

# Equipment Operator Training and Assessment

## for the City of Austin Public Works Department

**Provided to:**

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## **Equipment Operator Training and Assessment City of Austin Public Works Department**

### ***Overview***

The Texas A&M Engineering Extension Service (TEEX) can provide a consistent and formalized assessment for the City of Austin equipment operators on multiple major heavy equipment machines. TEEX can *develop curricula, train employees and provide assessment* for the machine operators as part of their advancement in various positions. This will include clearly defined, progressively more complex skill sets for the equipment common to each position, along with the necessary knowledge about the equipment and its use to include training if needed. The process will also involve both written and practical assessments that are progressively more rigorous. These steps will be fully integrated to provide logical and smooth progression across all promotional steps. One advantage of this approach is that everyone involved will have a clear view of what is necessary for promotion on each machine. It will follow the City of Austin Civil Service Guidelines to foster objectivity and consistency. Having one provider for these services will provide greater visibility for employees and be more cost effective for the City.

### ***Statement of Work***

#### ***Develop curricula***

TEEX offers the highest standards in training materials and is known worldwide for its development process used to achieve these standards. The curriculum development process is conducted by a team consisting of curriculum coordinators, instructional designers, multimedia project specialists, subject matter experts, stakeholders, translators and the Training Manager. The team is responsible for analyzing, developing, and revising training materials. TEEX has highly qualified subject matter experts which are available for timely review and advice. The team ensures training materials meet the heavy equipment industry standards. Courses are constantly revised and updated to keep abreast of changing technology. An example of material used for heavy equipment training is attached.

#### ***Training Delivery***

TEEX can provide the scheduling, planning, coordination and delivery of training as needed in conjunction with the City of Austin for a comprehensive training program. TEEX brings a significant level of expertise in the area of heavy equipment operator training. The expertise is evident in the deep cadre of senior level instructors and the infrastructure in place for the logistics of delivery.

In addition to instructional expertise is the capability to provide behind-the-scene logistics for TEEX courses. Administrative personnel assign a class to the course schedule database and populate the class with a student roster. The TEEX Training Manager will secure the class location and facilities, assign a qualified instructor, make travel arrangements, ship course materials, and act as the liaison with the City of Austin point of contact. Following class delivery, the instructor will return the class evaluations, student sign-in sheet and course materials to administrative personnel who will enter the students in a database which allows for tracking over a long period of time. Certificates are sent to students who successfully

complete the each class. Continuing education credits are given for successful completion of the courses.

Training becomes even more cost effective when delivered in blocks based on a single instructor. The training program provided by TEEEX is structured in a manner that provides for efficient delivery of courses that are consolidated within a common set of information. TEEEX will develop blocks or core training segments delivered to a single centralized location at prescheduled intervals in order to minimize redundancies, maximize efficient delivery of the curriculum and reduce the frequency of interrupting operations.

TEEX will provide the City of Austin with a single point of contact who will be responsible for coordinating, scheduling and assisting with the development of training blocks. The TEEEX Training Manager will utilize his subject matter expertise and those of internal TEEEX employees to determine which topics can be blocked and how to best coordinate the schedule. TEEEX has the depth of infrastructure to allow for flexibility in scheduling to meet the needs of City of Austin. Training is provided on-site to reduce travel time and cost for the City of Austin.

Having one training provider allows for standardized training across all levels. It also provides consistency in the use of terms and training at different levels. Test validity is easier to achieve, which decreases liability and provides objectivity when based on the City of Austin Civil Service Guidelines. Having subject matter experts in all types of equipment and used as both instructors and evaluators also provides a more consistent evaluation process.

The TEEEX goal is always to provide the highest quality training at the lowest possible cost to meet individual customer needs. The curriculum is designed to teach both the safety and technical aspects of heavy equipment operation. The method of instruction for each course includes both hands-on and instructor-led. Each course is designed in a challenging manner to help achieve the maximum level of training.

#### *Assessment*

TEEX is proposing an advancing assessment program for the City of Austin heavy equipment operators with requirements in place to meet the City of Austin Civil Service Guidelines. TEEEX will review the current program and work with the City of Austin Public Works Department to develop a process which is seen by employees as consistent and fair, thus reducing liability for the City.

Each level of advancement has specific training requirements and assessment criteria. Each is based on commonly accepted standards for the heavy equipment industry and the past experience of TEEEX. Assessments will be made using both written and performance measurements. The assessment process is designed for individual evaluation in the form of questions and the performance of specific tasks. Performing assessments in blocks of time also allows for a more effective use of resources and achieving cost efficiencies. This will reduce the time employees are away from their regular job duties and will also be a more cost efficient use of funds.

#### *Past Performance*

TEEX has the infrastructure in place to design and develop curricula, provide training and conduct assessments. TEEX has delivered traditional classroom and hands-on skills training for over 80 years. TEEX offers a wide range of technical skills training programs designed for employed workers and those entering the labor force. During its fiscal year 2013, TEEX provided training and technical assistance to more than 169,000 people from every U.S. state and territory, and in 79 countries worldwide. TEEX is a member of The Texas A&M University System, one of the largest systems of higher education in the United States. Whether throughout Texas or across the globe, TEEX can be counted on for excellent training and technical assistance by its nearly 1,000 employees, many of whom are the top experts in their respective fields. The mission of TEEX is to provide training and technical assistance to develop a skilled workforce that enhances safety, security and economic growth for Texas and the nation.

TEEX has previous experience with a variety of customers. As an agency of the State of Texas, TEEX has developed curricula and taught dozens of safety related courses for a variety of target audiences. OSHA expanded their outreach program to include TEEX in 1994. TEEX maintains a close affiliation with the Federal OSHA office as well as with OSHA Region VI. It successfully serves Region VI in its entirety and provides training throughout the United States and in several foreign countries.

TEEX offers highly diverse training programs that serve and reach nearly all skill groups and departments found in private industry and local government, as well as state and federal government. Training is offered in construction, electric power, public works, transportation, safety and health, water and wastewater, telecommunications, environmental and other occupational areas. TEEX maintains training grants and contracts with private industry and public agencies too numerous to mention but such as those shown below:

Knife River Construction	Hispanic Contractors Association
Irby Construction	U.S. Department of Labor
Conoco Philips	Patterson Drilling
Valero	Texas Department of Transportation
U.S. Air Force	Southwest Electrical Metering Association
City of Austin	City of McAllen
Texas Military Forces	Texas Commission on Environmental Quality

The TEEX Heavy Equipment Training Program currently employs five full-time employees who have accumulated over 130 years of instructional experience. The Heavy Equipment Training Program at TEEX is led by Rickie Lemons, Training Manager, who will work directly with the City of Austin. His biographical sketch is attached. The program offers a complete set of technical courses designed for operators of all types of major heavy equipment. Previous clients have included municipal utilities, contractors, investor-owned, industrial and other organizations that are involved in the construction industry, many of which required specifically customized courses.

### ***Cost***

Below is a summary of costs associated with the Equipment Operator Training and Assessment program. One means of contracting with TEEX is to provide an interlocal agreement. This type

of contracting instrument is both cost effective and time efficient. As a more generic agreement, it allows for pricing per task and finding as much cost savings as possible for each activity. It also saves time by not requiring a bidding process for each task.

*Pricing Summary*

	<b>Cost per Day</b>	<b>Total Cost per Week</b>	<b>Number of training/assessment days to equal \$50,000</b>
First day	\$3,900	\$3,900	1 day per week = 12 days
Second consecutive day	\$870	\$4,770	2 consecutive days per week = 20 days
Third consecutive day	\$870	\$5,640	3 consecutive days per week = 26 days
Fourth consecutive day	\$870	\$6,510	4 consecutive days per week = 30 days
Fifth consecutive day	\$870	\$7,380	5 consecutive days per week = 33 days

# BACKHOE-LOADER OPERATIONS

## PARTICIPANT MANUAL

*The Texas A&M University System*

*Texas Engineering Extension Service (TEEX)*

*Engineering, Utilities, and Public Works Training Institute (EUPWTI)*

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BACKHOE-LOADER OPERATIONS

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*The safety statements, procedures, and guidelines contained in this manual are current as of the publication date. Prior to using the safety statements, procedures, and guidelines contained in this manual, it is advised that you confirm the currency of these statements, procedures, and guidelines with the appropriate controlling authorities.*

**PARTICIPANT MANUAL**

# **Module 0**

## **Introduction and Orientation**

### **Terminal Objective**

Upon successful completion of this module, the participant will be able to participate in the course.

### **Enabling Objectives**

1. Complete the TEEEX course registration forms.
2. Ask questions related to the course.

# **Introduction**

In this module, participants complete registration procedures and receive course information including prerequisites and attendance requirements, as well as evaluation and certification information. The instructor will conduct a brief overview of the course, which includes the goals and objectives, required participant equipment, and the course schedule.

## **About Backhoe-Loader Operations**

### ***Course Goal***

Upon successful completion of this course, the participant will be able to safely demonstrate basic operations of a backhoe-loader.

### ***Target Audience***

This course is designed for personnel just beginning their career as a backhoe-loader operator, or the participant with limited experience. This course is also recommended for use as a refresher for more experienced operators.

### ***Delivery Methods***

Course delivery consists of instruction seminars, group discussion, demonstrations, participant activities, and practical applications.

### ***Course Prerequisites***

There are no prerequisites for this course.

### ***Recommended Training***

There is no recommended training for this course.

### ***Course Length***

32 hours

### ***Certification Information***

TEEX is approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 8405 Greenboro Drive, Suite 800, McLean, VA 22102. As an Authorized Provider, TEEX offers CEUs for its programs that qualify under IACET guidelines. TEEX is authorized by IACET to offer 3.2 CEUs for this program. For more information about IACET, please visit their web site at <http://www.iacet.org>.

## ***Registration/ Attendance Rosters***

Attendance is crucial in order to receive credit for this course. All participants must complete a registration form at the beginning of the course, sign the attendance roster for each day of the course, and complete the evaluation at the end of the course in order to receive a certification of completion.

### **Registration Forms**

Complete front and back of forms legibly. Privacy Act statement is included for your signature.

### **Student Roster**

Must be signed each day, legibly. Make corrections neatly. Information from the roster is used to complete your certificate.

## ***Class Schedule***

### **Day One**

#### *Morning*

Module 0: Course Introduction and Orientation

Module 1: Backhoe-Loader Overview

Module 2: Safety Procedures *Afternoon*

Module 3: Startup and Shut-down Procedures

Module 4: Preventative Maintenance

Module 5: Backhoe-Loader Operations

### **Day Two**

#### *Morning*

Module 5: Backhoe-Loader Operations (continued)

Module 6: Transporting a Backhoe-Loader

Module 7: Field Applications (classroom)

#### *Afternoon*

Module 7: Field Applications

### **Day Three**

*Morning*

Module 7: Field Applications

*Afternoon*

Module 7: Field Applications

### **Day Four**

*Morning*

Module 7: Field Applications

*Afternoon*

Module 7: Field Applications

Course Final Exam (classroom)

Course Evaluation (classroom)

### ***Participant Evaluation Strategy***

The instructor will use oral questioning during the presentation and the review questions at the end of modules to assess participants' mastery of the material. Problem areas identified in the questioning will be reviewed in further detail. In order to receive course credit, participants must complete all field activities with at least a "Satisfactory" rating from the instructor. Participants must also score a minimum of 70% on the final exam. In addition, after completion of this course, participants will complete a course evaluation.

## **Administrative Instructions**

The instructor will use this portion of the course for introductions and to familiarize the participant with facility safety and convenience features, as well as any resources and equipment that are available to you.

## **Summary**

Welcome to the *Backhoe-Loader Operations Course*. Now that the administrative section of the course is complete, we can turn our attention to Module 1, Backhoe-Loader Overview.

# **Module 1**

## **Transporting a Backhoe-Loader**

### **Terminal Objective**

Upon successful completion of this module, the participant will be able to discuss procedures to prepare a backhoe for trailer transport.

### **Enabling Objectives**

1. Explain procedures required to load a backhoe onto a trailer.
2. Discuss make-ready procedures for tie-down.
3. Discuss procedures for transporting a backhoe.

# Introduction

When transporting, either by trailer or driving a backhoe-loader down the street, certain preparations must be completed before it is safe to take the equipment onto public roads. This module will explain requirements and procedures necessary to ensure a backhoe-loader ready for travel, and what precautions to take when parking the equipment overnight at the jobsite.

## Make Ready Procedures

To prepare the machine for transport on a trailer:

1. Remove any loose material that may fall from machine during transport.
2. Set the boom lock and positive swing lock.
3. Remove the Slow Moving Vehicle (SMV) symbol when trailering the backhoe.
4. Lock brake pedals together, and secure cab door and windows.

## Transporting Procedures

### *Loading*

Load onto the trailer, lower front and rear buckets, and set the parking brake. Machine must be centered on the trailer and loaded with weight equally distributed over axles (Figure 6.1).

### *Tie-Down*

There are six required attachment points for the tie-down of a backhoe-loader. The manufacturer must provide labeled attachment points at each corner of the machine. The front and rear attachments shall also be restrained from movement. Also, ensure the chains and load binders used appropriately (Figure 6.2), and are of proper grade and Weight Load Limit (WLL).

### *Driving on Public Roads*

To make the backhoe-loader road-ready, use all required safety devices to ensure safe operation and local compliance. Fasten seat belt and start engine. Complete the following:

1. Remove any loose material that may fall from machine during transport.
2. Attach the SMV symbol to the backhoe.
3. Retract the crowd and curl bucket.
4. Raise backhoe boom and move to center position. Set boom lock and install the swing lock pin.
5. Raise stabilizers.
6. Turn seat to face the front of the backhoe.
7. Connect left and right brake pedals together.
8. Raise loader bucket off ground and roll bucket back.

9. Release the parking brake.

## ***Parking Outdoors***

When parking the backhoe at the jobsite overnight, prevent theft or vandalism as follows:

1. Park in a well-lit, fenced area when possible.
2. Lower all equipment to the ground.
3. Remove the ignition key.
4. Lock cab doors, windows, and enable anti-theft devices.

In the event of theft or vandalism, notify the local law enforcement and insurance company immediately. Provide a description, identification numbers, and color photographs of the backhoe. Notify the equipment dealership and request that the theft is posted with a full description and identification numbers.

## **Summary**

In this module, participants examined procedures required for transportation of a backhoe-loader. This module explained the preparations that must be completed before the equipment is ready to be taken onto public roads, either by trailering the backhoe or driving it down the road. Tie-down and loading procedures were detailed, as well as precautions to take when leaving the backhoe parked overnight at the jobsite.

Always check with state and local laws that apply to backhoes, tractors, and towed equipment. Additional lights, mirrors, or reflectors may be required when transporting heavy equipment.

# **Rickie Lemons**

## *Associate Training Specialist*

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### **SUMMARY OF QUALIFICATIONS**

Rickie Lemons is an Associate Training Specialist with the Infrastructure Training and Safety Institute, a division of the Texas A&M Engineering Extension Service (TEEX). He has vast experience in all phases of heavy construction. He possesses a very strong personal commitment to the safety and preservation of the workforce. Mr. Lemons has served in this capacity for five years. He has more than 30 years of hands-on experience in all aspects of industrialized construction. He has developed and implemented safe work practices for workers with physical limitations along with safety plans for several Texas counties and cities that incorporate OSHA regulations for general and industrial uses.

Specific qualifications include:

- ◆ Worked as a rigger and side boom operator for 6 years for pipeline and oilfield services
- ◆ Has 14 years of experience in strip mining operation
- ◆ Has 30 years heavy equipment construction experience
- ◆ No certification available for equipment operators, although qualified to instruct on about 20 different types, forklift trained
- ◆ Site Safety Officer for construction site
- ◆ Fire Safety Officer, Training Officer, Compliance Officer
- ◆ TEEX Instructor for the past 7 years: researched and developed curriculum, conducted technical training classes, developed and conducted safety training
- ◆ Technical Assistance Inspections for Site Safety Hazards
- ◆ Conveyor systems maintenance
- ◆ Permit Required Confined Space Programs

### **RELEVANT WORK EXPERIENCE**

- ◆ OSHA 500 – Trainer in OSHA Standards for Construction Industry
- ◆ OSHA 501 – Trainer in OSHA Standards for General Industry
- ◆ Emergency Vehicle Operator
- ◆ Fire Ground Command, Firefighter 1 and 2
- ◆ Forcible Entry
- ◆ Vehicle Extraction
- ◆ Unexploded Ordnance Equipment Operator
- ◆ Co-developer of the OSHA Fall Protection Program for the San Antonio Water Authority
- ◆ Development of Crane and Rigging Training Program
- ◆ Development of SWP3 programs for TCEQ conference
- ◆ Conduct Safety Meetings

### **EMPLOYMENT HISTORY**

- ◆ Texas A&M Engineering Extension Service, Associate Training Specialist, 2007 – Present
- ◆ Dragline Operator and Mine Rescue Team Captain Navasota Mining Company
- ◆ Rigger and Signalman/Trainer, MSHA – P&H Mine - Pro Beckley West Virginia
- ◆ Heavy Lift Specialist, Kirkland Crane and Rigging

- ◆ Fuel yard operator and member of Emergency Response Team – TMPA
- ◆ Equipment Operator, Texas Department of Transportation
- ◆ Instructor – Safety and Health for OSHA Training Institute Southwest Education Center, Mesquite, Texas

#### **EDUCATION**

- ◆ American Red Cross
- ◆ Texas Railroad Commission
- ◆ US Department of Labor, Mine Safety and Health Administration
- ◆ US Department of Labor, Occupational Safety and Health Administration
- ◆ Infrastructure Training and Safety Institute – Texas A&M University System
- ◆ OSHA – OTISEC, Mesquite, Texas
- ◆ TEEEX – H.B. Zachary Training Center, San Antonio, Texas
- ◆ TEEEX – A&M Texarkana, Texas

#### **CERTIFICATIONS/LICENSES**

- ◆ NCCCO Certified Overhead Operator and Overhead Practical Examiner
- ◆ MSHA Certified Trainer
- ◆ OSHA Certified Trainer
- ◆ NCCER Certified Crane Operator (small hydraulic and industrial)
- ◆ Medic 1<sup>st</sup> CPR/AED Trainer
- ◆ American Red Cross First Aid/CPR Instructor
- ◆ Emergency Care Attendant
- ◆ Emergency Medical Technician
- ◆ OSHA 510 – Construction Industry Standards
- ◆ OSHA 500 – Trainer for Construction Industry
- ◆ OSHA 511 – General Industries Standard
- ◆ OSHA 501 – Trainer for General Industries
- ◆ OSHA 301 – Excavations, Trenching and Soil Mechanics
- ◆ OSHA 755 – Accident Investigation
- ◆ OSHA 720 – Health Hazard Awareness
- ◆ OSHA 521 – Industrial Hygiene
- ◆ OSHA 701 – Bolting Safety, Principles and Practices
- ◆ OSHA 225 – Principles of Applied Ergonomics
- ◆ OSHA 784 – Recordkeeping
- ◆ OSHA 715 – Evacuation and Emergency Planning
- ◆ OSHA 204 – Machinery and Machine Guarding
- ◆ OSHA 201 – Hazardous Materials
- ◆ OSHA 309 – Electrical Standards
- ◆ PRT 123 – Scaffold Safety
- ◆ PRT 107 – Behavioral Based Safety
- ◆ Certified Safety and Health Official, General Industries
- ◆ Certified Safety and Health Official, Construction Industries