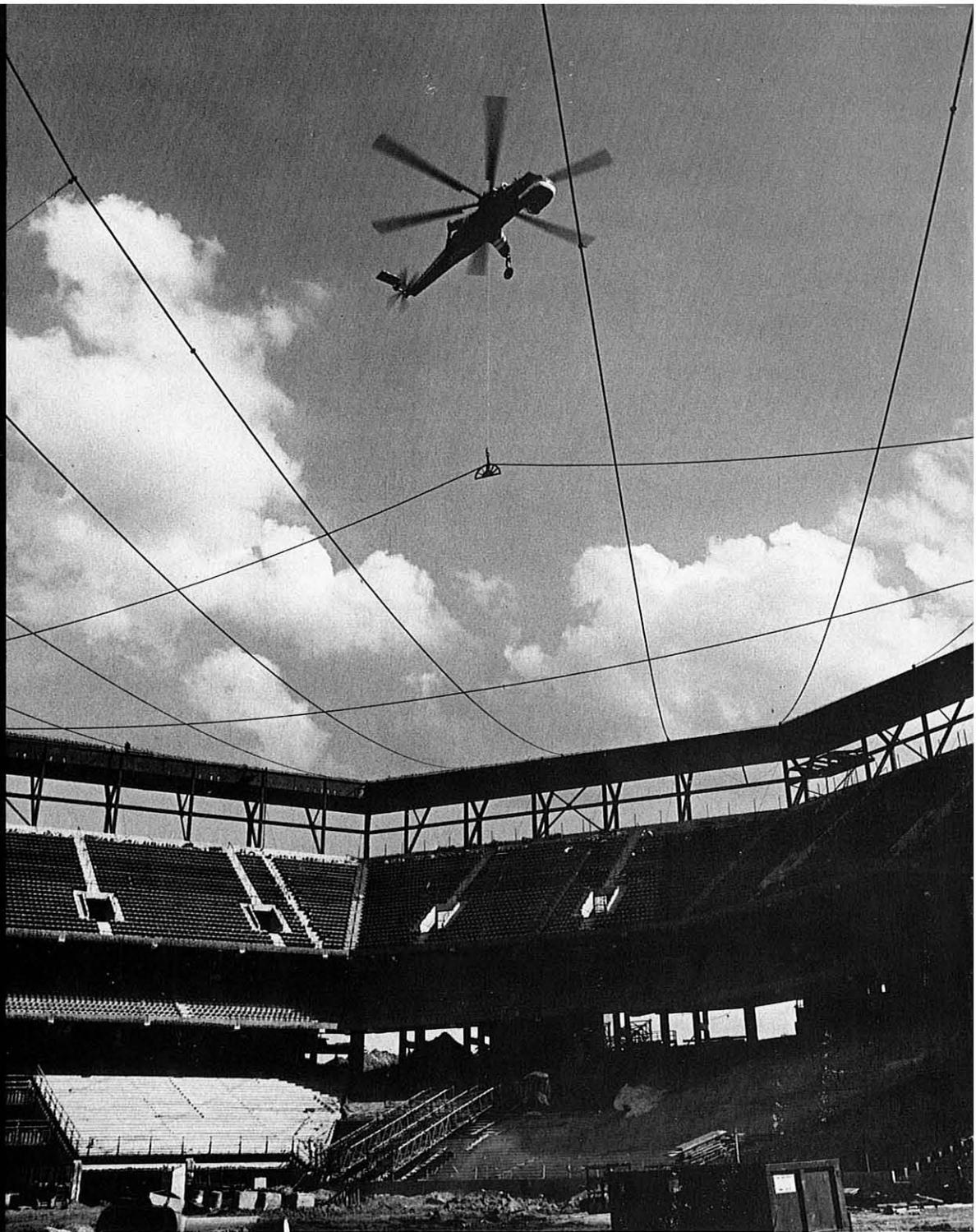


EVERGREEN HELICOPTERS

# Fleet report:

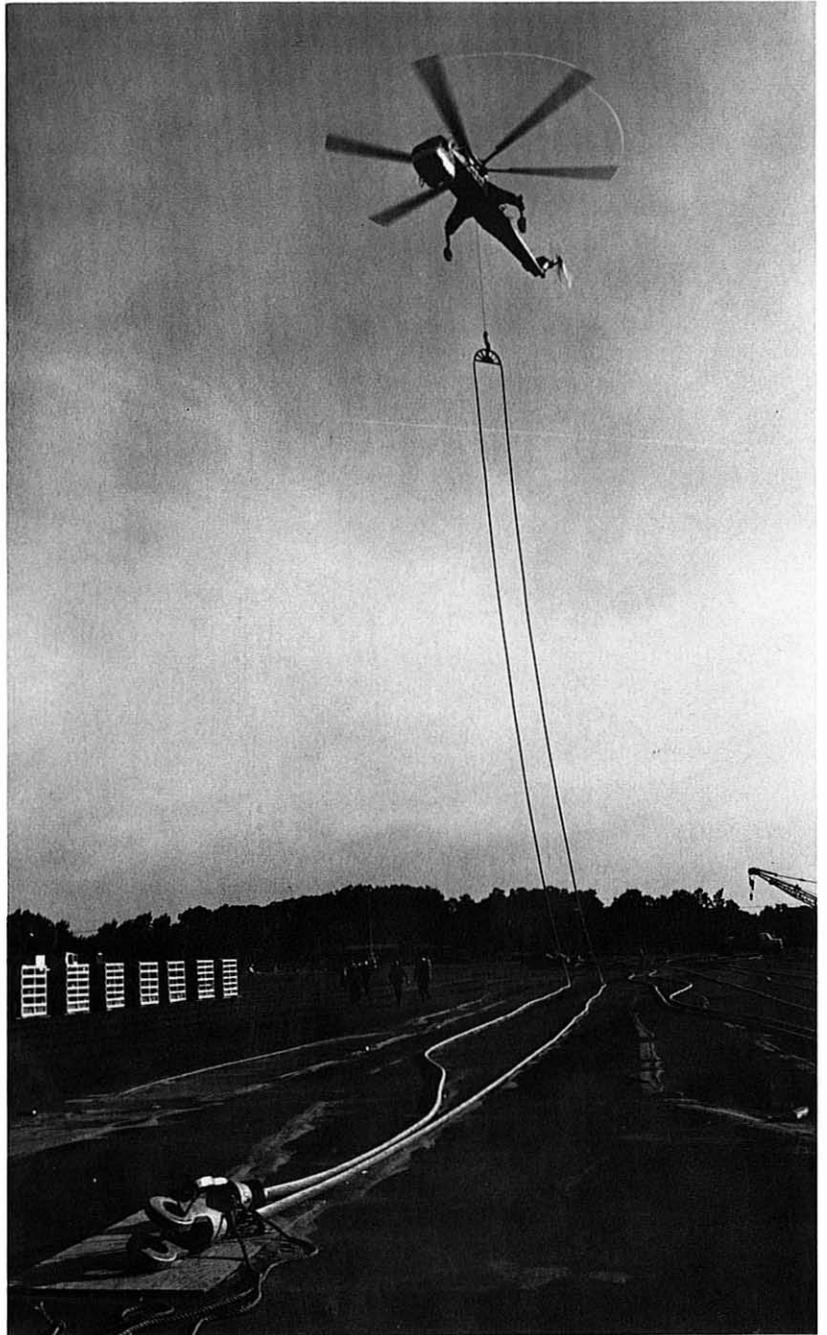


## **EVERGREEN SKYCRANE CUTS MONTHS FROM CONSTRUCTION PROJECTS IN EASTERN U.S.**

A thousand tons of rooftop construction equipment and materials installed by a single helicopter in 17 days, with major time and cost savings reported.



Skycrane pilot Bob Brown briefs Pontiac stadium ground crew on radio procedures and S-64 capabilities. At right, the second cable leaves parking area. The three-inch cables varied in length from 572 to 747 feet, and, complete with clevis assemblies, weighed 16,000 lbs. The semi-circular saddle was devised by Aggressive Erectors and Bridgemen, Inc.



World's Largest Air-Supported Roof

## Skycrane Keeps Detroit Lions Stadium on Schedule

Construction of a unique air-supported fabric roof over the \$55 million Detroit Lions stadium near Pontiac, Michigan, presented its contractors with unique time, cost and operational problems. All three were solved following consultation with Evergreen's construction specialist Hal Symes, who analyzed the benefits of using one of Evergreen's Sikorsky S-64 Skycranes for the job.

### Project Economics

The result was a 90% saving in time and 25% saving in cost, using the helicopter instead of cranes and winches to install the 3-inch diameter cables which join teflon-coated fibrous glass panels. Besides the time and dollar economy achieved, Evergreen's "Gentle Aircraft" positioned

the cables without damage to the seats of the stadium, which had been considered a risk using ground methods.

### Ballooning Roof

When finished, the stadium roof will be puffed up by air pressure generated from 29 blowers capable of moving 3.5 million cubic feet of air per minute. Stadium audiences will enter through revolving doors to maintain sufficient internal air pressure to keep the roof properly ballooned. When the stadium isn't in use, only two of the blowers will operate, causing a decided but acceptable sag overhead.

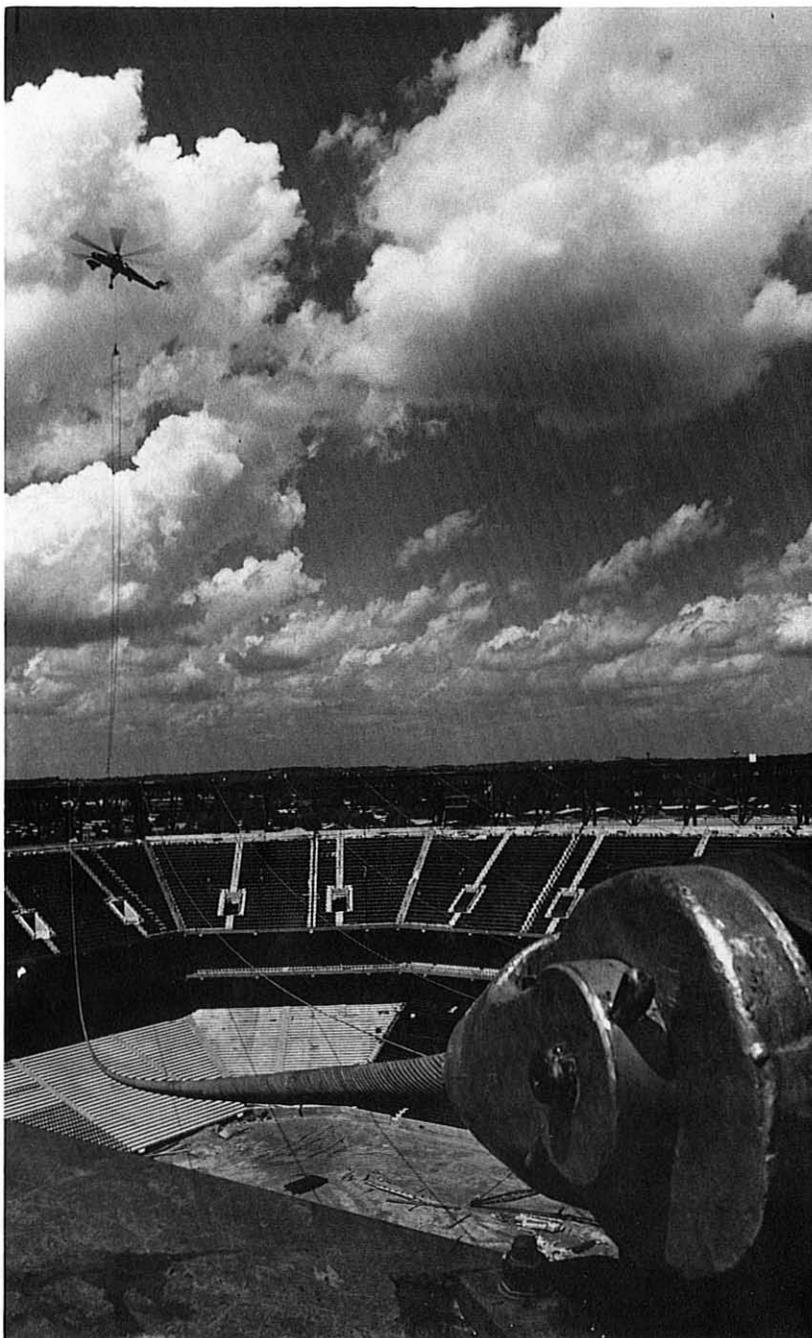
The air-supported fabric roof idea has been used before, but the Lions stadium is by far the largest, covering some ten acres.

Weighing 400,000 lbs., the roof when installed will hammock to within 102 feet of the ground, but when inflated will rise 202 feet above Lions and fans. Roof fabric is manufactured by Owens-Corning Corp., with a slick teflon coating to discourage overload accumulations of snow and water.

Named Pontiac Metropolitan Stadium, the project will seat 80,000 and feature a glass enclosed restaurant, and 102 private suites complete with closed circuit TV for instant replays.

### Spinning a Giant Web

With the 18 cables laid out in the stadium's parking lot, the Evergreen Skycrane lifted each from its midpoint and with



*Left: Cable pattern consists of 18 strands crisscrossing. Here, the 1-inch line is attached to the ninth cable. In the foreground is the clevis and pin assembly used to secure ends of the cable. Upper right: A winch and taglines draw the clevis into place. The winch held the clevis while the locking pin was driven, permitting some flexibility in Skycrane altitude. However, clearances were as small as 1/8 of an inch. Installation time for each cable varied from 25 to 40 minutes. Lower right: View of stadium with most of the 80,400 seats already in place. The playing field will be covered with synthetic turf, which will be laid over dirt rather than the more usual concrete, permitting use of the stadium for events such as rodeos.*

both ends dangling, flew it to one side of the stadium where a small line was attached. The entire package, with small line in tow, was then flown to the other side of the stadium and the free end winched and pinned into place.

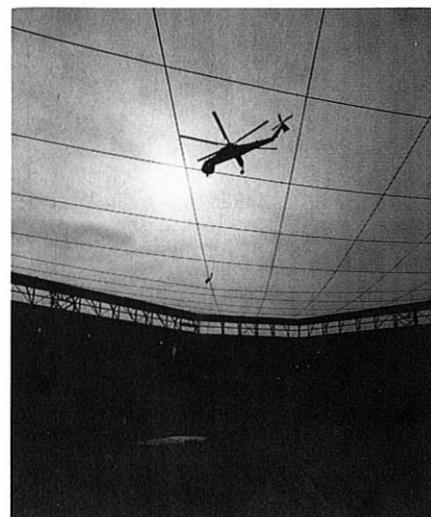
While the helicopter hovered, with the weight of the big cable supported on its own 75-foot winch line, the small line was used to pull the remaining free end back to the first side of the stadium. After both ends were permanently secured, the Skycrane descended gradually until the cable slipped off the half-wheel-shaped hanger at the end of the helicopter's winch line. The cycles averaged 30 minutes' flight time each.

### Impressed Contractors

"It's a heck of a good way to hang cables," said Buzz Bickerton, president of Aggressive Erectors and Bridgemen, Inc., of Englewood, Calif., who rigged the job.

General contractor for the Pontiac project is Barton-Malow Construction Management Services of Oak Park, Mich., and O'Dell-Hewlett & Luckenbach, Inc., of Birmingham, Mich. are the architects.

Evergreen's Hal Symes, whose experience combines construction, rigging and aviation, is the company's national construction marketing representative. His offices are located in Atlanta, Georgia.



# Evergreen's Newest Skycrane: from Factory to Work

Entering Evergreen's fleet of over a hundred aircraft, the company's newest S-64 Skycrane lost no time between the Sikorsky plant and its first heavy lift projects for the construction industry. The ten-ton payload giant flew direct from the factory to Rochester, N.Y., and got to work over the roof of a new Eastman Kodak supply warehouse, upon which it positioned four 10,000-lb. heat exchangers. With a little help from air and ground crews, who set the equipment on curbsings with quarter-inch clearances. In 26 minutes, the project which had posed a difficult problem by ground methods was finished.

Precision is often one of the advantages of flying cranes over ground counterparts. While load control problems of surface cranes increase proportionally to the distance between load and cab, the helicopter is disinterested in location. Wide roofs, high roofs, angled locations...all are prime contenders for helicopter service. Load oscillation isn't a factor, and with Evergreen's practised use of a long line, accuracy is increased, with additional control available to the ground crew to speed the operation.

## On to Peoria

The shiny green Skycrane was next hovering over a new 20-story office building in downtown Philadelphia. Eight Marley cooling towers were to be relocated over a 30-foot wall, a job which would have taken up to four weeks by ground methods, contractors estimated. By Evergreen's Skycrane: 51 minutes.

Enroute to temporary assignment in Oregon for logging operations, the S-64 fulfilled its next scheduled engagement in Peoria, to set 25 air conditioning units atop an unusually wide-roofed new Caterpillar plant. The Charles A. Strand units weighed about 14,000 lbs., well within the ten-ton capability of the Skycrane. Waldinger Corp. of Peoria — mechanical contractors — estimated the helicopter saved the project \$100,000.

After a month in West Coast forests, plucking timber from environmentally sensitive slopes, the Skycrane and crew were back in the East, ready to dig into the next list of construction contracts.



7:45 am above downtown Philadelphia: The Skycrane lifts the last of eight Marley air conditioning units into place atop a new 20-story office building. The job was finished by the time city streets started to crowd with office-bound workers.