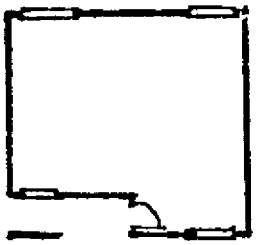
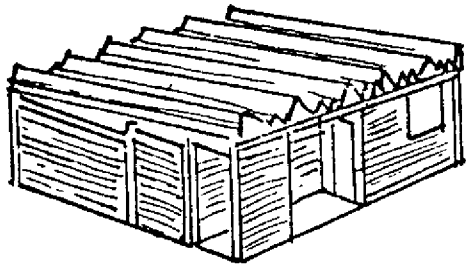
PROJECT SUMMARIES

BRICKS FOR GUATEMALA
Director: Marcel Ruff



6.27m x 5.94m
37m^2



dirt floor, stabilized adobe walls with concrete columns, cement asbestos channel roofing
material costs: Q.300
total costs: Q.330 = Q.9/m^2
construction time: 66 man days per house
number: 400 to 800
site: Sanarate

PROGRAM OBJECTIVES/DESCRIPTION

The intention of the program is to build a permanent house for everyone in the town of Sanarate. That could possibly mean 800 units but very likely the figure will not exceed 400. Some reasons for families not participating in the program are that a solution for those who are renters has not been resolved and others choose to build their houses independently using materials of their choice.

A major feature of the program is theemphasis on organization and teamwork. (perhaps more interesting because the community is not known for cooperative working arrangements) Two hundred twenty families are grouped into teams of 10 people each. They are to make all the blocks for eleven houses (one for widows or elderly who cannot contribute to the construction) and then build all of the eleven houses. None will have a roof put on its until the houses for that group are otherwise complete.

HOUSE DESCRIPTION/CONSTRUCTION

The house is of stabilized adobe block construction with poured in place concrete columns with steel reinforcing. The continuous footing and head tie beam also are steel reinforced concrete. No floor is provided, nor interior division walls but the house is one of the largest being built. The roof is single span Duralit (cement asbestos channels) There is one door, 4 windows and a covered porch.

The first stage of construction is the production of brick size blocks. The process is tightly controlled with strong direction. Half of the 220 people work on communal jobs, sifting earth and sand, mixing the earth, sand and cement in motorized mixers and then distributing the mix to each of the CINVA RAM type block making machines. The remaining five people at each the 22 machines add and mix the water into the material, put the mixture

into the machine, press the block and take the finished block to the shaded curing area. The mixture of the block is 6 parts earth, 2 parts sand and 1 part cement. About 700 brick shaped block are made a day by each team.

For the construction of the house each man is assigned a responsibility for a job that will be repeated on all of the houses. Making the blocks and building the houses will probably take about 66 man/days per unit.

DISTRIBUTION/COSTS/FINANCING

The families will receive the materials for the houses free of charge. The total cost of the house including transportation and pro-rated cost of the factory is estimated at Q.330. The family contributes their labor. If the material value of the house is divided by the number of days a worker takes to build the house, the amount of Q.6 per day would represent an equivalent pay for the worker.

The equipment may remain in the community and function as a base for an ongoing local business.

SITING/INFRASTRUCTURE

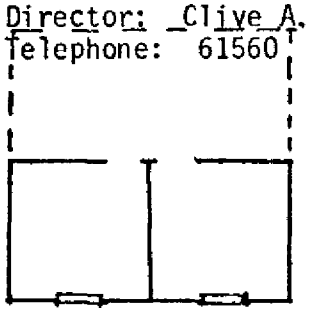
When a project intends to be comprehensive in rehousing of an urban area the siting and public utility considerations should be addressed more critically. However, the recipients will locate the house on their lots as desired and no program of services is included.

FUTURE IMPLICATIONS/CULTURAL SUITABILITY

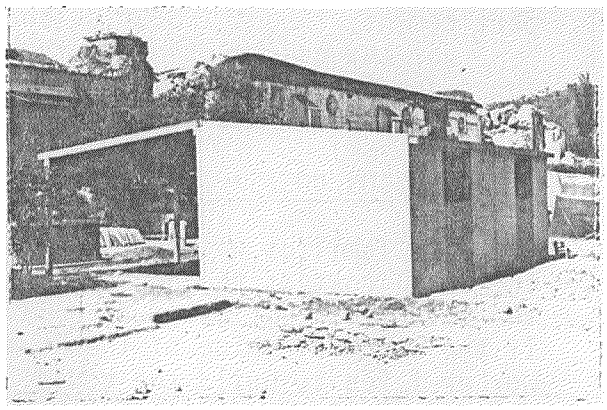
The house will probably be fairly well accepted by the recipients. It is large enough for most families to not require immediate amplifications. The interior is divisable in several different possible ways.

The house has a door opening onto the porch. The model house has placed the porch toward the street but this should probably be reversed and a second door added.

CANADIAN EMBASSY/CANADIAN AGENCY
FOR INTERNATIONAL DEVELOPMENT
7a. Ave. 12-19, zone 9
Director: Clive A. Carruthers
Telephone: 61560



3.67m x 7.34m
enclosed 27 m^2
porch also 27 m^2



concrete footings, wood post frame, plywood panels, corrugated zinc
material costs: app. Q600
total costs: Q750 = Q19/m^2
construction time: app. 8 man days
number: 2,000
sites: San Andres Itzapa, San Jose Poaquil

PROGRAM OBJECTIVES/DESCRIPTION

The goal of the program is to build a house for every family who wishes to participate in the two towns. A comprehensive reconstruction of housing is pursued with energy and determination by the director and a small staff. Several University of San Carlos students and professors have also been involved. With an organized production and ample supply of materials they expect to achieve the goal by mid May.

HOUSE DESCRIPTION/CONSTRUCTION

The flow of production is highly organized. The supply of wood feeds electric saws for precutting, there are jigs for different panels where the plywood sheets are nailed on the frames. About 80-100 men work in the factory production. Another 50 men deliever and assemble the houses. In teams of around eight, approximately 25 houses can be erected in a day. Accurate siting of the foundation excavation holes has been a delaying factor, but templates of the house layout are being made to correct this. They anticipate production of 40 houses a day in the future. The overall effect on San Andres Itzapa is a very active process with immediate results.

The assembly of the house begins with 50 cm. deep holes dug for the corner and center posts. The holes are filled with concrete when the house is completely in place. The seven wall panels and two ceiling panels are quickly nailed together. Another team follows to add the plywood panels for the ceiling of the porch. At a later date the corrugated zinc will be put in place.

There is some debate with the University personnel if the 11% slope to the roof is adequate for proper water drainage.

The dimension of the plywood is the major design factor. The houses for San Jose Poaquil will be going into production soon and will be different in design than those in San Andres Itzapa.

DISTRIBUTION/COSTS/FINANCING

The recipients will receive the houses free of charge. The men from each zone in the town are working for the time necessary to produce the houses for their area.

All the plywood, wood and corrugated zinc was shipped from Canada and then trucked to the sites thus adding approximately Q100 to the cost of each house. The production setup adds about Q10. The labor overhead is low because of the voluntary construction supervision. Administrative overhead is similarly minimal beyond the existing Embassy structure.

The extensiveness of the wood supply from Canada has aleviated the pressure its demand would have created on the limited resources in Guatemala.

SITING/INFRASTRUCTURE

The Municipality of San Andres Itzapa took an important step in addressing future land tenancy problems by issuing certificates for each lot. These were granted by previous legal or understood occupancy. Other land was made available for some families who had an obvious need. The Municipality is also in charge of negotiations regarding changes in width of roads or land use redesignations. The University personnel had some suggestions but basically no major changes will be made at this time.

Canada will help in the repair of public buildings and assist in the construction of a health center in San Andres Itzapa. The school program is focusing on five of the surrounding villages. However, the Canadians are helping the towns to plan and solicitate funds for future public improvements.

So far most locations of the houses in San Andres Itzapa by the recipients have been with the porch toward the backyard. The two windows face the street with the units generally lined up with the other near the front of the lot.

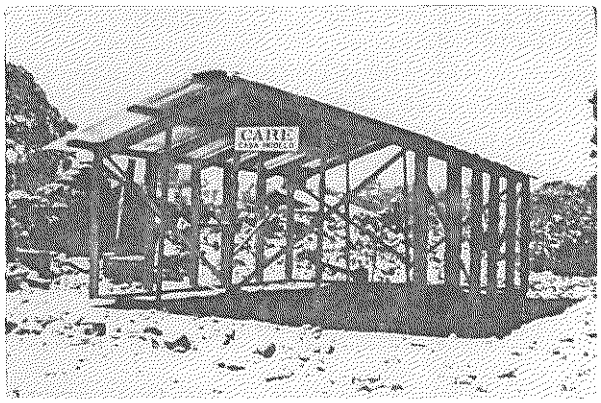
FUTURE IMPLICATIONS/CULTURAL SUITABILITY

With the focus of residential activity patterns on the outside back area, the siting is very logical. Future enclosure of the porch may happen to varying degrees with various types and quality of materials. If the house wasn't so large and the backyard focus so strong it might have added interest if the siting had been reversed and then produced a variety of facades in a town with so many similar houses.

The critical need for the future of the houses is a preservative treatment or paint on the plywood. Experts have stated that for the next five years there should be no problem. By then it is hoped that local residents will be able to afford the paint which is not included in the present Canadian budget.

CARE
6a. Ave. 6-47, zone 9
director: William Salas
project dir.: Ed Vaught
telephone: 66392, 66497

house plans are individualized by family



wood posts, wood or wire bracing, corrugated zinc roof (floor, walls, windows and doors are furnished by owner)
material cost: Q60-Q100 depending on number of zinc given
total cost per house: cost of zinc plus overhead Q.90-Q.130
construction time: varies, 6 man days typical
number: about 10,000
sites: Chimaltenango and Sacatepequez departments

PROGRAM OBJECTIVE/DESCRIPTION

Care has developed a program of zinc distribution to families with a demonstrated need for housing assistance. The program essentially works in the villages of the two departments but also works within the urban areas where other programs are not meeting the need.

The basic objective is to give the zinc sheets to a recipient who has constructed an approved earthquake resistant structure. The program has evolved from a related experience of Care's involvement after Hurican Fifi in Honduras. Many of the technical aspects were developed with Oxfam/World Neighbors.

HOUSE DESCRIPTION/CONSTRUCTION

A description of the Care house is more a description of principles of construction. These are taught in classes given in each of the communities where Care is working. The first step of the class is to build a model structure. In addition to training in the classes, the project participants also receive construction supervision and a manual that graphically describes the construction principles.

The specific details of the houses that result are as varied as the participants. What they have in common is a wood structure (with a preservative treatment) with diagonal bracing between all posts and in the roof structure. When this basic earthquake resistant structure has been approved Care gives the zinc sheets. The finish wall material depends on the desires and resources of the participants but could include wood, bajareque (waddle and dab), cane, or reinforced adobe. Future problems may exist where there is inadequate supervision of the wall construction. Many of the techniques may be new to some individuals and improper installations may result.

The manual is particularly instructive and is available from the Care office.

DISTRIBUTION/COSTS/FINANCING

The beneficiaries of the program are people of low income and who do not have resources to obtain roofing material. The zinc roofing is given to them so their costs for new housing will vary depending on their access to structural wood and what they use for finish walls. Care is not involved in financing any of these original costs. The program does not include any assistance to those who do not own their own land.

SITING/INFRASTRUCTURE

The education program offers several specific criteria for safe siting and the families are encouraged to follow these recommendations.

Care has an ongoing water supply construction program and currently a water system repair program. But these individual projects are not usually related to the housing program.

FUTURE IMPLICATIONS/CULTURAL ACCEPTABILITY

The strength of the program lies in the wide spread education of improved construction techniques. The result is a safer house and an experiential base upon which future improvements can be made.

As with the Oxfam/World Neighbors program the houses will have a high degree of cultural acceptability because the participant is making the essential decisions about the size, plan, and materials of the houses. Perhaps a weak point would be the lack of general improvement of the base housing condition. A higher housing standard might have been sought but this objective must be weighted against the scope of the need and resources available.

CARITAS ARCHDIOCESES
10a. Ave. 3-22, zone 1
director: Luis Alfredo Salazar
project promoter: Floridalma Meza
telephone: 60624

phase 1: concrete columns, corrugated zinc roof
phase 2: enclose half or all of structure with concrete blocks
material costs: Q.161 phase 1, Q.428 more for phase 2
total costs: Q.589 = Q.30/m^2 (plus overhead)
construction time: unknown
number: 1932
site: Sumpango

PROGRAM OBJECTIVES/DESCRIPTION

The Caritas Archdiocese proposes to build 1932 adequate shelters in the municipality of Sumpango. These shelters are intended as basic protection against the winter rains but construction had not begun as of the last week in April.

The program is seen as housing development integrated with a program to improve the social, educational, and economic level of the community. Their objectives are based on interviews with members of the community which helped determine the community's priorities. The project will be administrated through a multifunctional cooperative.

HOUSE DESCRIPTION/CONSTRUCTION

The house will be built in two phases and with two options. The first phase consists of the construction of steel reinforced concrete post and beam frame and corrugated zinc roof.

The second phase will consist of one of two options to be selected later. These are to build concrete block walls either, 1. completely enclosing the area covered by phase one, or 2. enclosing one half of the covered area. Both options have one door and window.

As no units have yet been constructed an evaluation of construction methods or time is not possible. However, preliminary plans indicate earthquake resistant construction.

DISTRIBUTION/COSTS/FINANCING

The qualifications for being a recipient of a house are that the recipient does not have a house nor sufficient economic resources to build one.

The first phase will cost Q.161 in materials. The second phase will cost an additional Q.428 to completely enclose the structure or Q.300 for the second option of enclosing half of the structure.

The total cost of the program is Q.1,147,111. Suggestions for lowering the overall cost include buying block making machines and producing the blocks in the community. This may save Q.25,000.

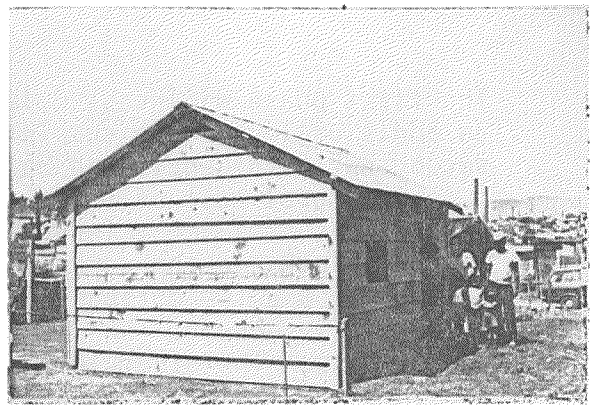
There are two options being considered for the financing of the beneficiaries house. One is to give the house to the family without further obligations. The other is to require repayment over a long term loan, the income of which is to be invested in municipal development projects.

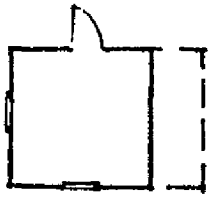
FUTURE IMPLICATIONS/CULTURAL ACCEPTABILITY

An important product of the program is the intention to accustom the people to work together for ultimately improving the community. The program specifically aims to respect cultural patterns, however, it is too early to be able to comment on either of these objectives.

Though reinforced concrete post and beam construction with block infill is not new to Guatemala, it will be a new form of construction to a majority of the recipients. Consequently, for those who make additions many will not elect to continue with the same method of construction. Particularly if the addition creates an L shape, it will consequently run a risk of structural damage in case of earthquake.

COMITE DE EMERGENCIA EL CALVARIO (CEMEC)
2a. Calle y Ave. Ferrocarril, zone 9
Director: Norman Parish Jr.
Telephone: 60926, 62307





3.70m x 3.70m or
5.00m
13.69m^2 or 18.50m^2
Type B (also see Red Cross)
Type A see Cuerpo Munidal.
Type C see Mennonites

dirt floor, wood frame and siding corrugated zinc roofing
material costs: Q.235 and Q.300
total costs: Q.275= Q.20/m^2 and Q.340= Q.18/m^2
construction time: 4 man days
number: 1,000
sites: Guatemala City and other sites with other groups

PROGRAM OBJECTIVES/DESCRIPTION

A woman in the Church had predicted the earthquake so members were prepared. In the first week afterwards plans for three types of houses were prepared by a retired U.S. engineer and approved by the National Emergency Committee. The cooperation and sharing of plans with other groups and being an ecumenical group internally has been an outstanding aspect of the program. Through their cooperation with other groups, CEMEC will assist in more houses beyond their commitment to build 1,000. The program has gone beyond providing houses for the members of the church who needed them.

HOUSE DESCRIPTION/CONSTRUCTION

At km. 18 1/2 on the San Juan carretera there is a production setup. All the pieces are precut, the bottom plate is treated and the doors and window shutters are assembled. The panel frames are not preassembled because of their size of easier transport, especially to difficult sites.

After the petition and site of the recipient has been checked, the size of unit and location of doors and windows is determined. Families of less than four members receive the smaller unit but most of the houses built have been of the 3.70m x 5.00 size. The lots of the recipients are very scattered.

Depending on the wood available the type of siding will vary, both horizontal and vertical siding of several widths have been used. The bottom sill sits on whatever surface the recipient provides. The sill's

probable future deterioration, though treated, and the lack of diagonal bracing are the two weak points of the house.

Recipients are supposed to work ten days but more commonly paid local residents and some foreign volunteers comprise the work crews.

DISTRIBUTION/COSTS/FINANCING

Though a 3.70m x 3.70m house costs approximately Q275 including transportation and administration the house is sold for Q.144. Like wise the larger unit is sold under cost for Q.180. The recipient is required to pay a minimum of Q5 each month until paid in total (approximately three years). Some have paid more initially and may pay off the loan more rapidly.

SITING/INFRASTRUCTURE

While the recipient may locate the house where desired on the lot they are being encouraged to place it near the back. If the recipient is not the owner of the land then evidence of the owner's authorization is supposed to be obtained.

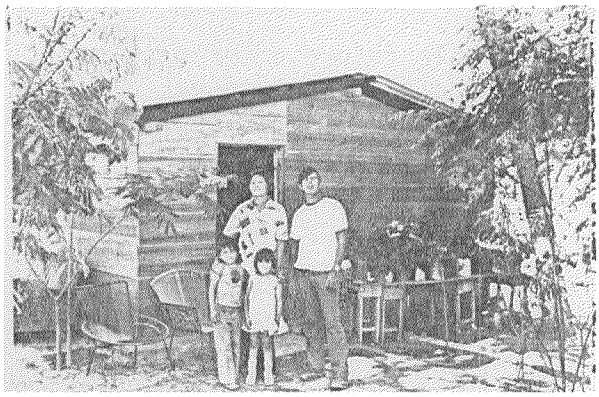
To date no utility provisions are anticipated. Since many of the houses are in urbanized areas the previous connections are sometimes available.

FUTURE IMPLICATIONS/CULTURAL SUITABILITY

The smaller unit is difficult to divide into two usable spaces if desired. The two pitched roof has been preferred over a shed roof. Some people plan to use the ceiling space under the roof for storage. If the storage is heavy and were to fall it could be dangerous.

COMITE EVANGELICO PERMANENTE
DE AYUDA (CEPA)

2 . Av. 1-44 Zone 13
Director: Lic. Virgilio Zapata
Project Director: John Durkovic
telephone: 60762



5.30m x 2.50m
13.25m^2

concrete footing, concrete floor, wood frame and siding, cement asbestos roofing
material costs: Q300
total costs: Q360 = Q27/m^2
construction time:
number: 400
site: Zacapa (there are also projects in San Lucas Sacatepequez and El Progreso but information was not obtainable)

PROGRAM OBJECTIVES/DESCRIPTION

The stated aim is to produce 400 houses and it was hoped before the rains. However, completion is now anticipated the first part of June. The project has had two phases. The initial phase was to build 2-3 model houses in each of the 15 areas within a radius of about 20 kms. including Zacapa. This phase was also used for training the crews. The second phase started by completing the houses furthest from the production center in Zacapa with the objective of lessining the transportation problem with the advent of rain. Presently the focus is on laying foundations and returning later to complete the work that wet ground would not hamper.

HOUSE DESCRIPTION/CONSTRUCTION

The house design is a portion of the CEPAL house used in Managua. The intended use of zinc was changed to cement asbestos roofing thereby changing the dimensions of the floor plan a little.

They have hired and trained approximately 100 men to work in specialized teams building the houses. The wood is precut and the frame sections assembled at the central location. From there a sequence of seven teams of varying size go out to do each of the following tasks: layout corners, place the forms for the foundation, structural frame and roof, concrete floor, siding, doors and windows and the latrine. The recipients help fill up the footings with stones and level the floor area.

DISTRIBUTION/COSTS/FINANCING

Local committees have done a census and classification of need. They determined who will receive the houses and the repayment arrangements.

The recipients will pay back at a minimum rate of Q3 a month the entire Q300 cost of materials. This goes to a fund which CEPA and the community representatives will determine for future community projects.

SITING/INFRASTRUCTURE

The present houses are on the recipient's lots but efforts are being made to acquire land for a long term project for non-land owners.

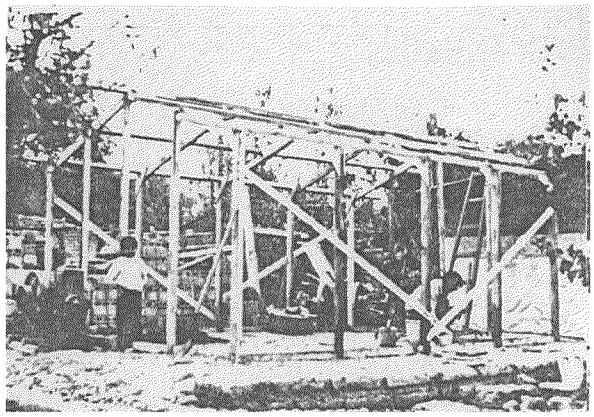
Latrines are an integral part of the program. Time and scheduling pressures sometimes mean the hole is not dug before the house is built as was intended. But the idea is generally accepted.

FUTURE IMPLICATIONS/CULTURAL SUITABILITY

The model houses built illustrated the addition of another section equal in size to the present so as to complete a two slope roof house. While some may be lead to expect the double house now it was the only program which provides a clear proposal for future expansion.

The change of roof material and leaving the top triangle open on the ends illustrates climatic considerations not noted on other programs.

COLEGIO SAN BERNARDINO
Patzún
Director: Sister Trintas Keltgan
Project director: Roy Battersby



2.4mx3m up to
4.8mx9.7m in modules
7.2m^2 - 46.6m^2

wood frame only
material costs: 3/5 of total
total costs: from Q.30 to Q.112
construction time: 4 man days
number: to be built as purchased
site: Patzún

PROGRAM OBJECTIVES/DESCRIPTION

Since the school was so damaged that classes could not be held and that anticipated housing reconstruction aid was not due for some time, Roy, the industrial arts teacher, with the help of a retired US engineer designed an efficient house frame. The program is to be self-financing and provide work for students who studied industrial arts at the school. With no other construction enterprise in town the non-profit project is meant to provide an immediate first stage for a permanent house.

HOUSE DESCRIPTION/CONSTRUCTION

If usable salvaged wood is available it is incorporated in the frame (which lowers the price). Otherwise 300 board feet of new wood is used to provide the frame for a 16x20 foot house. The bottom sill plate is placed on whatever surface or footing is provided by the buyer. While the side wall posts are only six feet three inches high, the use of gussett plates eliminate the need for a horizontal bottom cord for the roof trusses. This makes the space appear much larger.

With electric equipment in the school shop the sections are cut and preassembled. Then erection on the owner's site is done in half a day by a team of 4 or 5 students with a supervisor.

Generally the owner encloses the frame as desired. However, roofing from CARE is anticipated and block walls can be built by the Colegio.

DISTRIBUTION/COSTS/FINANCING

Only those people who can pay the full amount before delievery are presently able to purchase the frame. The Colegio hopes to obtain a small fund so that others who would pay back over a year could purchase the frame.

The present setup is a small scale nonprofit business serving a need in the community of Patzún. It is not meant as a social program and there is little administrative overhead except allowing for the existance of the school shop and pay for the students.

SITING/INFRASTRUCTURE

It is possible that a house of lightweight frame and walls would float on a tile floor without damage in case of an earthquake. But it is recommended, especially with heavier walls to anchor the house firmly to the ground.

The program does not address any services and permits the choice of the location of the house by the owner. To date the frame has often been placed in the rear of the lot and is seen as a safe place to sleep. More formal houses will be built later in front.

FUTURE IMPLICATIONS/CULTURAL SUITABILITY

The sismic and climatic quality will depend on the type of enclosing material and how it is attached to the frame.

A limitation of the frame is that doors must be located in the end walls to avoid cutting a diagonal brace. Partitions or ceiling covering will have to be installed without the presence of a bottom cord to the truss. The efficient use of wood and clean detailing are the remarkable features of the frame.