



#### LEGEND

- 1 DETROITER
- 2 DIVCO-WAYNE
- 3 GUERDON
- 4 MAGNOLIA
- 5 NASHUA
- 6 REDMAN
- 7 SKYLINE

DISTRIBUTION OF MAJOR MOBILE HOME  
MANUFACTURING PLANTS



Exhibit A

Mobile Home Manufacturing

Cost Ratios

(volume production)

|                            |             |
|----------------------------|-------------|
| Material                   | 67.0%       |
| Direct Labor and Variances | 7.5         |
| Overhead                   | 15.0        |
| Before Tax Profit          | <u>10.5</u> |
| Factory Price              | 100.0%      |

*Show conventional  
cost ratios*



# Exhibit B

## Comparative Costs for Mobile Homes and Mobile Home Type Houses

|                                     | <u>Size in</u><br><u>Sq. Ft.</u> | <u>Material</u><br><u>Cost</u> | <u>Factory</u><br><u>Price</u> | <u>Material</u><br><u>Price</u><br><u>Ratio</u> | <u>Per Sq. Ft.</u><br><u>Material</u> | <u>Ft.</u><br><u>Price</u> |
|-------------------------------------|----------------------------------|--------------------------------|--------------------------------|---|---------------------------------------|----------------------------|
| "X" Brand<br>Mobile Home            |                                  |                                |                                |   |                                       |                            |
| Economy                             | 684                              | \$2,585                        | \$3,850                        | 67.2%   | \$3.80                                | \$5.60                     |
| Deluxe                              | 684                              | 3,200                          | 4,800                          | 66.8  | 4.70                                  | 7.00                       |
| "X" Brand<br>Double-Wide<br>(house) | 1,040                            | 3,900                          | 6,000                          | 65.0  | 3.75                                  | 5.80                       |
| "Y" Brand<br>Mobile Home            | 672                              | 3,140                          | 4,700                          | 66.8  | 4.70                                  | 7.00                       |
| "Y" Brand<br>House                  | 1,220                            | 5,550                          | 9,500                          | 58.5  | 4.50                                  | 7.80                       |

*Show conventional  
Construction ratios*



EXHIBIT C

Example is a 1300 square foot townhouse selling for \$25,700 in 6.7 house per acre density.

|              |                                      |             |
|--------------|--------------------------------------|-------------|
| <u>Land</u>  | Acquisition Cost:                    | 3.0%        |
|              | Master Plan Improvements:            | 2.4         |
|              | Offsite Improvements:                | 6.3         |
|              | (including central air conditioning) |             |
| <u>House</u> | Overhead and Profit:                 | 5.1         |
|              | Onsite Improvements:                 | 4.3         |
|              | Amenities Surcharge:                 | 5.1         |
|              | Design Costs:                        | 2.2         |
|              | Construction Overhead                | 5.1         |
|              | and Financing                        |             |
|              | Selling Costs:                       | 5.5         |
|              | Closing Costs:                       | .4          |
|              | Contingencies:                       | .8          |
|              | General Administration:              | 4.3         |
|              | Gross Profit:                        | 4.3         |
|              | House Construction Cost:             | <u>51.2</u> |
|              |                                      | 100.0%      |



## MOBILE HOMES MANUFACTURERS ASSOCIATION

It was necessary to find as many mobile home manufacturers as possible who might be interested in our project. For this reason, Mr. Wilson, General Manager and Director of the Mobile Homes Manufacturing Association in Chicago, was contacted. On the occasion of their annual convention and exhibition in Louisville, Kentucky, on 11 January 1967, we arranged to have a meeting with as many manufacturers and their representatives as might be interested so a presentation could be made on behalf of industrialized housing of the nature that is under study in our project. Mr. Charles Dieman of the F.H.A. Experimental Housing Section had been scheduled to represent the views of the F.H.A., however, he was unable to attend, and Mr. Porter Driscoll took his place.

The response from the manufacturers was hardly enthusiastic. The audience consisted of approximately ten to fifteen manufacturers, including some of the larger corporations, and they appeared to be cautious. We explained the need for increased activity, particularly in multi-family housing, along the lines of factory produced living units. The question and answer period was devoted almost entirely to the problems that would exist or would become more prevalent with unions, particularly the plumbing and electrical crafts, and with building codes and a general inability to satisfy the requirements of on-site construction. We attempted to dissuade the manufacturers from pessimism, however, our final impression of the meeting was that the mobile home manufacturers as individual companies will not spend a great deal of money or energy in research toward this end.

There are some companies which have branched into the sectionalized housing business and some which are now active in the prefabricated housing business who have a more sophisticated outlook on the problem and offer more promise than the average mobile home manufacturer. Some of the larger ones such as Redman, Divco-Wayne, Magnolia and Detroitier have promised support, although the outcome remains to be seen.

Among approximately six hundred mobile homes and travel trailers on exhibition, there was virtually no difference in design or arrangement of space in any of the mobile homes,---"If you've seen one, you've seen them all." From conversation with a number of the manufacturers, it has become our opinion the industry has a highly developed system of competition. Every manufacturer copies new ideas and advantages of other manufacturers in very short order, mostly in terms of months, and for this reason, it appears most of the methods and materials presently used in mobile homes have arrived at the lowest common denominator.



HUD VA.-LIHD-1  
CONTACTS MADE TO 7 JUNE 1967

MOBILE HOME MANUFACTURERS

DETROITER MOBILE HOMES, INC.  
1617 Virginia Street  
St. Louis, Michigan  
Mr. John J. Moss, Vice President  
Marketing Services

DIVCO-WAYNE CORPORATION  
680 Fifth Avenue  
New York, New York 10019  
Mr. Newton Glekel, President

MAGNOLIA HOMES MANUFACTURING CORPORATION  
P. O. Box 230  
Vicksburg, Mississippi 39180  
Mr. David S. Wolff  
Director of Operations

MAGNOLIA HOMES OF VIRGINIA  
P. O. Box 127  
South Hill, Virginia  
Mr. Ivon Hauenstein, General Manager

REDMAN INDUSTRIES, INC.  
7800 Carpenter Freeway  
Dallas, Texas 75247  
Mr. Herbert G. Hammar, Director  
Research and Development

RICHARDSON HOMES CORPORATION  
Elkhart, Indiana  
Mr. Charles D. Lehman  
Market Research Manager

RITZ-CRAFT CORPORATION  
P. O. Box 491  
Shamokin, Pennsylvania  
Mr. John O. Richardson, Vice President

MODULUX, INC.



#### DETROITER MOBILE HOMES

Mr. John Moss of Detreater Mobile Homes was recommended by a number of sources. We soon found Detreater is one of the few manufacturers who has actively started a program to get into the low cost, permanent housing business and has an apparent desire to stay in it. Mr. Moss said they engaged Perkins and Will, the architectural firm of Chicago, to do their preliminary design work. He indicated the sensible attitude their firm is taking in limiting themselves to use only single story, single family type units which can be arranged in what they call a linear cluster. Some rough outline sketches of this idea were displayed.

Mr. Moss indicated his firm would be highly interested in cooperating with us and working up the necessary design details and estimates. Mr. Livingston has indicated that before any reliance is placed on the cooperation of Detreater, one must have the agreement of Mel Hutchinson who is Chairman of the Board. This will be secured in the near future.



## DIVCO-WAYNE INDUSTRIES

Divco-Wayne is the largest manufacturer of mobile homes in the United States in conjunction with other manufacturing interests. Its net sales are approximately \$110,000,000 per year. It manufactures over twenty of the brand names available in mobile homes which are up to 1,440 square feet in size. It is also an important manufacturer of educational units and hospital and mobile laboratories. Divco-Wayne has a large contract with the United States Air Force for housing in England and is operating a sectionalized house manufacturing plant there. Unlike most mobile home manufacturers, the company does not purchase the steel frame from manufacturers; the Wayne Division, specializing in the manufacture of bus bodies and educational laboratories, manufactures the frame. They also have their own plywood finishing factories.

We have had several meetings with Mr. Newton Glekel, President of Divco-Wayne, Mr. John Ohring, Assistant to the President, and other representatives of the firm. They have displayed much interest and enthusiasm regarding participation in our program, and Mr. Glekel feels a successful program at Reston is probably the key to a general acceptance of the sectionalized house.

Divco-Wayne was recently purchased by Boise Cascade, one of the country's largest building materials manufacturers and a firm which is also showing considerable interest in participating in the Reston program.



## MAGNOLIA

Magnolia Corporation appears to be the second largest manufacturer of mobile homes in the United States. We have had several contacts with Magnolia executives, the most frequent of whom has been Ivon Haunstein, who is Manager of the South Hill, Virginia plant. They have plastic laminating capabilities and can manufacture plastic foam core panels which has not been observed in the other plants we have visited.

Magnolia is deeply involved in the sectionalized housing industry and is currently starting a mobile home type unit stacking low income housing project for HUD in Vicksburg, Mississippi. It will also start a prototype for a married students housing project at Amherst, Massachusetts. This is designed by Tiffany Armstrong of Richmond and is of exceptional design quality.

Magnolia Homes has considerable stature with the F.H.A. who is very active with them. If asked for a recommendation of a manufacturer participant in our project, F.H.A. would undoubtedly mention this company. We believe they are probably too heavily involved in the Vicksburg and Amherst projects.

We are in contact with Mr. Haunstein and Mr. David Wolff and are exploring the possibilities of their participation in the program.



## REDMAN INDUSTRIES

As can be seen from the original application document, Redman Industries of Dallas, Texas, has long been interested in furthering the concept which is under study at Reston. It appeared from the outset that we might be working with Redman, and we spent much time in the company of Redman executives, primarily John Livingston, who at that time was Vice President in charge of marketing and new products and in whose baliwick this sort of research would fall.

We visited their factory in Hazleton, Pennsylvania, in order to make an inspection of the facilities presently available in the manufacture of mobile homes. We spent the better part of a day following in detail the manufacture of a typical mobile home unit, 12' wide and approximately 60' long. This visit proved informative and enlightening as it became evident that in the manufacture of standard mobile homes there are few systems available which are superior to the standard construction methods used in the field. One of the obvious differences is that the industry uses dry finishes exclusively. Everything that goes into a mobile home is in a prefinished condition. They are able to lay out the flooring materials for the entire 12' x 60' floor area in the form of sheet goods and/or carpeting without fear of damage during the construction process. All the wall panels in every mobile home in the business consist of very thin, prefinished wood veneer. Practically all framing is 2' x 2' studs (plywood lathe installation), light gauge aluminum exterior skin, light gauge galvanized iron roofing, light prefabricated roof trusses spanning the 12' across from wall to wall. The only evident painting or finishing in place is a limited amount of touch-up.

Almost all materials presently used in a mobile home would not be acceptable in a standard home. This is primarily because the mortgage term for a mobile home is a maximum of seven years versus thirty-five or forty years for a standard home. Also, from a market point of view, most materials in a mobile home would not appeal to the conventional home buyer. One of the main problems is the upgrading of present materials in terms of acceptability, but hopefully not in terms of cost.

The mobile home industry is a highly seasonal one. The visit to the Redman facilities was early in the year, and the factory was at a very low production rate. At that time they were producing three or four units a day; their plant capacity was thirteen or fifteen a day. Because of the seasonality and because the industry is not particularly stable, Mr. Redman made an about-face and decided he was going to concentrate on the manufacture of standard mobile homes whose sales are fairly well secured. For this reason, Redman Industries is no longer connected with this project.



RICHARDSON HOMES

We made several contacts with executives of Richardson Mobile Homes and went to Elkhart, Indiana, to visit their plant. We inspected their facilities and had a meeting with the president, Mr. Robert Richardson. This was in the winter months, their production was down, and the outlook was fairly dim. The tight money situation which prevailed throughout the housing industry all of last year had caught up with the mobile home industry, and their sales were slumping precariously. Mr. Richardson indicated some interest but was concerned over the state of affairs in the industry. He felt it was necessary for him to conserve his capital and energies and not venture into new products and new markets. This was similar to John Redman's attitude.

While on the premises of the Elkhart facility, we inspected some sectionalized houses built by Richardson for Alcan. These houses are now on display at Expo '67 in Montreal. Mr. Simon expressed interest in the manufacture and system of these houses, and some contact has been made with Alcan Homes. Mr. Schultz intends to visit Montreal sometime in July at which time he will report on the Alcan houses. A significant point regarding the Alcan houses is that they were built with conventional materials, and an attempt was made to keep them as conventional in appearance as possible. Brick surfaces, wood siding, wood sash, etc. were used which created a notable departure from mobile home appearance.