

# SAFETY CODE FOR CONTRACTORS



**National Aluminium Company Limited**

(A GOVERNMENT OF INDIA ENTERPRISE)

**SMELTER PLANT**

**ANGUL (ORISSA)**



*Safety code of contractor is mainly aimed at the use of personal protective equipment by contractor workers working in various types of work environment in Smelter. It is expected that the Engineer-in-Charge of each section / area will carefully go through the instructions and take adequate care of his contractor workers on the need to comply with the instructions containing herein.*

Date: 16th April 2011

**S. S. Mohapatra**

General Manager, Smelter

(Manager of the Factory, under Factories Rule 1950)

**Note:** *copy of these rules should be given to all the contractors,, Sub- Contractors or Agents through Contract Cell along with the Work Order*

## CONTENTS

| SL. NO. | Description   | Page No. |
|---------|---|----------|
| 01      | General Safety  | 3        |
| 02      | Responsibilities  | 4        |
| 03      | Safety Regulations  | 6        |
| 04      | First Aid & Industrial Injuries                               | 6        |
| 05      | Precautions against Fire                                      | 9        |
| 06      | Explosive   | 9        |
| 07      | Preservation of Peace   | 9        |
| 08      | Outbreak of Infectious Diseases                               | 10       |
| 09      | Treatment of Contractor's Staff in Company's Hospital         | 10       |
| 10      | Use of Intoxicants  | 10       |
| 11      | Contractor's Barricades                                       | 10       |
| 12      | Scaffolding   | 11       |
| 13      | Excavation and Trenching                                      | 12       |
| 14      | Demolition of Work  | 12       |
| 15      | Personal Safety Equipments                                    | 13       |
| 16      | Care in Handling Inflammable Gas                              | 15       |
| 17      | Temporary Combustible Structure                               | 15       |
| 18      | Road Safety   | 16       |
| 19      | Dumping ,Piling and Stacking                                  | 16       |
| 20      | Structural Erection   | 17       |
| 21      | Rigging   | 17       |
| 22      | Mechanical Erection   | 18       |
| 23      | Welding & gas Cutting   | 20       |
| 24      | Electrical  | 21       |
| 25      | Tools & Appliances  | 23       |
| 26      | Vehicles & Railways   | 24       |
| 27      | Mobile Lifting Appliances, Hoisting Machines' and Tackles     | 25       |
| 28      | Fork lift Pay loader  | 27       |
| 29      | Overhead Cranes   | 28       |
| 30      | Painting  | 28       |
| 31      | Cleaning  | 29       |
| 32      | Roofing   | 30       |
| 33      | Procedure for changing sheets in roof and other works on roof | 31       |
| 34      | Appendix-A,IOW(Contractor employees)                          | 34       |
| 35      | Appendix-B, Notice of Fatal accidents                         | 35       |
| 36      | Appendix-C, Working at height permit                          | 36       |

## SAFETY CODES

### 1. GENERAL SAFETY

- 1.01. Safety is responsibility of every worker individually and collectively.
- 1.02. The Contractor shall in connection with work provide adequate guards, illumination, fencing and watching wherever necessary at the construction site and working area for the safety and convenience of public or others.
- 1.03. Adequate Fire Extinguishers shall be kept by the contractor at the site of works where there is risk of fire hazard , especially near the site stores.
- 1.04. Adequate washing facilities with proper drainage shall be provided by the Contractor, properly maintained near the place of work but at a safe distance from railway tracks and busy roads.
- 1.05. An injury sustained in the Plant, must be reported through proper channel to Owner immediately with no time lapse, no matter however slight as per Appendix–A (Injured on Work Format)
- 1.06. In case of fatal accident, the contractor must inform the Engineer In- charge of the department for which he is working. Safety Department should be promptly intimated and report in writing should be made in the form as per Appendix-B (Notice of Fatal Accidents to Contractor Employees)
- 1.07. Smoking and carrying of matches, lighters and other spark producing devices are strictly prohibited within the area where inflammable liquids are stored, handled or used or where loading or unloading operations are performed. Any tank or container containing flammable liquid should be properly grounded for preventing ignition due to static electric spark.
- 1.08. Contractors should ensure that workers under his control do not come to work while still under the influence of intoxicants. Any worker found on duty under the influence of liquor or of intoxicating drugs, will be liable to severe disciplinary action /removal from site.
- 1.09. Contractors should ensure that workers under his control should use crash helmet while using two wheeler.
- 1.10. Work surroundings should be kept clean, free from oil, grease and other obstructions or fallen objects like nuts,

- bolts, scrap steel etc.
- 1.11. After a job work is completed, all left- over junk and the scrap materials should be cleared from the site immediately, otherwise the running bill will not be cleared until and unless the area is kept clean after the job is over.
  - 1.12. Drums or other make –shift arrangement must not be used in place of ladders or as work benches or supports for any job. However, Contractor should confirm in writing before taking up the job regarding availability of tools, tackles and ladders etc.
  - 1.13. Horseplay of any kind is prohibited inside the plant. No one should distract attention of others on work.
  - 1.14. Wearing of jewellery like finger rings or loose clothing such as Dhosis, Lungis, Turbans, Dangling sleeves ,Gloves, Ties , loose shirts etc. is prohibited when working near or around moving machinery.
  - 1.15. Workers must not walk through or across any operating units unless their duties require them to do so or they are authorized to do so.
  - 1.15. Compressed air should not be used for removing dust from the clothes. Compressed air should not be blown against any one as it may injure or even kill him.
  - 1.16. Water from fire hydrant should not be used for bathing / washing clothes other than its normal intended use.
  - 1.17. Contractor should particularly ensure that they or their workers do not meddle with any equipment and see that they keep away from such equipment.
  - 1.18. Contractor should ensure that no one takes rest/ shelter under any cut pit /excavation or near any stock of materials or under any standing/parked vehicle.

## 2. RESPONSIBILITIES

Contractor should adhere to safe construction practice and guard against hazardous and unsafe working conditions and shall comply with Owners Safety Rules as set forth herein. Prior to start of construction, contractor will be furnished copies of Owners Safety Code for information and guidance. However following clauses are strictly adhered to and the following agencies will be Responsible against each item for carrying out safe working practices.

- 2.01. The contractors shall take all safety precautions and provide adequate supervision by competent persons in order to ensure job safety without damage to equipment.
- 2.02. Along with contract document and job instructions from executing department, where he will be further briefed about the job, the contractor is not permitted to start the job without reporting to Safety Department
- 2.03. The contractor shall ensure of necessary shut- down where ever there are hazards of gases, electricity, moving machineries etc by the executing department & also ensure that these shutdown clearances are taken in writing before sending workers to such locations.
- 2.04. The contractor shall supply Safety appliances like safety shoes, helmets, gloves, Dust mask, rubber aprons, safety goggles, etc. to his workers depending on working conditions as advised by Safety Department
- 2.05. In addition in specific jobs, the contractors will supply Special Safety Appliances like Acid proof clothing, Rubber Gloves, Face Shield and Goggles for working on Acid/alkali lines; Gas Mask and Respirators, Safety belts, full body safety harness, Gum Boots in some case; Rain Coats , Asbestos Aprons etc. to the worker for use by them.
- 2.06. The Engineer in-charge executing the contract upon his satisfaction that the Contractor is not performing as per the safety requirements may direct stoppage of work. The contractor shall not proceed with the work until he has complied with such directions to the satisfaction of concerned Engineer in-charge.
- 2.07. The contractor shall be fully responsible for accidents caused due to him or his agents workmen's negligence or carelessness in regard to the observance of the safety requirements and shall be liable to pay compensations for injuries.
- 2.08. Without prejudice to the right conferred by the **Clause – 2.06** above for stoppage of work for violating of safety requirements, the contractor shall be liable for penalty up to Rs.3000/- for the first violation and up to Rs. 5000/- for the second violation. For the third violation, he shall be liable to be debarred from further contracts up to a period of one year minimum from the date of completion of jobs in hand.

- 2.09. The Engineer in-charge executing the contract will assess the penalty amount having regard to all the circumstances, in particular the nature and the gravity of the violation. & will issue a show- cause notice specifying therein the proposed penalty. Considering the cause shown by the Contractor, if any the The Engineer incharge executing the contract shall pass final orders which shall then be final and binding on the contractor. The penalty amount shall be recoverable from any bill and / or EMD/ SD of the Contractor without any further reference to him.
- 2.10. Whenever work at height is involved, contractor must obtain working at height permit from concerned Dept. for those persons required to do work at height as per Appendix -C
- 2.11. Contractor must insure all against Workmen's Compensation Act .

### 3. SAFETY REGULATIONS

- 3.01. In respect of all labour, directly or indirectly employed in the work for the performance of Contractor's part of this agreement, the contractor shall at his own expense arrange for all the safety provisions as per:
- Safety code of C.P.W.D. and BIS.
  - The Electricity Act
  - The Mine Act
  - Regulations, Rules & Orders made there-under
  - Factories Act
  - Labour Laws and
  - Safety Code of Nalco
- And Rules and order made there under and such other acts as applicable
- 3.02. The Contractor shall observe and abide by all fire and safety regulations of the owner. Before starting any work, contractor shall consult Owner's Safety Officer or Engineer In- charge and must make good to the satisfaction of the Owner any loss or damage due to fire to any portion of the work done under this contract or to any of the Owner's existing property.

### 4. FIRST AID AND INDUSTRIAL INJURIES:

- 4.01. Contractor shall maintain First Aid facilities for his workers and those of his sub-Contractors.

- 4.02. Contractors shall make outside arrangements for Ambulance service and for the treatment of the Industrial Injuries. Names of those providing these services shall be furnished to the Owner prior to start of construction and their telephone number shall be prominently pasted in Contractor's field office.
- 4.03. All critical Industrial Injuries shall be reported promptly to Owner, and a copy of contractors report covering each personal injury requiring the attention of a Physician shall be furnished to the Owner.
- 4.04. All contractors must maintain a First Aid Kit with them for use in emergencies. The First Aid kit must contain the following items:
- |  |   |         |
|--|---|---------|
| a) Aluminium Box                       | - | 1 no.   |
| b) Tincture Iodine –15 ml. (bottle)    | - | 1 no.   |
| c) Tincture Benzoin –15ml.(bottle)     | - | 1 no.   |
| d) Dettol –30ml.(bottle)               | - | 1 no.   |
| e) Spirit-30ml. (bottle)               | - | 1 no.   |
| f) Gause pieces (20 pcs)               | - | 20 pcs. |
| g) Roller bandages of different sizes  | - | 2 rls.  |
| h) Cotton                              | - | 5 gm.   |
| i) Borozine Eye Drop-10 ml.(bottle)    | - | 1 no.   |
| j) Triangular Bandage                  | - | 1 no.   |
| k) Merbromin Lotion –10 ml.(bottle)    | - | 1 no.   |
| l) Blade /Scissor                      | - | 1 no.   |
| m) Normal Saline- 500ml. (bottle)      | - | 1 no.   |
| n) Leukeplast(Roll)                    | - | 1 no.   |
| o) Antiseptic Ointmet-25 gm(Megadine)- | - | 1 no.   |
| p) Antibiotic Eye Applicap (pkt.)      | - | 1 no.   |
- 4.05. In case of Acid/ alkali burns, the affected parts of the body should be washed with profuse Water immediately and the injured person be sent for medical treatment.
- 4.06. If the clothing of any person catches fire, he should not be allowed to run. The flames should be smothered with thick clothing or blanket and the person should be rolled on the ground at once if these are not available.
- 4.07. The clothing sticking to the burnt parts should never be pulled. Blisters should not be pricked. If possible the burnt parts may be cooled by putting wet towels or in slow running water.
- 4.08. In case of shocks, clothes should be loosened; patient should be made to lie down comfortably on one side. He

should be re-assured. He should not be given any drink, only lips should be wetted with cotton soaked in water. If feeling cold he should be covered and sent for medical aid immediately.

- 4.09. In case of gas poisoning, the injured person should immediately be removed to an open aid area and given oxygen if possible and should be sent for medical aid immediately.
- 4.10. In case of electrical shocks or other types of shocks where breathing is stopped artificial respirations should be given immediately by trained first Aider.
- 4.11. All contractors should get some of their supervisors trained in First Aid methods.
- 4.12. In case of caustic burns, splashes, spillage and leakage etc. following precautions are to be taken:
  - a) If the substance has got into the eyes, immediately wash out with plenty of water for at least 15 minutes.
  - b) Remove contaminated clothing immediately and affected skin with plenty of water.
  - c) Seek medical treatment when any one has systems apparently to swallowing or contact with skin or eyes.
- 4.13. In case of bagging of abrasive materials like Alumina, Lime , Cryolite, Aluminium Fluorides etc. the following precautions are to be taken:
  - a) stack the bags properly, so as to prevent falling of piles
  - b) Do not use worn out bags for filling up, so as to prevent leakage of dusty material over body and face.
  - c) Suitable Personal Protective Equipments are to be used to prevent inhalation of the dusty material being bagged so.
- 4.14. In case of chlorine leakage, while handling it, the following precaution are to be taken:
  - a) If the substance has got into the eyes, immediately wash out with plenty of water for several minutes.
  - b) Remove contaminated clothing immediately, wash affected skin with plenty of water.
  - c) Seek medical treatment when any one has symptoms apparently due to inhalation of or contact with skin or eyes.
  - d) Persons who have inhaled the fumes must lie down

and keep quite still.

- e) Keep patient warm.
- f) Do not use artificial respiration if patient is breathing.

## 5. PRECAUTIONS AGAINST FIRE

The Contractor will have to provide Fire Extinguishers/ Fire Buckets and Drums at work site as recommended by Engineer In-charge. They will have to ensure all precautionary measures and exercise utmost care in handling the inflammable gas cylinders / inflammable liquids /paints etc.as advised by the Engineer In-charge. Temporary combustibile structures will not be built near or around the work site.

## 6. EXPLOSIVES

Explosives shall not be stored or used on the works or on the site by contractor without the permission of the Engineer In-charge in writing and then only in the manner and to the extent to which such permission is given. When explosives are required for the works they shall be stored in a special magazine to be provided at the cost of the contractor in accordance with the explosives rules. The contractor shall obtain the necessary licence for the storage and the use of explosives and all operations in which or for which explosives are employed shall be at sole risk and responsibility of the contractor and the contractor shall indemnify the owner against any loss or damage resulting directly or indirectly there from.

## 7. PRESERVATION OF PEACE

The contractor shall take requisite precautions and use his best endeavors to prevent any riotous or unlawful behavior by or amongst his workmen and others employed on the works and for the preservation of peace and protection of the inhabitants and security of property in the neighborhood of the work. In the event of the owner requiring the maintenance of a Special Police Force at or in the vicinity of the site during the tenure of works, the expenses thereof shall be borne by the contractor and if paid by the owner shall be recoverable from the contractor.

## 8. OUTBREAK OF INFECTIOUS DISEASES

The contractor shall remove from his camp such labour and their families who refuse protective inoculation and vaccination when called upon to do so by the Engineer In-charges Representative. should Cholera, Plague or other infectious diseases break-out the contractor shall burn the bedding clothes and other belongings of or used by the infected parties and promptly erect new huts on healthy sites as required by the Engineer In-charge, failing which within the time specified in the Engineer's requisition, the work may be done by the owner and the cost thereof recovered from the contractor.

## 9. TREATMENT OF CONTRACTORS STAFF IN COMPANY'S HOSPITAL

The contractor and his staff, other than labourers and their families requiring medical aid from the Owners Hospital and Dispensaries will be treated as private patients and charged accordingly. The contractors labourers and their families will be granted free treatment in Owners Hospitals and Dispensaries where no other Hospitals or Dispensaries are available provided the contractor pays the cost of medicines, dressing and money according to the normal scale as also additional charges if any for special examination e.g. X ray etc. However incase of emergencies, treatment will be extended to the patients with cost recovery from the contractor bills.

## 10. USE OF INTOXICANTS

The sale of dent spirits or other intoxicating beverages upon the working any of the buildings, encampments owned, occupied by or within the control of the contractor or any of his employee is forbidden and the contractor shall exercise his influence and authority to the utmost extent to secure strict compliance with this condition.

## 11. CONTRACTORS BARRICADES

- 11.01. Contractor shall erect and maintain barricades required in connection with his operation to guard or protect
- a) Excavations
  - b) Hoisting Areas
  - c) Areas adjudged hazardous by Contractors or Owners

Inspectors

d) Owners existing property subject to damaged by contractors operation

e) Rail, Road unloading spots

- 11.02. Contractors employees and those of his sub-contractors shall become acquainted with Owners barricading practice and shall respect the provisions thereof
- 11.03. Barricades and hazardous areas adjacent to, but not located in normal routes of travel shall be marked by red flasher lanterns at nights.

## 12. SCAFFOLDING

- 12.01. Suitable scaffolding should be provided for workmen for all works that can not be safely be done from the ground or from solid construction except such short period works as can be done safely from ladders. When a ladder is used a helper shall be engaged for holding the ladder and if the ladder is used for carrying materials as well , suitable footholds and handholds shall be provided on the ladder and the ladder shall be given an inclination not steeper than 1 in 4 (1 horizontal and 4 vertical).
- 12.02. Scaffolding or staging more than 10 metres above the ground or floor swing or suspended from an overhead support or erected with stationary support shall have a guard rail properly attached, bolted, braced and otherwise retarded at least one metre high above the floor or platform of such scaffolding or staging and extending along with entire length of the outside and ends there of with only such openings as may be necessary for the delivery of the materials. Such scaffolding or staging shall be fastened as to prevent it from swaying from the building or structure.
- 12.03. Working platforms gangways and stairways should be so constructed that they should not sag unduly or un-equally and if the height of the platform of gangway or the stairway is more than 4 meters above ground level of floor level, they should be closely boarded, should have adequate width and should be suitably fastened.
- 12.04. Every opening in the floor of a building or in a working platform be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 1 metre.
- 12.05. Safe means of access shall be provided to all working

platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 metres in length. The width between the side rails in run ladder shall in no case be less than 30 cms .for ladder up to and including 3 metres in length; for longer ladders this width should be increased at least 15 mm for each additional metre of length. Uniform step spacing shall not exceed 30 cms. Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or public. The contractor shall also provide all necessary fencing and lights to protect the workers and staff from accidents and shall be bound to bear the expenses of defense of every suit, action or other proceedings of law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay damages and cost which may be awarded in any such suit or action or proceedings to any such person or which may with the consent of the contractor be paid to promise any claim by any such person.

### **13. EXCAVATION AND TRENCHING**

- 13.01. All trenches 1.2 meters or more in depth, shall at times be supplied with at least one ladder for each 50 meters length or fraction thereof.
- 13.02. Ladder shall be extended from the bottom of the trench at least 1 meter above the surface of ground. The side of the trenches which are 1.5 meters in depth shall be stepped back to give suitable slope, or securely held by timber bracing, so as to avoid the danger to collapse. The excavated materials shall not be placed within 1.5 meters of the edge of the trench or half or the trench width which is more. Cutting shall be done from top to bottom. Under no circumstances undermining or under-cutting shall be done.

### **14. DEMOLITION WORK**

Before any demolition work is commenced and also during process of the demolition work

- a) All roads and open areas adjacent to the work site either be closed or suitably protected.
- b) No electric cable or apparatus which is liable to be a

- source of danger shall remain electrically charged.
- c) All practical steps to be taken to prevent danger to persons employed from risk of fire or explosion of flooding. No floor roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.

### **15. PERSONAL SAFETY EQUIPMENTS**

All necessary personal safety equipment as considered adequate by the Engineer In-charge, should be kept available for the use of the persons employed at the site and maintained in condition suitable for immediate use and the contractor should take adequate steps to ensure proper use of equipment by persons concerned as outlined below:

- 15.01. Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective foot wear and protective goggles.
- 15.02. Those engaged in white washing and moving or stacking of cement bags or any material which is injurious to the eyes shall be provided with protective goggles and dust respirators.
- 15.03. Those engaged in welding work shall be provided with welders protective eye shields.
- 15.04. Those engage din breaking of stones shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
- 15.05. When workers are employed in sewers and man holes which are in use, the contractors shall ensure that the manhole covers are opened and chambers are force ventilated with blower at least for one hour before the workers are allowed to go down in to the man holes, and so opened shall be cordoned of with suitable railing and provided with warning signals or boards to prevent accidents to public.
- 15.06. Safety belt with a sufficiently long life line should be worn before going down any manhole. Strict vigilance must be maintained whenever work inside sewers/ manholes are in progress and at least one supervisor /responsible person must ALWAYS be present at the opened manhole.
- 15.07. The workers going to the inspection chamber shall have

- gas masks, gum boots and rubber gloves while working inside. After coming out they shall have some disinfectant from the first aid box for proper washing.
- 15.08. Safety guards, safety devices and other equipments must not be tampered with and should always be used. Utmost care should be taken to keep the safety equipments and appliances in good condition. They should be inspected every time before use. If any defect is found either it should be rectified or reported to the supervisor concerned.
  - 15.09. Adequate foot wear or safety boots must be used by all workers working inside the plant.
  - 15.10. Safety goggles must be worn while grinding, whether by means of a portable electrical grinder or working on a table grinding machine.
  - 15.11. Gloves must never be worn while working on moving machinery particularly on grinding wheels.
  - 15.12. Full body safety harness must always be worn when working at heights. The minimum diameter of life line should be  $\frac{3}{4}$  inch for manila rope and  $\frac{1}{2}$  inch for nylon rope. The manufacturer test certificate of the safety harness to be submitted to the safety department before taken to them use.
  - 15.13. The contractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Whenever men above the age of 18 years are employed on the work of lead painting, the following precautions should be taken:
    - a) No paint containing lead or lead products shall be used except in the form paste or ready made paint.
    - b) Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.
    - c) Overalls shall be supplied by the contractor to the workmen and adequate facilities shall be provided to enable the working painters to wash them on cessation of work.
  - 15.14. When the work is done near any place where there is a risk of drowning all necessary safety equipments shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision should be made for prompt first aid

- treatment of all injuries likely to be sustained during the course of work.
- 15.15. All scaffolding, ladders and other safety devices mentioned or described herein shall be maintained in safe conditions and no scaffoldings, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities should be provided at or near places of work.
  - 15.16. These safety provisions should be brought to the notice of all concerned by displaying on a notice board at a prominent place at the work spot. The person responsible for the compliance of the safety code shall be named therein by the contractor.
  - 15.17. To ensure effective enforcement of the Rules and Regulations relating to Safety Precautions, the arrangements made by the contractor shall be open to inspection by the Welfare Officer, Engineer In- charge, Safety officer or their representatives.
  - 15.18. Notwithstanding the above clauses there is nothing in these to exempt the contractor from the operations of any other Act or Rules in force in the Republic of India. The works throughout, including any temporary works, shall be carried out in such a manner as not to interfere in any way whatsoever with the traffic on any roads or footpaths at the site or in vicinity thereto or any existing works whether the property of the Administrations or a third party.
  - 15.19. Smoking within the battery area, tank farm or dock limits is strictly prohibited. Violators of the no smoking Rules shall be discharged immediately.
- 16. CARE IN HANDLING INFLAMMABLE GAS**  
The contractor has to ensure all the precautionary measures and exercise utmost care in handling the inflammable gas cylinders/ inflammable liquids/ paints etc. as required under the law and /or as advised by the Fire Authority of the Owner.
- 17. TEMPORARY COMBUSTIBLE STRUCTURE**  
Temporary combustible structure will not be built near or around work site.



## **18. ROAD SAFETY**

- 18.01. All contractor employees must follow the Standard Road Safety Rules framed for the Purpose
- 18.02. Nobody should try to cross the level crossing when drop gates are closed or signal is given for blocking the road. STOP, LOOK & PROCEED should be followed.
- 18.03. None should try to cross under the standing train or down the tack where wagons are parked.
- 18.04. None should cross through the gap between buffers of wagons.
- 18.05. Under haste should be avoided.
- 18.06. All warning, cautions, instructions, DOs and DON'Ts of safety should be observed strictly by every one.
- 18.07. All should be attentive while crossing roads and level crossings. It should be remembered that Rail Traffic has the right of the way on railway level crossings.
- 18.08. While crossing the railway level crossing do not step on the track rail. Always cross over it.
- 18.09. The speed limits displayed among the road should be strictly followed.
- 18.10. Short-cuts and crossing across the corners should be avoided.

## **19. DUMPING, PILING, STACKING AND TRANSPORTING**

- 19.01. Materials shall not be dumped against wall or partitions to a height that may endanger the stability of the walls. A gap of minimum 18inch should be left between the wall and the stacks so as to check the construction and stability of stack.
- 19.02. While withdrawing piled materials like loose earth crushed stone, sand etc. from the stock piles, no overhanging shall be allowed.
- 19.03. No material on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or public or any other agency at work.
- 19.04. Dumping, piling or stacking of material below overhead Electric lines must be avoided.
- 19.05. No person should stand inside closed wagons (e.g. Box-wagon)being loaded / unloaded by crane. However before going inside for releasing /fixing the sling crane operator must be first informed and the crane boom and load brought to a dead stop.

- 19.06. No material should be piled, dumped or stacked at random, but only in areas specified for the same.
- 19.07. Roads, passage ways should not be blocked by dumping, piling or stacking of materials.
- 19.08. All materials should be stacked properly. The stack height should not exceed 4 ft. above ground level.
- 19.09. Safe approach to be provided and maintained from individual stack to place of work.
- 19.10. No materials should be stacked within 5 ft of the railway track.
- 19.11. Any loose material like sand, dross, bath, scrap to be transported in covered condition. If any spillage occurs on the road the same to be cleaned immediately at contractors' own labour and cost. Shifting of ingots, wire coils, and Billets etc. finished product to be transported with properly tied condition.
- 19.12. Transporting of material with more than one hydra crane at a time should never be used.

## **20. STRUCTURAL ERECTION**

- 20.01. All persons shall stand clear when a crane is sorting or shifting steel gliders or other structural materials
- 20.02. No person shall stand, walk or work beneath any suspended load.
- 20.03. Guide rope must be used for guiding while lifting load.
- 20.04. When guiding a beam or fabricated structure for erection it shall be so held that the workers' hands do not get jammed against other objects.
- 20.05. Safety belts equipped with suitable life lines must be used by persons working at heights and standing on structural members. Life line must be tied to an independent support. No non standard device other than a safety belt should ever be used. The manufacturers test certificate of safety belt/ full body harness to be submitted at the safety department before taken into use.
- 20.06. Shifting of load with the help of two hydra crane at a time should never be used.

## **21. RIGGING**

- 21.01. Lifting tools, tackles, slings ropes, Lifting machines, winch machines, lifting tacks etc. must be produced for inspection and load testing by a competent person before putting it for use. All such pulling /lifting machines must

be properly marked their safe load carrying capacity and date of test clearly on the machine. A record of such tests is to be kept with the Contractor for verification by Owner and production to Statutory Authority as and when required.

- 21.02. Defective or worn out tools, tackles, ropes or slings should never be raised even if the load appears small.
- 21.03. While hooking, slinging or unhooking any load, hands should be kept out of the pinch point.
- 21.04. Before lifting the load, it must be ensured that the crane hook is properly centered and the load balanced so as to avoid undue tilting or swerving of the load while lifting.
- 21.05. Slings should never be overloaded. For this is most important to have a corrected assessment of the load being lifted. In case of any doubt, Site In-charge /Supervisor should always be contacted.
- 21.06. While using double edged slings, the angle made by the legs with the horizontal should always be kept above 45 degree so as to prevent any overloading of sling. This is best achieved by using sufficiently long slings with the legs moderately spaced.
- 21.07. Only one person should signal the crane operator and only standard signals should be used.
- 21.08. Traveling loads should be always raised high enough to clear all obstacles coming in the way.
- 21.09. No person should walk or stand below any swinging load.
- 21.10. Slings should be released only after ensuring that they are completely free from load.
- 21.11. While using jack, care should be taken to provide wooden block both at the top and at the base of the jack.
- 21.12. If hydraulic jack is used, the load lifting should rest on wooden block or temporary support to prevent mishap due to failure of jack.

## **22. MECHANICAL ERECTION**

- 22.01. Load to be properly ascertained and position of center of gravity as well as load transfer at slinging point to be thought of before handling any equipment.
- 22.02. A special check is required regarding fitness of all lifting and haulage tackles, ropes, slings etc.
- 22.03. Selection of Tommy bars, rollers, kids etc. should be made depending on the type of equipment to be handled.
- 22.04. The common tendency of checking gear meshing,

lubrication, coupling matching, hole matching etc. by feeling with a finger must be strictly curbed.

- 22.05. Gas cutting of any member must be avoided.
- 22.06. In case of all installation to be tested and tried, the suppliers' instructions should be properly studied and followed during installation and testing.
- 22.07. A general check on integral or other service system, lubrication system and check on free and easy movement of all moving parts and their safe clearances to be taken care before such test.
- 22.08. All safety features to be checked.
- 22.09. Regulations e.g. Boiler regulation, regulation for explosives, electricity rules etc. and any other set procedure e.g. working near gas line, etc. should be followed.
- 22.10. Attention should be paid to all mechanical safety guards, toe boards, hand railings, hatchway covers, and ladders.
- 22.11. Grinding wheels should be handled with care. These should be visually inspected/ checked by ringing test for possible damage before mounting. Before mounting matching of the wheels maximum operating speed (marked on the tag) against machine speed should be ensured. Mounting flanges should be equal and diameter at least 1/3 dia, of the wheel. Wheels should be covered by guard at least one –half of the grinding wheel and operator should use safety goggles. Wheels should not be tempered for mounting and no materials should be ground for which the wheels are not designed for.
- 22.12. Working on roof top has the danger of person falling down. If work is to be carried out over fragile roof, all men required to work on the roof top should be trained for safe work on the roof top. Crawling boards should be made use of during any work on the fragile roof top. Also, caution boards should be fixed up at the ladders leading to the roof top "Danger Do not go to the roof top without permission" Use of fabricated roof ladders to work on fragile roofs is recommended.
- 22.13. Eye bolts fixed at correct slinging points for heavy machinery parts, motors, generators, turbines etc. should be utilized for handling.
- 22.14. Torque wrenches should be provided for taking the correct strain during tightening of nuts on bolts.
- 22.15. Supplier's instructions should be strictly followed for

- special installation e.g. fixing of friction grip bolts etc.
- 22.16. Safety valves for steam, compressed air gas requirement and expansion joints should be checked.
  - 22.17. No slings should be overloaded, Safe Working load for fibre rope and wire rope slings as given should be strictly adhered to.
  - 22.18. Proper quality of pulley block should be used. In no case pulley block suitable for fibre rope should be used for steel wire rope.

### **23. WELDING AND GAS CUTTING**

- 23.01. Oxygen cylinders must not be stored near other cylinders containing gas or oil, grease or other combustible materials.
- 23.02. While cylinder is in use, the cylinder valve, key or wrench must be placed on the valve spindle
- 23.03. Before a cylinder is moved, the cylinder valve must be closed.
- 23.04. Gas cutting torch must be lighted by means of friction flames or similar other methods and not with matches. Flash back arrester must be used.
- 23.05. When torches are being changed or welding stopped for short time, all cylinder valve must be closed.
- 23.06. The coloured lenses used for welding or gas cutting must be of proper shade for the work being done.
- 23.07. Before any heavy structural member is gas cut, it should be ensured that it is cleared and supported by ropes, cables, chains or any other means to prevent its dropping or swinging.
- 23.08. Substantial and combustible screen must be used below or near the welding operations, if there is a possibility of a spark falling on other workmen engaged in work close by.
- 23.09. All air/ gas pipe lines and air/ gas hoses are frequently inspected. Air/gas hoses shall not be used for de-dusting or cooling purposes.
- 23.10. Gas cylinders should not be stored near furnaces, cupolas, stove or any other source of heat. The cylinders lying in the open should be protected from direct rays of the sun.
- 23.11. All dissolved Acetylene cylinders should be kept in upright position whenever in use .
- 23.12. Gas cylinders should be placed in locations where sparks or flame from welding or cutting work cannot contact them.

- 23.13. The unloading and loading of gas cylinders must be carried out with utmost care:
  - I. Cylinders should not be allowed to drop or come into violent contact with one another. Adequate arrangement should be made to prevent cylinders falling from the vehicles.
  - II. Rolling of gas cylinders should be avoided and they should be transported by proper trolleys.
- 23.14. Oxygen and Acetylene cylinders should not be stored together.
- 23.15. Application of oil, grease or any other lubricating materials to regulators, valves or fittings of gas cylinders is **STRICTLY PROHIBITED**. Cylinders and fitting should be kept free from oil or grease to avoid ignition and explosion.
- 23.16. In case of leakage from regulators, valves or others fittings of the gas cylinders, the cylinders should be immediately removed and sent for necessary repair.
- 23.17. Proper protective clothing and appliances such as goggles, face shield, leather gloves, leather apron etc should be worn for protection against radiating heat and spark.
- 23.18. One should not watch an arc-welding operation with naked eyes.
- 23.19. When arc-welding operations are performed in an area not enclosed or isolated, workers or other persons connected with arc -welding job should wear coloured goggles.
- 23.20. It is preferable to provide portable shields in the area where arc –welding is carried out.
- 23.21. When welding or gas cutting is performed in a confined space, the cylinders should be left out side.
- 23.22. Suitable fire extinguishers in working condition should be kept closed to all welding and gas cutting operations.
- 23.23. In confined spaces, where the means of exit is a manhole other small opening, means should be provided, such as life belt and lift-line for quickly removing the workers in case of an emergency. An attendant should be stationed out side the exit at all times while the work is in progress.

### **24. ELECTRICAL**

- 24.01. All electrical installations shall be as per Indian Electricity Rules.
- 24.02. Only competent persons should make electrical connections and installations and electrical defects in line

with work permit. It is essential to ensure that they are not only capable of executing supervising the job but also have the necessary competent certificate as per statutory requirement.

- 24.03. The issue and return of permit to work should be operated by a person authorized to do so. Before energizing any installation testing of insulation resistances of individual units, proper phasing out and voltage testes, performance or protective control system, checking connection, making and tagging to be carried out. Safety appliances e.g. Rubber gloves, Rubber mat, Grounding Rod Neon Tester, Insulated Screw Driver, Plier etc. should be used. Installation should only be energized after taking necessary clearance from appropriate authority.
- 24.04. Only authorized persons shall handle or otherwise interfere with electrical equipment. Any person detecting an electrical apparatus being handled by an unauthorized person, or equipment in unsafe condition, must report the matter to executing authority in charge of electrical.
- 24.05. No person shall work on any live electrical conductor or apparatus, and no person shall assist such person on such work, unless he is authorized on his behalf.
- 24.06. All temporary electric line should be drawn at least above man's height. No live wire should be laid on the ground or wet surface. All the electrical joints should be properly insulated.
- 24.07. When working on the live equipment, only one hand should be used, preferably right hand, whenever possible. It is advisable to keep the other hand behind the back. Shocks from hand to hand are most dangerous.
- 24.08. All persons handling electrical gear in an elevated position must use safety belts, Even a slight shock may cause loss of balance and fall.
- 24.09. No one shall attempt to extinguish a fire on or near a live electrical apparatus with water as water is a conductor of electricity. Correct type (CO<sub>2</sub>, CTC or Dry Chemical) of extinguisher should be used wherever provided. Otherwise, sand and blanket may be used if available.
- 24.10. No person shall use any part of an electrical equipment,.
- 24.11. For attending the work on overhead lines or equipment, wooden ladders should be used. Metallic ladder shall not be used.
- 24.12. Insulated tools must be ensured that the insulation is in

proper condition by having periodical inspection at least once in three months. Rubber gloves should be used when working on HIGH TENSION LINES .

- 24.13. Verbal instructions shall be avoided in case of pre-arranged shut-downs of electrical Equipments.
- 24.14. When workers are employed for electrical installations, which are already energized, insulating mats, safety apparatus such as gloves, sleeves and boots as may be necessary, shall be provided. The workers shall not wear any finger rings, watches or carry keys and other materials which are good conductors to electricity.
- 24.15. The use of temporary wiring shall be avoided, frayed, loose or dangling wires are dangerous. These should be reported to the Electrical section for immediate repairs.
- 24.16. Hand lamps if used, must preferably be of a low voltage type (24 volt or 110 volt) and the earthlings must also be done properly.
- 24.17. Defective extension cords should not be used for cables or portable hand tools. Chords, cables and equipments are placed in such a way that they do not endanger any one
- 24.18. Permission must be obtained from the Executing Authority before any person is allowed on an elevated place or near power rails.
- 24.19. Abandoned electric poles should be removed if they are of temporary nature.

## **25. TOOLS AND APPLIANCES**

- 25.01. The contractor should see that sufficient number of good quality tools required for the work is made available to his workers.
- 25.02. The tools and lifting tackles should be inspected periodically and records of inspection maintained by a responsible person.
- 25.03. All hand tools such as chisels, Hammers, Files, punches, spanners, Wrenches etc. should be kept in good condition at all times.
- 25.04. Defective tools or tools having mushroom heads or tools having cracked or broken handles or improper fittings etc. should never be used. They should be replaced at once. Wrenches and Spanners should be kept in such a condition that they will not slip.
- 25.05. Tools should not be used for purpose other than for which they are designed.

- 25.06. Tools and materials shall not be left in elevated positions if there is possibility of their falling or being knocked off.
- 25.07. Tools or equipment should not be dropped or thrown from one level to another at any time.
- 25.08. All portable power tools such as Drills, Grinders, Saw etc. which are operated electrically should be thoroughly inspected before making use of them.
- 25.09. The ground wire provided to the electric tools should be checked.
- 25.10. Insulation of the cables and the chords must be intact. There should not be any joint and exposed live parts of the cables, chords or on the tools.
- 25.11. Sharp tools like chisel, knives etc. should be provided with casing.

**26. VEHICLES AND RAILWAYS**

- 26.01. No person shall board any vehicles or equipment when it is in motion.
- 26.02. Suitable blocks shall be placed against the wheels of a vehicle when it is used for tipping materials into excavation or a pit or over the edge of any embankment or earth work to avoid the danger of its running over the edge.
- 26.03. All workers shall stand clear of the Vehicle while it is dumping. If the material is being dumped is very heavy or sticky, dump hooks shall be used or dumper shall be clamped to prevent any danger of its tripping.
- 26.04. Materials shall not be used to be loaded in a vehicle so as to project horizontally beyond the sides of the body of the vehicle.
- 26.05. One should not take rest on rail-tracks or sit underneath stationary wagons.
- 26.06. One should not get on to locomotive or wagon unless he is an authorized person to travel or he has to go there in the performance of his duties. In any case the traffic crew must know his presence in the loco wagons.
- 26.07. Contractors should ensure that no material belonging to them is stacked close or high along the track. This reduces movement space for traffic crew and also obstructs their vision ahead.
- 26.08. If men have to work on or close to rail tracks, or materials are temporarily kept over the tracks, red flags on both sides should always be exhibited and advice to concerned

traffic zone should be given in advance.

- 26.09. While crossing rail tracks in Marshalling Yard, one should step over points, since points are remote controlled electrically.
- 26.10. Before crossing any un-manned level crossing, one should stop, look, listen and make sure no loco or train is approaching from either directions.
- 26.11. Blocking or using of running rail track inside the work is prohibited. If at all it is necessary to interfere with the rail track, prior permission must be obtained from the Traffic Department.
- 26.12. If men have to work on or close to tracks, red banner/ flags/ red light must be exhibited both sides and traffic department must be informed in advance.

**27. MOBILE LIFTING APPLIANCES, HOISTING MACHINES AND TACKLES**

- 27.01. No mobile lifting appliances shall be used on a sloping surface unless adequate
  - i. No persons should sit on loads or cabins in moving trucks.
  - ii. Proper scotch blocks to be given while transporting any material which is likely to roll.
  - iii. Loose material like muck, ash, chips, bricks etc. should not be loaded in excess of the height of the side boards.
  - iv. Nobody should stand in a moving truck.
  - v. Heavy and bulky packages should be properly tied to body of truck to avoid shifting and falling of loads.
  - vi. Before reversing one should make sure that it is safe to do so, if necessary the help of another person should be taken. Precautions are to be taken to ensure stability.
- 27.02. Adequate precautions shall be taken to see that the job of the mobile crane does not come in contact with overhead electric transmission line.
- 27.03. Only person shall give signals to the operator of mobile lifting appliances, and standard signals shall be used.
- 27.04. No loads shall be raised, lowered or suspended from a chain or rope having a knot in any of its parts

- 27.05. No chain which is joined to another chain by means of bolt and nut shall be used for rising/ lowering or suspending any load.
- 27.06. All chains, ropes and lifting gears shall be carefully examined and tested by a Competent person authorized by State Government at least once in a period of 12 months.
- 27.07. No person shall walk under a load which is swinging by a lifting equipment. Guide rope must be attached to the load to prevent its swinging.
- 27.08. Use of hoisting machines and tackles including their attachments, anchorage and supports shall conform to the following standards and conditions:
- i. a) These shall be of good mechanical construction, sound material and adequate strength and free from patent defect and shall be kept in good repair and in good working order.
    - b) Every rope used in hoisting or lowering materials or as a means of suspension, shall be of durable quality and adequate strength and free from patent defect.
  - ii. In case of every hoisting machine and chain, ring, hook, shackle, swivel and pulley block used in hoisting or lowering or as means of suspension , the safe working load shall be ascertained by adequate means and every hoisting machine and all gear referred above shall be plainly marked with the safe working load. In case of hoisting machine having a variable safe working load for the conditions under which it is applicable , shall be clearly indicated. No part of any machine or of any gear referred to above in this have the working load except for the purpose of testing. Mobile crane shall have the working load and the radius of job for the load marking on it.
  - iii. The top pulley for hoisting a load shall be opened monthly and the spindle inspected to any due wear has taken place and for greasing.
  - iv. In case of departmental machine the safe working load shall be notified by the executing authority or In charge of Electrical. As regards contractors machines , the contractor shall notify the safe working load of the machine to the Engineer In-charge whenever he brings any machinery to site of work and get it verified by the Electrical Engineer concerned.

- v. Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years should be In-charge of any hoisting machine including any scaffolding which give signals to the operator.
- 27.09. Motors, gearing transmission, electric wiring and other dangerous parts of hoisting appliances, shall be provided with efficient safe-guards. Hoisting appliances shall be provided with such means as will reduce to the minimum the risk of accidental descent of the load. Adequate precautions shall be taken to reduce to the minimum risk of any part of a suspended load becoming accidentally displaced.
- 27.10. When workers are employed on electrical installations which are already energized, insulating mats, wearing apparel such as gloves, sleeves and boots as may be necessary should be provided. The workers shall not wear any rings, watches and keys, or other materials which are good conductors of electricity.
- 28. FORKLIFT, PAYLOADER ETC.**
- 28.01. Only authorized persons will drive the above equipments.
- 28.02. Before starting, the equipment should be ensured that the brake, horn and lights are in good condition.
- 28.03. If any defect is found in the equipment, it must be reported at once to the supervisor concerned.
- 28.04. Before starting the equipment, one should look around and make sure that every body is clear.
- 28.05. While traveling the bucket, fork etc. as the case may be should lowered sufficiently to ensure maximum visibility.
- 28.06. It should be ensured that the engine has been stopped, the form or the bucket has been lowered and the hand brake has been applied before dismounting the pay loader of the fork lift.
- 28.07. Unauthorized riding on the equipment is prohibited.
- 28.08. While reversing the equipment, special care should be taken to see that the passage is absolutely clear. Likewise the same procedure should be observed while traveling forward, particularly with loads.
- 28.09. One should not drive too close to the edge of an excavation where caving-in earth is possible.

## **29. OVERHEAD CRANES**

- 29.01. One should not go an over head crane runway for any purpose without permission from the Electrical Foreman and without notifying to the crane operator.
- 29.02. One should not stand inside wagons when they are being loaded or unloaded by cranes.
- 29.03. No one should stand, or walk under loads suspended from a crane. Likewise crane operators must not carry loads over the heads of persons.
- 29.04. No work whatsoever in nature, shall be carried out near the crane walkways, girders of crane bus bar, unless permission in writing is obtained from the departmental Electrical Engineer In-charge or his representative. Crane operators must also be informed.
- 29.05. It is necessary to take power shutdown while working near the power rails.
- 29.06. If job is to be carried out in crane gantry agreed procedure is to be worked out in consultation with Electrical, Operation and Mechanical Department. Stop blocks to be provided on the gantry on either side at a distance about 20 ft. from working area. In addition, red flag(or at night red light)is to be provided to caution the crane driver about men working on the crane gantry. All men working on the crane gantry should be given induction regarding hazards due to clearance of the building etc. Caution boards wherever required to be provided at appropriate places.
- 29.07. Crane bridges should not be used as a means of access from crossing from one bay to the other. Proper passages provided for the purpose should be used.

## **30. PAINTING**

- 30.01. Any machinery/ equipment should be cleaned only after getting the necessary clearance from the concerned department.
- 30.02. Colour code of machinery /pipe lines etc. should never be changed without proper Permission of the concerned department.
- 30.03. A painter must always be provided with a Helper/ Asst. when painting at heights.
- 30.04. A supervisor must always be present at site whenever painting at heights is being done.
- 30.05. While painting at heights in addition to having safety belt,

painter should engage one hand in holding the paint brush and the other hand to catch support for him. Paint –box should never be carried in the hand while painting at heights.

- 30.06. While painting overheads, plain goggles should be worn to prevent paint from falling in eyes.
- 30.07. Before commencing painting of structural etc. near crane walkways, the crane operators in that area should be informed if the painting job to be undertaken and red flags should be displayed on both ends of the rail tracks.
- 30.08. Safety belts must always be worn when painting at heights. It is desirable to have safety nets tied below the area of work as additional protection in case of a fall.
- 30.09. While painting at heights, if any B.C.T. Crane comes just under the spot, stop painting and just sit or stand there till the crane moves away.
- 30.10. Great care should be taken to see that the crane bus-bars are not contacted either by the scaffoldings, slings or other hanging materials. Any job in the bus-bars area is to be done only after getting power shutdown.
- 30.11. The contractor shall not employ men below the age of 18 and women on the work of painting with products containing lead in any form. Whenever men are employed on the work of lead painting, the following precautions shall be taken:
  - i. No paint containing lead or lead products shall be used except in the form of paste or ready made paint.
  - ii. Suitable face masks should be supplied for use by them when paint is applied in the form of spray on a surface having lead paint dry rubbed and scrapped.
  - iii. Overalls shall be supplied by the contractors to the workmen and adequate facilities shall be provided to enable the working painters to wash after cessation of work.

## **31. CLEANING**

- 31.01. Any machinery / equipment should be cleaned only after getting the necessary clearance from the concerned department in writing.
- 31.02. While cleaning roofs, bags filled with dust should not be thrown down. These should be lowered down by help of ropes. Wherever down corners are provided, these should be used to bring down the refuse.

- 31.03. Persons engaged in cleaning of scrap metal sheets, turnings, mill scales must invariably wear shoes, helmets and also L.C.C. gloves.
- 31.04. While cleaning in fire hazard areas like oil cellars, by-products installations etc. smoking is strictly prohibited.
- 31.05. Before going down inside pits for cleaning/ removing scrap etc. department must be informed and prior permission taken at the beginning of each shift.
- 31.06. Electrical junction boxes, switch gears, fuse boxes etc. must never be tempered or cleaned without getting written clearance from the electrical section.
- 31.07. While cleaning rail tracks, red flags should be displayed at both ends of the track to warn the loco crew of the work in progress.
- 31.08. All workers engaged in cleaning jobs must be specially warned to be alert to the movement of overhead cranes, transfer cars, locos, trams and other mobile equipments which may be operating in their respective areas.
- 31.09. Before cleaning crane walkways, written clearance should be taken from the concerned departments.
- 31.10. Experience persons should be engaged, specially for cleaning of the crane walkways.
- 31.11. While cleaning tanks sufficient ventilation is to be ensured along with proper illumination inside the tank (24 volt). Oxygen concentration inside the tank is to be ensured before entering into it. Suitable Personal Protective Equipments are to be worn up to the satisfaction of the Engineer In-charge under whom the job is executed and all the jobs are to be carried out under strict supervision.
- 31.12. Before cleaning the effluent drains , the area should be taken under shut down, the pre-cast slabs are to be removed before cleaning to ensure sufficient ventilation. After the cleaning is over the pre-cast slabs are to be properly placed in its position, when man and materials are being removed from the drain pit. All the jobs are to be carried under strict supervision.

### **32. ROOFING**

- 32.01. All workers engaged in roofing jobs must wear safety belts, particularly in slope roofs.
- 32.02. One supervisor /responsible person must always be present at site whenever any roofing job in is in progress.

- 32.03. Great care is to be taken before climbing atop any fabricated roof for replacement of the worn out roof sheets (Corrugated asbestos cement or G.I.sheets etc.). It should be ensured that the roof structure is strong enough to sustain the load of the persons engaged.
- 32.04. No person should stand directly over roof of corrugated asbestos sheets. Two nos. of cat ladders (provided with hooks at top- end for getting support at the ridge end of the roof should be placed over the roof first and the persons engaged in the cleaning / repairing / replacement jobs should take position on one of these ladder can then be used for shifting position along the length of the roof as per requirement.
- 32.05. Dismantled roof sheets should not be thrown down on the ground or left loose on the roof. Ropes should be used for lifting or lowering the sheets.
- 32.06. On roofs where railings are not provided at the ends, great care is to be taken while doing cleaning /repairing /replacement jobs. Safety belts must be used and holding nets must be provided wherever required.

### **33. PROCEDURE FOR CHANGING SHEETS IN ROOF & OTHER WORKS ON ROOF**

- 33.01. Safe means of access should be provided for going to the roof. For this purpose, ladders which must project about one meter above the roof should be used .
- 33.02. Only person having work at height permit should be allowed to work at more than 3.5 meters height and on roof top.
- 33.03. While standing on the gutter, the safety belt should be worn and the life line should be tied to the purloin of the adjacent bay.
- 33.04. After changing two sheets/ asbestos and stitching them, sheets should be changed in longitudinal manner, after tying safety belts to the frame.
- 33.05. After changing two sheets each in longitudinal way , same procedure should be followed for other sheets. No sheets should be kept loose on the roof on any account.
- 33.06. For taking out bolts from old sheets, one ladder about 600 mm wide and 5 meters long can be placed on the sheets. The ladder should be tied /hooked to some fixed structure and the person using the ladder must tie safety belt with the ladder.



- 33.07. No loose material should be kept at the edge of an opening. All nuts and bolts, J hooks etc should be kept in a box. No piling over the asbestos sheets is allowed.
- 33.08. The area down below, work is going on the top should be cordoned off.
- 33.09. Drilling at the roof top with electrical drilling machine should be avoided.
- 33.10. If any single phase electrical line is required at the top, then the following precautions should be taken:
- a) Very good quality 3 core TRS flexible cable should be used.
  - b) The connection should be given only by a competent electrical person with proper earthlings.
  - c) All the plugs, sockets etc. should be of good quality and earthling should remain continuous.
  - d) The switch board should conform to the provision of Indian Electricity Rules. are not cut by the sharp edges of the sheets.
  - e) Care should be taken to see that the cables are not cut by the sharp edges of the sheets.
  - f) It should be laid in such a way that nobody stumbles or get entangled with the wire.
- 33.11. Sign boards (in 3 languages) warning about the fragile roof if any and not to walk on the roof without proper safety precautions should be placed at conspicuous places.
- 33.12. The Supervisor In-charge must check the roof , where sheets are to be changed first.
- 33.13. If any damaged or cracked sheet is found, then the same should be reported to the Officer In-charge and the sheet should be changed under strict supervisor In-charge.
- 33.14. Movement of persons as far as possible should be on the stitched portion of the sheets thereby the maximum load will be on the members and not on the sheets directly.
- 33.15. No material should be thrown from top.
- 33.16. At the end of the shift, the area should be checked by an experienced supervisor. No loose sheet should be left on the top.
- 33.17. In any factory no person should be allowed to stand, walk or do any work or go for any purpose whatsoever, on a roof or ceiling covered with or constructed of sheets plain, corrugated or otherwise made of cement, cement mixed with asbestos or with any other materials or any similar materials in respect of which there may be danger of the

sheet breaking due to the weight of the man and no person shall be allowed to work or go for any purpose whatsoever, on a sloping roof unless:

- a) Suitable and sufficient safety devices like ladders, access boards and crawling boards securely supported and fixed are provided and used.
- b) Suitable and sufficient parapet wall or any other equally effective device to prevent the person from falling from sloping roof is provided.

**Note: In addition to the above, the contractor shall abide the Safety code provision as per CPWD Safety Code and Indian Standard Safety Code framed from time to time.**



APPENDIX-C

Name of the Plant Unit:

**PERMIT FOR WORKING AT HEIGHT (Above 2.5 meters)**

- 01. Name of the Contractor Firm with Address:
- 02. Engaged by which Department:
- 03. Name of the representative /Supervisor of the Contractor supervising the job:
- 04. Precise nature of work to be carried out work order reference:
- 05. Precise location of work:
- 06. Proposed date and time of commencement of work:
- 07. Expected number of days required for the work:
- 08. Number of workers engaged for such type of jobs:
- 09. Whether Contractors workers are to be engaged in G,A,B,C shift and number of people engaged:  
 A) I accept responsibility for ensuring that all men under my control shall observe the statutory safety requirements and follow the safety instructions of the plant.

Date... Signature (Contractor)  
 B) (Certificate to be given by engaging Department)  
 Certified that the Contractor has been engaged by us for the work described above.

Signature:.....  
 Supervisor/Manager.....  
 Date.....  
 Department.....

C) (Certificate to be given by the Department/ Section where work is to be carried out ) You are authorized to carry out the work described above.

Signature.....  
 Supervisor/Manager.....  
 Date.....  
 Department.....

NOTE:  
 1) This form shall be filled in triplicate by the Contractor for record of ; Department engage the contractor, Dept./Section granting clearance and contractor.  
 2) These certificates are not a substitute for the Electrical Permits and do not give premises to use naked lights or work in gas hazardous areas or enter closed vessels, which shall be taken separately where required.