

# COMPETENCY STANDARDS



## WATER WELL DRILLING LEVEL II

**AGRICULTURE, FORESTRY AND FISHERY  
(AFF) SECTOR**

**TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY**  
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## COMPETENCY STANDARDS FOR WATER WELL DRILLING LEVEL II

### Section 1 WATER WELL DRILLING LEVEL II

The **WATER WELL DRILLING LEVEL II** Qualification consists of competencies that a person must achieve to set up drilling machine, casing design and well development. Practice of safety measures and proper handling of tools and equipment are also required for a competent performance.

The units of competency comprising this qualification include the following:

Code	<b>BASIC COMPETENCIES</b>
400311210	Participate in workplace communication
400311211	Work in team environment
400311212	Solve/address general workplace problems
400311213	Develop career and life decisions
400311214	Contribute to workplace innovation
400311215	Present relevant information
400311216	Practice occupational safety and health policies and procedures
400311217	Exercise efficient and effective sustainable practices in the workplace
400311218	Practice entrepreneurial skills in the workplace
Code	<b>COMMON COMPETENCIES</b>
CON931201	Prepare construction materials and tools
CON311201	Observe procedures, specifications and manuals of instruction
CON311203	Perform mensuration and calculations
CON311204	Maintain tools and equipment
Code	<b>CORE COMPETENCIES</b>
AFFXXXXXX	Collect baseline information
AFFXXXXXX	Prepare site and mobilize equipment
AFFXXXXXX	Perform hole drilling and reaming
AFFXXXXXX	Prepare casing design
AFFXXXXXX	Perform casing installation
AFFXXXXXX	Perform well development
AFFXXXXXX	Perform pump installation and test pumping
AFFXXXXXX	Perform well capability
AFFXXXXXX	Perform well completion and conduct partial potability test

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

- Water Well Installer

## SECTION 2 COMPETENCY STANDARDS

These guidelines are set to provide the Technical Vocational Education and Training (TVET) providers with information and other important requirements to consider when designing training programs for **WATER WELL DRILLING LEVEL II**.

### BASIC COMPETENCIES

**UNIT OF COMPETENCY : PARTICIPATE IN WORKPLACE COMMUNICATION**

**UNIT CODE : 400311210**

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

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from <b>appropriate sources</b> 1.2 Effective questioning, active listening and speaking skills are used to gather and convey information 1.3 Appropriate <b>medium</b> is used to transfer information and ideas 1.4 Appropriate non-verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and <b>storage</b> of information are used 1.7 Personal interaction is carried out clearly and concisely	1.1 Effective verbal and nonverbal communication 1.2 Different modes of communication 1.3 Medium of communication in the workplace 1.4 Organizational policies 1.5 Communication procedures and systems 1.6 Lines of Communication 1.7 Technology relevant to the enterprise and the individual's work responsibilities 1.8 Workplace etiquette	1.1 Following simple spoken language 1.2 Performing routine workplace duties following simple written notices 1.3 Participating in workplace meetings and discussions 1.4 Preparing work-related documents 1.5 Estimating, calculating and recording routine workplace measures 1.6 Relating/ Interacting with people of various levels in the workplace 1.7 Gathering and providing basic information in response to workplace requirements 1.8 Basic business

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
			writing skills 1.9 Interpersonal skills in the workplace 1.10 Active-listening skills
2. Perform duties following workplace instructions	2.1 Written notices and instructions are read and interpreted in accordance with organizational guidelines 2.2 Routine written instruction are followed based on established procedures 2.3 Feedback is given to workplace supervisor based instructions/ information received 2.4 <b>Workplace interactions</b> are conducted in a courteous manner 2.5 Where necessary, clarifications about routine workplace procedures and matters concerning conditions of employment are sought and asked from <b>appropriate sources</b> 2.6 Meetings outcomes are interpreted and implemented	2.1 Effective verbal and non-verbal communication 2.2 Different modes of communication 2.3 Medium of communication in the workplace 2.4 Organizational/ Workplace policies 2.5 Communication procedures and systems 2.6 Lines of communication 2.7 Technology relevant to the enterprise and the individual's work responsibilities 2.8 Effective questioning techniques (clarifying and probing) 2.9 Workplace etiquette	2.1 Following simple spoken instructions 2.2 Performing routine workplace duties following simple written notices 2.3 Participating in workplace meetings and discussions 2.4 Completing work-related documents 2.5 Estimating, calculating and recording routine workplace measures 2.6 Relating/ Responding to people of various levels in the workplace 2.7 Gathering and providing information in response to workplace requirements 2.8 Basic questioning/ querying 2.9 Skills in reading for information 2.10 Skills in locating
3. Complete relevant work related documents	3.1 Range of <b>forms</b> relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard	3.1 Effective verbal and non-verbal communication 3.2 Different modes of communication 3.3 Workplace forms and documents	3.1 Completing work-related documents 3.2 Applying operations of addition, subtraction,

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
	<p>workplace forms and documents</p> <p>3.3 Errors in recording information on forms/ documents are identified and acted upon</p> <p>3.4 Reporting requirements to supervisor are completed according to organizational guidelines</p>	<p>3.4 Organizational/ Workplace policies</p> <p>3.5 Communication procedures and systems</p> <p>3.6 Technology relevant to the enterprise and the individual's work responsibilities</p>	<p>division and multiplication</p> <p>3.3 Gathering and providing information in response to workplace requirements</p> <p>3.4 Effective record keeping skills</p>

## RANGE OF VARIABLES

VARIABLES	RANGE
1. Appropriate sources	May include: 1.1. Team members 1.2. Supervisor/Department Head 1.3. Suppliers 1.4. Trade personnel 1.5. Local government 1.6. Industry bodies
2. Medium	May include: 2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information dissemination 2.5. Follow-up or verbal instructions 2.6. Face-to-face communication 2.7. Electronic media (disk files, cyberspace)
3. Storage	May include: 3.1. Manual filing system 3.2. Computer-based filing system
4. Workplace interactions	May include: 4.1. Face-to-face 4.2. Telephone 4.3. Electronic and two-way radio 4.4. Written including electronic means, memos, instruction and forms 4.5. Non-verbal including gestures, signals, signs and diagrams
5. Forms	May include: 5.1. HR/Personnel forms, telephone message forms, safety reports

## EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p><b>Assessment requires evidence that the candidate:</b></p> <ul style="list-style-type: none"> <li>1.1. Prepared written communication following standard format of the organization</li> <li>1.2. Accessed information using workplace communication equipment/systems</li> <li>1.3. Made use of relevant terms as an aid to transfer information effectively</li> <li>1.4. Conveyed information effectively adopting formal or informal communication</li> </ul>
<p>2. Resource Implications</p>	<p><b>The following resources should be provided:</b></p> <ul style="list-style-type: none"> <li>2.1. Fax machine</li> <li>2.2. Telephone</li> <li>2.3. Notebook</li> <li>2.4. Writing materials</li> <li>2.5. Computer with Internet connection</li> </ul>
<p>3. Methods of Assessment</p>	<p><b>Competency in this unit may be assessed through:</b></p> <ul style="list-style-type: none"> <li>3.1. Demonstration with oral questioning</li> <li>3.2. Interview</li> <li>3.3. Written test</li> <li>3.4. Third-party report</li> </ul>
<p>4. Context for Assessment</p>	<ul style="list-style-type: none"> <li>4.1. Competency may be assessed individually in the actual workplace or through an accredited institution</li> </ul>



**UNIT OF COMPETENCY : WORK IN A TEAM ENVIRONMENT**

**UNIT CODE : 400311211**

**UNIT DESCRIPTOR :** This unit covers the skills, knowledge and attitudes to identify one's roles and responsibilities as a member of a team.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
1. Describe team role and scope	1.1 The <b>role and objective of the team</b> is identified from available <b>sources of information</b> 1.2 Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources	1.1 Group structure 1.2 Group development 1.3 Sources of information	1.1 Communicating with others, appropriately consistent with the culture of the workplace 1.2 Developing ways in improving work structure and performing respective roles in the group or organization
2. Identify one's role and responsibility within a team	2.1 Individual roles and responsibilities within the team environment are identified 2.2 Roles and objectives of the team is identified from available <b>sources of information</b> 2.3 Team parameters, reporting relationships and responsibilities are identified based on team discussions and appropriate external sources	2.1 Team roles and objectives 2.2 Team structure and parameters 2.3 Team development 2.4 Sources of information	2.1 Communicating with others, appropriately consistent with the culture of the workplace 2.2 Developing ways in improving work structure and performing respective roles in the group or organization
3. Work as a team member	3.1 Effective and appropriate forms of communications are used and interactions undertaken with team members based on company practices. 3.2 Effective and appropriate contributions made to complement team activities and	3.1 Communication Process 3.2 Workplace communication protocol 3.3 Team planning and decision making 3.4 Team thinking 3.5 Team roles 3.6 Process of team	3.1 Communicating appropriately, consistent with the culture of the workplace 3.2 Interacting effectively with others 3.3 Deciding as an individual and as a group using group think strategies

ELEMENT	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
	<p>objectives, based on <b><i>workplace context</i></b></p> <p>3.3 Protocols in reporting are observed based on standard company practices.</p> <p>3.4 Contribute to the development of team work plans based on an understanding of team's role and objectives</p>	<p>development</p> <p>3.7 Workplace context</p>	<p>and techniques</p> <p>3.4 Contributing to Resolution of issues and concerns</p>

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	May include but not limited to: <ul style="list-style-type: none"> <li>1.1. Work activities in a team environment with enterprise or specific sector</li> <li>1.2. Limited discretion, initiative and judgement maybe demonstrated on the job, either individually or in a team environment</li> </ul>
2. Sources of information	May include but not limited to: <ul style="list-style-type: none"> <li>2.1. Standard operating and/or other workplace procedures</li> <li>2.2. Job procedures</li> <li>2.3. Machine/equipment manufacturer's specifications and instructions</li> <li>2.4. Organizational or external personnel</li> <li>2.5. Client/supplier instructions</li> <li>2.6. Quality standards</li> <li>2.7. OHS and environmental standards</li> </ul>
3. Workplace context	May include but not limited to: <ul style="list-style-type: none"> <li>3.1. Work procedures and practices</li> <li>3.2. Conditions of work environments</li> <li>3.3. Legislation and industrial agreements</li> <li>3.4. Standard work practice including the storage, safe handling and disposal of chemicals</li> <li>3.5. Safety, environmental, housekeeping and quality guidelines</li> </ul>

## EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p><b>Assessment requires evidence that the candidate:</b></p> <p>1.1 Worked in a team to complete workplace activity            1.2 Worked effectively with others            1.3 Conveyed information in written or oral form            1.4 Selected and used appropriate workplace language            1.5 Followed designated work plan for the job</p>
<p>2. Resource Implications</p>	<p><b>The following resources should be provided:</b></p> <p>2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place            2.2 Materials relevant to the proposed activity or tasks</p>
<p>3. Methods of Assessment</p>	<p><b>Competency in this unit may be assessed through:</b></p> <p>3.1 Role play involving the participation of individual member to the attainment of organizational goal            3.2 Case studies and scenarios as a basis for discussion of issues and strategies in teamwork            3.3 Socio-drama and socio-metric methods            3.4 Sensitivity techniques            3.5 Written Test</p>
<p>4. Context for Assessment</p>	<p>4.1 Competency may be assessed in workplace or in a simulated workplace setting            4.2 Assessment shall be observed while task are being undertaken whether individually or in group</p>

**UNIT OF COMPETENCY : SOLVE/ADDRESS GENERAL WORKPLACE PROBLEMS**

**UNIT COD : 400311212**

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes required to apply problem-solving techniques to determine the origin of problems and plan for their resolution. It also includes addressing procedural problems through documentation, and referral.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
1. Identify routine problems	1.1 Routine <b>problems or procedural problem</b> areas are identified 1.2 Problems to be investigated are defined and determined 1.3 Current conditions of the problem are identified and documented	1.1 Current industry hardware and software products and services 1.2 Industry maintenance, service and helpdesk practices, processes and procedures 1.3 Industry standard diagnostic tools 1.4 Malfunctions and resolutions	1.1 Identifying current industry hardware and software products and services 1.2 Identifying current industry maintenance, services and helpdesk practices, processes and procedures. 1.3 Identifying current industry standard diagnostic tools 1.4 Describing common malfunctions and resolutions. 1.5 Determining the root cause of a routine malfunction
2. Look for solutions to routine problems	2.1 Potential solutions to problem are identified 2.2 Recommendations about possible solutions are developed, <b>documented</b> , ranked and presented to <b>appropriate person</b> for decision	2.1 Current industry hardware and software products and services 2.2 Industry service and helpdesk practices, processes and procedures 2.3 Operating systems 2.4 Industry standard diagnostic tools 2.5 Malfunctions and resolutions. 2.6 Root cause analysis	2.1 Identifying current industry hardware and software products and services 2.2 Identifying services and helpdesk practices, processes and procedures. 2.3 Identifying operating system 2.4 Identifying current industry standard diagnostic tools 2.5 Describing

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
			common malfunctions and resolutions. 2.6 Determining the root cause of a routine malfunction
3. Recommend solutions to problems	3.1 Implementation of solutions are <b>planned</b> 3.2 Evaluation of implemented solutions are planned 3.3 Recommended solutions are documented and submit to appropriate person for confirmation	3.1 Standard procedures 3.2 Documentation produce	3.1 Producing documentation that recommends solutions to problems 3.2 Following established procedures

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Problems/Procedural Problem	May include but not limited to: 1.1 Routine/non – routine processes and quality problems 1.2 Equipment selection, availability and failure 1.3 Teamwork and work allocation problem 1.4 Safety and emergency situations and incidents 1.5 Work-related problems outside of own work area
2. Appropriate person	May include but not limited to: 2.1 Supervisor or manager 2.2 Peers/work colleagues 2.3 Other members of the organization
3. Document	May include but not limited to: 3.1 Electronic mail 3.2 Briefing notes 3.3 Written report 3.4 Evaluation report
4. Plan	May include but not limited to: 4.1 Priority requirements 4.2 Co-ordination and feedback requirements 4.3 Safety requirements 4.4 Risk assessment 4.5 Environmental requirements

## EVIDENCE GUIDE

1. Critical aspects of Competency	<p><b>Assessment requires evidence that the candidate:</b></p> <ul style="list-style-type: none"> <li>1.1 Determined the root cause of a routine problem</li> <li>1.2 Identified solutions to procedural problems.</li> <li>1.3 Produced documentation that recommends solutions to problems.</li> <li>1.4 Followed established procedures.</li> <li>1.5 Referred unresolved problems to support persons.</li> </ul>
2. Resource Implications	2.1. Assessment will require access to a workplace over an extended period, or a suitable method of gathering evidence of operating ability over a range of situations.
3. Methods of Assessment	<p><b>Competency in this unit may be assessed through:</b></p> <ul style="list-style-type: none"> <li>3.1 Case Formulation</li> <li>3.2 Life Narrative Inquiry</li> <li>3.3 Standardized test</li> </ul> <p>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.</p>
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 : DEVELOP CAREER AND LIFE DECISIONS**

**UNIT CODE : 400311213**

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills, and attitudes in managing one’s emotions, developing reflective practice, and boosting self-confidence and developing self-regulation.

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms are elaborated in the Range of Variables</i>	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
1. Manage one’s emotion	1.1 <b>Self-management strategies</b> are identified 1.2 Skills to work independently and to show initiative, to be conscientious, and persevering in the face of setbacks and frustrations are developed 1.3 Techniques for effectively handling negative emotions and <b>unpleasant situation</b> in the workplace are examined	1.1 Self-management strategies that assist in regulating behavior and achieving personal and learning goals (e.g. Nine self-management strategies according to Robert Kelley) 1.2 Enablers and barriers in achieving personal and career goals 1.3 Techniques in handling negative emotions and unpleasant situation in the workplace such as frustration, anger, worry, anxiety, etc.	1.1 Managing properly one’s emotions and recognizing situations that cannot be changed and accept them and remain professional 1.2 Developing self-discipline, working independently and showing initiative to achieve personal and career goals 1.3 Showing confidence, and resilience in the face of setbacks and frustrations and other negative emotions and unpleasant situations in the workplace
2. Develop reflective practice	2.1 Personal strengths and achievements, based on self-assessment strategies and teacher feedback are contemplated 2.2 Progress when seeking and responding to	2.1 Basic SWOT analysis 2.2 Strategies to improve one’s attitude in the workplace 2.3 Gibbs’ Reflective Cycle/Model (Description, Feelings,	2.1 Using the basic SWOT analysis as self-assessment strategy 2.2 Developing reflective practice through realization of limitations, likes/

<b>ELEMENT</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
	<p>feedback from teachers to assist them in consolidating strengths, addressing weaknesses and fulfilling their potential are monitored</p> <p>2.3 Outcomes of personal and academic challenges by reflecting on previous problem solving and decision making strategies and feedback from peers and teachers are predicted</p>	<p>Evaluation, Analysis, Conclusion, and Action plan)</p>	<p>dislikes; through showing of self-confidence</p> <p>2.3 Demonstrating self-acceptance and being able to accept challenges</p>
<p>3. Boost self-confidence and develop self-regulation</p>	<p>3.1 Efforts for continuous self-improvement are demonstrated</p> <p>3.2 Counter-productive tendencies at work are eliminated</p> <p>3.3 Positive outlook in life are maintained.</p>	<p>3.1 Four components of self-regulation based on Self-Regulation Theory (SRT)</p> <p>3.2 Personality development concepts</p> <p>3.3 Self-help concepts (e. g., 7 Habits by Stephen Covey, transactional analysis, psycho-spiritual concepts)</p>	<p>3.1 Performing effective communication skills – reading, writing, conversing skills</p> <p>3.2 Showing affective skills – flexibility, adaptability, etc.</p> <p>3.3 Self-assessment for determining one’s strengths and weaknesses</p>

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Self-management strategies	<p><b>May include but not limited to:</b></p> <ul style="list-style-type: none"> <li>1.1 Seeking assistance in the form of job coaching or mentoring</li> <li>1.2 Continuing dialogue to tackle workplace grievances</li> <li>1.3 Collective negotiation/bargaining for better working conditions</li> <li>1.4 Share your goals to improve with a trusted co-worker or supervisor</li> <li>1.5 Make a negativity log of every instance when you catch yourself complaining to others</li> <li>1.6 Make lists and schedules for necessary activities</li> </ul>
2. Unpleasant situation	<p><b>May include but not limited to:</b></p> <ul style="list-style-type: none"> <li>2.1 Job burn-out</li> <li>2.2 Drug dependence</li> <li>2.3 Sulking</li> </ul>

## EVIDENCE GUIDE

1. Critical aspects of Competency	<p><b>Assessment requires evidence that the candidate:</b></p> <ul style="list-style-type: none"> <li>1.1 Express emotions appropriately</li> <li>1.2 Work independently and show initiative</li> <li>1.3 Consistently demonstrate self-confidence and self-discipline</li> </ul>
2. Resource Implications	<p><b>The following resources should be provided:</b></p> <ul style="list-style-type: none"> <li>2.1. Access to workplace and resource s</li> <li>2.2. Case studies</li> </ul>
3. Methods of Assessment	<p><b>Competency in this unit may be assessed through:</b></p> <ul style="list-style-type: none"> <li>3.1. Demonstration or simulation with oral questioning</li> <li>3.2. Case problems involving work improvement and sustainability issues</li> <li>3.3. Third-party report</li> </ul>
4. Context for Assessment	<ul style="list-style-type: none"> <li>4.1. Competency assessment may occur in workplace or any appropriately simulated environment</li> </ul>

**UNIT OF COMPETENCY** : **CONTRIBUTE TO WORKPLACE INNOVATION**

**UNIT CODE** : **400311214**

**UNIT DESCRIPTOR** : This unit covers the knowledge, skills and attitudes required to make a pro-active and positive contribution to workplace innovation.

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE</b>	<b>REQUIRED SKILLS</b>
1. Identify opportunities to do things better.	1.1 <b>Opportunities for improvement</b> are identified proactively in own area of work. 1.2 <b>Information</b> are gathered and reviewed which may be relevant to ideas and which might assist in gaining support for idea.	1.1 Roles of individuals in suggesting and making improvements. 1.2 Positive impacts and challenges in innovation. 1.3 Types of changes and responsibility. 1.4 Seven habits of highly effective people.	1.1 Identifying opportunities to improve and to do things better. Involvement. 1.2 Identifying the positive impacts and the challenges of change and innovation. 1.3 Identifying examples of the types of changes that are within and outside own scope of responsibility
2. Discuss and develop ideas with others	2.1 <b>People who could provide input</b> to ideas for improvements are identified. 2.2 Ways of approaching people to begin sharing ideas are selected. 2.3 Meeting is set with relevant people. 2.4 Ideas for follow up are review and selected based on feedback. 2.5 <b>Critical inquiry method</b> is used to discuss and develop ideas with others.	2.1 Roles of individuals in suggesting and making improvements. 2.2 Positive impacts and challenges in innovation. 2.3 Types of changes and responsibility. 2.4 Seven habits of highly effective people.	2.1 Identifying opportunities to improve and to do things better. Involvement. 2.2 Identifying the positive impacts and the challenges of change and innovation. 2.3 Providing examples of the types of changes that are within and outside own scope of responsibility 2.4 Communicating ideas for change through small group discussions and meetings.
3. Integrate ideas for change in the workplace	3.1 Critical inquiry method is used to integrate different ideas for change of key people. 3.2 Summarizing, analyzing and generalizing skills are used to extract	3.1 Roles of individuals in suggesting and making improvements. 3.2 Positive impacts and challenges in innovation. 3.3 Types of changes	3.1 Identifying opportunities to improve and to do things better. Involvement. 3.2 Identifying the positive impacts and the challenges of change and innovation.

ELEMENTS	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	<p>salient points in the pool of ideas.</p> <p>3.3 <b>Reporting skills</b> are likewise used to communicate results.</p> <p>3.4 <b>Current Issues and concerns</b> on the systems, processes and procedures, as well as the need for simple innovative practices are identified.</p>	<p>and responsibility.</p> <p>3.4 Seven habits of highly effective people.</p> <p>3.5 Basic research skills.</p>	<p>3.3 Providing examples of the types of changes that are within and outside own scope of responsibility.</p> <p>3.4 Communicating ideas for change through small group discussions and meetings.</p> <p>3.5 Demonstrating skills in analysis and interpretation of data.</p>

## RANGE OF VARIABLES

VARIABLES	RANGE
1. Opportunities for improvement	May include: 1.1 Systems. 1.2 Processes. 1.3 Procedures. 1.4 Protocols. 1.5 Codes. 1.6 Practices.
2. Information	May include: 2.1 Workplace communication problems. 2.2 Performance evaluation results. 2.3 Team dynamics issues and concerns. 2.4 Challenges on return of investment 2.5 New tools, processes and procedures. 2.6 New people in the organization.
3. People who could provide input	May include: 3.1 Leaders. 3.2 Managers. 3.3 Specialists. 3.4 Associates. 3.5 Researchers. 3.6 Supervisors. 3.7 Staff. 3.8 Consultants (external) 3.9 People outside the organization in the same field or similar expertise/industry. 3.10 Clients
4. Critical inquiry method	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.

VARIABLES	RANGE
5. Reporting skills	May include: 5.1 Data management. 5.2 Coding. 5.3 Data analysis and interpretation. 5.4 Coherent writing. 5.5 Speaking.

## EVIDENCE GUIDE

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified opportunities to do things better. 1.2 Discussed and developed ideas with others on how to contribute to workplace innovation. 1.3 Integrated ideas for change in the workplace. 1.4 Analyzed and reported rooms for innovation and learning in the workplace.
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 : PRESENT RELEVANT INFORMATION**

**UNIT CODE : 400311215**

**UNIT DESCRIPTOR :** This unit of covers the knowledge, skills and attitudes required to present data/information appropriately.

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE</b>	<b>REQUIRED SKILLS</b>
1. Gather data/ information	1.1 Evidence, facts and information are collected 1.2 Evaluation, terms of reference and conditions are reviewed to determine whether data/information falls within project scope	1.1 Organisational protocols 1.2 Confidentiality 1.3 Accuracy 1.4 Business mathematics and statistics 1.5 Data analysis techniques/procedures 1.6 Reporting requirements to a range of audiences 1.7 Legislation, policy and procedures relating to the conduct of evaluations 1.8 Organisational values, ethics and codes of conduct	1.1 Describing organisational protocols relating to client liaison 1.2 Protecting confidentiality 1.3 Describing accuracy 1.4 Computing business mathematics and statistics 1.5 Describing data analysis techniques/procedures 1.6 Reporting requirements to a range of audiences 1.7 Stating legislation, policy and procedures relating to the conduct of evaluations 1.8 Stating organisational values, ethics and codes of conduct
2. Assess gathered data/ information	2.1 Validity of data/information is assessed 2.2 Analysis techniques are applied to assess data/ information. 2.3 Trends and anomalies are identified 2.4 <b>Data analysis techniques</b> and procedures are documented 2.5 Recommendations are made on	2.1 Business mathematics and statistics 2.2 Data analysis techniques/procedures 2.3 Reporting requirements to a range of audiences 2.4 Legislation, policy and procedures relating to the conduct of evaluations 2.5 Organisational values, ethics and	2.1 Computing business mathematics and statistics 2.2 Describing data analysis techniques/procedures 2.3 Reporting requirements to a range of audiences 2.4 Stating legislation, policy and procedures relating to the



<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE</b>	<b>REQUIRED SKILLS</b>
	areas of possible improvement.	codes of conduct	conduct of evaluations 2.5 Stating organisational values, ethics and codes of conduct
3. Record and present information	<p>3.1 Studied data/information are recorded.</p> <p>3.2 Recommendations are analysed for action to ensure they are compatible with the project's scope and terms of reference.</p> <p>3.3 Interim and final reports are analysed and outcomes are compared to the criteria established at the outset.</p> <p>3.4 Findings are presented to stakeholders.</p>	<p>3.1 Data analysis techniques/procedures</p> <p>3.2 Reporting requirements to a range of audiences</p> <p>3.3 Legislation, policy and procedures relating to the conduct of evaluations</p> <p>3.4 Organisational values, ethics and codes of conduct</p>	<p>3.1 Describing data analysis techniques/procedures</p> <p>3.2 Reporting requirements to a range of audiences</p> <p>3.3 Stating legislation, policy and procedures relating to the conduct of evaluations</p> <p>3.4 Stating organisational values, ethics and codes of conduct practices</p>

## RANGE OF VARIABLES

VARIABLES	RANGE
1. Data analysis techniques	May include but not limited to: 1.1. Domain analysis 1.2. Content analysis 1.3. Comparison technique

## EVIDENCE GUIDE

1. Critical aspects of Competency	<p><b>Assessment requires evidence that the candidate:</b></p> <p>1.1 Determine data / information 1.2 Studied and applied gathered data/information 1.3 Recorded and studied studied data/information</p> <p>These aspects may be best assessed using a range of scenarios what ifs as a stimulus with a walk-through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.</p>
2. Resource Implications	<p><b>Specific resources for assessment</b></p> <p>2.1 Evidence of competent performance should be obtained by observing an individual in an information management role within the workplace or operational or simulated environment.</p>
3. Methods of Assessment	<p><b>Competency in this unit may be assessed through:</b></p> <p>3.1 Written Test 3.2 Interview 3.3 Portfolio</p> <p>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.</p>
4. Context for Assessment	<p>4.1 In all workplace, it may be appropriate to assess this unit concurrently with relevant teamwork or operation units.</p>

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

**UNIT CODE : 400311216**

**UNIT DESCRIPTOR :** This unit covers the knowledge, skills and attitudes required to identify OSH compliance requirements, prepare OSH requirements for compliance, perform tasks in accordance with relevant OSH policies and procedures

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE</b>	<b>REQUIRED SKILLS</b>
1. Identify OSH compliance requirements	1.1 Relevant <b>OSH requirements, regulations, policies and procedures</b> are identified in accordance with workplace policies and procedures 1.2 OSH activity non-conformities are conveyed to <b>appropriate personnel</b> 1.3 <b>OSH preventive and control requirements</b> are identified in accordance with OSH work policies and procedures	1.1. OSH preventive and control requirements 1.2. Hierarchy of Controls 1.3. Hazard Prevention and Control 1.4. General OSH principles 1.5. Work standards and procedures 1.6. Safe handling procedures of tools, equipment and materials 1.7. Standard emergency plan and procedures in the workplace	1.1. Communication skills 1.2. Interpersonal skills 1.3. Critical thinking skills 1.4. Observation skills
2. Prepare OSH requirements for compliance	2.1 OSH work activity material, tools and equipment requirements are identified in accordance with workplace policies and procedures 2.2. Required OSH materials, tools and equipment are acquired in accordance with workplace policies and procedures 2.3. Required OSH materials, tools and equipment are arranged/ placed in	2.1. Resources necessary to execute hierarchy of controls 2.2. General OSH principles 2.3. Work standards and procedures 2.4. Safe handling procedures of tools, equipment and materials 2.5. Different OSH control measures	2.1. Communication skills 2.2. Estimation skills 2.3. Interpersonal skills 2.4. Critical thinking skills 2.5. Observation skills 2.6. Material, tool and equipment identification skills

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE</b>	<b>REQUIRED SKILLS</b>
	accordance with OSH work standards		
3. Perform tasks in accordance with relevant OSH policies and procedures	3.1 Relevant OSH work procedures are identified in accordance with workplace policies and procedures 3.2 Work Activities are executed in accordance with OSH work standards 3.3 <b><i>Non-compliance work activities</i></b> are reported to <i>appropriate personnel</i>	3.1. OSH work standards 3.2. Industry related work activities 3.3. General OSH principles 3.4. OSH Violations Non-compliance work activities	3.1 Communication skills 3.3 Interpersonal skills 3.4 Troubleshooting skills 3.5 Critical thinking skills 3.6 Observation skills

## RANGE OF VARIABLES

VARIABLE	RANGE
1. OSH Requirements, Regulations, Policies and Procedures	May include: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Permit to Operate 1.6 Philippine Occupational Safety and Health Standards 1.7 Department Order No. 13 (Construction Safety and Health) 1.8 ECC regulations
2. Appropriate Personnel	May include: 2.1 Manager 2.2 Safety Officer 2.3 EHS Offices 2.4 Supervisors 2.5 Team Leaders 2.6 Administrators 2.7 Stakeholders 2.8 Government Official 2.9 Key Personnel 2.10 Specialists 2.11 Himself
3. OSH Preventive and Control Requirements	May include: 3.1 Resources needed for removing hazard effectively 3.2 Resources needed for substitution or replacement 3.3 Resources needed to establishing engineering controls 3.4 Resources needed for enforcing administrative controls 3.5 Personal Protective equipment
4. Non OSH-Compliance Work Activities	May include non-compliance or observance of the following safety measures: 4.1 Violations that may lead to serious physical harm or death 4.2 Fall Protection 4.3 Hazard Communication 4.4 Respiratory Protection 4.5 Power Industrial Trucks 4.6 Lockout/Tag-out 4.7 Working at heights (use of ladder, scaffolding) 4.8 Electrical Wiring Methods 4.9 Machine Guarding 4.10 Electrical General Requirements 4.11 Asbestos work requirements 4.12 Excavations work requirements

## EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p><b>Assessment requires evidence that the candidate:</b></p> <ul style="list-style-type: none"> <li>1.1. Convey OSH work non-conformities to appropriate personnel</li> <li>1.2. Identify OSH preventive and control requirements in accordance with OSH work policies and procedures</li> <li>1.3. Identify OSH work activity material, tools and equipment requirements in accordance with workplace policies and procedures</li> <li>1.4. Arrange/Place required OSH materials, tools and equipment in accordance with OSH work standards</li> <li>1.5. Execute work activities in accordance with OSH work standards</li> <li>1.6. Report OSH activity non-compliance work activities to appropriate personnel</li> </ul>
<p>2. Resource Implications</p>	<p><b>The following resources should be provided:</b></p> <ul style="list-style-type: none"> <li>2.1 Facilities, materials tools and equipment necessary for the activity</li> </ul>
<p>3. Methods of Assessment</p>	<p><b>Competency in this unit may be assessed through:</b></p> <ul style="list-style-type: none"> <li>3.1 Observation/Demonstration with oral questioning</li> <li>3.2 Third party report</li> </ul>
<p>4. Context for Assessment</p>	<ul style="list-style-type: none"> <li>4.1 Competency may be assessed in the work place or in a simulated work place setting</li> </ul>

**UNIT OF COMPETENCY : EXERCISE EFFICIENT AND EFFECTIVE SUSTAINABLE PRACTICES IN THE WORKPLACE**

**UNIT CODE : 400311217**

**UNIT DESCRIPTOR** : This unit covers knowledge, skills and attitude to identify the efficiency and effectiveness of resource utilization, determine causes of inefficiency and/or ineffectiveness of resource utilization and Convey inefficient and ineffective environmental practices

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE</b>	<b>REQUIRED SKILLS</b>
1. Identify the efficiency and effectiveness of resource utilization	1.1 Required resource utilization in the workplace is measured using appropriate techniques 1.2 Data are recorded in accordance with workplace protocol 1.3 Recorded data are compared to determine the efficiency and effectiveness of resource utilization according to established <b>environmental work procedures</b>	1.1 Importance of Environmental Literacy 1.2 Environmental Work Procedures 1.3 Waste Minimization 1.4 Efficient Energy Consumptions	1.1 Recording Skills 1.2 Writing Skills 1.3 Innovation Skills
2. Determine causes of inefficiency and/or ineffectiveness of resource utilization	2.1 Potential causes of inefficiency and/or ineffectiveness are listed 2.2 Causes of inefficiency and/or ineffectiveness are identified through deductive reasoning 2.3 Identified causes of inefficiency and/or ineffectiveness are validated thru established environmental procedures	2.1 Causes of environmental inefficiencies and ineffectiveness	2.1 Deductive Reasoning Skills 2.2 Critical thinking 2.3 Problem Solving 2.4 Observation Skills
3. Convey inefficient and ineffective environmental practices	3.1 Efficiency and effectiveness of resource utilization are reported to <i>appropriate personnel</i> 3.2 Concerns related resource utilization are discussed with appropriate personnel 3.3 Feedback on information/ concerns raised are clarified with appropriate personnel	3.1 Appropriate Personnel to address the environmental hazards 3.2 Environmental corrective actions	3.1 Written and Oral Communication Skills 3.2 Critical thinking 3.3 Problem Solving 3.4 Observation Skills 3.5 Practice Environmental Awareness

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Environmental Work Procedures	May include: 1.1 Utilization of Energy, Water, Fuel Procedures 1.2 Waster Segregation Procedures 1.3 Waste Disposal and Reuse Procedures 1.4 Waste Collection Procedures 1.5 Usage of Hazardous Materials Procedures 1.6 Chemical Application Procedures 1.7 Labeling Procedures
2. Appropriate Personnel	May include: 2.1 Manager 2.2 Safety Officer 2.3 EHS Offices 2.4 Supervisors 2.5 Team Leaders 2.6 Administrators 2.7 Stakeholders 2.8 Government Official 2.9 Key Personnel 2.10 Specialists 2.11 Himself



## EVIDENCE GUIDE

<p>1. Critical aspects of Competency</p>	<p><b>Assessment requires evidence that the candidate:</b></p> <ul style="list-style-type: none"> <li>1.1 Measured required resource utilization in the workplace using appropriate techniques</li> <li>1.2 Recorded data in accordance with workplace protocol</li> <li>1.3 Identified causes of inefficiency and/or ineffectiveness through deductive reasoning</li> <li>1.4 Validate the identified causes of inefficiency and/or ineffectiveness thru established environmental procedures</li> <li>1.5 Report efficiency and effectiveness of resource utilization to appropriate personnel</li> <li>1.6 Clarify feedback on information/concerns raised with appropriate personnel</li> </ul>
<p>2. Resource Implications</p>	<p><b>The following resources should be provided:</b></p> <ul style="list-style-type: none"> <li>2.1 Workplace</li> <li>2.2 Tools, materials and equipment relevant to the tasks</li> <li>2.3 PPE</li> <li>2.4 Manuals and references</li> </ul>
<p>3. Methods of Assessment</p>	<p><b>Competency in this unit may be assessed through:</b></p> <ul style="list-style-type: none"> <li>3.1 Demonstration</li> <li>3.2 Oral questioning</li> <li>3.3 Written examination</li> </ul>
<p>4. Context for Assessment</p>	<ul style="list-style-type: none"> <li>4.1 Competency assessment may occur in workplace or any appropriately simulated environment</li> <li>4.2 Assessment shall be observed while task are being undertaken whether individually or in-group</li> </ul>

**UNIT OF COMPETENCY : PRACTICE ENTREPRENEURIAL SKILLS IN THE WORKPLACE**

**UNIT CODE : 400311218**

**UNIT DESCRIPTOR : This unit covers the outcomes required to apply entrepreneurial workplace best practices and implement cost-effective operations**

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE</b>	<b>REQUIRED SKILLS</b>
1. Apply entrepreneurial workplace best practices	1.1 <b>Good practices</b> relating to workplace operations are observed and selected following workplace policy. 1.2 Quality procedures and practices are complied with according to workplace requirements. 1.3 Cost-conscious habits in <b>resource utilization</b> are applied based on industry standards.	1.1 Workplace best practices, policies and criteria 1.2 Resource utilization 1.3 Ways in fostering entrepreneurial attitudes: 1.3.1 Patience 1.3.2 Honesty 1.3.3 Quality-consciousness 1.3.4 Safety-consciousness 1.3.5 Resourcefulness	1.1 Communication skills 1.2 Complying with quality procedures
2. Communicate entrepreneurial workplace best practices	2.1 Observed good practices relating to workplace operations are communicated to <b>appropriate person</b> . 2.2 Observed quality procedures and practices are communicated to appropriate person 2.3 Cost-conscious habits in resource utilization are communicated based on industry standards.	2.1 Workplace best practices, policies and criteria 2.2 Resource utilization 2.3 Ways in fostering entrepreneurial attitudes: 2.3.1 Patience 2.3.2 Honesty 2.3.3 Quality-consciousness 2.3.4 Safety-consciousness 2.3.5 Resourcefulness	2.1 Communication skills 2.2 Complying with quality procedures 2.3 Following workplace communication protocol

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE</b>	<b>REQUIRED SKILLS</b>
3. Implement cost-effective operations	<p>3.1 Preservation and optimization of workplace resources is implemented in accordance with enterprise policy</p> <p>3.2 Judicious use of workplace tools, equipment and materials are observed according to manual and work requirements.</p> <p>3.3 Constructive contributions to office operations are made according to enterprise requirements.</p> <p>3.4 Ability to work within one's allotted time and finances is sustained.</p>	<p>3.1 Optimization of workplace resources</p> <p>3.2 5S procedures and concepts</p> <p>3.3 Criteria for cost-effectiveness</p> <p>3.4 Workplace productivity</p> <p>3.5 Impact of entrepreneurial mindset to workplace productivity</p> <p>3.6 Ways in fostering entrepreneurial attitudes:</p> <p>3.3.1 Quality-consciousness</p> <p>3.3.2 Safety-consciousness</p>	<p>3.1 Implementing preservation and optimizing workplace resources</p> <p>3.2 Observing judicious use of workplace tools, equipment and materials</p> <p>3.3 Making constructive contributions to office operations</p> <p>3.4 Sustaining ability to work within allotted time and finances</p>

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Good practices	May include: 1.1 Economy in use of resources 1.2 Documentation of quality practices
2. Resources utilization	May include: 2.1 Consumption/ use of consumables 2.2 Use/Maintenance of assigned equipment and furniture 2.3 Optimum use of allotted /available time

## EVIDENCE GUIDE

1. Critical aspects of competency	<b>Assessment requires evidence that the candidate:</b> 1.1 Demonstrated ability to identify and sustain cost-effective activities in the workplace 1.2 Demonstrated ability to practice entrepreneurial knowledge, skills and attitudes in the workplace.
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 2.3.1 Enterprise procedures manuals 2.3.2 Company quality policy
3. Methods of Assessment	<b>Competency in this unit should be assessed through:</b> 3.1 Interview 3.2 Third-party report
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.

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
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 Carpentry 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 Carpentry 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 Tools, accessories and materials are checked 3.2 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: 1.1 Brand name 1.2 Size 1.3 Capacity 1.4 Kind of application
2. Tools and accessories	May include: 2.1 Electrical supplies 2.2 Mechanical supplies 2.3 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	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Listed materials and tools according to quantity and job requirements</li> <li>1.2 Requested materials and tools according to the list prepared and as per company SOP</li> <li>1.3 Inspected issued materials and tools as per quantity and job specifications</li> <li>1.4 Provided tools with safety devices</li> </ul>
2. Resource implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Workplace location</li> <li>2.2 Materials relevant to the unit of competency</li> <li>2.3 Plans, drawings and specifications relevant to the activities</li> </ul>
3. Methods of assessment	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Direct observation/Demonstration with oral questioning</li> </ul>
4. Context for assessment	<ul style="list-style-type: none"> <li>4.1 Competency assessment may occur in workplace or any appropriately simulated environment.</li> <li>4.2 Assessment may be performed on multiple occasions involving a combination of direct, indirect and supplementary forms of evidence.</li> </ul>

**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 and applying services to specifications and manuals and storing manuals.

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
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 carpentry 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 carpentry 2.2 Types of symbols used in manuals 2.3 System of measurements Unit conversion	2.1 Interpreting symbols and specifications 2.2 Accessing information and data 2.3 Applying conversion of units of measurements
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 carpentry 3.2 Types and application of symbols in manuals 3.3 Unit conversion	3.1 Applying information from manuals



<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
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 carpentry 4.2 Manual storing and maintaining procedures	4.1 Storing and maintaining manuals

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Manual	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 evidence 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 MUST be provided: 2.1 All manuals/catalogues relative to construction sector
3. Method of assessment	Competency must be assessed through: 3.1 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 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.

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
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
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	2.1 Linear measurement 2.2 Geometrical measurement 2.3 Unit conversion 2.4 Ratio and proportion 2.5 Area	2.1 Interpreting formulas for volume, areas, perimeters of plane and geometric figures 2.2 Handling of measuring instrument

ELEMENTS	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
	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		

## 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 must 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.

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
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
2. Perform basic preventive maintenance	2.1 Equipment is checked for operation in accordance manufacturer's 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	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

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
	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)		
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. Protective Personal Equipment (PPE)	May include but are not limited to: 3.1 Goggles 3.2 Gloves 3.3 Safety shoes 3.4 Hard hat 3.5 Reflectorized Vest

## EVIDENCE GUIDE

<p>1. Critical aspect of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Selected and used appropriate processes, tools and equipment to carry out task</li> <li>1.2 Identified functional and non-functional tools and equipment</li> <li>1.3 Checked, lubricated and calibrated tools, equipment and instruments according to manufacturer's specifications</li> <li>1.4 Replaced defective tools, equipment and their accessories</li> <li>1.5 Observed and applied safe handling of tools and equipment and safety work practices</li> <li>1.6 Prepared and submitted inventory report, where applicable</li> <li>1.6 Maintained workplace in accordance with OSHA regulations</li> <li>1.7 Stored tools and equipment safely in appropriate locations and in accordance with company practices</li> </ul>
<p>2. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Workplace</li> <li>2.2 Maintenance schedule</li> <li>2.3 Maintenance materials, tools and equipment relevant to the proposed activity/task</li> </ul>
<p>3. Methods of assessment</p>	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Direct observation/Demonstration with Oral Questioning</li> <li>3.2 Written Examination</li> </ul>
<p>4. Context for assessment</p>	<p>4.1 Competency may be assessed in actual workplace or at the designated TESDA Accredited Assessment Center.</p>

## CORE COMPETENCIES

**UNIT OF COMPETENCY** : COLLECT BASELINE INFORMATION

**UNIT CODE** : AFFXXXXXX

**UNIT DESCRIPTOR** : This unit covers the knowledge, skills and attitudes required in gathering baseline data needed for water well drilling from the target area.

ELEMENTS	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
1. Plan and prepare for work	1.1 Work plan and timetable is prepared based on work requirements 1.2 Potential environment <b>hazards</b> and security concerns are coordinated with locals and end user 1.3 <b>Tools and materials</b> are selected and checked 1.4 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH	1.1 Interpretation of prepared plans and scope of work 1.2 Hazard identification and safe work procedures 1.3 Types of tools and equipment	1.1 Preparing work plan and timetable 1.2 Identifying hazards 1.3 Selecting and checking of tools, equipment and materials
2. Survey site / area for drilling	2.1 Site/area is surveyed and visited according to standard operating procedures 2.2 <b>Survey devices</b> are used according to standard operating procedures 2.3 Potential environment <b>hazards</b> and safety concerns are coordinated with locals and end user 2.4 <b>Personal protective equipment (PPE)</b> are selected and worn based on Rule 1080 of OSH	2.1 Principles of safe work practices 2.2 Respect and care for nature and the environment 2.3 OSH 2.4 Procedures in conducting site/area familiarization	2.1 Practicing occupational, safety and health 2.2 Application of different types of tools and equipment 2.3 Applying productive methods and techniques in conducting site/area familiarization 2.4 Observing safe use of tools 2.5 Implementing 3R and 5S

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
3. Evaluate collected baseline information and environment assessment	3.1 Collected baseline information and environment assessment are checked and verified 3.2 Relevant information during topographic mapping is logged and recorded 3.3 Standard operating procedures for evaluating baseline information and environment assessment are carried out.	3.1 Principles of safe work practices 3.2 Principles of 5S 3.3 Effective Communication and Record keeping. 3.4 OSH 3.5 Respect and care for nature and the environment 3.6 Procedures in evaluating collected baseline information and environment assessment	3.1 Evaluating collected baseline information and environment assessment 3.2 Practicing occupational safety and health

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Hazards	May include: 1.1 Conflict affected areas 1.2 Snake bites 1.3 Solar radiation 1.4 Dust 1.5 Noise 1.6 Air- and soil-borne micro-organisms 1.7 Chemicals 1.8 Hazardous substances 1.9 Sharp hand tools and equipment 1.10 Holes 1.11 Slippery 1.12 Uneven surfaces
2. Tools and materials	May include: 2.1 Tools 2.1.1 Measuring tape 2.1.2 Bolo too 2.1.3 Shovel  2.2 Materials 2.2.1 Field book 2.2.2 Metal staking 2.2.3 Nylon rope
3. Survey devices	May include: 3.1 Handheld GPS / altimeter 3.2 Water dosing / Water finder
4. Personal Protective Equipment (PPE)	May include: 4.1 Long sleeves 4.2 Gloves 4.3 Rubber boots 4.4 Working hat 4.5 Sunglasses

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Planned and prepared work for collecting baseline information</li> <li>1.2 Surveyed and visited site/area according to standard operating procedures</li> <li>1.3 Checked and verified collected baseline information and environment assessment</li> <li>1.4 Evaluated collected baseline information and environment assessment</li> <li>1.5 Carried out standard operating procedures for evaluating baseline information and environment assessment</li> <li>1.6 Observed safety measures applicable to worksite operation</li> <li>1.7 Communicated effectively with others to ensure effective work operation</li> <li>1.8 Complied with attitudinal work requirements</li> </ul>
<p>2. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Actual or simulated workplace</li> <li>2.2 Water finder equipment</li> <li>2.3 Tool, materials, supplies and equipment needed to perform required tasks</li> <li>2.4 Guide/plan for collecting baseline Information</li> <li>2.5 References and manuals</li> <li>2.6 PPEs</li> <li>2.7 First-aid kit</li> </ul>
<p>3. Methods of assessment</p>	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Demonstration/direct observation with oral questioning</li> </ul>
<p>4. Context for assessment</p>	<ul style="list-style-type: none"> <li>4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions</li> </ul>

**UNIT OF COMPETENCY : PREPARE SITE AND MOBILIZE EQUIPMENT**

**UNIT CODE : AFFXXXXXX**

**UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to prepare site and mobilize equipment.**

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
1. Plan and prepare for work	1.1 Work plan and time table is prepared based on work requirements 1.2 Potential environment <b>hazards</b> and safety concerns are coordinated with locals and end user 1.3 <b>Tools and materials</b> are selected and checked 1.4 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH 1.5 Solutions to potential environmental hazards are identified	1.1 Interpretation of prepared plans and scope of work 1.2 Types of hazards 1.3 Safe work procedures 1.4 Types of tools and equipment 1.5 OSH 1.6 PPE	1.1 Preparing work plan and timetable 1.2 Identifying hazards 1.3 Selecting and checking of tools, equipment and materials
2. Organize site	2.1 Site is checked for readiness of the activity 2.2 Tools, materials, and equipment are prepared 2.3 Existing infrastructure is identified and reported 2.4 Staking/markings is done based on work plan 2.5 Personal protective equipment (PPE)	2.1 Principles of safe work practices 2.2 OSH 2.3 Procedures in preparing site 2.5 Procedures in staking/markings 2.6 PPE	2.1 Practicing occupational, safety and health 2.2 Application of different types of tools 2.3 Applying productive methods and techniques in organizing/ preparing site 2.4 Observing safe use of tools 2.5 Implementing 3R and 5S

ELEMENTS	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
	<p>are selected and worn based on Rule 1080 of OSH</p> <p>2.6 Occupational safety and health practices are observed</p>		
3. Mobilize equipment	<p>3.1 <b>Equipment</b> are checked according to specification</p> <p>3.2 Equipment are prepared in accordance with mode of packaging</p> <p>3.3 Equipment are coordinated with concerned site and in accordance with acceptance procedures.</p> <p>3.4 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH</p> <p>3.5 Occupational safety and health practices are observed</p>	<p>3.1 Principles of safe work practices</p> <p>3.2 Different type of equipment</p> <p>3.3 Different types of packaging</p> <p>3.4 Different modes of transport</p> <p>3.5 Different types of freight forwarding services</p> <p>3.6 Acceptance procedures in the delivery of cargo</p> <p>3.7 PPE</p> <p>3.8 OSH</p>	<p>3.1 Keen to details of specifications of equipment</p> <p>3.2 Checking of equipment</p> <p>3.3 Packaging</p> <p>3.4 Coordination</p> <p>3.5 Interpersonal</p>
4. Set-up of bunkhouse for storage of materials and equipment	<p>4.1 List of tools, equipment and materials is prepared for safe keeping</p> <p>4.2 Area is laid out in accordance with plan</p> <p>4.3 Bunkhouse for storage of tools, materials and equipment is set-up in accordance with work specification</p> <p>4.4 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH</p> <p>4.5 Occupational</p>	<p>4.1 Different types of tools, materials and equipment</p> <p>4.2 Area layout</p> <p>4.3 Set-up procedures</p> <p>4.4 OSH</p> <p>4.5 PPE</p>	<p>4.1 Listing of materials required for setting up bunkhouse</p> <p>4.2 Lay-outing</p> <p>4.3 Setting-up</p> <p>4.4 Practicing occupational safety and health</p>



	safety and health practices are observed		
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### RANGE OF VARIABLES

VARIABLE	RANGE
1. Hazards	May include: 1.1 Conflict affected areas 1.2 Snake bite 1.3 Hazardous substances 1.4 Sharp hand tools and equipment 1.5 Slippery and uneven surface
2. Tools and materials	May include: 2.1 Tools: 2.1.1 Field book 2.1.2 Mallet 2.1.3 Shovel Materials: 2.2 Lubricants 2.2.1 Oil
3. Equipment	May include: 3.1 Tractor 3.2 Forward truck w/ boom

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Planned and prepared work based on work requirements</li> <li>1.2 Prepared site and mobilized equipment</li> <li>1.3 Set up of bunkhouse for storage of materials and equipment</li> <li>1.4 Observed safety measures applicable to worksite operation</li> <li>1.5 Communicated effectively with others to ensure effective work operation</li> <li>1.6 Complied with attitudinal work requirements</li> </ul>
<p>2. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Actual or simulated workplace</li> <li>2.2 Tool, materials, supplies and equipment needed to perform required tasks</li> <li>2.3 Guide/plan for the activity</li> <li>2.4 References and manuals</li> <li>2.5 PPEs</li> <li>2.6 First-aid kit</li> <li>2.7 Ox cart (if needed due to topographical site condition)</li> </ul>
<p>3. Methods of assessment</p>	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Demonstration/direct observation with oral questioning</li> </ul>
<p>4. Context for assessment</p>	<ul style="list-style-type: none"> <li>4.1 Competency may be assessed actual workplace or at the designated TESDA Accredited Assessment Center.</li> </ul>

**UNIT OF COMPETENCY : PERFORM HOLE DRILLING AND REAMING**

**UNIT CODE : AFFXXXXXX**

**UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to set up drilling equipment and perform hole drilling and reaming.**

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
1. Prepare tools and materials	1.1 <b>Work plan</b> and time table is followed based on work requirements 1.2 Potential environment <b>hazards</b> and safety concerns are coordinated 1.3 <b>Tools, equipment and materials</b> are selected and checked 1.4 <b>Personal protective equipment (PPE)</b> are selected and worn based on Rule 1080 of OSH	1.1 Work plan and time table 1.2 Different types of hazards 1.3 OSH 1.4 Different types of tools, equipment and materials 1.5 PPE	1.1 Following work plan and tie table 1.2 Selecting and checking tools, materials and equipment 1.3 Using tools and equipment 1.4 Practicing occupational safety and health
2. Set-up drilling equipment	2.1 Tools, equipment and materials are selected and checked 2.2 The drilling equipment is placed in the desired location for the hole, leveled and the derrick raised. 2.3 Drilling bit is prepared as per required sizes 2.4 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH	2.1 Procedures in setting-up drilling equipment 2.2 OSH 2.3 Types of drilling bit 2.4 PPE	2.1 Applying productive methods and techniques in setting-up drilling equipment 2.2 Observing safe use of tools 2.3 Implementing 3R and 5S 2.4 Practicing occupational safety and health 2.5 Selecting and checking tools, materials and equipment 2.6 Using tools and equipment
3. Set-up mad pit	3.1 Tools and materials are selected and checked 3.2 Mad pit adjacent to well is excavated	3.1 Procedures in setting-up mad pit and hauling of water	3.1 Applying productive methods and techniques in

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
	3.3 Concrete plastering is performed to prevent water leakage 3.4 Hauling of water is performed according to standard operating procedures 3.5 Tools and materials are selected and checked according to work plan 3.6 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH	3.2 OSH 3.3 PPE 3.4 5S and 3Rs	setting-up mad pit and hauling of water 3.2 Practicing 5S and 3Rs 3.3 Practicing occupational safety and health 3.4 Selecting and checking tools, materials and equipment 3.5 Using tools and equipment
4. Conduct drilling and reaming of soil	4.1 Tools and equipment are selected and checked according to work plan 4.2 Drilling and reaming are done in accordance to standard and basis to desired plan and designs 4.3 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH	4.1 Different types of tools and equipment 4.2 Work plan 4.3 Procedures in drilling and reaming 4.4 OSH 4.5 PPE	4.1 Applying productive methods and techniques in drilling and reaming of soil 4.2 Observing safe use of tools 4.3 Practicing occupational safety and health
5. Analyze soil formation as per drilling output	5.1 Tools, materials and equipment are selected and checked according to work plan 5.2 Soil is monitored and analyzed for every 10 feet 5.3 Activities are recorded and reported in accordance with organizational procedures 5.4 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH	5.1 Different types of tools and equipment 5.2 Analyzing soil 5.3 Effective communication and record keeping 5.4 Organizational policies and procedures 5.5 OSH 5.6 PPE	5.1 Applying productive methods and techniques in analyzing soil formation 5.2 Recording and reporting activities 5.3 Practicing occupational safety and health 5.4 Selecting and checking tools, materials and equipment 5.5 Using tools and equipment

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Work plan	May include: 1.1 Results based on the gathered baseline data 1.2 Notebook / logbook and Writing materials
2. Hazards	May include: 2.1 Conflict affected areas 2.2 Snake bites 2.3 Solar radiation 2.4 Dust 2.5 Noise 2.6 Air- and soil-borne micro-organisms 2.7 Chemicals 2.8 Hazardous substances 2.9 Sharp hand tools and equipment 2.10 Holes 2.11 Slippery 2.12 Uneven surfaces
3. Tools, equipment and materials	May include: 3.1 Tools: 3.1.1 Pipe Wrench 24" 3.1.2 Mallet 3.2 Equipment 3.2.1 Chain tong 3.3 Materials 3.3.1 Rope 3.3.2 Field book
4. Personal Protective Equipment (PPE)	May include: 3.3 Work gloves 3.4 Safety glasses 3.5 Safety footwear (safety shoes / rubber boots)

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Prepared tools, equipment and materials</li> <li>1.2 Set-up drilling equipment</li> <li>1.3 Set-up of mad pit</li> <li>1.4 Conducted drilling and reaming of soil in accordance to standard and basis to desired plan and designs</li> <li>1.5 Analyzed soil formation as per drilling output</li> <li>1.6 Observed safety measures applicable to worksite operation</li> <li>1.7 Communicated effectively with others to ensure effective work operation</li> <li>1.8 Complied with attitudinal work requirements</li> </ul>
<p>2. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Actual or simulated workplace</li> <li>2.2 Fag rig / percussion or small rotary drill (mobile type)</li> <li>2.3 Tools (portable welding machine w/ gen-set, pipe wrench and mechanical tools, chain tong)</li> <li>2.4 Materials (G.I. or B.I pipe, for rotary drilled used uPVC blue pipe series 1000)</li> <li>2.5 Guide/plan for the activity</li> <li>2.6 References and manuals</li> <li>2.7 PPEs</li> <li>2.8 First-aid kit</li> <li>2.9 Ox cart (if needed due to topographical site condition)</li> </ul>
<p>3. Methods of assessment</p>	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Demonstration/direct observation with oral questioning</li> </ul>
<p>4. Context for assessment</p>	<p>4.1 Competency may be assessed actual workplace or at the designated TESDA Accredited Assessment Center.</p>

**UNIT OF COMPETENCY : PREPARE CASING DESIGN**

**UNIT CODE : AFFXXXXXX**

**UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required for the design and fabrication of well drilling casing**

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
1. Prepare tools, materials and equipment	1.1 <b>Work plan</b> and time table is prepared based on work requirements 1.2 Area is prepared for fabrication 1.3 Potential environment <b>hazards</b> and safety concerns are coordinated 1.4 <b>Personal protective equipment (PPE)</b> are selected and worn based on Rule 1080 of OSHS 1.5 <b>Tools, materials and equipment</b> are prepared based on work plan	1.1 Work plan and time table 1.2 Fabrication 1.3 Different types of hazards 1.4 Types of tools and materials 1.5 PPE 1.6 OSH	1.1 Interpreting of work plan and time table 1.2 Preparing tools and materials for fabrication of perforated pipe 1.3 Practicing occupational safety and health
2. Fabricate perforated pipe	2.1 Tools, equipment and materials are prepared based on work plan 2.2 Fabrication tasks for perforated pipes are carried out according to manufacturer guidelines and legislative requirements 2.3 Safety practices during fabrication are applied 2.4 Electrical safety practices are applied 2.5 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH	2.1 Types of tools, equipment and materials 2.2 System layout 2.3 Principles of electricity and safe work procedures 2.4 Effective workplace communication processes 2.5 Materials handling 2.6 Risk factors and potential hazards 2.7 Tools operation, capacity and limitations 2.8 Effects of weather and conditions on fabrication of	2.1 Identifying materials required for fabrication works 2.2 Applying safety practices 2.3 Applying electrical safety practices 2.4 Practicing occupational safety and health 2.5 Applying productive methods and techniques in fabrication works 2.6 Observing safe use of tools 2.7 Implementing and 5S and 3Rs

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
		system, site and plant 2.9 Procedures in fabricating perforated pipe 2.10 OSH 2.11 PPE 2.12 5S and 3Rs	
3. Conduct cleaning and painting works	3.1 Tools, equipment and materials are prepared based on work plan 3.2 Cleaning and painting tasks for perforated pipes are carried out according to manufacturer guidelines and legislative requirements 3.2 Safety practices on handling tools and materials are applied during cleaning and painting works 3.3 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH	3.1 Types of tools, equipment and materials 3.2 OSH 3.3 Procedures in cleaning and painting works 3.4 Materials handling 3.5 Risk factors and potential hazards 3.6 Tools operation, capacity and limitations 3.7 5S and 3Rs 3.8 PPE	3.1 Identifying materials required for cleaning and painting works 3.2 Applying safety practices 3.3 Practicing occupational safety and health 3.4 Applying productive methods and techniques in cleaning and painting works 3.5 Observing safe use of tools and materials 3.6 Implementing and 5S and 3Rs
4. Perform shutting down activities	4.1 Waste management is practiced according to Ecological Solid Waste Management Act of 2000. 4.1 Good housekeeping is practiced following 5S and 3Rs 4.3 Work site is restored based on environmental and organizational requirements 4.4 Tools and equipment are cleaned and stored following workplace procedures. 4.5 Activities are recorded and reported in accordance with	4.1 Waste management 4.2 Safety orientation on Basic Health and Safety Practice 4.3 5S and 3Rs 4.4 Effective communication and record keeping. 4.5 Ecological Solid Waste Management Act of 2000 4.6 OSH 4.7 PPE	4.1 Disposing wastes 4.2 Practicing good housekeeping 4.3 Restoring work site 4.4 Recording and reporting activities 4.5 Practicing occupational safety and health



<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
	organizational procedures 4.6 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH		

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Workplan	May include: 1.1 Results based on the gathered baseline data 1.2 Designed plan / guide for fabrication of casing 1.3 Notebook / logbook and Writing materials
2. Hazards	May include: 2.1 Electric shock 2.2 Dust / Debris from work 2.3 Chemicals & Hazardous substances 2.4 Sharp hand tools and equipment 2.5 Slippery & Uneven surfaces 2.6 Noise
3. Personal Protective Equipment (PPE)	May include: 3.1 Welding hood with prescribe lenses 3.2 Safety eye glasses 3.3 Protective clothing 3.4 Safety working globes 3.5 Safety shoes
4. Tools, equipment and materials	May include: 4.1 Tools: 4.1.1 Tape measures 4.1.2 Level bar 4.1.3 Pliers 4.1.4 Cut-off Saw 4.1.5 Angle Grinder 4.1.6 Sander 4.1.7 Hacksaw 4.1.8 Tape measures 4.1.9 Level bar 4.1.10 Pliers 4.1.11 Cut-off Saw 4.1.12 Angle Grinder 4.1.13 Sander 4.1.14 Hacksaw  4.2 Equipment 4.2.1 Generator set  4.3 Materials 4.3.1 Anti-rust paints 4.3.2 Paint brush and tray 4.3.3 Paint thinner and cleaning cloth

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Prepared tools and materials for fabrication of perforated pipe</li> <li>1.2 Performed fabrication tasks for perforated pipes according to manufacturer guidelines and legislative requirements</li> <li>1.3 Performed cleaning and painting tasks for perforated pipes according to manufacturer guidelines and legislative requirements</li> <li>1.4 Performed shutting down activities</li> <li>1.5 Observed safety measures applicable to worksite operation</li> <li>1.6 Communicated effectively with others to ensure effective work operation</li> <li>1.7 Complied with attitudinal work requirements</li> </ul>
<p>2. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Power Tools</li> <li>2.2 Materials (G.I. or B.I pipe, for rotary drilled used uPVC blue pipe series 1000)</li> <li>2.3 Guide/plan for the activity</li> <li>2.4 References and manuals</li> <li>2.5 PPEs</li> <li>2.6 First-aid kit</li> </ul>
<p>3. Methods of assessment</p>	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Demonstration/direct observation with oral questioning</li> </ul>
<p>4. Context for assessment</p>	<ul style="list-style-type: none"> <li>4.1 Competency may be assessed individually in the actual workplace or simulation environment in TESDA accredited institutions</li> </ul>

**UNIT OF COMPETENCY : PERFORM CASING INSTALLATION**

**UNIT CODE : AFFXXXXXX**

**UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform casing installation.**

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
1. Prepare tools, materials and equipment for casing installation	1.1 Work plan and time table is prepared based on work requirements 1.2 <b>Tools, materials and equipment</b> for installation are checked and prepared based on work plan 1.3 Potential environment <b>hazards</b> and safety concerns are coordinated 1.4 <b>Personal Protective Equipment (PPE)</b> are selected and worn based on Rule 1080 of OSHS	1.1 Work plan and time table 1.2 Different types of hazards 1.3 Different types of tools and materials 1.4 OSH 1.5 PPE	1.1 Interpreting of work plan and time table 1.2 Applying productive methods and techniques in preparing tools and materials for casing installation 1.3 Selecting and checking the tools and materials to be use 1.4 Practicing occupational safety and health
2. Install casing pipe	2.1 Tools, equipment and materials are prepared based on work plan 2.2 Safety practices during installation are applied 2.3 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH 2.4 Casing are laid following lay-out plan and design 2.5 Installation is carried out according to manufacturer guidelines 2.6 Borehole is check prior to installation of casing 2.7 <b>Electrical</b> safety practices are applied	2.1 Types of tools, equipment and materials 2.2 Effective workplace communication processes 2.3 Materials handling 2.4 Tools operation, capacity and limitations 2.5 OSH 2.6 Casing installation and alignment 2.7 Soil Condition 2.8 Principles of electricity and safe work procedures	2.1 Applying safety practices 2.2 Applying productive methods and techniques in installing perforated pipe 2.3 Observing safe use of tools 2.4 Implementing 5S and 3R's 2.5 Practicing occupational safety and health 2.6 Applying electrical safety practices

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
3. Conduct gravel packing and cement grouting	3.1 Tools, equipment and materials are prepared based on work plan 3.2 Safety practices on handling tools and materials are applied during gravel packing and cement grouting 3.3 Gravel packing and cement grouting is performed in accordance with standards operating procedures 3.4 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH	3.1 Different types of tools, equipment and materials 3.2 OSH 3.3 Procedures in gravel packing and cement grouting 3.4 Materials handling 3.5 Tools operation, capacity and limitations 3.6 5S and 3Rs 3.7 PPE	3.1 Identifying materials required for gravel packing and cement grouting 3.2 Applying safety practices 3.3 Practicing occupational safety and health 3.4 Applying productive methods and techniques in gravel packing and cement grouting 3.5 Observing safe use of tools and materials 3.6 Implementing 5S and 3Rs 3.7 Selecting and checking the tools and materials to be used 3.8 Using tools and equipment

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Tools, equipment and materials	<p>May include:</p> <p>1.1 Tools:</p> <ul style="list-style-type: none"> <li>1.1.1 Tape measures</li> <li>1.1.2 Level bar</li> <li>1.1.3 Pliers</li> <li>1.1.4 Sander</li> <li>1.1.5 Cleaning cloth</li> <li>1.1.6 Bucket</li> <li>1.1.7 Shovel</li> </ul> <p>1.2 Equipment:</p> <ul style="list-style-type: none"> <li>1.2.1 Compressor</li> <li>1.2.2 Generator set</li> </ul> <p>1.3 Materials:</p> <ul style="list-style-type: none"> <li>1.3.1 G.I. or B.I pipe (for rotary drilled used uPVC blue pipe series 1000)</li> <li>1.3.2 Portland cement</li> <li>1.3.3 Mixing sand &amp; gravel</li> <li>1.3.4 Clean water (for concrete mixture)</li> </ul>
2. Hazards	<p>May include:</p> <ul style="list-style-type: none"> <li>2.1 Conflict affected areas</li> <li>2.2 Check loosen bolts and fastened securely</li> <li>2.3 Holes</li> <li>2.4 Electric shock</li> <li>2.5 Dust / Debris from work</li> <li>2.6 Chemicals &amp; Hazardous substances</li> <li>2.7 Sharp hand tools and equipment</li> <li>2.8 Slippery &amp; Uneven surfaces</li> <li>2.9 Noise</li> </ul>
3. Personal Protective Equipment (PPE)	<p>May include:</p> <ul style="list-style-type: none"> <li>3.1 Safety eye glasses</li> <li>3.2 Protective clothing</li> <li>3.3 Safety working gloves</li> <li>3.4 Safety shoes</li> <li>3.5 Rubber boots</li> </ul>

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Prepared tools &amp; materials for casing installation</li> <li>1.2 Installed casing pipe</li> <li>1.3 Carried out installation of casing pipe according to manufacturer guidelines</li> <li>1.4 Conducted gravel packing &amp; cement grouting in accordance with standards operating procedures</li> <li>1.5 Observed safety measures applicable to worksite operation</li> <li>1.6 Communicated effectively with others to ensure effective work operation</li> <li>1.7 Complied with attitudinal work requirements</li> </ul>
<p>2. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Tools (portable welding machine w/ gen-set, pipe wrench and mechanical tools, chain tong)</li> <li>2.2 Materials (G.I. or B.I pipe, for rotary drilled used uPVC blue pipe series 1000, Portland cement, mixing sand &amp; gravel)</li> <li>2.3 Guide/plan for the activity</li> <li>2.4 References and manuals</li> <li>2.5 PPEs</li> <li>2.6 First-aid kit</li> </ul>
<p>3. Methods of assessment</p>	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Demonstration/direct observation with oral questioning</li> </ul>
<p>4. Context for assessment</p>	<ul style="list-style-type: none"> <li>4.1 Competency may be assessed actual workplace or at the designated TESDA Accredited Assessment Center.</li> </ul>

**UNIT OF COMPETENCY : PERFORM WELL DEVELOPMENT**

**UNIT CODE : AFFXXXXXX**

**UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform well development.**

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
1. Conduct bailing	1.1 Work plan and time table is prepared based on work requirements 1.2 <b>Tools, materials and equipment</b> are selected, checked and prepared based on workplan 1.3 <b>Personal protective equipment (PPE)</b> are selected and worn based on Rule 1080 of OSHS 1.4 Potential environment <b>hazards</b> and safety concerns are coordinated 1.5 Bailing operation is performed based on standard operating procedures	1.1 Work plan and time table 1.2 Different types of hazards 1.3 Different types of tools and materials 1.4 Procedures in performing bailing 1.5 OSH 1.6 PPE	1.1 Interpreting of work plan and time table 1.2 Applying productive methods and techniques in performing bailing 1.3 Selecting and checking the tools and materials to be used 1.4 Practicing occupational safety and health 5.6 Using tools, materials and equipment
2. Conduct charging or airlift	2.1 Work plan and time table is prepared based on work requirements 2.2 Tools and materials are selected and checked 2.3 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSHS 2.4 Tools and materials are prepared based on work plan 2.5 Charging or airlift for well development is applied based on standard operating procedures 2.6 Sounding and deep	2.1 Work plan and time table 2.2 Different types of tools and equipment 2.3 Effective workplace communication processes 2.4 Materials handling 2.5 Tools operation, capacity and limitations 2.6 OSH 2.7 Principles of safe work practices 2.8 Procedures in charging or airlift	2.1 Selecting and checking the tools / equipment and materials to be used 2.2 Practicing occupational safety and health 2.3 Applying productive methods and techniques in performing charging or airlift



ELEMENTS	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables	REQUIRED KNOWLEDGE AND ATTITUDE	REQUIRED SKILLS
	measurement is applied based on standard operating procedures	2.9 PPE	
3. Conduct cleaning of interior pipe casing	3.1 Work plan and time table is prepared based on work requirements 3.2 Tools, equipment and materials are prepared based on work requirements 3.3 Cleaning of interior pipe casing is completed according to job requirements 3.4 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSH	3.1 Different types of tools, equipment and materials 3.2 Effective workplace communication processes 3.3 Materials handling 3.4 Tools operation, capacity and limitations 3.5 OSH 3.6 Procedures in cleaning of interior pipe casing 3.7 PPE	3.1 Applying safety practices 3.2 Applying productive methods and techniques in cleaning of interior pipe casing 3.3 Observing safe use of tools 3.4 Implementing 3R and 5S 3.5 Selecting and checking the tools and materials to be used 3.6 Practicing occupational safety and health 3.7 Using tools and equipment
4. Check well development and drawdown	4.1 Tools, equipment and materials are prepared based on work requirements 4.2 <b>Safety practices</b> during checking well development and drawdown is applied 4.3 <b>Checking of volume of water drawdown</b> is performed according to standard operating procedures 4.6 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSHS	4.1 Different types of tools and equipment 4.2 Effective workplace communication processes 4.3 Tools operation, capacity and limitations 4.4 OSH 4.5 Principles of safe work 4.6 Procedures in checking well development and drawdown 4.7 PPE	4.1 Selecting and checking the tools/ equipment and materials to be used 4.2 Selecting and wearing of personal protective equipment (PPE) 4.3 Practicing occupational safety and health 4.4 Applying productive methods and techniques in checking well development & drawdown 4.5 Observing safe use of tools 4.6 Implementing 3R and 5S

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Tools, materials and equipment	May include: 1.1 Tools: 1.1.1 Tape measure 1.2 Materials: 1.2.1 G.I. or B.I pipe (for rotary drilled used uPVC Blue pipe series 1000) 1.2.2 Cleaning cloth 1.3 Equipment: 1.3.1 Generator set 1.3.2 Air Compressor 1.3.3 Submersible pump
2. Personal Protective Equipment (PPE)	May include: 2.1 Safety eye glasses 2.2 Protective clothing 2.3 Safety working globes 2.4 Safety shoes 2.5 Rubber boots
3. Hazards	May include: 3.1 Conflict affected areas 3.2 Holes 3.3 Dust / Debris from work 3.4 Chemicals & Hazardous substances 3.5 Sharp hand tools and equipment 3.6 Slippery & Uneven surfaces 3.7 Noise
4. Safety practices	May include: 4.1 Cleaning out the clay and silt introduced during the drilling process 4.2 Over pumping (used mud pump as suction pump to pump water from the well if water level is within 10 to ft 15ft) 4.3 Surging (to forcefully moving water into and out of the well) 4.3.1 using air compressor 4.3.2 Bailer
5. Checking of volume of water drawdown	May include: 5.1 Testing well yield using submersible pump during a recommended specific time 5.2 Measures water level before and after pumping

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Planned and prepare work for the activity</li> <li>1.2 Conducted site / area familiarization</li> <li>1.3 Performed bailing based on standard operating procedures</li> <li>2.7 Performed charging or airlift for well development is applied based on standard operating procedures</li> <li>1.4 Performed cleaning of interior pipe casing according to job requirements</li> <li>1.5 Checked volume of water drawdown according to standard operating procedures</li> <li>1.6 Observed safety measures applicable to worksite operation</li> <li>1.7 Communicated effectively with others to ensure effective work operation</li> <li>1.8 Complied with attitudinal work requirements</li> </ul>
<p>2. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Nylon and tape measure</li> <li>2.2 Multi Tester and TF wire</li> <li>2.3 Guide/plan for the activity</li> <li>2.4 References and manuals</li> <li>2.5 PPEs</li> </ul>
<p>3. Methods of assessment</p>	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Demonstration/direct observation with oral questioning</li> </ul>
<p>4. Context for assessment</p>	<p>4.1 Competency may be assessed actual workplace or at the designated TESDA Accredited Assessment Center.</p>

**UNIT OF COMPETENCY : PERFORM PUMP INSTALLATION AND TEST PUMPING**

**UNIT CODE : AFFXXXXXX**

**UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform pump installation and test pumping.**

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
1. Splice pump connection wires	1.1 Work plan and time table is followed based on work requirements 1.2 <b>Tools, materials and equipment</b> are prepared based on job requirements 1.3 <b>Pump connection wires</b> are spliced according to job requirements 1.4 <b>Personal protective equipment (PPE)</b> are selected and worn based on Rule 1080 of OSHS 1.5 Potential environment hazards and safety concerns are coordinated	1.1 Effective workplace communication processes 1.2 Work plan and time table 1.3 Different types of tools and materials 1.4 OSH 1.5 PPE 1.6 Interpretation of symbols and use of legend on site plans and specifications, particularly in relation to the splicing works 1.7 Hazard identification and safe work procedures	1.1 Following work plan and time table 1.2 Applying productive methods and techniques in splicing pump connection wires 1.3 Selecting and checking tools, materials and equipment 1.4 Using tools and equipment 1.5 Practicing occupational safety and health
2. Install coupling to riser pipe or straw	2.1 Work plan and time table is followed based on work requirements 2.2 Tools, materials and equipment are prepared based on job requirements 2.3 Thread pipes are reviewed before installation 2.4 Installation of pipe and coupling is performed based on work requirements 2.5 Personal protective equipment (PPE) are selected and worn	2.1 Effective workplace communication processes 2.2 Different types of tools and materials 2.3 OSH 2.4 PPE 2.5 Interpretation of symbols and use of legend on site plans and specifications, particularly in relation to the installation of	2.1 Following work plan and time table 2.2 Selecting and checking tools, materials and equipment 2.3 Using tools and equipment 2.4 Applying productive methods and techniques in installing coupling 2.5 Practicing occupational safety and health

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
	based on Rule 1080 of OSHS	coupling	
3. Install riser pipe to submersible pump	3.1 Work plan and time table is followed based on work requirements 3.2 Tools, materials and equipment are prepared based on job requirements 3.3 Installation of riser pipe to motor and tucking of cable is performed based on work requirements 3.4 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSHS	3.1 Effective workplace communication processes 3.2 System layout 3.3 Principles of installation and safe work procedures 3.4 Materials handling 3.5 Tools operation, capacity and limitations 3.6 OSH 3.7 PPE	3.1 Following work plan and time table 3.2 Selecting and checking tools, materials and equipment 3.3 Using tools and equipment 3.4 Applying productive methods and techniques in installing riser pipe and tucking of cable 3.5 Practicing occupational safety and health
4. Perform test pumping	4.1 Work plan and time table is followed based on work requirements 4.2 Tools, materials and equipment are prepared based on job requirements 4.3 Sensitivity test is performed based on work requirements 4.4 Pump calibration is performed according to job requirements 4.5 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSHS	4.1 Effective workplace communication processes 4.2 System layout 4.3 Principles of installation and safe work procedures 4.4 Materials handling 4.5 Tools operation, capacity and limitations 4.6 OSH 4.7 PPE	4.1 Following work plan and time table 4.2 Selecting and checking tools, materials and equipment 4.3 Using tools and equipment 4.4 Applying productive methods and techniques in test pumping 4.5 Practicing occupational safety and health

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
5. Log and record work activities	5.1 Tools and materials are prepared based on job requirements 5.2 Voltage, amperage, water output and drawdown are recorded based on standard operating procedures 5.3 Activities are recorded and reported in accordance with organizational Procedures 5.5 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSHS	5.1 Effective workplace communication processes 5.2 Types of tools and materials 5.3 Recording work activities 5.4 OSH 5.5 PPE	5.1 Selecting and checking tools and materials 5.2 Using tools 5.3 Applying methods and techniques in recording work activities 5.4 Practicing occupational safety and health

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Tools, materials and	May include: 1.1 Tools 1.1.1 Tape measure 1.1.2 Level bar 1.1.3 Pliers 1.2 Materials 1.2.1 Cleaning cloth 1.3 Equipment 1.3.1 Generator set 1.3.2 Compressor 1.3.3 Submersible pump
2. Pump connection wires	May include: 2.1 AWG # 8 2.2 AWG # 10
3. Personal Protective Equipment (PPE)	May include: 3.1 Safety eye glasses 3.2 Safety working gloves 3.3 Safety shoes 3.4 Rubber boots

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Planned and prepared work activities.</li> <li>1.2 Spliced pump connection wires according to job requirements.</li> <li>1.3 Installed pipe and coupling based on work requirements</li> <li>1.4 Installed riser pipe to motor and tucking of cable based on work requirements</li> <li>1.5 Performed pump calibration according to job requirements</li> <li>1.6 Recorded voltage, amperage, water output and drawdown based on standard operating procedures</li> <li>1.7 Observed safety measures applicable to worksite operation</li> <li>1.8 Communicated effectively with others to ensure effective work operation</li> <li>1.9 Complied with attitudinal work requirements</li> </ul>
<p>2. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Multi tester</li> <li>2.2. Clamp meter</li> <li>2.3 Calibrated container</li> <li>2.4 PPEs</li> </ul>
<p>3. Methods of assessment</p>	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Demonstration/direct observation with oral questioning</li> </ul>
<p>4. Context for assessment</p>	<p>4.1 Competency may be assessed actual workplace or at the designated TESDA Accredited Assessment Center.</p>



**UNIT OF COMPETENCY : PERFORM WELL CAPABILITY**

**UNIT CODE : AFFXXXXXX**

**UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform well capability.**

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
1. Conduct pump discharge	1.1 <b>Tools and materials</b> are prepared based on job requirements 1.2 Check for calibrated and desired output of pump design 1.3 Pump discharge activities are performed based on standard operating procedures 1.4 Activities are recorded and reported in accordance with organizational procedures 1.5 Potential environment <b>hazards</b> and safety concerns are coordinated 1.6 <b>Personal protective equipment (PPE)</b> are selected and worn based on Rule 1080 of OSHS	1.1 Methods and techniques for measurements 1.2 Types of tools and materials 1.3 Pump specifications 1.4 Conducting pump discharge 1.5 Effective Communication and Record keeping 1.6 Principles of safe work 1.7 Hazard identification 1.8 OSH 1.9 PPE	1.1 Identifying hazards 1.2 Selecting and checking tools and materials 1.3 Using tools 1.4 Selecting and wearing of personal protective equipment (PPE) 1.5 Practicing occupational safety and health 1.6 Applying techniques in conducting pump discharge
2. Check drawdown and pump performance	2.1 Tools and materials are prepared based on job requirements 2.2 Conduct continuous checking of well performance (in every 15mins interval – for 72hrs) based on standard operating procedures 2.3 Activities are recorded and reported in accordance with organizational procedures 2.4 Personal protective equipment (PPE) are selected and worn	2.1 Methods and techniques for Measurements 2.2 Types of tools and materials 2.3 Checking drawdown and pump performance 2.4 Effective communication and record keeping 2.5 Principles of safe work 2.6 OSH 2.7 PPE	2.1 Preparing work plan and timetable 2.2 Selecting and checking tools and materials 2.3 Using tools 2.4 Selecting and wearing of personal protective equipment (PPE) 2.5 Practicing occupational safety, health and hazards elimination 2.6 Applying techniques in

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
	based on Rule 1080 of OSHS		checking drawdown and pump performance
3. Monitor water pump discharge	3.1 Tools and materials are prepared based on job requirements 3.2 Design of pump and reliability of well performance is observed 3.3 Water pump discharge is monitor as per specification of submersible pump 3.4 Activities are recorded and reported in accordance with organizational procedures 3.5 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSHS	3.1 Methods and techniques for Measurements 3.2 Types of tools and materials 3.3 Procedures in water pump discharge 3.4 Effective communication and record keeping 3.5 Principles of safe work 3.6 OSH 3.7 PPE 3.8 Record keeping	3.1 Selecting and wearing of personal protective equipment (PPE) 3.2 Selecting and checking tools and materials 3.3 Using tools 3.4 Practicing occupational safety and health 3.5 Monitoring water pump discharge

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Tools and materials	May include: 1.1 Tools 1.1.1 Tape measure 1.1.2 Multi tester 1.1.3 Clamp meter 1.1.4 Calibrated container or water meter 1.2 Materials 1.2.1 Field book 1.2.2 cleaning cloth
2. Hazards	May include: 2.1 Conflict affected areas 2.2 Holes 2.3 Dust / Debris from work 2.4 Chemicals & Hazardous substances 2.5 Sharp hand tools and equipment 2.6 Slippery & Uneven surfaces 2.7 Noise
3. Personal Protective Equipment (PPE)	May include: 3.1 Safety eye glasses 3.2 Safety working globes 3.3 Safety shoes 3.4 Rubber boots

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Planned and prepared work activities.</li> <li>1.2 Performed pump discharge activities based on standard operating procedures.</li> <li>1.3 Conducted continuous checking of well performance based on standard operating procedures</li> <li>1.4 Monitored water pump discharge as per specification of submersible pump</li> <li>1.5 Observed safety measures applicable to worksite operation</li> <li>1.6 Communicated effectively with others to ensure effective work operation</li> <li>1.7 Complied with attitudinal work requirements</li> </ul>
<p>2. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Guide/plan for the activity</li> <li>2.2 References and manuals</li> <li>2.3 Multi tester</li> <li>2.4 Clamp meter</li> <li>2.5 Calibrated container or water meter</li> <li>2.6 PPEs</li> </ul>
<p>3. Methods of assessment</p>	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Demonstration/direct observation with oral questioning</li> </ul>
<p>4. Context for assessment</p>	<p>4.1 Competency may be assessed actual workplace or at the designated TESDA Accredited Assessment Center.</p>

**UNIT OF COMPETENCY** : **PERFORM WELL COMPLETION AND CONDUCT PARTIAL POTABILITY TEST**

**UNIT CODE** : AFFXXXXXX

**UNIT DESCRIPTOR** : This unit covers the knowledge, skills and attitudes required to perform well completion and conduct partial potability test.

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
1. Check pump performance and controls	1.1 Work plan and time table is followed based on work requirements 1.2 <b>Tools and materials</b> are prepared based on job requirements 1.3 General checking of overall performance of motor pump to controller is performed based on standard operating procedures 1.4 Pipelines are check for leaks following standard operating procedures 1.5 Potential environment <b>hazards</b> and safety concerns are coordinated 1.6 Personal protective equipment (PPE) are selected and worn based on Rule 1080 of OSHS	1.1 Effective workplace communication processes 1.2 Data gathering 1.3 Work plan and time table 1.4 Different types of tools, materials and equipment 1.5 OSH 1.6 PPE 1.7 Procedures in checking pump performance 1.8 Hazard identification and safe work procedures 1.9 Leak test	1.1 Following work plan and timetable 1.2 Monitoring and data gathering 1.3 Identifying hazards 1.4 Selecting and checking tools, materials and equipment 1.5 Using tools and equipment 1.6 Practicing occupational safety and health 1.7 Applying productive methods and techniques in checking pump performance and controls
3. Test water potability	2.1 Tools, equipment and materials are prepared based on job requirements 2.2 Potability test is conducted based on standard operating procedures 2.3 <b>Personal Protective Equipment (PPE)</b> are selected and worn based on Rule 1080 of OSHS	2.1 OSH 2.2 PPE 2.3 Data gathering and recording 2.4 Procedures in testing water potability 2.5 Handling of test kit and Tester	2.1 Monitoring and data gathering 2.2 Selecting and checking tools, materials and equipment 2.3 Using tools and equipment 2.4 Practicing occupational safety and health 2.5 Applying productive

<b>ELEMENTS</b>	<b>PERFORMANCE CRITERIA</b> <i>Italicized terms</i> are elaborated in the Range of Variables	<b>REQUIRED KNOWLEDGE AND ATTITUDE</b>	<b>REQUIRED SKILLS</b>
			<p>methods and techniques in testing water potability</p> <p>2.6 Practicing occupational safety and health</p>
<p>4. Conduct shutting down activities</p>	<p>3.1 Tools, equipment and materials are prepared based on job requirements</p> <p>3.2 Personal Protective Equipment (PPE) are selected and worn based on Rule 1080 of OSHS</p> <p>3.3 General check- up and decommissioning of equipment are performed based on standard operating procedures</p> <p>3.4 Demobilization and clean up are performed based on standard operating procedures</p> <p>3.5 Damaged tools and equipment are recorded and reported in accordance with organizational procedures</p>	<p>3.1 OSH</p> <p>3.2 PPE</p> <p>3.3 Procedures in performing shut down activities</p> <p>3.4 Types of tools, equipment and materials</p> <p>3.5 Record keeping</p>	<p>3.1 Applying techniques in conducting shutting down activities</p> <p>3.2 Selecting and checking tools, materials and equipment</p> <p>3.3 Using tools and equipment</p> <p>3.4 Practicing occupational safety and health</p>

## RANGE OF VARIABLES

VARIABLE	RANGE
1. Tools and materials	May include: 1.1 Tools 1.1.1 Multi Tester (fluke) 1.1.2 Clamp meter 1.1.3 Resistance meter 1.1.4 Potability testing kit 1.1.5 Total Solid tester 1.2 Materials 1.2.1 Cleaning cloth 1.2.2 Field book
2. Hazards	May include: 2.1 Conflict affected areas 2.2 Dust / Debris from work 2.3 Chemicals & Hazardous substances 2.4 Sharp hand tools and equipment 2.5 Slippery & Uneven surfaces 2.6 Electric shock
3. Personal Protective Equipment (PPE)	May include: 3.1 Safety eye glasses 3.2 Safety working globes 3.3 Safety shoes 3.4 Rubber boots

## EVIDENCE GUIDE

<p>1. Critical aspects of competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Planned and prepared work activities.</li> <li>1.2 Performed general checking of overall performance of motor pump to controller based on standard operating procedures</li> <li>1.3 Conducted potability test based on standard operating procedures</li> <li>1.4 Performed general check- up and decommissioning of equipment based on standard operating procedures</li> <li>1.5 Performed demobilization and clean up based on standard operating procedures</li> <li>1.6 Observed safety measures applicable to worksite operation</li> <li>1.7 Communicated effectively with others to ensure effective work operation</li> <li>1.8 Complied with attitudinal work requirements</li> </ul>
<p>2. Resource implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> <li>2.1 Tester</li> <li>2.2 Clamp meter</li> <li>2.3 Potability testing kit</li> <li>2.4 Total Solid tester</li> <li>2.5 PPEs</li> <li>2.6 First-aid kit</li> </ul>
<p>3. Methods of assessment</p>	<p>Competency in this unit must be assessed through:</p> <ul style="list-style-type: none"> <li>3.1 Demonstration/direct observation with oral questioning</li> </ul>
<p>4. Context for assessment</p>	<p>4.1 Competency may be assessed actual workplace or at the designated TESDA Accredited Assessment Center.</p>



## **TRAINEE ENTRY REQUIREMENTS:**

The trainees or students wishing to gain entry into this course should possess the following requirements:

- Must possess good communication skills
- Must have arithmetic skills
- Can adjust to rural work situation

## **TRAINER'S QUALIFICATION**

The trainer shall have the following qualifications:

- Must have Trainers Methodology training certificate OR must be a practicing trainer for two (2) years within the five years
- Must have two (2) years industry work experience within the last five (5) years on water well drilling and rural water system project installation
- Can adjust to rural work situation

## LIST OF TOOLS, EQUIPMENT AND MATERIALS:

Recommended list of tools, equipment for the training of 25 trainees for Water Well Drilling

### TOOLS

QTY.	DESCRIPTION
	<b>Carpentry Tools</b>
10 pcs	Hammer
10 pcs	Cross Cut Saw
10 pcs	Shovel
	<b>Mechanical Tools</b>
10 pcs	Wrenches, 10"
10 pcs	Pipe wrenches 24"
5 pcs	Flat Screwdriver, 8"
5 pcs	Phillips Screwdriver, 8"
5 pcs	Pullers
5 pcs	Pliers
5 pcs.	Vise Grip, 10"
5 pcs	Chain tong
	<b>Power Tools</b>
3 pcs	Angle grinder
3 pcs	Cut-off Saw
	<b>Measuring Tools</b>
1 pc.	Altimeter / gps
25 pcs	Tape Measure
5 pcs	Multi Tester
5 pcs	Clamp Meter
5 pcs	Resistance meter
5 pcs	Calibrated Container or Water Meter
5 pcs	Portable Testing Kit
3 pcs	Total Solid Tester

## EQUIPMENT

QTY.	DESCRIPTION
	<b>Water Finder Equipment</b>
1 set	Water dosing
1 set	Water finder
1 set	Ox Cart (optional if needed due to terrain – could be rent on areas)
1 set	20kva Generator Set
1 unit	300amps Portable Welding Machine
1 unit	Air compressor 350psi
1 set	Self-loading drilling machine w/ drill bit & drilling rod
1 set	Mud pump w/ engine
1 unit	Forward truck w/ boom
1 set	1unit Submersible Solar Pump (0.5hp) with 2pcs PV Module (Panel) polycrystalline, Complete w/ accessories Cabling and MC4 connector, Ground Mounting System
1set	3hp AC submersible pump (model 25gs 30) complete control, cable & accessories (for test pumping)

## MATERIALS

QTY.	DESCRIPTION
9 lengths	2" G.I Pipe shed. 40
10 lengths	6" B.I. Pipe shed. 40
10 lengths	6" uPVC Blue Pipe Series 1000
3 rolls	Nylon
3 rolls	TF Wire
3 pcs	Calibrated Container

## PERSONAL PROTECTIVE EQUIPMENT

QTY.	DESCRIPTION
27 pcs	Long sleeves
27 pcs	Gloves
27 pcs	Rubber boots
27 pcs	Working hat
27 pcs	Sun glasses
3 pcs	First Aid kit

## REFERENCES

QTY.	DESCRIPTION
27 pcs	Manuals
27 pcs	Guide plan

## ACKNOWLEDGEMENTS

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