



**Safe
Equipment
Operator
Passport**

Employee Name

DUB-L-EE Welcomes you to our company. We invite and encourage you as an employee to join us in making all projects safe. As your employer, we are providing you with an environment and proper equipment, so that you will be working in the safest conditions. However, safe conditions are not enough; safe work habits are a vital part of a successful program. This handbook is provided as a basic guide to your safe conduct on the job. Read it carefully, learn the general safety rules and keep the handbook with you at all times. If there is anything in here you do not understand, ask your supervisor. He will be glad to help. Remember, our having a good safety program depends on you!

skid-steer loaders (Bobcats) and excavators. This passport is not for forklifts, rollers and water trucks. This passport is in addition to the Safety Passport, which must be on your person when on a DUB-L-EE jobsite.

General Rules

The operator is directly responsible for the safe operation of the equipment. Reckless and careless driving is prohibited.
The operator is required to complete a pre-shift and a post-shift operation checklist. The checklists are printed in small pocket sized books. Tear off the page and attach to your time sheet for that day. Wear your seat belt when operating the tractor. This includes excavators and backhoe digging operations.
Hard hats are required to be with operators at all times. When not protected by the tractor cab, a hard hat will be worn.¹⁹
Do not drive over extension cords.
Report any broken windows on the checklist. Windows must be clean for good visibility.
Back up alarms must be in working order. Horns must be in working order.

- h. Flashers and hazard lights must be in working order.
- i. Wheeled tractors must have a Slow Moving Vehicle triangle mounted in visible location for traveling on public right-of-way.
- j. Mirrors are required. Keep mirrors clean. If mirrors are inadequate, note it on the checklist.
- k. Do not check for hydraulic leaks with your hand. Use a piece of cardboard or paper. High-pressure leaks can cut your fingers off.
- l. Do not get under the elevated loader or bucket without securing the safety supports.
- m. Set the Parking Brake whenever you get off the machine. Lower the front bucket also.
- n. If a bucket must be left up, do not leave the machine²⁰attended. OSHA says the operator must be within 25 feet.
- o. When employees get within the swing radius of the boom/bucket, lower and contact the ground to prevent unintentional boom/bucket movement.
- p. Do not operate the boom/bucket when employees are within swing radius. This is common of laborers when digging around. You may have to get out and explain this to them.
- q. Have employees operating compactors and rollers face the area you're operating in. they need to see you.
- r. Do not lift loads using the teeth. Connect the load to a lifting eye or around a bucket pivot pin.

FORKLIFT OPERATORS – ALL DUB-L-EE EMPLOYEES

_____, Has completed DUB-L-EE's Forklift Operator Passport Training and has earned a passing score on the test over the training material.

_____ Trainer	_____ Date
_____ Employee	_____ Date
_____ Superintendent	_____ Date

FORKLIFT OPERATOR- JOB SPECIFIC

_____, passed a driving skills proficiency exam given by his/her jobsite Superintendent and can operate a forklift on this jobsite.

_____ Employee	_____ Date
_____ Superintendent	_____ Date
_____ Jobsite	

This certificate is valid for a 1-year period for the date above.

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on steel shoes, or shoes with high heels.
 e correct gloves when welding, handling chemicals, rough
 materials or items with sharp edges.
 wely that can get caught or snag by work practice and
 ould NOT be worn.
 ep horseplay and roughhousing away from the job. Practical
 ces often become painful injuries.
 yone involved in verbal abuse, harassment, or fighting on
 a job may be subject to immediate dismissal.
 ver point an air hose at anyone or use it to clean clothing.
 e only designated toilets.
 spect your safety equipment daily. If defective, do not use.
 port it to your foreman immediately.
 ork with care and good judgment at all time to avoid
 cidents- even if a specific safety rules not contained in this
 anual
 ft drinks, food, etc., are not to be cooled in drinking water
 gs or ice storage boxes.
 not operate any vehicle or equipment unless authorized by
 ur foreman.
 e use of alcohol beverage and or illegal drugs is strictly
 hhibited.
 iless authorized the use of cell phones on any project is
 hhibited.
 not violate company Safety Directives. See your foreman to
 come familiar with all safety Directives that apply to your
 ork.

- These attachments alter the machine's rated capacities as a
 forklift making the existing load chart inaccurate.
- z. DUB-L-EE Safety Director must approve job-made
 forklift attachments.
 - aa. Load Chart for attachments must be developed and
 used for attachments.
 - Attachments can change the lifting capacities of a
 forklift
 - Be aware of the changes and refer to your new
 load chart.
 3. Do not park in deep mud or water, especially in freezing
 weather.
 4. Lower the forks
 5. If the forks must be left elevated do not leave the
 machine unattended. OSHA says the operator must be
 within 25 feet.
 6. Neutralize all controls
 7. Set the parking brake
 8. Turn off the engine
 9. Block the wheels if the forklift is on an incline.

EQUIPMENT OPERATOR CERTIFICATION PAGE EXCAVATION OPERATORS

_____, has
 completed DUB-L-EE's Excavator Operator Passport Training
 and has earned a passing score on the test over the training
 material.

Trainer _____ Date _____

Employee _____ Date _____

Superintendent _____ Date _____

This certificate is valid for a 1- year period from the date above

Specific to Excavators

- s. **Overhead power lines must be insulated if
 the excavator boom can get within 10 feet.
 Many fatalities have occurred because the
 operators did not take this seriously.**
- t. Counterweight swing radius has crushed many
 employees. When working in tight spaces
 barricade the swing radius. Have quick safety
 meeting with employees working or passing
 through the area. Your foreman will support this.
- u. Load charts are to be in every excavator. Know the
 difference between the English and Metric chart
 values.
- v. If you run both backhoes and excavators on your
 job, ask your foreman to have the excavator
 controls altered to match the backhoe. Many
 fatalities have occurred when operators have
 switched from one tractor to the other and the
 controls were opposite. Your foreman will report
 this to the Superintendent who can have it
 corrected.

Specific to Backhoes

- w. When driving a tractor equipped with left and right
 brakes pedals connect both pedals for driving. This
 way a quick stop wont let the tractor lurch to one
 side.
- x. Engage the Boom lock for loader operations.
- y. Do not lift or hoist loads with boom lock engaged.
 If it breaks it can kill the operator or adjacent
 employees.

EMPLOYEE ORIENTATION ACKNOWLEDGEMENT

I have received the DUB-L-EE Employee Safety handbook.
 I have read and understand the General Safety Rules and
 agree to abide by the Safety Program while employed by
 DUB-L-EE. I understand that I must keep this book with
 me at all times while at work and if for any reason I do not
 have my Safety Passport with me, I understand that I will
 not be allowed to work or be on payroll until I can present
 my Safety Passport. I have read the consequences for
 each safety violation that is written in my Safety Passport
 and understand that if I reach FIVE Safety Violations, I will
 be automatically terminated unless the Superintendent
 requests an interview.

If I lose or destroy my Safety Passport a new Safety
 Passport will be issued after a THREE day without pay
 Suspension is completed.

***After a 12-month period, all violations are erased,
 and a new Safety Passport will be issued.**

NEW BOOK ISSUED _____ DATE _____

EMPLOYEE NAME _____ (PLEASE PRINT)

EMPLOYEE NUMBER _____ EMPLOYEE SS# _____

EMPLOYEE SIGNATURE _____ DATE _____

2.

Violation

3.

Violation

4.

Violation

17

5.

Violation

Specific to Scrapers

- z. Stay on designated haul roads when not loading or unloading.
- aa. Maintain a sufficient distance between scrapers on haul roads to stop safely.
- bb. Slow down and check for traffic when crossing roads.
- cc. Obey Flag Person's directions.
- dd. Stay on machine unless in designated area. See your foreman.

36.2 Safe Operations Underground Utilities Protection

36.2.1 Purpose

Protection of underground utilities is of vital importance to DUB-L-EE. Underground utilities are gas lines, electric lines, water, storm and sanitary sewer pipelines and communication lines telephone, fiber and cable television.

These lines are the property of the utilities owners or the property owner. They are obstacles to be worked around or removed and replaced. Other than cable television lines, all lines are considered as safety issues.

36.2.2 Procedure

The statute governing underground utilities is clear. Contractors must call for spots and powered excavating equipment must not dig within 24 inches of the spotted lines.

DRIVING ON INCLINES

- 13. Unloaded forklifts should always be driven forward down an incline.
- 14. Forklifts, whether they are loaded or unloaded, should not be driven up or down very steep inclines.
- 15. Loaded forklifts should always keep the load on the uphill side whether driving up or down a hill for stability and traction.
 - a. Drive forward up a hill with a load
 - b. Back down a hill with a loaded forklift
- 16. Keep load uphill when driving on steep inclines.

STACKING/UNSTACKING LOADS

- q. Make sure all loads are well centered and stable
- r. Use proper feathering techniques to ensure that the forks or the vehicle itself does not ump the stacks.

LOAD CAPACITIES

Forklift capacity charts show the amount of the weight that can be safely carried, how high, and how far in front of the front axle the load can be extended.

- s. Extendable boom forklift load charts must contain at least the following information:
 - Weights that can be lifted
 - Full range of boom extensions
 - Angles of operation
- t. Do not extend boom with load beyond chart.
- u. Do not operate forklifts without readable load charts.
- v. Do not operate, carry or lift loads beyond the load chart capacity. Some load charts are very complex and may be somewhat difficult to read.
- w. Make sure you understand all of its information before you operate the machine.
- x. Be aware of outrigger and ballast filled tire requirements for certain load charts.
- y. Be sure that you are reading the right load chart for your forklift's conditions.

FORKLIFT ATTACHMENTS

Some telescopic boom machines offer attachments that effectively transform the forklift into a crane, excavator, or specialized material-handling piece of equipment.

3. Your Foreman

- a. If you do not understand any safety rule, ask your foreman to explain it.
- b. Before doing a job where you are not familiar with the hazards, ask your foreman to show you the safe way to do the job. He'll be glad to do it.
- c. Give your wholehearted support to safety activities. Preventing your accident depends on mostly you!

4. Unsafe acts or conditions

Report or correct any unsafe acts or unsafe conditions or equipment to your foreman immediately.

5. Work Areas

- a. Be aware of work going on around you, Keep clear of suspended loads, traffic areas, etc.
- b. Before entering new work areas, familiarize yourself with any unusual hazards.
- c. Place barricades to warn traffic, overhead dangers, open footings, excavation, and swing radius of crane cab. Etc.
- d. Work, eat lunch, etc. only in your work area.

ekkeeping

ep materials orderly; prevent piles of materials from
y or shifting (tie down or support if necessary).
an up any oil, liquids, or other materials spilled or
ed on stairs, walkways, ladders or floors. Place your
sacks, paper, and or soft drink or containers in trash
ls.
ve all cords, welding leads, hoses placed to avoid
ng hazards or from getting damaged.
ep loose materials off stairs, walkways, ramps,
irms, scaffolds, etc.
t or Replace caps on rebar and grade stakes.

g

eck for a clear path first. Then have clear view while
ing load.
oid back strains when lifting (including shoveling) by
/ing these few simple suggestions:
Take a good look at what you're going to lift. If it is
o heavy or bulky for you, get help. (another employee,
ain hoist, forklift, crane etc.)
Get a firm clear footing and keep your feet about
oulder distance apart.
Squat down, keep whatever you are lifting close to
u and lift with your strong leg muscles keeping your
ck straight.

- o. "Feather" the load when starting and stopping, raising and lowering.
- p. Turnovers can be avoided by adhering to the following practices.

Forward Tipping

- 1. Use only two-wheel steering when traveling at higher speed to prevent turnovers.
- 2. Do not extend the load too far forward
- 3. Do not pick up loads too heavy for the machine
- 4. Anticipate changes to forward momentum: avoid sudden stopping.

Side Tipping

- 5. Do not raise loads while the machine is on uneven ground.
- 6. Machines with self level feature must be leveled prior to raising loads.
- 7. Control momentum (especially when turning the machine with a raised load) – it is the Number One cause of machines over turning.
- 8. Do not drive into holes or soft ground.
- 9. Re-level the machine after adjusting for a side hill when traveling.
- 10. Do not travel with raised load that can swing or shift.

OUTRIGGERS

- Outriggers widen the stability triangle when they are set on the ground.
- 11. Be very careful when reading load charts for forklifts equipped with outriggers – they can drastically affect the amount of weight that can be safely lifted

BACKWARD TIPPING

- Elevated loads place more weight on the rear axle of the forklift, especially with the mast tilted back or boom retracted. Any pivoting action of the frame tilt or rear wheels can shift that weight to the forklift's most vulnerable point. Loss of braking power or traction at the front wheels causes the machine to run out of control.
- 12. Do not back down a hill with a load elevated too high.

Therefore:

- 1. Spots must be called for. Document in the Daily Log or other appropriate place the call-time, date, and name of the person receiving the call.
- 2. Meet with them and have them place flags if on dirt in addition to paint.
- 3. Copy their sketch or plans of the utilities buried. Have them sign the copy clearly.
- 4. Using a tape measure, measure 24" on each side of their spot marks and mark with WHITE paint. Take photographs of the spots and our marks. These marks are known as "offset marks".
- 5. Only allow hand digging between our marks. Equipment operators and other employees who violate this hand-digging zone may be subject to termination.

36.2.3 Safe Operator Passport Rules for Underground Utilities

- a. Do not dig or remove earth in an area that may have underground utilities without review of the area by the supervising superintendent.
- b. Roads, alleys, overhead power lines, driveways, homes, businesses and sidewalks all indicate the presence of underground utilities. Colored metal markers usually mark fields and open lots having underground utilities. Do not dig in these areas unless the utilities have been called and the locators have conducted spotting.
- c. If spots for lines are on concrete and asphalt and are removed then the lines must be re-spotted. Stop and wait for re-spots. Following this rule will save DUB-L-EE tens of thousands of dollars.

- c. Face shields are to be worn when inflating and deflating.
- d. Stay out of the line of fire and keep back as much as possible.

35. Safety Violations

- 1. The FIRST Safety Violation is a written warning and will not result in penalty.
- 2. The SECOND Violation will result in employee being sent home without pay for the rest of the day.
- 3. The THIRD Violation will result in employee being sent home without pay for the rest of the current workday AND the following day.
- 4. The FOURTH Violation will result in three days without pay, suspension and possible termination based on the recommendation of the Superintendent.
- 5. The FIFTH Violation will result in automatic termination unless the Superintendent requests an interview with the Safety Director and Human Resources Manager.

36. Equipment Operator's Safety Certification (See Equipment Operator's Safety Passport)

- g. Riding in the back of trucks and equipment is not allowed.
- h. Hearing protection will be worn when sawing and jack hammering. Face shields or goggles will be worn when jack hammering.
- i. Excavations cannot be entered until inspected by a DUB-L-EE competent person. If a trench box is used, do not leave the protection of the trench box.
- j. Support all cross lines, pipes, conduits and wires.
- k. Do not get under suspended loads.
- l. Back-up alarms are required on water trucks, loaders and excavators.
- m. Use taglines when setting trench boxes.

33. Confined Spaces

- a. Confined spaces are not to be entered without the Foreman's first checking the atmosphere.
- b. If a confined space has a hazard (hazardous atmosphere, engulfment, entrapment, etc.) that cannot be eliminated before entry, do not enter until the DUB-L-EE permit-required Confined Space Competent Person authorizes entry. Ask your Foreman.
- c. Do not operate gasoline saw in deep trenches, manholes, or areas of poor air circulation without a ventilator and/or the supplied air hood.
- d. Jackhammer and chipping operations in confined spaces will be done only with supplied air hoods or ventilators and respiratory protection.

34. Air Test Balls and Plugs

- a. Test inflation of test balls and air plugs for leaks before use.
- b. Do not inflate while in a manhole

- d. Do not dig unless photographs have been taken of the line spots and the offset marks.
- e. Do not dig within 24" of the spot marks with excavating equipment. Be sure the offset marks are not disturbed while excavating.
- f. Support underground utilities and their structures (phone boxes, telephone poles) before digging beneath.
- g. Operator must not violate any practice or procedure in Safety Directive #3 Underground Utility Protection Program.

36.3.0 Excavations

Excavations account for many fatalities in construction or permanent disabling injuries. Employees may die in the excavation from inhaling dirt, be crushed and suffocated and even if rescued suffer crippling muscular and skeletal injuries and suffer postponed death from "Crushing Syndrome" (where vital organs fall over a matter days when deprived of oxygen while being buried).

Unsafe excavations are entirely preventable. All excavations are designed and constructed by employer and their employees and how safe that excavation is dependent on the employer and the employee. DUB-L-EE wants all excavations to be safe for employees and in compliance with OSHA's Excavation Standard. DUB-L-EE provides excavation training, inspections, design, and soil classification through its Safety Department.

37.2 Controls and Operations

DUB-L-EE Forklift training is general in nature for telescopic boom rough terrain forklifts. Supervising Superintendents and Operators must become familiar with each machine's capacities and limits.

- a. Do not operate forklifts with known mechanical defects.
- b. Do not travel on unsafe routes such as next to excavation edges, soft ground, holes, in public right-of-way, near overhead power lines etc.
- c. Do not carry unsafe loads such as loads that may swing or slide taking the forklift beyond its center of gravity.
- d. Do not use unsafe operating techniques such as starting and stopping quickly, not using horn properly etc.
- e. The operator is responsible for the safe condition and operation of his machine.
- f. Never operate a forklift from anywhere other than the operator's seat and never allow riders on the forks, frame etc.
- g. Use grab rails when mounting and dismounting machine. Do not grab levers to pull yourself up.
- h. Never reach through potential pinch points
- i. Beware of loose clothing, harnesses and lanyards, long hair around moving or rotating parts (fans, pulleys, belts).
- j. Keep all body parts inside the operator's compartment and WEAR YOUR SEATBELT.
- k. Wear your hard hat to prevent injury from smaller objects penetrating the overhead protective structure. Hard hats may save your life in the event of a turn over.
- l. Eye protection is required for windy, dusty conditions or when placing loads overhead.
- m. Use extreme caution when adjusting forks. Tilt forks forward to relieve the weight. Wear gloves and keep fingers from between pinch points.
- n. Space forks at the maximum width that will safely lift the load.

be sure you both carry the load on the same shoulder.
d. Have just one person give commands when teaming big loads.

8. Drugs and Alcohol

Possession, consumption or use of alcoholic beverages or illegal drugs (including marijuana) is not permitted. Anyone violating this policy will be subject to immediate termination. You must pass a drug screen prior to employment, after any accident, at any time that your foreman or other Company supervisory personnel suspect that the policy is being violated. Random drug tests may also be requested.

9. Safety Meetings

Attend all safety meetings and safety training classes held at your job site. You will get the latest information on what the company is doing and what you can do to keep from getting hurt.

paint, carpeting, floor waxing etc.) the wearing of hard hats may not be required as the site superintendent sees fit.

.. Eye Protection

General-purpose safety glasses will be issued to employees and must be worn on their person at all times. Eye protection must be worn when:

- a. Using grinders (all types), using cleaning materials, table saws, jack hammers, chipping guns, masonry saws, welding or cutting torches (under welding hood in arching weld), nail tools, powder actuated tools.
- b. Cleaning a weld or when the wind is such that it is blowing dust, sand, rust, or other particles about.
- c. Handling material in powder form such as cement or when mixing or cleaning brick with acid or other cleaning material.
- d. There is danger of concrete or mortar splashing in the eye.
- e. Filing or buffing any material.
- f. Working near persons whose work requires them to wear eye protection
- g. There is other dangerous exposure to your eyes.
- h. Sunglasses are ok for outside but clear glasses are to be with the employee for inside work.

- b. Look under the forklift and take note of any loose hardware or excessive leaks. The steering linkage should be tight and well greased.
- c. Look at the engine. Take note of loose or worn belts.
- d. Make sure all covers, guards, and inspection cover plates are secured properly.
- e. Check the oil level, fuel level, hydraulic fluid level, radiator coolant level, battery acid level and hydraulic brake fluid level.
- f. Note the tire condition and inflation. The tires should have proper inflation as recommended by the manufacturer, since the forklift's stability can be directly affected. Check owner/operator's manual for ballast filled tire maintenance.
- g. Inspect the hydraulic and brake lines. These lines often show signs of excessive wear before they break.
- h. Use a piece of cardboard to inspect for leaks. Never use bare hands to check for hydraulic leaks.
- i. If pressurized hydraulic fluid has penetrated your skin, seek medical attention immediately. Hydraulic fluid, injected into the skin, can cause gangrene. Wear eye protection when operating and inspecting forklifts.
- j. Check to make sure the overhead guard is secure.
- k. Check brake lights and turn signals, if so equipped.
- l. Check the back-up alarm.
- m. If conditions call for use of headlights, check them.
- n. You must check the operator's manual for the specific inspection procedures for your specific forklift. Many forklifts are different from each other and general inspection guidelines may not be sufficient. The operator's manual will instruct operators on proper inspection techniques and maintenance procedures.
- o. Check to see if the load chart is in the forklift.

Equipment Operators are the employees who construct excavations. Excavations are tricky to construct safely. Frequently employees working in excavations have little input into their design and shape. Operators have a tremendous amount of control over the excavations. Although the ultimate responsibility of safe excavations lies with the superintendent, the superintendents don't observe each foot of an excavation as it is constructed. In addition, compliance with OSHA Excavation regulations must be maintained on DUB-L-EE job sites.

36.3.1 Safe Operator Passport Rules for Excavation

- a. Soils must be classified by visual and manual tests (including the thumb test) or are considered Type C Soils and will be excavated to Type C soil sloping requirements.
- b. Type C Soil cannot have benches greater than 2 feet high
- c. Vertical walls greater than 5 feet high in trenches, excavations or spoil piles are prohibited.
- d. Unsafe excavations on DUB-L-EE sites need to be corrected if any employees are exposed or will be exposed to cave-ins or collapsing soil piles.
- e. Spoil piles will be set back 2 feet or more from the edge of all excavations.
- f. Do not let employees in an excavation unless they have a ladder or you have constructed a ramp they can walk up and down.
- g. Do not let employees get under loads that are handled by lifting or digging equipment. Use taglines on suspended loads that employees will guide or direct.

30. Hazard Communication Program

This Company has a written hazard Communication program, and in accordance with OSHA Standard 1926.59, the following items are available to you at your request:

- a. A copy of the Company's written Hazard Communication Program;
- b. A copy of the Company's "List of Hazardous Chemicals" for your workplace; and
- c. Copies of Material Safety Data Sheets (MSDS) for any covered chemicals to which you are exposed. To obtain any of this information, contact your supervisor.

31. Health Hazard Evaluations Records

You, upon written request, obtain a copy of any medical record or any analysis of sampling taken while on or near you with regard to your working conditions or workplace.

32. Civil Jobsites:

- a. Flag Men are required when equipment crosses the streets not closed off. Flagmen must have passed flagmen training course, ask your foreman.
- b. Hardhats should be with employees at all times when in trucks or equipment with protective cab.
- c. Orange safety vests must be worn at all times when around traffic and moving equipment.
- d. Eye protection should be worn at all times. Glasses should have UV coating to protect eyes from long-term exposure to sunlight.
- e. Sunscreen is encouraged, as are long-sleeved shirts.
- f. Seat belts are to be worn at all times.

27. Clearing and Grading Equipment

- Always operate a dozer, scraper, grader, backhoe/loader etc., at a safe speed.
- Only the operator should be on the operating platform or seat. No one else should be on the equipment.
- Walk around your equipment before starting up to make certain no one is in a danger zone.
- Always be aware of those persons working around your equipment.
- Always wear your seat belt.

28. Safe Driving

- Do not ride on vehicle or mobile equipment except on seat or designed passenger platform.
- Do not ride in the back of pickups
- When driving about the jobsite, never exceed 15mph. At all times, observe the rules of safe driving.
- Every day, check the company truck you are driving to see that the brakes, turn indicator, head lights, back up alarm (if required) and stoplights are working properly. WEAR YOUR SEATBELT AT ALL TIMES.

29. Protection of the Public

- Anytime you see sightseers or children in the work area, ask them to leave so they will not be hurt.
- If there is danger of pedestrians, automobiles, etc., being struck by falling materials that you are working with, tell your Foreman so he can arrange the necessary protection.
- Direct any visitors without hardhats to the job office for proper job clearance.

Cycle Times and Bucket Capacities

Front loader, Backhoe Buckets and Excavator hold different amounts of materials depending on the material itself. Bucket capacities are typically measured two ways: struck capacity and heaped bucket capacity. Struck Capacity refers to a bucket filled to level, whereas heaped capacity is a bucket filled with a heaping load.

Heaped Capacity is the more useful measurement and varies depending on the material. This is called the Bucket Fill Factor. To determine the average bucket payload the Heaped Capacity is multiplied by the Bucket Fill Factor (See Table) as in the formula below:

Using a Cat standard duty 24" backhoe bucket with a heaped capacity of 7 cubic feet and a bucket Fill Factor of 80%

$$\begin{aligned} 7 \text{ cu ft} \times 80\% &= \text{Average Bucket Payload} \\ 7 \times .80 &= 5.6 \text{ cubic feet of material per cycle} \end{aligned}$$

If a Backhoe can make a complete cycle in 30 seconds every minute it can move 11 cubic feet of earth:

$$30 \times 2 = 60 \text{ sec or 1 minute so } 5.6 \text{ cubic feet} \times 2 = 11 \text{ cubic feet per minute}$$

If this number is divided by 27 it gives the yards / minute:

$$11 \div 27 = .4 \text{ yards per minute}$$

Section 37 – Forklifts

37.1 Inspection and Maintenance

The forklift to be operated must be inspected prior to use and can be used only if the following conditions have passed inspection:

- The forks and backrest must be securely mounted.

- Do not allow employees to work in the excavation above other employees unless the lower level employees are adequately protected.
- While the excavation is open, underground installations are to be protected, supported, or removed as necessary to safeguard employees. Adjacent structures are to be supported to prevent possible collapse.
- Operators must construct diversion ditches, dikes, or other means to prevent surface water from entering an excavation and to provide drainage to the adjacent area.
- Do not let employees work in excavation where water has accumulated or is accumulating unless adequate precautions have been taken.
- Operator must not violate any part of 36.3 Appendix A of DUB-L-EE Safe Operator Passport Rules for Excavations.

36.3 Appendix A

Note: This Appendix is only for excavations using sloping and benching to prevent cave-ins. Shoring, Shields, Trench Boxes or a combination of these will be designed and approved of by the supervising Superintendent and the Safety Director.

Soil Types

Type A is composed chiefly of clay and can be sloped from 54° or 1 to 1 from horizontal (9 inches for every 1 foot of depth). Caliche is frequently Type A.

Type B is composed chiefly of silt or loam and can be sloped from 45° or 1 to 1 from horizontal (1 foot for every 1 foot of depth).

Type C Soils are composed chiefly of sand and gravel and must be sloped 34° or 1 to 1 from horizontal (1.5 feet for every 1 foot of depth).

12. Dust Masks

Dust masks should be used when spray painting, handling cement, lime, or when exposed to a steady dust hazard. Special equipment is required when sandblasting, welding, and cutting in confined spaces, on galvanized material or metal coated with red or zinc chromate – See your foreman under these circumstances.

13. Fall Protection

Employees within 6 feet of a fall hazard greater than 6 feet in height shall be protected from falling by:

- Guardrails- 42" high + 3", strong enough to withstand 200 lbs in down and outward directions, a mid rail is required. If persons are working or walking beneath or next to the fall done a toe board will be included or the area will be restricted to:

1. Lifelines, seat harness, full-body harnesses, lanyard and static lines connected to anchor points cable of supporting 3000 lbs. Safety belts are not allowed.

2. A lifeline and Harness shall be used in all areas where materials are loaded, landed or unloaded if an employee is within 6 feet of the edge.

Check your harness carefully each day. If defective, do not use, return it to your foreman. Some alternative fall protection methods are allowed. See your Foreman.

15. Hand Tools

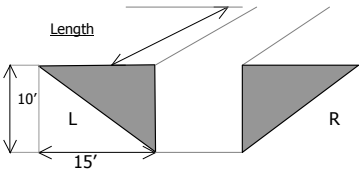
- a. Inspect tools before using to make sure they are not defective.
- b. When hand tools are not in use, lay them down in a safe place where they will not fall on a fellow worker or cause him/her to trip.
- c. Do not carry hand tools up or down a ladder; use a rope or tool belt.
- d. Know the correct use of hand tools before using; use the right tool for the job. If you are not sure how to use any tool talk to your foreman, they will instruct you on the proper and safe use of any tool.
- e. Have tools, with burred or mushroomed heads, dressed. Keep cutting tools sharp- and carry in a container or on a tool belt (not your pocket).
- f. Do not use tools with split, broken or loose handles.
- g. Be sure you have a clear area behind you before swinging a sledgehammer, axe, pick, or other tools or materials.

16. Portable Power Tools

- a. Be sure the electrical tools, such as portable power saws, grinders, drills, etc. are grounded (unless they are double insulated tools). Do not stand in water or on damp ground when using tools. (Report any minor shocks to your foreman)
- b. Make sure the tool has the proper guard and never block or lock the guard in an open position.
- c. Never block or lock the safety switch on a power tool so that it will operate the tool.
- d. Keep extension cords and power cord out of the center of walkways and off of ladders and stairways.

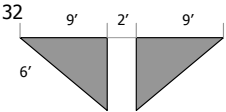
Appendix B

Formulas, Data and Useful Information



Type C Sloping Requires so much soil removal these Excavators are rarely in Compliance with 1926.652

If an excavation 6 feet deep X 2 feet wide in Type C soil has to be sloped, it has to be sloped back 9 feet on each side.



$(9 \times 6) + (2 \times 6) \div 27 =$ Yards to move per foot of excavation length.
 $54 + 12 \div 27 = 2.4$ yards/foot

So, to make one foot of progress, 2.4 yards have to be removed. The backhoe cycle time given is 40 yards per minute. By dividing 2.4 yards by 40 = 6 minutes per foot. If the trench is 10 feet long it is 10x6= 60 minutes or about an hour to correctly dig a safe excavation. And this is only if every cycle is within 30 seconds. By the time you account for machine movement, hard digging and other variables this time should be doubled or tripled.

Bucket Fill Factor Table

Material	Fill Factor
Moist loam or sandy Clay	100%
Sand And Gravel	95%
Hard Tough Clay	80%
Rock-Well Blasted	60%
Rock- Poorly Blasted	40%
Broken Concrete	30%

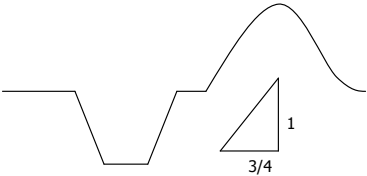
Stable Rock	VERTICAL (90°)
Type A	3/4:1 (53°)
Type B	1:1 (45°)
Type C	1 1/2:1 (34°)

Soil or Rock
Maximum Allowable Slopes (H:V)(*) For Excavations less than 20 Feet Deep**
Numbers shown are angles expressed in degrees in the horizontal. Angles have been rounded off.

Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

Slope Configurations
Excavations made in Type A Soil

All simple slope excavation 20 feet or less in depth in Type A soil shall have a maximum allowable slope or 3/4 to 1.



- e. Keep oily rags and oily gloves way from oxygen cylinders. (this could cause an explosion)
- f. Keep valve caps on cylinders, full or empty.

25. Fire Prevention

- a. Know the location of and how to use fire extinguishers and fire hoses
- b. Take extra care in disposing of cigarette butts and matches. Extinguish thoroughly. When in refineries or chemical plants, smoke only in designated areas.
- c. Flammable liquids should be transported and stored only in the original container or in an approved metal safety can.
- d. Store oily rags or paint rags in covered metal containers.
- e. Be sure there is a fire watch before welding or cutting above combustible materials.
- f. Tell your foreman if you use a fire extinguisher so it can be refilled.

26. Excavations

- a. Never enter an excavation or trench more than 5' deep unless it is shored or sloped.
- b. In any trench 4 feet greater in depth that you cannot walk out of, place an access ladder within 25' of any workman.
- c. When digging a trench, place soil (dirt from the excavation) at least 2" away from the edge of the excavation. Remove service tools, clods of dirt or other debris that could fall.

- c. When hoisting pipe or material that must stand upright. Lash it to prevent ends from catching in the hoist tower. Never ride a material hoist, never stay on it longer than necessary.
- d. Be sure to close hoist way gate after unloading.
- e. When loading or unloading a material hoist, never stay on it longer than necessary.

23. Electrical

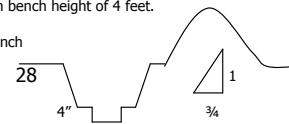
- a. Consider all wire "live" until checked out.
- b. Never remove or cut ground prong of any electrical tool or extension cord. (Plug in to matching receptacle only)
- c. All electrical power tools and extension cords should have RUBBER insulation. Damaged cords should be repaired or replaced immediately. Only type "S" cords are permitted.
- d. Only qualified personnel are authorized to make repairs to electrical tools and extension cords.
- e. Do not drive vehicles, aerial lifts or rolling scaffolds over extension cords.

24. Compressed Gas Cylinders

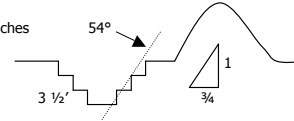
- a. Always turn cylinder valves off when not in use or when unattended for an extended period of time, such as during lunch period.
- b. Always secure a cylinder, full or empty, in an upright position.
- c. When cylinders are lowered or hoisted, use a skip box, net or cart. Never use a choker or hook on to the valve cap.
- d. Never store oxygen cylinders near flames, flammable, or combustible liquids or materials, oil, grease, or within 20 feet of fuel gas cylinders (acetylene, propane etc.).

- 2. All benched excavations 20 feet or less in depth in Type A soil shall have a maximum allowable slope of $\frac{1}{1}$ to 1 and a maximum bench height of 4 feet.

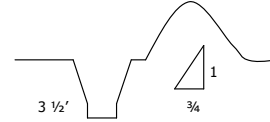
Single Bench



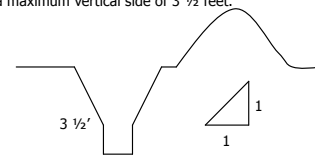
Multiple Benches



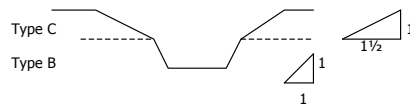
- 3. All excavations in Type A soil 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum allowable slope of $\frac{1}{1}$ and a maximum vertical side of 3 1/2 feet.



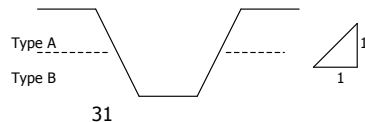
- 4. All excavations in Type A soil more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum allowable slope of $\frac{1}{1}$ and a maximum vertical side of 3 1/2 feet.



C over B



A over B



31

A over C and B over C



- e. Never point a compressed air tool or powder-actuated tool at yourself or a fellow employee.
- f. Only qualified personnel should operate or service power tools
- g. Do not use defective power tools. Report condition to your foreman.

17. Powder Actuated Tools

- a. Never use a powder actuated tool unless you are properly trained and have a **Valid Certificate Card** in your possession.
- b. Always wear eye protection and hearing protection.
- c. Do not shoot through sheetrock or plywood without making sure no one is on the other side.

8

18. Machines

- a. Before starting machinery, opening valves, switches, etc. check to make sure fellow employees are in the clear and have all safety guards in place.
- b. Never adjust or repair machinery while it is running.
- c. Operate machinery and vehicles within safe speeds and at rated capacity.
- d. Never refuel and engine while it is running.
- e. When using gasoline or diesel engine in an enclosed area, be sure to vent the exhaust outside.
- f. Never use an air hose for pressure to empty gasoline drums.
- g. Do not start or use any machinery unless you have been authorized to do so.
- h. If you are in charge of a compressed air tank, be sure to drain the tank and test the safety valve daily.

19. Ladders

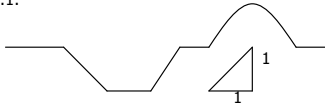
- Be sure straight or extension ladders are tied off at the top.
- Get someone to hold ladder while you are tying off, or if you can't tie it off.
- Make sure extension ladder locking clamps are in place before using.
- Have ladder reach at least 36" above landing for easy access.
- Use only sturdy ladders on firm level base at a 4 to 1 pitch and have clear access at top and bottom.
- Do not try to get additional height from ladder by placing it on a makeshift cribbing such as boxes, boards or scaffolds.
- Do not place a ladder in front of a door unless it is locked, barricaded, or guarded by another employee.
- Always engage snap spreaders on step ladders.
- Face ladder when climbing up or down; use both hands. Use hand line to lift or lower loads.
- Portable metal ladders must not be used for electrical lines.
- Never work off of the top two steps of a ladder.
- inspect all ladders daily before use.

20. Scaffolds and Aerial Lifts

- Scaffolds are to be erected only by employees trained to erect scaffolds.
- Do not get on scaffolds until the competent scaffold person has inspected them.
- Scaffolds are to be inspected every day before employees get on the scaffolds. Before any employee is allowed on any scaffold it must have a green tag attached.

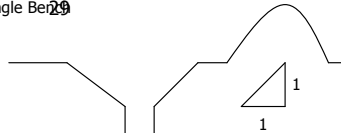
Excavations Made in Type B Soil

- All simple slope excavations 20 feet or less in depth in Type B Soil shall have a maximum allowable slope of 1:1:

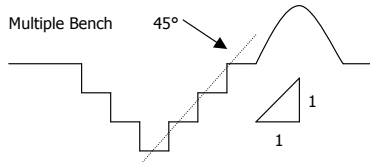


- All benched excavations 20 feet or less in depth in Type B soil shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:

Single Bench

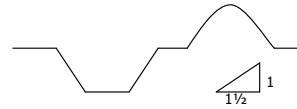


Multiple Bench



Excavations Made in Type C Soil

- All simple slope excavations 20 feet or less in depth in Type C Soil shall have a maximum allowable slope of 1½:1.

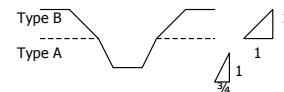


- Benches higher than 2 feet are not allowed in Type C soil
- All previously disturbed dirt is classified as Type C soil

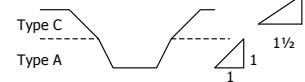
Layered Soil Sloping Configurations

- In New Mexico Type A soils (clay and adobe) are frequently found on top of Type C soils (sand and gravel). Many New Mexico fatalities occurred because the Type C soil beneath collapsed causing Type C soil to crush to death an employee. Follow the sloping rules for Layered Soils:

B over A



C over A



- Scaffolds with a fall height greater than 10 feet must have guardrails.
- Whenever working in any aerial lift in which the man basket extends beyond the perimeter of the vehicle's wheels you must wear a safety harness and lanyard tied to the approved anchorage point.
- Do not stand on the guardrails unless connected to the man basket with full body harness and lanyard.

21. Floor Openings

- Keep materials away from entrance or exits of stairs, hoist and elevators landings, traffic lanes and ladders.
- Avoid shortcuts – use ramps, stairs, walkways, ladders, etc.
- Do not work in areas with inadequate lighting. Tell your foreman and he will get it corrected.
- When necessary to remove guardrails around a floor opening or building perimeter, make certain they are replaced each time you leave the work area and immediately upon completion of work.
- Keep all stored materials a minimum of 6' away from any shaft opening and 10' from building edge.
- Secure material and equipment so it will not be blown out of the building.
- Any floor opening greater than 10" in the least direction must be covered and secured with a suitable covering marked "hole" and "oiyo."

22. Hoists

- Ride the personnel hoist only; never ride a material hoist.
- To prevent overloading of a personnel hoist, you must follow hoist operator's instruction for the loading of people or material.