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Special Construction Issue

Wireless Technologies Serve as Solid Foundation for Construction Industry

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INDUSTRY OVERVIEW:

Wireless Technologies Serve as Solid Foundation for Construction Industry

By John Czapko

With construction dust swirling around him, the project manager scrolled through the available numbers on his Nextel BlackBerry, looking for his plumbing subcontractor. The university student housing project was stalled until the plumber arrived. And lost time equals lost money for the company.

Considering how the construction industry as a whole relies on wireless technology, one wonders how the industry ever got along without it. One thing is for sure–there's no going back, not with the bevy of solutions being introduced that make companies and the workforce more seamless and efficient. Among them are:

- Two-way radios for communicating with employees
- Cellular and smart phones for keeping in touch with contractors, subcontractors, and suppliers
- Mobile broadband cards for easy, quick access to the Web or e-mail from the truck or job site
- Stationary or trailer-mounted IP video surveillance systems for securing on-site construction materials 24/7

Hugh Johnston, Purchasing Manager at BearCom, notes that a lot has changed in the construction industry, which has traditionally relied on portable two-way radios. "Even when cell phones came out in the mid-1980s, those on the job sites continued to use portable radios," Johnston said. "To this day, many commercial and residential construction companies still use radios, such as those produced by Motorola and Icom. The devices are rugged and durable and are ideally suited for just about any construction project."

But at the same time, he noted that more managers and supervisors are embracing cellular and smart phones and their accompanying applications, which facilitate efficiencies around deadlines and budget issues. These devices are being made more rugged and durable as well, making them practical for harsh construction environments.

"We're moving into a digital world," noted Johnston. "The construction industry may not have been the first industry to embrace digital technology, but it is coming on strong now." Good examples of this trend are the arrival of MOTOTRBO, the digital two-way radio system from Motorola that offers sophisticated GPS capabilities.

Mobile applications also are fueling the adoption of smart phones like the BlackBerry, according to IDC Analyst Kevin Burden. "Because the construction industry's business model relies so heavily on subcontracting, project management is one of its most important business processes," wrote Burden. "To optimize it, commercial construction companies are using BlackBerry devices to enable project managers to update project data at the work site, thus keeping clients up to date on project details. Real-time access to project data also enables project managers to solve problems onsite, thus reducing costly delays. Moreover, given the rigors of large-scale construction sites, the ability to employ a more compact device–instead of a laptop–provides the project manager with more flexibility. Mobile application access also has been important in the residential construction market, where mass production makes quality control and assurance critical."

Jeff McDowell, Vice President of Global Alliances at Research in Motion, told *Today's Wireless World*, "Construction has always been a high-pressure industry with tight deadlines, safety concerns, and broad-ranging resource

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"We're moving into a digital world. The construction industry may not have been the first industry to embrace digital technology, but it is coming on strong now."

Hugh Johnston, Purchasing Manager
BearCom

Portable and mobile two-way radios have served as vital communications tools in the construction industry for many years. In the recent past, advancements in chemistry and digital technologies have led to stronger, more durable housings and greatly enhanced communications capabilities, such as text messaging, GPS, escalating emergency alerts, remote monitoring, and much more.

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management. Construction companies are finding competitive advantage through mobile communications. The BlackBerry wireless solution provides the construction market with a solid, secure platform on which to build the best wireless infrastructure–offering new features and benefits to the business, while allowing organizations to leverage their previous IT investments in corporate communications applications."

New mobile applications are emerging on a weekly, if not daily, basis. Last year, for example, Sprint Nextel introduced the Trimble Construction Manager, a wireless solution that utilizes GPS technology and delivers to construction professionals a two-pronged solution: 1) locating and managing assets at construction sites via Nextel handheld phones, and 2) providing in-vehicle devices to optimize asset utilization and productivity of mobile assets. This solution effectively connects the office to the job site and is designed to reduce operating costs and improve construction efficiency.

The service available on Nextel handsets uses the iDEN network to deliver information to workers on job sites, allowing them to find the assets needed to complete projects. In addition, job site boundaries, or "geo-fences," can be sent to the phone, allowing the solution to record site entry and exit events so site managers are notified if a worker enters a hazardous or unsafe zone. Users also can download maps and site designs to their Nextel wireless phones and view their current locations superimposed on the design. This enables workers to perform reconnaissance activities, such as inspecting terrain and visualizing how the job site will be prepared.

One national publication recently profiled Lloyd's Construction in Eagan, Minnesota, as a company that has turned to managing its entire business with smart phones. With 100 employees, 30 trucks, and more than 400 dumpsters, Lloyd's recently moved away from "a hodgepodge of spreadsheets, paper ledgers, and accounting software on company PCs to keep track of its workers and equipment" to wireless technology. Its decision was made easier by the arrival of mobile productivity software, which is far more attainable for almost all medium-sized and small construction firms.

Since making the switch, Lloyd's confirmed that data entry and job logging by the dispatcher and foremen is roughly one-and-a-half times faster than paper

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The use of wireless IP video surveillance cameras to help monitor construction sites has been increasing dramatically over the past two years. It has proven to be a very effective method for reducing theft of building materials and equipment, as well as observing remote job sites during emergency situations, such as floods and other natural disasters.

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and radio. The company also has cut fuel costs by about 30 percent through more efficient routing. Finally, Lloyd's reports a net improvement in performance of 10 to 12 percent, or roughly $1 million for 2007, an impressive return on an initial $50,000 investment.

While the emergence of smart phones is a definitive trend, other wireless technologies are also facilitating productivity in the construction industry. Rugged notebook computers from companies like Dell, Xplore, Motion, and Motorola are appearing on the job site. The trend is further helped by Sprint's mobile broadband cards. "Where there is no wireless connection, managers are increasingly relying on Sprint's mobile broadband cards to connect to the Internet," said BearCom's Johnston.

Finally, construction companies are recognizing the benefits of wireless video surveillance as an important tool for securing job sites. Organizations like BearCom, with the help of partners Sony Electronics (video cameras), Firetide (mesh broadband networks), and OnSSI (monitoring software), are increasingly providing stationary and mobile, trailer-mounted video surveillance systems that can be used to monitor construction sites in order to identify and capture the individuals and the vehicles they use to steal expensive building materials or vandalize the job sites.

The net results of these trends, as is the case with many wireless technology solutions, are cost savings and enhanced productivity, two benefits that any commercial or residential construction firm can build on. ●

John Czapko is Vice President of Sales for BearCom.

For more information about the wireless products and solutions discussed in this article, please contact BearCom at TodaysWirelessWorld@BearCom.com.

In 2007, Motorola began shipping the MOTOTRBO digital two-way radio system, which represents a powerful and compelling improvement on the industry's existing platforms. And yet Motorola has made it possible for those construction firms that still use analog and remain wedded to that technology to make small, cost-efficient steps toward the inevitable transition to digital. But boy, is it compelling to make the switch now.

PRODUCT REVIEW:

MOTOTRBO Helps Increase Construction Site Productivity

By Hugh Johnston

Construction companies hear it all the time from their technology partners: "We need to upgrade you to the latest technology." That's what made Motorola's strategy so refreshing last year when it rolled out the MOTOTRBO digital two-way radio system.

Yes, the wireless technology leader introduced a powerful and compelling improvement on the industry's existing platforms. And yet Motorola has made it possible for those construction firms that still use analog and remain wedded to that technology to take small, cost-efficient steps toward the inevitable transition. No one is twisting their arms for a decision, but there are plenty of compelling reasons to make the switch. For example, Motorola's new digital communications platform combines the best of two-way radio with digital technology to deliver increased capacity and spectral efficiency, integrated data applications, and greatly enhanced voice communications.

"A major leap such as this in two-way communications typically comes around every couple of decades," said Mike Butler, Project Manager at BearCom. "What is impressive to me is the IP connectivity. You expect the voice quality with these radios, but what is stunning about them is that they move data equally as well. For example, you can send text messages directly to one or more radios. We're already seeing a different kind of reaction when we call on customers and prospects and discuss this platform."

MOTOTRBO utilizes a two-slot Time Division Multiple Access (TDMA) digital technology to improve basic functionality and system performance, including increased system capacity, improved audio quality, longer battery life, built-in privacy, and enhanced call signaling and control capabilities for future enhancements to the platform, such as emergency pre-emption.

In addition, users have access to various integrated data applications, such as global positioning system (GPS)-based location tracking, text messaging, and other IP data applications. And it doesn't end there. Motorola's published Application Programming Interface (API) enables the development of customized applications by third-party developers, creating additional versatility for all MOTOTRBO owners.

"That's another thing that's very exciting about MOTOTRBO," said Butler. "Yes, you have the GPS application with text messaging and an e-mail interface. And yet you also have an open API. Developers can get a kit from Motorola just like you would from Microsoft, so that they can write a variety of applications (for the platform)."

The integrated applications and the ability to write additional applications represent the real sizzle of the MOTOTRBO platform. A couple of these applications–GPS and text messaging–are very powerful. But Motorola is also working on many, many more applications. Those features and the many others will go a long way toward attracting construction firms as new customers, as well as encouraging existing customers to upgrade.

"Commercial and residential construction firms are constantly faced with the need for improved workforce

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Mobile communications centers, such as BearCom's QuickSite 1000, are now becoming fixtures on many construction sites. These highly flexible, self-contained trailers are fully customizable with a wide variety of wireless

communications equipment, such as IP video surveillance cameras, mesh broadband networks, IP PBXs, and repeaters for the new Motorola MOTOTRBO two-way radio system. The system is powered by a gasoline or diesel generator with a battery backup. Interoperability equipment can also be engineered into QuickSite, and everything can be controlled by a notebook computer. These trailers can be deployed and operational in less than 30 minutes and are easily towed by a standard half-ton pickup truck or SUV, and they can even be airlifted to remote locations by helicopter.

productivity, operational efficiency, and increased mobility, while maintaining constant connectivity with the workforce," said Butler. "MOTOTRBO was designed to meet the expanding needs of these customers, especially those requiring reliable, business-critical communications combined with the higher performance capabilities that digital technology can provide. Many construction companies also can benefit from the increased capacity and significant cost efficiencies that are inherent in MOTOTRBO."

By leveraging TDMA technology, MOTOTRBO doubles the effective capacity of a customer's repeater channels within the 12.5 kHz channel structure already utilized throughout the world. This straightforward re-use of spectrum allows more users on the system and with no changes to licensing requirements, which can increase the customer's capacity for wireless voice and data communications. In addition, MOTOTRBO's platform enables a single repeater to deliver the benefits of two analog repeaters, allowing businesses to realize up to a 50 percent reduction in repeater costs compared with equivalent analog systems. And MOTOTRBO provides a longer talk time with up to a 40 percent longer battery life than comparable analog radios.

Another feature that is highly beneficial to many construction companies is MOTOTRBO's digital noise suppression and audio, which keep communications clear throughout the coverage area, thus enabling workers to communicate at construction sites, no matter how loud and disruptive the background noise is. Moreover, MOTOTRBO's support of new digital applications, such as text messaging, creates an alternative way to get a message through, even when loud noises prevent any voice communication or when employees can't safely answer a call.

MOTOTRBO lowers acquisition and operating costs, particularly when compared to alternative technologies that require monthly fees. In addition to a lower total cost of ownership, MOTOTRBO can operate in both analog and digital modes, and it is easily integrated with legacy two-way radio infrastructures. Customers can improve basic functionality, add new features, and increase capacity at their own pace, while leveraging existing system investments."

What's more, Motorola is hardly resting on its laurels. In addition to the MOTOTRBO platform, it recently announced a new two-way portable radio, the CP110. "The Motorola CP110 was designed specifically to meet the rigorous demands of business users for whom two-way radios are a critical tool for day-to-day efficiency," noted Claudia Rodriguez, Motorola's Senior Business Manager, Professional-Commercial Radios. The device is being hailed for its exceptional audio quality and durable, rugged design.

With industry-leading technologies like the MOTOTRBO platform and the new CP110 radio, it's not surprising that Motorola has been, and continues to be, a favorite in the construction industry. ●

Hugh Johnston is Purchasing Manager for BearCom.

For more information about the wireless products and solutions discussed in this article, please contact BearCom at TodaysWirelessWorld@BearCom.com.

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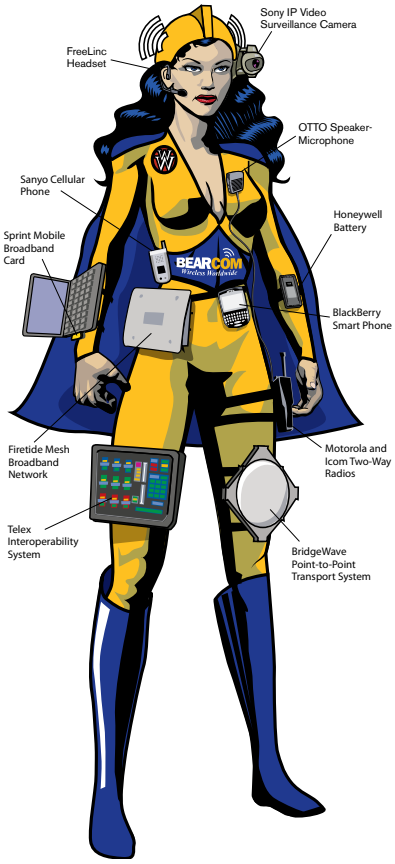

Meg A. Hertz, the Chief Technology Officer for BearCom, provides innovative wireless solutions to BearCom customers every day. But when a communications problem requires superhuman powers, Meg becomes Wireless Woman–and always saves the day!

Q&As:

Rugged Two-Way Radios and Remote Construction Projects

By Wireless Woman

Question:
I am looking for two-way radios that can stand up to the rigors of a construction site. They must be as rugged as the elements they will encounter. Any ideas?

Answer:
As a matter of fact, I do. For example, Icom produces a number of devices which can do the job.

I'd recommend first taking a look at the F-series radios. For example, the F50V is the wave of the future in many respects. In the past, many construction workers and their project managers have relied on one of two different wireless devices for communication–a radio or a pager.

In an attempt to put this dilemma to rest, Icom recently created a solution to help construction companies operate more efficiently. The F50V, which is priced very reasonably, offers a unique "3V" proposition (voice storage, vibrate, and value). In short, the F50V combines the best of a two-way radio and pager into one "hybrid" package. For example, the F50V offers the vibration alert feature and voice storage capability of a pager, as well as a full suite of radio features.

This makes it possible for construction companies to purchase one device, yet have the functionality of two.

Equally important is the fact that the F50V, like many other Icom devices, is rugged and reliable. It meets military standards for durability and is fully submersible. At the same time, it draws from some of the most sophisticated battery technology in the industry, delivering up to 190 hours of battery life.

If you don't need all the functionality that is inherent in this hybrid device, I'd recommend the F50 or the F60. Like the F50V, these are compact, lightweight, easy-to-use, portable two-way radios that offer just about everything the F50V provides, except the dual functionality. The F50 is the more basic model, while the F60 is waterproof.

Let's not forget Icom's IC-F70/F80 radios. Each of these devices has waterproof construction that is sealed with waterproof gaskets, able to withstand a depth of one meter for up to 30 minutes. What's more, its built-in

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The Adventures of Wireless Woman™

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CTCSS, DTCS, two-tone, five-tone, and BIIS capability allows users to set up their own talk groups, while providing for quiet stand-by when others are talking. You also can set up selective calls to individuals or control a repeater.

Users get up to 10 two-tone codes that can be decoded on a single memory channel, which is perfect for professionals who require multiple-district paging on one channel. When a matched tone is received, a number of items are programmable for each code.

The IC-F70/F80 covers a wide frequency range in one version. The large capacity of 256 memory channels with 32 memory banks allows the user to divide and store a variety of channels from local to wide area network channels. Both wide and narrow (25/12.5 kHz) channel bandwidth is programmable to each channel. In addition, programming for digital or analog modes can be selected on a per-channel basis.

Question:
We have a large construction project in the hills, where traditional cell phone and two-way radio service is spotty. Can you recommend a way for us to maintain reliable communications between all of our workers as well as the project manager?

Answer:
Absolutely. I'd recommend the QuickSite 1000, a highly mobile communications system with a telescoping radio tower. It is a lightweight trailer that can easily be towed behind a standard half-ton pickup truck or airlifted by helicopter to a remote location.

The unit deploys up to 42 feet in height and is durable enough to support the weight of multiple towers. Its portable qualities make the QuickSite 1000 ideal for deploying at one site and then moving to another when the job is completed. For most applications, it can be set up and operational within just 30 minutes.

A wide variety of components can be integrated into each QuickSite unit, such as VHF, UHF, and 800 MHz two-way radio repeaters (conventional or P-25 operation), IP servers and gateways, IP video surveillance cameras, mesh broadband networks, and various other types of wireless communications equipment.

The interoperability capabilities of QuickSite are controlled by a console, which can be operated by a notebook computer. An onboard gasoline or diesel generator and battery backup system provide more than adequate power for whatever equipment has been installed in the unit.

Alternatively, the QuickSite 750 delivers comparable functionality in a highly-portable, suitcase-based solution. The QuickSite 750 can re-establish communication from the convenience of a command center or wherever a power source is available. Due to its compact design, the 750's range becomes greater as the Height Above Average Terrain (HAAT) increases.

Both QuickSite configurations are reasonably priced—far below that of bulkier systems, which usually require heavy-duty cargo trailers or modified RVs for transporting. Because of their attractive prices and flexibility, the QuickSite 1000 and the 750 are ideal for commercial and residential construction companies of all sizes. ●

Wireless Woman, a.k.a. Meg A. Hertz, is Chief Technology Officer for BearCom.

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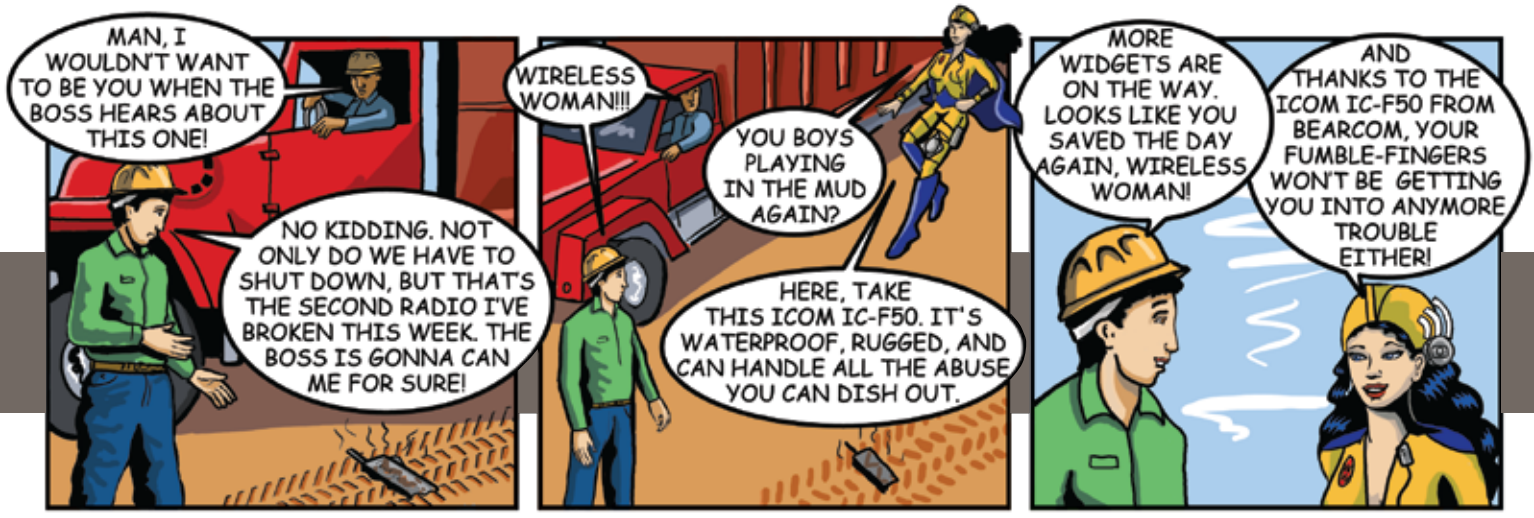

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SUCCESS STORY:

Reducing Wireless Expenses by Utilizing a Customized Extranet Site

By Kristin Kirkham

The Customer

Headquartered in Dallas, Texas, Balfour Beatty is a world-class engineering, construction, services, and investment business. The company creates and cares for essential assets, such as hospitals, schools, roads, railways, utilities, and other major structures. Balfour Beatty works in partnership with sophisticated customers who value the highest levels of quality, safety, and technical expertise.

The Challenge

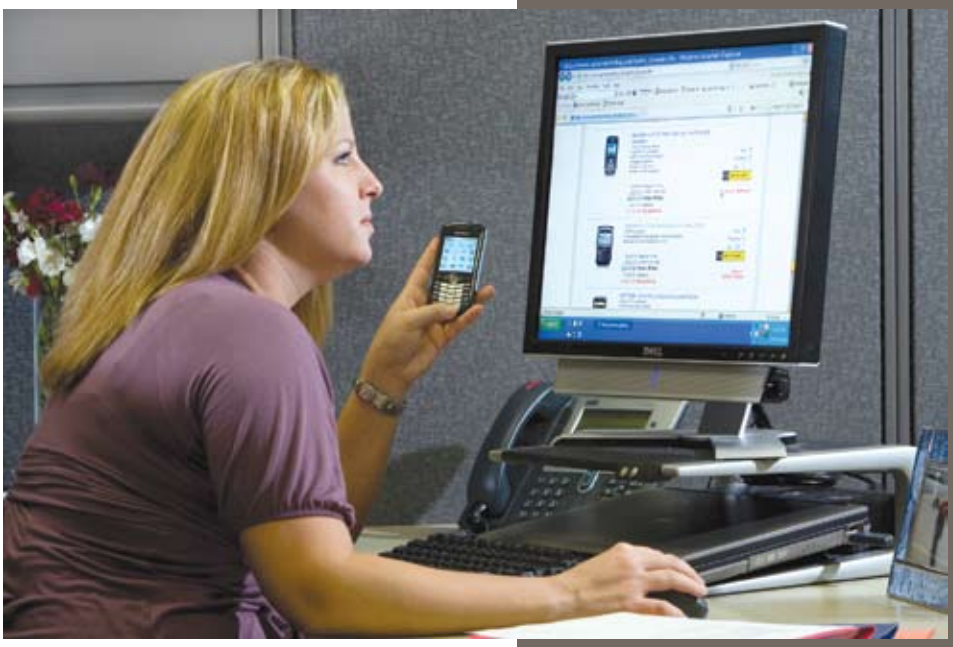
Although two-way radios had been used by the company in the past, Balfour Beatty found the iDEN smart phone platform to be the most useful. With iDEN, push-to-talk Nextel users could communicate with BlackBerry smart phone users with complete interoperability. This led to an opportunity to enable a greater number of Balfour Beatty employees to talk to more subcontractors at more construction sites. Also, wireless access to e-mail, corporate data, Internet, and organizer features is crucial to many Balfour Beatty employees. The company needed an integrated system to efficiently acquire and manage all of those devices, so BearCom was brought in to help.

The Solution

Prior to BearCom's involvement, Balfour Beatty had a decentralized procurement process for its wireless communications devices. After consulting with the Balfour Beatty IT leaders, BearCom's national accounts and marketing teams designed and developed a customized extranet site that not only provides a centralized fulfillment process with one point of contact but also reduces turnaround time and acquisition costs on all orders. BearCom also was able to negotiate a substantial discount on Sprint Nextel devices for Balfour Beatty by utilizing the extranet site as an order placement, fulfillment, and asset management tool.

The Results

BearCom's extranet site initially served two of Balfour Beatty's four divisions, covering nearly ten states. After witnessing the improvements derived for those two divisions, Balfour Beatty has announced that it will contract with BearCom for all four of its divisions, serving Balfour Beatty nationwide. "When we saw how BearCom's solution and customer service improved our communications, we awarded the national contract to BearCom," said Rick Roman, IT Operations Manager for Balfour Beatty. "Balfour Beatty maintains a high regard for service, and we hold our vendors to the same high standards. BearCom took our needs seriously and provided us with the quality solution and support services we expected." ●



Kristin Kirkham is Marketing & Technical Writer for BearCom.

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"When we saw how BearCom's solution and customer service improved our communications, we awarded the national contract to BearCom."

Rick Roman
IT Operations Manager
Balfour Beatty

Balfour Beatty serves its clients coast to coast with four divisions and nine regionally focused offices. Formerly Centex Construction, Balfour Beatty Construction US provides commercial construction services to public and private sector clients throughout the United States. The company has been an industry leader for more than 70 years.

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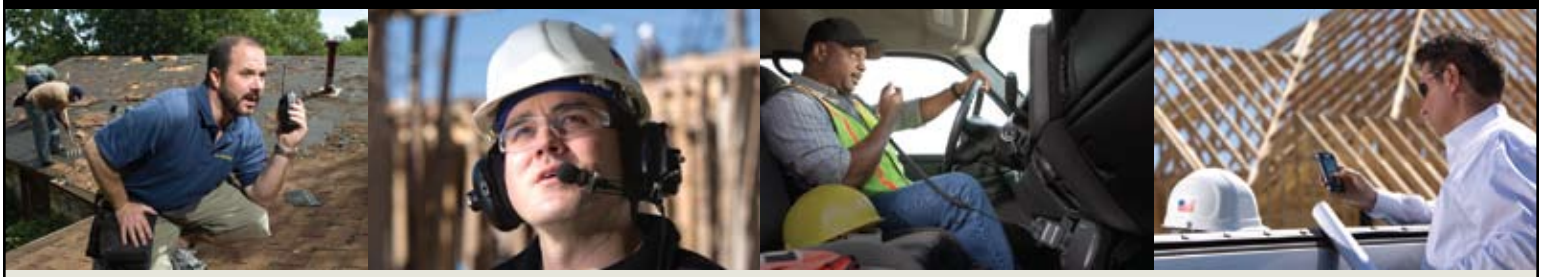

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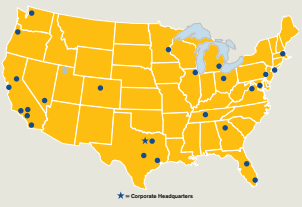

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