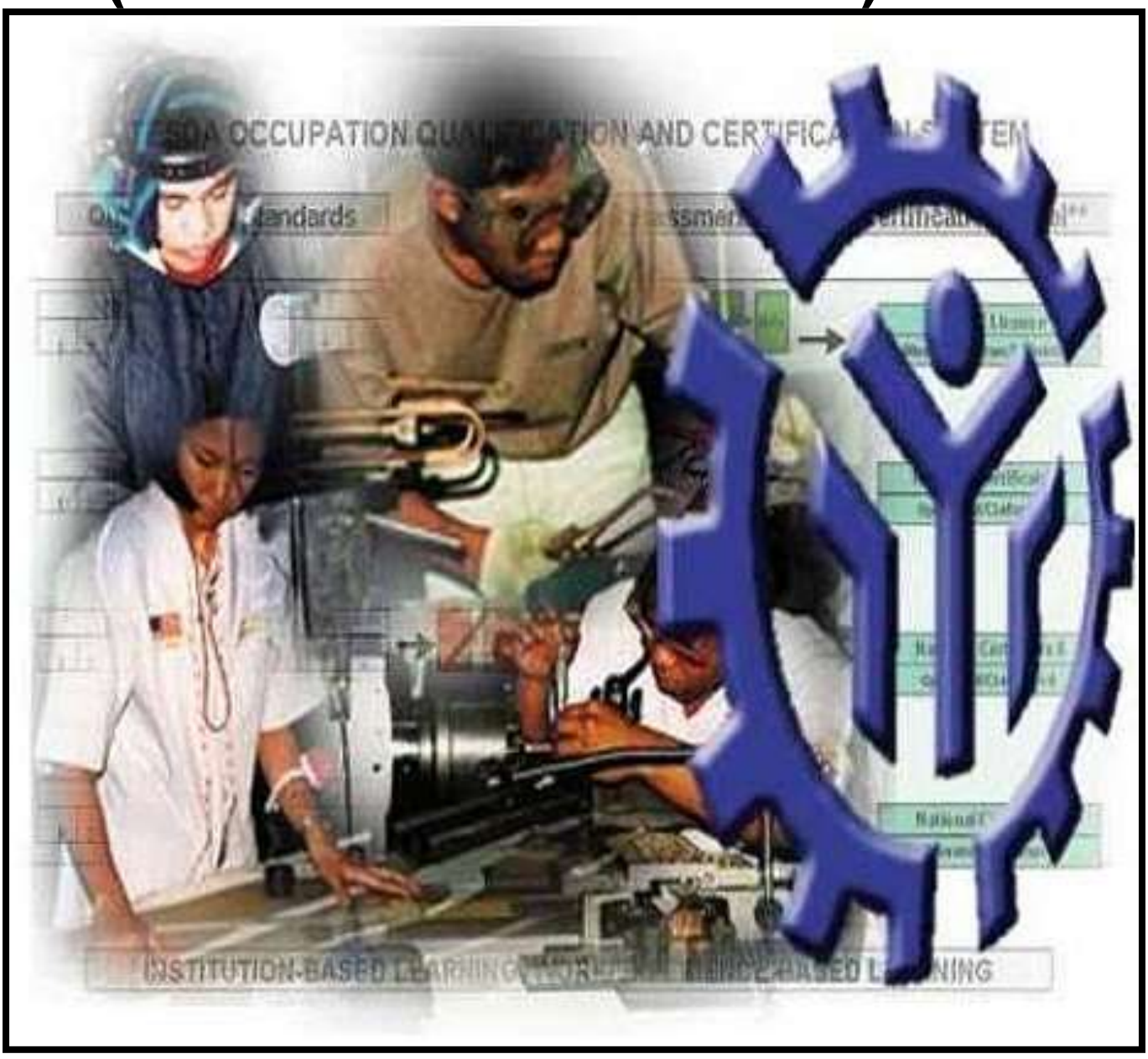
TRAINING REGULATIONS

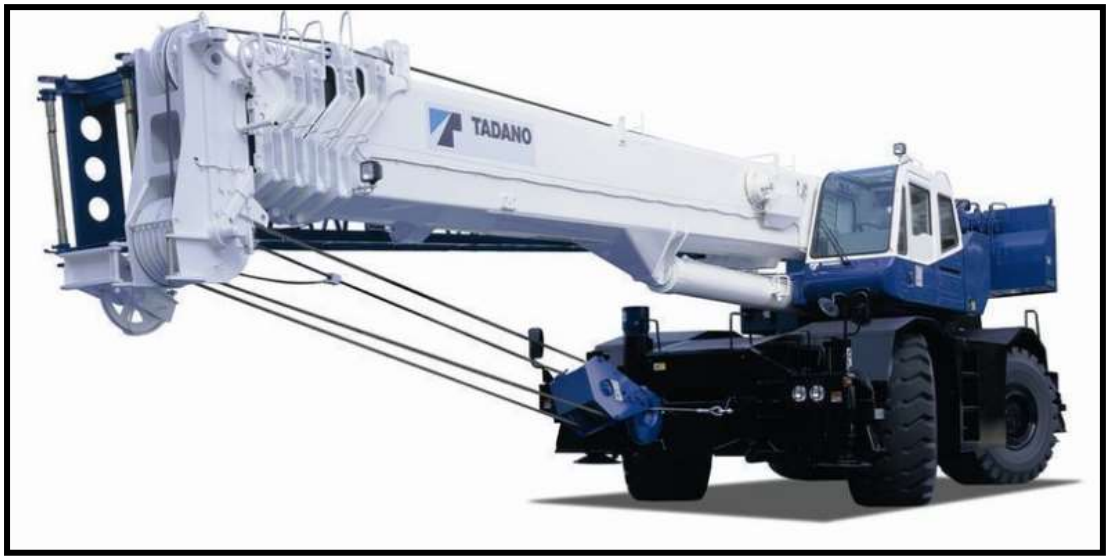
HEAVY EQUIPMENT OPERATION (ROUGH TERRAIN CRANE) NC III



CONSTRUCTION SECTOR (HEAVY EOUIPMENT OPERATION)

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

ROUGH TERRAIN CRANE



Technical Education and Skills Development Act of 1994
(Republic Act No. 7796)

Section 22, "Establishment and Administration of the National Trade Skills Standards" of the RA 7796 known as the TESDA Act mandates TESDA to establish national occupational skill standards. The Authority shall develop and implement a certification and accreditation program in which private industry group and trade associations are accredited to conduct approved trade tests, and the local government units to promote such trade testing activities in their respective areas in accordance with the guidelines to be set by the Authority.

The Training Regulations (TR) serves as basis for:

1. Development of curriculum and assessment tools
2. Registration and delivery of training programs; and
3. Establishment of competency assessment and certification arrangements.

Each TR has four sections:

Section 1 **Definition of Qualification** - describes the qualification and defines the competencies that comprise the qualification.

Section 2 **The Competency Standards** format was revised to include the Required Knowledge and Required Skills per element. These fields explicitly state the required knowledge and skills for competent performance of a unit of competency in an informed and effective manner. These also emphasize the application of knowledge and skills to situations where understanding is converted into a workplace outcome.

Section 3 **Training Arrangements** – contain the information and requirements which serve as bases for training providers in designing and delivering competency-based curriculum for the qualification. The revisions to Section 3 entail identifying the Learning Activities leading to achievement of the identified Learning Outcome.

Section 4 **Assessment and Certification Arrangements** - describe the policies governing assessment and certification procedures for the qualification.

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TRAINING REGULATIONS FOR

HEAVY EQUIPMENT OPERATION – ROUGH TERRAIN CRANE

SECTION 1 HEAVY EQUIPMENT OPERATION (ROUGH TERRAIN CRANE)

The **HEAVY EQUIPMENT OPERATION (ROUGH TERRAIN CRANE) NC III** qualification consists of competencies that workers must achieve to enable them to perform tasks such as inspection, basic preventive maintenance, interpreting load chart, constructing lifting plan and, lifting and transferring of heavy loads in construction sites or other locations with the use of a rough terrain crane.

This qualification is packaged from the competency map of Construction - Heavy Equipment sub-sector as shown in Annex A.

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
CON931201	Prepare construction materials and tools
CON311201	Observe procedures, specifications and manuals of instruction
CON311202	Interpret drawings and plans
CON311203	Perform mensurations and calculations
CON311204	Maintain tools and equipment

CODE NO.	CORE COMPETENCIES
CON834304	Perform pre and post-operation procedures for rough terrain crane
CON834305	Perform basic preventive maintenance servicing for rough terrain crane
CON834306	Perform productive operation for rough terrain crane

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

- Rough terrain crane operator

SECTION 2 COMPETENCY STANDARDS

This section gives the details and contents of the units of competency required in **HEAVY EQUIPMENT OPERATION (ROUGH TERRAIN CRANE) NC III**. These units of competency are categorized into basic, common and core competencies.

BASIC COMPETENCIES

UNIT OF COMPETENCY : LEAD WORKPLACE COMMUNICATION

UNIT CODE : 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:** Case problem 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 Team work 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,	2.1 Work plan and procedures 2.2 Work requirements and targets 2.2 Individual and group expectations and assignments 2.3 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

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	whenever possible		
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	4.1 Performance Coaching 4.2 Performance management 4.3 Performance Issues	4.1 Communication skills required for leading teams 4.2 Coaching skill

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	tasks which might impact on client/customer needs and satisfaction 4.5 Team operations are monitored to ensure that employer/client needs and 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 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. 4.2 Recommendations are presented to appropriate personnel. 4.3 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. Gant chart, Pert CPM and graphs 2.7. Scattergrams
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. Co-ordination 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 of time, 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 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 1.2Norms of behavior for interacting and dialogue with specific groups (e. g., Muslims and other non-Christians, non-Catholics, tribes/ethnic groups, foreigners) 1.3Different 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 Transtheoretical 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 Transtheoretical 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:** • Established the reasons why innovative systems are required • Established the goals of a new innovative system • Analyzed current organizational systems to identify gaps and barriers to innovation. • Assessed work procedures, processes and systems in terms of innovative practices. • Generate practical action plans for improving work procedures, and processes. 1.1 Reviewed the trial innovative work system and adjusted reflect evaluation feedback, knowledge management systems and future planning. 1.2 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 and edit, format & 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 are 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

ELEMENT	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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 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	2.1. 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 2.7. Methods of entering and processing information 2.8. WWW enabled applications	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 2.6. Extracting data and format reports 2.7. Describing methods of entering and processing information 2.8. Using WWW applications

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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 work place or in a simulated work place 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 work 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

ELEMENTS	PERFORMANCE CRITERIA ***Italicized terms*** are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED 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 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 3.1 Basic financial management 3.2 Basic financial accounting 3.3 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 : **PREPARE CONSTRUCTION MATERIALS AND TOOLS**

UNIT CODE : **CON931201**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on identifying, requesting and receiving construction materials and tools in various workplace settings.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variable	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify materials	1.1 Materials are identified as per job requirements 1.2 Quantity and ***description of materials and tools*** conform with the job requirements 1.3 Tools and accessories are identified according to job requirements	1.1 Different work specifications 1.2 Types and uses of heavy equipment tools and accessories	1.1 Identifying tools and accessories according to the job requirements
2. Prepare requisition of materials	2.1 ***Materials and tools*** needed are requested according to the identified requirements 2.2 Request is done as per ***company standard operating procedures (SOP)*** 2.3 Substitute materials and tools are provided without sacrificing cost and quality of work	2.1 Work requirements 2.2 Types and uses of Masonry tools and accessories 2.3 Material take-off 2.4 Requisition procedures	2.1 Preparing material take-off 2.2 Requesting materials and tools
3. Receive and inspect materials	3.1 Materials and tools issued are inspected as per quantity and specification 3.2 Tools, accessories and materials are checked 3.3 Materials and tools are set aside to appropriate location	3.1 Policy on receiving material deliveries 3.2 Material and tools quality and defects 3.3 Material handling	3.1 Checking and inspecting materials and tools 3.2 Storing/ stacking of tool and materials

RANGE OF VARIABLES

VARIABLE	RANGE
1. Description of materials and tools	May include: 2.1 Brand name 2.2 Size 2.3 Capacity 2.4 Kind of application
2. Tools and accessories	May include: 1.1 Electrical supplies 1.2 Mechanical supplies 1.3 Cleaning supplies
3. Company standard operating procedures	May include: 3.1 Job order 3.2 Requisition slip 3.3 Borrower slip

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Listed materials and tools according to quantity and job requirements 1.2 Requested materials and tools according to the list prepared and as per company SOP 1.3 Inspected issued materials and tools as per quantity and job specifications 1.4 Provided tools with safety devices
2. Resource Implications	**The following resources should be provided:** 2.1 Workplace location 2.2 Materials relevant to the unit of competency 2.3 Plans, drawings and specifications relevant to the activities
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Direct observation/Demonstration 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 : **OBSERVE PROCEDURES, SPECIFICATIONS AND MANUALS OF INSTRUCTIONS**

UNIT CODE : **CON311201**

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

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify and access specification/ manuals	1.1 Appropriate manuals are identified and accessed as per job requirements 1.2 Version and date of manual are checked to ensure that correct specification and procedures are identified	1.1 Types of manuals used in Masonry 1.2 Identification of symbols used in the manuals	1.1 Identifying manuals and specifications 1.2 Accessing information and data
2. Interpret manuals	2.1 Relevant sections, chapters of specifications/ manuals are located in relation to the work to be conducted 2.2 Information and procedure in the manual are interpreted in accordance with industry practices	2.1 Types of manuals used in Masonry 2.2 Types of symbols used in manuals 2.3 System of measurements 2.4 Unit conversion	2.1 Interpreting symbols and specifications 2.2 Accessing information and data 2.3 Applying conversion of units of measurements

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Apply information in manual	3.1 ***Manual*** is interpreted according to job requirements 3.2 Work steps are correctly identified in accordance with manufacturer's specification 3.3 Manual data are applied according to the given task 3.4 All correct sequencing and adjustments are interpreted in accordance with information contained on the manual or specifications	3.1 Types of manuals used in Masonry 3.2 Types and application of symbols in manuals 3.3 Unit conversion	3.1 Applying information from manuals
4. Store manuals	4.1 Manual or specification is stored appropriately to prevent damage, ready access and updating of information when required in accordance with company requirements	4.1 Types of manuals used in Masonry 4.2 Manual storing and maintaining procedures	1.1 Storing and maintaining manuals

RANGE OF VARIABLES

VARIABLE	RANGE
1. Manual	May include: 1.1 Manufacturer's Specification Manual 1.2 Maintenance Procedure Manual 1.3 Periodic Maintenance Manual

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires that the candidate:** 1.1 Identified and accessed specification/manuals as per job requirements 1.2 Interpreted manuals in accordance with industry practices 1.3 Applied information in manuals according to the given task 1.4 Stored manuals in accordance with company requirements
2. Resource implications	**The following resources should be provided:** 2.1 All manuals/catalogues relative to construction sector
3. Methods of assessment	**Competency in this unit may be assessed through:** 3.1 Direct observation/Demonstration 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 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 Signs, symbols and data are identified according to job specifications 1.2 ***Signs, symbols*** and data are determined according to ***site regulations***	1.1 Signs and symbols 1.2 Rules and regulations	1.1 Interpreting working drawing
2 Interpret drawings 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 requirements	1.1 Systems of measurement 1.2 Linear measurement 1.3 Dimension 1.4 Unit conversion	1.1 Interpreting drawing 1.2 Matching specification details with existing resources

RANGE OF VARIABLES

VARIABLE	RANGE
1. Signs and symbols	May include: 1.1 Speed limit 1.2 Direction/Road 1.3 Warnings
2. Site regulations	May include: 2.1 Instructions 2.2 Signages 2.3 Work schedules 2.4 Work bulletin boards 2.5 Charts 2.6 Memos 2.7 Site Map 2.8 Emergency response plan 2.9 Permits
2 Tools and materials	May include: 2.1 Rulers 2.2 Protractor 2.3 Steel tape 2.4 Calculator 2.5 Pencil
3 Work plan	May include: 3.1 Job requirements 3.2 Installation instructions 3.3 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
2. Resource Implications	**The following resources should be provided:** 1.4 Workplace 1.5 Drawings and specification relevant to task 1.6 Materials and instrument relevant to proposed activity
3. Methods of Assessment	**Competency in this unit may be assessed through:** 3.1 Direct observation/Demonstration 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 OF COMPETENCY : PERFORM MENSURATIONS AND CALCULATIONS

UNIT CODE : CON311203

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

ELEMENT	PERFORMANCE CRITERIA *Italicized terms* are elaborated in the Range of Variable	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	1.1 Selecting measuring instruments

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

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 propose activity
3. Methods of assessment	**Competency in this unit may be assessed through:** 3.1 Direct observation/Demonstration 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 : **MAINTAIN TOOLS AND EQUIPMENT**

UNIT CODE : **CON311204**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on checking condition, performing preventive maintenance and storing of construction painting tools and equipment.

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Check condition of tools and equipment	1.1 ***Materials, tools and equipment*** are identified according to classification and job requirements 1.2 Non-functional tools and equipment are segregated and labeled according to classification 1.3 Safety of tools and equipment are observed in accordance with manufacturer's instructions 1.4 Condition of ***Personal Protective Equipment (PPE)*** are checked in accordance with manufacturer's instructions	1.1 Use of PPE 1.2 Handling of tools and equipment 1.3 Good housekeeping 1.4 Types and uses of lubricants 1.5 Types and uses of cleaning materials	1.1 Maintaining tools and equipment 1.2 Handling of tools and equipment 1.3 Identifying tools and equipment defects

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Perform basic preventive maintenance	2.1 Appropriate lubricants are identified according to types of equipment 2.2 Tools and equipment are lubricated according to preventive maintenance schedule or manufacturer's specifications 2.3 Measuring instruments are checked and calibrated in accordance with manufacturer's instructions 2.4 Tools are cleaned and lubricated according to standard procedures 2.5 Defective instruments, equipment and accessories are inspected and replaced according to manufacturer's specifications 2.6 Tools are inspected, repaired and replaced after use 2.7 Work place is cleaned and kept in safe state in line with Occupational Safety and Health (OSHS)	2.1 Use of PPE 2.2 Handling of tools and equipment 2.3 Good housekeeping 2.4 Types and uses of lubricants 2.5 Types and uses of cleaning materials 2.6 Methods and techniques 2.7 Procedures	2.1 Handling of tools and equipment 2.2 Performing preventive maintenance

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Store tools and equipment	3.1 Inventory of tools, instruments and equipment are conducted and recorded as per company practices 3.2 Tools and equipment are stored safely in appropriate locations in accordance with manufacturer's specifications or company procedures	3.1 Use of PPE 3.2 Handling of tools and equipment 3.3 Storing procedures and techniques 3.4 Storage conditions/ locations	3.1 Storing tools and equipment 3.2 Handling of tools and equipment

RANGE OF VARIABLES

VARIABLE	RANGE
1. Materials	May include: 1.1 Lubricants 1.2 Cleaning materials 1.3 Rust remover 1.4 Rugs 1.5 Spare parts
2. Tools and equipment	May include: 2.1 Tools Cutting tools - hacksaw, crosscut saw Boring tools - brace, hand drill Holding tools - vise grip, C-clamp, bench vise Threading tools - die and stock, taps 2.2 Measuring instruments/equipment
3. Personal Protective Equipment (PPE)	May include: 3.1 Goggles 3.2 Gloves 3.3 Safety shoes 3.4 Hard hat 3.5 Reflectorized Vest

EVIDENCE GUIDE

1. Critical aspects of competency	**Assessment requires that the candidate:** 1.1 Selected and used appropriate processes, tools and equipment to carry out task 1.2 Identified functional and non-functional tools and equipment 1.3 Checked, lubricated and calibrated tools, equipment and instruments according to manufacturer's specifications 1.4 Replaced defective tools, equipment and their accessories 1.5 Observed and applied safe handling of tools and equipment and safety work practices 1.6 Prepared and submitted inventory report, where applicable 1.7 Maintained workplace in accordance with OSHA regulations 1.8 Stored tools and equipment safely in appropriate locations and in accordance with company practices
2. Resource implications	**The following resources should be provided:** 2.1 Workplace 2.2 Maintenance schedule 2.3 Maintenance materials, tools and equipment relevant to the proposed activity/task
3. Methods of assessment	**Competency in this unit may be assessed through:** 3.1 Direct observation/Demonstration 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.

CORE COMPETENCIES

UNIT OF COMPETENCY : **PERFORM PRE AND POST-OPERATION PROCEDURES FOR ROUGH TERRAINCRANE**

UNIT CODE : **CON834304**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in performing visual and operation check before and after productive operation of rough terrain crane.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** *terms are elaborated* in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Perform visual check of rough terrain crane	1.1 ***Capacity of rough terrain crane*** is selected based on job requirements. 1.2 ***Operator-serviceable (OS) parts*** are checked in accordance with equipment checklist and manufacturer's procedures. 1.3 ***Inspection*** is performed with equipment checklist and with engine stopped/not running. 1.4 ***Personal Protective Equipment (PPE)*** is used in accordance with Rule 1080 of Occupational Safety and Health Standards 1.5 Work area is cleaned according to safety and environmental regulations (e.g. PD 1152 Section 6, 8 & 42). 1.6 Required output is completed based on accomplished checklist.	1.1 DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 1.2 Procedures in conducting visual check 1.3 Computation of load versus capacity of rough terrain crane 1.4 Functions of parts and components of rough terrain crane 1.5 Factors affecting productivity 1.6 Productivity work measurements 1.7 Ways of improving productivity	1.1 Following visual and inspection procedures 1.2 Calculating load and capacity of rough terrain crane 1.3 Identifying parts and functions 1.4 Accomplishing checklist 1.5 Using PPE 1.6 Applying productive methods and techniques

ELEMENT	PERFORMANCE CRITERIA ***Italicized** terms are elaborated* in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Perform "B L O W A F" check	2.1 ***"BLOWAF" check*** is performed using checklist with engine stopped/not running. 2.2 ***Fluid*** levels are maintained in accordance with equipment maintenance manual. 2.3 Abnormal conditions noted in checklist and reported to ***authorized person*** 2.4 Personal Protective Equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 2.5 Required output is completed based on accomplished checklist.	2.1 Procedures in performing "BLOWAF" check 2.2 DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 2.3 Waste disposal procedures 2.4 Fluid's level and contamination 2.5 Factors affecting productivity 2.6 Productivity work measurements 2.7 Ways of improving productivity	2.1 Accomplishing checklist 2.2 Applying waste disposal procedures 2.3 Following "BLOWAF" checking procedures 2.4 Determining fluid level and contamination 2.5 Using PPE 2.6 Applying productive methods and techniques
3. Perform visual check for super structure, lower structure and power train components	3.1 ***Super structure, lower structure and power train components*** are checked in accordance with checklist and manufacturer's procedures 3.2 Super structure, lower structure and power train components are secured for safety lifting operation 3.3 Abnormal conditions are noted in checklist and reported to authorized person 3.4 Personal Protective Equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards Requirements 3.5. Required output is completed based on accomplished checklist.	3.1 Procedures in visual check for super structure, lower structure and power train components 3.2 DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 3.3 Functions of super structure, lower structure and power train components 3.4 Factors affecting productivity 3.5 Productivity work measurements 3.6.Ways of improving productivity	3.1 Accomplishing checklist 3.2 Following visual checking for super structure, lower structure and power train components 3.3 Identifying parts and functions 3.4 Using PPE 3.5 Applying productive methods and techniques

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** *terms are elaborated* in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Perform operation check	4.1. ***Starting/running check/operation check*** is performed with checklist and in accordance with manufacturer's recommendations. 4.2. Mechanical components are checked for normal functioning based on manufacturer's specifications. 4.3. Function check is performed with equipment checklist and while engine is running. 4.4. ***Safety devices*** are checked for proper functions in accordance with safe operating procedures 4.5. Personal Protective Equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards 4.6. Required output is completed based on accomplished checklist.	4.1 Start-up and warming procedures 4.2 Procedures in inspection while the engine is running 4.3 DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 4.4 Warning signs and symbols 4.5 Functions of all components and safety devices 4.6 Factors affecting productivity 4.7 Productivity work measurements 4.8 Ways of improving productivity	4.1. Accomplishing checklist 4.2. Following inspection procedures while the engine is running 4.3. Testing of rough terrain crane 4.4. Using PPE 4.5. Applying productive methods and techniques

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** *terms are elaborated* in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
5. Perform post-operation procedures	5.1. Rough terrain crane is parked and turned off after productive operation in accordance to manufacturer's manual. 5.2. Controls are set into neutral position and parking brakes are engaged in accordance to manufacturer's manual. 5.3. ***Safety locks*** and brakes are all engaged in accordance with manufacturer's manual. 5.4. Inspection is re-conducted while doing engine cool down 5.5. Daily equipment time record/report (DETR) is accomplished/submitted according to company rules and regulations 5.6. Personal Protective Equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards	5.1 Company rules and regulations 5.2 Parking and shut-down procedures 5.3 DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 5.4 Factors affecting productivity 5.5 Productivity work measurements 5.6 Ways of improving productivity	5.1 Accomplishing DETR 5.2 Following rules and regulations in parking and shutting down rough terrain crane 5.3 Using PPE 5.4 Applying productive methods and techniques 5.5 Preforming post operation procedures

RANGE OF VARIABLES

VARIABLE	RANGE
1. Capacity of rough terrain crane	May include: 1.1 10 - 25 tons 1.2 25 - 50 tons 1.3 50 tons and above
2. Operator serviceable parts (OS)	May include: 2.1 Air cleaner 2.2 Battery terminals/connection/clamp/case 2.2 Fan belt 2.3 Grease/lube points 2.4 Fuel water separator/radiator 2.5 Tire inflation 2.6 Fuel tank 2.7 Hydraulic and brake master cylinder 2.8 Engine oil fan 2.9 Lights 2.10 Steering/suspension
3. Inspection	May include: 3.1 Engine off 3.1.1 Leaks 3.1.2 Worn out/damaged parts 3.1.3 Fluid levels 3.1.4 Loose parts and accessories (nuts/bolts/belts) 3.1.5 Missing parts and accessories 3.1.6 Pulleys (gantry and boom end) 3.1.7 Hook block assembly 3.1.7.1 Sheaves 3.1.7.2 Hook and latch 3.1.8 Wire rope cable/clip 3.1.9 Levers and controls 3.1.9.1 Hoist 3.19.2 Steering wheels 3.1.9.3 Pedals 3.1.9.4 Hand brake 3.1.9.5 Swing 3.1.10 Counter weight 3.1.11 Outrigger

VARIABLE	RANGE
	3.2 Engine on 3.2.1 Gauges and controls 3.2.2 Safety devices 3.2.3 Oil and air leaks 3.2.4 Working equipment function 3.2.4.1 Outriggers 3.2.4.2 Boom 3.2.4.3 Hoist 3.2.4.4 Steering wheels 3.2.4.5 Pedals 3.2.4.6 Hand brake 3.2.4.7 Swing 3.2.5 Electrical lighting system
4. Personal Protective Equipment (PPE)	May include: 4.1 Hard hat 4.2 Goggles 4.3 Gloves 4.4 Safety shoes 4.5 Safety vest
5. B L O W A F check	May include: 5.1 **B**attery (starting and charging system) 5.2 **L**ight (lighting system) 5.3 **O**il (lubricating system) 5.4 **W**ater (cooling system) 5.5 **A**ir (intake and exhaust system) 5.6 **F**uel (fuel system)
6. Fluid	May include: 6.1 Engine oil 6.2 Hydraulic oil 6.3 Radiator coolant/radiator 6.4 Battery electrolyte/distilled water 6.5 Brake/clutch fluid 6.6 Transmission/Gear oil 6.7 Steering oil 6.8 Fuel 6.9 Torque converter oil 6.10 Automatic transmission fluid
7. Authorized person	May include: 7.1 Equipment Supervisor 7.2 Equipment Dispatcher/Foreman 7.3 Equipment Maintenance personnel

VARIABLE	RANGE
8. Super structure, lower structure and power train components	May include: <u>Super structure components</u> 8.1 Boom 8.2 Extension Boom and Jibs 8.3 Hook 8.4 Hoist (Main and Auxiliary) 8.5 Counterweight 8.6 Turntable 8.7 Hydraulic motor (Main and Auxiliary) 8.8 Slewing hydraulic motor 8.9 Hydraulic cylinder (Boom, Telescopic) 8.10 Hoist drum (Main and Auxiliary) 8.11 Boom sheaves 8.12 Anti-two block <u>Lower Structure</u> 8.13 Outriggers 8.13.1 Outrigger pads 8.13.2 Outrigger beams 8.13.3 Hydraulic cylinders <u>Power train</u> 8.14 Clutch and torque converter 8.15 Transmission 8.16 Differential 8.17 Tires/ Stud and Bolts
VARIABLE	**RANGE**
9. Starting/running check/operation check	May include: 9.1 Controls 9.1.1 Travel 9.1.2 Hoist 9.1.3 Swing 9.1.4 Outrigger 9.1.5 Boom 9.2 Gauges 9.2.1 Hour meter 9.2.2 Battery charging 9.2.3 Pressure (oil and air) 9.2.4 Temperature (oil and water) 9.2.5 RPM (Tachometer) 9.2.6 Boom angle indicator 9.2.7 Fuel indicator 9.2.8 Speedometer 9.2.9 Hydraulic pressure 9.3 Leaks in 9.3.1 Fuel 9.3.2 Oil 9.4 Electrical/switches 9.4.1 Lights 9.4.2 Horns 9.4.3 Wiper 9.5 Steering and brake

10. Safety devices	May include: 10.1 Load moment indicator (LMI) 10.2 Anti two block (Limit switch) 10.3 Automatic crane stopper (ACS) 10.5 Back horn/warning horn 10.6 Signal/stop light 10.7 Blinkers 10.8 Safety belt 10.9 Parking brake 10.10 Anemometer 10.11 Ground connection near high tension wires
11. Safety locks	May include: 11.1 Swing lock 11.2 Hoist lock 11.3 Control lever lock 11.4 Door lock

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Performed visual check of crawler crane 1.2 Performed "BLOWAF" check 1.3 Performed visual check for super structure, lower structure and power train components 1.4 Performed operation check 1.5 Observed safety measures applicable to worksite operation 1.6 Communicated effectively with others to ensure effective work operation
2. Resource Implications	**The following resources should be provided:** 2.1 Work area for rough terrain crane operation 2.2 Access to rough terrain crane and manuals 2.3 PPE
3. Method of Assessment	**Competency in this unit may be assessed through:** 3.1 Written examination 3.2 Direct observation/Demonstration with oral questioning
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : **PERFORM BASIC PREVENTIVE MAINTENANCE SERVICING FOR ROUGH TERRAINCRANE**

UNIT CODE : **CON834305**

UNIT DESCRIPTOR : This unit involves the knowledge, skills and attitudes required in cleaning/greasing, adjusting and replacing operator-serviceable (OS) parts of rough terrain crane.

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Perform adjustment or replacement for noted defects	1.1 ***Minor defects*** are identified and repaired/replaced in accordance with manufacturer's procedures. 1.2 ***Basic hand tools and portable powered tools*** are selected based on job requirements. 1.3 ***Major defects*** are identified using checklist and referred to ***authorized personnel*** for action 1.4 Personal Protective Equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards	1.1 DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 1.2 Waste disposal procedures 1.3 Volume and capacity 1.4 Clearance and distances 1.5 Types of fluids and lubricants 1.6 Procedures in performing adjustments or replacements for noted defects. 1.7 Types and uses of basic hand tools and portable powered tools 1.8 Structure and function of rough terrain crane components 1.9 Factors affecting productivity 1.10 Productivity work measurements 1.11 Ways of improving productivity	1.1 Application of different basic hand tools and portable powered tools 1.2 Identifying defects 1.3 Performing adjustments or replacements for minor defects 1.4 Using PPE 1.5 Applying productive methods and techniques 1.6 Implementing Proper Waste Management

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2 Perform basic preventive maintenance servicing (PMS)	2.1 ***Operator's Serviceable parts*** are identified and serviced according to manufacturer's recommendations. 2.2 ***Standard parameters*** are checked according to manufacturer's recommendations. 2.3 ***Fluids and lubricants*** are used based on manufacturer's manual. 2.4 Basic hand tools, portable powered tools and consumable materials are identified and used in accordance with job requirements. 2.5 ***Basic preventive maintenance servicing (PMS)*** is carried out in accordance with manufacturer's and ***site regulations*** 2.6 ***Site conditions*** are considered during PMS 2.7 Personal Protective Equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards	2.1 Understanding Operator's Maintenance Manual (OMM) 2.2 DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 2.3 Site and weather conditions 2.4 Waste disposal procedures 2.5 Volume/capacity 2.6 Clearance and distances 2.7 Types of fluids and lubricants 2.8 Procedures in basic preventive maintenance servicing 2.9 Types and uses of basic hand tools and portable powered tools 2.10 Factors affecting productivity 2.11 Productivity work measurements 2.12 Ways of improving productivity	2.1 Performing basic preventive maintenance servicing (PMS) 2.2 Application of basic hand tools and portable powered tools 2.3 Application of fluids and lubricants 2.4 Handling, segregation and disposal of hazardous waste 2.5 Using PPE 2.6 Applying productive methods and techniques

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3 Prepare equipment reports	3.1 Equipment checklist is accomplished in accordance with manufacturer's/company requirements 3.2 Equipment defects are reported to appropriate personnel 3.3 Document control procedures is observed based on company requirements 3.4 Personal Protective Equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards	3.1. DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 3.2. Completion of checklist and defects reports 3.3. Document control procedures	3.1 Prepare equipment report 3.2 Using PPE

RANGE OF VARIABLES

VARIABLE	RANGE
1. Minor defects	May include: 1.1 Weak battery 1.2 Tire inflation 1.3 Belt tension 1.4 Clogged air cleaner 1.5 Defective radiator cap
2. Basic hand tools and portable powered tools	May include: 2.1 Hand tools 2.1.1 Wrenches 2.1.2 Pliers 2.1.3 Brush (steel, paint) 2.1.4 Grease gun 2.1.5 Hammer (ball-peen, rubber, test) 2.1.6 Vice grip 2.1.7 Meter tape 2.1.8 Screw driver (Philips and flat tip) 2.1.9 Tire gauge (instrument) 2.2 Portable Powered Tools 2.2.1 High pressure washer 2.3 Air compressor
3. Major defects	May include: 3.1 Busted hydraulic hose 3.2 Hard starting engine 3.3 Excessive engine oil consumption 3.4 Leakage on 3.4.1 Air 3.4.2 Fuel 3.4.3 Cooling 3.4.4 Hydraulic system 3.5 Faulty gauges 3.6 Damaged/broken pulley 3.7 Incorrect/defective Load Moment Indicator (LMI) 3.8 Defective/frayed wire rope 3.9 Busted/flat tires 3.10 Defective electrical components 3.10.1 Charging 3.10.2 Lighting 3.10.3 Starting 3.10.4 Monitoring/gauges
4 Authorized personnel	May include: 4.1 Equipment supervisor 4.2 Equipment Dispatcher/Foreman 4.3 Equipment Maintenance personnel

VARIABLE	RANGE
5 Operator serviceable (OS) parts	May include: 5.1 Battery clamps, Battery distilled water 5.2 Belts 5.3 Filters 5.3.1 Air cleaner 5.3.2 Water fuel separator/drain valve 5.3.3 Hydraulic filter 5.3.4 Fuel filter 5.4 All fluid caps 5.5 All grease points and fittings 5.6 Wire rope grease/lubricants 5.7 Tire inflation
6. Standard parameters	May include: 6.1 Oil pressure 6.2 Air pressure 6.3 Temperatures 6.4 Tension 6.5 Clearance and distances
7. Fluids and lubricants	May include: 7.1 Engine oil 7.2 Hydraulic oil 7.3 Brake fluid 7.4 Grease 7.5 Coolant 7.6 Battery solutions 7.7 Transmission oil 7.8 Fuel
8. Basic preventive maintenance servicing	May include: 8.1 Check battery clamps 8.2 Check fan belt conditions (cracked or worn-out) 8.3 Adjust belt tensions (if necessary) 8.4 Clean/Replace filters 8.4.1 Air cleaner 8.4.2 Water separator 8.4.3 Hydraulic filter 8.4.4 Fuel filter 8.5 Replace defective fluid caps 8.6 Grease all fittings on lube points 8.7 Grease wire ropes
9. Site regulations	May include: 9.1 Instructions 9.2 Signages 9.3 Work schedules 9.4 Work bulletin boards 9.5 Charts 9.6 Memos 9.7 Site Map 9.8 Emergency response plan 9.9 Permits

VARIABLE	RANGE
10. Site conditions	May include: 10.1 Dusty 10.2 Windy 10.3 Sunny 10.4 Rainy 10.5 Crowded 10.3 Terrain (muddy and slippery)

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Performed adjustment or replacement for noted defects 1.2 Performed basic preventive maintenance servicing (PMS) 1.3 Prepare equipment reports 1.4 Observed safety measures applicable to worksite operation 1.5 Communicated effectively with others to ensure effective work operation
2. Resource Implications	**The following resources should be provided:** 2.1 Access to rough terrain crane and manuals 2.2 Access to rough terrain crane and lifting gears 2.3 Basic hand tools and portable powered tools 2.4 Fluids and lubricants 2.5 PPE 2.6 Safety signages/barricades
3. Method of Assessment	**Competency in this unit may be assessed through:** 3.1 Written examination 3.2 Direct observation/Demonstration with oral questioning
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

UNIT OF COMPETENCY : **PERFORM PRODUCTIVE OPERATION FOR ROUGH TERRAIN CRANE**

UNIT CODE : **CON834306**

UNIT DESCRIPTOR : This unit involves the knowledge, skills and attitudes in traveling, loading and unloading to low-bed trailer, setting-up, interpreting load chart and lifting operation for rough terrain crane.

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Travel the rough terrain crane	1.1 Road conditions are considered before travelling the crane 1.2 Work area is surveyed for ***potential hazards*** in accordance with safe operating procedures. 1.3 Outrigger assembly is secured during travel in accordance with manufacturers manual. 1.4 Telescopic boom is secured and in place during travel in accordance with manufacturers manual. 1.5 Travel speed is observed in accordance with traffic rules and regulations 1.6 Hook block on front frame is secured in accordance with manufacturers manual. 1.7 Aid of a rigger is required on the entire operation in accordance with standard operating procedures. 1.8 ***Unexpected situations*** are responded in line with company rules and regulations 1.9 Personal Protective Equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards	1.1 DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 1.2 Traffic rules and regulations 1.3 Site and weather conditions 1.4 Road worthiness 1.5 Clearance and distances 1.6 Speed limit 1.7 Procedures in operating, travelling of rough terrain crane 1.8 Factors affecting productivity 1.9 Productivity work measurements 1.10 Ways of improving productivity	1.1 Interpreting and following traffic rules and regulations 1.2 Driving skills 1.3 Travelling the crane 1.4 Using PPE 1.5 Applying productive methods and techniques

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Load and unload rough terrain crane to low-bed trailer	2.1 Low-bed trailer for transporting the rough terrain crane is selected according to job requirements. 2.2 Boom position is followed during loading and unloading in accordance with manufacturer's recommendations 2.3 Rough terrain crane ***components and attachments*** are positioned and secured based on manufacturer's recommendations. 2.4 Verbal instructions and hand signals are conveyed with authorized rigger during loading and unloading as per standard operating procedures. 2.5 All safety locks and control levers are secured at neutral position before and after loading based on manufacturer's specifications 2.6 Personal Protective Equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards	2.1 DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 2.2 Hand signals 2.3 Site and weather conditions 2.4 Clearance and distances 2.5 Procedures in loading and unloading 2.7. Factors affecting productivity 2.8. Productivity work measurement 2.9. Ways of improving productivity	2.1 Interpreting verbal instructions and hand signals 2.2 Operating skills in loading and unloading crawler crane to low-bed trailer 2.3 Using PPE 2.4 Applying productive methods and techniques

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Set-up the rough terrain crane	3.1 Site conditions are considered before setting up the crane 3.2 Crane is set-up and positioned in accordance with manufacturer's manual 3.3 Unexpected situations are responded in line with company rules and regulations 3.4 Personal Protective Equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards	3.1 DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 3.2 Hand signals 3.3 Site and weather conditions 3.4 Clearance and distances 3.5 Procedures in setting up the crane 3.6 Factors affecting productivity 3.7 Productivity work measurement 3.8 Ways of improving productivity	3.1 Setting up the crane 3.2 Interpreting and following hand signals 3.3 Using PPE 3.4 Applying productive methods and techniques
4. Interpret load chart and /or load moment indicator and construct lifting plan	4.1 Weight of the load is determined according to ***load information***. 4.2 Lifting capacity is determined according to working radius, boom length and boom angle by manufacturer's specifications 4.3 ***Rigging gears*** are determined and considered as part of the load based on manufacturer's specifications 4.4 Lifting capacity in the load chart and /or load moment indicator is followed according to manufacturer's specifications 4.5 Personal Protective Equipment (PPE) is used in accordance with Rule 1080 of	4.1DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 4.2 Conversion of units 4.3 Procedures in interpreting manual load chart and range diagram/ or load moment indicator to determine crane capacity 4.4 Capacity and uses of rigging gear 4.5 Factors affecting	4.1 Interpreting manual load chart and range diagram/or load moment indicator 4.2 Identifying rigging gears 4.3 Using PPE 4.4 Applying productive methods and techniques 4.5 Constructing lifting plan

	Occupational Safety and Health Standards 4.6 Lifting plan is constructed based on job description	productivity 4.6 Productivity work measurement 4.7 Ways of improving productivity 4.8 Procedures in constructing lifting plan 4.9 Crane capacity based on load chart and/or load moment indicator	

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
5. Perform lifting and transferring of load	5.1 Site and weather conditions are considered before lifting and transferring the load 5.2 ***Safe work procedures and practices*** are observed during lifting operation based on OSH standards and manufacturer's manual 5.3 Optimum engine speed during hoisting or swing operation is controlled based on manufacturer's manual 5.4 Communication with rigger is established and maintained during lifting and transferring of loads based on standard operating procedures 5.5 Unexpected situations are responded in line with company rules and regulations 5.6 Personal Protective Equipment (PPE) is used in accordance with Rule 1080 of Occupational Safety and Health Standards	5.1DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry 5.2 Standard hand Signals 5.3 Site and weather conditions 5.4 Conversion of units 5.5 Crane capacity based on manual load chart and range diagram/ or load moment indicator 5.6 Clearance and distances 5.7 Capacity and uses of rigging gears 5.8 Safety devices 5.9 Procedures in lifting and transferring of load 5.10 Factors affecting productivity 5.11 Productivity work measurements 5.12 Ways of improving productivity	5.1 Performing lifting and transferring of load 5.2 Interpreting and following standard hand signals 5.3 Using PPE 5.4 Applying productive methods and techniques

RANGE OF VARIABLES

VARIABLE	RANGE
1. Potential hazards	May include: 1.1 Other equipment 1.2 Building 1.3 Deep excavation 1.4 Sloping ground 1.5 Uneven terrain 1.6 Overhead “live” electrical wires 1.7 Underground utilities 1.8 Unstable ground
2. Unexpected situations	May include: 2.1 Sudden engine breakdown 2.2 Busted hydraulic hose and oil leakages 2.3 Broken wire rope 2.4 Sudden loss of brake 2.5 Hitting high tension wire 2.6 Loss control of steering 2.7 Sudden ground failure 2.8 Force majeure e.g., earthquake, tornado 2.9 Operator fatigue or sickness/condition 2.10 Accidents/incidents
3. Components and attachments	May include: 3.1 Wheels 3.2 Body frame 3.3 Main hook block 3.4 Auxiliary hook block
4. Load information	May include: 3.1 Bill of ladings 3.2 Packing and shipping list 3.3 Delivery receipt
5. Rigging gears	May include: 4.1 Shackle 4.2 Web sling 4.3 Chain sling 4.4 Wire rope sling 4.5 Turn buckle 4.6 Eye bolt 4.7 Hoist hook

VARIABLE	RANGE
6. Safe work procedures and practices	May include: 5.1 Lifting Plan 5.2 Load chart 5.3 Mattings 5.4 Work area 5.5 Storage 5.6 number of partlines 5.7 Trial lift 5.10 Communication 5.11 Risk control

EVIDENCE GUIDE

1. Critical aspects of Competency	**Assessment requires evidence that the candidate:** 1.1 Travelled the rough terrain crane 1.2 Load and unload rough terrain crane to low-bed trailer 1.3 Set-up rough terrain crane 1.4 Observed safety measures applicable to worksite operation 1.5 Communicated effectively with others to ensure effective work operation
2. Resource Implications	**The following resources should be provided:** 2.1 Access to rough terrain crane and job site/terrain 2.2 Available loads 2.3 Barricades and informative signages 2.4 Lifting/Rigging gears 2.5 PPE
3. Method of Assessment	**Competency in this unit may be assessed through:** 3.1 Written examination 3.2 Direct observation 3.3 Demonstration with oral questioning
4. Context for Assessment	4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center

SECTION 3 TRAINING ARRANGEMENTS

These standards are set to provide technical and vocational education and training (TVET) providers with information and other important requirements to consider when designing training programs for **HEAVY EQUIPMENT OPERATION (ROUGH TERRAINCRANE) NC III**.

They include information on curriculum design; training delivery; trainee entry requirements; tools and equipment; training facilities; and trainer's qualification.

3.1 CURRICULUM DESIGN

TESDA shall provide the training on the development of competency-based curricula to enable training providers develop their own curricula with the components mentioned below.

Delivery of knowledge requirements for the basic, common and core units of competency specifically in the areas of mathematics, science/technology, communication/language and other academic subjects shall be contextualized. To this end, TVET providers shall develop a Contextual Learning Matrix (CLM) to accompany their curricula.

Course Title: HEAVY EQUIPMENT OPERATION (ROUGH TERRAIN CRANE) NC III

Nominal Training Duration:

40	**Hours**	**Basic Competencies**
24	**Hours**	**Common Competencies**
160	**Hours**	**Core Competencies**

40 Hours - Supervised Industry Learning (SIL)

Total - 264 Hours

Course Description:

This course is designed to provide the learner with knowledge, practical skills and attitude, applicable in performing work activities involve in performing pre and post-operation procedures, performing basic preventive maintenance servicing and performing productive operation for rough terrain crane. This includes classroom learning activities and practical work in actual work site or simulation area.

Upon completion of the course, the learners are expected to demonstrate the above-mentioned competencies to be employed. To obtain this, all units prescribed for this qualification must be achieved.

BASIC COMPETENCIES
(40 HOURS)

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration

1. Lead workplace communication	1.1 Communicate information about workplace processes	• Read
		  ○ Effective verbal communication methods
		  ○ Sources of information
		• Practice organizing information
		• Identify organization requirements for written and electronic communication methods
		• Follow organization requirements for the use of written and electronic communication methods
		• Perform exercises on understanding and conveying intended meaning scenario
			• Lecture
			• Demonstration
			• Practical exercises
			• Role Play
				• Written Test
				• Observation
					2 Hours

	1.2 Lead workplace discussions	• Describe:
		  ○ Organizational policy on production, quality and safety
		  ○ Goals/ objectives and action plan setting
		• Read
		  ○ Effective verbal communication methods
		• Prepare/set action plans based on organizational goals and objectives
			• Group discussion
			• Lecture
			• Demonstration
				• Oral evaluation
				• Written Test
				• Observation
					2 Hours

	1.3 Identify and communicate issues arising in the workplace	• Describe: ○ Organizational policy in dealing with issues and problems • Read • Effective verbal communication methods	• Group discussion • Lecture	• Oral evaluation • Written Test	2 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
2. Lead small teams	2.1 Provide team leadership	• Discussion of Company policies and procedures • Read web pages on situational leadership • Role play on situational leadership	• Group work • Role Play • Lecture/ Discussion • Individual Work	• Role Play • Written Test	1 Hour
	2.2 Assign responsibilities	• Read web pages on performance management • Case study on allocating roles and responsibilities based on competencies of current staff	• Individual Work • Case Study	• Role Play • Written Test	1 Hour
	2.3 Set performance expectations for team members	• Role play to communicate performance expectations with staff • Discussion on performance issues	• Lecture/ Discussion • Role Play	• Role Play • Written Test	1 Hour
	2.4 Supervise team performance	• Discussion on performance monitoring • Role play on providing feedback on performance • Role play on performance coaching • Discussion on keeping the team informed of team performance • Case study on Team performance monitoring and feedback	• Lecture/ Discussion • Role Play • Case Study	• Role Play • Written Test	1 Hour
3. Apply critical thinking and problem-solving techniques in the workplace	3.1 Examine specific workplace strategies	• Show thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations • Show mastery of the current industry hardware and software products and services • Discuss process of identification of fundamental causes of specific workplace	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		challenges • Show mastery of knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations - Relevant equipment and operational processes - Enterprise goals, targets and measures - Enterprise quality OHS and environmental requirement - Enterprise information systems and data collation - Industry codes and standards			
	3.2 Analyze the causes of specific workplace challenges	• Show thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations • Show mastery of the current industry hardware and software products and services • Discuss process of identification of fundamental causes of specific workplace challenges • Show mastery of knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations - Relevant equipment and operational processes - Enterprise goals, targets and measures - Enterprise quality OHS and environmental requirement - Enterprise information systems and data collation	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		- Industry codes and standards • Identify extent and causes of specific challenges in the workplace • Use of range of analytical problem-solving techniques • Formulate clear-cut findings on the nature of each identified workplace challenges			
	3.3 Formulate resolutions to specific workplace challenges	• Show thorough knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations • Show mastery of the current industry hardware and software products and services • Discuss process of identification of fundamental causes of specific workplace challenges • Show mastery of knowledge and understanding of the process, normal operating parameters, and product quality to recognize non-standard situations - Relevant equipment and operational processes - Enterprise goals, targets and measures - Enterprise quality OHS and environmental requirement - Enterprise information systems and data collation - Industry codes and standards • Identify extent and causes of specific challenges in the workplace • Use of range of analytical problem-solving techniques • Formulate clear-cut findings on the nature	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		of each identified workplace challenges • Discus strategies on devising, communicating, implementing and evaluating strategies and techniques in addressing specific workplace challenges			
	3.4 Implement action plans and communicate results	• Identify extent and causes of specific challenges in the workplace • Use of range of analytical problem-solving techniques • Formulate clear-cut findings on the nature of each identified workplace challenges • Discus strategies on devising, communicating, implementing and evaluating strategies and techniques in addressing specific workplace challenges	• Group discussion • Lecture • Demonstration • Role playing	• Case Formulation • Life Narrative Inquiry (Interview) • Standardized test	1 Hour
4. Work in a diverse environment	4.1 Develop an individual's cultural awareness and sensitivity	• Show understanding of cultural diversity in the workplace • Recognize norms of behavior for interacting and dialogue with specific groups (e. g., Muslims and other non-Christians, non-Catholics, tribes/ethnic groups, foreigners) • Demonstrate different methods of verbal and non-verbal communication in a multicultural setting • Apply cross-cultural communication skills (i.e. different business customs, beliefs, communication strategies) • Show affective skills – establishing rapport and empathy, understanding, etc. • Demonstrate openness and flexibility in communication • Recognize diverse groups in the workplace	• Small Group Discussion • Interactive Lecture • Brainstorming • Demonstration • Role-playing	• Demonstration or simulation with oral questioning • Group discussions and interactive activities • Case studies/ problems involving workplace diversity issues • Written examination • Role Playing	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		and community as defined by divergent culture, religion, traditions and practices			
	4.2 Work effectively in an environment that acknowledges and values cultural diversity	• Explain the value of diversity in the economy and society in terms of Workforce development • Discuss the importance of inclusiveness in a diverse environment • Discuss the importance of shared vision and understanding of and commitment to team, departmental, and organizational goals and objectives • Identify and exhibit strategies for customer service excellence • Demonstrate cross-cultural communication skills and active listening • Recognize diverse groups in the workplace and community as defined by divergent culture, religion, traditions and practices • Demonstrate collaboration skills	• Small Group Discussion • Interactive Lecture • Brainstorming • Demonstration • Role-playing	• Demonstration or simulation with oral questioning • Group discussions and interactive activities • Case studies/ problems involving workplace diversity issues • Written examination • Role Playing	1 Hour
	4.3 Identify common issues in a multicultural and diverse environment	• Explain the value, and leverage of cultural diversity • Discuss the inclusivity and conflict resolution • Describe the workplace harassment • Explain the change management and cite ways to overcome resistance to change • Demonstrate advanced strategies for customer service excellence • Address diversity-related conflicts in the workplace • Eliminate discriminatory behavior towards	• Small Group Discussion • Interactive Lecture • Brainstorming • Demonstration • Role-playing	• Demonstration or simulation with oral questioning • Group discussions and interactive activities • Case studies/ problems involving workplace diversity issues • Written examination	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		customers and co-workers • Utilize change management policies in the workplace		• Role Playing	
5. Propose methods of applying learning and innovation in the organization	5.1 Assess work procedures, processes and systems in terms of innovative practices	• Show mastery of the following practical concepts (e.g., 7 habits of highly effective people, character strengths that foster learning and innovation, five minds of the future, adaptation concepts and transtheoretical model of behavior change) • Demonstrate collaboration and networking skills • Show basic skills in research • Generate practical insights on how to improve organizational procedures, processes and systems	• Interactive Lecture • Appreciative Inquiry • Demonstration • Group work	• Psychological and behavioral Interviews • Performance Evaluation • Life Narrative Inquiry • Review of portfolios of evidence and third-party workplace reports of on-the-job performance. • Standardized assessment of character strengths and virtues applied	1 Hour
	5.2 Generate practical action plans for improving work procedures, processes	• Show mastery of the following practical concepts (e.g., 7 habits of highly effective people, character strengths that foster learning and innovation, five minds of the future, adaptation concepts and transtheoretical model of behavior change) • Demonstrate collaboration and networking skills • Show basic skills in research • Generate practical insights on how to improve organizational procedures, processes and systems	• Interactive Lecture • Appreciative Inquiry • Demonstration • Group work	• Psychological and behavioral Interviews • Performance Evaluation • Life Narrative Inquiry • Review of portfolios of evidence and third-party workplace reports of on-the-	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Set up action plans on how to apply innovative procedures in the organization • Set up action plans on how to apply innovative procedures in the organization • Generate practical insights on how to improve organizational procedures, processes and systems		job performance. • Standardized assessment of character strengths and virtues applied	
	5.3 Evaluate the effectiveness of the proposed action plans	• Show mastery of the following practical concepts (e.g., 7 habits of highly effective people, character strengths that foster learning and innovation, five minds of the future, adaptation concepts and transtheoretical model of behavior change) • Demonstrate collaboration and networking skills • Show basic skills in research • Generate practical insights on continuous improvement	• Interactive Lecture • Appreciative Inquiry • Demonstration • Group work	• Psychological and behavioral Interviews • Performance Evaluation • Life Narrative Inquiry • Review of portfolios of evidence and third-party workplace reports of on-the-job performance. • Standardized assessment of character strengths and virtues applied	1 Hour
6. Use information systematically	6.1 Use technical information	• Lecture and discussion on: - Application in collating information - Procedures for inputting, maintaining and archiving information - Guidance to people who need to find and use information • Organizing information into a suitable form for reference and use • Classify stored information for identification	• Lecture • Group Discussion • Hands on • Demonstration	• Oral evaluation • Written Test • Observation • Presentation	4 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		and retrieval • Operate the technical information system by using agreed procedures			
	6.2 Apply information technology (IT)	• Lecture and discussion on: - Attributes and limitations of available software tool - Procedures and work instructions for the use of IT - Operational requirements for IT systems - Sources and flow paths of data - Security systems and measures that can be used - Methods of entering and processing information • Use procedures and work instructions for the use of IT • Extract data and format reports • Use WWW applications	• Lecture • Group Discussion • Self-paced handout/ module • Hands on • Demonstration	• Oral evaluation • Written Test • Observation • Presentation	2 Hours
	6.3 Edit, format and check information	• Lecture and discussion on: - Basic file-handling techniques - Techniques in checking documents - Techniques in editing and formatting - Proof reading techniques • Use different techniques in checking documents • Edit and format information applying different techniques • Proof read information applying different techniques	• Lecture • Group Discussion • Self-paced handout/ module • Hands on • Demonstration	• Oral evaluation • Written Test • Observation • Presentation	1 Hours
7. Evaluate Occupational Safety And Health Work Practices	7.1 Interpret Occupational Safety and Health practices	• Discuss the OSH standards, principles and legislations • Identify OSH work practices issues • Discuss standard safety requirements	• Lecture • Group Discussion	• Written Exam • Demonstration • Observation • Interviews / Questioning	1.5 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	7.2 Set OSH work targets	• Discussion in actions plans that are necessary in achieving the OSH target	• Lecture • Group Discussion	• Written Exam • Demonstration • Observation • Interviews / Questioning	1 Hour
	7.3 Evaluate effectiveness of Occupational Safety and Health work instructions	• Practice evaluating safety data (Historical or Simulated)	• Lecture • Group Discussion	• Written Exam • Demonstration • Observation • Interviews / Questioning	1.5 Hours
8. Evaluate Environmental Work Practices	8.1 Interpret environmental practices, policies and procedures	• Discussion Environmental Issues regarding - Water Quality - National and Local Government Issues - Safety - Endangered Species - Noise - Air Quality - Historic - Waste - Cultural • Updating of existing occupation practices	• Lecture • Group Discussion • Demonstration	• Written Exam • Demonstration • Observation • Interviews / Questioning	1 Hour
	8.2 Establish targets to evaluate environmental practices	• Discussion on - lower production costs and energy consumption - Environmentally Sound Processes - Resource Efficient - Recycling and Waste Management • Simple case study regarding energy efficiency	• Lecture • Group Discussion • Demonstration	• Written Exam • Demonstration • Observation • Interviews / Questioning	1 Hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	8.3 Evaluate effectiveness of environmental practices	• Identifying effective environmental practices relevant to the industry/occupation - Implementation of energy efficiency	• Lecture • Group Discussion • Demonstration • Case Study	• Written Exam • Demonstration • Observation • Interviews / Questioning • Third Party Reports	1 Hour
9. Facilitate Entrepreneurial Skills For Micro-Small-Medium Enterprises (MSMEs)	9.1 Develop and maintain micro-small-medium enterprise (MSMEs) skills in the organization	• Discussions on business models and strategies • Discussion on Types and categories of businesses and business internal control • Discussion on Relevant National and local legislations affecting businesses • Prepare promotional materials • Practice basic bookkeeping	• Lecture/ Discussion • Case Study • Demonstration	• Written Test • Portfolio • Work Related Project	2 Hours
	9.2 Establish and maintain client-base/market	• Role play on customer and employee relations • Discussion on Basic product promotion strategies • Preparation of Basic Feasibility study • Case studies on Basic Business ethics • Prepare basic advertising materials	• Role Play • Lecture Discussion • Case study	• Case problem • Written Test	2 Hours
	9.3 Apply budgeting and financial management skills	• Discussion on: - Basic cost-benefit analysis - Basic financial management - Basic financial accounting - Business internal controls	• Role Play • Lecture Discussion • Group work	• Written Test • Case problem	1 Hour

COMMON COMPETENCIES
(24 HOURS)

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Prepare construction materials and tools	1. 1 Identify materials	• Identifying tools according to the job requirements • Identifying materials and accessories according to the job requirements	• Lecture-demonstration • Group discussion • PowerPoint presentation	• Demonstration with oral questioning • Written examination • Portfolio (credentials)	1 Hour
	1.2 Requisition materials	• Preparing material take-off • Requesting materials and tools	• Simulation • Discussion	• Demonstration with oral questioning	1 Hour
	1.3 Receive and inspect materials	• Checking and inspecting materials and tools • Storing/ stacking of tool and materials	• Practical Exercise • Demonstration	• Written / Oral Test • Demonstration with oral questioning	2 Hours
2. Observe procedures, specifications and manuals of instructions	2.1 Identify and access specification/ manuals	• Identifying manuals and specifications • Accessing information and data	• Lecture-demonstration	• Demonstration with oral questioning • Written examination	2 Hours
	2.2 Interpret manuals	• Interpreting symbols and specifications • Accessing information and data • Applying conversion of units of measurements	• Actual demonstration • Group discussion	• Demonstration with oral questioning • Written examination	2 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	2.3 Apply information in manual	• Applying information from manuals	• Demonstration • Group discussion	• Demonstration with oral questioning	2 Hours
	2.4 Store Manual	• Storing and maintaining manuals	• Demonstration • Group discussion	• Demonstration with oral questioning • Practical and oral exam	2 Hours
3. Interpret technical drawings and plans	3.1 Analyze signs, symbols and data	• Identifying signs, symbols and data • Classifying signs, symbols and data	• Discussion • Demonstration	• Demonstration with oral questioning • Written examination	2 Hours
	3.2 Interpret drawings and plans	• Identifying tools, supplies, materials and equipment • Recognizing components, assemblies or objects • Identifying dimensions	• Discussion • Demonstration	• Demonstration with oral questioning • Written examination	2 Hours
4.Perform mensurations and calculations	4.1 Select measuring instruments	• Selecting measuring instruments	• Lecture-demonstration • Group discussion	• Demonstration with oral questioning	2 Hours
	4.2 Carry out measurements and calculations	• Interpreting formulas for volume, areas, perimeters of plane and geometric figures • Handling of measuring instruments	• Group discussion • Practical Lab • Demonstration	• Written examination • Third party report • Demonstration with oral questioning	2 Hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
5. Maintain tools and equipment	5.1 Check condition of tools and equipment	• Maintaining tools and equipment • Handling of tools and equipment • Identifying tools and equipment defects	• Lecture-demonstration • Group discussion	• Demonstration with oral questioning	1 Hour
	5.2 Perform basic preventive maintenance	• Handling of tools and equipment • Performing preventive maintenance	• Simulation • Group discussion • Practical Lab • Demonstration	• Written examination • Third party report • Demonstration with oral questioning	2 Hours
	5.3 Store tools and equipment	• Storing tools and equipment • Handling of tools and equipment	• Demonstration • Group discussion • Practical Lab	• Practical exam • Written examination • Demonstration with oral questioning	1 Hour

CORE COMPETENCIES
(160 HOURS)

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Perform pre- and post-operation procedures for rough terrain crane	1.1 Perform visual check of equipment	• Select personal protective equipment • Select rough terrain crane capacity • Identify and explain operator serviceable parts • Perform inspection	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	16 hours
	1.2 Perform “B L O W A F” check	• Explain procedures in performing BLOWAF check • Perform BLOWAF check	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	
	1.3 Perform visual check for super structure, lower structure and power train components	• Explain procedures in visual check for super & lower structure and power train components • Identify abnormal conditions • Perform visual check for super & lower structure and power train components	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	
	1.4 Perform operation check	• Explain start-up and warming procedures • Explain procedures in conducting function check while the engine is running • Perform operation of rough terrain crane components and safety devices	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	• Assessment Methods	Nominal Duration
	1.5 Perform post-operation procedure	• Explain inspection procedures while engine is cooling down • Explain parking and shut-down procedures • Perform parking and shut-down operation	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	
2. Perform basic preventive maintenance servicing for rough terrain crane	2.1 Perform adjustment or replacement for noted defects	• Explain procedures in performing adjustments or replacements for noted defects • Explain usage of basic hand tools and portable powered tools • Perform adjustments or replacements for minor defects	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	24 hours
	2.2 Perform basic preventive maintenance servicing (PMS)	• Explain procedures in basic preventive maintenance servicing • Enumerate Operator's Serviceable parts • Execute Basic preventive maintenance servicing (PMS)	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	
	2.3 Prepare equipment reports	• Explain procedures in accomplishing equipment reports • Accomplish equipment reports	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	• Assessment Methods	Nominal Duration
3. Perform productive operation for rough terrain crane	3.1 Travel the rough terrain crane	• Enumerate different road and weather conditions • Identify potential hazards in work area • Explain procedures in responding to unexpected situations • Perform travel operation	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	120 hours
	3.2 Load and unload rough terrain crane to low-bed trailer	• Perform loading and unloading of rough terrain crane to low-bed trailer • Identify the components and attachments of rough terrain crane • Explain and demonstrate verbal instructions and hand signals	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	
	3.3 Set-up rough terrain crane	• Identify potential hazards in work area • Explain procedures in setting-up rough terrain crane • Explain procedures in responding to unexpected situations • Perform rough terrain crane set-up	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	
	3.4 Interpret load chart and /or load moment indicator and construct lifting plan	• Read and interpret load chart and/or load moment indicator • Perform load computations based on load chart and /or load moment indicator	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	• Assessment Methods	Nominal Duration
	3.5 Perform lifting and transferring of load	• Understand site and weather conditions • Explain procedures and practices in lifting operation • Understand hand signals • Explain procedures in responding to unexpected situations • Demonstrate lifting and transferring of load	• Lecture • Practical / Demonstration	• Written test • Observation / Demonstration and interview	

3.2 TRAINING DELIVERY

1. The delivery of training shall adhere to the design of the curriculum. Delivery shall be guided by the principles of competency-based TVET.

    a. Course design is based on competency standards set by the industry or recognized industry sector; (**Learning system is driven by competencies written to industry standards**)

    b. Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;

    c. Training can be done on an actual workplace setting, simulation of a workplace and/or through adoption of modern technology.

    d. Assessment is based in the collection of evidence of the performance of work to the industry required standards;

    e. Assessment of competency takes the trainee's knowledge and attitude into account but requires evidence of actual performance of the competency as the primary source of evidence.

    f. Training program allows for recognition of prior learning (RPL) or current competencies;

    g. Training completion is based on satisfactory completion of all specified competencies not on the specified nominal duration of learning.

2. The competency-based TVET system recognizes various types of delivery modes, both on-and off-the-job as long as the learning is driven by the competency standards specified by the industry. The following training modalities and their variations/components may be adopted singly or in combination with other modalities when designing and delivering training programs:

    2.1 Institution- Based:

    - Dual Training System (DTS)/Dualized Training Program (DTP) which contain both in-school and in-industry training or fieldwork components. Details can be referred to the Implementing Rules and Regulations of the DTS Law and the TESDA Guidelines on the DTP;

- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, audio, video, computer technologies or other modern technology that can be used to facilitate learning and formal and non-formal training. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

- The classroom-based or in-center instruction may be enhanced through use of learner-centered methods as well as laboratory or field-work components.

2.2 Enterprise-Based:

- Formal Apprenticeship – Training within employment involving a contract between an apprentice and an enterprise on an approved apprenticeable occupation.

- Informal Apprenticeship - is based on a training (and working) agreement between an apprentice and a master craftsperson wherein the agreement may be written or oral and the master craftsperson commits to training the apprentice in all the skills relevant to his or her trade over a significant period of time, usually between one and four years, while the apprentice commits to contributing productively to the work of the business. Training is integrated into the production process and apprentices learn by working alongside the experienced craftsperson.

- Enterprise-based Training- where training is implemented within the company in accordance with the requirements of the specific company. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

2.3 Community-Based – Community-Based – short term programs conducted by non-government organizations (NGOs), LGUs, training centers and other TVET providers which are intended to address the specific needs of a community. Such programs can be conducted in informal settings such as barangay hall, basketball courts, etc. These programs can also be mobile training program (MTP).

3.3 TRAINEE ENTRY REQUIREMENTS

Trainees or students wishing to enroll in this course should possess the following requirements:

- At least Junior High School Level Completer or an Alternative Learning System (ALS) Certificate of Completion with grade 10 equivalent holder
- Must possess good communication skills
- Can perform basic mathematical computation
- Driver's License (Restriction 2 or 3)
- Physically fit

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS

List of tools, equipment and materials for the training of a maximum of 25 trainees for HEAVY EQUIPMENT OPERATION (ROUGH TERRAIN CRANE) NC III are as follows:

TOOLS		EQUIPMENT		MATERIALS	
QTY		**QTY**		**QTY**	
1 set	Wrenches (box and open-end 8-24 mm-metric & 7/16 –1" - English)	1 unit	Rough terrain crane with camera/ monitor for reverse mode (optional) certified by Third Party accredited by DOLE-OSHC (Memorandum of Agreement (MOA)/ rental)	5 kgs.	Multi- purpose grease
5 pcs.	Hammer ballpeen (3-4 lbs.)	2 units	Two-way radio	20 liters	Engine oil (SAE 15w40)
5 pcs.	Pliers (mechanical 10 ")	1 unit	Vacuum cleaner (heavy duty)	20 liters	Hydraulic / steering fluid (TELLUS 68/10W)
5 pcs.	Adjustable wrench (8",10", 12",18 ") 1 piece for each size	1 unit	Portable electric air compressor, 180 cfm	20 liters	PTO / differential and transfer case drive (gear oil GP90/ 140)
2 pcs.	Grease gun (portable)	1 unit	High pressure washer, 150-250 psi	20 liters	Automatic Trans-mission oil (ATF)
5 pcs.	Screw driver (10", flat)	1 unit	Low-bed trailer (MOA / rental)	20 liters	Manual transmission oil GP 90/140
5 pcs.	Screw driver (10", Philips)	1 unit	Rough Terrain Crane Simulator (Optional) Display (Screen, Monitor),Controls, Software and Hardware Components, Seat with Seatbelt, Power Supply (110-230 V 50-60Hz)	4 liters	Water coolant
5 pcs.	Putty knife	25 pcs	Safety Equipment/PPE (Safety vest, Gloves, Goggles, Dust mask, Hard Hat)	200 liters	Diesel fuel
5 pcs.	Pry bar (heavy duty)	5 pairs	Safety Equipment/PPE (Safety Shoes)	20 liters	Battery distilled water
5 pcs.	Tire gauge (0-150 psi)			1 set	Primary & secondary air filter
5 pcs.	Nylon Taglines (16mm x 6m)			1 unit	Fire extinguisher

TOOLS		EQUIPMENT		MATERIALS	
QTY		**QTY**		**QTY**	
2 pcs	Shackle (2 tons capacity)			1 unit	Test weights - 2 tons
2 pcs.	Shackle (6.5 tons capacity)			1 unit	Test weights - 4 tons
2 pcs.	Shackle (8.5 tons capacity)			1 pc.	Rough terrain crane miniature, (1:50 scale)
2 pcs.	Web sling (2 tons capacity)			1 pc	Operator's manual with load chart
2 pcs.	Web sling (4 tons capacity)				
2 pcs.	Chain sling (2 tons capacity)				
2 pcs.	Chain sling (4 tons capacity)				
2 pcs.	Wire rope sling (2 tons capacity)				
2 pcs.	Wire rope sling (4 tons capacity)				
2 pcs.	Eye bolt (4 tons)				
2 pcs.	Turn buckle (4 tons)				

3.5 TRAINING FACILITIES

Based on class intake of 25 students/trainees.

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	TOTAL AREA IN SQ. METERS
Student/Trainee's Working Space (Maintenance Workshop)	2 x 2 meters	4 sq.m per student	100
Lecture Room	8 x 6	48	48
Learning Resource Center	4 x 6	24	24
Facilities/Equipment/ Circulation Area	6.5 x 8	52	52
Working field	20 x 75	1,500	1,500
TOTAL AREA			**1,724**

NOTE: Training Center may enter into Memorandum of Agreement (MOA) with industry for use of facilities and heavy equipment

3.6 TRAINERS' QUALIFICATION FOR HEAVY EQUIPMENT OPERATION (ROUGH TERRAIN CRANE) NC III

- Holder of National TVET Trainer Certificate Level I (NTTC Level I) in Heavy Equipment Operation (Rough Terrain Crane) NC III
- Must have completed the 40-Hour Construction Occupational Safety and Health (COSH) per Department Order No. 13 s. 1998, Guidelines Governing Occupational Safety and Health in the Construction Industry conducted by OSHC and DOLE accredited Safety Training Organizations
- Must be computer-literate
- Must have at least 5 years work/industry experience.

3.7 INSTITUTIONAL ASSESSMENT

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

SECTION 4 ASSESSSMENT AND CERTIFICATION ARRANGEMENT

Competency Assessment is the process of collecting evidence and making judgments whether competency has been achieved. The purpose of assessment is to confirm that an individual can perform to the standards expected at the workplace as expressed in relevant competency standards.

The assessment process is based on evidence or information gathered to prove achievement of competencies. The process may be applied to an employable unit(s) of competency in partial fulfillment of the requirements of the national qualification.

4.1 NATIONAL ASSESSMENTAND CERTIFICATION ARRANGEMENTS

4.1.1 A National Certificate (NC) is issued when a candidate has demonstrated competence on all units of competency in a qualification with a promulgated Training Regulations.

4.1.2 Individuals wanting to be certified will have to be assessed in accordance with the requirements identified in the relevant unit/s of competency.

4.1.3 Assessment shall cover all the competencies of the qualification with the basic and common units integrated or assessed concurrently with the core units of competency.

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

- Graduates of formal, non-formal and informal institutions and enterprise-based training programs
- Experienced Workers (wage employed or self-employed)

4.1.5 For the renewal of valid or expired National Certificate (NC) in Heavy Equipment Operation (Rough Terrain Crane) NC II, the individual/holder will have to undergo assessment in the amended TR for Heavy Equipment Operation (Rough Terrain Crane) NC II.

4.1.6 The industry shall determine assessment and certification requirements for each qualification with promulgated Training Regulations: It includes the following:

a. Entry requirements for candidates
b. Evidence gathering methods
c. Qualification requirements of competency assessors
d. Specific assessment and certification arrangements as identified by industry

4.2 COMPETENCY ASSESSMENT REQUISITE

4.2.1 Self-Assessment Guide. The self-assessment guide (SAG) is accomplished by the candidate prior to actual competency assessment. SAG is a pre-assessment tool to help the candidate and the assessor determine what evidence is available, where gaps exist, including readiness for assessment.

This document can:

a. Identify the candidate's skills and knowledge
b. Highlight gaps in candidate's skills and knowledge
c. Provide critical guidance to the assessor and candidate on the evidence that need to be presented
d. Assist the candidate to identify key areas in which practice is needed or additional information or skills that should be gained prior `

4.2.2 **Accredited Assessment Center**. Only Assessment Center accredited by TESDA is authorized to conduct competency assessment. Assessment centers undergo a quality assured procedure for accreditation before they are authorized by TESDA to manage the assessment for National Certification.

4.2.3 **Accredited Competency Assessor**. Only accredited competency assessor is authorized to conduct assessment of competence. Competency assessors undergo a quality assured system of accreditation procedure before they are authorized by TESDA to assess the competencies of candidates for National Certification.

ANNEX A

COMPETENCY MAP - CONSTRUCTION Sector
(HEAVY EQUIPMENT OPERATION)
HEAVY EQUIPMENT OPERATION (ROUGH TERRAIN CRANE) NC III

BASIC COMPETENCIES

Receive and respond to workplace communication	Work with others	Solve/address routine problems	Enhance self-management skills	Support Innovation	Access and maintain information	Follow occupational safety and health policies and procedures	Apply environmental work standards	Adopt entrepreneurial mindset in the workplace
Participate in workplace communication	Work in Team Environment	Solve/address general workplace problems	Develop career and life decisions	Contribute to workplace innovation	Present relevant information	Practice occupational safety and health policies and procedures	Exercise efficient and effective sustainable practices in the workplace	Practice entrepreneurial skills in the workplace
Lead workplace communication	**Lead small teams**	**Apply critical thinking and problem-solving techniques in the workplace**	**Work in a diverse environment**	**Propose methods of applying learning and innovation in the organization**	**Use information systematically**	**Evaluate occupational safety and health work practices**	**Evaluate environmental work practices**	**Facilitate entrepreneurial skills for micro-small-medium enterprises (MSMEs)**

BASIC COMPETENCIES

Utilize specialize specialized communication skill	Develop and lead teams	Perform higher order thinking processes and apply techniques in the workplace	Contribute to the practice of social justice in the workplace	Manage innovative work instructions	Manage and evaluate usage of information	Lead in improvement of Occupational Safety and Health Program, Policies and Procedures	Lead towards improvement of environmental work programs, policies and procedures	Sustain entrepreneurial skills
Manage and sustain effective communication strategies	Manage and sustain high performing teams	Evaluate higher order thinking skills and adjust problem solving techniques	Advocate strategic thinking for global citizenship	Incorporate innovation into work procedures	Develop systems in managing, and maintaining information	Manage implementation of OSH programs in the workplace	Manage implementation of environmental program in the workplace	Develop and sustain a high-performing enterprise

COMMON COMPETENCIES

Prepare construction materials and tools	Observe procedures, specifications and manual of instructions	Interpret technical drawings and plans	Perform mensurations and calculations	Maintain tools and equipment

CORE COMPETENCIES	Perform pre and post operation procedures for truck mounted crane	Perform basic preventive maintenance servicing for truck mounted crane	Perform productive operation for truck mounted crane	Perform pre and post operation procedures for rough terrain crane	Perform basic preventive maintenance servicing for rough terrain crane
	Perform productive operation for rough terrain crane	Perform pre and post operation procedures for crawler crane	Perform basic preventive maintenance servicing for crawler crane	Perform productive operation for crawler crane	Perform pre and post operation procedures for forklift
	Perform basic preventive maintenance servicing for forklift	Perform productive operation for forklift	Perform pre and post operation procedures for tower crane	Perform basic preventive maintenance servicing for tower crane	Perform productive operation for tower care
	Perform pre and post operation procedures for overhead and gantry crane	Perform basic preventive maintenance servicing overhead and gantry crane	Perform productive operation for overhead and gantry crane	Perform pre and post operation procedures for hydraulic excavator	Perform basic preventive maintenance servicing for hydraulic excavator
	Perform productive operation for hydraulic excavator	Perform pre and post operation procedures for on-highway dump truck (rigid)	Perform basic preventive maintenance servicing for on-highway dump truck (rigid)	Perform productive operation for on-highway dump truck (rigid)	

GLOSARRY OF TERMS

1. Attachment	Refers to anything like fly jib used instead of the conventional lift block to perform different types of lifting jobs.
2. Boom (crane)	Refers to telescopic boom used for supporting the hoisting tackle.
3. Boom Length	Refers to the measurement from the boom foot pins to the center of the boom point sheaves.
4. Reeving	Refers to a rope system in which the rope travels around the drums and sheaves.
5. Telescopic Boom	Refers to a component of crane attached to the superstructure and is used to support hoisting tackle. Its extended and retracted movement is controlled by hydraulic cylinder.
6. Rough Terrain Crane	Refers to equipment, which has four-wheel crab and counter steering as well as the normal two-wheel front steering capabilities. This equipment also both two-wheel and four-wheel drive capabilities to enhance its usability.
7. Standard	Refers to a degree or level of requirement set by the manufacturer.
8. Stability	Refers to the machine resistance to overturning (Rough-terrain and Truck-mounted Cranes - lifting on outriggers are based on 85 percent of their tipping capacity).
9. Safety Devices	Refer to boom angle indicators, load moment indicators, anti-two blocking devices (where applicable), boom kick out lever, etc.
10. Work Area	Refers to any place inside the swing circle of the crane. It must be barricaded off and only those directly involve in the lift shall be allowed to entry.
11. Derated capacity of equipment	Refers to the reduction of lifting capacity of equipment as certified by a third party.
12 Load Moment Indicator (LMI)	Refers to electronic device that indicates crane configuration such as boom angle, boom length, load weight and working radius.
12. Rigging Gears	Refers to equipment such as wire rope, turnbuckles, clevis, jacks, shackles, slings used with cranes and other lifting equipment in material handling and structure relocation.
13. Super Structure	Refers to upper or lifting component of the crane which includes the boom.
14. Lower Structure	Refers to the carrier of the crane.

15.	Power train	Refers to mechanism that transmits the drive from the engine of a vehicle to its axle.
16.	Hazards	Refers to situation that poses threat to life, health, property, or environment.
17.	Rigger	Refers to signalman that directs the schedule of lifts for the crane, and is responsible for the safety of the loads.
18.	Computer Literate	Is defined as the knowledge and ability to utilize computers and related technology efficiently, with a range of skills covering levels from elementary use to computer programming and advanced problem solving.

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