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A Low-slope Commercial Roofing Overview

by Steve Patterson and Madan Mehta

THE AESTHETIC ASPECTS OF A ROOF may or may not be important, but in functional performance, the roof is one of the most critical components of a building. Most energy loss from a building envelope (particularly from a single-story building) occurs through the roof. Disastrous wind-caused damage to a building begins when the roof fails to function as a structural diaphragm. An overload due to inadequate roof drainage may cause the roof to collapse. Water leakage, the most aggravating aspect of the malperformance of a building envelope, occurs primarily through the roof.

In fact, a large majority of owners' complaints with the design and construction of buildings are with roofs that leak. Although authoritative data are not available, it is estimated that nearly 50 percent of building construction lawsuits relate, in one way or the other, to roofing problems. The above statistic assumes significance when viewed in conjunction with the fact that the roof covering of a typical building is replaced every few years—one estimate gives a seven- to ten-year period. This replacement frequency would be unacceptable for any other envelope component—doors, windows, curtain walls, etc.

Water-shedding versus Water-resisting Roof

All photos and drawings courtesy Madan Mehta

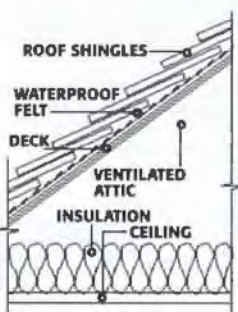


Figure 1

A DISCUSSION OF roofing issues must begin with its classification under two types: *water-shedding roof* and *water-resisting roof*. A water-shedding roof typically consists of small individual roofing units (shingles) that overlap each other (Figure 1). The roof surface must be sloped so that the water is shed off the roof by gravity. The slope must generate adequate gravitational force to overcome the forces generated by wind, head pressure, and capillary action that might push the water up the slope between adjacent shingles and cause the roof to leak.

A water-resisting roof consists of a con-

tinuous roofing membrane over a relatively flat roof surface. Although water ponding is generally to be avoided, a water-resisting roof has to be designed for a certain minimum depth of ponding (usually a minimum of two inches—50 mm—of water) that might collect on the roof in the event of a blockage in roof's drainage system. The roof membrane must therefore act as waterproofing membrane and be able to resist water pressure until the drainage system is able to function again. This period may be as long as several hours or a few days.

A water-shedding roof is generally referred to as a *steep roof*, and is commonly used

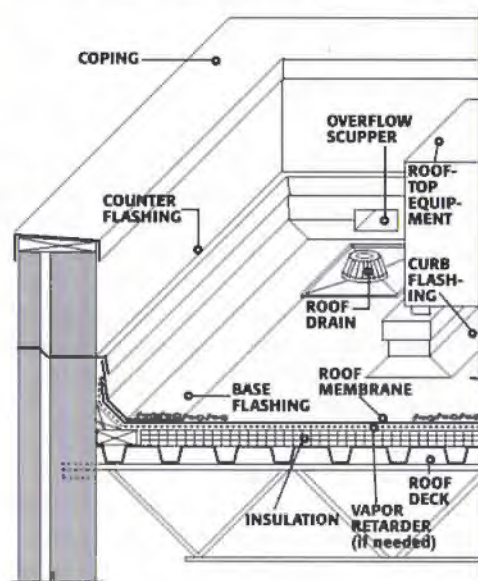


Figure 2

for residential structures—individual homes, apartments, motels, etc. A water-resisting roof is referred to as a *low-slope commercial roof*, since it is generally used for commercial and industrial structures. Although a low-slope roof, by definition, has a slope of 3:12 (three units horizontal to 12 units vertical—a 25 percent slope) or less, it is generally a flat roof. However, even a flat roof is mandated by building codes to have a minimum slope of 0.25:12 (two percent).

In a low-slope roof, the insulation is usually provided between the deck and the roofing membrane (Figure 2). In a steep roof, on the other hand, the insulation is provided above the ceiling, and there is usually a large

ventilated attic space between the deck and the ceiling. The results of this fact are that the temperature range to which the roofing units in a steep roof are subjected is much smaller than in a low-slope roof. In a steep roof, the heat can easily travel from the roofing units to the attic space, from which it is extracted by ventilation.

In a low-slope roof, the location of insulation just below the membrane retards the escape of heat away from the membrane. Consequently, the roof membrane can become extremely hot during a summer afternoon. A roof membrane temperature of 155° F (68° C) on a 100° F (38° C) afternoon is fairly common in Texas. At night, the roof membrane temperature is lower than the air temperature due to nocturnal heat radiation from the roof to the sky. Typically under a clear night sky, the membrane is 10° F (6° C) cooler than the air temperature.

Thus, a 65° F (36° C) diurnal temperature differential of the roof membrane over and above the diurnal air temperature differential is not uncommon. In other words, if the

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Learning Objectives

After reading this article and completing the exercises, you will have:

1. learned the important components of a low-slope roof;
2. learned the major design and system selection criteria for a low-slope roof;
3. understood the processes of laying a built-up roof, modified bitumen roof, and a single-ply roof;
4. understood the advantages and limitations of a built-up roof, modified bitumen roof, and a single-ply roof, and in which situation to specify each roof type; and
5. learned about the commonly used roof decks and roofing insulations.



Components of a Low-slope Roof

- Roof membrane and surfacing
- Insulation
- Vapor retarder (if needed)
- Roof deck
- Base flashing and counter flashing
- Roof-top equipment and flashing
- Roof penetrations and flashing
- Roof drainage system—primary and secondary
- Expansion joints and area dividers
- Traffic pads

Figure 3

Major Design and System Selection Criteria of a Low-slope Roof

- Local climate and energy conservation
- Building type and size
- Type and number of roof penetrations
- Roof drainage
- Fire-safety
- Wind resistance
- Sound transmission
- Roof traffic
- Economics and roof warranties

Figure 4

minimum air temperature on a day is 75° F, and the maximum 100° F—a 25° F differential—the roof membrane may experience a temperature differential of nearly 90° F (50° C). Therefore, the yearly temperature differential of the roof membrane may well exceed 150° F (83° C).

Temperature differentials create expansion and contraction of a material, inducing fatigue—a major cause of a material's deterioration. That is why the durability of a low-slope roof membrane decreased substantially with the introduction of insulation on roofs. Several built-up roofs laid directly on reinforced concrete decks without any insulation have survived in excess of 50 years. Today, when high-R roof insulations are common, a 25-year life span is the upper limit for a low-slope roof membrane.

Low-slope Roofing—A System

THERMAL FACTOR IS NOT the only factor that affects the durability or performance of a roof. Several other factors, such as chemical degradation of roof membrane by ultraviolet (UV) radiation and pollutants deposited on

Market Shares (1995) of Roof Membranes

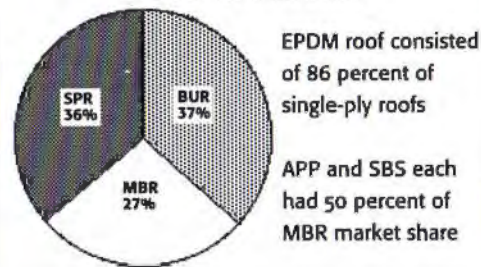


Figure 5

the roof (e.g., the oils emitted by kitchen exhausts); the effects of wind, rain, and hail-storm; chemical incompatibility between the insulation and the membrane and between the deck and the insulation; and roof drainage, etc., affect the performance of a roof substantially.

With several factors that affect its performance, and with several components that constitute a low-slope roof, roofing design must take a systems approach, in which the interaction between components (subsystems) and with external factors such as solar radiation, wind, rain, hailstorm, fire, etc., must be considered.

Figure 3 lists important components of a low-slope roof, and Figure 4 indicates the major factors that must be considered in roof system selection and design.

Low-slope Roof Types

DEPENDING ON THE ROOF membrane used, a low-slope roof is classified as:

- Built-up roof (BUR)
- Modified bitumen roof (MBR)
- Single-ply roof (SPR)

As explained in the following section, a BUR membrane consists of several individual layers laminated into one membrane. An SPR membrane consists of a single layer. An MBR is in between BUR and SPR, and usually consists of two to three layers. A BUR is, therefore, the most labor-intensive roof, followed by MBR; an SPR is generally the least labor intensive.

It is interesting to note that according to the market survey conducted by the National Roofing Contractors Association (NRCA) in 1995, the above three roof types had an almost equal percentage U.S. market share (Figure 5).

Built-Up Roof: A BUR membrane consists of several layers of roofing felts adhered together by bitumen (asphalt or coal tar). In this combination of felts and bitumen, the bitumen is the waterproofing material. However, bitumen alone cannot be used, since, being a thermoplastic material, it becomes soft at high temperatures and begins to flow. At low temperatures, it becomes hard and brittle, and cracks. Thus, bitumen does not have the requisite tensile strength to withstand stresses imposed by the changes in temperature, deck movement, foot traffic, hail storm, etc.



Figure 6a



Figure 6b



Figure 6c

6a laying a BUR: joints between insulation boards being covered with strips of felt and mopping of bitumen, as a preparation for laying the first ply

6b All felt plies have been laid.

6c flood coat and surfacing operations



The felts work as reinforcing material, giving the required tensile strength. Although organic felts (made of paper pulp) are still used, most BUR felts in contemporary low-slope roofs are made of fiberglass scrim, which is impregnated with bitumen. Thus, a fiberglass felt is black in color, and has tiny voids between individual fiberglass strands. In a BUR, a felt is laid over a mopping of bitumen, followed by second mopping of bitumen, and then the second felt, and so on. Thus, a number of felt layers (called plies), separated by moppings of bitumen, are necessary to build a BUR membrane—hence the name built-up roof.

A BUR normally consists of three to five

plies. The greater the number of plies, the thicker and hence the stronger and more durable the membrane. The last felt is typically covered with a surfacing material to protect the membrane from the effects of weather (UV radiation, rain and wind erosion, and hail impact) and external fire. The most common surfacing material is gravel over a flood coat of bitumen in which the bitumen is poured over the roof (not mopped on). Figures 6a-c show a few stages in the laying of a typical BUR.

BUR Felts: According to the American Society of Testing and Materials (ASTM) standard D 2178, fiberglass roofing felts are classified as type III, IV, and VI, having a tensile strength of 22 pounds per inch (3.85 N/mm), 44 pounds per inch (7.70 N/mm) and 60 pounds per inch (10.51 N/mm) respectively. Types IV and VI are more commonly specified. Type VI, the strongest felt (Figure 7) is recommended where the membrane is subjected to a high tensile stress. These stresses may be caused by a high annual temperature differential that occurs in most parts of Texas, or a relatively flexible deck, or excessive impact on a roof due to hailstorm and/or foot traffic. In addition to using type VI felt, a thicker (four- to five-ply) BUR is recommended for the above situations, since a thicker membrane is stronger. Long-term roofing warranties by roofing manufacturers are usually contingent on the use of type VI felt. However, type IV felt is a little easier to work with.

Fiberglass felts are manufactured in rolls, usually three feet (914 mm) wide. They are laid in shingle fashion: the upper felt overlaps the lower felt by a constant dimension. In a three-ply roof, there must be at least three plies under any roof point. Similarly, a four-ply roof must have four plies at every point.

The lap at the exposed end of a ply with respect to the lowest ply at that end, referred to as the *head lap*, is two inches (50 mm)—the industry standard (Figure 8). Under

Table 1: Softening Point Temperatures and Maximum Roof Slopes of Various Asphalt Types

Asphalt type	SPT °F (°C)	Maximum slope
Type I	135-151 (57-66)	0.5:12 (14%)
Type II	158-176 (70-80)	1.5:12 (12%)
Type III	185-205 (85-96)	3:12 (25%)
Type IV	210-225 (99-107)	6:12 (50%)

the head lap, there is one additional ply. Thus, there are four plies under a head lap in a three-ply BUR. The dimension EXP is called the *exposure* of the felt. EXP is related to the number of plies by the following relationship:

$$EXP = \frac{\text{Felt width} - \text{Head lap}}{\text{Number of BUR plies}}$$

Thus, in a two-ply BUR, EXP = 17 inches (432 mm); in a three-ply BUR, EXP = 11-3/8 inches (288 mm); and so on. BUR felts are manufactured with two-, three-, and four-ply lines marked on them (as shown in Figure 9) to help roofers lay the felts correctly.

Bitumen: As stated previously, bitumen is used as an adhesive between BUR plies. Two types of bitumen—*asphalt* and *coal tar*—are used. Although both materials have the same appearance (both are black in color and highly viscous), and both are hydrocarbons, they are chemically different. Coal tar has a ring-like molecular structure, while the molecular structure of asphalt is chain-like. It is nature's law that a material with a ring-like structure weathers more slowly (is more durable) than the one with a chain-like structure. Thus, everything else being the same, a coal tar BUR is more durable than an asphalt BUR.

Asphalt is the waste product (residue) obtained from crude oil refineries. Although asphalt appeared much later in the roofing industry, it is the one that is commonly used today, because of its lower cost and greater availability. ASTM standard D 312 divides roofing asphalts into four types—types I, II, III, and IV. The most important property that



Figure 7

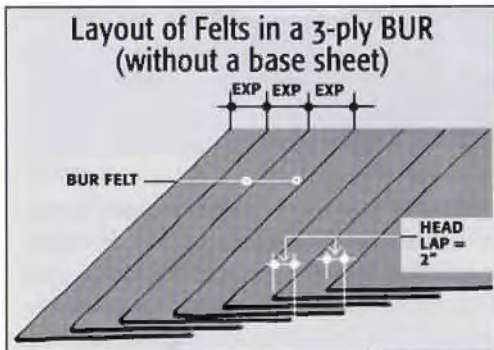


Figure 8

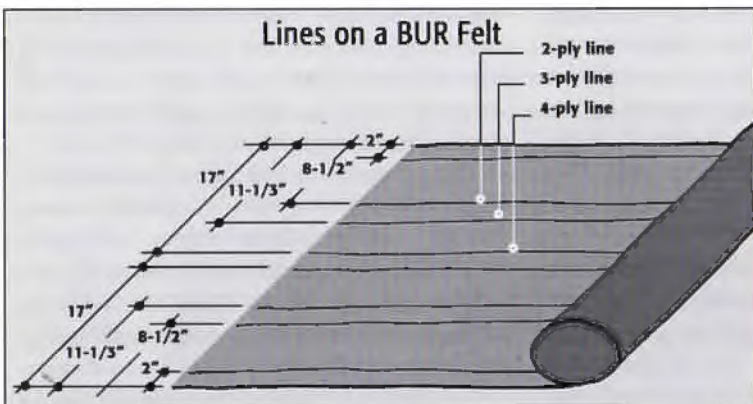


Figure 9



Figure 10

Figure 10 asphalt kegs at a job site

distinguishes one type from the other is the softening point temperature (SPT) of asphalt. SPT is the temperature at which the asphalt begins to flow. It is directly related to the weathering characteristics of asphalt. The lower the SPT, the more durable the asphalt, and the more easily the asphalt will heal any cracks caused by expansion or contraction in roof membrane. Table 1 gives the SPT of the four asphalt types.

Historically (when organic felts were in use), type I asphalt was recommended for extremely small slopes—less than 0.5:12 (four percent); type II asphalt for slopes less than 1.5:12 (12 percent); type III asphalt for slopes less than 3:12 (25 percent); and type IV asphalt for slopes less than 6:12 (50 percent). With the introduction of fiberglass felts, which have a greater slippage problem² than the organic felts, the asphalt commonly used these days for interply moppings is type III.

Type III asphalt is easier to use (has better workability) and can be heated with relatively less damage to a much higher temperature than types I and II. The higher temperature of mopped-on asphalt helps melt the asphalt already in the felts, providing a better fusion between the felts. Type IV asphalt can do the same thing better than type III, but its lower durability is a deterrent. However, type IV asphalt is commonly used with SBS modified bitumen membranes (see the following section), in which a higher asphalt temperature is an advantage.

Type III asphalt is also specified frequently for the flood coat for roofs in Texas, due to the higher ambient temperatures in the state. However, where low temperatures exist (and with the roof slope permitting), type I or type II asphalt should be considered for the flood coat due to their better weathering characteristics.

Type III and IV asphalts are typically supplied at job sites in solid paper-wrapped kegs (Figure 10); types I and II asphalts and coal tar are supplied in metal containers because of their lower SPT. The asphalt is melted in a roofing kettle on the ground and pumped up to the roof. Squeegees and buckets are used for mopping operations. Typically, 25-pounds of asphalt per roof square³ is recommended for interply moppings and 65- to 75-pounds per roof square for the flood coat. The flood coat is poured on the roof, not mopped on, to provide the large asphalt quantity required for the flood coat.

Coal tar (also called *tar* or *pitch*) is obtained from the distillation of coal. While the distillate in this process is coal tar, the residue is coke. Coal tar is more expensive, its fumes are considered more hazardous to roofers, and it has a much smaller number of manufacturers than asphalt. It has a much lower SPT than asphalt, and hence it is more self-healing and more durable. Because of its lower SPT, tar flow is a major problem, particularly in the warm climate of Texas. Special detailing is required to overcome the flow and possible drippage of tar from the roof.

Although available in three types—types I, II, and III—types I and III are roofing tars. Type III used to be the more commonly used roofing tar, because of its lower fume hazard, but of late there have been numerous performance-related questions with respect to type III. Therefore, the most commonly used tar these days is type I. However, note that coal tar fumes are hazardous, which must be duly considered before specifying a tar roof. Additionally, because of its low SPT, slippage can be a problem with tar BURs in Texas on slopes greater than 0.125:12 (one percent).

Due to its higher durability and greater water-resisting characteristics, a coal tar BUR may be considered for reroofing of an existing roof, where the roof slope is less than the mandated 0.25:12 (two percent), and where

incorporating the required minimum slope on the roof is not a possibility.

Note that tar and asphalt, being chemically different, are not compatible with each other. They should not be mixed together. In other words, only coal tar felts should be used with coal tar moppings, and vice versa. However, asphalt products are used for flashings on coal tar roofs.

BUR Surfacing: Although coal tar is generally considered more weather-resistant⁴ than asphalt, both will degrade over a period of time. The primary degrading agent is UV radiation. Therefore, the final flood coat of bitumen on a BUR must be protected. The best available protection is gravel. This not only blocks sunlight, but provides resistance against wind uplift and damage from foot traffic and hail impact. It also adds to the fire-resistance of the roof. Gravel surfacing (400 pounds per square—190 Pa) on a BUR with a slope not exceeding 3:12 meets Underwriters Laboratory's (UL) class A rating⁵ in the generic category.

Other surfacing materials include ceramic mineral granules, crushed-stone aggregate, blast-furnace slag, and volcanic rock. Mineral granule surfacing is the lightest surfacing but is more prone to damage as a result of foot traffic and wind uplift. Once the granules have come off, the bitumen is exposed, which leads to a more rapid deterioration of the roof. However, granule surfacing is generally more durable than coatings, which require constant maintenance.

Gravel-covered BURs have a long history of superior performance in Texas. However, gravel surfacing has some disadvantages. Gravel surfacing can hide poor workmanship, making roof inspection and roof repairs more difficult. A mineral-surfaced modified bitumen cap sheet, in place of the flood coat and surfacing, also provides an excellent protection for Texas climate, provided the cap sheet is counted as a sacrificial (additional) ply—a replacement for the flood coat.

Cap sheets are applied after the last ply has been mopped. They are laid in roll roofing format—with two-inch (50 mm) overlaps at the edges—not shingled with the rest of the plies. Typically, the cap sheets are laid using a "mop and flop" technique, in which the cap sheet is unrolled, laid upside down so that hot bitumen can be applied, and finally turned

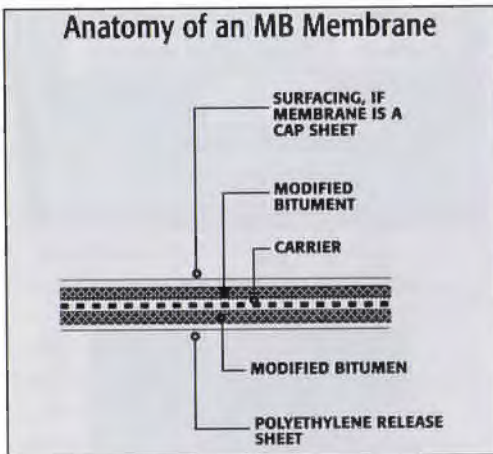


Figure 11



Figure 10



Figure 12

Figure 10 asphalt kegs at a job site

Figure 13 field covering the flow-out with mineral granules in an APP membrane

Figure 12 torch-applied APP membrane

over and laid on the roof. Cap sheets are particularly suitable for warm coastal (high-wind) locations, where a gravel (or aggregate) covered BUR may be undesirable due to the possibility of gravel (or aggregate) becoming wind-borne missiles. Wind-borne gravel has been identified as a source of much damage to buildings in high-wind locations.

Modified Bitumen Roof: A modified bitumen membrane may be regarded as similar to a BUR membrane, since the waterproofing agent is asphalt, to which polymers have been added to modify the asphalt's properties. The

polymer's addition improves the membrane's ability to withstand standing water and UV radiation. It also adds pliability to the membrane, which improves the membrane's ability to withstand temperature extremes.

The polymer added to asphalt is either styrene butadiene styrene (SBS) or atactic polypropylene (APP). SBS is a synthetic rubber. Therefore, it is more flexible and more resistant to thermal shock than APP. An APP membrane is more resistant to UV radiation than an SBS membrane.

An MB membrane consists of a reinforcing mat, called the *carrier*, which is impregnated and coated with modified bitumen on both sides (Figure 11). The carriers commonly used are polyester or fiberglass or both. Polyester gives the membrane pliability and puncture and tear resistance, but increases problems related to shrinkage. Fiberglass provides tensile strength and increases fire resistance, but reduces the membrane's pliability.

The thickness of an MB membrane varies from 90 to 200 mil (2 mm to 5 mm). Therefore, an MB membrane is much thicker than an asphalt felt, which is nearly 40 mil (1 mm) thick. It is also non-porous, unlike the asphalt felt. Therefore, an MB membrane need only consist of two to three plies, as compared with three to five plies of a BUR.

APP Membrane: An APP membrane is typically applied using a propane torch (Figure 12). In this application, the heat from the torch melts the asphalt on the underside of the membrane. The felts are usually factory laminated with a thin polyethylene release sheet, to prevent stickiness in the roll. The torch burns the polyethylene sheet.

In laying the APP membrane, a certain amount of molten bitumen flows out at the edges. The bitumen flow-out verifies that the bitumen in the membrane has melted sufficiently to ensure the membrane's adhesion. If the APP membrane is a mineral-surfaced cap sheet, the flow-out asphalt must be protected with field-applied mineral surfacing (Figure 13).

The open torch used in laying an APP membrane presents a fire risk, which must be considered when selecting an APP membrane system. Fire extinguishers must be available on the roof, and perlite board cants (not wood cants) should be used with an APP sys-

tem.⁶ If plastic foam insulation is used with an APP sheet, it should be covered over by a non-combustible board—e.g., perlite board—before applying the APP membrane.

An APP membrane system is particularly suitable for a roof where the hot bitumen used in a conventional BUR (or in an SBS MBR) cannot be pumped from the ground to the roof such as on the roof of a high-rise building. The system is also suitable for a roof with numerous penetrations. A two-layer APP membrane, the first layer a smooth-top membrane and the top layer a mineral-surfaced cap sheet, can provide the necessary redundancy in most situations.

Most manufacturers recommend lap seams of nearly four inches (100 mm) for APP membranes. A quality-control mechanism ensuring complete adhesion of the lap seams is fundamental to the success of an APP system. An APP membrane system is not generally specified for high-wind locations, since the failure of a lap seam can become progressively worse under high winds.

SBS Membrane: SBS membrane is typically mop-applied, like the BUR. Its advantage lies in its greater low-temperature pliability. It is, therefore, suitable for colder climates, where a conventional BUR (even an APP membrane) would become brittle sooner. It is also suitable for a roof deck that is subjected to abnormal movements. The asphalt used with SBS membranes may either be the same (unmodified) asphalt as for BUR, or the SBS-modified asphalt. The temperature of the asphalt must be higher than that required for laying the conventional BUR in order to melt the asphalt in the membrane. Therefore, type IV asphalt is the norm with an SBS membrane.

The best-performing SBS roof system uses three plies, consisting of a base sheet (on a nailable deck), a smooth SBS ply felt, and a granule-surfaced SBS cap sheet. Another option includes a two- or three-ply conventional BUR with a granule-surfaced SBS cap sheet.

Being fully adhered, an SBS system is suitable for high-wind regions if the top sheet is a granule-surfaced cap sheet. In low- or normal-wind regions, an SBS roof may be covered with a flood coat of (preferably modified) asphalt and gravel surfacing.

An SBS membrane roof applied with a cold adhesive is becoming increasingly popu-

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SPR systems. The survey reports that although BUR market share was 37 percent, only 20 percent of roofing problems occurred in buildings with BURs. By comparison, SPR market share was 36 percent, but it had 55 percent of roofing problems (Figure 23).

- *Lifecycle cost vs. initial cost:* Examine the lifecycle cost of the roofing system, not just its initial cost, since a roof will probably be replaced several times during the life of a building. In examining the lifecycle cost, include the cost of all materials that will be replaced, including the insulation, since in most roofing systems insulation will need replacement along with the membrane.

- *Roof maintenance:* Every roof will require some degree of regular maintenance. Make the owner aware of the necessary maintenance schedule.

- *Roofing warranties:* Warranties (or guaranties) came into the roofing business as sales tools used by the roofing manufacturers. Once a manufacturer introduced better war-

ranty terms to the owners, other manufacturers had to follow suit in order to stay competitive. Most earlier roofing warranties were of questionable value. In fact, they limited the manufacturer's liability rather than providing a protection to the owner or the designer. The competition among roofing manufacturers and a better informed design community has led to better roofing warranties.

The two critical issues in a warranty are the penal sum and the workmanship. Some warranties have a limit on the penal sum—a cap on the amount that the warrantor will pay in the event of a roof failure. This is generally in terms of a dollar figure, say \$100 per roof square. Other warranties may have limits based on the original materials cost, i.e., not to exceed the cost of the original installation. With ever-increasing roofing material and installation costs, such a warranty may be worth very little when an actual failure occurs.

The best roofing warranty is the one that has no limit on the penal sum—referred to as

a no-dollar-limit (NDL) warranty. Such a warranty guarantees to pay for all the repairs (material and labor), regardless of the cost involved. It is usually given by a manufacturer as a full-system (FS) warranty. In an FS NDL warranty, all materials and specifications must be per the manufacturer, and only a manufacturer-certified and approved contractor can install the roof.

Although an FS NDL warranty is ideal from an owner's or a designer's point of view, it is expensive, since the manufacturer usually forces the use of expensive materials. The additional cost of on-site quality control is also built into the warranty.

Steve Patterson is the principal of Roof Technical Services, a roofing consultancy firm in Fort Worth, and an adjunct faculty member in the School of Architecture, University of Texas at Arlington. Madan Mehta is a full-time faculty member in the School of Architecture, University of Texas at Arlington.

Self-Test Questions

1. On the average, which of the following roof assemblies is least prone to major failures? a) built-up roof b) modified bitumen roof c) single-ply roof.
2. In a three-ply built-up roof, the exposure of plies is a) 12-1/2 inches b) nine inches c) 11-1/3 inches d) 15-1/3 inches.
3. In a built-up roof, the most commonly used asphalt type for inter-ply moppings is a) type I b) type II c) type III d) type IV.
4. For a durable built-up roof, which fiberglass felt would you recommend? a) type III b) type IV c) type V d) type VI.
5. Which of the following modified bitumen membranes is torch-applied? a) SBS modified bitumen b) APP modified bitumen.
6. The carrier in a modified bitumen membrane consists of a) an organic felt b) a fiberglass felt c) organic and fiberglass felts d) polyester and fiberglass felts.
7. Which of the following roofing membranes is most unsuitable for a roof with numerous penetrations? a) built-up roof membrane b) modified bitumen membrane c) single-ply membrane.
8. Which of the following roofing assemblies are most unsuitable for a roof in a high-wind region? a) gravel-covered built-up roof b) APP modified bitumen roof with mineral-surfaced cap sheet c) mechanically fastened single-ply roof d) fully-adhered single-ply roof.
9. Which of the following single-ply membranes is most commonly specified? a) neoprene b) EPDM c) PVC.
10. Which of the following two plastic foam insulations is most commonly specified for low-slope roofs? a) extruded polystyrene foam b) polyisocyanurate foam.
11. Which of the following roof insulations is least hazardous in the event of a fire? a) polyisocyanurate b) extruded polystyrene c) wood fiberboard d) perlite board.
12. Foamed concrete consists of a) Portland cement, vermiculite, foaming agent, and water b) Portland cement, perlite, foaming agent, and water c) Portland cement, foaming agent, and water.



Further Reading

As the reader may have realized, roofing design and construction issues are too numerous and complex to be covered adequately in an overview article. Therefore, the following bibliography will be of help as further reading.

1. National Roofing Contractors Association, Rosemont, Illinois: *NRCA Roofing and Waterproofing Manual*, 1996.
2. National Roofing Contractors Association, Rosemont, Illinois: *Commercial Low-slope Roofing Materials*, 1997.
3. Sheet Metal and Air Conditioning Contractors National Association, Chantilly, Virginia: *Architectural Sheet Metal Manual*, 1993.

References

¹ Sometimes, a base sheet may be used as the lowest felt, which is not shingled with the upper felts. It is laid simply with two-inch (50 mm) laps at edges and six-inch (150 mm) laps at the ends.

² If asphalt BUR is used for slopes greater than 1:12, felts must be back-nailed, to prevent their slippage.

³ One roof square is equal to 100 ft² (9.3 m²).

⁴ Many experts believe that the durability difference between asphalt and tar BURs is marginal.

⁵ UL class A rating is the maximum fire-rating of a roof assembly.

⁶ Some roofing system manufacturers do not require cant strips with an MBR.

⁷ This is particularly true in reroofing applications, where the building owners may justifiably refuse the transport of liquid propane cylinders through the building elevators.

⁸ Foamed concrete should not be confused with lightweight insulating concrete, which consists of Portland cement and lightweight aggregate (perlite or vermiculite).

⁹ A slotted metal deck with tiny slots at its underside is preferable to allow a more rapid evaporation of water from foam concrete.

Answers to Self-Test Questions

1. a) built-up roof
2. c) 11-1/3 inches
3. c) type III
4. d) type VI
5. b) APP modified bitumen
6. b) a fiberglass felt or d) polyester and fiberglass felts
7. c) single-ply membrane
8. a) gravel-covered built-up roof
9. b) EPDM
10. b) polyisocyanurate foam
11. d) perlite board
12. c) Portland cement, foaming agent, and water

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An Honor Roll Call

AUSTIN Outstanding contributions to architecture by individuals and organizations outside the profession will be recognized during the Texas Society of Architects' (TSA) Annual Convention, October 1-3 in Austin. In addition, several distinguished members will be recognized for their achievements. The society will also award the Llewelyn W. Pitts award for lifetime achievement, the highest honor TSA can bestow on a member; the Pitts winner will be announced at the convention.

Frank Welch & Associates, Inc., will receive the TSA Architecture Firm Award, which recognizes a TSA firm that has consistently produced distinguished architecture for a period of at least 10 years. The firm was established in Odessa in 1959, before moving to Midland and eventually to Dallas in 1984; it has received 49 regional and chapter awards for design distinction, and received the 25-Year Award from TSA in 1997 for The Birthday in Sterling County.

The William W. Caudill, FAIA, Award for young professional achievement, recognizing leadership in the early years of membership in the American Institute of Architects (AIA), will be awarded to Ben Heimsath, managing partner of Heimsath Architects of Austin. Heimsath is the chair of the Citizens' Planning Committee in Austin, and participated in the first AIA Leadership Institute.

Natalie de Blois, FAIA, who worked for 30 years at Skidmore, Owings & Merrill before joining the University of Texas at Austin as an adjunct professor, will receive the Edward J. Romieniec Award for outstanding educational contributions.

Three individuals and one daily newspaper will receive the John G. Flowers Award for excellence in the promotion of architecture through the media. Mike Clark-Madison, a writer, editor, and graphic designer, covers urban affairs, planning, and development and community issues for *The Austin Chronicle*. He was honored by the Central Texas and state chapters of the American Planning Association for a 1995 series examining comprehensive planning in Austin. Dr. Patricia Cummings Loud, the curator of architecture at the Kimbell Art Museum, was co-curator of the international exhibit *Louis I. Kahn: In the Realm of Architecture*. She also received honorary membership from TSA in 1995.

Elizabeth Chu Richter will receive the Flowers Award for her efforts to demystify architec-



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ture and elevate the public's understanding and expectations. She has volunteered with public broadcasting and written about architecture for the *Corpus Christi Caller-Times*. *The Dallas Morning News*, with a circulation of 500,000, will also receive the Flowers Award; it has been instrumental in bringing public attention and awareness of the relevance of architecture, urban planning, and design to the community, particularly with features, columns, articles, and editorial comment.

Honorary membership, which is awarded to individuals for long-term association with architects and architecture, will be awarded to three individuals. Joel Warren Barna served as editor of *Texas Architect* from 1985 to 1995. He was author of *The See-Through Years: Creation and Destruction in Texas Architecture and Real Estate 1981-1991*, and was the first managing editor of *Cite*. Sally Fly, executive director of the Austin Chapter of the AIA since 1993, has been an active and vocal supporter of the profession in Texas, as well as a community volunteer. Stanley Marcus, the chair and chief executive officer of Neiman Marcus, is a trustee of Southern Methodist University and vice president of the O'Keeffe Museum in Santa Fe, N.Mex.

Four groups will receive citations of honor for activities that have made significant contributions to the goals of architecture. The Texas Military Facilities Commission has taken steps in their selection of architects to ensure that their facilities are considered community assets,

- 1 Ben Heimsath
- 2 Natalie de Blois, FAIA
- 3 Mike Clark-Madison
- 4 Dr. Patricia Cummings Loud
- 5 Elizabeth Chu Richter
- 6 Joel Warren Barna
- 7 Sally Fly
- 8 Stanley Marcus

from reinforcing local and regional design to promoting the buildings' visibility and aesthetic quality. The Intown Housing Program, created by the City of Dallas through infrastructure participation, gap financing, and the Preservation Tax Incentives Program, allows neighborhoods to renovate residential buildings within central city neighborhoods. So far, over 690 units have been renovated or are under construction.

The Southeast Austin Neighbors will receive a citation for its efforts to solve a variety of neighborhood issues, including graffiti, street lighting, and the lack of library and health services. The group, which is comprised of several neighborhood committees and associations, also received funding from a city bond program to complete several new facilities within the neighborhood. New Hope Housing, Inc., which was formed in 1993, has organized funding for 130 units of below-market rate housing in downtown Houston. Funding for the project came from a variety of sources, including private grants and public financing. **KR**



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Submitted by: Central Texas Masonry Contractors
Association



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Project: Byzantine Fresco Chapel Museum, Houston

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*Special thanks to Dennis Stacy, FAIA, Robert Jackson, AIA,
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Of Note: Across Borders

WASHINGTON, D.C. The National Council of Architectural Registration Boards (NCARB) voted during its 79th annual meeting in July to explore the development of "bilateral accords" to allow U.S. and foreign architects to practice in each other's jurisdictions. If approved at the 1999 annual meeting, the accord would open the way for NCARB to enter into discussions leading to agreements with foreign registration bodies. **KR**

Of Note: Threatened Places

WASHINGTON, D.C. The National Trust for Historic Preservation has included the 225 historic courthouses of Texas in its tenth annual list of America's 11 Most Endangered Historic Places. The courthouses were constructed from the 1850s to the 1940s; 201 remain in active use, but many have fallen into disrepair. The Trust's list does not ensure protection or guarantee funding, but to date, no site named to the list has been lost. **KR**

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"A Revitalized Heritage" continued from page 11

basement that contains the giant pumping machinery. On the exterior, nature walks and an amphitheater will enliven the visitor experience. Set for inauguration in early 1999, the Old River Pumphouse will preserve a unique chapter of Texas history.

Several miles downriver, the Hidalgo County Heritage Foundation and the Fernández Family joined to protect St. Joseph's Church, the 1899 family chapel at Toluca Ranch. A leaky wood shingle roof was replaced and windows were repaired to guard original furnishings, statuary, and the unusual blue cloth ceiling that defines the gothic revival interior. North of Hidalgo, 20 miles from the Rio Grande, the City of Edinburg sponsored the rehabilitation of the 1927 Southern Pacific Union Railroad Depot. Abandoned for several decades, the depot went through numerous owners and proposed uses before the city decided to refurbish it as the headquarters of the Edinburg Chamber of Commerce. Historic tile floors, woodwork, and ticket counters were preserved in work overseen by Morales-Best Hinojosa Architects, partially funded by TxDOT. Inaugurated in 1997, the building is part of a series of mission revival railroad depots that have been rehabilitated throughout the Valley to serve various contemporary uses.

In Brownsville, further toward the Gulf, the rehabilitation of the Alonso Building (1890) was sponsored by the Gorgas Science Foundation through community donations and volunteer efforts. Located in one of the city's residential historic districts, the brick structure originally served as a family business and residence. As part of the work, the finely detailed two-story wraparound porch was refurbished and the courtyard and its cistern were reclaimed. Upon completion in 1996, the foundation adopted the building as its headquarters.

Along the coast, the City of Port Isabel undertook the rescue of the 1899 Champion Building, overseen by architect Manuel Hinojosa. Historic paintings on the front elevation of the two-story brick structure were restored. Inaugurated in 1997, the building houses the Port Isabel Historical Museum with exhibits on traditional ways of life along the Gulf. In addition, the 1853 Port Isabel Lighthouse is being renovated by TPWD in partnership with the city government and TxDOT. On the park grounds, the keeper's cottage was reconstructed based on the original 1855 plans; it



houses interpretive exhibits and the offices of the chamber of commerce. The lighthouse will continue to serve as a state historical park once it is reopened in 1999.

In Mexico, various city governments and civic organizations have taken up the challenge to preserve their architectural heritage. The City of Mier and the Fundación Cultural del Cántaro have pooled state and federal funds to



2

1 Port Isabel Lighthouse 2 Old River Pumphouse

revitalize the historic district, including the repair of historic sidewalks and cobblestone streets. The Purísima Concepción Parish, the city's main place of worship, has had its massive tower realigned and its deteriorated steeple renovated.

The most daring of renovations in the entire corridor region, however, is underway at Guerrero Viejo. Abandoned in 1953 as a result of the construction of Falcon Dam, this Spanish colonial town was partially submerged until a prolonged drought fully exposed it in 1993. Throughout this time period, former residents and an increasing number of visitors have continued to pilgrimage to the massive sandstone

"A Revitalized Heritage" continued on page 19

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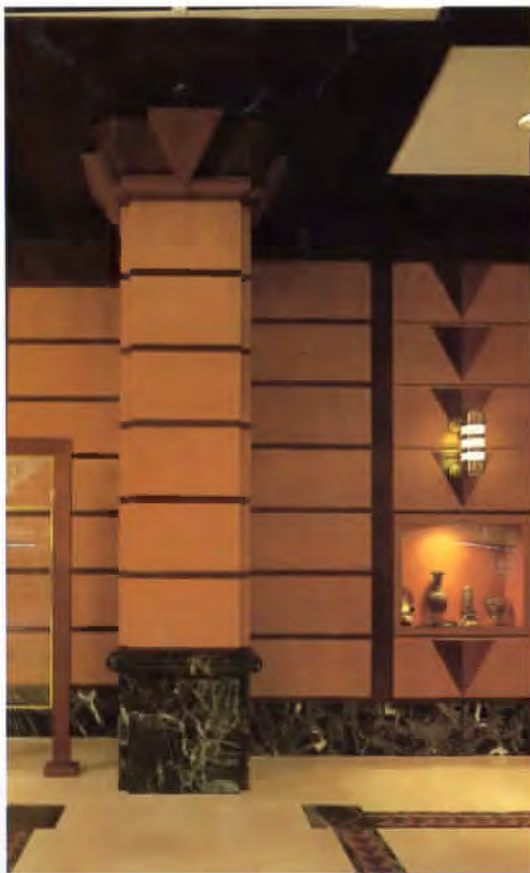
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"A Revitalized Heritage" continued from page 17

ruins of this 1750 townsite.

In 1997, a group of former residents founded Hijos y Amigos de Nueva Ciudad Guerrero, a private non-profit organization dedicated to preserving the elegant city they had to evacuate when a massive rainstorm rapidly filled the reservoir. As their initial challenge, they set out to raise funds for the stabilization of Our Lady of Refuge Church, the centerpiece of the main plaza. Under the guidance of the Instituto Nacional de Antropología e Historia—the Mexican federal agency for historic preservation—the organization is presently managing the stabilization and erecting interpretive signage for visitors. Last July 4, the first mass since 1953 was celebrated at the church.

The rich architectural heritage of the Lower Rio Grande is being showcased by Los Caminos del Rio to a variety of audiences through educational and cultural tourism activities. The cultural survey, *A Shared Experience*, and its companion teacher's guide are now in use in fourth and seventh grade classrooms at border schools, and will be available to all Texas schools for the first time during the 1998 school year. To complement these printed materials, a set of architecture traveling history trunks is also making its way throughout the schools. The trunks include measured drawings, drafting and construction tools, building materials, as well as vocabulary games and a 16-minute architectural video.

Rio Grande: La Frontera, a one-hour documentary produced in English and Spanish by KLRU-TV of Austin which was nominated for an Emmy Award, presents the architecture of the region to national audiences in the U.S. and Mexico. *Legacies of the Borderlands*, a visitors' map and guide now in its third edition, offers interpretation of numerous architectural sites along the cultural corridor. To further enrich the visitor experience, interpretive and directional signage is now underway for the main roads and key rest stops along the river roads.

In recent years, the accomplishments of Los Caminos del Rio have instigated similar projects. In 1995, the binational California Missions Heritage Corridor was initiated to preserve and to promote these historic landmarks. In 1997, the El Paso-Ciudad Juárez corridor was created to interpret and to preserve the historic resources of this binational metropolitan area. Together with Los Caminos del Rio, the

development of these preservation projects along the border will ensure that citizens of the U.S. and Mexico continue to discover the rich architectural legacy that lies in their own backyard.

Mario Sánchez

Mario L. Sánchez is an architect and historian at the Texas Historical Commission, the state agency for historic preservation.

A Shared Experience and its 16-minute architectural video are on sale as a package to the design professions for \$15.00; the teacher's guide costs \$5.00. Price includes postage and tax. Write the Texas Historical Commission, POB 12276, Austin, TX 78711, or call 512/463-5754. To obtain a copy of *Legacies of the Borderlands* write Los Caminos del Rio of Texas and Mexico, POB 415, Laredo, TX 78042.

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Of Note: Ten for a Tour

AUSTIN Ten homes will be showcased during the 1998 Austin Homes Tour, organized by the Austin chapter of the American Institute of Architects (AIA) and scheduled for October 17-18. The annual tour, which is self-guided, is designed to illustrate the value and range of architectural services. Tickets for the tour are available by calling 512/452-4332; they are \$15, and include a tour guide, map, and brief descriptions of the homes. **KR**



Gary Furman Architects; photo by Patrick Wong

CALENDAR

"Spirited Journeys"

Spirited Journeys: Self-Taught Texas Artists of the Twentieth Century, organized by the Blaffer Gallery, will survey the variety and production of self-taught, or outsider, artists working in Texas in this century. Many of the most renowned and visible expressions of folk art in the state—the Orange Show, The Beer Can House—have come from Houston. The exhibition includes works by artists such as Rev. Johnny Swearingen, Eddie Arning, Ida Mae Kingsbury, and Ezekial Gibbs, and has been organized to complement collections and installations at other venues across the city. Blaffer Gallery, University of Houston, Houston (713/743-9528), THROUGH OCTOBER 11

An Exhibit of Print

Lithography was invented in 1798 when Alois Senefelder received a patent for a technique of "drawing on stone" and reproducing the drawing on any surface in limitless editions. The revolutionary effect of the technique on printmaking will be examined by the Blanton Museum in *Lithography: The Modern Art and its Traditions*. The exhibition, scheduled in conjunction with a seminar taught at the University of Texas at Austin, commemorates the second centennial of the invention of lithography, and will showcase 200 works from leading practitioners of the art such as George Bellows, Honoré Daumier, Henri de Toulouse Lautrec, Jasper Johns, and Roy Lichtenstein. Jack S. Blanton Museum of Art, Austin (512/471-7324), SEPTEMBER 5—OCTOBER 18

Grand Designs

The Museum of Fine Arts, Houston, will present 200 masterpieces that chart the history of the Victoria and Albert Museum in London in the exhibition *A Grand Design: The Art of the Victoria and Albert Museum*. The Victoria and Albert, founded in 1852 under the patronage of Queen Victoria and Prince Albert, has one of the world's largest art, decorative arts, and design collections; the history of the collection is intimately linked with the history of Great Britain and the British Empire. The exhibition will include work from designers as diverse as Leonardo da Vinci, François Boucher, Thomas Chippendale, Charles Dickens, and Eileen Gray, and in areas including plaster casts, textiles, paints, sculpture, and photography. The Museum of Fine Arts, Houston (713/639-7300), OCTOBER 18—JANUARY 10, 1999

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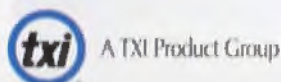
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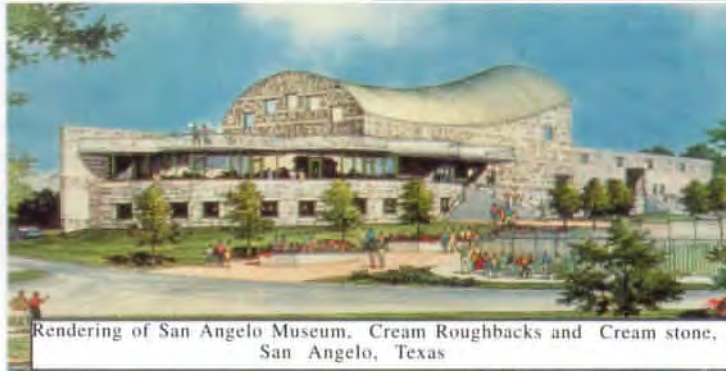
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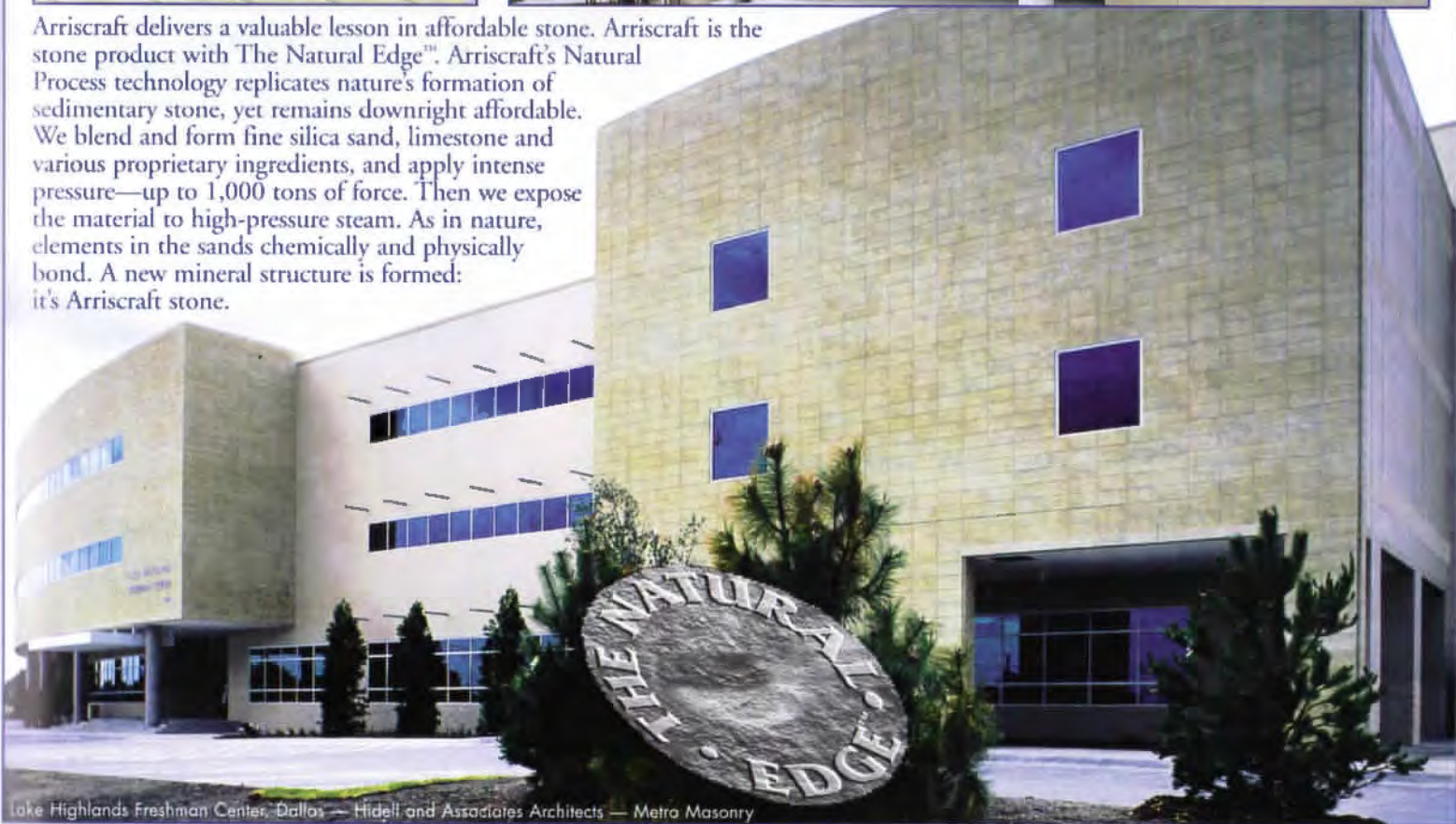
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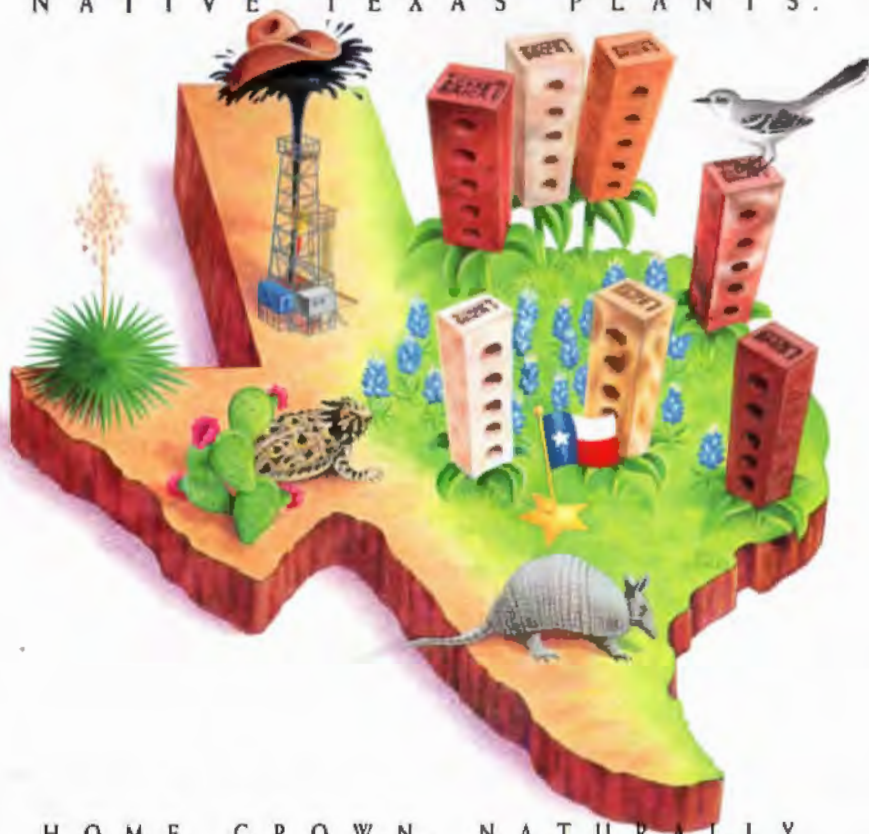
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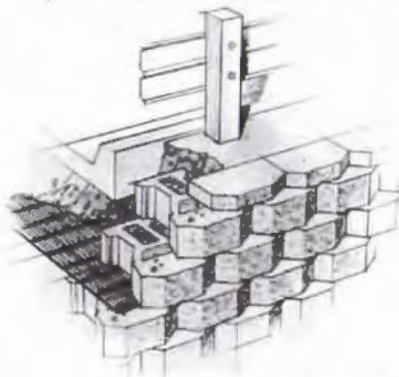


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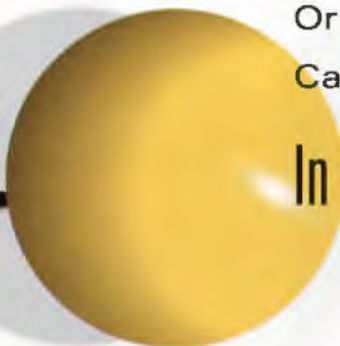
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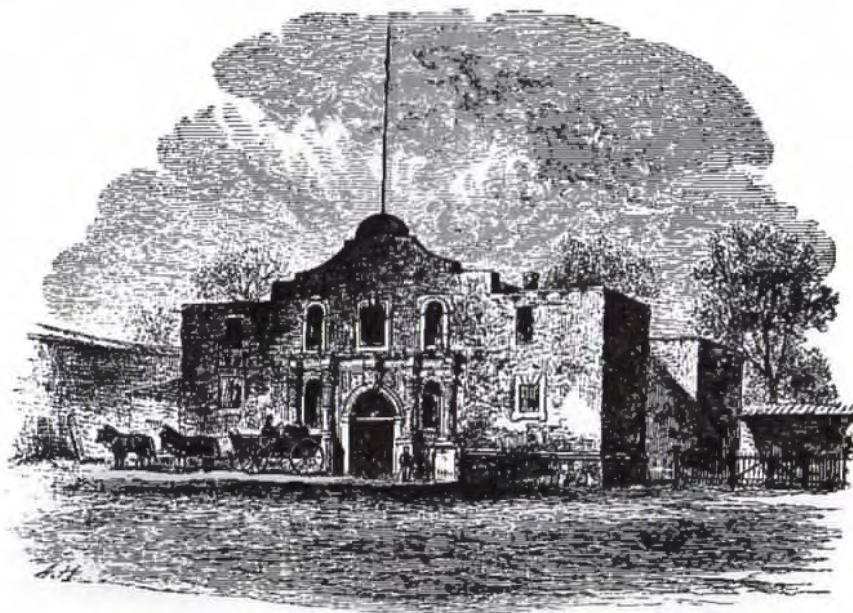
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And Then There Were Six

by Nestor Infanzón

THE TEXAS SOCIETY OF ARCHITECTS (TSA) Design Awards program was created 44 years ago to honor and recognize design excellence by Texas architects. This year, reversing a trend of a few years ago, the number of entries grew: A total of 175 projects were submitted in 1998, a sign perhaps of a healthy economy and a reflection of the diversity of projects most firms are working on in today's market. Given this large number of entries, the question has to be: Why so few winning projects and why so many of such a small scale? Where are the large, complex projects? And what happened to the interiors, planning, and historic preservation entries? Couldn't the jury find projects to recognize in these areas? The firms that submitted projects, as well as those looking at the presentation of the winning projects here, are left to ponder these and other related questions.

As chair of this year's TSA Design Awards committee, I had the opportunity to participate in the selection of the jury and watch its initial review of the entries, and then to listen to the jury's final deliberations and its selection of six award-winning projects. As always, the committee attempted to appoint a balanced set of jurors. The intention was to identify and select only individuals whose analytical skills exceeded their potential stylistic bias. In addition, we tried to select one juror from the East Coast, one from the West Coast, and one from the midsection of the country. Other considerations included selecting representatives of a national firm, a regional firm, and a local firm whose design credentials put them in the mainstream of architectural discourse.

continued on page 34



continued from page 33

1 stacks of submissions to the 1998 Texas Society of Architects Design Awards program

2 Jurors Julie Snow, Michael Palladino, and Cal Lewis, FAIA, deliberate over project data sheets.



"One of the reasons we were drawn to these six projects was the quality of the materials . . ."

**— Juror
Michael Palladino**

We also wanted to include a firm with experience with large complex projects, a firm with a diverse portfolio of building types, and a firm with a well-established niche. This year's jury met those criteria and represented three well-known design firms: Michael Palladino of Richard Meier & Partners Architects of Los Angeles; Cal Lewis, FAIA, of Herbert Lewis Kruse Blunck of Des Moines, Iowa; and Julie Snow of Julie Snow Architects of Minneapolis, Minn.

In early June, the jurors assembled in Austin at the TSA offices. At the beginning of that first afternoon, I charged the jury with the following goals: "As jurors for the 44th annual design awards program you are charged with the review,

assessment, and identification of those projects that you collectively select to recognize as prime examples of design excellence. Your selection should be based on the review and critical analysis of each project in comparison only to those projects submitted here. You are to recognize the

diversity in size, scale, and typology and are to select only those entries that not only will be able to withstand further individual criticisms but also the criticisms created by peer association in the selection of awards. Finally, there are no quotas or required number of projects to be premiated."

With this charge, the jury proceeded to review all 175 entries. During that first day, the three jurors read the individual project descriptions and reviewed every single entry slide. In that respect, this jury worked as hard as could be expected and, in comparison to previous jury programs that I have observed, they truly made an effort to view and consider each project in its totality. With this careful and critical analysis, the jury was able to reduce the submissions by almost two-thirds by the end of this first session.

After a good meal and a good night's sleep, the second round started with just over 60 entries to revisit. The jury slowly started to hone in on the qualities they were looking for, the qualities that made a project stand above the others. They looked at scale and the use of materials and they tried to reconstruct the design parti, review the solutions, and look for obvious flaws and for pre-



dictable mistakes. The jury searched for hints into the thought of the designers and architects, they dug for clues about budget and for the innovative use of technology, and finally, they searched for attempts to expand the body of knowledge within our profession. They challenged every project to meet a complex set of parameters, and after a long four hours, they finally had their top 25 projects. At this point, the jury started to wrestle with those elements that, in their minds, would place the winners into a group above the rest.

In the early stages, the projects that were eliminated tended to suffer from issues such as a poorly written description that did not clarify the design intent of the project and images that did not help answer the questions created by this lack of information. Other submissions lacked clarity within the plan, used materials in a seemingly arbitrary way, or included inadequate photography.

By the time the jury began considering the final group of 25 projects, the issues had become more substantive. As they examined these finalists, their discussion tended to be more focused and directed to the elements that held the strongest entries together. As the afternoon started to fade and the discussion continued, a group of projects started to separate themselves from the rest of the finalists. These projects, the jurors said, portrayed a design excellence capable of withstanding the scrutiny of a jury at a national level. These projects exemplified a sensitivity towards materials and scale, an architectural vocabulary of their own, and a sense of clarity that overshadowed trendy styles. Over the next hour, the jurors came back again and again to six projects that stood alone among the finalists. These six submissions were described as projects

that took advantage of their site, that created a balanced relationship between the public and private realm. These projects had an ability to make places between elements, the ability to take from the ordinary and create the extraordinary. Each of these projects, the jurors concluded, graphically displayed an understanding of materiality in a fresh and inventive manner. Each project seemed to be clear and precise rather than random or arbitrary. There was an understanding of the original, the simple, and the appropriate in each of the solutions.

As the jury moved to finalize a decision to select just six winners, they spent a considerable amount of time discussing the projects and types of projects that they did not feel able to select. Two categories that received the most discussion were historic restoration/adaptive reuse and interiors. The question in the restoration/reuse category, the jurors felt, was one of whom to reward: the original architect or the architect of the restoration? How much, they asked, does the success of the intervention depend on the success of the original building? In most cases, the jury concluded that they had not been presented with enough information to evaluate the relative success of the restoration/reuse projects submitted.

Similarly the jury was unable to recognize any



3 entries in the interior design category, although the concerns in this particular section of submissions were not about understanding current trends in interior design and being able to make a judgement, but rather about the actual quality of the projects presented. In general, most of the submissions tended to be about quick images—an “MTV” approach to design—and not about experiencing the interior spaces. Many of the spaces had no relation to the existing building, didn’t take clues from the context, or were not clearly presented. The few that lasted into the later rounds of deliberation attempted to create an interface between concept and the act of making spaces and the clear use of mate-

rials, but did not seem to be coherently focused. In the last set of 25 projects, the jury found some carefully crafted interiors solutions. Even so, they felt unable to justify giving an award to any of those projects: For the most part, the jury said, these were submissions that provoked more questions than they could answer.

So, why were there only six winners and why no large-scale projects? The bottom line, at least for this jury, was clarity, both in terms of plan and presentation. The projects that were clearly presented, with good writing and excellent photographs, were at an advantage. Presenting a small-scale, relatively straightforward project will always be easier than presenting a large, complex project; those larger projects tend to challenge a jury to search for more answers than can be easily provided. Design awards are not just about images, but also about technology, details, site, and an understanding of the program. If jurors are



4 given clear, concise information about a project that successfully addresses those issues—and a few stunning images as well—it has a good chance of being a winner.

As this year’s chair, I found that the diversity represented by the entries was exciting, that the quality of the last 25 projects would make any awards program envious, and that the six winning projects are great candidates for any national awards program. I was a little disturbed by the lack of representation from some of the smaller TSA chapters, as well as by the lack of submissions for the 25-Year Award, the state’s highest honor for design. Overall though, the design awards program is healthy and thriving. As you prepare to review the winners of this year’s competition, let’s hope we can continue to debate architecture at a higher standard. Let me extend my congratulations to the winners and be the first to say good luck to those who submit projects to the 45th annual competition in 1999.

TA

Nestor Infanzón is a TA contributing editor; he is the chair of the 1998 TSA Design Awards Committee and a member of the 1999 American Institute of Architects Honor Awards for Architecture jury.

“[In some projects] we couldn’t exactly tell, through the complexity and chaos of what was taking place, what priorities somebody was trying to establish. In the case of these six projects, it was very clear.”

—Juror Cal Lewis, FAIA

3 Julie Snow and Cal Lewis, FAIA, watch slides of design awards submissions.

4 juror Michael Palladino



1



2

Natural Beauty

by Kelly Roberson

PROJECT *TxDOT Brooks County Safety Rest Area, U.S. Highway 281 near Falfurrias*

CLIENT *Texas Department of Transportation*

ARCHITECT *Richter Associates Architects, Inc., Corpus Christi*

ENGINEER *Shiner-Moseley & Associates, Inc. (prime professional, structural, civil)*

CONTRACTOR *Rio Valley Construction, Inc.*

CONSULTANTS *Doug Wade (landscape); GPM Engineering (electrical)*

PHOTOGRAPHER *David R. Richter, FAIA*

1 The flagstone path turns to gravel as the birding trail winds from one picnic arbor to the next.

2 Using concrete rubble to vary the masonry coursing gave the craftsmen a chance to become artists, says David Richter, FAIA, as they wove a pattern into each structure.

3 The tile pattern on the inside of the restroom buildings evokes the shadows of trees on the outside; the glass ceiling directs the eye upward.

4 Picnic tables, fabricated by the Texas Department of Corrections, are made of galvanized steel grating to ensure their durability and to discourage graffiti.

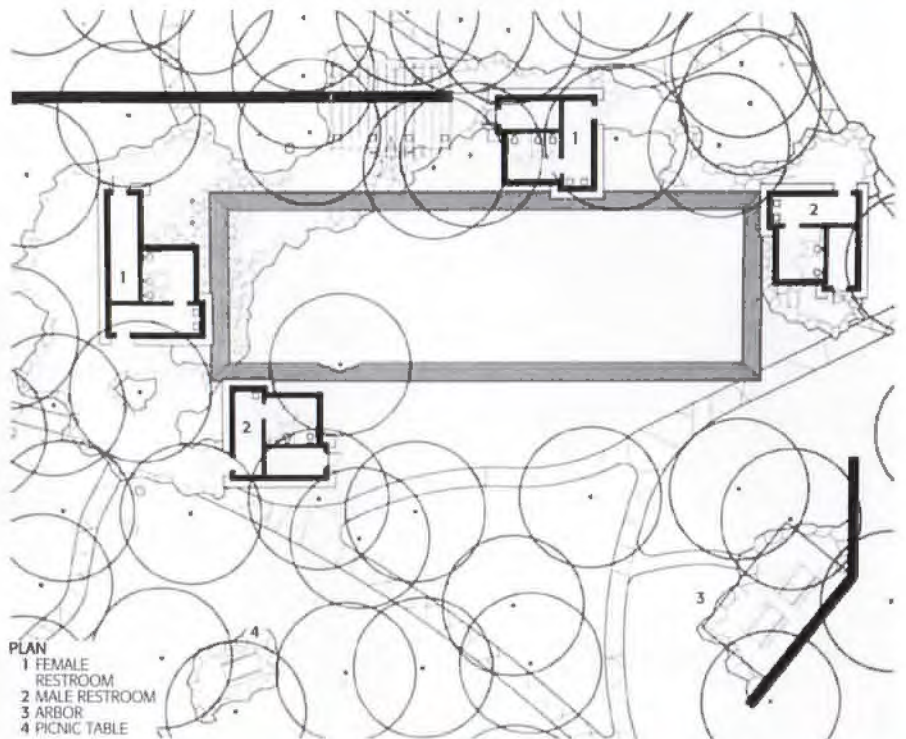
EIGHT MILES SOUTH of Falfurrias lies a large oak mott, home to some 1,000 trees, all constrained by the divided north and south lanes of U.S. Highway 281. The 12.5-acre site, which housed an existing rest area, is considered by many a gateway to the Lower Rio Grande Valley. It is also home to the Brooks County Safety Rest Area (TA, March/April 1998), which won unanimous praise as the jury favorite in the 1998 Texas Society of Architects Design Awards program for its careful details, controlled imagery, and serene peacefulness. The project, designed by Richter Associates Architects of Corpus Christi, is a testament to the power of intricate details and common materials when combined with a sensitive approach to public architecture; juror Cal Lewis, FAIA, said the project was “clearly the best we saw. [It is] of national quality that would stand up with any piece of architecture in any awards program.”

The site was originally home to several 1970s-era buff-colored brick picnic arbors and restrooms, which, says Elizabeth Chu Richter, were “not sited with any sensitivity or cohesiveness. The setting was welcoming, but the buildings were not.” The Texas Department of Transportation knew, says Chu Richter, that encouraging travelers to stop at a welcoming, inviting place could enable safer journeys; the area is also a long-time community gathering place, and is listed on the Great Texas Coastal Birding Trail. In addition, the architects realized that as a border gateway, the project should reflect the historical and cultural context of the region. For inspiration and reference, the firm turned to the Los Caminos del Rio preservation project. “Our two primary influences were the natural beauty and the vernacular architecture,” says Chu Richter.

“We wanted the design to grow out of the earth . . . and to echo the historical references in scale, form, and texture.”

On the surface, the project’s components seem fairly simple: restrooms, pathways, picnic arbors, a containing wall. The regular, formal elements—a grassy quadrangle, anchored by four toilet buildings connected by flagstone paths—are centered among irregularly placed brick walls and picnic arbors, around which winds a quarter-mile birding trail. The low, wide containing walls at the perimeter, which link the arbors, gradually rise up and down, “protecting” the site from the highway while inviting “spontaneous interaction” from visitors, particularly children, says Chu Richter. Weaving through and tucked in the trees, the arbors facilitate gatherings of varying sizes, as do free-standing tables without cover, conceived in the spirit of “throwing a blanket down,” says Chu Richter.

Each piece, by itself, suggests a randomness, but when taken together, there is a careful order to the place. The center hierarchy—the quadrangle—becomes less formal as it radiates outward, from the



3



4



1 Common durable materials—brick, tile, timber columns and beams, galvanized pipe roofs—were crafted in varying ways for each structure at the site. In addition to the birding trail, native plants were added to the mott of oak trees.

RESOURCES

Structure: Ladrillera Manufacturing; **wall surfacing:** Ladrillera Manufacturing, Reynosa S.A. de C.V., Dal-Tile; **interior floor surfacing:** Dal-Tile; **ceiling surfacing/system:** D'Hanis Tile Co.; **roofing:** U.S. Intec Inc.; **signage:** The Southwell Co.; **display cases:** Claridge Products & Equip.; **lighting:** Bronzelite, Spaulding; **electric distribution:** Square-D, Levitron, General Electric; **plumbing and sanitary:** American Standard, Sloan, McGuire, Bobnick, Elkay Mfg. Co., Truebro, Merloni Termo Sanitari; **flag poles:** Pole-Tech

flagstone paths that turn to gravel to the diminishing lights at the edges of the trails: To allow users to enjoy nature, the elements become more natural. Every building or wall was deliberately sited, not only to save trees, but to enable privacy, to allow a sense of connection or separation depending on the needs of the user; each, though built of the same materials and with the same craft, maintains its own identity. That order impressed juror Lewis: "You get into a natural setting and the normal tendency is to deal with random objects . . . instead here they have taken this very natural setting and organized it and gave it a strength that didn't exist."

The details in the restroom buildings and picnic arbors are decidedly low-tech, but reveal an inspired craftsmanship. The Mexican adobe bricks were laid up in a pattern that incorporated concrete chunks from old buildings on the site. Masons were taught to lay a broken concrete piece occasionally, which threw a "wrinkle" into the coursing, says David Richter, FAIA. "We were playing with an obscure time frame. . . . The details are contemporary, but the way they are put together is reminiscent of the past," says Richter.

Many of the details are intended to remind visitors of the natural environs. In the restrooms, glass, supported by wood beams, forms the ceiling in the lavatory sections; the openness "lets people appreciate the canopy of trees," says Richter. The remaining ceiling sections were constructed of shored pipes, which were topped with tented tiles

and in turn, covered with concrete. A mosaic tile mural in blacks, reds, and yellows evokes the waving branches and shadows of trees in the compound, says Richter. The palette is much like the landscape: sage, burnt orange, browns, greens. The sense of materials and the way they were assembled also affected the jury's opinion of the rest area. "This [project] has a number of different materials, but each of them is in complete control, every one of them is thought through for what its role is in the composition," said Michael Palladino.

In the end, the architects realized the space they needed to create should be not simply public, but civic as well. The distinction may seem slight, but to the architects it was crucial. "The project belongs to the public, but is civic in the way it draws respect and in its dignity," Chu Richter says. "Because of the sense of community, we wanted to design a place that has a civic sense, that instills pride and memory. . . . The idea is that it is not just a building or one structure. It is a whole place, as well as imagery. When it involves people, they become a part of that imagery."

Beyond these lofty goals, however, is the reality of a place that is pleasant, welcoming, serene. "As juror Julie Snow said, "One issue is what appeals to architects and what appeals to the public; I think this piece really spans that gap. It's something that we as architects all immediately agreed upon, but it's also something that would make the general public just say 'Wow.'"

TA

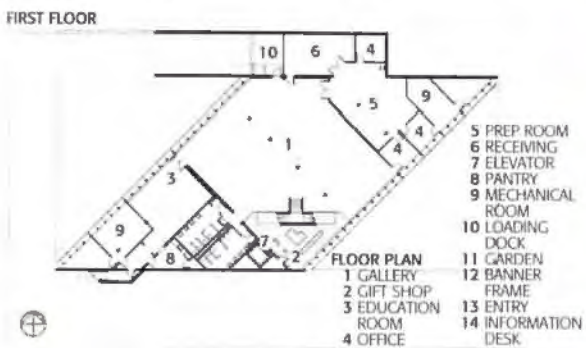
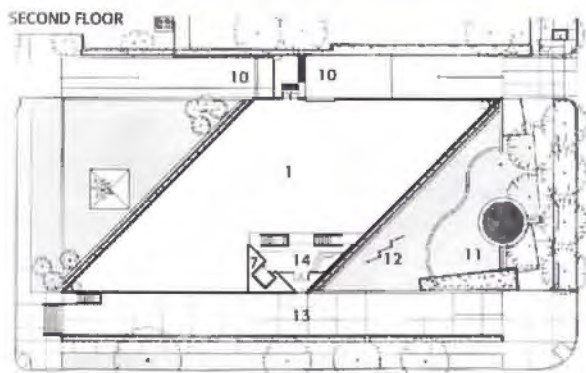
Artful Restraint

by Kelly Roberson



IN THE EARLY 1990S, the Contemporary Arts Museum, located on a sliver of a site in downtown Houston, was stretched to overflowing, and as a result needed to undertake a limited, complicated renovation to its landmark building. The changes would allow larger exhibitions and increased public outreach, but would need to refrain from significantly disturbing the building's distinctive interior or exterior. The end result, designed by William F. Stern & Associates of Houston on a shoestring, \$1.3-million construction budget, was engaging enough to win the project a TSA Design Award, with high praise for its restraint and appropriateness.

The original two-story, 16,000-square-foot building, a ribbed stainless steel parallelogram, was designed by Gunnar Birkerts and completed in 1972. It was intended as an open, uncluttered receptacle for a museum that concentrated on exhibiting contemporary art rather than acquiring a permanent collection. As the museum's programs expanded, its board had, at various times, considered moving, but by the early '90s found it was "wedded to the site, its distinctiveness, and its architectural value," says Marti



1 The grassy expanse of lawn facing Montrose Boulevard is divided by a serpentine seating wall, with a sign structure on one side and a fountain and sycamores on the other.

2 A new white canopy marks the entrance, an apt counterpoint to the steel-gray of the building and the bright blue of the handrails.



PROJECT Contemporary Arts Museum Renovation, Houston

CLIENT Contemporary Arts Museum

ARCHITECT William Stern & Associates, Architects, Houston (William F. Stern, FAIA, principal; David C. Bucek, Jr., FAIA, project architect)

LANDSCAPE ARCHITECT Olin Partnership (Laurie Olin, principal; Lucinda Sanders, project architect)

CONTRACTOR W.S. Bellows Construction Corporation

CONSULTANTS Minor Design Group (graphic); Matrix Structural Engineers (structural); Burr Engineers, Inc. (mechanical); Walter P. Moore & Associates (civil)

PHOTOGRAPHER Hester + Hardaway

RESOURCES

Fountains: Pem Fountain Co.; **recreational equipment:** Forms & Surfaces; **planting accessories:** Gibson's Landscape; **precast architectural concrete:** Redundo Manufacturing; **lighting:** Edison Price; **elevator:** Dover; **architectural metal work (canopy, railings and handrails):** Berger Iron Works; **architectural woodwork:** Houston Woodworking Co.; **laminates:** Formica; **specialty doors:** Overhead Door; **paint:** ICI Paints (Devroe); **high-performance coatings:** Carboline Benjamin Moore; **resilient flooring:** Johnsonite; **signage, letters, and plaques:** Graphtec; **blinds, shutters, and shades:** Mecho

Mayo, museum director. To analyze the space that could be gained by a renovation, William Stern, FAIA, completed a short planning study, which found that the current building could yield the necessary square footage. "The challenge was how to bring the changes in the program together with the building, while respecting what was there," says Stern. "Every decision we made had to do with working with the particular geometry of the building. There is so little on that building, it is so spare, we knew that everything we did would show."

Space for expanded exhibitions and education was gained by moving the administrative offices to an adjacent 3,000-square-foot house, doubling the size of the first-floor gallery. A multi-purpose education resource room for programs, social gatherings, and meetings was added, and the art preparation area expanded. Carpet glued to the concrete floor and white paint on the ceiling (both added during an earlier renovation) were removed, restoring the gallery "to a pure, industrial space," says Stern. On the second floor, an information desk was dropped into a snippet of space inside the entry door.

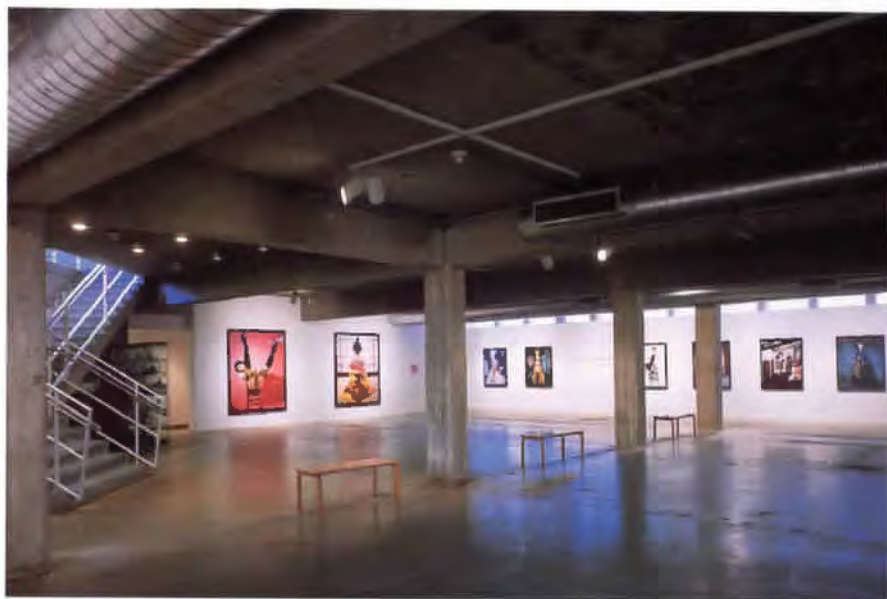
The original entrance, a miniscule slot in a corner, had always been difficult to find, and became "the one place we touched the building," says Stern; a white projecting aluminum canopy was added. A triangular-shaped lawn facing Montrose Boulevard was sculpted into a public street park, with a circular fountain basin and a staggered row of Mexican sycamores enclosed by a serpentine seating wall,



which rises out of the ground, dividing the expanse of grass before terminating in the entrance ramp. The pocket park was one of the jury's favorite images. "It made a place for people to interact on the street façade, actually taking the strengths of the original architecture and engaging the site more completely," said Cal Lewis, FAIA. A staggered steel-tubing signage structure was inserted into the grassy expanse above the curving wall, enabling the museum to display program and informational banners.

Much of the program brought the structure into compliance with building codes and requirements of the Americans with Disabilities Act: an elevator tucked discreetly into a coat closet; new mechanical systems, replacing roof-mounted air-conditioning, which provided a much-needed ability to control humidity. A new low wall and handrails were added to the sides of the entrance ramp; the delicately detailed steel-and-cable system, painted blue, also makes an appearance in white on the interior stairs.

From the tight budget to a collaborative team to the understated nature of the program, each piece proved important to maintaining the building's identity while enhancing its character. From the people who work in the museum each day, the renovation team has earned the highest praise. "Our needs have absolutely been answered. [The renovation] has had an enormous impact on our ability to serve the public and make the traditional and non-traditional audience feel they are welcomed and valued," says Mayo. **TA**



1 A new low wall separates the entrance ramp from the park.

2 A before view: The museum's entrance is at the corner to the left.

3 The streetscape park invites passersby to sit and relax under the shade of Mexican

sycamores and by the cool water of the fountain.

4 The first-floor clerestory windows, which had been shut off from the gallery, were opened; a shading system enables staff to shut out natural light if necessary.



Deborah Hunter



Deborah Hunter

In the Landscape

by Susan Williamson

THE HILLS OF BOSQUE COUNTY are a delightful surprise, a bit of the Hill Country stranded unexpectedly south of Fort Worth and west of Waco. The Little Big House by Dan Shipley Architect of Dallas is just as much a surprise, appearing suddenly at the end of a winding road into the site. But, while the hills are something of an anomaly, the simple barn-like house inhabits the landscape in a way that seems almost inevitable. That relationship to the land was at the heart of the design process, Shipley says, and helped convince the TSA Design Award jury to select the project as a winner in this year's competition.

The clients, an intergenerational group including mother and father, son and daughter-in-law, wanted a weekend house that would work for one family as well as for the 40 or more people likely to visit for the annual family reunion. The budget was modest—less than \$90 per square foot, Shipley says—and the family's main request was a house that looked like it belonged to its place. Driving back and forth to the site, about 90 miles south of Fort Worth, Shipley studied the agricultural buildings that he passed along the way. These buildings have a directness and clarity, Shipley says, that make them almost elements of the natural landscape. One barn in particular captured his attention: a primary central volume with symmetrical shedlike structures "hanging off" either side. The key to reenergizing this common form, he says, was in the manipulation of proportions and materials, using basic parts but carefully controlling the relationships among the parts.

In plan, the house is as simple as its vernacular counterpart; however, the complexity of the massing, with the juxtaposition of solid, shingle-clad and transparent, screen-clad side sections, both in counterpoint to the masonry-clad central volume, belies its humble origins. As juror Julie Snow said, "A tension is created between the open side and the enclosed side that actually advances the whole thing."

Beyond the questions of massing were issues of space planning. In order to make a small house—1,600 square feet including the screened porch—live big, Shipley carefully controlled both the organization of the interior spaces and their relationship to the landscape beyond. The views were to the east and so the transparent side of the house faces that way; the screened porch and substantial overhangs shield the interior from the eastern sun. Functions that could do without a view—bedrooms, bathrooms, and utility—were stacked on the west side, almost completely closed to provide a buffer from afternoon heat. The upstairs bedrooms were outfitted with pairs of louvered doors that swing open to allow views across the double-height living area and through the screened porch to the outside. The small second-level deck in the screened porch, accessed by a bridge spanning the central space, was pulled in at the

PROJECT *Little Big House, Bosque County*
CLIENT *Wick and Janna Alexander*
ARCHITECT *Dan Shipley Architect, Dallas*
CONTRACTOR *FJW Co., Inc.*
CONSULTANTS *James Smith, P.E. (structural); MEP Systems, Inc. (mechanical)*
PHOTOGRAPHER *James F. Wilson, unless noted*

1 The Granbury stone was laid up in a purposefully mosaic-like fashion to make clear that it was a veneer.

2 A narrow slit in the front door, repeated in the window overhead, provides a view to the road leading to the site.

RIGHT The prowlike overhang on the south side covers an additional large porch; juror Michael Palladino said, "The porch is overscaled relative to a house of this size but it's appropriate to the landscape. The scale of the gesture has to be scaled to the vista."





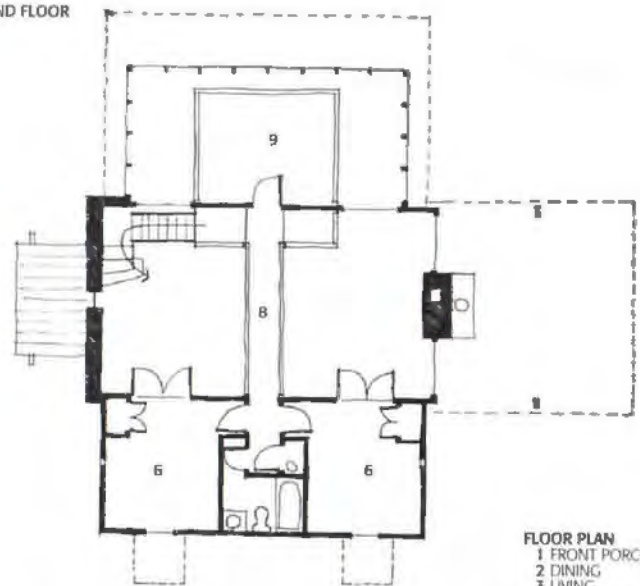
Spec Note: Structural Insulated Panels

When Dan Shipley designed the double-height living area for the Little Big House, he didn't want to compromise the space by enclosing the roof framing with insulation and drywall. He wanted the ceiling system to be clearly expressed but, because the house was sited in an open area, away from large shade trees, insulation was important.

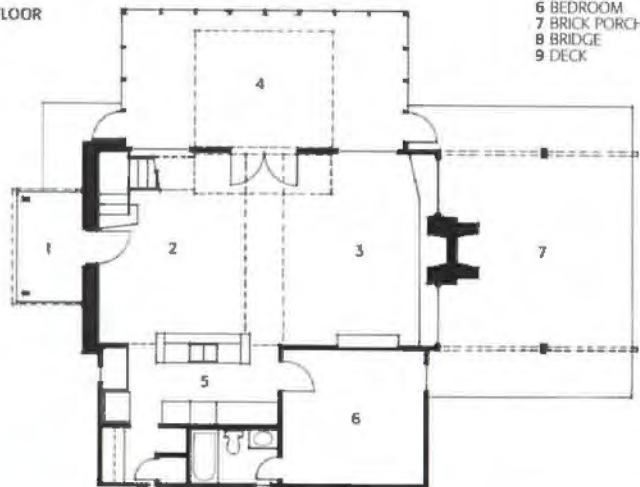
Shipley decided to use structural insulated panels (SIP), which provide structure, sheathing, insulation, and airtightness in one product. The panels are constructed of a core of rigid insulation between two wood-fiber skins. Although SIPs can replace dimensional lumber as the structural element in wood-framed construction, Shipley used them only to replace roof decking and installation. The large panels—8 by 32 feet—were painted on the interior side prior to insulation and then lifted into place by crane. The metal roof was installed directly onto the SIPs. "The panels allow you to have a very efficient type of insulation," Shipley says, and, beyond the technological advantages, also honored the tradition that inspired the Little Big House: agricultural buildings whose form is directly related to their structure.

For information about SIPs, contact the Structural Insulated Panel Association, 202/347-7800, or visit the web site, www.sipadc@aol.com.

SECOND FLOOR



FIRST FLOOR



- FLOOR PLAN**
- 1 FRONT PORCH
 - 2 DINING
 - 3 LIVING
 - 4 SCREENED PORCH
 - 5 KITCHEN
 - 6 BEDROOM
 - 7 BRICK PORCH
 - 8 BRIDGE
 - 9 DECK



sides to allow the bedroom views to the outside. Throughout, the most is made of little: Kitchen and bathrooms have a ship-like compactness.

Clearly, Shipley's mandate to create a house of its place was met. As juror Cal Lewis, FAIA, said, "The way the house allows the setting to become a part of it is its success. You don't live in the house, you live in the setting." And as Julie Snow added: "The thrust of that central volume propels the house out into the landscape so that the little house acquires the big landscape." **TA**

1 Louvered doors allow views from the upstairs bedrooms to the outdoors. Cedar siding used on the exterior was repeated on the interior wall of the west shed.

RESOURCES

Structural insulated roof panels: Component Building Systems, Inc.; **windows:** Marvin; **skylights:** Velux; **floor surfacing:** Scofield; **roofing:** MBCI; **waterproofing:** Sonne-born; **paint and stain:** Penofin, Sherwin Williams; **hardware:** Schlage; **insulation:** Owens Corning; **lighting:** Kichlen; **plumbing and sanitary:** Crane, Lasco Bathware, Delta; **air-conditioning system:** Janitrol



PROJECT Dallas Public Library, Oak Lawn Branch, Dallas
CLIENT City of Dallas and The Kroger Company
ARCHITECT Good, Fulton & Farrell Architects, Dallas (David M. Farrell, principal; Craig J. Henry, project designer)
CONTRACTOR Sedalco, Inc.
CONSULTANTS Mitchell Hall Engineers (structural); Eisenbeck Engineering (MEP); JBM Engineers & Planners (civil); Craig Roeder & Associates (lighting); Spencer Design Group (FF & E)
PHOTOGRAPHER Charles Davis Smith

1 The transparency of the glass-clad façade allows views into the library from the street, particularly at night.

2 Masonry-clad areas house employee and support

spaces, as well as a children's area and community meeting room; these enclosed volumes provide a buffer between the building and the parking lot and the busy street in front.

Celebration of Books

by Susan Williamson

THE OAK LAWN PUBLIC LIBRARY captured the attention of the 1997 TSA Design Awards jurors, at least initially, because of the unusual cooperation between the City of Dallas and the Kroger grocery chain to create a new public space. Once the project had the jurors' attention, though, it held it with the clarity of its plan and thoughtfulness of its design. The 13,000-square-foot library, by Good, Fulton & Farrell Architects of Dallas, was built in the corner of a parking lot on a busy near-downtown thoroughfare; it establishes its civic presence by making itself "a celebration of books," said juror Michael Palladino.

The deal between the city and Kroger began when the grocery store chain began eyeing a site on Cedar Springs Road already home to an 18-year-old branch library. The developers came to Director of Libraries Ramiro Salazar and proposed a deal: If the city would grant a long-term lease giving Kroger access to the store from Cedar Springs, Kroger would pay to build a new state-of-the-art library; the store and library would share parking. The old library suffered from maintenance problems and inefficient space usage, Salazar says, and he was able to sell the deal to the city. "It was a way for us to respond to community needs for a new li-





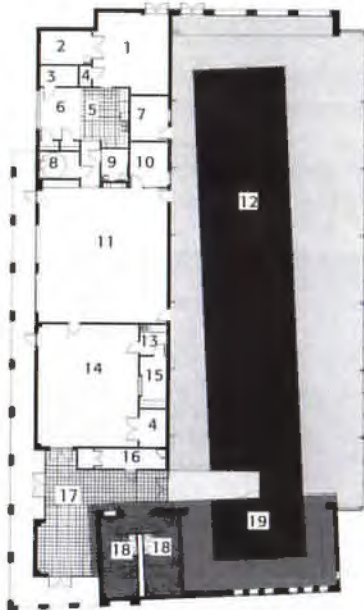
library and a new grocery store by leveraging existing resources," he explains.

By the time Good, Fulton & Farrell got involved, the footprint on the southeast corner of the site was set. That constraint dictated the basic rectilinear form of the building, but discussions continued about how the library would address its urban context: Original plans called for the building to turn its back on Cedar Springs, with the entrance placed toward the grocery store. The architects convinced the clients of the importance of a connection to the street and that choice, marked by overscaled concrete-block columns at the entry, as well as the corresponding decision to open one long façade with a tall curtainwall, establishes the library's dramatic civic presence.

The architects, who also designed the similarly detailed Kroger façade, were faced with concerns from neighborhood residents about the design. The neighborhood wanted a building that stylistically echoed its early 20th-century neighbors, specifically the brown brick and terra cotta Melrose Hotel. Initial resistance, particularly to the con-

FLOOR PLAN

- 1 MECHANICAL
- 2 BOILER
- 3 ELECTRIC
- 4 STORAGE
- 5 STAFF KITCHEN
- 6 STAFF LOUNGE
- 7 CONFERENCE
- 8 BOOK DROP
- 9 STAFF TOILET
- 10 MANAGER'S OFFICE
- 11 WORKROOM
- 12 READING ROOM/SERVICE FLOOR
- 13 COFFEE BAR
- 14 COMMUNITY MEETING ROOM
- 15 AUDIO VISUAL
- 16 JANITOR
- 17 LOBBY
- 18 RESTROOM
- 19 CHILDREN'S READING ROOM



1 The open ceiling structure and exposed mechanical systems were unusual for the Dallas library system, says director of libraries Ramiro Salazar.

2 The new library sits on the southeast corner of the parking lot it shares with the grocery store.

3 Oversized concrete-block columns mark the corner entry; the front masonry volume is slightly skewed, a contrast to the otherwise rectilinear plan.

4 elevations (clockwise from top left), northwest, northeast, southeast, and southwest



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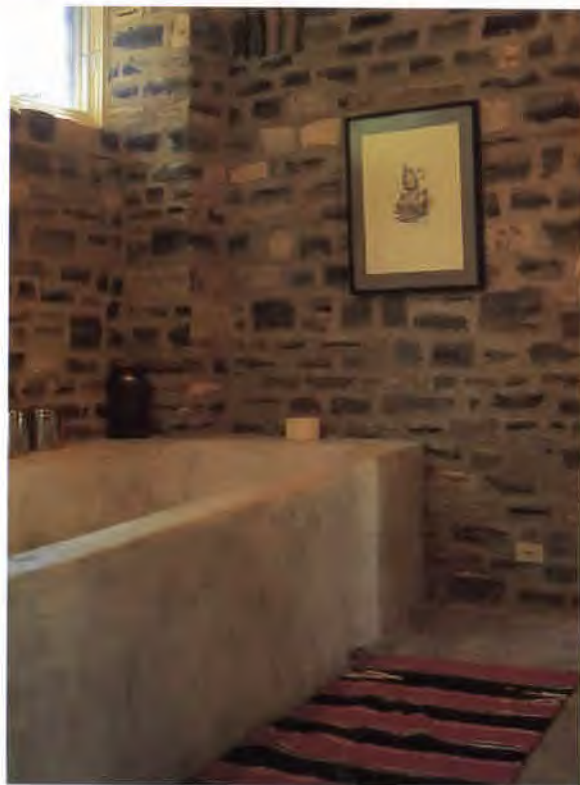
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crete-block columns, was overcome, architect David Farrell says, when the architects compromised on the brick choice and involved neighborhood groups in the review process.

From the cleanly detailed and clearly organized intersection of the masonry-clad and glass-clad volumes to the careful mediation between commercial and civic, the library project exhibits a clarity of priorities and planning that the Design Award jurors found convincing. As juror Palladino said, "[The library has] a transparent quality balanced by a weighted counterpart that gives the building a sense of permanence and at the same time lets someone outside the building engage with what's going on inside." **TA**

RESOURCES

Wood frame: Boise Cascade; **concrete block and limestone split block:** Featherlite; **exterior/standing-seam metal roof:** Berridge Co.; **stucco:** Portland Cement Products; **gypsum board:** American Gypsum; **windows:** Kawneer; **doors:** Lonestar Door Co.; **composition tile:** Kentile; **ceramic tile:** Walker Zanger; **paint/stain:** Pratt & Lambert, Sherwin Williams; **incandescent lighting:** Lightolier; **exterior floodlights:** Hubbell; **evergreen glass:** LOF; **brick:** Acme, Boral Brick; **CMU:** TXI; **brick pavers:** Acme; **linear direct/indirect:** Day-o-lite; **entrances and store fronts:** Kawneer; **curtain wall:** Kawneer; **tile:** American Olean Granite Fiandre; **ceilings:** USG



Design by Subtraction

by Susan Williamson

THE GUIDING PRINCIPLE behind the restoration of a ranch house in San Saba County was to do as little as possible. "The driving force was respect for the original house," says project architect John Grable of Lake/Flato Architects of San Antonio. The renovation was completed step by step, Grable says, with each new step taken only as the client was convinced that the architects understood his absolute desire to protect the integrity of the place. The original building was an 1850s-era spring house, a two-story L-shaped limestone structure built near a spring tumbling out of 60-foot cliffs. Runoff from the spring ran under the fortress-like house, providing water and refrigeration for inhabitants taking shelter during the Indian wars.

Over the years, water and a series of unsightly additions had compromised the original structure. The additions were removed, opening the house to views of surrounding pastureland, and the spring water, which had been contained by a previous owner in a stone-lined acequia, was rechanneled under the house in an enclosed tunnel to reduce moisture-related problems. "We debated for a long time over whether to express the water in the house," Grable says, describing





PROJECT *San Saba Ranch House Renovation and Addition, San Saba*

CLIENT *Name withheld by request*

ARCHITECT *Lake/Flato Architects, Inc., San Antonio (David Lake, FALA; Ted Flato, FALA; John Grable, Andrew Gomez)*

CONTRACTOR *Duecker Construction Co. (Henry Duecker)*

CONSULTANTS *Reynolds Schlattner, Cbether-Roll, Inc. (structural)*

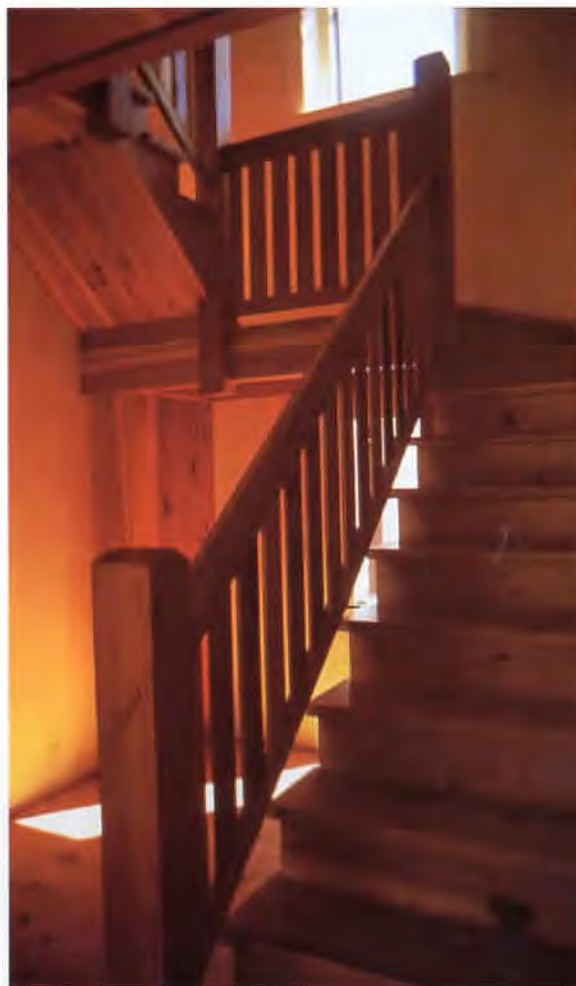
PHOTOGRAPHER *John Grable*

dreams, ultimately deemed impractical, of a hatchdoor opening onto waters flowing below.

The connection to the acequia, though not expressed inside, was reinforced through one of the main interior interventions: the reorientation of the central stair. The acequia flowed directly beneath the dogrun-like central section. Moving the stair allowed an old rear opening to be reclaimed and, in turn, reestablished the axial connection to the acequia. A new two-story front porch that shields the house from the western sun was also added during this phase, as well as improvements to the kitchen; woodwork there, and throughout the house, was inspired by the client's collection of Stickle furniture.

Once the mechanical systems had been upgraded—at the client's request, none of the new systems, including central heat and air, were exposed—and structural issues addressed—both foundation and mortar had suffered water damage—the client was ready to move to the next step: construction of an outdoor cooking porch at the rear of the house. The porch, constructed on the site of a previous outdoor kitchen, was seen by architects and client as less a change than a continuation of those earlier activities, Grable says. The new porch is anchored with a stone wall that incorporates a fireplace and barbecue pit, all constructed of stone found on the site.

The final step was the construction of a guest house across the acequia from the new porch. Much as the porch was conceived as “an ode to activities that had been there before,” Grable says, the guest



1 The spacious bathroom in the guest house includes a nearly 10-foot-long plaster bathtub.

2 looking through the new cooking porch toward the guest house addition

3 Water in the spring-fed acequia flows at 800 to 1,000 gallons per minute. The stone-lined acequia was built by a previous owner.

4 A new stair of long leaf pine opened up the central dogrun space and allowed a visual connection from front to rear.



1

1 All of the technology banished from the main house, including computers and the like, are housed in the guest house.

2 A patio between the guest house and the hillside and accessible from the guest bathroom houses an outdoor shower.

3 A concrete-block front porch addition was removed as part of the renovation; the exterior limestone was covered with lime plaster, which was also removed.

house was conceived as an ode to water. The three-room structure is tucked into the hill next to the headwaters of the spring and was initially planned as a bathhouse. In its final form, it includes a guest room and study and a spacious bath, as well as a laundry room. The L-shaped guest house, with its double wythe stone walls and low shed roofs, brackets its larger neighbor, and the two buildings compose a serene courtyard centered on the acequia. Down the slope, the parking area was lowered by 18 inches to reduce its impact on the site and allow expansive views across the ranch.

The client sees himself as more steward than owner and he wanted whatever he did to preserve more than change. Using craftspeople from the area, mostly second and third generation workers in their fields, was a direct expression of this attempt to create a connection with a place and a history. These Mexican and German craftsmen were endlessly inventive, addressing the myriad problems uncovered as the renovation project went forward, Grable says.

The idea was to provide modern amenities without compromising the character of a special place. The Design Awards jurors appreciated that restraint. "So much was achieved just by removing. It's sort of design by subtraction. There's almost a seamless sensibility moving from addition to existing pieces," said Julie Snow. Michael Palladino added, "The architect had the good sense to stand back and let the architecture speak for itself because it was doing fine on its own."

TA



2



3

RESOURCES

Fences, gates, architectural metal work, hardware: Wayne Gossett; concrete and masonry restoration and cleaning: E.J. Beyer; stone and limestone: Texas Stone Products; slate: Swenney Marble & Granite; lumber: Parrott Forest Inc.; metal roofing: MBCI; wood windows: Kolbe & Kolbe; tile: Dal Tile; wood ceilings: Allen & Allen; paints: Benjamin Moore; tub, shower doors and enclosures: Dal Tile; kitchen and bath cabinets: Duecker Construction Co.

House and Garden

by Susan Williamson

FROM STREETSIDE, THE KOVACH RESIDENCE in Highland Park is unassuming and astounding at the same time. The smooth planes of its unembellished façade are both restrained and monumental on a street of traditional and, for Highland Park, relatively modest houses; the little yellow bungalow next door looks like someone's grandmother should live in it. The TSA Design Award winner, designed by Morrison Seifert Murphy of Dallas, seems to hide behind its cleanly detailed limestone front wall; even the front door turns to the side instead of to the street. "It's a very mute entrance but also revealing that there is something more beyond," said Design Awards juror Julie Snow.

Architect Lionel Morrison, FAIA, says the house started with that front stone wall, the division between the public world of the street and the private realm of the house. "I wanted to leave the wall as pure as possible, so I didn't want to punch a hole in it," he says, explaining the front door location. The 18-inch-thick wall is clad on all sides in buff-colored limestone from West Texas; vertical surfaces throughout the house are covered in that stone, while horizontal surfaces are clad in a grayer limestone from the same quarry.



1

PROJECT Kovach Residence, Dallas
CLIENT Craig Kovach
ARCHITECT Morrison Seifert Murphy, Dallas (Lionel Morrison, EALA, project architect and partner; Susan Seifert, interior design team leader; Jennifer Haralson, interior design)
CONTRACTOR Parallel Construction
CONSULTANTS Bill Walker (structural engineer)
PHOTOGRAPHER James Wilson and Lionel Morrison, EALA

RESOURCES

Pool: Pool Environments; **limestone:** Architectural Limestone; **granite:** Texas Stone; **slate:** Texas Stone; **pre-fabricated structural wood:** Associated Truss; **architectural woodwork:** Ivins Millwork; **EIFS:** STO; **metal windows:** Thermal Windows; **glass:** Viracon; **gypsum board framing and accessories:** Pittcon; **tile:** Dal Tile; **food service equipment:** Gaggenau, Subzero; **shades:** Mecho Shades; **drapery and curtain hardware:** Bolmé

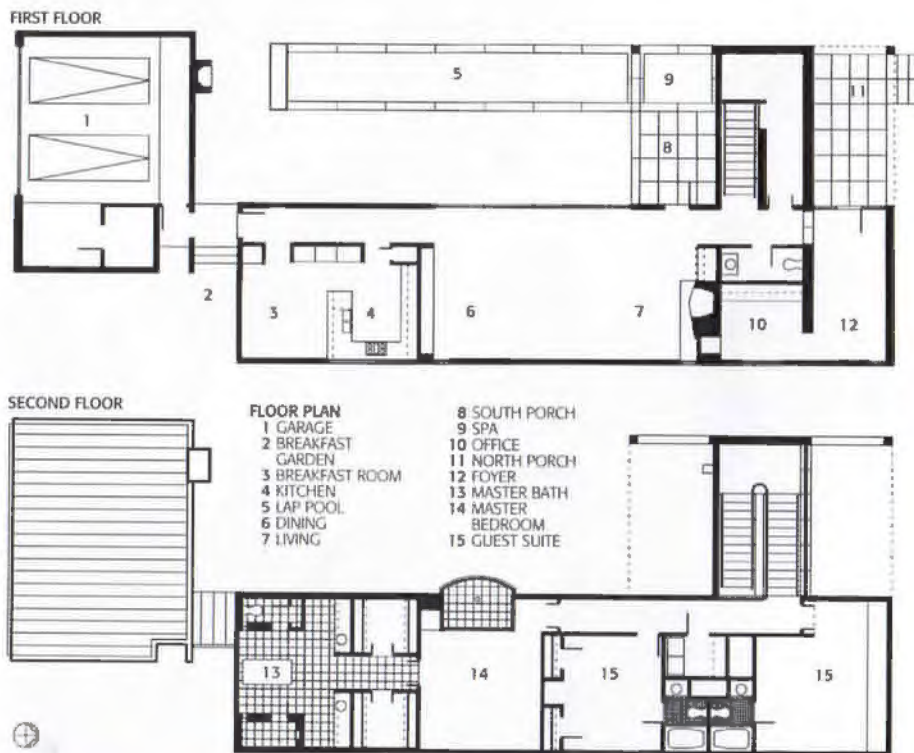


2

1 A window on axis with the lap pool provides views from the stair landing into the courtyard. The stair tower provides shade for porches on both the courtyard and front yard sides. The architects were also

responsible for the landscape design.

2 A Corbusier chaise longue sits beside a floor-to-ceiling window in the kitchen that looks out over a small rear courtyard.



In plan, the house is a long, narrow rectangle paralleling a similarly long courtyard and lap pool. The stair tower, framed on one side by the limestone front wall, is the primary organizing feature. Windows at the upper level on both north and south sides provide a tantalizing peek through from the street. Inside the tower, the views are also controlled: At the landing, a window is placed to provide the perfect view of the pool, terminating with an outdoor fireplace. At the top of the stair, the second-story windows provide expansive views in both directions.

The stair tower has a presence that belies its relatively modest dimensions in plan. The sweep of light across and through the tall, open space gives the tower a monumental quality that size alone does not explain. The stair needed to be commodious, Morrison says, because, with living areas downstairs and master suite upstairs, the client—a single man—would be using the space often.

From the limestone-clad vestibule and past the stair tower, the house opens into the gallery-like main living area. On one side, the long room is a mostly closed wall—space for some of the art collection the architects helped the client assemble—while on the other side it opens completely to the garden. As juror Michael Palladino said, “This is clearly a contemporary home and it’s done with a sensibility of *house* but also garden and how the two things, house and garden, can work together.” The glass wall of this central space faces west, but





3

Morrison says the low-emission glass used, as well as the motorized, recessed shades that hum down from the ceiling, control the western sun.

The client, Craig Kovach, says he wanted to build an architect-designed house because “the only way to get real quality is to go to the professional in the field. With a house, that’s an architect.” Kovach says that, although he and Morrison discussed the design at length, he willingly relinquished control of the process to the architect; not doing so would have compromised the finished product, he says.

Control is certainly the watchword of the project. Surfaces and details, as well as furnishings—which the architects helped select—are clean and refined. Limestone, white oak floors, stained maple millwork, sandblasted glass, and marble are composed with little fuss and a great deal of restraint. As juror Cal Lewis, FAIA, said, “When you’re doing something this simple and clear, it needs to be perfect. This house edited itself down and refined itself to that point of perfection.” **TA**

1 The stair tower was designed to display art, here a piece by Joe Mancuso.

2 The front entrance is turned away from the street.

3 Looking from the living area through the courtyard

toward the stair; enabling views between various parts of the house was important, the architect says.

4 With its high window openings, the subdued front façade hints at the surprises that it conceals.



4

Industry News: Roofing Products



GAF Materials Corp. has added the Topcoat® Roofing System to its line of roofing products. The addition comes as a result of GAF Materials' acquisition of the assets of Major Group Inc., manufacturer of the product. Topcoat is a liquid-applied polymeric roofing system specifically designed to protect and waterproof existing metal roofing.

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Pan Am Distributing, Inc. will distribute MetalWorks steel roofing system throughout Texas. The company is currently enrolling contractors in various Texas cities to install the system, which replicates wood shingles but is made of steel, so it will not rot, chip, crack, or burn. Every roof is also warranted against buckling, warping, or penetration by hail. MetalWorks roofs are formed from 12"x40" steel panels, made using "GalvaStrength" technology, a process that increases the strength of the metal by 50 percent over unprocessed steel. Thirteen coatings add durability and fade resistance, and the non-prorated warranty is in effect



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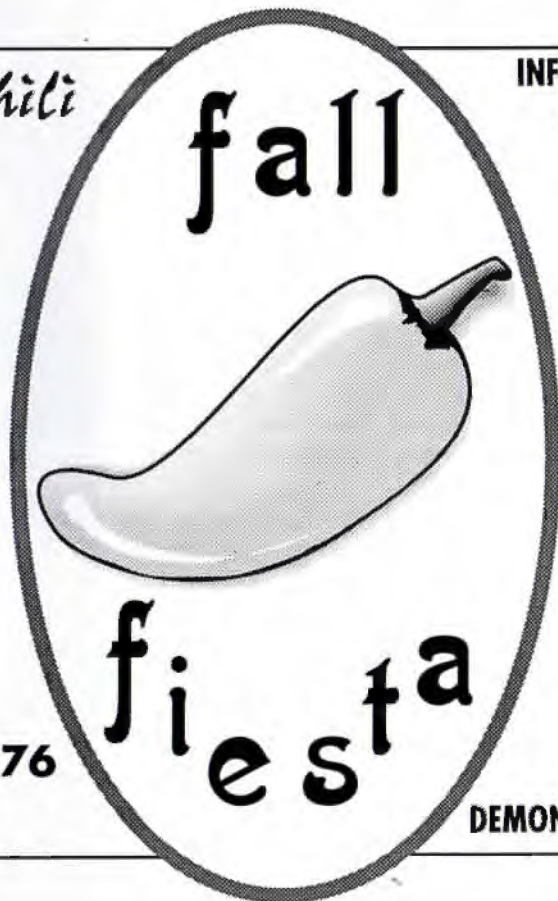
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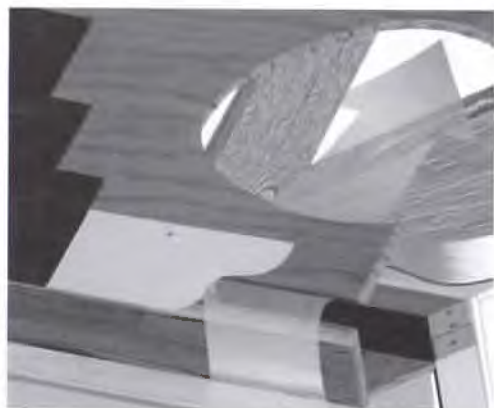
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tomatically, within five minutes, per the standard FM fire exposure test. The vents have the double insulation of the outer-dome, constructed of colorless acrylic plastic, and an inner dome of heat-activated acrylic plastic. The vent frames are made of extruded aluminum with integral condensation gutters. Single- or double-wall construction curbs, are available with one inch of fiberglass insulation. Heat and smoke vents are factory assembled and ready for installation. Curbs are available in heights of nine or 12 inches.

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Survey

Be Prepared 58

HISTORY Hugo Leipziger-Pearce, long-time professor of planning at UT Austin, died in July.

Total Control 60

ARCHIMOVIES In the return of their series about architecture and the movies, Gerald Moorhead, FAIA, and Yolita Schmidt consider *The Truman Show*.

An Architect's Daughter 61

MEMORY The daughter of a long-time Texas architect looks back at their years together.

Coming next issue . . . 61

Fly Me to the Moon 72

JOURNEY Austin's moonlight towers—17 of the 31 original structures are still functional—are a glimpse into the capital city's turn-of-the-century past.

Be Prepared

HISTORY With a twinkle in his eye and a rare lapse into his mother tongue, Hugo Leipziger-Pearce, professor emeritus of planning at the University of Texas (UT) at Austin, repeated a favorite German expression: "Glück muß Mann haben." "You've got to have luck," he was saying, as if he could so easily and cheerfully wave away the extraordinary accomplishments of a richly lived life. And in some sense, his death on July 13 seemed to bear out his faith in good fortune. He and his wife Martha had just the day before marked their 56th wedding anniversary, at age 95 he was in full possession of his lively mind, and his face still bore the healthy glow of a suntan from days spent swimming this summer. "He lived until he died," said Martha.

But it wasn't luck that turned a youthful painter in Breslau, Germany, into the founder of the Community and Regional Planning Department at UT. To understand that transformation, it helps to borrow the words of a different expression: "Chance," Louis Pasteur once wrote, "favors the prepared mind." And Hugo Leipziger's mind was nothing if not prepared. "Different things," he once mused, "there are always different things you can do because the mind takes to new ideas."

He was born in Breslau, Germany, on December 8, 1902, to a family with a history of shaping the world around it. His maternal grandfather engineered the bridges that carried trains across rivers; his father was a court-appointed design consultant and an expert on such things as the silk-damask upholstered Louis XIV chairs with which he furnished the castles and mansions he restored for the nobility in that region of southeastern Germany.

It was through his father's friend Hans Poelzig that the young Leipziger was first exposed to architecture. Poelzig's teaching at Breslau's *Akademie für Kunst und Kunstgewerbe* (which Leipziger later attended) focused on the workshop method of design that Walter



1 Hugo Leipziger-Pearce, circa 1960; he added his wife's name after they married.

2 Government-funded housing in Silesia designed by Leipziger in 1927.

Gropius would co-opt for his Bauhaus curriculum. Leipziger was deeply impressed by the philosophy that coordinated all aspects of the design—light fixtures, rugs, furniture, and art—within an architectural space. The multi-faceted, teamwork approach came back to him when, as Professor Leipziger in Texas, he involved his students in the city-planning issues of communities all over the state, including Burnet, Monahans State Park, towns in the Rio Grande Valley or in the Trinity River basin, and the Austin central business district. One of his most forward-looking assignments challenged his students to come up with ways to utilize the



3

3 Haus Hausmann in Schweidnitz, Germany, was one of the modernist houses designed by Leipziger in the 1930s.



4

4 Leipziger-Pearce's own house in Austin, designed in 1948, drew its inspiration more from the Hill Country's climate and materials than from the international style.

undeveloped banks of Austin's Town Lake.

After college in Breslau and studies at the *Akademie*, he attended the University of Hamburg. Pre-World War II Germany was in economic chaos, and he chose to pursue painting rather than architecture. Nevertheless, in 1924 he entered a competition for the remodeling of the plaza surrounding the Ulm Cathedral in Ulm, Germany, that turned out to have life-changing consequences for him. His conceptual drawing for a hotel that protected the view of the church caught the eye of Bruno Taut, who invited him into his Berlin firm. At that moment, Taut and his partner Martin Wagner were heavily involved with mass housing, a situation that gave the young Leipziger important experience. A year later, he was back at home with a commission to design 64 dwellings for workers in Namslau, a village about 60 miles away from Breslau.

Soon afterwards, he became the regional director for Upper and Lower Silesia of DEWOG (a government-supported housing program), replacing the famous city planner Ernst May,

who was called away to Frankfurt. From 1927 until 1933, Leipziger oversaw the completion of 6,000 units of housing before resigning in the wake of the growing anti-Semitism in Germany. Leipziger, who had a Jewish grandparent on each side of his family, and whose passport was stamped *Jude*, moved to Paris where he worked for six months with an old friend. Believing that Hitler would be forced to resign after the Nazi murder of a prominent citizen, he returned to Berlin. His grave miscalculation left him in Germany for three more years until, in 1937, he had a stroke of true good luck. A former colleague with a child who was seriously ill asked Leipziger to take his place on a job in Australia. Although Leipziger embarked with only a six-month visa from the German military, he would not return until 1951 when, as a naturalized American citizen, he was asked by the U.S. High Commissioner in Germany to be a consultant to the postwar reconstruction program known as *Amerika Haus*.

Within two years of his voyage to Australia, Leipziger was on his way to America, sent by the architectural firm of Stephenson & Turner to help complete the Australian Pavilion at the 1939 World's Fair. Before the year was out, he had managed, through the intercession of Maury Maverick, then mayor of San Antonio, and UT president Homer Rainey to join the faculty of the UT School of Architecture in Austin.

Students at the university suddenly had the opportunity to work with a man who had just emerged from the hotbed of modern architecture: Europe in the period between the wars. Leipziger's architecture—Namslau and the other DEWOG housing commissions, as well as a small house he designed for Dr. Herbert

Hausmann and a prize-winning women's hospital in Melbourne, Australia—certainly reflected the values of the nascent international style, particularly noticeable in their streamlined, unadorned stucco surfaces. But Leipziger was not a designer who could be easily pinned down. The Austin house he designed in 1948 for himself and his wife eschewed the international style in favor of a modernism that drew its inspiration from the Texas Hill Country region, its materials, and its climate. He liked individual problems with unique solutions rather than broad theories broadly applied. Some of the lessons he learned from worker housing may have emerged in the city plans he made for such places as Irving and Laredo, but the models he talked most about were the Radburn, N.J., plan by Clarence Stein and Frank Lloyd Wright's very organic scheme for Broadacre City.

Leipziger-Pearce initiated the program in Community and Regional Planning at UT and directed it for 19 of the 35 years he was associated with the university. Before his retirement in 1974, his great enthusiasm for planning had spilled over into the organization of many conferences and the publication of numerous articles and books, including *The Architectonic City in the Americas*, which he was pleased to learn was required reading in Pitirim Sorokin's sociology class at Harvard University.

"He was a wonderful teacher," one of his students, the Canadian architect Douglas Cardinal, said recently. "He was able to inspire me to find my own expression and that's the best thing a professor can do. I always feel that a little part of Hugo is in my work—in my Canadian Museum, for instance, and the National Museum of the American Indian [planned for Washington, D.C.]. He was so excited about the profession—some of it just rubbed off on me."

A memorial service for Hugo Leipziger-Pearce will be held on Saturday, September 12 at 10 a.m. at the First Unitarian Church in Austin. On October 6, the Texas Chapter of the American Planning Association will honor him posthumously with its Lifetime Achievement Award in Planning. It seems fitting that this is the first time that the award has been presented.

Lisa Germany

Lisa Germany lives in Austin; she met Leipziger-Pearce while working on her book Harwell Hamilton Harris (1992) and conducted a number of interviews with him in the years since.

Total Control

ARCHIMOVIES Good morning! It's *The Truman Show*, live 24 hours a day, starring Truman Burbank, created by Christof. Every moment of Truman's life is televised live around the world, a perpetual situation-comedy/drama with slyly inserted product endorsements.

In the movie, released this summer and directed by Peter Weir, Truman Burbank (Jim Carrey) is adopted by a mega-media corporation with the sole purpose of televising his entire life. He is born on live television, learns to walk, goes to school, gets married, goes to work, and experiences daily foibles, all in front of millions of viewers in TV land. Everyone except Truman is in on the charade. His world, entirely stage-managed by Christof (Ed Harris), is the island town of Seahaven, an idyllic community of smiling neighbors and picket fences, protected from the outside world by a huge dome. Even the weather, from sunrise to sunset and the stars, is computer-controlled. Truman's parents, wife, and the town folks are all actors.

The unreality of Truman's world is made more surreal by the film's setting in the "real" location of Seaside, Fla., the design-controlled resort by Duany Plater-Zyberk, where all the mandated porches are the same and cars don't park on the narrow brick streets.

Unlike the settings of most other dramas about controlled societies, Seahaven is not portrayed as a slick, futurist world. It is a seemingly kinder, gentler world of traditional architectural forms and planning—a walkable town with a square. A generation (or maybe two by now) of urban historians and social scientists have decried the effects of the suburbs on the form and substance of city life. According to this way of thinking, the suburbs—idealized ranch-style escapes, forgetful or downright ignorant of urban history, physically disconnected from traditional urban form and from each other—have sucked the economic and cultural juices from abandoned city centers.

The opposite end of the spectrum, ideologically speaking, is the suburban mythology of happy families and back-door sociability, probably more a creation of Hollywood television and movies—the *Leave It To Beaver* syndrome—than a reflection of reality. Indeed, the reality of the suburban lifestyle has often proved to be quite dark and sinister: dysfunctional families, psychological disconnectedness, loss of identity of place, pollution and traffic of the imposed car culture, and numerous environmental disasters

from loss of wildlife habitat and farmland to increased runoff and ozone depletion.

If suburbia was the utopian model for the 1950s, the recreation of small town America, as epitomized in neo-traditionalist planned communities like Seaside, is the model for the postmodern era. Our theme park culture has replaced both the good and bad qualities of a real small town with a controlled physical environment imposing near-fascist regimentation and obedience. Truman's Seahaven is just an extreme version of this control.

Truman stays in Seahaven because he has been conditioned to fear crossing the water to the mainland. But his curiosity is intact. He dreams of a girl he met in high school and of escaping to Fiji. And then mistakes start to happen on the set and Truman gets glimpses backstage, slowly realizing that something is not real in wonderland.

All true, all real, nothing fake,
just controlled.

Christof,
director of *The Truman Show*

The Truman Show is open to a wide variety of interpretations. One possible frame of reference is novels and films such as *Brave New World*, 1984, *The Prisoner*, *Smile*, *The Stepford Wives*, and *Alphaville*, while another is the imaginings of futurists such as Buckminster Fuller and Le Corbusier. Even a religious interpretation is possible. Is Truman a real life Adam in a garden of Eden with a creator, Christof? Or he is the young Prince Siddhartha, sheltered from most calamities of the world?

The Truman Show can also be viewed as a comment on complacent middle-class existence and mindless acceptance of the forces that exert control over our lives. Truman lives a Dagwood Bumstead existence in a cookie-cutter cottage on a sunny street with smiling neighbors in a spic-n-span small town. Every day the same routine, a boring job, with a mate who doesn't really care. At the same time, Truman is a cult hero to the millions who watch him. Media becomes religion, the salve for the masses: Truman's life is an example to the viewing public of the value of adjustment and conformity. Is Truman the only one who is being controlled or is the audience just as much a pawn?

In our world, as in Truman's, much of our "culture" is created by media (TV, movies, advertising) to benefit commercial sponsors and more and more of our physical environment is stage-managed into a theme park hallucination, usually some romanticized illusion of a non-historical past. The boundary between what we can think and experience for ourselves and what we are programmed to feel may already be lost.

Truman finally decides to leave his island. He sails away and Christof, at his computer controls, confronts him with a mighty storm to persuade him to turn back. Weathering the storm and more purposeful than ever, Truman's boat finally rams the edge of the dome, the ultimate confirmation that everything has been



photographs by Steven Brooke



Views of Seaside, Fla.,
the town where *The Truman Show* was
filmed

unreal all along. In a scene out of Magritte, Truman climbs a flight of stairs rising against the painted sky of the dome and finds a door. Christof, a God-like voice emanating from the clouds, tries to convince him of the reality of "the world I created for you." Smiling and taking his last bow, Truman exits.

But does he really leave or just step into another "reality?" Can he become independent and style his own world? Does Prince Siddhartha become Buddha? What are the implications for the moviegoer? We'd rather just sit and watch.

Yolita Schmidt and Gerald Moorhead, FAIA

Gerald Moorhead, FAIA, is a TA contributing editor; he and Yolita Schmidt wrote about movies in Texas Architect from 1993 to 1996.

An Architect's Daughter

MEMORY The bond between father and daughter is often the most important in their lives. In my case, Dad and I were an extraordinary match. As a girl, my earliest toys included not only my dolls and stuffed animals, but also Dad's templates and T-squares. While I played dress-up in high heels and fashionable hats, Dad always had a hat of his own made of hard white plastic. He took me to the park, to parades, and to strange but wonderful places where steel, glass, and brick mixed together to form mighty buildings.

I am an architect's daughter.

So it went in those long-ago years, seen now



Long-time Texas architect Jim Ring, circa 1968

through the soft lens of nostalgia. In third grade, I read my Nancy Drew mysteries and sat next to Dad on the couch as he showed me one of his picture books with buildings made, he said, by a man named Frank Lloyd Wright. In my mind, I imagined Mr. Wright was a friend of Dad's at work. Everything important, it seemed, happened to Dad "at work"—at that time, George Dahl Architects, a large firm in Dallas.

By fifth grade, I was familiar with terms like fascia, pediment, and joist. Dad was learning my vocabulary, too, and phrases like Three Dog Night, bell bottoms, and quadrasonic stereo entered our conversations.

I recently came across an old photograph from that era. Dad is pictured standing boldly and confidently, in hard hat, sensible shoes, and work clothes (he always wore a nice tie) in a meadow in front of an enormous building in progress. The perspective makes Dad appear taller than the building, larger than life. And that is how I always thought of him.

Later on, when my friends had their first jobs flipping burgers or working in record

stores, I was enduring ammonia fumes while working in Dad's office as his "blueprint girl." Later still, the computers came along, but Dad staunchly refused to get aboard the technology bandwagon. He believed until the end that it was just a "crazy fad" that would eventually pass. Meanwhile, he watched sadly as the art of manual drafting went out of fashion. People still tell me that for 50 years he was the finest draftsman they ever knew in West Texas.

Probably it was about this time that I realized that being an architect—as is the case for many artists—is something someone is, and not something one does for a living. The love of buildings and of creating spaces in which to live and work was an abiding passion with most of Dad's architect buddies. They were always recognizable by their easy familiarity with each other, honed by decades of working in the same city, their banter about various jobs, past and present, and usually an ink-stained shirt pocket or dog-eared pocket protector filled with pencils and pens. They were a tightknit fraternity whose number is rapidly declining.

When I graduated from the University of Texas at El Paso and moved to Washington, D.C., I made sure to tell Dad whenever I saw an important architectural monument, like an ultramodern I.M. Pei building or a glorious classic like Union Station. Although he was always politely impressed, he would respond that he was busy with his current big project, the construction of Franklin High School. Dad kept on working despite a weak heart and after many of his colleagues had slowed down or retired. His comment on retirement was always a joking one-liner: "What would I do the second week?"

After I returned to West Texas, Dad and I would still marvel at the beauty of buildings built long ago by Trost & Trost and other architects and still standing in El Paso. He wasn't shy about admiring his own designs that have endured over the years, including the Texas Commerce Bank Building in downtown El Paso (originally El Paso National Bank), churches, apartment buildings, and dozens of libraries, city halls, and other buildings located all over Texas and other states. I took this small talk for granted, as the sort of thing that, surely, all fathers and daughters did.

In March 1997, Dad left for the office one morning saying, "No, I can't take the day off today. Maybe next week." My reply, "Okay, well, have a nice day," was answered with the closing

and locking of the door behind him. That was the last time I saw him.

Soon, a street bearing Dad's name will open in east El Paso. New houses will be built on it, families will live there, cars will drive by, mail will be delivered, and Dad's name will live on. Of course, his spirit remains much alive in the many buildings he built. That is the legacy of the architect. And, for an architect's daughter, memories will last forever. *Allison Ring*

Allison Ring is the daughter of John E. Ring, a long-time Texas architect and a faithful reader of this magazine; she is a graduate student at UT El Paso.

Coming next issue . . .

The November/December issue of *Texas Architect* will examine the issue of sustainability. It is a term used more and more often these days, but questions linger about what it means.

Although we know we cannot begin to answer all the questions, we hope to start a discussion by presenting stories about the implications of developing sustainable communities and utilizing a range of sustainable technologies, case studies of several projects recently completed or in progress, as well as profiles of several Texans who are working to find ways to make sustainability something more than a theory.

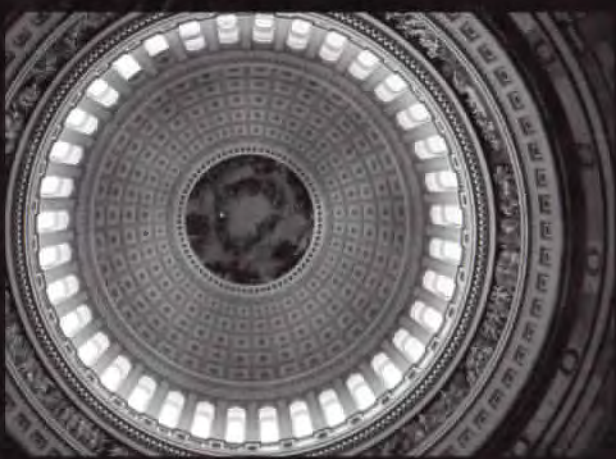
Look for the November/December issue of *Texas Architect* in your mailbox or at the newsstand in November.



Our thanks

The Texas Society of Architects would like to thank the following companies for their generous support of the 59th Annual Convention and Design Products & Ideas Exposition, October 1–3, 1998, in Austin.

- **Acme Brick:** Acme Breakfast
- **Featherlite Building Products:** Presidents' Gala
- **Herman Miller, Inc.:** Design Charrette
- **PyroTherm/TXI:** Registration Folios
- **Texas Architectural Foundation:** General Session Speaker and New Architects' Convocation
- **Texas Architects Committee:** 5th Annual Golf Tournament and 1998 Tennis Tournament



Expo Review

The companies listed below are exhibitors in the 59th Annual TSA Design Products & Ideas Exposition in Austin, October 1-3.

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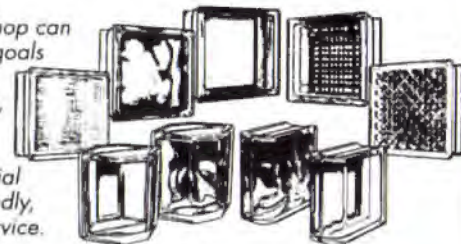
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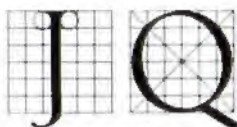
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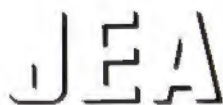
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JOURNEY At the end of the last century, in 1894, Austin's city fathers ordered a street illumination system from the Fort Wayne Indiana Electric Company; it would cost \$70,000 in cash, which paid for installation, and the trade of a narrow-gauge railroad, which was worth \$43,500. Provisions from the city for the lights required that "time could be seen with an ordinary watch in the darkest night within a circle 3,000 feet in diameter." The 31 moonlight towers, as they came to be known, lit up the Austin night sky for the first time on May 6, 1895. Before they were erected, many city residents predicted the 24-hour light would cause severe overgrowth of gardens and lawns: Farmers said that the giant corn and beans would be impossible to harvest, that grass would have to be cut with an axe, and that chickens would lay eggs 24 hours each day. Fortunately, none of these dire predictions came to pass.

Today, 17 of the delicate triangular cast- and wrought-iron frameworks remain, their numbers dwindled due to rust and decay, or the occasional run-in with a city bus or wind storm. They rise 165 feet in the air, supported by a network of cables and a 15-foot iron pedestal, a remnant from a bygone era, a glimpse of turn-of-the-century Austin.

When they were erected, tower lighting was prevalent in cities across the nation: It was easier to light a large area with tower lights than to erect street lights. A ladder on the outside and an elevator inside the structure enabled workers to reach the top, make repairs, and change lights, a job that originally required a full-time person. Each tower was mounted with six 2,000-candlepower carbon arc lamps, which were replaced with incandescent lights and then mercury vapor lamps, and finally with 13,200-candlepower bulbs that light a four-block area. Of the 31 towers ordered, only 30 were known to have actually been delivered and installed. Each has had to be uprooted from its original location, at one time or another, to make way for wider streets and sidewalks.

After their construction, the towers received their fair share of local fame. On June 4, 1930, at the corner of 9th and Guadalupe Streets, Jimmie Fowler, age 11, climbed to the top of one of the towers, fell, bouncing along the tower's side, to the bottom, and lived, awaking from a nine-day coma and suffering only 187 stitches. His escapade is listed in *Ripley's Believe It or Not*. What is probably

the most well-known of the structures, the Zilker Park tower, which serves each year as a brightly lit Christmas tree, is actually a reproduction, erected in 1968 at a cost of \$10,000.

Austin is the only city in the nation that has preserved portions of its original system. The towers are listed as landmarks by all three levels of government, and on July 12, 1976, were listed on the National Register of Historic Places. In 1995, on the occasion of their 100th birthday, each one was restored and an exhibition was devoted to their history.

Kelly Roberson



2 the historical marker that adorns each remaining tower



3 historical photo showing workers using the elevator to replace lights



4 historical photo; a worker can be seen mid-way up the tower

1 a montage photo of one tower, at the corner of 9th and Guadalupe Streets

2 the historical marker that adorns each remaining tower

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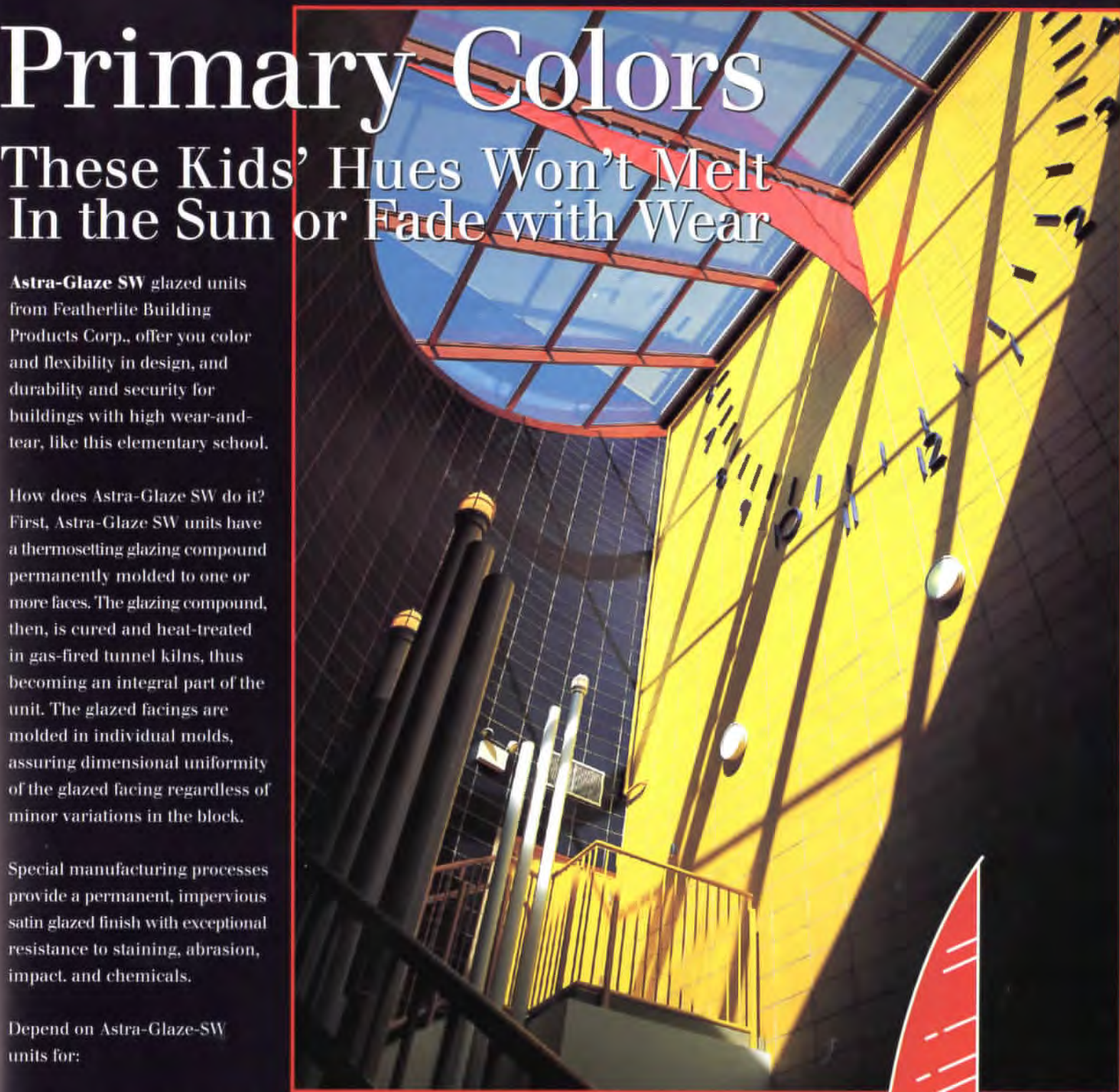
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