PURPOSE:

When arriving on a drilled pile job, setup and operation of the grout/concrete pump is critical to the safety of the employees and other personnel on site. The superintendent and pump operator should be trained on how to properly setup, operate, and clean the pumps to prevent creating hazards on the job and/or damaging the equipment.

PROCESS:

Setup

In preparation of the job scope, the following should be considered before pumping operations begin:

- Pump operator must be trained, and a practical evaluation performed before being issued a Cajun qualified operator card. (See practical evaluation below)
- A pre-use pump inspection shall be performed by the qualified operator and reviewed/signed by a supervisor onsite. This shall be performed on each pump placed in use during the course of the work.
- All hoses and connections must be inspected before each use and cleaned after every use.
- Hoses should be connected with a rubber gasket and clamp. Grease should be placed around the gasket and clamp to help reduce concrete/grout build up that can result in damage.
- Whip-checks must be placed at every hose connection with the spring pressing the cable against the hose firmly.
- A loop bail grip (reference photos below) will be used to secure the hose and 90 degree elbow to the pump with a shackle. The mesh portion of the grip will go around the hose, clamp, and elbow securing all three together.
- Clamps must be installed properly. Threaded type clamps shall be installed as tight as possible, starting at refusal and backed off one whole turn until the clamp can be closed with a considerable amount of force. It shall be secured with a pin to lock the handle in the downward position.
- Any clamps that will be suspended in the air during the job should be the bolted type clamp and tightened to manufacturer's specified torque.

Operation:

- Pump inspection must be documented before the shift begins.
- A biodegradable form releasing agent (i.e.; Durogard 2, or equivalent) must be sprayed on the pump to prevent any material from sticking or building up on the pump. (SDS available for reference and approval needs to be obtained before use)
- Nitrogen for the surge chamber, needs to be opened and set until the gauges read between 100-200 psi. Once the pressure is set to desired psi, the nitrogen bottle should be closed until the pressure falls below 100 psi.
- The fluid level in the splash box should be around the half way point of the box.
- The hydraulic pressure should be set at the lowest point and be gradually increased while pumping until the desired pressure is reached (1000-3000 psi.)
- Hydraulic pressure should be adjusted throughout the day depending on the consistency of the material being pumped.
- Both cylinders should operate at the same pressure when working properly.

Quality Control

- The specified flow range or slump must be determined before pumping grout/concrete
- Grout/concrete must be mixed with an additive and the allowable water volume to achieve the target flow/slump. The amount of water added must not exceed the amount of water withheld from the mix design noted on the batch ticket.
- Grout/concrete must be ordered with time spacing between trucks to allow adequate time to pump the material before the time restriction has expired
- The allowable time between batching and the time the grout/concrete is used must be determined and approved before pumping. The range may vary depending on mix design and outside temperatures.
- Grout/concrete shall not be held for a period exceeding 2 ½ hours at a material temperature below 70 degrees and for a period not exceeding 2 hours at temperatures exceeding 100 degrees, unless project specifications require more stringent conditions.
- The pump shall be calibrated before installation of the piles to determine the volume of material per stroke.

- Theoretical volume, target percentage, and minimal stroke count must be determined at the beginning of the job. A record of total stroke count, total yardage, pile numbers, and drill depth should be kept by the pump operator.

- The pump operator and crane/rig operator must have a clear line of sight to each other. If the operators cannot see each other, a signal person must be placed to translate signals.

Cleaning

- Between installations of each pile, the pump and screen must be cleaned using a water hose and nozzle.

- At the end of the shift, the pump must be flushed out with water until all material is cleaned out of the system. Water being pumped through the system must be clean and free of any aggregate or cement.

- The 90 degree reducer on the discharge end of the pump must be removed EVRY DAY after the pump is washed out. A hose must be placed in the end of the discharge with water spraying into the material cylinders. The cylinders need to be in the pumping motion to properly clean them out.

- The hopper and screen must be pressure washed at the end of each day using wash skids.

- Splash box must be inspected daily. Any material other than oil/water may indicate a problem with the seals on the cylinders.

- Once a week, adequate time must be allowed to clean the fine specks of grout/concrete build up using a biodegradable solvent.

- All clamps and connections must be free of grout/concrete build up in order to identify stress cracks and fatigue in the metal.

Pump operators will be held accountable for maintaining pump appearance and operation.

CLOSE UP OF LOOP BAIL GRIP

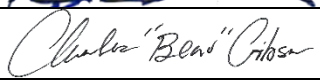
LOOP BAIL GRIP CONNECTING HOSE TO PUMP
(CAN BE USED FOR THREAD AND/OR BOLT TYPE CLAMPS)

PAYOFF:

By following this best practice for the proper setup, operation, and maintenance of concrete and grout pumps, safety hazards are minimized, and equipment performance is optimized. Regular inspections, proper handling, and thorough cleaning reduce the risk of equipment malfunctions, prevent project delays, and extend the lifespan of the pumps.

Crew Review:

Superintendent: Instruct the crew to use their phones to scan one of the QR codes below, which will direct them to a short review session. After personnel enter their information and submit it, training records will be generated and automatically saved for future reference. Utilize this time for open engagement with the crew. Each review will have different questions, which can be answered either as a team or individually.

Approvals		
Title	***Signature***	***Date***
BU 15 Vice President		10-1-24
BU 15 Senior Construction Manager		10-1-24
BU15 Manager of Safety		10-1-24

Revision History				
Rev #	***Date***	***Reason for Changes***	***Originator***	***Effective Date***
1	06-26-2024	Update to new format/ add QR training codes	Lance Bradley	10-1-24

Note: BP Requirement

Work must be performed in accordance with the information in this BP. If it is determined that work cannot be done as required in the document or that it presents additional risk, you must obtain authorization for variance from the Business Unit Sr. Construction Manager and Business Unit Manager of Safety.