ENVIRONMENT, HEALTH, AND SAFETY

MANUAL

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Approved and Issued By:

Managing Director

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FOREWORD

Shristi is a leading infrastructure development group in India which specializes in railways, airports, marine and off-shore, roads, highways, flyovers, power plants, townships, hotels, residential and commercial complexes.

The Shristi Group proudly confirms the desire, intention and commitment towards Sustainable Development. It considers the ***Environment, Health, and Safety*** *as an integral part of our strategic development model. We are committed towards the welfare of the environment, ensuring highest level of safety to our workers at site, and emphasizing on a continual improvement of the same. We are sensitive towards the environmental impact associated with our infrastructure business – be it a Sports complex with a training academy at Haldia, an Integrated township at Asansol, a world class 5 star hotel at Rajarhat, or a Integrated Logistic Hub at Ranigaunj.* ***All our projects have always given utmost importance to environmental impacts associated with our operations, and have taken mitigating measures for the same. It has also ensured complete health care facilities to our workers at site, and adopted the highest level of safety management practices.***

Keeping all this in mind, this ***"EHS Manual"*** *has been framed which clearly spells our Vision, Objectives, Plan of Action, taking necessary mitigatory measures against major non-conformance in EHS, and last but not the least, aiming at continual improvement in Environment, Health, and Safety.*

Date:

Managing Director

1.0 THE EHS POLICY

The Shristi Group is aware of the importance of Environment, Health, and Safety and shall strive for its continual improvement in their regular business activities. This would be integrated with Planning, Design, Purchase, Construction, Installation & Commissioning of facilities, Services and also during Selection and Placement of Personnel.

We shall strive for:

- Increased awareness, through campaigns and training program among employees, contractors, and clients, about significant environmental aspects, occupational safety and health risks and control measures.
- Ensuring compliance with applicable legal & other requirements
- Making realistic efforts to prevent injuries, accidents, occupational diseases, fire, explosions, pollution, and damage to equipment, property & environment.
- Achieving a level of "Minimum Man days Loss" due to accidents.
- Installing a sense of duty in every Shristian towards "personal safety", as well as that of others working with us.
- Carrying out regular EHS audits on regular basis to ensure that systems are in place, updated and continually improved.
- Setting and reviewing EHS objectives and targets on points mentioned above, and publish EHS performance in the Annual Report.

Each Senior Executive, and Officers of the company should ensure:

- Health and safety of employees working under him / her
- Identification of Environmental Health and Safety hazards and provide training to the subordinates working under him / her
- Initiating corrective measures for eliminating or, minimizing risk from hazards identified by him/her or, by his/her subordinates.
- Knowing and ensuring compliance with legal requirements in his/her area of work.

It is expected from each employee

- To Know and adhere to Environmental Health, and Safety requirements applicable to his/her job.
- Work safely to ensure his/her safety, safety of others & the environment.
- Use Personal Protective Equipments (PPE) and promote its usage among all.
- Actively participate & bring unsafe acts, unsafe conditions & environmental issues to the notice of his/her superior.

2.0 THE PROJECT EHS PLAN (PEHSP)

- EHS plan will assist the construction team to address all Environmental Health, and Safety issues in a professional way and as per Safety standards during entire execution of the project.

PEHSP TO ADDRESS THE FOLLOWING ISSUES:

- ✓ *PEHSP objectives*
- ✓ *PEHSP Organization Structure*
- ✓ *PEHSP Rules, Procedure, and Discipline*
- ✓ *Traffic management*
- ✓ *Permit system*
- ✓ *Site administration facilities*
- ✓ *PEHSP Performance Monitoring & Reports*
- ✓ *Emergency Preparedness Plan*

2.1 PEHSP Objectives

Objective of the PEHSP is to facilitate safe execution of the Project by adopting eco friendly approaches in a healthy environment as per the various stages of construction.

The following Objectives are to be accomplished:

- Identify critical activities & assess the risks associated therein & suggest proper mitigation measures to avoid incidents/ accidents.
- Integrate Environment, Health, and Safety Standards at all work levels.
- Create EHS awareness among every individual associated with the project execution.
- Provide the necessary EHS inputs & guide the project Site Management.
- Formulate and effectively maintain the accident prevention program.
- Establish responsibilities / accountability for EHS.

2.2 PEHSP ORGANISATION STRUCTURE

The Construction Manager is entrusted with the responsibility of implementing the EHS Standards at Project Site through all the contractors. He would be assisted by the entire project team to ensure that the EHS practices are properly implemented at site. The Construction Manager will review the EHS status with contractors at least on monthly basis and record the proceedings.

Shristi Engineers during their regular rounds of the project site shall carry with them a "Hazard Spotting Report" (attached at Annexure- II) and shall issue it to the contractor in case any unsafe work or potential hazard is observed.

The Construction Manager shall insist on contractors to identify Safety Officer in their team. The responsibility of the Safety Officer implementing the EHS Standard at site would be:

- Developing a "Safe Work Culture"
- Induction Training to New Joinees
- Organise meetings / trainings / awareness spreading
- Ensure effective EHS Inspection, rules, procedure, and discipline and implement Permit System.
- Create continuous awareness through motivational talk, Safety meetings, safety slogans, and signs.
- Ensure effective housekeeping
- Maintain EHS records for all statutory compliance.

Safety Officers shall be supported by Safety Stewards (1 for each 25-30 workers) for effective implementation, as also be provided with site administration facilities.

This would be reviewed and revised by Construction Manager on monthly basis or earlier as per requirement.

2.3 PEHSP RULES, PROCEDURES, AND DISCIPLINE

The PEHSP shall try to address the EHS rules, procedure, and discipline to be set at Site apart from General Safety rules.

- Permit to Work System
- Barricading / warning signs / Working at heights / Fall protection
- Mandatory use of Personal Protective Gears like Helmet, Safety shoes, welding goggles, hand gloves as required.
- Access Control / entry to authorised personnel only.
- Prohibition of use of Electronic equipments
- Ensuring strict "no smoking" at site
- Environment management / Hygienic condition requirements at work place / House Keeping / Waste Management & Disposal
- Machinery & Hand tools safety
- Plant Equipment / vehicles operations and safety requirements
- Energy distribution, installation & Electrical safety
- Fire prevention and fire protection.

2.4 PEHSP TRAFFIC MANAGEMENT

PEHSP will comply with the following Traffic Managements requirements.

- Drivers to have proper license
- Restriction on speed Limit, compulsory wearing of seat belts.
- Proof load testing / certification by competent person for material handling equipments.
- Providing warning signs and signals at appropriate places.
- Providing regular training to drivers / operators
- Ensuring proper tyre pressure, head light condition, and vehicle in good condition

2.5 PERMIT SYSTEM

Objectives of the permit system at the construction site are:

- To consider all possible hazards and remove those before allowing work to proceed.
- Inform the personnel carrying out the work of particular procedures and precautions they must use in order to carry out the work safely.
- To eliminate the risk of unauthorized persons of entry in the restricted areas.

Suitable permits will be taken before proceeding with any work at site. The concerned Safety Person must ensure this at construction site:

2.6 PEHSP SITE ADMINISTRATION FACILITIES

PEHSP plan will comply with the following site administration facilities and the Safety Officer would ensure its effectiveness in implementation:

- **Trained first aid persons** shall be posted at site to administrate first aid injuries. If it is not possible, it has to be organized with nearest First aid Centre.
- **Standard first aid box** with eyewash facility will be available at first aid center.
- First aid medicines will be periodically inspected and maintained
- **Qualified doctor / medical personnel** will be identified and agreement will be made to treat the ill / injured person round the clock.
- **Random inspection** would be done on the first aid facility and evaluate the requirement and recommend improvements to the top management.
- **First aid register** will be maintained to analyze the root causes of the injury and illness signals
- **Designated space /** room for induction training.

2.7 PEHSP PERFORMANCE MONITORING & REPORTS

The person in charge of implementing the effectiveness of the EHS at site would be required to periodically monitor the EHS implementation. This would be ensured through the following manner:

- ✓ Preparing Weekly Safety Minutes of Meeting as reviewed by Construction Manager
- ✓ Prepare EHS performance report for the followings -
  - Near miss case
  - Frequency rate
  - Severity rate
  - Incidence rate
  - Accident rate
  - Reportable sick cases
  - Hazard / Risk
  - Accident Reports.
- ✓ Examine the Safety Audit Report maintained by the Principal Construction Contractor, and take necessary action as far as non – conformance would be concerned.
- ✓ All these would be reviewed by construction manager and forwarded to the Project owner for discussion in the Review Meetings at Head Office.

2.8 EHS EMERGENCY PREPAREDNESS PLAN

The EPP (Emergency Preparedness Plan) is an integral tool of the EHS Manual, and the EHS / Safety Officer would ensure its effective planning and implementation. The Key Features of the EPP would be :

- ✓ **Listing out for all important TELEPHONE NUMBERS (OFFSITE EMERGENCY) as under, and displaying them in a Notice Board at each of the Company's Project Site:**
  - ❖ Local DM Office
  - ❖ Local Zilla Parishad Office
  - ❖ Local Fire Station
  - ❖ Local Police Station
  - ❖ Local Hospital / Nursing Home

- Local Medicine Shop
- Home Department, Writers Building, Govt. of WB

ONSITE EMERGENCY TELEPHONE NUMBERS should include

- Managing Director
- Construction manager at site
- Head of construction at HO
- CEO
- COO
- Head of Human Resources
- Head of Administration

- Arranging for **Fire Extinguishers** and making aware of the people at site on how to use them during emergency
- Arranging for **Mock Drills** atleast once a month.
- Arranging for Emergency Procedures involving personal injury / chemical burn / bleeding
- Formation of an **Emergency Action Committee** to ensure effective action. Such a Committee at site should include –

  - ✓ Demarcation of the areas to be evacuated with priorities;
  - ✓ Safe area and shelters;
  - ✓ Security of property left behind in the evacuated areas;
  - ✓ Functions and responsibilities of various members; and,
  - ✓ Setting up of joint control action.

The **Emergency Action Committee** would comprise of the followings:

- Construction Manager
- EHS / Safety Officers nominated by Contractors.
- Project Owner
- Representative from HR Department
- Representative from Administration Department

3.0 INDEX FOR MEASUREMENT OF EHS

The EHS should have an index for its measurement, and the EHS Incharge should ensure its effectiveness in implementation. Some of the major index of measurement of EHS is outlined below:

- ✓ **Near Miss Case**

  An incident that had the potential to cause personal injury, & property damage

- ✓ **Hazard**

  Hazard is any existing or potential physical condition in the workplace that by itself or by interacting with other variables can result in death, injuries, property damage and any other losses.

- ✓ **Risk**

  Risk is the likelihood that the hazard will result in an accident. Risk also considers how serious the resultant injury would be.

- ✓ **Reportable Sick cases:**

  A sickness case causing disablement of the affected person for 48 hours or more excluding the day of work on which he fell sick.

- ✓ **Frequency Rate**

  Number of Reportable lost time injuries per million man hours worked.

$$\text{Frequency Rate} = \frac{\text{Number of Reportable Lost Time Injuries} \times 10^6}{\text{Man-hours worked}}$$

- ✓ **Severity Rate**

  Number of man-days lost due to reportable injuries per million man-hours worked.

$$\text{Severity Rate} = \frac{\text{Mandays Lost due to Reportable LTI} \times 10^6}{\text{Manhours worked}}$$

✓ **Incidence Rate**

Ratio of number of injuries to the number of persons during the period under review. It is expressed as number of injuries per 1000 persons employed.

$$\text{Incidence Rate} = \frac{\text{Number of injuries or indents recorded x 1000}}{\text{Average Number of Persons Employed}}$$

✓ **Accident Rate**

$$\text{Accident Rate} = \frac{\text{Frequency Rate X Severity Rate}}{\text{Risk Index}}$$

ANNEXURE – 1: ACCIDENT INVESTIGATION REPORT FORMAT

1. DETAILS OF THE PROJECT	
Project Site	
Nature of Project	
Business Unit & Sector	
Name of the EHS Person nominated by Construction manager	
Name of the the Project Owner	
Name of Principal Architect	
Name of Principal Contractor	

2. Category of Accident			
☐ Near Miss Case	☒ eportable Loss Time Injury	☐ Dangerous Occurrence	☐ Fatality

3. Details of the Accident (Write N.A if not applicable)

Name of the person	Age	Sex	Designation	Working Since

Date & Time of Accident:	

3.2) Exact Location where the Accident occurred:

3.3) Nature of Injury:

3.5) Describe briefly how the accident occurred (Add sketches and additional sheets to support the description): .
4. Causes of the Accident
4.1) Direct Causes: .
4.2) Root Causes:
5. Precautionary Measures
5.1) What are the precautions taken / being taken to prevent similar occurrence?
6. Any other information
.

(CONSTRUCTION MANAGER)

ANNEXURE – 2: HAZARD SPOTTING REPORT

1) EHS Officer's Report Number:
2) Name of the Contract:
3) Location Grid:
4) Date of Inspection / Audit:
5) Time of Recording:

For Action By:
Contractor _____

For Information To:
Client _____

ITEMS CHECKED		
1) Scaffolding	7) Portable Tools	13) Health hazard
2) Ladders	8) Electricity	14) First Aid
3) Demolition	9) Guarding / Fencing	15) Site tidiness
4) Excavation / Earthworks	10) Gases	16) Registers / documentation
5) Lifting Appliances / Gear	11) Safety Equipment	17)Working at heights
6) Plant / machinery	12) Fire Protection	18) Welfare

Remarks:

ITEM NO.	COMMENTS (LIST DEFECTIVE ITEMS ONLY)

Signature of contractor's official

Signature of Client's official

ANNEXURE – 3: SAFETY CHECKLIST

(FOR DISPLAY IN THE WALLS AT SITE)

SAFETY CHECK LIST

- ✓ Helmets and Shoes for all the staff and workers
- ✓ ENSURE fire extinguisher and sand bucket are healthy and placed at the location.
- ✓ REMOVE fire hazard materials from site.
- ✓ LPG Cylinder NOT TO BE USED in project area use acetylene.

Following SAFETY MEASURES to be taken at the time of using Welding Machine and Electrical Hand Tools -

- Isolating switch fixed with the machine
- Earth wire connected with the machine and source
- Use proper lugs with welding lead.
- All electrical connections must be shrouded
- No PVC tape joint in the cable.
- Use welding holder for earth lead also
- Prefer use of cutler hammer metallic plug top only
- Keep fire extinguisher with welding machine.
- Use black glass/goggles for the welding.
- Use hand gloves for welding
- Only double insulated wires with plug tops to be allowed on site.

Following SAFETY MEASURES to be taken at the time of using Hotwork, Gas Cutting, Lead Caulking etc.

- Keep fire extinguisher while working
- Use goggles at the time of working
- Use hand gloves
- Cylinder must be placed vertically
- Use mask while working
- Wet sack cloth to be spread around to arrest sparks flying around

MISCELLENEOUS SAFETY MEASURES

- ➢ Only LICENCED AND AUTHORIZED ELECTRICIAN must work on electrical panel.
- ➢ While working electrician must use RUBBER HAND GLOVES, GOGGLES also

- Take work permit and make use of pad locking.
- WORK PERMIT must be taken for demolition, hot work, and deep excavation, working in a confined space and working at a height.
- USE SAFETY BELT at the time of working at height.
- USE MASK at the time of working on Marble Cutting Machine, Lead Caulking or any other work which can create dust or fumes.
- USE SCAFFOLDING made out of pipes and with the provision of Toe Guard. Bamboo and wood to be discouraged and not above 10 feet
- STABLE AND GOOD QUALITY LADDERS only to be used.
- DO NOT ALLOW LOOSE CABLES to float on the floor.
- USE STANDS FOR HOLDING HAND LAMPS. No naked bulb holders allowed.
- Check First Aid Box at site for the stock of medicines as per the list lying inside the box. Record usage of medicines to track incidents.
- DISPLAY of proper safety signage and instructions at site.
- Keep EDUCATING WORKERS and engineers of contractor for safety measures. Do Fire Drills and use of extinguishers for guards. Keep ATTENDANCE RECORD of people who attend safety meets.
- DISPLAY CONTACT NUMBERS of HODs, Engineering and Security Control, Ambulance, Hospital for EMERGENCY CONTACT.
- All the tools used at site should be certified by the authorized engineer for its safe-worthiness. INSPECTION STICKER of engineer on tools is a must. CONFISCATE illegal tools, which are unsafe.
- Marble polishing machine, wood cutting machine and air compressors must have
  - Isolating switch fixed with the machine
  - Earthing connected with the machine and at source
  - Electrical connections fully shrouded.
  - Mechanical guard for the moving part.
  - No tape joints in the cable/wires

When using excavators (JCB's etc.), keep site personnel clear of boom area.

- During excavation, all rock drillers to have EAR PROTECTION MUFFS, EYE PROTECTION, GLOVES and DUST MASKS. Indent more dust mask, if required.
- ENSURE PROPER SHORING of loose soil through planks shuttering and propping arrangements.
- All fire extinguishers to be MOUNTED ON THE WALL AT 1 metre height.
- All temporary electrical outlets to be protected with ELCBS AT DB LEVEL.

ANNEXURE – 4: MANAGEMENT OF FIRE SAFETY

FIRE PROTECTION

Fire protection is one of the most essential services to be provided and taken care of in the construction sites. In design component of the project adequate measures would be taken as per the provisions of the **National Building Code (SP 7: 1983 Part IV Amendment No 3 of January 1997)**. The fire safety measures are discussed below.

Fire Safety Measures

Special safety measures would be taken for Fire Safety. Separate and individual circuit lines for water pumps, lifts, lightings, fire pumps are provided so that one switch operation is possible. A separate firewater tank should be proposed at designated places of the proposed construction sites. The building materials shall be of appropriate fire resistance standard. Further, design shall include provision for the following:

- The electrical systems shall be provided with automatic circuit breakers activated by the rise of current as well as activated by over current.
- Fire detection systems
- Fire Alarm systems at appropriate places
- Means of escape,
- Access for fireman
- Adequate fire fighting requirement shall be taken into account while designing the electrical distribution system
- Separate and individual circuit lines for water pumps, Lifts, Lightings, Fire pumps are provided so that one switch operation is possible.
- Entire project should be protected by providing Fire hose reel to be reached to all parts of the proposed project.
- Detection and fire fighting system, HVAC system shall be interlocked with fire alarm/smoke detectors so that in the event of fire units shut down automatically and thus there shall be cutting of air supply.
- Sprinkler in all the floors and even in the office area should be provided as per the standard requirement.
- Automatic Sprinkler system should also be preferably there..
- If possible, there would be arrangement for "Public Addressing system (Voice Evacuation system)". The campus if possible, should be provided with "Talk back facility" and "2-way communication facility".

Apart from these the following safety measures should also be taken:

When Fire Alarm Sounds:

- The campus should be evacuated immediately via nearest exit;
- Use of Elevators should be avoided and greater emphasis on stairwells;
- If fire is small, attempt should be made to extinguish it.

Fire Extinguisher

Fire extinguishers are labelled according to the kind of fire they would be effective against. Proper attention must be paid to read the label & confirm with certainty the appropriate equipment needed to extinguish the fire. Labels will indicate:

Class A - wood, paper, grass, cloth
Class B - grease, oil, flammable liquids
Class C - energized electrical equipment

Fire Extinguisher Use Instructions:

- The ring pin is to be removed by pulling;
- The discharge lever is to be squeezed;
- Discharge nozzle is to be directed at base of fire;
- All fire should be out before stopping discharge;
- Back away from extinguished fire; and,

Environmental Health & Safety should be reported as soon as possible about the fire and the need for extinguisher recharge.

ANNEXURE – 5: HEALTH CARE INITIATIVES

The Principal Contractor should ensure the following health care initiatives for the labours working under him.

- ✓ ESI Registration of the labours
- ✓ Accident Insurance for the labours
- ✓ Pre employment and periodical health checkup of all the labours
- ✓ Provision of adequate first aid boxes in all departmental shops and floors
- ✓ Well equipped and adequately maintained Occupational Health Centre inside the construction site.
- ✓ Ensuring availability of trained doctors, compounders, and ambulance at site round the clock.
- ✓ Tie ups with reputed nursing homes / pathological centres in the locality for effective treatment of the labours.
- ✓ Proper sanitation and housing of the labours at site.

The Principal Contractor should ensure these through a periodic audit, which would be supervised by the Construction Manager / Project owner.