



ANNEXURE 8

HANDLING AND DISPOSAL OF HAZARDOUS MATERIAL AT CONSTRUCTION SITE

Eco-housing Assessment Criteria Version - II

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1 INTRODUCTION

The Hazardous Wastes (Management & Handling) Rules 1989 was notified by the Ministry of Environment and Forests, Government of India, under the provision of the Environment (Protection) Act 1986. The Hazardous Wastes (Management and Handling) Amendment Rules, 2003 came into force with effect from 20 May 2003 after further amendment to the 1989 rules.¹

Rule 3 of the Hazardous Wastes (Management and Handling) Amendment Rules, 2003 defines "Hazardous waste" as any waste which by reason of any of its physical, chemical, reactive, toxic, flammable, explosive or corrosive characteristics causes danger or is likely to cause danger to health or environment, whether alone or in contact with other wastes or substances.²

Manufacturers of products generating hazardous waste materials are required to provide detailed directions for handling and disposal of these products. These instructions are in the form of "Material Safety Data Sheets" (MSDS). MSDS for each product/material should be referred to for handling, storage and usage specifications. Precautionary steps for handling and disposal are necessary for the following reasons

- Protection of workers on site.
- Protection for other materials, products, equipments etc. on site
- Water, air and soil contamination

1.1 General Instructions for Handling and Disposal of Hazardous Waste

1. Labelling all hazardous products and waste as 'Hazardous Materials' in local and other preferred languages, should be incorporated as a general practice.
2. All waste classified as hazardous, should be isolated and stored as per the Hazardous Waste Management Rules or as per the MSDS provided by the manufacturer.
3. Locations to store the used/scrap wastes should be identified on the construction site and the items should be segregated and stored in the bins accordingly.
4. After filling up the scrap disposal form and certification from the Engineer/ Manager of the department, the waste is to be handed over to the authorized agency for disposal.
5. Fire Extinguisher should be accessible.
6. Emergency exit to be marked clearly and should be devoid of any obstructions.

In addition to the hazardous materials, following items used for application of hazardous chemicals should also be properly disposed

- Cotton Hosiery gloves/ Criss cross gloves
- Arm Guards
- Corrugated /Thermocol Scrap
- Plastic and glassware.

^{1& 2} http://www.cpcb.nic.in/Hazardous_waste.php , MOEF Notification, 20th May 2003, S.O. 593(E)

Following is a list of most commonly found toxicants, contaminants on a building construction site and certain guidelines for their handling and disposal. (NOTE: The MSDS for each product should be strictly adhered for each of these materials.)

2 MOST COMMONLY FOUND TOXICANTS & CONTAMINANTS ON A BUILDING CONSTRUCTION SITE

2.1 Asbestos products² – insulation, tiles etc

To effectively handle asbestos products, several elements need to be considered. Site Engineers and building owners must:

- Keep an up-to-date inventory of all asbestos-containing materials on the site/building
- Ensure that all asbestos-containing materials are clearly identified.
- Conduct a risk assessment of the potential for exposure to any of the asbestos-containing materials.
- Develop safe work procedures, including the correct use of personal protective equipment, for workers who may work near asbestos-containing materials
- Instruct workers who could be exposed, in all aspects of the asbestos handling precautions.
- Make manufacturer's manuals and instructions available to workers
- Prepare written work procedures specific to each job site and make them available to workers that are required to follow the procedures.
- Ensure that work is carried out under the supervision of experienced and qualified supervisors along with the uses of appropriate safety equipments.
- Keep accurate and complete records regarding asbestos management
- Handling and disposal of the asbestos products should be as per instructions and procedures marked in the manufacturer's manual.
- Any asbestos containing building component should be clearly identified and information should be given to the building residents/manager.
- All asbestos products for disposal should be kept in a separately marked covered bin and given to authorized agency for disposal.

² Asbestos Safe Work Practices for Handling
(http://www.worksafebc.com/publications/health_and_safety_information/by_topic/assets/pdf/asbestos.pdf)

2.2 Fuels and heating oils and other volatile / flammable liquids such as coolants, grease etc.

2.2.1 Prevention of diesel spillage at the time of charging diesel into drums, and also at the time of maintenance and cleaning work

- Only 200 litres of diesel should be charged into the drum instead of filling it up to the top of the drum.
- The drum caps should be closed tightly to avoid spillage during conveying of drums.
- Vessels should be kept under the equipments for collection of any leaking diesel during maintenance of vehicles, heavy machinery and generators etc.
- Inspect the vehicle/machinery for any leakage at the beginning of the shift. If any leakage is found, call auto-shop personnel for repairing.
- Send the vehicle to auto-shop for regular preventive maintenance.

2.2.2 To prevent fire/ spillages during unloading of diesel

- To prevent fire/ spillages during unloading of diesel tanker, tanker should be sent to the unloading tank, after verification of quantity, leakage etc
- Stoves and other inflammable materials should be removed from the vicinity of the truck.
- Usage of mobile phones to be avoided.
- All the hosepipes should be free of any leakages.
- The unloading should be done in presence of the stores person.
- Any diesel spill is to be covered with sand immediately.
- In case of fire/spillage the Fire & Safety department should be informed.
- In case of heavy leakage of diesel the Security department should be notified.

2.2.3 Prevention of oil spillage at the time of oiling of machinery or metal works on construction site.

- All vessels used for oil collection/ storage should be appropriately secured to avoid spillage.
- Vessels should be kept under the equipments, for collection of any leaking oil during maintenance of equipments or during time of greasing of metal works during construction.
- Any oil spill should be covered with sand immediately.
- In case of fire/spillage the Fire & Safety department should be informed.
- In case of heavy leakage of oil the Security department should be notified.

- It is the primary responsibility of the site engineer to ensure that these procedures are adhered to. Mop cloths or other materials used for cleaning up or wiping during oil and diesel work should be disposed off as per procedure. .

2.3 Tar and Tar products

Tar and tar products cover bitumen, felt, water proofing compounds etc.³

- Wear personal protective equipment & clothes (hardhat, gloves, goggles, earmuffs, etc.), as appropriate.
- Avoid any kind of contacts with the materials.
- Switch off all electric cables leading to the work area
- Wear respiratory protection and gloves while working.
- Wear chemical goggles when using, applying or handling chemical liquids or powders from containers labelled "Caustic" or "Corrosive."
- When handling hot tar, wear clothing made of cotton or non-synthetic fibres. Wear long sleeve shirts, long pants and gloves.
- Do not smoke or eat while performing tar work.
- Prevent spillage on the ground and other surfaces.
- Disposal - All tar and tar products for disposal should be kept in a separate marked covered bin and given to authorized agency for disposal.

2.4 Wood Dust⁴

- Avoid any kind of exposure to certain types of wood dust (from chemically treated wood).
- As chemicals in the wood or chemicals created in the wood by bacteria, fungi, or moulds can create health problems, care should be taken while working.
- Respiratory protective equipment and well fitting gloves should be used.
- All workers handling wood should have access to respiratory protection and appropriately designed ventilation systems.
- No flammable chemicals should be stored near the working place.
- Fire extinguishers should be kept at the working place

³ Dictionary of Toxins, (<http://www.budgetartmaterials.com/diofto.html>)

⁴ Workplace Health and Safety Bulletin Health Effects From Exposure To Wood Dust

(<http://www3.gov.ab.ca/hre/whs/publications/pdf/ch045.pdf>)

2.5 Lead containing products⁵

- Wear respiratory protection and gloves while working.
- Respirator filters should be changed whenever it is noticed that there is an increase in breathing resistance.
- To prevent skin irritation, always wash your face and respirator face piece whenever you leave the work area and especially at the end of every shift.
- Do not eat, drink or sleep near the working place to reduce chances of swallowing or inhaling lead.
- Disposal – Segregate lead containing products for disposal in a separate bin and give to authorized agency for disposal.

2.6 Paints⁶, pigments, dyes and primers⁷:

- Wear safety shoes with non-skid soles.
- Wear long-sleeve shirts and protect hands with protective gloves and appropriate eye protection.
- Every worker should use respiratory protective equipment during working with chemical admixture products, sealants, adhesives, solvents etc.
- Avoid any kind of skin contact with the chemicals used.
- Lead-based paint should be avoided completely.
- Wash well with soap and warm water or use special cleansers, especially after direct contact with paints, pigments, etc., and before drinking and eating.
- Do not inhale or smell the chemicals when the cans are opened.
- Disposal of containers of paints, pigments, dyes and primers, other products used for its application, or any other products applied with these products, should be done by segregating and collecting these separately as hazardous waste. These should then be given to an authorized agency for disposal.

⁵ Dictionary of Toxins, (<http://www.budgetartmaterials.com/diofto.html>)

⁶ Paint, Preparation and Existing Paint Safety
(<http://www.seemydesign.com/livingroom/considerthis/safety/paint.htm>)

⁷ Dictionary of Toxins (<http://www.budgetartmaterials.com/diofto.html>)

2.7 Carbon black⁸:

- Wear long-sleeve shirts and protect hands with protective gloves and appropriate eye protection.
- Contain and isolate areas where carbon black is used or exposed.
- Reduce your chances of swallowing or inhaling the carbon black by avoiding eating, drinking or sleeping near the working place.
- Avoid overexposure to the materials.
- Every worker should use respiratory protective equipment.
- Disposal should be done by collecting it separately as a hazardous material and giving to an authorized agent for disposal.

2.8 Pesticides:

Handling of these chemicals should be done as specified by the manufacturer.

- Pesticide storage areas on construction sites should be protected from the elements. Warning signs should be placed in areas recently sprayed or treated.
- Persons mixing and applying these chemicals should wear suitable protective clothing.
- Disposal of excess pesticides and pesticide-related wastes should be done by collecting it separately as a hazardous material and giving it to an authorized agent for disposal.

2.9 Tarpaulin

Tarpaulin sheet is generally inert as a product with no emission as such. However, it should be used properly and be kept away from very high temperature, which could result in the sheet emitting toxic fumes due to melting of the material. It should be fully recycled and reused. Recycling will involve proper ventilation of the work place, personal protective equipments, emergency preparedness, proper working knowledge, guidelines about the process and supervision of an expert.

2.10 Explosives and related products and equipment used in excavations:

- These should be used under expert supervision and as per instructions from the manufacturer.
- Explosives and related products should be stored in a safe and secured manner.
- Disposal: The waste generated from use of explosives should be separated and collected separately as hazardous waste or as per manufacturer's instructions. These should then be given to an authorized agency for disposal.

⁸ Genes, Ethics and Environment -The Ramazzini Institute for Occupational and Environmental Health Research (<http://www.ramazziniusa.org/sept02/humanecology.htm>)

2.11 Product packaging

Product packaging materials include cement bags, cartons, containers, plastic covers etc.

- Collect all products packaging material at a designated area.
- Reuse & recycle to the extent possible the product packaging material.
- Handover the packaging material to proper recycling agents or municipal authority for recycling or proper disposal.

2.12 Plastics, Acrylics, Silica, PVC

- Collect all unwanted / broken plastic parts and non biodegradable material at the appropriate designated areas.
- Collect the scrap in the appropriate bins with a list of all scrap parts.
- Handover the scrap material to proper recycling agents or municipal authority.

2.13 Compressed Gases / Cylinders⁹

Compressed gas can pose severe hazard. Therefore, the following measures must be taken:

- Site Engineer or supervisor must obtain a permit from the fire department that allows for the storage of compressed gas.
- Valve protection caps must be in place when compressed gas cylinders are transported, moved or stored.
- Close cylinder valves and replace valve covers when work is complete or when cylinders are empty or moved.
- Secure compressed gas cylinders in an upright position in a welding cart or to a solid object using chains, straps or rigid retaining bars. Secure compressed gas cylinders on an approved carrier while being transported.
- Keep cylinders at a safe distance or shielded from welding or cutting operations. Do not place cylinders where they can contact an electrical circuit.
- Keep oxygen and flammable gas regulators in proper working order and a wrench in position on the acetylene valve when in use. Separate oxygen and flammable gas cylinders by 20-feet or a 5-foot high fireproof barrier.
- If a leak develops in a cylinder and it cannot be immediately corrected, move the cylinder to a safe location outside the building.
- Use only approved spark igniters to light torches.
- Cylinders must not be taken into or stored in confined spaces, including gang boxes and office/storage trailers.

⁹ Compressed Gas Cylinders - Safety - Environmental & Safety, University Operation Services, (http://www.uos.harvard.edu/ehs/saf_compgascyl.shtml)

- Do not leave behind partially filled or empty cylinders. Always remove them from the site.
- Return the used and empty cylinders to the manufacturer for recycling.

2.14 Fluorescent Lamps

This includes intact and crushed halogen lamps, arc lamps, UV lamps, high pressure sodium lamps, neon lamps, incandescent lamps.

- Collect all the above mentioned materials separately in properly marked bins.
- Handover the material to proper recycling agents or Municipal authority.

2.15 Mercury Containing Devices

Mercury containing material on site include lamps, tubes, mercury vapour lamps, mercury switches, relays, regulators, thermostats, thermometers, manometers and debris containing mercury

- Builder should be encouraged to buy products that do not contain mercury. There are now several products on the market that can be used as substitutes to mercury.
- Make sure personnel are familiar with the proper cleanup procedures for handling a spill involving mercury.
- Do not place mercury-containing materials in waste receptacles for bio-hazardous waste because mercury will be released to the atmosphere when the bio-hazardous waste is incinerated.
- Collect all the mercury containing materials separately in properly marked bins.
- Handover the material to proper recycling agents or municipal authority.

2.16 Batteries

- Always wear goggles or a visor when working on batteries.
- Wherever possible, always use a properly designated, well ventilated area for charging.
- Remove any metallic items from hands, wrists and neck (rings, chains etc) before working on a battery.
- Used battery should be disposed of to the authorized battery dealer

2.17 Electronic Equipment

This includes ballasts, PCBs, transformers, capacitors, switchgear, lead cable, oil filled / gel filled cables.

- Collect all the above mentioned materials separately in properly marked bins as per manufacturer's instructions.

- Handover the material to proper recycling agents or municipal authority.

2.18 Electronic Waste

Electronic waste consists of computer products, circuit boards, CRTs, electronic parts, solder dross, weld waste.

- Collect all the above mentioned materials separately in properly marked bins as per manufacturer's instructions.
- Store them properly and prevent rusting of the components, so as to maintain its recycling value.
- Handover the material to proper recycling agents or Municipal authority.

3 REFERENCES

1. http://www.cpcb.nic.in/Hazardous_waste.php , MOEF Notification, 20th May 2003, S.O. 593(E)
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3. Dictionary of Toxins, (<http://www.budgetartmaterials.com/diofto.html>)
4. Workplace Health and Safety Bulletin Health Effects From Exposure To Wood Dust (<http://www3.gov.ab.ca/hre/whs/publications/pdf/ch045.pdf>)
5. Genes, Ethics and Environment -The Ramazzini Institute for Occupational and Environmental Health Research (<http://www.ramazziniusa.org/sept02/humanecology.htm>)
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