

February 27, 1986

TO: Roy Pederson, City Manager
FROM: Tom Davis, Assistant City Manager *Tom*
FIRE SPRINKLER COSTS/SINGLE FAMILY HOUSES

In December 1985 you asked that I re-evaluate the cost differences between installing fire sprinklers in single family houses and the trade-offs made available as a part of our sprinkler ordinance and administrative policies for implementing the ordinance. With this memo I am submitting that evaluation. The situation has been that the Homebuilder's Association did not have confidence in the cost breakdown completed by our staff and Rural/Metro's staff and the City staff did not have confidence in the Homebuilder's analysis.

Both the City and the Homebuilder's Association are interested in establishing a reasonable estimate. I asked Reese/Carr, a consulting firm of architects and engineers, to assist us in trying to resolve our differences. In explaining our goal to Reese/Carr, I simply defined the issue and asked them to apply their expertise to finding a net projected cost difference. In addition, I emphasized the need to be as objective in the process as they could because the City's primary interest is to have as accurate a cost projection as possible. I met with representatives of Reese/Carr three times. First to explain the project and provide them with pertinent written data. The second time was with representatives of the Homebuilder's Association to look at installations and clarify questions and issues. Finally, we met when the document was presented as complete. I advised the Homebuilder's that they could call Reese/Carr whenever they wanted to provide or seek information. There was also three or four phone conversations between Grish Shirvani and Reese/Carr staff to exchange data. It should be noted that Rural/Metro staff did not at any time discuss this project with Reese/Carr.

The work done by Reese/Carr appears to be complete and as accurate as possible until we have more experience with sprinklers in single family homes. Cost differences contained in the report are based on a 2,000 square foot house. Homes that are 3,000 or 4,000 square feet in size will of course have an increased price difference.

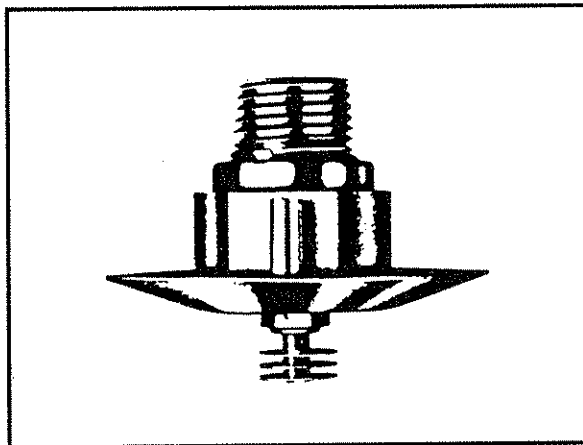
Copies of the report has been delivered to the Homebuilder's Association. We will make ourselves and the consultants available should they wish to discuss any part of the report.

Please let me know if there is anything more you would like to have done on this subject.

TD:ad

*Report for the
City of Scottsdale*

STUDY OF COST RAMIFICATIONS OF THE FIRE SPRINKLER ORDINANCE



*Prepared by:
Reese - Carr, Inc.*

February 14, 1986



Reese-Carr

Project Management

February 21, 1986

Reese-Carr, Inc.
4350 East Camelback
220E CamelSquare
Phoenix, Arizona 85018
602/952-8171

Mr. Tommy J. Davis
Assistant City Manager
City of Scottsdale
3939 Civic Center Plaza
Scottsdale, Arizona 85251

RE: EVALUATION OF SCOTTSDALE FIRE SPRINKLER ORDINANCE

Dear Tom:

Attached you will find our conclusions relative to the cost ramifications of the fire sprinkler ordinance adopted by the City of Scottsdale.

Using materials provided by the City of Scottsdale, Home Builders Association, and Fire Sprinkler Ordinance 1709, the following report has been prepared. We have attempted to be succinct, yet detailed enough to allow complete and thorough understanding as to our approach to evaluating this interesting issue. Should you have any questions or comments, please do not hesitate to call.

Thank you for the opportunity to work for you on this important project.

Sincerely,
REESE-CARR, INC.

Jeff A. Turner
Director of Owner Services

Enclosure

JT:bc

CITY OF SCOTTSDALE
STUDY OF COST RAMIFICATIONS
OF THE
FIRE SPRINKLER ORDINANCE

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I. EXECUTIVE SUMMARY

CITY OF SCOTTSDALE
STUDY OF COST RAMIFICATIONS
OF THE
FIRE SPRINKLER ORDINANCE

EXECUTIVE SUMMARY

1. Basis

The objective of this report is to determine the actual cost of installing a fire sprinkler system as per NFPA 13-D (modified) in an average 2,000 sf single family residence in Scottsdale, Arizona.

This study was based upon an average of 11 different house designs by three different developers in various Scottsdale subdivisions. By using this basis a good average of house and lot was developed. All the enclosed calculations are based upon an average 2,000 sf, single family, single level detached house with interior flat ceilings and a two car garage.

2. Summary of Costs

To determine the actual cost of installing a fire sprinkler system in a residence, two main cost categories were established: 1) Costs and 2) Trade Offs. The costs were subdivided into two sections. A) Sprinkler costs and B) Additional associated costs, i.e., painting sprinkler escutcheons, etc. The trade-offs were items in the ordinance allowing the developer/builder to reduce previous building code requirements because of installing the sprinkler system, i.e., changing 5/8" Type-X gypsum board in garages to 1/2" standard gypsum board, etc. Those trade-offs were also subdivided into two sections: A) On-site trade offs - changes in the construction of the residence, and B) Off-Site trade-offs - Changes to the actual building area, i.e., reducing the road width from 50 feet to 46 feet. (Reference Section II)

The actual cost difference for incorporating the fire sprinkler ordinance in single family residences of 2,000 sf in Scottsdale would be an additional cost of \$157.24 to the homebuilder, or, \$212.27 to the home buyer.

II. SUMMARY OF COSTS

CITY OF SCOTTSDALE
FIRE SPRINKLER ORDINANCE
SUMMARY OF COSTS

General

The following is a summary of cost ramifications associated with the adoption by the City of Scottsdale of the Fire Sprinkler ordinance in single family residences.

The following calculations are based upon an average of 11 different house designs by three different developers on three different subdivisions. For this exercise, an average 2,000 sf single family, single level, detached with flat ceilings and a two car garage was considered.

1. Costs

A. Sprinkler Costs	\$2,053.79
B. Additional Costs	<u>273.52</u>
TOTAL COSTS	\$2,267.31

2. Trade Offs

A. On Site	\$ 158.52
B. Off Site	<u>1,951.55</u>
TOTAL TRADE OFFS	\$2,110.07

3. Cost Difference

Total Cost	\$2,267.31	
Trade Offs	<u>2,110.07</u>	
		<hr/>
TOTAL COST DIFFERENCE		\$ 157.24 *

* Additional Costs to the builder/developer for incorporating the fire sprinkler ordinance in single family residences in Scottsdale.

Note: The above figures do not include for the 35% mark-up by the builders as costs to the buyer. If the 35% mark-up is incorporated, the total additional costs are \$212.27.

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III. SPRINKLER COSTS

CITY OF SCOTTSDALE
FIRE SPRINKLER ORDINANCE
SPRINKLER COSTS

<u>Builder</u>	<u>Model</u>	<u>House Area</u>	<u>No. of Sprinklers</u>
Coventry Homes	1754	1961	20
	1714	2131	19
	1724	1833	19
	1743	1669	18
Knoell Homes	Madera	1751	19
	Riviera	1943	19
	Regency	2246	20
Malouf Bros.	Majestic	2440	21
	Hearthside	2680	19
	Laguna	2565	20
	Northlight	2590	20
<hr/>			
TOTALS	///	23809	214
<hr/>			
AVERAGE	///	2164.45	19.45
<hr/>			
2000 sf House	///	2000	17.97
<hr/>			

Sprinkler system cost per 2,000 sf house = 17.97 x \$114.29 = \$2,053.79

CITY OF SCOTTSDALE

FIRE SPRINKLER ORDINANCE

TYPICAL SPRINKLER LAYOUT - UNIT COSTS

Description	Unit	Qty.	Unit Cost	Total Cost
<u>Material - System</u>				
1" CPVC	LF	280	1.35	378.00
1"x90"	No	24	3.75	90.00
1"xT's	No	24	5.48	131.52
Sprinkler Adaptors	No	20	3.83	76.60
Riser Adaptor	No	1	3.83	3.83
Hangers	No	45	1.95	87.75
<u>Material - Riser</u>				
1" Couplings	No	1	7.50	7.50
1"x1"x1/2" Tee	No	1	7.50	7.50
1"x1"x1" Tee	No	1	7.50	7.50
1/2"x1/2"x1/2" Tee	No	1	7.50	7.50
1" Pipe	LF	10	2.10	21.00
1"x90"	No	1	7.50	7.50
1/2" Pipe	LF	6	2.40	14.40
1/2" Angle Valve	No	1	16.50	16.50
Gauge	No	1	30.00	30.00
Heads	No	20	7.50	150.00
1" W/F Switch	No	1	52.00	52.00
1" Butterball	No	1	90.00	90.00
Bell	No	1	28.00	28.00
Labor - Mechanical	Hrs	24	12.00	288.00
- Lab	Hrs	4	6.00	24.00
Design	Hrs	4	30.00	120.00
Equipment & Consumables			Lump Sum	<u>10.00</u>
SUBTOTAL				1649.10
General Conditions 5%				82.46
Overhead 10%				173.16
Mark Up 20%				381.00
TOTAL				\$2285.72 or \$114.29/head =====
				or \$1.14/sf =====

IV. ADDITIONAL SPRINKLER COSTS

V. ON-SITE TRADE-OFF COSTS

CITY OF SCOTTSDALE

FIRE SPRINKLER ORDINANCE

ON-SITE TRADE-OFFS - TOTAL COST REDUCTIONS PER HOUSE

1.	To change 5/8" Type-X gypsum board on garage walls to 1/2" gypsum	284.47 sf @ 0.078/sf =	<u>\$22.19</u> (mat)
2.	To change 5/8" Type-X gypsum board on garage ceilings to 1/2" gypsum board	430.22 sf @ 0.078/sf =	<u>\$33.56</u> (mat)
3.	To change 2'-8" x 6'-8" sc door to 2'-8" x 6'-8" h.c. door	1.09 no. @ \$13.00 =	<u>\$14.17</u> (mat)
4.	To delete 2" x 4" fireblocking	32.61 lf @ \$0.25 = \$ 8.15 (mat) 32.61 lf @ \$1.50 = <u>\$48.92</u> (lab)	<u>\$57.07</u> =====
5.	To change 3 1/2" x 3 1/2" hinges to 2 3/4" x 2 3/4"		No cost change
6.	Payroll charges on labor (\$48.92 x 35%)		<u>\$17.12</u>
7.	Subcontractors mark up on labor and material (\$144.11 x 10%)		<u>\$14.41</u>
	TOTAL ON-SITE TRADE-OFFS		<u>\$158.52</u> =====

CITY OF SCOTTSDALE

FIRE SPRINKLER ORDINANCE

ON-SITE TRADE-OFFS - UNIT COSTS

1. To change 5/8" Type-X Gypsum to 1/2" gypsum
(material cost only - no labor)

8'x4'x5/8" Type-X = \$6.69 per sheet

8'x4'x1/2" gypsum = \$4.19 per sheet

Difference \$2.50 per sheet OR 0.078 per sf
 =====

2. To change 2'-8"x6'-8" s.c. door to 2'8"x6'8" m.c. door
(material cost only - no labor)

2'-8"x6'-8" s.c. door = \$32.95 per door

2'-8"x6'-8" h.c. door = \$10.95 per door

Difference \$13.00 per door
 =====

3. To delete 2"x4" fire blocking
(material and labor costs)

Material = \$ 1.99 per 8lf = \$0.25 per lf

Labor = \$12.00 per 8lf = \$1.50 per lf

CITY OF SCOTTSDALE

FIRE SPRINKLER ORDINANCE

ON-SITE TRADE-OFFS - QUANTITIES

Builder	Model	Floor Area SF	Change Gypsum Walls SF	Change Gypsum Ceilings SF	Change SC Doors to HC No.	Delete Fire- block'g LF
Knoell	Madera	1751	384.00	552.50	1	42.67
	Riviera	1943	261.00	490.00	1	29.00
	Regency	2246	319.50	544.00	1	35.50
Malouf Bros.	Majestic	2440	216.00	480.00	1	24.00
	Hearthside	2680	432.00	441.00	1	48.00
	Laguna	2565	414.00	451.00	2	46.00
	Northlight	2590	216.00	441.00	2	24.00
Coventry Homes	Plan 1714	1961	288.00	436.00	1	32.00
	Plan 1724	2131	296.00	410.00	1	37.00
	Plan 1743	1833	196.00	430.50	1	24.50
	Plan 1754	1669	364.00	445.50	1	45.50
Totals	11 No.	23809	3386.50	5121.50	13	388.17
Average	1 No.	2164.45	307.86	465.59	1.18	35.29

2000 sf House	1 No.	2000	284.47	430.22	1.09	32.61
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VI. OFF-SITE TRADE OFF COSTS

CITY OF SCOTTSDALE

FIRE SPRINKLER ORDINANCE

OFF-SITE TRADE-OFFS - TOTAL REDUCTIONS PER HOUSE

BASED UPON 2,000 SF SINGLE FAMILY DETACHED SINGLE LEVEL HOUSE

1a.	Reduce street width from 50 ft to 46 ft (Asphalt + ABC) 19.81 sy @ \$8.50/sy	\$ 168.39
b.	Reduce excavation/backfill for road width reduction. 19.81 sy @ \$1.43/sy	\$ 28.33
2.	Reduce water main size from 8" to 6" (roads and cul-de-sacs.) 44.39 lf @ \$3.50/lf	\$ 155.37
3.	Increased hydrant spacing resulting in fewer hydrants. (Including valves) 0.03 @ \$2,000.00/each	\$ 60.00
4.	Additional building plots (see next page)	<u>\$1,539.46</u>
	TOTAL OFF-SITE TRADE-OFFS	\$1,951.55

CITY OF SCOTTSDALE
FIRE SPRINKLER ORDINANCE
ADDITIONAL BUILDING PLOTS

1. General

Building plot (improved) of 7,000 sf retails for \$70,000,
Therefore, 1 sf = \$10.00

2. Overall

Average building plot = 9,317.787 sf

Total road reduction area (not including cul-de-sacs) =
55,454.48 sf

Therefore, no. of additional plots = $55,454.48 / 9,317.787 =$
5.954 plots.

Total no. of building plots = 311

Therefore, no. of building plots per existing plots = $5.951 /$
 $311 = 0.019$

Reimbursable revenue to builder/developer
for additional 0.019 plots/house = $0.019 \times 9,317.787 \text{ sf} \times$
 $\$10.00/\text{sf} = \$1,770.38$

This revenue includes 35% mark up by builders. As this cost is
only land and improvements, we would suggest for the purpose of
this report, a figure of 15% would be more appropriate as a
mark up which relates to \$1,539.46, builder's cost.

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CITY OF SCOTTSDALE

FIRE SPRINKLER ORDINANCE

OFF-SITE TRADE-OFFS - UNIT COSTS

1 a)	Road topping 2" asphalt + 6" ABC Fill	\$8.50 sy
b)	Excavation/backfill	
	1 yd x 1 yd x 8" = 0.22 cy @ \$3.00/cy =	\$0.66 sy
c)	Backfill	
	1 yd x 1 yd x 8" = 0.22 cy @ \$10.00/cy =	\$2.20 sy

AVERAGE EXCAV/BACKFILL	\$1.43 sy
	=====

2. Reduce watermain from 8" to 6"
Cost for 8" = \$12.00/lf
Cost for 6" = \$ 8.50/lf

Difference = \$3.50/lf

CITY OF SCOTTSDALE
FIRE SPRINKLER ORDINANCE
REDUCTION IN ROAD WIDTH

Roadway reduced from 50'-0" to 46'-0"

Subdivision	<u>No. of Lots</u> <u>No.</u>	<u>Total Road</u> <u>Reduction</u> <u>SF</u>	<u>AV Reduction/Lot</u> <u>SF</u>
The retreat - Coventry homes	96	11,146.56	116.11
Preston Hills Unit II - R.M. Properties	32	10,519.42	328.73
Knoell, Scottsdale	183	<u>33,788.50</u>	<u>108.64</u>
<hr/> TOTALS	<hr/> 311	<hr/> 55,454.48	<hr/> 178.64

or

19.81 sy

CITY OF SCOTTSDALE
FIRE SPRINKLER ORDINANCE
FIRE HYDRANT REDUCTION

<u>Subdivision</u>	<u>No. of Lots</u> <u>#</u>	<u>Hydrant Reduction</u> <u>#</u>	<u>Hydrants/Lot</u> <u>#</u>
The Retreat - Coventry Homes	96	2	0.02
Preston Hills Unit II - R.M.P.	32	2	0.06
Knoell, Scottsdale	183	6	0.03
<hr/> TOTAL	<hr/> 311	<hr/> 10	<hr/> 0.03

CITY OF SCOTTSDALE
FIRE SPRINKLER ORDINANCE
LENGTHS OF WATER MAINS

<u>Subdivision</u>	<u>No. of Lots</u> <u>#</u>	<u>Total Frontage</u> <u>LF</u>	<u>Average Length/Lot</u> <u>LF/Lot</u>
The Retreat - Coventry Homes	96	2993.34	31.18
Preston Hills Unit II - R.M.P.	32	2323.86	72.62
Knoell, Scottsdale	183	8489.45	46.64
<hr/> TOTAL	<hr/> 311	<hr/> 13,806.65	<hr/> 44.39

CITY OF SCOTTSDALE
FIRE SPRINKLER ORDINANCE
AVERAGE BUILDING LOT

<u>Subdivision</u>	<u>No. of Lots</u> <u>#</u>	<u>Total Area</u> <u>SF</u>	<u>Average Area</u> <u>SF</u>
The Retreat - Coventry Homes	96	534,030,843	5,562,820
Preston Hills Unit II - R.M.P.	32	719,343,281	22,479,602
Knoell, Scottsdale	183	1,644,457,830	8,986,108
<hr/> TOTAL	<hr/> 311	<hr/> 2,897,831,954	<hr/> 9,317,787

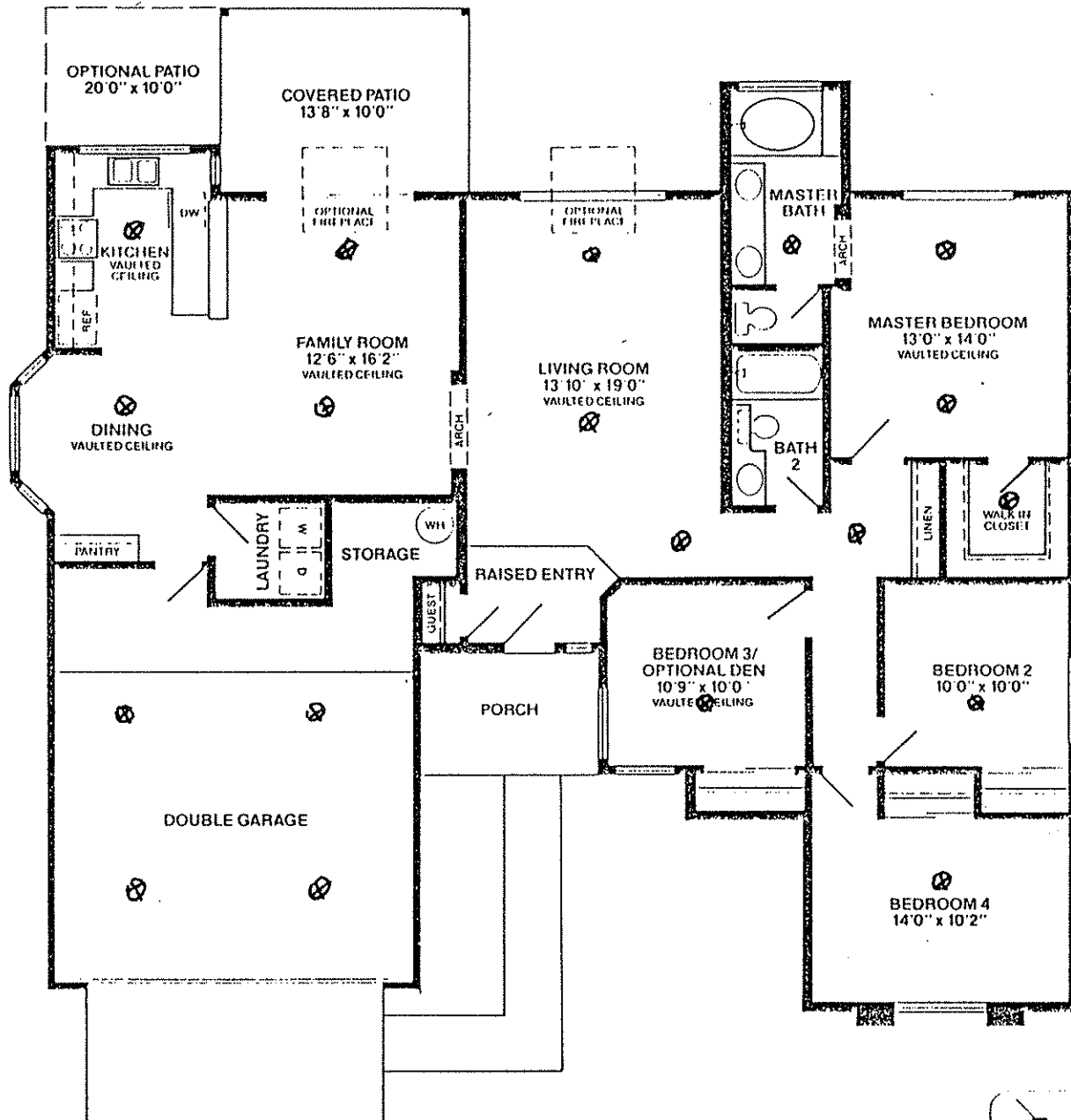
CITY OF SCOTTSDALE
FIRE SPRINKLER ORDINANCE
BUILDING LOT FRONTAGES

<u>Subdivision</u>	<u>No. of Lots</u> <u>#</u>	<u>Total Frontage</u> <u>LF</u>	<u>Average Frontage</u> <u>LF</u>
The Retreat - Coventry Homes	96	7101.93	73.978
Preston Hills Unit II - R.M.P.	32	5096.82	159.276
Knoell, Scottsdale	183	17,520.82	95,742
<hr/> TOTAL	<hr/> 311	<hr/> 29,719.57	<hr/> 95.561

VII. TYPICAL SPRINKLER LAYOUTS

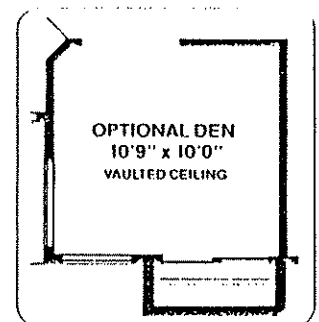
SHILOH CANYON

The Madera
plan KS-44-4



Please note:
This floor plan is an artist rendering.
The location, size and existence of doors,
windows, walls, fireplaces and any other
items depicted may vary slightly depend-
ing on exterior preference or choice of
options. Complete plans are available for
inspection upon request.

All measurements are approximate



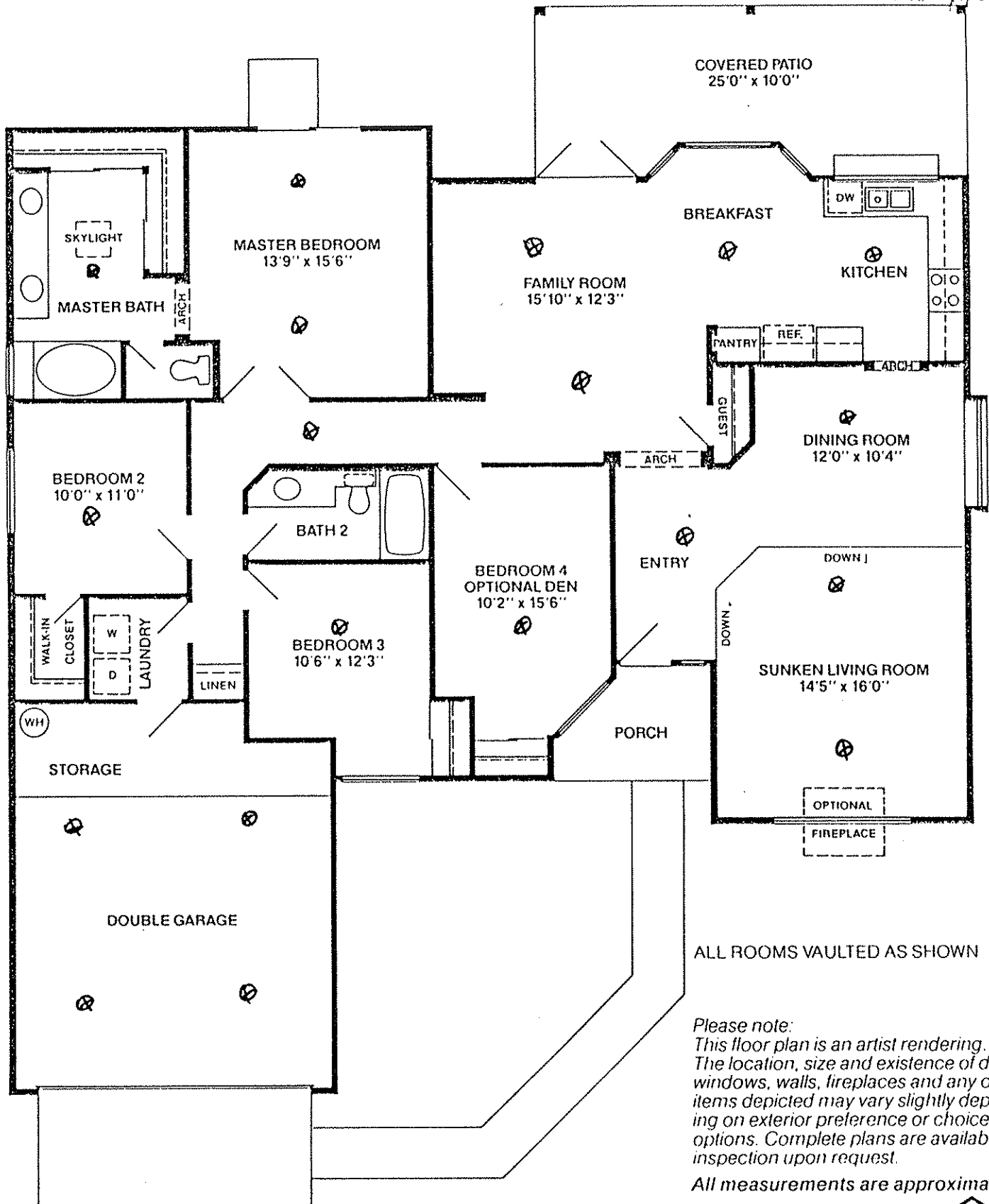
Knoell Homes



SHILOH CANYON

The Riviera
Plan KS-63-4

14'-13 1/2" x 26'-0"



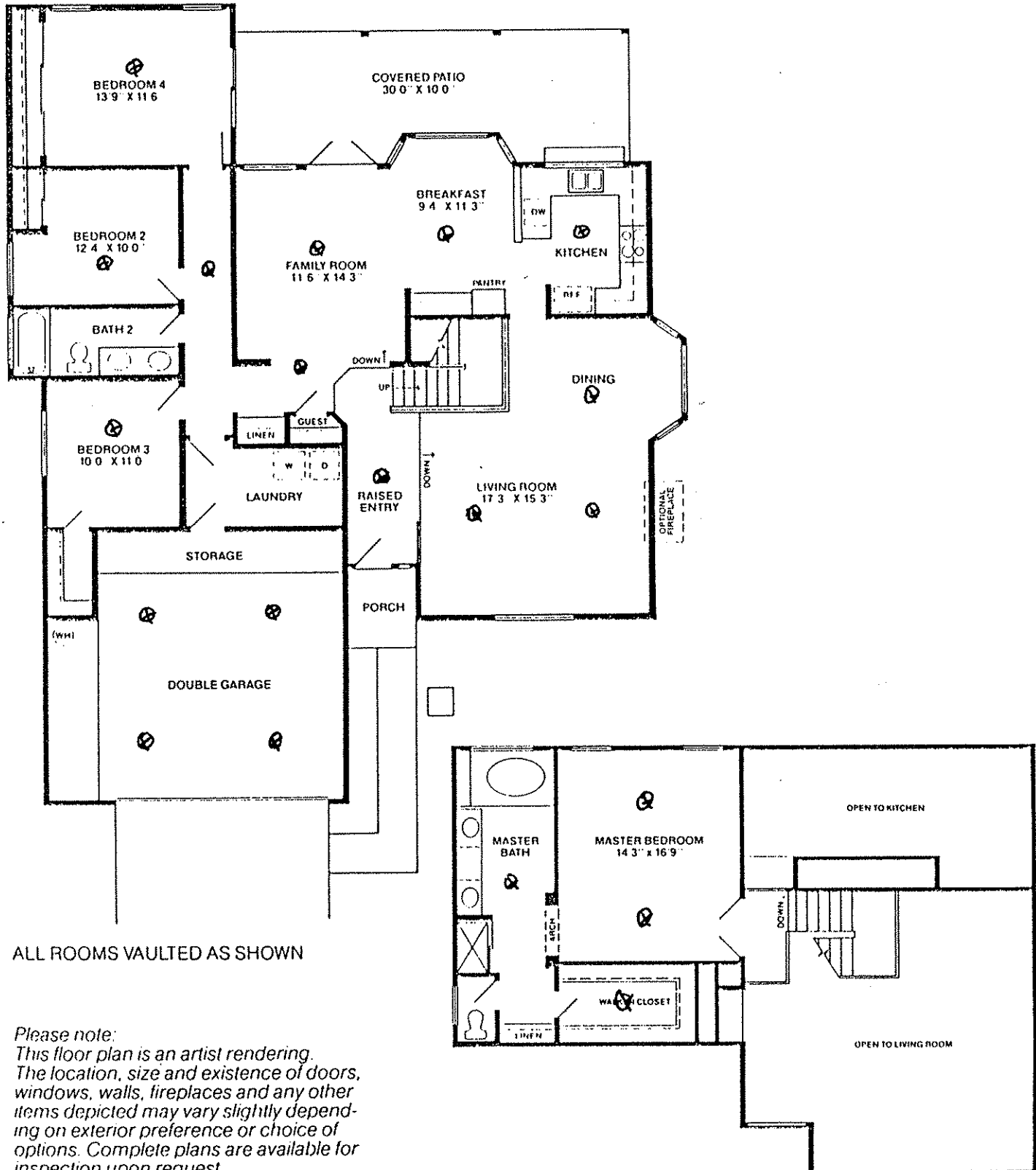
Knoell Homes



SHILOH CANYON

The Regency
Plan KS-64-4

2276 sq. ft.



ALL ROOMS VAULTED AS SHOWN

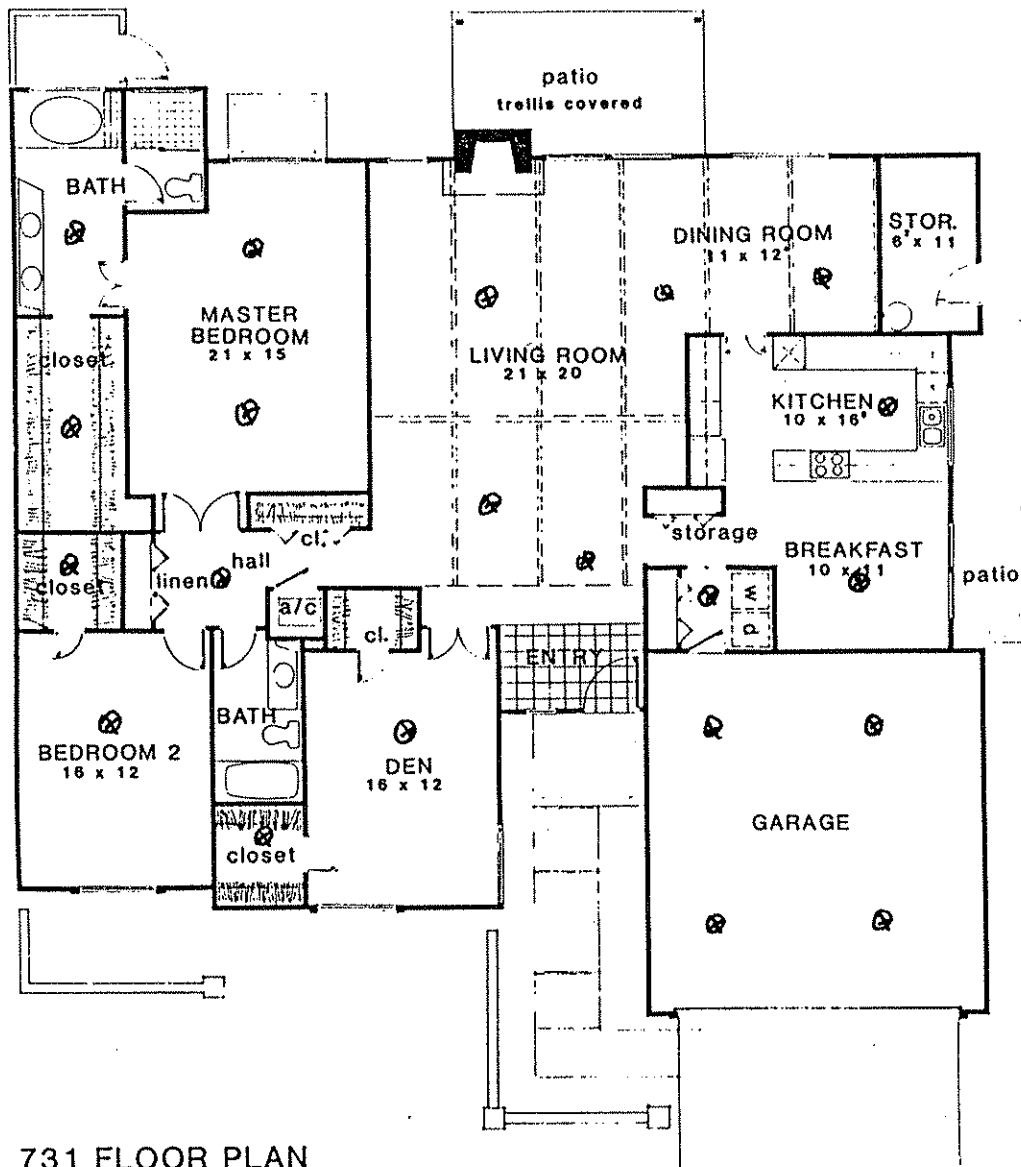
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Knoell Homes



THE MAJESTIC



731 FLOOR PLAN

The stepping stones that lead to the entrance are the only features randomly placed in this traditionally beautiful home.

Everything else follows a perfect and sensible order. Throughout the home there is a harmony, well thought-out, of function and style.

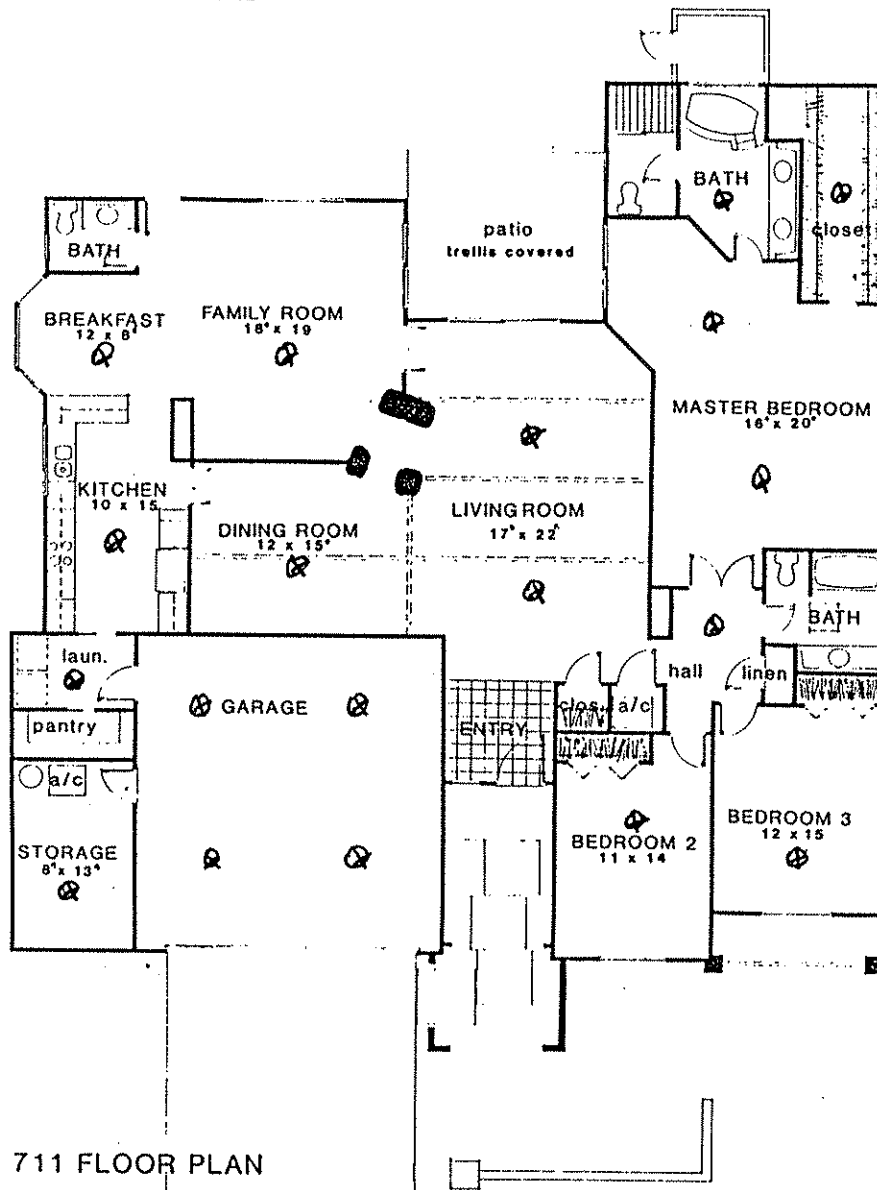
Glowing warmth from the fireplace greets you at the door, and provides the focal point in a truly enormous living room. The ceiling in this room alone rises as high as most homes two stories tall.

Just off the living room you'll find a room that's perfect for a den, study, library, even a third bedroom.

Linger over a relaxed meal in the dining room, as you share the sunshine with thriving greenery on the other side of your window.

Or take your after-dinner coffee to the poolside. Every Briarwood VI home includes a large family swimming pool at no extra cost.

THE HEARTHSTONE



711 FLOOR PLAN

Have you ever regretted that your fireplace can't follow you from room to room—to be enjoyed throughout the house?

When you've taken one look at the imaginative, daring Belltower, you'll never be satisfied with just sitting in front of the fire.

It's a fireplace you can sit in front of. Walk in back of. Or pass by as you rise to greet a guest.

Enjoy a warmth that flickers into three rooms—dining, living and family room. Ideal for entertaining, as it allows the party to flow freely from room to room, with the fireplace acting as the "centerpiece."

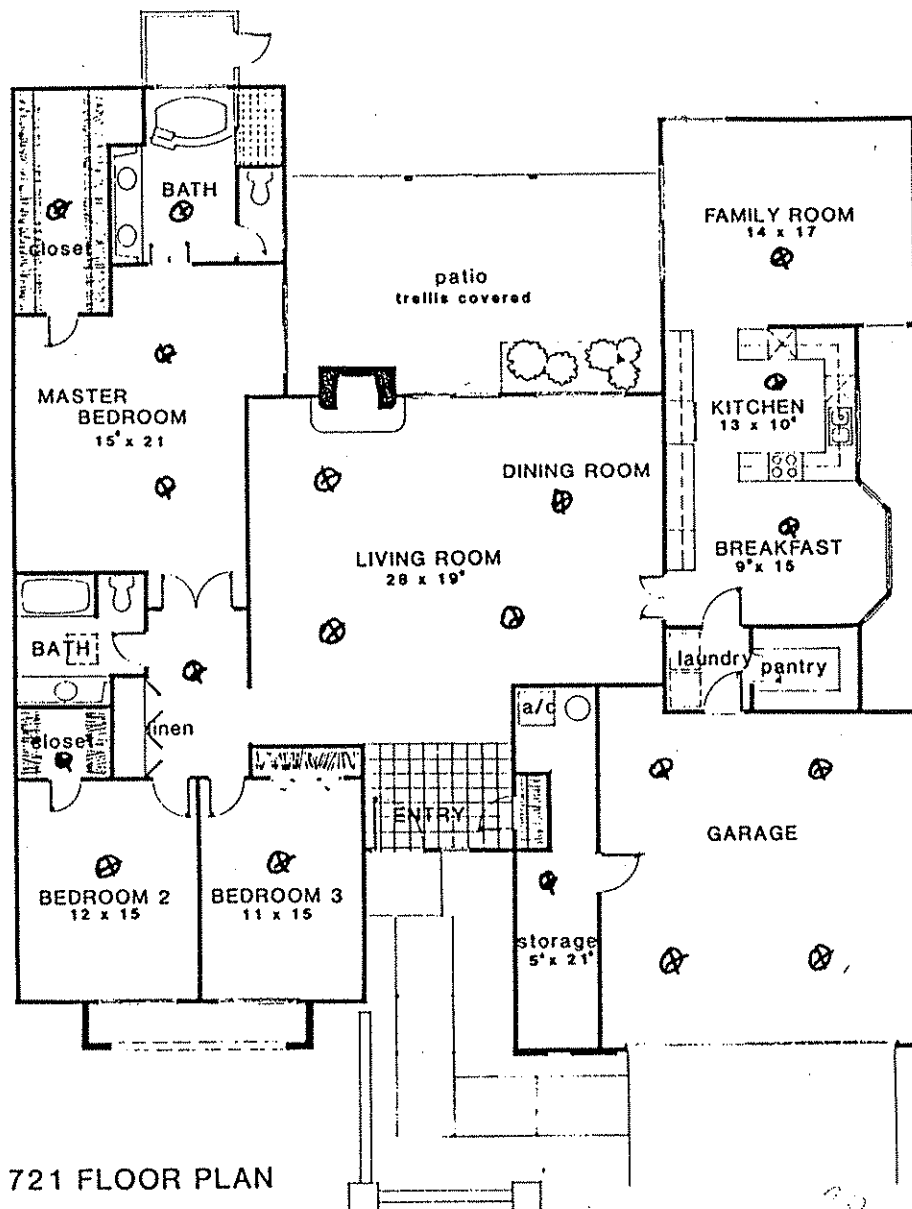
Bold beams capture the angle of the striking vaulted ceiling.

Your kitchen is spacious and airy, and a convenient walk-in pantry holds enough ingredients for the most exotically prepared meal.

A large breakfast nook is warmed by the morning sun filtering through generous bay windows.

At the end of the day, sink into a warm bath as the last bit of sunlight washes in from your private, lush atrium.

THE LAGUNA



Guests enter through impressive double-doors under a glittering chandelier. A large entry chamber welcomes them as the introductions, and the evening, get under way.

Your family will cherish the hours spent together in this home. Enjoy some time in the family room, located away from the other areas of the home...where everyone can be together.

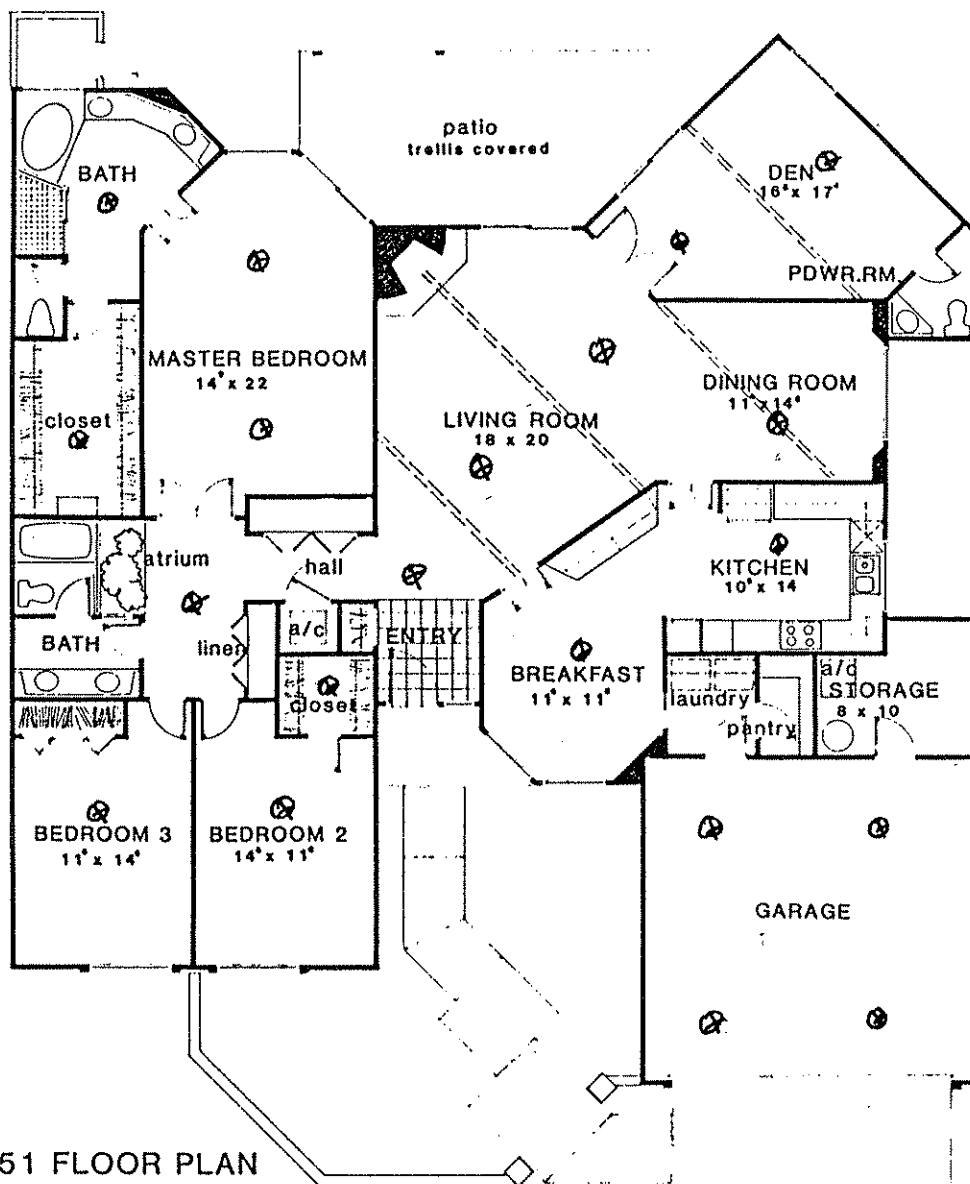
Three separate rooms look out past arcadia doors to the swimming pool, just a few wet footprints away. It's so easy to keep an eye on the activity in the pool, while you move about the house.

Gourmet cooks love the open feel and design of the huge, U-shaped kitchen. A walk-in pantry offers what seems like a grocery store full of shelf space.

Living room and dining room are combined in a special way that actually enhances your enjoyment of a meal.

Magnificent double-doors lead into a bedroom you've dreamed of, complete with an expansive sitting area. Beyond the arcadia doors, the moon reflects off the surface of the pool, inviting you in for a midnight swim.

THE NORTHLIGHT



751 FLOOR PLAN

Bold, striking architecture, highlighted with towering cathedral ceilings, make this home the perfect choice for a family seeking a unique environment for contemporary living.

The fireplace rises from floor to ceiling, accenting a spectacular angled living room like none you've ever seen.

The kitchen is centrally located between two large dining areas, with abundant counter space to give you the room to cook with a flourish. A breakfast room, filled with sunshine, rises to a beamed, towered ceiling. Bay windows seem as big as Arizona sunsets.

All around, you'll find plenty of space for your linens and large, walk-in closets. Even a sit-down vanity in the bathroom, right next to your luxurious Roman tub.

An interior planter can be filled with your favorite lush plants, where they will thrive under the skylight.

It's an altogether elegant way to live.

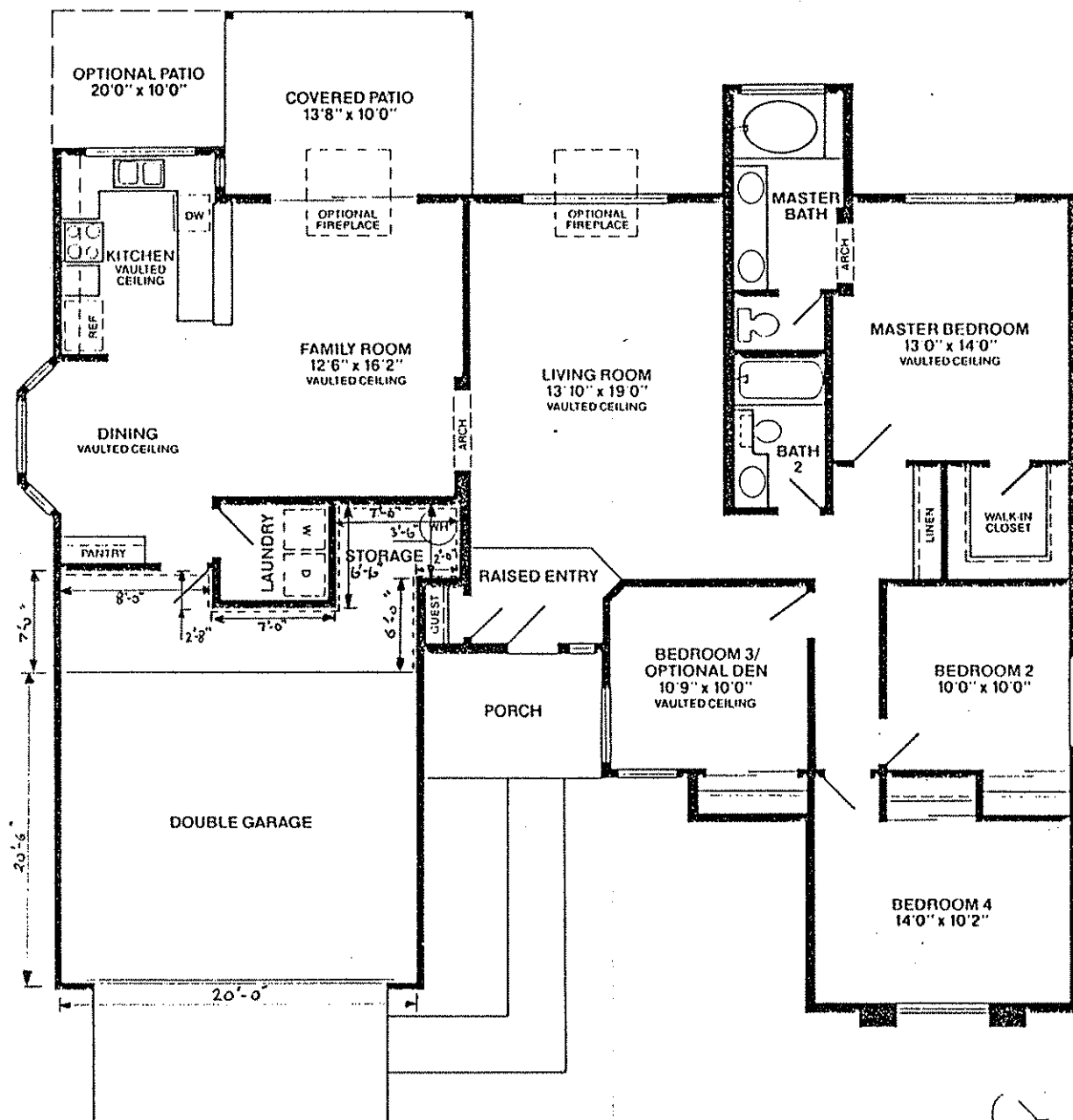
VIII. TYPICAL HOUSE PLANS

SHILOH CANYON

The Madera

plan KS-44-4

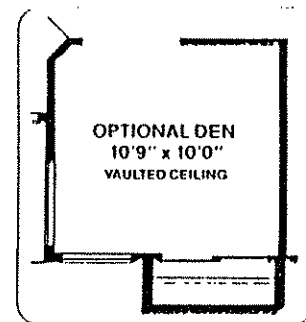
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Please note:

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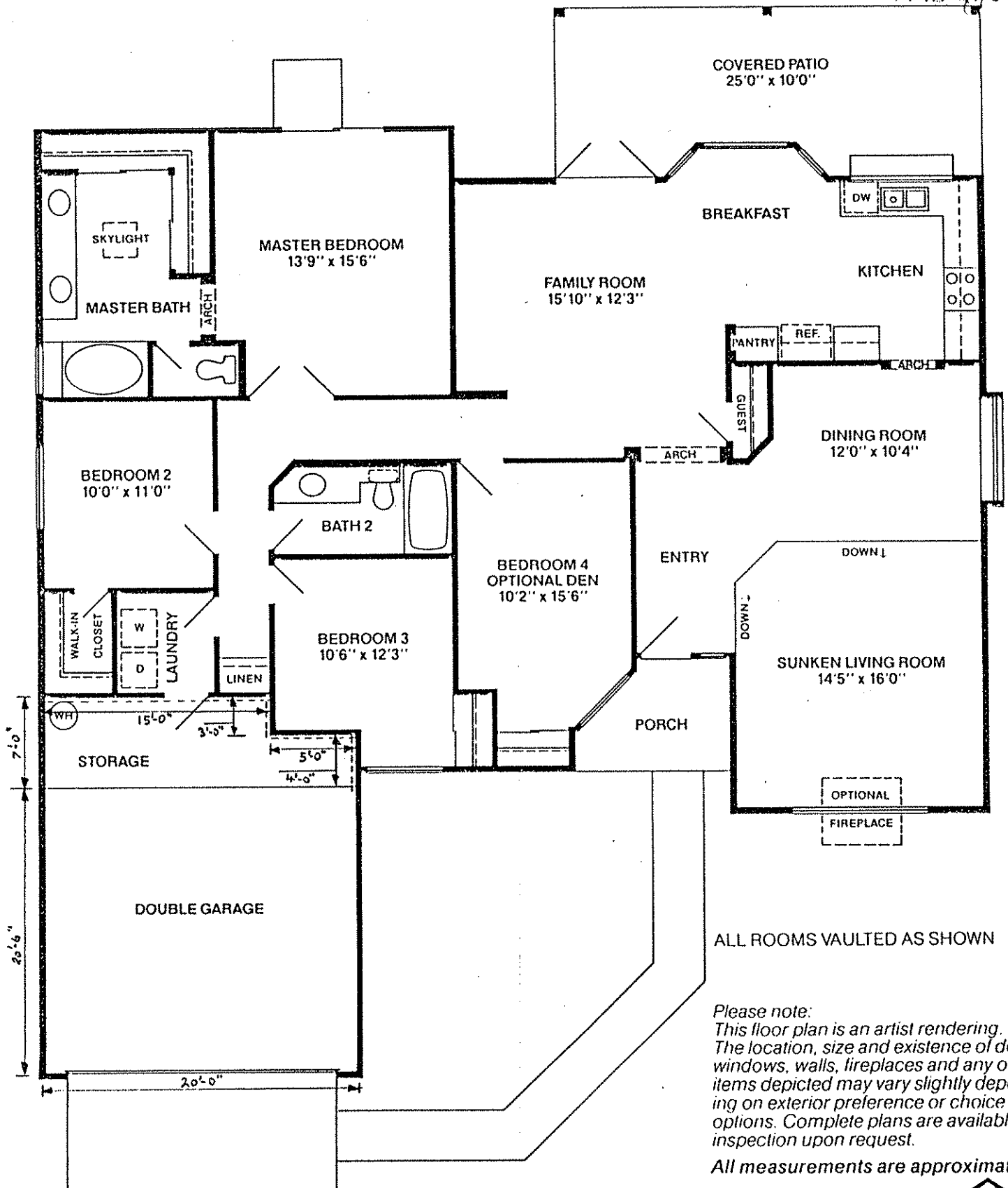
All measurements are approximate



SHILOH CANYON

The Riviera
Plan KS-63-4

1913 sq. ft.



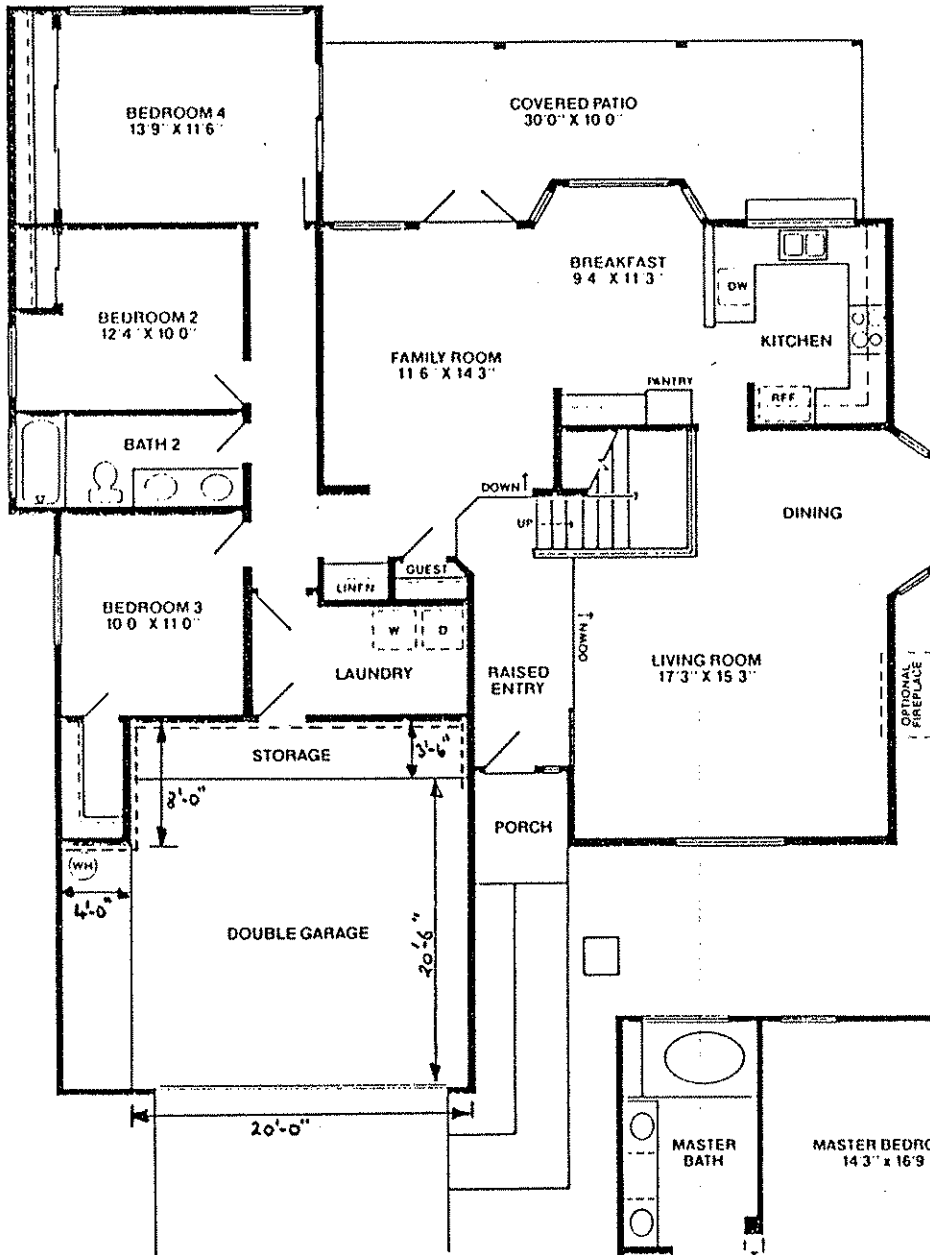
Knoell Homes



SHILOH CANYON

The Regency
Plan KS-64-4

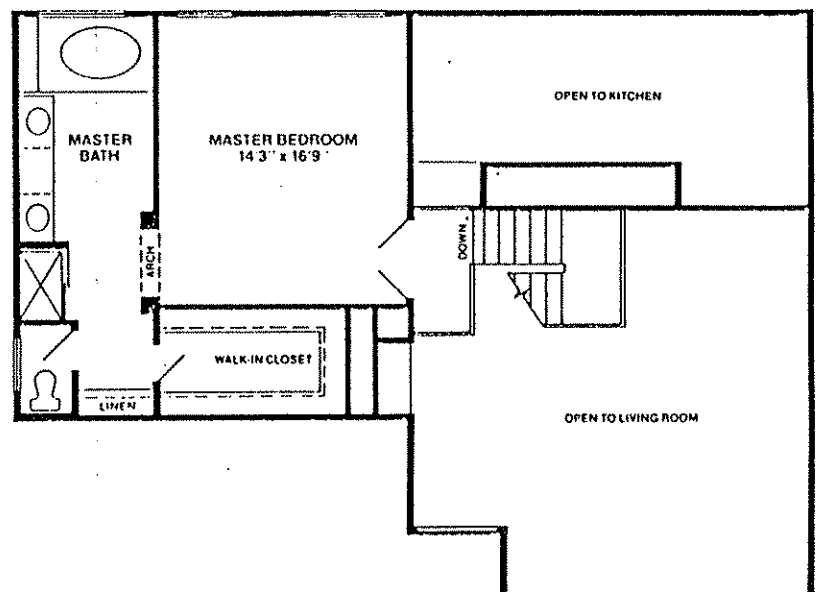
2.7.86 37.1.6



ALL ROOMS VAULTED AS SHOWN

Please note:
This floor plan is an artist rendering.
The location, size and existence of doors,
windows, walls, fireplaces and any other
items depicted may vary slightly depend-
ing on exterior preference or choice of
options. Complete plans are available for
inspection upon request.

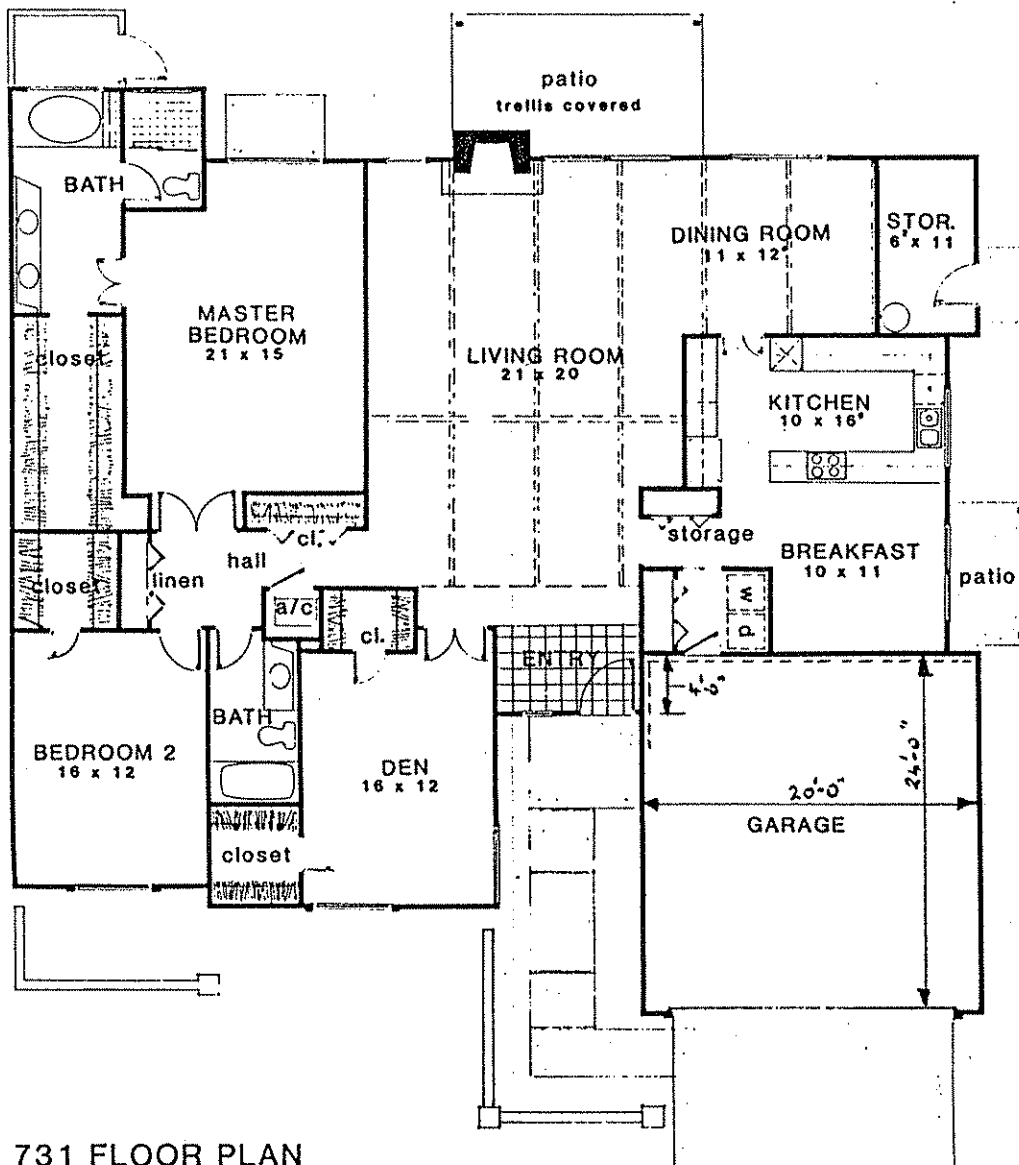
All measurements are approximate



Knoell Homes



THE MAJESTIC



731 FLOOR PLAN

The stepping stones that lead to the entrance are the only features randomly placed in this traditionally beautiful home.

Everything else follows a perfect and sensible order. Throughout the home there is a harmony, well thought-out, of function and style.

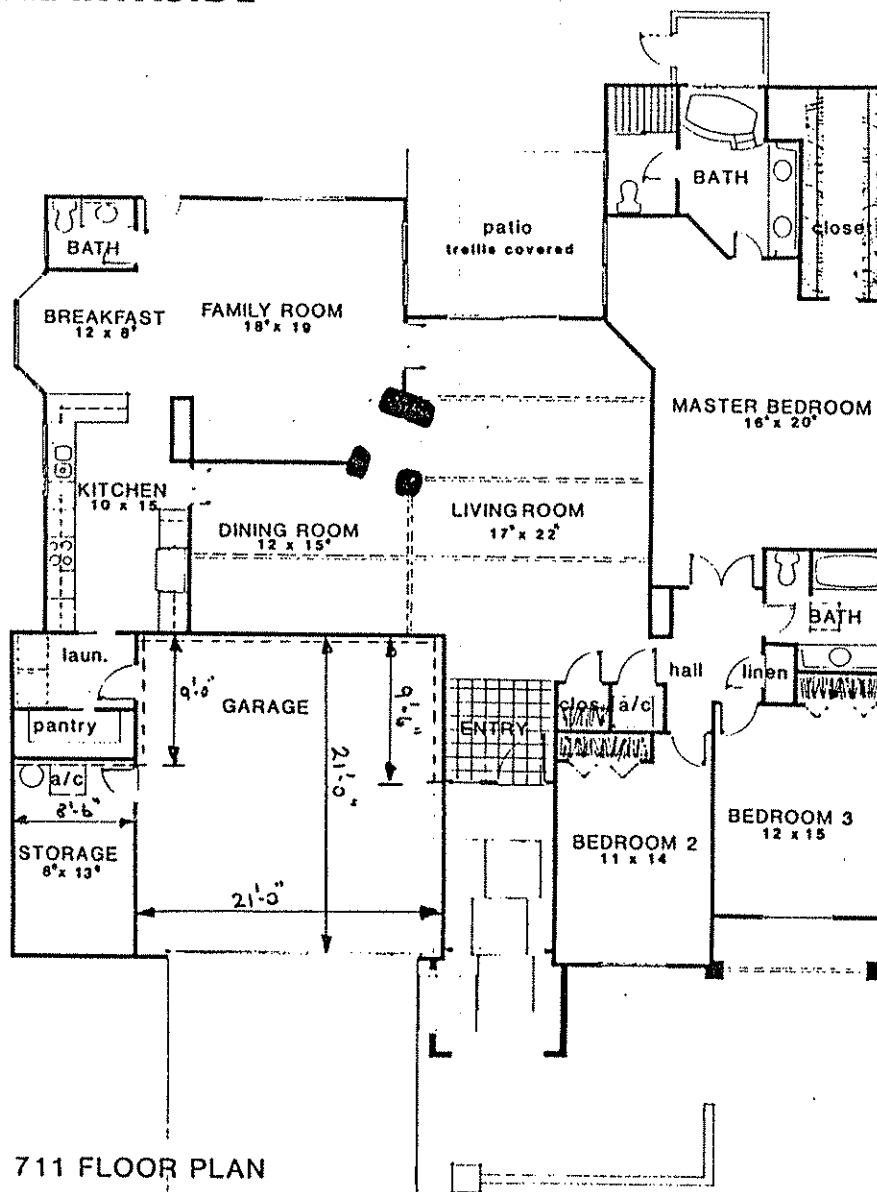
Glowing warmth from the fireplace greets you at the door, and provides the focal point in a truly enormous living room. The ceiling in this room alone rises as high as most homes two stories tall.

Just off the living room you'll find a room that's perfect for a den, study, library, even a third bedroom.

Linger over a relaxed meal in the dining room, as you share the sunshine with thriving greenery on the other side of your window.

Or take your after-dinner coffee to the poolside. Every Briarwood VI home includes a large family swimming pool at no extra cost.

THE HEARTHSTONE



Have you ever regretted that your fireplace can't follow you from room to room—to be enjoyed throughout the house?

When you've taken one look at the imaginative, daring Belltower, you'll never be satisfied with just sitting in front of the fire.

It's a fireplace you can sit in front of. Walk in back of. Or pass by as you rise to greet a guest.

Enjoy a warmth that flickers into three rooms—dining, living and family room. Ideal for entertaining, as it allows the party to flow freely from room to room, with the fireplace acting as the "centerpiece."

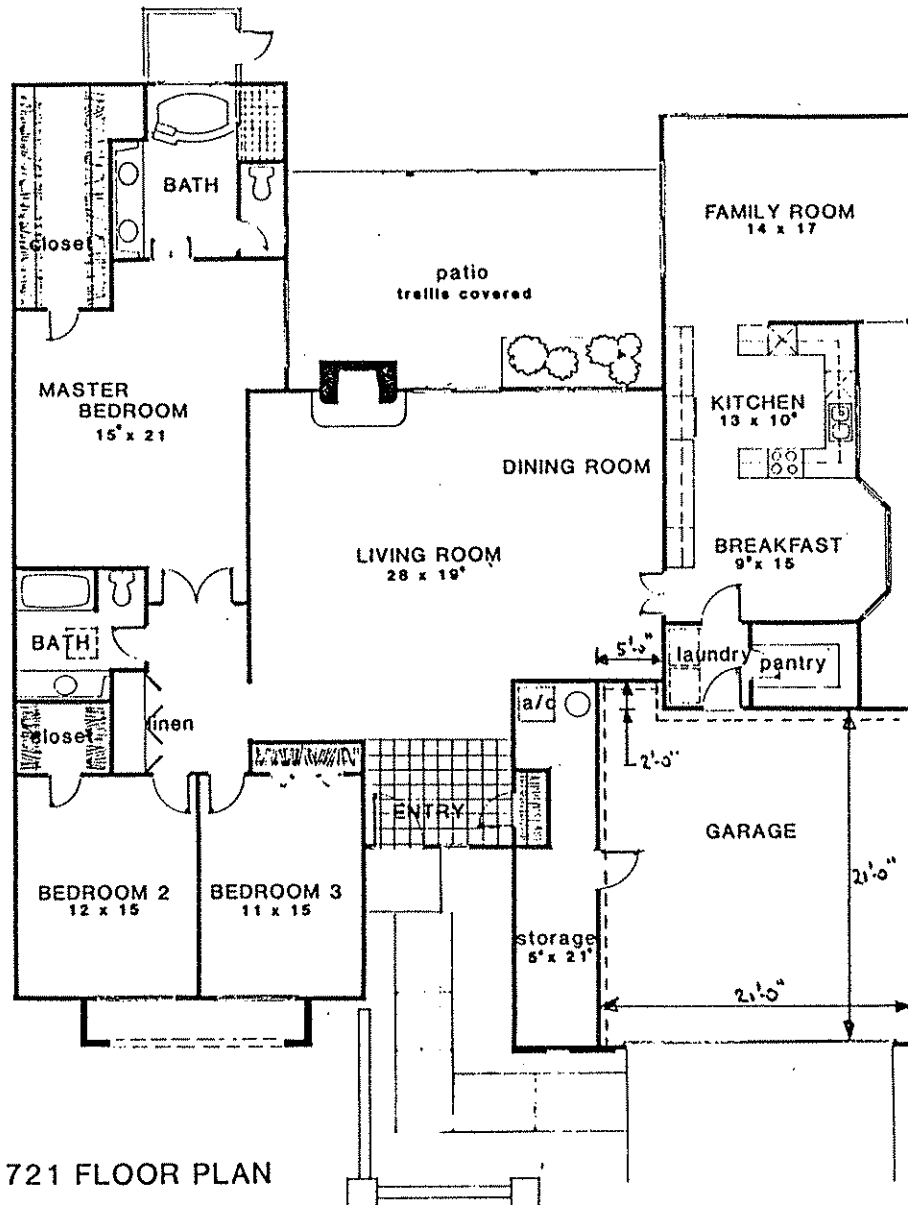
Bold beams capture the angle of the striking vaulted ceiling.

Your kitchen is spacious and airy, and a convenient walk-in pantry holds enough ingredients for the most exotically prepared meal.

A large breakfast nook is warmed by the morning sun filtering through generous bay windows.

At the end of the day, sink into a warm bath as the last bit of sunlight washes in from your private, lush atrium.

THE LAGUNA



Guests enter through impressive double-doors under a glittering chandelier. A large entry chamber welcomes them as the introductions, and the evening, get under way.

Your family will cherish the hours spent together in this home. Enjoy some time in the family room, located away from the other areas of the home...where everyone can be together.

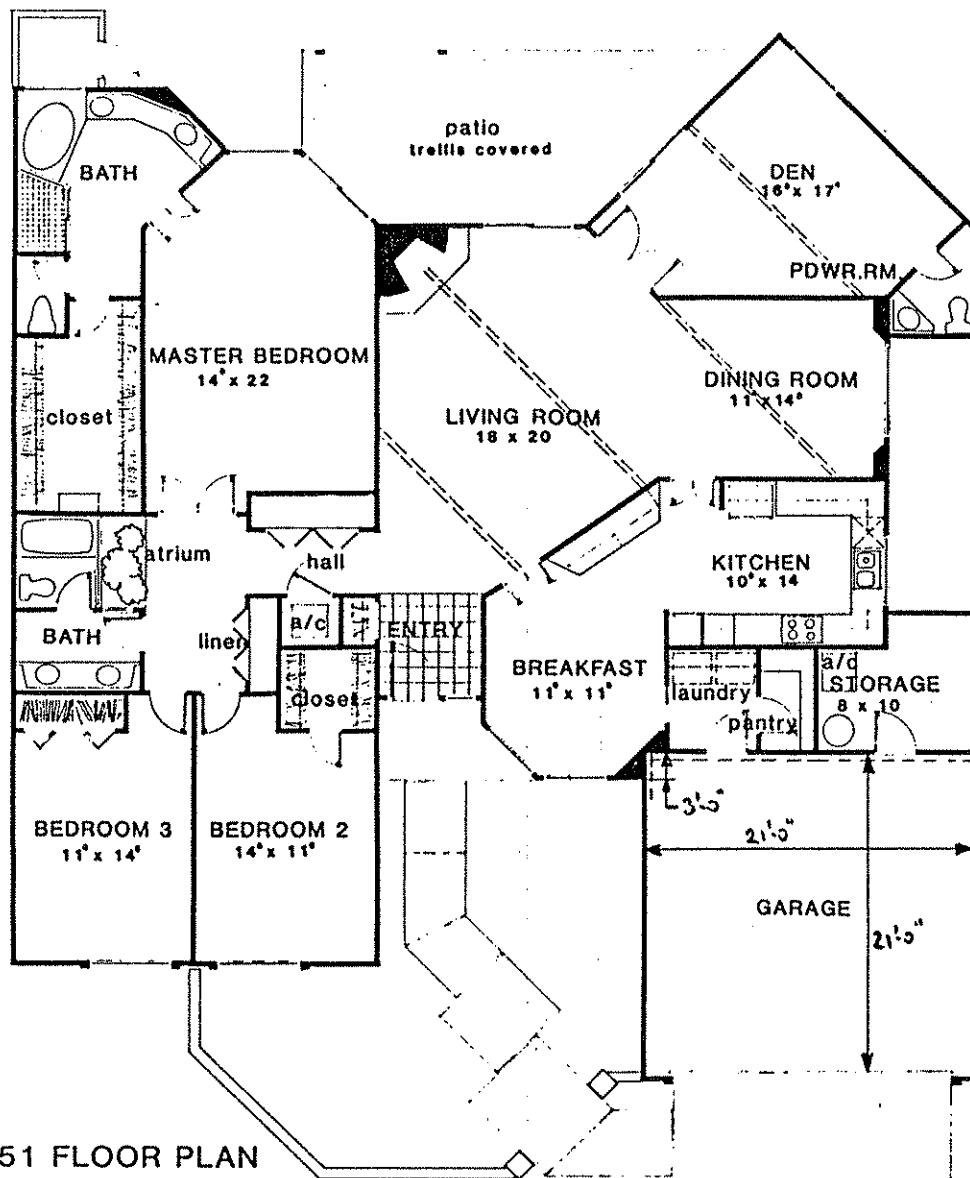
Three separate rooms look out past arcadia doors to the swimming pool, just a few wet footprints away. It's so easy to keep an eye on the activity in the pool, while you move about the house.

Gourmet cooks love the open feel and design of the huge, U-shaped kitchen. A walk-in pantry offers what seems like a grocery store full of shelf space.

Living room and dining room are combined in a special way that actually enhances your enjoyment of a meal.

Magnificent double-doors lead into a bedroom you've dreamed of, complete with an expansive sitting area. Beyond the arcadia doors, the moon reflects off the surface of the pool, inviting you in for a midnight swim.

THE NORTHLIGHT



751 FLOOR PLAN

Bold, striking architecture, highlighted with towering cathedral ceilings, make this home the perfect choice for a family seeking a unique environment for contemporary living.

The fireplace rises from floor to ceiling, accenting a spectacular angled living room like none you've ever seen.

The kitchen is centrally located between two large dining areas, with abundant counter space to give you the room to cook with a flourish. A breakfast room, filled with sunshine, rises to a beamed, towered ceiling. Bay windows seem as big as Arizona sunsets.

All around, you'll find plenty of space for your linens and large, walk-in closets. Even a sit-down vanity in the bathroom, right next to your luxurious Roman tub.

An interior planter can be filled with your favorite lush plants, where they will thrive under the skylight.

It's an altogether elegant way to live.

IX. SITE PLANS

X. INFORMATION AND DATA SOURCES

CITY OF SCOTTSDALE

FIRE SPRINKLER ORDINANCE

SECTION TEN - INFORMATION AND DATA SOURCES

1. House Plans

Knoell Homes - Madera Plan KS-44-4
 - Riviera Plan KS-63-4
 - Regency Plan KS-64-4

Malouf Bros. - Majestic
 - Hearthside
 - Laguna
 - Northlight

Coventry Homes - Plan 1714
 - Plan 1724
 - Plan 1743
 - Plan 1754

2. Site Plans

Coventry Homes - The Retreat
R.M. Properties - Preston Hills Unit II
Knoell Homes - Scottsdale - Skyrun at Shea

3. Costs

Building Materials - O'Malleys
Land Costs - Metropolitan Development and Malouf Bros.

XI. PHOTOGRAPHS



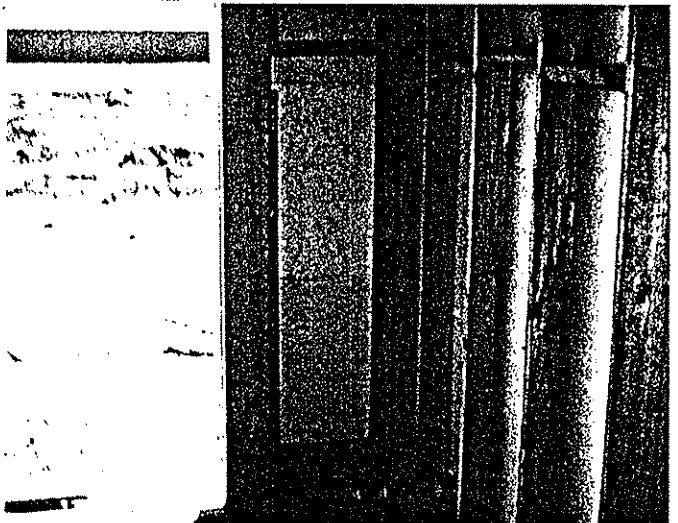
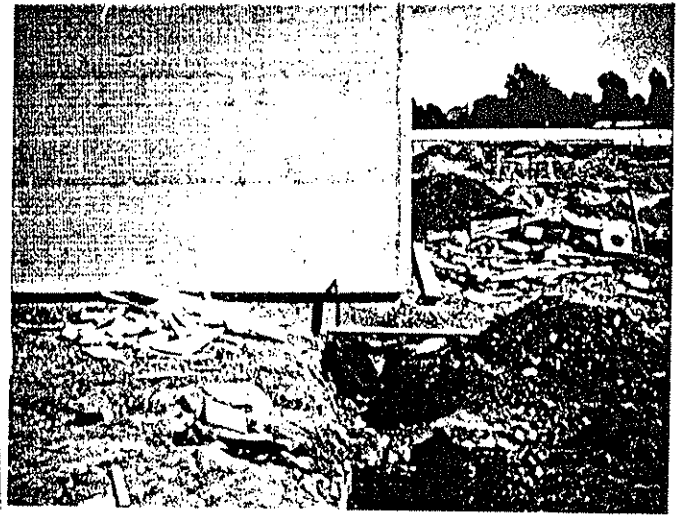
CITY OF SCOTTSDALE
FIRE SPRINKLER ORDINANCE

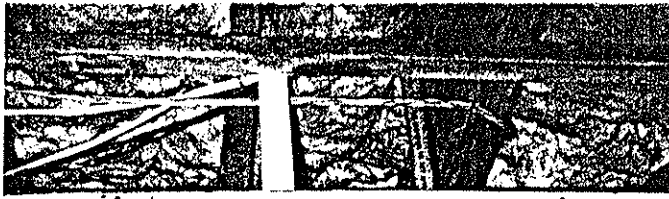
TOP: Site: Malouf Bros. -
Briarwood North. Exterior mains
water supply entering building.

MIDDLE: Site: Malouf Bros. -
Briarwood North. Mains feeder
entering interior of house.

BOTTOM: Site: Malouf Bros. -
Briarwood North. Sprinkler
piping from point of riser.

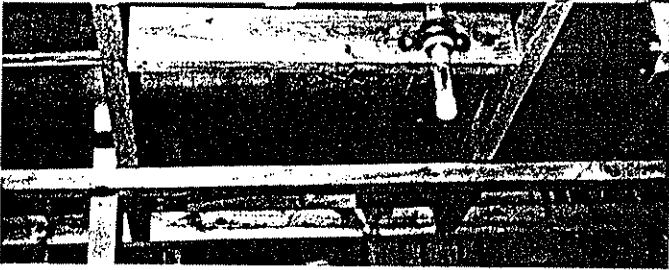
BELOW: Site: Malouf Bros. -
Briarwood North. Typical CPVC
branch connection of sprinkler
system piping.





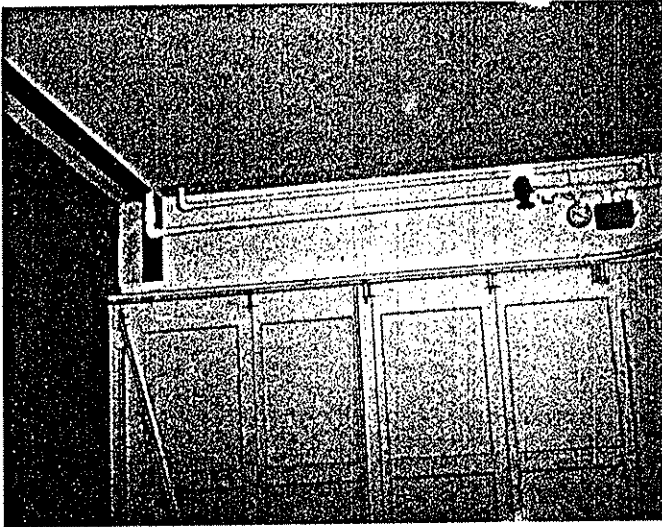
CITY OF SCOTTSDALE
FIRE SPRINKLER ORDINANCE

TOP: Site: Malouf Bros. -
Briarwood North. Sprinkler
drop pipe capped off ready for
drywall and sprinkler head
installation.



MIDDLE: Site: Malouf Bros. -
Briarwood North. Completed
sprinkler riser. Located in
garage.

BOTTOM: Site: Malouf Bros. -
Briarwood North. Close-up of
riser control.



BELOW: Site: Malouf Bros. -
Briarwood North. Completed
ceiling showing sprinkler head
and escutcheon plate.

