



www.apai.net

The Right Tool for the Job

Part 2 of 2 part series

This is the second in a two-part series on finding the right rehabilitation method for a particular street or highway project. Part 1 in the series (available by clicking here) described the Straight Overlay, the Mill and Fill, and the use of the Asphalt Interlayer rehabilitation methods. This article will evaluate the use of cold-in-place recycling, crack and seat, rubblization and full-depth reclamation.

Cold-in-Place-Recycling (CIPR). The use of cold-in-place recycling or CIPR is a great Iowa success story. The process was originally adopted by some Eastern Iowa County Engineers to prolong the lives of their hot-mix asphalt (HMA) pavements. However, this process

Cold-in-Place Recycling utilizes 3-4 inches of existing HMA *in-situ* to create a flexible bond breaker between the existing roadway and a new HMA overlay. The process requires the use of a specialized contractor that brings in a CIPR "train". The train consists of an



HMA milling machine that cuts the roadway to the desired depth, the millings are conveyed to a crusher where they are sized and, if necessary, crushed further; the millings are then coated or foamed with a hot asphalt emulsion and then conveyed back on the road and placed through an asphalt paver. The CIPR material is compacted with both rubber tire and

has been so successful in prolonging the life of the low volume HMA and composite pavements that it has been brought forward successfully by the Iowa DOT for use on several high-volume, high truck traffic roadways.

steel drum rollers, and is opened to traffic. The CIPR material is allowed to cure for approximately 10-14 days or until the CIPR material reaches 2.5% moisture content. The CIPR is overlaid with 3-5" of traditional HMA.

(Continued Page 3)



Tales from the Road

Doing the Right Thing

My son Henry, age 7, and I were shopping for a Christmas present for his mother in late December (yes, I'm that guy) when we came across a rather unique looking shop in the mall run by a nice Chinese man. This shop had everything a seven-year-old would find fascinating including swords, lava lamps, Chinese throwing stars and beautifully carved Buddha. It reminded me of the shop where the guy bought the Mogwai in the movie "Gremlins". Henry selected a small Buddha statue for his mother that sold for \$3.99. Henry had somewhere in the range of five dollars in his pocket. He took the Buddha to the man who was extremely pleased to see he had chosen the Buddha and exclaimed, "Buddha will bring you very good luck!" As Henry attempted to count out enough change to pay for the present the man exclaimed, "Buddha brings you good luck today - he only cost \$3.00!", and he gave Henry a dollar bill back. "That is good luck", I tell him as we left the store and thanked the man. Henry was absolutely beaming.

As we continued to walk through the mall, we came upon this beautifully dressed older woman playing the piano in the causeway. Without prompting,

(Continued Page 2)

Inside This Issue

Upcoming Events.....	2
Darwin Larson Joins APAI Staff.....	3
GIAC at a Glance	4
APAI Welcomes New Members	6

Upcoming Events

(Click event for more information)

NAPA Annual Convention

Date: January 25-29, 2015
Location: Marco Island Marriott
Marco Island, FL

[Click here for more information.](#)

Iowa Night: January 26, 7:00 p.m.

AMPP Short Course:

Intro to Performance Based Testing and Trouble Shooting the Mix

Date: February 18-19, 2015

2015 Greater Iowa Asphalt Conference & Equipment Show

Date: March 4-6, 2015
Location: Holiday Inn Convention Center
Des Moines, IA 50312

[Click here to register.](#)

World of Asphalt

Date: March 17 - 19, 2015
Location: Baltimore, MD

APAI Eastern Iowa Golf Outing

Date: June 23, 2015
Location: Iowa City, Iowa

NAPA Mid-Year Meeting

Date: July 13-15, 2015
Location: Denver, CO

APAI Summer Meeting

Date: July 23-24, 2015
Location: Dubuque, IA

APAI Western Iowa Golf Outing

Date: August 25, 2015
Location: Denison, IA

APAI 60th Anniversary Annual Convention

Date: December 2-3, 2015
Location: West Des Moines Marriott

(Tales from the Road – Cont. from Page 1)

Henry walked up and placed the dollar bill in the ladies jar and told her thank you. Now I was beaming. She paused in her playing to say “Thank you and Merry Christmas, young man.” More beaming all

the best in the nation. This success does not occur in a bubble. The partnership and trust with the Iowa DOT is the underlying factor of this success. The adoption of Quality Management Assurance (QMA) in the mid-1980’s placed the burden of mix design and quality control on the contractors and the quality of the asphalt mixtures and roadways increased exponentially. This trust between the contractor and the agency it serves is built from doing the right thing, every time, on every road. Do we fall down, do we fail to do the right thing every time? Yes we do, but these



failures are not tolerated by contractors’ foremen, superintendents or owners. We need to insure that this commitment to quality and excellence is passed forward to the new men and women that enter our industry. Please teach them that “Doing the Right Thing” is a proud tradition of Iowa Asphalt.

around. Doing the right thing isn’t always so immediate or tangible but it does always lead to that feeling of pride. The backbone of Iowa’s asphalt industry’s success has always been the desire of its people to do the right thing even when no one is watching. Iowa’s asphalt contractors have been finalists for the Sheldon G. Hayes Award, awarded for the best asphalt project in the nation, nine times in the past thirteen years, and have won the award three times. This isn’t just a single contractor being nominated, but five different contractors from tiny Iowa. The fact is Iowa’s asphalt contractors are

Smoother is Better.

Bill Rosener

WE
CANT
AFFORD
TO
WAIT
.COM

PAID FOR BY IOWA GOOD ROADS ASSOCIATION



(The Right Tool for the Job – Cont. from Pg. 1)

Although the cold-in-place recycling rehabilitation method adds additional time and costs to a project, it does offer two distinct advantages: 1. It is an extremely “green” construction method, all materials are recycled *in situ* with only additional asphalt cement added to the CIPR materials. 2. The CIPR process has proven over time to add 3-5 years of performance life to roadways by delaying, or eliminating, reflective and thermal cracking. A definitive treatise on CIPR was written by APAI Field Engineer, Royce Fichtner, PE entitled “Cold-in-Place Recycling: The Mystery Unveiled” for the Summer edition of the *Iowa Asphalt Report*.

Crack and Seat, Rubblization and Modified Rubblization: In addition to the traditional crack and seat, and full rubblization processes, a new hybrid of this process has been added known as a “Modified Rubblization” or “Break and Seat”. All three processes are used to rehabilitate failing PCC pavements by turning the rigid PCC pavement into a flexible base for the HMA overlay. The difference between these processes lies in the severity of the cracking process, the selection of appropriate pavements, and the depth of the final HMA overlay. The Crack and Seat process utilizes a specialized concrete breaker to fracture the concrete roadway into approximately 36" squares. Crack and seat is best used on structurally “good” PCC roads with limited panel movement. Its primary purpose is to help limit or retard reflective cracking through the HMA overlay. To limit damage to utilities and curb lines, it is recommended to saw cut along curbs, manholes and water valves. Once a short stretch of the roadway has been cracked, a water truck sprays the area and as the street begins to dry, the cracking pattern will become evident. It is recommended that the engineer and the representative of the cracking contractor have a discussion on any changes that may be needed before proceeding with the cracking of the remainder of the project. All roadways

Darwin Larson Joins APAI Staff

The APAI is proud to announce that Darwin Larson, former Chief Design Engineer for the City of Des Moines, has joined the APAI Staff as Municipal Field Engineer. Darwin recently retired after serving the City of Des Moines since 1979. During his career with the City of Des Moines, he served in the Design and Construction Division of the Engineering Department, the Public Works Department, and the City’s Storm Water Utility. He received his Bachelor of Science degree in Civil Engineering from the University of Minnesota in 1976 and became a registered professional engineer in 1980. Darwin’s experience with the city included the design and construction of 100’s of projects ranging from small park projects to large transportation projects. His extensive and varied experiences can assist you in making technically sound and cost effective decisions on your municipal project. Please congratulate and welcome Darwin at darwinl@apai.net.



react differently and it is **imperative** to listen to the cracking experts.

The road is then “seated” by driving a heavy roller over the cracked roadway. The crack and seat specification suggests utilizing a 50 ton roller for this process, but experience has shown that a 20-30 ton roller is more than adequate to seat the pavement. Any failed areas will need to be excavated and replaced with an HMA patch. The roadway is then cleaned and overlaid with 3"-5" of new HMA.

Rubblization should be utilized on projects with severe deterioration of the PCC, major faulting of the PCC panels and / or “D” cracking. It is also recommended that rubblization should not be used on urban roadways unless they are of rural design. Rubblization breaks a poorly performing PCC roadway into an interlocking grid of 4" nominal sized PCC platform to build a new HMA roadway. Once the road has been rubblized it is compacted using a Z-grid roller to seat the material in place. Recent rubblization projects in Iowa have included the use of 2"-3" of ¾" roadstone interlayer to provide a construction platform for the asphalt

overlay. (Click here to review the Fall 2012 *Iowa Asphalt Report* for more information on Rock Interlayer.) Rubblization projects typically receive 5"-8" of HMA over the rubblized roadway depending upon the traffic loading.

Modified rubblization has become increasingly popular in Iowa over the past ten years. It blends the principles of both crack and seat and full rubblization in reducing reflective cracking by cracking the roadway to approximately 12"-18" squares while reducing the risk of catastrophic failures that may occur during full rubblization projects. This process also may incorporate the use of the rock interlayer to reduce reflective cracking and provide a construction platform. Typical modified rubblization projects use 4"-8" of new HMA overlay depending upon traffic loading.

Full-Depth Reclamation. Full Depth Reclamation, or FDR, is an excellent rehabilitating method for roads that have been hodge-podged together or for roadways with moderate to severe subgrade issues. This method

(Continued Pg. 7)

IOWA ASPHALT REPORT

GREATER IOWA ASPHALT CONFERENCE

& EQUIPMENT EXPO

WEDNESDAY, MARCH 4 - FRIDAY, MARCH 6, 2015

AIRPORT HOLIDAY INN, 6111 FLEUR DRIVE, DES MOINES, IA

WEDNESDAY, MARCH 4, 2015

- 11:30 a.m. - 4 p.m. Registration - Airport Holiday Inn, Fleur Drive, Des Moines, Iowa
- 1 - 4 p.m. Optional Pre-Conference Workshop: "5 Practices of Exemplary Leadership"
\$125 per person - FREE for Greater Iowa Asphalt Conference registrants
- 1 - 4 p.m. Optional Pre-Conference Workshop: "Safety is Priority #1"
\$125 per person - FREE for Greater Iowa Asphalt Conference registrants
- 1 - 4 p.m. Iowa DOT Update for Technicians
FREE to those needing to update their HMA Certification
- 5:00 - 7 p.m. Working Man's Break at the Equipment Expo Opening
Sponsored by APAI

THURSDAY, MARCH 5, 2015

- 8:00 a.m. Registration and Continental Breakfast
- 9:00 Morning Session - Welcome and Opening Remarks -
Bill Rosener, Executive Vice President, APAI
Darren Woodson - ESPN NFL analyst and 3X Super Bowl Champion with Dallas Cowboys
- 10:00 Refreshment Break at the Equipment Expo (Iowa Hall)
- 10:30 The Future of Asphalt - Steve Hourscht & Tom Dittmer from Caterpillar Paving Products
The Future is Bright - Paul Trombino III, Director Iowa DOT
- 12:00 p.m. APAI Smoothness Awards Luncheon (Banquet Room)
Mitch Dillavou and Scott Dockstader, Iowa DOT, Presenting
- 1:30 Afternoon Breakout Sessions I
- | | | | |
|---|--|----------------------------------|---|
| Track A
Plant Operations:
Troubleshooting the Mix | Track B
Road Rehab Clinic:
Pavement Rehabilitation | Track C
The Future of Asphalt | Track D
Leadership Track:
Conflict Resolution |
|---|--|----------------------------------|---|
- 3:00 Refreshment Break at the Equipment Expo (Iowa Hall)
- 3:30 Afternoon Breakout Sessions II
- | | | | |
|--|--|---|------------------------------|
| Track A
Paving for Success
Pavement Preservation | Track B
Road Rehab Clinic:
Counties & Municipalities | Track C
Pavement Asset Mgmt for
Skill Development | Track D
Leadership Track: |
|--|--|---|------------------------------|
- 6:00-8:00 Reception at the Equipment Expo

FRIDAY, MARCH 6, 2015

- 6:30 a.m. Continental Breakfast (in Courtyard Atrium)
- 7:45 a.m. Prize Drawing during Breakfast (must be present to win)
- 8:00 a.m. Review of Asphalt Research 2015 - Drs. David Lee, University of Iowa, &
Chris Williams, Iowa State University
The Asphalt Industry: Past, Present and Future
- 9:45 a.m. Refreshment Break
- 10:00 a.m. Most Interesting Asphalt Projects in Iowa
- 11:30 Grand Prize Drawings (must be present to win)
- 11:45 Adjourn

IOWA ASPHALT REPORT

REGISTER NOW!

GREATER IOWA ASPHALT CONFERENCE

& EQUIPMENT EXPO

MARCH 5-6, 2015

PRE-CONFERENCE MARCH 4, 2015

Greater Iowa Asphalt Conference
Des Moines Airport Holiday Inn • 6111 Fleur Drive

SIGN ME UP!
**REGISTER
NOW!**

SPONSORED BY

IOWA STATE UNIVERSITY

IOWA STATE UNIVERSITY
Institute for Transportation

Iowa Department
of Transportation



ASPHALT PAVING
ASSOCIATION OF IOWA



CONFERENCE HIGHLIGHTS:

- Keynote Speaker: Darren Woodson, ESPN Analyst and 3X Super Bowl Champion
- Inaugural GIAC Equipment Expo
- Most Interesting Asphalt Projects in Iowa
- The Future of Asphalt
- Developing Leadership in your Employees
- Great Networking Opportunities
- Road Rehab Clinic: Preservation and Rehabilitation
- Fabulous Prizes!
- Pavement Asset Management for Cities and Counties
- Safety is Priority #1
- Designing and Constructing the Perfect Project
- 2014 APAI Quality Construction Awards
- Iowa DOT Technicians Update
- Innovative Asphalt Research Projects
- Surprise Special Guests

APAI Welcomes New Members

APAI continues to add new members. At their last Board Meeting, the Board of Directors elected three Associate Members and one Associate Member: Consulting Engineers to the Association. Thank you to those who have helped recruit these new members.



Soil-tek is the Midwest's largest provider of Erosion & Sediment Control Installation and Storm Water Pollution Prevention Plan (SWPPP) Management Services. Soil-tek is headquartered in Des Moines Iowa, and has offices in Iowa City, Kansas City, and Omaha.

Soil-tek's SWPPP Management Services Division provides Inspections, Administration and Reporting Services to keep their clients compliant with EPA Phase II Storm Water Regulations.

Soil-tek's team of professionals can help reduce your risk of fines from violations of local, state, or federal ordinances. Soil-tek's Storm Water inspectors are highly trained, certified and equipped with the latest software technology. Their Web based software allows their clients and inspectors to monitor the compliance status of all of their projects. Soil-tek currently manages over 450 projects in Missouri, Kansas, Iowa Nebraska and Illinois.



Ritchie Bros. Auctioneers is the world's largest auctioneer of equipment both on-site and online. They were established in 1958 with a head office in Vancouver, Canada. Ritchie Bros. has more than 40 auction sites across 13 countries and they handle hundreds of unreserved public auctions each year.

Every day, all over the world, tens of thousands of people find, inspect, buy, finance, protect, ship, appraise, refurbish or sell equipment through Ritchie Bros. They are a full-service company, and are committed to delivering solutions that make it easy for the customer to buy and sell equipment with confidence.



Rexco Equipment, Inc. was founded in 1964 by Rex Smith Sr. and his wife Mildred. They started with 26 counties in

eastern Iowa selling and servicing the Link-Belt crane account, whom Rex had worked for in various positions for 23 years, (including 6 years as national sales manager), before deciding to open his own dealership.

Rexco eventually expanded their territory and added new facilities with Des Moines in 1976 and Davenport in 1989 and most recently a branch in Gretna, Nebraska. Rexco is the oldest Link-Belt crane and excavator dealer in the country. In conjunction with Link-Belt, Rexco is a dealer for companies such as Elliott, Genesis, Rogers, and Sakai.

In 1985 Rexco also branched out into the compact equipment sector with Lines that Include Bobcat, Kubota, and ExMark. The company currently operates 4 Bobcat dealerships in the Cedar Rapids, Iowa City, Quad Cities and Burlington 2008 areas.

Please welcome these new members and show your support for them, by contacting them and utilizing their services. To find contact information for these members, go to www.apai.net/members.aspx.



National Minerals Company (NMC) was formerly a division of GRT, Inc. NMC is a supplier of flyash and C-stone that services Iowa. They have sources in Minnesota, Wisconsin, and Iowa. For service information contact Aaron Kjolhede at 844-454-5400.



Dynapac/Atlas Copco is a company dedicated to sustainability. Originating in 1873, Atlas Copco has a 140 year tradition of innovating for sustainable productivity. Their products and services include compressors, vacuum solutions and air treatment systems, construction and mining equipment, power tools and assembly stems. Their customers are located in more than 170 markets, with their own sales operations in more than 80 countries. They have production facilities in more than 20 countries. Dynapac provides a selection of rollers and pavers to the Asphalt industry. Atlas Copco is pleased to have Road Machinery & Supplies as their Iowa market representative.

(The Right Tool for the Job - Cont. from Pg. 3)

utilizes a reclaimer or pulverizer to blend the existing road, aggregate base and sometimes dirt subgrade to create a strong and homogenous base course in which to build a new roadway.

Many low volume roads in Iowa began as gravel roads, were seal-coated for many years and may eventually have been overlaid with a thin lift of asphalt. As traffic volumes increased, the road was

added in conjunction with the cementitious materials, or if the existing roadway section to be reclaimed is mainly bituminous materials, it may be the only additive needed to reach stabilization. FDR is also extremely useful when widening roadways to increase the roadway top and increase the safety of the road. Once the roadway has been reclaimed, it is shaped using a motor grader to achieve proper



patched and spot overlays were used to strengthen the road. However, the time has come to create a stronger base to support the increased traffic volumes. FDR would be an excellent choice for this roadway and still receive the value of the materials already in place on the road. Reclaimers are generally able to reclaim or blend materials from a depth of 8" to 18". Depending on the depth of the blend, the existing roadway materials, and the subgrade stability; different additives can be blended into the reclaimed materials. Dry cementitious materials such as fly-ash, C-stone, lime screenings, or Portland cement can be incorporated in the reclaimed material to make a stable and homogenous subgrade. Asphalt emulsions or foamed asphalt can be

slope and is compacted with a steel drum roller, or, if needed, a sheep's foot roller may be added. The prepared road base is then overlaid with a structurally designed depth of hot mix asphalt dependent upon traffic volumes.

Summary

This series has examined the myriad of ways in which asphalt or composite (asphalt over PCC) pavements may be rehabilitated. The ease, the speed, and the environmental advantages allow asphalt roads the privilege of being "The Right Choice" for your next roadway project. For more information and/or consultation on any of these rehabilitation methods, please contact the Asphalt Paving Association of Iowa at 515-233-0015 or at apai@apai.net.

APAI Members

CONTRACTOR MEMBERS

Aspro, Inc., Waterloo
Barkley Asphalt, Sioux City
Blacktop Service Company, Humboldt
Determann Asphalt Paving, L.L.C., Camanche
Duininc Inc., Prinsburg, MN
Fort Dodge Asphalt Company, Fort Dodge
Gee Asphalt Systems, Inc., Cedar Rapids
General Asphalt Construction Company, Davenport
Grimes Asphalt & Paving Corp., Grimes
Hansen Asphalt, Inc., Iowa City
Heartland Asphalt, Inc., Mason City
Henningsen Construction, Inc., Atlantic
Illowa Investment, Inc., Blue Grass
Kluesner Construction, Inc., Farley
Knife River Midwest, L.L.C., Sioux City
Koss Construction Company, Topeka, KS
Manatt's, Inc., Brooklyn
Mathy Construction Company, Onalaska, WI
River City Paving, Dubuque
McCarthy Improvement Company, Davenport
Midstate Reclamation, Inc., Lakeville, MN
Norris Asphalt Paving Company, Ottumwa
Oldcastle Materials Group
Cessford Construction Company, LeGrand
Des Moines Asphalt & Paving Company, Des Moines
Omni Engineering, Omaha, NE
Tri-State Paving, Inc., Estherville
L. L. Pelling Company, Inc., North Liberty
Shamrock Construction Company, L.L.C., Coralville
Sta-bilt Construction Co., Harlan
Tri-City Blacktop Inc., Bettendorf
Valley Construction, Rock Island, IL
Western Engineering Company, Inc., Harlan
W.K. Construction Co., Middleton, WI

SUPPLIER MEMBERS

Bituminous Material & Supply Company, Inc., Des Moines
Flint Hills Resources, Dubuque
Jebro, Inc., Sioux City

AGGREGATE SUPPLIER MEMBERS

BMC Aggregates, L.C., Elk Run Heights
Concrete Materials Co., Sioux Falls, SD
L. G. Everist, Inc., Sioux Falls, SD
Hallett Materials, Des Moines
Martin Marietta, Des Moines
Schildberg Construction Company, Greenfield
Wendling Quarries, DeWitt

ASSOCIATE MEMBERS

Advanced Drainage Systems, Stuart
Ahrold Fay Rosenberg, Inc., Des Moines
Akzo Nobel Surface Chemistry, Chicago, IL
Altorfer, Inc., Cedar Rapids
Antigo Construction, Inc., Antigo, WI
Astec, Inc., Chattanooga, TN
Barnhill & Associates, West Des Moines
James W. Bell Company, Inc., Cedar Rapids
Bituminous Insurance Company, West Des Moines
BOMAG Americas, Kewanee, IL
Bonnie's Barricades, Inc., Des Moines
Burroughs Consulting Group, Hiawatha
Capital City Equipment Co., Des Moines
Central Service & Supply, Inc., Ankeny
Clarence Richard Company, Minnetonka, MN
Coleman-Moore Company, Des Moines
Construction & Aggregate Products, Des Moines
Construction Materials Testing, Des Moines
CWMF, Corp., Waite Park, MN
Cylosoft, Inc., Ames
Dahl Trucking, Inc., Elmore, MN
Denco Highway Construction, Mingo
Dynapac (Atlas Copco), Andover, KS
J.D. Donovan, Inc., Rockville, MN
Edwards Contracting Ltd., Hampton
Elite Flagging, Inc., Cedar Rapids
Flagger Pros USA, L.L.C., Ames
Fusion / Cryogenic Engineering, Cedar Rapids
Gencor Industries, Inc., Orlando, FL
Glendandy Marketing & Advertising, Ames
Heuss Printing, Inc., Ames
Holmes Murphy & Associates, West Des Moines
Housby / VOCON, Des Moines
Humboldt Manufacturing Company, Schiller Park, IL
Iowa Parts, Inc., Cedar Rapids
Iowa Plains Signing, Slater
IronPlanet, West Des Moines
Jerico Services, Inc.
Jim Hawk Truck Trailers, Inc., Altoona
Kwik Trip, Inc., LaCrosse, WI
La Mair-Mulock-Condon Company, West Des Moines
Logan Contractor Supply, Urbandale
Manhole Adjustable Riser Company, Oskaloosa
Maxam Equipment Inc., Kansas City, MO
MeadWestvaco Corporation, North Charleston, SC
Merchants Bonding Company, Des Moines
Mid-Iowa Enterprises, Inc., Ames
Midwest Tennis & Track, Denison
Modified Asphalt Solutions, Inc., West Des Moines

Ron Monson and Sons, Britt
Murphy Tractor & Equipment Company, Inc., Wichita, KS
National Minerals Company, Eagan, MN
Olson Brothers Sodding and Landscaping, Marion
Principal Financial Group, West Des Moines
QPR, Alpharetta, GA
Quality Striping, Inc., Des Moines
Quality Traffic Control, Inc., Des Moines
Quick Supply Company, Des Moines
R2R Recycling, L.L.C., West Des Moines
Rexco Equipment, Inc., Cedar Rapids
Ritchie Bros. Auctioneers, Medford, MN
Road Machinery & Supplies, Des Moines
RoadSafe Traffic Safety, Inc., Des Moines
Roadtec, Inc., Chattanooga, TN
Sakai America, Inc., Adairsville, GA
Save and Pave, Sioux City
Save Our Sewers, Inc., Cedar Rapids
Scott Van Keppel, Cedar Rapids
Soil-Tek, Grimes
Star Equipment, Ltd., Des Moines
S.T.A.T.E. Testing, L.L.C., East Dundee, IL
3M Company, Omaha, NE
Tarmac, Inc., Blue Springs, MO
Titan Machinery, Des Moines
Unique Paving Materials, Cleveland, OH
Valley Distribution, West Burlington
Valley Environmental Services, Newton
Walker Construction Company, Emporia, KS
Waste Commission of Scott County, Buffalo
Weiler, Knoxville
Wells Fargo Bank, Des Moines
Whitfield & Eddy, P.L.C., Des Moines
Wirtgen America, Inc., Antioch, TN
XL Specialized Trailers, Inc., Manchester
Ziegler, Inc., Des Moines

CONSULTING ENGINEERS

Anderson-Bogert Engineers & Surveyors, Inc., Cedar Rapids
Bolton & Menk, Ames
Calhoun-Burns Associates, West Des Moines
Clapsaddle-Garber Associates, Marshalltown
FOTH, Cedar Rapids
Fox Engineering Associates, Ames
French-Reneker-Associates, Fairfield
Debra S. Haugen, LLC, Minneapolis, MN
HGM Associates, Inc., Council Bluffs
I & S Group, Storm Lake
IIW, P.C., Dubuque
JEO Consulting Group, Inc., Carroll
McClure Engineering, Clive
Terracon, Cedar Rapids
Veenstra & Kimm, West Des Moines