# ONERSOL, Niamey, Niger

***Project Data***

*ONERSOL, Solar Energy Research Centre, Niamey, Niger.*
*Physical facilities to house activities for research, development and fabrication of prototype elements, administration, documentation, and residences for temporary staff.*
*Client: Professor A. Moumouni, Director of ONERSOL.*
*Architect: Laszlo Mester de Parajd*
*Contractor: Satom*
*Completion: March, 1981*
*Cost: US$2.6 million*

*Text by* ***Brian Taylor.***
*Photographs by* ***Kamran Adle****/*AKAA.
*Drawings courtesy of the architect.*

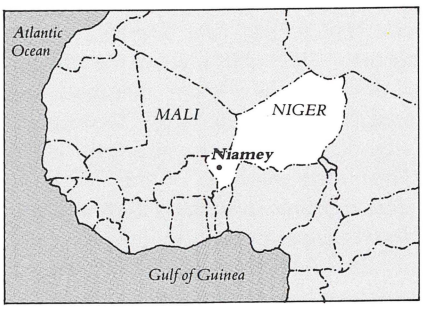
One of the key issues in development programmes, throughout the Third World, and particularly in West Africa, is the conservation of energy. Understandably, emphasis has been placed upon exploiting renewable energy resources of all kinds, solar energy being one of the most abundant. The government of Niger has been a leader among African nations in establishing policies and giving active support to research and development in this field since 1975.

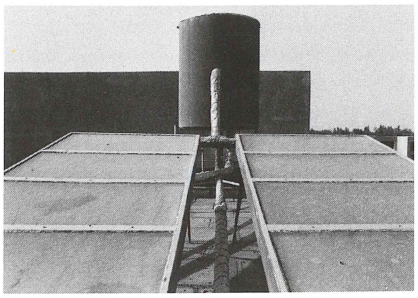
The ONERSOL complex is doubly significant in that it is intended to serve the objectives of a solar energy programme through project conception and experimentation towards practical applications, but it is also a physical structure inspired by traditional local architecture and building materials. Thus, it was from the outset designed as a *model* of self-reliance in terms of style, materials, and energy-consciousness.

The brief for the ONERSOL building contained provisions for research and development activities (i.e. laboratories), administrative offices and documentation, as well as residential accommodation for temporary staff. Professor A. Moumouni, Director of ONERSOL, was instrumental in bringing the project through the stages of initial conception to completion. The French architect, Laszlo Mester de Parajd, attached to the Ministry of Public Works in Niamey, created a building with four distinct parts joined by and communicating through internal courtyards with peripheral galleries. Entry for the public is through the central, single-storey block containing reception, lounge and cafeteria; each of these adjoining spaces is covered with a dome, carried on columns, which demarcates the different areas. To the west of the entry, is a two-storey residential block containing 15 bedrooms with bath and organised around a courtyard.

Laboratories, offices, library and meeting rooms are located in another two-storey wing to the southeast of the entrance. These spaces are situated at the centre of the wing with hallways and galleries around them for protection against the sun. Natural cross-ventilation is provided through these into an enclosed courtyard which separates this wing from the technical workshops and solar mirror in the northern-most section of the building. The total complex covers 3,500 square metres.

Since the main strategy was to utilise traditional materials and local labour,



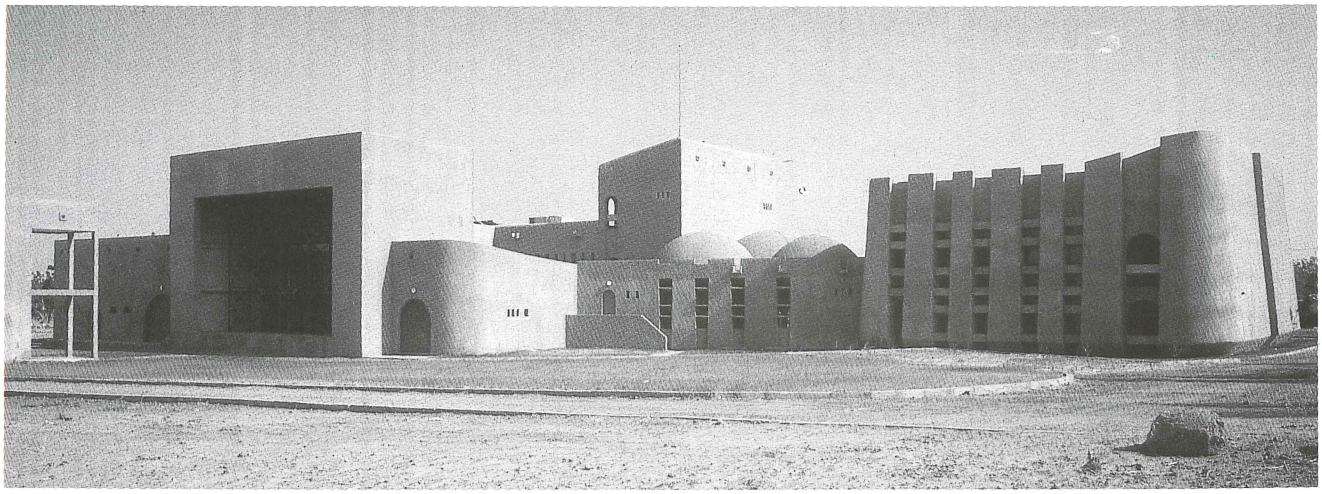



*Solar water heater installed by ONERSOL*

combining these with modern technology and expertise where necessary, the structure relies wherever possible upon load-bearing walls of mud brick, stabilised with cement; however, concrete is employed for the foundations, metal trusses of local fabrication and other tension elements elsewhere, as well as aluminium for the roofing. Exteriors are covered with cement plaster tinted by pigments found locally. The labour force was entirely local, comprised of unskilled labourers (65%) and those with professional skills (35%).

Apart from the choice of a low-rise building containing functions arranged around inner courtyards, in keeping with local customs and methods of climate control, there is an interesting architectural feature on the west wall of the residential block. The structural bearing walls have hollow, chimney-like elements, measuring 90 centimetres at the base and 20 centimetres at the top, with holes at the top and bottom allowing for circulation of air. A continuous airflow through these helps to keep the interiors cool, while their spacing and thickness on the exterior façade provides protection for window openings.

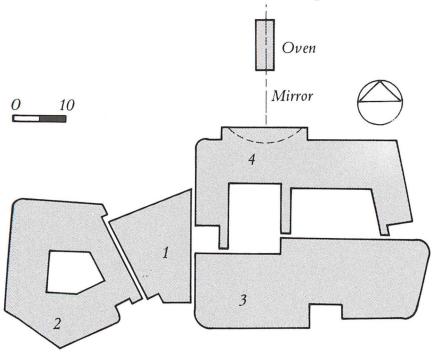
Although the building was designed with incorporation of a mechanical air-cooling system run on solar energy, this system was not yet functioning as of May 1983. Efforts at the ONERSOL centre have been concentrated upon the development and production of prototype solar captors, water heaters, dis-



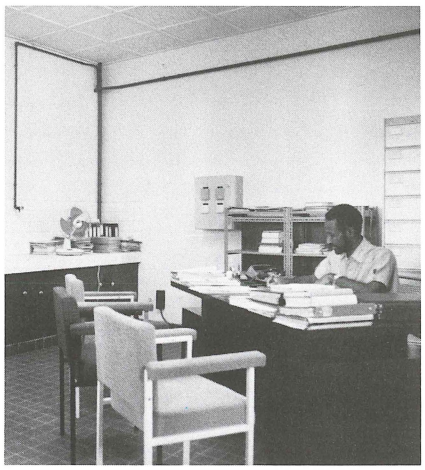
*Above: ONERSOL building, north facade with the residential wing to the right, the entrance hall in the centre and solar mirror to the left.*
*Right: Domed spaces of the entrance hall. Cafeteria and lounge space at right.*

tillors, motor pumps and one electro-solar power generator (50 kilowatts), located in the centre of Niger.

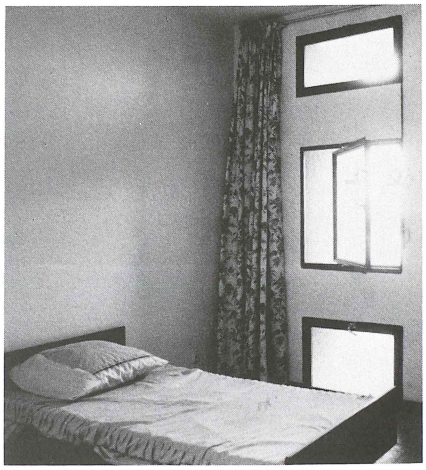
Among the principal factors contributing to the building's present low occupancy (30% in 1983) is the dearth of qualified students and teaching staff. Education in the sciences has always been a long and gradual process in developing countries, due to traditional and conservative ideas and behaviour in many cultures. In the case of Niger, there was only 4% of the 2,500 student body at the University of Niamey enrolled in science programmes last year. Perhaps the ONERSOL programme should be enlarged and diversified in the immediate future to permit this excellent physical plant to accommodate a somewhat wider range of educational functions to aid the people of Niger.



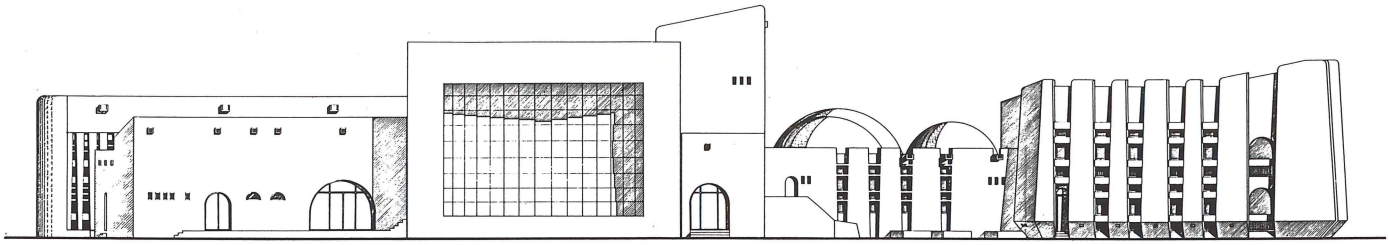

*Site plan*
1. *Entrance hall, lounge, cateteria*
2. *Residential wing*
3. *Laboratories, library, offices*
4. *Workshops and solar mirror, with brick kiln opposite*



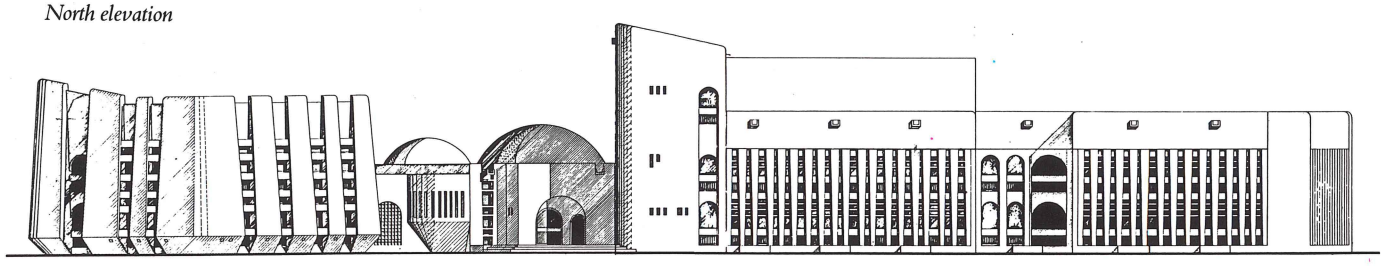
*Interior of an office space.*



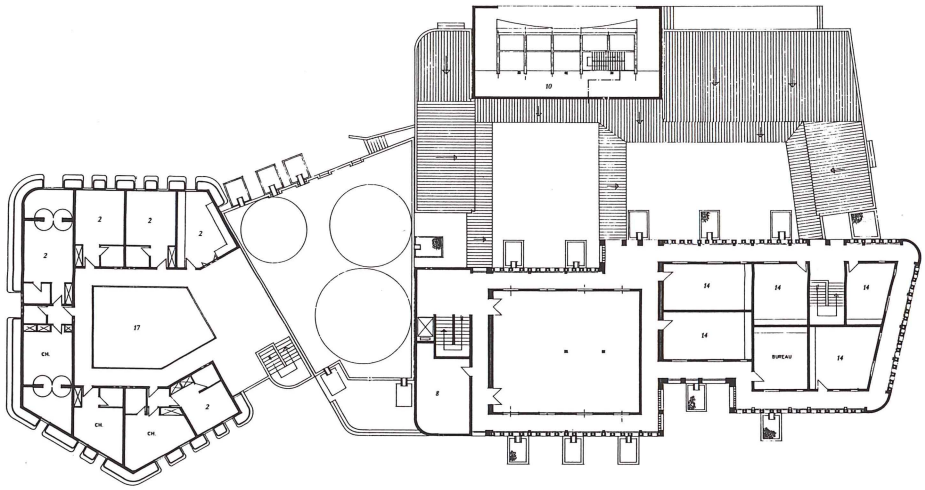
*Interior of a bedroom in the residential wing.*



*North elevation*



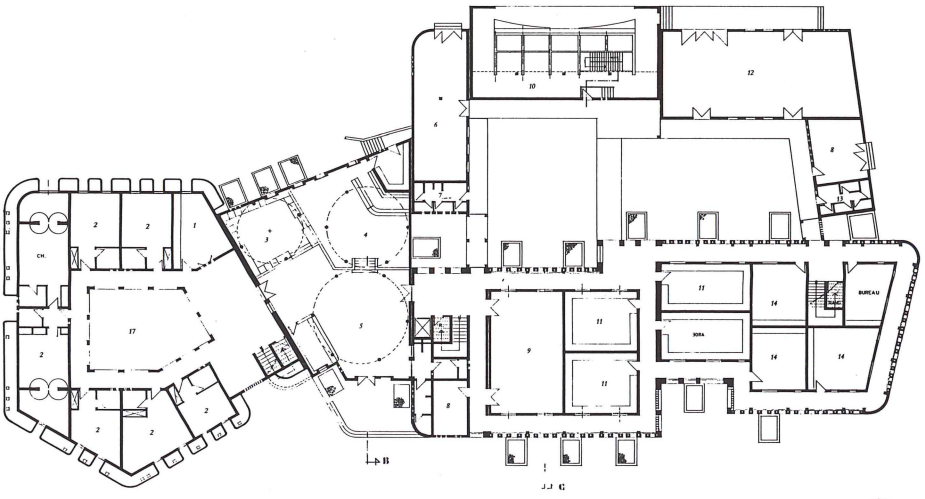
*South elevation*



*First floor plan*

*Key*

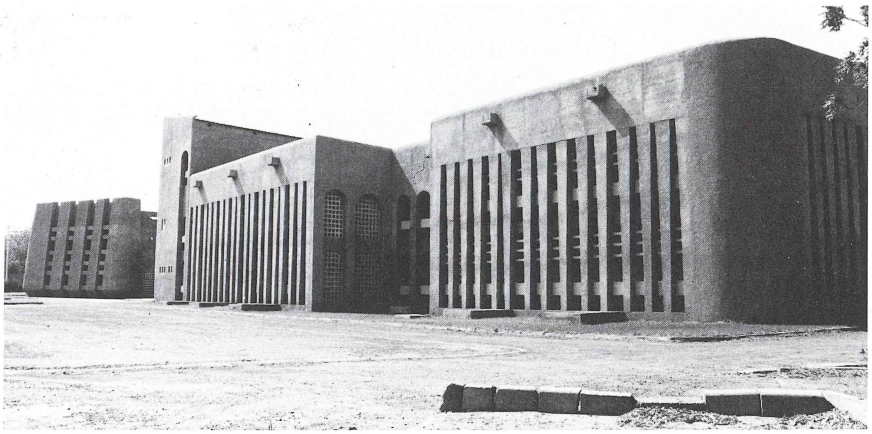
1. *Laundry room*
2. *Bedroom*
3. *Lounge*
4. *Cafeterian*
5. *Entrance hall*
6. *Workshop*
7. *W.C., male*
8. *Equipment room*
9. *Conference room*
10. *Solar mirror*
11. *Laboratory*
12. *Workshop*
13. *W.C., female*
14. *Office*
15. *Hall*
16. *Library*
17. *Patio*

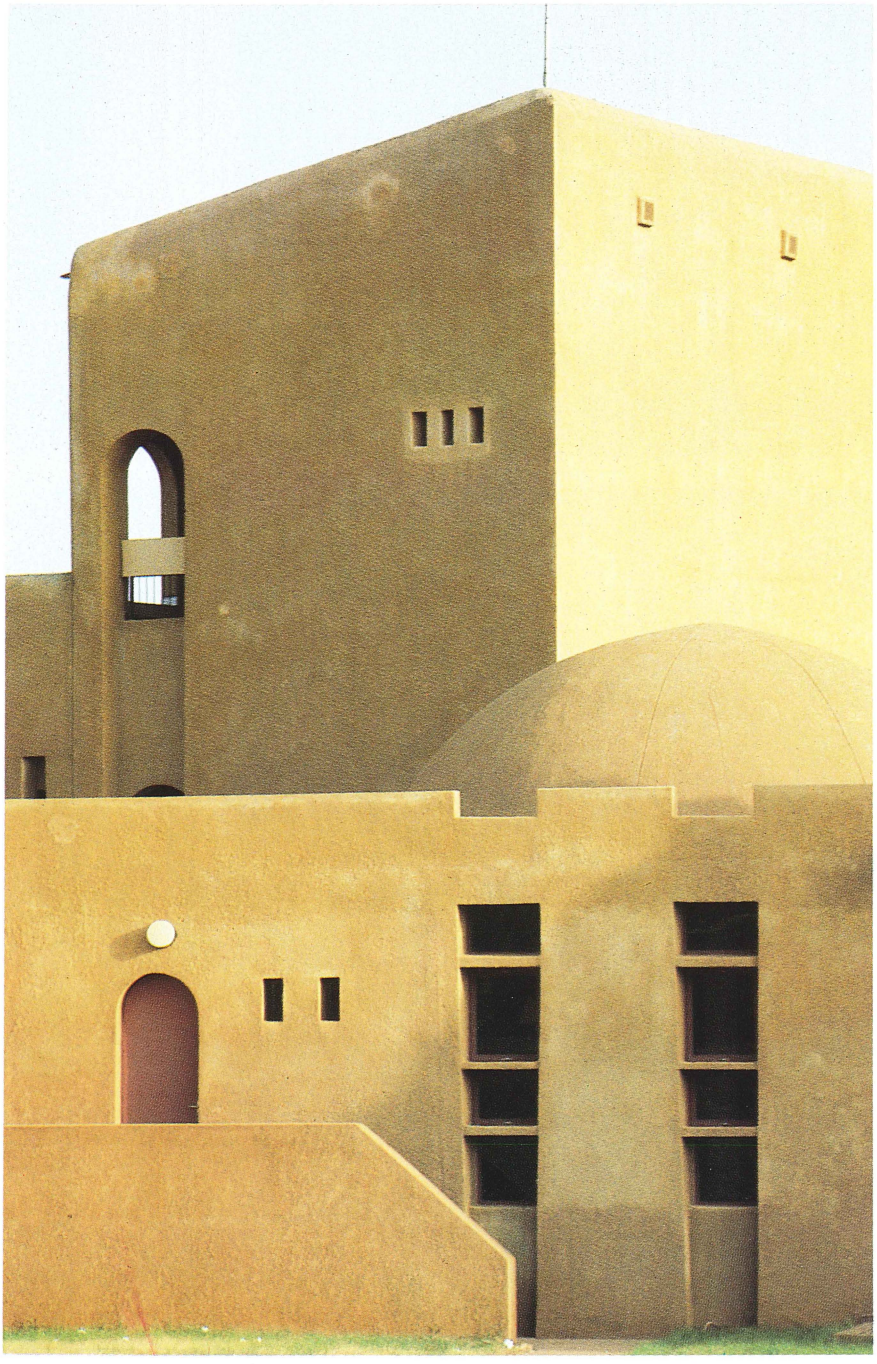


*Ground floor plan*

0 10m

*Right, above: Interior courtyard.*
*Right : Covered passageway linking north and south wings of the main building.*





*Left: South façade with two-storey laboratory blocks in foreground.*
*Left, below: Detail view of low entrance building and a portion of the two-storey research block.*