MIDCONTINENT PERSPECTIVES

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An Insider's View Of The Construction Industry

This session of Midcontinent Perspectives will focus on the past, present, and future of the construction industry and the roles of those people who participate in it. It is the single largest industry in this country. The value of construction put in place each year will average between 12 and 15 percent of the gross national product. In addition, the industry employs nearly 6 million people. This number could easily be doubled if one considers the ripple effect of related segments of our economy such as insurance and surety bonding, banking and mortgage lending, legal and accounting, and manufacturing and distribution.

For the purpose of our discussion, we will define the construction industry as that industry which through planning, design, construction, maintenance, and repair transforms resources of materials, labor, equipment, technology, capital, and land into constructed facilities. We can divide the constructed facilities into three groups: nonresidential building, residential building, and non-building construction.

Nonresidential building includes schools, hospitals, churches, offices, shopping centers, manufacturing plants, warehouses, and distribution centers. In 1979 the dollar value of nonresidential building amounted to $49.6 billion. In 1980 this increased to $52.3 billion, and for 1981 the estimate is more than $53 billion, according to the revised estimate of the F.W. Dodge Corporation – the economic forecasters for the construction industry.

Residential building includes both single family and multifamily housing, and its dollar value for 1979 was nearly $75 billion. For 1980 it dropped to $63.1 billion. The revised 1981 forecast is calling for a dollar value of $76 billion.

Non-building construction includes highways, bridges, railroads, dams, sewers, and water, oil, gas, and power facilities. In 1979 this sector had a dollar value in excess of $42 billion, and in 1980 the dollar value dropped to $31.6 billion. The revised forecast for 1981 is for a dollar value of more than $35 billion.

Although total construction dollar volume varies from year to year, with 1979 accounting for $166 billion, 1980 for $147 billion, and 1981's revised forecast calling for $164.5 billion, there is a great disparity in the dollar volume of the three different types of construction and an even greater contrast by geographic region. It is not uncommon to have a boom in all three types of construction in one geographic region and, simultaneously, a recession in other parts of the country. A typical example of this is the boom now occurring in the Sun Belt. In 1965 the Sun Belt accounted for one-half of all nonresidential building construction. By contrast, in 1981 the

Sun Belt is expected to generate two-thirds of all nonresidential building. The two most active states are California and Texas, generating 20 percent and 10 percent, respectively.

The demand for construction comes from a variety of sources, including public bodies-such as federal, state, county, and city governments – and the private sector, from the largest corporation down to the smallest business. Fluctuation of demand causes the construction industry to experience cycles of boom and bust. In tracing the construction industry from World War I to the present, one turns up the following data:

- The 1920's capitalized on the accumulated demand caused by World War I in both the public and private sectors.
- The 1930's were the depression years following the wild speculation, boom, and bust of the 1920's.
- The early 1940's were the World War II years, and the construction industry made an almost miraculous response to the defense needs of this country for training camps, factories, and transportation facilities.
- The late 1940's and the 1950's reflected the pent-up demand for construction that had been stymied by the war effort, as well as a population explosion that required more schools, more housing, and more small shopping centers.
- The 1960's and the 1970's focused on the demand for modern highways, hospitals, offices, and giant shopping centers outside the downtown areas. Those two decades also witnessed the flight to the suburbs and the mass exodus to the Sun Belt.
- The late 1960's and the 1970's saw the beginning of an energy crisis that now has this country searching for energy alternatives and putting forth an all-out effort to locate new gas and oil fields. In this period also, we started to experience wild fluctuations in both inflation and interest rates and new technology has been developed to combat inflation and increase productivity.

The 1980's and the 1990's will present this country both tremendous challenges and opportunities that will definitely impact on the construction industry. An impressive effort is now being made by the federal government to balance the budget. However, at the same time, it is considering an all-out effort to bolster this country's military potential. Also, a substantial cut in tax rates is being proposed, along with accelerated depreciation schedules which will further reduce taxes. It is hoped the net result will stimulate a slow economy.

While the government wrestles with balancing the budget, there are other factors that will impact on the construction industry during the last two decades of this century. We are now approaching a demographic milestone in which persons born during the population explosion of the 1950's will be turning 30 years of age. This should have a significant impact on housing, shopping, offices, factories, distribution centers, and recreational facilities.

During the 1980's and the 1990's, there will be a great need to rebuild and modernize our factories, as well as to repair and replace utility lines, highways, bridges, and railroads. At the same time, our utilities must keep pace with both population growth and geographic population shifts. Other factors that will have a profound effect on the construction industry in the years ahead are the extent of defense spending; monetary and fiscal policies of the federal and state governments, the Federal Reserve Board, and the lending institutions; an aggressive energy

policy that will eliminate our dependence on foreign oil and simultaneously eliminate the current deficit between our exports and imports; and tax incentives to encourage business to expand and modernize.

We have looked thus far at the construction industry statistics. Who are the people comprising the construction industry? Planning and design are done by architects, engineers, and consultants. The physical construction combines the efforts of contractors, subcontractors, material suppliers, and equipment suppliers. The physical labor at the site is performed by employees of both the contractor and the subcontractor.

As each year passes, it seems the construction projects become more complex, and, of necessity, the design team becomes more specialized. Using the modern hospital as a typical example, the following consultants might be used by the owner-user and the lead designer:

Feasibility and financial consultant

Environmental impact consultant

Traffic control consultant

Civil engineer for site development and surveying

Geologist for soil borings

Structural engineer

Mechanical and electrical engineers

Kitchen consultant

Laboratory consultant

X-ray consultant

Finish hardware consultant

Interior decorator

Acoustical consultant

Landscape architect

As the planning and design of each construction project become more complex, the need for knowledge and expertise by the contractor and subcontractor is increased. Coordinating, managing, and scheduling the work require knowledgeable managers with a multitude of disciplines such as real estate financing and feasibility, marketing, taxation and accounting, engineering and architecture, safety, insurance, affirmative action, and personnel and business administration. As a result, the office staff is more highly educated. There are fewer clerical and secretarial slots and a multitude of bachelor's and master's degrees and in-house certified public accountants.

With the complexity of construction there has also evolved a new breed of field manager. Although supervisors are still being promoted from the ranks of skilled workers, there is an influx of field managers who have college degrees. Project supervisors and superintendents must have not only technical know-how in addition to understanding the complexity of business administration, but also they need to understand the psychology of effectively managing people.

Generally speaking, the work crews are still being developed through apprenticeship programs. The length of apprenticeship training will vary from craft to craft, but it will normally be a four-year program before a journeyman skill level is developed. Some examples of these craft positions are: plumbers, electricians, ironworkers, carpenters, bricklayers, glaziers, and sheet metal workers.

At the present time field employees are approximately 40 percent unionized. This is a considerable decrease in the number of union workers and an increase in the number of nonunion workers, and it is my personal feeling that the increase in nonunion workers is the result of strikes, jurisdictional disputes, and the featherbedding that was prevalent from World War II until the late 1970's. In recent years there has been a trend in our geographic region toward a more realistic approach by union leaders who are aware of the interdependence of labor and management and the need for well-trained, productive workers. When a business decides to expand or relocate, bad labor markets are passed over. When this occurs, there are no jobs for workers.

The whole field of labor relations has become highly regulated by the federal and state governments and will become even more so in the future. Social security, withholding taxes, earnings taxes, workers' compensation, pensions, vacations, and medical and wage continuation are representative types of deductions that have been taken from the paychecks of the worker, and each one of these requires separate accounting and special reports. In addition, the federal government has special legislation covering pensions, minimum wages, safety, affirmative action, and collective bargaining and picketing, to name a few of the matters now addressed by labor law.

Perhaps no sector of our economy has felt the impact of inflation like the construction industry. Nearly 100 years ago the average skilled worker in the Kansas City area worked for 39¢ an hour. I learned this after digging through some very old files and reports at the Builders' Association office. In 1968 the pay of this same worker had increased to approximately $5 per hour. Today the national average scale for all crafts is in excess of $15 per hour, and this number will increase to $20 an hour in 1983, just on the basis of the settlements that have been reached this year. If there is one problem in the construction industry, it is the entire framework of wage bargaining, where each side reaches an impasse and then decides to see who is the stronger. In a strike, usually no one wins. I'm hoping that in my lifetime I will see machinery set up so that both sides transmit their information to impartial bargaining agents who are bound to settle the strike in a timely fashion. We found in 1969 and 1970, when we had strikes lasting four to six months, that it was a no-win situation for both sides. I think the labor people will admit that also. With the cost of labor leading the way, it is not surprising to discover that the cost of construction between 1968 and 1983 will have quadrupled.

What is the construction industry doing to combat inflation and increase productivity? Technology is rapidly developing new methods, systems, and equipment to increase productivity. Communication through the use of walkie-talkies, transportation of construction materials and workers by personnel hoists, the pumping of concrete, and laser levels, in addition to climbing cranes and flying forms, are but a few of the new techniques to increase productivity.

Back in the early 1940's when I was working on construction projects, the types of equipment and materials used were very different from those that are used today. Then, there was heavy dependence upon wood shores, while today we use metal shores and metal

scaffolding. Then, the transportation of materials was usually handled vertically by a wood tower constructed adjacent to the building through which the material was transported. Today we can deliver materials to any spot on the building with a minimal amount of labor handling. A few years earlier foundations for houses were dug by a team of horses with a slip. Today we have very efficient excavating equipment and all types of cranes which have had a great impact on productivity and laborsaving. Today we see the use of the laser level, an item brought in probably by the acoustical ceiling people five to ten years ago. With a laser level, we can use the surveyor on only a part-time basis because the level does the work much better.

The problem of inflation is being solved by new approaches that have generated such buzzwords as the team approach, fast track construction, cost design, value engineering, and critical path scheduling. In simple language, it means that the owner-user, the designer, and the contractor have joined hands to compress the design and construction time without sacrificing quality or economy. If all members of the construction team understand their role and are committed to the approach, the owner-user can expect to save construction costs and interest on money and gain occupancy of the constructed facility sooner.

I would like to discuss a few figures and photographs I've included of current projects in which new technology is being used.

Figure 1

HISTORICAL BUILDING COST INDEXES - AVERAGE OF ALL NON-RESIDENTIAL BUILDING TYPES, 21 CITIES

1941 average for each city = 100.00

Metropolitan Area	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
Atlanta	422.4	459.2	497.7	544.8	575.0	598.7	657.1	714.2	755.8	904.3	964.3
Baltimore	348.8	381.7	420.4	475.5	534.3	581.1	585.0	635.6	662.2	802.2	825.3
Birmingham	309.3	331.6	358.3	402.1	421.2	448.9	551.9	585.4	609.2	751.3	764.9
Boston	328.6	362.0	394.4	437.8	462.5	513.2	555.9	587.7	759.5	745.4	759.9
Chicago	386.1	418.8	444.3	508.6	529.6	560.1	635.2	689.9	717.3	918.7	953.9
Cincinnati	348.5	386.1	410.7	462.4	500.1	550.6	609.8	656.6	669.5	840.0	876.9
Cleveland	380.1	415.6	429.3	462.2	509.5	531.0	632.9	625.2	653.5	885.1	929.8
Dallas	327.1	357.9	386.6	436.4	477.9	499.6	538.5	615.2	637.6	905.3	835.3
Denver	368.1	392.9	415.4	461.0	510.0	553.6	616.0	703.8	730.5	878.8	936.8
Detroit	377.4	409.7	433.1	501.0	538.7	597.5	617.2	664.2	756.6	897.6	920.4
Kansas City	315.3	344.7	367.0	405.8	444.9	509.1	547.3	603.0	631.8	737.3	789.9
Los Angeles	361.9	400.9	424.5	504.2	531.8	594.1	673.1	756.8	784.2	990.8	1,032.5
Miami	353.2	384.7	406.4	447.2	485.5	558.9	592.5	628.4	649.0	764.1	784.7
Minneapolis	361.1	417.1	412.9	456.1	488.6	538.0	564.1	629.4	651.3	854.8	856.7
New Orleans	318.9	341.8	369.7	420.5	442.1	494.7	534.8	614.7	637.0	761.9	793.3
New York	366.0	395.6	423.1	485.3	515.3	533.5	580.8	619.8	646.3	807.8	831.4
Philadelphia	346.5	374.9	419.5	485.1	518.5	567.5	579.2	658.8	680.0	844.8	857.6
Pittsburgh	327.2	362.1	380.3	424.4	465.6	509.5	526.3	589.6	614.0	763.8	788.4
St. Louis	344.4	375.5	402.5	444.2	476.7	528.9	537.1	617.1	637.4	811.8	836.9
San Francisco	465.1	512.3	561.0	632.3	672.5	753.3	820.8	963.2	990.0	1,244.8	1,285.6
Seattle	341.8	358.4	371.5	424.4	450.2	515.1	570.5	629.6	669.0	789.1	823.7

Figures for the Historical Building Cost Indexes and Summary of Building Costs for the fourth quarter are projections made by McGraw - Hill Cost Information Systems, based on the analysis of key economic factors over the past six to nine months.

ARCHITECTURAL RECORD March 1981

Figure 1 is a page from a document which appeared in the *Architectural Record* of March 1981 showing what has happened to costs between 1970 and 1980 in 20 typical cities. You will notice that the Kansas City cost index, when compared to the base number of 100 in 1941, had risen to 315 in 1970 and 789 by the end of 1980. These same kinds of problems are occurring in various cities.

Figure 2

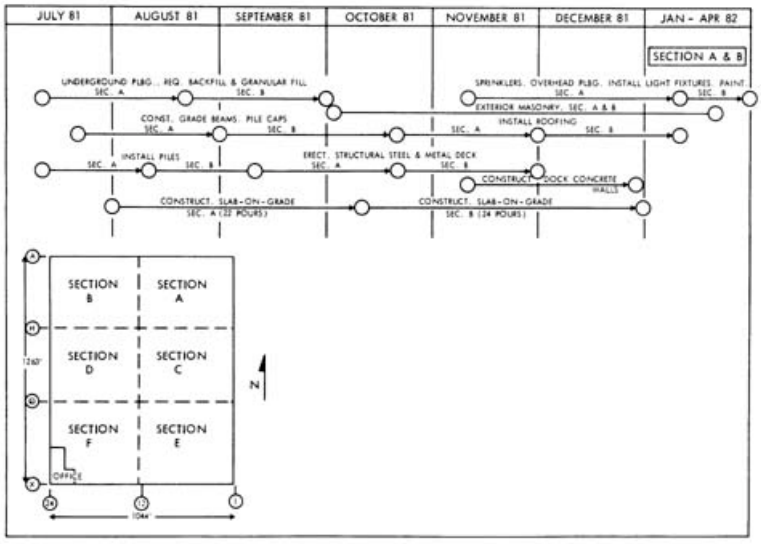

Figure 2 illustrates a portion of a typical critical path schedule used to save time and money. This particular schedule is being used as a starting point on a distribution center that is 1.4 million square feet in area. It has a difficult schedule because we have to pour all the concrete floor slabs and have the building under roof by the end of this year. It means that we will be pouring concrete now at the rate of 10,000 square feet a day and by the early part of June at the rate of up to 20,000 square feet per day. This schedule breaks the building up into six sectors and the sectors into a number of activities. We even generate these schedules for pre-construction where there is an agreed-upon time period during which the owner and designer make decisions and produce documents that can be costed by the contractor.

Figure 3

VALUE ENGINEERING

Floor Slabs

1. Flat Plate	$ 8.79 s.f.
2. Flat Plate with Drophead	8.70 s.f.
3. Hyperbolic Slab	10.26 s.f.
4. Pan Joist System	11.04 s.f.
5. Concrete Beam and Slab	12.53 s.f.
6. Composite Steel	10.43 s.f.
7. Non Composite Steel	10.66 s.f.
8. Precast System	9.62 s.f.

Wall Systems

1. Face Brick with Masonry Block	$ 8.00 s.f.
2. Face Brick with Studs	8.00 s.f.
3. Precast Slab Panel – Unfinished Gray Concrete	6.50 s.f.
White Concrete w/Sandblast	8.00 s.f.
4. Preassembled Stucco Panel	8.75 s.f.
5. Insulated Metal Panel	5.70 s.f.
6. Precast Double Tee Panel	5.00 s.f.

Roof Decks

1. Structural Steel with Wheeling Type “F” Deck or Equal	3.03 s.f.
2. Structural Steel with Metal Deck and Zonolite Fill	4.08 s.f.
3. Precast Roof Deck	4.30 s.f.

Figure 3 shows an example of value engineering on a distribution center that was completed a couple of years ago. This was a building of 1 million square feet that had to be constructed on a very tight schedule. They asked us

VALUE ENGINEERING

to look at eight different systems of floor slabs. We went through the analysis, and the owner picked a flat plate, which had the lowest cost for that particular project. We also looked at the various wall systems that we could use, and in this particular case the owner chose the insulated metal wall panel, which again was the most economical approach. They also considered using a concrete roof. When we analyzed the figures, we found that it was about $3 per square foot cheaper to use the concrete column supported by structural steel beams, bar joists, and metal deck. It was nearly $1 million cheaper to go with the structural roof deck.

Photograph 1, taken at a 470,000 square foot office building now under construction at Johnson County industrial airport, shows some of the laborsaving devices we use. These three climbing cranes can be erected to their maximum height and raised by hydraulic jacks. In this case we were able to set them up to the full height and did not have to go through the jacking operation. There was 96 feet under the hook, which goes in and out a distance of about 150 feet. The entire crane rotates 360 degrees. With it you can pick up 5,000 pounds of material and place it at an exact location. The middle crane is picking up a wall form called a gang form. Because the same type of walls was being used in all five levels of this building, we constructed the wall forms at the bottom level and moved them in large sections with the cranes. This method, as contrasted with tearing down the forms and starting all over again, saves much time and labor.

Photograph 2 shows some sectional steel scaffolds in an area that would have been a nightmare to form in earlier days. This section of the building is nearly five stories high, where we have to form a concrete roof from the ground to the bottom of the slab.

In **Photograph 3** the crane is "flying the forms." That section of scaffold and plywood is probably 250 to 300 square feet in area. These tables are made up for the first formed slab. After the slab is formed and poured, we bring in adjustable jacks to lower the sections just enough to put rollers on them, push them to the edge of the building, pick them up with the crane, and set them right back down on the next level. This is quite a laborsaving device. With the same crane, you can place reinforcing steel exactly where it is needed.

Photograph 4 shows a freshly poured concrete slab. A vibrating screen which has come on the market in recent years assures that the concrete is placed at the right elevation and is properly compacted. A compressor with an air line attached to the vibrating screen is performing the role of vibration.

Photograph 5 shows a pump that is pumping the concrete over to where it is to be poured. Today most concrete is placed either by concrete buckets from cranes or by pumps. There is a five-inch diameter line from a concrete pump that can pump up to 100 cubic yards of concrete per hour. When I worked as a laborer in construction, we used wheelbarrows and "Georgia buggies" to transport concrete, which was very labor intensive and would be too expensive today.

Photograph 6 shows a bulldozer that is controlled by a laser level. This worker is adjusting an instrument so that the exact elevation of subgrade for the blade of the bulldozer can be noted. The worker reads a panel on the machine and, at the signal, knows when he is at

exactly the right elevation. This one laborer and this one piece of machinery can grade about 20,000 square feet per day, whereas a number of years ago it would have taken approximately 20 laborers to do the same work in the same day's time.

Photograph 7 shows the concrete walls formed by using prefabricated concrete forms. The forms are two feet by eight feet and they can be moved very rapidly, so they are a great labor-saver. We are able to form and pour about 200 lineal feet per day of concrete foundation walls on this project with a small crew.

The piece of equipment you see in **Photograph 8**, a walkie-talkie, has revolutionized the communications in our industry. When I worked as a laborer, it was always difficult to find someone while they were on a job. Today the superintendent, the assistant superintendents, and the foremen all use walkie-talkies. This piece of equipment is expensive and costs over $1,500; however, it is a great labor-saver in making sure that people are in the right place at the right time.

In summary, I have been able to give you only a bird's eye view of a complex industry which is unlike any other major industry. No two projects are identical. The risks greatly outweigh the rewards. Profit margins are about half that in other major industries and bankruptcy cases are nearly double that of any other industry. The industry is cyclical in nature and has a boom or bust history. By its nature, this cyclical process does not utilize the labor force to the best advantage. Its success is dependent on labor, weather, material and equipment deliveries, and ingenuity, and mainly lots of luck. Murphy's law is the rule rather than the exception. However, after 35 years in this industry, I must admit, it has never been dull.

QUESTIONS AND ANSWERS

QUESTION: How does the productivity of the construction industry in the United States compare with that of other countries?

ANSWER: With the exception of a few countries such as Germany, most countries are behind us in productivity. However, many people say, "In the good old days, workers really put out a day's work." I would have to say that in our industry the productivity, the dedication, the desire, and the technology have come a long way. I feel that if there is ever a way we can stop the tremendous inflation in this industry, we will find that productivity remains the underlying issue.

QUESTION: Do you see the expanded use of lasers as a major cost-reducing influence?

ANSWER: The laser level has replaced two laborers, one operating the level continuously and a rod person, operating that part of the operation continuously. Laser levels are very effective in distances of up to about 400 feet; after that the light has a tendency to bend. One person sets up the level and comes back to check it on a periodic basis, probably eliminating the equivalent of one and a half workers during the day. It's an expensive instrument, but it pays for itself probably every month.

QUESTION: Is prefabrication playing an important part in the construction industry?

ANSWER: It plays a definite part in our industry. We use precast concrete and precast panels which are made in a plant, hauled by truck to a job site, and then picked up by heavy equipment to be set in place. Prefabricated structural components, such as columns and beams,

have worked out very effectively. In most garages built today we see columns, beams, and the double-T panels that go on top of these beams which are prefabricated in a plant. Sometimes the time element can be a bit of a problem, but we do use prefabricated materials wherever possible.

QUESTION: Whatever happened to the lift-slab approach that was used several years ago?

ANSWER: There were only a few of the lift-slabs used in the Kansas City area. We did one of them, and it is still being used. Although the idea was exceptionally good, we found that the cost savings were just not there and there were problems with deflection in a number of projects. In a project downtown, which, I think, used this method, there was a considerable problem getting the degree of accurate leveling of floor slabs that is possible with conventional methods. It was a good idea that just did not work at the time. There is always the possibility that previously used technology can be redesigned and come back to be a dominant force.

QUESTION: Would you comment on the building codes and what kind of problems they generate.

ANSWER: Within 25 or 30 miles of Kansas City, one finds different building codes. It drives out-of-town architects and designers up the wall because they may be totally familiar with codes in their area and then find that they have a completely different ball game in the Kansas City area. The Uniform Building Code and some others are being used quite frequently in different sections of the country, and I am hopeful that there will be a day when there will be one national code that would be applicable for the whole country. All we need is a disaster like the hotel fires in Las Vegas and we find the fire and life safety systems codes being revised all over the country.

QUESTION: What advice do you have for construction contractors seeking work?

ANSWER: There needs to be a greater marketing effort with both designers and owners to make them aware of the advantages of the team approach. It works very well if all members of the team understand their role, what responsibilities they have, and whether they can make decisions in a timely manner. There is a tremendous cost benefit to the average owner willing to use that approach.

This has been a long time in coming. I can recall 1969 and 1970, when wages doubled in this area. All of a sudden, designers and owners, who never talked to the contractor until bid time, were making certain that the specifications would allow the project to come in within the budget by consulting with the contractor.

QUESTION: What is the role of the construction industry in negotiating with labor when, in fact, it can pass the costs on to the owner?

ANSWER: The construction industry people can pass the costs along only if they know about them in time. In the two years 1969 and 1970, wages nearly doubled. There was no way that contractors who were out on contracts or who had buildings taking one or two years to build could have anticipated that. We feel that we have to keep our wages in this area competitive with other areas of the country so that we can attract the laborers.

The whole subject of labor relations and collective bargaining needs to be addressed on a national basis by the construction industry, the laborers, and the owner-users. There is no reason why one industry should always lead the pack with regard to inflation. The inflation is caused

first of all by wages, but right behind that follows the price of materials. The owner, of course, pays the end load.

QUESTION: Is there such a thing as a fireproof building?

ANSWER: The construction is fireproof. The problems occur in the furnishings, interior finishes, and the fact that many of these buildings have not been brought up to the latest codes. Many buildings have been built under antiquated codes that do not require them to have smoke detectors, to have stairways pressurized to keep smoke out of them, to have stair towers with automatic closers, and to have sprinkler systems. There have been enough catastrophes in recent years, however, that we should see a drastic overhaul of these codes.

QUESTION: What are your feelings about females in the construction industry?

ANSWER: We have eight to ten women who are hoisting engineers, laborers, and painters. The national goal is to get the percentage of women in construction up to 8 to 9 percent of the national construction industry work force. At this time they do not constitute more than 1 percent in the work force. The increase in wages will surely encourage women to consider the construction industry.

QUESTION: With today's interest rates, what is forecast in the way of increases this year?

ANSWER: The forecasts I showed earlier were revised forecasts done by the F.W. Dodge Corporation. I think they will be revised again. At the time they revised the first forecasts, there was a trend downward in the interest rates. But probably one of the greatest problems is the fact that there is demand out there that is not being satisfied because we have not been able to get our act together with regard to financing. In the commercial field most of the mortgage lenders are not only making the loan but also owning part of the project. In certain parts of the country housing is still moving ahead. Financing is simply very hard to find.

QUESTION: What is your opinion about the use of construction management firms?

ANSWER: I have always felt that if an owner has the in-house capability to understand all that the job requires, the designer and the contractor should have the combined expertise to provide all of the services that are generated by a construction manager. On very complicated and large projects, where you might have 20 or 30 buildings going up at the same time, there may be some need for someone to have the overview of the entire project.

QUESTION: What do you look for in a project manager?

ANSWER: I will tell you what we look for in a project manager; every contractor has a different definition of what a project manager is.

We have had excellent results in recent years in people from the top echelons of architectural, engineering and building construction schools who are interested in the construction side as contrasted with the design side of building. We feel that a technical background is almost a must. If we determine that good candidates need further training, we encourage them by financing their master's degree in business administration at night school. We think these individuals need to be able to communicate well with owners and designers as well as with the people who work for us, inside and outside. The outside field crews are an entirely separate group from the project managers. The project superintendent is the person out in the field who works with the field people. The project manager in our shop handles a project from

the very beginning, working with the designer and the owner in developing cost information, developing cost estimates, even staying with the project through the warranty periods and handling problems which occur after that period. It's a very responsible position. We think it's an intriguing position for young project managers because they head up a business within a business. They have a lot of responsibility and it takes a lot of technical know-how, a lot of business training, and a lot of common sense.

WILLIAM H. DUNN is chief executive officer of a construction firm founded by his father, the late J.E. Dunn, in 1924. For the past eleven years this firm has been among the top 400 construction contractors in the nation, operating primarily in Missouri and Kansas. In April 1981 the *Engineering-News-Record* ranked the company 19th among the top 25 general building contractors in the United States. After serving as a naval aviator in World War II, Bill graduated from Rockhurst College with a bachelor's degree in mathematics and physics. Since then his entire career has been with the J.E. Dunn Construction Company. Dunn is a director of both the Builders' Association and the local chapter of the Associated General Contractors. He is a past president of the Chamber of Commerce of Greater Kansas City and a trustee of both Rockhurst College and Midwest Research Institute. He is also metro chairman of the National Alliance of Business and co-chairman of the Labor-Management Council of Greater Kansas City.

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MIDCONTINENT PERSPECTIVES was a lecture series sponsored by the Midwest Research Institute as a public service to the midcontinent region. Its purpose was to present new viewpoints on economic, political, social, and scientific issues that affect the Midwest and the nation.

Midcontinent Perspectives was financed by the Kimball Fund, named for Charles N. Kimball, President of MRI from 1950 to 1975, Chairman of its Board of Trustees from 1975 to 1979, and President Emeritus until his death in 1994. Initiated in 1970, the Fund has been supported by annual contributions from individuals, corporations, and foundations. Today it is the primary source of endowment income for MRI. It provides "front-end" money to start high-quality projects that might generate future research contracts of importance. It also funds public-interest projects focusing on civic or regional matters of interest.

Initiated in 1974 and continuing until 1994, the sessions of the Midcontinent Perspectives were arranged and convened by Dr. Kimball at four- to six-week intervals. Attendance was by invitation, and the audience consisted of leaders in the Kansas City metropolitan area. The lectures, in monograph form, were later distributed to several thousand individuals and institutions throughout the country who were interested in MRI and in the topics addressed.

The Western Historical Manuscript Collection-Kansas City, in cooperation with MRI, has reissued the Midcontinent Perspectives Lectures in electronic format in order to make the valuable information which they contain newly accessible and to honor the creator of the series, Dr. Charles N. Kimball.