

728.3
:333
(78956)
A336

The Affordable Housing Demonstration

Santa Fe New Mexico

A Case Study



The Joint
Venture for
Affordable
Housing



THE SECRETARY OF HOUSING AND URBAN DEVELOPMENT
WASHINGTON, D.C. 20410

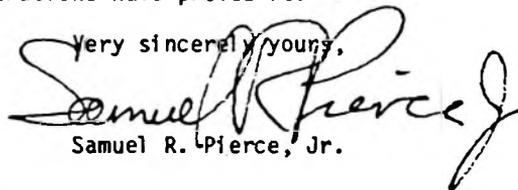
In January 1982 I announced the formation of the Joint Venture for Affordable Housing as a public-private partnership to combat the problem of high housing costs resulting from outdated and unnecessary building and land use regulations.

In the intervening years, much has been accomplished toward this goal. One of the most satisfying and successful efforts has been the series of Affordable Housing Demonstrations carried out through the cooperative efforts of builders, developers, and local officials in all areas of the country. In project after project, builders have reported costs savings of up to 20 percent through the effective use of innovative site planning, site development, and building construction practices.

As projects are completed, case studies report the steps taken by the builders and the help that has been received from local officials. Each project is different, and each case study has its own story to tell. This case study is one of a number reporting on the second group of projects now being sold or -- in some cases -- sold out!

I urge you to read each of the case studies and to use the ideas described in them as they apply to your situation in your community. Housing costs can be reduced without Federal subsidies; the Affordable Housing Demonstrations have proved it!

Very sincerely yours,



Samuel R. Pierce, Jr.

The Affordable Housing Demonstration A Case Study

Santa Fe, New Mexico

U.S. Department of Housing and
Urban Development Library Rm. 8141
Washington, DC 20410

DEPARTMENT OF HOUSING
AND URBAN DEVELOPMENT

JAN 25 1985

LIBRARY
WASHINGTON, D.C. 20410

Prepared for:
U.S. Department of
Housing and Urban Development,
Division of Building Technology

By:
NAHB Research Foundation, Inc.
P.O. Box 1627
Rockville, Md. 20850

November 1984

This report was produced by the NAHB Research Foundation, Inc., for the United States Department of Housing and Urban Development. The views and conclusions contained herein are those of the authors and should not be interpreted as necessarily representing the official view or policies of the United States Government.

Table of Contents

| | |
|--|----|
| Summary | v |
| Introduction | 1 |
| The Joint Venture for Affordable Housing | 1 |
| The Affordable Housing Demonstrations | 1 |
| The Case Study Approach | 2 |
| Chapter 1: Project Description | 3 |
| The Community - Santa Fe | 3 |
| The Builder - Walton Chapman Builders | 6 |
| The Project - Fairway Village | 7 |
| Chapter 2: Project History | 13 |
| Proposed Mobile Home Park | 13 |
| Proposed Conventional Housing Subdivision | 13 |
| Construction | 16 |
| Marketing | 16 |
| Summary of Buyer Choices | 17 |
| Chapter 3: Innovations and Their Impact on Costs | 19 |
| Change List and Approval Process | 19 |
| Administrative and Processing Changes | 21 |
| Site Planning and Development Changes | 21 |
| Building Design and Construction | 22 |
| Chapter 4: Details of Changes and Their Costs | 25 |
| Administrative and Processing Changes | 25 |
| Site Planning and Development Changes | 25 |
| Raw Land, Rights-of-Way and Density | 25 |
| Earthwork | 29 |
| Gas Line | 29 |
| Sanitary Sewer | 30 |
| Electric Service | 30 |
| Water Service | 31 |
| Curbs and Gutters | 32 |
| Streets | 33 |
| Sidewalks | 34 |
| Fencing | 35 |
| Other Land Development | 36 |
| Building Design and Construction Changes | 36 |
| Foundation and Slab | 38 |
| Exterior Wall Framing | 39 |
| Insulation | 40 |
| Interior Partitions | 40 |
| Floor Framing and Sheathing | 41 |
| Plumbing | 42 |
| Electrical | 42 |
| Wall Sheathing and Siding | 43 |
| On-Site Shop | 44 |
| Indirect | 44 |
| Total Cost Savings Summary | 45 |
| Appendix I - Floor Plans | 47 |
| Appendix II - Project Schedule | 51 |
| Appendix III - Mayor's Task Force on Affordable Housing | 53 |

Fairway Village, the Santa Fe affordable housing demonstration project, is located on 31 acres of level land just southwest of the city limits in a rapidly expanding area of Santa Fe County.

This project was initiated in December 1982 when the City Council established the Mayor's Task Force on Affordable Housing to "broaden the opportunity for home ownership to include a wider spectrum of Santa Fe families," and Walton Chapman Builders was selected by HUD to carry out the affordable housing demonstration project in Santa Fe.

Because the project site is in an area targeted for annexation by the city, project approvals and coordination involved the builder in discussions with a number of different regulatory authorities. Even so, a spirit of cooperation continued throughout the project, and the various authorities were willing to consider any reasonable request. Among the variances granted were: smaller lots, a smaller park with playground, sidewalks on only one side of the street, narrower streets and rights-of-way, roll curbs, and

regular inspections by the authorities to minimize project delays.

The 154 single-family detached homes in this development, built at a density of 5 units per acre, range in area from 1,000 square feet to 1,236 square feet (expansion spaces increase the maximum area to 1,656 square feet). The 47 units in Phase I, the demonstration phase, sold for \$49,950 to \$61,950. An average of \$9,140 per unit was saved by the steps taken by Walton Chapman Builders with the cooperation of Santa Fe County, Santa Fe City, New Mexico State, and Extraterritorial Zone Commission officials.

The homes, targeted to the "young professional" market, provide an interesting contrast to other Santa Fe homes: they are wood-framed instead of adobe, and include expansion space, cathedral ceilings, skylights, loft areas, and two-car garages. Due to the affordable price and attractive design of the homes, all 47 units in Phase I were sold less than one month after the opening of the three demonstration models.

The Joint Venture for Affordable Housing

Housing costs have risen dramatically in recent years, so that many people have been unable to buy a home. Part of this cost increase was due to the high rate of interest on home mortgages, which reached almost 20 percent in some areas of the country before dropping under 14 percent in 1983.

A large part of the increase, however, was due to other factors -- rising costs of materials and labor, a reduction in the amount of land available for housing which has drastically increased lot prices, and changes in market patterns leading to larger homes on larger lots. Studies by the President's Commission on Housing and by a special U.S. Department of Housing and Urban Development (HUD) Task Force on Housing Costs confirmed the findings of earlier studies showing that ways exist to cut the cost of housing. These studies also show, however, that out-of-date regulations and building practices frequently prevent these ideas from being applied. In fact, the studies pointed out that many builders and local officials do not even know about many of the ways that exist to reduce housing costs.

The Joint Venture for Affordable Housing was initiated by HUD Secretary Samuel R. Pierce, Jr., to correct this situation. Since affordable housing is a problem which involves all levels of government as well as the rest of the housing industry, finding an answer requires the participation of all of these elements.

Through conferences, workshops, demonstrations, publications, and similar activities, ways to cut construction costs through more

effective and efficient planning, site development, and building procedures are being brought to the attention of builders and local government officials all over the country.

The Affordable Housing Demonstrations

Home builders learn from other builders; successful ideas are copied and used in new ways by other builders in many different areas of the country. The affordable housing demonstrations have been developed to illustrate ideas for reducing housing costs in real projects and to provide information on the cost savings that resulted.

The central theme of the demonstration program is that a builder and those local officials responsible for regulatory approval can, together, identify ways to reduce the cost of housing and to modify or interpret local building codes and site development regulations so that these methods can be used. In the demonstration program, no Federal funds are provided either to the builder or to the community to support the demonstration projects. HUD and the National Association of Home Builders Research Foundation do provide technical assistance through various publications documenting previous research studies and through suggestions to the project designers, but it is the builder's responsibility to develop a list of possible cost-cutting ideas and it is the responsibility of local officials to accept those which are reasonable for that community.

Participating builders and communities have been selected for the demonstration program in several

ways. Before the Joint Venture was announced in January 1982, HUD approached a number of communities which had already demonstrated, in other activities, a willingness to modify regulations and to take other steps to encourage local development. As these communities agreed to participate in the program, NAHB worked through its local associations to identify builders in the communities with reputations for quality and records of innovation. Following announcement of the first twelve communities and builders selected to participate in the demonstration program, many other communities and other builders expressed interest in joining the program. In each case, HUD required a formal commitment by the highest elected official that the local government would support the program.

Once a project was accepted, HUD and the NAHB Research Foundation assisted the builder to identify cost-cutting ideas and to develop a workable, attractive site plan. The cost-cutting measures used in the various demonstrations vary widely. In some projects, street widths, street design standards, and utility system requirements were changed to reduce costs. In other projects, unit densities have been increased to reduce the impact of land cost on the final price, while good site planning and design have made this increased density acceptable to the communities. New housing materials and construction methods were used in

many projects. In addition to these changes in materials and methods, many projects benefited from improvements in local administrative procedures which reduced the time and effort needed to obtain building and land use approvals.

The Case Study Approach

Each project undertaken as an Affordable Housing Demonstration as part of the Joint Venture for Affordable Housing is being described in a case study report. The case studies are intended to be learning tools to help home builders, local officials, and others concerned about affordable housing to recognize and seize opportunities to reduce housing costs through regulatory reform and the use of innovative planning and construction techniques.

Information on the changes and their impact on costs is collected by the NAHB Research Foundation. Each case study describes the community, outlines the builder's experience, and discusses the specific project characteristics and history. Where possible, the cost savings resulting from the use of the various procedural, planning, development, and construction changes are calculated and reported in detail.

The following material provides this information on the Affordable Housing Demonstration project in Santa Fe, New Mexico.

Project Description

The Community - Santa Fe

Santa Fe, the capital of New Mexico, is a desirable place to live and visit. An old city located in the north-central part of the state, midway between Albuquerque and several ski resorts in an area with old Spanish towns, flat grazing lands, and picturesque mesas and mountains, Santa Fe has recently become extremely popular. Situated at an elevation of 7,000 feet, the city averages 330 days of sunshine annually, 13 inches of rain, some measurable snowfall, and a clear, dry, healthy climate.

The incorporated city includes rolling hills and flat land. Population in 1980 was 48,953 in the city and 75,360 in Santa Fe county, according to the United States

Census. In 1980, there were 17,851 occupied housing units in the city, and 26,287 in the county, with about 2.75 persons per unit.

Santa Fe calls itself "The City Different," descriptive of the heterogeneity of its residential neighborhoods -- rich and poor, Spanish and Anglo, young and old, living in the same neighborhood. To the city fathers this is as important in making Santa Fe a desirable place to live as are climate, cultural opportunity, and historical background. However, the recent lack of affordable housing has forced poorer families from the economically integrated areas of town, creating more homogeneous neighborhoods. The city also has expressed a strong concern for maintaining historical districts and the "old-fashioned" look.



AFFORDABILITY GAP WIDENS

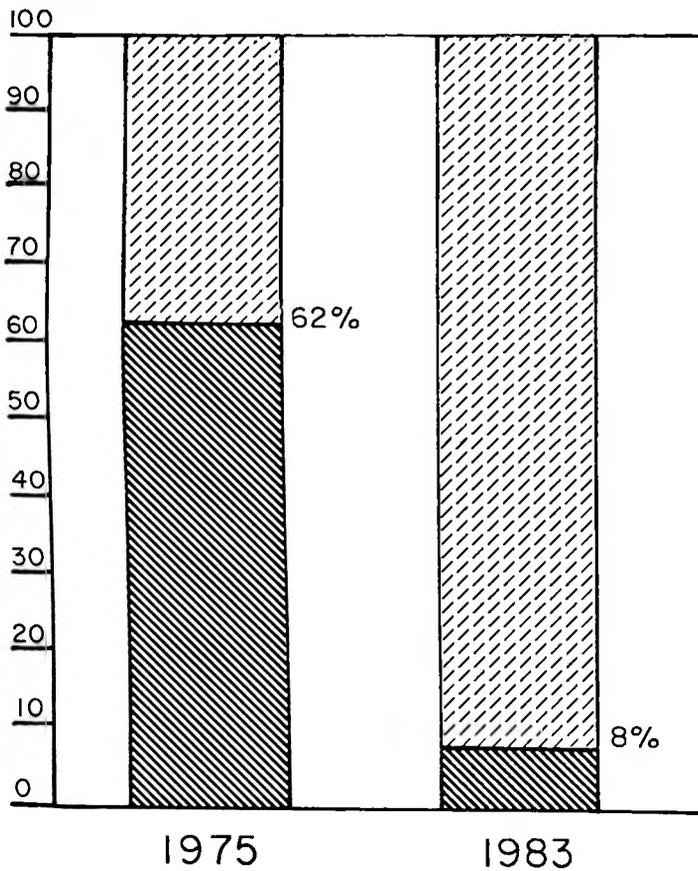
PERCENT OF SANTA FE HOUSEHOLDS



CAN
AFFORD



CANNOT
AFFORD



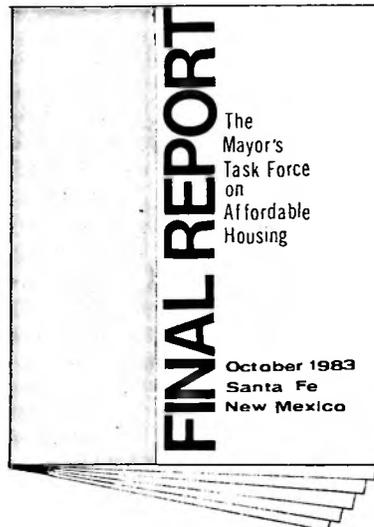
| | <u>1970</u> | <u>1983</u> |
|----------------------------------|-------------|-------------|
| Median Household Income | \$ 8,000 | \$ 20,200 |
| Average Single Family Home Price | \$21,000 | \$105,000 |

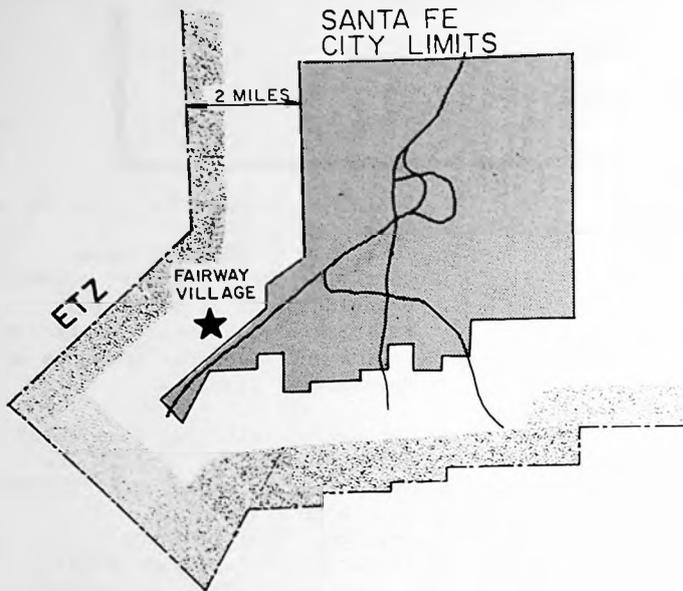
Median household income in Santa Fe was \$20,200 in 1983. The average single family home was \$105,000 in 1983. Household income increased 2-1/2 times between 1970 and 1983, but the average selling price of a home increased 5 times during the same period. Today, only 8 percent of Santa Fe's 18,000 households can afford to buy a home compared with 62 percent in 1975. Land costs and real estate values have sky-rocketed in Santa Fe largely due to the "discovery" of the city by affluent newcomers, investors, second-home owners and speculators.

Because the demonstration project is located in an area of Santa Fe County planned for annexation to Santa Fe City in the near future, reviews and approvals of plans for the project were required by four levels of government. A brief description of each follows:

- o Santa Fe City has a Mayor/City Council form of government. The Mayor and eight council members are elected in a partisan election for four year terms. All plans for Fairway Village were reviewed and approved by the city to facilitate annexation to the city. On December 8, 1982, the City Council created the Mayor's Task Force on Affordable Housing "to broaden the opportunity for home ownership to include a wider spectrum of Santa Fe families." The final report of the Task Force is an indication of Santa Fe's desire to deal with the affordable housing problem. (See Appendix III.)
- o Santa Fe County is governed by a three-member Board of Commissioners, one of whom serves as Chairman. The county planning staff is small and relies heavily on city staff for review and technical comments on developers' plans.
- o The Extraterritorial Zone (ETZ) Commission was created by New Mexico State law to guide future growth of the Santa Fe metropolitan area. The ETZ includes all territory within two miles of the Santa Fe City boundaries. Membership of the Commission consists of three members of the County Development Review Commission, three members of the City Planning Office, and a seventh member appointed by the first six members.

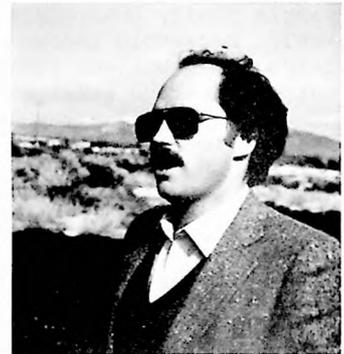
Cover of Final Report





ETZ Map

Michael Chapman,
Walton Chapman Builders Company



- o The State of New Mexico has a building code which all construction must meet. The state also issues building permits and performs building inspections, unless the locality chooses to do its own.

The Builder - Walton Chapman Builders

The Chapman Land Company and Walton Chapman Builders Company are the developers/builders of the Santa Fe affordable housing project. The Chapman Land Company purchased and developed the demonstration site, and the Walton Chapman Builders Company purchased the developed lots and designed, constructed, and marketed the homes. Walton and Michael Chapman, father and son, also operate several other companies involved in remodeling, heavy construction, light commercial work, and custom home design and construction. The Chapman companies, active in the Santa Fe area for 20 years, are well respected for their construction of quality housing and improvement of the

housing industry in New Mexico. Walton Chapman was twice named New Mexico Builder of the Year.

The Chapman Company built approximately 48 housing units in 1979, mostly single-family attached homes. Few homes were built in 1980 and 1981 due to a very slow housing market. In 1982, the company constructed about 25 homes, again mostly single-family attached, and in 1983 it built 30 single-family detached and 24 townhomes. During these years, the company also built a few custom homes, apartments, and commercial buildings. About 100 homes were estimated for 1984.

The firm does most of its design work and site-planning in-house. Excavation work is subcontracted. For the demonstration project, the company added carpentry and painting crews.

Michael Chapman has been active in local, state, and national NAHB activities and has become a popular speaker on affordable housing issues.

He has served on several affordable housing committies -- most notably the National Association of Home Builders (NAHB) Affordable Housing Task Force and the Santa Fe Mayor's Task Force on Affordable Housing. According to Chapman, it is important for builders to be involved with other successful builders. "You can't just decide to build affordable housing. Go out and learn," he advocates.

Anxious to participate in the Affordable Housing Demonstration, the Chapmans initiated contact with HUD in October 1982.

The Project - Fairway Village

The Chapman Company owned a 31 acre parcel of land outside the Santa Fe city limits, which had been planned as a mobile home park of 230 lots. Preliminary plans for the mobile home park had been approved in early 1981. When the Chapmans decided to join the Affordable Housing Demonstration, this site was selected for the project.



Fairway Village entrance sign

The project, Fairway Village, is in Santa Fe county, in an area planned for future annexation by the city. Because of the location, reviews and approvals are required by three principal levels of local government -- the city, the county, and the

Extraterritorial Zone (ETZ) Commission -- in addition to the state of New Mexico and private utility companies. Involvement by this many official bodies can cause extensive delays in the land development and building construction business, with the resulting costs adding to the price of homes. Many of these potential delays were avoided in this project due to the cooperation of all parties.



Fairway Village logo

Fairway Village is located on a level site in the rapidly expanding area southwest of the city limits, surrounded at a distance by various mountain ranges. The site is adjacent to an existing mobile home park in an area of light industry and planned future commercial growth. Nearby are the local airport, the area's major country club and golf course, and a 154 acre Chapman development which includes duplexes, fourplexes, and custom built homes selling for \$80,000 to \$180,000.

The 154 detached single family homes in Fairway Village are constructed at a density of five units per acre. The Chapmans planned to build the

homes in three phases over a three-year period: 47 homes during the first year; 46 homes the second year; and 61 homes the third. As noted in Chapter II, however, the market success of the project has expedited this schedule. Homes in Phase I sold for \$49,950 to \$61,950. Slight increases are anticipated for Phases II and III.

The three models are:

- o Sun Tree - Approximately 1,000 sq. ft., one bedroom, one full bath, fully finished loft
- o Wild Creek - Approximately 1,112 sq. ft., one bedroom, one full bath, fully finished loft; completion of unfinished space within the shell adds one more

bedroom and one additional bath, making total liveable space 1,352 sq. ft.

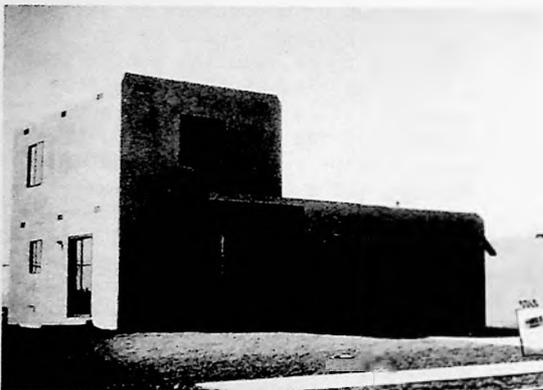
- o Pinehurst - Approximately 1,236 sq. ft., two bedrooms, one full bath, fully finished loft; completion of unfinished space within the shell adds one more bedroom, a large walk-in closet, and one additional bath, making total liveable space 1,656 sq. ft.

Floor plans of the three models are shown in Appendix I.

Fairway Village homes are an unusual architectural style for Santa Fe. They feature wood siding instead of stucco and pitched instead of flat roofs.



Fairway Village model,
an unusual style for Santa Fe



Typical Santa Fe style

Each home has a cathedral ceiling, a double-dome skylight, stairwell and loft area with open wood railing, attic storage space, utility service area, and a ceiling fan. Two-car garages are attached to each unit. Each home buyer is given a \$250 landscaping allowance.

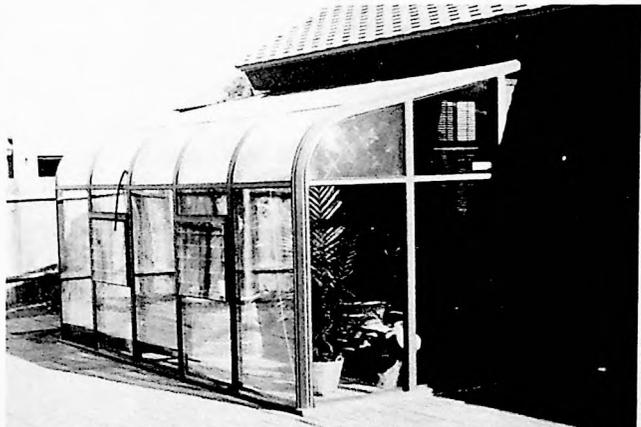
Several optional features were offered which allow the buyers to add amenities to the units with their own labor. Options include: a free-standing wood burning stove; an insulated glass bronzed aluminum greenhouse with curved profile;

completion of expansion space; rear garage door; higher-grade carpet; cedar fencing for the unfenced portions of the yard; and dishwashers.

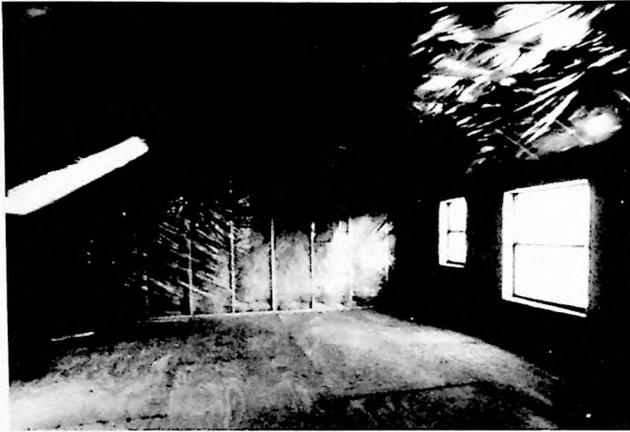
Homes are sited in a pinwheel arrangement rather than in traditional rows. Most lots will accommodate any of the three models. This allows Chapman to build models according to sales. Varying setbacks create interesting front yards and streetscapes. The pinwheel siting and varying roof lines create a feeling of community. Outdoor privacy is enhanced by the siting.



Fairway Village street scene



Optional greenhouse



Expansion space



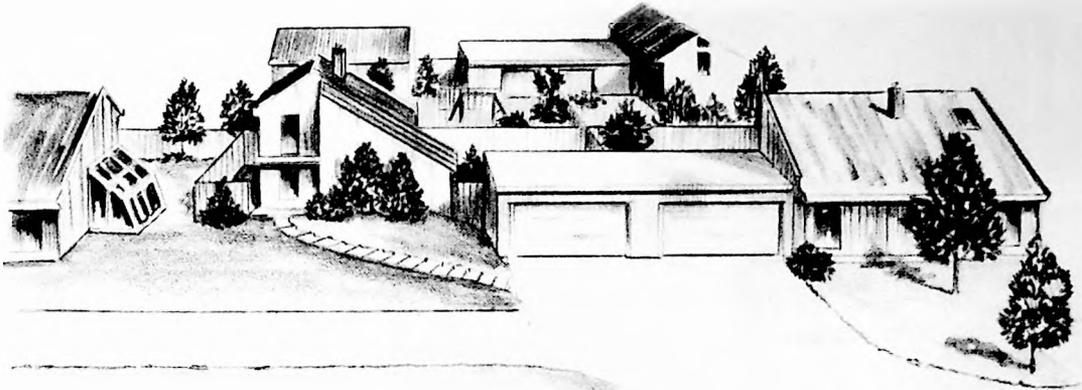
Woodburning stove (optional)

Fairway Village homes are targeted to the young professional market, mostly first-time home buyers. These are primarily couples and young families with one or two children or single-parent buyers.

Potential buyers have one or two incomes, generally totalling \$20,000 to \$30,000, and are employed by state

government, local government (police, fire, schools), or are in entry level career positions. This income segment had been excluded from the conventional housing market. Many of these potential buyers rented apartments or owned mobile homes, a major housing alternative in Santa Fe.





Drawing of housing cluster at Fairway Village

Chapman's market analysis showed that potential buyers are knowledgeable and practical concerning housing. They entertain at home and look for excitement, creativity, and open space in the home's design. All are ultimately concerned with cost. Although the study showed that target buyers were not concerned about central location in town, they did place high priority on access to shopping, banking, schools --

conveniences of day-to-day living. Chapman carefully selected his site to be close to all amenities.

Because the Chapman Company designed and built homes identified by market analysis, it met its market. Three sales models were completed in early August 1983; the Grand Opening was held August 6, 1983; and all homes in the demonstration project, Phase I, were sold by mid-August 1983!



Interior



Interior

Project History

Proposed Mobile Home Park

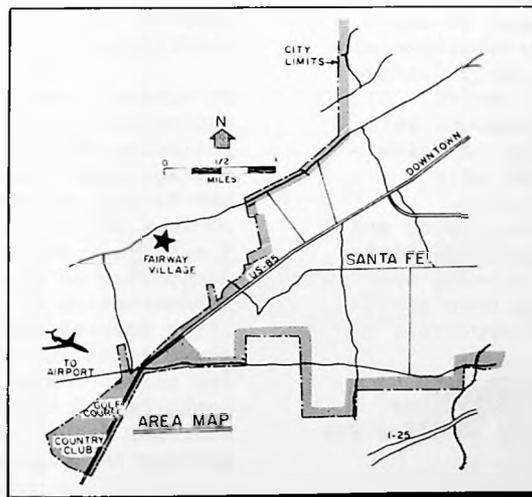
The Chapman Company purchased the Fairway Village site for \$11,000 per acre in May 1981 from a developer who originally planned a 230 unit mobile home park for the 31.5 acre land parcel. The site is just outside the Santa Fe city limits in the southwest sector, an area planned for early annexation by the city. Zoning for the mobile home park had been approved before the sale. Permission to connect to city water was granted. Chapman planned to develop and sell the 230 lots to mobile home owners.

The Chapmans applied to the city for approval to connect to the city sewer system; approval was denied. As a result, Chapman planned a sewage treatment system for the site. Preliminary plans for the mobile home park were then approved by Santa Fe County, Santa Fe City, and the Extraterritorial Zone in November 1981. Approvals, after zoning, had taken six months -- May to November 1981 -- at this point.

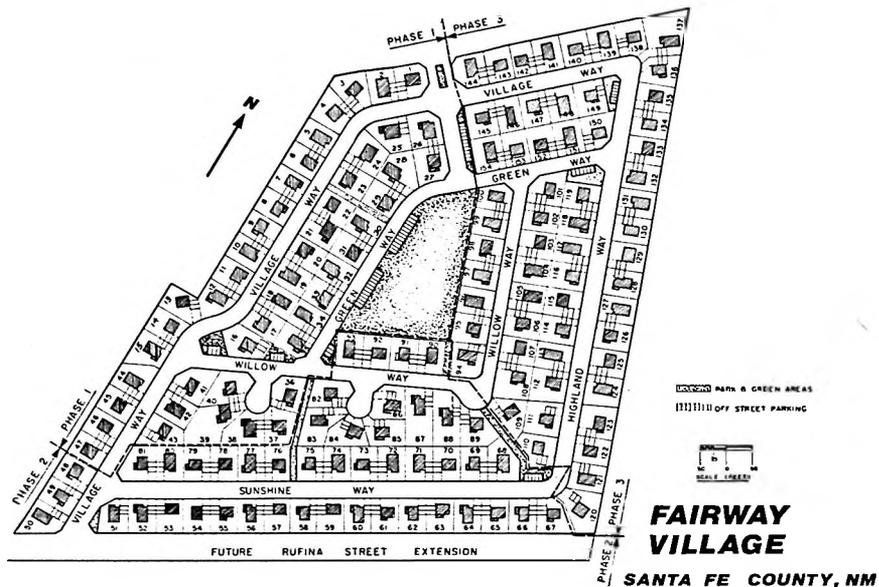
Proposed Conventional Housing Subdivision

During this time, the market for mobile home lots was slow and the Chapmans became interested in building lower-priced conventional homes. Michael Chapman had been involved in Approach '80 and the Cost Buster House (HUD/NAHB projects) and wanted to use some of the affordable housing techniques documented by these demonstrations. The mobile home park site was an excellent location for a subdivision where Chapman could use these various techniques to reduce costs.

Chapman requested approval to use the site for single family housing and to retain the water rights already granted for the mobile home park. The city, noting the need for affordable housing in Santa Fe, agreed to transfer the water rights from the mobile home park to the housing subdivision on the same site. Chapman also requested city sewer connection for the subdivision, but approval to connect to the city sewer system was again denied.



Location of Fairway Village



Fairway Village plat

Because the site was downzoned, meaning the density was lowered, it was assumed approvals would move swiftly. This did not happen. From November 1981 to November 1982, the Chapmans negotiated with city and county staff for changes to the preliminary plans. Discussions with the city were particularly intense regarding streets and street lighting, since the Chapmans were anticipating annexation of Fairway Village by the city and city acceptance of streets, etc. Variances to normal developing and building procedures were negotiated with city staff before being sent to the ETZ Commission and County Commission for formal approval.

HUD's Albuquerque Office also was involved in site considerations, because Chapman planned to offer FHA insurance.

Several private utility companies provide service to Fairway Village, including The Public Service Company of New Mexico (electricity), the Mountain States Telephone Company, and the Gas Company of New Mexico. They all signed final approval of the subdivision plans in May 1982.

In October 1982, Michael Chapman approached HUD regarding participation in the Affordable Housing Demonstration and submitted the Fairway Village site plans and house plans to HUD for consideration. The Fairway Village project was designated as an affordable housing demonstration by HUD in December 1982 after several modifications and with suggestions for some redesign work on the units. Mayor Louis Montano of Santa Fe and County Commission Chairman Samuel Garcia supported the project and pledged to bring the

demonstration to a successful conclusion. The City Council also endorsed the concept.

Eighteen months of reviews, negotiations, and approvals had taken place concerning the site before it became a demonstration project. After designation as a demonstration, seven months passed before the first homes were sold.

On November 5, 1982, the city reversed its earlier decision and granted permission to the Chapman Company to discharge to the city sewer system. The following reasons contributed to the city's positive decision:

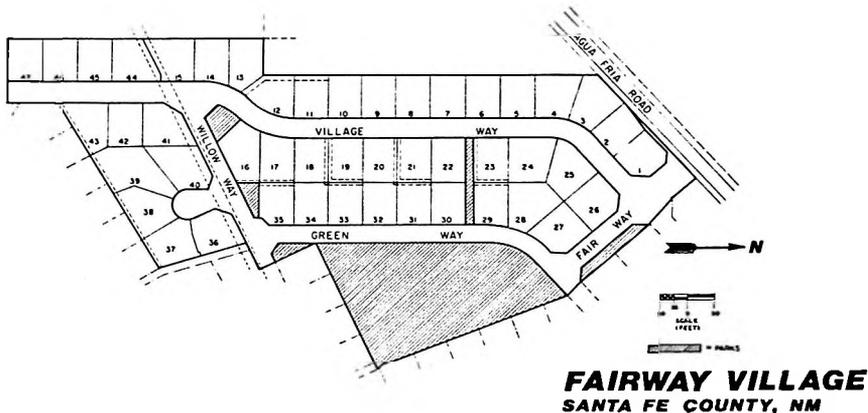
- o The builder already had permission to use city water. The city wanted the sewage created by the homes so it could be treated and resold by the city for irrigation water.
- o The site was down-zoned from mobile homes to single family homes and from 230 lots to 154.

- o The city supported the "affordable" concept.
- o The builder agreed to give the city a right-of-way from a new arterial road along the back (south side) of the subdivision, 66 feet wide by approximately 1,350 feet in length.
- o The Fairway Village Home Owners Association (HOA) established provisions to guarantee that individual sewer charges would be paid, or a lien would be placed against the property.

With sewer connection approval from the city, final approval of the project was granted on November 5, 1982, by the ETZ Commission and County Commission to proceed with Fairway Village.

On February 10, 1983, a list of requested changes in regulations and processing procedures was discussed by the Chapmans and city, state, and county officials. Some of the requests were approved for the demonstration project only. Some were being discussed concurrently by

Demonstration plat



the Mayor's Task Force on Affordable Housing and were approved or tabled for further consideration. Still others were rejected. A summary of these items appears in Chapter 3.

Construction

Grading on the site began in January 1983. Site utility installations and curb and gutter work began in March 1983. The three model homes and the on-site shop were started in April 1983. The on-site shop for prefabricating, precutting, and prefinishing components was a new effort by the Chapmans to reduce construction time and costs. (Detailed information is in Chapter 4.) The on-site shop began operating in May 1983, and construction was in full production by June 1, 1983.

The three sales models were completed by early August, 1983, and the Grand Opening was held August 6, 1983. (A detailed Project Schedule appears in Appendix II.)

Marketing

The Chapman Company alerted news media of Santa Fe City, Santa Fe County, Albuquerque and other surrounding areas of the company's inclusion in the Affordable Housing Demonstration. Primarily, Chapman focused on the uniqueness of the demonstration as the only one in New Mexico, the need for affordable housing in Santa Fe, and the special features of the Fairway Village project.

News and feature articles appeared in the local press, and a television station did a short feature spot. The Albuquerque Journal ran an article as early as February 4, 1983. On August 10, 1983, The New Mexican, a Santa Fe newspaper, printed an editorial titled "Standing Firm," which discussed the Mayor's Task

Force on Affordable Housing and encouraged readers to visit Fairway Village to see an example of an affordable housing development.

Additional articles featured cost cutting measures -- narrower streets, wood siding, expandable space, plastic sewer lines, city water and sewer, and roll curbs.

As a result of the media attention and flyers circulated among local apartment buildings and mobile home parks by the Chapmans, interested potential buyers contacted the Chapman Company even before construction of the models began. Fairway Village had a waiting list of 200 people interested in purchasing homes six weeks prior to the start of the sales program. The Chapmans accepted a \$250 refundable deposit on the homes, which encouraged potential buyers to commit to the purchase of a Fairway Village home. Michael Chapman reported, "By the time we opened we had basically presold the first phase!"

By the Grand Opening on August 6, 1983, firm contracts had been signed on 17 of the 47 homes planned for Phase I, and reservation agreements were held on 30 more homes. By late August 1983, all homes in Phase I were sold. All homes in Phase I were occupied by late June 1984.

Another 200 people were on the waiting list for Phase II when sales began. Construction on Phase II began in early May 1984; completion was scheduled for November 1984. Phase III will begin on completion of Phase II, with the entire 154 unit subdivision due for completion in 1985, a year earlier than anticipated.

Summary of Buyer Choices

Of the 47 units in Phase I, the demonstration project, three are the Suntree model, the smallest home; 22 are the Wild Creek model, the mid-size home; and 22 are the Pinehurst model, the largest model. Eight buyers elected to have the Chapman Company complete the expansion space, four in the Wild Creek for \$3,625, and four in the Pinehurst for \$4,425. No buyers purchased installed greenhouses; one opted for the uninstalled greenhouse.

The rear garage door was chosen by six buyers, the fencing material package by two buyers, and the wood-burning stove by five buyers. Thirty-two buyers elected to purchase dishwashers, and 29 up-graded the carpet.

FHA financing was used by 11 of the buyers, state bond financing by 21, and conventional financing by six. Seven buyers financed through adjustable rate mortgages (ARMs), and one paid cash.



Sales office



Sales office interior

Innovations and Their Impact on Costs

One purpose of the Affordable Housing Demonstration Program is to collect and evaluate cost data on residential development practices and construction techniques. The following discussion describes specific variances from the norm in administration and processing, site planning and development, and building design and construction.

Change List and Approval Process

As discussed in Chapters 1 and 2, several regulatory jurisdictions were involved in the approval process, creating complexities not normally encountered in other communities across the nation. Chapman had to deal with the county, city, state, Extraterritorial Zone (ETZ) Commission, and private utility companies to obtain all necessary approvals.

Obtaining all necessary approvals in Santa Fe is a time-consuming process because of the need to satisfy requirements of all the regulatory agencies involved. But because the site had already been approved as a mobile home park and because of the cooperative attitude of all the regulatory agencies, Michael Chapman estimated that the total process time was reduced by six months.

Fairway Village was granted variances from each of the jurisdictions responsible for approvals. Even after the final plat was approved, Chapman continued to push for more changes and the city was responsive to most of his requests. It is important to note that as Chapman was discussing changes with the city, county, and ETZ Commission, the Mayor's Task Force on Affordable Housing was also recommending better methods for processing, developing land, and constructing homes.

The local HUD office also cooperated with the Chapmans to reduce processing time and costs in Fairway Village. Site plans were reviewed and approved quickly, and HUD eliminated normal presale requirements that 75 percent of the homes be sold before any unit could be closed.

HUD also waived the requirement for 24 oz. carpet with 3/8 in. pad so that 16.5 oz. carpet with 1/2 in. pad could be installed. A 26 oz. carpet was offered as an upgrade option.

Against this backdrop of cooperative effort and progressive attitudes by regulatory officials of all jurisdictions, Fairway Village was developed as an example of how regulatory reform and innovative land planning and home design can be combined to reduce housing costs without sacrificing the health and safety of the occupants.

Chapman did not submit one exhaustive list of requested changes, but rather made separate requests to different authorities at different times. This approach allowed Chapman to concentrate his efforts on changes that promised significant cost reductions. Some of the requested changes were allowed outright, some were approved for Fairway Village only, and some were disapproved.

The city allowed the use of roll curbs instead of vertical curbs and gutters for Phase I of Fairway Village only. Although roll curbs were rejected for Phase II, the Mayor's Task Force on Affordable Housing has recommended that the city's land development standards be revised to include roll curbs as an acceptable practice. Chapman was optimistic that the regulation might be changed in time for Phase III so roll curbs could again be used.

Chapman requested that the city increase its normal manhole spacing requirement from 300 feet to 400-600 feet. Although this was rejected by the city, the Mayor's Task Force report recommended wider manhole spacing since the necessary cleanout equipment is available in Santa Fe. Because sewer lines were installed for all three phases, Fairway Village will not benefit should the city accept the Task Force's recommendations.

The city engineer rejected curvilinear sewer design but did allow Chapman to place sanitary sewer lines anywhere within the street rights-of-way. Normally, sewers must follow the street center line. The variance allowed Chapman to avoid corners where street directions changed slightly, saving three manholes in Phase I of Fairway Village. Cleanouts instead of manholes were also rejected.

The request for common utility trenching was rejected, too. The city argued that the utilities would have an impossible scheduling task and, therefore, joint trenching would not be cost-effective. The utility companies agreed that common trenching would not be practical for Fairway Village.

Chapman requested an increased density from 1 unit per 2.5 acres to 6 units per acre, based on the availability of city water and sewer. This request was approved by Santa Fe County. In addition, the city normally requires a minimum lot size of 6,000 square feet. Chapman obtained approval for an average lot size of 5,525 square feet.

The city allowed sidewalks on one side of the street only versus the normal requirement of 3-foot sidewalks on each side of the street. For a project the size of Fairway Village, the city would normally

require a 2.5 acre park. For the demonstration project, the city allowed a 1.5 acre park if it included playground equipment and landscaping.

Normally, the city requires the street right-of-way to be 8 feet behind the curb, or 16 feet wider than the combined street and curb. For the demonstration project, Chapman was allowed a 3-foot behind-the-curb right-of-way. In addition, the city reduced street paving width from 30 feet to 24 feet on about one-half of all streets and reduced paving thickness from 5 inches to 3 inches of asphalt on all streets.

Chapman requested and received permission to deviate from Santa Fe's original fencing requirements of a 6-foot high concrete block fence separating the subdivision from arterial streets and roads. Instead, a cedar fence with concrete pilasters was installed along the abutting streets.

The National Electrical Code (NEC) is used by the State of New Mexico, and Chapman was required to comply with all the provisions except the arbitrary location of electrical outlets. Chapman submitted an electrical layout based on logical use patterns which was accepted by the State. In addition, one ground fault circuit interruptor (GFCI) in the garage was loop wired to bathroom outlets, eliminating separate GFCI's.

Some of the innovations Chapman introduced in Fairway Village were already acceptable under local and state codes and standards but were not typically used in Santa Fe. Such innovations included use of polyethylene instead of steel gas lines, a monolithic foundation/slab, 24 inches on center floor and wall framing, polybutylene hot and cold water piping in the homes, and the

use of an on-site shop where subcontractors could prefabricate and prefinish components. Wood siding and sloped roofs were used rather than the typical stucco and flat roof Santa Fe design.

Administrative and Processing Changes

Although the city rejected Chapman's request for concurrent rather than sequential processing, it made every effort to expedite processing for Fairway Village. In addition, the State provided daily inspections of homes under construction. Chapman's on-site shop for precutting, prefabricating, and prefinishing components also reduced time. Chapman estimated that the project started at least six months sooner than normal and home construction schedules were reduced from 12 to 6 weeks.

Total cost savings in construction loan interest because of reduced construction time amounted to \$35,720 or \$760 per unit.

Site Planning and Development Changes

Site planning and land development represent major areas of potential cost reduction for most builders/developers. These costs often are directly proportional to the complexity of local regulations, zoning ordinances, and levels of required standards. Because the city, county, and ETZ Commission were cooperative, Chapman was able to cut costs substantially in Fairway Village.

Savings were realized in all phases of land development. Some savings were due to regulatory variances, others to increased density, and others to the use of techniques and materials not normally used in the Santa Fe area.

Use of roll curbs instead of the standard vertical curbs and gutters in Phase I, the demonstration portion of Fairway Village, resulted in a savings of \$10,368. Reduction in some street widths from 30 to 24 feet and street paving thickness from 5 to 3 inches reduced costs by \$15,809.

Sanitary sewer costs were reduced by \$2,400 by eliminating three manholes. This was accomplished by not running sanitary sewer lines down the center of the street. By using the entire right-of-way for sewer line placement, three turns in the line were eliminated.

Sidewalks were placed on one side of the street rather than on both sides which is the normal Santa Fe requirement. This reduced development costs by \$6,810. Cedar fencing instead of concrete block fencing resulted in a savings of \$11,634.

Use of 2-inch polyethylene gas pipe instead of the standard 2-inch steel pipe saved \$2,659. Because of narrower streets, reduced sidewalks, and reduced rights-of-way, total grading costs were reduced by \$5,700.

By donating \$2,500 worth of park equipment, Chapman was able to reduce the park size from 2.5 to 1.5 acres. About one-third of the one-acre savings could be allocated to Phase I, the 47 unit demonstration portion of the project. Another 36,000 square feet of land was gained for housing because of narrower streets and reduced rights-of-way. Therefore, nine more units could be built because of reductions in requirements and standards. This density increase reduced costs by \$2,720 per dwelling unit.

All site planning and development changes resulted in a savings of \$3,845 per unit.

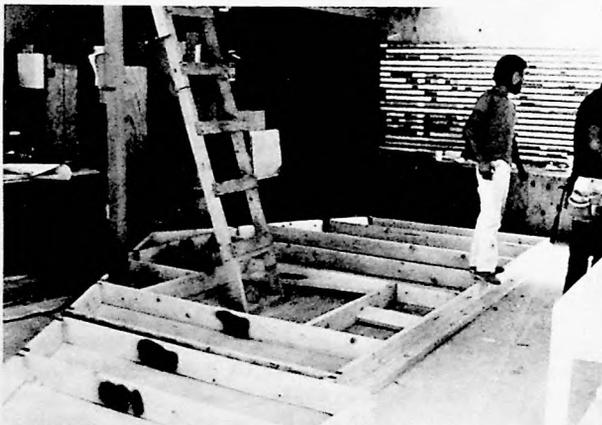
Building Design and Construction

Fairway Village home designs are dramatically different than typical Santa Fe architecture. Wood siding was used instead of the more typical and more expensive adobe stucco. Roofs are pitched, a divergence from Santa Fe's usual flat roofs. One roofing material, one siding material, and one paint color for trim, siding, and fences permitted quantity purchases.

An on-site shop was used for component fabrication, precutting, and prefinishing. The shop was

actually the first house built, with no interior partitions or interior finish. When combined with an open garage and a fenced-in yard, the house provided an ample area for all material storage as well as space for precutting, prestaining, and prefabricating certain components such as stairs and railings. The shop was used by Chapman's own workers as well as by subcontractors. Chapman believes the shop saved about \$500 per unit in direct costs because pilferage, scrap, and waste were reduced, weather-related problems were eliminated, and work was better organized.

On-site shop



On-site shop: interior

Chapman used the Optimum Value Engineered (OVE) framing system with 2x6 exterior wall studs. The studs were placed 24 inches-on-center with two-stud corners, windows and doors aligned with regular stud spacing, no partition posts where interior partitions abut exterior walls, and no headers in nonbearing walls. Interior partitions also were OVE framed with 2x4s. And floors were framed 24 inches-on-center with single layer, underlayment grade 3/4 in. tongue-and-groove plywood glued and nailed to joists. Although the exterior wall construction did not cut costs when compared with 2x4, 16 inches-on-center conventional construction, total framing and sheathing savings amounted to \$530 per unit.



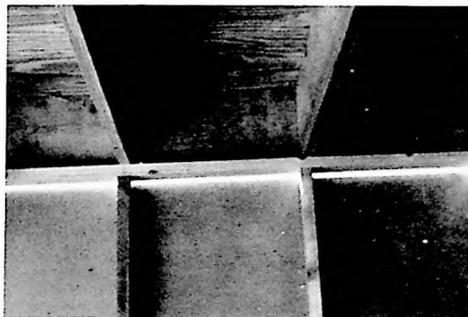
Framing

The use of a monolithic foundation/slab for the first floor instead of a typical spread footing/concrete foundation wall/slab-on-grade reduced costs by \$106 per unit.

The 2x6 exterior walls enabled Chapman to build energy efficient R-19 walls simply by installing 5-1/2 in. glass fiber batts. To get the same R-value with 2x4 walls, R-13 glass fiber batts and 3/4 in. thick polystyrene foam sheathing would have been required, increasing costs by \$460 per unit.

Polybutylene pipe and fiberglass fixtures reduced plumbing costs by \$367 per unit when compared to copper pipe, cast iron bathtubs, and ceramic tile. Electrical wiring costs were reduced by \$340 per unit by reduction in the number of outlets and by loop wiring the bathrooms to the garage GFCI.

In addition to substantial direct construction cost savings (\$2,303),



In-line framing showing single top plate



Two-stud corner

Chapman estimated a total savings of \$2,232 per unit in indirect costs due to reductions in overhead, taxes, interest, sales expenses, and profit.

It should be noted that no material, system or technique was used in Fairway Village that had not been



Monolithic foundation/slab

thoroughly proven in other parts of the country. Health, safety, and welfare remained primary concerns of the Chapmans when each new practice was discussed for possible inclusion in the project.

A more detailed analysis and discussion of processing, land development, house construction, and indirect cost savings is presented in Chapter 4, Details of Changes and Their Costs.

Details of Changes and Their Costs

ADMINISTRATIVE AND PROCESSING CHANGES

Because the County of Santa Fe cooperated in reducing processing time for the demonstration, the project was started about six months sooner than usual. The builder estimated a total interest and overhead cost reduction of \$16,000 for the demonstration as a result of this reduced time. In addition, the New Mexico State inspector cooperated by providing daily inspections without being called. He made Fairway Village the first stop on his inspection rounds every day. Because Chapman used an on-site shop for component fabrication and because of the lack of inspection delays, direct construction schedules were reduced from 12 weeks to 6 weeks, saving \$420 per unit in construction financing. Total savings due to fast-track processing and the shorter construction schedule are shown below.

SITE PLANNING AND DEVELOPMENT CHANGES

Presented in this section are land development cost comparisons of Fairway Village (as built) versus the same project if it had been built according to existing standards and practices.

Raw Land, Rights-of-Way and Density

The size of the entire subdivision was 31.5 acres, developed in three phases: Phase I, the demonstration site, contained 10.9 acres; Phase II, 10.2 acres; and Phase III, 10.4 acres. Raw land cost was \$365,000, or \$11,604 per acre.

The City of Santa Fe required a 2.5 acre park dedication before final land plan approval. In a compromise, however, the builder agreed to provide a 1.5 acre park and \$2,500 worth of park equipment. This, in effect, provided another acre for development at a cost of only \$2,500.

A total of 1.96 acres was reserved for parks and public areas for the entire three-phase project. Density of the demonstration phase was 4.3 units per acre, but the net density, excluding parks and public areas, was 5.1 units per acre.

The one-acre reduction in park size added 43,560 square feet of land available for housing. Since the park was designed for the entire three phase subdivision, about 34 percent (14,810 square feet) can be allocated to Phase I, the 47 unit demonstration portion of the project.

| | <u>Savings Per Unit</u> |
|-------------------------|-------------------------|
| Fast-track processing | \$340 |
| Schedule time reduction | 420 |
| TOTAL | \$760 |

The minimum lot size required by the City of Santa Fe was 6,000 square feet. For the demonstration, smaller lots were allowed, resulting in an average lot size of 5,525 square feet.



Typical Fairway Village yard areas



Typical Fairway Village private yard



Sidewalk and roll curb in Fairway Village

Santa Fe's land use standards required the right-of-way (ROW) to be eight feet behind the curb at the time of the demonstration. However, for the demonstration the city agreed to a three-foot behind the curb ROW with a ten-foot utility easement, resulting in a 30,080 square foot increase in land available for housing in the demonstration portion of the project. This reduction in ROW has now been adopted as the city standard.

Because 1,010 lineal feet of streets in the demonstration project were reduced in width from 30 feet to 24 feet, a total of 6,060 square feet was added to land available for housing.

In total, land use changes resulted in an increase in land available for housing of about 1.2 acres as shown in the following table.

Land Use Changes

| | Total Square Feet | | |
|---------------|----------------------|-------------------|-------------------|
| | <u>Demonstration</u> | <u>Comparison</u> | <u>Difference</u> |
| Parks* | 22,216 | 37,026 | 14,810 |
| Rights-of-Way | 18,048 | 48,128 | 30,080 |
| Streets | 70,290 | 76,350 | 6,060 |
| TOTAL | 110,554 | 161,504 | 50,950 |

*Phase I portion of park

With an average lot size of 5,525 square feet, about 9 more units could be built because of reduction in development standards. In other words, only 38 units normally would have been built instead of the 47 that were built. All development

cost analyses that follow are based upon the addition of these 9 lots.

Following is a summary of all raw land and land development costs. Detailed land development cost analyses are presented separately.

Raw Land and Development Cost Comparison Summary

| | <u>Demonstration</u> | <u>Comparison</u> | <u>Total Savings</u> | <u>Savings Per Unit***</u> |
|-----------------------------|----------------------|--------------------|----------------------|----------------------------|
| Raw Land | \$126,484 | \$126,484 | \$----- | \$ 638 |
| Earthwork | 9,700 | 15,400 | 5,700 | 199 |
| Gas Line | 20,065 | 22,724 | 2,659 | 172 |
| Sanitary Sewer | 62,888 | 65,288 | 2,400 | 380 |
| Electric Service | 51,549 | 51,549 | ----- | 259 |
| Water Service | 57,662 | 57,662 | ----- | 290 |
| Curbs and Gutters | 40,638 | 51,006 | 10,368 | 477 |
| Streets | 60,541 | 76,350 | 15,809 | 721 |
| Sidewalks | 3,558 | 10,368 | 6,810 | 197 |
| Fencing | 16,481 | 28,115 | 11,634 | 389 |
| Landscaping and Drainage | 20,000 | 20,000 | ----- | 100 |
| Streetlights | 8,800 | 8,800 | ----- | 45 |
| Ditch Relocation | 6,000 | 6,000 | ----- | 30 |
| Park Equipment | 2,500 | ----- | (2,500) | (52) |
| TOTAL | \$486,866 | \$539,746 | \$52,880 | \$3,845 |
| COST PER UNIT | \$ 10,358* | \$ 14,203** | \$ 3,845 | |

Amount attributable to infrastructure changes = \$1,125

Amount attributable to density increase = \$2,720

*47 Units

**38 Units

***Reflects both infrastructure changes and density increase

Earthwork

Clearing and grubbing the land was relatively simple because the parcel was flat with few, if any, trees and very little brush. The lowest subcontract bid for clearing was \$4,200 but the builder decided to have the work done on an hourly basis instead because his estimate indicated clearing could be done for much less. His estimate proved

correct as clearing and grubbing total costs were \$1,000, saving \$3,200 over the low bid.

Street grading was subcontracted. The earthwork contractor estimated that about 1,000 fewer cubic yards of earth had to be moved because of narrower streets. At \$2.50 per cubic yard, total savings amounted to \$2,500.

Earthwork Cost Comparisons

| | <u>As Built</u> | <u>Comparison</u> | <u>Savings</u> |
|----------------------|-----------------|-------------------|----------------|
| Clear and grub site | \$1,000 | \$ 4,200 | \$3,200 |
| Street grading | 8,700 | 11,200 | 2,500 |
| TOTAL | \$9,700 | \$15,400 | \$5,700 |
| COST PER UNIT | \$ 206* | \$ 405** | \$ 199 |

*47 Units

**38 Units

Gas Line

Typically, 2-inch steel gas lines are used in Santa Fe, costing \$6.50 per foot installed. Polyethylene gas

lines were used in the demonstration at a cost of \$5.56 per foot. The builder was required to install 542 feet of 4-inch steel line to hook up to the nearest off-site service.

Gas Line Cost Comparison

| | <u>As Built</u> | <u>Comparison</u> | <u>Savings</u> |
|-----------------------------|-----------------|-------------------|-----------------|
| 4 in. steel gas line | \$ 4,336 | \$ 4,336 | \$----- |
| 2 in. steel gas line | ----- | 18,388 | 18,388 |
| 2 in. polyethylene gas line | 15,729 | ----- | (15,729) |
| TOTAL | \$20,065 | \$22,724 | \$ 2,659 |
| COST PER UNIT | \$ 426* | \$ 598** | \$ 172 |

*47 Units

**38 Units

Sanitary Sewer

The builder used polyvinylchloride (PVC) sanitary sewer pipe. PVC was recently approved by the city, and Fairway Village was one of the first subdivisions to actually use it. Curvilinear design was requested but rejected by the City Engineer because

of his concern about the relatively flat grades within the subdivision. He did, however, allow the sewer line to run outside the center line of the street which is the city standard. By prudent placement of the sewer lines to avoid corners where street directions changed slightly, three manholes were saved.

Sanitary Sewer Cost Comparison

| | <u>As Built</u> | <u>Comparison</u> | <u>Savings</u> |
|------------------------|------------------|-------------------|-----------------|
| 8 in. main | \$38,038 | \$38,038 | \$ ----- |
| 4 in. laterals | 14,100 | 14,100 | ----- |
| Sewer saddles | 2,350 | 2,350 | ----- |
| Connection to off-site | 400 | 400 | ----- |
| Manholes | 8,000 | 10,400 | 2,400 |
| TOTAL | \$62,888 | \$65,288 | \$ 2,400 |
| COST PER UNIT | \$ 1,338* | \$ 1,718** | \$ 380 |

*47 Units

**38 Units

Electric Service

No change was made from city standard requirements. Common trenching with

other utilities was requested but not allowed. A \$259 per unit savings occurred because of increased density.

Electric Service Cost Comparison

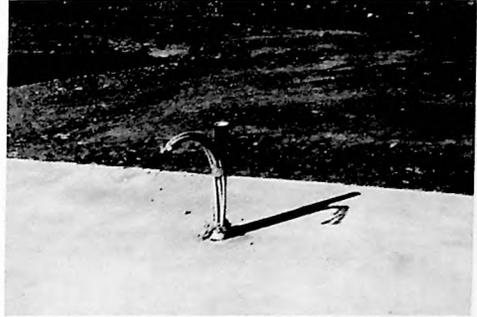
| | <u>As Built</u> | <u>Comparison</u> | <u>Savings</u> |
|---------------------------|------------------|-------------------|----------------|
| Off-site electric service | \$51,549 | \$51,549 | \$---- |
| COST PER UNIT | \$ 1,097* | \$ 1,356** | \$ 259 |

*47 Units

**38 Units

Water Service

No changes were made from Santa Fe's water service standards. The builder installed 8-inch polyvinylchloride (PVC) water mains off-site and 6-inch and 4-inch PVC mains on-site. The 8-inch main, costing a total of \$30,774 will eventually service all 154 lots within the three-phase subdivision. Some \$9,400 of the cost of off-site mains can be pro-rated for the 47 lot demonstration. The increased density resulted in a \$290 per unit savings.



Plastic water and drain pipe

Water Service Cost Comparison

| | <u>As Built</u> | <u>Comparison</u> | <u>Savings</u> |
|------------------|-----------------|-------------------|----------------|
| 8 in. PVC main | \$ 9,400 | \$ 9,400 | \$---- |
| 6-8 in. PVC main | 48,262 | 48,262 | ---- |
| TOTAL | \$57,662 | \$57,662 | \$---- |
| COST PER UNIT | \$ 1,227* | \$ 1,517** | \$ 290 |

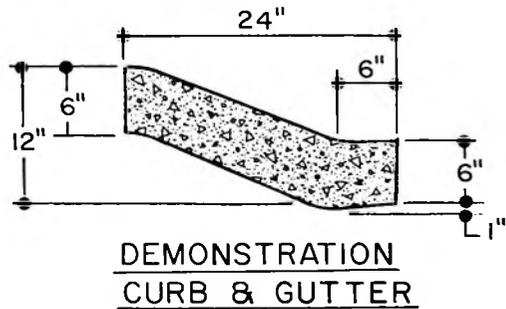
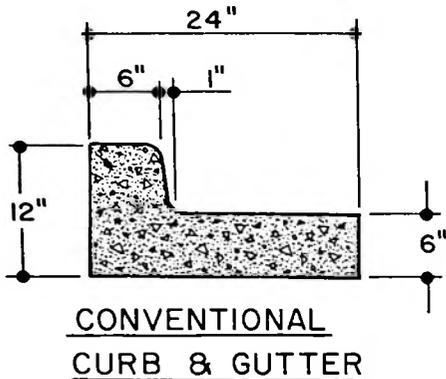
*47 Units

**38 Units

Curbs and Gutters

The builder was allowed to use 2-foot wide roll concrete curbs instead of Santa Fe's standard 2-foot wide, 6-inch high vertical curbs. Vertical curbs cost \$9.00 per foot while roll

curbs cost \$7.00 per foot. Some 5,184 lineal feet of curb was installed. Standard 5-foot wide valley gutters were used at street intersections as required by Santa Fe.

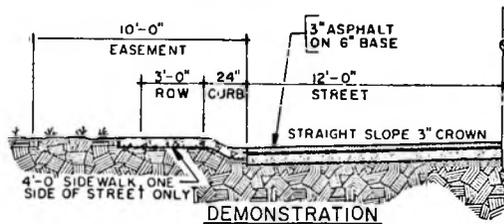
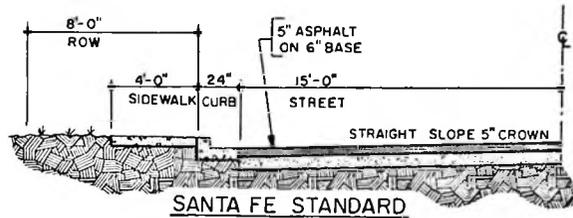


Curb Cost Comparison

| | <u>As Built</u> | <u>Comparison</u> | <u>Savings</u> |
|------------------------------------|-----------------|-------------------|-----------------|
| 2 ft. vertical curb, 6 in. high | \$----- | \$46,656 | \$46,656 |
| 2 ft. roll curb | 36,288 | ----- | (36,288) |
| 5 ft. wide valley gutter | 4,350 | 4,350 | ----- |
| TOTAL | \$40,638 | \$51,006 | \$10,368 |
| COST PER UNIT | \$ 865* | \$ 1,342** | \$ 477 |

*47 Units

**38 Units



ROW/street width comparison

Streets

The Santa Fe standard would have required 30-foot wide streets throughout the subdivision with 5-inch thick asphalt paving. The city agreed to a 2-foot wide street in a portion of the project based on

estimated average daily traffic provided by the builder and on the provision of some off-street parking space. In addition, the city allowed a reduction in pavement thickness from 5 inches to 3 inches of asphalt on all streets.

| Street Cost Comparison | | | |
|----------------------------------|-----------------|-------------------|----------------|
| | <u>As Built</u> | <u>Comparison</u> | <u>Savings</u> |
| 30 ft. wide, 5 in. thick asphalt | \$----- | \$76,350 | \$76,350 |
| 30 ft. wide, 3 in. thick asphalt | 39,664 | ----- | (39,664) |
| 24 ft. wide, 3 in. thick asphalt | 20,877 | ----- | (20,877) |
| TOTAL | \$60,541 | \$76,350 | \$15,809 |
| COST PER UNIT | \$ 1,288* | \$ 2,009** | \$ 721 |
| *47 Units | | | |
| **38 Units | | | |

Sidewalks

Under existing Santa Fe standards, 3-foot wide concrete sidewalks are required on both sides of the street. For the demonstration, the builder was allowed to place sidewalks on one side only. Some 5,184 feet of sidewalk normally would have been required but only 1,779 feet of sidewalk was installed because the developer placed all sidewalks on the inside, or shortest, portion of the street and eliminated the sidewalk along the park boundary.



Sidewalk/roll curb

Sidewalk Cost Comparison

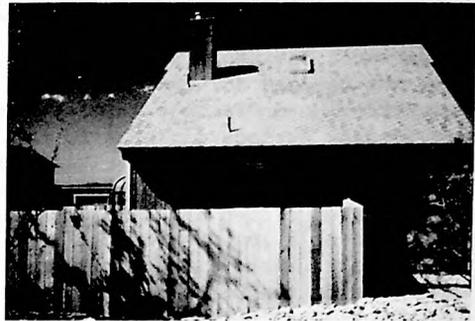
| | <u>As Built</u> | <u>Comparison</u> | <u>Savings</u> |
|------------------------------|-----------------|-------------------|----------------|
| 3 ft. wide concrete sidewalk | \$3,558 | \$10,368 | \$6,810 |
| COST PER UNIT | \$ 76* | \$ 273** | \$ 197 |

*47 Units

**38 Units

Fencing

Santa Fe staff originally required a 6-foot high concrete block fence to separate subdivisions from arterial streets and roads. However, the builder received permission to build an attractive cedar fence with concrete pilasters. Total fence length was 1,530 feet.



Fencing in Fairway Village

Fencing Cost Comparison

| | <u>As Built</u> | <u>Comparison</u> | <u>Savings</u> |
|------------------------------|-----------------|-------------------|----------------|
| 6 ft. concrete fence | \$----- | \$25,704 | \$25,704 |
| Cedar fence | 10,710 | ----- | (10,710) |
| Cedar fence w/pilasters | 3,360 | ----- | (3,360) |
| Block and stucco entrance | 2,411 | 2,411 | ----- |
| TOTAL | \$16,481 | \$28,115 | \$11,634 |
| COST PER UNIT | \$ 351* | \$ 740** | \$ 389 |

*47 Units

**38 Units

Other Land Development

Storm water drainage requirements were not changed for the demonstration. Drainage largely was provided by surface drainage to the park and to a normally dry river bed across from the project entrance. A large gravel filled dry sump was installed at a low area on the edge of the park. Water sprinklers were installed in the park.

Streetlights were unchanged from Santa Fe's standard requirements. Eight streetlights were installed in Phase I at a cost of \$1,100 each.

A drainage ditch that previously cut diagonally across the property was relocated at a cost of \$6,000. This would have been done in any case. Increased density resulted in a total savings of \$175 per unit.

| Other Land Development | | | |
|--------------------------|-----------------|-------------------|----------------|
| | <u>As Built</u> | <u>Comparison</u> | <u>Savings</u> |
| Landscaping and drainage | \$20,000 | \$20,000 | \$---- |
| Streetlights | 8,800 | 8,800 | ---- |
| Ditch relocation | 6,000 | 6,000 | ---- |
| TOTAL | \$34,800 | \$34,800 | \$---- |
| COST PER UNIT | \$ 740* | \$ 915** | \$ 175 |

*47 Units
**38 Units

BUILDING DESIGN AND CONSTRUCTION CHANGES

This section discusses cost saving techniques in building design and construction. The 47 units ranged in size from 1,000 to 1,236 square feet of finished area. The largest unit

has an upstairs unfinished closed space of 420 square feet which, if finished, will increase total area to 1,656 square feet.

The following construction cost savings summary is followed by an item-by-item description of each technique used to reduce total costs.

Construction Cost Savings Summary

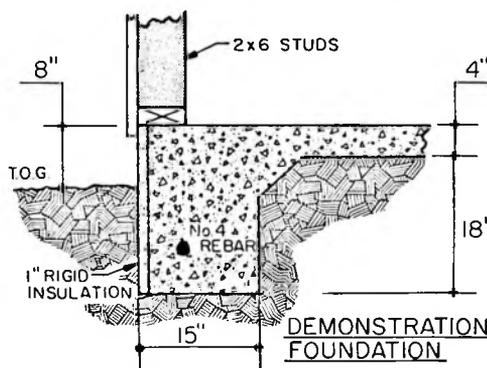
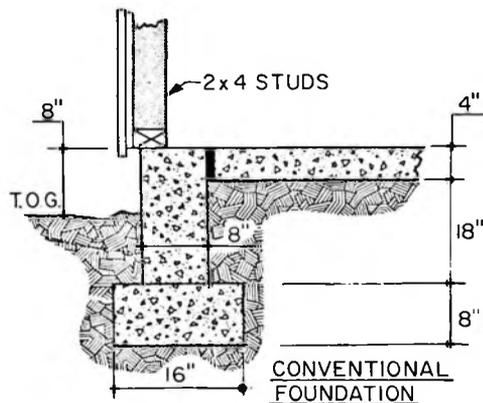
| <u>Demonstration</u> | <u>Comparison</u> | <u>Savings Per Unit</u> |
|--|--|-----------------------------|
| 1. Foundation/Slab 4 in. thick monolithic slab/ foundation | Foundation/Slab 8 in. x 16 in. spread footing, concrete foun- dation wall, 4 in. slab | \$ 106 |
| 2. Exterior Wall Framing 2x6, 24 in. o.c. studs, 2 stud corners, reduced blocking | Exterior Wall Framing 2x4, 16 in. o.c. studs, 3 stud corners, typical blocking | --- |
| 3. Insulation 5-1/2 in. thick, R-19 glass fiber batts | Insulation 3-1/2 in. thick, R-13 glass fiber batts, 3/4 in. polystyrene foam sheathing | 460 |
| 4. Interior Partitions 2x4, 24 in. o.c. studs, single top plate, 2 stud corners, no struc- tural headers | Interior Partitions 2x4, 16 in. o.c. studs, double top plate, 3 stud corners, structural headers | 210 |
| 5. Floor Framing and Sheathing 2x10, 24 in. o.c. joists, no bridging with 3/4 in. under- layment grade T&G plywood | Floor Framing and Sheathing 2x10, 16 in. o.c. joists, bridging, 1/2 in. plywood sub- floor, 5/8 in. particle- board underlayment | 320 |
| 6. Plumbing Polybutylene hot and cold water supply, fiberglass bathtubs, cultured marble lavatory/vanity top | Plumbing Copper hot and cold water supply, cast iron bathtubs, ceramic tile surrounds, hardboard vanity top, ceramic lavatory | 367 |
| 7. Electrical Reduced outlets, eliminate bath exhaust fans and ceiling fixtures, reduced ground fault interruptors by loop wiring to garage GFI | Electrical National electrical code plus ceiling light fixtures and bath exhaust fans | 340 |

| <u>Demonstration</u> | <u>Comparison</u> | <u>Savings Per Unit</u> |
|---|-------------------|-------------------------|
| 8. On-Site Shop Prefab and prefinish stairs and railings, precut framing and trim, store materials, prefinish trim. Estimated labor and material scrap savings. | Not Done | 500 |
| TOTAL | | \$2,303 |

Following are item-by-item discussions of the methods used by Chapman to reduce on-site direct construction costs. All are proven methods that have no effect on health, safety, and welfare of the occupants.

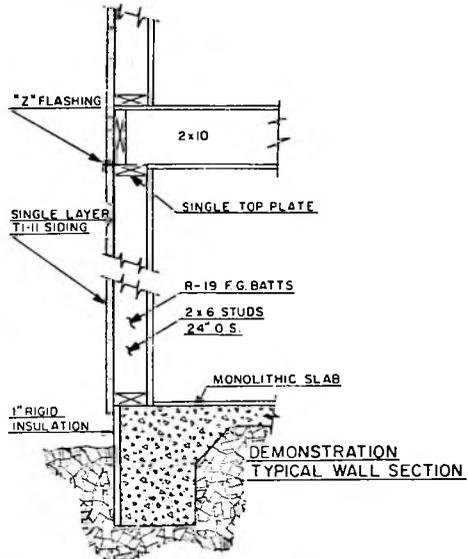
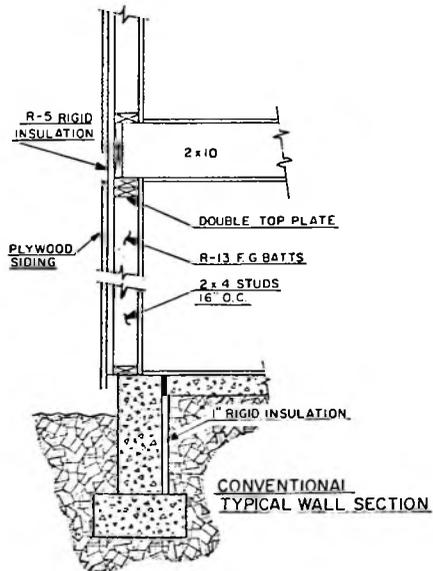
Foundation and Slab

A four-inch-thick monolithic slab/foundation was used instead of a spread footing/foundation wall/slab which is typically used in the Santa Fe area. This allowed a one-step operation instead of three steps and saved two days of construction time. The monolithic slab also saved about two yards of concrete and about four man-hours per house. Foundation/slab savings amounted to an average of \$106 per unit.

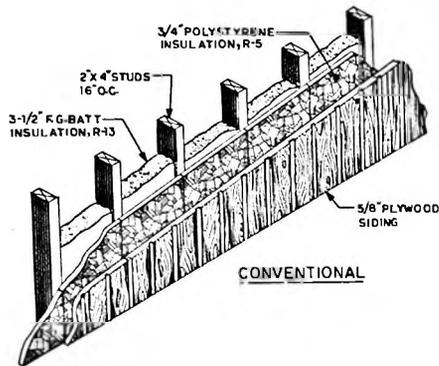


Exterior Wall Framing

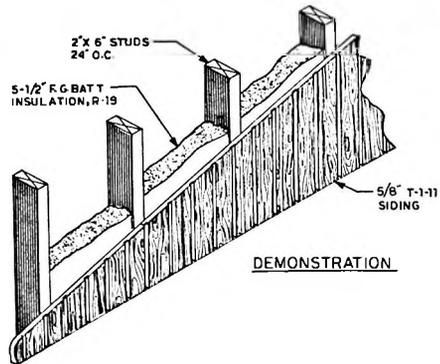
Over the years, Chapman has built highly energy-efficient homes. He continued this practice in the Affordable Housing Demonstration. Two-by-six (2x6) studs, placed 24-inches on center, were used in the exterior wall, with 2-stud corners, windows and doors aligned with normal stud spacing, and blocking at exterior/interior wall intersections instead of partition posts built with 2 studs and blocking. About 60 studs per house were eliminated, reducing labor and material costs by about \$200 when compared to conventional 2x6, 16 inches on center framing. When compared to conventional 2x4, 16 inches on center exterior walls, total wall framing costs would have been about the same. However, to obtain the same insulation "R" value (R-19), the 2x4 wall would be much more expensive as discussed below.



Wall section comparison



CONVENTIONAL



DEMONSTRATION

Insulation comparison

Insulation

Chapman installed 5-1/2-inch-thick glass fiber batts (R-19) in exterior walls of the demonstration units. Because studs were spaced 24-inches on center instead of 16-inches on center, about 60 fewer cavities were insulated, reducing labor costs by about 30 percent, or \$25 per unit. If 2x4, 16-inches on center walls were built with R-19 insulation, a rigid plastic foam sheathing, such as 3/4-inch-thick polystyrene, would have been necessary in addition to R-13 glass fiber insulation inside the walls. This method of obtaining an R-19 insulation value would have increased costs about \$460 per unit.

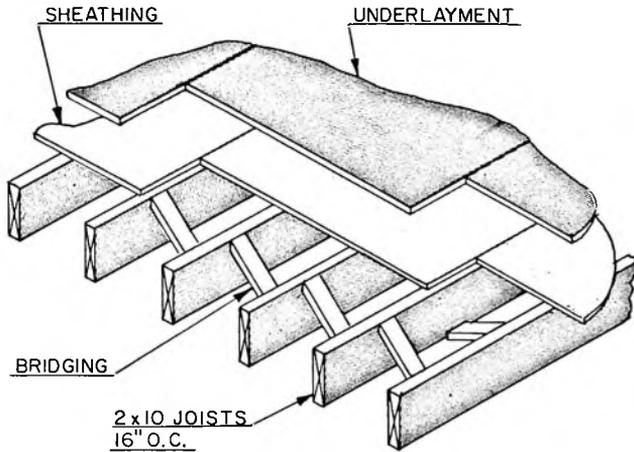
Interior Partitions

Two-by-four (2x4) studs, 24-inches on center, with single top plates were used for non-load bearing interior partitions. Structural headers were eliminated and corners were built with two instead of three studs. Metal drywall back-up clips were used. An average of 52 studs and 145 lineal feet of plate were eliminated, reducing labor and material costs by about \$210 per unit when compared to conventionally framed 2x4, 16-inches on center partitions.

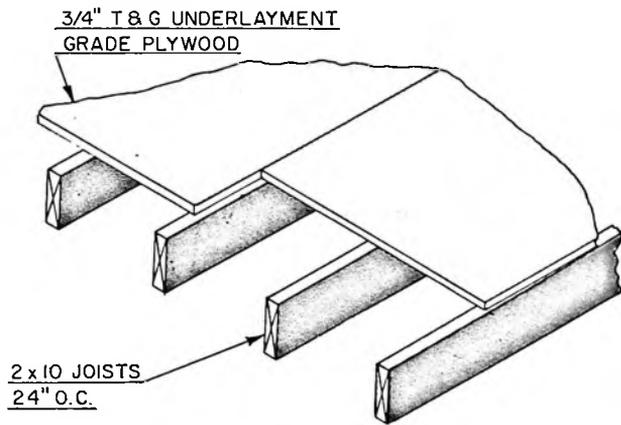
Floor Framing and Sheathing

Second story floors were framed with 2x10 joists spaced 24-inches on center and sheathed with 3/4-inch-thick underlayment grade

tongue-and-groove plywood, glued and nailed. Midspan bridging was eliminated. The builder calculated a savings of \$320 when compared to typical 2x10, 16-inches on center floors with bridging and separate layers of sheathing and underlayment.



CONVENTIONAL
FLOOR FRAMING



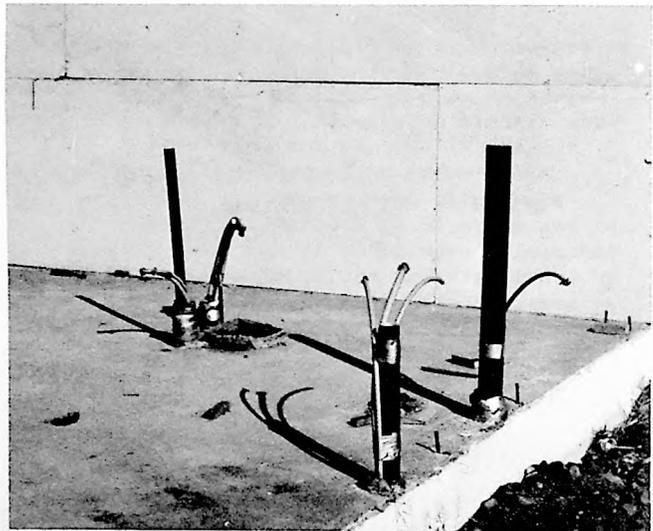
DEMONSTRATION
FLOOR FRAMING

Plumbing

Copper pipe is typically used in Santa Fe. For the demonstration, Chapman used polybutylene pipe with insert fittings. Instead of cast iron bathtubs with tile shower surrounds, one-piece fiberglass reinforced polyester bathtubs with shower surrounds were used. Also, one-piece cultured marble lavatories were used instead of separate vanity tops and porcelain lavatories. Cost savings due to the use of polybutylene pipe averaged \$127 while savings due to use of different fixtures was estimated to be \$240 per unit.

Electrical

The National Electrical Code is used in New Mexico, and Chapman was required to comply with all the provisions except the arbitrary spacing of electrical outlets. A well-thought-out electrical layout based on logical use patterns was submitted along with the rationale for outlet location. In addition, garage ground fault interruptors were "loop" wired to bathroom outlets, eliminating ground fault interruptors in bathrooms. Bathroom exhaust fans were also eliminated as were overhead light fixtures in bedrooms. Total electrical savings amounted to \$340.



Water service - PVC

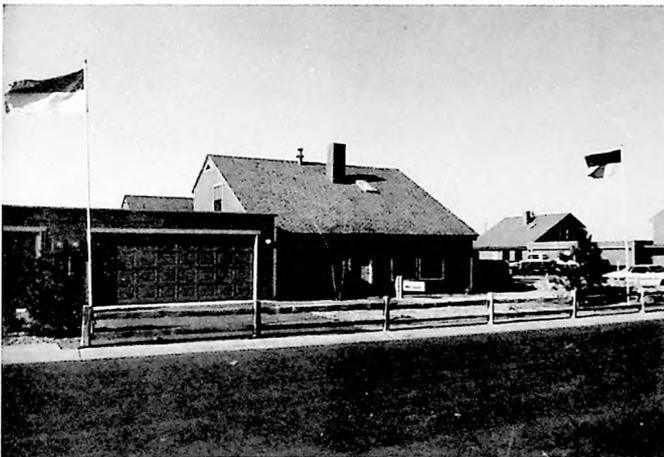
Wall Sheathing and Siding

Chapman used single-layer plywood siding applied directly to framing, thereby eliminating sheathing. The typical exterior surface material used in Santa Fe is stucco applied to wire lath which costs about \$1.00 per square foot more installed than the plywood siding. Although plywood siding is common in many parts of the country, most Santa Fe homes are built to resemble the older

flat-roofed adobe structures in the area. Therefore, the use of sloping roofs and plywood siding represented a major change in architecture from local norms. The builder estimated that it would have cost \$1,545 more on average to build the demonstration units with stucco exterior surfaces. Because Santa Fe type stucco is rarely used in other parts of the country, this cost reduction is not included in the Direct Cost Savings Summary.



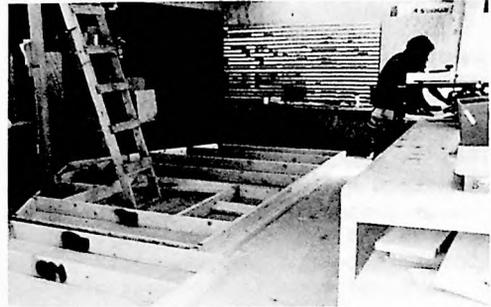
Typical Santa Fe style



Fairway Village style

On-Site Shop

The first home built on the demonstration site was used as a shop for fabricating certain components, precutting framing and trim materials, and for prefinishing stairs, railings and other components. The shop yard also served as a secure storage area for bulk lumber, plywood and other heavy use materials. The shop all but eliminated pilferage and reduced total scrap and waste to a minimum. It also allowed Chapman to use his own crews more effectively and to reduce dependency on subcontracted crews. The builder was confident of substantial cost reductions because of the on-site shop, but actual savings were impossible to calculate. When compared with conventional methods used at other construction sites, the shop probably reduced costs in the neighborhood of \$500 per unit. Chapman estimates a minimum of 40 homes must be built at a site shop for it to be cost effective.



On-site shop interior

INDIRECT

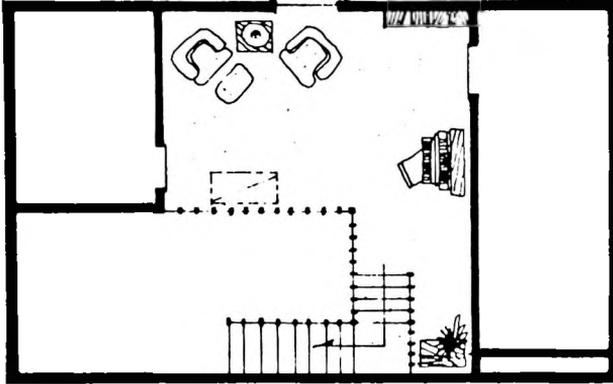
Chapman always applies a set percentage to all construction costs for overhead, taxes, insurance, profit, etc. Excluding profit, this percentage amounts to 32 percent of all costs. Therefore, a reduction in "hard" costs results in a reduction in indirect costs. For the demonstration, total indirect cost reduction amounted to \$2,232.

TOTAL COST SAVINGS SUMMARY

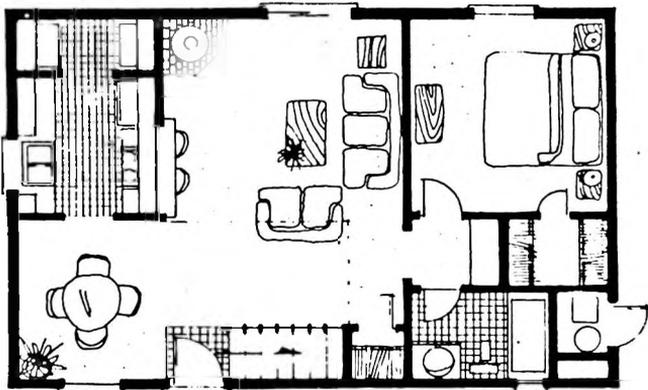
Following is a summary of all cost savings for the Santa Fe demonstration project.

| | <u>Savings Per Unit</u> |
|------------------------------------|-------------------------|
| Process time, scheduling reduction | \$ 760 |
| Land and land development | 3,845 |
| Direct construction | 2,303 |
| Overhead, taxes, insurance | 2,232 |
| TOTAL COST SAVINGS | \$9,140 |

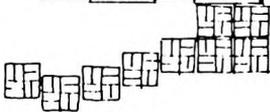
Floor Plans



Second floor



First floor



Scale 1/8" = 1 foot

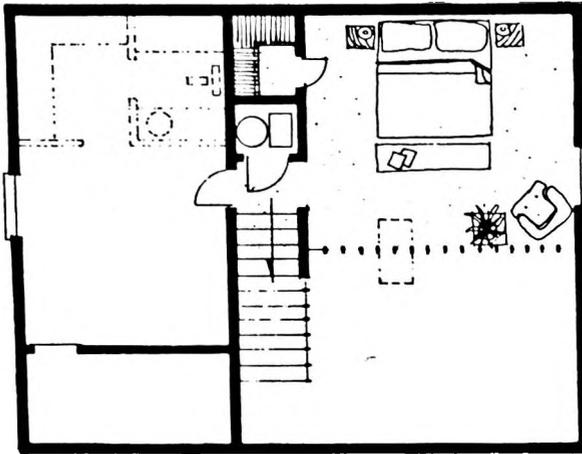
All dimensions are approximate

SUN TREE

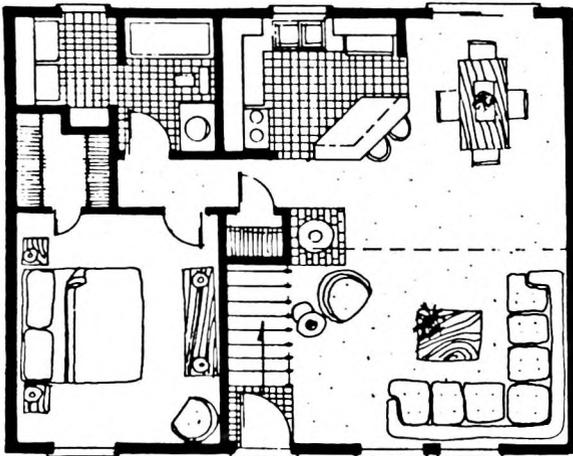
- Offers a 1 bedroom home with a fully finished loft
- approximately 1000 Sq. Ft.
- cathedral ceiling with skylight
- 1 full bath
- food service bar for casual eating as well as more formal dining area
- separate utility area for washer/dryer with storage area above
- walk-in closet in bedroom
- stairwell and loft area detailed with open wooden railing
- linen storage area
- attic areas offering extra storage
- 2 car garage



Equal Opportunity Housing



Second floor



First floor

Scale 1/8" = 1 foot

All dimensions are approximate

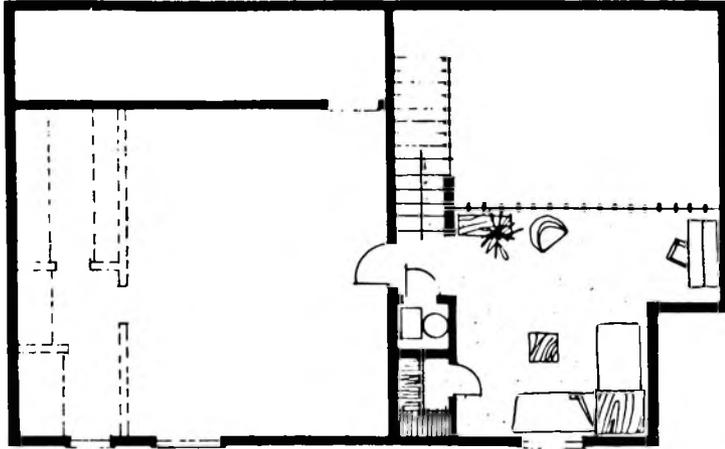


WILD CREEK

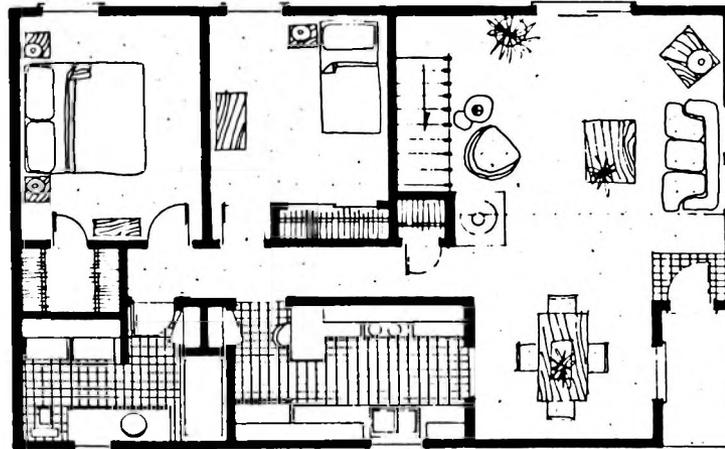
- Offers a 1 bedroom home with 1 full bath and fully finished loft
- completion of optional space results in a 2 bedroom 2 bath home with a loft.
- approximately 1112 Sq. Ft.
- With optional space completed, 1352 Sq. Ft.
- cathedral ceiling with skylight
- designer island offers food service bar for informal eating plus added work area
- formal dining area
- master bedroom with walk-in closet
- washer/dryer utility area with linen storage
- loft area detailed with open wooden railing
- attic area offering extra storage
- 2 car garage



Equal Opportunity Housing



Second floor



First floor

- PINEHURST**
- Offers a 2 bedroom home with a full bath and fully finished loft
 - completion of optional space results in a 3 bedroom 2 bath home with a loft. A master "suite" with spacious walk-in closet and full bath is created.
 - approximately 1236 Sq. Ft. With optional space completed, 1656 Sq. Ft.
 - cathedral ceiling with skylight
 - food service bar for casual eating as well as more formal dining area
 - pantry and linen storage
 - loft offers walk-in closet for storage
 - stairwell and loft area detailed with open wooden railing
 - attic area offering extra storage

• 2 car garage

Scale $\frac{1}{8}'' = 1$ foot

All dimensions are approximate



Equal Opportunity Housing

Project Schedule

May 1981 - Chapman purchased Fairway Village site and began approval process for city water and sewer for mobile home park.

October 1981 - Water approval granted.

November 1981 - Preliminary plat approval granted for mobile home park.

November 1982 - Approval granted for city sewer hook-up. Subdivision project fully approved by city, county and ETZ, but Chapman continued to request more changes to normal standards.

December 1982 - Fairway Village designated by HUD as Affordable Housing Demonstration project.

January 1983 - Site grading began on Phase I.

February 1983 - Discussions on additional changes between state, ETZ, county, city, HUD and builder.

March 1983 - Phase I site utilities in-place. Curb and gutter work began.

April 1983 - Site shop started.

May 1983 - Site shop in operation.

June 1983 - Full production. Customer waiting list totaled 210.

August 1983 - Grand Opening. All units in Phase I (47 units, demonstration) sold.

May 1984 - Waiting list of 200 for Phase II. Construction began on Phase II.

June 1984 - All Phase I, demonstration project, homes occupied.

Late 1985 - Entire subdivision expected to be sold out and completed.

Mayor's Task Force on Affordable Housing

The Mayor's Task Force on Affordable Housing was formally created by the City Council of Santa Fe on December 8, 1982, about the same time the Chapmans joined the Affordable Housing Demonstration. The purpose of the Task Force was to "try to broaden the opportunity for home ownership to include a wider income spectrum of Santa Fe families" (from Final Report, October 1983, p. 2). The City Council resolved:

1. That increasing the opportunity for the creation of affordable housing is a priority for the City of Santa Fe;
2. That affordable housing is appropriate in all areas of Santa Fe;
3. That zoning ordinances, design standards, building code requirements and other land use regulations should not discriminate against affordable housing or manufactured housing;
4. That city-owned land should be treated as a prime resource in creating affordable housing opportunities; and
5. That these objectives should be met in a manner that does not jeopardize the unique aesthetic, architectural, cultural, historic and social qualities of this community.

The Task Force and city staff worked together for over six months to produce a final report of findings and recommendations. The report concluded that if the market for affordable housing was demonstrated and the need for it was supported by strong city policy coupled with programs to make it economically feasible, the private sector would

build such housing. The Report states, "Since the city oversees all development, it must, in effect, become a partner in meeting affordable housing goals."

Because the City of Santa Fe is responsible for regulating all development within the city limits, the way this duty is discharged is a central issue of the Report, and also central to the Affordable Housing Demonstration project.

Principal recommendations of the Task Force which are relevant to the Fairway Village project include:

- o That special administrative incentives be adopted to streamline the review process for housing projects meeting the criteria of the Affordable Housing Program;
- o That the city complete its current program to improve the development review process, design standards for development, zoning ordinances and administrative procedures;
- o That all information regarding building and development codes, procedures, processes, standards, regulations and ordinances be consolidated in concise and easily understood written form in a single central location;
- o That the cost impact on affordable housing be analyzed and considered prior to adoption of any proposed additional building code requirements by the City Council;
- o That a committee appointed by the local HBA (Home Builders Association) be formed to work with staff to resolve questions of interpretation of building codes;

- o That all building code design standards imposed by the City be analyzed for their impact on housing cost;
- o That the city consider changing the following land development standards where feasible and appropriate:
 1. Common utility trenches
 2. Use of rolled curb and gutter
 3. Increased manhole spacing and more flexibility in sewerline location; and
- o That greater residential densities be permitted in all residential districts where surrounding utilities, roads and city services are capable of sustaining them.

Implementation by the city of the recommendations of the Task Force has progressed as follows:

- o A development handbook including all land development regulations and policies is being completed.
- o Review processes have been consolidated in one location -- one part of City Hall.
- o Application forms have been standardized.
- o The Utility Council has decided common utility trenching is not cost effective and will not be implemented.
- o Roll curbs and gutters have been accepted and a new ordinance is being formulated.

DEPARTMENT OF HOUSING
AND URBAN DEVELOPMENT

JAN 25 1995

LIBRARY
WASHINGTON, D.C. 20410

U.S. Department of Housing and Urban Development
Washington, D.C. 20410

Official Business
Penalty for Private Use, \$300



Postage and Fees Paid
Department of Housing
and Urban Development
HUD - 401



January 1985
HUD-PDR-941