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المركز الوطني لإدارة النفايات
National Center for Waste Management

الضوابط والأدلة الفنية لإدارة نفايات البناء والهدم (الجمع والنقل)

Technical Guidelines for Construction and Demolition Waste Management **Collection & Transport**

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LIST OF ACRONYMS

C&D	Construction and Demolition
CDW	Construction and Demolition Waste
CDWMP	Construction and Demolition Waste Management Plan
EMP	Environmental Management Plan
EPC	Environmental permit to construct
EPL	Environmental Protection Law
EPO	Environmental Permit to operate
ESIA	Environmental and social impact assessment
GPS	Global Positioning System
GVW	Gross Vehicle Weight
HDPE	High Density Polyethylene
H&S	Health and safety
HSE	Health, safety and environment
IRs	Implementing Regulations of Waste Management Law
KPI	Key performance indicator
KSA	Kingdom of Saudi Arabia
LDPE	Low Density Polyethylene
MoMAH	Ministry of Municipalities and Housing
MRF	Material Recovery Facility
MSW	Municipal Solid Waste
MWAN	National Center for Waste Management
NCEC	National Center for Environmental Compliance
NORM	Naturally Occurring Radioactive Material
NWMS	National Waste Management Strategy
O&M	Operations and Maintenance
PET	Polyethylene Terephthalate

PP	Polypropylene
PPE	Personal Protective Equipment
QA	Quality Assurance
QC	Quality Control
QHSE	Quality, health, safety and environment
QMS	Quality Management System
RDF	Refuse Derived Fuel
RORO	Roll-on / Roll-off
SASO	The Saudi Standards, Metrology, and Quality Organization
SBC	Saudi Building Code
SCA	Saudi Contractors Authority
TGA	Transport General Authority
TIA	Traffic Impact Assessment
WAC	Waste Acceptance Criteria
WML	Waste Management Law
WMP	Waste Management Plan

DEFINITIONS

Centre	National Centre for Waste Management (MWAN)
Aggregates	Materials such as sand, gravel, and crushed stone used in construction, often derived from Recycled CDW.
Aluminum	Refers to a recyclable metal commonly used in construction for building materials such as window frames, roofing, cladding, and structural components. When a building is demolished or renovated, Aluminum can be separated from other materials as part of the CDW management process. Due to its high recyclability and value, Aluminum is often targeted for Recovery and Reuse, contributing to sustainable Waste management practices by reducing the demand for raw materials and minimising environmental impact.
Aluminum Profiles	Lightweight, corrosion-resistant metal extrusions used in construction for windows, doors, curtain walls, and structural components. Aluminum profiles are highly recyclable, making them a valuable material in CDW management.
Architects, Developers, and Engineers	Professionals involved in the design, planning, and engineering of construction projects, ensuring that structures are safe, functional, and aesthetically pleasing.
Asbestos	A hazardous fibrous mineral used historically in construction for insulation, fireproofing, and other applications. Asbestos poses significant health risks when disturbed and must be carefully handled and disposed of by specialized contractors.
Authorized Person	The person who has obtained the permit from the National Centre for Waste Management (MWAN)
Built Up Area (BUA)	The total constructed covered area of all the floors within the building envelope up to the extent of external walls excluding the projections.
Bituminous Materials	Asphalt and tar-based products used for roofing, waterproofing, and paving. Bituminous materials are often recycled in road construction but can pose environmental risks if not managed properly.
Brass Fittings	Components made from copper and zinc alloy, used in plumbing, electrical, and decorative applications due to their durability, corrosion resistance, and aesthetic appeal. Brass fittings are often recovered and recycled from construction sites.
Brick	Solid or hollow blocks made of clay or concrete used in construction. When demolished or removed, bricks contribute to CDW and can often be cleaned and reused or crushed for recycling.
Buildings	Structures such as residential, commercial, and industrial properties, where construction and demolition activities generate CDW like concrete, bricks, wood, and metals that require management and Disposal.
Bulk Trailers	Large trailers used for transporting bulk quantities of CDW materials.
Cardboard	Cardboard in CDW primarily includes packaging materials used for construction supplies, such as boxes and cartons. Like Paper, Cardboard is highly recyclable but must be kept clean and dry to retain its value. Proper segregation of Cardboard in the Waste management process is crucial for Recycling and Reducing the

	environmental impact of Construction activities.
CDW Management Plan (CDWMP)	A plan outlining the methods and processes for managing CDW, including Collection, Transportation, Recycling, and Disposal.
Cement Kilns	Refers to industrial facilities used in the production of cement, which can also serve as an effective method for disposing of certain types of CDW. Cement kilns operate at very high temperatures, which allows them to safely incinerate Waste materials while incorporating the ash into the final cement product. This process not only reduces the volume of Waste that would otherwise go to Landfill but also recycles it into a useful construction material. Using CDW in cement kilns is a form of energy recovery and resource efficiency, contributing to more sustainable Waste management practices.
Ceramics	Non-metallic, inorganic materials made from clay and other natural compounds that are shaped and hardened through high-temperature firing. Ceramics, such as tiles, bricks, and sanitaryware, are widely used in construction for their durability, water resistance, and aesthetic qualities. They contribute to CDW when removed or replaced during demolition or renovation.
Chutes	Inclined tubes or channels used on construction and demolition sites to safely and efficiently transport CDW, such as debris, rubble, and other loose materials, from higher levels of a building or structure to designated collection points, skips, or containers on the ground level.
Circular Economy	An economic model that aims at sustaining products and consumable sources for the longest period possible by way of consuming products to each product's maximum limit if it is usable, and to turn it recyclable and regeneratable thereafter upon the end of its lifecycle.
Climate Considerations	Factors related to the impact of CDW management on climate change, including greenhouse gas emissions and energy consumption.
Civil Engineers	Engineers who design, construct, and maintain infrastructure projects, playing a crucial role in managing CDW through efficient project planning and execution. They are involved in the selection of materials, construction methods, and site management practices that minimize CDW production. Civil Engineers also develop and implement strategies for the recycling and reuse of materials, such as concrete and metals, and ensure compliance with environmental regulations. Their expertise supports the sustainable management of CDW by optimising resource use and integrating CDW reduction techniques into civil engineering projects.
Collection	The collection of waste from storage containers of various sizes and types, carried out using trucks and machinery specifically designed for this purpose.
Compactors	Machines used to compress Waste materials to reduce their volume for easier handling and transportation.
Competent Authority	The government entity responsible for the operational management of waste in compliance with specific regulatory provisions.
Commercial and Administrative Waste	Includes, without limitation, waste generated from economic activities that can be collected alongside household waste, considering their characteristics and the quantities produced, without specific technical constraints. This waste includes, but is not limited to, waste generated from commercial activities and businesses (such as craftsmen, merchants, and traders) as well as waste from general service sectors, including healthcare administrations and facilities (such as non-hazardous healthcare waste). It also encompasses other similar types of waste

	that are collected under the same conditions as residential waste.
Concrete	A composite building material made of cement, sand, gravel, and water. Concrete waste from demolition or construction is a significant component of CDW, typically crushed and reused as aggregate or recycled into new concrete.
Construction Contractors	Companies or individuals licensed by the Amanah or the Saudi Contractors Authority, responsible for constructing buildings and infrastructure, and managing the entire building process from planning to completion.
Construction and Demolition Waste (CDW)	All solid Waste arising from construction and demolition activities. This includes waste produced from construction of buildings and infrastructure, destruction or demolition of buildings and infrastructure, and the maintenance, renovation, rehabilitation and refurbishment of buildings and infrastructure. Construction and demolition waste includes without limitation brick, concrete, hardcore, subsoil and topsoil, materials resulting from excavation works, and it can also include quantities of timber, metal, plastics and, occasionally, hazardous materials.
Construction Project	A project involving the building, assembly, or renovation of structures, infrastructure, or other physical assets, typically involving activities such as excavation, concreting, bricklaying, and installation of systems.
Containment	The use of bins, skips, containers, or other designated structures to safely hold and control CDW at construction or demolition sites. Containment is essential for preventing spillage, cross-contamination, and exposure to hazardous materials, thereby ensuring safe storage and transport.
Copper Pipes and Wires	Copper is a highly conductive metal used extensively for plumbing pipes and electrical wiring in construction. It is valued for its resistance to corrosion and is commonly recycled from construction and demolition waste.
Demolition Contractors	Contractors licensed by the Amanah or the Saudi Contractors Authority and specialized in the safe and efficient demolition of buildings and structures, ensuring correct handling and Disposal of CDW.
Demolition Project	A project focused on the dismantling, deconstruction, or demolition of buildings, structures, or infrastructure, often to clear land for new development or to remove unsafe or outdated facilities.
Depositing	Depositing waste with another person
Destruction	The complete dismantling or demolition of structures, resulting in mixed CDW that must be sorted, recycled, or disposed of according to waste management regulations.
Disposal	Defined as Safe Disposal under IRs of WML – Safe storage or disassembly of any type of waste in an engineering manner that prevents causing any pollution or negative impact on the environment, including soil, air, water, and biological diversity. These methods include engineering cemeteries, prepared incinerators, and other licensed technologies and facilities, which contain the technical technology necessary to protect public health, safety, and the environment.
Disposal Document	A document issued by Service Providers to Waste Producers upon the completion of the safe disposal process, confirming that the waste has been disposed of in compliance with the MWAN's controls and requirements.

End-of-Life Dismantling	The process of systematically taking apart a building or structure at the end of its useful life in a controlled and selective manner. Unlike traditional demolition, end-of-life dismantling focuses on the careful removal of materials and components to maximise the recovery, reuse, and recycling of building elements such as metals, timber, fixtures, and concrete. This approach reduces the amount of waste sent to landfills, minimises environmental impact, and supports circular economy principles by extending the life of building materials through repurposing and recycling.
End of Waste	Moment when waste ceases to be waste and becomes a product or raw material.
Entity	Any entity that practices activities of an industrial, commercial, agricultural or service-provision nature.
Environment	Everything that surrounds a person, animal, plant, or any living organism, including water, air, land, soil, organisms, biodiversity, atmospheric gases, water bodies, inanimate objects, various forms of energy, environmental habitats, natural processes, and the interactions among these elements.
Environmental Impact	Every negative or positive change that affects the environment due to the practice of any activity.
Excavator	A powerful, heavy-duty machine with a rotating platform, a long arm (boom), and a bucket or other attachment at the end, used for a variety of tasks on construction and demolition sites. Excavators are commonly employed for digging, lifting, sorting, and moving large volumes of CDW, such as concrete, metal, and soil.
Ferrous Metals	Metals containing iron, such as steel, which are commonly Recycled from CDW.
Front Loader	Refers to a heavy-duty, wheeled machine equipped with a large, front-mounted bucket used for loading and transporting bulk materials. Front loaders are commonly utilized on construction and demolition sites to scoop, lift, and move large volumes of CDW, such as soil, rubble, concrete, and other debris, into trucks, skips, or other containers for sorting, Recycling, or Disposal.
Green Waste	Any Waste that is produced from accumulations of cut grass, plants, tree leaves and tree corners, and other accumulations resulting from public and private gardening and green landscaping caring at roadsides and parks.
Hardcore	Dense, inert materials such as crushed concrete, brick, or rubble used as a base layer in construction. Hardcore waste from construction or demolition can be recycled as aggregate for new building projects.
Hard Standing Surface	A durable, solid surface area used for storing and processing CDW materials.
Hazardous Waste	Waste classified as hazardous based upon the provisions of the Law and Regulations, which is resulting from industrial or non-industrial activities that contain toxic, flammable, or reactive materials, or corrosives, solvents, degreasers, oils, colorants, paste residuals, acids and alkalis.
High-Density Polyethylene	A durable, high-strength plastic used in piping, containers, and other construction materials. HDPE is widely recycled due to its versatility and resistance to chemicals and moisture.
Hook lift Trucks	Trucks that are equipped with a hydraulic hook lift system for loading and unloading large containers of CDW.
Incineration	**Implementing regulations definition:** Burning of waste component for disposal, either by open burning or by controlled burning in special incinerator, with or

	without energy recovery. **Proposed definition:** The EU Directive 2010/75/EU on Industrial Emissions (also known as the Industrial Emissions Directive, IED) defines incineration as: "The thermal treatment of waste with or without the recovery of the combustion heat generated, including pyrolysis, gasification, or plasma processes if the substances resulting from the treatment are subsequently incinerated."
Inert Materials	Waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter that it comes into contact with, in a way likely to cause environmental pollution or harm to human health. The total leachability and pollutant content of the Waste and the ecotoxicity of the leachate must be insignificant and not endanger the quality of surface water or groundwater.
Infrastructure	Large-scale projects such as roads, bridges, and utilities where construction and demolition produce CDW, including asphalt, concrete, and soil that need proper management.
Iron	A strong, durable metal commonly used in construction for various applications, including structural beams, frames, and components. Iron is often recycled from CDW due to its value and widespread use in building materials.
Laborers	Workers who perform manual tasks on construction sites, including activities such as loading and unloading materials, digging, cleaning, assisting skilled tradespeople, and handling basic construction duties. Laborers play a crucial role in the day-to-day operations of construction projects, providing essential support to ensure the smooth progress of work. They are typically involved in tasks that require physical strength, endurance, and basic construction skills, contributing to the overall efficiency and safety of the work site.
Law	Waste Management Law
License	A written permission issued by the Centre for the purpose of carrying out any activity related to waste management in accordance with the controls determined by law and regulation
Licensee	The person who has obtained the license from the Centre
Low-Density Polyethylene	A flexible plastic used in sheeting, film, and insulation materials in construction. LDPE is less commonly recycled than HDPE but still contributes to the plastic waste stream in construction.
Maintenance	Routine upkeep activities on buildings and infrastructure that generate small amounts of CDW, such as debris from repairs and replacements, requiring appropriate Disposal or Recycling.
Material Recovery Facility (MRF)	Material Recovery Facilities can be described as infrastructures that accept waste materials, either source segregated or mixed, and further separates, processes, and stores for further processing, in order to divert reusable and recoverable waste from landfill, while also obtaining the maximum value out of each material.
Materials Audit	An assessment of the types and quantities of materials present in a building or site, often conducted before demolition.
Mechanical Recycling	The process of physically breaking down Waste materials into smaller pieces for Reuse in new products.

Metal	Includes steel, aluminum, copper, and other metals used in construction. Metal waste from CDW is highly Recyclable and valuable, often collected for recycling into new metal products.
Minimizing Waste	Reducing waste production to the lowest possible level
Minimizing Waste Products	Reducing waste production to the lowest possible level. Materials or goods manufactured or derived from other materials for sale or consumption.
MSW (Municipal Solid Waste)	Includes residential Waste, which is Waste resulting from the usual activity of households, whether or not they are collected mixed or separately, and also includes commercial and administrative Waste, which is Waste that is produced from other sources that are similar in nature and composition to Residential Waste.
National Waste Management Strategy (NWMS)	Comprehensive national plan that outlines the vision, ambitions, strategic objectives, and measurable targets to improve the performance of the Waste management sector in KSA. It identifies current gaps, sets directions and actions for sector transformation, establishes a timeline for progress monitoring, and outlines the sector's contribution to the national economy.
Non-Ferrous Metals	Metals that do not contain iron, such as Aluminum and Copper, which are commonly Recycled from CDW.
Non-Hazardous Waste	Waste that does not impose any risks to the general health or environment, and that may not be classified as Hazardous Waste.
NORM (Naturally Occurring Radioactive Material)	Materials that contain radioactive elements naturally found in the environment, sometimes present in CDW.
Oils and Lubricants	Used oils and lubricants from machinery and equipment on construction sites. These substances are hazardous and must be collected, stored, and disposed of in accordance with environmental regulations to prevent soil and water contamination.
Other Contractors	Various specialised Contractors involved in specific aspects of construction and demolition, such as electrical, plumbing, and roofing Contractors.
Biodegradable Waste	Any waste that can undergo anaerobic or aerobic decomposition, such as food and garden Waste, and paper and paperboard.
Paint Cans and Paint Residues	Empty containers and leftover paint from construction and renovation activities. These materials can contain hazardous chemicals and require proper Disposal or Recycling to prevent environmental contamination.
Paper	Paper typically refers to materials such as architectural plans, packaging, and office Waste generated during construction activities. Although paper is Recyclable, it must be properly sorted and kept dry to ensure it can be effectively Recycled. In CDW management, separating paper from other Waste streams helps reduce Landfill usage and supports Recycling efforts.
Permit	A document granted by the Centre to waste recycling facilities attesting that they fulfil the Centre’s Controls and Requirements before they obtain licenses issued by the competent authorities in accordance with their Regulations
Person	A natural or legal person
Personal Protective	Safety gear worn by workers to protect against hazards, including helmets, gloves, and masks.

Equipment (PPE)	
PET	A type of plastic commonly used in packaging, including bottles and containers. PET is recyclable and often found in construction sites as packaging Waste.
Plastics	Plastics in CDW include a wide range of materials, such as piping, insulation, packaging, and fittings. Plastics are often Recyclable, but their recyclability depends on the type of plastic and its condition. Segregating Plastics at the source is important to maximise recycling potential and reduce the environmental impact of CDW. Proper handling also prevents contamination of other Recyclable materials.
Polypropylene (PP)	A strong, lightweight plastic used in construction for items like piping, fittings, and insulation. PP is resistant to chemicals and moisture and can be Recycled, though it often requires separation from other plastics.
Quarantine	The process of isolating Waste materials that may be contaminated or hazardous until they can be safely managed.
Recycled Aggregates	Aggregates produced from the Recycling of CDW materials, used in new Construction Projects.
Recycling	The process of converting certain components of Waste into usable materials for recovery or use as raw materials in manufacturing processes.
Recycling Infrastructure	Facilities and equipment used for the collection, sorting, and processing of Recyclable materials.
Refuse Derived Fuel (RDF)	Fuel is produced from various types of Waste, including CDW, that can be used to generate energy.
Refurbishment	Upgrading or modernizing structures to improve their appearance or functionality, resulting in CDW from replaced or removed components that must be managed and recycled appropriately.
Regulations	The Implementing regulations of the Waste Management Law
Regulatory Bodies	Government agencies and organizations responsible for creating and enforcing regulations related to CDW management to ensure safety and environmental protection.
Rehabilitation	Restoring and repairing buildings and infrastructure to a functional state, producing CDW from the removal of damaged or outdated materials, necessitating careful Waste Management.
Relevant Authority	Government authorities responsible for issuing their licenses and / or permits in accordance with their regulatory requirements.
Renovation	The process of updating or improving existing structures, generating CDW from removed materials like old fixtures, flooring, and wall coverings that need proper handling and Disposal.
Residential Waste	Waste that includes without limitation: paper and cardboard, glass, metals, plastics, food residuals, Green Waste, wood, textiles, packaging, waste electrical and electronic equipment, and bulky waste, including without limitation mattresses and furniture.
Resource Recovery	The process of extracting energy, raw materials, or any other product from Waste and using it again.
Reuse of products	Reusing materials and resources as much as possible before turning them into Waste.

Rubber	A material commonly found in CDW, typically originating from components like flooring, roofing membranes, seals, and gaskets, as well as insulation and damp-proofing materials.
Safe Disposal	Safe storage or disassembly of any type of Waste in an engineered manner that prevents causing any pollution or negative impact on the environment, including the soil, air, water, and biological diversity. These methods include engineering cemeteries, prepared incinerators, and other licensed technologies and facilities, which contain the technological techniques necessary to protect public health, safety, and the environment.
Sand	A granular material composed of finely divided rock and mineral particles, typically used in construction as a key component in concrete, mortar, and asphalt. Sand is essential for creating stable foundations and various structural elements, and its management is important to ensure sustainable use and minimize environmental impact.
Sensitive Receptors	Receptors that may be notably affected by the activity or the project due to its location being nearby or due to its sensitive nature, and these include without limitation: environmental components, living organisms, historical and cultural and religious sites, or social groups, such as endangered species, hospitals, retirement homes, schools and residential compounds.
Separation	See Sorting.
Service Provider	The person licensed or authorized to engage in one of the waste management activities.
Skip Loaders	Vehicles equipped with a skip loading mechanism for transporting large containers of CDW.
Smart Buildings	Buildings that incorporate advanced technologies and sustainable design principles to minimize CDW production during construction, renovation, and demolition processes. In the context of CDW, smart buildings utilize efficient construction methods, prefabrication, and material tracking systems to reduce waste, promote recycling, and ensure the responsible Disposal of materials. They are designed with a focus on lifecycle management, incorporating strategies that facilitate the reuse of components and reduce the overall environmental impact of building activities.
Soft Strip	Refers to the process of removing non-structural elements from a building before demolition or significant refurbishment. This includes the careful extraction of fixtures and fittings, such as doors, windows, and light fixtures, as well as the removal of internal walls, partitions, ceilings, flooring, and mechanical systems like wiring and ductwork. The goal of a soft strip is to segregate materials that can be Reused or Recycled, thereby reducing the volume of Waste sent to Landfill and facilitating more sustainable Waste management practices. This process is a crucial preparatory step in ensuring that demolition projects are conducted in an environmentally responsible manner, aligning with regulatory requirements and sustainability goals.
Sorting	It means separating waste components from each other manually or automatically, such as paper, glass, metal, and setting aside other components in transitional stations or sorting and treatment facilities; with the intent of recycling or processing them.
Segregation of Waste at the	The action of the generator of the Waste of segregating their waste to its components as defined by the nature of such waste, to enable higher resource

Source	recovery through recycling or reuse.
Sorting at Source for CDW	Defined as Segregation at Source under IRs of WML – Refers to the action of the generator of the CDW segregating their CDW to its components as defined by the nature of such CDW, to enable higher resource recovery through Recycling or Reuse, as defined in the IRs.
Steel Rebar	Reinforcing bars made of steel used to strengthen and support concrete structures in construction. Steel rebar provides tensile strength and durability to concrete elements like beams, slabs, and columns, making them essential in construction projects.
Stones	Natural solid aggregates of minerals or rock fragments commonly used in construction for foundations, walls, paving, and landscaping. Stones, including granite, limestone, and sandstone, are valued for their durability, strength, and aesthetic appeal in various building and infrastructure projects.
Storage	Storing the waste components or some of them temporarily for the transfer or use later
Storage Bays	Areas designated for the temporary storage of CDW materials before processing or Disposal.
Subsoil and Topsoil	Layers of earth removed during excavation. Subsoil is the deeper layer of soil, while topsoil is the nutrient-rich upper layer. These materials from excavation can be Reused in landscaping, construction, or restoration projects.
Timber	Wood materials generated from construction, demolition, or renovation, including beams, planks, and off-cuts. Timber Waste can often be Reused, Recycled, or processed into wood products or biomass fuel.
Topsoil	See Subsoil and Topsoil.
Transportation	Transporting waste by approved means of transportation to transitional stations, treatment or sorting facilities, or approved landfills.
Transportation Document	The form specified by the competent authority to follow up the waste from the point of production to the point of production to the point of safe storage, handling or disposal.
Treatment	It means the use of physical, biological or chemical means, or a combination of these means, or other to bring about a change in the specification of waste in order to reduce its volume, or facilitate the process of treating it when reusing or recycling, or extracting some products from it or to remove organic pollutants and others in order to reduce or utilize some of the waste component or eliminate the possibility of harm to huma or the environment.
Triple Handling of Waste (minimize)	In the context of CDW, this refers to reducing the number of times waste is moved or handled on-site before reaching its final Disposal or recycling point. This approach streamlines waste management, saves time, reduces labour costs, decreases the risk of contamination, and enhances site efficiency by limiting unnecessary movements of waste materials.
UV-Resistant Polyethylene	A type of plastic resistant to degradation from ultraviolet light, used in various construction applications.
Waste	All materials that are discarded or disposed of, and that directly or indirectly affect public health or the environment
Waste from Electrical and	waste resulting from equipment operating with electric current (or electromagnetic fields). This shall include without limitation all components, sub-

Electronic Equipment (WEEE)	assemblies and consumables which are part of the product at the time of discarding, including but not limited to: mobile phones, chargers, printing machines, computers and automatic disponers.
Waste Hierarchy	A framework for managing Waste that prioritizes Waste prevention, followed by Reduce, Reuse, Recycling, Recovery, and Disposal.
Waste Incineration Plants	any stationary or mobile technical unit and equipment dedicated to the thermal treatment of Waste, with or without recovery of the combustion heat generated.
Waste Management	Organizing any activity or practice related to waste commencing from waste collection, transportation, sorting, storage, treatment, recycling, import, export, and safe disposal, including aftercare at waste disposal sites.
Waste Management Establishments and/or Waste Management Facilities	Establishments, facilities and sites, permitted and licensed by MWAN, that engage in Waste Management.
Waste Producer	Every person who produces classified waste according to the provisions of the Waste Management Law
Wood	In KSA, wood in the context of CDW typically includes timber used in structural frameworks, formwork, scaffolding, and interior finishes like doors, windows, and cabinetry.

1 PURPOSE AND SCOPE

1.1 Purpose

This guideline aims to establish a standard procedure for carrying out collection and transportation activities for construction and demolition waste (CDW) in the Kingdom of Saudi Arabia (KSA) in accordance with the provisions of Waste Management Law (WML) and its implementing regulations (IRs).

Once CDW is generated, whether it be from the demolition of old buildings, renovations, or construction activities, it is essential that the waste be efficiently and safely transported to designated processing, treatment, recycling and disposal facilities. Therefore, the need for an efficient transportation plan cannot be overstated. The transportation system is not only about moving waste from point A to point B but also about optimizing the process to achieve sustainability goals. This includes utilizing the right vehicles, ensuring proper waste containment during transit, and adhering to safety and regulatory standards.

In this context, the collection and transportation play a crucial role in effective CDW management. Transportation serves as a vital link between the generation of waste on construction and demolition sites and the final destination for processing, recycling, resource recovery and disposal facilities. **Figure 1-1** provides the relevant objectives and targets of the National Waste Management Strategy (NWMS) and CDW National Plan which are directly linked with the collection and transportation of CDW.



Figure 1-1: CDW Specific target to be achieved by 2040

The following table outlines the annual targets for CDW landfill diversion and waste prepared for recycling, demonstrating the planned progression towards achieving the 2040 objectives.

Table 1-1: Annual estimates of objectives of the CDW National Plan

Performance Indicators	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
CDW Landfill Diversion Rates	9%	18%	27%	36%	45%	53%	58%	62%	67%	71%	76%	78%	81%	84%	86%	89%

1.2 Scope

The guideline for collection and transportation of CDW serves as an essential framework for responsibly managing the waste generated from construction and demolition activities. This procedure has been designed by considering groups as mentioned in **Figure 1-2** below.



Figure 1-2: Relevant stakeholders involved in CDW collection & transportation activities

This technical guideline covers the best practices to be adopted for carrying out CDW collection and transportation activities during any construction and demolition projects.

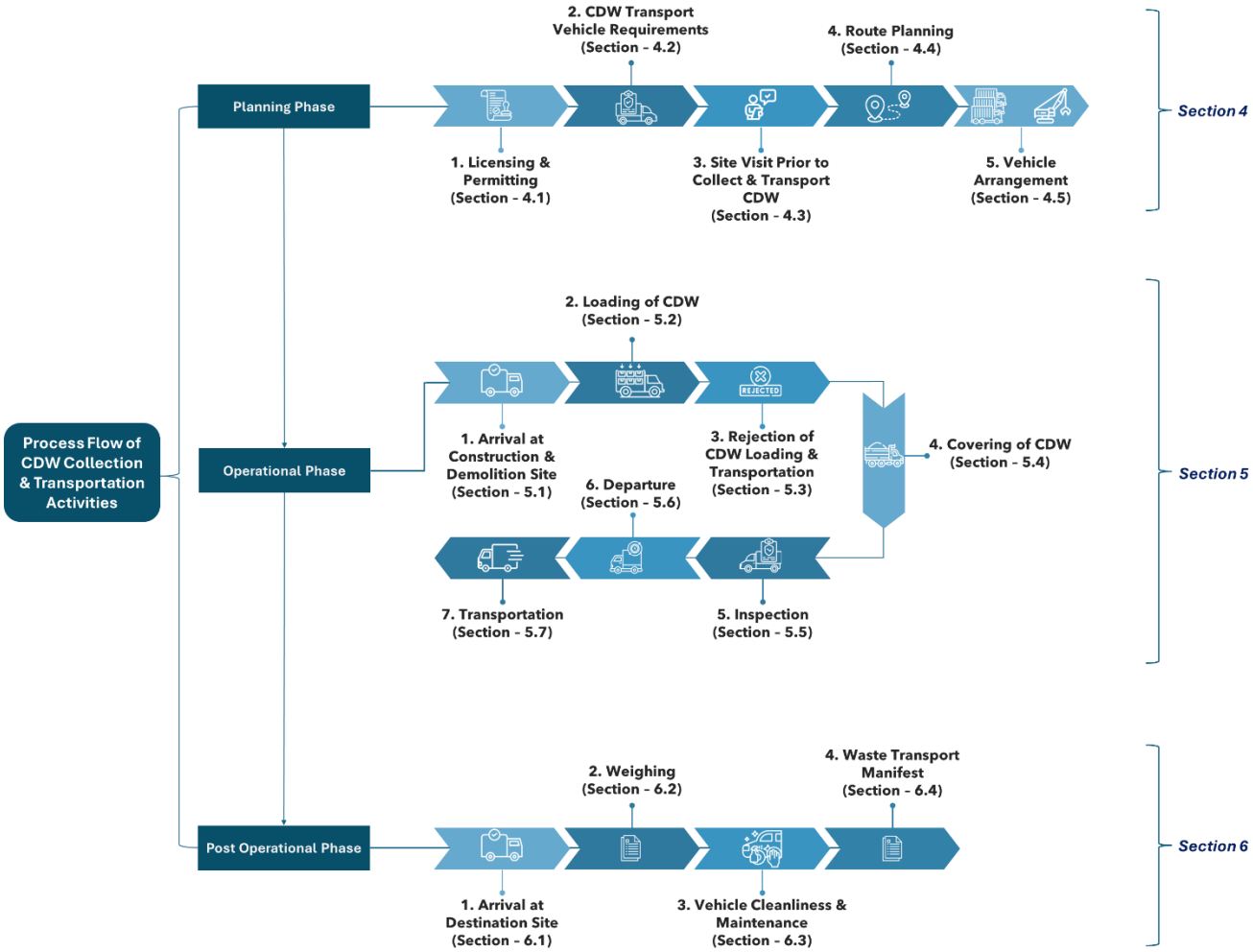


Figure 1-3 presents the process flow of collection and transportation along with the section of this technical guideline where further details can be found.

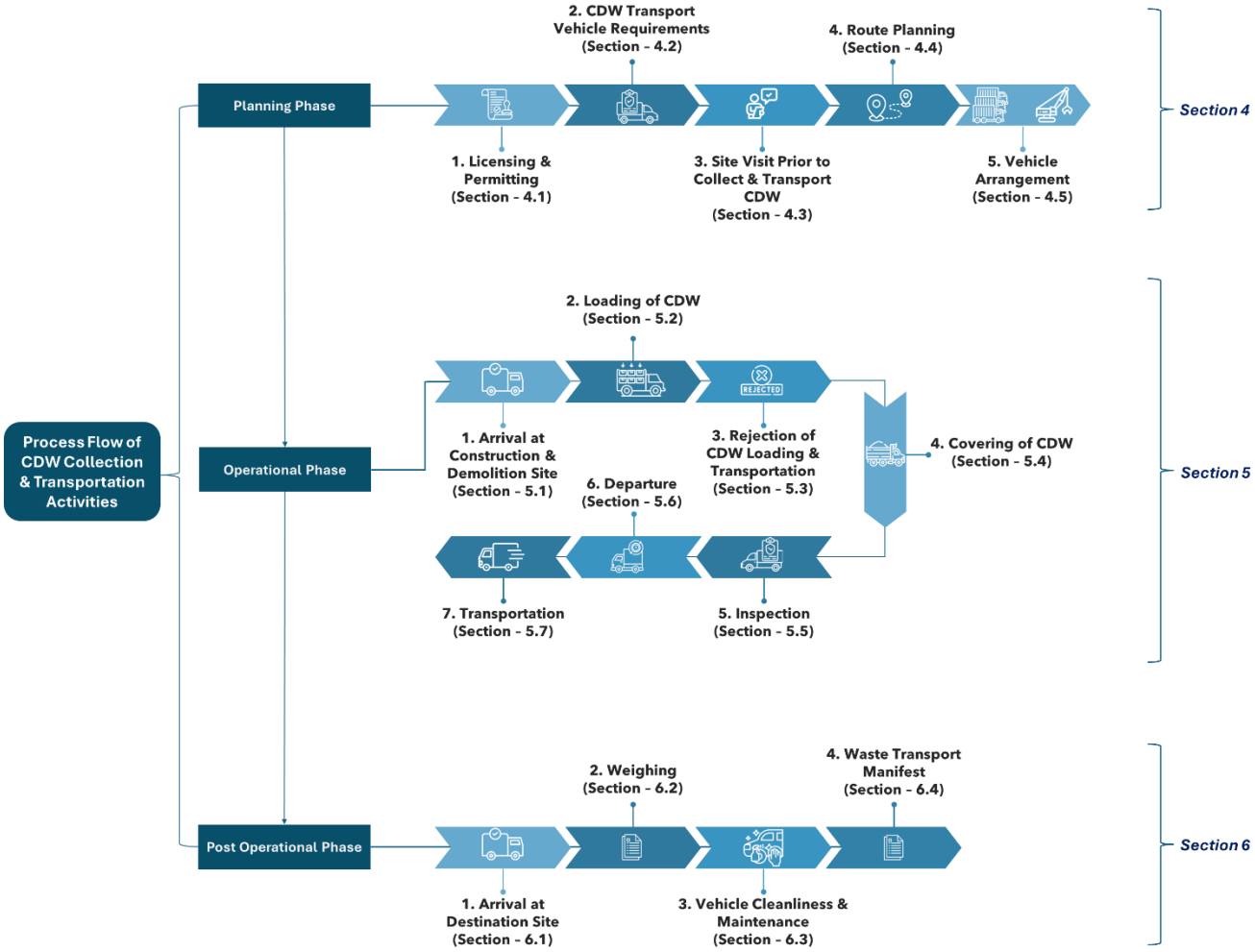


Figure 1-3*:* Process flow of CDW collection and transportation activities

1.3 Dependency on other technical guidelines

The guideline for collection and transport of CDW may overlap with other technical Guidelines issued by MWAN as presented in **Figure 1-4**.



Figure 1-4: Relevant technical guidelines issued by MWAN

Further, this guideline may overlap with other guidelines issued by other regulatory authorities such as Ministry of Municipalities and Housing (MoMAH) and Transport General Authority (TGA), which also provide essential frameworks for the safe, efficient, and compliant transportation of CDW. Vehicle specifications, and safety protocols for the driver and vehicles are critical for maintaining safety and compliance throughout the transportation process. Therefore, this guideline should be read in conjunction with the guidelines - presented in **Figure 1-5**, as they collectively form a comprehensive regulatory framework. This ensures that all aspects of CDW collection and transportation are addressed, from planning and implementation to enforcement and monitoring, helping to achieve the overarching goals of sustainability, public safety, and regulatory compliance.



Figure 1-5: Relevant guidelines issued by other regulatory authorities

1.4 Applicability

CDW collection and transportation guidelines are designed to provide a structured and responsible approach to managing waste generated in construction and demolition projects.

Source of CDW	▪ Construction activities ▪ Renovation activities ▪ Demolition activities ▪ Other related activities
Type of Projects	▪ **All types of building projects** including residential, offices, commercial, hospitality, educational, mixed-use developments, airports, sports facilities, etc. ▪ **Public Infrastructure Projects** including roads, parks, water sewage and drainage infrastructure, water supply, etc.
Types of Waste	▪ All types of Waste generated during Construction and Demolition Activities like inert waste, metallic, plastic, glass, gypsum, wood, textile etc. except for hazardous waste



Pathways

- Waste transported from a construction or demolition site to either a treatment facility or a disposal facility
- Waste transported from a treatment facility to a disposal facility
- Waste transported from a temporary CDW storage site to either a treatment or a disposal facility

2 LEGAL REQUIREMENTS

This section outlines the regulatory framework governing CDW collection and transport, providing the legal foundation necessary for compliance. The primary stakeholders and their associated regulations are as shown below:

MWAN مـــوان المركز الوطني لإدارة النفايات National Center for Waste Management	Waste Management Law WM Law, Council of Ministers Resolution ا	Implementing Regulations WML - IR (English).pdf
وزارة البلديات والإسكان Ministry of Municipalities and Housing	Requirements for the Disposal of Construction, Demolition and Renovation Waste MoMAH Requirement for CDW	
المركز الوطني للرقابة على الالتزام البيئي National Center for Environmental Compliance المملكة العربية السعودية	Environmental Protection Law (EPL) NCEC Environmental Law.pdf	
الأمن العام المرور	Traffic Law Traffic Law.pdf	
TGA الهيئة العامة للنقل Transport General Authority	TGA Regulations of Freight Transport, Freight Forwarder, and Truck Rental on Roads TGA Regulations of Freight Transport, Fre	

The specific and mandatory regulatory requirements related to collection and treatment in each of the above regulatory references are outlined below.

2.1 Waste Management Law (WML)

The Waste Management Law (WML) establishes the legal framework for managing waste activities in compliance with environmental priorities. Key articles relevant to CDW collection and transport are summarized below:

Article 4 It is not permissible to engage in any activity related to waste management except after obtaining a license or permit from the Centre, according to the terms and requirements of each activity, and as specified by the Regulation.

Article 8 It is prohibited to leave, bury, burn, dump or throw any kind of waste in places other than those assigned for that particular purpose. The Regulation shall specify the necessary controls for this

Article 16

- The service provider shall dispose of waste by the methods determined by the Centre and in accordance with the Regulations
- The service provider must verify the authenticity of the waste information received and shall complete the transportation record and document details and ensure that they fall within the licensed competency of the license
- The service provider contracting with a government entity shall submit periodic reports to the Centre, as per controls stipulated by the Regulations
- Providers of transportation, storage, handling and safe disposal services are required to comply with the requirements of the transport document, in accordance with the provisions specified by the Regulations
- Providers of safe handling, recycling and disposal services shall accept any kind of waste that falls within their licensed competency

Article 17 The service providers licensed to transport hazardous waste must comply with the following:

- Transporting waste through means of transport whose specifications comply with the provisions stipulated in the Centre
- Place warning signs on the means of transport
- Ensuring the availability of documents related to hazardous waste
- Notifying the competent authority of the routes of the means of transportation carrying hazardous waste and informing them of any changes that occur
- Ensuring that the vehicle carrying hazardous waste shall not pass within residential communities and the city centre during the times determined by the competent authority
- Notifying the competent authority of the address of the parking lots at which the means of transporting hazardous waste are parked
- Washing and disinfecting the means of transporting hazardous waste after each use in accordance with the instruction and guidelines prescribed in coordination with the competent authority

The Regulations shall determine the records and documents that must be kept by the hazardous waste transport service providers, as well as the controls and conditions necessary to implement the provisions of this Article

Article 18 In the event that it is not possible to deliver the waste of all kinds to its approved destination, the transport service provider shall return it to the waste producer in order to bear the responsibility of taking necessary measures to treat and dispose of it in accordance with the provisions stipulated on the Regulations

2.2 Implementing Regulations (IR)

Implementing regulations provides a comprehensive framework by addressing the key issues covering the entire value chain of waste. The brief requirements of the implementing regulations related to collection and transportation of CDW have been identified below.

Article 03 No activity related to waste, such as wastes collection, sorting, storing, treatment, recycling, import, export and safe disposal thereof, including the aftercare of disposal site, shall be undertaken without obtaining the proper license or permit out of the licenses and permits.

Article 71 The collection and transport of Hazardous Waste from the Waste Producers to the Service Providers of storage / treatment / recovery / disposal, shall be undertaken in accordance with the provisions of these Regulations.

Article 72 Waste Producers shall complete the Transport Document according to the template issued by the Centre.

Article 73 The Service Provider shall be prohibited from providing the service of collecting and transporting Waste without obtaining the appropriate License and completing the Transport Document in accordance with the provisions of the Law, Regulations and the technical controls the Centre issues.

Article 74 The transportation Service Provider shall comply with all health and environmental safety regulations at all phases of Waste collection and transportation.

Article 75 The transporter of Waste shall transport it to the facility for collecting Waste, temporary storage of Waste, treatment of Waste, recovery of Waste or the safe disposal of Waste after the Transport Document is completed and signed by the Waste Producer, Waste transporter and Waste recipient.

Article 76 Waste Producer, Waste transporter and Waste recipient shall all provide the Centre with the Transport Document if the Centre requests so from any of them.

Article 77 The Waste Producer shall dispose of his Waste as close as possible to the place of generation, and in accordance with the controls and requirements set forth by the Centre.

Article 78 The Centre may specify Wastes that the management of which requires a Transport Document and/or a Disposal Document.

Article 79 The Service Provider shall sign the Transport Document after receiving the Waste, and the Service Provider shall sign the Transport Document after receiving the Waste to show that he agrees on receiving it. The Service Provider that receives the Waste – after he manages it properly by way of temporary storage and/or treatment and/or recovery and/or disposal of – shall sign the Transport Document to ensure that the Waste Management activity has been carried out in accordance with the provisions of the Law and the Regulations, and shall send a copy of it to the Waste Producer and the Centre.

Article 80 The Service Provider shall hand a copy of the Disposal Document to the Waste Producer after the conclusion of the safe disposal of Waste process, and the Waste Producer shall ensure that he receives a copy of the Disposal Document after it is signed by the Service Provider.

Article 81 Each Service Provider to which any waste is transported shall verify the Transport Document prepared by the Waste Producer. The Service Providers must reject any Waste that the Waste Producer has not properly described in the Transport Document and/or has been stored incorrectly. Service Providers shall report to the Centre if doubts arise about the accuracy of information and/or Waste Management procedures by the Waste Producer within a period not exceeding 48 hours, and the Waste Producer or the Service Provider whose Waste was rejected may file an objection to the Centre within a period not exceeding (7) days.

Article 82 In the event that the Centre establishes an electronic system for the submission of Transport Documents, the Service Provider shall comply with all the instructions of the Centre regarding the submission of Transport Documents via this electronic system.

Article 83 The Waste Producer and the Service Provider shall keep a copy of every Transport Document they sign, and shall:

- Keep a copy for five years, and the Centre may require the Waste Producer or the Service Provider to keep it for another five years.
- Show it to an inspector or provide copies to the Centre when asked.

Article 84 The transport and collection Service Provider shall take the necessary means to ensure the arrival of Waste at its destination without endangering the general health, the Environment, facilities or establishments, and in a manner that fulfils the terms and conditions of, the Law, the Regulations, the technical controls and what the Centre issues from time to time.

Article 85 If the transportation Service Provider reaches the approved destination under the Transport Document and is unable to deliver the Waste for reasons related to the receiving party (such as being a holder of an expired license) or related to the delivery site (such as being a site unfit to receive the waste), he shall return the Waste to the Waste Producer or the waste storing facility to bear the responsibility for taking the necessary measures to treat and/or dispose of the same in accordance with the duty of care provisions set out in Section One of Chapter Four. In the event that such Waste threatens health, safety or environment such that it cannot be returned to the Waste Producer or the waste storing facility (such as certain Healthcare Waste), the Waste shall be

transported to another Service Provider, and the violator shall incur the costs for such procedure as determined by the Centre.

Article 86 Service Providers who collect and transport Hazardous Waste must provide training sessions for their employees. The training sessions must be recorded and provided in line with international best practices and standards.

Article 87 Service Providers must implement a comprehensive vehicle and Hazardous Waste tracking system. The Centre will be provided unrestricted access to this system in order to fully oversee Waste transport activities, in accordance with the technical controls the Centre issues.

Article 88 Hazardous Waste transport vehicles must be appropriately branded and easily recognizable, in accordance with the technical controls the Centre issues.

Article 89 The Transport Document shall require the following information as a minimum:

- A detailed description of the Waste, its components, status, quantity, and classification in accordance with the Waste classification that is set out in the relevant technical controls and with the relevant provisions.
- Waste Producer's Commercial name, representative name, amount of Waste delivered, delivery date and signature.
- Waste Transporter's Commercial name, representative name, amount of waste received, Types of means of transport, delivery date and signature
- Service Provider's commercial name, type of services provided (storage/ treatment/recovery/final disposal); amount of Waste received; amount of waste rejected (if any); receiving date and signature.

2.3 Requirements for the disposal of construction, demolition, and renovation waste

Articles (1, 2, and 3) of the Ministry of Municipal and Rural Affairs and Housing (MoMAH) document titled *"Requirements for the Disposal of Construction, Demolition, and Renovation Waste"* clearly set out mandatory requirements related to construction and demolition waste management activities. These requirements are as follows:

Article 1 **Requirements for license applicant:**

- Contract with a licensed transporter to move all waste to the disposal sites designated by the Amanah / landfill.

Requirements for design engineering offices:

- Calculate the estimated quantities of waste using mathematical equations during the building permit issuance process and enter this data into the permit via the Balady platform (Annex No. 3).

Requirements for supervising engineering offices:

- Verify, in coordination with the license applicant, the contract with a transporter licensed by the National Centre for Waste Management to collect and transport waste to the disposal sites designated by the Amanah / landfill, and include the contract data in the commencement of works report.
- Verify that the construction contractor uses the "Construction and Demolition Waste Receipt Form" to record the quantities received at the disposal sites designated by the Amanah / landfill during the project implementation period, through the licensed transporter (Annex Form No. 1).
- Submit the "Final Waste Disposal Confirmation Document" (Annex Form No. 2), confirming the transfer of all waste, and attach the construction and demolition waste form to prove that the waste was transported to the designated sites at the project's final stage, and record this in the "End of Works Report."

Article 2 **Requirements for the License Applicant:**

- Contract with a licensed transporter to move all waste to the disposal sites designated by the Amanah / landfill.
- Verify that the service provider (the transporter) uses the Construction and Demolition Waste Receipt Form to record the quantities received at the disposal sites designated by the Amanah / landfill during the project implementation period, through the licensed transporter (Annex Form No. 1).

Requirements for design engineering offices:

- Calculate the estimated quantities of waste using mathematical equations during the building permit issuance process and enter this data into the permit via the Balady platform (Annex No. 3).
- Verify, in coordination with the license applicant, the contract with a transporter licensed by the National Center for Waste Management to collect and transport waste to the disposal sites designated by the Amanah / landfill.

Article 3 **Requirements for license applicant:**

- Undertake to provide a container for the transport of construction waste.
- Contract with a transporter licensed by the National Center for Waste Management, in coordination with the license applicant, to collect and transport waste to the disposal sites designated by the Amanah / landfill.

2.4 Environmental Protection Law (EPL)

المركز الوطني
للرقابة على الالتزام البيئي
National Center for Environmental Compliance
المملكة العربية السعودية

As per **Article 2** of Environmental Protection Law, it aims to protect develop and sustain the environment; adhere to environmental principles; and regulate the environmental sector and related activities and service. Since collection and transportation activities might have a significant impact on the environment, a few mandatory requirements of the EPL must be adhered to:

Article 32 Any act that harms protected areas or disrupts their natural balance shall be prohibited, particularly the following:

- **Clause No. 04:** Littering therein, or burying, burning, or disposing of waste in places other than those designated by the competent authority

Article 35 Any of the following acts shall be deemed a violation of this Law:

- **Clause No. 03:** Disposing hazardous waste in environmental mediums

2.5 Traffic Law

Traffic regulations directly influence how CDW is transported, minimizing risks such as road accidents, environmental hazards, and disruptions to public safety

Article 3

- Each vehicle shall carry a special number registered at the competent authority in accordance with the Regulations.
- The number of a vehicle's license shall be the same as the number on the vehicle's license plate. If the number on the plate is changed, the number on the vehicle's license must be changed accordingly.

Article 8

- No vehicle may be operated before registering said vehicle, paying the prescribed fees in accordance with the Fee Schedule annexed to this Law, issuing the vehicle license, and fitting the license plates in accordance with this Law and its Regulations, excluding military vehicles used for military purposes which do not normally use public roads.
- All due traffic fines must be paid prior to starting the process of issuing vehicle licenses.
- Any vehicle owner must insure his vehicle, in accordance with the Regulations.

Article 22

Legal weights and dimensions set for vehicles must be complied with

Article 24 All vehicles shall conform to the specifications and standards approved by the Saudi Arabian Standards Organizations

Article 26 Vehicles of all types shall undergo a periodic technical inspection to ensure they are fit for use, subject to the conditions set by the regulations

Article 32 It shall be prohibited for any person to drive vehicle prior to obtaining a driving license in accordance with the provisions of this Law and its Regulations.

2.6 Regulations of Freight Transport, Freight Forwarder, and Truck Rental on Roads

Regulations of Freight Transport, Freight Forwarded and Trucks Rental on Roads ensures that the movement of CDW is conducted in a manner that is safe, efficient, and compliant with legal and environmental standards.

Article 3 Any activities in accordance with the provisions of this Regulation must be carried out by:

- **Clause No. 1:** Establishments after obtaining a license to do so.

Article 13 A person who works in - freight transport for own account by his own trucks must obtain a special transport card for each transport vehicle according to the following:

- Individuals- one single unit truck or tractor unit as a maximum, in accordance with the controls and requirements issued by a decision of the President
- Establishments: Nine vehicles (single unit truck and / or tractor unit) as a maximum, in accordance with the controls and requirements issued by a decision of the President

Article 31 The driver must be required to meet the following requirements:

- He must have a valid public driving license issued in accordance with the traffic law and its Executive regulations.
- He must have a valid Professional driver's card.
- He must have valid Hazardous Material Transport Driver's Card in case of transport of hazardous materials.

Article 36 Each transport vehicle must have an operation card issued by the Authority in accordance with the form approved by the Authority.

Article 37 **Clause No. 1:** The operating age of single unit trucks or single tractor units for the freight transport activity or the truck rental activity must not exceed (20) years from the year of manufacturing

Article 39 The carrier or the person who practices freight transport for own account must be obligated to monitor the performance of the truck and the driver during the transport, and record the daily movement during the transport including the speed of the truck, the number of driving and resting hours, downtime and reading distance at the beginning and end of the working day also, data , time, The license number and the operating card number of the truck in accordance to the elements and requirements and the data transfer mechanism determined by the Authority.

Article 40 The carrier or person who practices freight transport for his own account must comply with the following:

- Use the type of truck suitable for the type of freight, and make sure that the truck meets the conditions and requirements and all approved standard specifications.
- Subject the transport vehicle during the duration of its operation for periodical technical inspection.
- Installation of front, lateral and rear underrun protection barriers on the vehicle in accordance with the approved standard specifications.

Article 41 The Authority may request that any transport vehicle be subject to periodical technical inspection before its expiry date in the following cases:

- An accident affects the components and parts of the main transport vehicle related to safety.
- Reaching an odometer-reading of (250.000) km and its multiples.

Article 44

- The establishment licensed to practice the activity of freight transport may operate transport vehicles in excess of the minimum required for the operation to operate in its activities through operating contracts with other carriers or through rental contracts in accordance with the terms and conditions of the regulation. Provided that the establishment must be responsible for the transport in accordance with the provisions of this Regulation.
- The driving of a licensed individual vehicle must be limited to the owner or his authorized representative as an assistant driver provided that he must be a Saudi national.
- Transport vehicles intended for own account transport must not be used by a person other than its owner or operated in the freight transport activity.
- The Licensee of truck rental activity must perform the leasing of transport vehicles only to the licensed establishments for freight transport activity. The trailers and semi-trailers may be rented to the licensed individuals in the freight transport activity.
- The operators of freight transport activity or the person who works in freight transport for own account must be obliged to install and use the equipment related to the electronic tracking service and to ensure its effectiveness.
- The establishments and individuals licensed to practice the activity of freight transport and establishments licensed to perform the activity of the freight

forwarder must be bound by any electronic systems determined by the Authority to provide the service of issuance of the consignment note.

- Licensed establishment for practicing freight transport, freight forwarder and the activity of trucks rental must appoint a manager for its activity and the presence thereof or his representative in the center.
- Licensed establishments for freight transport activity, freight forwarding activity and truck rental activity must be obliged to enable the service controller to inspect the records of the establishment or provide him with information or documents related to the activity.
- The driver must comply with the request of the service monitor to apply the roadside inspection in a safe area.
- The freight forwarder must not load freight on the foreign truck destined for a state other than in which the state registered unless it is authorized.
- The establishment licensed in freight forwarder activity must not load any foreign trucks for domestic transport within the Kingdom.
- Licensed establishments must get the Authority's prior approval when the Center is changed, amendments to its legal establishment or any changes to the Center's equipment.
- Licensed establishment for freight transport activity, freight forwarding activity and truck rental activity must place a copy of the license in a prominent place in the center through which the activity is carried out.
- The person who works in transporting his freight for the own account must issue a transport document for own account for each carriage process according to the form, data and mechanism approved by the Authority

Article 54 The carrier who transports the hazardous substances must comply with the following:

- Hazardous Substances Accident Handling Manual, as well as all laws, regulations, instructions and standard specifications issued by the competent authorities related to the transport and handling of hazardous substances.
- Training the drivers and providing them with the means, equipment and information on the hazardous of the transferred substances and protection methods from their risks and handling processes and how to act in the event of accidents or risks.
- Drivers are required to obtain Hazardous material Transport Driver's Card.
- Write the name of the transported hazardous substance, the international number of the substance, the symbol of the state of emergency and the severity of the danger on plates and pin it to the trucks body in a clear writing, so that the paintings in accordance with international specifications and the decision of the Authority and the competent authorities, and also pin on the truck the needed warning signs in accordance with the manual Handling hazardous substances accidents and following any instructions in this regard.
- Ensure the validity and safety of the truck technically to the carriage process and ensure the availability of emergency requirements.

- Inform the concerned authorities immediately after the truck is exposed to any accident or malfunction, and to confirm its drivers accordingly.
- Removal and treatment of traces and residues of hazardous substances resulting from the exposure of the truck to a road accident in accordance with the manual dealing with accidents of hazardous substances and instructions of the competent authorities.
- Obtain a permit from related authority when transporting any dangerous substances that require certain conditions to be transported, and adherence to the roads, tracks, times and instructions specified in the permit.
- If the transport permit does not include the truck's route, the driver must move as far as possible from the roads near the residential communities, freshwater sources, dams or desalination plants.
- Adhere to the provisions of international and regional conventions relating to the transport of hazardous substances to which the Kingdom is part of.

3 ROLES AND RESPONSIBILITIES

Effective collection and transportation of CDW requires close coordination between the relevant stakeholders in minimizing the environmental impact, promoting sustainability, and ensuring compliance with regulatory standards. A well-defined structure of roles and responsibilities and clear communication are essential for managing risks, meeting sustainability goals, and ensuring that all legal and regulatory requirements are fulfilled. Below, all relevant regulatory and non-regulatory stakeholders have been identified along with their roles and responsibilities.

3.1 Regulators and competent authorities

	National Center for Waste Management (MWAN)
Description: Regulates Waste Management activities, including licensing service providers for collection, transportation, Treatment, and Disposal of CDW.	
1	**Plans and regulates waste management activities:** Develops waste management plans and strategies and regulates waste management activities across the entire value chain and is mandated to develop and ensure economic sustainability of the sector.
2	**Issues licenses and permits:** Issues licenses to waste management services providers and permits to processing, treatment and recycling facilities and ensures that their operations are in accordance with the regulatory requirements.
3	**Sets the requirements for CDW Management Plans:** establishes technical requirement of construction and demolition waste management plans for construction projects to cover aspects such as reusing, recycling and treatment of waste prior to disposal.
4	**Carries out inspection:** Carries out inspections to assess stakeholder's compliance with the waste management regulatory requirements.
5	**Records and processes data:** Collects and processes periodic reports from waste producers and service providers.
6	**Raises Awareness:** Organizes awareness campaigns in relation to best waste management practices and develops technical guidelines to guide the stakeholders on sustainable waste management practices.
7	**Issues violations:** Issues violation and penalizes in case of any non-compliances against fulfilling regulatory requirements.
8	**Approves CDW treatment sites:** Approves the sites proposed by either the Amanahs or the private investors for developing treatment facilities.
9	**Approves treatment technologies:** Reviews and approves technologies proposed for the treatment of CDW.

Ministry of Municipalities and Housing (MoMAH)

Description: Sets requirements for construction and demolition permits and assigns Disposal sites.

1	**Sets requirement for permits:** Establishes requirements and pre-requisites for construction and demolition permits.
2	**Manages Balady Platform:** MoMAH manages Balady platforms for permit applications.

Amanahs

Description: Review and process the building permits applications and monitor compliance.

1	**Issue building and demolition permits:** Regional Amanahs are responsible for issuing permits for construction, demolition, and renovation works.
2	**Process Building permit applications through Balady Platform:** Amanahs process building permit applications submitted via the Balady Platform.
3	**Review and approval of CDWMP:** Regional Amanahs are responsible for reviewing and approving the CDWMP submitted as part of the building and demolition permit applications.
4	**Monitor compliance:** Oversee construction and demolition contractors' works to ensure they adhere to building regulations including compliance with the Saudi building code.
5	**Urban Planning Collaboration:** Work with MoMAH to implement urban development plans, including infrastructure upgrades and smart city initiatives.
6	**Issue violations:** Issue violation and penalize in case of any non-compliances against fulfilling regulatory requirements.

General Department of Traffic Ministry of Interior

Description: Sets requirements for movement and transportation of CDW Transportation Vehicle.

1	**Vehicle registration and licensing:** Registers vehicles, issues license plates for the vehicles
2	**Vehicle Dimension:** Regulates vehicle weight and dimensions to protect infrastructure.
3	**Vehicle Inspection:** Conducts periodic inspections (e.g., FAHAS) for roadworthiness and emissions compliance.
4	**Issues driving license:** Issues and renews driving licenses based in vehicle type.
5	**Enforcement:** Enforce traffic laws like speed limits, lance discipline, signages and road marking etc.
6	**Accident Management:** Investigates and reports on road accidents.
7	**Issues violations:** Issue violation and fines, escalates penalties for repeat offenses, and maintains violation databases

	Transport General Authority
Description: Sets requirements for safety for vehicles and drivers during movement and transportation of CDW.	
1	**Vehicle Licensing:** Issue licenses to provide transportation services Ensures that vehicles for CDW transport are properly registered and licensed. Issues operational permits for freight transport
2	**Vehicle Standards:** Mandates that vehicles used for transportation comply with specific technical and safety standards.
3	**Issues Licenses for Drivers:** Issues licenses like professional driver's card and hazardous material transport driver's card
4	**Driver's Training:** Sets requirements for driving training for competence development
5	**Vehicle Inspection:** Ensure periodic roadside technical inspection for vehicles
6	**Load Management:** Ensures vehicles do not exceed legal weight and size limits to prevent road damage and accidents.
7	**Vehicle & Driver Safety:** Issues guidelines for vehicle and driver safety during transportation
8	**Issues violations:** Issue violation and penalize in case of any non-compliances against fulfilling regulatory requirements

	National Center for Environmental Compliance (NCEC)
Description: Protect, develop, and sustain the environment by regulating the environmental sector and related activities and services.	
1	**Regulates the environment:** Develops, implements, and enforces environmental laws and regulations across the Kingdom of Saudi Arabia.
2	**Issues licenses and permits and monitors environmental compliance:** Issues permits and licenses to project owners and services providers and ensures that their operations are in accordance with the regulatory requirements.
3	**Carries Inspection:** Carries out inspections, measurements and tests to assess stakeholder's compliance with the environmental regulatory requirements.
4	**Records and processes data:** Collects and processes periodic reports from the project owners, contractors and service providers.
5	**Issues Violation and Penalties:** Issues violation and penalizes in case of any non-compliances against fulfilling environmental regulatory requirements

	Saudi Building Code (SBC)
Description: Establishes standards and guidelines related to construction and demolition activities and promotes through the Saudi green building code sustainable waste management practices on construction sites.	
1	**Establishes Building Standards and Guidelines:** The SBC sets comprehensive regulations, codes, standards, and guidelines that govern the design, construction, and maintenance of buildings in Saudi Arabia. These include technical requirements related to structural design, building materials, and fire safety.
2	**Sets the requirements for CDW Management Plans:** Saudi Green Construction Code SBC-1001-CR sets the requirement to have construction and demolition waste management plans for construction projects to cover aspects such as reusing, recycling and treatment of waste prior to disposal.

	Saudi Standards, Metrology and Quality Organization (SASO)
Description: SASO establishes national standards for vehicle, truck, trailers and semi-trailers that will be used to transport CDW from point of generation to treatment or disposal facility.	
1	**Development of Technical Standards:** Develops and establishes technical standards that define the specifications for CDW transport vehicles
2	**Issues compliance certificates and set requirements:** Issues compliance certificates, ensuring they meet the relevant specifications.

3.2 Waste producers

	Project Owners and Developers
Description: W Waste producers include individuals, groups, or business entities that generate CDW through their construction or demolition activities. They are responsible for ensuring compliance with regulations and adopting the best practices for the sustainable management of CDW.	
1	**Ensure compliance:** Comply with the regulatory requirements and implement efficient and effective on-site sorting of CDW as per the criteria outlined in the MWAN Technical Guidelines for CDW Source Segregation.
2	**Contract licensed providers:** engage licensed service providers and authorized facilities for waste collection, transportation, treatment, and disposal to ensure proper management of CDW.
3	**Record and report waste data:** Maintain accurate records of waste data and submit reports to relevant regulatory authorities. Ensure workers are trained in proper waste segregation practices to support compliance.

4	**Obtain environmental permits and ensure compliance:** Secure the necessary environmental permits from NCEC before initiating site activities. Implement all required environmental monitoring measures to ensure full compliance with applicable regulations.



Construction Contractors

Description: Responsible for managing CDW generated during construction projects. Their duties include ensuring compliance with waste management regulations and adopting best practices for proper handling, segregation, and disposal of CDW.

1	**Obtain licenses & registrations:** secure the appropriate licenses and registration certificates from relevant regulatory authorities including Saudi Contractors Authority (SCA).
2	**Implement CDW management plans:** Implement the CDW management plans in compliance with MWAN technical guidelines to ensure proper handling and disposal of construction waste.
3	**Identify & classify waste:** Conduct on-site identification and classification of construction and demolition waste at the point of generation in accordance with guidelines for waste classification.
4	**Ensure proper segregation and storage:** implement effective waste segregation and storage practices at the source to prevent mixing and contamination of different types of waste.
5	**Contract licensed service provider:** engage only licensed service provider for collection/ transportation and authorized facilities for treatment, processing, recycling or disposal of construction waste.
6	**Ensure waste is treated:** confirm that construction waste is treated, recycled and recovered in accordance with the best practices and regulatory requirements.
7	**Comply with regulations:** adhere to all relevant Waste Management regulations and technical guidelines related to sorting, handling, processing, treatment, recycling and disposal of construction waste.
8	**Build workers capacity:** Ensure that only trained workers are assigned to segregate waste, enabling effective source segregation and compliance with best practices.
9	**Maintain Records submit reports:** keep accurate records of construction waste and submit regular reports to relevant regulatory authorities to ensure transparency and accountability.
10	**Obtain environmental permits and ensure compliance:** Obtain the required environmental permits from NCEC for the construction site, when applicable. Implement all necessary environmental monitoring measures to achieve full compliance with the relevant regulations.



Demolition Contractors

Description: Responsible for managing CDW generated during demolition Projects. Their duties include ensuring compliance with waste management regulations and adopting best practices for proper handling, segregation, and disposal of waste.

1	**Obtain appropriate license & registration:** secure the appropriate licenses and registration certificates from relevant regulatory authorities including SCA.

2	**Implement CDW management plans:** Implement the CDW management plans in compliance with MWAN technical guidelines to ensure proper handling and disposal of construction waste.
3	**Preparation of the Demolition Plan:** Develop and implement a demolition plan tailored to the characteristics of the project and in accordance with the selective demolition framework established by the National Center for Waste Management (MWAN).
4	**Execute demolition:** Execute demolition activities and implement demolition as per method statement outlined in the CDW management plan.
5	**Identify & classify waste:** Conduct on-site identification and classification of construction and demolition waste at the point of generation in accordance with guidelines for waste classification.
6	**Ensure proper segregation and storage: implement effective waste segregation and storage practices** at the source to prevent mixing and contamination of different types of waste.
7	**Contract licensed service provider:** engage only licensed service provider for collection/transportation and authorized facilities for treatment, processing, recycling or disposal of construction waste.
8	**Ensure waste is treated:** confirm that construction waste is treated, recycled and recovered in accordance with the best practices and regulatory requirements.
9	**Comply with regulations:** adhere to all relevant Waste Management regulations and technical guidelines related to sorting, handling, processing, treatment, recycling and disposal of construction waste.
10	**Build workers capacity:** Ensure that only trained workers are assigned to segregate waste, enabling effective source segregation and compliance with best practices.
11	**Maintain Records submit reports:** keep accurate records of construction waste and submit regular reports to relevant regulatory authorities to ensure transparency and accountability.
12	**Obtain environmental permits and ensure compliance:** Obtain the required environmental permits from NCEC for the demolition site, when applicable. Implement all necessary environmental monitoring measures to achieve full compliance with the relevant regulations.

3.3 Service providers

	**Waste Collection & Transportation Service Providers**
Description: Licensed companies responsible for collecting and transporting non-Hazardous, recyclable and inert CDW to processing, treatment, recycling, or disposal facilities.	
1	**Obtain licenses & registrations:** secure the appropriate licenses from MWAN for collecting and transporting hazardous and non-Hazardous CDW to processing, treatment, recycling or disposal facilities.
2	**Obtain environmental permits:** acquire the necessary environmental permits from NCEC for the site allocated for vehicle shelter.

3	**Collect CDW:** ensure the collection of segregated CDW directly from waste producers in accordance with the relevant guidelines.
4	**Ensure safe handling and transportation:** implement safe and secure transportation methods for CDW to processing, treatment, recycling or disposal facilities, ensuring that segregated waste is not mixed during transportation.
5	**Comply with regulations:** adhere to all waste management regulations and technical guidelines related to handling, collection and transportation of CDW.
6	**Maintain records and submit reports:** keep accurate records of CDW collected and transported and submit regular reports to MWAN as required for monitoring and compliance purposes.



Treatment Providers

Description: Licensed entities permitted to operate recycling facilities and treat CDW according to regulatory standards.

1	**Obtain permits & registrations:** secure the required permits and registrations from MWAN for of the treatment of CDW.
2	**Acquire environmental permits:** obtain environmental permits (i.e., EPC or EPO) from NCEC for the construction and operational phases of the treatment facilities.
3	**Inspect and accept waste:** Monitor and inspect incoming waste to ensure it meets treatment acceptance criteria and identify non-conforming materials that should go to disposal sites or non CDW treatment and/or disposal facilities.
4	**Process and treat CDW:** Ensure that incoming CDW is efficiently processed, treated or recycled with minimal residual waste generation.
5	**Ensure quality control and assurance**: verify that recycled materials meet industry standards and quality requirements, making them safe and viable for use in construction projects.
6	**Dispose of residual waste: properly identify, classify, transport and dispose of** residual waste generated after processing or treatment, in compliance with regulations.
7	**Conduct environmental monitoring: perform** regular testing of air, soil, and water quality during processing or treatment of CDW to detect any potential contamination and ensure compliance with NCEC's regulations.
8	**Ensure regulatory compliance:** comply with all regulatory requirements and the relevant technical guidelines issued by MWAN.
9	**Maintain recordkeeping and documentation:** Maintain records of waste types, volumes, and sources, as along with operational activities, environmental monitoring data, and maintaining logs for regulatory reporting and tracking purposes.



Waste Disposal Service Providers / Landfill Operators

Description: Companies licensed to handle the final Disposal of CDW in designated landfill sites.

1	**Obtain permits & registrations:** secure the necessary permits and registrations from MWAN for the final disposal of CDW.
2	**Acquire environmental permits:** obtain environmental permits (i.e., EPC or EPO) from NCEC for all phases of landfill operations, including construction and operation.
3	**Inspect and accept waste:** Monitor and inspect incoming waste to ensure it meets landfill acceptance criteria, identifying any non-conforming material for further processing or treatment.
4	**Perform waste placement and compaction:** Place and compact waste to maximize landfill space, enhance stability, and minimize odors and emissions.
5	**Conduct environmental monitoring:** regularly test air, soil, and water quality around the landfill site to detect potential contamination and ensure compliance with NCEC's regulations.
6	**Ensure regulatory compliance:** comply with all regulatory requirements and technical guidelines related to waste acceptance criteria, landfill operations and the final disposal of CDW.
7	**Maintain records and documentation:** keep detailed records of waste types, volumes, and sources, as well as operational activities, environmental monitoring data, and maintenance logs for regulatory reporting and tracking.



Engineering Offices

Description: Entities responsible for supervising overall construction and demolition projects in accordance with approved plans, procedures, and regulations.

1	**Apply and acquire building Permit:** Acquire relevant construction and demolition permits on behalf of the developers, contractors and owners.
2	**Pre-Demolition Audit:** Conduct pre-demolition audit of the asset to be demolished.
3	**Waste Estimation and Quantification:** Based on the audit, estimate and quantify waste material to be generated.
4	**Identification of Hazardous Materials:** Identify the presence of any hazardous materials including asbestos, PCB, chemicals etc.
5	**Risk Assessment:** Carry out risk assessment based on the audit.
6	**Waste Inventory:** Prepare waste inventory based on the information collected and gathered during audit.
7	**Framework for Selective Demolition:** Implement framework of selective demolition for selection of appropriate demolition method.
8	**Develop CDW management plans:** Design and prepare CDW management plans for developers and contractors who lack the technical expertise to develop such plans.
9	**Demolition Completion Report:** Prepare a demolition completion report after the demolition works are finished, outlining all details related to demolition waste management, as well as site cleaning and clearance.
10	**Prepare Environmental and Social Impact Assessments:** Prepare Environmental and Social Impact Assessment (ESIA) studies for various projects, limited to consultants certified by NCEC.

11	**Supervise construction activities:** Oversee and supervise the construction, demolition, and operation phases of built assets to ensure compliance with project requirements and applicable regulations.
12	**Monitor the implementation of the CDWMP:** Monitor the implementation of the CDWMP by construction and demolition contractors when assigned as the supervision consultant to ensure compliance with CDW management requirements and alignment with national targets
13	**Ensure quality assurance:** verify that construction activities align with local codes, standards, and approved building permit documentation.
14	**Monitor and report:** Monitor overall performance by analyzing data, providing insights and adjustments for optimization, and maintaining records and reports for stakeholders.

4 PLANNING PHASE FOR CDW COLLECTION AND TRANSPORTATION

The transportation of CDW is a very critical phase in the waste management process, therefore, proper planning ensures that waste is removed from the site effectively and directed to appropriate recycling, processing or disposal facilities. The key considerations that need to be considered during planning have been summarized in **Figure 4-1**:



Figure 4-1: Key elements of the planning phase of the CDW collection and transportation activities

4.1 Licensing & permitting of CDW transport service providers

The planning phase of CDW collection and transportation begins with ensuring compliance with licensing and regulatory requirements. As outlined in **Section 2** i.e., **Regulatory Requirements**, all business entities involved in CDW transportation must obtain the necessary licenses and approvals from relevant authorities like MWAN, MoMAH, TGA, The General Department of Traffic, etc. These licenses confirm that the transportation activities meet environmental and safety standards.

Further, for the site infrastructure like parking space additional permits are required. Such facilities must secure an Environmental Permit to Construct (EPC) before establishing the infrastructure and an Environmental Permit to Operate (EPO) before commencing operations. These permits are issued by the NCEC and are designed to ensure that all operational activities align with environmental standards, including waste and water management, air quality controls, and noise reduction measures. The complete licensing journey for a CDW collection and transportation service provider has been presented in **APPENDIX - 1.**

4.2 CDW transport vehicles requirement

4.2.1 Regulatory compliance

All CDW transport vehicles must abide by the following:

- **Registration & Licensing:** All heavy vehicles must be registered with the appropriate authorities and possess a valid operating license. This includes passing a comprehensive vehicle inspection to ensure compliance with safety and environmental standards.
- **Drivers Qualifications:** Drivers of heavy vehicles must hold a valid heavy vehicle driving license, which requires specialized training and passing a rigorous driving test. Continuous professional development and periodic reassessment are mandatory.
- **Vehicles Maintenance:** Regular maintenance schedules must be adhered to for all heavy vehicles. This includes routine inspections, servicing, and necessary repairs to maintain optimal safety and performance standards.

- **Emergency Response:** A comprehensive emergency response plan must be in place for incidents involving heavy vehicles. This includes protocols for accident reporting, vehicle recovery, and environmental spill management.

4.2.2 Axle loads

Axle load is defined as the total weight exerted by a vehicle onto the road surface by a single axle. The Saudi Standards, Metrology and Quality Organization (SASO) sets the national standards for axle loads. The maximum allowable axle load is 8 tons for a steerable single axle with a single tire, 10 tons for a double tire, and 13 tons for an unsteerable single axle.

4.2.3 Gross Vehicle Weight (GVW)

Gross Vehicle weight (GVW) represents the total weight of the vehicle, including its cargo, passengers, fuel, and the vehicle itself. SASO sets the national standards for it. The GVW must not exceed 45 tons for a combination of a truck, bus, truck with trailer, or tractor with a semi-trailer. For a double trailer truck, the maximum GVW is restricted to 60 tons.

The standards set the baseline for axle-load limits throughout the Kingdom. However, local municipalities have the authority to adjust these limits for roads within their jurisdiction, allowing for adaptation to specific local road conditions and traffic management requirements. These adjustments are in accordance with the Public Utilities Protection mandate, which aims to extend the lifetime of roads and enhance their safety.

4.2.4 Vehicle dimensions

SASO sets the national standards for vehicle dimensions and weight which can be directly linked with the CDW transport vehicle. For transport vehicles, the total length of a single truck must not exceed 12.50 meters, while the maximum permissible length for a locomotive and semi-trailer is 23 meters, and for a truck and trailer, it is 20 meters. The total width of any vehicle must not exceed 2.6 meters, and the height is restricted to 4.5 meters without loads or 4.8 meters with loads, in accordance with traffic regulations. These dimensions are crucial to ensure safe maneuverability and compliance with road standards. The gross weight of CDW transport vehicles, including single trucks, trucks with trailers, locomotives, semi-trailers, or other approved configurations, must not exceed 45 tons to prevent road infrastructure damage and maintain vehicle stability. The weight on a single-wheel steering axle is limited to 8 tons, on a double-wheeled axle to 10 tons, and on a single non-steerable axle to 13 tons. Additionally, the weight at the tip of any non-steerable axle must not exceed 6.5 tons. These limits are set to minimize road wear and ensure the safe transport of heavy and bulky CDW materials, reducing the risk of accidents and environmental hazards during transit. Figure 4-2 represents the illustration for vehicle dimensions whereas **Table *4-1*** to **Table 4-4** provide the gross weight standards for different types of trucks.

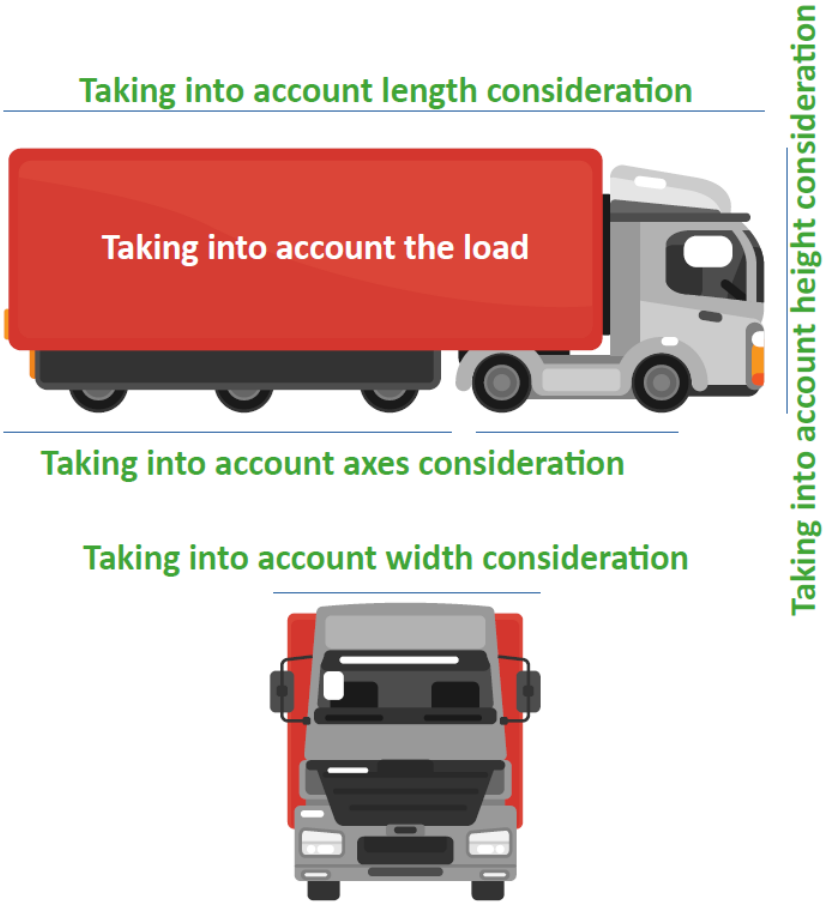


Figure 4-2: Illustration of vehicle dimensions

Table 4-1: Single truck dimensions having 02 axles and its corresponding gross weight



Length (meter)	Width (meter)	Height (meter)	Maximum Axle Weight in Tons		Gross Weight (Tons)
			Axle-1	Axle-2	
1.25	2.60	5.5	8	12	21

Table 4-2: Single truck dimensions having 03 axles and its gross weight



Length (meter)	Width (meter)	Height (meter)	Maximum Axle Weight in Tons					Gross Weight
			Axle-1	Opposite Axes				
				Distance in Meters	Axle-2	Axle-3	Total	
1.25	2.60	4.5	8	0.09 – 1	7.35	7.35	14.70	22.70
1.25	2.60	4.5	8	1 – 1.10	8.05	8.05	16.10	24.10
1.25	2.60	4.5	8	1.10 – 1.20	8.75	8.75	17.50	25.50
1.25	2.60	4.5	8	1.20 – 1.30	9.45	9.45	18.90	26.90
1.25	2.60	4.5	8	1.30 – 1.35	10.15	10.15	20.30	28.30
1.25	2.60	4.5	8	1.35 – 2.5	10.5	10.5	21	29

Table 4-3: Trailer & semi-trailer dimensions having 03 axles and its gross weight



Length (meter)	Width (meter)	Height (meter)	Maximum Axle Weight in Tons			Gross Weight
			Axle-1	Axle-2	Axle-3	
23	2.60	4.5	8	13	13	34

Table 4-4: Trailer & semi-trailer dimensions having 04 axles and its gross weight



Length (meter)	Width (meter)	Height (meter)	Maximum Axle Weight in Tons						Gross Weight
			Axle-1	Axle-2	Opposite Axes				
					Distance in Meters	Axle-3	Axle-4	Total	
23	2.60	4.5	8	13	0.09 – 1	7.35	7.35	14.70	35.70
23	2.60	4.5	8	13	1 – 1.10	8.05	8.05	16.10	37.10
23	2.60	4.5	8	13	1.10 – 1.20	8.75	8.75	17.50	38.50
23	2.60	4.5	8	13	1.20 – 1.30	9.45	9.45	18.90	39.90
23	2.60	4.5	8	13	1.30 – 1.35	10.15	10.15	20.30	41.30
23	2.60	4.5	8	13	1.35 – 2.5	10.50	10.50	21	42

4.2.5 Skip dimensions and compatibility

The dimension of the CDW collection and transportation vehicle must align with the dimensions of the skip specified in the Technical Guidelines of Source Segregation issued by MWAN. The dimensions of the skip, including its height, width, and length, must be assessed against the dimensions of the vehicle's cargo area. The vehicle must have an adequate load area to accommodate the skip with sufficient clearance for loading, unloading, and securing the skip. This ensures that the vehicle is capable of safely and efficiently transporting the waste while minimizing the risk of spillage, damage, and operational inefficiencies. Key measurements to consider include:

- **Length:** The length of the skip should match the loading area of the vehicle to ensure a proper fit without overhanging.
- **Width:** The width of the skip should be aligned with the vehicle's width to prevent any instability during transport.
- **Height:** The height of the skip must be compatible with the vehicle's loading height to allow for smooth loading/unloading operations.

4.2.6 Electronic tracking device

The use of Global Positioning System (GPS) and other technology-based systems installed in heavy vehicles to monitor their location, routes, and operational status in real-time. These devices are integral for fleet management, ensuring compliance with regulations, enhancing safety, and improving the efficiency of transport operations. The implementation of such tracking systems allows for the continuous oversight of vehicle movements, facilitating better planning, swift response to incidents, and adherence to prescribed routes and schedules.

The operators of CDW transport activity must be obliged to install and use the equipment related to the electronic tracking service and to ensure its effectiveness. The establishments and individuals licensed to practice the activity of CDW transport and establishments licensed to perform the activity of the CDW collection and transportation must be bound by any electronic systems determined by the Authority to provide the service of issuance of the consignment note.

4.2.7 Cleanliness

The maintenance of a dirt and debris-free condition of heavy vehicles operating within urban areas. This encompasses the exterior cleanliness and integrity of the vehicle, ensuring that operational byproducts (such as mud, dirt, construction materials, or waste) do not adhere to the vehicle's body, wheels, or undercarriage. Upholding strict cleanliness protocols is crucial for the compliance with environmental standards and fostering a positive public image; these standards include but are not limited to:

- All heavy vehicles must be maintained in a clean state to prevent the accumulation of dirt, debris, and other materials that may compromise the vehicle's safety, operational efficiency, or contribute to environmental pollution.
- Specific areas of the vehicle, including but not limited to, the undercarriage, wheels, wheel wells, and external surfaces, must be regularly cleaned to remove materials that may contribute to the degradation of public infrastructure or overall image of the vehicle.
- External surfaces of the vehicle, including trailers and cargo areas visible from the outside, must be cleaned whenever visible dirt, grime, or residues exceed a coverage of 25% of any surface area, to ensure visibility of regulatory markings and to maintain a positive visual impact on the community.
- Regular checks and maintenance must be conducted to prevent leaks of operational fluids (oil, fuel, hydraulic fluids, etc.), which can contribute to environmental pollution and unsafe operating conditions.
- Unpleasant odors from vehicles must be controlled and eliminated, including those arising from cargo, to ensure they do not cause discomfort to the public or the vehicle operators.
- License plates must be kept clean and legible at all times to ensure that vehicles are easily identifiable by traffic authorities and automated systems. This includes removing any dirt, mud, or debris that could obscure the plate's letters, numbers, and registration tags.
- Vehicle appearance and integrity must be maintained to prescribed standards, ensuring that the vehicle's lights remain unobstructed, the original color is preserved without alterations, and the body is free from significant and/or numerous deformations.
- The bed of the dump truck must be cleared of residual materials post-delivery to prevent spillage on roadways. This includes any materials stuck to the sides or hidden compartments.
- Special attention must be given to cleaning mud flaps and the chassis to remove any trapped debris that could fall onto roadways during transport
- Ensure all building materials such as sand, gravel, and cement are securely contained within the vehicle to prevent spillage onto roadways during transit.

4.2.8 Inspection

Regular inspection of CDW transport vehicles is essential to ensure safe, efficient, and compliant transportation. These inspections help maintain the vehicle's performance, prevent accidents, and minimize the risk of environmental contamination. A comprehensive inspection should cover several key areas:

- **Structural Integrity:** Inspect the vehicle's chassis, body, and frame for any signs of wear, rust, or structural damage. Ensure that the vehicle is structurally sound and capable of safely carrying the load. Any damage, particularly to the frame or cargo area, should be addressed immediately to prevent failure during transit.
- **Cargo Area Condition:** The cargo area of the vehicle must be free from any damage, sharp edges, or obstructions that could cause waste to spill or shift during transportation. The floor should be intact, without any cracks or holes that could lead to leakage or contamination of surrounding areas. Additionally, check that containment systems, such as side walls, tarps, or covers, are functioning properly and are secure to prevent waste from escaping.
- **Waste Containment Systems:** For vehicles transporting loose or bulk materials, ensure that containment systems, such as tarpaulins, netting, or other covers, are in good condition. These systems help prevent spillage, dust, and debris from escaping during transit, minimizing the risk of road contamination and environmental damage. Ensure that load-bearing mechanisms, such as hydraulic lifts or tipping mechanisms, are working properly and are securely attached.
- **Vehicle Tires and Suspension:** Inspect the tires for wear and tear, ensuring that they are inflated to the recommended pressure levels. Check for any visible damage, such as punctures or cracks, which could compromise vehicle stability or cause tire failure during transit. The suspension system should also be inspected for any damage or wear that could affect the vehicle's handling and load stability.
- **Braking and Safety Systems:** The braking system is crucial for the safe operation of the vehicle. Inspect the brakes to ensure they are responsive and function properly, with adequate brake pads and fluid levels. Verify that other safety features, such as the emergency brake, warning lights, and signals, are fully operational. Ensure that safety equipment, such as fire extinguishers, first-aid kits, and spill kits, are available and in good condition.
- **Lighting and Signage:** Check that all external lights, including headlights, brake lights, turn signals, and hazard lights, are working properly. Proper visibility is essential for the safe operation of transport vehicles, especially when traveling in low-light conditions. Additionally, ensure that the vehicle is clearly marked with the appropriate signage, including waste type labels and hazard symbols, if applicable.
- **Fuel and Engine System:** Inspect the engine for leaks, unusual noises, or other signs of malfunction. Ensure that the fuel system is intact and free from leaks, as fuel leaks can create safety hazards. Routine maintenance, such as oil changes and air filter replacements, should also be performed regularly.
- **Environmental Control Systems:** For vehicles transporting hazardous or odorous materials, inspect the air filtration and odor control systems. Ensure that the vehicle's system is functioning to prevent any harmful emissions or unpleasant odors from escaping, particularly when transporting materials that could impact air quality.
- **Driver's Cabin and Controls:** Inspect the driver's cabin to ensure all controls are easily accessible and functional. The dashboard, steering wheel, and other essential systems should be in working

order. Check that the driver has access to safety equipment and that the cabin is free from debris that could distract or obstruct the driver's view.

- **Compliance with Regulations:** Ensure that the vehicle is compliant with regulatory requirements regarding weight limits, road safety, and environmental standards. This includes checking that the vehicle's registration, insurance, and necessary permits are up to date and that the vehicle meets all regulatory requirements for transporting waste.
- **Cleaning and Maintenance Records:** Ensure that the vehicle has undergone regular cleaning and maintenance, particularly if it is used for transporting different types of waste. Keep records of maintenance and inspections to ensure compliance with regulatory requirements and to track any issues over time.

Template for vehicle inspection have been attached **APPENDIX - 2** and **APPENDIX - 3**.

4.3 Site visit prior to CDW collection and transport

The site visit serves to assess the overall readiness for waste collection. This includes evaluating the accessibility and condition of the storage areas to ensure that waste can be safely and efficiently loaded onto collection vehicles. The site should have enough space for vehicles to manoeuvre and for waste to be loaded without causing disruption to other site activities.

An essential part of the site visit is to ensure that the waste transport manifest has been correctly prepared. This manifest serves as an official document that tracks the waste from the site to its final destination, containing details such as the waste producer's information, the waste types, quantities, and the transport, treatment and disposal facility details. It is critical to verify that the manifest aligns with the waste inventory and that all required information is accurate and complete. This ensures transparency and regulatory compliance throughout the transportation process.

Information gathered during the site visit not only helps in preparing waste transport manifest but also ensures that the collection and transportation process can proceed smoothly, safely, and in compliance with relevant regulations. This helps reduce risks, improve efficiency, and ensure that waste is disposed of or recycled in an environmentally responsible manner.

4.4 Route planning

Route planning involves a comprehensive analysis to ensure efficient, safe, and compliant CDW transportation to treatment, processing, recycling or disposal facilities. The starting point for route planning involves identifying waste collection and destination points. Collection points at the project site need to be evaluated for accessibility, ensuring that transport vehicles can efficiently load without causing disruptions. Factors such as road width, vehicle maneuverability, and proximity to staging areas for waste segregation and temporary storage play a crucial role in this evaluation. Similarly, destination facilities, such as recycling centres or landfills, must be certified and capable of handling the specific waste type being transported. It is essential to verify the operational capacity and working hours of these facilities to avoid delays or overloading issues.

Efficiency is a key consideration in route planning. Routes are selected to minimize travel distance and fuel consumption, reducing transportation costs and environmental impact. Real-time traffic data and predictive modelling tools are often used to identify routes that avoid congestion and ensure smooth transit.

Safety is another critical factor. The chosen routes must be suitable for the size and weight of the transport vehicles, avoiding roads with weight restrictions, or sharp curves. Routes should also steer clear of residential or environmentally sensitive areas where the risk of public exposure or environmental harm from potential accidents.

Emergency response capabilities along the route are also evaluated to ensure that adequate support is available in case of accidents or spills. Alternative routes are identified as part of contingency planning, providing options to mitigate potential disruptions caused by road closures, weather conditions, or unforeseen events.

4.5 Vehicle arrangement

The planning phase for the collection and transportation of CDW involves a thorough assessment of the specific vehicle and equipment needs to ensure efficient, safe, and compliant operations. Arranging vehicles for CDW collection requires considering the type of waste, the site conditions, and the volume of material to be transported. Alongside transport vehicles, heavy machinery such as forklifts, excavators, and loaders play a vital role in the collection process.

When dealing with hazardous materials such as asbestos, contaminated soil etc., the planning phase includes specific requirements for equipment designed to handle these waste types safely. Excavators and loaders may need to be equipped with specialized attachments like clamshell buckets or vacuum systems to safely contain hazardous materials. Machines may also have enclosed cabins with air filtration systems to protect operators from harmful substances. Vehicles used for transporting hazardous materials are often fitted with leak-proof, secure containers or tarps to prevent exposure during transit.



Figure 4-3: Illustration of vehicles used during collection & transportation of CDW

5 OPERATIONAL PHASE OF CDW COLLECTION AND TRANSPORTATION

The process of collecting and transporting CDW involves a series of steps to ensure that materials are efficiently removed, transported, and sent for processing, treatment, recycling or disposal facilities in a lawful and environmentally responsible manner. Proper planning, safety protocols, and effective execution are paramount in mitigating the environmental impact of CDW and ensuring smooth operations from the point of collection to final disposal or recycling.

Figure 5-1 outlines the flow of activities involved in the collection and transportation of CDW, from arrival of vehicle at C&D site till arrival at the destination site, including key considerations for safety, compliance, and operational efficiency.

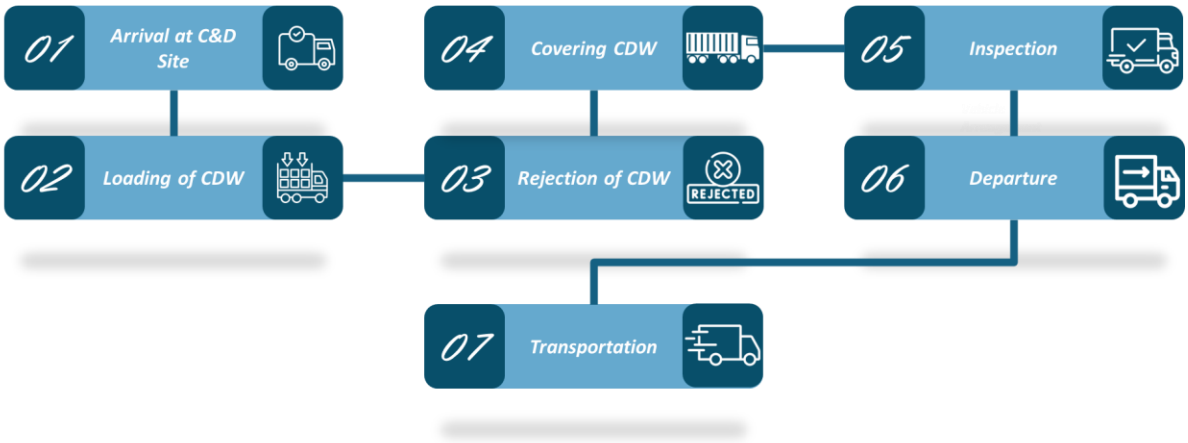


Figure 5-1: Flow of activities carried out during operational phase of CDW collection and transportation

5.1 Arrival at C&D site

Upon arrival at the construction or demolition site, the transport vehicle must adhere to a structured series of procedures designed to ensure safe entry, proper parking, and secure movement within the site. These steps are essential for minimizing the risk of accidents, ensuring operational efficiency, and maintaining safety standards as the vehicle approaches and interacts with ongoing activities.

The vehicle's entry begins with controlled access to the site. A designated entry point is typically staffed by site personnel who are responsible for managing the flow of traffic. As the vehicle approaches the entry point, the driver will be required to present several key documents for verification. These may include waste transport manifest (please refer **APPENDIX - 2** for template), the necessary permits for transporting the waste, and the weighbridge ticket that was issued when the vehicle was weighed at the weighbridge. This documentation is critical for confirming that the vehicle is authorized to transport the waste and that it complies with environmental and legal standards for the project.

Once the vehicle has been cleared for entry, it must follow a predetermined route within the site to avoid interfering with ongoing construction or demolition operations. Upon reaching the designated loading area, the vehicle must park in a specific space that has been allocated for this purpose. The vehicle should be parked in such a way that it does not block any other machinery or personnel and allows for a smooth flow of operations.

5.2 Loading of CDW

The handling of various waste materials requires the use of specialized machinery, along with strict adherence to safety protocols, to ensure that the materials are safely and efficiently transferred into the transport vehicle. The types of machinery and equipment used are determined by the nature of the waste, its volume, and the site conditions. When dealing with large, heavy, or bulky debris, excavators are often used. For handling smaller debris or loose materials such as soil, sand, gravel, or mixed waste, loaders are commonly used.

In certain situations, the entire skip, (i.e., roll-on / roll-off (RORO) skips having different dimensions as identified in the Technical Guideline for Source Segregation issued by MWAN,) filled with CDW is removed and transported by the vehicle for processing, treatment or disposal. The vehicle is positioned properly, the skip is securely attached to the lifting mechanism, and it is carefully raised to prevent tilting or spillage. After the skip is placed on the truck bed, it is locked and firmly secured to ensure stability during transit.

The process of loading CDW requires careful load management to ensure that materials are handled safely and efficiently. It involves careful planning, monitoring, and controlling of the materials being loaded into the transport vehicle, with a focus on legal compliance, safety, and operational efficiency. Effective load management helps prevent accidents, vehicle damage, and environmental contamination while optimizing the use of transport resources. In addition to the load management, it is vital to consider capacity management when loading the transport vehicle. The vehicle must not exceed its legal weight capacity, as overloading can lead to dangerous consequences such as load spillage, compromised vehicle stability, and potential legal violations. Load distribution is equally important. The waste should be evenly distributed within the vehicle to maintain balance and prevent tipping during transportation. Unevenly distributed loads can affect the vehicle's handling, increasing the risk of accidents, particularly when navigating tight turns or uneven terrain. Details of load and capacity management for different types of vehicles have been presented from **Section 4.2.2** to **Section 4.2.3.**



Figure 5-2: Illustration of CDW loading

5.3 Rejection of CDW

A key consideration is that CDW collection and transportation service providers are allowed to collect all types of CDW except those classified as hazardous waste. Furthermore, mixed waste or non-compliance with source segregation requirements will not be accepted. Proper source segregation is mandatory, with specific expectations depending on the type of project as identified in the **Technical Guideline for Source Segregation** issued by MWAN. CDW transport service provider can reject the following:

- **Hazardous Waste:** Waste identified as hazardous cannot be collected or transported.
- **Waste for Treatment:** Waste intended for treatment must comply with the waste acceptance criteria outlined in the **MWAN technical Guideline for CDW Treatment**. Non-compliance will result in rejection.
- **Waste for Disposal:** Waste intended for disposal must meet the waste acceptance criteria specified in the **MWAN Technical Guideline for CDW Disposal**. If these criteria are not met, the waste will be rejected.
- **Non-CDW Waste:** Any waste that does not qualify as CDW should be rejected and not transported.

5.4 Covering CDW

Once the loading of CDW is complete, covering the waste is an essential step in ensuring its safety and compliance during transport. Proper covering helps prevent materials from being scattered, reduces environmental contamination, and mitigates potential risks to other road users. The type of cover used depends on the nature of the waste and its susceptibility to being blown away, falling off the vehicle, or causing accidents.

For lighter materials such as insulation, plastic sheeting, and loose debris, durable tarps or netting should be used to securely cover the load. These covers must be tightly fastened to prevent any waste from escaping during transit. Tarps should be made of weather-resistant material to withstand varying conditions, including rain, wind, and dust. The tarp should cover the entire load, with excess material folded over the edges of the vehicle and secured with ropes, bungee cords, or straps. This ensures that the cover remains intact and prevents the wind from lifting it, which could result in debris being blown off the vehicle and creating hazards on the road.

For bulkier materials such as construction rubble, heavy-duty mesh netting may be used as an alternative to tarps. This type of netting allows for ventilation while keeping larger pieces of debris from falling off the vehicle. It is essential that the netting is properly tensioned and secured at the edges to prevent any gaps where debris could slip through.

In addition to tarps and netting, vehicles with high sides may use bulkheads or side panels to prevent material from spilling over the sides. These barriers help contain larger or more irregularly shaped debris and ensure that the load remains confined during transport.



Figure 5-3: Illustration of Covering of CDW with tarp

5.5 Trip inspections

Once the CDW is loaded, it is crucial to inspect the vehicle before leaving the site. Pre-trip inspections focus on preparing the vehicle for transport by addressing key areas such as load security, tilt mechanisms, tire and wheel conditions, fuel systems, and engine functionality. These proactive checks help prevent delays, accidents, and non-compliance with transportation regulations. Post-departure inspections maintain safety and performance during the journey by monitoring load stability, tire and brake conditions, fuel system functionality, and vehicle handling. These ongoing checks ensure that any issues arising during transit are promptly addressed, minimizing risks and maintaining operational efficiency. **Figure 5-4** shows different types of pre-trips and post-trip inspection that need to be done.

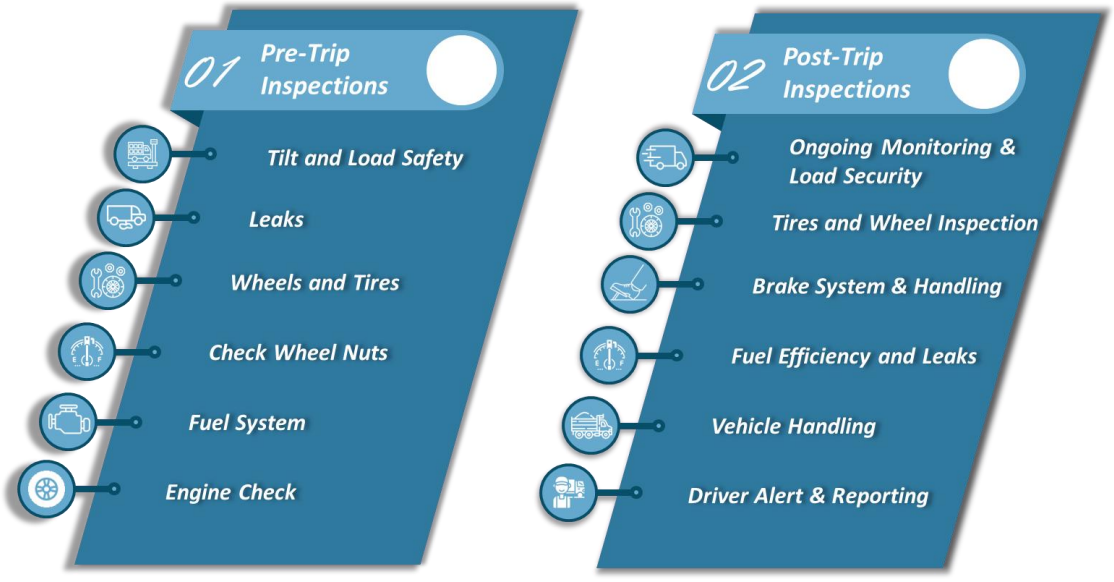


Figure 5-4: List of pre-trip and post-trip vehicle inspections

5.5.1 Pre-trip inspection

Before the transport vehicle departs the site for the destination, a thorough pre-trip inspection must be conducted to ensure the vehicle is in optimal condition for safe and efficient operation. This inspection is essential to identify any potential issues that could cause delays, accidents, or vehicle damage during transportation. The pre-trip inspection includes the following critical checks:

A. Tilt and load safety:

The vehicle's tilt mechanism, if applicable, must be inspected to ensure it operates properly and that the vehicle's load is safely secured. If the vehicle is titled on one side, the problem may be:

- Perforated tire.
- The problem could be excessive weights and incorrect load distribution.
- There might be a failure in the springs or tie rods.

Any issues with the vehicle's tilt function or load stability could result in spillage or imbalance during transport, leading to safety hazards. Transporters must take the following measures:

- Trailer doors are closed and locked.
- The dimensions of the load don’t exceed the truck body.
- The load is well fixed, and all clamps are secured.
- Turning off the engine when loading or unloading any hazardous materials.
- The load is well packed and evenly distributed.
- In an open trailer, the load can be covered. Be sure that you secure the cover because tarpaulins and unfixed loads can fall and cause accidents.
- Ensure that there is no leakage or volatilization of the contents of the load.
- Adhering to all requirements and instructions necessary to transport hazardous materials safely.
- Ensure that the maximum height from road level of the loaded vehicle does not exceed the maximum height prescribed by law to avoid hitting low bridges.

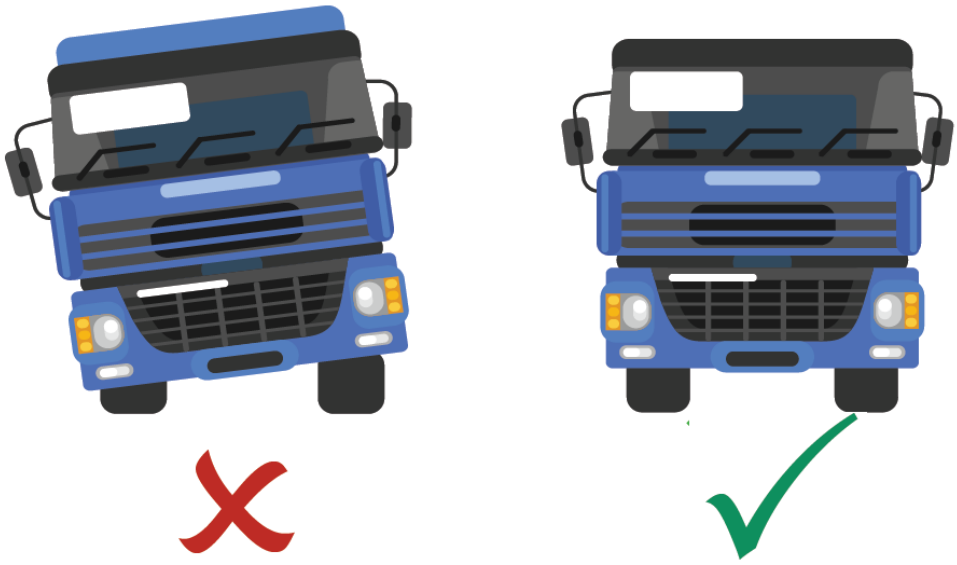


Figure 5-5: Illustration of the tilting of a vehicle

B. Leaks:

A check for any fluid leaks, such as hydraulic, fuel, or oil leaks, should be conducted. Leaks can compromise vehicle performance, lead to environmental contamination, and create hazardous driving conditions. All potential leak sources should be sealed or repaired before departure.

C. Wheels & tires:

The wheels should be inspected for any visible damage or signs of wear, including cracks or corrosion. Tires should be checked for sufficient tread depth, uneven wear patterns, and visible punctures. The tire pressure must be verified to ensure they are within the manufacturer's recommended specifications. Under- or over-inflated tires can negatively impact vehicle handling and fuel efficiency.

D. Check the wheel nuts:

The wheel nuts should be tightened to the correct torque specifications to prevent them from loosening during transit. Additionally, the spacing between dual wheels should be checked to ensure they are properly aligned and that there is no obstruction or debris between them, which could cause uneven wear or hinder wheel movement.

E. Fuel system:

The fuel system should be inspected for any potential leaks or damage. A full check of the fuel tank, lines, and connections ensures that there will be no fuel loss or risk of fire during the journey.

F. Engine check:

A full engine check is essential before departure. This includes inspecting fluid levels for the engine oil, coolant, and transmission fluid, ensuring that they are at the proper levels. The electrical system should be checked, including the battery, lights, and other electrical components, to ensure functionality. The belts and pulleys should be examined for wear, cracks, or misalignment, as these components are critical for the engine's smooth operation. The cockpit (driver's cabin) should also be checked to ensure that all controls, indicators, and safety features (such as the horn, brake lights, and dashboard indicators) are functioning correctly.

5.5.2 Post-departure inspection

After the vehicle departs from the site and is enroute to the processing, recycling, or disposal facility, a post-departure inspection is required to monitor the vehicle's condition throughout its journey. This inspection is vital for identifying any issues that may arise once the vehicle is in transit, as well as to ensure continued safety and compliance with transportation regulations. The post-departure inspection includes the following considerations:

A. Ongoing Monitoring of Load Security:

The load must be monitored throughout the journey to ensure it remains securely fastened. Any shifting of materials during transit can lead to accidents, spillage, or damage to the vehicle. If necessary, the vehicle should pull over at a safe location to re-secure the load.

B. Tire and Wheel Inspection:

After the vehicle has been on the road for a short period, the tires and wheels should be checked again, especially after traversing rough terrain or experiencing significant impacts. This ensures there are no issues with tire pressure, wear, or wheel integrity that could develop once the vehicle is in motion.

C. Brake System and Handling:

The brake system should be re-evaluated during the journey, particularly after the vehicle has been on the road for some time. Any unusual sounds, vibrations, or loss of braking power should be immediately addressed by pulling over and conducting an in-depth check.

D. Fuel Efficiency and Leaks:

Fuel consumption should be monitored to identify any signs of fuel leakage, which can be detrimental to both the environment and vehicle performance. The driver should remain alert for unusual fuel consumption patterns that could indicate an issue with the fuel system.

E. Vehicle Handling:

Throughout the journey, the driver should pay close attention to any changes in vehicle handling, such as difficulty steering or instability in the load. Any signs of vehicle malfunction, such as strange noises, warning lights, or issues with acceleration, should be addressed by pulling over and conducting a further inspection.

F. Driver Alerts and Reporting:

The driver should remain vigilant for any dashboard warning signals or alerts related to the vehicle's systems (e.g., engine temperature, brake fluid levels). These issues should be reported promptly to the fleet management team to assess whether immediate corrective action is needed.

5.6 Departure

During the departure process, drivers must adhere to strict traffic safety protocols used within the construction or the demolition site. This includes maintaining appropriate speed limits within and outside the site, following clear directional signage, and exercising caution when maneuvering around other operational equipment or vehicles. Further, a key component of the departure procedure is the completion and updating of waste transfer manifest. This includes verifying that the weighbridge ticket and any additional waste transfer notes reflect the current load and destination. These records provide an auditable trail of waste's journey, ensuring compliance with environmental regulations and facilitating accountability throughout the transportation process. The documentation also serves as a crucial reference point for regulatory reporting and any inspections by enforcement authorities.

5.7 Transportation

Drivers should adhere to pre-planned routes to avoid congested areas, residential zones, or regions with roadworks. Routes should minimize travel time and fuel consumption while also considering road weight limits, bridges, and restrictions on the transport of heavy or hazardous loads. Additionally, should unexpected events such as road closures, accidents, or traffic delays occur, the driver must remain in contact with site management and local authorities to adjust the route accordingly. In such situations, real-time communication and GPS tracking can help drivers take alternative routes to maintain safety and avoid delays.

6 POST OPERATIONAL PHASE OF CDW COLLECTION AND TRANSPORTATION

The post-operational phase of CDW transportation involves a series of key activities that ensure the transportation process is properly concluded, and all regulatory, safety, and documentation requirements are fulfilled. This phase is critical to finalize the waste management cycle, close out operational procedures, and ensure accountability and compliance with regulations. **Figure 6-1** summarizes the list of activities that are carried out during post-operational phase.



Figure 6-1: List of post operational activities related to CDW collection and transportation

6.1 Arrival at destination site

Once the transport vehicle arrives at the designated processing, recycling, or disposal facility, the receiving facility will inspect the materials for contamination, ensuring that all waste is sorted correctly according to its type (recyclable, hazardous, or non-recyclable) and condition and that the waste meets the waste acceptance criteria set for treatment and disposal facilities.

6.2 Weighing and unloading

Upon arrival at the disposal or recycling site, the vehicle should be weighed while it is fully loaded. This is typically done at a designated weighbridge located at or near the entrance of the recycling site or disposal. Weighing the vehicle with its load ensures accurate tracking of the waste's weight and helps maintain regulatory compliance and operational efficiency.

After the CDW is unloaded at the designated area, the vehicle is weighed again to determine its empty weight. This ensures that the exact amount of waste delivered is calculated by subtracting the empty vehicle weight from the initial loaded weight. Recording these weights eliminates discrepancies and ensures the accuracy of waste documentation.

The final weight, along with the corresponding waste stream details, is documented and compared with the original records from the point of departure. Any inconsistencies are addressed promptly. The disposal or recycling site updates the waste transfer documentation to reflect the receipt of the waste and issues a final receipt for disposal or recycling. These records are vital for ensuring regulatory compliance and facilitating future audits.



Figure 6-2: Illustration of waste truck weighing after waste acceptance

6.3 Vehicle cleanliness

After unloading, and if deemed necessary, the transport vehicle should be cleaned thoroughly to remove any remaining debris, dirt, or waste that may have accumulated during the journey. Cleaning reduces the risk of cross-contamination for future loads and ensures the vehicle remains in good condition for subsequent use. The vehicle should be quickly inspected for any possible damage caused during transportation, including any signs of wear on tires, brakes, or the chassis. If repairs or maintenance are required, these should be documented and addressed promptly.

6.4 Waste Transport Manifest

All waste transfer notes, manifests, weighbridge tickets, and final disposal certificates should be retained for a specified period according to local regulations. These records provide legal proof that the waste has been transported, treated, recycled, or disposed of in compliance with environmental laws and regulations. Waste management records are also essential for audits and environmental reporting, ensuring that the transportation and disposal process is handled properly from start to finish. A template for waste transport manifest has been provided in **APPENDIX - 2**.

7 QUALITY ASSURANCE & MANAGEMENT

Effective quality assurance management during the collection and transportation of CDW begins with comprehensive pre-collection planning. Identify specific collection schedules, optimize vehicle routes to minimize congestion and delays, and designate clear loading and unloading points. Conduct risk assessments to identify potential hazards such as uneven terrain or proximity to heavy machinery and implement mitigation measures that are clearly documented and communicated to all personnel. CDW collection and transport service providers must implement the following quality measures:

- **Vehicle Inspection and Maintenance:** Service provider must ensure that vehicles and equipment meet rigorous technical and safety standards. Conduct mandatory pre-trip inspections, checking critical systems such as brakes, tires, lights, fluid levels, and load-securing mechanisms. Equip transport vehicles with spill kits, fire extinguishers, and tarpaulins or covers to prevent spillage and control dust emissions. Specialized machinery, including excavators, loaders, and forklifts, should undergo daily checks to verify that hydraulic systems, control systems, and safety features are functioning properly. Maintain a regular schedule for equipment maintenance and keep detailed records to ensure reliability and compliance.
- **Development of Operational Procedures:** During on-site operations, adhere to strict protocols for waste segregation, handling, and loading. Clearly marked areas must be used for different waste streams, and personnel should follow standard operating procedures when operating machinery to load waste securely onto vehicles. Conduct quality assurance checks to confirm that loads are evenly distributed, properly secured with restraints or covers, and compliant with legal weight limits. Implement additional measures, such as wetting down dust-prone materials, to control particulate emissions during the loading process.
- **Waste Transport Manifest:** Maintain waste transport manifest, accurate documentation and tracking at every stage of waste handling. Verify all waste transfer notes, weighbridge tickets, and permits to ensure compliance with applicable regulations. Keep detailed transport records that include waste type, quantity, vehicle identification, driver information, and destination details. Utilize real-time tracking systems where feasible to monitor vehicle movements and adherence to designated routes.

Further, implementation of the integrated system for quality, environment, health and safety (QHSE) is also vital for CDW collection and transportation. The integrated QHSE system should outline procedures for documenting waste collection and transportation practices, clear KPIs for each aspect, and regular and periodic monitoring for operational efficiencies. This data is essential for evaluating the success of waste collection and transportation efforts and identifying areas for improvement.

8 REPORTING, RECORD KEEPING AND DOCUMENTATION

Appropriate reporting, recordkeeping, and documentation are essential components of CDW collection and transportation management. These practices ensure compliance with environmental and safety regulations, facilitate transparency and accountability, and contribute to a structured, efficient waste management process. Effective documentation provides a comprehensive record of CDW collection and transportation activities, from waste generation site to processing, treatment, recycling or final disposal site, enabling stakeholders to monitor performance, assess compliance, and take corrective actions when necessary. Each type of documentation serves a unique purpose, yet they collectively support the goal of responsible and sustainable waste management. Specific documentation requirement include:

8.1 Permits and licenses

Transporting CDW requires appropriate permits and licenses to confirm the transporter's authorization to handle specific waste types. This includes licenses for the transporter, permits for the vehicle, and special authorizations for hazardous waste transportation. Hazardous waste permits specify approved routes and handling procedures, ensuring compliance with legal and environmental standards. All permits and licenses must be up to date, with renewal dates monitored closely to maintain validity.

8.2 Waste transport manifest

Waste transport manifests are legally required to accompany each load of CDW during transit. This document provides detailed information about the type, classification, and composition of the waste, its quantity, and its origin and destination. The waste transport manifest also includes transporter details, such as the names and contact information of all parties involved, along with the date, time, and signatures verifying responsibility at each stage. These records must be retained for a legally specified period for regulatory audits and compliance checks. The template of waste transport manifest has been provided in **APPENDIX - 2.**

8.3 Weighbridge Tickets

Weighbridge tickets are essential for accurate measurement of the transported waste. These tickets are issued at the loading and unloading points and record the vehicle's gross weight with the waste and tare weight without it, allowing for the calculation of the net waste weight. Each ticket includes vehicle identification details, such as the license plate number, and date and time stamps for traceability. Verification of these tickets against the waste transfer notes ensures consistency between declared and measured weights.

8.4 Vehicle Inspection records

Vehicle inspection records are critical for maintaining safety and roadworthiness during transportation. Pre-trip inspection logs document checks on brakes, tires, lights, fluid levels, load-securing mechanisms, and overall vehicle condition, while post-trip inspections ensure the vehicle remains in good operational condition after delivery. Maintenance records should include details of scheduled services and repairs. Inspections must also confirm the availability and functionality of emergency equipment, such as spill kits, fire extinguishers, and first aid supplies. Inspection Checklists for vehicles have been provided as **APPENDIX - 2** and **APPENDIX - 3.**

9 HSE CONSIDERATIONS

The collection and transportation of CDW poses various health, safety, and environmental (HSE) risks that must be addressed proactively:

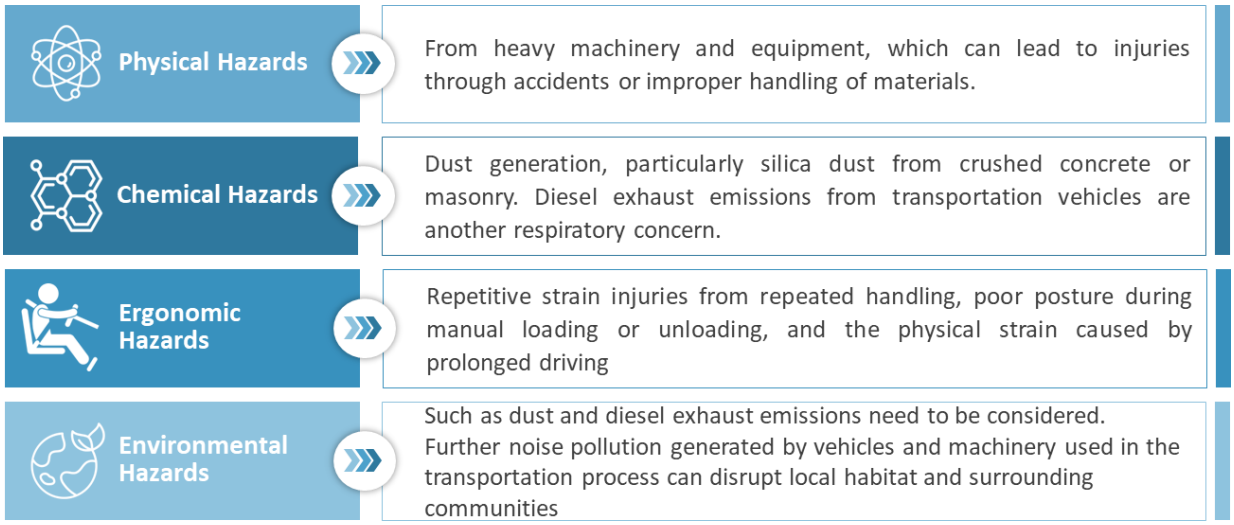
- **Health considerations:** Proper health management during CDW collection and transportation is critical to protecting workers from harmful exposure to hazardous materials such as asbestos, silica dust, and other contaminants, which pose serious health risks if not managed correctly.
- **Safety considerations**: Safety is paramount in managing CDW, as construction and demolition sites often present dynamic and hazardous conditions. Adherence to safety protocols, regular equipment maintenance, and comprehensive worker training on safe handling, lifting techniques, and emergency response can reduce risks and enhance operational safety.
- **Protection of the environment** is also paramount in CDW collection and transportation. Collection and transportation practices should prevent spillage, use vehicles that meet emission standards, and optimize routes to reduce the carbon footprint.

This section outlines the critical HSE considerations necessary for the effective collection and transportation of CDW.

9.1 Health & Safety (H&S) Plan

9.1.1 Risk assessment and management

A comprehensive risk assessment for the collection and transportation of CDW is essential to minimize potential hazards and enhance safety throughout the waste management process. The first step involves identifying various hazards associated with CDW, including:



After identifying these hazards, the likelihood of their occurrence must be assessed, alongside the potential severity of consequences, creating a risk matrix to prioritize risks and come up with a mitigation plan for those risks. Regular monitoring and review of the risk management plan are also necessary to adapt to any changes in the work environment or legislation, ensuring ongoing compliance and safety.

9.1.2 General vehicle safety requirements

- The truck body may have no inclination.
- All electrical connections must be intact, insulated, and protected.
- Lighting device connections between freight vehicle and trailer, or locomotive and semi-trailer shall allow a full free movement of the group while driving.
- The braking system must be reliable, with no leaks or malfunction in the locomotive, trailer and semi-trailer.
- The front, rear, and side lights must be intact and working properly, with no breaks or scratches.
- Trailers and semi-trailers' stopping and signal lights shall operate in synchronization with their freight or locomotive.
- The truck must be equipped with a horn, which should be put in place and working properly.
- Mud flaps shall be installed behind rear tires of trailers and semitrailers to prevent rocks, mud, or any other debris from being pushed towards vehicles coming from behind.
- Goods shall be secured and covered properly.
- Windshield must be in good condition, with no fracture or crack that can prevent vision, or with sharp edges that can pose danger.
- Windshield wipers and washer shall be working properly in accordance with the approved standard specifications.
- The side mirrors shall not be broken or cracked in a manner that obstructs view.
- The vehicle must be equipped with lights or reflective strips to be placed in the rear and sides of the truck.
- All tires must be sound and compatible in terms of size, load, and speed according to truck specifications.
- It shall be equipped with a spare tire.
- It shall be equipped with safety triangle.
- It shall be equipped with first aid kit.
- Vehicle seats must have three-point seat belts.
- Vehicle must be free of any wear in any interior or exterior part.
- It shall be equipped with the necessary tool kit (tools) to carry out the necessary quick repairs on the road in case of emergency.
- Every vehicle shall be equipped with required number of fire extinguishers according to the standards and specifications based on what fits the transported. They shall be located in a certain place with a sign indicating their location to facilitate access thereto.
- It shall be equipped with side barriers, front, and rear bumpers according to the technical regulations of front, rear, and side bumpers of trucks and trailers issued by the Saudi Standards Metrology and Quality Organization No. (M.A. 161-17-07-01).
- A regular periodic maintenance must be conducted.

- The driver shall have a heavy-transport license and a professional driver card according to the regulation governing the activity of transportation of goods, freight brokers, and truck rental on land roads issued by the Transport General Authority, as well as the Truck Drivers Guidelines.

9.1.3 Load safety requirements

- Compliance with the regulation on the carriage of exceptional (indivisible) cargo issued by the Ministry of Transport.
- The truck must be suitable for the type of load being transported, ensuring that the number of its axles is sufficient to distribute the weight of the load on it.
- Obtaining an exceptional load permit in accordance to the regulations for transporting exceptional loads and complying with its provisions.
- Organizing and distributing the load weight on truck axles while complying with the minimum limit in its hight, length, and width.
- Ensuring that the height of the loading surface is suitable for the load. It is preferable to use trailers with low loading surfaces.
- Raising at least (6) clean red flags of no less than (40 * 25) centimeters, distributed on the truck and the transported load as follows:
    - One flag on each end of the truck's front bumper, each flag to be fixed on a short mast placed at a corner so that can flutter freely.
    - One flag on each of the four corners of the truck or load.
    - If a part of the transported load goes beyond the flag, then, an additional flag shall be raised on each side.
    - Writing the phrase "extraordinary load" with a clear line on two plates fixed in front and behind the truck so that the floor of the plate is yellow and the writing is in red with the following sizes: a plate with a size of (200 * 40) square centimeter with letters (30) square centimeter in size, which shall be fixed on the front bumper of the truck.
    - A plate measuring (250*50) square centimeters with letters size (40) centimeters must be fixed on the backside of the transported load at a height no less than two meters from the road surface.
- A vehicle equipped with a bright orange or rotating lantern on top must be allocated to accompany the truck from behind if the width of its transported load or material ranges between (3.50-4.30) meters. If its width exceeds (4.30) meters, it is necessary to allocate another vehicle with the same previous specifications to accompany the truck from front.
- If the width of the exceptional load exceeds (4.30) meters, warning lanterns must be placed as follows:
    - Two bright orange or rotating lanterns on the load.
    - A lantern must be placed on top of the front of the truck.
    - Two bright orange or rotating lanterns must be placed behind the load.

9.1.4 Worker safety

Worker safety in CDW collection and transportation activities is critical due to the unique hazards associated with handling and transporting of such materials. CDW collection and transportation require specific safety measures to protect workers from physical, chemical, and environmental risks. Implementing effective safety protocols is essential to mitigate risks and ensure a safe working environment like:

- **Personal Protective Equipment (PPE):** Personnel involved in CDW collection and transportation must use appropriate personal protective equipment (PPE) to safeguard against potential hazards. Basic PPE includes helmets, gloves, safety boots, high-visibility vests, and respiratory masks. For handling hazardous waste, additional specialized PPE, such as chemical-resistant gloves and protective eyewear, may be required. PPE selection must be based on the specific risks associated with the waste being handled. Proper training in the use and maintenance of PPE is essential to ensure worker safety.

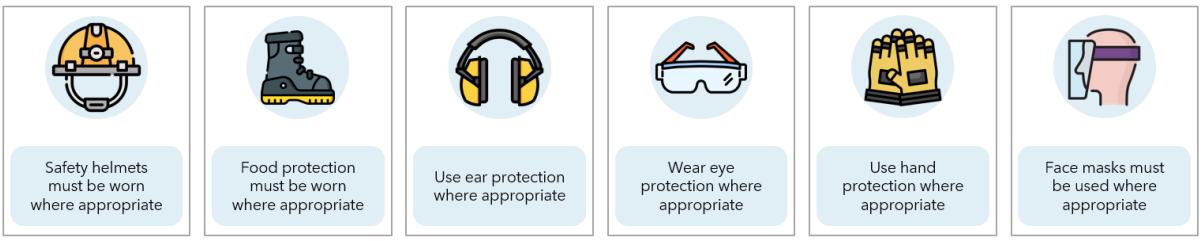


Figure 9-1: General PPEs to be used during CDW collection and transportation activities

9.1.5 Emergency preparedness

Emergency preparedness during operational activities of CDW collection and transportation is essential to effectively respond to potential incidents that could jeopardize worker safety, environmental integrity, and public health. Given the unique challenges posed by CDW, which may include hazardous materials and unpredictable waste characteristics, having a comprehensive emergency preparedness plan is critical including:

- **Emergency Response Plan:**
  - **Comprehensive Plan Development:** Create an emergency response plan detailing procedures for handling various emergencies, including traffic accidents / incidents, spills, and injuries.
  - **Emergency Contacts:** Ensure that contact information for emergency services, local authorities, and internal safety personnel is readily accessible.
- **Emergency Drills:**
  - **Regular Emergency Drills:** Conduct periodic drills to familiarize workers with emergency procedures and ensure they can respond effectively in a crisis situation.

9.1.6 Safe manual handling and lifting practices

Safe manual handling and lifting practices during the collection and loading of CDW are essential for preventing injuries and ensuring worker safety. Workers should receive training on safe manual handling techniques, which include proper lifting methods, recognizing hazardous materials, and understanding the risks associated with manual tasks. Before lifting any materials, it's crucial to assess the load's weight, shape, and stability; if it appears too heavy or awkward, workers should seek assistance or use mechanical aids. When lifting, workers should stand close to the load with their feet shoulder-width apart for stability, bend their knees while keeping their back straight, and lift using their legs rather than their back. It’s also important to hold the load as close to the body as possible to maintain balance and reduce strain.



Figure 9-2: Handling CDW for disposal

9.1.7 Incident reporting and investigation

Establish a system for reporting and investigating incidents, near misses, and safety concerns. Encourage workers to report any safety issues without fear of reprisal. Use these reports to analyze trends, implement corrective actions, and continuously improve safety practices on-site.

9.2 Environmental Management Plan (EMP)

The environmental management plan should address such aspects as dust and airborne particle control, noise and vibration exposure, soil contamination, etc. Reporting should also follow the regulatory requirements of NCEC.

9.2.1 Dust and airborne particles control

Dust generation is a significant concern during the collection, loading, and transportation of CDW, especially in demolition activities. Dust can contribute to air pollution and pose health risks to workers and nearby communities. To control dust emissions, wetting agents or water spraying should be used on dust-prone materials, particularly during loading and transportation. Using tarps or covers to enclose waste during transit helps reduce the dispersion of dust particles. Vehicles with open or uncovered loads should be prohibited, especially when transporting dust-generating materials, to avoid environmental contamination.



Figure 9-3: Dust emission during CDW collection and transportation activities

9.2.2 Fuel consumption and carbon emissions

The transportation of CDW can result in significant fuel consumption and greenhouse gas emissions, depending on the type of vehicle used and the distance travelled. To mitigate these environmental impacts, transport routes should be optimized to reduce travel time and fuel use. Using more fuel-efficient or alternative fuel vehicles, such as electric or hybrid trucks, can further decrease carbon emissions. Regular vehicle maintenance, such as keeping tires properly inflated and ensuring engines are running efficiently, also helps minimize fuel consumption and emissions. Proper route planning can reduce the overall environmental impact by avoiding congested areas and minimizing fuel wastage.

9.2.3 Noise and vibration exposure

Noise pollution from the collection and transportation of CDW can impact local communities and wildlife. To mitigate noise, transport vehicles should be well-maintained to ensure engines and exhaust systems are operating quietly. In addition, equipment used in waste collection, such as excavators and loaders, should be fitted with noise-reducing attachments. Whenever possible, operations should be scheduled during off-peak hours to minimize disturbance to residential areas or noise-sensitive locations.

9.2.4 Soil and water Contamination

Spills of hazardous or non-hazardous materials during transportation can have serious environmental consequences, including soil and water contamination. To prevent spills, vehicles must be equipped with proper load-securing mechanisms, such as tarps, covers, or containers that prevent materials from spilling onto roads or into water bodies. Spill kits and emergency response equipment should always be available on-site and in the transport vehicles. In the event of a spill, immediate action should be taken to contain

the spread of the material, prevent further environmental damage, and follow proper clean-up procedures to restore the site to its original condition.

9.3 Communication and Coordination

Effective communication and coordination of Health, Safety, and Environmental (HSE) protocols for CDW transportation are critical to maintaining safety standards, ensuring compliance, and promoting a culture of safety. Here are key modes of communication and coordination typically used for HSE protocols:

- **Daily toolbox talks:** Short, daily safety meetings held on-site focus on current tasks, potential hazards, and any recent incidents. Toolbox talks help reinforce HSE protocols and ensure workers understand the risks associated with their specific activities.
- **Safety bulletins and updates:** Weekly or monthly bulletins on HSE updates, safety tips, and lessons learned from past incidents can be circulated via email or posted in common areas. This documentation keeps everyone informed about evolving HSE practices and insights.

10 TRAINING AND CAPACITY BUILDING

Training and capacity building during CDW collection and disposal activities are essential for ensuring that workers and management understand best practices, comply with regulations, and effectively contribute to sustainable waste management efforts. Investing in training programs not only enhances operational efficiency but also mitigates environmental impacts, promotes worker safety, and fosters a culture of accountability within organizations.

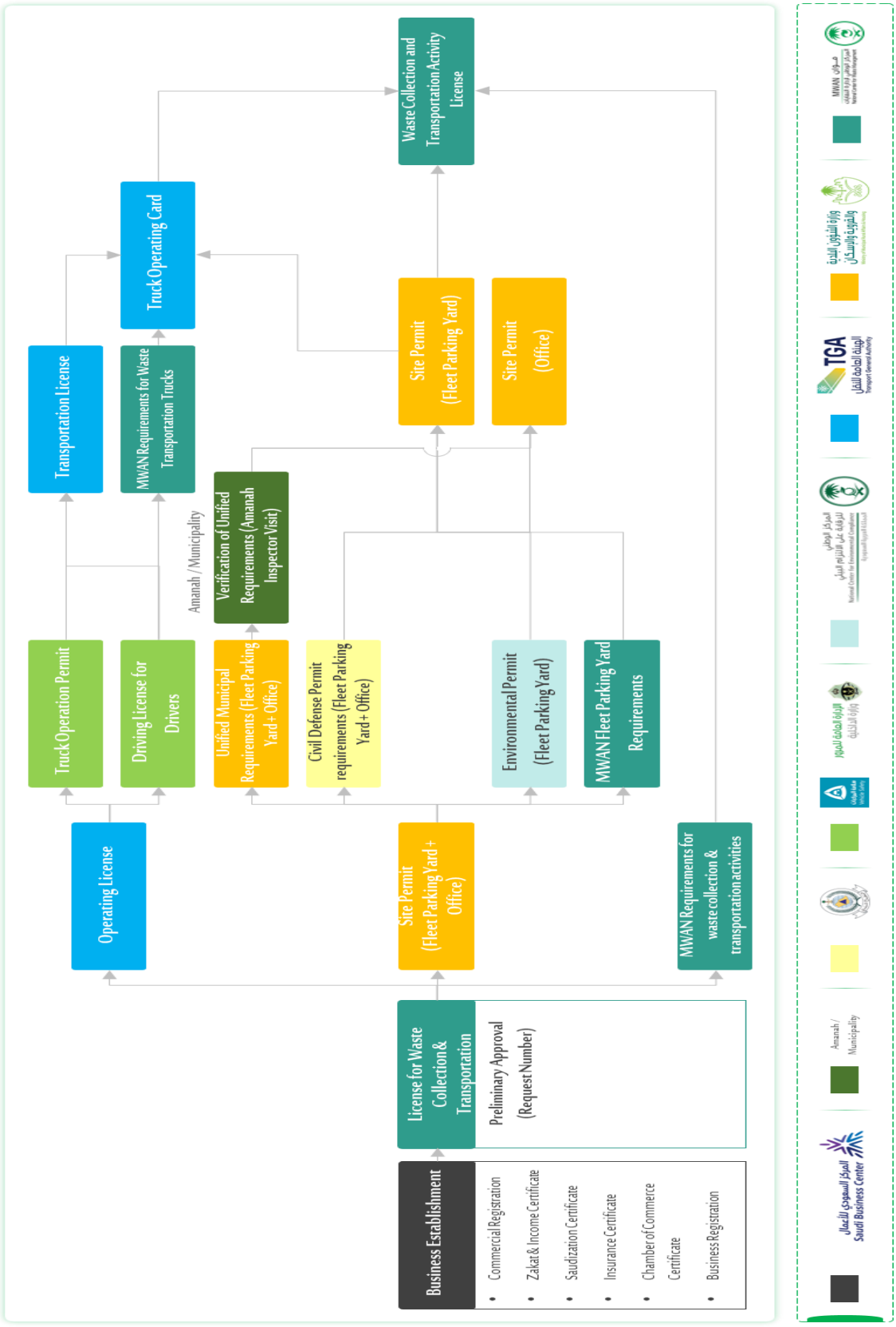
Personnel involved in CDW transportation must be trained to handle various waste types, including hazardous materials, and to safely operate the vehicles and machinery used in the collection process. Training also addresses the use of personal protective equipment (PPE), environmental protection measures, and the proper documentation needed for waste transport. By investing in comprehensive training, organizations can ensure that the transportation of CDW is conducted safely, efficiently, and in compliance with all applicable standards. In **Table 10-1** some significant training requirements have been identified specifically for CDW collection and transportation activities.

Table 10-1: Training requirements for CDW collection and transportation

S/No	Training Name	Training Description	Target Audience	Responsibility
1.	Hazardous Waste Identification	Training on how to identify hazardous materials within CDW, including asbestos, lead, and other contaminants, as well as proper handling techniques.	All workers involved in waste handling	Internal training provided by trained HSE personnel
2.	Safe Driving and Vehicle Operation Training	Covers safe driving techniques, adherence to speed limits, vehicle handling, and securing loads. Includes emergency response for accidents, breakdowns, or spills.	Drivers of CDW transport vehicles	The Fleet management team is responsible for organizing and conducting; drivers must attend and apply learned skills.
3.	Hazardous Waste Management Training	Focuses on identifying hazardous waste and following safety protocols. Covers regulatory requirements and emergency response procedures for handling hazardous materials.	Personnel handling hazardous materials	Internal training provided by trained HSE personnel
4.	Emergency response and	Teaches how to respond to accidents, spills, or vehicle malfunctions during	Drivers and on-site personnel	Internal training provided by

S/No	Training Name	Training Description	Target Audience	Responsibility
	Spill Control Training	transportation. Includes spill containment and basic first-aid procedures.		trained HSE personnel
5.	Equipment Maintenance and Safety Training	Provides instruction on the maintenance and safe operation of machinery and vehicles used in CDW handling. Covers pre-trip and post-trip vehicle inspections, equipment checks, and operational safety.	Maintenance personnel and machine operators	Maintenance managers or equipment supervisors are responsible for organizing and ensuring all staff are trained.
6.	Personal Protective Equipment (PPE) Training	Instructs personnel on the correct use and importance of PPE, including helmets, gloves, masks, and high-visibility clothing to protect from physical and health hazards.	All personnel involved in CDW collection and transportation	Internal training provided by trained HSE personnel
7.	Legal and Regulatory Compliance	Educate on laws, regulations and guidelines of relevant regulatory stakeholders identified in Section 2 i.e., Regulatory Requirement.	Contractor involved in collection and transportation of CDW	Accredited training provider Internal training provided by trained HSE personnel

APPENDIX - 1. LICENSING JOURNEY FOR CDW COLLECTION AND TRANSPORTATION SERVICES PROVIDERS



APPENDIX - 2. VEHICLE INSPECTION CHECKLIST

Classification	Criteria
Immaculate	☐ No Visible mud, dirt, or debris on the body, undercarriage or wheels
	☐ Windows, mirror, lights and reflectors are clean and unobstructed
	☐ tires free from debris
	☐ License plate clearly visible
	☐ Pristine condition with no visible deformations, dent, or any signs of wear and tear
	☐ No fluid leaks detected, represents optimal maintenance and care
Clean	☐ Minor presence of dirt, or debris on the vehicle body, undercarriage has insignificant grime
	☐ Windows, mirror may have minimal spots, lights and reflectors are mostly clean
	☐ Small amount of mud in tyres treads
	☐ License plate readable with slight dirt
	☐ Shows minimal signs of use with only few scratches on the exterior surface
	☐ Interior and cargo area are tidy with minor exceptions, no significant fluid leaks
Moderately Clean	☐ Mud, dirt or debris on the vehicle is noticeable but not excessive
	☐ windows and mirrors have visible dirt that does not fully obstruct visibility
	☐ Lights and reflectors are somewhat dirty but functional
	☐ Moderate mud in tires tread, some build-up on wheels / mudguards
	☐ Interior has accumulated trash or debris; cargo area has occasional spillage
	☐ Signs of wear, including several small to medium sized dents and minor deformation

Classification	Criteria
Dirty	☐ Excessive Mud, dirt or debris on the vehicle, undercarriage grimy
	☐ Windows and mirrors are dirty, slightly impairing visibility
	☐ Lights and reflectors have a layer of grime, Tires and wheels have significant debris buildup
	☐ License Plate obstructed by dirt or mud
	☐ Interior and cargo area have considerable trash or debris, signs of spillage
	☐ Significant wear is evident, characterized by multiple large dents and deformation
	☐ Fluid leaks are noticeable and need alteration
Unacceptable	☐ The Vehicle is covered in mud, dirt and debris
	☐ Windows and mirrors are obstructed, and visibility is significantly impaired
	☐ Lights and reflectors are barely visible under dirt
	☐ Tires clogged with debris, wheels and mudguards are extremely dirty
	☐ License plate is not visible
	☐ Interior is littered and unhygienic, cargo area is unclean with poor containment of materials
	☐ Severely compromised conditions, with extensive deformations and dents on its structures

APPENDIX - 3. VISUAL INSPECTION REPORT TEMPLATE

Inspection Date:	
Notified Body Registration No.:	

First: Labels of Protection Barriers

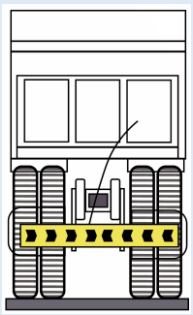
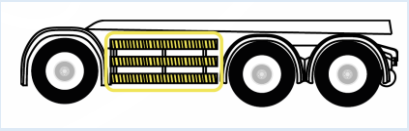
1. **General Requirement**

The result (yes/no) shall be placed only after the completion of the barrier inspection

Description	**Yes**	**No**	**Note: Please Specify the existent Labels**
Manufacturer name and / or trademarks			
Manufacturing date			
Vehicle maximum block on which the protection barrier may be installed			
Country of Origin			
Detailed Description with explanatory drawings for the barrier proper installation and adjustment			
The chassis component drawings, diagrams and plan			
Type of the vehicle for which the side protection barrier is designed (shall be applied with the side protection barrier)			
Brief description of the barrier such as: dimensions and material (shall be applied with the side protection barrier)			
The product in conformity with the main rule if containing no abusing data or symbols or letters of Hebrew Language			

- The lack of the information set out above should lead to conditioned inspection results, the facility shall take corrective actions

- The protection barriers shall be visually inspected to make sure that there is no damage, cracks or sharp outer edge or any clear defects

Protection Barrier		
☐ Rear Protection Barrier	☐ Front Protection Barrier	☐ Side Protection Barrier
☐ Accepted ☐ Rejected	☐ Accepted ☐ Rejected	☐ Accepted ☐ Rejected
		

2. Special Requirement	
3. Second: Inspector Notes	

Additional Notes

Inspector Name	Signature	Date

APPENDIX - 4. TEMPLATE OF WASTE TRANSPORT MANIFEST

Section A: Waste Transport Details	
Commercial Name	
Physical Address:	
Representative Name:	
Vehicle Plate No.	
Chassis No.	
Vehicle Crew Member Names:	
Waste Transportation Date	

Section B: Waste Producer	
Commercial Name	
Physical Address:	
Site:	Choose an item.
Representative Name:	
Waste Collection Date:	

Section C: Details of Waste	
Waste is Segregated:	Choose an item.

Waste Code	Description of Waste Item	Collected Amount	Rejected Amount	Remarks

Section D: Details of Service Providers to Whom Waste is Sent	
Commercial Name	
Physical Address:	
Site:	Choose an item.
Representative Name:	
Waste Acceptance	Choose an item.
Amount of Waste Received	
Amount of Waste Accepted	
Amount of Waste Rejected	
In Case if Waste is rejected	
Waste Delivery Date	

Section E: Summary	
Total Amount of Waste Collected	
Total Amount of Waste Rejected by Transporter	
Total Amount of Waste Delivered to Waste Recycling, Treatment or Disposal Service Provider	

Amount of Waste Rejected by Waste Delivered to Waste Recycling, Treatment or Disposal Service Provider	
Amount of Waste Returned Back to Waste Producer	

Section F: Initials			
Waste Producer	**Name**	**Signature**	**Date**
Waste Producer Representative			
Waste Transporter Representative			
Waste Recycling, Treatment or Disposal Service Provider Representative			

APPENDIX - 5. SPECIAL REQUIREMENTS FOR TRANSPORTATION OF HAZARDOUS WASTE

The transport of hazardous waste, regardless of the annual quantity in which it is generated, is carried out in accordance with the legal provisions regarding the activity of road transport of dangerous goods in KSA. All stakeholders engaged in waste transportation must comply to all regulations, requirements and guidelines established by these entities to ensure safe hazardous waste transport operations.

In order to comply with the Law and Implementing Regulations, entities involved in the transport of hazardous waste must comply, at a minimum, with the following requirements:

- A technical description of the waste transport fleet and the necessary equipment for each type of Waste (cooling, preservation and appropriate protection systems, labels and tags).
- Providing an emergency response plan for transportation operations and in cases of leakage of the hazardous waste during the loading, unloading, and transportation operations.
- Providing the evidence on the installation of vehicle tracking systems, and providing the Centre with access to the monitoring and tracking systems at any time.
- Provide data on the qualifications of the drivers and their capabilities to deal with accident cases (certificates of specialized training courses).
- Describing the training program of the employees.
- Providing a list of emergency equipment and its capabilities.
- Designing the cleaning stations and facilities and maintaining the equipment and means of transportation.
- Attach an environmental permit for the vehicle shelter site(s) issued by the National Centre for Environmental Compliance
- The provision of a number of truck parking spots within the site in accordance with the entity's size and the vehicle fleet.
- In order to minimise theft or misuse of hazardous waste, security provisions shall apply, if applicable.
- Packaging's shall comply with the UN Model Regulations as implemented in the KSA, if applicable.
- Containers, tanks and any mean that come into direct contact with waste, shall not be used for transport of foodstuffs and/or feedstuffs.

In addition to the above, transporting entities must also abide by the following conditions:

- Vehicle specifications must be suitable for the type of waste and used exclusively for the collection and transportation of the types of waste for which they are licensed.
- The carrier shall not transfer or deliver any hazardous waste to a waste management facility that does not have a licence from the Centre.
- The carrier is fully committed to the delivery terms specified in the attached Waste Manifest in relation to the Hazardous Waste to be transported, as well as the instructions pertaining to shipping hazardous waste, as indicated in the Document.
- The carrier is liable for ensuring that the Waste Manifest for each type of waste is available with all shipments of hazardous waste to be transported.

- The carrier must maintain a copy of the Waste Manifest from the deliverer of the hazardous wastes, and from the recipient thereof, for a period of at least five years from the date of receipt of such wastes by the carrier, until the E-Manifest is implemented.
- The carrier shall submit all records and Waste Manifests to the Centre or the authorities specified by the Centre on demand.
- The facility shall maintain the records and data related to its operations for a period of five years, and place them under disposal of the Centre's inspectors, as well as providing the Centre with periodic reports on the volume and types of waste and the quantities of waste collected and transported for perusal by the Centre at any time.
- The facility shall provide monthly reports (electronic version) to the Centre containing the movement of waste collection and transportation, their types, sources, volumes, and other basic information concerning the operational processes.
- Trucks and vehicles allocated for collection and transportation of the waste shall not be parked outside the facility wall.
- A carrier who stores shipments of hazardous waste registered for transport for a period exceeding five days shall be considered as operator of a storage facility, and it must comply with the rules and procedures pertaining to storage of the hazardous waste.
- Provide the form of hazardous waste transport manifest, specify the type of waste, its composition, source, quantities and any additional information specified by the Centre.

APPENDIX - 6. UNFORESEEN INCIDENTS DURING TRANSPORTATION

Accidents, leaks, and spillages involving waste can happen anywhere and during any stage of transport between loading and unloading, and lead to serious consequences, particularly when dealing with hazardous waste. To prevent that, thorough training must be provided, along with appropriate tools and precautionary procedures to be followed daily, including but not limited to:

- Compartments are cleaned prior to vehicle loading in order to avoid interaction between incompatible waste residues;
- Loading and unloading must be carried by trained personnel;
- Accept for transport only the waste mentioned in the manifest;
- Accept for transport only packaging and containers that are clearly and correctly marked, placard and labelled;
- Accept for transport only packaging and containers that are suited for the waste identified in the manifest;
- Accept for transport only packaging and containers in good physical condition;
- Ensure that no incompatible waste is loaded into the same vehicle (mixed loading);
- Ensure that all vehicles carrying hazardous waste contain a spill kit, consisting at a minimum of the PPE mentioned above and cover-all attire, scooping tools or spade, mask (for toxic waste), absorbent materials, rigid plastic or metal containers with lid, spare sacks of appropriate material and appropriate fire extinguishers, and masks fit for the chemicals being transported.

In the eventuality of an accident or breakdown occurring for a vehicle carrying waste, a few steps are essential to ensure the safety of everyone in the vicinity and to prevent further consequences. Generally, in the case of an accident, a visual verification will be the first step to assess whether any material was released, followed by due procedures depending on the type of waste being transported. If no leak occurred and the waste is not hazardous, procedures to follow should be the same as any other vehicle accident. If a spill of -hazardous waste occurred then the appropriate measures should be taken in order to isolate the area to prevent further spread, and to clean the waste as soon as possible.

Figure *A6-1* details the general sequence of procedures to adopt in case of emergency with hazardous waste, corresponding to the “Instructions in Writing” of ADR, which is a set of instructions on how to proceed in the event of an emergency situation, and that should be provided by the carrier to the vehicle crew. Crew members, before the start of the journey, shall inform themselves of the dangerous goods loaded and consult the instructions in writing for details on actions to be taken in the event of accident or emergency.

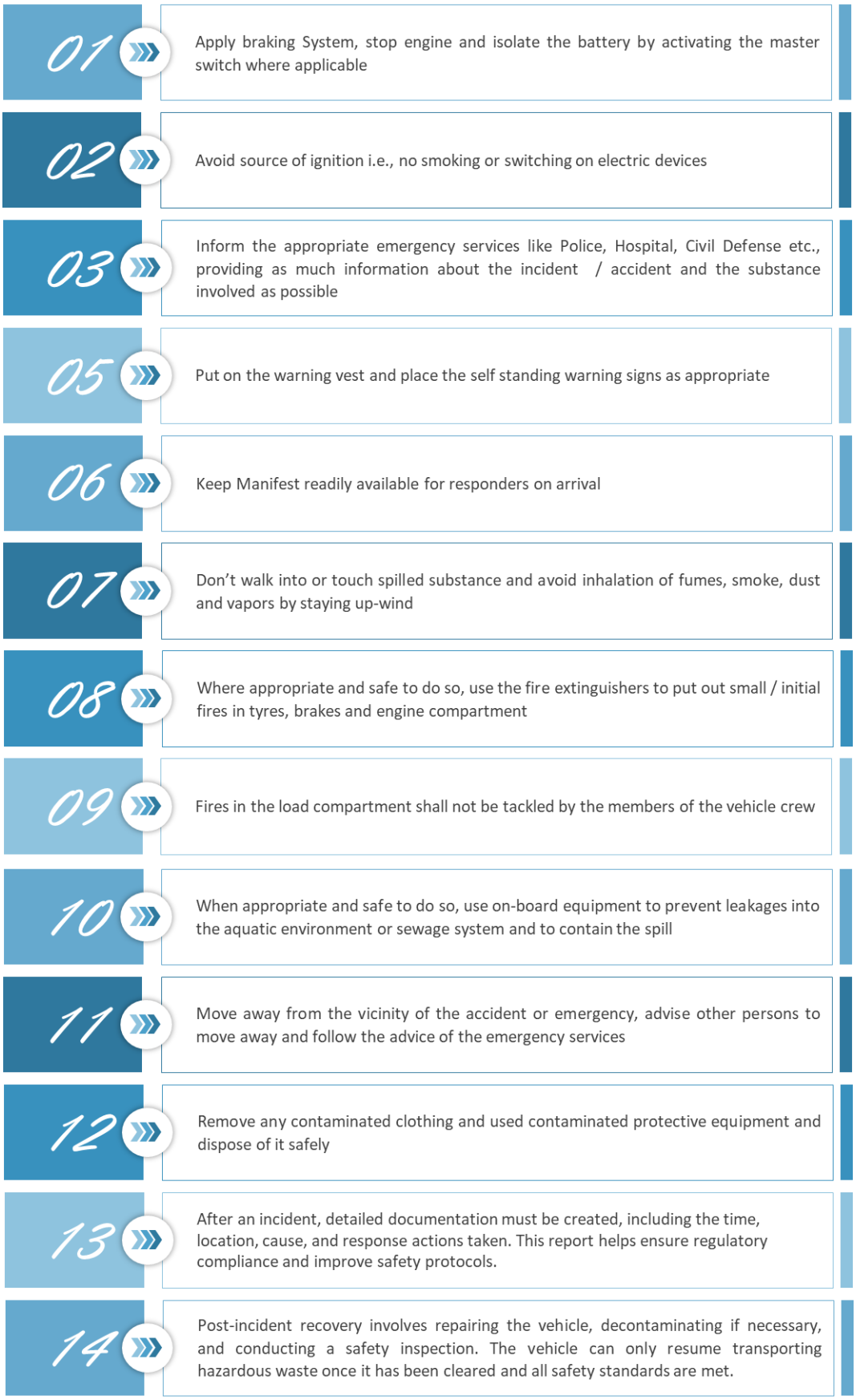


Figure A6-1: Procedures in case of accident or emergency while transporting hazardous waste

When an accident occurs involving a vehicle transporting hazardous wastes the procedures should be thoroughly employed in order to ensure that no harm is done to both human health and the environment. If a leak occurs, emergency procedures must immediately be employed in order to limit the spread of the leaked waste resorting to the spill kits available in the vehicle, as long as the driver's safety is not compromised, and all due diligences must be employed to ensure site cleaning and to prevent further damage from the waste being released. If no spill occurred, the first step is to signal the area of the breakdown or accident with portable warning/hazard triangles in order to create an exclusion zone and alert passers-by in the vicinity of the truck. The triangles need to be placed between 50 and 150m both in front and behind the vehicle, and beside the vehicle on the side closer to the traffic.

For any of the scenarios, either with or without spill of waste, an investigation is required in order to evaluate the causes of the accident, and preventive measures for future situations are to be implemented.