

CONTRACTOR[®]

THE NEWSMAGAZINE OF MECHANICAL CONTRACTING

Michigan's largest geothermal system cuts HVAC costs by 35%

BY CANDACE ROULO
OF CONTRACTOR'S STAFF

SAGINAW, MICH. — Saginaw Valley State University (SVSU) here is home to the largest closed-loop geothermal pond system in the state of Michigan. Built into a 6.75 acre, 2.2-million gal. retention pond with an average depth of 13-ft., the geothermal system will heat and cool the university's Crystal M. Lange Health and Human Services building, scheduled to be completed this summer, and is expected to cut total building energy costs by approximately 35% per year — an estimated \$63,000 per year in energy savings.

The geothermal pond system will not only heat and cool the new building, it will also be connected to an adjoining building, plus have the ability to heat and cool future campus buildings. SVSU

has an existing addition 7 acre south pond and is estimated to have 700 tons of additional capacity for future heat pump expansion, and two additional glycol lines have been installed for future building projects.

"The geothermal system is installed interconnecting to the adjoining Regional Educational Center building's pipes, so on lighter loads the geother-

mal can serve both systems with better energy efficiencies without firing the boilers and chillers in the Regional Educational Center," said Wayne Kerbelis, mechanical engineer and principal of Peter Basso Associates Inc., Troy, Mich., the project's consulting engineering firm.

"The SVSU Health Science
▶ Turn to Michigan, page 10



The concrete vault, now underground, houses the piping manifolds.

Water shortages, reuse in contract

BY ROBERT P. I
OF CONTRACTOR'S STAFF

SAN FRANCISCO — In the few years that a drought is being stated in the water industry, green guru Jerr the Mechanical Association of

nual convention here in late March.

Why water? Water is blue gold, Yudelson said.

Various green standards and the standards from the American Society of Heating, Refrigerating & Air-Conditioning Engineers, such as Standard

▶ Turn to Water, page 6

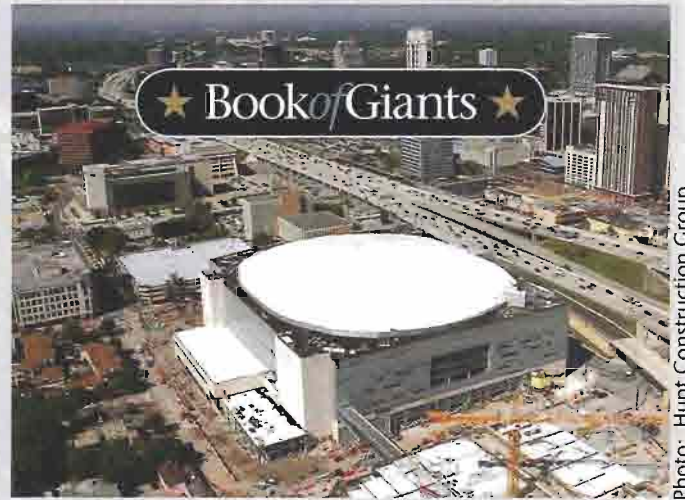


Photo: Hunt Construction Group

Fasten your seatbelts

IF LARGE mechanical contractors thought 2009 was a challenging year, 2010 will be even more difficult as the markets on which they depend — hotels, office buildings and industrial work — hit bottom. Only four CII markets are predicted to be up this year: healthcare, educational, public safety and transportation. The Federal government, utilities and large data centers are among the few active customers.

At least one significant mechanical exec predicts a major shakeout in contractor capacity as those firms that took jobs for cash flow lose their shirts and go out of business. A lack of credit and a dearth of small jobs means few startups will take their place.

In order to live to fight another day, contractors will have to right-size, focus on BIM, and find ways to save customers energy and money.

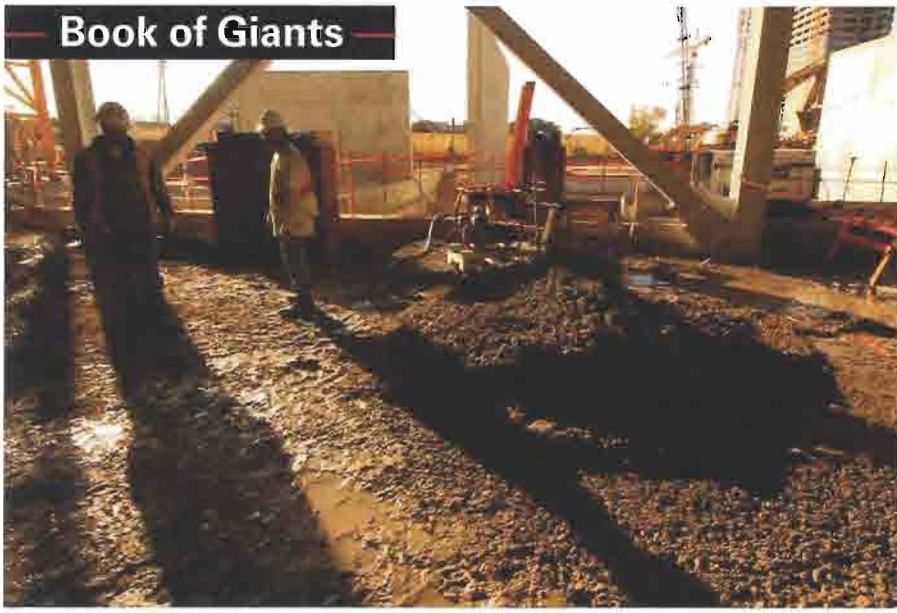
Our Book of Giants coverage begins on page 26.

Most profitable Giants

Most of the Giants decline to answer the net profit question and those who do are often not the largest. Here are the nation's most profitable large mechanical contractors and the top managers who produce the best bottom line results.

RANK	COMPANY/LOCATION	TOP EXECUTIVE	NET PROFIT
42	Coastal Mechanical Services Group, Melbourne, Fla.	Paul J. Goodwin III, President	14.30%
110	Century Mechanical Contractors Inc., Ft. Worth, Texas	Rod Campbell, President	13.00%
54	Titan Contracting & Leasing/Horn Cos., Owensboro, Ky.	Michael E. Horn, President/CEO	10.00%
126	J.A. Croson LLC, Sorrento, Fla.	Dave Croson, CEO	9.52%
71	AZCO Inc., Appleton, Wis.	Mark Loper, President/CEO	8.60%
118	A&R Mechanical Contractors, Urbana, Ill.	Jon Reichard, President	8.57%
81	Environmental Air Systems Inc., Greensboro, N.C.	James B. Bullock Jr., President	8.00%
122	R.T. Moore Co. Inc., Indianapolis	Douglas R. Moore, President	8.00%
75	BCH Mechanical, Largo, Fla.	Daryl W. Blume, President	7.50%
90	R.W. Warner Inc., Frederick, Md.	Mathew M. Warner, President/CEO	7.00%

Source: CONTRACTOR magazine Book of Giants survey



WHAT **BAD** LOOKS LIKE

BY ROBERT P. MADER
OF CONTRACTOR'S STAFF

YEESH! WHAT a year! At least now we know what really bad looks like. Not that it's going to get any better this year, but at least the construction economy has stabilized for now.

Lee Smither, from construction industry consultants FMI Corp., spoke at the recent Mechanical Contractors Association of America convention in San Francisco and showed a table titled "Construction Put in Place — Estimated for the United States." It wasn't pretty. The markets that large mechanicals have depended on for years have tanked. Commercial will be down 29% this year, FMI projects, and down another 6% next year. The lodging category will be down 35% this year and office buildings will be down 25%. Industrial will be down 35% this year and 17% next year.

Single family residential will be up 15% this year, but that's from a small base of around 650,000. It will increase by double digits each year. Maybe that will get some of the residential market refugees out of the commercial market. FMI is forecasting multi-family to remain slightly down for the next two years and not take off until 2012.

FMI is predicting that the market will start to turn upward next year, but the recovery will not be going full steam until 2012.

The consulting firm is predicting that just four non-residential markets will be up this year, although not by much: healthcare, educational, public safety and transportation.

In non-building construction, the orbital welding crowd can take comfort in FMI's prediction that utility work will be up 6%. Two categories that can be financed with revenue bonds, sewage/waste disposal and water supply,

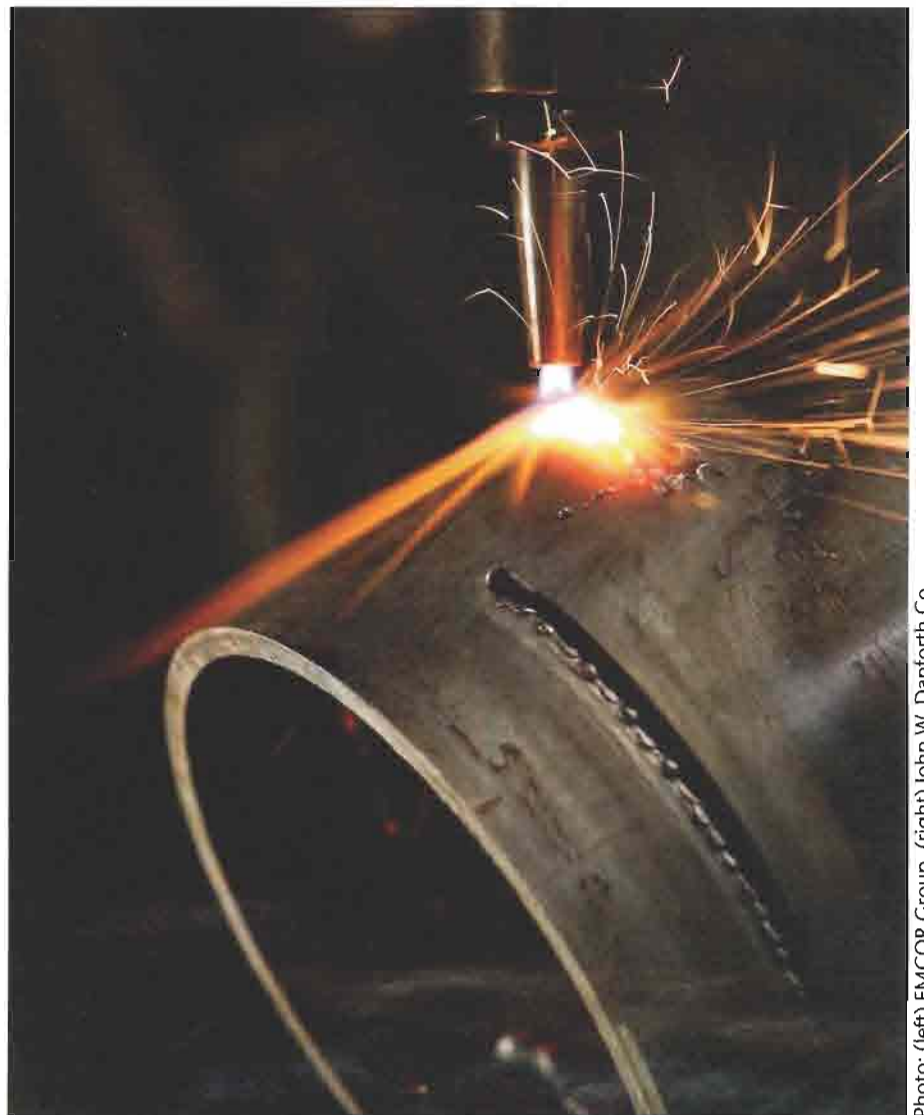


Photo: (left) EMCOR Group, (right) John W. Danforth Co.

Mechanicals burn through their backlogs as government, institutional and green work are the only sectors showing signs of life

are forecasted to increase by 5% and 4% respectively.

"It doesn't look good out there," says Lonnie Coleman, president of Coleman-Spohn Corp., Cleveland, and past president of the Mechanical Contractors Association of America. Coleman isn't one of the Giants but, as MCAA president, he's spent the last year on an airplane talking with contractors all over the country.

Labor hours for MCAA contractors in California are down 30%-35%, Coleman says, the Boston area is in the same bad shape, Cleveland is down 20%, Atlanta is down 30%. Nationwide labor hours are down an average of 15% and service hours are down 5%.

"Contractors are just tearing into their backlogs," he says. "If it wasn't for healthcare and higher education it would be dead in this city."

Next year, however, is a different story, even in Ohio, which suffers from its proximity to Detroit and an over-dependence on the auto industry.

Ohio voters have approved four ca-

minos. Dan Gilbert, the owner of the Cleveland Cavaliers and chairman and founder of Quicken Loans, has won the rights for two of them, including one in Cleveland. A \$486 million medical mart convention center is in the works for downtown across from city hall. Eaton Corp. is planning a \$170 million headquarters building. In Columbus, Ohio, Ohio State University is doing a \$1 billion research facility and the mechanical portion alone is worth \$100 million. Coleman is partnering with Sauer Inc. and Limbach Facility Services to try to win the project, which will be design-assist. The Cleveland Clinic has announced \$680 million in six separate design-assist projects. Cleveland will get \$32 million in stimulus funds for a mixed-use tower on the lakefront, the major tenant of which will be Ernst & Young.

Inhospitable

"The hospitality market will be dead after the last casino-hotel is done in Vegas," says Tony Guzzi, president and



Photo: Harris Mechanical

Contractor's Top 100 Who They Are...



Rank	Company	Revenue \$ Millions	% Change	Rank	Company	Revenue \$ Millions	% Change
1	EMCOR Group	\$2,580.00	4.30%	51	Therma Corp.	\$114.00	0.70%
2	Johnson Controls, Building Efficiency Div.	\$2,168.00	-10.00%	52	John J. Kirlin	\$113.20	even
3	Comfort Systems USA Inc.	\$1,128.90	-15.00%	53	A.O. Reed & Co. Inc.	\$111.50	9.24%
4	Service Experts Div. of Lennox	\$535.40	-14.60%	54	Titan Contracting & Leasing/The Horn Cos.	\$110.50	-31.78%
5	ARS/Rescue Rooter	\$528.00	even	55	Mechanical Inc.	\$106.82	-25.18%
6	ACCO Engineered Systems	\$526.00	-14.30%	56	Letsos Co.	\$103.60	11.58%
7	Southland Industries	\$471.57	9.20%	57	Grunau Co.	\$102.70	-17.71%
8	McKinstry Co.	\$395.00	NA	58	Warwick Plumbing & Heating Corp.	\$102.00	even
9	MMC Corp.	\$392.20	16.10%	59	Critchfield Mechanical Inc.	\$101.50	-9.78%
10	Nooter Construction	\$380.00	25.30%	60	Joule Industrial Contractors	\$98.65	-21.08%
11	Sterling Boiler & Mechanical Inc.	\$360.00	55.40%	61	Foley Co.	\$98.57	even
12	Roto-Rooter/Service America	\$335.89	-1.20%	62	Monterey Mechanical Co.	\$98.10	even
13	Kinetic Systems Inc.	\$333.00	even	63	Hermanson Co. LLP	\$98.00	7.36%
14	TDIndustries	\$299.22	-7.60%	64	Nashville Machine Co., Inc.	\$96.54	NA
15	Limbach Facility Services LLC	\$296.00	-15.40%	65	KSW Mechanical Services	\$93.03	even
16	The State Group	\$269.90	NA	66	Shapiro and Duncan Inc.	\$92.10	even
17	Hardy Corp.	\$265.79	even	67	Corrigan Co. Mechanical Contractors	\$90.00	even
18	Harder Mechanical Contractors Inc.	\$251.00	25.50%	68	McKamish Inc.	\$90.00	-14.29%
19	JH Kelly LLC	\$245.20	even	69	University Mechanical Contractors Inc.	\$90.00	NA
20	Murphy Co. Mechanical Contrs. & Engrs.	\$232.90	even	70	Pioneer Pipe Inc./Viking Fabricators	\$86.76	even
21	McKenney's Inc. Mech. Contractors & Engrs.	\$230.80	10.00%	71	Charles E. Jarrell Contracting Inc.	\$86.50	-4.15%
22	Brandt Engineering Co.	\$229.40	even	72	AZCO INC.	\$84.50	-44.61%
23	ColonialWebb Contractors	\$219.70	20.30%	73	Herman Goldner Co., Inc.	\$83.48	-3.42%
24	Midwest Mechanical Group	\$215.00	-0.92%	74	MLN Co.	\$81.00	even
25	John E. Green Co.	\$210.00	-19.23%	75	J.F. Ahern Co.	\$80.42	-62.06%
26	U.S. Engineering Co.	\$201.95	11.64%	76	BCH Mechanical Inc.	\$80.24	even
27	P1 Group	\$199.20	24.09%	77	Baker Group	\$80.00	NA
28	Ivey Mechanical Co. LLC	\$195.00	5.13%	78	Lee Co.	\$79.70	even
29	Hill Mechanical Group	\$193.00	-31.15%	79	Dorvin D. Leis Co. Inc.	\$77.16	-27.16%
30	Elkhorn Construction	\$190.01	NA	80	Durr Mechanical Construction Inc.	\$75.99	NA
31	W.E. Bowers Associates Inc.	\$189.50	12.93%	81	Hussung Mechanical Contractors Inc.	\$75.49	-22.09%
32	Harris Cos.	\$176.00	-20.00%	82	Environmental Air Systems Inc.	\$75.00	-50.66%
33	Fire & Life Safety America	\$170.00	-8.80%	83	Fort Pitt Group	\$71.70	-28.30%
34	RK Mechanical Inc.	\$164.90	7.96%	84	W.G. Tomko Inc.	\$70.00	-28.86%
35	Sauer Inc.	\$164.20	even	85	Alakai Mechanical Corp.	\$64.25	even
36	Clockwork Home Services	\$158.50	even	86	McDaniel Fire Systems	\$64.00	-6.15%
37	Starcon International Inc.	\$156.00	-18.07%	87	Martin Petersen Co. Inc.	\$62.00	even
38	VSC Fire & Security	\$145.52	even	88	Delcard Assocs. Inc. - Mechanical Contrs.	\$61.00	15.16%
39	Murray Co.	\$143.00	28.74%	89	Midstate Mechanical Inc.	\$59.80	-20.26%
40	CECO Environmental Co.	\$139.00	-41.09%	90	North American Mechanical	\$58.60	even
41	John W. Danforth Co.	\$136.00	8.24%	91	R.W. Warner Inc.	\$57.10	even
42	Coastal Mechanical Services Group	\$135.71	-21.21%	92	CCI Mechanical Inc.	\$55.80	-19.71%
43	McCarl's Inc.	\$131.00	23.66%	93	Egan Cos. Inc.	\$55.30	-15.12%
44	BHI - Bahnsen Holdings Inc.	\$130.30	8.29%	94	Berger Engineering Co.	\$54.91	even
45	CorVal Group, Inc.	\$130.00	-4.06%	95	Action Electrical & Mechanical Contractors	\$53.00	even
46	Fresh Meadow Mechanical Corp.	\$130.00	31.49%	96	Holiday-Parks Inc.	\$52.80	NA
47	Metropolitan Mechanical	\$130.00	-29.73%	97	Hill York	\$52.53	-36.85%
48	Sanders Bros. Inc.	\$130.00	7.69%	98	Bonland Industries Inc.	\$51.00	even
49	Worth & Company	\$116.25	15.91%	99	Advance Mechanical Systems	\$48.00	-32.54%
50	Pierce Associates Inc.	\$114.30	NA	100	Western Allied Corp.	\$48.00	-27.27%

Data was compiled from questionnaires completed and returned from the Giants, and data from allbusiness.com, hoovers.com, onesource.com, and other public and published sources.

COO of EMCOR Group. (Guzzi makes me want to hide under my desk until 2011 every time I talk to him.) "The market that's keeping everybody alive is the institutional market."

EMCOR shrank 18% last year and has told the stock market that it will shrink another 10% this year. The only reason why its numbers are up in our

tables is because they're reporting their mechanical service revenues, which they did not report last year.

EMCOR is doing some military base realignment work, like Fort Riley, Kan., or El Paso, Texas. It is also performing energy retrofit work for the Feds, like putting in variable speed drives and upgrading the mechanical and light-

ing systems. Money for that is just beginning to flow, as Guzzi's boss, Frank MacInnis, predicted last year. MacInnis noted that passing out billions in stimulus money would be a challenge for the best finance minds in the private sector, let alone government bureaucrats.

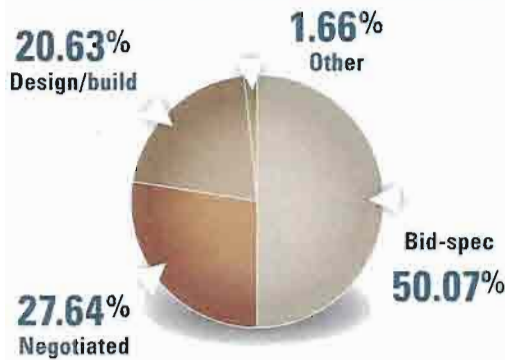
"We'll focus our energy on where the

work is," Guzzi says. "We'll get in front of customers with good energy-saving ideas on how to take cost out of their businesses. On the construction side, we'll be very careful and right size our operations to live and fight another day, take the best work that we can and not get a belly full of bad work."

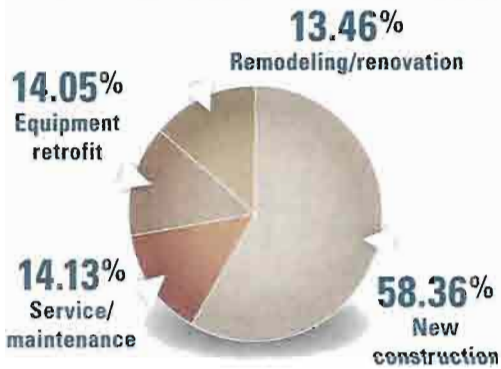
Guzzi says the market is divided in

Book of Giants

How They Get Work



Markets Served



SOURCE: CONTRACTOR MAGAZINE BOOK OF GIANTS SURVEY

three: Under a million dollars, owners are reluctant to break ground. Jobs between \$2 million and \$10 million have way too many bidders. Jobs valued at more than \$15 million or \$20 million have fewer bidders because of the bonding requirements, but the owners' budgets are tough to meet.

"I think there will be a shakeout of contractor capacity here over the next 18 months," Guzzi says, "as these guys who took \$2 million to \$10 million jobs at or below cost realize what they've done. They thought they were working for cash flow and they're not and it will get ugly. There will be a shakeout and not lot of guys will be starting businesses since credit is tight and owners are reluctant to spend money on small projects. We won't see the trunk slammers and pickup truck guys in this downturn."

All of the major mechanicals interviewed by CONTRACTOR said that healthcare and federal government work were the two sectors that are holding up.

Robert Krier, president of Hill Mechanical Group, Franklin Park, Ill., is teaming up with U.S. Engineering in Kansas City, Mo., for a whopper of a federal project. The two mechanicals are part of a team with a GC joint venture of Peter Kiewit-Thompkins (a Turner unit)-Jacobsen to build a billion and half dollar data center in Utah for the National Security Agency.

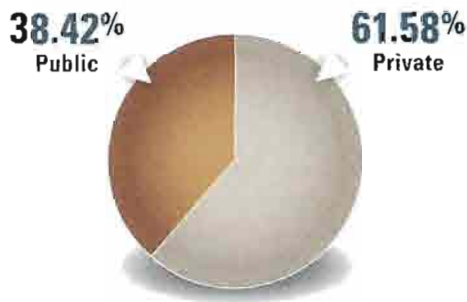
Three to five joint ventures are making proposals for the job, which will probably be awarded on a best-value basis. Phase one of the project, scheduled for completion in 2011, is expected to be awarded in September.

Giants Breakdown

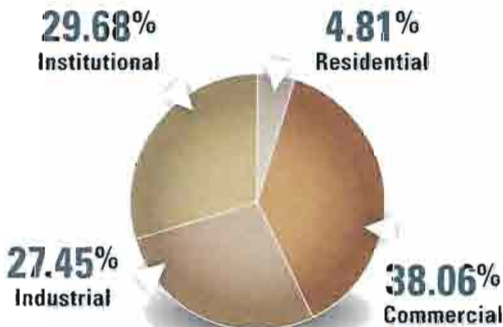
Rank	Company/Location	Revenue	HVAC	Piping	Plumbing	Sheet Metal	Refrigeration	Controls	Fire Protection	Wastewater	Other
1	EMCDR Group, Norwalk, Conn.	\$2,580.00	1,006.20	258.00	567.60	180.60	103.20	0.00	309.60	154.80	0.00
2	Johnson Controls, Building Efficiency Div., N. American Service, Milwaukee	\$2,168.00	1,084.00	0.00	0.00	0.00	0.00	1,084.00	0.00	0.00	0.00
3	Comfort Systems USA Inc., Houston	\$1,128.90	869.25	0.00	564.45	0.00	0.00	33.87	11.29	0.00	45.16
4	Service Experts Div. of Lennox, Dallas	\$535.40	535.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	ARS/Rescue Rooter, Memphis	\$528.00	248.16	0.00	205.92	0.00	0.00	0.00	0.00	0.00	73.92
6	ACCD Engineered Systems, Glendale, Calif.	\$526.00	494.44	0.00	31.56	0.00	0.00	0.00	0.00	0.00	0.00
7	Southland Industries, Irvine, Calif.	\$471.57	471.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	McKinstry Co., Seattle	\$395.00	65.83	65.83	65.83	65.83	65.83	65.83	0.00	0.00	0.00
9	MMC Corp., Overland Park, Kan.	\$392.20	39.22	78.44	78.44	58.83	0.00	0.00	0.00	0.00	137.27
10	Nooter Construction, Treose, Pa.	\$380.00	95.00	95.00	95.00	95.00	0.00	0.00	0.00	0.00	0.00
11	Sterling Boiler & Mechanical Inc., Evansville, Ind.	\$360.00	72.00	144.00	144.00	0.00	0.00	0.00	0.00	0.00	0.00
12	Roto-Rooter/Service America, Cincinnati	\$335.89	4.03	0.00	287.57	0.00	0.00	0.00	0.00	0.00	44.29
13	Kinetic Systems Inc., Fremont, Calif.	\$333.00	49.95	183.15	66.60	33.30	0.00	0.00	0.00	0.00	0.00
14	TDIndustries, Dallas	\$299.22	149.61	59.84	89.77	2.99	2.99	2.99	2.99	2.99	0.00
15	Limbach Facility Services LLC, Pittsburgh	\$296.00	88.80	47.36	0.00	88.80	0.00	71.04	0.00	0.00	0.00
16	The State Group, Mississauga, Ont.	\$269.90	67.48	67.48	67.48	0.00	0.00	0.00	0.00	0.00	67.48
17	Hardy Corp., Birmingham, Ala.	\$265.79	2.66	228.58	5.32	0.00	0.00	2.66	0.00	0.00	26.58
18	Harder Mechanical Contractors Inc., Portland, Ore.	\$251.00	0.00	200.80	0.00	0.00	0.00	50.20	0.00	0.00	0.00
19	JH Kelly LLC, Longview, Wash.	\$245.20	0.00	122.60	122.60	0.00	0.00	0.00	0.00	0.00	0.00
20	Murphy Co. Mechanical Contrs. & Engrs., St. Louis	\$232.90	41.92	123.44	27.95	32.61	6.99	0.00	0.00	0.00	0.00
21	McKenney's Inc. Mech. Contractors & Engrs., Atlanta	\$230.80	96.94	0.00	96.94	36.92	0.00	0.00	0.00	0.00	0.00
22	Brandt Engineering Co., Dallas	\$229.40	149.11	22.94	57.35	0.00	0.00	0.00	0.00	0.00	0.00
23	ColonialWebb Contractors, Richmond, Va.	\$219.70	65.91	65.91	70.30	0.00	17.58	0.00	0.00	0.00	0.00
24	Midwest Mechanical Group, Kansas City, Mo.	\$215.00	55.90	68.80	61.28	24.73	21.50	21.50	0.00	0.00	0.00
25	John E. Green Co., Highland Park, Mich.	\$210.00	63.00	63.00	48.30	0.00	0.00	0.00	21.00	14.70	0.00
26	U.S. Engineering Co., Kansas City, Mo.	\$201.95	22.21	109.05	48.47	20.20	2.02	0.00	0.00	2.02	0.00
27	P1 Group, Lenexa, Kan.	\$199.20	39.84	39.84	19.92	39.84	19.92	19.92	0.00	19.92	0.00
28	Ivey Mechanical Co. LLC, Kosciusko, Miss.	\$195.00	68.25	39.00	48.75	29.25	0.00	9.75	0.00	0.00	0.00
29	Hill Mechanical Group, Franklin Park, Ill.	\$193.00	57.90	40.53	11.58	75.27	1.93	1.93	0.00	0.00	3.86
30	Elkhorn Construction, Evanston, Wyo.	\$190.01	0.00	152.00	0.00	0.00	0.00	0.00	0.00	0.00	38.00
31	W.E. Bowers Associates Inc., Beltsville, Md.	\$189.50	63.17	63.17	63.16	0.00	0.00	0.00	0.00	0.00	0.00
32	Harris Cos., St. Paul, Minn.	\$176.00	35.20	44.00	44.00	35.20	0.00	0.00	0.00	8.80	8.80
33	Fire & Life Safety America, Richmond, Va.	\$170.00	0.00	0.00	0.00	0.00	0.00	0.00	170.00	0.00	0.00
34	RK Mechanical Inc., Denver	\$164.90	51.12	29.68	46.17	31.33	6.60	0.00	0.00	0.00	0.00
35	Sauer Inc., Pittsburgh	\$164.20	57.47	32.84	54.19	11.49	0.00	8.21	0.00	0.00	32.84
36	Clockwork Home Services, Sarasota, Fla.	\$158.50	79.25	0.00	79.25	0.00	0.00	0.00	0.00	0.00	0.00
37	Starcon International Inc., Manhattan, Ill.	\$156.00	0.00	156.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	VSC Fire & Security, Ashland, Va.	\$145.52	0.00	0.00	0.00	0.00	0.00	0.00	145.52	0.00	0.00
39	Murray Co., Gardena, Calif.	\$143.00	28.60	28.60	28.60	14.30	0.00	14.30	0.00	28.60	0.00
40	CECO Environmental Co., Cincinnati	\$139.00	0.00	0.00	0.00	139.00	0.00	0.00	0.00	0.00	0.00
41	John W. Danforth Co., Buffalo, N.Y.	\$136.00	34.00	28.56	18.00	18.00	4.08	1.36	0.00	27.20	0.00
42	Coastal Mechanical Services Group, Melbourne, Fla.	\$135.71	35.28	21.71	13.57	16.29	2.71	5.43	0.00	0.00	29.86
43	McCarl's Inc., Pittsburgh	\$131.00	6.55	91.70	0.00	0.00	0.00	6.55	0.00	19.65	6.55
44	BHI - Bahnsen Holdings Inc., Winston-Salem, N.C.	\$130.30	65.15	0.00	65.15	0.00	0.00	0.00	0.00	0.00	0.00
45	CorVal Group Inc., St. Paul, Minn.	\$130.00	13.00	26.00	13.00	13.00	6.50	2.60	3.90	19.50	32.50
46	Fresh Meadow Mechanical Corp., Fresh Meadows, N.Y.	\$130.00	117.00	0.00	13.00	0.00	0.00	0.00	0.00	0.00	0.00
47	Metropolitan Mechanical, Eden Prairie, Minn.	\$130.00	0.00	39.00	39.00	39.00	0.00	6.50	0.00	0.00	6.50
48	Sanders Bros. Inc., Gaffney, S.C.	\$130.00	52.00	26.00	0.00	26.00	0.00	13.00	0.00	0.00	13.00
49	Worth & Co., Pipersville, Pa.	\$116.25	0.00	58.13	58.12	0.00	0.00	0.00	0.00	0.00	0.00
50	Pierce Associates Inc., Alexandria, Va.	\$114.30	38.10	0.00	38.10	38.10	0.00	0.00	0.00	0.00	0.00

Book of Giants

Public vs. Private



Where They Do It



SOURCE: CONTRACTOR MAGAZINE BOOK OF GIANTS SURVEY

Like many other mechanicals, Greg Hosch, CEO of Harris Cos., St. Paul, Minn., has had some good luck with large, high profile medical projects. Harris Cos. travels nationally, and has performed hospital work in Minnesota, Arizona, Utah, San Francisco and Las Vegas.

But those are big hospital projects. The mechanicals report that ordinary hospital projects are being delayed as the owners worry about the new healthcare legislation and how it might affect their reimbursement levels.

On the government side, Federal work is, not surprisingly, strong. Local work is spotty because some state and local governments are broke.

"Everybody is rushing to chase the Federal market," Hosch says. "We headed that way long ago, so this is not just a reaction to the current econ-

A contractor puts the finishing touches on part of a mechanical system.



Photo: John W. Danforth Co.

Giants Breakdown

Rank	Company/Location	Revenue	HVAC	Piping	Plumbing	Sheet Metal	Refrigeration	Controls	Fire Protection	Wastewater	Other	
51	52	Therma Corp., San Jose, Calif.	\$114.00	22.80	22.80	22.80	22.80	0.00	22.80	0.00	0.00	0.00
52	51	John J. Kirlin, Rockville, Md.	\$113.20	28.30	28.30	28.30	28.30	0.00	0.00	0.00	0.00	0.00
53	58	A.O. Reed & Co. Inc., San Diego	\$111.50	36.80	36.80	36.90	0.00	0.00	0.00	0.00	0.00	0.00
54	36	Titan Contracting & Leasing/The Horn Cos., Owensboro, Ky.	\$715.10	0.00	71.51	35.75	0.00	0.00	0.00	0.00	5.00	607.84
55	68	Letsos Co., Houston	\$103.60	89.10	1.04	7.25	6.24	0.00	0.00	0.00	0.00	0.00
56	47	Grunau Co., Oak Creek, Wis.	\$102.70	30.81	12.32	15.41	10.27	2.05	3.08	26.70	2.05	0.00
57	56	Warwick Plumbing & Heating Corp., Newport News, Va.	\$102.00	16.32	21.42	29.58	21.42	4.08	9.18	0.00	0.00	0.00
58	53	Critchfield Mechanical Inc., Menlo Park, Calif.	\$101.50	30.45	20.30	30.45	20.30	0.00	0.00	0.00	0.00	0.00
59	46	Joule Industrial Contractors, Edison, N.J.	\$98.65	0.00	98.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	61	Foley Co., Kansas City, Mo.	\$98.57	19.71	24.64	14.79	0.00	0.00	0.00	0.00	39.43	19.71
61	63	Monterey Mechanical Co., Oakland, Calif.	\$98.10	3.92	7.85	0.00	3.92	0.00	0.00	0.00	74.56	7.85
62	69	Hermanson Co. LLP, Kent, Wash.	\$98.00	0.00	14.70	29.40	53.90	0.00	0.00	0.00	0.00	0.00
63		Nashville Machine Co. Inc., Nashville, Tenn.	\$96.54	28.00	9.65	15.45	16.41	0.00	0.00	0.00	0.00	27.03
64	66	KSW Mechanical Services, Long Island City, N.Y.	\$93.03	93.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	67	Shapiro and Duncan Inc., Rockville, Md.	\$92.10	46.05	23.03	23.02	0.00	0.00	0.00	0.00	0.00	0.00
66	71	Corrigan Co. Mechanical Contractors, St. Louis	\$90.00	0.00	72.00	0.00	18.00	0.00	0.00	0.00	0.00	0.00
67	55	McKamish Inc., Pittsburgh	\$90.00	18.00	12.60	14.40	22.50	0.00	9.00	0.00	0.00	13.50
68		University Mechanical Contractors Inc., Mukilteo, Wash.	\$90.00	0.00	36.00	31.50	0.00	0.00	0.00	0.00	9.00	13.50
69	73	Pioneer Pipe, Inc./Viking Fabricators, Marietta, Ohio	\$86.76	2.60	60.73	5.21	0.87	0.00	0.00	0.00	2.60	14.75
70	70	Charles E. Jarrell Contracting Inc., Earth City, Mo.	\$86.50	65.74	4.33	6.06	6.06	0.86	3.46	0.00	0.00	0.00
71	39	AZCO Inc., Appleton, Wis.	\$84.50	0.00	29.57	0.00	4.23	0.00	0.00	0.00	0.00	53.24
72	74	Herman Goldner Co. Inc., Philadelphia	\$83.48	16.70	16.70	16.70	16.70	0.00	8.35	0.00	8.35	0.00
73	77	MLN Co., Houston	\$81.00	56.70	0.00	20.25	4.05	0.00	0.00	0.00	0.00	0.00
74	24	J.F. Ahern Co., Fond du Lac, Wis.	\$80.42	40.21	20.11	20.11	0.00	0.00	0.00	0.00	0.00	0.00
75	78	BCH Mechanical Inc., Largo, Fla.	\$80.24	26.88	8.18	13.08	10.03	0.00	4.01	0.00	0.00	18.05
76		Baker Group, Des Moines, Iowa	\$80.00	22.40	0.00	21.60	19.20	0.00	4.80	3.20	0.00	8.80
77	79	Lee Co., Franklin, Tenn.	\$79.70	31.88	7.97	23.91	7.97	7.97	0.00	0.00	0.00	0.00
78	54	Dorvin D. Leis Co. Inc., Honolulu	\$77.16	11.57	17.75	33.95	2.32	3.09	0.77	7.72	0.00	0.00
79		Durr Mechanical Construction Inc., New York, N.Y.	\$75.99	22.72	5.40	1.37	0.00	0.00	0.00	1.90	44.61	0.00
80	65	Hussung Mechanical Contractors Inc., Louisville, Ky.	\$75.49	40.01	3.77	25.66	0.00	0.00	3.02	3.02	0.00	0.00
81	40	Environmental Air Systems Inc., Greensboro, N.C.	\$75.00	37.50	18.75	18.75	0.00	0.00	0.00	0.00	0.00	0.00
82	59	Fort Pitt Group, Forest Hill, Md.	\$71.70	53.06	0.00	14.34	0.72	0.00	3.59	0.00	0.00	0.00
83	62	W.G. Tomko Inc., Finleyville, Pa.	\$70.00	14.00	0.00	49.00	0.00	0.00	0.00	0.00	7.00	0.00
84	91	Alakai Mechanical Corp., Honolulu	\$64.25	31.48	16.06	16.71	0.00	0.00	0.00	0.00	0.00	0.00
85	86	McDaniel Fire Systems, Valparaiso, Ind.	\$64.00	0.00	0.00	0.00	0.00	0.00	0.00	64.00	0.00	0.00
86	92	Martin Petersen Co. Inc., Kenosha, Wis.	\$62.00	24.80	24.80	12.40	0.00	0.00	0.00	0.00	0.00	0.00
87	99	Delcard Assocs. Inc. - Mechanical Contrs., New Castle, Del.	\$61.00	30.50	12.20	6.10	6.10	1.22	4.27	0.00	0.00	0.00
88	80	Midstate Mechanical Inc., Phoenix	\$59.80	47.84	0.00	8.97	0.00	0.00	2.99	0.00	0.00	0.00
89	93	North American Mechanical, Deforest, Wis.	\$58.60	58.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	94	R.W. Warner Inc., Frederick, Md.	\$57.10	49.11	0.00	0.00	7.99	0.00	0.00	0.00	0.00	0.00
91	84	CCI Mechanical Inc., Salt Lake City	\$55.80	27.90	11.16	13.95	0.00	0.00	2.79	0.00	0.00	0.00
92	90	Egan Cos. Inc., Brooklyn Park, Minn.	\$55.30	13.83	19.36	8.30	8.30	0.00	5.53	0.00	0.00	0.00
93		Berger Engineering Co., Dallas	\$54.91	49.42	0.00	5.49	0.00	0.00	0.00	0.00	0.00	0.00
94	97	Action Electrical & Mechanical Contractors, Smyrna, Ga.	\$53.00	2.65	15.90	1.59	7.95	2.65	0.00	0.00	0.00	22.26
95		Holiday-Parks Inc., Tukwila, Wash.	\$52.80	10.56	10.56	10.56	10.56	0.00	10.56	0.00	0.00	0.00
96	76	Hill York, Ft. Lauderdale, Fla.	\$52.53	90.00	5.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00
97	100	Bonland Industries Inc., Wayne, N.J.	\$51.00	12.75	0.00	0.00	38.25	0.00	0.00	0.00	0.00	0.00
98	83	Advance Mechanical Systems, Mt. Prospect, Ill.	\$48.00	12.00	12.00	12.00	12.00	0.00	0.00	0.00	0.00	0.00
99	88	Western Allied Corp., Santa Fe Springs, Calif.	\$48.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100		GEM Industrial Inc., Walbridge, Ohio	\$45.70	4.57	18.28	18.28	0.00	2.29	2.29	0.00	0.00	0.00

omy. The University of Minnesota is still spending money. We're bidding schools in Utah, bidding schools in Arizona. If they're out of money, they don't know it yet. We also did a couple prisons recently."

Donald Yerks, director of manufac-

turing, Dunbar Mechanical Inc., Toledo, Ohio, says his firm is going after federal dollars and Ohio is spending money on higher education.

"Ohio State has money, so does Ohio University and Bowling Green has money, but the state is facing the

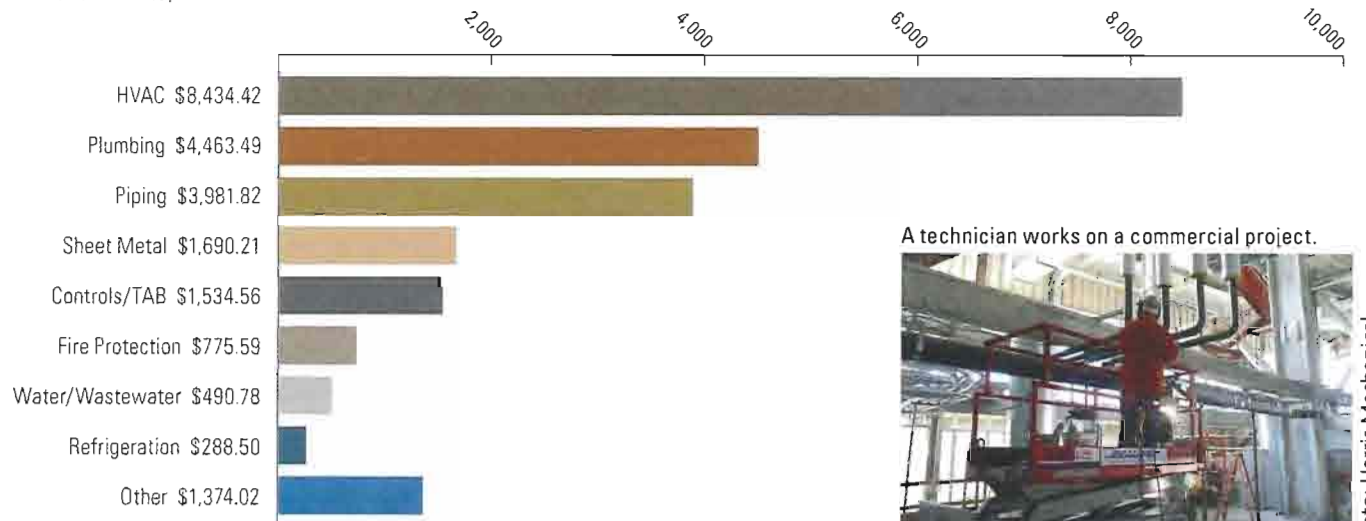
same budget issues as other states," Yerks says. "Ohio has been on a strong public education building program for the last four to five years and that's winding down now, but some money is still there. We've done a fair amount

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What They Do

SOURCE: CONTRACTOR MAGAZINE BOOK OF GIANTS SURVEY

(Dollars in Millions)



A technician works on a commercial project.



Photo: Harris Mechanical

of work for the University of Toledo and some for Lucas County."

The problem, says William McDermott, CEO, Midwest Mechanical Group Inc., Overland Park, Kan., is that the work out there consists of large medical centers, large data centers, and big Federal government projects. The middle market has disappeared for lack of money.

"We continue to be faced with the issue that there is simply a lack of financing in non-governmental sectors, which is simply cutting the spigot off for the number of projects that are able to be put out for bid," McDermott says. "Couple that with the fiscal problems the states are having and the contractors who depended on state projects and those guys are impacted and thrown back into the pool with everybody else. We're on the border between Missouri and Kansas — I'm a Kansas resident — and I heard on the news that Kansas' income stream is even lower than expected so the state will need even more cuts, so there will be fewer capital improvements. And I'm sure that Kansas is not unique. You can't tell me that revenue streams aren't a mess."

Let's hope that changes soon. *Crain's Chicago Business* magazine has reported that bank financing for middle market customers is beginning to make a comeback, and that might make for a brighter 2011.

BIM gets bigger

Building Information Modeling continues to grow in importance, depending on the market and the owner.

"BIM, especially on the commercial side, depends on who the owner is," says Paul Jordan, CEO of the CorVal Group Inc., St. Paul, Minn. "If you do stadium work, it's a foregone conclusion that you will use BIM on stadium work, but it's not widespread. It depends on the sophistication of the customer and what they want. There are

A Harris Cos. technician works in a facility's mechanical room.



Photo: Harris Mechanical

Contractor's Top 10 Companies by Type of Work

Piping			Plumbing		
Rank	Company/Location	\$ Millions	Rank	Company/Location	\$ Millions
2	Johnson Controls, Building Efficiency Div., N. American Service, Milwaukee	\$258.00	1	EMCOR Group, Norwalk, Conn.	\$567.60
15	Limbach Facility Services LLC, Pittsburgh	\$228.58	3	Comfort Systems USA, Houston	\$564.45
36	Clockwork Home Services, Sarasota, Fla.	\$200.80	5	ARS/Rescue Rooter, Memphis	\$205.92
10	Nooter Construction, Treose, Pa.	\$183.15	11	Sterling Boiler & Mechanical Inc., Evansville, Ind.	\$144.00
13	Kinetic Systems Inc., Fremont, Calif.	\$156.00	12	Roto-Rooter/Service America, Cincinnati	\$287.57
29	Hill Mechanical Group, Franklin Park, Ill.	\$152.00	19	JH Kelly, Longview, Wash.	\$122.60
100	Western Allied Corp., Santa Fe Springs, Calif.	\$144.00	21	McKenney's Inc. Mech. Contractors & Engrs., Atlanta	\$96.94
11	Sterling Boiler & Mechanical Inc., Evansville, Ind.	\$123.44	10	Nooter Construction, Treose, Pa.	\$95.00
112	James Craft & Son Inc., Manchester, Pa.	\$122.60	14	TDIndustries, Dallas	\$89.77
44	BHI - Bahnsen Holdings Inc., Winston-Salem, N.C.	\$109.05	36	Clockwork Home Service, Sarasota, Fla.	\$79.25

HVAC			Sheet Metal		
Rank	Company/Location	\$ Millions	Rank	Company/Location	\$ Millions
2	Johnson Controls, Building Efficiency Div., Milwaukee	\$1,084.00	1	EMCOR Group, Norwalk, Conn.	\$180.60
1	EMCOR Group, Norwalk, Conn.	\$1,006.20	40	CECO Environmental Co., Cincinnati	\$139.00
3	Comfort Systems USA, Houston	\$869.25	10	Nooter Construction, Treose, Pa.	\$95.00
4	Service Experts Div. of Lennox, Dallas	\$535.40	15	Limbach Facility Services LLC, Pittsburgh	\$88.80
6	ACCO Engineered Systems, Glendale, Calif.	\$494.44	29	Hill Mechanical Group, Franklin Park, Ill.	\$75.27
7	Southland Industries, Irvine, Calif.	\$471.57	8	McKinstry Co., Seattle	\$65.83
14	TDIndustries, Dallas	\$149.61	9	MMC Corp., Overland Park, Kan.	\$58.83
22	Brandt Engineering Co., Dallas	\$149.11	62	Hermanson Co. LLP, Kent, Wash.	\$53.90
46	Fresh Meadow Mechanical Corp., Fresh Meadows, N.Y.	\$117.00	27	P1 Group, Lenexa, Kan.	\$39.84
21	McKenney's Inc. Mech. Contractors & Engrs., Atlanta	\$96.94	47	Metropolitan Mechanical, Eden Prairie, Minn.	\$39.00

a lot of contractors and owners who still look at it as an expense. One problem in the industry is there are people who don't know where it's effective. If you're doing a refinery or a power plant, you use 3D modeling all the time. On the commercial side, they're not used to that. Also on the commercial side, there are so many more contractors trying to coordinate that they are less willing to take ownership of the BIM model."

Yerks recalls that Dunbar did a BIM project several years ago at the Toledo Museum of Art Collegiate Center for Glass. It is an all-glass building where the mechanicals could only be located in part of the basement, which also

contains some public space. Because of the use of BIM, the contractors were able to cram everything in that confined space without a single change order for interferences.

"We probably have 36 people that do nothing but BIM," says Hosch. "It's been a key to differentiation, especially when we do large projects like medical projects. We think we have best in the business BIM capabilities. It's getting so that large general contractors and sophisticated owners see the value in BIM rather than just seeing it as additional cost to the project."

The rewards of BIM far outweigh the difficulties in getting it done if you make sure that the content is in

there and leverage it to gain efficiency, Krier says. Some contractors may be drawing pretty pictures so they're only getting visualization. Hill Mechanical, on the other hand, loads the components with meta-data. When the air balancer comes in, he not only sees a VAV box, he has access to data on that box and everything that it's connected to downstream.

Krier believes that BIM is best used as part of integrated project delivery, not design-bid-build. Yerks agrees that BIM provides a great opportunity if you start using it early in the design phase and it's even better if you bring the constructors on board for a design-assist

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partnered project. The overall project cost should go down, but the owner might have to spend more money up front.

BIM also presents some intangible benefits that may only be fully realized in the future. How valuable will a complete set of digital as-builts be to the owner? If the fire department comes to a building, how valuable is it if they know where the pressurized tanks are, as well as the hazardous materials and explosive or inflammable materials, before they enter the building?

Energy saving vs. green

Coleman mentioned that he was in the White House in early March and met with Carole Browner, director of the White House Office of Energy and Climate Change Policy, as part of the Rebuild America Coalition. The Rebuild America Coalition is made up of 60 associations, labor and policy groups and its goal is to garner the right incentives and rebates where contractors can retrofit and provide energy savings to 50 million commercial and residential buildings throughout the U.S. Fifty million structures is 40% of the building stock in the U.S., Coleman says. The effort would provide 300,000-plus green jobs, besides saving a lot of energy.

"As I've talked to our [MCAA] affiliates, I've said that's the industry that we should own," Coleman says. "While we are going through this slow period, now is the time to renew ourselves and focus on green and sustainable initiatives. [MCAA President] Bob Armistead is taking the same charge and pushing it forward."

The mechanicals had varying experiences with green.

"We're seeing LEED certification becoming more important and we have a sizeable number of people who have gone through LEED accreditation be-

On a John W. Danforth Co. commercial project, a technician works on the gas connection in the facility's mechanical room.



Photo: John W. Danforth Co.

Contractor's Top 10 Companies Geographically

Northeast			Midwest		
Rank	Company/Location	\$ Millions	Rank	Company/Location	\$ Millions
1	EMCOR Group, Norwalk, Conn.	\$2,580.00	2	Johnson Controls, Building Efficiency Div., Milwaukee	\$2,168.00
10	Nooter Construction, Trevese, Pa.	\$380.00	9	MMC Corp., Overland Park, Kan.	\$392.20
15	Limbach Facility Services LLC, Pittsburgh	\$296.00	11	Sterling Boiler & Mechanical Inc., Evansville, Ind.	\$360.00
16	The State Group, Mississauga, Ont.	\$269.90	12	Roto-Rooter/Service America, Cincinnati	\$335.89
31	W.E. Bowers Associates Inc., Beltsville, Md.	\$189.50	20	Murphy Co. Mech. Contractors & Engrs., St. Louis	\$232.90
35	Sauer Inc., Pittsburgh	\$164.20	24	Midwest Mechanical Group, Kansas City, Mo.	\$215.00
41	John W. Danforth, Buffalo, N.Y.	\$136.00	25	John E. Green Co., Highland Park, Mich.	\$210.00
43	McCarl's Inc., Pittsburgh	\$131.00	26	U.S. Engineering Co., Kansas City, Mo.	\$201.95
46	Fresh Meadow Mechanical, Fresh Meadows, N.Y.	\$130.00	27	P1 Group, Lenexa, Kan.	\$199.20
49	Worth & Co., Pipersville, Pa.	\$116.25	29	Hill Mechanical Group, Franklin Park, Ill.	\$193.00

South and Southeast			West		
Rank	Company/Location	\$ Millions	Rank	Company/Location	\$ Millions
3	Comfort Systems USA Inc., Houston	\$1,128.90	6	ACCO Engineered Systems, Glendale, Calif.	\$526.00
4	Service Experts Div. of Lennox, Dallas	\$535.40	7	Southland Industries, Irvine, Calif.	\$471.57
5	ARS/Rescue Rooter, Memphis	\$528.00	8	McKinstry Co., Seattle	\$395.00
17	Hardy Corp., Birmingham, Ala.	\$265.79	18	Harder Mechanical Contractors Inc., Portland, Ore.	\$251.00
21	McKenney's Inc. Mech. Contractors & Engrs., Atlanta	\$230.80	19	JH Kelly LLC, Longview, Wash.	\$245.20
22	Brandt Engineering Co., Dallas	\$229.40	30	Elkhorn Construction, Evanston, Wyo.	\$190.01
23	ColonialWebb Contractors, Richmond, Va.	\$219.70	34	RK Mechanical, Denver	\$164.90
28	Ivey Mechanical, Kosciusko, Miss.	\$195.00	39	Murray Co., Gardena, Calif.	\$143.00
33	Fire & Life Safety America, Richmond, Va.	\$170.00	51	Therma Corp., San Jose, Calif.	\$114.0
36	Clockwork Home Services, Sarasota, Fla.	\$158.50	53	A.O. Reed & Co. Inc., San Diego	\$111.50

cause we believe that it is an important differentiator in the marketplace," says McDermott. "We believe that it is not going to go away and it is one of these type of processes that will create opportunities for construction in general. We need to gravitate toward the requirements that are being put forth out there. We're huge supporters of it. It's good for business and it will create opportunities for our industry."

"I think for all of us it's something we have to embrace and try to incorporate in buildings today," said Krier. But Krier notes that there's a difference between saving energy on a payback basis and green and sustainable. The customers who are most interested in green are, for example, universities that are go-

ing to be in their buildings long-term. Installing variable frequency drives, on the other hand, is a money-saving investment that can be sold to most any customer.

Hosch relates that he has more than

private businesses are much less interested in spending more than they have to on many things, so we see that sustainable projects going forward are often associated with government, either local or the Federal government. They

There will be a **shakeout of contractor capacity** over the next 18 months as these **guys who took \$2 million-\$10 million jobs at or below cost** realize what they've done.

40 LEED-APs on staff, making up perhaps a quarter of his office staff.

Hosch says he's feeling confident about winning a utility-scale solar project. He's heard a lot of chatter about biomass or renewable energy projects, but there isn't any money backing such projects. Harris is, however, wrapping up a waste-to-energy incinerator in Minnesota.

"For us, for our company, it's very important," Hosch says of green work. "If you look at the projects that we've been able to develop over the last year and a half when we could push a project forward, a good chunk of them are based on energy conservation or renewable energy. For example, we're on our third conversion of an ice rink to a geo-exchange refrigeration plant and all those are based on payback. We've done schools with geo-exchange systems, so for us it's an important part of our business. Now we do see that

have a longer view."

Yerks says there's almost a wall separating energy saving from green and sustainable.

"I would say like BIM, the definition of green is still being developed and it means something different to everybody," Yerks says. "Energy conservation is definitely a very strong interest to our clients here in Northwest Ohio. How to tie that into sustainability is being discussed ... we have not found any with the payback that clients want unless they've made a policy decision that wants to include LEED or sustainable energy into their overall company strategy."

Be that as it may, saving energy still sells. Dunbar is working with an industrial client where they think they can save him some serious money by altering his plant utilities. Dunbar is tinkering with the operation of his chill-

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What bad looks like: Mechs burn through backlogs

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ers and the flow of his process cooling water, changing the velocity of the cooling water and running the water through the cooling towers instead of the chillers if conditions permit.

"We're doing the analysis right now to come back with recommendations on what we can do to save him energy," Yerks says.

Robert Shaw, president, R.M. Thornton Inc., Capitol Heights, Md., says that his firm has more LEED-APs than any other contractor in the Washington market. He's working on a LEED project at the National Zoo that includes geothermal, a green roof, water recycling and radiant heat for the animals. Additionally, numerous local governments in the D.C. area are requiring government buildings to be LEED certified, he says.

A tough year

Last year was the rough year for residential contractors. Now that market is starting to bounce back. This year will test the mettle of commercial/industrial/institutional contractors.

Yerks met recently with a customer for whom he had been working for the last three years and they talked about using BIM at the inception of a project. But then after the design phase, the owner said he was going to put the project out to bid because he "had to get the best price."

"Especially for the last year and a half or two years, there's been this pervasive feeling that contractors are so hungry that they'll 'buy' something, so let's bid it out and see how stupid they'll be," Yerks says. "Engineers have followed up on that by lowering budgets. Most savvy owners know that prices may have gone down some but, generally speaking, we have not reduced the price of craftsman wages or benefits. Material prices have not gone down. The craftsmen who are still working are the most productive guys. The contractors who are more efficient can reduce some cost that way or reduce some margins, but to think that you are going to get the same project 30% cheaper than two years ago, no."

Hosch says that Harris Cos. and its competitors are willing to travel hundreds of miles to follow work and staffs are more willing to travel because they know that their future employment may depend on it. Competition on small and medium sized projects is crazy competitive with contractors leaving out overhead and margin and just bidding for cash flow.


"We're going to continue to focus on BIM," Hosch says of the coming year. "We going to look to the federal market, keep overhead staff lean and try to keep down all those expenses that we can control. We're going to be aggressive on collections. I believe we're at the bottom

and things will start to improve at the end of this year. Then we'll shift from crisis planning to what are the opportunities as we come out of this. For us, our plan to grow is to move into different market geographies or different market segments. I think in terms of geography that this is a good time to make an acquisition or a merger. We're thinking about the Pacific Northwest."

"I've been in this business for a little over 20 years and I've never experienced a cycle like this one," says McDermott. "There is light at the end of the tunnel and it's just a matter of how

long it will take. I don't see an end for 12 to 18 months."

For this recession to end, the uncertainty caused by Washington has to end. Too many businesses are hesitating because they don't know how healthcare costs will affect them. Healthcare providers are worried about Medicare payments. Industry is worrying about energy and cap-and-trade legislation. And, secondly, bank financing has to come back.

"This is going to be a pivotal year in the industry for a lot of contractors," says Krier. "You'll find out who the strong ones are." 

Contractors finish working on part of a mechanical system, on the roof of one of Harris Companies' high-profile commercial projects.



Photo: Harris Mechanical

Hotel goes for LEED Gold, maintains its charm

► Continued from page 5

toilets. At a minimum, we'd expect more than 100,000 gallons of water saved each year assuming just 50% occupancy and four flushes per room per day. Additionally, using these toilets is a key component in helping us receive three points towards LEED certification."

The Sydney Smart range is a dual-flush toilet, featuring two buttons. The full flush button uses 1.28-gpf for solid waste, and the half flush button uses 0.8-gpf for liquid and paper waste. Assuming a 1:4 full/half flush ratio, it averages 0.90-gpf. The Caravelle HETs average 0.96-gpf, using 1.6 gallons for a full flush and 0.8 gallons for a half flush.

According to Sand, one of the main reasons Caroma toilets were chosen was because of the adjustable rough-in.

"This hotel was originally opened in 1939, and during that time, rough-ins were usually 10-in.," explained Sand. "However, when we were remodeling

the bathrooms, we discovered that the rough-ins were 10-in., 11-in., 12-in., or somewhere in-between. With the offset connector supplied with the Caroma toilets we chose, we could easily handle any of these variations."

Since the hotel has reopened, there have been no clogs or blockages.

"Compared to other toilets that have a small trapway, the Caroma HETs have basically eliminated the need for maintenance to fix toilet issues," said Sand. "That not only helps keep the maintenance costs down, but it also eliminated the possibility that guests will be frustrated or embarrassed by toilet issues."

Besides utilizing high-efficiency toilets to conserve water, a 7, 500-gal. rainwater capture system is being installed to reduce storm water runoff and irrigate outdoor and indoor landscaping at the hotel. Rainwater will be collected from the 10th and 11th story roofs—a total of 6,200-sq.ft. of roof space—and stored in three 2,500-gal. cisterns.

According to Sand, the three cisterns will be put inside the adjacent parking structure, and stored water will be used to irrigate the tree lined street and the plants in the hotel. It is estimated that stormwater runoff will be reduced by more than 25%.

At this time, according to Sand, the renovated hotel is using approximately 76% less water than before it was renovated, and the rainwater capture tank has not even been installed yet.

Solar and more

Another sustainable feature of the hotel is a solar heated hot water system with 73 solar panels. The system provides 60% of the heating required for domestic hot water for the hotel's kitchens, restaurant, laundry and guest rooms.

"This is doing an amazing job," said Sand. "The solar system preheats water before it travels to the boiler. As a result, the boiler doesn't have to work as hard to maintain the proper temperature."

The renovated hotel also has a central HVAC plant with a cooling tower. Components of the HVAC system include small boilers, which are 87% efficient, and two Trane chillers.

"Part of the reason why we picked this [small sized boilers] is because it would fit down the access door in the sidewalk that goes into the basement," explained Sand. "The basement was not originally designed to house large equipment, so we did not have a lot of space to work with."

Other environmentally-friendly features of the hotel include an integrated building energy management system, the Trane Tracer Summit, to control the heating, cooling and lighting when the room is unoccupied and interior finishes incorporating natural, recycled and low volatile organic compound (VOC) products.

"This renovation illustrates that green state-of-the-art technology can be blended successfully in historic renovations while maintaining the build's historic character," said Sand. 