



Dedicated Drill Rigs Used as a Crane

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Director of Safety

ADSC: The International Association of Foundation Drilling

ADSC & OSHA

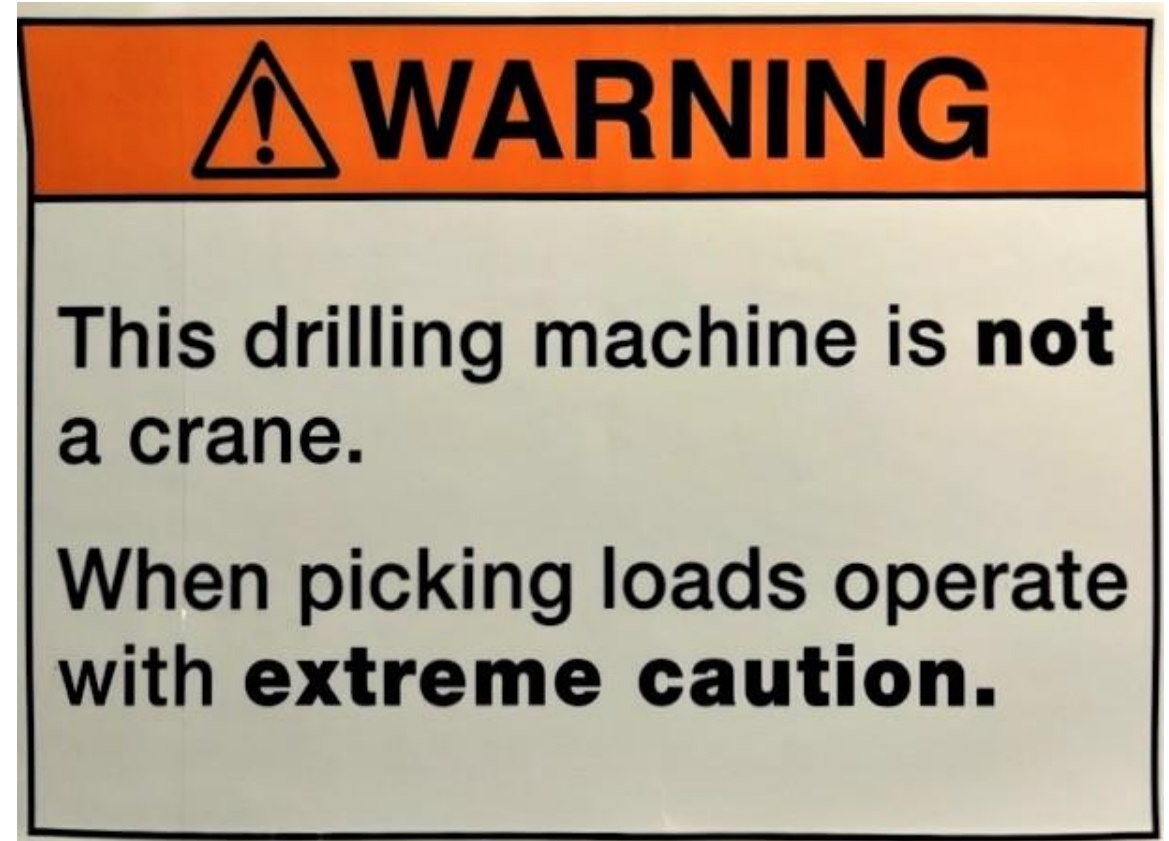
The ADSC has a long history of working with OSHA in keeping the deep foundation industry a safe environment for employees to work in.

As far back as 1998, the ADSC began to take a pro-active stance to better define drill rig hoisting procedures and the inherent dangers associated with them.

ADSC & OSHA

As an association, the ADSC membership working with drill rig manufacturers, created informational procedures and warning labels describing to the user of a dedicated drill rig of the hazards associated with hoisting loads.

To this day, warnings regarding the use of a dedicated drill rigs for hoisting are found in almost every manufacturer's operator manual – giving the operator detailed instruction regarding the **extremely limited ability** for hoisting by the respective equipment.



ADSC & OSHA

- In November 2003, members of the ADSC were graciously invited to speak at a C-DAC (The Cranes and Derricks Negotiated Rulemaking Committee) meeting. We made a presentation asking to have dedicated drilling rigs excluded from Subpart CC requirements.
- We explained the very limited hoisting capacity of the equipment, the extremely limited working radius of a suspended load, and the limited hoisting capacities listed in what most refer to as a “load chart”.

ADSC & OSHA

- We asked the C-DAC panel to think about the ramifications of defining this type of construction equipment as a crane. If included, the standard, it would give “license” to the operator to use the equipment in a manner it was not intended to perform.
- Our fear would be that employers will use the equipment to offload material from a trailer for example, and thus create the high potential for an accident - resulting from improper use of the equipment.
- Additionally, this would require manufacturers to design and retrofit existing equipment, and then design future equipment to comply with the subpart CC crane requirements – a significant financial burden on the manufacturers and the end user.

Federal
Register / Vol.
75, No. 152 /
Monday,
August 9,
2010 / Rules
and
Regulations

“Proposed paragraph (c)(11) excluded dedicated drilling rigs. This exclusion received substantial attention during the C–DAC negotiations and was discussed at length in the proposed rule (see 73 FR 59730, Oct. 9, 2008).

OSHA requested public comment on issues related to this exclusion. No written comments were submitted but, in testimony at the public hearing, a trade association supported the proposed exclusion. (ID–0341.)

Accordingly, paragraph (c)(11) is promulgated as proposed.”

Types of Dedicated Drill Rigs

Carrier Mount

- Drill unit is mounted on a commercial type truck frame
- Numerous sizes and capacities
- Ability to travel on most roadways
- Drill is self contained, independent of the carrier
- This drill rig has limited lifting capacity using its auxiliary hoist line

- This equipment is not a crane





Types of Dedicated Drill Rigs

Crawler Track Mount

- Unit is on a crawler-based frame
- Numerous sizes and capacities
- Drill is self contained, independent of the carrier
- This drill rig has limited lifting capacity when using its auxiliary hoist line
- This equipment is not a crane



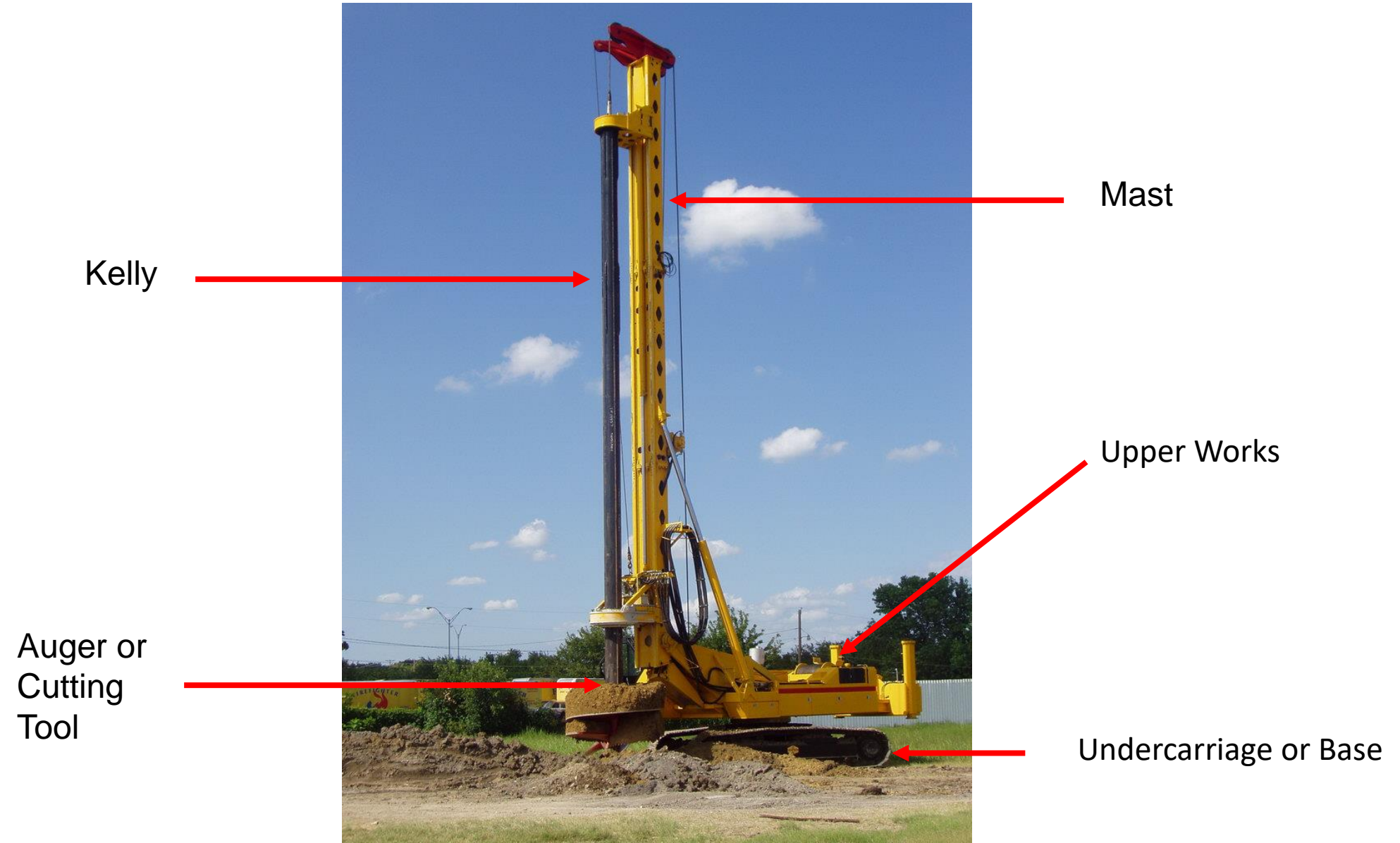
Types of Drill Rigs

Crane Mount

- Drill attachment is mounted to the crane base, and suspended from the boom tip
- Operator use crane hoist lines to raise and lower kelly
- Used for large diameter and deep shafts
- Crane has reduced lifting capacity due to existing suspended weight of drill, kelly, and tool.

This is a crane with a drill attachment

“Dedicated Drill Rig”



Dedicated Drill Rig Configurations



Drilled Shaft Installation



Continuous Flight Auger Installation

Dedicated Drill Rig Configurations



Excavator Based



Small Diameter Carrier Mount

Dedicated Drill Rig Configurations



Same Base Machine – Different Configurations = Multi-Purpose



Dedicated Drill Rig Configurations



Jet Grouting Tool



Cutter Soil Mixing Tool

Dedicated Drill Rig Configurations



Casing Driver – allows drilling and advancing casing simultaneously



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Dedicated Drill Rig vs. Crane

Most drill rigs have an auxiliary or service winch to assist in the drilling operation. It is used to handle tooling, small reinforcing cages, and some casing, much like a “crane” might do. That said, drill rigs differ from a crane in the following ways:

Dedicated Drill Rig vs. Crane

The function of drill rig's mast is to contain and guide the rotating kelly or drill stem in a vertical position - not to serve as a load positioning or handling system, as does a crane boom.

The mast length is fixed, while a crane boom and / or its working radius can be variable. This function is critical to crane operation, as they are a material handling device.

Dedicated Drill Rig vs. Crane

- Dedicated Drill Rigs cannot usefully travel with a load suspended from the auxiliary hoist line.
- Dedicated Drill Rig's primary function is for excavating - not material handling.
- Dedicated Drill Rigs do not meet the definition of a crane according to ANSI B 30.5.
- Dedicated Drill Rigs do not meet the definition of a crane according to OSHA CFR1926.1400

Dedicated Drill vs. Crane

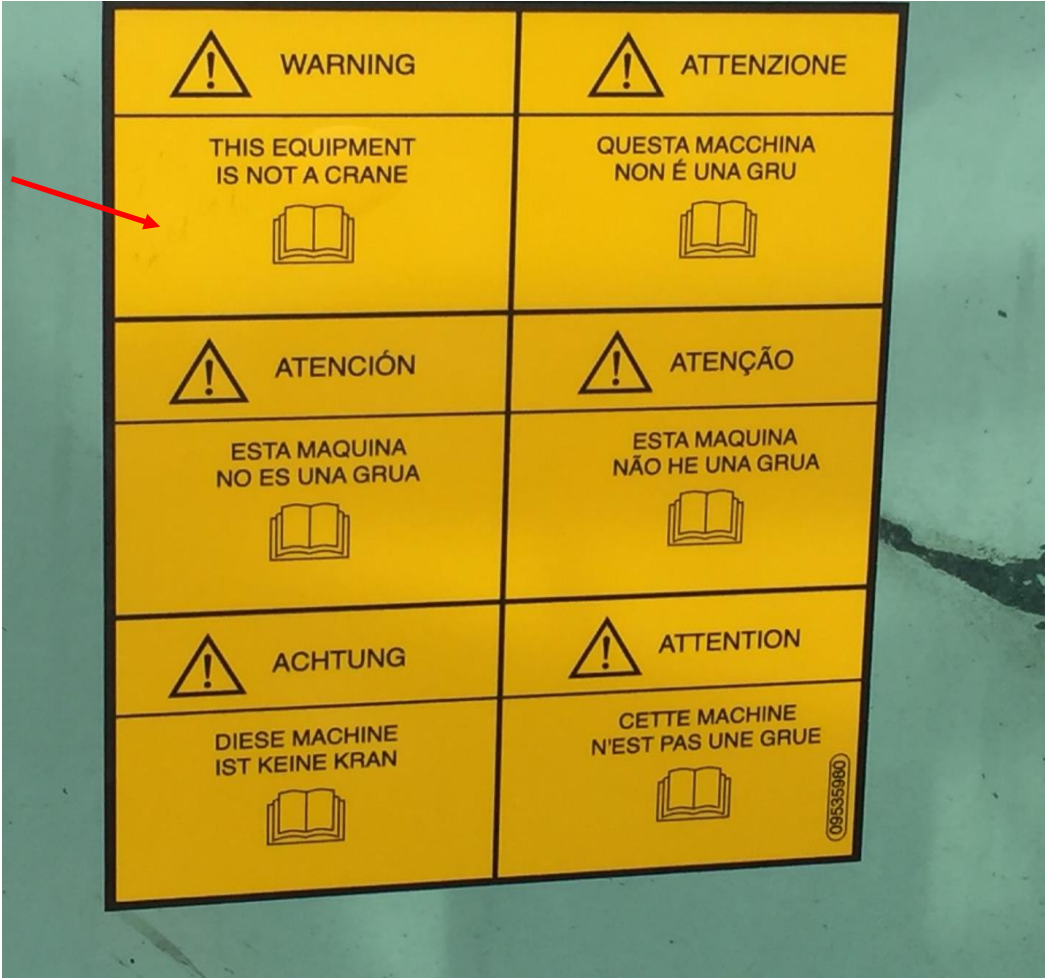
Most drill rig manufacturers have numerous warnings regarding the use of their equipment as a crane, throughout the operator's manual.

 **WARNING!**

This machine is not a crane. This machine has a limited picking zone and capacity.

Casagrande B300 XP

Dedicated Drill Rig vs. Crane



Soilmec SR - 30



Watson EDT-7

Dedicated Drill Rig vs. Crane

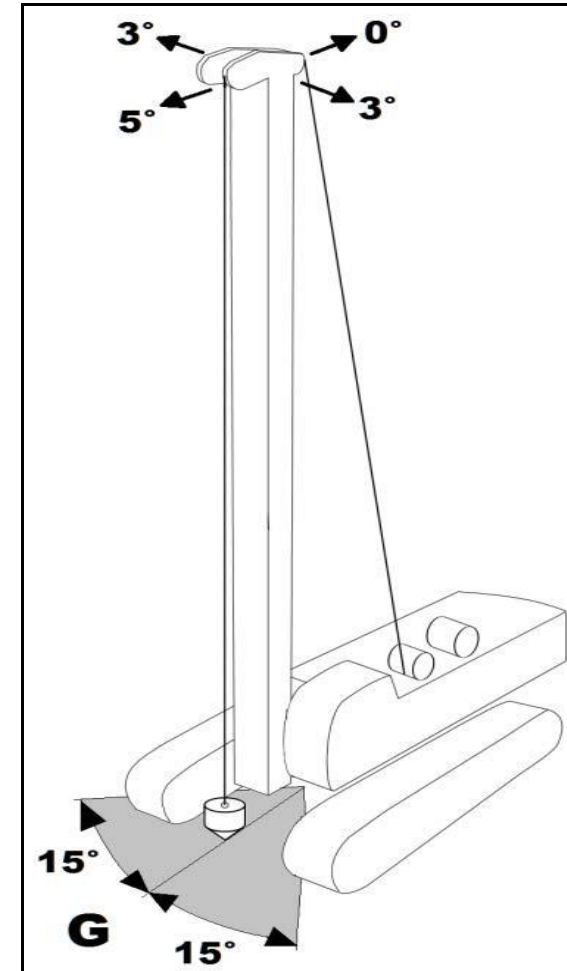
The manufacturer will state restrictions such as:

- Degree of level for the machine
- Mast inclination
- Tracks fully extended
- No travel with suspended load

 **WARNING!**

This machine is not a crane. The auxiliary winch must be used only for lifting, supporting and lowering support equipment for drilling or excavating (tool, casing pipes, rope grab, chisel) and for casting operations (cage, casting pipe).

Casagrande B300 XP

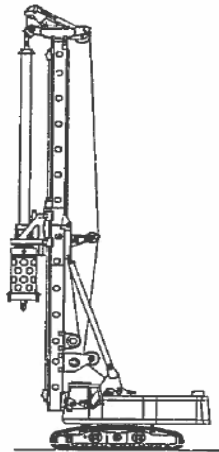


1 DESCRIPTION

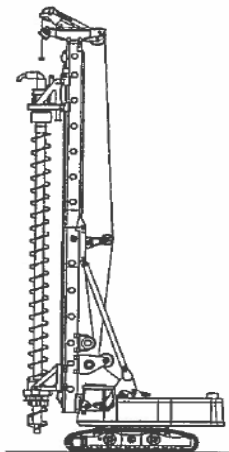
The large diameter rotary drilling rig BAUER BG 36 is designed for drilling casings down to 60 m in depth or boreholes of up to 3000 mm in width.

Range of application:

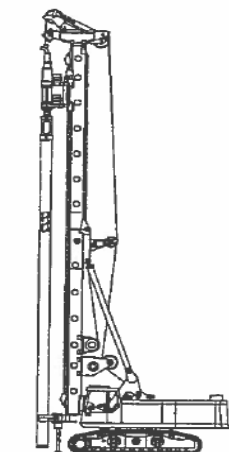
- Drilling with a Kelly bar
- Drilling with a continuous flight auger
- Drilling with a dual rotary drive.



Drilling with Kelly bar



Drilling with continuous flight auger (CFA)



Drilling with dual rotary drive (FOW = Front-of-Wall)

BFASE002.wmf

Special feature:

Suitable for depths down to 53 m

Special feature:

Fills the bore hole with concrete while pulling the auger out

Special feature:

Can be operated in the direct vicinity of buildings, canals, etc.

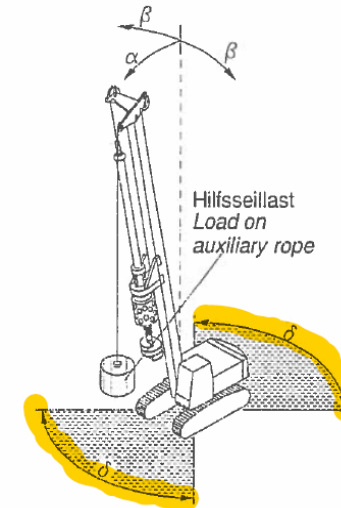
The drilling rig must not be used in other applications than those listed here; using the drilling rig as a liftcrane or a levelling tool e.g. is prohibited.

2.4.2.2 With Mast in Tilted Position

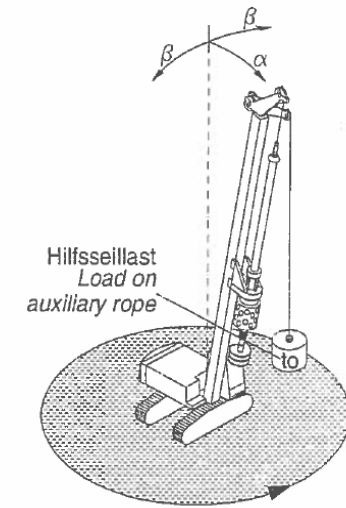
2.4.2.2.1 Auxiliary Rope

The max. load which may be slewed by $\delta = 80^\circ$ (see shaded area) is 13.0 tonnes:

The max. load which may be slewed 360 is 3.5 tonnes:



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B0000519.wmf

CONDITIONS:

- Machine on firm level surface.
- Mast angle not exceeding $\alpha < 5^\circ$ forward, $\beta < 4.5^\circ$ sideward from true vertical.

The resulting pressure on the ground is max. 1040 kPa.

Service Winch Safety



14206 N. Ohio St. Rathdrum ID 83858
1-888-569-3745
www.bayshoresystems.com

WARNING

This drilling machine is **not** a crane.
The service winch is for drilling tool installation only.
Operate with **extreme** caution.
Do not travel with suspended loads.

Several factors are considered when adding a service winch on your specific base machine. These factors are:

- Horsepower availability
- Ground contact area of the tracks
- Load capacities based on the "center of gravity."

The service winch has been added only for the purpose of handling drilling tools at a drilling site. Large, heavy tools will have an effect on the stability of your machine. The operator and crew must be aware of the hoisting capacities of the winch (see manual). When hoisting with the service winch, the weight of the tool is transferred to the ground contact areas of the base machine when it is raised off either the ground or an elevated surface. **NEVER MODIFY THE SERVICE WINCH BY MULTI-PARTING THE HOIST LINE IN AN EFFORT TO INCREASE HOISTING CAPACITY.**

Thorough considerations must be made by the operator before hoisting up any tool with the service winch.

1) Is the ground surface stable?

Soft or unstable ground, working surfaces or platforms may become depressed and may cause a tipping effect to the machine. This will offset the center of gravity unexpectedly. Never pick a tool while the excavator is on soft or unstable ground, surfaces or platforms.

2) Is the ground surface level?

A slope of any kind can have a major effect on pick capabilities. Especially if the tool is picked up on the uphill side of the machine, held suspended and then swung to the downhill side. The weight shift of the load is transferred to different contact areas while in motion. Perform picks only on level ground.

3) Is the object within my pick zone?

Ensure that the mast is in a vertical position. The pick area is within a five-foot radius of the final service line sheave. When performing an angled pick be aware of the swing factor of the object. Minimize angle picks as much as possible. Maneuvering the machine over a tool prior to picking is the preferred technique.

4) Pick the tool up slowly.

A rapid hoisting movement can cause a sudden instability in the base machine. All hoisting should be performed in a manner so that the operator has complete control of the tools movement. A swinging tool is out of control. The inertia generated also changes the center of gravity of the machine.

5) Winch, cable and rigging equipment.

All components utilized in the hoisting of tools must be in good condition. Constant and thorough inspection of these items is essential for the safety of all personnel. Inspection of the hoisting hook is recommended by the manufacturer and required by OSHA. Check and document the hook throat opening when new and at monthly intervals thereafter. Safety latches must be installed and operable. Cable slings, chokers and bridles must also be inspected for damage and deformities. Frayed cables must not be used under any circumstances and they should be immediately replaced.

Refer to Operators manual for additional information.

Safety First

SERVICE WINCH SAFETY

The LoDril drilling machine is not a crane. It has a limited picking zone and capacity, and can tip over if limits are exceeded. Operate with extreme care.

There are factors to consider when using a service winch with your specific excavator. These factors include:

- Ground contact area of the tracks
- Load capacities based on the "center of gravity"

When preparing to perform a "pick" on a tool there are also several factors to consider. These factors include:

1) How stable is the ground surface?

Soft or unstable ground may become depressed and may cause a tipping effect to the machine. This will offset the center of gravity unexpectedly. Never pick a tool while the excavator is on soft or unstable ground, surfaces or platforms.

2) How level is the ground surface?

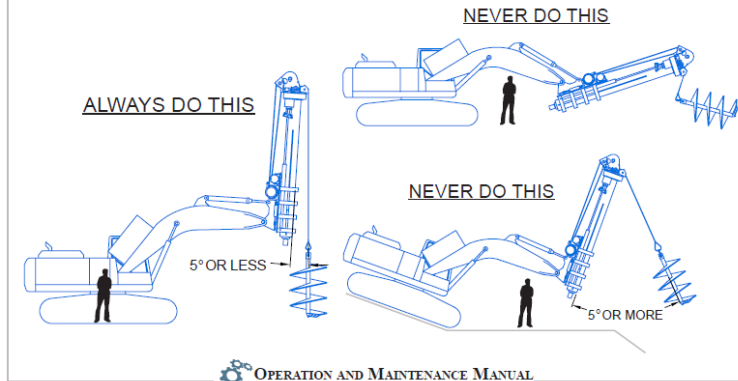
A slope of one or two degrees can have a major effect on pick capabilities, especially if the tool is picked up on the uphill side of the machine, held suspended and then swung to the downhill side. The weight shift of the load is transferred to different areas while in motion. Perform picks only on level ground.

3) Is the tool within my pick zone?

Ensure that the mast is in a near vertical position. The optimum pick area is within a five foot radius of the final service line sheave. When performing an angled pick be aware of the swing factor of the tool. Minimize angle picks as much as possible. Maneuvering the machine over a tool prior to picking is the preferred technique.

4) What condition is my equipment in?

All components utilized in the picking of a tool must be in good condition. Constant and thorough inspection of these items is essential for the safety of all personnel. Frayed cables reduce line pull abilities and increase the chance of mechanical failure. Inspection of the hook is recommended by the manufacturer and required by OSHA. Check and document the hook throat opening when new and at monthly intervals there after. Safety latches must be installed and operable. Cable slings, chokers and bridles must also be inspected for damage and deformities. Proper setting and use of picking equipment must be understood by all riggers.





Compliance

The 1926.1400(c)(11) exclusion is not a “Get out of Jail, Free” card. There are numerous hazards an employer must protect employees from when a dedicated drill rig is in operation. Some examples are:

- Fall Protection
- Exposure to Pressurized Lines/Hoses
- Housekeeping
- Training
- Rigging
- Confined Space / Emergency Rescue

Compliance

For compliance issues, OSHA should enforce the correct use of the dedicated drill rig's limited lifting capacities, by referencing the operator's manual, and the ANSI A10.23-2019 Safety Requirements for the Installation of Drilled Shafts .

Failure to have the correct manual, not following the manufacturer's recommended procedures, or industry best practices should be citable offences.

Compliance

If there is an apparent violation regarding the operation of a dedicated drill rig, but an existing OSHA standard does not specifically address it, then the compliance officer should use Section 5(a)(1) a.k.a. the General Duty Clause, as a basis for the citation, and reference the operator's manual and existing best practice documents – but not use Subpart CC.

Several conditions must be met for OSHA to issue a General Duty Clause violation:

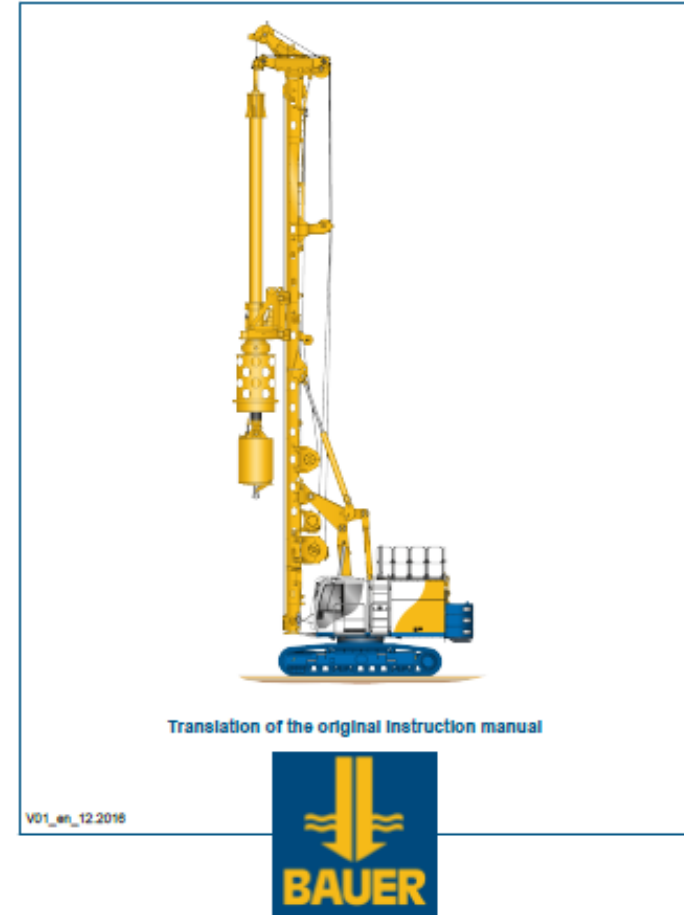
- The hazard was recognized.
- The employer failed to keep the workplace free of a hazard to which his or her employees were exposed.
- A feasible and useful method was available to correct the hazard.
- The hazard was causing or likely to cause death or serious injury.

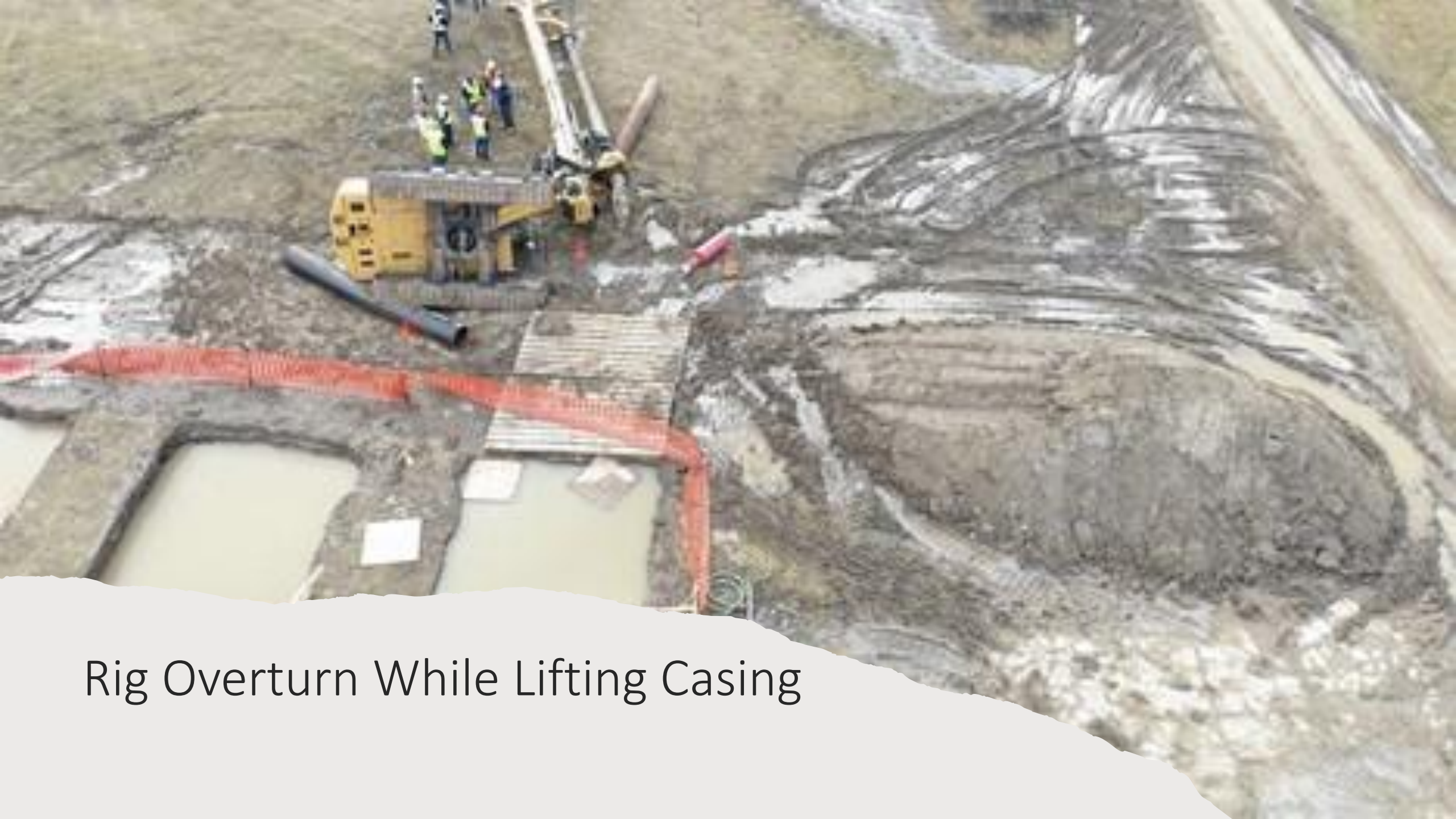
Dedicated Drill Rig vs. Crane

You must enforce the correct use of the drill rig's limited lifting capacities, by referencing the operator's manual.

Failure to have correct manual or not following the manufacturing recommended procedures may be a citable offence.

Instruction manual
BG 24 H # 3410





Rig Overturn While Lifting Casing



PRE-BID CONSTRUCTION MEETING

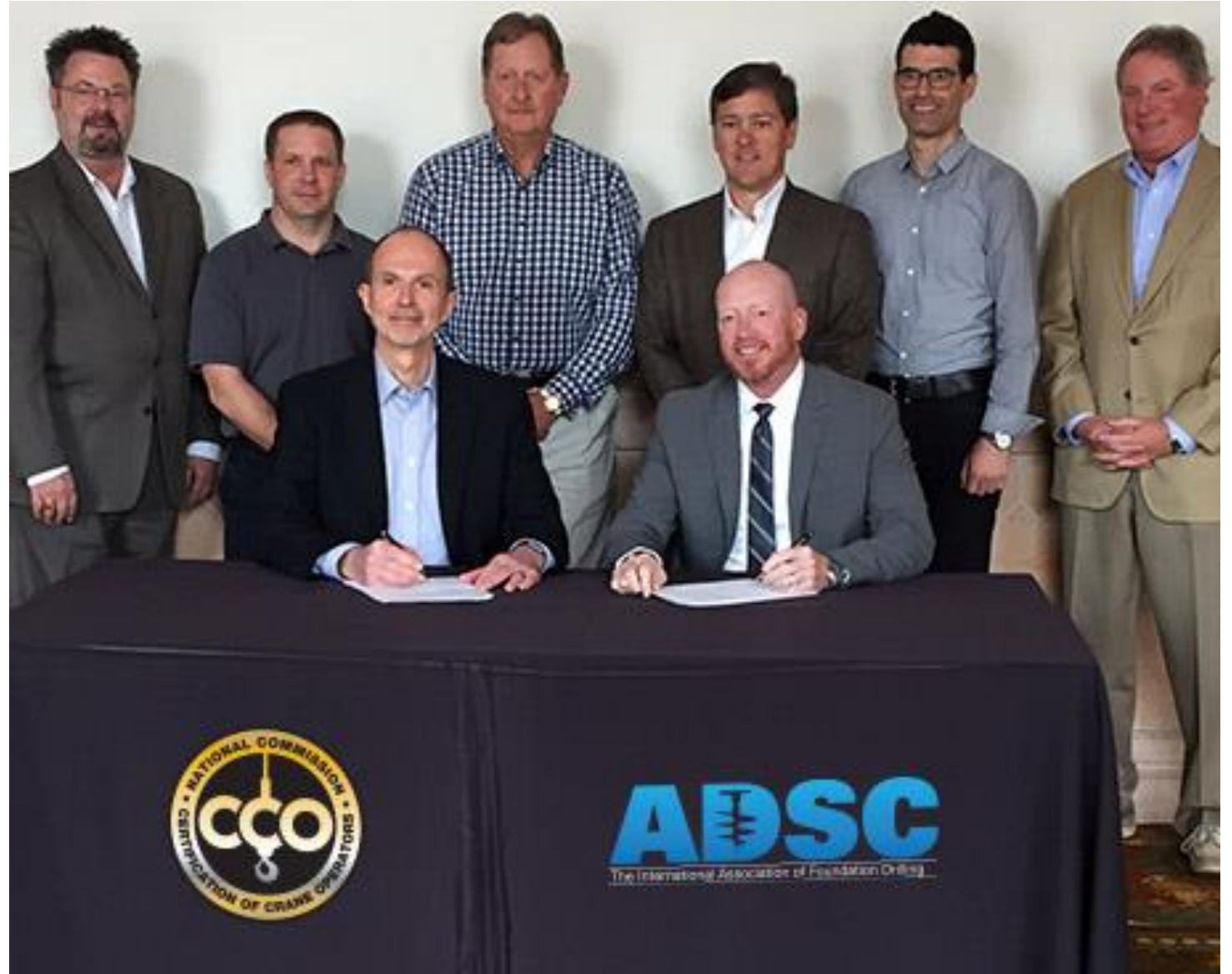
- If you plan on using an auxiliary crane or other material handling equipment (not your drill rig) onsite for the handling of reinforcing steel cages, soldier piles, tremie pipes, or casing, then you need to inform the prospective client that your estimate may be higher than those who choose not to do so.
- Remember - You are using the auxiliary material handling equipment as a risk management tool to better provide a safer, more productive, and high-quality deep foundation installation.



Operator Certification

February 23, 2017—The National Commission for the Certification of Crane Operators (NCCCO) and ADSC – The International Association of Foundation Drilling have announced plans to jointly develop a certification program for operators of foundation drill rigs.

The official announcement was made at ADSC's Annual Meeting in La Quinta, CA, in February 2017.



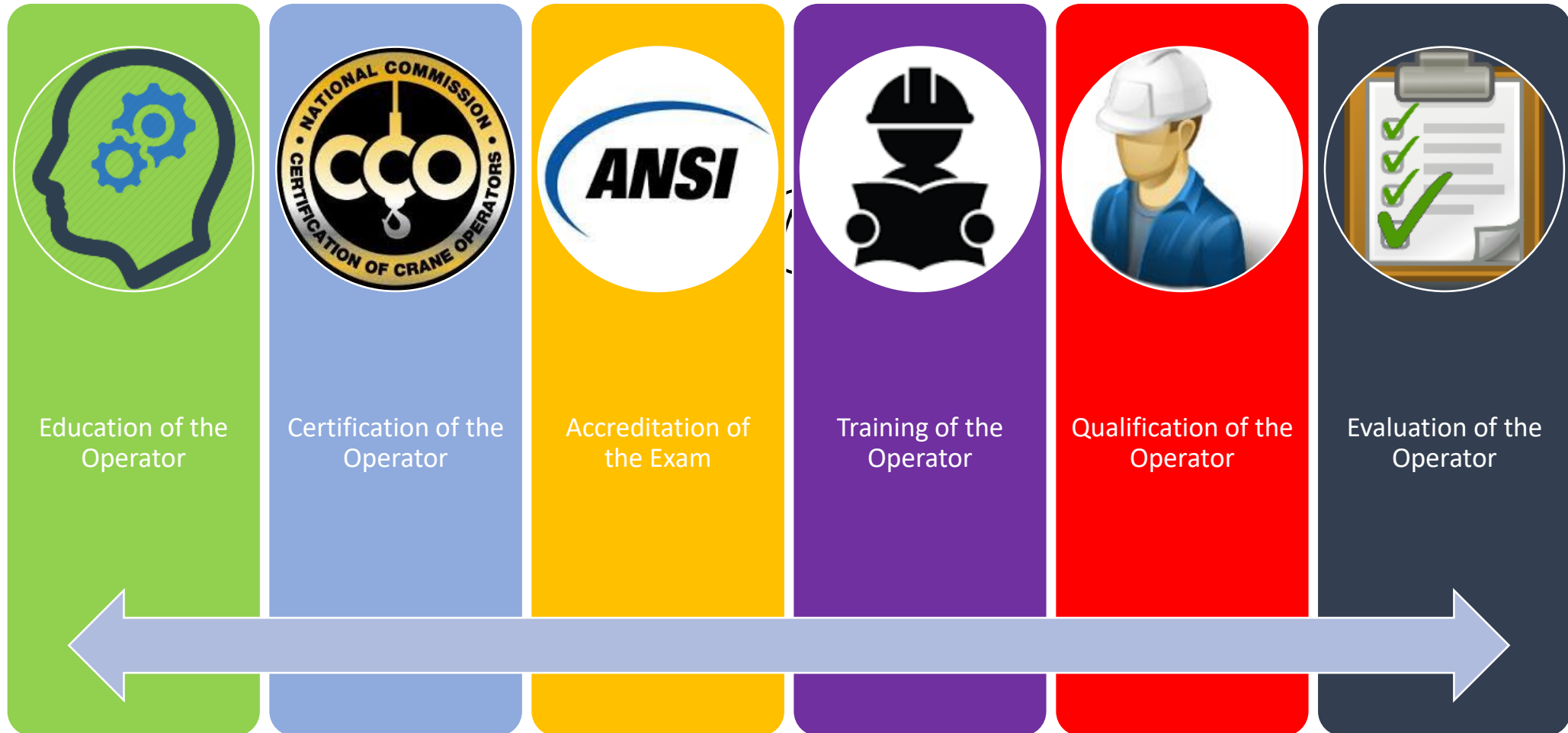
Certification



The ADSC task force achieved a consensus on the structure of the program and identified the test components:

- Written core exam covering general information on both types of foundation drill rigs – 90 questions.
- Two written specialty exams (Large Foundation Drill Rig and for Anchored Earth/Micropile Drill Rig) – 45 questions each.
- Two corresponding practical exams (Large Foundation Drill Rig and for Anchored Earth/Micropile Drill Rig).
- Candidates will be able to earn their certification in one or both specialty designations.

The Certification Process



Education

An education (or the process of receiving or giving systematic instruction) is a hands-on process that requires both theory and practice.

Ideally, an operator learns definitions and processes from instructors/mentors, and course materials and is then given an opportunity to practice and apply those learned instructions on the appropriate equipment.

Certification

Certification would occur after an individual receives appropriate education either on the job, from a trade union, trade association, or educational institution.

NCCCO Certification, demonstrates the candidate has skills and knowledge that industry subject matter experts have deemed necessary for safe performance of a given type of equipment.

Certification

The NCCCO Foundation Drill Rig Operator Certification is in no way a “certification” of the operator’s proficiency to install a given product – i.e., a drilled shaft or tieback anchor.

It is a certification of the candidate’s ability to recognize the safe operational procedures and then safely perform basic maneuvers inherent to all types of large and small foundation drill rigs.

Training

Training is more finite and is typically of shorter duration. Training often consists of development and eventual mastery of a specific skill or concept.

An operator may have passed a certification exam and may understand the parts and processes of the equipment in general but will still need further expert training (by a manufacturer or employer) on the operation of a specific foundation drill rig or procedure, in order to be deemed “qualified” by their employer.

It has been proven that non-trained operators are more likely than trained operators to have accidents, quality control and production issues.

Qualification

Expert training on a specific foundation drill rig and the performance of certain tasks, ensures that an individual can be deemed competent by their employer to operate a specific piece of machinery.

This means that the operator can differentiate the specialized and unique attributes that each individual type of foundation drill rig possesses and can operate the equipment and perform those tasks - safely.

Evaluation

Once the operator has gone through the process of education, certification, training, and employer qualification, they need to be evaluated on their ability to perform the tasks assigned to them.

Evaluation may take place coincidentally to qualification, but only for a specific machine and task. Each time the operator is assigned to a substantially different machine or task, they should be “evaluated” to ensure they can operate the equipment and perform those tasks - safely.



Practical Exams

Written Exams

The Core Exam (Written or Computer Based) will have questions related to the following “Domains”:

DOMAIN 1: PROJECT SITE

DOMAIN 2: Assembly / Disassembly

DOMAIN 3: PRE-OPERATION

DOMAIN 4: OPERATION

DOMAIN 5: TECHNICAL KNOWLEDGE

DOMAIN 6: MANUFACTURERS’ STABILITY / RANGE CHARTS FOR
AUXILIARY WINCH

Separate Specialty Exam for
Anchor/Micropile Foundation Drill Rig

RECERTIFICATION REQUIREMENTS

NCCCO certification is valid for five years. ***Recertification candidates must complete all recertification requirements during the 12 months prior to their certification's expiration date.*** This includes:

- Passing the Recertification Written Examination(s)
- Continuing to meet medical requirements
- Compliance with NCCCO's Substance Abuse Policy
- Compliance with the Code of Ethics

Practical Examiners

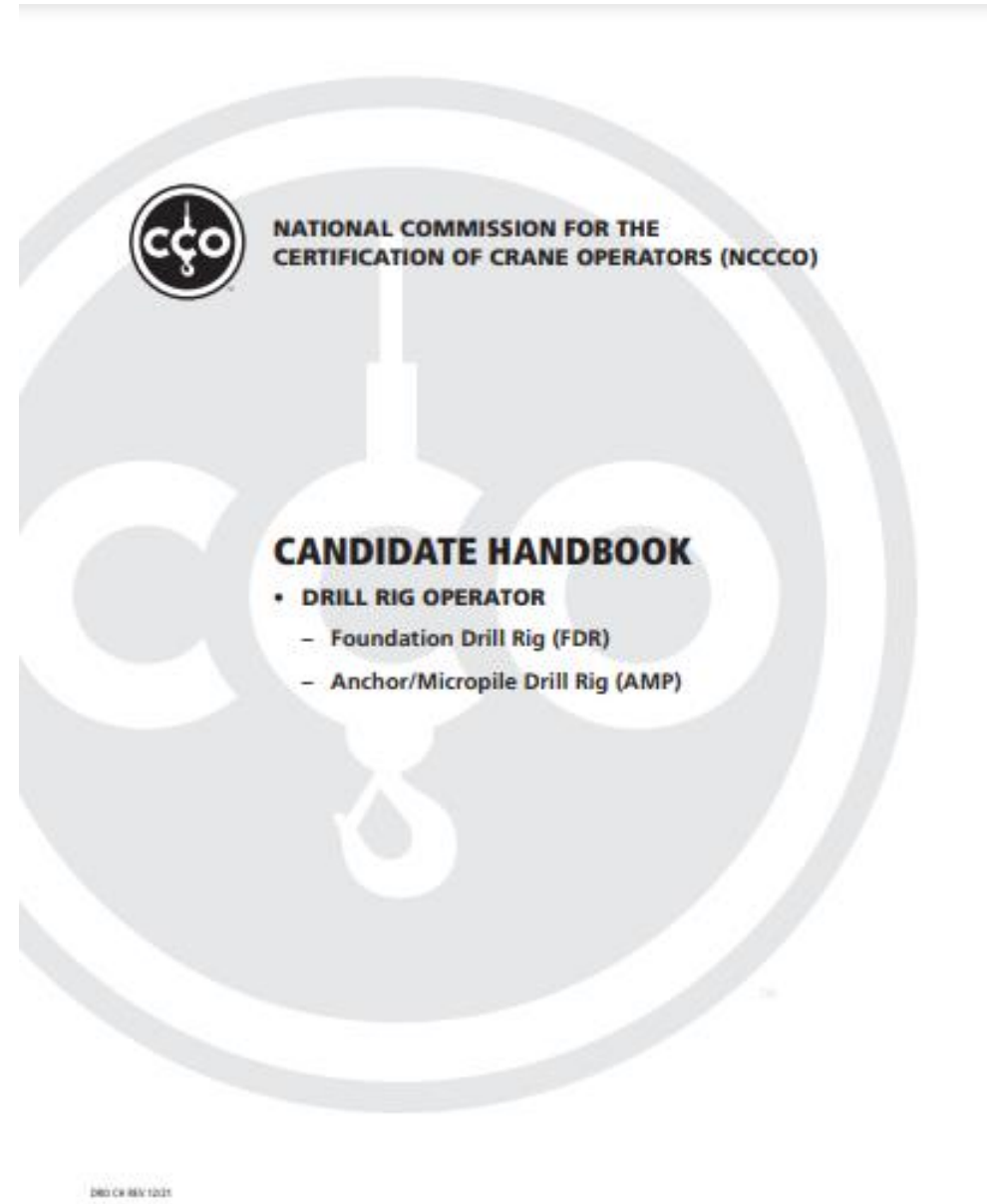
NCCCO-accredited Practical Examiners are CCO-certified personnel who have been trained and authorized by NCCCO to administer the practical examinations for CCO certification programs.

NCCCO Practical Examiners are recognized as professionals in their field and may offer their services for hire.

Employers with NCCCO-accredited Practical Examiners on staff appreciate the convenience of being able to schedule in-house tests to accommodate changing schedules caused by weather, workloads, and other factors.

Candidates Handbook

The NCCCO offers a “Candidate Handbook” specifically for the Foundation Drill Rig Operator Programs



Reference Manual

A small secondary task force generated information to be used as a “Reference Manual” for a potential candidate to use as a “study guide” for the written exams.

There are two written manuals – one for Large Diameter Foundation Drill Rigs (Kelly Bar, CFA, Jet Grout, Displacement Pile, etc.) and a separate manual for Small Diameter Foundation Drill Rigs (Anchor / Micropile)



LARGE FOUNDATION DRILL RIG

Reference Manual

[Abstract](#)

The ADSC - The International Association of Foundation Drilling in association with the NCCCO is proud to bring you this reference manual to assist you in your preparation for the NCCCO Foundation Drill Rig Operator Certification Exam.

Special thanks go to the members of the NCCCO Foundation Drill Rig Task Force for their cooperation in the development of this resource.

Rick Marshall
Director of Safety - ADSC



ADSC & Trade Unions

The West Coast Chapter of the ADSC conducts a Drill Rig Operator training school with Operating Engineer Locals in California and Washington. Practical Exams are available during these schools.

Benefits of Certification

- In the 1990's Ontario Canada began their mandated crane operator certification program. Within a short period of time, Ontario recorded a noticeable drop in crane related accident and fatalities. Crane Operator Certification became mandatory throughout Canada as a result of the Ontario requirement.
- Here in the U.S., OSHA began looking into the necessity of updating the crane safety standards in the late 1990's. One of the priority topics was mandatory crane operator certification.
- ADSC took a proactive stance and developed the Foundation Drill Rig Operator Certification Program and the NAIT Foundation Drill Rig Operator Course to demonstrate that we are a self-governing association. As such, we collectively should support these programs so we can all can install our products with greater safety, higher quality control, and maximize productivity.

Benefits of Certification

As an employer you still must ensure your operators are trained to operate the equipment you assign them to. So, having made that investment, why not find out if that training has been effective?

The only sure way you can do that is having their knowledge and skills tested through a professionally developed, OSHA-recognized, ANSI-compliant accredited certification program such as FDR/AMP CCO certification from NCCCO.

Why would so many underwriters whose business is the mitigation of risk put their stamp of approval on certification if it wasn't effective in reducing accidents and incidents related to cranes?

Benefits of Certification

So, why wait?

The safety benefits that increase from the professionally developed, accredited certification that has been available since 2018 are so compelling, it just doesn't make any sense to delay embracing it a day longer.

The wait simply isn't worth it.

Question???

Just how close are we to having Foundation Drill Rig Operator Certification as Mandatory?

We are probably just one more serious accident or fatality away . . .



Questions?

