out work area preparation	3.1 Work area location • Level • Area 3.2 Occupational Safety and Health Act (OSHA) 3.3 5S method: • Sort • Set in Order • Shine • Standardize • Sustain	3.1 Determine work area location 3.2 Ensure work area is clean and safe 3.3 Ensure proper lighting when required 3.4 Ensure work area comply to Occupational Safety and Health Act (OSHA) 3.5 Apply 5S method	Attitude • Meticulous and precise in preparing work area • Time and cost conscious in completing task Safety • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace	Related Knowledge 4 Related Skill 8	Related Knowledge Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar Related Skill Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	3.1 Related act under Occupational Safety and Health Act (OSHA) determined and explained 3.2 5S method listed out and explained 3.3 Work area kept clean and safe
4. Confirm opening readiness	4.1 Measurement tools usage and application 4.2 Opening size and verticality checking method 4.3 Function of lintels	4.1 Refer to structural drawing 4.2 Check opening size and verticality 4.3 Ensure type of metal window frame	Attitude • Meticulous and precise in confirming opening readiness • Time and cost conscious in completing	Related Knowledge 4 Related Skill 8	Related Knowledge Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar	4.1 Measurement tools usage and application explained 4.2 Function of lintels explained 4.3 Checking of opening size

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
		4.4 Ensure lintels installation	task Safety • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace		Related Skill Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	and verticality demonstrated
5. Install metal window frame	5.1 Installation tools & equipment, which include: • Scaffolding & accessories • Hand tools (Hand-drills, hammer, grinder etc.) • Ladder • Spirit Level • Laser levelling machine • Plumb bob • Measuring tape	5.1 Determine installation tools & equipment 5.2 Determine installation materials 5.3 Determine window accessories 5.4 Determine window leaf opening direction 5.5 Set up window sub frame 5.6 Check metal window frame	Attitude • Meticulous and precise in installing metal window frame • Time and cost conscious in completing task Safety • Adhere to DOSH safety requirements • Alert to hazards and risks in	Related Knowledge 25 Related Skill 59	Related Knowledge Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar Related Skill Demonstration, Simulation, Project, Scenario Based Training (SBT),	5.1 Installation tools & equipment listed out and its usage explained 5.2 Installation materials listed out and explained 5.3 Window accessories listed out and explained 5.4 Metal window frame defect listed out and explained

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Air Compressor • Grouting spray nozzle 5.2 Installation materials, which include: • Fixes • Nails • Thread • Temporary fix in place supports and bracing • Packing piece/wedges • Polyurethane foam 5.3 Window accessories, which include: • Stay • Window latch 5.4 Metal window sub frame installation method 5.5 Metal window	for any defect 5.7 Determine metal window frame high 5.8 Set up metal window frame 5.9 Set up supports and bracing 5.10 Set fixes onto metal window frame 5.11 Check metal window frame alignment & dimension 5.12 Carry out finishing works	workplace <u>Environment</u> • Adhere to Department Of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices		Coaching, Observation or Mentoring	5.5 Metal window frame height and level transfer explained 5.6 Checking of any defect on metal window frame demonstrated 5.7 Installation method of metal window frame demonstrated 5.8 Setting up supports and bracing method demonstrated 5.9 Checking on metal window frame alignment & dimension demonstrated 5.10 Metal window frame finishing works demonstrated

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	frame defect, which include: • Dented frame • Scratch • Paint/coat peel off 5.6 Metal window frame height and level transfer 5.7 Metal window frame installation method 5.8 Supports and bracing set up method 5.9 Metal window frame alignment & dimension checking method 5.10 Metal window frame installation finishing works					

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
6. Check installed metal window frame and wall condition	6.1 Metal window frame checking method 6.2 Type of installation defects, which include: • Cracked wall • Non parallel surface	6.1 Ensure metal window frame squareness, verticality, height, alignment, supports and fixes 6.2 Ensure installed metal window frame free from defects 6.3 Ensure wall free from defects	Attitude • Meticulous and precise in checking installed metal window frame • Integrity in checking own works Safety • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace	Related Knowledge 7 Related Skill 17	Related Knowledge Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar Related Skill Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	6.1 Type of installation defects listed out and explained 6.2 Criteria on metal window frame checking explained 6.3 Checking on installed metal window frame and wall demonstrated
7. Carry out housekeeping works	7.1 Cleaning tools and equipment 7.2 Category of waste, which include: • Construction waste • Domestic waste	7.1 Clean work area from concrete spills, debris & etc. 7.2 Dump concrete spills, debris at designated area 7.3 Clean and	Attitude • Meticulous and precise in cleaning work area • Time and cost conscious in completing task	Related Knowledge 7 Related Skill 17	Related Knowledge Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar	7.1 Category of waste listed out and explained 7.2 3R's listed out and explained 7.3 Proper usage of cleaning tools and

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	7.3 3R's definition: • Reduce • Reuse • Recycle	store tools and equipment 7.4 Gather and store remaining materials 7.5 Segregate waste materials accordingly 7.6 Apply 5S method	<u>Safety</u> • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace <u>Environment</u> • Adhere to Department Of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices		<u>Related Skill</u> Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	equipment demonstrated 7.4 Proper handling of waste material demonstrated

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
01.01 Identify and gather information. 01.02 Document information procedures or processes. 02.01 Interpret and follow manuals, instructions and SOP's. 02.02 Follow telephone/telecommunication procedures. 02.03 Communicate clearly. 02.05 Read/Interpret flowcharts and pictorial information. 03.01 Apply cultural requirement to the workplace. 03.02 Demonstrate integrity and apply practical practices. 03.03 Accept responsibility for own work and work area. 03.04 Seek and act constructively upon feedback about work performance. 03.05 Demonstrate safety skills. 03.06 Respond appropriately to people and situations. 03.07 Resolve interpersonal conflicts. 06.01 Understand systems. 06.02 Comply with and follow chain of command. 06.03 Identify and highlight problems. 06.04 Adapt competencies to new situations/systems. 01.04 Analyse information. 03.08 Develop and maintain a cooperation within work group. 04.01 Organize own work activities. 04.02 Set and revise own objectives and goals. 04.03 Organize and maintain own workplace. 04.04 Apply problem solving strategies. 04.05 Demonstrate initiative and flexibility.	1 Communication skills 2 Conceptual skills 3 Interpersonal skills 4 Learning skills 5 Leadership skills 6 Multitasking and prioritising 7 Self-discipline 8 Teamwork

Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1 Metal window frame with fixes	1:5
2 Metal window sub frame	1:5
3 Structural drawing	1:5
4 Architectural drawing (including Window Schedule)	1:5
5 Shop drawing	1:5
6 Hand tools	
• Hand-drills	As required
• Hammer	As required
• Grinder	As required
7 Measuring and testing tools	
• Measuring tape	1:5
• Plumb bob	1:5
• Spirit level	1:5
• Water level	1:5
8 5 steps aluminium ladder	1:5
9 Air Compressor	1:20
10 Grouting spray nozzle	1:5
11 Scaffolding with accessories:	As required
• Bracing	
• Platform	
• ladder	

ITEMS	RATIO (TEM : Trainees)
12 Metal window frame installation materials • Fixes • Nails • Thread • Polyurethane foam • Support and bracing (1” x 2” x 10’ wood) • Packing piece/wedges	 As required As required As required As required As required As required

References for Learning Material Development

1 Badron, Jahiman. 2007. Teknologi Binaan Bangunan. Petaling Jaya : IBS Buku, 2007. ISBN 9679502414. 2 Chudley, R. and Greeno, R. 2006. Building Construction Handbook (6th Edition). United Kingdom : Butterworth-Heinemann, 2006. ISBN 978-0-7506-6822-4. 3 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. 4 Emmitt, Stephen and Gorse, Christopher A. 2010. Barry's Introduction to Construction of Buildings. United Kingdom : Wiley-Blackwell Publication, 2010. ISBN 978-1-4051-8854-8.

17. Curriculum of Competency Unit (CoCU)

SECTOR	**(F) Construction**						
SUB SECTOR	**(43) Specialized Construction Activities**						
JOB AREA	**IBS Metal Door & Window Frame**						
NOSS TITLE	**IBS Metal Door & Window Frame Installation**						
COMPETENCY UNIT TITLE	**IBS Metal Door & Window Frame Rectification**						
LEARNING OUTCOME	The person who is competent in this CU shall be able to fix installed metal door & window frame with the right methods in accordance with frame manufacturer specifications, work instructions and drawings. Upon completion of this competency units, trainees will be able to:- 1. Identify metal door & window frame rectification works requirements 2. Carry out metal door & window frame rectification works preparation 3. Carry out work area preparation 4. Rectify damage metal door & window frame 5. Check rectified metal door & window frame and wall condition 6. Carry out housekeeping works						
PRE-REQUISITE (if applicable)	Competence in Metal Door Frame Installation and Metal Window Frame Installation						
COMPETENCY UNIT ID	F433-002-2:2017-C03	**LEVEL**	2	**TRAINING DURATION**	120	**SKILL CREDIT**	12

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
1. Identify metal door & window frame rectification works requirements	1.1 Work instructions 1.2 Type of defects, which include: • Broken frame • Dented frame • Rusty • Scratch • Paint/coat	1.1 Interpret work instructions 1.2 Determine defected metal door & window frame location 1.3 Determine type of defects 1.4 Determine repairing method	Attitude • Meticulous and precise in interpreting work instruction • Time and cost conscious in completing task	Related Knowledge 7 Related Skill 17	Related Knowledge Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar	1.1 Information on work instructions explained 1.2 Type of defects listed out and explained 1.3 Details on rectification method

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	peel off 1.3 Rectification method, which include: • Replacement • Repairing	1.5 Determine restoration works time duration			<u>Related Skill</u> Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	explained
2. Carry out metal door & window frame rectification works preparation	2.1 Metal door & window frame rectification tools & equipment, which include: • Hand tools (Hand-drills, hammer, grinder etc.) • Ladder • Spirit level • Water level • Laser levelling machine • Measuring tape • Air Compressor	2.1 Prepare metal door & window frame rectification tools & equipment 2.2 Prepare metal door & window frame rectification materials	<u>Attitude</u> • Meticulous and precise in preparing rectification tools, equipment and materials • Time and cost conscious in completing task <u>Safety</u> • Adhere to DOSH safety requirements	<u>Related Knowledge</u> 4 <u>Related Skill</u> 8	<u>Related Knowledge</u> Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar <u>Related Skill</u> Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching,	2.1 Metal door & window frame rectification tools & equipment listed out and explained 2.2 Metal door & window frame restoration materials listed out and explained

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Grouting spray nozzle • Scaffolding & accessories 2.2 Metal door & window frame rectification materials, which include: • Fixes • Thread • Mortar • Filler • Undercoat • Antirust • Sand paper • Polyurethane foam				Observation or Mentoring	
3. Carry out work area preparation	3.1 Work area location • Level • Area 3.2 Work platform set up 3.3 Occupational Safety and Health Act (OSHA) 3.4 5S method: • Sort	3.1 Determine work area location 3.2 Ensure work area is clean and safe 3.3 Ensure proper lighting when required 3.4 Set up proper work platform 3.5 Ensure work area comply to	Attitude • Meticulous and precise in preparing work area • Time and cost conscious in completing task	Related Knowledge 4 Related Skill 8	Related Knowledge Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar Related	3.1 Related act in Occupational Safety and Health Act (OSHA) determined and explained 3.2 Work area kept clean and safe 3.3 Proper work platform

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	• Set in Order • Shine • Standardize • Sustain	Occupational Safety and Health Act (OSHA) 3.6 Apply 5S method	<u>Safety</u> • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace		<u>Skill</u> Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	setting up demonstrated
4. Rectify damage metal door & window frame	4.1 Damage metal door & window frame dismantling method 4.2 Damage metal door & window frame repairing method, which include: • Beating • Patching • Sanding • Painting 4.3 Damage metal door & window frame replacing method 4.4 Metal door & window frame	4.1 Dismantle damage metal door & window frame 4.2 Repair damage metal door & window frame 4.3 Replace damage metal door & window frame 4.4 Set up metal door & window frame 4.5 Set supports and bracing 4.6 Check metal door & window frame alignment & dimension	<u>Attitude</u> • Meticulous and precise in rectifying metal door & window frame • Time and cost conscious in completing task <u>Safety</u> • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace	<u>Related Knowledge</u> 14 <u>Related Skill</u> 34	<u>Related Knowledge</u> Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar <u>Related Skill</u> Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or	4.1 Damage metal door & window frame repairing method listed out and explained 4.2 Method of dismantling damage metal door & window frame demonstrated 4.3 Method of repairing damage metal door & window frame demonstrated 4.4 Method of

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	installation method 4.5 Supports and bracing set up method 4.6 Metal door & window frame alignment & dimension checking method 4.7 Metal door & window frame installation finishing works	4.7 Carry out finishing works	<u>Environment</u> • Adhere to Department Of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices		Mentoring	replacing damage metal door & window frame demonstrated 4.5 Method of installing metal door & window frame demonstrated 4.6 Method of setting up supports and bracing demonstrated 4.7 Method of checking metal door & window frame alignment & dimension demonstrated 4.8 Metal door & window frame installation finishing works demonstrated

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
5. Check rectified metal door & window frame and wall condition	5.1 Metal door & window frame checking method 5.2 Type of installation defects, which include: • Cracked wall • Non parallel surface	5.1 Ensure metal door & window frame squareness, verticality, height, alignment, supports and fixes 5.2 Ensure installed metal door & window frame free from defects 5.3 Ensure wall free from defects	Attitude • Meticulous and precise in checking rectified metal door & window frame • Integrity in checking own works Safety • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace	Related Knowledge 4 Related Skill 8	Related Knowledge Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar Related Skill Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	5.1 Type of installation defects listed out and explained 5.2 Method of checking metal door & window frame and wall demonstrated 5.3 Installed metal door & window frame free from defects confirmed and justified
6. Carry out housekeeping works	6.1 Cleaning tools and equipment 6.2 Category of waste, which include: • Construction waste • Domestic waste	6.1 Clean work area from concrete spills, debris & etc. 6.2 Dump concrete spills, debris at designated area 6.3 Clean and store tools and	Attitude • Meticulous and precise in cleaning work area • Time and cost conscious in completing task	Related Knowledge 4 Related Skill 8	Related Knowledge Lecture, Group Discussion, E-Learning, Case Study, Problem Based Learning (PBL) or Seminar	6.1 Category of waste listed out and explained 6.2 3R's listed out and explained 6.3 Proper usage of cleaning tools and

Work Activities	Related Knowledge	Related Skill	Attitude/Safety/ Environment	Training Hours	Delivery Mode	Assessment Criteria
	6.3 3R's definition: • Reduce • Reuse • Recycle	equipment 6.4 Gather and store remaining materials 6.5 Segregate waste materials accordingly 6.6 Apply 5S method	<u>Safety</u> • Adhere to DOSH safety requirements • Alert to hazards and risks in workplace <u>Environment</u> • Adhere to Department Of Environment requirements • Adhere to 3R's (Reduce, Reuse and Recycle) practices		<u>Related Skill</u> Demonstration, Simulation, Project, Scenario Based Training (SBT), Coaching, Observation or Mentoring	equipment demonstrated 6.4 Proper handling of waste material demonstrated

Employability Skills

CORE ABILITIES	SOCIAL SKILLS
01.01 Identify and gather information. 01.02 Document information procedures or processes. 02.01 Interpret and follow manuals, instructions and SOP's. 02.02 Follow telephone/telecommunication procedures. 02.03 Communicate clearly. 02.05 Read/Interpret flowcharts and pictorial information. 03.01 Apply cultural requirement to the workplace. 03.02 Demonstrate integrity and apply practical practices. 03.03 Accept responsibility for own work and work area. 03.04 Seek and act constructively upon feedback about work performance. 03.05 Demonstrate safety skills. 03.06 Respond appropriately to people and situations. 03.07 Resolve interpersonal conflicts. 06.01 Understand systems. 06.02 Comply with and follow chain of command. 06.03 Identify and highlight problems. 06.04 Adapt competencies to new situations/systems. 01.04 Analyse information. 03.08 Develop and maintain a cooperation within work group. 04.01 Organize own work activities. 04.02 Set and revise own objectives and goals. 04.03 Organize and maintain own workplace. 04.04 Apply problem solving strategies. 04.05 Demonstrate initiative and flexibility.	1 Communication skills 2 Conceptual skills 3 Interpersonal skills 4 Learning skills 5 Leadership skills 6 Multitasking and prioritising 7 Self-discipline 8 Teamwork

Tools, Equipment and Materials (TEM)

ITEMS	RATIO (TEM : Trainees)
1 Metal door & window frame with fixes	1:5
2 Metal window sub frame	1:5
3 Hand tools	
• Hand-drills	As required
• Hammer	As required
• Grinder	As required
4 Measuring and testing tools	
• Measuring tape	1:5
• Plumb bob	1:5
• Spirit level	1:5
• Water level	1:5
5 5 steps aluminium ladder	1:5
6 Air Compressor	1:20
7 Grouting spray nozzle	1:5
8 Work platform	As required
9 Support and bracing (1” x 2” x 10’ wood)	As required
10 Packing piece/wedges	As required
11 Metal door & window frame restoration materials	
• Fixes	As required
• Thread	As required
• Mortar	As required
• Filler	As required
• Undercoat	As required
• Antirust	As required
• Sand paper	As required
• Polyurethane foam	As required

References for Learning Material Development

1 Badron, Jahiman. 2007. Teknologi Binaan Bangunan. Petaling Jaya : IBS Buku, 2007. ISBN 9679502414.
2 Chudley, R. and Greeno, R. 2006. Building Construction Handbook (6th Edition). United Kingdom : Butterworth-Heinemann, 2006. ISBN 978-0-7506-6822-4.
3 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.
4 Emmitt, Stephen and Gorse, Christopher A. 2010. Barry's Introduction to Construction of Buildings. United Kingdom : Wiley-Blackwell Publication, 2010. ISBN 978-1-4051-8854-8.

18. Training Hour Summary

CU Code	Competency Unit Title	Work Activities	Related Knowledge (A)	Related Skill (B)	Hours (C) = (A)+(B)	Total (Hours) ∑(C)
C01	IBS METAL DOOR FRAME INSTALLATION	Identify metal door frame installation requirements	14	34	48	240
		Carry out metal door frame handling	11	25	36	
		Carry out work area preparation	4	8	12	
		Confirm opening readiness	4	8	12	
		Install metal door frame	25	59	84	
		Check installed metal door frame and wall condition	7	17	24	
		Carry out housekeeping works	7	17	24	
C02	IBS METAL WINDOW FRAME INSTALLATION	Identify metal window frame installation requirements	14	34	48	240
		Carry out metal window frame handling	11	25	36	
		Carry out work area preparation	4	8	12	
		Confirm opening readiness	4	8	12	
		Install metal window frame	25	59	84	
		Check installed metal window frame and wall condition	7	17	24	
		Carry out housekeeping works	7	17	24	

CU Code	Competency Unit Title	Work Activities	Related Knowledge (A)	Related Skill (B)	Hours (C) = (A)+(B)	Total (Hours) ∑(C)
C03	IBS METAL DOOR & WINDOW FRAME RECTIFICATION	Identify metal door & window frame rectification works requirements	7	17	24	120
		Carry out metal door & window frame rectification works preparation	4	8	12	
		Carry out site preparation	4	8	12	
		Rectify damage metal door & window frame	14	34	48	
		Check rectified metal door & window frame and wall condition	4	8	12	
		Carry out housekeeping works	4	8	12	
TOTAL HOURS (CORE COMPETENCY)			**181**	**419**	**600**	**600**