COMPETENCY STANDARDS

BASIC 3D BUILDING INFORMATION MODELLING LEVEL III

CONSTRUCTION SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Luzon Expressway (SLEX), Taguig City, Metro Manila

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SECTION 1   BASIC 3D BUILDING INFORMATION MODELLING LEVEL III QUALIFICATION

The **BASIC 3D BUILDING INFORMATION MODELLING LEVEL III** Qualification consists of competencies that a person must achieve to enable him / her to model architectural layout and detail (structural, electrical/electronic, sanitary/plumbing, and mechanical) drawings for vertical projects using Virtual Modeling methods like BIM Software.

The units of competency comprising this qualification include the following:

CODE NO.	BASIC COMPETENCIES
400311319	Lead workplace communication
400311320	Lead small teams
400311321	Apply critical thinking and problem-solving techniques in the workplace
400311322	Work in a diverse environment
400311323	Propose methods of applying learning and innovation in the organization
400311324	Use information systematically
400311325	Evaluate occupational safety and health work practices
400311326	Evaluate environmental work practices
400311327	Facilitate entrepreneurial skills for micro-small-medium enterprises (MSMEs)

CODE NO.	COMMON COMPETENCIES
CON311203	Perform mensuration and calculations
CON311202	Interpret 2D drawings and plans
CON311202	Apply quality standards
CON311203	Operate personal computer

CODE NO.	CORE COMPETENCIES
CON834XXX	Analyze completeness of drawing for basic 3D Building Information Modelling
CON834XXX	Create 3D Model of architectural layout and details
CON834XXX	Create 3D Model of structural layout and details
CON834XXX	Create 3D Model of electrical and electronic layout and details
CON834XXX	Create 3D Model of sanitary and plumbing layout and details
CON834XXX	Create 3D Model of mechanical layout and details

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

❑   BIM Modeler

SECTION 2 COMPETENCY STANDARDS

This section gives the details and contents of the units of competency required in **BASIC 3D BUILDING INFORMATION MODELLING LEVEL III**. These units of competency are categorized into basic, common and core competencies.

BASIC COMPETENCIES

UNIT OF COMPETENCY : LEAD WORKPLACE COMMUNICATION

UNIT COD   : 400311319

UNIT DESCRIPTOR   : This unit covers the knowledge, skills and attitudes required to lead in the effective dissemination and discussion of ideas, information, and issues in the workplace. This includes preparation of written communication materials.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Communicate information about workplace processes	1.1 Relevant ***communication method*** is selected based on workplace procedures 1.2 Multiple operations involving several topics/areas are communicated following enterprise requirements 1.3 Questioning is applied to gain extra information 1.4 Relevant sources of information are identified in accordance with workplace/ client requirements 1.5 Information is selected and organized following enterprise procedures 1.6 Verbal and written reporting is undertaken when required 1.7 Communication and negotiation skills are applied and maintained in all relevant situations	1.1 Organization requirements for written and electronic communication methods 1.2 Effective verbal communication methods 1.3 Business writing 1.4 Workplace etiquette	1.1 Organizing information 1.2 Conveying intended meaning 1.3 Participating in a variety of workplace discussions 1.4 Complying with organization requirements for the use of written and electronic communication methods 1.5 Effective business writing 1.6 Effective clarifying and probing skills 1.7 Effective questioning techniques (clarifying and probing)

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Lead workplace discussions	2.1 Response to workplace issues are sought following enterprise procedures 2.2 Response to workplace issues are provided immediately 2.3 Constructive contributions are made to *workplace discussions* on such issues as production, quality, and safety 2.4 Goals/ objectives and action plans undertaken in the workplace are communicated promptly	2.1 Organization requirements for written and electronic communication methods 2.2 Effective verbal communication methods 2.3 Workplace etiquette	2.1 Organizing information 2.2 Conveying intended meaning 2.3 Participating in variety of workplace discussions 2.4 Complying with organization requirements for the use of written and electronic communication methods 2.5 Effective clarifying and probing skills
3. Identify and communicate issues arising in the workplace	3.1 Issues and problems are identified as they arise 3.2 Information regarding problems and issues are organized coherently to ensure clear and effective communication 3.3 Dialogue is initiated with appropriate personnel 3.4 Communication problems and issues are raised as they arise 3.5 Identify barriers in communication to be addressed appropriately	3.1 Organization requirements for written and electronic communication methods 3.2 Effective verbal communication methods 3.3 Workplace etiquette 3.4 Communication problems and issues 3.5 Barriers in communication	3.1 Organizing information 3.2 Conveying intended meaning 3.3 Participating in a variety of workplace discussions 3.4 Complying with organization requirements for the use of written and electronic communication methods 3.5 Effective clarifying and probing skills 3.6 Identifying issues 3.7 Negotiation and communication skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Methods of communication	May include: 1.1. Non-verbal gestures 1.2. Verbal 1.3. Face-to-face 1.4. Two-way radio 1.5. Speaking to groups 1.6. Using telephone 1.7. Written 1.8. Internet
2. Workplace discussions	May include: 2.1. Coordination meetings 2.2. Toolbox discussion 2.3. Peer-to-peer discussion

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Dealt with a range of communication/information at one time 1.2 Demonstrated leadership skills in workplace communication 1.3 Made constructive contributions in workplace issues 1.4 Sought workplace issues effectively 1.5 Responded to workplace issues promptly 1.6 Presented information clearly and effectively written form 1.7 Used appropriate sources of information 1.8 Asked appropriate questions 1.9 Provided accurate information
2. Resource Implications	**The following resources should be provided:** 2.1 Variety of Information 2.2 Communication tools 2.3 Simulated workplace
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Third-party report 3.2. Portfolio 3.3. Interview 3.4. Demonstration/Role-playing
4. Context for Assessment	4.1. Competency may be assessed in the workplace or in a simulated workplace environment

UNIT OF COMPETENCY : LEAD SMALL TEAMS

UNIT CODE   : 400311320

UNIT DESCRIPTOR   : This unit covers the knowledge, skills and attitudes to lead small teams including setting, maintaining and monitoring team and individual performance standards.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Provide team leadership	1.1 **Work requirements** are identified and presented to team members based on company policies and procedures 1.2 Reasons for instructions and requirements are communicated to team members based on company policies and procedures 1.3 **Team members'** and leaders' **concerns** are recognized, discussed, and dealt with based on company practices	1.1 Facilitation of Teamwork 1.2 Company policies and procedures relating to work performance 1.3 Performance standards and expectations 1.4 Monitoring individual's and team's performance vis a vis client's and group's expectations	1.1 Communication skills required for leading teams 1.2 Group facilitation skills 1.3 Negotiating skills 1.4 Setting performance expectation
2. Assign responsibilities	2.1. Responsibilities are allocated having regard to the skills, knowledge and aptitude required to undertake the assigned task based on company policies. 2.2. Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible	2.1 Work plan and procedures 2.2 Work requirements and targets 2.3 Individual and group expectations and assignments 2.4 Ways to improve group leadership and membership	2.1 Communication skills 2.2 Management skills 2.3 Negotiating skills 2.4 Evaluation skills 2.5 Identifying team member's strengths and rooms for improvement

3. Set performance expectations for team members	3.1 Performance expectations are established based on client needs 3.2 Performance expectations are based on individual team members knowledge, skills and aptitude 3.3 Performance expectations are discussed and disseminated to individual team members	3.1 One's roles and responsibilities in the team 3.2 Feedback giving and receiving 3.3 Performance expectation	3.1 Communication skills 3.2 Accurate empathy 3.3 Congruence 3.4 Unconditional positive regard 3.5 Handling of Feedback
4. Supervise team performance	4.1 Performance is monitored based on defined performance criteria and/or assignment instruction 4.2 Team members are provided with feedback, positive support and advice on strategies to overcome any deficiencies based on company practices 4.3 Performance issues which cannot be rectified or addressed within the team are referred to appropriate personnel according to employer policy 4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on client/customer needs and satisfaction 4.5 Team operations are monitored to ensure that employer/client needs, and	4.1 Performance Coaching 4.2 Performance management 4.3 Performance Issues	4.1 Communication skills required for leading teams 4.2 Coaching skill 4.3 Managing Performance

	requirements are met 4.6 Follow-up communication is provided on all issues affecting the team 4.7 All relevant documentation is completed in accordance with company procedures		

RANGE OF VARIABLES

VARIABLE	RANGE
1. Work requirements	May include: 1.1. Client Profile 1.2. Assignment instructions
2. Team member's concerns	May include: 2.1. Roster/shift details
3. Monitor performance	May include: 3.1. Formal process 3.2. Informal process
4. Feedback	May include: 4.1. Formal process 4.2. Informal process
5. Performance issues	May include: 5.1. Work output 5.2. Work quality 5.3. Team participation 5.4. Compliance with workplace protocols 5.5. Safety 5.6. Customer service

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Maintained or improved individuals and/or team performance given a variety of possible scenario 1.2. Assessed and monitored team and individual performance against set criteria 1.3. Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf 1.4. Allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed 1.5. Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members
2. Resource Implications	**The following resources should be provided:** 2.1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2. Materials relevant to the proposed activity or task
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Written Examination 3.2. Oral Questioning 3.3. Portfolio
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : **APPLY CRITICAL THINKING AND PROBLEM-SOLVING TECHNIQUES IN THE WORKPLACE**

UNIT CODE **: 400311321**

UNIT DESCRIPTOR **:** This unit covers the knowledge, skills and attitudes required to solve problems in the workplace including the application of problem-solving techniques and to determine and resolve the root cause/s of specific problems in the workplace.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Examine specific workplace challenges	1.1 Variances are examined from normal operating **parameters,** and product quality. 1.2 Extent, cause and nature of the specific problem are defined through observation, investigation and analytical techniques. 1.3 Problems are clearly stated and specified.	1.1 Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations. 1.2 Competence to include the ability to apply and explain, enough for the identification of fundamental causes of specific workplace challenges. 1.3 Relevant equipment and operational processes. 1.4 Enterprise goals, targets, and measures. 1.5 Enterprise quality OHS and environmental requirement. 1.6 Enterprise information systems and data collation 1.7 Industry codes and standards.	1.1 Using a range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 1.2 Identifying extent and causes of specific challenges in the workplace.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Analyze the causes of specific workplace challenges.	2.1 Possible causes of specific problems are identified based on experience and the use of problem-solving tools / analytical techniques 2.2 Possible cause statements are developed based on findings. 2.3 Fundamental causes are identified per results of investigation conducted.	2.1 Competence includes a thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations. 2.2 Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations. 2.3 Relevant equipment and operational processes. 2.4 Enterprise goals, targets and measures. 2.5 Enterprise quality OSH and environmental requirement. 2.6 Enterprise information systems and data collation. 2.7 Industry codes and standards.	2.1 Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 2.2 Identifying extent and causes of specific challenges in the workplace. 2.3 Providing clear-cut findings on the nature of each identified workplace challenges.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Formulate resolutions to specific workplace challenges	3.1 All possible options are considered for resolution of the problem. 3.2 Strengths and weaknesses of possible options are considered. 3.3 Corrective actions are determined to resolve the problem and possible future causes. 3.4 **Action *plans*** are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures	3.1 Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations 3.2 Relevant equipment and operational processes 3.3 Enterprise goals, targets, and measures 3.4 Enterprise quality OSH and environmental requirement 3.5 Principles of decision-making strategies and techniques 3.6 Enterprise information systems and data collation 3.7 Industry codes and standards	3.1 Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 3.2 Identifying extent and causes of specific challenges in the workplace. 3.3 Providing clear-cut findings on the nature of each identified workplace challenges. 3.4 Devising, communicating, implementing, and evaluating strategies and techniques in addressing specific workplace challenges.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
4. Implement action plans and communicate results	4.1 Action plans are implemented and evaluated. 4.2 Results of plan implementation and recommendations are prepared. 4.3 Recommendations are presented to appropriate personnel. 4.4 Recommendations are followed-up, if required.	4.1 Competence to include the ability to apply and explain, sufficient for the identification of fundamental cause, determining the corrective action and provision of recommendations 4.2 Relevant equipment and operational processes 4.3 Enterprise goals, targets, and measures 4.4 Enterprise quality, OSH, and environmental requirement 4.5 Principles of decision-making strategies and techniques 4.6 Enterprise information systems and data collation 4.7 Industry codes and standards	4.1 Using range of analytical techniques (e.g., planning, attention, simultaneous and successive processing of information) in examining specific challenges in the workplace. 4.2 Identifying extent and causes of specific challenges in the workplace. 4.3 Providing clear-cut findings on the nature of each identified workplace challenges. 4.4 Devising, communicating, implementing, and evaluating strategies and techniques in addressing specific workplace challenges.

RANGE OF VARIABLES

VARIABLES	RANGE
1. Parameters	May include: 1.1 Processes 1.2 Procedures 1.3 Systems
2. Analytical techniques	May include: 2.1. Brainstorming 2.2. Intuitions/Logic 2.3. Cause and effect diagrams 2.4. Pareto analysis 2.5. SWOT analysis 2.6. Gantt chart, Pert CPM, and graphs 2.7. Scatter grams
3. Problem	May include: 3.1. Routine, non – routine and complex workplace and quality problems 3.2. Equipment selection, availability, and failure 3.3. Teamwork and work allocation problem 3.4. Safety and emergency situations and incidents 3.5. Risk assessment and management
4. Action plans	May include: 4.1. Priority requirements 4.2. Measurable objectives 4.3. Resource requirements 4.4. Timelines 4.5. Coordination and feedback requirements 4.6. Safety requirements 4.7. Risk assessment 4.8. Environmental requirements

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Examined specific workplace challenges. 1.2. Analyzed the causes of specific workplace challenges. 1.3. Formulated resolutions to specific workplace challenges. 1.4. Implemented action plans and communicated results on specific workplace challenges.
2. Resource Implications	2.1. Assessment will require access to an operating plant over an extended period, or a suitable method of gathering evidence of operating ability over a range of situations. A bank of scenarios / case studies / what ifs will be required as well as a bank of questions which will be used to probe the reason behind the observable action.
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1. Observation 3.2. Case Formulation 3.3. Life Narrative Inquiry 3.4. Standardized test The unit will be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. Simulation may be required to allow for timely assessment of parts of this unit of competency. Simulation should be based on the actual workplace and will include walk through of the relevant competency components. These assessment activities should include a range of problems, including new, unusual, and improbable situations that may have happened.
4. Context for Assessment	In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.

UNIT OF COMPETENCY : WORK IN A DIVERSE ENVIRONMENT

UNIT CODE   : 400311322

UNIT DESCRIPTOR   : This unit covers the outcomes required to work effectively in a workplace characterized by diversity in terms of religions, beliefs, races, ethnicities and other differences.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Develop an individual's cultural awareness and sensitivity	1.1 Individual differences with clients, customers and fellow workers are recognized and respected in accordance with enterprise policies and core values. 1.2 Differences are responded to in a sensitive and considerate manner 1.3 Diversity is accommodated using appropriate verbal and non-verbal communication.	1.1 Understanding cultural diversity in the workplace 1.2 Norms of behavior for interacting and dialogue with specific groups (e. g., Muslims and other non-Christians, non-Catholics, tribes/ethnic groups, foreigners) 1.3 Different methods of verbal and non-verbal communication in a multicultural setting	1.1 Applying cross-cultural communication skills (i.e. different business customs, beliefs, communication strategies) 1.2 Showing affective skills – establishing rapport and empathy, understanding, etc. 1.3 Demonstrating openness and flexibility in communication 1.4 Recognizing diverse groups in the workplace and community as defined by divergent culture, religion, traditions and practices

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2 Work effectively in an environment that acknowledges and values cultural diversity	2.1 Knowledge, skills, and experiences of others are recognized and documented in relation to team objectives. 2.2 Fellow workers are encouraged to utilize and share their specific qualities, skills or backgrounds with other team members and clients to enhance work outcomes. 2.3 Relations with customers and clients are maintained to show that diversity is valued by the business.	2.1 Value of diversity in the economy and society in terms of Workforce development 2.2 Importance of inclusiveness in a diverse environment 2.3 Shared vision and understanding of and commitment to team, departmental, and organizational goals, and objectives 2.4 Strategies for customer service excellence	2.1 Demonstrating cross-cultural communication skills and active listening 2.2 Recognizing diverse groups in the workplace and community as defined by divergent culture, religion, traditions and practices 2.3 Demonstrating collaboration skills 2.4 Exhibiting customer service excellence

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Identify common issues in a multicultural and diverse environment	3.1 **Diversity-related conflicts** within the workplace are effectively addressed and resolved. 3.2 Discriminatory behaviors towards customers/stakeholders are minimized and addressed accordingly. 3.3 Change management policies are in place within the organization.	3.1 Value, and leverage of cultural diversity 3.2 Inclusivity and conflict resolution 3.3 Workplace harassment 3.4 Change management and ways to overcome resistance to change 3.5 Advanced strategies for customer service excellence	3.1 Addressing diversity-related conflicts in the workplace 3.2 Eliminating discriminatory behavior towards customers and co-workers 3.3 Utilizing change management policies in the workplace

RANGE OF VARIABLES

VARIABLE	RANGE
1. Diversity	This refers to diversity in both the workplace and the community and may include divergence in: 1.1 Religion 1.2 Ethnicity, race or nationality 1.3 Culture 1.4 Gender, age or personality 1.5 Educational background
2. Diversity-related conflicts	May include conflicts that result from: 2.1 Discriminatory behaviors 2.2 Differences of cultural practices 2.3 Differences of belief and value systems 2.4 Gender-based violence 2.5 Workplace bullying 2.6 Corporate jealousy 2.7 Language barriers 2.8 Individuals being differently abled persons 2.9 Ageism (negative attitude and behavior towards old people)

EVIDENCE GUIDE

1.	Critical aspects of Competency	**Assessment requires evidence that the candidate**: 1.1 Adjusted language and behavior as required by interactions with diversity 1.2 Identified and respected individual differences in colleagues, clients and customers 1.3 Applied relevant regulations, standards, and codes of practice
2.	Resource Implications	**The following resources should be provided:** 2.1 Access to workplace and resources 2.2 Manuals and policies on Workplace Diversity
3.	Methods of Assessment	**Competency in this unit may be assessed through**: 3.1 Demonstration or simulation with oral questioning 3.2 Group discussions and interactive activities 3.3 Case studies/problems involving workplace diversity issues 3.4 Third-party report 3.5 Written examination 3.6 Role Plays
4.	Context for Assessment	Competency assessment may occur in workplace or any appropriately simulated environment

UNIT OF COMPETENCY : PROPOSE METHODS OF APPLYING LEARNING AND INNOVATION IN THE ORGANIZATION

UNIT CODE   : 400311323

UNIT DESCRIPTOR   : This unit covers the knowledge, skills and attitudes required to assess general obstacles in the application of learning and innovation in the organization and to propose practical methods of such in addressing organizational challenges.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Assess work procedures, processes, and systems in terms of innovative practices	1.1. R*easons* for innovation are incorporated to work procedures. 1.2. *Models of innovation* are researched. 1.3. G*aps or barriers* to innovation in one's work area are analyzed. 1.4. Staff who can support and foster innovation in the work procedure are identified.	1.1 Seven habits of highly effective people. 1.2 Character strengths that foster innovation and learning (Christopher Peterson and Martin Seligman, 2004) 1.3 Five minds of the future concepts (Gardner, 2007). 1.4 Adaptation concepts in neuroscience (Merzenich, 2013). 1.5 Transtheoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	1.1 Demonstrating collaboration and networking skills. 1.2 Applying basic research and evaluation skills 1.3 Generating insights on how to improve organizational procedures, processes and systems through innovation.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Generate practical action plans for improving work procedures, processes	2.1 Ideas for innovative work procedure to foster innovation using individual and group techniques are conceptualized 2.2 Range of ideas with other team members and colleagues are evaluated and discussed 2.3 Work procedures and processes subject to change are selected based on *workplace requirements* (feasible and innovative). 2.4 Practical action plans are proposed to facilitate simple changes in the work procedures, processes and systems. 2.5 *Critical inquiry* is applied and used to facilitate discourse on adjustments in the simple work procedures, processes and systems.	2.1 Seven habits of highly effective people. 2.2 Character strengths that foster innovation and learning (Christopher Peterson and Martin Seligman, 2004) 2.3 Five minds of the future concepts (Gardner, 2007). 2.4 Adaptation concepts in neuroscience (Merzenich, 2013). 2.5 Trans theoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	2.1 Assessing readiness for change on simple work procedures, processes and systems. 2.2 Generating insights on how to improve organizational procedures, processes and systems through innovation. 2.3 Facilitating action plans on how to apply innovative procedures in the organization.

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Evaluate the effectiveness of the proposed action plans	3.1 Work structure is analyzed to identify the impact of the new work procedures 3.2 Co-workers/key personnel is consulted to know who will be involved with or affected by the work procedure 3.3 Work instruction operational plan of the new work procedure is developed and evaluated. 3.4 Feedback and suggestion are recorded. 3.5 Operational plan is updated. 3.6 Results and impact on the developed work instructions are reviewed 3.7 Results of the new work procedure are evaluated 3.8 Adjustments are recommended based on results gathered	3.1 Five minds of the future concepts (Gardner, 2007). 3.2 Adaptation concepts in neuroscience (Merzenich, 2013). 3.3 Trans theoretical model of behavior change (Prochaska, DiClemente, & Norcross, 1992).	3.1 Generating insights on how to improve organizational procedures, processes and systems through innovation. 3.2 Facilitating action plans on how to apply innovative procedures in the organization. 3.3 Communicating results of the evaluation of the proposed and implemented changes in the workplace procedures and systems. 3.4 Developing action plans for continuous improvement on the basic systems, processes and procedures in the organization.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Reasons	May include: 1.1 Strengths and weaknesses of the current systems, processes, and procedures. 1.2 Opportunities and threats of the current systems, processes, and procedures.
2. Models of innovation	May include: 2.1 Seven habits of highly effective people. 2.2 Five minds of the future concepts (Gardner, 2007). 2.3 Neuroplasticity and adaptation strategies.
3. Gaps or barriers	May include: 3.1 Machine 3.2 Manpower 3.3 Methods 3.4 Money
4. Critical Inquiry	May include: 4.1 Preparation. 4.2 Discussion. 4.3 Clarification of goals. 4.4 Negotiate towards a Win-Win outcome. 4.5 Agreement. 4.6 Implementation of a course of action. 4.7 Effective verbal communication. See our pages: Verbal Communication and Effective Speaking. 4.8 Listening. 4.9 Reducing misunderstandings is a key part of effective negotiation. 4.10 Rapport Building. 4.11 Problem Solving. 4.12 Decision Making. 4.13 Assertiveness. 4.14 Dealing with Difficult Situations.

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Established the reasons why innovative systems are required 1.2 Established the goals of a new innovative system 1.3 Analyzed current organizational systems to identify gaps and barriers to innovation. 1.4 Assessed work procedures, processes, and systems in terms of innovative practices. 1.5 Generate practical action plans for improving work procedures, and processes. 1.6 Reviewed the trial innovative work system and adjusted reflect evaluation feedback, knowledge management systems and future planning. 1.7 Evaluated the effectiveness of the proposed action plans.
2. Resource Implications	**The following resources should be provided:** 2.1 Pens, papers and writing implements. 2.2 Cartolina. 2.3 Manila papers.
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Psychological and behavioral Interviews. 3.2 Performance Evaluation. 3.3 Life Narrative Inquiry. 3.4 Review of portfolios of evidence and third-party workplace reports of on-the-job performance. 3.5 Sensitivity analysis. 3.6 Organizational analysis. 3.7 Standardized assessment of character strengths and virtues applied.
4. Context for Assessment	4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions.

UNIT OF COMPETENCY : USE INFORMATION SYSTEMATICALLY

UNIT CODE : 400311324

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to use technical information systems, apply information technology (IT) systems, edit, format, and check information.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Use technical information	1.1. ***Information*** are collated and organized into a suitable form for reference and use 1.2. Stored information is classified so that it can be quickly identified and retrieved when needed 1.3. Guidance are advised and offered to people who need to find and use information	1.1. Application in collating information 1.2. Procedures for inputting, maintaining and archiving information 1.3. Guidance to people who need to find and use information 1.4. Organize information 1.5. classify stored information for identification and retrieval 1.6. Operate the technical information system by using agreed procedures	1.1. Collating information 1.2. Operating appropriate and valid procedures for inputting, maintaining and archiving information 1.3. Advising and offering guidance to people who need to find and use information 1.4. Organizing information into a suitable form for reference and use 1.5. Classifying stored information for identification and retrieval 1.6. Operating the technical information system by using agreed procedures
2. Apply information technology (IT)	2.1. ***Technical information*** system is operated using agreed procedures 2.2. Appropriate and valid procedures are operated for inputting, maintaining and archiving information 2.3. ***Software*** required are utilized to execute the project activities 2.4. Information and data obtained are	2.1. Attributes and limitations of available software tools 2.2. Procedures and work instructions for the use of IT 2.3. Operational requirements for IT systems 2.4. Sources and flow paths of data 2.5. Security systems and measures that can be used 2.6. Extract data and format reports	2.1. Identifying attributes and limitations of available software tools 2.2. Using procedures and work instructions for the use of IT 2.3. Describing operational requirements for IT systems 2.4. Identifying sources and flow paths of data 2.5. Determining security systems and measures that can be used

	handled, edited, formatted, and checked from a range of internal and external *sources* 2.5. Information are extracted, entered, and processed to produce the outputs required by *customers* 2.6. Own skills and understanding are shared to help others 2.7. Specified *security measures* are implemented to protect the confidentiality and integrity of project data held in IT systems	2.7. Methods of entering and processing information 2.8. WWW enabled applications	2.6. Extracting data and format reports 2.7. Describing methods of entering and processing information 2.8. Using WWW applications
3. Edit, format, and check information	3.1 Basic editing techniques are used 3.2 Accuracy of documents are checked 3.3 Editing and formatting tools and techniques are used for more complex documents 3.4 Proof reading techniques is used to check that documents look professional	3.1 Basic file-handling techniques 3.2 Techniques in checking documents 3.3 Techniques in editing and formatting 3.4 Proof reading techniques	3.1 Using basic file-handling techniques is used for the software 3.2 Using different techniques in checking documents 3.3 Applying editing and formatting techniques 3.4 Applying proof reading techniques

RANGE OF VARIABLES

VARIABLE	RANGE
1. Information	May include: 1.1. Property 1.2. Organizational 1.3. Technical reference
2. Technical information	May include: 2.1. paper based 2.2. electronic
3. Software	May include: 3.1. spreadsheets 3.2. databases 3.3. word processing 3.4. presentation
4. Sources	May include: 4.1. other IT systems 4.2. manually created 4.3. within own organization 4.4. outside own organization 4.5. geographically remote
5. Customers	May include: 5.1. colleagues 5.2. company and project management 5.3. clients
6. Security measures	May include: 6.1. access rights to input. 6.2. passwords. 6.3. access rights to outputs. 6.4. data consistency and back-up. 6.5. recovery plans

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Used technical information systems and information technology 1.2. Applied information technology (IT) systems 1.3. Edited, formatted, and checked information
2. Resource Implications	**The following resources should be provided:** 2.1. Computers 2.2. Software and IT system
3. Methods of Assessment	**Competency in this unit should be assessed through:** 3.1. Direct Observation 3.2. Oral interview and written test
4. Context for Assessment	4.1. Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY : EVALUATE OCCUPATIONAL SAFETY AND HEALTH WORK PRACTICES

UNIT CODE   : 400311325

UNIT DESCRIPTOR   : This unit covers the knowledge, skills and attitudes required to interpret Occupational Safety and Health practices, set OSH work targets, and evaluate effectiveness of Occupational Safety and Health work instructions

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Interpret Occupational Safety and Health practices	1.1 **OSH work practices issues** are identified relevant to work requirements 1.2 OSH work standards and procedures are determined based on applicability to nature of work 1.3 Gaps in work practices are identified related to relevant OSH work standards	1.1. OSH work practices issues 1.2. OSH work standards 1.3. General OSH principles and legislations 1.4. Company/ workplace policies/ guidelines 1.5. Standards and safety requirements of work process and procedures	1.1. Communication skills 1.2. Interpersonal skills 1.3. Critical thinking skills 1.4. Observation skills
2. Set OSH work targets	2.1 Relevant work information are gathered necessary to determine OSH work targets 2.2 **OSH Indicators** based on gathered information are agreed upon to measure effectiveness of workplace OSH policies and procedures 2.3 Agreed OSH indicators are endorsed for approval from appropriate personnel 2.4 **OSH work instructions** are received in accordance with workplace policies and procedures*	2.1 OSH work targets 2.2 OSH Indicators 2.3 OSH work instructions 2.4 Safety and health requirements of tasks 2.5 Workplace guidelines on providing feedback on OSH and security concerns 2.6 OSH regulations Hazard control procedures 2.7 OSH trainings relevant to work	2.1 Communication skills 2.2 Collaborating skills 2.3 Critical thinking skills 2.4 Observation skills

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Evaluate effectiveness of Occupational Safety and Health work instructions	3.1 OSH Practices are observed based on workplace standards 3.2 Observed OSH practices are measured against approved *OSH metrics* 3.3 Findings regarding effectiveness are assessed and gaps identified are implemented based on OSH work standards	3.1 OSH Practices 3.2 OSH metrics 3.3 OSH Evaluation Techniques 3.4 OSH work standards	3.1 Critical thinking skills 3.2 Evaluating skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. OSH Work Practices Issues	May include: 1.1 Workers' experience/observance on presence of work hazards 1.2 Unsafe/unhealthy administrative arrangements (prolonged work hours, no break-time, constant overtime, scheduling of tasks) 1.3 Reasons for compliance/non-compliance to use of PPEs or other OSH procedures/policies/ guidelines
2. OSH Indicators	May include: 2.1 Increased of incidents of accidents, injuries 2.2 Increased occurrence of sickness or health complaints/symptoms 2.3 Common complaints of workers' related to OSH 2.4 High absenteeism for work-related reasons
3. OSH Work Instructions	May include: 3.1 Preventive and control measures, and targets 3.2 Eliminate the hazard (i.e., get rid of the dangerous machine 3.3 Isolate the hazard (i.e. keep the machine in a closed room and operate it remotely; barricade an unsafe area off) 3.4 Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one) 3.5 Use administrative controls to reduce the risk (i.e. give trainings on how to use equipment safely; OSH-related topics, issue warning signages, rotation/shifting work schedule) 3.6 Use engineering controls to reduce the risk (i.e. use safety guards to machine) 3.7 Use personal protective equipment 3.8 Safety, Health and Work Environment Evaluation 3.9 Periodic and/or special medical examinations of workers
4. OSH metrics	May include: 4.1 Statistics on incidence of accidence and injuries 4.2 Morbidity (Type and Number of Sickness) 4.3 Mortality (Cause and Number of Deaths) 4.4 Accident Rate

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Identify OSH work practices issues relevant to work requirements 1.2. Identify gaps in work practices related to relevant OSH work standards 1.3. Agree upon OSH Indicators based on gathered information to measure effectiveness of workplace OSH policies and procedures 1.4. Receive OSH work instructions in accordance with workplace policies and procedures 1.5. Compare Observed OSH practices with against approved OSH work instructions 1.6. Assess findings regarding effectiveness based on OSH work standards
2. Resource Implications	**The following resources should be provided:** 2.1 Facilities, materials, tools, and equipment necessary for the activity
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Observation/Demonstration with oral questioning 3.2 Third party report 3.3 Written exam
4. Context for Assessment	4.1 Competency may be assessed in the workplace or in a simulated workplace setting

UNIT OF COMPETENCY   :   **EVALUATE ENVIRONMENTAL WORK PRACTICES**

UNIT CODE   :   **400311326**

UNIT DESCRIPTOR   :   This unit covers the knowledge, skills and attitude to interpret environmental Issues, establish targets to evaluate environmental practices and evaluate effectiveness of environmental practices

ELEMENTS	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Interpret environmental practices, policies and procedures	1.1 ***Environmental work practices*** issues are identified relevant to work requirements 1.2 Environmental Standards and Procedures nature of work are determined based on Applicability to nature of work 1.3 Gaps in work practices related to Environmental Standards and Procedures are identified	1.1 Environmental Issues 1.2 Environmental Work Procedures 1.3 Environmental Laws 1.4 Environmental Hazardous and Non-Hazardous Materials 1.5 Environmental required license, registration or certification	1.1. Analyzing Environmental Issues and Concerns 1.2. Critical thinking 1.3. Problem Solving 1.4. Observation Skills
2. Establish targets to evaluate environmental practices	2.1. Relevant information are gathered necessary to determine environmental work targets 2.2. ***Environmental Indicators*** based on gathered information are set to measure environmental wo targets 2.3. Indicators are verified with appropriate personnel	2.1. Environmental Indicators 2.2. Relevant Environment Personnel or expert 2.3. Relevant Environmental Trainings and Seminars	2.1. Investigative Skills 2.2. Critical thinking 2.3. Problem Solving 2.4. Observation Skills

3. Evaluate effectiveness of environmental practices	3.1. Work environmental practices are recorded based on workplace standards 3.2. Recorded work environmental practices are compared against planned indicators 3.3. Findings regarding effectiveness are assessed and gaps identified are implemented based on environment work standards and procedures 3.4. Results of environmental assessment are conveyed to appropriate personnel	3.1 Environmental Practices 3.2 Environmental Standards and Procedures	3.1 Documentation and Record Keeping Skills 3.2 Critical thinking 3.3 Problem Solving 3.4 Observation Skills

RANGE OF VARIABLES

VARIABLE	R A N G E
1. Environmental Practices Issues	May include: 1.1 Water Quality 1.2 National and Local Government Issues 1.3 Safety 1.4 Endangered Species 1.5 Noise 1.6 Air Quality 1.7 Historic 1.8 Waste 1.9 Cultural
2. Environmental Indicators	May include: 2.1 Noise level 2.2 Lighting (Lumens) 2.3 Air Quality - Toxicity 2.4 Thermal Comfort 2.5 Vibration 2.6 Radiation 2.7 Quantity of the Resources 2.8 Volume

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1. Identified environmental issues relevant to work requirements 1.2. Identified gaps in work practices related to Environmental Standards and Procedures 1.3. Gathered relevant information necessary to determine environmental work targets 1.4. Set environmental indicators based on gathered information to measure environmental work targets 1.5. Recorded work environmental practices are recorded based on workplace standards 1.6. Conveyed results of environmental assessment to appropriate personnel
2. Resource Implications	**The following resources should be provided:** 2.1 Workplace/Assessment location 2.2 Legislation, policies, procedures, protocols and local ordinances relating to environmental protection 2.3 Case studies/scenarios relating to environmental protection
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Written/ Oral Examination 3.2 Interview/Third Party Reports 3.3 Portfolio (citations/awards from GOs and NGOs, certificate of training – local and abroad) 3.4 Simulations and role-plays
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA center.

UNIT OF COMPETENCY : FACILITATE ENTREPRENEURIAL SKILLS FOR MICRO-SMALL-MEDIUM ENTERPRISES (MSMEs)

UNIT CODE   : 400311327

UNIT DESCRIPTOR   : This unit covers the outcomes required to build, operate and grow a micro/small-scale enterprise.

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Develop and maintain micro-small-medium enterprise (MSMEs) skills in the organization	1.1 Appropriate ***business strategies*** are determined and set for the enterprise based on the current and emerging business environment. 1.2 ***Business operations*** are monitored and controlled following established procedures. 1.3 Quality assurance measures are implemented consistently. 1.4 Good relations are maintained with staff/workers. 1.5 Policies and procedures on occupational safety and health and environmental concerns are constantly observed.	1.1 Business models and strategies 1.2 Types and categories of businesses 1.3 Business operation 1.4 Basic Bookkeeping 1.5 Business internal controls 1.6 Basic quality control and assurance concepts 1.7 Government and regulatory processes	1.1 Basic bookkeeping/ accounting skills 1.2 Communication skills 1.3 Building relations with customer and employees 1.4 Building competitive advantage of the enterprise
2. Establish and maintain client-base/market	2.1 Good customer relations are maintained 2.2 New customers and markets are identified, explored, and reached out to. 2.3 Promotions/Incentives are offered to loyal customers 2.4 Additional products and services are evaluated and tried where feasible. 2.5 ***Promotional/advertising initiatives*** are carried out where necessary and feasible.	2.1 Public relations concepts 2.2 Basic product promotion strategies 2.3 Basic market and feasibility studies 2.4 Basic business ethics	2.1 Building customer relations 2.2 Individual marketing skills 2.3 Using basic advertising (posters/ tarpaulins, flyers, social media, etc.)

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Apply budgeting and financial management skills	3.1 Enterprise is built up and sustained through judicious control of cash flows. 3.2 Profitability of enterprise is ensured though appropriate *internal controls*. 3.3 Unnecessary or lower-priority expenses and purchases are avoided.	3.1 Cash flow management 3.2 Basic financial management 3.3 Basic financial accounting 3.4 Business internal controls	3.1 Setting business priorities and strategies 3.2 Interpreting basic financial statements 3.3 Preparing business plans

RANGE OF VARIABLES

VARIABLE	RANGE
1. Business strategies	May include: 1.1. Developing/Maintaining niche market 1.2. Use of organic/healthy ingredients 1.3. Environment-friendly and sustainable practices 1.4. Offering both affordable and high-quality products and services 1.5. Promotion and marketing strategies (e. g., on-line marketing)
2. Business operations	May include: 2.1 Purchasing 2.2 Accounting/Administrative work 2.3 Production/Operations/Sales
3. Internal controls	May include: 3.1 Accounting systems 3.2 Financial statements/reports 3.3 Cash management
4. Promotional/Advertising initiatives	May include: 4.1 Use of tarpaulins, brochures, and/or flyers 4.2 Sales, discounts, and easy payment terms 4.3 Use of social media/Internet 4.4 "Service with a smile" 4.5 Extra attention to regular customers

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires evidence that the candidate:** 1.1 Demonstrated basic entrepreneurial skills 1.2 Demonstrated ability to conceptualize and plan a micro/small enterprise 1.3 Demonstrated ability to manage/operate a micro/small-scale business
2. Resource Implications	**The following resources should be provided:** 2.1 Simulated or actual workplace 2.2 Tools, materials, and supplies needed to demonstrate the required tasks 2.3 References and manuals
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Written examination 3.2 Demonstration/observation with oral questioning 3.3 Portfolio assessment with interview 3.4 Case problems
4. Context of Assessment	4.1 Competency may be assessed in workplace or in a simulated workplace setting 4.2 Assessment shall be observed while tasks are being undertaken whether individually or in-group

COMMON COMPETENCIES

UNIT OF COMPETENCY : PERFORM MENSURATION 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	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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 Measuring instruments are selected according to job requirements 1.5 Alternative measuring tools are used without sacrificing cost and quality of work	1.1 Types of measuring tools and its uses 1.2 Selection and identification of measuring tools 1.3 Selection of measuring instruments based on job requirements	1.1 Selecting measuring instruments 1.2 Identifying measuring tools based on job requirements 1.3 Using alternative measuring tools

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variable	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Carry out measurements and calculations	2.1 ***Measurements*** are obtained according to job requirements 2.2 Alternative measuring tools are used without sacrificing cost and quality of work 2.3 ***Calculations*** needed to complete work tasks are performed using the four, basic process of addition (+), subtraction (-), multiplication (x) and division (/) 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 Workpieces are measured according to job requirements	2.1 Linear measurement 2.2 Unit conversion 2.3 Ratio and proportion 2.4 Area	2.1 Interpreting formulas for volume, areas, perimeters of plane and geometric figures 2.2 Handling of measuring instruments 2.3 Checking and correcting numerical computation for accuracy 2.4 Using fractions, percentages, and mixed numbers to complete workplace tasks 2.5 Reading of instruments to the limit of tool's accuracy 2.6 Identifying measurement system and converting according to job requirement / ISO 2.7 Measuring workpieces according to job requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Geometric shape	May include: 1.1 Round 1.2 Square 1.3 Rectangular 1.4 Triangle 1.5 Sphere 1.6 Conical
2. Measuring instruments	May include: 2.1 Micrometer (In-out, depth) 2.2 Vernier caliper (out, inside) 2.3 Thickness gauge 2.4 Torque gauge 2.5 Small hole gauge 2.6 Try-square 2.7 Protractor 2.8 Steel ruler 2.9 Voltmeter 2.10 Ammeter 2.11 Gauges 2.12 Thermometers
3. Measurements and calculations	May include: 3.1 Linear 3.2 Volume 3.3 Area 3.4 Wattage 3.5 Voltage 3.6 Amperage 3.7 Inside diameter 3.8 Length 3.9 Thickness 3.10 Outside diameter 3.11 Density

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. Resource implications	The following resources should be provided: 2.1 Workplace location 2.2 Problems to solve 2.3 Measuring instrument appropriate to carry out tasks 2.4 Instructional materials relevant to the proposed activity
3. Methods of assessment	Competency in this unit may be assessed through: 3.1 Demonstration/Direct Observation/with Oral Questioning
4. Context of assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : INTERPRET 2D 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	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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 specification, classification or as appropriate in ***drawing*** 1.3 ***Signs, symbols,*** and data are reviewed according to standards of the specified job	1.1 Signs and symbols 1.2 Rules and regulations according to trades 1.3 Use of ***tools and materials*** 1.4 Standards, symbols, and data of the specified job	1.1 Interpreting Line and symbols to its equivalent technical drawing representation. 1.2 Identifying signs, symbols, and data according to job specification, classification, or as appropriate in drawing 1.3 Obtaining technical plans according to job requirements 1.4 Reviewing the signs, symbols, and data in accordance with the standards of the specified job
2 Interpret drawings / models and plans	2.1 Necessary ***tools and materials*** are identified according to the ***work 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 requirement	2.1 Systems of measurement 2.2 Linear measurement 2.3 Dimension 2.4 Unit conversion	2.1 Interpreting drawing 2.2 Matching specification details with existing resources 2.3 Listing of supplies and materials in accordance with specifications 2.4 Recognizing components, or objects 2.5 Identifying dimensions that are appropriate to the plan 2.6 Matching the specification details with the existing / available resource that are in line with job requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Technical Plans	May include: 1.1 Architectural 1.2 Structural plans 1.3 Electrical and electronics plans 1.4 Sanitary and Plumbing plans 1.5 Mechanical plans
1. Signs and symbols	May include: 1.1 Drawing symbols 1.2 Alphabet of lines 1.3 Specification symbols 1.4 Engineering trades symbols

3 Drawing	May include:
	 3.1 Orthographic views
	      3.1.1 Plan views
	      3.1.2 Elevation views
	      3.1.3 Sections and spot details
	 3.2 Schematic diagram
	 3.3 Electrical load computations and diagrams
	 3.4 Structural analysis and drawings
	 3.5 Plumbing drawings
	      3.5.1 Drain, waste and vent piping system
	      3.5.2 Plans
	      3.5.3 Isometric
	      3.5.4 Water supply layout

4 Tools and materials	May include: 4.1 Rulers 4.2 Protractor 4.3 Steel tape 4.4 Calculator 4.5 Pencil
5 Work plan	May include: 5.1 Job requirements 5.2 Installation instructions 5.3 Components instruction

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 and job requirements 1.2 Identified tools and materials in accordance with job requirements 1.3 Demonstrated ability to determine job specifications based on working drawing 1.4 Demonstrated ability to list materials as specified in the given drawing. 1.5 Determined job specifications based on working / technical drawings.
2. Resource Implications	The following resources should be provided: 2.1 Workplace 2.2 Drawings and specification relevant to task 2.3 Materials and instrument relevant to proposed activity
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Demonstration/Direct Observation with Oral Questioning 3.2 Written Examination
4. Context of Assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT TITLE   :   APPLY QUALITY STANDARDS

UNIT CODE   :

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	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Assess quality of received materials or components	1.1 Work instruction is obtained, and work is carried out in accordance with standard operating procedures. 1.2 Received *materials or component parts* are checked based on material specifications 1.3 *Defective* material or components are identified and isolated following standard operating procedures 1.4 Defective materials or components are replaced in accordance with workplace procedures.	1.1 Relevant production processes, materials, and products 1.2 Characteristics of materials, software and hardware used in production process 1.3 Quality checking procedures 1.4 Quality workplace procedures 1.5 Identification of faulty materials related to work	1.1 Reading skills required to interpret work instruction 1.2 Critical thinking 1.3 Interpreting work instructions
2. Assess own work	2.1 *Documents* relative to *quality* within the company are 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	2.1 Safety and environmental aspects of production processes 2.2 Fault identification and reporting 2.3 Workplace procedure in documenting completed work 2.4 Workplace quality indicators	2.1 Carry out work in accordance with OHS policies and procedures 2.2 Identifying and using documents relative to quality within the company 2.3 Checking of completed work based on workplace standards relevant to the task undertaken

ELEMENT	PERFORMANCE CRITERIA *Bold and Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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	3.1 Quality improvement processes 3.2 Company customers defined 3.3 Process improvement procedures 3.4 Operation performance 3.5 Product quality 3.6 Service quality	3.1 Solution providing and decision-making 3.2 Practice company process improvement procedure 3.3 Performing work in accordance with process improvement procedure 3.4 Monitoring of operation, and product / service quality in accordance with customer satisfaction

RANGE OF VARIABLES

VARIABLE	RANGE
1. Materials / components	May include: 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: 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: 3.1 Organization work procedures / reports 3.2 Manufacturer's instruction manual 3.3 Customer requirements 3.4 Forms
4. Quality standards	May include: 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 requires that the candidate: 1.1 Demonstrated ability to follow company's standard operating procedures 1.2 Demonstrated knowledge of types and uses of materials and component parts 1.3 Demonstrated knowledge of quality standards 1.4 Demonstrated ability to follow process improvement procedures
2. Resource implication	The following resources should be provided: 2.1 Materials and component parts relevant to the activity 2.2 Documents related to quality
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Demonstration/Direct Observation with Oral Questioning
4. Context of Assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY: OPERATE A PERSONAL COMPUTER

UNIT CODE   :

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	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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	1.1 Main types of computers and basic features of different operating systems 1.2 Main parts of a computer 1.3 Information and hardware and software 1.4 Data security Guidelines	1.1 Reading and comprehension skills required to interpret work instruction and to interpret basic user manuals. 1.2 Communication skills to identify lines of communication, request advice, follow instructions and receive feedback 1.3 Interpreting user manuals and security guidelines
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	2.1 Desktop screen or windows 2.2 Desktop icon 2.3 Computer or desktop setting	2.1 Changing desktop screen or windows 2.2 Adding, renaming, moving, copying, or deleting desktop icons 2.3 Selecting, opening, and closing application programs 2.4 Displaying properties of icons

ELEMENT	PERFORMANCE CRITERIA *Bold and italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.4 Computer or desktop settings are saved and restored		2.5 Saving and restoring computer setting
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 3.3 and restored 3.4 Details and properties of files and folders are displayed or viewed 3.5 *Various files* are organized for easy lookup and use 3.6 Files and information are searched 3.7 *USB Drive/other removable storage* are checked, erased, or formatted as necessary	3.1 Files and folders 3.2 Details and properties of files and folders 3.3 Files and folders organization	3.1 Creating, opening, moving, renaming, or copying of files and/or folders 3.2 Locating, deleting, and restoring of files 3.3 Displaying and viewing of the details and properties of files and folders 3.4 Organizing of various files and folders 3.5 Searching of files and corresponding information 3.6 Checking, erasing, or formatting USB Drives and other removable storage
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	4.1 Application programs 4.2 User software 4.3 Computer based information and data	4.1 Adding, changing, removing, or running application programs 4.2 Installing, updating, and upgrading user software or application program 4.3 Moving information or data between documents or files

ELEMENT	PERFORMANCE CRITERIA *Bold and italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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	5.1 Printer settings 5.2 Default printer 5.3 Documents	5.1 Adding or installing Printer 5.2 Correcting or updating printer settings 5.3 Assigning default printer 5.4 Printing of information or document 5.5 Viewing progress and deleting of print jobs
6. Shut down computer	6.1 All open application programs are closed 6.2 Peripheral devices are shut down following a standard procedure 6.3 Computer is shut down following a standard procedure	6,1 Application programs 6.2 Peripheral Devices 6.3 Computer	6.1 Closing application programs 6.2 Shutting down Peripherals devices 6.3 Shutting down of computer
7. Work with user application programs	7.1 ***Application programs*** are added, changed, removed, or ran 7.2 User software or application program are installed, updated, and upgraded 7.3 Information/data are moved between documents or files	7.1 Application program 7.2 User software 7.3 Computer based information or data	7.1 Adding, changing, removing, or running application program 7.2 Installing, updating, or upgrading user software 7.3 Moving of information or data between documents or files
8. Print information	8.1 Printer is added or installed, and correct ***printer settings*** is ensured 8.2 Default printer is assigned accordingly 8.3 Information or document is printed on the installed printer 8.4 Progress of print jobs are viewed and deleted as required	8.1 Printer settings 8.2 Default printer 8.3 Computer based documents	8.1 Adding or installing, and correcting printer settings 8.2 Assigning default printer 8.3 Viewing progress and/or deleting print jobs

9. Shut down computer	9.1 All open application programs are closed 9.2 Peripheral devices are shut down 9.3 Computer is shut down	9.1 Application programs 9.2 Peripheral Devices 9.3 Computer	9.1 Closing of application programs 9.2 Shutting-down of peripheral devices 9.3 Shutting-down of computer

RANGE OF VARIABLES

VARIABLE	RANGE
1. Peripheral device	May include: 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	May 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: 4.1 Windows 4.2 NT 4.3 Mac OS 4.4 Linux 4.5 Solaris 4.6 Unix
5. System features	May include: 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 5.9 Bluetooth 5.10 Fiber connections

VARIABLE	RANGE
6. Online help functions (Put in the glossary of terms)	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	May include: 8.1 Documents 8.2 Records 8.3 Pictures 8.4 Music 8.5 Video
9. USB Drive/other removable storage	May include: 9.1 Flash drives 9.2 External Hard Disk drives
10. Printer settings	The properties of the printer that enables it to work may include: 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	Assessment requires that the candidate: 1.1 Demonstrated ability to utilize software, navigate the desktop using system features to perform tasks and save results of work.
2. Resource Implications	The following resources should be provided: 2.1 A personal computer 2.2 A printer 2.3 Mouse and keyboard 2.4 Basic systems software
3. Methods of Assessment	Competency in this unit may be assessed through: 3.1 Observation in a workplace or simulated environment 3.2 Third party reports 3.3 Exams and tests 3.4 Demonstration of required skills 3.5 Interviews
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

CORE COMPETENCIES

UNIT OF COMPETENCY   **: Analyze completeness of drawing for basic 3D Building Information Modelling**

UNIT CODE   **: CON834XXX**

UNIT DESCRIPTOR   : This unit covers the knowledge, skills and attitudes required to analyze, review, and check 2D drawings completeness; architectural, structural, electrical and electronic, sanitary / plumbing and mechanical working drawings using computer aided drafting software and prepare the BIM software environment for creating 3D Building Information Modelling.

ELEMENT	PERFORMANCE CRITERIA *Bold and italicized* terms are elaborated in the Range of Variable	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 Work instruction is secured following *standard operating procedures* (SOP) and interpreted according to *drawing / model job requirements* 1.2 Application program is identified based on job requirement 1.3 Computer unit is identified based on required application program installed	1.1 Computer Hardware requirements 1.2 Application program for the specified job 1.3 Factors affecting productivity 1.4 Productivity work measurements 1.5 Ways of improving productivity 1.6 Adherence to work requirements	1.1 Identifying computer hardware requirements 1.2 Identifying application program for the specified job 1.3 Reading and interpreting work instruction 1.4 Setting-up procedures following job requirements 1.5 Applying productive methods and techniques in performing drawing / model assessment.
2. Prepare and set-up equipment and system for drawing / model	2.1 Equipment is set-up for running BIM Tool 2.2 BIM Tool System is set-up 2.3 System set-up procedure for working drawing is performed following job requirements	2.1 Setup of equipment based on BIM tool requirement 2.2 Setup of the BIM tool based on drawing to be performed 2.3 Required plans and drawings for basic 3D modeling	2.1 Setting-up of equipment BIM tool use 2.2 Setting-up of BIM Tools 2.3 Identifying the required drawing for basic 3D Modelling

| 3. Review and check completeness of drawing / model | 3.1 **Sheet requirement accomplishment procedure** is performed following technical drawing / model standards and symbols
3.2 Preparation of the Model is Reviewed following job requirement
3.3 Completeness of the model is Checked following job requirement | 3.1 Complete elements of drawings / models required to be modelled per drawing / model trade.
3.2 Standard procedures in the preparation of model
3.3 Acceptance criteria in the completeness of the drawing / model | 3.1 Reading work instruction
3.2 Interpreting work instruction
3.3 Interpreting user manual
3.4 Interpreting security guidelines |

RANGE OF VARIABLES

VARIABLE	RANGE
1. Standard Operating Procedures	May include: 1.1 Basic knowledge on collaboration procedures 1.2 BIM standards 1.3 Familiarity of file types and file extensions 1.4 File naming conventions 1.5 Basic knowledge on building standards and compliance
2. Drawing / model job requirements	May include: 2.1 Architectural 2.2 Structural 2.3 Electrical and electronic 2.4 Sanitary / plumbing 2.5 Mechanical

3. Sheet requirement accomplishment procedure	May include:
	3.1 Building Elements
	   3.1.1 Footings
	   3.1.2 Columns
	   3.1.3 Beams and Girders
	   3.1.4 Floors Slabs, Structural Floors
	   3.1.5 Architectural Floors & Finishes
	   3.1.6 Doors & Windows
	   3.1.7 Curtain Walls, Storefronts
	   3.1.8 Structural Walls, Architectural Walls
	   3.1.9 Foundation Walls
	   3.1.10 Truss
	   3.1.11 Purlins
	   3.1.12 Ceilings
	   3.1.13 Fixtures
	   3.1.14 Railing, Architectural Railing
	   3.1.15 Roof
	   3.1.16 Stairs
	   3.1.17 Furnitures
	   3.1.18 Caseworks
	   3.1.19 Site Development Plan
	   3.1.20 Pipes, conduits, and fittings
	   3.1.21 Pipe Accessories
	   3.1.22 Cable trays and ladder
	   3.1.23 Ducts, flex ducts and duct fittings
	   3.1.24 Devices (lighting, power, and auxiliary)
	   3.1.25 Sprinklers
	   3.1.26 Air Terminals
	   3.1.27 Mechanical Equipment
	   3.1.28 Electrical Equipment
	   3.1.29 Electrical Fixtures (lighting, power, and auxiliary)
	   3.1.30 Panel Boards (Branch, Distribution, and Main)
	   3.1.31 Branches, feeders, and main circuit connections

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Secured work instructions following standard operating procedures (SOP) and interpret according to drawing / model job requirements. 1.2 Performed sheet requirement accomplishment procedure following technical drawing / model standards and symbols 1.3 Reviewed and checked drawing / model completeness. 1.4 Observed safety measures applicable to worksite operation 1.5 Communicated effectively with others to ensure effective work 1.6 Observed and complied with the productivity requirements 1.7 Complied with attitudinal work requirements
2. Resource implications	The following resources should be provided 2.1 Architectural and engineering base plans and working drawing / model 2.2 Drawing / model materials, equipment, and software
3. Methods of Assessment	Competencies may be assessed using the following 3.1 Demonstration/Direct Observation with oral questioning 3.2 Written test 3.3 Portfolio 3.4 Third party report
4. Context of assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : **CREATE 3D MODEL OF ARCHITECTURAL LAYOUT AND DETAILS**

UNIT CODE : CON834XXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to model architectural - site development plan, floor plan, ceiling, elevation, and section, and working drawing / model details.

ELEMENT	PERFORMANCE CRITERIA Bold and italicized terms are elaborated in the Range of Variable	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 A3 Printer is set-up for running BIM Tool 1.2 Work instruction is secured following standard operating procedures (SOP) and interpreted according to **architectural job requirements** 1.3 **Drawing** / model tools, materials and A3 Printer are identified based on job requirements.	1.1 Setup of A3 Printer based on BIM tool requirement 1.2 Architectural job requirements 1.3 Standard Operating procedure in handling work instruction 1.4 BIM tools, materials, and A3 Printer required based on architectural job performed 1.5 Occupational Safety and Health Guidelines 1.6 DOH Guidelines on Safety and Health as applicable 1.7 Green Building Code 1.8 Energy Efficiency and Conservation Guidelines based on RA11285 1.9 Environmental Laws	1.1 Setting-up of A3 Printer for BIM tool use 1.2 Reading the architectural job requirements 1.3 Handling work instruction based on standard operating procedure 1.4 Identifying the BIM tools, materials, and A3 Printer required based on architectural job performed 1.5 Applying Occupational Safety and Health Guidelines 1.6 Applying DOH Guidelines on Safety and Health 1.7 Applying Green Building Code 1.8 Applying Energy Efficiency and Conservation Guidelines 1.9 Applying Environmental Laws
2. Prepare and set-up tools and materials for	2.1 A3 Printer is set-up for running BIM Tool 2.2 Drawing / model tools, materials, and A3 Printer are selected and	2.1 Setup of A3 Printer based on BIM tool requirement 2.2 Selection of drawing / model tools,	2.1 Setting-up of A3 Printer for BIM Tool use 2.2 Selecting the appropriate

drawing / model	prepared according to architectural lay-out job requirements 2.3 Set-up procedure for working drawing / model is performed following job requirements	materials, and A3 Printer required for the architectural job at hand 2.3 Preparation of drawing / model tools, materials, and A3 Printer for the architectural job to be performed 3.1 Set-up of drawing / model tools, materials, and A3 Printer based on the requirement of the architectural job to be performed	drawing / model tools, materials, and A3 Printer as required for the architectural job to be handled 2.3 Preparing the required drawing / model tools, materials, and A3 Printer for the architectural job to be performed 2.4 Setting-up of drawing / model tools, materials, and A3 Printer
3. Layout architectural drawings / models and details	3.1 Sheet requirement is accomplished following *technical drawing / model standards* 3.2 Sheet requirement is reviewed based on technical drawing / model standards 3.3 *Sheet requirement* is revised following technical drawing / model standards, if necessary	3.1 Accomplishment of sheet following technical drawing / model standards 3.2 Review of the sheet requirement based on technical drawing / model standards 3.3 Revision of the sheet requirement, as needed, following the technical drawing / model standards	3.1 Accomplishing the sheet following the technical drawing / model standards 3.2 Reviewing the sheet requirement based on the technical drawing / model standards 3.3 Revising the sheet requirement following the technical drawing / model standards
4 Submit complete drawings / models	4.1 Complete drawing / model is submitted to *personnel* following SOP. 4.2 Comments and corrections are noted for final drawings / models following SOP. 4.3 Comments and corrections are integrated into final drawing / model based on job requirements 4.4 *Housekeeping procedure* is performed following SOP	4.1 Submission of complete drawing / model to the personnel following the Standard Operating Procedure (SOP) 4.2 Notation of comments and corrections on final drawing / model following the SOP 4.3 Performance of Housekeeping procedure following the SOP	4.1 Submitting the complete drawing / model to the personnel following the SOP 4.2 Noting of comments and corrections on the final drawing / model following the SOP 4.3 Performing the housekeeping procedure following the SOP

RANGE OF VARIABLES

VARIABLE	RANGE
1. Architectural job requirements	May include: 1.1 Site development plan 1.2 Floor, ceiling, and roof plans 1.3 Elevations and sections 1.4 General notes and symbols
2. Drawing	May Include: 2.1 Generated plans 2.2 Construction Drawing 2.3 Detailed engineering drawings 2.4 Combined/Coordinated Services Drawings 2.5 Shop drawings
3. Technical drawing / model standards	May include: 3.1 Lines 3.2 Font & Font Size 3.3 Scale 3.4 Labeling 3.5 Dimensioning
4. Sheet Requirements	May include: 4.1 Architectural Floors & Finishes 4.2 Doors & Windows 4.3 Curtain Walls, Storefronts 4.4 Architectural Walls 4.5 Ceilings 4.6 Fixtures 4.7 Architectural Railing 4.8 Roof 4.9 Stairs 4.10 Furnitures 4.11 Caseworks 4.12 Site Development Plan 4.13 Interior and Exterior Perspective
5. Personnel	May include: 5.1 Supervisor 5.2 Coordinator 5.3 BIM Specialist or BIM Modeler
6. Housekeeping procedure	May include: 6.1 Store reference drawing / model and storage media 6.2 Clean work area and drawing / model A3 Printer

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate:
	1.1 Demonstrated ability to interpret architectural job requirements
	1.2 Demonstrated ability to identify, select, prepare, and use drawing / model tools, materials, and A3 Printer
	1.3 Demonstrated ability to perform set-up procedure following job requirements
	1.4 Demonstrates ability to lay-out drawings / models and details
	1.5 Demonstrated ability to submit complete drawings / models according to job schedule
	1.6 Communicated effectively with others to ensure effective work
	1.7 Observed and complied with the productivity requirements
	1.8 Complied with attitudinal work requirements
2. Resource implications	The following resources should be provided
	2.1 Architectural working drawing / model
	2.2 Drawing / model tools, materials, and A3 Printer
3. Methods of Assessment	Competencies maybe assessed using the following
	3.1 Demonstration/Direct Observation with oral questioning
	3.2 Written test
	3.3 Portfolio
	3.4 Third party report
4. Context of assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY   :   CREATE 3D MODEL OF STRUCTURAL LAYOUT AND DETAILS

UNIT CODE   :   CON834XXX

UNIT DESCRIPTOR   :   This unit covers the knowledge, skills and attitudes required to model structural - foundation plan, framing plans, structural drawing / model details.

ELEMENT	PERFORMANCE CRITERIA *Bold and italicized* terms are elaborated in the Range of Variable	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 A3 Printer is set-up for running BIM Tool 1.2 Work instruction is secured following standard operating procedures (SOP) and interpreted according to *structural job requirements* 1.3 *Drawing* / model tools, materials and A3 Printer are identified based on job requirements.	1.1 Setup of A3 Printer based on BIM Tool requirement 1.2 Structural job requirements 1.3 Standard Operating Procedure (SOP) in handling work instruction 1.4 BIM tools, material, and A3 Printer required based on structural job performed 1.5 Occupational Safety and Health Guidelines 1.6 DOH Guidelines on Safety and Health as applicable 1.7 Green Building Code 1.8 Energy Efficiency and Conservation Guidelines based on RA11285 1.9 Environmental Laws	1.1 Setting-up of A3 Printer for BIM tool use 1.2 Reading and comprehension required to interpret the structural job requirements 1.3 Handling work instruction based on standard operating procedure 1.4 Identifying the BIM tools, material, and A3 Printer required based on structural job performed 1.5 Applying Occupational Safety and Health Guidelines 1.6 Applying DOH Guidelines on Safety and Health 1.7 Applying Green Building Code 1.8 Applying Energy Efficiency and Conservation Guidelines 1.9 Applying Environmental Laws

2. Prepare and set-up tools and materials for drawing / model	2.1 A3 Printer is set-up for running BIM Tool 2.2 Drawing / model tools, materials, and A3 Printer are selected and prepared according to structural lay-out job requirements 2.3 Set-up procedure for working drawing / model is performed following job requirements	2.1 Setup of A3 Printer based on BIM tool requirement 2.2 Selection of drawing / model tools, materials, and A3 Printer required for the architectural job at hand 2.3 Preparation of drawing / model tools, materials, and A3 Printer for the structural job to be performed 2.4 Set-up of drawing / model tools, materials, and A3 Printer based on the requirement of the structural job to be performed	2.1 Setting-up of A3 Printer for BIM Tool use 2.2 Selecting the appropriate drawing / model tools, materials, and A3 Printer as required for the architectural job to be handled 2.3 Preparing the required drawing / model tools, materials, and A3 Printer for the structural job to be performed 2.4 Setting-up of drawing / model tools, materials, and A3 Printer
3. Layout structural drawings / models and details	3.1 Sheet requirement is accomplished following ***technical drawing / model standards*** 3.2 Sheet requirement is reviewed based on technical drawing / model standards 3.3 ***Sheet requirement*** is re-accomplished following technical drawing / model standards, if necessary	3.1 Accomplishment of the sheet required following the technical drawing / model standards 3.2 Review of the sheet requirement based on the technical drawing / model standards 3.3 Re-accomplishment of the sheet requirement, if needed, following the technical drawing / model standards	3.1 Accomplishing the required sheet following the technical drawing / model standards 3.2 Reviewing the sheet requirement based on the technical drawing / model standards 3.3 Re-accomplishing the sheet requirement following the technical drawing / model standards

4. Submit complete drawings / models	4.1 Complete drawing / model is submitted to *personnel* following SOP. 4.2 Comments and corrections are noted for final drawings / models following SOP. 4.3 Comments and corrections are integrated into final drawing / model based on job requirements 4.4 *Housekeeping procedure* is performed following SOP	4.1 Submission of complete drawing / model to the personnel following the Standard Operating Procedure (SOP) 4.2 Notation of comments and corrections on final drawing / model following the SOP 4.3 Performance of Housekeeping procedure following the SOP	4.1 Submitting the complete drawing / model to the personnel following the SOP 4.2 Noting of comments and corrections on the final drawing / model following the SOP 4.3 Performing the housekeeping procedure following the SOP

RANGE OF VARIABLES

VARIABLE	RANGE
1. Structural job requirements	May include: 1.1 Foundation plan 1.2 Excavation Plan 1.3 Beam and slab setting-out plan 1.4 Column & Shear wall Setting out 1.5 General notes and symbols
2. Drawing	May Include: 2.1 Generated plans 2.2 Construction Drawing 2.3 Detailed engineering drawings 2.4 Combined/Coordinated Services Drawings 2.5 Shop drawings
3. Technical drawing / model standards	May include: 3.1 Lines 3.2 Font & Font Size 3.3 Scale 3.4 Labeling 3.5 Dimensioning
4. Sheet Requirements	May include: 4.1 Wall Footings 4.2 Structural Columns 4.3 Beams and Girders 4.4 Structural Floors 4.5 Structural Foundations 4.6 Structural Walls 4.7 Foundation Walls 4.8 Truss 4.9 Purlins
5. Personnel	May include: 5.1 Supervisor 5.2 Coordinator 5.3 BIM Specialist or BIM Modeler
6. Housekeeping procedure	May include: 6.1 Store reference drawing / model and storage media 6.2 Clean work area and drawing / model A3 Printer

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Demonstrated ability to interpret structural job requirements 1.2 Demonstrated ability to identify, select, prepare, and use drawing / model tools, materials, and A3 Printer 1.3 Demonstrated ability to perform set-up procedure following job requirements 1.4 Demonstrated ability to lay-out drawings / models and details 1.5 Demonstrated ability to submit complete drawings / models according to job schedule 1.6 Communicated effectively with others to ensure effective work 1.7 Observed and complied with the productivity requirements 1.8 Complied with attitudinal work requirements
2. Resource implications	The following resources should be provided 2.1 Structural working drawing / model 2.2 Drawing / model tools, materials, and A3 Printer
3. Methods of Assessment	Competencies maybe assessed using the following 3.1 Demonstration/Direct Observation with oral questioning 3.2 Written test 3.3 Portfolio 3.4 Third party report
4. Context of assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : CREATE 3D MODEL OF ELECTRICAL AND ELECTRONIC LAYOUT AND DETAILS

UNIT CODE : CON834XXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to model 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	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 A3 Printer is set-up for running BIM Tool 1.2 Work instruction is secured following standard operating procedures (SOP) and interpreted according to *electrical and electronic layout drawing / model job requirements* 1.3 *Drawing /* model tools, materials and A3 Printer are identified based on job requirements.	1.1 Setup of A3 Printer based on BIM tool requirement 1.2 Electrical and electrical layout drawing / model job requirements 1.3 Standard Operating Procedure in handling work instruction 1.4 BIM tools, material, and A3 Printer required based on the electrical and electronic layout drawing / model job performed 1.5 Occupational Safety and Health Guidelines 1.6 DOH Guidelines on Safety and Health as applicable 1.7 Green Building Code 1.8 Energy Efficiency and Conservation Guidelines based on RA11285 1.9 Environmental Laws	1.1 Setting-up of A3 Printer for BIM tool use 1.2 Reading and comprehension required to interpret the electrical and electronics layout drawing / model job requirements 1.3 Handling work instruction based on standard operating procedure 1.4 Identifying the BIM tools, material, and A3 Printer required based on electrical and electronics layout drawing / model job performed 1.5 Applying Occupational Safety and Health Guidelines 1.6 Applying DOH Guidelines on Safety and Health 1.7 Applying Green Building Code 1.8 Applying Energy Efficiency and Conservation Guidelines

			1.9 Applying Environmental Laws
2. Prepare and set-up tools and materials for drawing / model	2.1 A3 Printer is set-up for running BIM Tool 2.2 Drawing / model tools, materials, and A3 Printer are selected and prepared according to job requirements 2.3 Set-up procedure for working drawing / model is performed following job requirements	2.1 Setup of A3 Printer based on BIM tool requirement 2.2 Selection of drawing / model tools, materials, and A3 Printer required for the electrical and electronics layout drawing / model job at hand 2.3 Preparation of drawing / model tools, materials, and A3 Printer for the electrical and electronics layout drawing / model job to be performed 2.4 Set-up of drawing / model tools, materials, and A3 Printer based on the requirement of the electrical and electronics layout drawing / model job to be performed	2.1 Setting-up of A3 Printer for BIM tool use 2.2 Selecting the appropriate drawing / model tools, materials, and A3 Printer as required for the electrical and electronics layout drawing / model job to be handled 2.3 Preparing the required tools, materials, and A3 Printer for the electrical and electronics layout drawing / model job to be performed 2.4 Setting-up of drawing / model tools, materials, and A3 Printer
3. Layout electrical and electronics drawings / models and details	3.1 Sheet requirement is accomplished following *technical drawing / model standards* and symbols 3.2 *Sheet requirement* is reviewed based on technical drawing / model standards and symbols 3.3 Sheet requirement is re-accomplished following technical drawing / model standards, if necessary	3.1 Accomplishment of sheet following technical drawing / model standards 3.2 Review of the sheet requirement based on technical drawing / model standards 3.3 Revision of the sheet requirement, as needed, following the technical drawing / model standards	3.1 Accomplishing the sheet following the technical drawing / model standards 3.2 Reviewing the sheet requirement based on the technical drawing / model standards 3.3 Revising the sheet requirement following the technical drawing / model standards

4. Submit complete drawings / models	4.1 Complete drawing / model is submitted to *personnel* following SOP. 4.2 Comments and corrections are noted for final drawings / models following SOP. 4.3 Comments and corrections are integrated into final drawing / model based on job requirements 4.4 *Housekeeping procedure* is performed following SOP	4.1 Submission of complete drawing / model to the personnel following the Standard Operating Procedure (SOP) 4.2 Notation of comments and corrections on final drawing / model following the SOP 4.3 Performing of Housekeeping procedure following the SOP	4.1 Submitting the complete drawing / model to the personnel following the SOP 4.2 Noting of comments and corrections on the final drawing / model following the SOP 4.3 Performing the housekeeping procedure following the SOP

RANGE OF VARIABLES

VARIABLE	RANGE
1. Electrical and electronics layout drawing / model job requirements	May include: 1.1 Power system and diagram 1.2 Auxiliary systems and layout 1.3 General notes and symbols
2. Drawing	May Include: 2.1 Generated plans 2.2 Construction Drawing 2.3 Detailed engineering drawings 2.4 Combined/Coordinated Services Drawings 2.5 Shop drawings
3. Technical drawing / model standards	May include: 3.1 Lines 3.2 Font & Font Size 3.3 Scale 3.4 Labeling 3.5 Dimensioning
4. Sheet Requirements	May include: 4.1 Conduits and fittings 4.2 Pipe Accessories 4.3 Cable trays and ladder 4.4 Devices (lighting, power, and auxiliaries 4.5 Electrical and equipment 4.6 Electrical Fixtures (lighting, power, and auxiliary) 4.7 Panel Boards (Branch, Distribution, and Main) 4.8 Branches, feeders, and main circuit connections
5. Personnel	May include: 5.1 Supervisor 5.2 Coordinator 5.3 BIM Specialist or BIM Modeler
6. Housekeeping procedure	May include: 6.1 Store reference drawing and storage media 6.2 Clean work area and drawing A3 Printer

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires that the candidate:
	1.1 Demonstrated ability to interpret electrical drawing / model job requirements
	1.2 Demonstrated ability to identify, select, prepare, and use drawing / model tools, materials, and A3 Printer
	1.3 Demonstrated ability to perform set-up procedure following job requirements
	1.4 Demonstrated ability to lay-out drawings / models and details based on standard electrical symbols
	1.5 Demonstrated ability to submit complete drawings / models according to job schedule
	1.6 Communicated effectively with others to ensure effective work
	1.7 Observed and complied with the productivity requirements
	1.8 Complied with attitudinal work requirements
2. Resource implications	The following resources should be provided
	2.1 Architectural and engineering base plans and working drawings / models
	2.2 Drawing / model tools, materials, and A3 Printer
3. Methods of Assessment	Competencies maybe assessed using the following
	3.1 Demonstration/Direct Observation with oral questioning
	3.2 Written test
	3.3 Portfolio
	3.4 Third party report
4. Context of assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : CREATE 3D MODEL OF SANITARY AND PLUMBING LAYOUT AND DETAILS

UNIT CODE : CON834XXX

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to model 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	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 A3 Printer is set-up for running BIM Tool 1.2 Work instruction is secured following standard operating procedures (SOP) and interpreted according to *sanitary and plumbing layout drawing / model job requirements* 1.3 *Drawing* / model tools, materials and A3 Printer are identified based on job requirements.	1.1 Setup of A3 Printer based on BIM tool requirement 1.2 Sanitary and plumbing layout drawing / model job requirements 1.3 Standard Operating procedure in handling work instruction 1.4 BIM tools, material, and A3 Printer required based on sanitary and plumbing layout drawing / model job to be performed 1.5 Occupational Safety and Health Guidelines 1.6 DOH Guidelines on Safety and Health as applicable 1.7 Green Building Code 1.8 Energy Efficiency and Conservation Guidelines based on RA11285 1.9 Environmental Laws	1.1 Setting-up of A3 Printer for BIM use 1.2 Reading and comprehension required to interpret the sanitary and plumbing layout drawing / model job requirements 1.3 Handling work instruction based on standard operating procedure 1.4 Identifying the BIM tools, material, and A3 Printer required based on sanitary and plumbing layout drawing / model job to be performed 1.5 Applying Occupational Safety and Health Guidelines 1.6 Applying DOH Guidelines on Safety and Health 1.7 Applying Green Building Code 1.8 Applying Energy Efficiency and Conservation Guidelines

			1.9 Applying Environmental Laws
2. Prepare and set-up tools and materials for drawing / model	2.1 A3 Printer is set-up for running BIM Tool 2.2 Drawing / model tools, materials, and A3 Printer are selected and prepared according to job requirements 2.3 Set-up procedure for working drawing / model is performed following job requirements	2.1 Setup of A3 Printer on BIM tool requirement 2.2 Selection of drawing / model tools, materials, and A3 Printer required for the sanitary and plumbing layout drawing / model at hand 2.3 Preparation of tools, materials, and A3 Printer for the sanitary and plumbing layout drawing / mode job to be performed 2.4 Set-up of drawing / model tools, materials, and A3 Printer based on the requirement of the sanitary and plumbing layout drawing / model job to be performed	2.1 Setting-up of A3 Printer for BIM Tool use 2.2 Selecting the appropriate drawing / model tools, materials, and A3 Printer as required for the sanitary and plumbing layout drawing / model job to be performed 2.3 Preparing the required drawing / model tools, materials, and A3 Printer for the sanitary and plumbing layout drawing / model job to be performed 2.4 Setting-up of drawing / model tools, materials, and A3 Printer
3. Layout sanitary and plumbing drawings / models and details	3.1 Sheet requirement is accomplished following *technical drawing / model standards* and symbols 3.2 *Sheet requirement* is reviewed based on technical drawing / model standards and symbols 3.3 Sheet requirement is re-accomplished following technical drawing / model standards, if necessary	3.1 Accomplishment of sheet following technical drawing / model standards 3.2 Review of the sheet requirement based on technical drawing / model standards 3.3 Revision of the sheet requirement, as needed, following the technical drawing / model standards	3.1 Accomplishing the sheet following the technical drawing / model standards 3.2 Reviewing the sheet requirement based on the technical drawing / model standards 3.3 Revising eh sheet requirement following the technical drawing / model standards

| 4. Submit complete drawings / models | 4.1 Complete *drawing* / model is submitted to *personnel* following SOP.
4.2 Comments and corrections are noted for final drawings / models following SOP.
4.3 Comments and corrections are integrated into final drawing / model based on job requirements
4.4 *Housekeeping procedure* is performed following SOP | 4.1 Submission of complete drawing / model to the personnel following the Standard Operating Procedure (SOP)
4.2 Notation of comments and corrections on final drawing / model following the sop
4.3 Performance of Housekeeping procedure following the SOP | 4.1 Submitting the complete drawing / model to the personnel following the SOP
4.2 Noting of comments and corrections on the final drawing / model following the SOP
4.3 Performing the housekeeping procedure following the SOP |

RANGE OF VARIABLES

VARIABLE	RANGE
1. Sanitary and plumbing drawing / model job requirements	May include: 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	May Include: 2.1 Generated plans 2.2 Construction Drawing 2.3 Detailed engineering drawings 2.4 Combined/Coordinated Services Drawings 2.5 Shop drawings
3. Technical drawing / model standards	May include: 3.1 Lines 3.2 Font & Font Size 3.3 Scale 3.4 Labeling 3.5 Dimensioning
4. Sheet Requirements	May include: 4.1 Pipes and fittings 4.2 Pipe Accessories 4.3 Fixtures 4.4 Pumps and equipment
5. Personnel	May include: 5.1 Supervisor 5.2 Coordinator 5.3 BIM Specialist or BIM Modeler
6. Housekeeping procedure	May include: 6.1 Store reference drawing / model and storage media 6.2 Clean work area and drawing / model A3 Printer

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate:
	1.1 Demonstrated ability to interpret sanitary and plumbing drawing / model job requirements
	1.2 Demonstrated ability to identify, select, prepare, and use drawing / model tools, materials, and A3 Printer
	1.3 Demonstrated ability to perform set-up procedure following job requirements
	1.4 Demonstrated ability to lay-out drawings / models and details based on standard sanitary symbols
	1.5 Demonstrated ability to submit complete drawings / models according to job schedule
	1.6 Communicated effectively with others to ensure effective work
	1.7 Observed and complied with the productivity requirements
	1.8 Complied with attitudinal work requirements
2. Resource implications	The following resources should be provided
	2.1 Architectural and engineering base plans and working drawing / model
	2.2 Drawing / model tools, materials, and A3 Printer
3. Methods of Assessment	Competencies maybe assessed using the following
	3.1 Demonstration/Direct Observation with oral questioning
	3.2 Written test
	3.3 Portfolio
	3.4 Third party report
4. Context of assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

UNIT OF COMPETENCY : **CREATE 3D MODEL OF MECHANICAL LAYOUT AND DETAILS**

UNIT CODE : **CON834XXX**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to model 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	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 A3 Printer is set-up for running BIM Tool 1.2 Work instruction is secured following standard operating procedures (SOP) and interpreted according to *mechanical layout drawing / model job requirements* 1.3 *Drawing* / model tools, materials and A3 Printer are identified based on job requirements.	1.1 Setup of A3 Printer based on BIM tool requirement 1.2 Sanitary and plumbing layout drawing / model job requirements 1.3 Standard Operating procedure in handling work instruction 1.4 BIM tools, material, and A3 Printer required based on sanitary and plumbing layout drawing / model job to be performed 1.5 Occupational Safety and Health Guidelines 1.6 DOH Guidelines on Safety and Health as applicable 1.7 Green Building Code 1.8 Energy Efficiency and Conservation Guidelines based on RA11285 1.9 Environmental Laws	1.1 Setting-up of A3 Printer for BIM use 1.2 Reading and comprehension required to interpret the sanitary and plumbing layout drawing / model job requirements 1.3 Handling work instruction based on standard operating procedure 1.4 Identifying the BIM tools, material, and A3 Printer required based on sanitary and plumbing layout drawing / model job to be performed 1.5 Applying Occupational Safety and Health Guidelines 1.6 Applying DOH Guidelines on Safety and Health 1.7 Applying Green Building Code 1.8 Applying Energy Efficiency and Conservation Guidelines 1.9 Applying Environmental Laws

2. Prepare and set-up tools and materials for drawing / model	2.1 A3 Printer is set-up for running BIM Tool 2.2 Drawing / model tools, materials, and A3 Printer are selected and prepared according to job requirements 2.3 Set-up procedure for working drawing / model is performed following job requirements	2.1 Setup of A3 Printer on BIM tool requirement 2.2 Selection of drawing / model tools, materials, and A3 Printer required for the sanitary and plumbing layout drawing / model at hand 2.3 Preparation of tools, materials, and A3 Printer for the sanitary and plumbing layout drawing / mode job to be performed 2.4 Set-up of drawing / model tools, materials, and A3 Printer based on the requirement of the sanitary and plumbing layout drawing / model job to be performed	2.1 Setting-up of A3 Printer for BIM Tool use 2.2 Selecting the appropriate drawing / model tools, materials, and A3 Printer as required for the sanitary and plumbing layout drawing / model job to be performed 2.3 Preparing the required drawing / model tools, materials, and A3 Printer for the sanitary and plumbing layout drawing / model job to be performed 2.4 Setting-up of drawing / model tools, materials, and A3 Printer
3. Layout sanitary and plumbing drawings / models and details	3.1 Sheet requirement is accomplished following ***technical drawing / model standards*** and symbols 3.2 ***Sheet requirement*** is reviewed based on technical drawing / model standards and symbols 3.3 Sheet requirement is re-accomplished following technical drawing / model standards, if necessary	3.1 Accomplishment of sheet following technical drawing / model standards 3.2 Review of the sheet requirement based on technical drawing / model standards 3.3 Revision of the sheet requirement, as needed, following the technical drawing / model standards	3.1 Accomplishing the sheet following the technical drawing / model standards 3.2 Reviewing the sheet requirement based on the technical drawing / model standards 3.3 Revising eh sheet requirement following the technical drawing / model standards

4. Submit complete drawings / models	4.1 Complete *drawing* / model is submitted to *personnel* following SOP. 4.2 Comments and corrections are noted for final drawings / models following SOP. 4.3 Comments and corrections are integrated into final drawing / model based on job requirements 4.4 *Housekeeping procedure* is performed following SOP	4.1 Submission of complete drawing / model to the personnel following the Standard Operating Procedure (SOP) 4.2 Notation of comments and corrections on final drawing / model following the sop 4.3 Performance of Housekeeping procedure following the SOP	4.1 Submitting the complete drawing / model to the personnel following the SOP 4.2 Noting of comments and corrections on the final drawing / model following the SOP 4.3 Performing the housekeeping procedure following the SOP
	4.1 Complete *drawing* / model is submitted to *personnel* following SOP.	4.1 Submission of complete drawing / model to the personnel following	4.1 Submitting the complete drawing / model to the personnel following the

RANGE OF VARIABLES

VARIABLE	RANGE
1. Mechanical layout Drawing / model job requirements	May include: 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	May Include: 2.1 Generated plans 2.2 Construction Drawing 2.3 Detailed engineering drawings 2.4 Combined/Coordinated Services Drawings 2.5 Shop drawings
3. Technical drawing / model standards	May include: 3.1 Lines 3.2 Font & Font Size 3.3 Scale 3.4 Labeling 3.5 Dimensioning
4. Sheet Requirement	May include: 4.1 Pipes and fittings 4.2 Ducts, flex ducts and duct fittings 4.3 Devices 4.4 Sprinklers 4.5 Air Terminals 4.6 Mechanical and equipment
5. Personnel	May include: 5.1 Supervisor 5.2 Coordinator 5.3 BIM Specialist or BIM Modeler
6. Housekeeping procedure	May include: 6.1 Store reference drawing / model and storage media 6.2 Clean work area and drawing / model A3 Printer

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Demonstrated ability to interpret mechanical layout drawing / model job requirements 1.2 Demonstrated ability to identify, select, prepare, and use drawing / model tools, materials and A3 Printer 1.3 Demonstrated ability to perform set-up procedure following job requirements 1.4 Demonstrated ability to lay-out drawings / models and details based on standard mechanical symbols 1.5 Demonstrated ability to submit complete drawings / models according to job schedule 1.6 Communicated effectively with others to ensure effective work 1.7 Observed and complied with the productivity requirements 1.8 Complied with attitudinal work requirements
2. Resource implications	The following resources should be provided 2.1 Architectural and engineering base plans and working drawing / model 2.2 Drawing / model tools, materials, and A3 Printer
3. Methods of Assessment	Competencies maybe assessed using the following 3.1 Demonstration/Direct Observation with oral questioning 3.2 Written test 3.3 Portfolio 3.4 Third party report
4. Context of assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.

SECTION 3 TRAINEE ENTRY REQUIREMENTS, TRAINER'S QUALIFICATION AND LIST OF TOOLS, EQUIPMENT AND MATERIALS

3.1 TRAINEE ENTRY REQUIREMENTS

Trainees or students wishing to enroll in this program must possess the following requirements:

- Must possess good communication skills.
- Can perform basic mathematical computation and mensuration
- Holder of National Certificate Level II in Technical Drafting or at least graduate of Senior High School Graduate with elective in drafting or with at least 1-year work experience as technical draftsman or AutoCAD Operator

3.2 TRAINERS' QUALIFICATION FOR Basic 3D Building Information Modeling Level III

- Must be a holder of Trainer's Methodology Certificate (TMC) OR must have training of trainer's certificate OR must be a practicing trainer for two (2) years within the last five (5) years

- Must have at least three (3) years industry experience in 3D Building Information Modeling for Mechanical, Electrical, Plumbing, and Sanitary (MEPS) or Architectural and Structural layout and details

3.3 TOOLS, MATERIALS AND EQUIPMENT

Recommended list of tools, equipment, and materials for the training of 20 trainees for Basic 3D Building Information Modeling NC III.

Up-to-date tools, materials, and equipment of equivalent functions can be used as alternatives. This also applies in consideration of community practices and their availability in the local market.

TOOLS	
QTY	Description
1 Unit	A3 Printer
1 Unit	60 "- Screen Monitor / Flat Smart TV

MATERIALS	
QTY	**Description**
4 sets	Ink / Toner
21 sets	32 GB - USB
1 Ream	A3 Paper

EQUIPMENT	
QTY	**Description**
21 sets	Quad-core multi-threaded CPU @ 3.5 GHz, 16 GB RAM (dual channel), dedicated video card with 4 GB VRAM and DX11 compatible, 256GB SSD/1TB HDD, 22in. full HD (1080p) display, keyboard and mouse. Microsoft Windows 10, 64-bit Enterprise or Pro with Office Basic
21 sets	BIM Authoring Tool Software for Architectural, Structural and MEPS

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The MEMBERS of the TESDA Board and Secretariat

The MANAGEMENT and STAFF of the TESDA Secretariat
- Qualifications and Standards Office (QSO)

- Competency Standards Development Division
  - **MA. ISABEL G. GAMUROT**
  - **EVANGELINE A. COSEP**
  - **HOWARD MARK N. PLETE**