

### SECTION III

#### ENVIRONMENT MANAGEMENT FRAMEWORK

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The section here lists out the various elements/aspects/measures that will help in creating and maintaining good and safer campus environment. The list provided under the various sub-heads is a comprehensive one to ensure that various possibilities that often exist in a national level project can be addressed effectively.

##### **I. Building Design and Related Aspects for Extensions**

During the designing ensure the following mandatory activities:

- Water Supply arrangement/s, as per applicable norms
- Sanitation arrangement/s, as per applicable norms including separate arrangements for men, women and physically challenged
- Waste water discharge or disposal arrangement/s
- Adequate storm water discharge arrangement
- Floor height and window area, as per National Building Code (NBC) norms.
- Promote wood substitutes and use of materials like fly ash and unleaded paint.
- Adoption of relevant construction code/s, applicable for earthquake, cyclone, flood and/or landslides.
- Barrier free access for the physically challenged.

Clear and comprehensive drawings for various utility services such as wiring, water supply, waste collection and disposal, plumbing, drainage and sewage disposal diagrams will be made (as explained in Section 8).

Additionally, the following suggestive measures shall be considered and provided in the design:

- Building or block orientation, keeping in mind the solar and wind direction and also the existing layout (as explained in the earlier sections to the extent possible).
- Natural Light and Ventilation in Classrooms, Laboratories, Canteen and Toilets
- Appropriate shading devices (*chajjas* and louvers)
- Signage inside and outside the building
- Display/notice boards for display of information in the classrooms and at other required locations.
- Fire and electrical safety arrangements
- Provision of alarms or hooters to alert building occupiers in case of emergency.
- Clear demarcation of escape routes and assembly points for emergency situations.
- Provision of parking (segregated for two and four wheelers)
- Preserve existing trees, to the extent possible.

Many of these measures can be given effect even when there is no new construction involved.

The Office of the University Engineer generally look into these aspects. For the special cases, every effort is made to appraise the University Engineer's Office about these mandatory and suggestive measures. The Institute is full of greenery and situated beside Botanical Garden. Most of the points mentioned above are mentioned in this Institute. **The Planning and Monitoring Board and the Building Committee draw plans of development of the Institute.**

## **II. Environment Augmentative Measures**

The following suggestive environment augmentative measures should be encouraged in the institutes:

- Rain water harvesting.
- Promotion of energy efficient lighting.
- Provision of acoustic measures.
- Use of heat reflecting glass.
- Promotion of water conservation measures.
- Promoting use of solar energy.
- Minimization of paved area: Eg: Loose aggregate and paving stones can be used for pedestrian movement areas in place of a hard concrete surface.
- Appropriate use of colors for buildings and walkways. Eg: Colors that absorb less heat can be chosen.
- Vermi-composting for biodegradable waste.
- Landscaping (such as of roads, parking areas, water bodies, entry and exit gates, boundary walls, open spaces and footpaths)
- Tree plantation (including use of drip irrigation system to reduce wastage of water)
- Use of locally available materials, as possible.

The Department of Architecture, town and Regional Planning of this Institute is generally entrusted with ensuring these measures.

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**III. Environment and Safety Management Measures for the Construction Stage**

The institute will ensure that the implementing agency (such as CPWD or State PWD) and/or its contractor fully abide by the required legal requirements, including adherence to labour laws such as Building & Other Construction Act, Minimum Wages Act, Child Labour Act, Equal Remuneration Act, etc. Some key environment and safety requirements that need to be enforced and monitored include the following:

- Provision and enforcement of Personal Protective Equipment (PPE), as relevant to the needs of the work.
- Ensuring proper safety precautions during erection, use and dismantling of temporary structures such as scaffoldings.
- Ensuring proper barricading and delineation of worksites.
- Ensuring that the required electrical, fire and mechanical safety practices are followed during various construction operations.
- Ensuring provision of safe access and working platforms for workers and supervisors.
- Display of information on Minimum Wages.
- Provision of accommodation for workers as per norms.
- Provision of proper potable water supply arrangements for workers.
- Provision of sanitation arrangements (toilets, urinals, bathrooms) for workers (including separate ones for women workers, as required).
- Provision of first aid and emergency response arrangement.
- Minimization of wastage including reuse and recycle of materials, as possible.
- Proper stacking and disposal of waste materials (including proper segregation, storage and disposal of any toxic and hazardous wastes).
- Use of acoustic jacket for generators to be used during construction work.
- Ensure proper and safe storing/stacking of construction material.
- Provide for silt control measures, if there are any streams/water bodies in the vicinity.
- Proper planning and sequencing of construction activities to reduce/minimize disturbance to students.

These requirements should be clearly mentioned in the Bidding Documents.

All these steps will be followed for a new project by the University Engineer. For upcoming Projects, it will be through implementing agencies. Most of the items are followed in this Institute.

#### **IV. Integration of Environment Management Aspects**

The key steps that will guide the integration of environment management measures into civil works are as follows;

- Step 1: A reference to the environment management elements/measures (planning or design stage related) listed in the section above needs to be made. Then, a clear list of elements that will 'apply' to the particular civil work being proposed needs to be identified/ made.
- Step 2: The identified environment management elements/measures need to be clearly reflected/ marked in the Detailed Project Reports including Design Drawings.
- Step 3: The construction stage environment management requirements need to be integrated into Bidding Documents.

The civil works cum environment coordinators both at the institute and the state level will cross-check and ascertain the integration of environment management aspects into civil works. Format provided in Annex 4 should be used for this purpose.

#### **V. Over-all Maintenance/Management of the Campus**

All institutes participating in the project (even in cases where no new construction is proposed) need to ensure over-all cleanliness and hygiene in the campus. This includes:

- Adequate provision of waste collection bins including arrangements for segregation of solid wastes and their regular disposal.
- Separate collection and disposal of toxic, inflammable wastes, specifically from laboratories.
- Hygiene in kitchen, mess, canteen and toilets
- Proper storage of materials (whether in kitchen/mess, workshops and stores)
- Provision and maintenance of first aid boxes, particularly in laboratories and workshops.
- Posters with safety and cleanliness messages, as applicable.

Each and every items will be ensured by the Office of the University Engineer.