

A firm foundation

Having a proper foundation for a 1,200-ton stamping press is a key component in ensuring the facility that houses it does not eventually shake itself apart. A foundation is so important, says Brian Siess, vice president of manufacturing, Radar Industries, Warren, Mich., that “without one, your building can experience some profound changes, and none of them good.”

A stamping-press foundation is one of the most important aspects to consider before purchasing land, an existing building or a stamping press, says Siess. Stamping presses can demand intricate foundations when looping pits, scrap removal and press tie-rod installation are considered.

Radar Industries uses Delta Industrial, Chesterfield, Mich. to construct its press foundations. For a stamping-press facility in Mexico, Delta worked closely with Radar’s staff before making the purchase. Delta’s crew took boring soil samples to ensure presses could be set without extensive modifications, such as steel or concrete piers below the concrete foundation. By researching this beforehand, Radar could decide whether or not to purchase the facility. If the location required heavy foundation modifications, the facility’s cost could increase considerably.

Stamping-press foundations are more critical than other machine tool types, says Tom Lytle, vice president at Delta. “Some of these press lines can become very intricate as to the foundational work because you get into various elevations that are needed to support the press along with the feed line. Also, we have to incorporate what will be done at the press’ floor elevation. For instance, will there be forklifts coming into and out of the press to move the stamping die? If this is the case, then when we design and build a press pit, we

would have to encompass beam ledges at the top, allowing us to do finished floor plating for forklift access. Also, many of these presses have movable bolsters, and this has to be taken into consideration. They require a very flat surface area around the bolster,” he says.

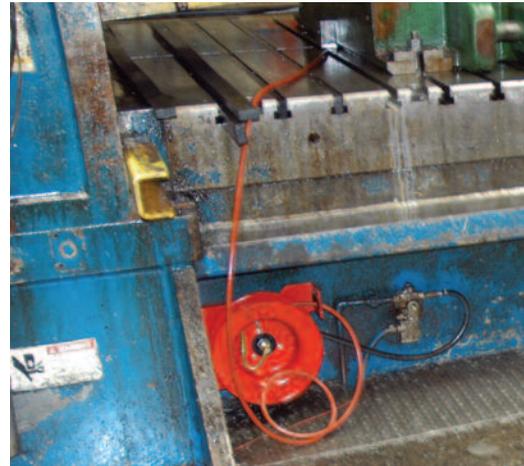
Building a foundation

A tremendous amount of engineering goes into press foundations, says Kristyn Slanec, Delta vice president of operations. Once the press manufacturer’s recommendations are taken into consideration, soil borings will determine how to build the foundation.

Delta has mechanical engineers who use AutoCAD to develop an entire set of drawings for each project foundation. They start from a site plan or the actual site location or use drawings for an existing building and information from soil borings. They also have to know where equipment will be placed.

“We’ll do an excavation drawing that will show how the excavation will look based on the determinations of a particular press’ needs. Then we’ll show what shoring is required and the types needed depending on how deep we need to go in the pit. We also need to find out if there is water intrusion at the site,” says Slanec.

Drawings for the reinforced steel will show the size of the steel bar, the type and quantity used, and the spacing. Delta can



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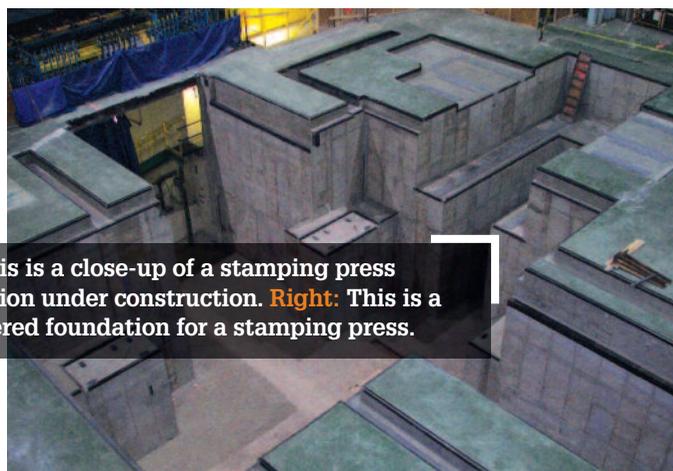
What's under a stamping press is just as important as the press itself



Stamping presses can require intricate foundations to help create a safe and stable facility.



After excavation, workers will set up concrete walls on the foundation.



Left: This is a close-up of a stamping press foundation under construction. **Right:** This is a multitiered foundation for a stamping press.

build the steel reinforcements, mezzanines and any other steel structures needed for the foundation or around it at the company's Michigan facility. Drawings also will show the foundation's concrete thicknesses and any unique elevations, such as the working height for a bolster plate. Once approved, the field foreman uses the drawings to build the foundation.

"Then there is also a factor for our foundations that we specify called mass dampening," says Siess. "We want the weight of the footings to be pound-for-pound equal to the weight of the press so that the shock loading through the elastomeric isolators [used to set the press on] is modified by the mass in the footings. This prevents the shock load from transferring up through the structure. We also have considerations for draining coolant from the pit, along with handling scrap and other variables."

Stamping presses are often so large they have to be assembled on-site, says Siess. Therefore, the tie rods need sumps underneath the bed of the press so they can be dropped down to assemble the columns and crown and then drawn back up. All this has to be factored into the foundation's design. The height of the roll feed elevation also has to be considered, says Siess. "Delta has to do the engineering so that the feed interface has the correct elevation for the press."

Some companies require feedline looping pits as part of the foundation. Also, press feed lines need underground utilities placed within the foundation for electricity and pneumatics. All this has to be in the site plan, says Siess.

There are many variables to consider, says Lytle. "You have ground conditions, the depth of the foundation, what type of wall form is needed along with the types of reinforced steel that will be used in the concrete foundation. And depending on the thickness of the wall, we might have to change the concrete mix design. We can put waterproofing agents in the concrete mix if needed to help eliminate water coming into the foun-

Stamping

dition. We can also put plasticizers in the concrete. All of these concrete needs are site specific depending on the conditions," he says.

Site considerations

"Before we decide on any press or facility, we do soil tests down to 30 ft.," says Siess. "This is deep enough to test any soil conditions. When we bought the Mexican plant, the soil condition beneath it was one of our first considerations. We had to make sure that we could put in press foundations for a reasonable cost."

When Radar purchased a used press for its Mexican facility, Bob Grucz, Delta's president, inspected the press and the footings.

"We agreed on changes to the Mexican installation because we have more rigorous criteria for installation," says Siess. "Grucz did the engineering [and] submitted drawings incorporating our changes to the foundation. I approved these. They then sent a layout crew down to Mexico to work with the plant manager there, and we did the layout in the floor. Then they provided a series of construction drawings for our approval. Delta sent their building supervisor to Mexico to arrange the subcontractors and excavating crew to dig, form and reinforce the foundation area."

Radar's press in Mexico has a bed size of 60 in. by 120 in., with an overall length-to-width size of 10 ft. by 16 ft. A pit was excavated to 16 in. with a 30-in. concrete solid footing underneath the excavation and press.

"Any stamper who buys a facility without knowing the soil characteristics is taking a tremendous risk," says Siess. "Radar's facilities are blessed with excellent soil conditions, and we don't have to use either pilings or have an extended foundation."

Siess also says soil conditions within a small area can change rapidly. A few years ago Radar considered moving its entire operation ½ mile up the road from its existing location. "Delta had worked in that building before, and they quickly advised us not to buy it because the soil conditions were terrible. Grucz said that foundational work would be very expensive



Above: The project included a more than 200,000 sq. ft. building expansion with footings, floor and multiple equipment foundations. Left: The metal around the press allows use of a forklift to remove dies.

because of the change in soil conditions. So Radar dropped its interest in a larger facility on the basis of this knowledge and the construction conditions," he says.

"The ownership of Radar and Delta have worked together for 10 years prior to my being employed here," Siess says. "I have found Delta to be highly skilled and a very reliable source. I've used them on all press footings during my time here. We've set probably 11 presses together. We did use another company one time, but because of the difference in workmanship, we chose to go back to Delta and have stayed with them ever since."

Radar primarily has mechanical presses used for progressive stamping operations along with some blanking operations. This facility, which is one of two, runs nine presses from 300 tons to 1,200 tons. All except one are on Delta foundations.

"Primarily, we do automotive stampings, but we have a high growth curve in producing stainless steel exhaust systems for heavy trucks. We can handle up to 3.5-mm thick stainless steel," says Siess.

Before acquiring a facility, a stamper should work with an engineering company capable of conducting soil borings and analyzing them, says Siess. "It's a very expensive mistake to find the building that you want and then can't cost-effectively install the equipment that you need to run," he says. **FFJ**

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