

the magazine of kiewit corporation

KIEWAYS





Kiewit is one of North America's largest and most respected construction and engineering organizations. With its roots dating back to 1884, the employee-owned company operates through a network of offices in the United States, Canada and abroad. Kiewit offers construction and engineering services in a variety of markets including transportation, water/wastewater, heavy civil, power, oil, gas and chemical, building and mining. With 2011 revenues more than \$10 billion, Kiewit's workforce includes approximately 10,300 salaried and hourly staff along with more than 14,400 craft workers.

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KIEWAYS

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BUILDING CLIENTS FOR LIFE:

For Kiewit Building Group, maintaining client relationships involves so much more than bricks and mortar. Story on Page 10.



SETTING THE ETHICAL STANDARD

Each quarter, Kieways magazine highlights Kiewit's expertise and innovative spirit, which combine to bring our high-quality work to life. In this issue, you'll read about the innovative ideas behind the successful DFW Connector project, which received extensive praise for its use of innovation. You'll also see articles about Kiewit Building Group's forward-thinking approach to warranties, the exciting technology in use by Kiewit Mining Group and the strong client relationship behind our track work in Carlsbad, Calif.

Success, however, shouldn't only be measured by the quality of the final product, but also by the ethical way we conduct our business and by our compliance with regulations. In April 2008, Kiewit and 12 other U.S. construction firms formed the Construction Industry Ethics and Compliance Initiative (CIECI) to promote integrity and ethical conduct within our industry. Our goal was to set the industry standard for ethics and compliance, and we have made great progress. Since its formation, 37 companies have joined CIECI. Each pledged to uphold a set of principles that include: establishing and adhering to a written code of business conduct; training personnel about ethics and compliance; sharing best ethical and compliance practices; and participating in the annual Best Practices Forum.

As current chairman of CIECI, I'm gratified to know that we are continuing to help construction companies develop codes of conduct and strengthen their compliance programs. It's been said that a rising tide lifts all boats. In the same way, by strengthening the industry's emphasis on ethics and compliance with government regulations, we are strengthening the industry as a whole.

BRUCE GREWCOCK
President and CEO

A WHOLE NEW KIND OF MINE

What makes Buckskin Mining Company a Caterpillar Global Mining World-Class Operation? Find out on Page 22.

IN THIS ISSUE

04 INSIGHT INTO INNOVATION

From telematics to intelligent compaction, NorthGate Constructors' use of innovation has led to savings in both schedule and cost on the DFW Connector project.

10 BUILDING CLIENTS FOR LIFE

Not only is Kiewit Building Group an expert in constructing buildings, it offers a variety of services aimed at helping clients effectively maintain their facility for the long haul.

16 PARTNERSHIP ON TRACK

Amtrak and Kiewit team up for another successful partnership on the Carlsbad Double Track project in Southern California.

22 A WHOLE NEW KIND OF MINE

Technologies and innovations recently implemented at Buckskin Mining Company are changing the way the mine is operated.

ON THE COVER

Kiewit was only allowed a set of nine-hour shutdown windows per location when constructing Carlsbad Double Track. Story on Page 16.

DFW CONNECTOR

INSIGHT INTO INNOVATION

To take a complex project that was supposed to be constructed in eight to 10 years, and complete it in four, takes innovation, planning and communication — something the Kiewit-led joint venture NorthGate Constructors has in spades.



The Dallas/Fort Worth Connector project consists of eight-and-a-half miles of construction across four highways, two interchanges and more than 39 bridges. Continuous frontage road lanes are also being constructed throughout the project. The widest point of the highway corridor, when completed, will be 24 lanes wide.

To complete this billion dollar, 3.5 million-manhour project ahead of schedule, NorthGate Constructors had to innovate. The design-build team assembled weekly task force meetings that involved participation from all parties – the designer, contractor and client, the Texas Department of Transportation (TxDOT). Here, they used transparent communication to discuss the best technical solutions for design and construction.

Even the way the team phased the project was innovative. By breaking the mega-project into manageable blocks of work, they were able to accomplish the goals established at procurement:

- Maintain existing capacity
- Create large, efficient work areas
- Minimize full freeway closures
- Minimize right-of-way and utility conflicts
- Establish work areas unaffected by traffic
- Create temporary traffic configurations better than what is existing

1. By breaking the mega-project into manageable blocks, NorthGate Constructors was able to minimize right-of-way and utility conflicts and full freeway closures. 2. Craft Superintendent Chris Speakman, left, and Concrete Paving Manager David Santin are helping lead paving crews to success. After surpassing the 50 percent completion milestone, crews have tied more than 22 million pounds of steel, batched more than 250,000 cubic yards of concrete and worked more than 500 million manhours without a hurt.



GROUNDBREAKING GPS TECHNOLOGY

NorthGate Constructors was able to use GPS technology to bring time and cost savings to the DFW Connector. Not only is there GPS grade control equipment, but GPS is also used for the electronic tracking of equipment, trucks and materials. Mobile devices placed in trucks provide managers the ability to see the location of trucks in real time. With this procedure, managers are able to track cycle times and look for bottlenecks.

Project Engineer Justin Mannina was involved in the initial integration and development of FiveCubits, a web-based truck and material tracking system. It uses GPS technology to automatically track trucks and materials, giving the project team instant access to materials delivered. FiveCubits also eliminates the need for clerks and engineers to manually enter tickets and track orders on spreadsheets.

“It has been a great tool for tracking permanent materials,” Mannina said. “We are using the system to track more than \$200 million in subcontractors and materials in real time with little manual input.”

FiveCubits uses electronic timecards for hourly trucking, providing actual pay time by the minute as opposed to rounding to the nearest half hour. Mannina and his team

Champion of Change

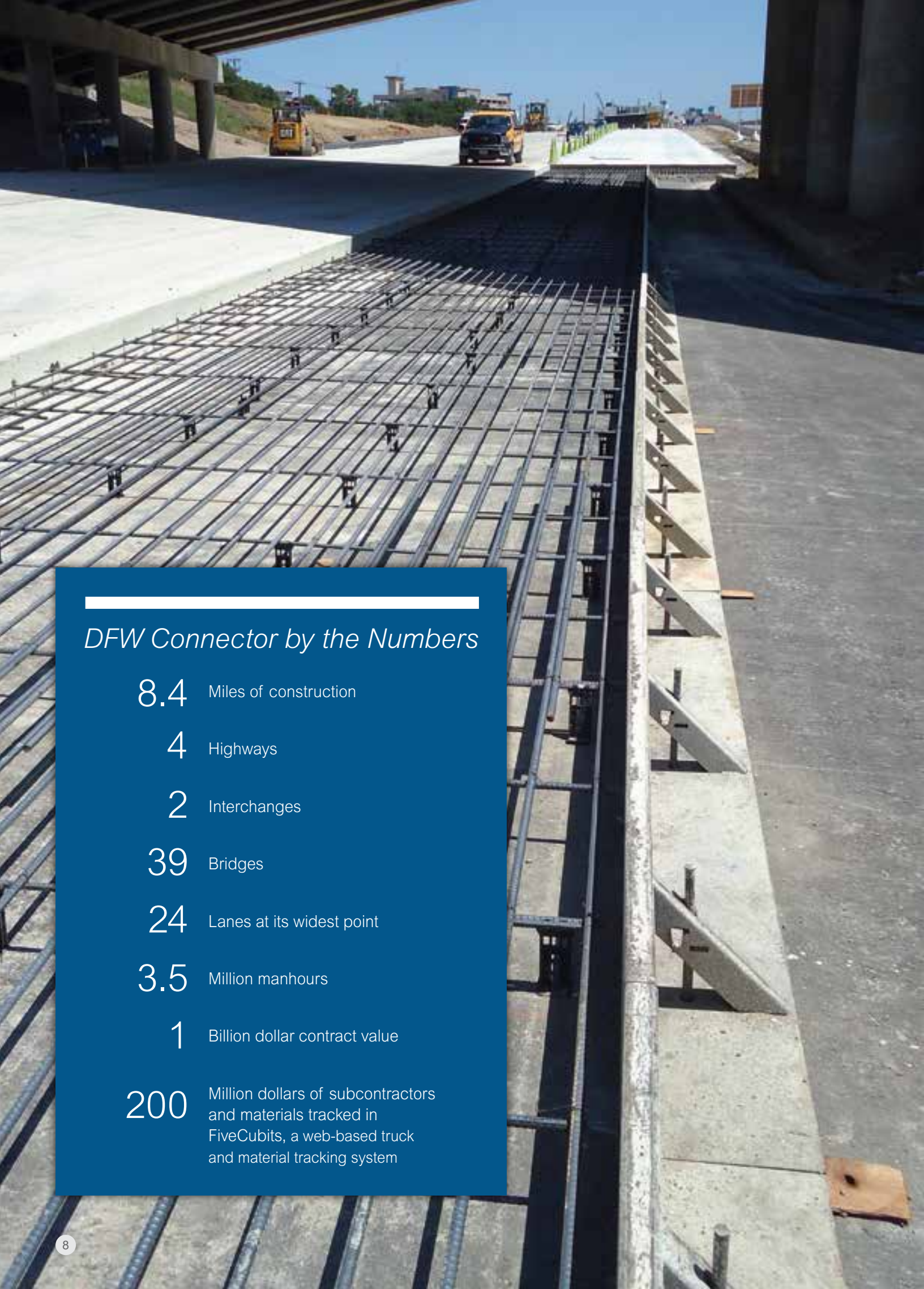
The DFW Connector project has received praise from all over the nation for its renowned use of innovations, the greatest coming from the White House.



The Texas Department of Transportation's project manager for the DFW Connector project was one of only 11 individuals honored at the White House earlier this year for innovation in infrastructure.

Sam Swan was honored as a Champion of Change as part of President Obama's Winning the Future initiative. Each week, a different issue is highlighted, and groups of champions, ranging from educators to entrepreneurs to community activists, are recognized for the work they are doing to improve their communities.

Swan's group was recognized for creating jobs in their communities and using innovative techniques to develop valuable projects helping to improve America's infrastructure.



DFW Connector by the Numbers

8.4 Miles of construction

4 Highways

2 Interchanges

39 Bridges

24 Lanes at its widest point

3.5 Million manhours

1 Billion dollar contract value

200 Million dollars of subcontractors and materials tracked in FiveCubits, a web-based truck and material tracking system

continue to create innovative ways to use FiveCubits, from managing the onsite trucking fleet to dispatching and managing quality assurance personnel.

The GPS technology even ties into the innovations used in 3-D design. The modern 3-D design and modeling provides better visualization while identifying and eliminating conflicts. It can also be downloaded directly into the GPS-controlled equipment enhancing communication while saving on time and cost.

Equipment Superintendent AJ Casas has been impressed with the efficiency in the telematics tools, especially when it comes to the benefits provided to his department.


“The telematics devices installed on the equipment provide real-time information that managers can use to help make decisions,” he said. “The devices provide location, run hours, utilization, fuel usage and even diagnostics. We use this information to increase our operations efficiency, maximize equipment utilization, control our idling and ultimately save money.”

ALL IN THE GRADING

Intelligent Compaction (IC) systems were introduced on the project to measure the same stiffness and strength parameters called for in the pavement design. The machine drive power (MDP) technology measures every square foot of the area being worked on, as opposed to the traditional single-density test performed by a quality technician.

“Intelligent Compaction is an awesome tool,” Mannina said. “The DFW Connector team has worked diligently with TxDOT to rewrite the specification to allow a more efficient operation and provide a better overall quality product to the client.”

IC allows the compactor operator to see the results of his work in real time, enabling him or her to apply more effort towards areas that need additional work and bypass the areas that meet or exceed quality expectations. This, said Mannina, leads to optimal machine utilization and fuel use. “It’s an exciting look into the future of grading operations,” he said.

The paving is just as impressive as the grading success. Wireless paving, which was first used by Kiewit in 2003, was brought to the DFW Connector. It eliminates wire or string line and improves access and safety. Additionally, all crushed materials are being used as base materials for concrete paving, rather than being hauled offsite. 



1. In March alone, the structures concrete pour crew poured more than 3,000 cubic yards of concrete, drilled more than 900 linear feet of shaft and set 75 girders. 2. As part of the more than eight miles of construction, continuous frontage roads are being constructed throughout the project. 3. A structures crew is setting girders on Main Street Bridge.

— KIEWIT BUILDING GROUP — **BUILDING CLIENTS FOR LIFE**

More and more, clients in the building sector are asking, “What happens during my warranty phase?” Big names in the industry have proved time and time again that they can build the work, but often overlook the value of standing behind it.

Since 2005, Kiewit Building Group (KBG) has made some radical changes to its services and warranty program based on growing client needs — and because it was the right thing to do.

KBG’s approach to handling the warranty period isn’t merely about minimizing callbacks after the building is completed. The team designed preventive maintenance and post-warranty programs that feature services customized to fit clients’ needs — while expanding client relationships throughout the life of the structure.

“All the services KBG offers – whether it’s our commissioning or post-warranty programs – are designed to help clients find ways to efficiently manage their facilities,” said Joe Lempka, KBG district manager. “Depending on the type of facility, studies have shown that construction costs account for less than 10 percent of a building’s overall lifetime cost. The remaining is in operations and maintenance costs. When we started KBG Services, we did so with the goal of helping clients find cost-effective solutions to managing their facilities.”

PROJECT CLOSEOUT PROGRAM

Since the inception of KBG Services, KBG continues to improve its programs by focusing on and enhancing quality initiatives. In 2005, KBG put the spotlight on its project closeout efforts. KBG Services Manager Tarna Kidder, then district engineer, formed a task force to start reviewing innovative ways to make the process better.

“We weren’t doing anything wrong,” said Kidder. “But we weren’t knocking anybody’s socks off. It became apparent that the turnover documents we provided our clients at the end of the project could have been as flashy as we wanted. However, if we didn’t deliver a quality effort on startup and commissioning, then it was all for show.”

The KBG team soon recognized the need to hire people specifically assigned to project closeout and commissioning. Construction activities require different expertise than commissioning and closeout. Services team members have educational backgrounds in mechanical, electrical and architectural engineering to support those requirements.

COMMISSIONING

By the end of 2006, KBG began formalizing a Commissioning Department specific to the nuances of commercial buildings. Commissioning, simply put, is the testing process that a building and its systems undergo

to make sure each system communicates effectively with the others.

Most commercial buildings today are managed with the use of computers, and even though each piece of equipment may run separately, someone must make sure the entire facility functions holistically. This is the primary focus of KBG’s commissioning team.

KBG hired a commissioning manager to formalize KBG-specific standards and the necessary forms and tools required to complete the work. KBG also created a career path for commissioning engineers and mapped out the appropriate certifications that would provide credibility externally. Newly hired commissioning engineers take part in training and certification at the University of Wisconsin to become qualified commissioning process providers. In early 2010, KBG made a commitment to provide commissioning services on all of its projects.

PROACTIVE SERVICE DURING WARRANTY

Just because the project is complete doesn’t mean the relationship should end, said Kidder. Today, the paradigm shift in KBG’s warranty program is toward a much more proactive effort.

Commissioning Engineer Gabe Trevizo performs a water testing procedure testing the building skin for water penetration.



Contractually, on most projects only one visit is required in the 11th month to resolve any warranty issues.

However, KBG chooses to visit clients monthly. This allows them to resolve issues in a timely way and attend to the preventive maintenance program, run trend reports on equipment and visit the building at night when the building is unoccupied.

FACILITY SERVICES

Making themselves more available after the building was constructed meant the team needed to increase the number of facility-related services. In the past two years,

KBG has focused on developing a suite of services to help clients take care of their buildings after construction was complete, maximizing the overall building life.

“From day one, we wanted to approach it differently,” Kidder said. “We, very intentionally, wanted to make it integral with the construction process. Being part of the larger Kiewit family, we have a vested interest in making it right.”

One such facility maintenance service is KBG’s facility preventive maintenance management program. Clients pay a monthly fee to make sure their preventive maintenance

is executed according to manufacturer recommendations, so their building lasts as long as it possibly can. The program came about because Kidder and her team noticed that one of two things would happen:

- Clients didn’t have a structured process for the budgeting of preventive maintenance procedures
- Facility maintenance personnel didn’t have the training or expertise to operate today’s complicated building systems

KBG’s facility preventive maintenance management program can be used in cases where clients do not have facility staff or to supplement existing staff. This added service extends contractor/client relationships, which is a benefit to Kiewit and the client.

“Our people have shifted their thinking,” she said. “We don’t only have clients for construction. We have clients forever. It doesn’t matter what their facility needs are. We’ll be there for them.”

POST-WARRANTY PROGRAM

To facilitate this notion of “clients for life,” KBG has made it a goal that at some point every year, the team talks to their clients. One way they do this is through the post-warranty program. This begins after the initial warranty is complete. It consists of a 10-year program where KBG performs annual facility visits, focusing on a particular building system each time.

For example, the KBG team knows that, depending on the climate, in Year Three the exterior sealants can begin to fail. The focus for that year is on the exterior building envelope. They aim to be an extra set of eyes, helping to identify small issues before they become big ones.

KBG is constantly evolving to adapt to the ever-changing building market. However, there is one thing that has remained the same: a focus on building long-lasting relationships that go far beyond bricks and mortar.

“Improving the warranty program has been a good place to start,” said Kidder. 🗨️

“We don’t only have clients for construction. We have clients forever. It doesn’t matter what their facility needs are. We’ll be there for them.”

TARNA KIDDER,
KBG SERVICES
MANAGER



Build Nebraska. Build relationships.

Kiewit Building Group received the Build Nebraska award for the craftsmanship displayed on the recently completed Mammel Hall for University of Nebraska-Omaha’s College of Business Administration – but construction is not all the team is receiving accolades for.

While it might not be an award, Warranty Coordinator Mike Schulte and his team have been receiving praise from the client for their post-construction efforts. David Nielsen serves as both the director of technology and budget and the Mammel Hall building manager. His experience with KBG’s services team impressed him as much as the construction team who completed the project ahead of schedule and under budget.

“Throughout the construction process, I was impressed with KBG’s can-do attitude,” he said.

“This attitude continued into the warranty period. Mike and his team communicated with us before construction was complete, which made the transition into the Kiewit warranty team absolutely seamless.”

After completing the construction of the 120,000-square-foot Leadership in Energy and Environmental Design (LEED) Gold certified building, Schulte and his team provided the following services for Mammel Hall: commissioning, enhanced project closeout, warranty management and post-warranty management.

“Their positive attitude and personal attention made for a smooth warranty period, rather than what could have been a time of intense stress – getting staff and students settled into a new building,” Nielsen said.

Beyond bricks and mortar

When KBG finished construction of Blue Cross Blue Shield's Nebraska headquarters in 2011, the team didn't walk away. Instead, they stayed on to perform a series of services that helps the client maximize commissioning and preventive maintenance efforts for the 315,000-square-foot facility.

1 PROJECT CLOSEOUT PROGRAM

KBG's Commissioning Department put together a comprehensive electronic document that puts building material information and maintenance data at the client's fingertips.



2 COMMISSIONING

With the large size and scope of this project, KBG dedicated a full-time commissioning engineer to this project to ensure systems were being installed properly and functioning together as designed.

3 FACILITY SERVICES

KBG's commissioning engineer put together a preventive maintenance management schedule outlining the maintenance needs of everything in the building – from how often to vacuum the carpet through maintaining the complex mechanical and electrical systems.



4 PROACTIVE SERVICE

As part of KBG's proactive service within first year warranty, a warranty coordinator made monthly walks with the building's facility managers where client concerns were discussed and potential or apparent issues were identified and resolved.

5 POST-WARRANTY

KBG's post-warranty coordinator continues to visit the site, at least yearly, to walk the building with the owner. These walks are dedicated to proactively identifying potential issues that could include roofing, building pressurization and site drainage.



PARTNERSHIP ON TRACK

Carlsbad, Calif., may best be known as a San Diego-area resort community with beautiful views of the Pacific Ocean. A lesser-known fact is that the area is home to the Aqua Hedionda Lagoon, an environmentally protected body of water. Until recently, a single railroad track ran above the lagoon every day, carrying 46 trains running in both directions.



In October 2010, the Kiewit team began work on the Carlsbad Double Track project for Amtrak with one mission in mind: to increase the trains' on-time performance. The team constructed a two-mile stretch of the coastal railway, which included a 213-foot, three-span girder bridge over the lagoon.

A PARTNERSHIP BASED ON TRUST

Amtrak and Kiewit worked so well together that Amtrak Senior Director of Projects Michael Albanese remarked, "Together, Amtrak and Kiewit have built a model of how construction can be done with limited impacts to the operating railroads, train operations and on-time performance."

Because of their unique relationship, Kiewit and Amtrak were able to tackle several challenges and still complete the project on time and on budget. How they did it was simple: They strengthened a partnership that was developed years before they even arrived onsite.

Back in 1996, John Eschenbach from Amtrak and Jim Holmes from Kiewit worked together on the Stuart Mesa Second Track project in North San Diego County. Since then, they have collaborated on four other successful rail projects, including the Carlsbad Double Track project. Over the years, the client/contractor relationship has flourished.

"We were open with one another," Eschenbach said. "We wanted the same thing — a project without change orders, on budget and on time. We just began a working relationship with trust, which is hard to do in the construction industry."

Eschenbach, now retired, worked briefly as the senior project director of the Amtrak Southwest Division. He handed his responsibilities to Albanese to take over the working relationship in Carlsbad. Holmes, the project manager over Carlsbad, transferred and was replaced by Project Manager Eric Stocklmeir.

"John and Jim built a relationship of working together," Albanese said. "We took it to a whole other level. It's not one where if I ask for something to be done that I have to write a written request. We have kind of a handshake agreement that we say we're going to cover it. I'll support Kiewit any way I can."

When working with clients on projects, it's not uncommon to see the contractor sitting on one side of the table and the client sitting on the other — symbolic of both parties taking care of their best interests. That was never the case on any of the previous Kiewit/Amtrak projects, and it wasn't the case on the Carlsbad Project.

"The way it happened on this project, and I can only assume on the previous Kiewit/Amtrak projects, was that it was very much a partnership," Stocklmeir said. "Kiewit worked hand-in-hand with Amtrak on solutions. At Kiewit, we were going to do the right thing for our client. Amtrak was there to help, and we were there to help them."

“Together, Amtrak and Kiewit have built a model of how construction can be done with limited impacts to the operating railroads, train operations and on-time performance.”

MICHAEL ALBANESE,
AMTRAK SENIOR
DIRECTOR OF
PROJECTS

To install the turnouts and crossovers for the double-track project, the Kiewit team knew they could complete all the work in three weekend shutdowns. However, under the original project specifications, Kiewit was only allowed a set of nine-hour shutdown windows for each location. Contractually, Kiewit had to stick with the specifications.

Because Kiewit had worked so well with Amtrak, Albanese and his team listened to the Carlsbad team's perspective. They negotiated three 56-hour shutdown windows, so Kiewit could do the work while providing minimal impacts to the host railroad. Kiewit finished that portion of the job on those three weekends, on time as promised.

"Working for Amtrak was awesome," said Project Engineer Brad Adrian. "We covered everything that we needed to, but it was just a more relaxed environment. They helped us out quite a bit, and we helped them out. They challenged us to be better contractors."

There were many complex challenges on this seemingly small project. In the end, the project turned out to be anything but small.



DOUBLE THE SAFETY MEASURES

Like all projects, the most important area of focus was safety. It was business as usual along the coastal railway corridor as the team worked alongside a live track to finish the project on time. There were 46 trains capable of speeds of 90 miles per hour, running only a few feet away from the work.

Every job always starts with the client's safety program. Everyone visiting the project or working on the project near the right-of-way had to take a North County Transit District Rail Safety Program — a two-hour safety training session that required a passing grade in order to work near the tracks.

The railroad also requires a flagger or an employee in charge (EIC), a person who works for the railroad to ensure people are working safely with the trains and tracks. The Kiewit team had three miles of Form B protection, which means that any train about to enter the project site area had to call the EIC to gain permission to enter.

The EIC is responsible for calling all the designated flaggers, who in turn are responsible for watching the

Tracking a partnership



Building more than just rail, Kiewit's Jim Holmes, left, and Amtrak's John Eschenbach have been building upon and maintaining a working relationship since the 1990s. The timeline track below depicts the accomplishments that led up to the duo's success in Carlsbad.



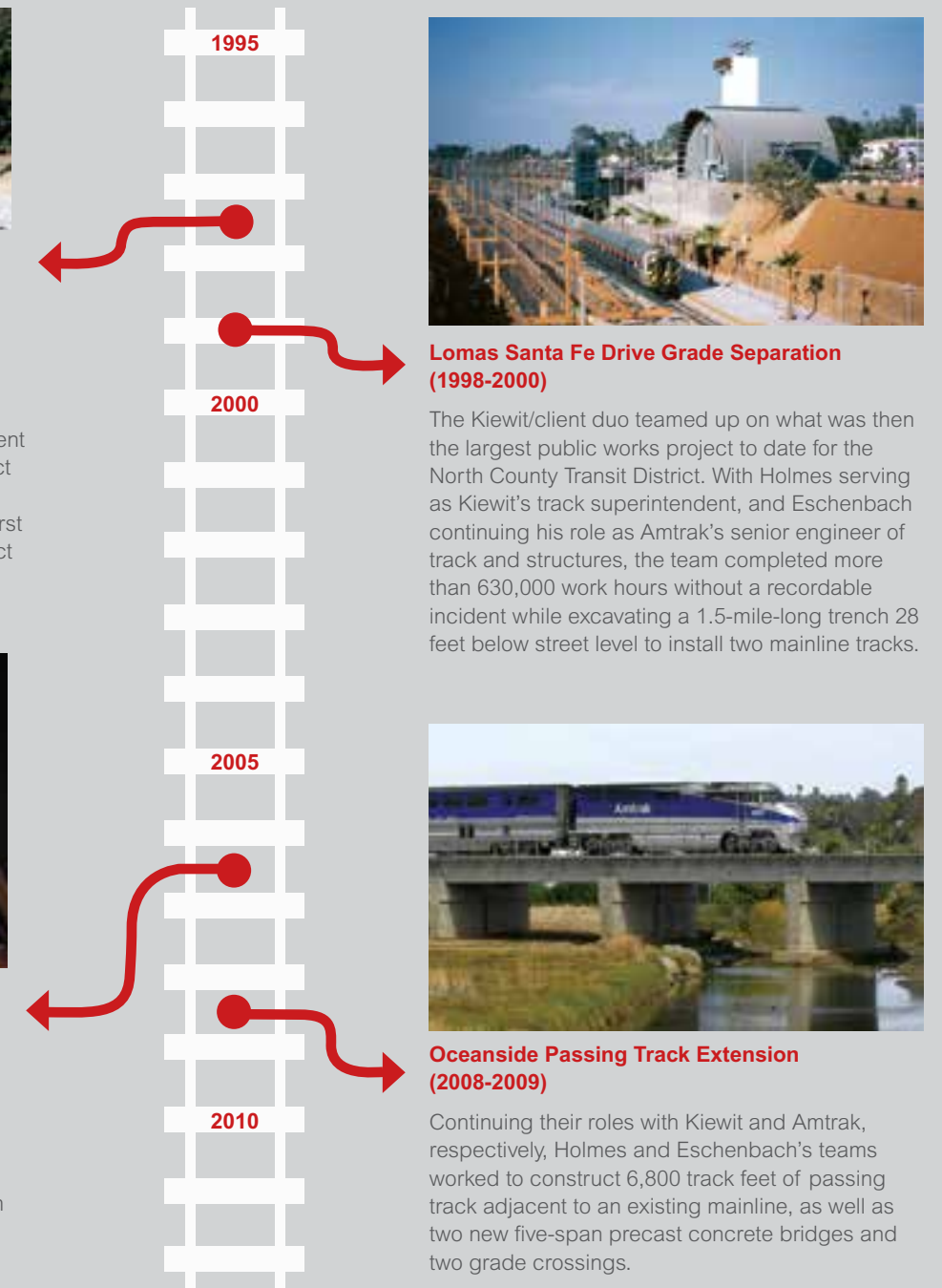
Stuart Mesa Second Track (1997-1998)

In Eschenbach and Holmes' first interaction together Eschenbach served as the senior engineer for track and structures, and Holmes was project manager of the installation of two miles of secondary mainline track awarded by the North San Diego County Transit Development Board. The turnouts implemented in this project were designed to handle 90 mph passenger traffic – the highest speed to its date. For the first time in Eschenbach's Amtrak career, the project was completed without a single change order.



O'Neil to Flores Second Main Track (2006-2007)

The track experts reunited once again to construct 10,200 track feet of second main track. Holmes once again served as Kiewit's project manager, with Eschenbach assuming the role of Amtrak's senior project director. As part of its environmental commitment, the team built noise wall barriers to protect breeding habitats for native birds.



Lomas Santa Fe Drive Grade Separation (1998-2000)

The Kiewit/client duo teamed up on what was then the largest public works project to date for the North County Transit District. With Holmes serving as Kiewit's track superintendent, and Eschenbach continuing his role as Amtrak's senior engineer of track and structures, the team completed more than 630,000 work hours without a recordable incident while excavating a 1.5-mile-long trench 28 feet below street level to install two mainline tracks.



Oceanside Passing Track Extension (2008-2009)

Continuing their roles with Kiewit and Amtrak, respectively, Holmes and Eschenbach's teams worked to construct 6,800 track feet of passing track adjacent to an existing mainline, as well as two new five-span precast concrete bridges and two grade crossings.

construction crews work on the right-of-way. The flaggers give the authorization to proceed once they know that the railroad tracks are clear of oncoming train traffic. The EIC performed this duty for every train that came through.

Both the railroad and Kiewit's safety programs were executed without question. Every employee on the job went home safely every day. In more than 45,000 manhours, the entire project didn't have one reportable or recordable injury.

"We were blessed with a lot of skilled craft workers and foremen on the job," said Stocklmeir, "including Aidan O'Kane, Bobby Pineda and Sergio Hernandez. Aidan was our foreman of the year for the Southwest District. He was very in tune with the safety program."

Along with the railroad safety program, the Kiewit team executed the Nobody Gets Hurt safety program, a company-wide initiative that ensures that management is fully behind the safety plan, employees are engaged at all levels and the right safety training is in place.

"I've been with Amtrak for almost 32 years," Albanese said. "I've seen a lot of programs, and I'm very pleased with Kiewit's safety program and how they drive it."

ENVIRONMENT

Some challenges the team faced complex and unfamiliar requirements, such as California's in-depth environmental regulations. Everything the Kiewit team did was closely monitored. The team was working right above an environmentally protected lagoon that had been designated by the State of California as a Risk Level 3 for sediment.

"Being from the Southwest District," Stocklmeir said, "we stepped out of our comfort zone and into something a lot more restrictive. We were very careful when we built the bridge to stay in line with all regulations."

To work next to the lagoon and ocean, Amtrak had to obtain around seven permits to start the project. Ordering basic items such as generators could take up to three months because they required special permits in California.


The equipment, which came from Utah, Arizona and Colorado, had to be specially permitted to meet California regulations. The team was required to know California's Storm Water Pollution Prevention plans, perform in accordance with the regulations and write the appropriate reports.

By far, the biggest environmental issue was working near a 1950s-era 48-inch sewer line. Directly beneath it sat a highly sensitive gas line that ran parallel with the existing and future railroad tracks. With any unplanned move, the team ran the risk of causing massive environmental problems.

"Building a new bridge with giant cranes and 100-ton girders within 30 feet of an exposed sewer line right over a lagoon and a 12-inch high-pressure gas line was probably the biggest risk on the job," Stocklmeir said. "The sewer line kept me up at night. If anything happened to crack or break it, that sewer water was going right into the lagoon."

Despite these hurdles, the team substantially completed the project in January — with the trains now running on both tracks.

"Everybody liked the finished track. The trains ran smooth, and the agency and our team was very happy with it," Albanese said.

"It's a friendship that's going to last a lifetime," added Adrian, about working with the Amtrak team. "We went fishing, had barbecues, visited each other's houses and played fantasy football. Hopefully, we will work with them again." 



The Kiewit team built three grade crossings, installed a turnout (turning one track into two) and two crossovers (which allow trains to switch from one track to another), installed casings on about 10 utilities, excavated more than 25,000 cubic yards along the railroad right-of-way, and built two different types of retaining walls more than a mile long.

Any track, any train, anytime

As with all Kiewit jobs, public safety is a primary concern – but when working on a project in the rail industry where the tracks are live, the crews' situational awareness for themselves and for the public needs to be at an all-time high.

Amtrak is no stranger to educating the public on safety when it comes to approaching the railroad tracks, and neither is the government. The Federal Railroad Administration, along with volunteers and railroads across the country, support the work of Operation Lifesaver.

Operation Lifesaver's mission is to end collisions, deaths and injuries at highway-rail grade crossings and on rail property through a nationwide network of volunteers who work to educate people about rail safety. Its outreach in education has helped reduce the number of train/motor vehicle collisions from a 1972 high of about 12,000 annual incidents, to a 2009 record low of about 1,900 incidents. For more information visit www.oli.org.



Source: www.oli.org



A WHOLE NEW
BUCKSKIN
KIND OF MINE

Significantly longer truck haul distances and deeper coal seams may prove too challenging for many mine operations. However, that is far from the case for Buckskin Mining Company, part of Kiewit Mining Group. This year, the mine has the opportunity to achieve record-setting volumes.



1. In 2012, the operation is estimated to move 97 million yards of overburden — the earth and rock layer above mineral deposits — to uncover and ship 24 million tons of coal.

“To move these all-time high volumes requires precise planning, efficient operations and reliable equipment,” said Kiewit Mining Group Area Manager Stephen Mullaney. “Two new powerful tools acquired in 2011, the Caterpillar MineStar System and Immersive Technologies PRO3 simulator training, will help drive results for 2012 and into the future.”

The new technology is impacting production and changing the way the mine is operated. Through MineStar, the amount of paperwork that a field superintendent has to perform has been greatly reduced, allowing more time in the field. Many of the daily field surveys can be downloaded off operating equipment into the mine-planning software, reducing the time engineers spend surveying the pit. The software, which uses GPS capabilities, links all 71 pieces of equipment together and gathers real-time information on the fleet 24 hours a day, seven days a week.

Not only does MineStar improve productivity through truck allocation, it can also monitor machine health on all Caterpillar equipment and operational delays. These functions will improve maintenance planning and enhance operating hours.

“With MineStar, we have much more consistent, accurate information on equipment tracking and component replacement,” said Brady West, mine manager. “That helps reduce equipment costs by better utilizing our truck fleets and support equipment.”

George Leupold, Buckskin’s manager of MineStar implementation, said the team had a vision of what they wanted in mine management computer software, and spent more than a year and a half evaluating their options.

“MineStar was the best fit because of our alliance with Caterpillar and it offered the most comprehensive package,” he said. “MineStar is going to play a huge role in reducing inefficiencies. This new technology is going to require a cultural shift for all employees. Every person has some involvement with the data that we are tracking and using in our decision making.”

The instantaneous data is critical for Buckskin’s fast-paced mining operation. Crews have to uncover what they ship daily. Coal is excavated, crushed, blended and shipped on the same day, with up to seven trains leaving Buckskin



1. Located outside of Gillette, Wyo., Buckskin Mining Company — a top 10 coal producer — sits deep within the Powder River Basin, an area known for its ample coal supply. 2. Among the equipment fleet at Buckskin is the Cat 797, one of the world’s largest trucks. The 797 has a haul capacity of 400 tons. 3. In a single 24 hour period, up to seven fully loaded coal trains will leave Buckskin.

MineStar’s Capabilities

Since implementing the Caterpillar MineStar system, even routine activities have evolved. For Kiewit’s MineStar Manager George Leupold, one example that comes to mind is how a superintendent performs shovel performance. Before MineStar, a superintendent

would use a stopwatch to time one shovel. Because Buckskin continually runs five shovels per shift, considerable time was involved to track all five independent shovels. Now, superintendents can get time studies for all shovels at a moment’s notice.



“We always know where we stand on performance as,” Leupold said. “We can instantly see the impacts of changes made in the field and provide the information to those that make decisions. MineStar does more than reduce inefficiencies, it provides awareness and better ensures individual operator accountability.”

MineStar ties directly into PRO3 Mine Simulator training, too. By itself, PRO3 simulator training:

- Enhances the operator’s response to emergencies through deliberate practice
- Reduces operator-induced errors
- Improves productivity through timely and precise placement of truck at loading tool and dump
- Reduces the amount of time required for new hires to become proficient operators



MineStar links all 71 pieces of equipment together, gathering real-time information on the fleet 24 hours a day, seven days a week. It also lets controllers view all aspects of mine operation in as it is happening.

“MineStar does more than reduce inefficiencies, it provides awareness and individual operator accountability.”

GEORGE LEUPOLD,
KIEWIT’S MINESTAR
MANAGER

Mine fully loaded each day. With MineStar, employees can use the real-time information and focus on value-added activities.

Combine those capabilities with MineStar, and PRO3 becomes a state-of-the-art training tool that can identify and correct individual operators' strengths and weaknesses. MineStar reports basic operator errors, such as engine overspeeds, abusive shifts and aggressive cornering. PRO3 then gives the identified drivers real-time practice tools to learn and rectify their mistakes.

"By combining the technologies, we can take experienced equipment operators and show them what they do well," said West. "We can also show them — from a neutral point of view — where they can improve their techniques to

increase machine efficiency and equipment reliability.

The results of the training have been almost immediate. Within two months of implementing PRO3 training, there was a 50 percent reduction in operator errors.

"We have been seeing major improvements," said Matt Young, operations manager. "We are using our simulator to make us better operators and help us get more component life out of our trucks and other equipment. We now have the ability to tailor our training focus on each individual operator."

With PRO3, trainers are able to take information from MineStar to the simulator, working one on one with operators in a controlled atmosphere. Trainers even have the ability

to mirror tricky operator conditions, such as driving a loaded 797 haul truck down a snowy ramp. PRO3's portability is another plus: The simulator can travel to any Kiewit site for training.

A CATERPILLAR GLOBAL MINING WORLD-CLASS OPERATION

The Maintenance Department's role has been immeasurable in helping Buckskin be named one of only six mines in the world to receive the coveted World-Class Operation designation from Caterpillar Global Mining.

"Contamination control, training, planning, housekeeping, parts storage and shop setup all play a role in acquiring the distinction," Mullaney said. "But our drive for continuous improvement did not stop with this highly acclaimed distinction.

"Buckskin has continued to push forward for higher productivity and lower costs to ensure we reach the challenging 6,800 operated hours per year per truck."

Instead of redesigning the department's program, Maintenance Manager Ronald Burr and his team focused on the methods they used. Burr dedicated two full-time crews to do nothing but preventive maintenance. In year's past, the team combined the backlog and preventive maintenance duties. Now, they have separated the two and added a structured order to the preventive maintenance tasks.

As a result, they reduced their preventive maintenance times by 50 percent — and achieved their two-month reduction goal within three weeks.

"We streamlined the process and assigned superintendents to oversee it," Burr said. "The impact has been huge. With our former program method we were struggling to keep up. Now we are ahead of schedule, which helps overall scheduling and production because they know exactly when the equipment will be brought into the shop and when it will return to the field operations."

DISCOVERING THE BEST AND THE BRIGHTEST PROFESSIONALS

Customers and coal sales are not the only things mines in the Powder River Basin compete for. Wyoming hosts the nation's top 10 producing coal mines, allocating

Huge reductions in two months or less

Some may argue that, at Buckskin, two months is the magic period of time to make remarkable things happen.

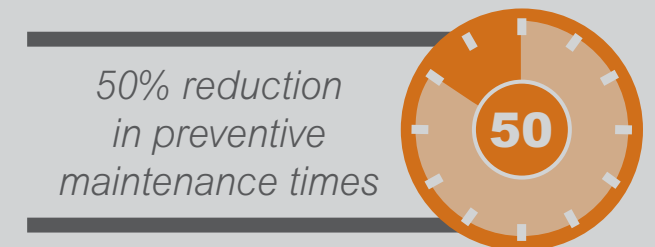
Within two months of implementing PRO3 simulator training, there was a 50 percent reduction in operator errors in the mine — from abusive shifts to engine overspeeds.

The World-Class Operation Maintenance Department set a two-month goal to reduce its preventive maintenance times by 50 percent. Within three weeks, the team already surpassed that goal.

A Day in the Life of Coal

Coal at Buckskin is shipped the same day as it is excavated. Buckskin loads up to seven trains per day, with a nominal average of five daily depending on contracted annual customer tonnage.

- 1 Coal is mined from the pit and loaded into truck.
- 2 Coal is hauled to an onsite hopper, sized in a secondary crusher, analyzed in the lab and stored in silos.
- 3 Coal is blended as needed according to customer contract specifications as it is loaded into rail cars and then shipped to various final destinations.



“Now is an exciting time to be at Buckskin. We have new technologies; new methods and we are not going with the status quo. We are not letting the fear of making a mistake prevent us from trying new things.”

MATT YOUNG,
OPERATIONS
MANAGER

nearly 40 percent of the nation's coal supply and providing fuel for 20 percent of domestic electric power generation.

While many cities were plagued by recent recessions, Gillette, Wyo., continued to prosper — in large part due to surrounding mines like Buckskin. Consequently, mines have had to compete to find talented employees.

“In the Powder River Basin, it can be very difficult to get skilled mechanics,” Burr said. “The recession has not hit us as hard as many other places in the country. There are numerous jobs and the competition is high.”

One-third of Burr's crew consists of seasoned mechanics with 10 to 20 years of experience. He relies heavily on these individuals to mentor newer mechanics. He often looks to Montana State University-Northern (MSUN) in Havre to help recruit talent.

“The students out of MSU-Northern have been great,” he said. “They have sound mechanical training and we teach them the Kiewit way.”

With one-third of his team consisting of seasoned mechanics, and one-third being alumni from MSUN, Burr said he had to change his thinking when it came to finding additional skilled professional mechanics. He decided the answer was to create a training program to develop professional mechanics. Burr brought on a full-time mechanic trainer and hired local workers with a passion and dedication to learn. All three methods of recruitment have paid off in leaps and bounds.

“The secret to any organization is that you have to constantly change and look to continuously improve your operation,” he said.

Change and continuous improvement appear to be the theme at Buckskin Mine for 2012 and into the future.

“The fact that we have such a great workforce open to change is a testament to our success and it will continue to make us successful,” Young said. “Now is an exciting time to be at Buckskin. We have new technologies; new methods and we are not going with the status quo. We are not letting the fear of making a mistake prevent us from trying new things.”

And it is that passion and boldness that will continue to propel Buckskin Mine.

“Our people and their drive toward excellence, along with Kiewit's willingness to invest in innovation and technology, are helping Buckskin be a successful producer in the competitive Powder River Basin,” Mullaney said. “We have our challenges, but with our sights on continuous improvement, we at KMG lay our claim to being the best miners on Earth.”





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