

# Narendra Naidu of Rhino Engineers Makes Ayodhya's RAM MANDIR Bask in LUMINESCENT GLORY

Naidu's AV consultancy firm Rhino Engineers successfully achieves the first phase of the temple's lighting design and AV installation

80

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**Ram Mandir**, a temple constructed in the holy town of Ayodhya, is more than a brick-and-mortar structure. Built with love and devotion for devotees of Lord Ram by the devotees of Lord Ram, the massive temple, spread over 2.7 acres of land, witnessed an on-site footfall of more than 5 lakh visitors on the day of the consecration ceremony. As AV and lighting consultants Rhino Engineers undertake a rigorous process of planning, analysing, and evaluating the site before the final installations, **AV-ICN Expo Magazine team** gets in touch with **Narendra Naidu**, Managing Director, **Rhino Engineers Pvt. Ltd.** and **Yash Mevada**, Project Manager, Rhino Engineers Pvt. Ltd. to understand more about the lighting design and AV installation deployed at the Ram Mandir site in its first phase.

symbol of devotion for millions of devotees around the world, the Ram Mandir, a temple located at the site of *Ram Janmbhoomi*, Ayodhya and constructed around 2.77 acres with 70 acres of total land area, garnered worldwide attention and aplomb, courtesy its magnificent architecture, during the consecration ceremony held on **22nd January 2024**. The temple, spanning 380 ft. in length, 250 ft. in width, and 161 ft. in height with three floors, 392 pillars, and 44 doors, is enveloped in the Indian Nagara architectural design. Rhino Engineers' team played a crucial role in creating this modern architectural marvel with the installation of AV systems, lighting, and PA systems.

Temple premises -Façade lighting

The newly constructed Ram Mandir attracts national and international audience setting a perfect example of the blend of innovation and architecture with lighting design and AV installations on the site

# **ILLUMINATIONS at Ram Mandir**

The temple's premises are illuminated with several types of lighting designs in various forms such as general lighting, ambient lighting, architectural lighting, façade lighting, and pathway lighting, designed by Rhino Engineers. 200 KA light arresters have been installed over the temple structure to protect it from lightening. Lightning Protection System (LPS) have also been installed to ensure that all related activities are executed in accordance within the outlined specifications and requirements and all applicable safety measures are implemented throughout the entire process.

Along with illuminating the idol of Lord Ram in the sanctum sanctorum and the premises, the team also worked on MEPF (Mechanical, Electrical, Plumbing, and Fire Detection and Protection System) design of the site. This included HVLS fan proposed in the temple premises and VRF system proposed in the Parkota premises, power distribution system, protection against storm water drain, and fire extinguishers in the enclosed areas of the temple premises and systems like fire detection & alarm, automatic sprinkler system, liner heat sensing and more along with the fire extinguisher in the Parkota premises. Furthermore, the International Civil Aviation Organization (IACO) specifies two main requirements of aviation obstruction lights: height, number & location



Rhino Engineers lights up the significant architecture of Ram Mandir around ceilings and pillars with column lightings







Lighting at the parkota premises of Ram Mandir, Ayodhya

of lights, and light intensity. Types of AOL's required depending on the height include:

 From 6 m to 45 m: Low intensity AOL's

 A minimum radial light intensity of 10 cd in red. (Recent requirements for 3G

 cellular towers are 32 cd).

- 2. From 45 m to 150 m: Medium intensity AOL's - A minimum radial light intensity of 2000  $\pm$  25 % cd in flashing red.
- 3. Above 150 m: High intensity AOL's -



LED RGBW Strip light 14.4W/Ceiling Lighting



LINEATE 24W 2200K (1mtr) – For top OM stone grooving wall lighting and LINEATE 24W 3000K (1mtr) - For outer columns uplighting



source's volume.

White light of 200000 cd for daytime

visibility and red light of 20000 cd for

night; all flashing. Also, medium inten-

sity lights can be used if the structure is

painted with bands as specified.

**PA (Public Address) systems** The goal of a PA system is to provide "public address", or a way to transmit audio communication to a group. This transmission can begin with a microphone, which is a device that can assist in magnifying an audio

While the generic use of PA/VA is for

LINELIGHT 40W RGBW 18X56° (1mtr) - For columns uplighting



FLEXILINELED14.4W/M3000K - For Ceiling strip lighting



FLEXILINELED14.4W/M3000K - For outer strip lighting

beaming important communications, at Ayodhya's Ram Mandir, it is also meant for playing ritual chants to contribute to the spiritual ambience of the place. Stating the role of PA systems, Mr. Naidu said, "A place of worship requires PA system for several use cases. It can be used for general announcement as well as in the case of emergency, PA systems can also be utilized to create spiritual ambience by educating the devotees by playing ritual chants." He adds, "The public address/voice announcement system is designed to divide the entire premises into multiple number of zones and programmed to voice the communication selectively to the required zones as per the need. It is always integrated with the security system."

### PA system components used on the site include:

- Announcement Console (microphones)
- Amplifier/DSP/audio mixer
- Zone selector
- Speakers
- Equipment rack

Yash Mevada notes, "The design specification included installation of as many as 133 IP speakers from German audio major Fohhn Audio, whose output is augmented by 13 units of Fohhn Audio amplifiers that are powered by a Symmetrix DSP, and a wall mount controller from Symmetrix. For capturing the audio from speakers, four units of microphones from Audio-Technica are specified to be integrated. Furthermore, the PA/VA set-up as well as background music featuring Fohhn Audio was installed by TSG Optimus India."

## Digital displays around the Temple and Parkota premises

The ease of viewing live aarti from anywhere around the temple premises was made possible with cutting-edge AV systems. The system has been designed





LINEATE 24W 2200K (1mtr) – For top dome part lighting and RANGER 120W DMX – For parkota dome lighting

in such a manner that additional displays can be installed based on the requirements. However, the installation is in progress around the Parkota premises.

## LED display use cases around the temple premises include:

- Live Aarti
- Content play
- Advertisement
- General announcement
- Route guide
- Emergency broadcast display

The video management system has been designed as one of the most sophisticated systems in the world. Apart from a slew

The temple's design services include types of lighting design in the peripheric of Ram Mandir temple campus like general lighting, ambient lighting, architectural lighting, façade lighting, and pathway lighting by Rhino Engineers. of built-in features like recording, redundancy/back-up, failover management, and advanced SDK with APIs to provide monitoring and control, it is designed to record and stream 4K, H.265 formats, compatible interactive HTML maps, and integration with Google Earth.

It is also scalable to add as many as 10,000 cameras in single management system and as many as 268 surveillance cameras from American security and surveillance solutions with major PELCO Incorporated (till now). The cameras comprise of three varieties bullet, dome, and PTZ. Furthermore, the site is installed with the digital signage and video display elements, amounting to as many as 31 units of Samsung 55-inch 4K displays that are placed across the temple premises at many vantage points. It is also scalable to accommodate any additional displays that may be required in future. The AV-over-IP job is performed to perfection by as many as 13 units from Lightware.

Adding to the intent of illuminating every nook and corner of the temple, the lighting design at the Ram Mandir required the fixation of:

 10W 3000K in-ground burials with asymmetric light distribution for flooring around pillars, keeping nine inches distance from their base

- 24W linear wall washer ground burial for sanctum sanctorum illumination
- 2-way customised light for ceiling and wall grazer with spotlight 10W
- 10W per meter LED profile lights for handrails
- 5W per meter LED profile lights for ramp lighting
- Spotlight 20W for illuminating the idol of Lord Ram in the sanctum sanctorum
- Spotlight 4W for the smaller idol of the Lord
- Mono 15W, 10W and 7W flexible lighting in layer for the dome (Mandapas)
- 5W Washer lighting for recessed pathway step illumination

### Rhino Engineers Go Beyond AV & Lighting:

Besides installation of AV, lighting, and PA systems at the temple, the team at Rhino Engineers also installed the power distribution system, which was design keeping mind the continuity and reliability of power supply, flexibility of operation, concentration/distribution of loads, safety of personnel and equipment, investment and operational costs, compliance with various statutory provisions such as Indian Electricity Act and Rules, National Electrical Code and the relevant B.I.S. Specifications and State Electricity Authority norms, easy future extensions/modifications, ease of maintenance, maximum interchangeability of equipment resulting in minimum inventories and spare parts, minimum fire risk, and simplicity of operation. Various areas of Shree Ram Janmabhoomi Tirtha Kshetra, Ayodhya are being protected against Storm Water Drain. The systems used are in line with various guidelines including NBC 2016 / CPHEEO MANUAL.

Nothing in the temple is inflammable. Therefore, there was no provision for sprinkler system or fire alarm system. As per the instructions of the Trust, Rhino Engineers provided fire extinguishers only in the enclosed areas. In the Parkota premises, Rhino Engineers installed automatic sprinkler system, fire extinguisher, addressable fire detection & alarm, linear heat sensing, clean agent-based ceiling mounted modular fire extinguishing units, Aerosol based fire protection system for the electrical panels located inside the electrical room, clean agent gas-based (FK-5-1-12 / NOVEC 1230 ) fire extinguishing system for CCTV Monitoring Room and Sound Control.

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Rhino Engineers has also proposed HVLS fan in the Temple premises and VRF system in the Parkota premises.

#### Conclusion

With the intent to create a large visitors attraction venue, the team at Rhino Engineers, led by Narendra Naidu, managed to blend innovation with the profound Indian architecture. Reminiscing on the lighting design and AV installation at the pious temple, Mevada remarked, "Keeping in view the textural and structural challenges of running long cables through and/or along the hard and intricately sculpted stone pillars and walled surfaces, the think-tank at Rhino Engineers came up with an innovation. For the entire external facades and exterior pillars, the team proposed replacing conventional lighting of cables and irregular lighting fixtures with laser projectors."

Achieving the first phase of the temple's lighting design and AV installation successfully on the ground floor, the team strives to fulfil the project's requirement within the first floor and second floor of the temple premises and the area around Parkota premises shortly, as claimed by the Rhino Engineers' team.