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Rosendin Electric Wires Massive Communications Infrastructure At Silicon Valley's New Airport

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The new thoroughfare at San Jose International Airport with CONRAC on the left and Terminal B on the right.

Network Infrastructure Built To Perform For The Next 20 Years

The new $1.3 billion Norman Y. Mineta San Jose Airport (SJC), which opened in June after a three year modernization, is one of the world's most technologically advanced facilities.

The project included construction of the new Terminal B and Terminal B Concourse; renovation of Terminal A; reconfiguration and demolition of the airport's oldest facility, Terminal C; and construction of a seven-deck consolidated rental car facility, as well as roadway construction.

The "glue" that connects all the buildings, roads, and systems together is the $6.2 million airport communications infrastructure, built out by Rosendin Electric Network Services. The infrastructure is spread across the sprawling airport campus, which covers over 2 million square feet. It includes teledata locations, copper and fiber backbone, CCTV, access control, CATV, paging, and digital platforms for public art.

Terminal B

"Our group completed the entire campus, both inside and between the buildings, including the tower," said Ron Clarkson, Rosendin Electric's Division Manager for Network Services,

who oversaw the infrastructure project. "It was a huge job. There are over 5 million feet of cable and fiber involved, as well as over 25,000 termination points."

(SEE CENTER SPREAD MAP FOR DETAILS OF COMMUNICATIONS INFRASTRUCTURE, PAGES 4-5)

Reactive Digital Art Wall in Terminal B

Building out a new communications infrastructure at the airport began with a plan to replace the main wiring closet (TER), which had been located in Terminal C. Terminal C, built in the '60s, was demolished, leading to a relocation of the TER to the Terminal B Concourse.

Rosendin Electric Network Services linked all the other new

Terminal B Check-in

facilities to the TER in the Terminal B Concourse through a copper and fiber backbone that ran between the buildings. Network Services also surveyed existing infrastructure that linked all of the existing buildings. Rosendin Electric Network Services routed the backbone under the street to connect the CONRAC rental car facility to the Concourse.

Moving the TER was a challenging job. "Because the airport buildings were basically 50 years old, moving the TER meant going through layers and layers of systems and changes," said Clarkson. "It was a big part of the make ready."

The Network Services Team

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Front Entrance of the Palo Alto VA Hospital

Intrepid Electronic Systems Connects Palo Alto VA Hospital Campus With A Fire Alarm/Notification System

Just a few short years ago, fire alarm systems were pretty simple. They contained several devices and sensors wired together to give an alert in the case of smoke or fire; more recent versions have been networked and

monitored through a computer console and/or web page.

How times—and technology—have changed. Just ask Intrepid Electronic Systems of Oakland, now completing the installation of a state-of-the-art $2 million fire alarm system on the campus of the VA Palo Alto Health Care System.

The Palo Alto VA system installed by Intrepid Electronic Systems is far more than just a fire alarm. It's a network of networks connected by fiber optics, linking buildings throughout the campus and capable of linking this VA campus to other Northern California VA campuses. Currently, the VA campus in Menlo Park is being added to this system.

It is also the backbone of a massive and sophisticated notification system that can alert a single campus or multiple campuses if a disruptive threat—from terrorism to downed electrical wires—occurs.

"All it takes is the push of one button, and the message could go out across the campus audio, LED light bars, employee computers and phones," said Norm

Clevenger, Engineering Project Manager for Intrepid Electronic Systems.

The system, a Notifier NFS-2 3030 controlled via an ONYXWorks workstation, can be viewed and controlled from virtually anywhere on the campus web. "It was chosen because it is the best on the market, and provides future proofing," said Clevenger.

Construction underway with James O'Brien, Sound and Communications Journeyman Installer from IBEW Local 332.

The Notifier NFS-2 3030 supports over 1,200 intelligent devices on several signaling line circuits. It features integrated digital voice evacuation and can broadcast multiple distinct messages throughout the entire facility

simultaneously. In the case of an emergency, everyone on campus will instantaneously receive clear, concise voice instructions.

Intrepid Electronic Systems designed and built the system themselves using NOTIFIER components; they also provided the drawings, turnkey installation, full conduit, wiring of the devices, and system testing. In addition, they coordinated all the energy connections and contracted the life/safety engineering. Intrepid Electronic Systems was assisted on the project by sound and communication technicians from IBEW Local 332 in San Jose and IBEW Local 595 in Dublin.

Intrepid Electronic Systems initially wired four buildings on campus, including the hospital, the administrative and outpatient facility, the scanning and imaging facility, and the backup power station. It installed a new fiber optic network to connect all the buildings. Ultimately the entire campus will be connected, and then the single campus connection will be expanded to other VA facilities in Menlo Park and Livermore.

Aaron Johnson, IBEW Local 332; Brian Wynn, IBEW Local 595; and James O'Brien, IBEW Local 332, work on the VA Hospital.

The main console for the system, controlled by the ONYXWorks workstation, is in the operations center. It is monitored around the clock. Six other control panels are located throughout the campus, and each is networked together. Dispatch officials and facility managers also monitor control panels continuously on the campus.

Each panel maintains its individual programming and continues to operate independently, yet cohesively, as part of a unified network. The control panels are monitored through a graphic interface that shows the entire campus. A designated building and location is highlighted on the control panel if an alarm goes off.

The graphic interface is animated, so that if an event occurs, the building changes color and the data is displayed on the screen automatically. If necessary, an operator can scroll down to building floor plans, as well as to pinpoint the location of all devices in the building and receive other metadata.

The NOTIFIER system acknowledges an incident, transmits information and completes a report within 90 seconds. If a fire event occurs, the NOTIFIER system has a number of integrated abilities that allow it to respond more completely to the event. It has the capability to notify the fire dispatch station, and then automatically captures elevators in the building and brings them to a designated floor.

It can also operate the building's HVAC system, so that dampers and fans can be shut off, and can monitor the sprinkler system. It can release magnetically held open doors to create smoke free compartments inside a designated building. It has the ability to interface as a life safety system to override the security system so that people can be allowed in or out of the affected areas.

If a fire event occurs, each staff member receives a coded message that provides information about how the event is affecting a specific area. Each building is networked so that it can exchange information with other buildings and sections of buildings.
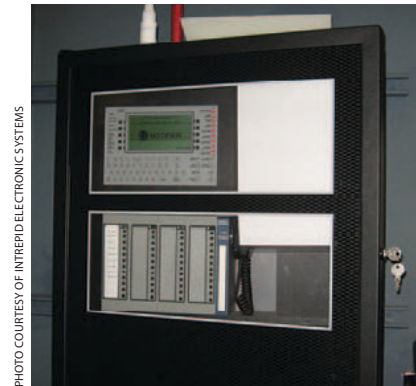
Fire Alarm Control Panel with voice control

If a disruptive event such as a toxic spill occurs, the NOTIFIER mass notification system can send emails and text and voice message to all phones and computers and designated PDA's on campus. Metadata is stored for all rooms, so that if a particular room or area is affected or contaminated, important information is instantaneously available about a particular area.
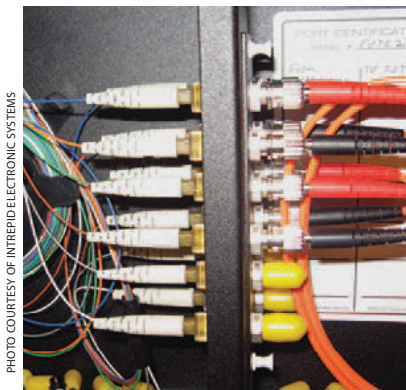
Fiber Optic Terminal Can (F.O.T.C.)

"The rapid response system is part of a communication network," said Clevenger. "It can communicate with one person, one building, an entire campus, or multiple campuses. You can speak into a microphone or have a prerecorded voice message that is activated automatically by the push of a button."

Intrepid Electronic Systems, Inc., Oakland, frequently works on multi-system fire alarm/mass notification projects, including Oakland International Airport and the Novartis Pharmaceuticals Campus in Emeryville.
Norm Clevenger can be reached at Norman@intrepidelectronic.com; 510-597-9966.

Fire Alarm Network System

Electronic Shop

Electronics shop - Fire Alarm System is monitored here during normal working hours.

Boiler Plant

Boiling Plant - Fire Alarm System is monitored here during off-normal working hours.

Scanning, imaging, MRI, and CAT Scan building.

103

MRI, CT-Scan, and Nuclear Cyclotron building.

102

101

100

Hospital

Administrative building and outpatient building

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Intrepid Electronic Systems Project Team VA Palo Alto Health Care System

PRINCIPAL:
Kurt Brinkman
GSA contract negotiations, design concept

PROJECT MANAGER/PROJECT ENGINEER:
Norman Clevenger
Design engineering, project management

DRAFTER:
Lyubov Solomakha, Project CAD

SENIOR TECH:
Brian Wynn
Installation supervisor, system programmer

INSTALLER TECHNICIANS (SOUND AND COMMUNICATION):
Brian Wynn - Senior Technician - IBEW Local 595
Aaron Felt - Installer - IBEW Local 595
Johnny Ponce - Installer - IBEW Local 332
Stephen Michel - Technician - IBEW Local 595
James O'brien - Installer - IBEW Local 332
James Holliday - Installer - IBEW Local 595
Robert Wilhelm - Senior Technician - IBEW Local 595
Dave Schreiber - Senior Technician - IBEW Local 595
Bob Craig - Senior Technician - IBEW Local 595
Aaron Johnson - Apprentice - IBEW Local 332
Jason Lara - Apprentice - IBEW Local 332
Spiro Sarlis - Technician - IBEW Local 595

INSIDE WIREMEN (ELECTRICIANS):
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Vlastimil Kotyza - Inside Wireman - IBEW Local 332
Thomas Wolfe - Inside Wireman - IBEW Local 332
Daniel Grenanada - Apprentice - IBEW Local 332
Kirsten Hart - Apprentice - IBEW Local 332

ENGINEERING FIRMS:
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Hughes Associates - Dave Boswell
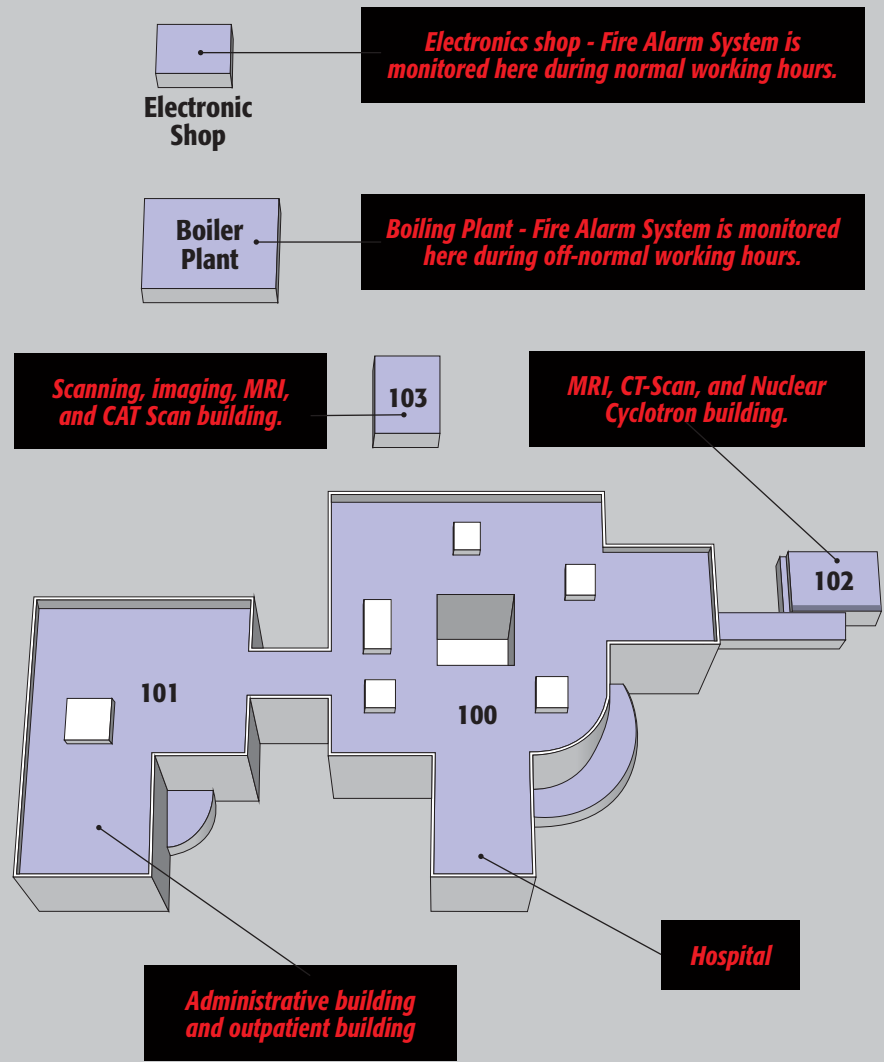
VA CONTRACTING OFFICER:
COTR - James Veitch

Rosendin Electric Network Services installed a state-of-the-art communications infrastructure at the new San Jose Airport that is designed to meet the needs of Silicon Valley travelers for the next two decades. The infrastructure begins with a new copper and fiber backbone that originates in Terminal B Concourse TER and then links to all the buildings and systems through a series of communication closets (TR's). The fiber and backbone cable is routed

Fiber and copper backbone is routed under the runways and carries phone lines and other communications wiring. Backbone cable is routed from the TER in Terminal B Concourse to the Tower and to the lighting vault next to it.

Terminal B Concourse

Network infrastructure originates in lower level of Terminal B Concouse in the TER room. All buildings are linked to the TER room through copper backbone. Backbone cable is routed from the Main TR in Terminal A to the TER in the Terminal B Concourse.

Terminal B Gates
Terminal B Gates

Wired smart seats for laptop plugin.

Terminal B

Airport Communications Infrastructure Fast Facts:

CONTRACTOR: Rosendin Electric Network Services, Ron Clarkson, Division Manager, Network Services, San Jose

CONTRACT: $6.2 million contract for the infrastructure, network connections and other sound and communications work.

SCOPE OF WORK: Communications infrastructure covers over 2 million square feet and includes Terminal B, Terminal B Concourse, Terminal A, Terminal A Parking Garage, and the CONRAC Rental Facility

WORK HOURS: Over 15,000

TECHNICIANS: 40 technicians from IBEW Local 332 in San Jose assisted Rosendin Electric Network Services

ESTIMATOR: Randy Sessler

SR. PROJECT MANAGER: Dustin Cognetti

SUPERINTENDENT: Mike Sandoval

GENERAL FOREMAN: Ray Cisneros

TERMINAL A FOREMAN: Will Ladd

TERMINAL B FOREMAN: Gilbert Marlow Jr.

CONRAC FOREMAN: Jesus Serrano

Terminal B

- Wired all security checkpoint systems, as well as the security camera system
- Wired the EDS network for baggage scanning equipment; wired the cabling for the body scanning systems
- Wired the teledata infrastructure, including all backbone and horizontal cable, cabinets, racks and cable trays
- Provided backbone cable from Terminal B through a specified pathway to the TER in the Terminal B Concourse
- Built out all the TER and TR closets
- Provided core cabling for 10 digital art drops

Terminal B Concourse

- Originated and wired copper and fiber backbone through a primary TER room used to connect to TER's in Terminal B, Terminal A and CONRAC
- Cabled 17 jet bridges and built out the infrastructure for the gates
- Cabled all airport operations offices
- Wired the digital art LAN
- Wired 10 digital art drops

under the runways, carrying phone lines and other communications wiring. Roadways are wired with security cameras and courtesy phone podiums.

Rosendin Electric Network Services also wired various aspects of network connectivity, including voice and data, security camera systems and

security checkpoint systems, bomb detecting device stations, baggage handling points, entrance and exit booths and digital art drops.

Terminal A

Terminal A Parking Garage
Fiber and copper backbones wired for two new TR's.

CONRAC Rental Car Facility

1.8 million sq. ft., 7 floors for fueling stations and car washes.

Technology Equipment Room (TER) located near the center of CONRAC connects to 18 TR locations throughout the building (most of these are on the lower floors).

Backbone cable is routed from CONRAC under the street through a specified pathway to the MDF in the Terminal B Concourse.

Installed cameras on Terminal Drive to monitor the roadway; also installed the courtesy phone podiums.

Terminal A

- Wired the bomb detecting device stations
- Wired security camera system
- Wired baggage handling points
- Installed wireless access network for airport monitors
- Installed cabling for 5 digital art drops
- Connected the TER to 12 TR closets

CONRAC Rental Car Facility

- Wired teledata infrastructure; installed backbone cable; cabled all of the entrance and exit booths
- Wired over 6,000 termination points
- Connected the TER to 18 TR closets
- Wired the security camera system
- Installed cable to link solar panel system to the network for monitoring
- Installed cabling for 4 digital art drops

Solar Panel Rooftop

- 1.2 Mega Watt (DC) solar array installed on 1.8 million square foot rental car facility rooftop

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Level 2 Terminal B
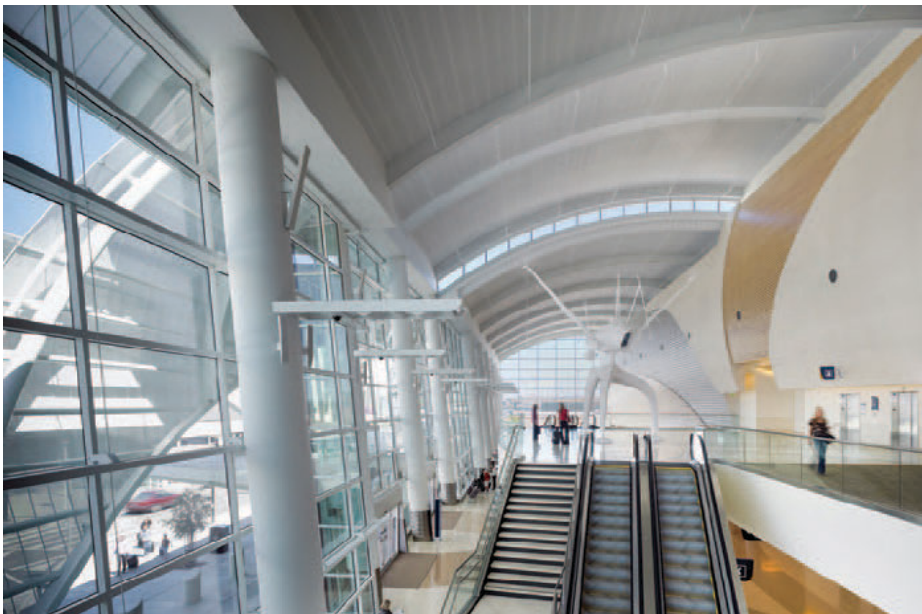
eCLOUD in Terminal B

AIRPORT NETWORK INFRASTRUCTURE CONT'D

Once the TER was moved, communication closets (TR's) had to be set up in each of the new or renovated buildings. The TR's in each building serve as "traffic cops" for each facility's cabling infrastructure, routing signals through the building so that the systems work properly. Rosendin Electric Network Services built out a total of 32 communications closets in the new facilities and then linked each of the TR's with fiber and copper backbone as well.

Space Observer in Terminal B

Rosendin Electric Network Services also pulled both fiber optic cable and copper cable from the TER to the Airport Tower. Fiber and copper backbone is routed under the runways to a lighting vault near the Tower that houses some of the communications systems.

Rosendin Electric Network Services installed lighting controls for all the runways, as well as security cameras on the roadways.

CONRAC

Voice data communications for the buildings were run through CAT 6 copper. Rosendin Electric Network Services also wired "art drops" for the airport's digital art system in all the new and renovated buildings.

Rosendin Electric Network Services' infrastructure buildout didn't stop with voice data and network infrastructure. It also includes wiring various security checkpoint systems and security camera systems, as well as connecting networks to operate the baggage scanning systems

Terminal B Art Exhibit

and bomb detecting device stations.

Clarkson's point men on the project included Senior Project Manager Dustin Cognetti, General Foreman Ray Cisneros, along with Foreman Jesus Serrano, Will Ladd and Gilbert Marlow. Over 40 installer technicians from IBEW Local 332 in San Jose worked more than 15,000 hours to wrap up the installation.

Terminal B

Clarkson and his staff built to LEED Silver specifications to complete the connections in the new Terminal B. "The biggest thing we did to work toward the LEED certification was to cut back waste," said Clarkson. "We worked as efficiently as we could in terms of materials and products, trimming waste, buying close to home, cutting cost."

"The intent of the design and installation was to meet the IT needs for the next 20 years, and we used all of the latest and greatest technology and cabling and connectivity," added Clarkson. "It's going to perform for the next two decades."

North Concourse

Network Services Team: Left to right, Ron Clarkson, Division Manager; Dustin Cognetti, Senior Project Manager; Ray Cisneros, General Foreman; Jesus Serrano, Foreman CONRAC; Will Ladd, Foreman Terminal A; Gilbert Marlow JR., Foreman Terminal B and North Concourse.

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Healthcare Consultant Steve Hoffman Of Building Knowledge Talks Hospital Codes

Steve Hoffman is a partner (along with Bundy Chamberlain) in Building Knowledge, a company which provides code training, OSHPD IOR Examination Preparation and other consultation for California health care construction. Hoffman frequently serves as LEAD IOR or QA Manager for health care facilities. His projects include John Muir Medical Center, Walnut Creek; John Muir Medical Center, Concord; Kaiser Antioch Deer Valley Medical Center and Kaiser Livermore.

Q: As a consultant for hospital/health care technology, what requests do you receive most often for technology implementation?

A: Most of our requests have to do with how to implement and execute the construction into new or existing facilities. Most organizations are heading to full electronic reporting/controls and this naturally drives improvements to the infrastructure needed to support it.

Q: What challenges do you face?

A: Most of the challenges we see from our clients and installers have to do with a lack of knowledge of the codes, their requirements and the processes to get approvals. Unfortunately, incomplete planning and scope development is also a big driver for requests for help. Many are surprised that in health care settings, code driven items which are not typically enforced on commercial projects are strictly adhered to. This not only impacts those that are new to health care projects but also experienced clients trying to keep up with frequent building code changes.

Q: How do OSHPD and other regulations affect the design and installation of sound and communications technologies in health care?

A: There is really no difference with the California Building Codes on most types of projects. It is just that on health care and OSHPD projects in particular these codes are more rigorously reviewed and inspected. This can tend to carry very significant risks to the uninformed. This is why we stress knowledge, the need for an early and complete design (including actual verification of the areas to be installed) and flawless implementation as the keys to success.

Q: What are some of the technology trends in hospitals?

A: The trends for most health care providers and hospitals are to move rapidly to add technology to meet higher demands. As the industry continues to evolve, information technology plays an increasingly important part in the streamlining and quality assurance of health care.

Q: Any specific health technologies that have been impacted by new technology trends?

A: The trends to smaller faster devices with higher levels of capacity are the main drivers. Great strides have been made - a few significant items are electronic patient records, robotic assisted surgery, digital diagnostic and treatment tools, automated building management systems and VOIP. These items have not only been a great aid to patient care and facilities management, but should also help to minimize impacts on health care costs and our environment.

Q: What does this change mean in terms of requirements for the VDV infrastructure?

A: For voice, data and video transmissions infrastructure (VDV), it means more and greater upgrades to infrastructure to come. This can include things like smarter phones, added servers, cables, fiber optics, monitors and way more wireless infrastructure and devices.

Q: What would you like to tell hospital facility directors to keep in mind about telecommunications wiring in the next few years?

A: Try to look five years ahead and be sure to talk to your IT professionals on the trends they foresee. Knowledge and proper planning at all levels is naturally the key to success. Be clear to your designer on the need to verify the actual routes, rooms, power and heat loads as applicable (not just from old plans). If you can afford it, add extra capacity for future growth, especially in IT rooms and extra supports and chases at corridors.

Q: What are some of the tricks of planning so that you don't have a lot of cost down the line when you have to change?

A: The best trick is to avoid late stage changes as much as possible through early complete planning, scoping and design. Things however will always happen. Knowledge of the project specific processes and pre-agreed to unit costs always help to drive quick resolutions.

Q: How do you like working with IBEW technicians?

A: IBEW Technicians are typically the most highly trained, are passionate about their workmanship and a great asset to any project. I truly enjoy working with such highly trained technicians and I learn from them on every project!

To contact Steve Hoffman, e-mail Steve@IORED.com, or call 925.817.9412.

Where can I find a Fire Alarm contractor?

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Young Communications Co. Inc.
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http://www.youngelec.com

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Communication Service Company Uses Light Beam Technology And Smart Detectors To Protect The Walnut Creek Library

Walnut Creek Library

PHOTO COURTESY OF GROUP 4 ARCHITECTURE, RESEARCH + PLANNING

Children's Room

PHOTO COURTESY OF GROUP 4 ARCHITECTURE, RESEARCH + PLANNING

Beam me up, Scotty! I'm at the library!

While the Walnut Creek Library bears little resemblance to the science fiction television series Star Trek, and Captain Kirk doesn't roam the library's spacious rooms, there IS light beam technology at work.

As part of the new library's state-of-the-art fire alarm system, Communication Service Company of Antioch has installed smoke beam detectors on the facility's second floor that use beams of light to detect smoke.

The light beam technology is part of the $100,000 fire-alarm system that Communication Service Company designed for the $39 million contemporary facility. The new Walnut Creek Library, located in Civic Park, opened in July, and was financed by a public-private partnership that included $5 million raised by the Walnut Creek Library Foundation. It features 42,000 square feet of space, 600 visitor seats, and 94 public computers, and was built to LEED silver standards.

"The library is designed with elegant and modern lines," said Patrick Stine, project manager for Communication Service Company. "It's spacious with a lot of natural lighting, and it's filled with art. The City and the library staff wanted to make sure that the fire alarm system was installed discreetly, so it wouldn't be seen, and wouldn't interfere with the building's aesthetics. That's why we went with light beam detectors on the second floor."

Stine and his crew of four fire-life certified installer technicians from IBEW Local 302 installed five of the light beams on the library's upper level about 10 feet above the floor level, placing them 40 feet apart. A light beam detector is placed on one side of the wall, with a reflector on the other side. The light beam detector is programmed to function as a smoke detector; it looks for smoke, and activates an alarm if smoke enters the area.

For the library's main floor, underground parking garage and outdoor perimeter, Communication Service Company used 127 "smart detectors." The smart detectors, which function as both thermal detectors and smoke detectors, are 100% programmable. They are operated from a central console system within the library's electric room that is monitored 24/7 by the City. Communication Service Company designed and installed the entire system, which is manufactured by Faraday. It is designed to be integrated with the library's elevators; a fire alarm will bring the elevators to a designated floor for lock down.

For the new library, which incorporates a children's wing and garden, a Teen Zone and business and conference areas, the fire alarm system is the best of both worlds. It incorporates the latest technology and provides superior protection, while being almost invisible.

Communication Service Company, Antioch, specializes in fire and security systems, and often works for municipalities, including Walnut Creek, Martinez and Pittsburg. Patrick Stine can be reached at pstine@calcsc.com or 925.755.3473.

Project Team Walnut Creek Library

ARCHITECT:
Group 4 Architecture, Research + Planning

CONTRACTOR:
Gilbane Building Company
West Bay Builders

ELECTRICAL CONTRACTOR:
Del Monte Electric
Garry Edgell, Sr. Project Manager

FIRE ALARM SYSTEM INSTALLATION:
Communication Service Company
Patrick Stine, Project Manager

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Edward Alarcon, IBEW Local 595