

Laying it Down

How to Choose the Right Pipelayer for an Installation Project

By Bradley Kramer

Pipelayers are the workhorses of a pipeline construction project. A short list of the chores that these heavy-duty machines perform includes unloading pipe from trucks and rail cars, lifting pipe for welding and bending and lowering the line into the trenches. Pipelayers can be used singly to handle a length of pipe or as a collective force to manipulate a pipeline section.

With so many vital tasks at stake, it's important to know which machine is right for your needs. *North American Pipelines* gathered the experts at Midwestern Manufacturing Co. and Volvo Construction Equipment, and asked them how to go about choosing the right pipelayer for the job.

The first things to consider when choosing a pipelayer are what it will be lifting — the pipe — and where it will be doing the lifting — primarily, the terrain.

"The size of a pipelayer needed will be determined by the diameter of the pipe, weight of the pipe per foot and the length of the pipe to be handled, as well as the type of terrain where the pipeline is to be laid," says James Shelley, vice president and general manager of Midwestern Manufacturing Co., which builds a variety of sidebooms that can be attached to rubber-tired front-end loaders and crawler style tractors from other OEM manufacturers.

Make sure to also consider pipe size and wall thickness and whether the pipe is concrete coated, says Lewis Long, vice president of global accounts for Volvo Construction Equipment, which offers two pipelayers in its stockades, the PL4608 and PL4611, with 80 and 110-metric ton tipping capacities, respectively. Long also notes that terrain slope and bearing pressure will help determine which pipelayer will be better suited for the jobsite.

Other important considerations, Shelley suggests, are whether the pipelayer is manufactured by a reputable manufacturer, if the machine is built to ASME B3014 standards, what types of winches are used (hydraulic vs. mechanical) and the length of the boom.

The type of pipeline will also play a role in sizing a pipelayer, whether the project is for long-distance transmission or shorter distribution lines.

Transmission or transportation pipelines need a dedicated right of way, and consequently require earth



The size of a pipelayer is determined by the size and weight of the pipe being installed and the terrain conditions on the jobsite. Large-scale transmission pipelines will require larger machines, while distribution projects are better suited for smaller and midsize machines.

moving machines, Long says. Pipelines are built over long distances and at high speed, several miles per day. Distribution lines, on the other hand, are built in cities, are smaller in size and over short distances. Daily, linear production is very low, and therefore machinery requirements are also lower.

"Largescale pipeline work will need 90,000-lb to 200,000-lb lift pipelayers and small distribution lines typically use 10,000-lb to 40,000-lb lift pipelayers," Shelley says. "The small distribution pipelines use the combination machines — this is a tractor that has both a pipelayer and a dozer blade attached. This allows the contractor to use the machine for all phases of pipeline construction and not have to have a separate dozer for backfill and clearing operations."

The adjustable boom of the pipelayer performs the work, but its length will depend on the machine size, Long says. The working height of the boom is determined by the activity that the pipelayer is performing, whether that is pipe stringing and bending or transport.

"There is no correct boom height," Shelley adds. "Different job conditions call for different length booms. The standard boom length for smaller pipelayers runs from 15 ft to 20 ft, and for larger pipelayers they will run from 20 ft to 28 ft. Longer or shorter booms for any pipelayer will be determined by job conditions or by contractors' preference."

The majority of pipelayers are of the sideboom configuration, and that's for good reason, Long says. The side-mounted setup is better suited for applications in which the machine has to lift or lower pipe and move forward at the same time, where the ditch can be on either side of the machine.

"The 360-degree upper structure swing capability of Volvo pipelayers provides the sideboom capability while also enabling pipe handling and placement capabilities at any point of the swing, for maximum flexibility," Long adds.

The engine of the pipelayer — or in the case of Midwestern Manufacturing's products, the OEM tractor or crawler — is an important factor in assuring that the machine will have enough power to meet the demands of the job, as well as meeting today's tough environmental standards.

"All tractors are produced with diesel engines," Shelley says, "and fuel consumption is definitely a big factor in selecting a pipelayer, as well as making sure when buying a new pipelayer that the engine will meet Tier 3 requirements."

However, fuel consumption may not be as big of a factor as in other construction machines, Long says, because pipelayers spend a large portion of their time on the job idling at low engine rpm.

A bigger consideration with the engine may be the flywheel power or rated horsepower, Shelley says. "A pipelayer needs to have sufficient horsepower in order to perform all the pipelayer functions, as well as move and maneuver the tractor in all types of terrain," he adds. Midsize pipelayers range from 125 to 300 hp, while larger scale machines range from 300 to 400 hp.

Outside of the engine and boom, the undercarriage plays a vital role in a pipelayer's performance, Shelley says. The undercarriage can affect the maneuverability and the stability of the pipelayer because of the heavy side-loading the pipelayer is subjected to during pipelaying operations.

"Undercarriage track length and shoe width are important since they contribute to machine stability and ground pressure," Long says. "Shoe type (single, double or triple

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grouser) depends on terrain conditions (dry, sandy, rocky or muddy) and slope grade."

Soil conditions will dictate the type of shoe configuration and width needed, as well as track length, Long adds. However, the soil also plays a part in how you size a pipelayer for the job.

"Soil conditions play a big part in the selection of the size of pipelayer needed, as it will determine how far the pipelayer will have to be from the edge of the ditch in order to maintain the desired safety margin," Shelley says. "This in turn will also determine boom length for the pipelayer on that particular job."

Creature Comforts

Despite all the impressive stats and durability offered by the pipelayers on the market, it's the operator who makes it function on the jobsite. That's where the cab comes into play.

"In what can be extreme conditions, a better cab will make the job easier by providing comfort for the operator, which reduces fatigue and increases productivity and should also provide protection for the operator," Long says.

Options such as the seat, controls, air conditioning and heat help make the operator more comfortable, while cab visibility, load indicators and the roll over protective structure (ROPS) will provide safety. Shelley adds that the ease of getting in and out of the cab is another important consideration.

"The more comfortable the operator is, the less fatigued he will become during the long hours spent on the machine," he says.

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Considering Costs

In times of tough finances, it's important to consider the cost of owning a machine, as well as whether to buy new or used. Resale value may also play a vital role in choosing the make and model.

The decision to buy used will depend on the contractor, Shelley says. "Some buy only used," he says, "while others will only buy new or late models with low hours."

However, buyer beware.

"Used pipelayers often do not meet modern safety requirements and have very poor stability," says Long, who suggests that new machines offer better stability and often include a load management system for increased jobsite safety.

The cost of ownership for a pipelayer includes fuel, lubricants, filters, wire rope, spare and replacement parts and transportation requirements. Shelley suggests that potential buyers make sure that the pipelayer has a parts and service manual that provides maintenance intervals and a list of recommended spare parts. He also recommends that maintenance personnel have adequate training. Maintenance service and dealer support are a high value in pipeline contracting.

"It is very important to the contractor to know that he can get parts and service for his machines, because of the remoteness of most pipelines," Shelley says. "Dealer support is a big issue with pipeline contractors. In most cases when a machine goes down it needs to be back in operation in a matter of hours, not days."

The right pipelayer with the necessary options and strong service support will provide the versatility and durability needed for any pipeline project.

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Avoiding the Tipping Point Cranesmart Pipelayer System Monitors Load to Improve Safety

As sidebooms lift pipe lengths from point to point on a pipeline construction project, operators must take care not to overload the machine, which could result in dangerous tip-over. Just like on any other jobsite, safety is paramount.

Cranesmart's wireless Pipelayer System operator aid is specifically designed and engineered for sideboom tractors to aid operators in improving safety when handling pipe. The retrofit system provides the operator with a clear, easy-to-read display that shows vital information to help avoid overloading, dangerous and costly tip-overs and damage to the pipe itself from abrupt tilting of the pipelayer in the case of an overload.

All load chart information for each make and model of pipelayer is programmed into the Pipelayer System. The display panel shows boom overhang, load on the hook, percentage of permissible rated load and maximum rated load. When operating in out-of-level ground conditions, the display indicates the slope in degrees and warns. The system can also provide information on tip height, boom angle, boom length, parts-of-line and detailed four axis ground slope indication.

The Pipelayer System is self checking in design, alerting the operator of any malfunctions in the system. Cranesmart provides a "free battery for life" program. So in addition to a five-year battery life in each component of the system, replacement batteries are free for the life of the system. All components are solid state, with no moving parts for rugged and reliable usage in any environment. For more information, visit www.cranesmart.com.

