TRAINING REGULATIONS

SYSTEM FORMWORKS INSTALLATION NC II

CIVIL WORKS
(CONSTRUCTION SECTOR)

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Superhighway, Taguig City, Metro Manila

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CONSTRUCTION SECTOR

SYSTEM FORMWORKS INSTALLATION NC II

TRAINING REGULATIONS FOR SYSTEM FORMWORKS INSTALLATION NC II

SECTION 1 SYSTEM FORMWORKS INSTALLATION NC II QUALIFICATION

The SYSTEM FORMWORKS INSTALLATION NC II Qualification consists of competencies that a person must achieve that will enable him to assemble and dismantle scaffolds/ shoring and braces, perform installation and stripping of system formworks (includes combinations of metal and other materials- e.g. engineered plastic material, laminated plywood), its components and supports. Working together in a team composed of surveyor (line and grade), rebar installer, crane operator, rigger and under the direct supervision of a lead man or foreman.

This Qualification is packaged from the competency map of Construction – Civil Works sub-sector as shown in Annex A.

The Units of Competency comprising this Qualification include the following:

CODE NO.	BASIC COMPETENCIES
	Units of Competency
500311105	Participate in workplace communication
500311106	Work in a team environment
500311107	Practice career professionalism
500311108	Practice occupational health and safety procedures

CODE NO.	COMMON COMPETENCIES
	Units of Competency
CON931201	Prepare construction materials and tools
CON311201	Observe procedures, specifications and manuals of instruction
CON311202	Interpret technical drawings and plans
CON311203	Perform mensurations and calculations
CON311204	Maintain tools and equipment

CODE NO.	CORE COMPETENCIES
	Units of Competency
CON713341	Assemble and dismantle scaffolds/ shoring and braces
CON712322	Install System Formworks
CON712323	Strip System Formworks

A person who has achieved this Qualification is competent to be:

- System formworks installer

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the basic, common and core units of competency required in SYSTEM FORMWORKS INSTALLATION NC II.

BASIC COMPETENCIES

UNIT OF COMPETENCY : PARTICIPATE IN WORKPLACE COMMUNICATION

UNIT CODE : 500311105

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from ***appropriate sources*** 1.2 Effective questioning , active listening and speaking skills are used to gather and convey information 1.3 Appropriate ***medium*** is used to transfer information and ideas 1.4 Appropriate non- verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and ***storage*** of information are used 1.7 Personal interaction is carried out clearly and concisely
2. Participate in workplace meetings and discussions	2.1 Team meetings are attended on time 2.2 Own opinions are clearly expressed and those of others are listened to without interruption 2.3 Meeting inputs are consistent with the meeting purpose and established ***protocols*** 2.4 ***Workplace interactions*** are conducted in a courteous manner 2.5 Questions about simple routine workplace procedures and maters concerning working conditions of employment are asked and responded to 2.6 Meetings outcomes are interpreted and implemented
3. Complete relevant work related documents	3.1 Range of ***forms*** relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Basic mathematical processes are used for routine calculations 3.4 Errors in recording information on forms/ documents are identified and properly acted upon 3.5 Reporting requirements to supervisor are completed according to organizational guidelines

RANGE OF VARIABLES

VARIABLE	RANGE
1. Appropriate sources	1.1. Team members 1.2. Suppliers 1.3. Trade personnel 1.4. Local government 1.5. Industry bodies
2. Medium	2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information discussion 2.5. Follow-up or verbal instructions 2.6. Face to face communication
3. Storage	3.1. Manual filing system 3.2. Computer-based filing system
4. Forms	4.1. Personnel forms, telephone message forms, safety reports
5. Workplace interactions	5.1. Face to face 5.2. Telephone 5.3. Electronic and two way radio 5.4. Written including electronic, memos, instruction and forms, non-verbal including gestures, signals, signs and diagrams
6. Protocols	6.1. Observing meeting 6.2. Compliance with meeting decisions 6.3. Obeying meeting instructions

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1. Prepared written communication following standard format of the organization 1.2. Accessed information using communication equipment 1.3. Made use of relevant terms as an aid to transfer information effectively 1.4. Conveyed information effectively adopting the formal or informal communication
2. Required Knowledge and Attitudes	2.1. Effective communication 2.2. Different modes of communication 2.3. Written communication 2.4. Organizational policies 2.5. Communication procedures and systems 2.6. Technology relevant to the enterprise and the individual's work responsibilities
3. Required Skills	3.1. Follow simple spoken language 3.2. Perform routine workplace duties following simple written notices 3.3. Participate in workplace meetings and discussions 3.4. Complete work related documents 3.5. Estimate, calculate and record routine workplace measures 3.6. Basic mathematical processes of addition, subtraction, division and multiplication 3.7. Ability to relate to people of social range in the workplace 3.8. Gather and provide information in response to workplace requirements
4. Resource Implications	4.1. Fax machine 4.2. Telephone 4.3. Writing materials 4.4. Internet
5. Methods of Assessment	5.1. Direct Observation 5.2. Oral interview and written test
6. Context of Assessment	6.1. Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY: WORK IN TEAM ENVIRONMENT

UNIT CODE : 500311106

UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes to identify role and responsibility as a member of a team.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Describe team role and scope	1.1. The ***role and objective of the team*** is identified from available ***sources of information*** 1.2. Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources
2. Identify own role and responsibility within team	2.1. Individual role and responsibilities within the team environment are identified 2.2. Roles and responsibility of other team members are identified and recognized 2.3. Reporting relationships within team and external to team are identified
3. Work as a team member	3.1. Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives 3.2. Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and ***workplace context*** 3.3. Observed protocols in reporting using standard operating procedures 3.4. Contribute to the development of team work plans based on an understanding of team's role and objectives and individual competencies of the members.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	1.1. Work activities in a team environment with enterprise or specific sector 1.2. Limited discretion, initiative and judgement maybe demonstrated on the job, either individually or in a team environment
2. Sources of information	2.1. Standard operating and/or other workplace procedures 2.2. Job procedures 2.3. Machine/equipment manufacturer's specifications and instructions 2.4. Organizational or external personnel 2.5. Client/supplier instructions 2.6. Quality standards 2.7. OHS and environmental standards
3. Workplace context	3.1. Work procedures and practices 3.2. Conditions of work environments 3.3. Legislation and industrial agreements 3.4. Standard work practice including the storage, safe handling and disposal of chemicals 3.5. Safety, environmental, housekeeping and quality guidelines

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Operated in a team to complete workplace activity 1.2. Worked effectively with others 1.3. Conveyed information in written or oral form 1.4. Selected and used appropriate workplace language 1.5. Followed designated work plan for the job 1.6. Reported outcomes
2. Required Knowledge and Attitude	2.1. Communication process 2.2. Team structure 2.3. Team roles 2.4. Group planning and decision making
3. Required Skills	3.1. Communicate appropriately, consistent with the culture of the workplace
4. Resource Implications	The following resources MUST be provided: 4.1. Access to relevant workplace or appropriately simulated environment where assessment can take place 4.2. Materials relevant to the proposed activity or tasks
5. Methods of Assessment	Competency may be assessed through: 5.1. Observation of the individual member in relation to the work activities of the group 5.2. Observation of simulation and or role play involving the participation of individual member to the attainment of organizational goal 5.3. Case studies and scenarios as a basis for discussion of issues and strategies in teamwork
6. Context for Assessment	6.1. Competency may be assessed in workplace or in a simulated workplace setting 6.2. Assessment shall be observed while task are being undertaken whether individually or in group

UNIT OF COMPETENCY: PRACTICE CAREER PROFESSIONALISM

UNIT CODE : 500311107

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in promoting career growth and advancement.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Integrate personal objectives with organizational goals	1.1 Personal growth and work plans are pursued towards improving the qualifications set for the profession 1.2 Intra- and interpersonal relationships ~~is~~ are maintained in the course of managing oneself based on performance ***evaluation*** 1.3 Commitment to the organization and its goal is demonstrated in the performance of duties
1. Set and meet work priorities	2.1 Competing demands are prioritized to achieve personal, team and organizational goals and objectives. 2.2 ***Resources*** are utilized efficiently and effectively to manage work priorities and commitments 2.3 Practices along economic use and maintenance of equipment and facilities are followed as per established procedures
2. Maintain professional growth and development	3.1 ***Trainings and career opportunities*** are identified and availed of based on job requirements 3.2 ***Recognitions*** are sought/received and demonstrated as proof of career advancement 3.3 ***Licenses and/or certifications*** relevant to job and career are obtained and renewed

RANGE OF VARIABLES

VARIABLE	RANGE
1. Evaluation	1.1 Performance Appraisal 1.2 Psychological Profile 1.3 Aptitude Tests
2. Resources	2.1 Human 2.2 Financial 2.3 Technology 2.3.1 Hardware 2.3.2 Software
3. Trainings and career opportunities	3.1 Participation in training programs 3.1.1 Technical 3.1.2 Supervisory 3.1.3 Managerial 3.1.4 Continuing Education 3.2 Serving as Resource Persons in conferences and workshops
4. Recognitions	4.1 Recommendations 4.2 Citations 4.3 Certificate of Appreciations 4.4 Commendations 4.5 Awards 4.6 Tangible and Intangible Rewards
5. Licenses and/or certifications	5.1 National Certificates 5.2 Certificate of Competency 5.3 Support Level Licenses 5.4 Professional Licenses

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Attained job targets within key result areas (KRAs) 1.2 Maintained intra - and interpersonal relationship in the course of managing oneself based on performance evaluation 1.3 Completed trainings and career opportunities which are based on the requirements of the industries 1.4 Acquired and maintained licenses and/or certifications according to the requirement of the qualification
2. Required Knowledge and Attitude	2.1 Work values and ethics (Code of Conduct, Code of Ethics, etc.) 2.2 Company policies 2.3 Company-operations, procedures and standards 2.4 Fundamental rights at work including gender sensitivity 2.5 Personal hygiene practices
3. Required Skills	3.1 Appropriate practice of personal hygiene 3.2 Intra and Interpersonal skills 3.3 Communication skills
4. Resource Implications	The following resources **MUST** be provided: 4.1 Workplace or assessment location 4.2 Case studies/scenarios
5. Methods of Assessment	Competency may be assessed through: 5.1 Portfolio Assessment 5.2 Interview 5.3 Simulation/Role-plays 5.4 Observation 5.5 Third Party Reports 5.6 Exams and Tests
6. Context of Assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY : **PRACTICE OCCUPATIONAL HEALTH AND SAFETY PROCEDURES**

UNIT CODE : **500311108**

UNIT DESCRIPTOR : This unit covers the outcomes required to comply with regulatory and organizational requirements for occupational health and safety.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Identify hazards and risks	1.1 ***Safety regulations*** and workplace safety and hazard control practices and procedures are clarified and explained based on organization procedures 1.2 ***Hazards/risks*** in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment in accordance with organization procedures 1.3 ***Contingency measures*** during workplace accidents, fire and other emergencies are recognized and established in accordance with organization procedures
2. Evaluate hazards and risks	2.1 OHS issues and/or concerns and identified safety and health hazards are reported to designated personnel in accordance with workplace requirements and relevant workplace OHS legislation 2.2 Terms of maximum tolerable limits which when exceeded will result in harm or damage are identified based on threshold limit values (TLV) 2.3 Effects of the hazards are determined
3. Control hazards and risks	3.1 Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed 3.2 Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies 3.3 ***Personal protective equipment (PPE)*** is correctly used in accordance with organization OHS procedures and practices 3.4 Appropriate assistance is provided in the event of a workplace emergency in accordance with established organization protocol
4. Maintain OHS awareness	4.1 ***Emergency-related drills and trainings*** are participated in as per established organization guidelines and procedures 4.2 ***OHS personal records*** are completed and updated in accordance with workplace requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Safety regulations	May include but are not limited to: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Code Safety Codes 1.4 Waste management statutes and rules 1.5 Philippine Occupational Safety and Health Standards 1.6 DOLE regulations on safety legal requirements 1.7 ECC regulations
2. Hazards/Risks	May include but are not limited to: 2.1 Physical hazards – impact, illumination, pressure, noise, vibration, temperature, radiation 2.2 Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects 2.3 Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 2.4 Ergonomics • Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles • Physiological factors – monotony, personal relationship, work out cycle
3. Contingency measures	May include but are not limited to: 3.1 Evacuation 3.2 Isolation 3.3 Decontamination 3.4 (Calling designed) emergency personnel
4. PPE	May include but are not limited to: 4.1 Mask 4.2 Gloves 4.3 Goggles 4.4 Hair Net/cap/bonnet 4.5 Face mask/ shield 4.6 Ear muffs 4.7 Apron/Gown/coverall/jump suit 4.8 Anti-static suits
5. Emergency-related drills and training	5.1 Fire drill 5.2 Earthquake drill 5.3 Basic life support/CPR 5.4 First aid 5.5 Spillage control 5.6 Decontamination of chemical and toxic 5.7 Disaster preparedness/management
6. OHS personal records	6.1 Medical/Health records 6.2 Incident reports 6.3 Accident reports 6.4 OHS-related training completed

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Explained clearly established workplace safety and hazard control practices and procedures 1.2 Identified hazards/risks in the workplace and its corresponding indicators in accordance with company procedures 1.3 Recognized contingency measures during workplace accidents, fire and other emergencies 1.4 Identified terms of maximum tolerable limits based on threshold limit value- TLV. 1.5 Followed Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace 1.6 Used Personal Protective Equipment (PPE) in accordance with company OHS procedures and practices 1.7 Completed and updated OHS personal records in accordance with workplace requirements
2. Required Knowledge and Attitude	2.1 OHS procedures and practices and regulations 2.2 PPE types and uses 2.3 Personal hygiene practices 2.4 Hazards/risks identification and control 2.5 Threshold Limit Value -TLV 2.6 OHS indicators 2.7 Organization safety and health protocol 2.8 Safety consciousness 2.9 Health consciousness
3. Required Skills	3.1 Practice of personal hygiene 3.2 Hazards/risks identification and control skills 3.3 Interpersonal skills 3.4 Communication skills
3. Resource Implications	The following resources must be provided: 4.1 Workplace or assessment location 4.2 OHS personal records 4.3 PPE 4.4 Health records
4. Methods of Assessment	Competency may be assessed through: 5.1 Portfolio Assessment 5.2 Interview 5.3 Case Study/Situation
5. Context for Assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

COMMON COMPETENCIES

UNIT OF COMPETENCY: PREPARE CONSTRUCTION MATERIALS AND TOOLS

UNIT CODE : CON931201

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on identifying, requesting and receiving construction materials and tools based on the required performance standards.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variable
1. Identify materials and tools	1.1 ***Materials*** are listed as per job requirements 1.2 Quantity and ***description of materials*** conform with the job requirements 1.3 Tools and accessories are identified according to job requirements
2. Requisition, equipment, materials and tools	2.1 Materials and tools needed are requested according to the list prepared 2.2 Request is done as per ***company standard operating procedures (SOP)*** 2.3 Substitute materials and tools are provided without sacrificing cost and quality of work
3. Receive and inspect materials	3.1 Materials and tools issued are inspected as per quantity and specification 3.2 Tools, accessories and materials are checked for damages according to enterprise procedures 3.3 Materials and tools are set aside to appropriate location nearest to the workplace

RANGE OF VARIABLES

VARIABLE	RANGE
1. Materials and Tools	1.1 Electrical supplies 1.2 Structural 1.3 Plumbing 1.4 Welding/pipefitting 1.5 Carpentry 1.6 Masonry
2. Description of Materials and Tools	2.1 Brand name 2.2 Size 2.3 Capacity 2.4 Kind of application
3. Company standard procedures	3.1 Job order 3.2 Requisition slip 3.3 Borrower slip

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Listed materials and tools according to quantity and job requirements 1.2 Requested materials and tools according to the list prepared and as per company SOP 1.3 Inspected issued materials and tools as per quantity and job specifications 1.4 Tools provided with appropriate safety devices
2. Required knowledge and Attitude	2.1 Types and uses of construction materials and tools 2.2 Different forms 2.3 Requisition procedures
3. Required skills	3.1 Preparing materials and tools 3.2 Proper handling of tools and equipment 3.3 Following instructions
4. Resource implications	The following resources should be provided: 4.1 Workplace location 4.2 Materials relevant to the unit of competency 4.3 Technical plans, drawings and specifications relevant to the activities
5. Methods of assessment	Competency in this unit must be assessed through: 5.1 Direct observation and oral questioning
6. Context of assessment	6.1 Competency may be assessed in the workplace or in a simulated workplace 6.2 Competency assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines

UNIT OF COMPETENCY: **OBSERVE PROCEDURES, SPECIFICATIONS AND MANUALS OF INSTRUCTIONS**

UNIT CODE : **CON311201**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on identifying, interpreting, applying services to specifications and manuals and storing manuals.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Identify and access specification/manuals	1.1 Appropriate manuals are identified and accessed as per job requirements 1.2 Version and date of manual are checked to ensure that correct specification and procedures are identified
2. Interpret manuals	2.1 Relevant sections, chapters of specifications/ manuals are located in relation to the work to be conducted 2.2 Information and procedure in the manual are interpreted in accordance with industry practices
3. Apply information in manual	3.1 ***Manual*** is interpreted according to job requirements 3.2 Work steps are correctly identified in accordance with manufacturer's specification 3.3 Manual data are applied according to the given task 3.4 All correct sequencing and adjustments are interpreted in accordance with information contained on the manual or specifications
4. Store manuals	4.1 Manual or specification is stored appropriately to prevent damage, ready access and updating of information when required in accordance with company requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Procedures, Specifications and Manuals of Instructions	Kinds of Manuals: 1.1 Manufacturer's Specification Manual 1.2 Repair Manual 1.3 Maintenance Procedure Manual 1.4 Periodic Maintenance Manual

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Identified and accessed specification/manuals as per job requirements 1.2 Interpreted manuals in accordance with industry practices 1.3 Applied information in manuals according to the given task 1.4 Stored manuals in accordance with company requirements
2. Required knowledge and Attitude	2.1 Types of manuals used in construction sector 2.2 Identification of symbols used in the manuals 2.3 Identification of units of measurements 2.4 Unit conversion
3. Required skills	3.1 Reading and comprehension skills required to identify and interpret construction manuals and specifications 3.2 Accessing information and data
4. Resource implications	The following resources should be provided: 4.1 All manuals/catalogues relative to construction sector
5. Methods of assessment	Competency should be assessed through: 5.1 Direct observation 5.2 Questions/interview Assessment of underpinning knowledge and practical skills may be combined
6. Context of assessment	6.1 Competency assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines 6.2 Assessment may be conducted in the workplace or a simulated environment

UNIT OF COMPETENCY: INTERPRET TECHNICAL DRAWINGS AND PLANS
UNIT CODE : CON311202
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in analyzing and interpreting symbols, data and work plan based on the required performance standards.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Analyze signs, symbols and data	1.1 ***Technical plans*** are obtained according to job requirements 1.2 Signs, symbols and data are identified according to job specifications 1.3 Signs symbols and data are determined according to ***classification*** or as appropriate in ***drawing***
2. Interpret technical drawings and plans	2.1 Necessary ***tools, materials*** and equipment are identified according to the ***plan*** 2.2 Supplies and materials are listed according to specifications 2.3 Components, assemblies or objects are recognized as required 2.4 Dimensions are identified as appropriate to the plan 2.5 Specification details are matched with existing/available resources and in line with job requirements 2.6 Work plan is drawn following the specifications
3. Apply freehand sketching	3.1 Where applicable, correct freehand sketching is produced in accordance with the job requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Technical Plans	Including but not limited to: 1.1 Electrical plans 1.2 Structural plans 1.3 Architectural plans 1.4 Plumbing plans 1.5 Welding Procedures Specifications (WPS)
2. Work plan	2.1 Job requirements 2.2 Installation instructions 2.3 Components instruction
3. Classification	Including but not limited to: 3.1 Electrical 3.2 Mechanical 3.3 Plumbing
4. Drawing	4.1 Drawing symbols 4.2 Alphabet of lines 4.3 Orthographic views 4.4 Front view 4.5 Right side view/left side view 4.6 Top view 4.7 Pictorial 4.8 Schematic diagram 4.9 Electrical drawings 4.10 Structural drawings 4.11 Plumbing drawings 4.12 Water 4.13 Sewerage/Drainage 4.14 Ventilation 4.15 Welding symbols
5. Tools and materials	Including but not limited to: 5.1 Compass 5.2 Divider 5.3 Rulers 5.4 Triangles 5.5 Drawing tables 5.6 Computer

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Identified and determined signs, symbols and data according to work plan, job requirements and classifications 1.2 Identified tools and equipment in accordance with job requirements 1.3 Listed supplies and materials according to blueprint specifications 1.4 Drawn work plan following specifications 1.5 Demonstrated ability to determine job specifications based on working / technical drawing
2. Required Knowledge and Attitude	2.1 TRADE MATHEMATICS 2.1.1 Linear measurement 2.1.2 Dimension 2.1.3 Unit conversion 2.2 BLUEPRINT READING AND PLAN SPECIFICATION 2.2.1 Electrical, mechanical plan, symbols and abbreviations 2.2.2 Drawing standard symbols 2.3 TRADE THEORY 2.3.1 Basic technical drawing 2.3.2 Types technical plans 2.3.3 Various types of drawings 2.3.4 Notes and specifications
3. Required Skills	3.1 Interpreting drawing/orthographic drawing 3.2 Interpreting technical plans 3.3 Matching specification details with existing resources 3.4 Following instructions 3.5 Handling of drawing instruments
4. Resource Implications	The following resources should be provided: 4.1 Workplace 4.2 Drawings and specification relevant to task 4.3 Materials and instrument relevant to proposed activity
5. Methods of Assessment	Competency should be assessed through: 5.1 Direct Observation 5.2 Questions/Interview 5.3 Written test related to underpinning knowledge
6. Context of Assessment	6.1 Competency assessment may occur in the workplace or in any appropriate simulated environment Assessment shall be observed while task are being undertaken whether individually or in group 6.2 Competency assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines

UNIT OF COMPETENCY: PERFORM MENSURATIONS AND CALCULATIONS

UNIT CODE : CON311203

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on identifying and measuring objects based on the required performance standards.

ELEMENT	PERFORMANCE CRITERIA ***Italicized** terms* are elaborated in the Range of Variable
1. Select measuring instruments	1.1 Object or component to be measured is identified, classified and interpreted according to the appropriate regular ***geometric shape*** 1.2 Measuring tools are selected/identified as per object to be measured or job requirements 1.3 Correct specifications are obtained from relevant sources 1.4 Appropriate measuring instruments are selected according to job requirements 1.5 Alternative measuring tools are used without sacrificing cost and quality of work
2. Carry out measurements and calculations	2.1 Accurate ***measurements*** are obtained according to job requirements 2.3 Alternative measuring tools are used without sacrificing cost and quality of work 2.4 ***Calculation*** needed to complete work tasks are performed using the four basic process of addition (+), subtraction (-), multiplication (x) and division (/) including but not limited to: trigonometric functions, algebraic computations 2.5 Calculations involving fractions, percentages and mixed numbers are used to complete workplace tasks 2.6 Numerical computation is self-checked and corrected for accuracy 2.7 Instruments are read to the limit of accuracy of the tool 2.8 Systems of measurement identified and converted according to job requirements/ISO 2.9 Workpieces are measured according to job requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Geometric shape	Including but is not limited to: 1.1 Round 1.2 Square 1.3 Rectangular 1.4 Triangle 1.5 Sphere 1.6 Conical
2. Measuring instruments	Including but not limited to: 2.1 Micrometer (In-out, depth) 2.2 Vernier caliper (out, inside) 2.3 Dial gauge with mag, std. 2.4 Straight edge 2.5 Thickness gauge 2.6 Torque gauge 2.7 Small hole gauge 2.8 Telescopic gauge 2.9 Try-square 2.10 Protractor 2.11 Combination gauge 2.12 Steel rule 2.13 Voltmeter 2.14 Ammeter 2.15 Mega-ohmeter 2.16 Kilowatt hour meter 2.17 Gauges 2.18 Thermometers
3. Measurements and calculations	3.1 Linear 3.2 Volume 3.3 Area 3.4 Wattage 3.5 Voltage 3.6 Resistance 3.7 Amperage 3.8 Frequency 3.9 Impedance 3.10 Conductance 3.11 Capacitance 3.12 Displacement 3.13 Inside diameter 3.14 Circumference 3.15 Length 3.16 Thickness 3.17 Outside diameter 3.18 Taper 3.19 Out of roundness 3.20 Oil clearance 3.21 End play/Thrust clearance

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Selected and prepared appropriate measuring instruments in accordance with job requirements 1.2 Performed measurements and calculations according to job requirements/ ISO
2. Required knowledge and Attitude	**2.1 TRADE MATHEMATICS / MENSURATION** • Four fundamental operation • Linear measurement • Dimensions • Unit conversion • Ratio and proportion • Trigonometric functions • Algebraic equations
3. Required skills	3.1 Performing calculation by addition, subtraction, multiplication and division; trigonometric functions and algebraic equations 3.2 Visualizing objects and shapes 3.3 Interpreting formulas for volume, areas, perimeters of plane and geometric figures 3.4 Proper handling of measuring instruments
4. Resource implications	The following resources should be provided: 4.1 Workplace location 4.2 Problems to solve 4.3 Measuring instrument appropriate to carry out tasks 4.4 Instructional materials relevant to the propose activity Assessment of underpinning knowledge and practical skills may be combined
5. Methods of assessment	Competency should be assessed through: 5.1 Actual demonstration 5.2 Direct observation 5.3 Written test/questioning related to underpinning knowledge
6. Context of assessment	6.1 Competency assessment may occur in workplace or any appropriate simulated environment 6.2 Assessment shall be observed while task are being undertaken whether individually or in group 6.3 Competency assessment must be undertaken in accordance with the TESDA assessment guidelines

UNIT OF COMPETENCY: MAINTAIN TOOLS AND EQUIPMENT

UNIT CODE : CON311204

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on checking condition, performing preventive maintenance and storing of tools and equipment based on the required performance standards.

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Check condition of tools and equipment	1.1 ***Materials, tools and equipmen***t are identified according to classification and job requirements 1.2 Non-functional tools and equipment are segregated and labeled according to classification 1.3 Safety of tools and equipment are observed in accordance with manufacturer's instructions 1.4 Condition of ***PPE*** are checked in accordance with manufacturer's instructions
2. Perform basic preventive maintenance	2.1 Appropriate lubricants are identified according to types of equipment 2.2 Tools and equipment are lubricated according to preventive maintenance schedule or manufacturer's specifications 2.2 Measuring instruments are checked and calibrated in accordance with manufacturer's instructions 2.4 Tools are cleaned and lubricated according to standard procedures 2.2 Defective instruments, equipment and accessories are inspected and replaced according to manufacturer's specifications 2.6 Tools are inspected, repaired and replaced after use 2.7 Work place is cleaned and kept in safe state in line with OHSA regulations
3. Store tools and equipment	3.1 Inventory of tools, instruments and equipment are conducted and recorded as per company practices 3.3 Tools and equipment are stored safely in appropriate locations in accordance with manufacturer's specifications or company procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Materials	Including but not limited to: 1.1 Lubricants 1.2 Cleaning materials 1.3 Rust remover 1.4 Rugs 1.5 Spare parts
2. Tools and equipment	Including but not limited to: 2.1 Tools - Cutting tools - hacksaw, crosscut saw, rip saw - Boring tools - auger, brace, grinlet, hand drill - Holding tools - vise grip, C-clamp, bench vise - Threading tools - die and stock, taps 2.2 Measuring instruments/equipment
3. PPE	Including but not limited to: 3.1 Goggles 3.2 Gloves 3.3 Safety shoes 3.4 Aprons/Coveralls
4. Forms	4.1 Maintenance schedule forms 4.2 Requisition slip 4.3 Inventory Form 4.4 Inspection Form 4.5 Procedures

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Selected and used appropriate processes, tools and equipment to carry out task 1.2 Identified functional and non-functional tools and equipment 1.3 Checked, lubricated and calibrated tools, equipment and instruments according to manufacturer's specifications 1.4 Replaced defective tools, equipment and their accessories 1.5 Observed and applied safe handling of tools and equipment and safety work practices 1.6 Prepared and submitted inventory report, where applicable 1.7 Maintained workplace in accordance with OHSA regulations 1.8 Stored tools and equipment safely in appropriate locations and in accordance with company practices
2. Required knowledge and Attitude	**2.1 SAFETY PRACTICES** • Use of PPE • Handling of tools and equipment • Good housekeeping **1.4 MATERIALS, TOOLS AND EQUIPMENT** • Types and uses of lubricants • Types and uses of cleaning materials • Types and uses of measuring instruments and equipment **1.5 PREVENTIVE MAINTENANCE** • Methods and techniques • Procedures
3. Required skills	3.1 Preparing maintenance materials, tools and equipment 3.2 Proper handling of tools and equipment 3.3 Performing preventive maintenance 3.4 Following instructions
4. Resource implications	The following resources should be provided: 4.1 Workplace 4.2 Maintenance schedule 4.3 Maintenance materials, tools and equipment relevant to the proposed activity/task
5. Methods of assessment	Competency should be assessed through: 5.1 Direct observation 5.2 Written test/questioning relevant to Underpinning knowledge
6. Context of assessment	6.1 Competency assessment may occur in workplace or any appropriate simulated environment 6.2 Competency assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines

CORE COMPETENCIES

UNIT OF COMPETENCY : **ASSEMBLE AND DISMANTLE SCAFFOLDS/ SHORING AND BRACES**

UNIT CODE : **CON 713341**

UNIT DESCRIPTOR : This unit covers the outcomes in the erection, checking and dismantling of limited-height temporary structures, particularly scaffolding, shoring and braces.

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables
1. Plan and prepare for operation	1.1 Occupational Safety and Health Standards (OSHS) requirements consistent to erect and dismantle. ***shoring / scaffolding*** are verified and complied with 1.2 Site access and emergency routes are identified and confirmed. 1.3 Work instruction is reviewed, clarified and confirmed with ***authorized personnel.*** 1.4 Operation to erect and dismantle shoring / scaffolding is determined and planned in line with job and site requirements. 1.5 Purpose of shoring / scaffolding is confirmed and ***associated activities*** are identified. 1.6 ***Equipment*** are selected in accordance with work requirements. 1.7 OSH orientation, toolbox meetings and specialized instructions are participated in accordance with organization guidelines and procedures
2. Erect shoring / scaffolding	2.1 Shoring / scaffolding and components are inspected with damaged components are isolated, labeled, tagged and rejected. 2.2 ***Footings*** are prepared in accordance with OSHS requirements, codes of practice, manufacturer specifications and engineer's instructions. 2.3 Shoring / scaffolding is set out and ***erected*** in accordance with OSHS requirements and manufacturer specifications. 2.4 ***Fall protection devices*** are installed in accordance with job specification and OSHS requirements.

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables
3. Inspect and replace defective shoring / scaffolding component	3.1 Defective components are reported to appropriate personnel in line with company safe operating procedure. 3.2 Shoring / scaffolding instability is reported to appropriate personnel in line with company safe operating procedure. 3.3 Replacement of defective components are carried out. 3.4 Shoring / scaffolding checklist report is accomplished and submitted to appropriate personnel following work procedures.
4. Dismantle shoring / scaffolding and clean up	4.1 Dismantling area is isolated with safety signs and barricades are put in place. 4.2 Shorings / scaffolding are dismantled in accordance with safe principles. 4.3 Work area is cleared and materials disposed of, re-used or recycled in accordance with OSHS requirements, codes of practice and job specifications. 4.4 ***Tools*** and equipment are cleaned, checked, maintained and stored in accordance with manufacturer recommendations and standard work practices. 4.5 Work completion procedures are applied and appropriate personnel notified of work completion. 4.6 Advanced shoring / scaffolding operations and faults are recorded and reported to the appropriate personnel.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Shoring / Scaffolding	Includes: 1.1 Jack base/ base plates 1.2 U-heads 1.3 Cross brace 1.4 Frames (Vertical frames, A-frames, H-frames, Ladder type, Adjusting frames) 1.5 G.I. pipes 1.6 Handrails 1.7 Cantilever brackets 1.8 Fixed/ swivel clamps 1.9 Arm lock 1.10 Ties (wall/ column ties) 1.11 Joint pin 1.12 Monkey ladder. 1.13 Catwalk (with and without opening) 1.14 U-clip 1.15 Lock pin 1.16 Sleeve coupler 1.17 Vertical props 1.18 Horizontal shores 1.19 Scaffolds shores 1.20 Free-standing pre-fabricated scaffolds 1.21 Cantilevered hoists with loads not exceeding 500kgs. 1.22 Ropes Excludes: • Scaffolds more than 3 meters in height • Crane loading platforms • Cantilevered scaffolds • Sloping platforms • Wire ropes and chains
2. Authorized personnel	May include: 2.1 Leadman / Foreman 2.2 Supervisor 2.3 Engineer 2.4 Safety officer

VARIABLE	RANGE
3. Associated activities	May include: 3.1 Work platform 3.2 Edge protection 3.3 Access ways 3.3.1 Falsework 3.3.2 Stages 3.3.3 Covered walkways 3.4 Debris net 3.5 Debris guard
4. Equipment	May include: 4.1 Frame type 4.2 Tubular type 4.3 Tubes/ Pipes and fittings
5. Footings	May include: 5.1 Sole boards 5.2 Base plate 5.3 Adjustable base jack
6. Erection	May include: 6.1 Placement 6.2 Sequencing 6.3 Squaring 6.4 Leveling 6.5 Anchoring to structure
7. Fall protection devices	May include: 7.1 Full body harness 7.2 Working platform edge protection
8. Tools	May include: 8.1 Cantilevered hoist 8.2 Fiber ropes 8.3 Static lines 8.4 Hammer 8.5 Spirit level

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Demonstrates ability to verify and comply OSHS requirements to erect and dismantle shoring / scaffolding. 1.2 Demonstrates ability to identify site access. 1.3 Demonstrates ability to follow work instruction . 1.4 Demonstrates ability to assess shoring / scaffold load capacity. 1.5 Demonstrates ability to erect and dismantle shoring / scaffolding following established / recommended standard procedures.
2. Required Knowledge and attitude	2.1 OSHS and other relevant regulatory requirements (DOLE DO 13) 2.2 Quality procedures, e.g., 5S 2.3 Environmental-conservation procedures, e.g., 3R (reduce, reuse, recycle) 2.4 Established / recommended standard procedure in the erection and dismantling of shoring / scaffolding. 2.5 Ability to test and determine the required load. 2.6 Familiarity on the types and uses of shoring / scaffolding.
3. Required Skills	3.1 Following OSHS and other relevant regulatory requirements for erecting and dismantling shoring / scaffolding. 3.2 Following established / recommended standard procedures for erecting and dismantling shoring / scaffolding. 3.3 Complying ancillary requirements in the erection of advanced shoring / scaffolding. 3.4 Identifying and avoiding hazards. 3.5 Using hand tools.
4. Resource Implications	The following resources MUST be provided: 4.1 Tools and equipment relevant to the activity 4.2 Specifications or work instruction 4.3 Workplace or simulated venue
5. Methods of Assessment	Competency may be assessed through: 5.1 Direct observation / Demonstration of practical skills 5.2 Oral questioning
6. Context for Assessment	6.1 Competency may be assessed in the workplace or in a simulated work environment.

UNIT OF COMPETENCY: **INSTALL SYSTEM FORMWORKS**
UNIT CODE **CON712322**
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in installation of system formworks for concrete work. It includes preparing materials, perform setting out, fabricate and set/fix form system of structure components and double-check installed formworks systems.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Prepare materials, tools and equipment for installing formworks	1.1 Approved type of ***PPE*** is selected and used according to job requirements and OSHS specifications. 1.2 ***Formworks components, power and hand tools and equipment*** are selected and prepared consistent with job requirements. 1.3 ***Materials and other semi-consumables*** are re-checked and properly staged according to job requirements. Damaged materials are reported to immediate superior. 1.4 Unexpected situations are responded to in line with company rules and regulations. 1.5 Housekeeping is performed according to safety regulations. 1.6 OSH orientation, toolbox meetings and specialized instructions are participated in accordance with organization guidelines and procedures
2. Perform setting out	2.1 Base line is established/ Identified/according to the site layout. 2.2 Center line/location of columns/walls are established. 2.3 Dimension of footing (columns & walls) are established. 2.4 Defined locations are marked-out using marking gauge or paints (columns/walls). 2.5 Squareness of markings are checked. 2.6 Offset lines for checking purposes are set-up.
3. Set/fix form system of structure components	3.1 Appropriate PPE is selected and used according to job requirements and OSHS specifications. 3.2 Form oil is applied to form panels or sheathing in accordance with specifications. 3.3 Formworks components are fabricated and set to the required alignment, squareness, levelness, plumbness. 3.4 Connectors, braces and locks are properly secured according to job requirements. 3.5 Unexpected situations are responded to in line with company rules and regulations. 3.6 Housekeeping is performed according to safety regulations. 3.7 Formworks components are set to the required output at the given time. 3.8 Debris are removed in accordance to standard procedure.
4. Double-check installed formworks systems	4.1 Installed formworks are double checked in accordance to job instruction. 4.2 Appropriate remedies/ adjustments are made to rectify non conformance to standards. 4.3 Appropriate personnel are notified of the accomplished task.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Personal protective equipment (PPE)	May include: 1.1 Gloves 1.2 Safety shoes 1.3 Hard hat / Helmet 1.4 Safety/ Body harness 1.5 Safety goggles 1.6 Respirator/dust mask 1.7 Ear muffs/ear plugs 1.8 Face mask/shield
2. Formworks components	May include: 2.1 Sheathing (metal, laminated plastic) assembly 2.2 Shoring and accessories 2.3 Scaffolds and accessories
3. Power and hand tools and equipment	May include: 3.1 Compressor 3.2 Saw(hand,circular) 3.3 Hammer 3.4 Meter tape 3.5 Pencil 3.6 Plumb bob 3.7 Level hose 3.8 Spirit level 3.9 Tri-square
4. Materials and other semi- consumables	May include: 4.1 Lumbers/ Plywood 4.2 Nails 4.3 Form ties/ walers 4.4 Form oil

EVIDENCE GUIDE

1. Critical aspects of competency	Competency assessment requires evidence that the candidate: 1.1 Prepared materials, tools and equipment for installing formworks Selected and prepared materials, power and hand tools, equipment and PPE are consistent with job requirements. 1.2 Assembled scaffolds/shoring and braces. 1.3 Set/fixed form system of structure components. 1.4 Double checked installed formworks systems.
2. Required knowledge and attitude	2.1 Types and uses of PPE 2.2 Types of formworks system 2.3 Formworks tagging and coding systems 2.4 Mensuration 2.5 Materials, power and hand tools and equipment and specifications 2.6 Safe and effective use of power and hand tools 2.7 Fabrication, assembling and fixing procedures 2.8 5-S 2.9 Environmental-conservation procedures, e.g., 3R (reduce, reuse, recycle) 2.10 Company rules and regulations 2.11 Relevant sections of DOLE DO 13 Guidelines governing occupational safety and health in the construction industry.
3. Required skills	3.1 Using PPE 3.2 Applying mensuration 3.3 Preparing materials, power and hand tools and equipment 3.4 Following safe fabricating, assembling and fixing procedures 3.5 Following safe and effective use of power and hand tools and equipment. 3.6 Communicating effectively
4. Resource implications	The following resources must be provided: 4.1 Work place location 4.2 Hand and power tools and equipment appropriate for installation of formworks components 4.3 Materials relevant to the proposed activity 4.4 Appropriate PPE
5. Methods of assessment	Competency must be assessed through: 5.1 Observation with questioning 5.2 Demonstration with questioning 5.3 Portfolio
6. Context for assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting.

UNIT OF COMPETENCY: **STRIP SYSTEM FORMWORKS**
UNIT CODE **CON712323**
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in stripping formworks components and accessories for concrete work. It includes preparing tools, equipment and staging of materials and re-shoring operations.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Prepare staging area, tools and equipment	1.1 Work instruction is secured from immediate superior. 1.2 Approved type of ***PPE*** is selected and used according to job requirements and OSHS specifications. 1.3 Staging area is identified and prepared based on job requirements. 1.4 ***Tools*** are selected and prepared consistent with job requirements. 1.5 Unexpected situations are responded to in line with company rules and regulations. 1.6 Housekeeping is performed according to safety regulations. 1.7 OSH orientation, toolbox meetings and specialized instructions are participated in accordance with organization guidelines and procedures
2. Strip formworks of structure components	2.1 Stripping permit is secured from immediate supervisor. 2.2 ***Formworks components and accessories*** are stripped carefully, safely and sequentially. 2.3 Formworks components and accessories are sorted, arranged and properly staged. 2.4 Formworks components and accessories are cleaned, refurbished, inventoried and stored. 2.5 Formworks components and accessories which are beyond repair are discarded for proper disposal. 2.6 Unexpected situations are responded to Housekeeping is performed according to safety regulations.
3. Re-shore and remove props	3.1 Appropriate PPE is selected and used according to job requirements and OSHS. 3.2 Formworks structure components are re-shored where applicable. 3.3 Shores are removed in accordance with standard procedures. 3.4 Shores, tools and equipment are cleaned, maintained, inventoried and stored properly. 3.5 Unexpected situations are responded to. 3.6 Housekeeping is performed according to safety regulations.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Personal protective equipment (PPE)	May include: 1.1 Gloves 1.2 Safety shoes 1.3 Hard hat / Helmet 1.4 Safety/ Body harness 1.5 Safety goggles 1.6 Respirator/dust mask 1.7 Ear muffs/ear plugs 1.8 Face mask/shield
2. Tools	May include: 2.1 Hammer 2.2 Open end wrench 2.3 Steel brush
3. Formworks components and accessories	May include: 3.1 Form panels 3.2 Scaffolds 3.3 Props

EVIDENCE GUIDE

1. Critical aspects of competency	Competency assessment requires evidence that the candidate: 1.1 Prepared staging area, tools and equipment. 1.2 Stripped formworks of structure components. 1.3 Re-shored and removed props.
2. Required knowledge and attitude	2.1 Types and uses of PPE 2.2 Tools used in stripping 2.3 Safety rules and regulations 2.4 5-S 2.5 Environmental-conservation procedures, e.g., 3R (reduce, reuse, recycle) 2.6 Safe and effective use of tools 2.7 Formworks components and accessories 2.8 Inventory of metal formworks components and accessories 2.9 Proper storing and maintenance of formworks components and accessories 2.10 Stripping and re-shoring procedures 2.11 Relevant sections of DOLE DO 13 Guidelines governing occupational safety and health in the construction industry.
3. Required skills	3.1 Using PPE 3.2 Following safety rules and regulations 3.3 Preparing formworks components 3.4 Stripping, and removal of shores/ props 3.5 Practicing 5-S 3.6 Following safe and effective use of tools 3.7 Demonstrate proper storing and maintenance of formworks components and accessories.
4. Resource implications	The following resources must be provided: 4.1 Work place location 4.2 Access to formworks components 4.3 Tools for stripping of formworks components 4.4 Appropriate PPE
5. Methods of assessment	Competency must be assessed through: 5.1 Observation with questioning 5.2 Demonstration with questioning 5.3 Portfolio
6. Context for assessment	6.1 Competency may be assessed in the work place or in a simulated work place setting

SECTION 3 TRAINING STANDARDS

These standards are set to provide technical and vocational education and training (TVET) providers with information and other important requirements to consider when designing training programs for System Formworks Installation NC II.

3.1 CURRICULUM DESIGN

Course Title: **SYSTEM FORMWORKS INSTALLATION** NC Level: **NC II**

Nominal Training Duration:

18 Hours (Basic)
18 Hours (Common)
80 Hours (Core)
40 Hours (OJT)
156 Hours

Course Description:

This course is designed to develop knowledge, skills and desirable work attitude along System Formworks Installation. It covers the basic, common and core competencies.

BASIC COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Participate in workplace communication	1.1 Obtain and convey workplace information. 1.2 Complete relevant work related documents. 1.3 Participate in workplace meeting and discussion.	Group discussion Interaction	• Demonstration • Observation • Interviews/ questioning
2. Work in a team environment	2.1 Describe and identify team role and responsibility in a team. 2.2 Describe work as a team member.	Discussion Interaction	• Demonstration • Observation • Interviews/ questioning
3. Practice career professionalism	3.1 Integrate personal objectives with organizational goals. 3.2 Set and meet work priorities. 3.3 Maintain professional growth and development	Discussion Interaction	• Demonstration • Observation • Interviews/ questioning
4. Practice occupational health and safety	4.1 Identify hazards and risks 4.2 Evaluate hazard and risks 4.3 Control hazards and risks 4.4 Maintain occupational health and safety awareness	Discussion Plant tour Symposium	• Observation • Interview

COMMON COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Prepare construction materials and tools	1.1 Identify Materials and tools 1.2 Requisition, equipment, materials and tools 1.3 Receive and inspect materials	Audio Visual Simulation Discussion Practical Exercise Demonstration	Direct observation Questions or interview Portfolio (credentials) Written / Oral Test Demonstration
2. Observe procedures, Specifications and Manuals of Instructions	2.1 Identify and access specification/ manuals 2.2 Interpret manuals 2.3 Apply information in manual 2.4 Store manuals	Audio Visual Simulation Discussion Practical Lab Demonstration	Direct observation Oral questioning Written test or examination Third party report Demonstration (able to impart knowledge and skills)
3. Perform mensurations and calculations	3.1 Select measuring instruments 3.2 Carry out measurements and calculations	Audio Visual Simulation Discussion Practical Lab Demonstration	Direct observation Oral questioning Written test or examination Third party report Demonstration (able to impart knowledge and skills)
4. Maintain tools and equipment	4.1 Check condition of tools and equipment 4.2 Perform basic preventive maintenance 4.3 Store tools and equipment	Audio Visual Simulation Discussion Practical Lab Demonstration	Direct observation of application of tasks. Oral questioning Written test or examination Third party report Demonstration
5. Interpret technical drawings and plans	5.1 Analyze signs, symbols and data 5.2 Interpret technical drawings and plans 5.3 Apply freehand sketching	Lecture Demonstration Practical exercises	Demonstration and oral questioning Written test

CORE COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Assemble and dismantle scaffolds/ shoring and braces	1.1 Plan and prepare for operation 1.2 Erect shoring/ scaffolding 1.3 Inspect and replace defective shoring/ scaffolding component 1.4 Dismantle shoring/ scaffolding and clean up	Lecture/ discussion Demonstration	Observation Questioning Written Test Demonstration
2 Install System Formworks	2.1 Prepare materials, tools and equipment for installing formworks 2.2 Perform setting out 2.3 Set/fix form system of structure components 2.4 Double check installed formworks system	Audio Visual Simulation Discussion Practical Lab Demonstration	Observation Questioning Written Test Demonstration
3 Strip System Formworks	3.1 Prepare staging area, tools and equipment 3.2 Strip formworks of structure components 3.3 Re-shore and remove props	Audio Visual Simulation Discussion Practical Lab Demonstration	Observation Questioning Written Test Demonstration

3.2 TRAINING DELIVERY

The delivery of training should adhere to the design of the curriculum. Delivery should be guided by the 10 basic principles of competency-based TVET:

- The training is based on curriculum developed from the competency standards;
- Learning is modular in its structure;
- Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;
- Training is based on work that must be performed;
- Training materials are directly related to the competency standards and the curriculum modules;
- Assessment is based in the collection of evidence of the performance of work to the industry required standard;
- Training is based both on and off-the-job components;
- Training program allows for recognition of prior learning (RPL) or current competencies;
- Training allows for multiple entry and exit; and
- Training programs are registered with the UTPRAS.

The competency-based TVET system recognizes various types of delivery modes, both on and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities may be adopted when designing training programs:

- The dualized mode of training delivery is preferred and recommended. Thus programs would contain both in-school and in-industry training or fieldwork components. Details can be referred to the Dual Training System (DTS) Implementing Rules and Regulations.
- Modular/self-paced learning is a competency-based training modality wherein the trainee is allowed to progress at his own pace. The trainer facilitates the training delivery
- Peer teaching/mentoring is a training modality wherein fast learners are given the opportunity to assist the slow learners.
- Supervised industry training or on-the-job training is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies prescribed in the training regulations.
- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, or audio, video or computer technologies.
- Project-Based Instruction is an authentic instructional model or strategy in which students plan, implement and evaluate projects that have real world applications.

3.3 TRAINEE ENTRY REQUIREMENTS

This section specifies the qualifications of trainees and educational experience. Other requirements like health and physical requirements are also stated. Passing entry written examinations may also be indicated if necessary.

- Can communicate both orally and written
- Physically fit and mentally healthy
- With good moral character
- Can perform basic mathematical computation and mensuration.
- Legal age with NSO Birth Certificate

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS FOR SYSTEM FORMWORKS INSTALLATION NC II

Based on a class size of 25 students/trainees

TOOLS		EQUIPMENT		MATERIALS	
QTY		**QTY**		**QTY**	
5 pcs	Claw hammer	1 unit	Air/ Water Pressure washer	2 sets	Sheathing (metal, laminated plastic,plywood) assembly
5 pcs	Spirit level	1 unit	Circular saw	2 sets	Shoring and accessories
5 pcs	Pull-push rule	25 sets	Personal protective Equipment (Gloves, Safety shoes,Hard hat/ Helmet, Safety/ Body harness, Safety goggles, Respirator/ dust mask, ear muffs/ ear plugs, Face mask/ shield)	2 sets	Scaffolds and accessories
5 pcs	Plumb bob	2 units	Power drill	25 pcs	Pencil
5 pcs	Steel square	1 unit	Portable grinder	5 sets	• Form system accessories
3 pcs. each	Adjustable wrench (6”, 10”, 12”)	1 unit	Lifting equipment		• Release agent
5 pcs.	Cross cut saw			**LEARNING MATERIALS**	
5 pcs.	Chisels			Reference books,	
25 pcs.	Steel brush			Modules, hands out, multimedia materials.	
5 pcs.	Crow bar			Plan and working drawings	
5 pcs.	Level hose (10 meters)			Audio- video equipment	

NOTE: Considering the possible prohibitive cost of the formworks and related equipment and materials to be used during the training, the TVET provider may choose to provide access to such equipment and materials through tie-up or on the job training arrangements with construction firms.

3.5 TRAINING FACILITIES FOR SYSTEM FORMWORKS INSTALLATION NC II

Based on a class size of 25 students/trainees

Space Requirement	Size in Meters	Area in Sq. Meters	Total Area in Sq. Meters
Student/Trainee Working Space	3 x 4 per student/trainee	12	300
Contextual Learning Laboratory / Lecture Room	6 x 7	42	42
Learning Resource Center	4 x 5	20	20
Tool Room/Storage	4 x 8	32	32
Wash room	2.5 x 4	10	10
Circulation area	10 x 6	60	60
TOTAL AREA			**464**

3.6 TRAINER'S QUALIFICATION FOR SYSTEM FORMWORKS INSTALLATION NC II

- Must be a holder of National TVET Trainers Certificate level I (NC + TM) or at least bachelor's degree or college level with 2 years relevant industry experience.
- Must be physically and mentally fit
- Holder of Basic Occupational Safety and Health (BOSH) Certificate or Construction Occupational Safety and Health
- Good moral character
- Must be computer literate
- 1 year teaching experience

*Optional. Only when required by the hiring institution
Reference: TESDA Board Resolution No. 2004-03

3.7 INSTITUTIONAL ASSESSMENT

Institutional assessment is undertaken by trainees to determine their achievement of units of competency. A certificate of achievement is issued for each unit of competency.

SECTION 4 NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

4.1 To attain the national Qualification of System Formworks Installation NC II the candidate must demonstrate competence through project-type assessment covering all the units listed in Section 1. Successful candidates shall be awarded a National Certificate signed by the TESDA Director General.

4.2 Assessment shall focus on the core units of competency. The basic and common units shall be integrated or assessed concurrently with the core units.

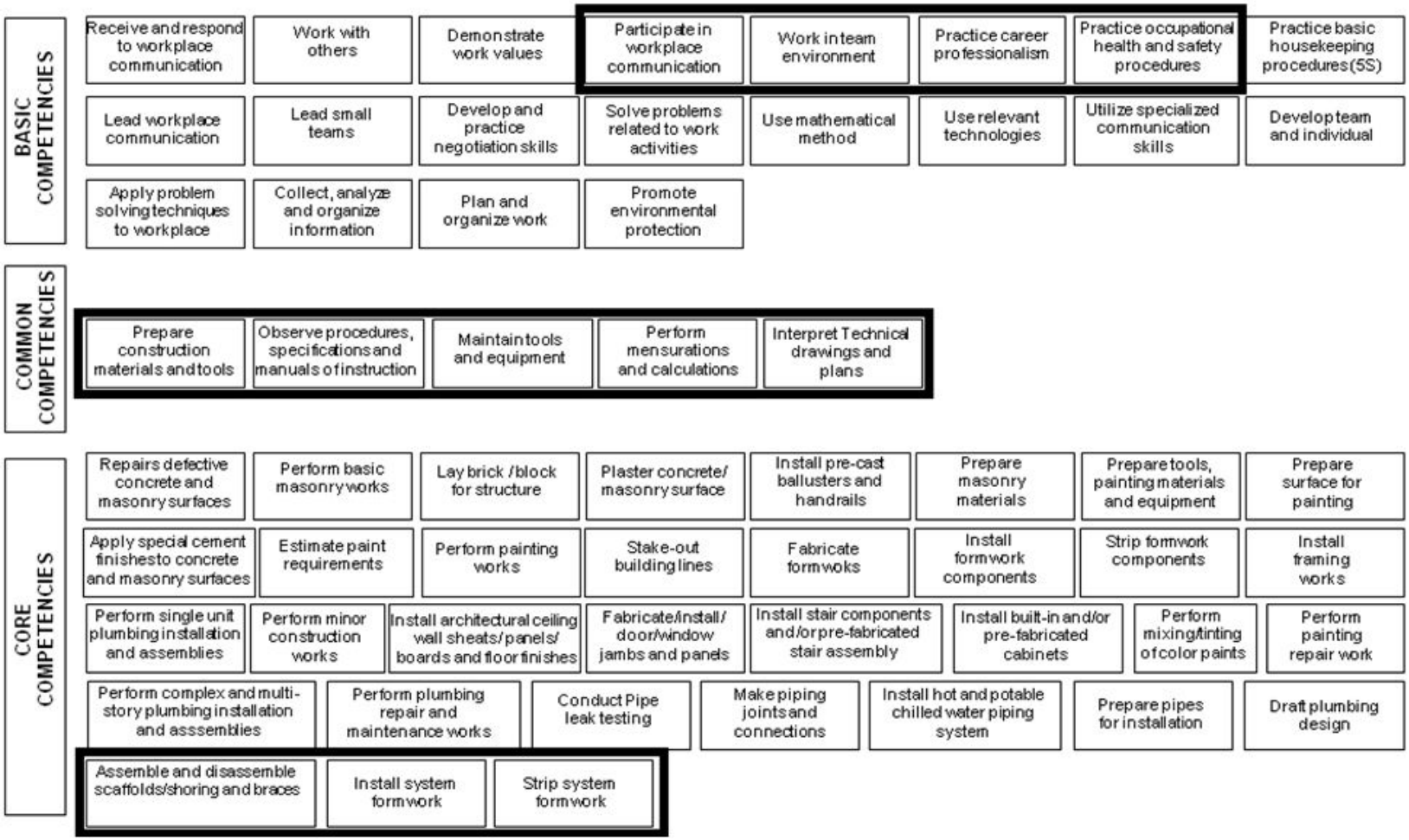
4.3 The following are qualified to apply for assessment and certification:

4.3.1 Graduates of formal, non-formal and informal including enterprise-based training programs

4.3.2 Experienced workers (wage employed or self employed)

4.4 The guidelines on assessment and certification are discussed in detail in the "Procedures Manual on Assessment and Certification" and "Guidelines on the Implementation of the Philippine TVET Qualification and Certification System (PTQCS)"

COMPETENCY MAP
SYSTEM FORMWORK INSTALLATION NC II



DEFINITION OF TERMS

1.	Certification	Refers to the process of verifying and validating competencies of a person through assessment.
2.	Competency	Is the application of knowledge, skills and attitudes to perform work activities to the standard expected in the workplace.
3.	Element	Refers to the building blocks of a unit of competency. It describes in outcome terms the functions that a person who works in a particular area of work is able to perform
4.	Evidence Guide	It is a guide for assessment that provides information on critical aspects of competency, underpinning knowledge, underpinning skills, resource implications, context of assessment and assessment method.
5.	Level	Refers to the category following the level of difficulty and complexity of skills and knowledge required to do the job.
6.	Philippine TVET Qualification Framework	Refers to a comprehensive, nationally consistent framework for qualifications in the TVET sector. It also provides the parameter for the integration of learning and assessment in the middle skills development.
7.	Qualification	Refers to the national certificate issued by the TESDA or its accredited industry organizations in recognition that a person has achieved competencies relevant to a trade or industry
8.	Range of Variable	It describes the circumstances or context in which the work is to be performed.
9.	Unit of Competency	Refers to a discrete aspect of work, which would normally be performed by only one person.
10.	Shoring	Refers to the provision of temporary support with shores to a building or an excavation.
11.	Formworks	Refers to boarding used to contain wet concrete as it sets. The formworks is a temporary structure and can be made of wood or steel. Once the concrete has hardened, the formworks boarding is removed.
12.	Scaffolds	Refers to the temporary elevated structure that is used as a platform for supporting workers and equipment.

13.	Braces	Refers to a device that holds or fastens two or more parts together or in place.
14.	Form oil	Refers to the oil applied to the interior surface of formworks to promote easy release from the concrete when forms are removed.
15.	Panels	Refers to a section of form sheathing, constructed from boards, plywood, metal sheets, etc., that can be erected and stripped as a unit.
16.	Joist	Refers to a steel or wood beam providing direct support for a floor.
17.	Sheathing	Protective covering consisting, for example, of a layer of boards applied to the studs and joists of a building to strengthen it and serve as a foundation for a weatherproof exterior.
18.	Studs	A vertical member of appropriate size (2" x 4" to 4" x 10") (or 50 mm x 100 mm to 100 mm x 250 mm) and spacing (16" to 30") (or 400 mm to 750 mm) to support sheathing or concrete forms.
19.	Formties/ walers	A tensile unit adapted to prevent concrete forms from spreading due to the fluid pressure of freshly placed, unhardened concrete.
20.	Squareness	The quality or characteristic of being square or rectangular in shape; also refers to corners being at exactly or near right angles (90˚).
21.	Plumbness	The quality of being exactly vertical or perpendicular.

ACKNOWLEDGEMENTS

The Technical Education and Skills Development Authority (TESDA) wishes to extend thanks and appreciation to the many representatives of business, industry, academe and government agencies and who contributed their time and expertise to the development and validation of this Training Regulations.

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TESDA EXCOM

The MANAGEMENT and STAFF of the TESDA Secretariat

- Qualification and Standards Office (QSO)
- **The Management and Staff of the Philippine Constructors Association (PCA)**
- **These Training Regulations were reviewed by the Occupational Safety and Health Center**