INFRASTRUCTURE FACILITIES

1. COMPUTER CENTRE

Computer Center provides the necessary computing and information sharing tools to the scientists/engineers at CAT. Computer Center has done software development for various scientific applications and it has also built a campus wide local area computer network providing access to various computing and other servers. A brief description of the various development and support activities is given below:

- Software for instrumentation setup for training of magnets: For performing quality check of the magnets designed by our center, but manufactured elsewhere.
- Software for harmonic coil measurement: For alignment of the magnets and performing various measurement and analysis tasks on magnets.
- Software for DC permeability measuring: For measuring B-H characteristics of the soft magnetic materials using the DC Permeameter.
- LDAP based directory search system: For designing low-cost, customizable directory search systems over Internet.
- Email system administration software: For web based email system administration on Linux.
- Web based collaboration software: For collaboration among users of precision manufacturing systems at CAT.
- Integrated telephone data management module: for all services like telephone directory on web, billing etc.
- Web based budget-monitoring software: for project coordinators.
- Up gradation of computing resources of the center by configuring 4 nodes compute cluster and installation of one high-end compute servers.
- Imparting formal computer training to the employees in upcoming computer technologies and as per the user needs.
- Anunet implementation and maintenance for inter DAE, voice and data communication.

(Reported by: Anil Rawat; rawat@cat.ernet.in)

2. INDUS-2 CIVIL CONSTRUCTION

Construction of second phase of Indus-2 building, which included 18-metre wide column free annular experimental hall (see fig. 2.1) for beamlines, is at the advance stage of completion. The building apart from stringent quality control has several special features like non prismatic folded plate, vacuum dewatered floor raft on designed granular sub base to achieve limiting differential settlement, structural steel false ceiling to accommodate various services for magnet Power Supply, R.F Power Supply, LCW etc. Annular EOT crane of 2 MT capacity designed for anticipated torsional stresses was provided with accurate alignment. The shielding walls were optimally utilized as structural support for folded plate roof, crane brackets, service gallery etc.

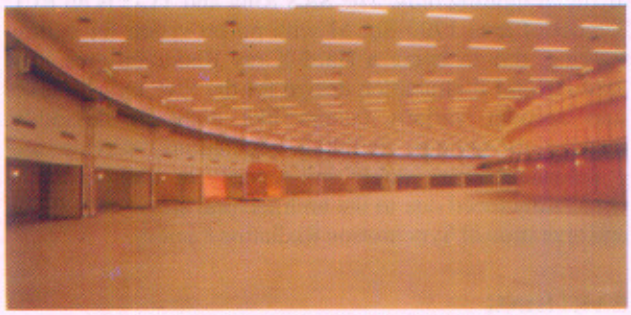

Fig. 2.1 The Experimental hall of Indus-2

Building features at a glance

a) Plinth area of SRS ring & TL3-1820 Sq. M
b) Plinth area of Exp hall & User's Lab.-1091 Sq. M
c) Level of False Ceiling-7.00 M
d) Anticipated cost of Civil, PH, Electrical bulk power, HVAC and miscellaneous works: Rs 2553 Lakhs

Non-prismatic folded plate was cast in 7 pours with a designed joint for thermal expansion and contraction using specially designed scaffolding and shuttering keeping in view the safety aspect. Double shuttering of folded plate roof was also an important additional feature for enhanced durability of concrete ensuring proper compaction while vibrating on slopes.

Specifications:

Cement: 43 grade ordinary Portland Cement. aggregate: 20mm & down gauge conforming to IS 383.

Steel: Thermo mechanically treated bars Fe 415 grade.

Concrete mix: M25 for folded plate and M20 for rest.

Density of concrete: 25 KN per cu.m.

Flooring: Self-leveling epoxy over Ironite floor topping in TL3 and SRS ring. Hardonite topping in all areas except offices.

Waterproofing: China mosaic over folded plate roof and cement based treatment over rest of the area.

ELECTRICAL WORKS

The total electrical power requirement for Indus Complex has been estimated to the tune of 10 MVA. Electrical power distribution for the subsystems needed different approaches in their planning. Moreover, due to the layout and the nature of loads, special design approach has been adopted.

The majority area of the main building depends on artificial lighting only. The SRS Ring and TL-3 is an RCC Tunnel of area 1700 Sq. M with no provision for natural lighting, due to being a Hard-X ray Radiation area. The approach for illumination design for the SRF Indus-2 takes into account various factors like comfort, flexibility, installation savings, building regulations, service and maintenance costs, safety and security in addition to the constraints faced due to the architectural shape of building and operation of Synchrotron Radiation Facility.

EARTHING

Special type of earthing with 21 Nos. of 50 M Deep bore earthing pit having interconnections with 400mm widex2mm thick electrolytic grade copper plate for RF Power Supply has been provided.

BUS TRUNKING SYSTEM

A TPN, 160A, 415V, IP 52, bus trunking system has been specially designed for circular shaped building. The same has been installed inside the SRS Ring and TL-3 for flexible power distribution having number of Tap-off points.

SUB STATION

Sub station for Indus facility comprises 7 nos. of 11/.433 KV oil filled transformers, 13 nos. of 11 KV vacuum circuit breakers, 100 M, 3000A LT bus duct, and LT panels having air circuit breakers and MCCBs etc, 200 AH battery and battery charger SCADA System and other associated equipments. The SCADA system has a parallel station in the Indus-2 control room. Transformers, LT panels and bus ducts have been installed.

A/C WORKS

Indus-2 building as of now is the single largest HVAC load, approximately 600 TR, designed for stringent requirements. Major feature of this project is incorporation of Direct Digital Control (DDC) for remote and centralized operation of 15 air handling units. CO_2 sensors for fresh air demands are an advanced concept for conservation of energy. All the major equipments have been installed and are ready for testing and commissioning.

(Reported by: A. M. Kekre; kekre@cat.ernet.in)