TRAINING REGULATIONS

Heavy Equipment Operation [On-highway dump truck [Rigid] NC II

CONSTRUCTION SECTOR

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

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SECTION 1 HEAVY EQUIPMENT OPERATION - On-HIGHWAY DUMP TRUCK [RIGID] NC II

The **HEAVY EQUIPMENT OPERATION - On-HIGHWAY DUMP TRUCK [RIGID]** qualification consists of competencies that workers must achieve to enable them to perform tasks such as loading and dumping of earth materials in the construction, mining sites or other locations.

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

The units of competency comprising this qualification include the following:

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

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

CODE NO.	CORE COMPETENCIES
CON833316	Perform pre- and post-operation procedures for hauling equipment
CON833317	Perform basic preventive maintenance servicing for hauling equipment
CON833318	Perform productive operation for on-highway dump truck (rigid)

A person who has achieved this Qualification is competent to be an -

- On-highway dump truck (rigid) operator

SECTION 2 COMPETENCY STANDARDS

This section gives the details and contents of the core units of competency required in **HEAVY EQUIPMENT OPERATION - ON-HIGHWAY DUMP TRUCK (RIGID) NC II**. These units of competency are categorized into basic, common and core competencies.

BASIC COMPETENCIES

UNIT OF COMPETENCY:	**PARTICIPATE IN WORKPLACE COMMUNICATION**
UNIT CODE :	**500311105**
UNIT DESCRIPTOR :	This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENT	PERFORMANCE CRITERIA ***Bold and italicized*** terms are elaborated in the Range of Variables
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from ***appropriate sources*** 1.2 Effective questioning , active listening and speaking skills are used to gather and convey information 1.3 Appropriate ***medium*** is used to transfer information and ideas 1.4 Appropriate non- verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and ***storage*** of information are used 1.7 Personal interaction is carried out clearly and concisely
2. Participate in workplace meetings and discussions	2.1 Team meetings are attended on time 2.2 Own opinions are clearly expressed and those of others are listened to without interruption 2.3 Meeting inputs are consistent with the meeting purpose and established ***protocols*** 2.4 ***Workplace interactions*** are conducted in a courteous manner 2.5 Questions about simple routine workplace procedures and maters concerning working conditions of employment are asked and responded to 2.6 Meetings outcomes are interpreted and implemented

3. Complete relevant work related documents	3.1 Range of ***forms*** relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Basic mathematical processes are used for routine calculations 3.4 Errors in recording information on forms/ documents are identified and properly acted upon 3.5 Reporting requirements to supervisor are completed according to organizational guidelines

RANGE OF VARIABLES

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

EVIDENCE GUIDE

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

UNIT OF COMPETENCY:	**WORK IN TEAM ENVIRONMENT**
UNIT CODE :	**500311106**
UNIT DESCRIPTOR :	This unit covers the skills, knowledge and attitudes to identify role and responsibility as a member of a team.

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

RANGE OF VARIABLES

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

EVIDENCE GUIDE

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

UNIT OF COMPETENCY:	**PRACTICE CAREER PROFESSIONALISM**
UNIT CODE :	**500311107**
UNIT DESCRIPTOR :	This unit covers the knowledge, skills and attitudes in promoting career growth and advancement.

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

RANGE OF VARIABLES

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

EVIDENCE GUIDE

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

UNIT OF COMPETENCY :	**PRACTICE OCCUPATIONAL HEALTH AND SAFETY PROCEDURES**
UNIT CODE :	**500311108**
UNIT DESCRIPTOR :	This unit covers the outcomes required to comply with regulatory and organizational requirements for occupational health and safety.

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

4. Maintain OHS awareness	4.1 ***Emergency-related drills and trainings*** are participated in as per established organization guidelines and procedures 4.2 ***OHS personal records*** are completed and updated in accordance with workplace requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Safety regulations	May include but are not limited to: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Philippine Occupational Safety and Health Standards 1.6 DOLE regulations on safety legal requirements 1.7 ECC regulations
2. Hazards/Risks	May include but are not limited to: 2.1 Physical hazards – impact, illumination, pressure, noise, vibration, temperature, radiation 2.2 Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects 2.3 Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 2.4 Ergonomics 2.4.1 Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles 2.4.2 Physiological factors – monotony, personal relationship, work out cycle
3. Contingency measures	May include but are not limited to: 3.1 Evacuation 3.2 Isolation 3.3 Decontamination 3.4 (Calling designed) emergency personnel
4. PPE	May include but are not limited to: 4.1 Mask 4.2 Gloves 4.3 Goggles 4.4 Hair Net/cap/bonnet 4.5 Face mask/shield 4.6 Ear muffs 4.7 Apron/Gown/coverall/jump suit 4.8 Anti-static suits

5. Emergency-related drills and training	5.1 Fire drill 5.2 Earthquake drill 5.3 Basic life support/CPR 5.4 First aid 5.5 Spillage control 5.6 Decontamination of chemical and toxic 5.7 Disaster preparedness/management
6. OHS personal records	6.1 Medical/Health records 6.2 Incident reports 6.3 Accident reports 6.4 OHS-related training completed

EVIDENCE GUIDE

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

COMMON COMPETENCIES

UNIT OF COMPETENCY:	**PREPARE CONSTRUCTION MATERIALS AND TOOLS**
UNIT CODE :	**CON931201**
UNIT DESCRIPTOR :	This unit covers the knowledge, skills and attitudes on identifying, requesting and receiving construction materials and tools based on the required performance standards.

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

RANGE OF VARIABLES

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

EVIDENCE GUIDE

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

UNIT OF COMPETENCY:	**OBSERVE PROCEDURES, SPECIFICATIONS AND MANUALS OF INSTRUCTIONS**
UNIT CODE :	**CON311201**
UNIT DESCRIPTOR :	This unit covers the knowledge, skills and attitudes on identifying, interpreting, applying services to specifications and manuals and storing manuals.

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

RANGE OF VARIABLES

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

EVIDENCE GUIDE

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

UNIT OF COMPETENCY:	**PERFORM MENSURATIONS AND CALCULATIONS**
UNIT CODE :	**CON311203**
UNIT DESCRIPTOR :	This unit covers the knowledge, skills and attitudes on identifying and measuring objects based on the required performance standards.

ELEMENT	PERFORMANCE CRITERIA ***Bold and italicized*** *terms* are elaborated in the Range of Variable
1. Select measuring instruments	1.1 Object or component to be measured is identified, classified and interpreted according to the appropriate regular ***geometric shape*** 1.2 Measuring tools are selected/identified as per object to be measured or job requirements 1.3 Correct specifications are obtained from relevant sources 1.4 Appropriate measuring instruments are selected according to job requirements 1.5 Alternative measuring tools are used without sacrificing cost and quality of work
2. Carry out measurements and calculations	2.1 Accurate **measurements** are obtained according to job requirements 2.2 Alternative measuring tools are used without sacrificing cost and quality of work 2.3 **Calculation** needed to complete work tasks are performed using the four basic process of addition (+), subtraction (-), multiplication (x) and division (/) including but not limited to: trigonometric functions, algebraic computations 2.4 Calculations involving fractions, percentages and mixed numbers are used to complete workplace tasks 2.5 Numerical computation is self-checked and corrected for accuracy 2.6 Instruments are read to the limit of accuracy of the tool 2.7 Systems of measurement identified and converted according to job requirements/ISO 2.8 Workpieces are measured according to job requirements

RANGE OF VARIABLES

VARIABLE	RANGE
1. Geometric shape	Including but is not limited to: 1.1 Round 1.2 Square 1.3 Rectangular 1.4 Triangle 1.5 Sphere 1.6 Conical
2. Measuring instruments	Including but not limited to: 2.1 Micrometer (In-out, depth) 2.2 Vernier caliper (out, inside) 2.3 Dial gauge with mag, std. 2.4 Straight edge 2.5 Thickness gauge 2.6 Torque gauge 2.7 Small hole gauge 2.8 Telescopic gauge 2.9 Try-square 2.10 Protractor 2.11 Combination gauge 2.12 Steel rule 2.13 Voltmeter 2.14 Ammeter 2.15 Mega-ohmeter 2.16 Kilowatt hour meter 2.17 Gauges 2.18 Thermometers
3. Measurements and calculations	3.1 Linear 3.2 Volume 3.3 Area 3.4 Wattage 3.5 Voltage 3.6 Resistance 3.7 Amperage 3.8 Frequency 3.9 Impedance

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

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Selected and prepared appropriate measuring instruments in accordance with job requirements 1.2 Performed measurements and calculations according to job requirements/ ISO
2. Underpinning knowledge	TRADE MATHEMATICS / MENSURATION 2.1 Four fundamental operation 2.2 Linear measurement 2.3 Dimensions 2.4 Unit conversion 2.5 Ratio and proportion 2.6 Trigonometric functions 2.8 Algebraic equations
3. Underpinning skills	3.1 Performing calculation by addition, subtraction, multiplication and division; trigonometric functions and algebraic equations 3.2 Visualizing objects and shapes 3.3 Interpreting formulas for volume, areas, perimeters of plane and geometric figures 3.4 Proper handling of measuring instruments
4. Resource implications	The following resources should be provided: 4.1 Workplace location 4.2 Problems to solve 4.3 Measuring instrument appropriate to carry out tasks 4.4 Instructional materials relevant to the propose activity Assessment of underpinning knowledge and practical skills may be combined
5. Methods of assessment	Competency should be assessed through: 5.1 Actual demonstration 5.2 Direct observation 5.3 Written test/questioning related to underpinning knowledge
6. Context of assessment	6.1 Competency assessment may occur in workplace or any appropriate simulated environment 6.2 Assessment shall be observed while task are being undertaken whether individually or in group 6.3 Competency assessment must be undertaken in accordance with the TESDA assessment guidelines

UNIT OF COMPETENCY:	**MAINTAIN TOOLS AND EQUIPMENT**
UNIT CODE :	**CON311204**
UNIT DESCRIPTOR :	This unit covers the knowledge, skills and attitudes on checking condition, performing preventive maintenance and storing of tools and equipment based on the required performance standards.

ELEMENTS	PERFORMANCE CRITERIA ***Bold and italicized*** terms are elaborated in the Range of Variables
1. Check condition of tools and equipment	1.1 ***Materials, tools and equipmen***t are identified according to classification and job requirements 1.2 Non-functional tools and equipment are segregated and labeled according to classification 1.3 Safety of tools and equipment are observed in accordance with manufacturer's instructions 1.4 Condition of ***PPE*** are checked in accordance with manufacturer's instructions
2. Perform basic preventive maintenance	2.1 Appropriate lubricants are identified according to types of equipment 2.2 Tools and equipment are lubricated according to preventive maintenance schedule or manufacturer's specifications 2.3 Measuring instruments are checked and calibrated in accordance with manufacturer's instructions 2.4 Tools are cleaned and lubricated according to standard procedures 2.5 Defective instruments, equipment and accessories are inspected and replaced according to manufacturer's specifications 2.6 Tools are inspected, repaired and replaced after use 2.7 Work place is cleaned and kept in safe state in line with OHSA regulations

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

RANGE OF VARIABLES

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

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Selected and used appropriate processes, tools and equipment to carry out task 1.2 Identified functional and non-functional tools and equipment 1.3 Checked, lubricated and calibrated tools, equipment and instruments according to manufacturer's specifications 1.4 Replaced defective tools, equipment and their accessories 1.5 Observed and applied safe handling of tools and equipment and safety work practices 1.6 Prepared and submitted inventory report, where applicable 1.7 Maintained workplace in accordance with OHSA regulations 1.8 Stored tools and equipment safely in appropriate locations and in accordance with company practices
2. Underpinning knowledge	2.1 SAFETY PRACTICES 2.1.1 Use of PPE 2.1.2 Handling of tools and equipment 2.1.3 Good housekeeping 2.2 MATERIALS, TOOLS AND EQUIPMENT 2.2.1 Types and uses of lubricants 2.2.2 Types and uses of cleaning materials 2.2.3 Types and uses of measuring instruments and equipment 2.3 PREVENTIVE MAINTENANCE 2.3.1 Methods and techniques 2.3.2 Procedures
3. Underpinning skills	3.1 Preparing maintenance materials, tools and equipment 3.2 Proper handling of tools and equipment 3.3 Performing preventive maintenance 3.4 Following instructions
4. Resource implications	The following resources should be provided: 4.1 Workplace 4.2 Maintenance schedule 4.3 Maintenance materials, tools and equipment relevant to the proposed activity/task
5. Methods of assessment	Competency should be assessed through: 5.1 Direct observation 5.2 Written test/questioning relevant to Underpinning knowledge

6. Context of assessment	6.1 Competency assessment may occur in workplace or any appropriate simulated environment 6.2 Competency assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines

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

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

RANGE OF VARIABLES

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

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires that the candidate: 1.1 Identified and determined signs, symbols and data according to work plan, job requirements and classifications 1.2 Identified tools and equipment in accordance with job requirements 1.3 Listed supplies and materials according to blueprint specifications 1.4 Drawn workplan following specifications 1.5 Determined job specifications based on working/technical drawing
2. Underpinning knowledge	**2.1 TRADE MATHEMATICS** 2.1.1 Linear measurement 2.1.2 Dimension 2.1.3 Unit conversion 2.2 **BLUEPRINT READING AND PLAN SPECIFICATION** 2.2.1 Electrical, mechanical plan, symbols and abbreviations 2.2.2 Drawing standard symbols **2.3 TRADE THEORY** 2.3.1 Basic technical drawing 2.3.2 Types technical plans 2.3.3 Various types of drawings 2.3.4 Notes and specifications
3. Underpinning skills	3.1 Interpreting drawing/orthographic drawing 3.2 Interpreting technical plans 3.3 Matching specification details with existing resources 3.4 Following instructions 3.5 Handling of drawing instruments
4. Resource implications	The following resources should be provided: 4.1 Workplace 4.2 Drawings and specification relevant to task 4.3 Materials and instrument relevant to proposed activity
5. Methods of assessment	Competency should be assessed through: 5.1 Direct observation 5.2 Questions/interview 5.3 Written test related to underpinning knowledge

6. Context of assessment	6.1 Competency assessment may occur in the workplace or in any appropriate simulated environment 6.2 Assessment shall be observed while task are being undertaken whether individually or in group 6.3 Competency assessment must be undertaken in accordance with the endorsed TESDA assessment guidelines

CORE COMPETENCIES

UNIT TITLE:	**PERFORM PRE- AND POST-OPERATION PROCEDURES FOR HAULING EQUIPMENT**
UNIT CODE:	**CON833316**
UNIT DESCRIPTOR:	This unit deals with the outcomes required to perform pre- and post operation procedures for off-highway dump truck (rigid).

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables
1. Perform visual check of equipment	1.1 ***Hauling*** equipment is selected based on job requirements. 1.2 ***Operator serviceable (OS) parts*** are checked in accordance with equipment checklist and manufacturer's procedures. 1.3 ***Walk-around check*** is performed with equipment checklist and with engine stopped/not running.
2. Perform "B L O W A F" check	2.1 ***"BLOWAF" check*** is performed following checklist form and with engine stopped/not running. 2.2 Deficiencies in ***fluids level*** are identified and if below normal level are refilled/topped up in accordance with equipment maintenance manual. 2.3 Abnormal conditions are reflected/noted in the checklist and reported/referred to ***authorized person***.
3. Perform operation check	3.1 ***Starting/running check*** is performed following checklist and in accordance with manufacturer's recommendations. 3.2 Normal functions of brake, steering and Power Take-off (PTO), etc. are checked. 3.3 Walk-around check is performed following equipment checklist and with engine running. 3.4 ***Safety devices*** are checked for proper functions in accordance with safe operating procedures.

4. Perform post operation procedure	4.1 Hauling equipment is parked in firm and level ground after productive operation in accordance with safety company rules and regulations. 4.2 Equipment controls are set into neutral position and parking brakes are engaged according to manufacturer's operations manual. 4.3 ***Safety locks*** and brakes are all set/engaged in accordance with operator's manual. 4.4 Walk-around inspection check is conducted while doing engine cool down. 4.5 Daily equipment time report/record (DETR) is accomplished/submitted according to company rules and regulations

RANGE OF VARIABLES

VARIABLE	RANGE
1. Hauling	1.1 Off-highway dump truck (rigid) 1.2 Off-highway dump truck (articulated) 1.3 On-highway dump truck (rigid)
2. Operator serviceable parts	2.1 Air cleaner 2.2 Battery terminals/Connection 2.3 Belt 2.4 Tire inflation 2.5 Grease/Lube points 2.6 Water/Fuel separator 2.7 Wiper blade
3. Walk around check	3.1 Engine off 3.1.1Leaks 3.1.2 Worn out/damaged parts 3.1.3 Fluid levels 3.1.4 Loose and missing parts 3.1.5 Tire condition 3.1.5.1 Cracked/Thread separation 3.1.5.2 Air pressure 3.1.5.3 Thread wear 3.1.5.4 Imbedded materials 3.1.5.5 Damaged rim 3.1.6 Side mirrors 3.1.7 Cab condition and windshields 3.1.8 Wiper bottle <u>Off-highway dump truck (articulated)</u> 3.1.9 Pins 3.2 Engine on 3.2.1 Gauges, alert/warning indicators and controls 3.2.2 Oil and air leaks 3.2.3 Safety devices 3.2.4 Working implement function e.g. dump, steering, etc
4. **<u>B</u> <u>L</u> <u>O</u> <u>W</u> <u>A</u> <u>F</u>** check	4.1 **B**attery (starting and charging system) 4.2 **L**ight (lighting system) 4.3 **O**il (lubricating system) 4.4 **W**ater (cooling system) 4.5 **A**ir (intake and exhaust system) 4.6 **F**uel (fuel system)

5. Fluid levels	5.1 Battery electrolyte (maintenance type) 5.2 Engine oil 5.3 Hydraulic oil 5.4 Radiator coolant 5.5 Fuel 5.6 Wiper fluid <u>On-highway dump truck (rigid)</u> 5.7 Brake fluid 5.8 Steering oil 5.9 Transmission
6. Authorized person	6.1 Equipment maintenance supervisor 6.2 Maintenance personnel <u>Off-highway dump truck (rigid) and on-highway dump truck (rigid)</u> 6.3 Chief Mechanic <u>Off-highway dump truck (articulated)</u> 6.4 Hauling operation supervisor

7. Starting/Running check	7.1 Controls 7.1.1 PTO 7.1.2 Steering/Secondary 7.1.3 Shifting 7.1.4 Dump lever 7.1.5 Accelerator pedal 7.1.6 Brake 7.1.6.1 Service 7.1.6.2 Retarder 7.1.6.3 Secondary/Emergency 7.1.6.4 Parking On-highway dump truck 7.1.6.5 Anti-lock brake system <u>Off-highway dump truck (rigid) and Off-highway dump truck (articulated)</u> 7.1.7 Transmission control 7.1.8 Retarder lever On-highway dump truck (rigid) 7.1.9 Differential / inter-axle lock 7.2 Gauges 7.2.1 Battery charging 7.2.2 Pressure (oil and air) 7.2.3 Temperature (oil and water) 7.2.4 RPM (tachometer) 7.2.5 Speedometer <u>Off-highway dump truck (rigid) and Off-highway dump truck (articulated)</u> 7.2.6 Fuel indicator 7.2.7 Hour meter 7.2.8 Transmission indicator <u>Off-highway dump truck (articulated)</u> 7.2.9 Payload meter / sensor

	7.3 Leaks in systems 7.3.1 Air 7.3.2 Cooling 7.3.3 Suspension charge 7.3.4 Lubricating 7.3.5 Fuel 7.3.6 Hydraulic 7.3.7 Washer fluid 7.4 Electrical/switches 7.4.1 Lights 7.4.2 Horn 7.4.3 Safety devices 7.5 Steering and brakes
8. Safety devices	May include but not limited to: <u>Off-highway dump truck (rigid) and Off-highway dump truck (articulated)</u> 8.1 Parking brake 8.2 Retarder 8.3 Exhaust brake 8.4 Service brake <u>On-highway dump truck (rigid) and off-highway dump truck (articulated)</u> 8.5 Emergency brake 8.6 Fire extinguisher 8.7 Beacon lights 8.8 Seat belt <u>On-highway dump truck (rigid)</u> 8.9 Emergency / secondary steering 8.10 Anti lock brake system 8.11 Wheel choke 8.12 Early Warning Device (EWD) <u>Off-highway dump truck (articulated)</u> 8.13 Back-up alarm 8.14 Buggy whip 8.15 Warning device 8.16 Neutral lock switch 8.17 Battery disconnect switch

9. Safety locks	May include but not limited to: 9.1 PTO 9.2 Safety implement lock 9.3 Door lock 9.4 Dump box safety pin <u>Off-highway dump truck (rigid) and On-highway dump truck (rigid)</u> 9.5 Steering <u>On-highway dump truck (rigid)</u> 9.6 Hydraulic implement lock

EVIDENCE GUIDE

1. Critical aspects of evidence to be considered	Assessment must confirm evidence that the candidate: 1.1 Demonstrates ability to select hauling equipment based on the job requirements 1.2 Demonstrates ability to check operator-serviceable (OS) parts 1.3 Demonstrates ability to perform walk-around and "BLOWAF" inspection following equipment checklist and with engine stopped/not running. 1.4 Demonstrates ability to perform walk-around check while engine is running. 1.5 Demonstrates ability to observe risk-control/safe procedures 1.6 Demonstrates ability to perform post-operation checking procedures 1.7 Demonstrates ability to accomplish and submit daily equipment time record/report (DETR)
2. Underpinning (related) knowledge and attitude	2.1 Types and uses of personal protective equipment (PPE) 2.2 Controls, instruments, indicators, safety devices and their uses 2.3 Start-up and shutdown procedures 2.4 Familiarity with manufacturer's operation manual 2.5 Familiarity with job site and work/terrain conditions 2.6 Familiarity with pre- and post-operation checking procedures and checklist form 2.7 Positive work values (time and cost conscious, etc.)
3. Underpinning skills	3.1 Performing pre- and post-operation checking procedures for dump truck. 3.2 Using personal protective equipment (PPE) 3.3 Maintaining dump truck records 3.4 Communicating with work site personnel 3.5 Complying with the manufacturer's operation and maintenance manual 3.6 Accomplishing and submitting pre- and post-operation checklist form
4. Resource implications	The following resources must be provided: 4.1 Access to hauling equipment and manuals. 4.2 Access to work site or work area for dump truck operation 4.3 Personal protective equipment (PPE)

5. Method of assessment	Competency in this unit must be assessed through 5.1 Written/oral questioning 5.2 Observation/demonstration 5.3 Work record and documents
6. Context for assessment	6.1 Assessment may be conducted on-the-job or in a simulated venue. 6.2 Competency shall be assessed while work is being undertaken independently

UNIT TITLE:	**PERFORM BASIC PREVENTIVE MAINTENANCE SERVICING FOR HAULING EQUIPMENT**
UNIT CODE:	**CON833317**
UNIT DESCRIPTOR:	This unit deals with the knowledge, skills and attitudes in the routine basic preventive maintenance for hauling equipment.

ELEMENT	PERFORMANCE CRITERIA ***Bold and Italicized*** terms are elaborated in the Range of Variables
1. Perform adjustments/ replacements	1.1 ***Minor defects*** are identified and remedied in accordance with company/manufacturer's procedures. 1.2 Correct/proper tools are selected based on job requirements. 1.3 ***Major defects*** are identified with checklist and referred to ***appropriate personnel.***
2. Perform basic preventive maintenance servicing (PMS)	2.1 ***Operator serviceable (OS) parts/standards*** are identified and serviced according to manufacturer's specifications and company preventive maintenance operating procedures. 2.2 ***Fluids and lubricants*** are used based on operation's manual. 2.3 Appropriate ***basic hand tools and equipment*** are identified and used in accordance with job requirements. 2.4 ***Basic preventive maintenance servicing (PMS)*** is carried out in accordance with manufacturer's and/or ***site conditions/ requirements***.
3. Prepare equipment reports	3.1 Preventive maintenance checklist form is properly accomplished in accordance with manufacturer's/company requirements. 3.2 Minor/major equipment defects are reported to concerned personnel.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Minor defects	May include but not limited to: 1.1 Clogged air cleaner 1.2 Loose clamps, bolts and mountings 1.3 Presence of water in the fuel separator 1.4 Weak battery 1.5 Defective radiator cap <u>On-highway dump truck (rigid)</u> 1.6 Incorrect tire inflation 1.7 Loose belts
2. Major defects	May include but not limited to: 2.1 Incorrect tire inflation / busted/flat tire 2.2 Excessive engine oil/fuel/water/fluid consumption 2.3 Poor working implement performance 2.4 Poor engine performance (e.g. lack of engine power, hard starting engine) 2.5 Weak/Defective brakes 2.6 Defective electrical components 2.6.1 Charging 2.6.2 Lighting 2.6.3 Starting 2.6.4 Monitoring/gauges 2.7 Leakage on <u>Off-highway dump truck and Off-highway dump truck (rigid)</u> 2.7.1 Air 2.7.2 Fuel 2.7.3 Cooling 2.7.4 Hydraulic <u>On-highway dump truck (rigid)</u> 2.7.5 Gas
3. Appropriate personnel	3.1 Equipment maintenance supervisor 3.2 Maintenance personnel <u>Off-highway dump truck (articulated) and On-highway dump truck (rigid)</u> 3.3 Hauling operation supervisor <u>Off-highway dump truck (rigid)</u> 3.4 Chief mechanic

4. Operator-Serviceable (OS) parts/standards	May include but are not limited to: 4.1 OS Parts 4.1.1 Battery distilled water 4.1.2 Battery clamps/holders 4.1.3 Filters 4.1.3.1 Air cleaner 4.1.3.1 Water fuel separator 4.1.4 All caps (e.g. oil, water, fluid and fuel) <u>Off-highway dump truck (rigid) and Off-highway dump truck (articulated)</u> 4.2 OS Standards 4.2.1 Oil pressure 4.2.2 Air pressure 4.2.3 Temperature 4.2.4 Fuel 4.2.5 Charging rate 4.2.6 End/free play clearances (brake, accelerator pedal and control levers)
6. Fluids and Lubricants	May include but are not limited to: 6.1 Engine oil 6.2 Hydraulic oil 6.3 Multi purpose grease 6.4 Coolant 6.5 Battery distilled water 6.6 Washer fluids <u>Off-highway dump truck (articulated) and On-highway dump truck (rigid)</u> 6.7 Cleaning solutions 6.6.1 Detergent soap 6.6.2 Degreaser <u>On-highway dump truck (rigid)</u> 6.8 Brake and fluid

7. Basic hand tools and equipment	May include but are not limited to: 7.1 Hand tools 7.1.1 Wrenches (open and box) 7.1.2 Mechanical pliers 7.1.3 Screw driver (Philips and flat) 7.1.4 Paint brush 7.1.5 Hammer 7.1.6 Vice grip 7.1.7 Tire gauge (instrument) 7.1.8 Steel brush <u>Off-highway dump truck (articulated) and On-highway dump truck (rigid)</u> 7.1.9 Grease gun 7.1.10 Oiler <u>On-highway dump truck (rigid)</u> 7.1.11 Pry bar 7.2 Equipment 7.2.1 High pressure washer 7.2.2 Air compressor 7.2.3 Grease gun 7.2.4 Hydraulic jack 7.2.5 Lube pump
8. Basic preventive maintenance servicing (PMS)	May include but not limited to: 8.1 Check/Tighten battery clamps/holders 8.2 Clean filters 8.2.1 Air cleaner 8.2.2 Fuel/Water separator 8.3 Check/Replace defective caps 8.4 Belt tension adjustment 8.5 Tire inflation pressure

9. Site conditions/ Requirements	May include but are not limited to: 9.1 Instructions/Site lay-out/Regulations 9.2 Warning Signages/barricades (e.g. caution tape) 9.3 Work and maintenance schedules 9.4 Work bulletin boards 9.5 Vicinity/Rerouting chart 9.6 Environmental/Site conditions 9.6.1 Dusty 9.6.2 Toxic/hazardous fumes 9.6.3 Rainy/Windy 9.6.4 Muddy/slippery ground 9.6.5 Poor lighting and ventilation 9.6.6 Site obstruction

EVIDENCE GUIDE

1. Critical aspects of evidence to be considered	Assessment requires evidence that the candidate: 1.1 Demonstrates ability to identify minor defects based on checklist and service them in accordance with manufacturer/company preventive maintenance program/procedure 1.2 Demonstrates ability to identify major defects based on checklist and report them to appropriate personnel 1.3 Demonstrates ability to use basic hand tools and equipment 1.4 Demonstrates ability to identify and service OS parts/standards according to manufacturer's service manual 1.5 Demonstrates knowledge of applicable fluids and lubricants 1.6 Demonstrates ability to carry-out preventive maintenance servicing procedure based on job site condition/requirement 1.7 Demonstrates ability to accomplish and submit preventive maintenance checklist form 1.8 Demonstrates ability to use personal protective equipment (PPE)
2. Underpinning (related) knowledge and attitude	2.1 Knowledge of equipment minor and major defects 2.2 Servicing procedure for minor defects 2.3 Types and uses of basic hand tools and equipment 2.4 Knowledge of fluids and lubricants 2.5 Uses and functions of OS parts 2.6 Company rules and regulations 2.7 Types and uses of PPE 2.8 Operation and maintenance manual 2.9 Positive work values (time and cost conscious, etc.)
3. Underpinning skills	3.1 Identifying minor and major defects 3.2 Performing servicing procedure for minor defects 3.3 Using basic hand tools and equipment 3.4 Identifying and servicing OS parts/standards 3.5 Using fluids and lubricants 3.6 Carrying out basic preventive maintenance servicing procedures and accomplishing checklists 3.7 Complying company rules and regulations 3.8 Using personal protective equipment (PPE) 3.9 Interpreting operation and maintenance manual

4. Resource implications	Things necessary for the conduct of assessment 4.1 Access to hauling equipment and its corresponding manual 4.2 Work site 4.3 Basic hand tools and equipment 4.4 Fluids and lubricants 4.5 PPE 4.6 Preventive maintenance instruction manual/ checklist forms
5. Method of assessment	Competency in this unit must be assessed through 5.1 Written and/or oral questioning 5.2 Observation /demonstration 5.3 Work record and documents 5.4 Third party
6. Context for assessment	6.1 Competency shall be assessed in a normal or simulated workplace environment and in accordance with preventive maintenance procedures 6.2 Competency shall be assessed while work is being undertaken independently

UNIT TITLE:	**PERFORM PRODUCTIVE OPERATION FOR ON-HIGHWAY DUMP TRUCK [RIGID]**
UNIT CODE:	**CON833318**
UNIT DESCRIPTOR:	This unit deals with the knowledge, skills and attitude required for performing productive operation for on-highway dump truck [rigid]. It covers the skills required to perform loading, handling and dumping operations of earth materials.

ELEMENT	**PERFORMANCE CRITERIA** ***Bold and Italicized*** terms are elaborated in the Range of Variables
Perform loading operation	1.1 ***Safe work practices*** are observed in accordance with company rules and regulations. 1.2 ***Communication*** is established with the station during operation. 1.3 Correct positioning and allowable load capacity of truck is observed at the loading area. 1.4 Required ***control levers*** are applied according to operations manual. 1.5 Engine is set at low idle speed while waiting / loading operation. 1.6 ***Unexpected situations*** are responded in line with company rules and regulations.
Perform hauling operation	2.1 Communication is maintained with the station during operation. 2.2 ***Worksite conditions*** and appropriate ***safe operating techniques*** are identified according to safe operating practices. 2.3 Retarder brake is applied with appropriate speed prior to downhill operation. 2.4 ***Appropriate engine RPM*** and required travel speed is observed according to work site condition. 2.5 Appropriate ***brake*** is applied when necessary. 2.6 Power Take-Off switch is disengaged during operations. 2.7 Differential lock and inter axle lock are engaged and disengaged according to terrain conditions. 2.8 Road safety precautions are observed especially when negotiating on narrow / curve roads. 2.9 Unexpected situations are responded in line with company rules and regulations.
Perform dumping operation	3.1 Communication is maintained with the station

	during operation. 3.2 Proper illumination of dumpsite is checked. 3.3 Assistance from spotter is obtained when necessary. 3.4 Dumping operation is performed following ***established / recommended procedures***.

RANGE OF VARIABLES

VARIABLE	RANGE
1. Safe work practices	1.1 Observed safety awareness 1.2 Observed firm and flat ground for the loading and dumping area 1.3 Wear minimum PPE 1.4 Checked for proper illumination of work site 1.5 Observed 3-point contact in embarking on and alighting from equipment 1.6 All controls must be in neutral position and parking brake applied before alighting from equipment 1.7 Observed proper housekeeping
2. Communication	2.1 Hand signal 2.2 Radio / mobile phone and GPS a. Horn / Light signal
3. Control levers	3.1 Parking brake 3.2 Transmission gear shift 3.3 Steering
4. Unexpected situations	May include but are not limited to: 4.1 Sudden engine breakdown 4.2 Busted hydraulic hose and oil leakages 4.3 Sudden loss of brake 4.4 Loss control of steering 4.5 Sudden ground failure 4.6 Force majeure e.g., earthquake, fire, tornado 4.7 Operator fatigue or sickness/condition 4.8 Accidents/incidents
5. Worksite conditions	May include but are not limited to: 5.1 Muddy 5.2 Sandy 5.3 Slippery 5.4 Uneven / unstable terrain
6. Safe operating technique	6.1 Dump box is maintained in float position during traveling 6.2 Differential lock is engaged and disengaged during full stop 6.3 Running dumping is applied at lower gear operation 6.4 Reverse operation is not allowed during dumping operation

7. Appropriate engine RPM	6.1 700 – 2,200 RPM
8. Brake	8.1 Service 8.2 Secondary / Emergency / ASBS 8.3 Exhaust
9. Established / recommended procedures	9.1 Dump truck is properly positioned in the dumping area in accordance with site condition. 9.2 Transmission is set at neutral position and parking brake is engaged. 9.3 Horn is sounded prior to dump box raising / lowering position. 9.4 Dump box is raised / lowered in smooth and controlled engine RPM. 9.5 Unexpected situations are responded in line with company rules and regulations.

EVIDENCE GUIDE

1. Critical aspects of competency to be considered	Assessment must confirm evidence that the candidate: 1.1 Demonstrates ability to comply with company rules and regulations 1.2 Demonstrates ability to operate dump truck in accordance with established operating procedures 1.3 Demonstrates ability to carry out safe work practices 1.4 Demonstrates knowledge of functions of instrument panel gauges, controls and alert indicators. 1.5 Demonstrates ability to determine and observe positioning and allowable load capacity of dump truck. 1.6 Demonstrates ability to observe safe and efficient loading / hauling / dumping procedures from loading area to dumping site 1.7 Demonstrates ability to communicate.
2. Underpinning knowledge, attitudes	2.1 Familiarity with company rules and regulations 2.2 Knowledge of dump truck operating procedures 2.3 Safe work procedures and practices 2.4 Dump truck functions of instrument panel gauges, controls, alert/warning indicators and their uses. 2.5 Comprehension of dump truck operations and maintenance manual. 2.6 Correct positioning and allowable load capacity of dump truck 2.7 Safe and efficient loading / hauling / dumping procedures 2.8 Defensive-driving and hazard-avoidance techniques 2.8.1 Motorist guide 2.8.2 Prohibitive and restrictive sign 2.8.3 Regulative sign 2.9 Site/Terrain layout and obstacles 2.10 Types of materials to be loaded 2.11 Positive work values (time and cost conscious, etc.)
3. Underpinning skills	3.1 Accomplishing dump truck checklist and reports 3.2 Reporting dump truck component failure 3.3 Performing actual operation procedure of dump truck 3.4 Performing safety procedures and practices 3.5 Determining type and load capacity of dump truck *3.6* Calculation and mensuration skills 3.7 Defensive driving skills
4. Resource implications	Things necessary for the conduct of assessment 4.1 Access to dump truck and job site/terrain 4.2 Operation and maintenance manual 4.3 Available loads 4.4 PPE 4.5 Spotter

5. Method of assessment	Competency in this unit must be assessed through 5.1 Written/Oral questioning 5.2 Observation/ practical demonstration 5.3 Work record and documents
6. Context for assessment	6.1 Assessment maybe conducted in the work site or in a simulated venue. 6.2 Competency shall be assessed while work is being undertaken independently.

SECTION 3 TRAINING STANDARDS

These guidelines are set to provide the Technical and Vocational Education and Training (TVET) providers with information and other important requirements to consider when designing training programs for **HEAVY EQUIPMENT OPERATION (RIGID ON-HIGHWAY DUMP TRUCK) NC II**.

3.1 CURRICULUM DESIGN

Course Title: HEAVY EQUIPMENT OPERATION – ON-HIGHWAY DUMP TRUCK (RIGID)
NC Level: **NC II**

BASIC COMPETENCIES

Nominal Training Hours: 18 Hours (Basic) + 24 Hours (Common)
Course Description:

This course is designed to equip individual with the basic, common and core competencies in Construction Sector particularly in Heavy Equipment Operation.

To obtain this, all units prescribed for this qualification must be achieved:

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Participate in workplace communication	1.1 Obtain and convey workplace information 1.2 Complete relevant work related documents 1.3 Participate in workplace meeting and discussion	Group discussion Interaction	• Demonstration • Observation • Interviews/ questioning
1. Work in a team environment	2.1 Describe and identify team role and responsibility in a team 2.2 Describe work as a team member	Discussion Interaction	• Demonstration • Observation • Interviews/ questioning
3. Practice career professionalism	3.1 Integrate personal objectives with organizational goals 3.2 Set and meet work priorities 3.3 Maintain professional growth and development	Discussion Interaction	• Demonstration • Observation • Interviews/ questioning

4. Practice occupational health and safety	4.1 Evaluate hazard and risks 4.2 Control hazards and risks 4.3 Maintain occupational health and safety awareness	Discussion Plant tour Symposium	• Observation • Interview

COMMON COMPETENCIES

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Interpret technical drawings and plans	1.1 Read / Interpret blueprints and plans 1.2 Perform freehand sketching	Lecture Demonstration Practical exercises	Demonstration and oral questioning Written test
2. Observe procedures, specifications and manuals of instructions.	2.1 Identify and access specifications / technical manuals 2.2 Interpret technical manuals 2.3 Apply information in technical manual 2.4 Store technical manual	Lecture Demonstration Practical exercises	Demonstration and oral questioning Written test
3. Perform mensurations and calculations	3.1 Select measuring instruments 3.2 Carryout measurement and calculations	Lecture Demonstration Practical exercises	Demonstration and oral questioning Written test
4. Maintain tools and equipment	4.1 Check condition of tools and equipment 4.2 Perform preventive maintenance 4.3 Store tools and equipment	Lecture Demonstration Practical exercises	Demonstration and oral questioning Written test
5. Prepare construction materials and tools	5.1 Identify materials 5.2 Request materials 5.3 Receive and inspect materials	Audio Visual Simulation Discussion Practical Exercise Demonstration	Direct observation Questions or interview Portfolio (credentials) Written / Oral Test Demonstration

CORE COMPETENCIES
(80 hours)

Unit of Competency	Learning Outcomes	Methodology	Assessment Approach
1. Perform pre- and post-operation procedures for On-highway Dump Truck (Rigid)	1.1 Identify and explain the functions of controls, gauges, instruments, safety devices and hydraulic implements 1.2 Explain the importance of and elaborate on equipment cleaning and checking procedures 1.3 Perform checking, procedures	Lecture Practical Demonstration	• Observation • Demonstration with oral questioning • Written test
2. Perform productive operation for On-highway Dump Truck (rigid)	2.1 Identify and explain the importance of safe work practices 2.2 Elaborate loading, hauling and dumping procedures 2.3 Perform loading and hauling procedures 2.4 Perform dumping procedures 2.5 Identify and explain possible unexpected situation during productive operation	Lecture Practical demonstration	• Observation • Demonstration with oral questioning • Written test

3. Perform basic preventive maintenance servicing for On-highway dump Truck (Rigid)	3.1 Identify and explain the use of basic hand tools and consumables 3.2 Use basic hand tools in servicing minor defects and OS parts 3.3 Prepare equipment report 3.4 Perform good housekeeping	Lecture Practical demonstration	• Observation • Demonstration with oral questioning • Written test

3.2 TRAINING DELIVERY

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

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

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

- The dualized mode of training delivery is preferred and recommended. Thus programs would contain both in-school and in-industry training or fieldwork components. Details can be referred to the Dual Training System (DTS) Implementing Rules and Regulations.
- Modular/self-paced learning is a competency-based training modality wherein the trainee is allowed to progress at his own pace. The trainer facilitates the training delivery
- Peer teaching/mentoring is a training modality wherein fast learners are given the opportunity to assist the slow learners.
- Supervised industry training or on-the-job training is an approach in training designed to enhance the knowledge and skills of the trainee through actual experience in the workplace to acquire specific competencies prescribed in the training regulations.

- Distance learning is a formal education process in which majority of the instruction occurs when the students and instructor are not in the

same place. Distance learning may employ correspondence study, or audio, video or computer technologies.

3.3 TRAINEE ENTRY REQUIREMENTS

This section specifies the qualifications of trainees and educational experience. Other requirements like health and physical requirements are also stated.

- Can drive and holder of Professional Drivers license
- Can communicate both oral and written (English or Tagalog)
- Physically and mentally fit
- Can perform basic mathematical computation.

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS

Below is the recommended list of tools, equipment and materials for the training of 25 trainees for the operation of on-highway dump truck (rigid).

TOOLS		EQUIPMENT		MATERIALS	
QTY		**QTY**		**QTY**	
2 sets	• Standard mechanical hand tools	2 pcs	• Two-way radio	20 liters	• Engine oil SAE-15W-40
25 pcs.	• Hard hat	1 unit	• Rigid On-Highway Dump Truck	1,600 liters	• Diesel fuel
25 pcs.	• Safety shoes			20 liters	• Hydraulic oil
1 unit	• 10 kg. Fire extinguisher			10 liters	• Trans differential oil
25 pcs.	• Eye goggles			10 kls.	• Forming grease
25 pcs.	• Cover alls			25 kilos	• Waste rags
				2 liters	• Bunk oil • DOT - 4
				25 pcs.	• Cotton gloves

**Quantity will depend on actual training consumption*

3.5 TRAINING FACILITIES

The on-highway dump truck (rigid) operation workshop must be of concrete structure. Based on class size of 25 students/trainees the space requirements for the teaching/learning and circulation areas are as follows:

SPACE REQUIREMENT	SIZE IN METERS	AREA IN SQ. METERS	QTY	TOTAL AREA IN SQ. METERS
• Lecture area	8.0 x 6.0 meters	48M^2	1	48M^2
• Learning resource area	4.0 x 6.0 meters	24M^2	1	24M^2
• Tool room / Storage area	3.0 x 3.0 meters	9M^2	1	9M^2
• Wash, toilet and locker room	8.0 x 4.0 meters	32M^2	1	32M^2
TOTAL	-	-		113M^2
Facilities / Equipment / Circulation*	-			**5,000M^2**
TOTAL AREA				**5,113M^2**

Area requirement is equivalent to 30 percent of total teaching / learning areas
**Equipment maneuvering area (OPM) (MOA)*

3.6 TRAINERS' QUALIFICATION
HEAVY EQUIPMENT OPERATION (RIGID ON-HIGHWAY DUMP TRUCK)

- Must be a holder of **Heavy Equipment Operation (On-highway dump truck) NC II**
- Must have undergone training on Training Methodology III (TM III) or its equivalent
- Must be physically and mentally fit
- Must have at least 5 years job/industry experience*
- Must be a civil service eligible (for government position only)

* Optional. Only when required by the hiring institution.

Reference: TESDA Board Resolution No. 2004 03

SECTION 4 NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

4.1 To attain the National Qualification of **HEAVY EQUIPMENT OPERATION (Rigid On-Highway Dump Truck] NC II**, the candidate must demonstrate competence in all the units of competency in Section 1. The successful candidates shall be awarded a National Certificate signed by the TESDA Director General.

4.2 The qualification of **HEAVY EQUIPMENT OPERATION (Rigid On-Highway Dump Truck) NC II** maybe attained through demonstration of competence in a project-type assessment covering the following core units.

4.2.1 **RIGID ON-HIGHWAY DUMP TRUCK**

- Perform pre- and post-operation procedures for hauling equipment
- Perform productive operation for on-highway dump truck (rigid)
- Perform basic preventive maintenance servicing for hauling equipment

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

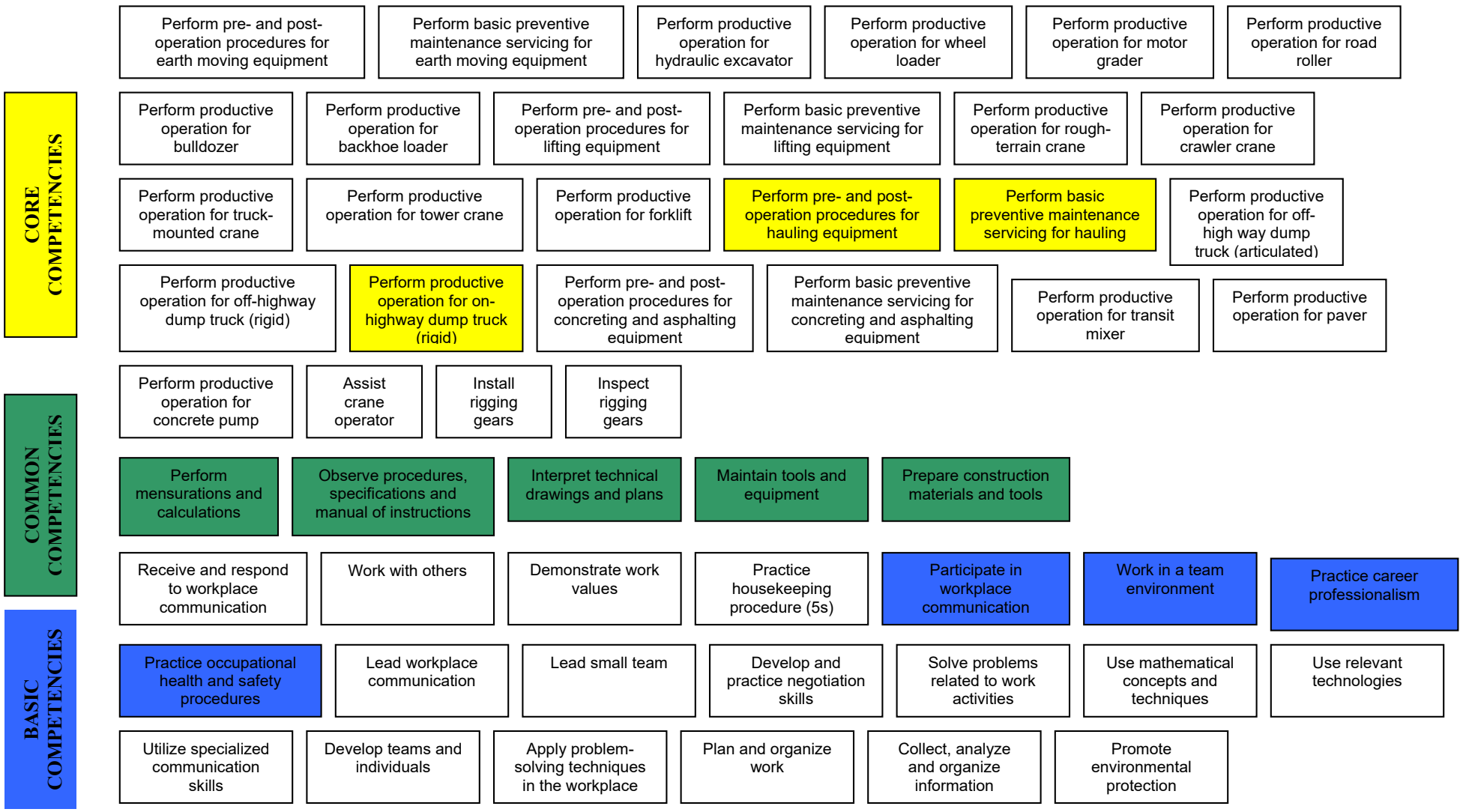
4.4 The following are qualified to apply for assessment and certification:

4.4.1 Graduates of formal, non-formal and/or informal training including enterprise-based training programs

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

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

COMPETENCY MAP
CONSTRUCTION-HEAVY EQUIPMENT OPERATION - SUB- SECTOR



Definition of Terms

For the purpose of this Competency Standard, the words

1. On-highway dump truck (rigid)	Refers to rigid frame type of dump truck used for loading/ hauling/ transporting construction materials such as aggregates, sand, soil, etc.
2. Operator serviceable (OS) parts	Refer to any part of the equipment that can be service by the operator, e.g. air cleaner, fuel filter, battery clamp, fan belt, etc.
3. Dump box	Part of the truck where the materials are being loaded.
4. Site inspection	Refer to a work activity in determining the actual condition of the project site to include location, transport route, site terrain, work area, hazards, type of materials, etc.
5. Daily Equipment Time Report (DETR)	Refers to equipment operating hours or working hours.
6. Retarder brake	Refers to the control of truck speed to maintain safe downhill operation.
7. Service brake	Refers to the control of speed to slowdown and stopping of dump truck.
8. Steering	Refers to the mechanism that controls the dump truck direction.

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