

VOICE  
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SOUND AND  
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*of Northern California*

# THE VOICE

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L A T E S T S O U N D & C O M M U N I C A T I O N S T E C H N O L O G Y N E W S

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Cupertino Electric, Inc.,  
Wires 49ers Levi's Stadium



See Levi's Stadium From  
The Sky



Sprig Electric Wires  
Security Systems



ICS Designs Fire/Life Safety  
Control Systems



Preview: The New San Jose  
Earthquakes Stadium

And  
more...



A publication of the National Electrical  
Contractors Association (NECA) and the  
International Brotherhood of Electrical  
Workers (IBEW) of Northern California.



*Fans enter the new home of the 49ers, Levi's Stadium, the most technologically advanced stadium in the NFL, wired by Cupertino Electric.*

***Helping to provide a unique stadium experience for 49ers fans  
has been an important part of the mission for Cupertino Electric, Inc.,  
the electrical contractor that wired Levi's stadium.***

**A**cting in a design-build capacity for most of the stadium's electrical infrastructure, Cupertino Electric, Inc. (CEI) fast-tracked the electrical and low-voltage construction for the complex 1.85 million square foot project in 18 months, bringing it in on time and on budget.

While installing the massive electrical infrastructure, CEI was also responsible for the low-voltage wiring in the stadium. This expansive project included an extensive wireless network; a distributed antenna system (DAS); broadcasting studios; a state-of-the-art fire alarm system; network backbone cabling and structured cabling; lighting controls and an on-site data center. Low-voltage installation was under the supervision of Project Manager Dave Dorcak.

As part of its low-voltage work, CEI installed over 1,250 wireless access points at Levi's stadium, making it one of the most wirelessly accessible stadiums in the United States.

## Enhancing The Game Day Experience

Fans love the various high-technology conveniences brought to them via the CEI wireless installation, making their time at the stadium more user-friendly. The wireless accessibility gives visitors the ability to watch videos and high-definition replays only seconds after a play via the Levi's Stadium mobile app. Officials say that after a big play, more than 1,000 fans are viewing multi-angle replays via the app.

Fans also have the option to use the app from any seat in the stadium to order food, drinks, and merchandise, which can be delivered by stadium staff. Fans can also use the stadium app to purchase or transfer tickets and parking passes, and find the nearest concession stand or bathroom. The app can support 70,000+ fans logging on simultaneously to their mobile device during a game.

*(View CEI's work at Levi's Stadium on pages 4-5)*



***Low Voltage Project Manager Dave Dorcak details  
elements of the data center installation during an  
on-site tour of Levi's Stadium.***

CONTINUED ON NEXT PAGE

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A Cupertino Electric low voltage technician reviews the safety measures implemented on-site with the safety team member during installation.

CONTINUED FROM PREVIOUS PAGE

# Cupertino Electric Wires Technology To Enhance The Fan Experience At Levi's Stadium

The distributed antennae system (DAS) includes 600 antennas and 400 amplifiers to boost coverage for all of the major telecommunications carriers, ensuring that fans will be connected during game day. Wireless Access Points (WAPs) are located under the seats, along the concourse, and within the club suites and restaurants. The distributed antenna system helps to insure the reliability of transmission

of data across the stadium. (During 253 games at 31 NFL stadiums this last season, fans using one of the four major service providers used more than 85.7 terabytes of mobile data, according to industry officials. That's the equivalent of posting almost 1 million social media posts per game.) During its inaugural season at Levi's Stadium, average wi-fi traffic held steady at 2.3 terabytes per game.

Through a central lighting control system installed by CEI, stadium staff can easily and conveniently illuminate only certain areas of the stadium for special events.

## Protecting The Fans & The Future

Working with ICS – Integrated Communication Systems, CEI installed and commissioned a state-of-the-art fire system which includes fire alarm, voice evacuation, and smoke control. In total, the system incorporates several thousand programmable detection and control points throughout the stadium. These include multiple smoke control zones both in the tower and the bowl spaces, and points that interface with the elevators, HVAC, fire pump, generators, sprinkler system, card access, corridor roll down doors, and elevator lobby smoke guards.

*(Learn more about the Fire/Life Safety system at Levi's Stadium on page 7)*

"They wanted a contractor that could handle the schedule, the manpower, and the technical aspects. We had the horsepower, with the ability to design/engineer and execute a fast-track schedule," said Dorcak.

**For more information about Cupertino Electric, Inc., or its work on the stadium, contact Autumn Casadonte at [Autumn-Casadonte@CEI.com](mailto:Autumn-Casadonte@CEI.com) or call 408.808.8034.**

**Cupertino Electric Team List:**  
**Levi's Stadium**

**SERVICES:**  
 Electrical, Data Communications, Wireless, DAS, Fire Alarm, Solar Electric, LED Lighting

**OWNER:**  
 The Stadium Authority of the City of Santa Clara

**OWNER'S REPRESENTATIVE:**  
 Jack Hill

**ARCHITECT:**  
 HNTB Corporation, Kansas City, MO

**GENERAL CONTRACTOR:**  
 A joint venture of Turner Construction Company, New York and Devcon Construction, Milpitas, CA

Jonathan Harvey and Kesor Kim from Turner Devcon JV

**ELECTRICAL CONTRACTOR:**  
 Cupertino Electric, San Jose, CA

Levi's Stadium also offers an updated technology for those who follow football statistics. CEI installed Zebra Technologies' real-time location system (RTLS), an innovative technology that tracks players and officials, providing location-based data known as "NextGen Stats" to fans. The NextGen statistical system operates through sensors placed in players' shoulder pads that sends signals to receivers that CEI installed throughout the stadium. Signals are then routed to a software program, allowing coaches, players, and the NFL to access precise player tracking of distance and speed, says Dorcak.

CEI also installed the structured cabling network and network backbone cabling. The electrical contractor built-out more than 50 communications rooms throughout the stadium and also cabled the main server room. CEI also installed wiring for 2,400 internet protocol televisions (IPTV).

CEI wired the stadium's sports lighting and suite lighting systems. Eighty percent of the 16,000 luminaries feature LED technology, chosen for its performance, long life, and reduced warm-up time.



PHOTOGRAPHY BY SCOTT PORTER



On average, wi-fi traffic held steady at 2.3-plus terabytes of data per game last season.

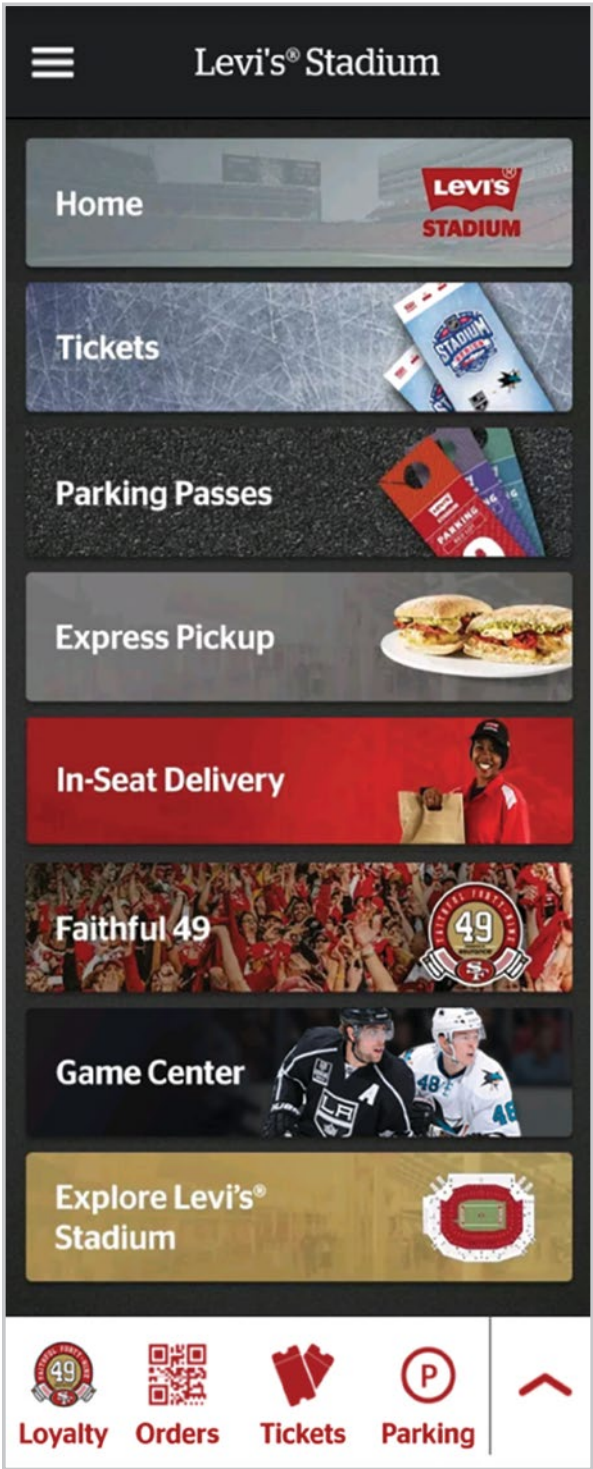


PHOTO COURTESY VENUE NEXT, INC.

The Levi's Stadium app enhances the fan experience, allowing fans to order items with their mobile devices and have them delivered to their seats.



RENDERING COURTESY ZEBRA TECHNOLOGIES

Precise player tracking and data analysis are available using 'NextGen' stats.



PHOTOGRAPHY BY SCOTT PORTER

Charging stations are available for fans through out the stadium to charge their mobile devices.

### Cupertino Electric, Inc. Low Voltage Team:

**PROJECT EXECUTIVE:**

Jim Medefesser

**LOW VOLTAGE PROJECT MANAGER:**

Dave Dorcak

**LOW VOLTAGE SERVICES:**

- Wireless System
- DAS System
- RTLS System
- Network Backbone Cabling
- Structured Cabling System
- Teledata Systems
- Lighting System Controls
- Fire System Installation

**ENGINEERING:**

Don Boresch, P.E.

**BIM:**

Damien Dudley

**FIELD STAFF:**

Over 60 technicians from  
IBEW Local 332, San Jose

**FIRE SYSTEMS CONTRACTOR:**

ICS – Integrated Communication Systems  
Amir Mohammadian, Project Executive

**ICS FIRE SYSTEM SERVICES:**

- Design and Engineering
- Materials
- Permitting
- Programming and Commissioning



# Wiring 1.85 Million Square Feet At The San Francisco 49ers, Is A Multi



Wiring for state-of-the-art Fire Alarm System Controls, including Mass Notification Controls and Speaker/Strobe Fire Detectors located throughout the stadium.

Wiring 52 communication closets and main server room



Wiring for scoreboard and two 500 kVA scoreboard substations

Power Distribution and Control Systems for Lighting



The Levi's Stadium app enhances the fan experience, allowing fans to order items with their mobile devices and have them delivered to their seats.



Zebra Technologies 'NextGen Stats' capture and convert sports location and motion data to provide real-time performance data to sports franchises.

Receivers for NextGen player tracking statistic system

Aerial Photography By Hawkeye Photography



# Levi's Stadium, The New Home Of -Faceted Job For Cupertino Electric

Wiring of the state-of-the-art wireless system, which has 1,250 wireless access points, and distributed antenna system (DAS), which has 600 antennas and 400 amplifiers to boost coverage for the major telecommunications carriers

Network backbone cabling, structured cabling systems, and raceway for all low-voltage systems



Cabling for Security Camera System

Lighting system controls  
16,000  
Luminaries  
(80% LED lights)  
for club and  
field lighting

## Fast Facts About Levi's Stadium Wiring:

- More than 2.5 million linear feet of Cat 6A cable
- 450 miles of conduit
- 1,700 miles of conductor
- 16,000 luminaries
- 13,000 circuit breakers
- 1,250 wireless access points
- 600 DAS antennas
- 52 telecom rooms
- Full server room/data center on site
- 2,400 Internet Protocol Televisions
- 174 kW rooftop solar system
- 210 kW solar system installed on pedestrian bridges

Inset Photography By VenueNext, Inc., Zebra Technologies, Nick Elias, and Scott Porter

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# Sprig Electric Wires Comprehensive Security System At Levi's Stadium

*Sprig Electric used a custom swing stage in order to install the CCTV system in the suites at Levi's Stadium.*

## ***State-of-the-art security is in place at the new Levi's® Stadium, thanks to the installation of a \$1,000,000 security system wired by Sprig Electric, Inc.***

The new security system, designed by Johnson Controls, Inc. (JCI), is wired throughout all areas of the 1.8 million square-foot stadium. Sprig worked with JCI in a design-assist capacity.

Sprig Electric wired all system components, including a mammoth CCTV installation that features over 650 IP cameras, a card access system, an intrusion panic button system, and 19 Infrared (IR) illuminators for use in the stadium bowl area during evening events other than football games. Five types of state-of-the-art cameras are used in the IP system and in certain cases, all five types of cameras are included within one enclosure.

Sprig Electric also provided cabling infrastructure to support all of the systems, including installation of security monitoring rooms and all head-end work.

"We were able to complete the project within a tight 12-month schedule," said Heather Gard, Sprig Electric Project Engineer. "We brought it in on time and with much customer satisfaction."

Security for the stadium begins in the main parking lot, where 60 pole-mounted cameras can pan the surrounding area on a 360-degree scan, providing surveillance of all visitors. Security cameras are also mounted above the solar energy bridges which are used as a walkway into the stadium.

Cameras are installed at the stadium's entry gates, throughout the facility (offices areas, walkways, etc.), as well as within the stadium seating area. Over 240 cameras are mounted within nine levels of walkways, and some 50 cameras are mounted on pedestals in the seating area.

In addition to the CCTV system, the stadium is equipped with a card access security system. Sprig Electric installed 622 card readers on doors throughout the stadium, including doors for all the tower suites. Intrusion panic button systems have been added to the administrative areas for the cash rooms and ticketing areas.

"Our job was to help make sure that the security system protects the facility, as well as increases safety for all visitors to the stadium," Gard added. "This state-of-the-art security system meets that goal."

**To learn more about the security services provided by Sprig Electric, Inc. contact Tim Martin at [tmartin@sprigelectric.com](mailto:tmartin@sprigelectric.com) or call 925.989.9031.**



*Sprig Electric installed a CCTV system and card readers across various areas of the stadium including the north suites at Levi's Stadium.*

### **Sprig Electric, Inc. Team List: Levi's® Stadium:**

#### **SERVICES:**

Security System Wiring & Installation; Design-Assist

#### **SECURITY SYSTEMS DESIGN & ENGINEERING:**

Johnson Controls, Inc.

#### **ENGINEERING:**

Matt Nixon; Jess Duran; Patrick Bockert

#### **SECURITY SYSTEMS DESIGN-ASSIST CONTRACTOR:**

Sprig Electric, Inc., San Jose, CA

#### **PROJECT EXECUTIVE:**

Tim Martin, Vice President

#### **PROJECT ENGINEERING:**

Heather Gard

#### **PROJECT MANAGER:**

Kevin Kincaid

#### **FIELD STAFF:**

Jeronimo Medina, Fidel Estrada, Ben Sarellano, Carl Coloma, Erik Wentworth, Gary Gonzales  
IBEW Local Union 332, Santa Clara



*Sprig Electric installed 60 pole-mounted cameras in the main parking lot.*

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# ICS Designs Fire/Life Safety System At Levi's Stadium



ICS's Fire Systems Group designed the state-of-the-art fire life safety system at Levi's Stadium.

***How do you design a fire alarm and live voice evacuation system for a massive 1.8 million square-foot facility like Levi's® Stadium? How difficult is it to obtain the necessary permits and approvals? And how do you develop an evacuation plan for a large stadium and its many public spaces?***

ICS – Integrated Communication Systems and its Fire Systems Group faced all of these challenges and more when they designed the fire alarm system for Levi's Stadium. The system includes fire alarm, voice evacuation, and smoke control. ICS supplied engineering, materials, permitting, programming, and commissioning, while Cupertino Electric installed the system.



ICS – Integrated Communication Systems Senior Project Executive Amir Mohammadian is a veteran of fire system design and permitting.

ICS Senior Project Executive Amir Mohammadian, a veteran of fire system design and permitting, oversaw the development of the engineering of the system, and coordinated with the City of Santa Clara Fire Department and the Santa Clara Building Department to secure permits, approvals, and inspections. ICS provided an Edwards EST™ peer-to-peer network system, drawing on the company's reputation as a world leader in innovative life safety solutions for large projects and entertainment venues.

ICS initiated project design in 2012, and completed commissioning and inspections in the summer of 2014. The fire system was designed to embrace multiple challenges, including a broad interpretation of applicable codes, and the need to integrate with the MEP (Mechanical, Electrical, Plumbing) design build contractors.

The system in total consists of several thousands of programmable detection and control points, which include multiple smoke control zones both in the tower and bowl spaces, and interfaces with the elevators, HVAC, fire pump, generators, sprinkler system, card access, corridor roll down doors, and elevator lobby smoke guards. The Fire Command Center, which monitors and graphically displays system status, is located in the Security Command Center. In addition, this system



In addition to designing the fire system, ICS also oversaw the development of the engineering of the systems, and secured permits, approvals, and inspections.

incorporates an emergency override of the "house" audio systems. In the event of an emergency requiring evacuation, this system shunts the normal audio program and the life safety takes over to broadcast emergency announcements and instruction.

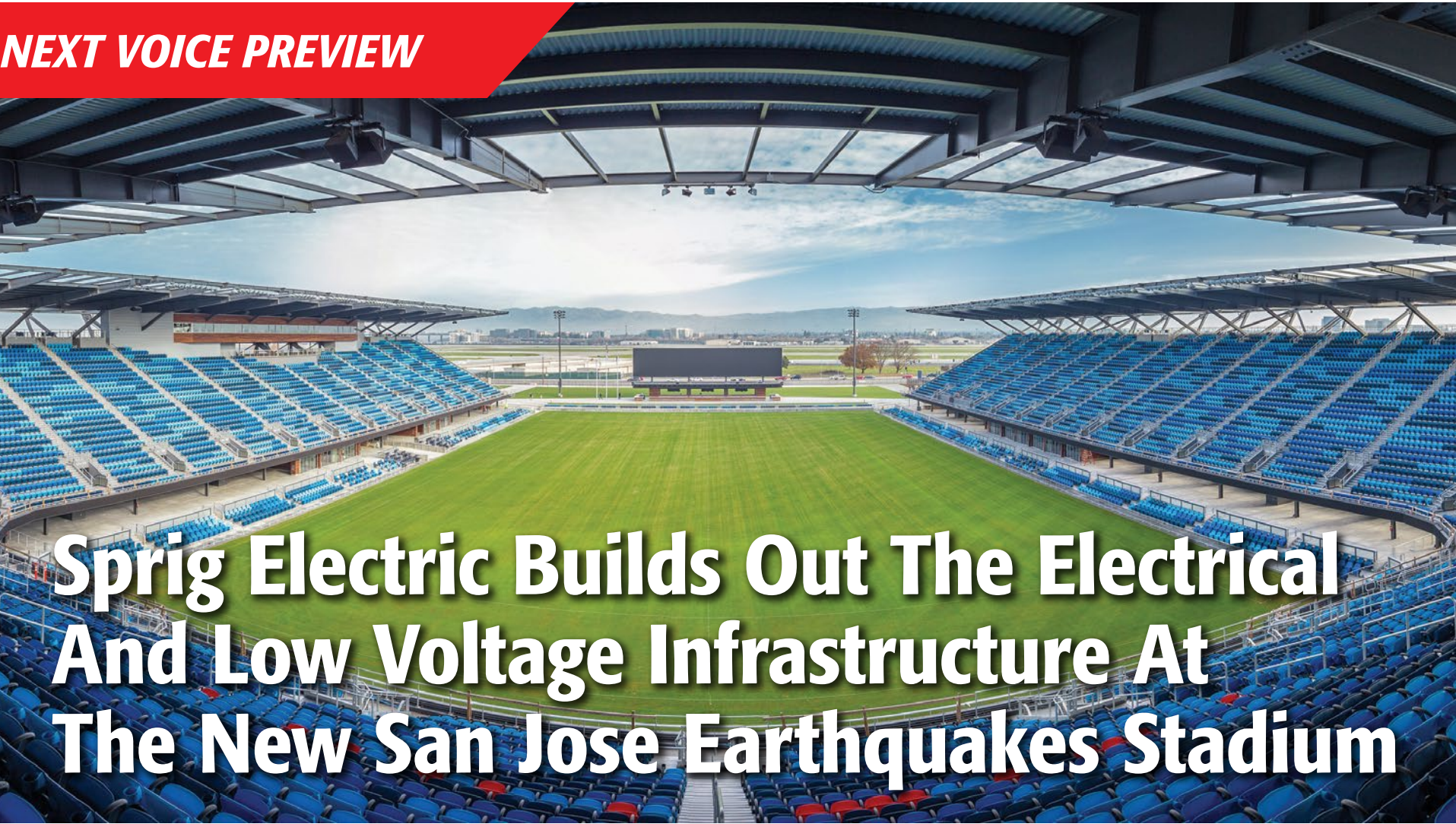
The sheer size of the 1.8 million square-foot stadium added an exponential degree of difficulty to every aspect of construction. Scheduling inspections and demonstrating system functionality alone was almost a full-time job.

The stadium has an extensive staff of first responders including dedicated fire department personnel that are present at every event. Trained personnel are on site to monitor and respond to all alarms and emergencies. The Fire Alarm/Life Safety system and its ability to provide live voice evacuation notification is a critical tool for these emergency workers.

**To learn more about the services of the ICS Fire Systems Group, contact Amir Mohammadian at [amir.mohammadian@ICS.com](mailto:amir.mohammadian@ICS.com), or Aaron Colton, CEO of ICS – Integrated Communication Systems at [aaron.colton@ICS.com](mailto:aaron.colton@ICS.com) or call 408.491.6000.**



**NEXT VOICE PREVIEW**



*The new San Jose Earthquakes will be complete this spring in time for the beginning of the MLS season.*

***Don't miss reading about the new San Jose Earthquakes stadium in our next issue! Sprig Electric is building out the electrical infrastructure and completing the low voltage work for the new Earthquakes stadium in a joint venture with ERMCO, Inc., an electrical construction firm headquartered in Indianapolis, IN.***

As part of the Design/Build project, Sprig Electric is providing all electrical services including the fiber optic transmission wiring, wiring for all lighting and lighting control systems, the fire alarm systems, and the duct structure for wiring coming into the data center.

Sprig Electric began working on the two-phase stadium project in April 2013. Phase one included wiring the team's 24,000 square foot two story office building, which is built on the west side of the stadium. The second phase of the project includes wiring the stadium itself and will be completed this spring.

The Earthquakes organization has spearheaded the efforts for the construction of the privately-financed stadium, which is being built to LEED Silver specifications. The 18,000 seat \$60 million facility, located on Coleman Avenue across from the San Jose International Airport, is designed to meet Major League Soccer (MLS) standards and also includes a 24,000 square foot office building.

The stadium, a two-story structure that is 75 feet high, has seating going up to about 60 feet. The stadium includes 12 luxury suites and 576 club seats on the field level, as well as a sky box built for broadcasting, and the largest outdoor bar in North America on the north end of the stadium. A European roof design covers all stands to hold in sound and build atmosphere.

The stadium's presence will have a significant impact on MLS, as well as a major economic impact on San Jose. The project includes plans for a major mixed-use project next door, featuring office, hotels, and retail. The city is building out four adjacent soccer fields, which will attract major tournaments to the downtown area.

**For more information about Sprig Electric and its services, contact AJ Ramirez, marketing coordinator at [aramirez@sprigelectric.com](mailto:aramirez@sprigelectric.com) or call 408.298.3134 ext. 303.**

**Union Contractors (IBEW/NECA) in Sound & Communications combine a skilled and trained work force with world class technology. For the best installations in voice/data/cabling, network systems, data center facilities, audio/video systems, sound systems, fiber optics, wireless, security systems, fire/life safety systems and CATV, call a union contractor or visit [www.norcalvdv.org](http://www.norcalvdv.org).**

