Course Objectives for C202 - Excavator 360° Below 10 tonnes Tracked - Experienced

It is envisaged that by the end of this course of training the trainee operator will be able to answer questions on and perform the following:

- Have a basic understanding of the industry, the dangers of working in the industry and their responsibilities as a plant operator - the factors that help maintain a safe working environment in the construction industry, and their responsibilities as a 360 - excavator operator
- Have a working knowledge of the manufacturer's handbook for the particular machine to be used - identify and extract information from the manufacturers' handbook / operator's manual, and other information sources including digital
- Be able to locate and identify the major components, signs and decals and all controls of the excavator and explain their functions
- Conduct all pre-operational checks in accordance with manufacturers and legislative requirements
- Identify and maintain PPE appropriate for excavator use
- Safely mount and dismount the machine
- Prepare and configure the excavator for site travel
- Travel and manoeuvre the excavator safely across varying terrain and inclines
- Travel and manoeuvre in areas of restricted space
- Attach and remove buckets, using quick-hitch couplers - fit and remove attachments
- Conduct all necessary safety checks at the work area
- Configure and set-up for excavating and loading duties
- Explain actions required for hazards, underground and overhead services
- Carry out excavating tasks - excavate different types of excavations in various types of ground to given dimensions
- Load material onto transporting vehicles or into containers - place materials into transporting vehicles and hoppers
- Reinstate excavation – grade, spread and level ground and materials
- Explain environmental considerations of machine use
- Explain loading / unloading procedures for machine transportation
- Carry out all end of shift and shut down procedures

Learning Outcomes for C202
Excavator 360° Tracked Below 10 tonnes - Experienced

Learning Outcome	Instructor Notes
Have a basic understanding of the industry, the dangers of working in the industry and their responsibilities as a plant operator - the factors that help maintain a safe working environment in the construction industry, and their responsibilities as a 360 - excavator operator	**Explain** the structure of the course and the need to comply with your instructions at all times • Explain that the industry is very dangerous and that only safe working practices will be adopted throughout the course • Personal safety is not just the absence of physical injury, can be affected by noise, vibration, dust and can lead to serious illness, death, lost time, lost income, expense for the employer, etc • Explain Health & Safety at Work Act 1974, Restraining systems in accordance with risk assessment, PUWER Regs, LOLER Regs, Management of Health and Safety of Work (MHSW) Regulations CDM Regs, Avoiding danger from overhead powerlines, HSG144, GS6, HSG47, Road Traffic Act, risk assessment, method statement, Codes of Practice and other relevant legislation • CPA Guidance Documents • Remind learners that operators have moral obligations, legal obligations and environmental obligations • Explain reporting structures, the importance of good communication on site (colleagues, management, and other workers on site marshallers, supervisors, other plant operatives)
Have a working knowledge of the manufacturer's handbook for the particular machine to be used - identify and extract information from the manufacturers' handbook / operator's manual, and other information sources including digital	**Explain and demonstrate** the importance of the manufacturer's handbook and that it will be used throughout the course. Stress that it has to be used in alliance with all relevant legislation. Use of the operator's manual (for the specific machine) during the practical elements of training to identify key preparation, operational and safety aspects of the machine. types of information sources including machine control systems
Be able to locate and identify the major components, signs and decals and all controls of the excavator and explain their functions	**Explain** how to locate the different types of components • Explain the function of the components the basic construction, controls, and terminology and how they all contribute to the safety and operational integrity of the machine • Explain power units, hydraulic systems, undercarriage, wheels / tracks, booms, dipper arms, buckets, slewing, stability, ground pressures, ROPS, FOPS, attachments and safety systems etc •how correct and sympathetic use of the controls can ensure efficiency and safety of the machine and help prolong machine life by reducing wear and tear. •machine control systems – efficiencies, GPS
Conduct all pre-operational checks in accordance with manufacturers and legislative requirements	**Explain** the importance of pre-operational checks and legal implications of using a machine without having checked it. Go through the sequence of checking, use manufacturer's handbook, check sheet, defect reporting procedure etc complete all pre-start and running checks before any activity takes place, including visual checks for damage, functionality, and effectiveness checking all componentry systems are fully functional, including mechanical, hydraulic, pneumatic, electrical and electronic etc. replenish fuels, fluids and lubricants, and undertake grease-based lubrication activities manufacturers periodic checks and operator level maintenance requirements defect reporting requirements carry out routine adjustments safety systems functions including emergency stop health and safety requirements when undertaking basic maintenance activities including personal

	protection equipment (PPE) check condition and function of seatbelt and any other restraining equipment check condition and function of any lighting and warning systems requirements for dealing with fluid spills including prevention and clean-up methods
Identify and maintain PPE appropriate for excavator use	**Explain** that PPE should include the following: Suitable safety boots, ear defenders, face / eye protection, dust mask if appropriate, suitable gloves, overalls, hard hat etc respiratory protective equipment (RPE), protective clothing etc. appropriate use of local exhaust ventilation (LEV), i.e. in confined spaces why weather conditions, including heat and cold, can determine what PPE is worn when using specific machine and the personal effects of incorrect equipment
Safely mount and dismount the machine	**Explain and demonstrate** the following fully: Correct mounting procedure, observations, use of safe hand holds • Working at height awareness, slips trips and falls • Correct dismounting procedure • facing the machine when getting on and off the excavator cab for operational and maintenance purposes. • effects of continually getting in to and out of the excavator e.g. fatigue, increased risk of falling etc. • safe areas to get in on/off the excavator e.g., ground location, other vehicle movements etc. • procedures for accessing the excavator when carrying out adjustment and maintenance activities - Observations • Safe use of hand holds

Learning Outcomes for C202 Excavator 360° Tracked Below 10 tonnes - Experienced

Learning Outcome	Instructor Notes
Prepare and configure the excavator for site travel	**Explain and demonstrate** the use of seatbelts and other restraining equipment • adjustment of seating position and mirrors • chassis checks • isolation controls • starting and stopping procedures including cold starting and those for turbochargers • procedural requirements for exhaust particulate filter cleansing activities • types of visibility aids and what factors can affect effective vision • where and why effective vision is very important • where issues can arise where vision is limited during operation • ensuring warning and safety systems are operable • legislative requirements and restrictions for being on the public highway • machine configuration for site travel • carrying of passengers/non-authorised personnel • use of travel controls and speed modes
Travel and manoeuvre the excavator safely across varying terrain and inclines	**Explain and demonstrate** how travel speeds affect tracked excavator chassis longevity • how travel speeds affect excavator stability, safety, and emissions • issues which can occur if departing from designated travel routes and work areas/restricted zones • types of underground services and the effects of travelling near to/over services • effects of travelling close to edges, embankments, structures and trenches • travelling over various types of terrain • travelling up, down and across inclines • how certain types of surfaces can affect traction, particularly on inclines • how uncompacted surfaces and inclines affect machine stability • precautions when working on stockpiled materials • effects due to changes of centre of gravity when on inclines • machine configuration when travelling on and across steep inclines • direction of travel • precautions and obstructions on travel routes including overhead utilities • regulative requirements for travelling near to or under overhead power lines
Travel and manoeuvre in areas of restricted space	**Explain and demonstrate** the precautions to be taken: when manoeuvring in areas of restricted space • requirements when working alongside highways, railways and public areas • height and slew restriction limiters • checking machine size including height, width and working radius including tail swing relevant to working area • lighting requirements and issues that may occur due to poor light
Attach and remove buckets, using quick-hitch couplers - fit and remove attachments	**Explain and demonstrate** the procedures to be adopted including: Prepare machine and attachment Different bucket types, Manufacturer's handbook Other types of attachments / Manual handling issues LOLER Quick hitch attaching systems – manual, semi-automatic, fully automatic Security of attachment – checks to be made Codes of practice and industry best practice • removal and attachment of buckets/attachments, classifications of quick-hitch couplers, procedures for the removal and fitting of attachments using manual and hydraulically operated quick-hitch couplers, including coupling, securing and checking to ensure safe attachment relevant health and safety

	legislation and legal duties risks associated with quick-hitch couplers visual inspections maintenance and storage
Conduct all necessary safety checks at the work area	**Explain and demonstrate** how to carry out pre-excavation safety checks, including: Vehicles Ground conditions Overhead obstructions Power lines Buried services Other workers • safety checks that must be carried out to ensure the excavation area is clear of hazards, communication and relationship requirements and methods with other machine operators and support workers requirements for sufficient manoeuvring area for manoeuvring between work areas ground conditions for excavating and maintaining stability, overhead obstructions and nearby proximity hazards, awareness of other machines and workers restricted segregation and exclusion zoning requirements people/plant interface, procedures and dangers of allowing others near to a working machine. danger zones of a working excavator working in hours of darkness and lighting requirements.
Configure and set-up for excavating and loading duties	**Explain and demonstrate**: working radius – minimum to maximum • required configuration for intended activity • methods of relaying and interpreting excavation work specification • visual reference points for excavation work • temporary works requirements and efficiencies of working safely on raised platforms • where spoil can and should not be placed • why segregation of materials should be maintained • positioning of excavator and vehicles for loading • use of blades to maintain stability • selection of correct bucket to meet work specification
Explain actions required for hazards, underground and overhead services	**Explain** the regulatory requirements for working near to or under overhead services • types of services, including buried and surface laid, and the various methods on how they are identified • emergency and reporting procedures if contact is made with services • minimum clearances when near to services • permit to break ground requirements
Carry out excavating tasks - excavate different types of excavations in various types of ground to given dimensions	**Explain and demonstrate** procedures to be adopted including: Different types of excavations • Method statements, job specifications, risk assessments, permits to dig • Types of buried services and how they are identified • Reporting procedures if services are damaged • Minimum clearance • Placement or disposal of spoil • Segregation of materials • Measuring techniques and devices • Environmental issues• regulatory requirements for working near to or under overhead services types of services, including buried and surface laid, and the various methods on how they are identified emergency and reporting procedures if contact is made with services minimum clearances

	when near to services permit to break ground requirements. typical types of excavations able to be created by 360 excavators how soil types determine excavation types and methods. methods of minimising excavation collapse including benching, trench boxes, other shoring and support methods etc. causes of excavation collapse. method statements, job specifications, risk assessments, placement or disposal of spoil. segregation of excavated materials. typical excavation tolerances. reasons for excavation dimensions and effects of not conforming to given tolerances. methods of efficient excavation techniques for different types of ground and support requirements. carrying out a range of excavating activities following given dimensions and tolerances. working near to edges and deep excavations. required control methods for open excavations methods of establishing excavation dimensions and tolerances. establishing and maintaining visual contact with dedicated supporting workers.
Place materials into transporting vehicles and hoppers	**Explain and demonstrate**: types of transporting vehicle typically loaded by 360 excavators • visibility requirements for loading purposes including raised platforms • transporting vehicle positioning for loading and how this varies with type • communication methods – signals etc. • positioning of excavator for loading • maintaining safety and stability of transporting vehicle during loading • sequence of loading a vehicle • how incorrect loading can cause stability issues for transporting vehicle • effects of overloading a transporting vehicle • vision issues of overloading front-facing skip/body types • safe positioning of loading vehicle driver prior to loading • efficient methods of loading vehicles to capacity • carrying out loading activities to capacity of various transporting vehicle types.
Reinstate excavation, grade, spread and level ground and materials	**Explain and demonstrate:** procedures to be adopted including: The importance of ground compaction and settlement, grading various types of soil, spreading • Job specification • Measuring levels and centres • Method statements, risk assessments • Attachments etc • various types of soil. use of grading buckets and blades. for grading and levelling purposes. types of attachments for grading and levelling activities. methods of establishing grading and levelling dimensions and tolerances. carrying out grading and levelling activities following given dimensions and tolerances.

Learning Outcomes for C202 Excavator 360° Tracked Below 10 tonnes - Experienced

Learning Outcome	Instructor Notes
Explain environmental considerations of machine use	**Explain and demonstrate** procedures to be adopted including: health and social reasons to reduce machine emissions government industry zero emission initiatives. what 'tailpipe' emissions are caused by compression ignition (CI) diesel engines during internal combustion - air quality and the component gases of air - how engine emissions, including particulate matter, affect air quality and the effects on human and environmental wellbeing - measures to reduce emissions during operations including alternative/low emission fuels, fuel treatments and particulate filtration systems etc. efficient use of the machine and when and how minimising engine use can aid air quality and fuel savings - eco-friendly oils, fluids and lubricants - fuel-saving techniques for specific item of plant - appropriate disposal of waste - spillage procedures
Explain loading / unloading procedures for machine transportation	**Explain and demonstrate** procedures to be adopted including. Procedures for preparing the machine for loading onto a transporter. traction and surface preparation requirements. understanding of agreed methods of communication between the plant operator and others. working at height requirements when driving onto or off a transporter bed.
Carry out all end of shift and shut down procedures	**Explain and demonstrate** procedures to be adopted including: Safe parking and positioning • Shut down procedures and machine security • types of safe locations, areas, and ground/terrain types where an excavator may be parked and should not be parked. reasons for ensuring safe parking and unintentional movement and ground support requirements. carrying out parking, shut down and isolation requirements according to manufacturer's instructions. reasons for machine isolation including security and non-authorised use by others. use of anti-vandalism equipment

The learning outcomes listed should not be considered in isolation and may be added to in order to accurately reflect the learner's duties and working environment