

as heat pump in winter. This has not only reduced the cost of resistive heating but has also enabled precise control of temperature. It also provides added benefit of energy saving. In hot mode the indoor units work as condensers and outdoor units work as evaporator. Option of running the system in Cold/Hot mode is available in the installed software.



Fig.I.4.5: Alignment Lab Calibration table

The complete system has been tested for hot mode as well as cold mode. The calibration facility is in use.

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I.5: Clean Room for Laser Micro Machining Centre as per Class 8 of ISO 14644

A clean room has been made for the Laser Micro Machining Centre (built in the new Laser Work Centre Building Laser Systems Engineering Division) that will fabricate Fiber-Bragg Gratings using ultra violet laser from the second harmonic of Copper Vapor Lasers. The planning, design, execution and third party validation of the clean room has been completed in all respect.

The room is designed for 20 air changes per hour with 8.75 TR, 4400 cfm condensing units with fully ducted air supply and return. The duct losses, which account for 5-10% of total loss, have been reduced by using pre-fabricated ducts manufactured by lock-forming machine and special slip making tools. Terminal High efficiency particulate air filters (HEPA) with filtration efficiency of 99.97% @ 0.3 micron have been used with low grill velocity of 150-175 fpm. The clean room is designed to be maintained at 10 Pa of positive pressure and equipped with Magnahelic Gauges for online monitoring of positive pressure & HEPA filter status to ensure reliable operation of the system. The laser particle counts finally achieved and measured were found to be around 10000 which is one class better than the desired.

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I.6 Erection of Experimental station platform for TIFR experiment on Cosmic Ray Measurement

In the wake of the solar eclipse on 22nd July 2009, Tata Institute of Fundamental Research had planned a month-long experiment for cosmic ray measurement to be carried out on top of the Accelerator Development Lab building of RRCAT. The experimental platform was a raised structure above the roof level of the building at a leveled floor free of vibration and radiation. The estimated loading on the platform was about one metric tonne.

Starting from the planning, structure design and the selection of materials, the work was executed within a week's time, complete in all respects, including the safety provisions of railings, approaches, ladders, illumination, grounding and lightning protection etc. A control room was set up just in vicinity of the platform, with complete power distribution, illumination and air-conditioning systems. Communication arrangements along with emergency power supply arrangements like UPS and generator back up were also made.

Technical summary of the work is as given below:

Size : 4m x 6 m

Level: 12.5 from the Finished ground level outside the building

Weight bearing capacity of the structure: 1.5 MT

Electrical loads in the control room: 5 kVA

Air-conditioning: 2 Nos of 1.5 TR Split type Air-conditioners.

Total Time from Concept to Completion: 10 days.

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I.7 Other Civil Works

Chemical treatment facility building with a provision for chemical treatment of large components, which can be handled by using the installed 5 MT EOT crane was completed and occupied. Chemical resistant epoxy flooring and provision of drainage pipe network and effluent treatment plant are special features of the facility. For the hazardous chemical rooms, indirect illumination scheme has been adopted. For flexible power distribution in the high bay area bus trunking system has been used.

Radiation shielded vault of R & D block 'G', meant for installation of Laser based accelerator set up, has been cast with stringent temperature control & joint preparation.

A lecture hall with a capacity of 110 seats has been setup in the RRCAT Training School Building. Special features include scene selection through illumination with intelligent luminaires and air-conditioning system.

About 25 % work of construction of 18 nos type IV-D houses has been completed. About 50% work of construction of PG Hostel building has also been completed.

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