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FROM: New York State Commission on the World's Fair
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"Raising the roof" was climaxed yesterday at the New York State Pavilion's "Tent of Tomorrow" at the World's Fair. It was the culmination of the most unusual roof-raising in building history, with the world's largest pre-stressed cable suspension roof finally in place.

Both in design and construction, it represents a major breakthrough in construction engineering.

Almost as large as a football field, the 55,000 square foot, over 2000 ton suspension system had been hydraulically jacked at the rate of about six feet per day to its 100 feet height. Only two hours of actual jacking time were required. Elliptically shaped, it spans 320 x 250 feet and its 96 suspension cables will support over 1500 multi-colored translucent plastic panels that will bathe the Pavilion's Tent of Tomorrow in a glow of soft light.

The State's exhibit is being built under the jurisdiction of the New York State Commission on the World's Fair,

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with Lt. Governor Malcolm Wilson as Chairman.

Details of the construction were given to the press by Dr. Lev Zetlin, structural engineer; Mr. John Topham, project engineer for Thompson-Starrett Construction Company, Inc. and Mr. H. Peter Saenger, project engineer, New York State Department of Public Works.

Twin rows of relatively light weight cables are anchored, on one end, into an oval steel ring floating on the inside periphery of the sixteen 100 foot high hollow, concrete columns circling the Tent of Tomorrow. On the other end, they are anchored into a steel tension ring in the center of the roof. The resultant cable suspension provides the "platform" upon which the 1500 plastic panels will be fixed, forming a rigid roof with all the structural advantages of rigid construction and none of the disadvantages.

The basic roof structure - the outer ring, the tension ring at the center and the 96 cable strands - were assembled at ground level. After the cables were firmly attached a supporting frame under the tension ring was removed and the cables stressed to predetermined settings. Then the lifting operation was begun.

Two hydraulic jacks - each with a lift of 2 and 1/2 feet - had been placed under the 2000 ton outer ring at each

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of the sixteen columns. A master pumping station activated the 32 jacks at precisely the same moment and at the same rate of ascent, raising the huge roof assembly evenly. Electrical monitors assured that all jacks were synchronized.

Since the jacks' lift was only 2 1/2 feet, the outer ring had to be secured to the runners on each column at the end of each lift and the jacks, on their attached platforms, raised to the new level for the next lift. As stated, the actual lifting time took only 2 hours while the total time from stressing to completion consumed about two weeks.

The principal advantage of this construction is the spanning of the great distances without the necessity of scaffolding, structural trusses and supporting columns that divide the floor area.

Time and material are also saved because the roof can be raised in a fraction of the time required for the standard roof. The relative lightness of the roof - only 9 feet per square foot as opposed to 80 per square foot for steel - also results in a much lighter foundation.

Since the steel ring floats on lubrite plates on brackets projecting from the top of the two columns, the normal expansion and contraction of the roof due to heat and cold, are absorbed by the minute play in the lubrite

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plates - again permitting lighter foundations.

A similarly designed and constructed roof was built five years ago on the Utica Municipal Auditorium and one was built for the Travelers Insurance Pavilion at the World's Fair. All were structurally designed by Dr. Lev Zetlin, of Lev Zetlin Associates. Many others, for various industrial and commercial organizations, are in the process of design at the present time.

Despite the apparent savings in time and material of such construction, engineers were unable, until recently, to eliminate "flutter" - or aero-dynamic instability due to winds. The upper and lower system of cables in use in the Tent of Tomorrow acts, in effect, as a built-in shock absorber. Under the controlled and regulated tensions the 96 cables interact to negate even minor fluctuations due to the wind. The roof is as rigid as the standardly constructed roof.

During the 5th day of the jacking operation, workmen began putting the translucent panels into place. They are working from the center tension ring outward and when the roof was completely raised were well towards completion. The panels are secured in place on the steel strands by special brackets.

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The roof curves gently from the center to the ends and the water ducts will carry rainwater, condensation and melted snow to leaders running down through four of the sixteen white columns forming the perimeter of The Tent. At night batteries of flood-lights will be focused upon the multi-colored roof, lighting the Tent's interior.

The Tent of Tomorrow is one of the three structures of New York State's Pavilion at the Fair. Along with it will be a cluster of three observation towers and the Theaterama.

The tallest tower - 226 feet - will be the highest point of the Fair and its observation platform will be reached via high speed "capsule" elevators ascending on the outside of the tower.

The Tent of Tomorrow, which is the State Exhibit's main feature, will be the scene of daily special programming events. It will also house an art museum, the New York State Power Authority's exhibit, eating facilities and exhibits by various state and business agencies. Its mezzanine will feature a walking tour through the state of New York.

On the main floor of the Tent will be a huge terrazzo map of the state, installed by the Texaco Company. In

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addition to the various performing events, it is expected that the fashion industry will sponsor daily fashion shows.

The Theaterama will house a 360 degree motion picture on New York State as a place to work, live, study and play. Several hundred people will be able to view the 12 to 14 minute film each time it is shown.

Philip Johnson is the architect of the New York State exhibit and Thompson-Starrett Construction Company, Inc. is the general contractor.

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