

UNIQUE LIGHTING AT A CENTURY OF PROGRESS

By  
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The exterior lighting effects at "A Century of Progress" are designed to harmonize with the futuristic character of the buildings which so effectively express the spirit of modern architecture, - functionalism. From the illuminating engineer's standpoint they represent altogether different problems in exposition lighting from those hitherto encountered. Instead of buildings requiring decorative colored light, there are vividly colored buildings, requiring for the most part only the normal light of the Mazda lamp. These modernistic buildings with expansive facades and few attempts at decorative treatments present extensive areas, mostly in the horizontal, painted in brilliant hues.

Previous exposition buildings were painted more by the illuminating engineer, less by the exterior decorator. The former introduced opalescent intermingling of colors by dimming and blending and a great variety of other effects in changing shadows and colors. But once the exterior decorator has applied his art in a bold manner, the color is fixed and essentially static. Mobile color lighting, which has contributed

An address presented before the 27th annual convention of the Illuminating Engineering Society, Lake Delavan, Wisconsin, August 28 - 31, 1933.



greatly to the beauty of expositions in the past, has practically no application to these surfaces, on which the color is definitely fixed.

Colors can, of course, be altered by the illumination. By the use of red light, for example, some blue surfaces can be changed to purple, and blue light may change yellow surfaces to green, unless the surface presents saturated colors. Even in this case the same color mixing may be obtained if the surface presents minute specular areas, such as are found in flakes of metallic paints. But these methods have a limited range; and when the exterior decorator does his job thoroughly, as at the present exposition, the illuminating engineer must apply himself to revealing the decorator's work unaltered, or at most accentuate it. A surface painted blue, for example, can usually be illuminated with white light to a satisfactory color intensity more effectively than can a light colorless surface be illuminated to the same color value with blue light. In the first case, in addition to the desired color value, there is also more atmospheric illumination.

Although light sources are aimed primarily at given colored surfaces, intervening areas are illuminated by "spilled" light, a condition which adds to the overall lighting efficiency. With white light there is not the necessity of shaping and fitting the light output of a certain color accurately to a limited area. Lighting equipment for an accurately controlled beam pattern is in general less efficient than equipments giving a

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blunderbuss delivery. In general, then, the lighting of A Century of Progress may be considered largely utilitarian. The lighting equipment, however, is supported on or housed in decorative and modernistic structures.

Rational design and frank treatment have produced pleasing results. Light sources are screened with translucent material to reduce glare from unfavorable viewpoints. Certain areas difficult to reach are illuminated from floodlights and searchlights installed 600 feet above the ground on the "Sky Ride" towers. This advantageous mounting height creates pleasing lighting effects and naturalistic shadows.

Relief, outline, and decorative lighting is accomplished by a generous use of gaseous-tube lamps. Particularly, the use of hot-cathode tubes is significant of their great possibilities in the future floodlighting of building exteriors in colors. For example, the Hall of Science has a very large chimes tower, the facades of which are striped with gaseous conductor tubes. Two sides are illuminated blue and two in neon red. The beautiful effects here, as at numerous other points throughout the exposition grounds, are visible to a considerable distance.

Unlike previous expositions in which the buildings were more or less concentrated, A Century of Progress is strung out along the shores of Lake Michigan for a distance of upwards three and one-half miles. In designing the grounds lighting an endeavor was made, not only to tie-in the various buildings at night with light, but also to emphasize centers of interest



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Unlike previous expositions in which the buildings were more or less concentrated, A Century of Progress is strung out along the shores of Lake Michigan for a distance of upwards of three and one-half miles. In designing the grounds lighting an endeavor was made, not only to tie-in the various buildings at night with light, but also to emphasize centers of interest

and attract visitors to them. The spectacular scintillator composed of a battery of 36-inch arc searchlights, located at the southern extremity of the grounds, effectively draws the crowds to this section.

With a thorough appreciation of the unusual character and coloring of the buildings, the form of the luminaires and their supporting structures in A Century of Progress is modernistic simplicity, with little attempt to disguise either material or purpose. They have been frankly treated in the most direct manner and reflect the functionalism which characterizes the buildings which they illuminate.

The louver standard in the Avenue leading to the Midway is another example of the frank expression which at times results in attractive combinations, such as the group of translucent cylinders mounted on a lattice mast. These luminaires are conspicuous features of the 12th Street entrance and are also located in other parts of the grounds.

The indirect luminaires on the bridge to Northerly Island at Twelfth Street are of unusual interest, they, also, expressing functionalism. There are 18 of these standards, spaced 50 feet apart, opposite, and constructed as integral parts of the parapets. Each standard is equipped with one 1000-watt floodlight directed upward towards the secondary reflecting surface.

Another interesting luminaire is the glass sea shell reflector, which is mounted in groups of three upon Hollowspun



granite standards. Each shell is equipped with one 500-watt lamp and they are used to floodlight the facades of some of the buildings.

Part of the exposition grounds are located on the mainland over one of the outer drives which were originally illuminated by ball globes mounted on concrete standards. The existing standards have been made a part of the lighting system for the grounds and, instead of the ball globes, the standards are now equipped with modernistic lanterns of the semi-indirect type which blend harmoniously with the decorative scheme.

Perhaps the most interesting of the luminaires used for general lighting are the "telegraph pole" standards lining the Avenue of Flags. The telegraph pole luminaire consists of groups of 100-watt tubular lamps, 32 inches in length, projecting horizontally from the top of a tubular steel pole like cross arms. Each group of lamps is separated from the one above by a circular metal disc which acts as a reflector. These tubular lamps are of the vacuum type and are suitable for outdoor service.

It is now dusk and in order not to tire you, we will hire a fleet of rickshas and make a tour of the grounds to study the unique lighting effects which transform the Fair at night into a gorgeous fairyland of color.

Starting at the Twelfth Street entrance we see in front of us a luminous turret flanked by flag poles and two of the tall lattice masts supporting groups of translucent cylinders.



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Perhaps the most interesting of the luminaires mounted for general lighting are the "telegraph pole" standards lining the Avenue of Flags. The telegraph pole luminaire consists of groups of 100-watt tubular lamps, 38 inches in length, projecting horizontally from the top of a tubular steel pole. Like cross arms, each group of lamps is separated from the one above by a circular metal disc which acts as a reflector. These tubular lamps are of the vacuum type and are suitable for outdoor service.

It is now dusk and in order not to tire your eyes, we will hire a fleet of rickshaws and make a tour of the grounds to study the unique lighting effects which transform the Fair at night into a gorgeous fairyland of color.

Starting at the Twelfth Street entrance we see in front of us a luminaire flanked by flag poles and two of the tall lattice masts supporting groups of translucent cylindrical

The luminous turret is illuminated by floodlights concealed behind an elevated enclosure of flower beds, and in addition inside the turret are located eight 24-inch searchlights, each of which individually illuminates a flag.

As we enter the grounds, we are facing the Avenue of Flags leading directly to the Hall of Science. This Avenue is lined with modernistic flag poles and telegraph pole standards and presents a unique appearance which piques the curiosity of visitors.

Turning to the left, we catch a glimpse of Northerly Island with the Electrical Building in the distance surmounted by a 376,000,000 candlepower battery of incandescent searchlights. The bridge by which we approach this group is illuminated indirectly by concealed floodlights mounted below a secondary reflector.

The Planetarium which we now see, while not a part of the Fair buildings, blends harmoniously and presents a charming picture with its reflection pool illuminated by the "Mushroom" luminaires. The mushroom luminaire consists of a fabricated steel stem on which is mounted an inverted cone of translucent micarta, equipped with a Holophane refractor and one 150-watt inside-frosted lamp. The luminaire, which is 40 inches in height to bottom of cone, is supported by an iron pipe inserted in the shaft, the projecting end of the pipe being "tamped" into the ground. The amount of illumination and its effective distribution is remarkable and is well illustrated by the charming



vista of the Florida Orange Grove. The sensation of walking about waist high in a sea of light, with a dim colored illumination reaching the eye, is in the extreme.

Chicago has built up a reputation for "pineapples" and this illustration shows the real fruit growing under one of the luminous mushrooms.

This luminaire will satisfy those who advocate low mounted fixtures for street lighting and will prove to them that while such a system is feasible it is economically unsound because of the comparatively close spacing required. For decorative purposes and garden illumination, the Mushroom should find a large field of application.

Turning northward along the east side of the lagoon, we find the Dairy Building floodlighted by the sea shell luminaires.

To the east is the Agricultural Group, the rear of which is illuminated with the "shell" standards.

The facades of this group are illuminated by a row of structural steel standards each surmounted by a chamber in which is housed a group of 200-watt floodlights.

Continuing along the shore of the lagoon, we come to the Federal Building with its three pylons representing the judicial, legislative and executive functions of Government. The dome and pylons are illuminated by 1000-watt floodlights and also by a battery of 24-inch incandescent searchlights on the top of the East Sky Ride tower. These latter produce some



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very interesting effects of high lights and naturalistic shadows due to the incidence of the light being at an angle of approximately 45 degrees with the horizontal.

Shower standards are used to illuminate the court of the States Group, surrounding the Federal Building. Ten such standards, each equipped with 323 15-watt flame tinted lamps form "weeping willows" which give a decorative impression and effective illumination.

Proceeding southward on the Island, we come to the Hall of Social Science and the Electrical Group. Above the north entrance of the Hall of Social Science, on the left of the picture, are four characteristic pylons, each illuminated by ten 1000-watt floodlights with an overcast predominating light from two of the 24-inch searchlights in the Sky Ride battery.

Adjacent to this group, the grounds are beautifully landscaped and illuminated indirectly by tree lighting boxes, each of which houses six 200-watt floodlights. Supplementing this lighting are a number of mushrooms.

Riding southward along the shore of the lagoon, there now comes in view the beautiful court of the Electrical Group, which presents a noteworthy lighting accomplishment. The main feature of this court is a fountain illuminated in color which is surmounted by a hammered chromium plated canopy serving as a luminaire to light the court. Behind is the circular facade of the Electrical Building over the front of which



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flows a waterfall in light formed by a series of mercury vapor tubes. Radiating from above the waterfall of vapor tubes on the roof of the building is a great sky canopy in the form of a silver fan of searchlight beams which meet over the fountain. Seventeen 3 kw., 32-volt, 36-inch incandescent searchlights, each developing 21,000,000 candlepower, produce this effect. These searchlights which are placed out of view on the roof of the Electrical Building represent a new accomplishment in the use of Mazda lighting, aggregating the largest battery of incandescent searchlights ever employed to produce a spectacular effect.

The fountain consists of a stepped basin having a total of 496 jets through which spurt 1200 gallons of water per minute. The outer and lower circle is red, the next amber, then green, and the smaller circle in the upper basin is illuminated blue. There are 135 underwater floodlights in the fountain and the illumination is constant.

Out of the center of the fountain rise supports for the huge canopy, 31 feet in diameter, and set approximately 70 feet above the ground level. Each indentation in the under surface of the canopy reflects the four colors projects through the spray from below and the result is an iridescent canopy of superb beauty. The illumination of the semi-circular facade and court is the result of the approximately synthetic white light produced by the four reflected colors.

Leaving our rickshas we ascend the East Sky Ride tower,



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Leaving our rickshaws we ascend the East Sky Ride tower,

from the top of which a glorious view of the Exposition is obtained.

At the front of the Electrical Group is a boat landing indirectly illuminated by louver standards, and here we enter a gondola for a trip on the lagoon, from which the most comprehensive views of the grounds can be obtained.

Disembarking on the mainland at the 23rd Street landing, we will short-circuit the Midway and amusement section and proceed in a northerly direction past Morocco and the Belgian Village with its luminous pylons and pause at the General Exhibits Group. The northern court of this group is illuminated by an interesting pylon 38 feet in height. This is constructed in a series of louvers, concealing alternately hot cathode neon and mercury vapor tubes. Recently developed dimming equipment for the control of hot cathode tubes is employed so as to cause the color of this pylon to change very gradually from neon red to the greenish yellow of the mercury vapor tube.

The grounds to the south are entirely occupied by exhibitors with their various individual lighting effects and, except for the mushrooms which are found throughout the exhibition area, there is provided by A Century of Progress only utilitarian lighting for the midway and some interesting indirect luminaires.

It is a terribly hot night so we will only give a passing glance at the huge thermometer which towers 300 feet



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It is a terribly hot night so we will only give a passing glance at the pure thermometer which towers 300 feet

into the air and registers 100 degrees.

The buildings in the Fair are windowless but for night effect the Transportation Building is provided with a dummy window to "let the light out" to give the impression of light within.

The lighting of the grounds of "A Century of Progress" was a cooperative undertaking by the Westinghouse and General Electric Companies, headed up by Mr. D'Arcy Ryan, who was assisted by Messrs. Chas. J. Stahl, H.E. Mahan and J.W. Shaffer. The results obtained may be summed up in brief --

"The buildings are crazy, the colors crazier, and the whole a peep into fairyland transcending in beauty the dreams conjured up by the wildest imagination".

\* Manager Lighting Division, Westinghouse Elec. & Mfg. Co., Cleveland.  
Lighting Division Representative, Westinghouse Elec. & Mfg. Co., Chicago, Ill.



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