TRAINING REGULATIONS

Technical Drafting NC II

CONSTRUCTION SECTOR

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

TABLE OF CONTENTS

CONSTRUCTION SECTOR

Technical Drafting NC II

TRAINING REGULATIONS FOR
TECHNICAL DRAFTING NC II

SECTION 1 TECHNICAL DRAFTING NC II QUALIFICATION

The **Technical Drafting NC II** Qualification consists of competencies that a person must achieve to enable him / her to draft architectural layout and detail (structural, electrical/electronic, sanitary/plumbing, and mechanical) drawings using both CAD system and manual drafting methods.

This Qualification is packaged from the competency map of Construction sector as shown in Annex A.

The Units of Competency constituting 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
CON311203	Perform mensuration and calculations
CON311202	Interpret technical drawings and plans
FUR714202	Apply quality standards
ICT311201	Operate personal computer

CODE NO.	CORE COMPETENCIES
	Units of Competency
CON311301	Draft architectural layout and details
CON311302	Prepare computer-aided drawings
CON311303	Draft structural layout and details
CON311304	Draft electrical and electronic layout and details
CON311305	Draft sanitary and plumbing layout and details
CON311306	Draft mechanical layout and details

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

- Draftsman
- CAD operator

Candidates are granted a national certificate under this qualification once they achieve all of the above basic, common and core units.

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the competency standards required in **TECHNICAL DRAFTING NC II.** These competencies are categorized into basic, common and core units of competency.

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 ***Bold and 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 matters 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 Demonstrates ability to prepare written communication following standard format of the organization 1.2 Demonstrates ability to access 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. Underpinning 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. Underpinning 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 5.3 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** ***Bold and 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 teamwork 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 Demonstrates ability to operate in a team to complete workplace activity 1.2 Demonstrates ability to work effectively with others 1.3 Demonstrates ability to convey information in written or oral form 1.4 Demonstrates ability to select and use appropriate workplace language 1.5 Demonstrates ability to follow designated work plan for the job 1.6 Demonstrates ability to report outcomes
2. Underpinning Knowledge and Attitude	2.1 Communication process 2.2 Team structure 2.3 Team roles 2.4 Group planning and decision making
3. Underpinning 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 ***Bold and 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
2. 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
3. Maintain professional growth and development	3.1 ***Training and career opportunities*** are identified and availed of based on job requirements 3.2 ***Recognition*** is 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. Training 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. Recognition	4.1 Recommendations 4.2 Citations 4.3 Certificate of Appreciation 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 Demonstrates ability to attain job targets within key result areas (KRAs) 1.2 Demonstrates ability to maintain intra - and interpersonal relationship in the course of managing oneself based on performance evaluation 1.3 Demonstrates ability to complete training and career opportunities which are based on the requirements of the industries 1.4 Demonstrates ability to acquire and maintain licenses and/or certifications according to the requirement of the qualification
2. Underpinning Knowledge	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. Underpinning 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: Workplace or assessment location 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 ***Bold and 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 Terms of maximum tolerable limits which when exceeded will result in harm or damage are identified based on threshold limit values (TLV) 2.2 Effects of the hazards are determined 2.3 OHS issues and/or concerns and identified safety hazards are reported to designated personnel in accordance with workplace requirements and relevant workplace OHS legislation
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

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables
4. Maintain OHS awareness	4.1 ***Emergency-related drills and training*** 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 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 2.4.1 Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles 2.4.2 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

VARIABLE	RANGE
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 Demonstrates ability to explain clearly established workplace safety and hazard control practices and procedures 1.2 Demonstrates ability to identify hazards/risks in the workplace and its corresponding indicators in accordance with company procedures 1.3 Demonstrates ability to recognize contingency measures during workplace accidents, fire and other emergencies 1.4 Demonstrates ability to identify terms of maximum tolerable limits based on threshold limit value- TLV 1.5 Demonstrates ability to follow Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace 1.6 Demonstrates ability to use PPE in accordance with company OHS procedures and practices 1.7 Completed and updated OHS personal records in accordance with workplace requirements
2. Underpinning 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. Underpinning Skills	3.1 Practice of personal hygiene 3.2 Hazards/risks identification and control skills 3.3 Interpersonal skills 3.4 Communication skills
4. 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

5. Methods of Assessment	Competency may be assessed through: 5.1 Portfolio Assessment 5.2 Interview 5.3 Case Study/Situation
6. 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:	**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 ***Bold and 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 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 2.2 Alternative measuring tools are used without sacrificing cost and quality of work 2.3 ***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 2.4 Calculations involving fractions, percentages and mixed numbers are used to complete workplace tasks 2.5 Numerical computation is self-checked and corrected for accuracy 2.6 Instruments are read to the limit of accuracy of the tool 2.7 Systems of measurement identified and converted according to job requirements/ISO 2.8 Work pieces 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

VARIABLE	RANGE
	3.10 Conductance 3.11 Capacitance 3.12 Displacement 3.16 Inside diameter 3.17 Circumference 3.18 Length 3.19 Thickness 3.20 Outside diameter 3.21 Taper 3.22 Out of roundness 3.23 Oil clearance 3.24 End play/Thrust clearance

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Demonstrates ability to select and prepare measuring instruments in accordance with job requirements 1.2 Demonstrates ability to perform measurements and calculations according to job requirements/ ISO
2. Underpinning knowledge	TRADE MATHEMATICS / MENSURATION 2.1 Four fundamental operation 2.2 Linear measurement 2.3 Dimensions 2.4 Unit conversion 2.5 Ratio and proportion 2.6 Trigonometric functions 2.8 Algebraic equations
3. Underpinning 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:	**INTERPRET TECHNICAL DRAWINGS AND PLANS**
UNIT CODE :	**CON311202**
UNIT DESCRIPTOR :	This unit covers the knowledge, skills and attitudes on analyzing and interpreting symbols, data and work plan based on the required performance standards.

ELEMENT	PERFORMANCE CRITERIA ***Bold and 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 - Front view - Right side view/left side view - Top view - Pictorial 4.4 Schematic diagram 4.5 Electrical drawings 4.6 Structural drawings 4.7 Plumbing drawings - Water - Sewerage/Drainage - Ventilation 4.8 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 workplan following specifications 1.5 Determined job specifications based on working/technical drawing
2. Underpinning knowledge	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. Underpinning 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 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 endorsed TESDA assessment guidelines

UNIT TITLE:	**APPLY QUALITY STANDARDS**
UNIT CODE:	**FUR714202**
UNIT DESCRIPTOR:	This unit covers the knowledge, skills, attitudes required to apply quality standards in the workplace. The unit also includes the application of relevant safety procedures and regulations, organization procedures and customer requirements.

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables
1. Assess quality of received materials or components	1.1 Received ***materials or component parts*** are checked based on material specifications 1.2 ***Defective*** material or components are identified and isolated following standard operating procedures 1.3 Defective materials or components are replaced in accordance with workplace procedures.
2. Assess own work	2.1 ***Documents*** relative to ***quality*** within the company is identified and used 2.2 Completed work is checked based on workplace standards relevant to the task undertaken 2.3 In cases of deviations from specified quality standards, causes are documented and reported in accordance with the workplace' standards operating procedures
3. Engage in process improvement	3.1 Process improvement procedures are participated in relation to workplace assignment 3.2 Work is carried out in accordance with process improvement procedures 3.3 Performance of operation or quality of product or service is monitored in accordance to ***customer*** satisfaction

RANGE OF VARIABLES

VARIABLE	RANGE
1. Materials / components	May include but not limited to: 1.1 Electrical materials and consumables 1.2 Welding materials and consumables 1.3 Furniture making materials and consumables 1.4 Carpentry materials and consumables 1.5 Masonry materials and consumables 1.6 Heavy equipment materials and consumables
2. Defective	May include but not limited to: 2.1 Components / materials do not conform to specification 2.2 Components / materials containing manufacturing defects 2.3 Components / materials do not conform with government regulation i.e., PEC, environmental code 2.4 Components / materials possessed safety defects
3. Documents	May include but not limited to: 3.1 Organization work procedures / reports 3.2 Manufacturer's instruction manual 3.3 Customer requirements 3.4 Forms
4. Quality standards	May include but not limited to: 4.1 Materials / consumables 4.2 Component parts 4.3 Final product 4.4 Production processes 4.5 Methods
5. Customer	May include but not limited to: 5.1 Co-worker 5.2 Supplier 5.3 Client 5.4 Organization receiving the product or service

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment must show that the candidate: 1.1 Demonstrates ability to follow company's standard operating procedures 1.2 Demonstrates knowledge of types and uses of materials and component parts 1.3 Demonstrates knowledge of quality standards 1.4 Demonstrates ability to follow process improvement procedures
2. Underpinning knowledge	2.1 Production processes 2.2 Types and uses of materials and components 2.3 Company standard operating procedures 2.4 Safety practices and applications
3. Underpinning skills	3.1 Following production processes 3.2 Checking of materials and component parts and finished products 3.3 Following company standard operating procedures 3.4 Applying safety practices
4. Method of assessment	4.1 Observation of practical skills 4.2 Oral questions
5. Resource implication	The following materials must be provided: 5.1 Materials and component parts relevant to the activity 5.2 Documents related to quality
6. Context of Assessment	6.1 Assessment may be conducted in the workplace or in a simulated environment.

UNIT OF COMPETENCY:	OPERATE A PERSONAL COMPUTER
UNIT CODE	ICT311201
UNIT DESCRIPTOR	This unit defines the competency required to operate a personal computer by: starting the PC, logging in, using and working with files, folders and programs, saving work, and closing down the PC.

ELEMENT	PERFORMANCE CRITERIA ***Bold and italicized*** terms are elaborated in the Range of Variables
1. Start the computer	1.1 The ***peripheral devices*** are properly connected 1.2 Power is checked and the ***computer*** and peripheral devices are switched on 1.3 Proper logging in and logging off is successfully done 1.4 The ***operating system*** features and functions are accessed and navigated 1.5 Hardware configuration and other ***system features*** are checked
2. Arrange and customize desktop display/ Windows settings	2.1 The desktop screen or Windows elements are changed as needed 2.2 Desktop icons are added, renamed, moved, copied or deleted 2.3 The ***online help functions*** are accessed or used as needed 2.4 Desktop icons of ***application programs*** are selected, opened and closed 2.5 ***Properties*** of icons are displayed 2.6 Computer or desktop settings are saved and restored
3. Work with files and folders (or directories)	3.1 A file or folder is created, opened, moved, renamed or copied 3.2 Files are located, deleted and restored 3.3 Details and properties of files and folders are displayed or viewed 3.4 ***Various files*** are organized for easy lookup and use 3.5 Files and information are searched 3.6 ***Disks*** are checked, erased or formatted as necessary

4. Work with user application programs	4.1 ***Application programs*** are added, changed, removed or ran 4.2 User software or application program are installed, updated and upgraded 4.3 Information/data are moved between documents or files
5. Print information	5.1 Printer is added or installed and correct ***printer settings*** is ensured 5.2 Default printer is assigned accordingly 5.3 Information or document is printed on the installed printer 5.4 Progress of print jobs are viewed and deleted as required
6. Shut down computer	6.1 All open application programs are closed 6.2 Computer and peripheral devices are properly shut down

RANGE OF VARIABLES

VARIABLE	RANGE
1. Peripheral device	This may include but is not limited to: 1.1 Mouse 1.2 Keyboard

	1.3 Monitor or visual display unit 1.4 Printer 1.5 Scanner
2. Computer	May include: 2.1 Laptops/notebooks 2.2 Workstations 2.3 Servers 2.4 Other personal computer devices
3. Application programs	Can include: 3.1 User programs 3.2 Database programs 3.3 Word processors 3.4 Email programs 3.5 Internet browsers 3.6 System browsers 3.7 Spreadsheets
4. Operating system	May include but is not limited to the various versions and variants of: 4.1 Windows 4.2 NT 4.3 Mac OS 4.4 Linux 4.5 Solaris 4.6 Unix
5. System features	May include but is not limited to the operating system features and hardware features like: 5.1 Memory size 5.2 Disk capacities 5.3 Video cards 5.4 USBs 5.5 Modems 5.6 1394 and LAN connectors 5.7 SD and PC cards 5.8 Wireless and infrared connections.

6. Online help functions	6.1 An instruction manual or a portion of the manual, integrated and accessible from within the program or software being used.
7. Properties	Indicates the description of the file or folder to include the: 7.1 File name 7.2 Type of file 7.3 File size 7.4 Date created and modified 7.5 Attributes (hidden, read-only).
8. Various files	8.1 Documents 8.2 Records 8.3 Pictures 8.4 Music 8.5 Video
9. Disks	May include but is not limited to: 9.1 Floppy disks 9.2 CDs 9.3 CD-RW (Compact discs-Read/Write) 9.4 DVD RW 9.5 Zip disks 9.6 Flash drives 9.7 Memory sticks 9.8 Hard drives
10. Printer settings	The properties of the printer that enables it to work includes: 10.1 Page layout 10.2 Paper size 10.3 Ink/cartridge type 10.4 Number of copies 10.5 Page orientation.

EVIDENCE GUIDE

1. Critical aspects of Competency	1.1 Assessment must confirm the ability to utilize software, navigate the desktop using system features to perform tasks and save results of work.
2. Underpinning Knowledge	Knowledge includes: 2.1 Keyboard layout and functions 2.2 Computer functions 2.3 Basic parts of a computer and various hardware components 2.4 Storage devices and file concepts 2.5 Basic software operation and functionalities
3. Underpinning Skills	Skills include: 3.1 Saving and retrieving files to and from various folders or disk storage 3.2 Mouse and keyboarding skills for running software applications 3.3 Reading and writing at a level where basic workplace documents are understood 3.4 Clear ability to communicate with peers and supervisors 3.5 Interpretation of user manuals and help functions 3.6 The ability to carry out written and verbal instructions using a personal computer whether standalone or in a networked environment
4. Resource Implications	To demonstrate competence in this unit access to the following resources will be required: 4.1 A personal computer 4.2 A printer 4.3 Mouse and keyboard 4.4 Basic systems software
5. Methods of Assessment	Competency may be assessed through: 5.1 Observation in a workplace or simulated environment 5.2 Third party reports 5.3 Exams and tests 5.4 Demonstration of required skills 5.5 Interviews
6. Context for Assessment	6.1 Competency may be assessed in the workplace or in a simulated work environment.

CORE COMPETENCIES

UNIT OF COMPETENCY:	**DRAFT ARCHITECTURAL LAY-OUTS AND DETAILS**
UNIT CODE :	**CON311301**
UNIT DESCRIPTOR :	This unit covers the knowledge, skills and attitudes required to manually draft architectural - site development plan, floor plan, ceiling, elevation and section, and working drawing details.

ELEMENT	PERFORMANCE CRITERIA ***Bold and italicized*** terms are elaborated in the Range of Variable
1. Plan and prepare for work	1.1 Work instruction is secured following standard operating procedures (SOP) and interpreted according to ***architectural job requirements*** 1.2 ***Drawing tools***, ***materials*** and equipment are identified based on job requirements.
2. Prepare and set-up tools and materials for drawing	2.1 Drawing tools, materials, and equipment are selected and prepared according to job requirements 2.2 ***Set-up procedure*** for working drawing is performed following job requirements
3. Lay-out architectural drawings and details	3.1 Sheet requirement is accomplished following ***technical drawing standards*** 3.2 Sheet requirement is reviewed based on technical drawing standards 3.3 Sheet requirement is revised following technical drawing standards, if necessary
4. Submit complete drawings	4.1 Complete drawing is submitted to ***personnel*** following SOP. 4.2 Comments and corrections are noted for final drawings following SOP. 4.3 Comments and corrections are integrated into final drawing based on job requirements 4.4 ***Housekeeping procedure*** is performed following SOP

RANGE OF VARIABLES

VARIABLE	RANGE
1. Architectural job requirements	1.1 Site development plan 1.2 Floor, ceiling and roof plans 1.3 Elevations and sections 1.4 Working drawing details 1.5 General notes and symbols
2. Drawing tools	May include but not limited to: 2.1 Drawing board 2.2 T-square 2.3 Triangles 2.4 Scale 2.5 Technical pens and pencils 2.6 Erasers 2.7 Drawing templates 2.8 Sharpener
3. Materials	3.1 Tracing paper 3.1.1 Sketch 3.1.2 Final 3.2 Blueprint
4. Set-up procedure	Manual 4.1 Alignment of T-square with tracing paper 4.2 Proportioning of drawings within the sheet of paper
5. Technical drawing standards	5.1 Lines 5.2 Letterings 5.3 Targets 5.4 Labeling 5.5 Dimensioning
6. Personnel	6.1 Job captain 6.2 Senior draftsman 6.3 Supervisor
7. Housekeeping procedure	7.1 Clean drawing tools and equipment 7.2 Store drawing tools and equipment 7.3 Clean work area

EVIDENCE GUIDE

1. Critical aspects of competency	Evidence must show the candidate can: 1.1 Demonstrates ability to interpret architectural job requirements 1.2 Demonstrates ability to identify, select, prepare and use drawing tools, materials and equipment 1.3 Demonstrates ability to perform set-up procedure following job requirements 1.4 Demonstrates ability to lay-out drawings and details 1.5 Demonstrates ability to submit complete drawings according to job schedule
2. Underpinning knowledge	2.1 Architectural working drawing 2.2 Drawing tools, materials and equipment 2.3 Procedure for setting-up drawing equipment 2.4 Procedure to lay-out drawings and details 2.5 Company rules and regulations and SOP 2.6 Architectural terms
3. Underpinning skills	3.1 Interpreting architectural working drawing 3.2 Identifying, selecting, preparing and using drawing tools, materials and equipment 3.3 Following procedures for setting-up drawing equipment 3.4 Following procedures for lay-out drawing and details 3.5 Following company rules and regulations and SOP 3.6 Using architectural terms
4. Resource implications	The following resources MUST be provided 4.1 Architectural working drawing 4.2 Drawing tools, materials and equipment
5. Methods of Assessment	Competencies maybe assessed using the following 5.1 Observation of practical skills with oral questioning 5.2 Written test 5.3 Portfolio 5.4 Third party report
6. Context of assessment	6.1 Assessment maybe conducted in the work place and in TESDA accredited assessment center.

UNIT OF COMPETENCY:	**PREPARE COMPUTER-AIDED DRAWINGS**

UNIT CODE	**:**	**CON311302**
UNIT DESCRIPTOR	**:**	This unit covers the knowledge, skills and attitudes required to prepare drawings such as architectural, structural, electrical and electronic, sanitary / plumbing and mechanical working drawings using CAD software and hardware.

ELEMENT	PERFORMANCE CRITERIA ***Bold and italicized*** terms are elaborated in the Range of Variable
1. Plan and prepare for work	1.1 Work instruction is secured following standard operating procedures (SOP) and interpreted according to ***drawing job requirements*** 1.2 Drawing guidelines and parameters***, materials, tools and equipment*** are identified based on job requirements.
2. Prepare tools and materials and set-up equipment for drawing	2.1 Material is selected and prepared according to job requirements. 2.2 ***System set-up procedure*** for working drawing is performed following job requirements
3. Lay-out and produce computer-aided drawings and details	3.1 ***Sheet requirement accomplishment procedure*** is performed following ***technical drawing standards and symbols*** 3.2 ***Review procedure*** for final drawing is performed following job requirements. 3.3 Page set-up and scaling procedure is performed based on technical drawing requirements and printer characteristics. 3.4 Saving and backup procedure for final working drawing is performed in accordance with enterprise procedure.
4. Submit complete drawing	4.1 Complete drawing is submitted to ***personnel*** following SOP. 4.2 Comments and corrections are noted for final drawings following SOP. 4.3 Comments and corrections are integrated into final drawing based on job requirements 4.4 ***Housekeeping procedure*** is performed following SOP

RANGE OF VARIABLES

VARIABLE	RANGE
1. Drawing job requirements	1.1 Architectural 1.2 Structural 1.3 Electrical and electronic 1.4 Sanitary / plumbing 1.5 Mechanical
2. Materials, tools and equipment	May include but not limited to: Materials and consumables 2.1 Pen / pencil 2.2 Ink 2.3 Paper 2.4 Flashdisk 2.5 External drive 2.6 Recordable or rewritable CD Drawing tools 2.7 CAD software 2.7.1 AUTOCAD 2.7.2 Intellicad 2.7.3 Intericad 2.7.4 Sketchup Equipment 2.8 Computer hardware 2.9 Plotter 2.10 Printer
3. System set-up procedure	3.1 Selection of work space 3.2 Selection of toolbars 3.3 Definition of layers 3.3.1 Colors 3.3.2 Line type 3.3.3 Line weight 3.3.4 Layer description 3.4 Automatic saving and recovery

4. Sheet requirement accomplishment procedure	May include but are not limited to: 4.1 Drawing commands 4.1.1 Lines 4.1.2 Circles 4.1.3 Ellipse 4.1.4 Multi-lines 4.1.5 Polylines 4.2 Modifications command 4.2.1 Trim 4.2.2 Fillet 4.2.3 Break 4.2.4 Offset 4.2.5 Extend 4.2.6 Copy
5. Technical drawing standards and symbols	5.1 Lines 5.2 Letterings 5.3 Targets 5.4 Labeling 5.5 Dimensioning
6. Review procedure	6.1 Work space 6.2 Printed copy
7. Personnel	7.1 Job captain 7.2 Senior draftsman 7.3 Supervisor
8. Housekeeping procedure	8.1 Clean drawing equipment 8.2 Store drawing materials and storage media 8.3 Clean work area and drawing equipment

EVIDENCE GUIDE

1. Critical aspects of competency	Evidence must show the candidate: 1.1 Demonstrates ability to interpret drawing job requirements 1.2 Demonstrates ability to identify, select, and prepare drawing materials and use drawing tools and equipment 1.3 Demonstrates ability to perform set-up procedure following job requirements 1.4 Demonstrates ability to lay-out produce computer-aided drawings and details 1.5 Demonstrates ability to submit complete drawings according to job schedule
2. Underpinning knowledge	2.1 Architectural, structural, electrical and electronic, sanitary / plumbing and mechanical working drawings 2.2 Drawing materials and equipment and tools 2.3 Procedure for setting-up system for drawing equipment 2.4 Procedure to lay-out produce computer-aided drawings and details 2.5 Company rules and regulations and SOP 2.6 Architectural, structural, electrical and electronic, sanitary / plumbing and mechanical terms
3. Underpinning skills	3.1 Interpreting architectural, structural, electrical and electronic, sanitary / plumbing and mechanical working drawings and symbols 3.2 Identifying, selecting, preparing and using drawing tools, materials and equipment 3.3 Following procedures for setting-up drawing equipment 3.4 Following procedures for lay-out drawing and details 3.5 Following company rules and regulations and SOP 3.6 Architectural, structural, electrical and electronic, sanitary / plumbing and mechanical terms
4. Resource implications	The following resources MUST be provided 4.1 Architectural and engineering base plans and working drawing 4.2 Drawing materials, equipment and software

5. Methods of Assessment	Competencies maybe assessed using the following 5.1 Observation of practical skills with oral questioning 5.2 Written test 5.3 Portfolio 5.4 Third party report
6. Context of assessment	6.1 Assessment maybe conducted in the workplace or in TESDA accredited assessment center.

ELECTIVE COMPETENCIES

UNIT OF COMPETENCY:	**DRAFT STRUCTURAL LAY-OUTS AND DETAILS**
UNIT CODE :	**CON311303**
UNIT DESCRIPTOR :	This unit covers the knowledge, skills and attitudes required to manually draft structural - foundation plan, framing plans, structural drawing details

ELEMENT	PERFORMANCE CRITERIA ***Bold and italicized*** terms are elaborated in the Range of Variable
1. Plan and prepare for work	1.1 Work instruction is secured following standard operating procedures (SOP) and interpreted according to ***structural job requirements*** 1.2 ***Drawing tools***, ***materials*** and equipment are identified based on job requirements.
2. Prepare and set-up tools and materials for drawing	2.1 Drawing tools, materials, and equipment are selected and prepared according to job requirements 2.2 ***Set-up procedure*** for working drawing is performed following job requirements
3. Lay-out structural drawings and details	3.1 Sheet requirement is accomplished following ***technical drawing standards*** 3.2 Sheet requirement is reviewed based on technical drawing standards 3.3 Sheet requirement is re-accomplished following technical drawing standards, if necessary
4. Submit complete drawings	4.1 Complete drawing is submitted to ***personnel*** following SOP. 4.2 Comments and corrections are noted for final drawings following SOP. 4.3 Comments and corrections are integrated into final drawing based on job requirements 4.4 ***Housekeeping procedure*** is performed following SOP

RANGE OF VARIABLES

VARIABLE	RANGE
1. Structural job requirements	1.1 Foundation plan 1.2 Framing plans 1.3 Structural drawing details 1.4 General notes and symbols
2. Drawing tools	May include but not limited to: 2.1 Drawing board 2.2 T-square 2.3 Triangles 2.4 Scale 2.5 Technical pens and pencils 2.6 Erasers 2.7 Drawing templates 2.8 Sharpener
3. Materials	3.1 Tracing paper 3.1.1 Sketch 3.1.2 Final 3.2 Blueprint
4. Set-up procedure	4.1 Alignment of T-square with tracing paper 4.2 Proportioning of drawings within the sheet of paper
5. Technical drawing standards	5.1 Lines 5.2 Letterings 5.3 Targets 5.4 Labeling 5.5 Dimensioning
6. Personnel	6.1 Job captain 6.2 Senior draftsman 6.3 Supervisor
7. Housekeeping procedure	7.1 Clean drawing tools and equipment 7.2 Store drawing tools and equipment 7.3 Clean work area

EVIDENCE GUIDE

1. Critical aspects of competency	Evidence must show the candidate can: 1.1 Demonstrates ability to interpret structural job requirements 1.2 Demonstrates ability to identify, select, prepare and use drawing tools, materials and equipment 1.3 Demonstrates ability to perform set-up procedure following job requirements 1.4 Demonstrates ability to lay-out drawings and details 1.5 Demonstrates ability to submit complete drawings according to job schedule
2. Underpinning knowledge	2.1 Architectural and structural working drawings 2.2 Drawing tools, materials and equipment 2.3 Procedure for setting-up drawing equipment 2.4 Procedure to lay-out drawings and details 2.5 Company rules and regulations and SOP 2.6 Architectural and structural terms
3. Underpinning skills	3.1 Interpreting architectural and structural working drawings 3.2 Identifying, selecting, preparing and using drawing tools, materials and equipment 3.3 Following procedures for setting-up drawing equipment 3.4 Following procedures for lay-out drawing and details 3.5 Following company rules and regulations and SOP 3.6 Using architectural and structural terms
4. Resource implications	The following resources MUST be provided 4.1 Structural working drawing 4.2 Drawing tools, materials and equipment
5. Methods of Assessment	Competencies maybe assessed using the following 5.1 Observation of practical skills with oral questioning 5.2 Written test 5.3 Portfolio 5.4 Third party report
6. Context of assessment	6.1 Assessment maybe conducted in the workplace and TESDA accredited assessment center.

UNIT OF COMPETENCY:	**DRAFT ELECTRICAL AND ELECTRONIC LAYOUT AND DETAILS**
UNIT CODE :	**CON311304**
UNIT DESCRIPTOR :	This unit covers the knowledge, skills and attitudes required to manually draft electrical drawing plans and design layout of wiring diagrams, electrical circuits system and auxiliary system and layout.

ELEMENT	PERFORMANCE CRITERIA ***Bold and italicized*** terms are elaborated in the Range of Variable
1. Plan and prepare for work	1.1 Work instruction is secured following standard operating procedures (SOP) and interpreted according to ***electrical layout drawing job requirements*** 1.2 ***Drawing tools***, ***materials*** and equipment are identified based on job requirements.
2. Prepare and set-up tools and materials for drawing	2.1 Drawing tools, materials, and equipment are selected and prepared according to job requirements 2.2 ***Set-up procedure*** for working drawing is performed following job requirements
3. Lay-out electrical drawings and details	3.1 Sheet requirement is accomplished following ***technical drawing standards and symbols*** 3.2 Sheet requirement is reviewed based on technical drawing standards and symbols 3.3 Sheet requirement is re-accomplished following technical drawing standards, if necessary
4. Submit complete drawings	4.1 Complete drawing is submitted to ***personnel*** following SOP. 4.2 Comments and corrections are noted for final drawings following SOP. 4.3 Comments and corrections are integrated into final drawing based on job requirements 4.4 ***Housekeeping procedure*** is performed following SOP

RANGE OF VARIABLES

VARIABLE	RANGE
1. Electrical drawing job requirements	May include but are not limited to: 1.1 Power system and diagram 1.2 Auxiliary systems and layout 1.3 General notes and symbols
2. Drawing tools	May include but are not limited to: 2.1 Drawing board 2.2 T-square 2.3 Triangles 2.4 Scale 2.5 Technical pens and pencils 2.6 Erasers 2.7 Drawing templates 2.8 Sharpener
3. Materials	3.1 Tracing paper 3.1.1 Sketch 3.1.2 Final 3.2 Blueprint
4. Set-up procedure	4.1 Alignment of T-square with tracing paper 4.2 Proportioning of drawings within the sheet of paper
5. Technical drawing standards and symbols	5.1 Lines 5.2 Letterings 5.3 Targets 5.4 Labeling 5.5 Dimensioning
6. Personnel	6.1 Job captain 6.2 Senior draftsman 6.3 Supervisor
7. Housekeeping procedure	7.1 Clean drawing tools and equipment 7.2 Store drawing tools and equipment 7.3 Clean work area

EVIDENCE GUIDE

1. Critical aspect of competency	Evidence must show the candidate can: 1.1 Demonstrates ability to interpret electrical drawing job requirements 1.2 Demonstrates ability to identify, select, prepare and use drawing tools, materials and equipment 1.3 Demonstrates ability to perform set-up procedure following job requirements 1.4 Demonstrates ability to lay-out drawings and details based on standard electrical symbols 1.5 Demonstrates ability to submit complete drawings according to job schedule
2. Underpinning knowledge	2.1 Architectural and electrical working drawings 2.2 Drawing tools, materials and equipment 2.3 Procedure for setting-up drawing equipment 2.4 Procedure to lay-out drawings and details 2.5 Company rules and regulations and SOP 2.6 Architectural and electrical terms and symbols
3. Underpinning skills	3.1 Interpreting architectural and electrical working drawing and symbols 3.2 Identifying, selecting, preparing and using drawing tools, materials and equipment 3.3 Following procedures for setting-up drawing equipment 3.4 Following procedures for lay-out drawing and details 3.5 Following company rules and regulations and SOP 3.6 Using architectural and electrical terms and symbols
4. Resource implications	The following resources MUST be provided 4.1 Architectural and engineering base plans and working drawings 4.2 Drawing tools, materials and equipment
5. Methods of Assessment	Competencies maybe assessed using the following 5.1 Observation of practical skills with oral questioning 5.2 Written test 5.3 Portfolio 5.4 Third party report
6. Context of assessment	6.1 Assessment maybe conducted in the workplace and in TESDA accredited assessment center.

UNIT OF COMPETENCY:	**DRAFT SANITARY AND PLUMBING LAYOUT AND DETAILS**
UNIT CODE :	**CON311305**
UNIT DESCRIPTOR :	This unit covers the knowledge, skills and attitudes required to manually draft sanitary and plumbing drawing plans and design layouts of hot and cold, drainage and isometric sanitary diagram.

ELEMENT	PERFORMANCE CRITERIA ***Bold and italicized*** terms are elaborated in the Range of Variable
1. Plan and prepare for work	1.1 Work instruction is secured following standard operating procedures (SOP) and interpreted according to ***sanitary and plumbing layout drawing job requirements*** 1.2 ***Drawing tools***, ***materials*** and equipment are identified based on job requirements.
2. Prepare and set-up tools and materials for drawing	2.1 Drawing tools, materials, and equipment are selected and prepared according to job requirements 2.2 ***Set-up procedure*** for working drawing is performed following job requirements
3. Lay out sanitary and plumbing details and drawings	3.1 Sheet requirement is accomplished following ***technical drawing standards and symbols*** 3.2 Sheet requirement is reviewed based on technical drawing standards and symbols 3.3 Sheet requirement is re-accomplished following technical drawing standards, if necessary
4. Submit complete drawings	4.1 Complete drawing is submitted to ***personnel*** following SOP. 4.2 Comments and corrections are noted for final drawings following SOP. 4.3 Comments and corrections are integrated into final drawing based on job requirements 4.4 ***Housekeeping procedure*** is performed following SOP

RANGE OF VARIABLES

VARIABLE	RANGE
1. Sanitary and plumbing drawing job requirements	1.1 Hot and cold waterline layout 1.2 Sanitary lay-out 1.3 Drainage systems 1.4 Isometric sanitary diagram 1.5 General notes and symbols
2. Drawing tools	May include but not limited to: 2.1 Drawing board 2.2 T-square 2.3 Triangles 2.4 Scale 2.5 Technical pens and pencils 2.6 Erasers 2.7 Drawing templates 2.8 Sharpener
3. Materials	3.1 Tracing paper 3.1.1 Sketch 3.1.2 Final 3.2 Blueprint
4. Set-up procedure	4.1 Alignment of T-square with tracing paper 4.2 Proportioning of drawings within the sheet of paper
5. Technical drawing standards and symbols	5.1 Lines 5.2 Letterings 5.3 Targets 5.4 Labeling 5.5 Dimensioning
6. Personnel	6.1 Job captain 6.2 Senior draftsman 6.3 Supervisor
7. Housekeeping procedure	7.4 Clean drawing tools and equipment 7.5 Store drawing tools and equipment 7.6 Clean work area

EVIDENCE GUIDE

1. Critical aspects of competency	Evidence must show the candidate can: 1.1 Demonstrates ability to interpret sanitary and plumbing drawing job requirements 1.2 Demonstrates ability to identify, select, prepare and use drawing tools, materials and equipment 1.3 Demonstrates ability to perform set-up procedure following job requirements 1.4 Demonstrates ability to lay-out drawings and details based on standard sanitary symbols 1.5 Demonstrates ability to submit complete drawings according to job schedule
2. Underpinning knowledge	2.1 Architectural and sanitary / plumbing working drawings 2.2 Drawing tools, materials and equipment 2.3 Procedure for setting-up drawing equipment 2.4 Procedure to lay-out drawings and details 2.5 Company rules and regulations and SOP 2.6 Architectural and sanitary / plumbing terms
3. Underpinning skills	3.1 Interpreting sanitary / plumbing working drawing and symbols 3.2 Identifying, selecting, preparing and using drawing tools, materials and equipment 3.3 Following procedures for setting-up drawing equipment 3.4 Following procedures for lay-out drawing and details 3.5 Following company rules and regulations and SOP 3.6 Architectural and sanitary / plumbing terms
4. Resource implications	The following resources MUST be provided 4.1 Architectural and engineering base plans and working drawing 4.2 Drawing tools, materials and equipment
5. Methods of Assessment	Competencies maybe assessed using the following 5.1 Observation of practical skills with oral questioning 5.2 Written test 5.3 Portfolio 5.4 Third party report
6. Context of assessment	6.1 Assessment maybe conducted in the workplace and in TESDA accredited assessment center.

UNIT OF COMPETENCY:	**DRAFT MECHANICAL LAYOUT AND DETAILS**
UNIT CODE :	**CON311306**
UNIT DESCRIPTOR :	This unit covers the knowledge, skills and attitudes required to manually draft mechanical drawing plans and layouts of heating, ventilating and air-conditioning or refrigeration, gas piping, vertical / horizontal / materials conveyor system, and fire protection system.

ELEMENT	PERFORMANCE CRITERIA ***Bold and italicized*** terms are elaborated in the Range of Variable
1. Plan and prepare for work	1.1 Work instruction is secured following standard operating procedures (SOP) and interpreted according to ***mechanical layout drawing job requirements*** 1.2 ***Drawing tools***, ***materials*** and equipment are identified based on job requirements.
2. Prepare and set-up tools and materials for drawing	2.1 Drawing tools, materials, and equipment are selected and prepared according to job requirements 2.2 ***Set-up procedure*** for working drawing is performed following job requirements
3. Lay-out mechanical details and drawings	3.1 Sheet requirement is accomplished following ***technical drawing standards and symbols*** 3.2 Sheet requirement is reviewed based on technical drawing standards and symbols 3.3 Sheet requirement is re-accomplished following technical drawing standards, if necessary
4. Submit complete drawings	4.1 Complete drawing is submitted to ***personnel*** following SOP. 4.2 Comments and corrections are noted for final drawings following SOP. 4.3 Comments and corrections are integrated into final drawing based on job requirements 4.4 ***Housekeeping procedure*** is performed following SOP

RANGE OF VARIABLES

VARIABLE	RANGE
1 Mechanical layout drawing job requirements	1.1 Heating, ventilating, and air-conditioning (HVAC) or refrigeration layout 1.2 Gas piping layout 1.3 Vertical / horizontal pedestrian / materials conveyor system layout 1.4 Fire protection system layout 1.5 General notes and symbols
2. Drawing tools	May include but not limited to: 2.1 Drawing board 2.2 T-square 2.3 Triangles 2.4 Scale 2.5 Technical pens and pencils 2.6 Erasers 2.7 Drawing templates 2.8 Sharpener
3. Materials	3.1 Tracing paper 3.1.1 Sketch 3.1.2 Final 3.2 Blueprint
4. Set-up procedure	4.1 Alignment of T-square with tracing paper 4.2 Proportioning of drawings within the sheet of paper
5. Technical drawing standards and symbols	5.1 Lines 5.2 Letterings 5.3 Targets 5.4 Labeling 5.5 Dimensioning
6. Personnel	6.1 Job captain 6.2 Senior draftsman 6.3 Supervisor
7. Housekeeping procedure	7.1 Clean drawing tools and equipment 7.2 Store drawing tools and equipment 7.3 Clean work area

EVIDENCE GUIDE

1. Critical aspects of competency	Evidence must show the candidate: 1.1 Demonstrates ability to interpret mechanical layout drawing job requirements 1.2 Demonstrates ability to identify, select, prepare and use drawing tools, materials and equipment 1.3 Demonstrates ability to perform set-up procedure following job requirements 1.4 Demonstrates ability to lay-out drawings and details based on standard mechanical symbols 1.5 Demonstrates ability to submit complete drawings according to job schedule
2. Underpinning knowledge	2.1 Architectural and mechanical working drawings 2.2 Drawing tools, materials and equipment 2.3 Procedure for setting-up drawing equipment 2.4 Procedure to lay-out drawings and details 2.5 Company rules and regulations and SOP 2.6 Architectural and mechanical terms
3. Underpinning skills	3.1 Interpreting architectural and mechanical working drawings and symbols 3.2 Identifying, selecting, preparing and using drawing tools, materials and equipment 3.3 Following procedures for setting-up drawing equipment 3.4 Following procedures for lay-out drawing and details 3.5 Following company rules and regulations and SOP 3.6 Architectural and mechanical terms
4. Resource implications	The following resources MUST be provided 4.1 Architectural and engineering base plans and working drawing 4.2 Drawing tools, materials and equipment
5. Methods of Assessment	Competencies maybe assessed using the following 5.1 Observation of practical skills with oral questioning 5.2 Written test 5.3 Portfolio 5.4 Third party report
6. Context of assessment	6.1 Assessment maybe conducted in the workplace and in TESDA accredited assessment center.

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 **Technical Drafting NC II**.

3.1 CURRICULUM DESIGN

Course Title: **Drafting** Level: **NC II**

Nominal Training Duration: **148 Hrs**

Course Description:

This course is designed to enhance the knowledge, skills and desirable work attitude of a **draftsman or CAD operator**. It covers the basic, common, core and elective competencies i.e. prepare architectural, structural, electrical and electronic, plumbing and sanitary, and mechanical layouts and details using both CAD system and manual drawing methods.

BASIC COMPETENCIES
(18 Hours)

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 Evaluate hazard and risks 4.2 Control hazards and risks 4.3 Maintain occupational health and safety awareness	• Discussion • Plant tour • Symposium	• Observation • Interview

COMMON COMPETENCIES
(36 Hours)

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Perform mensuration and calculation	1.1 Select measuring instruments 1.2 Carry out measurements and calculations	• Simulation • Discussion • Practical exercise	• Direct observation • Written / Oral test • Demonstration
2. Interpret technical drawings and plans	2.1 Analyze signs, symbol and data. 2.2 Interpret technical drawings and plans	• Audio visual • Simulation • Discussion practical lab • Demonstration	• Direct observation • Oral questioning • Written test or examination • Demonstration
3. Apply quality standards	3.1 Assess quality of received materials 3.2 Assess own work 3.3 Engage in quality improvement	• Audio Visual • Simulation • Discussion practical lab • Demonstration	• Direct observation • Oral questioning • Written test or examination • Demonstration (able to impart knowledge and skills)
4. Perform computer operations	4.1 Apply computer basic operation procedures 4.2 Organize and manipulate files 4.3 Install, configure and work with application program 4.4 Work with internet 4.5 Log off from a computer	• Audio Visual • Simulation • Discussion practical lab • Demonstration	• Direct observation • Oral questioning • Written test or examination • Demonstration

CORE COMPETENCIES
(94 hours)

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Draft architectural layout and details	1.1 Plan and prepare for work 1.2 Prepare and set-up tools and materials for drawing 1.3 Draft Site development plan 1.4 Draft Floor plan 1.5 Draft roof plans 1.6 Draft ceiling plans 1.7 Draft elevations and sections 1.8 Submit complete drawings	• Lecture / discussion • Modular / self-paced learning • Practical exercises	• Demonstration / observation • Oral questioning • Written test
2. Prepare computer-aided drawings	2.1 Operate CAD software and computer hardware 2.2 Prepare plans using CAD	• Lecture / discussion • Modular / self-paced learning • Practical exercises	• Demonstration / observation • Oral questioning • Written test

ELECTIVE COMPETENCIES
(58 hours)

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Draft structural layout and details	1.1 Draft foundation plans 1.2 Draft structural floor and roof framing plans	• Lecture / discussion • Modular / self-paced learning • Practical exercises	• Demonstration / observation • Oral questioning • Written test
2. Draft electrical and electronic layout and details	2.1 Draft electrical plans and layouts 2.2 Draft auxiliary systems and layout	• Lecture / discussion • Modular / self-paced learning • Practical exercises	• Demonstration / observation • Oral questioning • Written test
3. Draft sanitary / plumbing layout and details	3.1 Draft water distribution systems 3.2 Draft sanitary and storm drainage	• Lecture / discussion • Modular / self-paced learning • Practical exercises	• Demonstration / observation • Oral questioning • Written test
4. Draft mechanical layout and details	4.1 Draft heating, ventilating and air-conditioning systems layout 4.2 Draft mechanical details of conveyor system 4.3 Draft fire protection systems 4.4 Draft gas piping system	• Lecture / discussion • Modular / self-paced learning • Practical exercises	• Demonstration / observation • Oral questioning • Written test

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.

- Good moral character
- Ability to communicate
- Physically fit and mentally healthy
- Can perform basic mathematical computation and mensuration

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS FOR TECHNICAL DRAFTING NC II

Below is the recommended list of tools, equipment and materials for the training of 25 learners for **TECHNICAL DRAFTING NC II**.

TOOLS		EQUIPMENT		MATERIALS	
QTY.	**ITEM**	**QTY.**	**ITEM**	**QTY.**	**ITEM**
25 pcs.	• Drawing board	25 sets	• Computer hardware	5 rolls	• Tracing paper
25 pcs.	• T-square	1 set	• Plotter	25 pcs.	• Blueprint
25 pcs.	• Triangle	2 sets	• Printer	50 pcs.	• Pen / pencil
25 pcs.	• Scale			4 sets	• Ink
50 pcs.	• Technical pens and pencils			3 rims	• Paper
25 pcs.	• Erasers			5 pcs.	• External drive
25 pcs.	• Drawing templates			1 box	• Recordable or rewritable CD
25 pcs.	• Sharpeners			25 sets	• CAD software

3.5 TRAINING FACILITIES

The size of the training facility is based on size of class intake of 25 students or trainees.

Space Requirement	**Size in Meters**	**Area in Sq. Meters**	**Total Area in Sq. Meters**
Student or trainee's working Space	10 x 10	4 sq.m per student	100.0 sq.m.
Lecture room	6 x 8	48.00	48.0
Learning resource center	4 x 6	24.00	24.0
			172
Facilities / Circulation area	8 x 8	64.00	64.0
TOTAL AREA			**236**

3.6 TRAINER'S QUALIFICATION FOR TECHNICAL DRAFTING NC II

- Must be a holder of **Technical Drafting NC II**
- Must have undergone training on Training Methodology II (TM II)
- Must be physically and mentally fit
- *Must have at least 5 years job/industry experience*
- Must be a civil service eligible (for government position or appropriate professional license issued by the Professional Regulatory Commission)

**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 **Technical Drafting NC II**, the candidate must demonstrate competence in all the units required in Section 1. Successful candidates shall be awarded a National Certificate signed by the TESDA Director General.

4.2 The qualification of **TECHNICAL DRAFTING NC II** can be attained through –

4.2.1 Demonstration of competence in a project-type assessment covering all of the following core units.

4.2.1.1 Draft architectural layout and details
4.2.1.2 Prepare computer-aided drawings
4.2.1.3 Draft structural layout and details
4.2.1.4 Draft electrical and electronic layout and details
4.2.1.5 Draft sanitary and plumbing layout and details
4.2.1.6 Draft mechanical layout and details

For this assessment, the candidate shall be required to demonstrate drafting of basic architectural layout and details (e. g., floor plan) using both `manual drafting and CAD. The specialized detail drawings (structural, electrical/electronic, sanitary/plumbing and mechanical) shall be prepared using CAD system.

4.2.2 Accumulation of Certificates of Competency in all the following units of competency:

4.2.2.1 Draft architectural layout and details
- 4.2.2.1.1 Draft architectural layout and details
- 4.2.2.1.2 Prepare computer-aided drawings

4.2.2.2 Draft structural layout and details
- 4.2.2.2.1 Draft structural layout and details
- 4.2.2.2.2 Prepare computer-aided drawings

4.2.2.3 Draft electrical-electronic layout and details
- 4.2.2.3.1 Draft electrical-electronic layout and details
- 4.2.2.3.2 Prepare computer-aided drawings

4.2.2.4 Draft plumbing-sanitary layout and details
- 4.2.2.4.1 Draft plumbing-sanitary layout and details
- 4.2.2.4.2 Prepare computer-aided drawings

4.2.2.5 Draft mechanical layout and details
- 4.2.2.5.1 Draft mechanical layout and details
- 4.2.2.5.2 Prepare computer-aided drawings

The unit of competency *"Prepare computer-aided drawings"* is embedded in each specialized drawing whenever the candidate shall apply for Certificate of Competency

(COC). The assessment for each of the unit of competency from 4.2.2.1 to 4.2.2.5 will cover both manual and computer-aided drafting. To qualify for a COC in each of the above (4.2.2.1 to 4.2.2.5) areas, the candidate should demonstrate competency in BOTH manual and computer-aided drafting.

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

4.4. 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

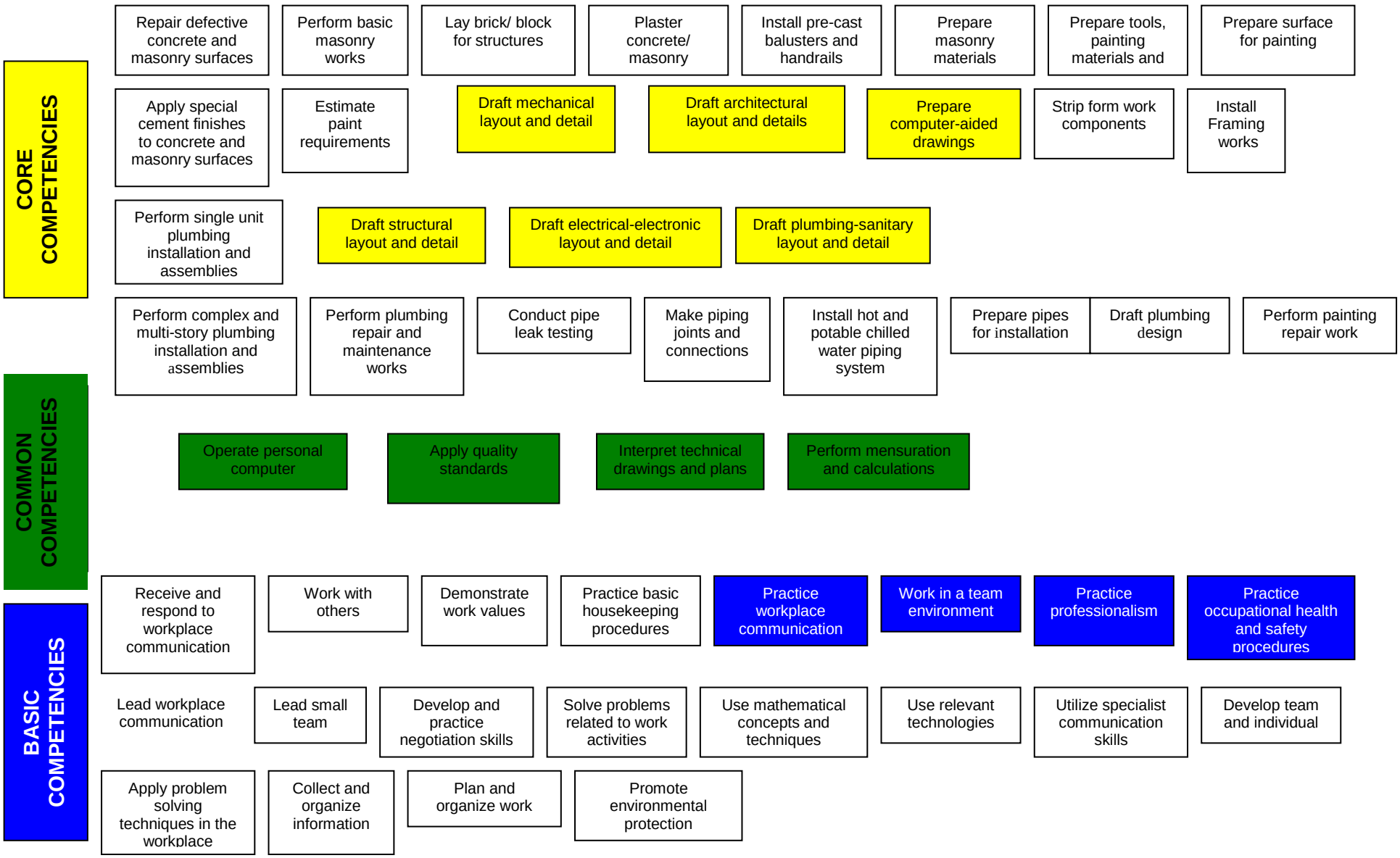
4.4.2. Experienced Workers (wage employed or self-employed)

4.5. 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

ANNEX A

TECHNICAL DRAFTING



DEFINITION OF TERMS

1. Competency	Is the application of knowledge, skills and attitudes to perform work activities to the standard expected in the workplace
2. Certification	Refers to the process of verifying and validating competencies of a person through assessment.
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. Draftsman	Refers to a person who is skilled in drawing.
6. Drafting	is the practice of creating accurate representations of objects for technical, architectural and engineering needs.
7. 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.
8. 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.
9. Range of Variable	It describes the circumstances or context in which the work is to be performed.
10. CAD operation	is the use of computer technology to aid in the design of a product. Current software packages range from 2D vector base drafting systems to 3D solid and surface modellers.
11. Unit of Competency	Refers to a discrete aspect of work, which would normally be performed by only one person.

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 of this Training Regulations.

- **THE TECHNICAL/INDUSTRY EXPERTS**

ANA S. MANGALINO LING
Private Practice
National Executive Vice President
UNITED ARCHITECTS OF THE PHILIPPINES

CORAZON F. CRUZ-ADIVOSO
Private Practice
Deputy Executive Director
UNITED ARCHITECTS OF THE PHILIPPINES

PAMELA N. AMADOR
Private Practice
Chairperson
UNITED ARCHITECTS OF THE PHILIPPINES

CORAZON F. TANDOC
Private Practice
Executive Director
UNITED ARCHITECTS OF THE PHILIPPINES

MARIA ELENA C. CAYANAN
University of Sto. Tomas
Past Chancellor, College of Fellows
UNITED ARCHITECTS OF THE PHILIPPINES
Project Director, Center for Filipino Architecture

CLAUDIO O. RILLERA JR.
Private Practice
UNITED ARCHITECTS OF THE PHILIPPINES, La Union Chapter
Past President

GARY M. ADVENTO
Tarlac State University
UNITED ARCHITECTS OF THE PHILIPPINES
Deputy District Director, A2B

MINERVA C. ROSEL
Private Practice
UNITED ARCHITECTS OF THE PHILIPPINES
Chapter president, Diliman Chapter

CIPRIANO T. CRUZ JR.
Central Colleges of the Philippines
UNITED ARCHITECTS OF THE PHILIPPINES
Chapter Secretary, Quezon City, South Triangle

MARIA CLARA G. EPINO
Private Practice
UNITED ARCHITECTS OF THE PHILIPPINES
Member, Quezon City Chapter

ZOSIMO M. BREGUERA JR.
Private Practice
UNITED ARCHITECTS OF THE PHILIPPINES
Member, Manila, Maharlika Chapter

RICHARD R. PAMPLENA
Private Practice
UNITED ARCHITECTS OF THE PHILIPPINES
Member, San Juan, Mandaluyong Chapter

FELICISIMO A. TEJUCO JR.
UNITED ARCHITECTS OF THE PHILIPPINES
Past President, Kalayaan 100 Chapter