

# A Big Lift

## CASE HISTORY

### Sync Lift Project For Disaster Assistance Rescue Team of NASA

By Mike Murphy



*Editor's Note: The following is an interesting and probably unique example of applying today's technology. Lifting a 139,000-pound load is a challenge for any lifting device but when you're asked to do it for NASA it's even more challenging.*

#### Introduction

The D.A.R.T. is a division of NASA responsible for designing and testing support forms for disaster rescue teams throughout the United States. These forms are used to support failing structures such as building and roof collapses due to earthquake, bombings or terrorists attacks. The primary goal of the group is to provide rescue teams design criteria that will enable them to construct wooden support structures on-site that will allow them entry into a compromised or partially collapsed structure. The construction materials brought to the site consist of various sizes of top-quality dimensioned wood pieces and heavy-duty fasteners, generally heavy gauge nails or screws. Many different designs must be constructed

and tested to provide reliable data regarding the load holding capabilities of each design.

#### Training

This group is also responsible for training various groups of rescue personnel from across the United States such as fire departments, FEMA rescue crews, city and county rescue crews, and various other government entities. They have constructed training buildings designed to test the ability of the crews to punch through concrete, secure failing roofs for entry and rescue trapped persons in many different situations. They also have a concrete block pile carefully constructed with hiding places for rescue dog training, and conduct exercises in all of the above over a several-day period.

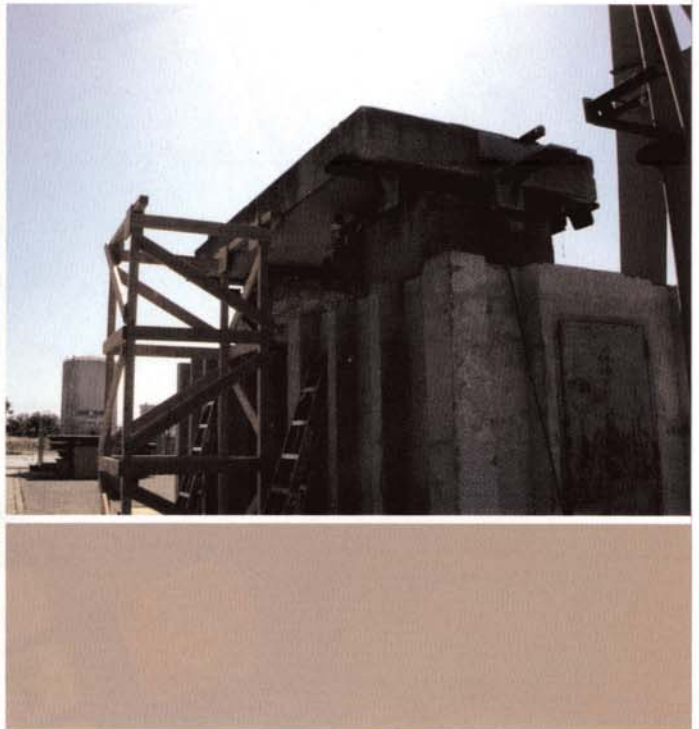
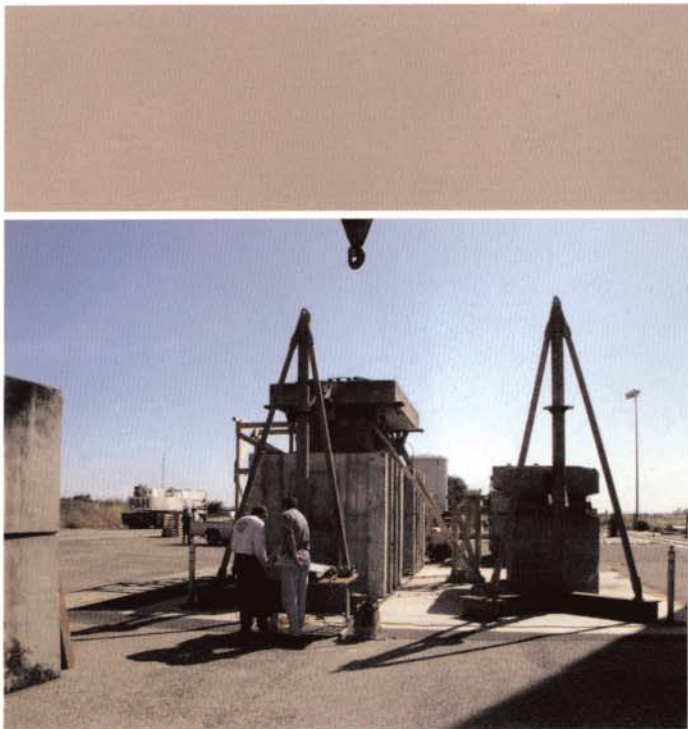
#### Testing

The testing process begins by building the test form and placing it between two support blocks, which support the overhead test weight to be lowered onto the form. In the past the only way to

raise and lower the test weight was by use of an overhead gantry crane and cables. This created an unstable load applied to the top of the form and compromised the test. The concrete block weighing approximately 40,000 pounds would be lowered onto the form using only the gantry crane, which created an unequal load on the form structure. Therefore the test form would not see equal load across all of the supports. Side-to-side motion was also difficult to control.

#### Enerpac sync lift system

Enerpac was called in by our distributor, C.H. Bull Co. representative John Bruzus, who has been working with NASA for several years on many types of projects. NASA engineers Gerry O'Connell and Roger Miller were looking for a way to lift the concrete block and allow the wooden form to be positioned, then lower the load evenly onto the structure for load testing. After reviewing the application I contacted Don Bishel to meet with the engineers and discuss a sync lift system



for this application. We all agreed that the Enerpac sync lift system would provide them with the controlled lifting and lower necessary to achieve an optimum test.

### Homeland Security

The Undersecretary of Science and Technology for Homeland Security, Dr. Charles E. McQueary, was visiting in approximately two weeks and a successful test would be critical to be awarded the \$5 million in funding necessary to continue and expand the D.A.R.T. program. Don Bishel contacted Duane Dwyer in Glendale to work out the system and check delivery. Duane was able to assemble ship the SLCG8 system including cables, stroke sensors, directional control valves, and all necessary hardware to the site in less the 10 days, including the RACL506 aluminum cylinders. Don worked with the engineers for the next three days to get the system up and running for the final test, which was finished and programmed just as Undersecretary McQueary arrived.

### Success!

The system worked perfectly and lifted a load of approximately 139,000 pounds to allow the form to be positioned, and then was lowered in stages as the form was slowly crushed by the weight. The form was designed to hold 40,000 pounds and actually held closer to 60,000

pounds, which confirms a safe design for a 40,000-pound design criteria. The D.A.R.T. team was extremely satisfied with the Sync Lift System and commented that this was by far the most accurate load testing they have seen to date and will be used for all wooden form structure testing in the future. ■

