SUMMARY

This technical report presents analytical data and information related to:

- The characteristics of the Construction and Demolition Waste – C&DW (composition, hazardous substances/materials, potential environmental impacts)
- The European and Cypriot legislative framework concerning the management of C&DW
- The existing situation related to the management of C&DW in European countries.
- The current construction and demolition procedures that are followed in Cyprus as well as the practices that are applied for the management of C&DW
- The actors and Authorities involved directly and indirectly in the generation and management of C&DW in Cyprus, as well as their responsibilities.

Synoptically:

**Composition of C&DW**

In general, Construction and demolition waste is generated through the following activities:

- Building activities: construction of new buildings, demolition of old buildings, renovation and repairing of existing buildings etc.
- Development of infrastructure works: construction and repairing of roads, bridges, sewerage networks, pavements, etc.
- Natural or technological disasters: earthquake, floods, sliding, destruction of buildings etc.

As a result, C&DW could be categorized, according to their origin, as follows:

- Demolition
- Waste from
- Excavation waste
- Road construction and maintenance waste
Regardless of their origin, the C&W could contain the materials that are presented in Table 1:

### Table 1: Composition of Construction and Demolition Waste

<table>
<thead>
<tr>
<th>Substance</th>
<th>Demolition waste</th>
<th>Construction waste</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt</td>
<td>1.61</td>
<td>0.13</td>
</tr>
<tr>
<td>Concrete</td>
<td>19.99</td>
<td>9.27</td>
</tr>
<tr>
<td>Armed concrete</td>
<td>33.11</td>
<td>8.25</td>
</tr>
<tr>
<td>Impurities, soil, sludge</td>
<td>11.91</td>
<td>30.55</td>
</tr>
<tr>
<td>Stones</td>
<td>6.83</td>
<td>9.74</td>
</tr>
<tr>
<td>Gravel</td>
<td>4.95</td>
<td>14.13</td>
</tr>
<tr>
<td>Wood</td>
<td>7.46</td>
<td>10.95</td>
</tr>
<tr>
<td>Brick from cement</td>
<td>1.11</td>
<td>0.90</td>
</tr>
<tr>
<td>Brick</td>
<td>6.33</td>
<td>5.00</td>
</tr>
<tr>
<td>Glass</td>
<td>0.20</td>
<td>0.56</td>
</tr>
<tr>
<td>Other organics</td>
<td>1.30</td>
<td>3.05</td>
</tr>
<tr>
<td>Plastic pipes</td>
<td>0.61</td>
<td>1.13</td>
</tr>
<tr>
<td>Sand</td>
<td>1.44</td>
<td>1.70</td>
</tr>
<tr>
<td>Fixture</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Others items</td>
<td>0.07</td>
<td>0.24</td>
</tr>
<tr>
<td>Metals</td>
<td>3.41</td>
<td>4.36</td>
</tr>
<tr>
<td>Σύνολο</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

**Hazardous substances/materials of C&DW**

The main hazardous materials that are included in construction waste are:

- Additives based on solvents
- Chemical substances for protection from moisture
- Adhesives and resins
- Emulsions based on asphalt
- Asbestos
- Mineral fibres
- Dyes
The main hazardous materials that are included in demolition waste are:

- Asbestos
- Mineral fibres
- Metals
- Dyes
- Adhesives and resins
- Biohazards

**Potential environmental impacts**

As mentioned above, a portion of the substances/materials that are included in C&DW is considered as hazardous. The application of inappropriate practices for the management of C&DW such as i. their disposal to landfill or uncontrolled sites ii. application of inefficient procedures during their management can lead to the release of these substances/materials to the environment, causing significant negative environmental impacts.

Also, when practices for the recovery, reuse and recycling of materials from the ELVs are not applied, loss of raw materials and energy exist.

Table 2 summarizes the main environmental impacts that could be occurred from the inappropriate management of C&DW.

**Table 2: Environmental impacts from C&DW.**

<table>
<thead>
<tr>
<th>Substance/material</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts that contain asbestos</td>
<td>Abandonment of materials at worksites</td>
</tr>
<tr>
<td></td>
<td>- Soil pollution</td>
</tr>
<tr>
<td></td>
<td>- Potential pollution of waters through surface runoff</td>
</tr>
<tr>
<td></td>
<td>- Transfer of fibers of asbestos to the atmosphere</td>
</tr>
<tr>
<td>Final disposal:</td>
<td>Obstruction of biochemical actions that are developed at landfill sites due to releasing of metals</td>
</tr>
<tr>
<td>Metal parts</td>
<td>Abandonment of materials at worksites:</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td></td>
<td>- Soil pollution</td>
</tr>
<tr>
<td></td>
<td>- Potential pollution of waters through surface run off</td>
</tr>
<tr>
<td></td>
<td>- Transfer of particles that contain heavy metals to the atmosphere</td>
</tr>
</tbody>
</table>

**Final disposal:**
- Problems in the operation of the landfill site
- Obstruction of biochemical actions that are developed at landfill sites
- Obstruction of the natural circulation of water at the area of the landfill
- Pollution of soil through corrosion procedures
- Potential transfer of heavy metals to surface and underground waters
- Perturbation of the ecosystems’ balance in the area of the landfill
- Threat for the habitats of the landfill area

<table>
<thead>
<tr>
<th>Solvents, adhesives, paints, resins, chemicals for protection of moisture etc.</th>
<th>Abandonment at shredding sites:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Soil pollution</td>
</tr>
<tr>
<td></td>
<td>- Potential pollution of waters through surface run off</td>
</tr>
<tr>
<td></td>
<td>- Transfer of organic substances (e.g. dyes, solvents) to the atmosphere through evaporation procedures</td>
</tr>
</tbody>
</table>

**Final disposal:**
Legislative framework for the management of ELVs

In this report, the European legislative framework related to the management of C&DW is presented and analysed in detail. According to the Sixth Environment Action Programme, the Community’s approach on recycling has been focused on “priority waste streams” including C&DW and action plans should be developed in respect to the waste stream generated from construction and demolition activities. This waste stream refers to a wide range of materials and there are three basic characteristics that need to be taken into consideration concerning the management of
this waste: i. it includes mainly inert materials ii. it is generated in high volume and
iii. some materials in small quantities included in this waste stream are characterized
as hazardous. In addition, C&DW streams become hazardous when hazardous
materials are not recovered and subsequently get mixed with them.

Due to the fact that specific European legislation framework focuses on the
management of C&DW does not exist, its management is governed by the priorities,
the provisions and the restrictions included in the European legislation related to solid
and hazardous waste. In this report, analytical description of the relevant European
legislation (Directives, Decisions, Regulations) is given.

Concerning the Cypriot legislative framework on the field, the management of
C&DW is governed by the General Law on Solid and Hazardous Waste of 2002 and
the enactments that resulted from it.

**Existing situation concerning the management of ELVs**

In this report, analytical information related to the management of C&DW in other
European countries and Cyprus is given. Synoptically:

**Management of C&DW in European countries**

The practices that are applied at European level for the management of C&DW are
recorded and analysed. The aim is to obtain a complete picture on the alternative
systems that are applied as well as to utilize the experience gained from the operation
of these systems for the purposes of the KYPROS project. In specific, data
information from the following countries are given: England, Austria, Belgium,
France, Germany, Denmark, Ireland, Spain, Italy, Netherlands, Portugal, Sweden,
Luxembourg, Greece and Finland. Also, aggregated data for other countries (countries
of Eastern Europe) is provided.

**Management of C&DW in Cyprus**

The current situation related to the procedures that result in the generation of C&DW
as well as to the practices that are followed for the management of C&DW is recorded
and analysed in detail.
In particular, data and information on the following procedures and practices are given:

- Provision of license for the construction of a building
- Provision of license for the demolition of a building
- Demolition procedures
- Management of demolition waste
- Management of construction waste
- Management of waste from road construction and maintenance
- Management of waste from alterations and repairing of buildings
- Provision of license for the management of C&DW
- Uncontrolled disposal of C&DW
- Recovery, separation and recycling of materials from C&DW
- Provisions of the existing legislation for the management and final disposal of C&DW

According to the analysis that is carried out, the following points could be remarked:

- The country has the institutional and administrative structures for the development of the appropriate management schemes/systems
- Integrated schemes/systems for the collection and management of C&DW do not exist.
- The majority of the C&DW that is generated in the country is disposed to landfills together with other solid waste streams or to non licensed sites
- The separation of materials from C&DW is applied in limited level mainly by big private companies - contractors that deal with the construction of public works (asphalt, concrete and soil).
- There are no licensed installations for the management of C&DW

**Actors and authorities involved in the field**

All the actors and authorities that are involved in the generation and management of ELVs in Cyprus as well as their responsibilities are recorded. In particular:
a. Authorities and actors involved directly in the management of C&DW

**Authority of Draining and Solid management (Ministry of Interior)**

It constitutes the responsible authority for the preparation of the Regulation for the management of the inert construction and demolition waste.

**Environmental Service (Ministry of Agriculture, Natural Resources and Environment)**

It involves in the management of ELVs through the following:

- Provision of the permit for the construction and operation of systems and plants for the management of C&DW - Setting of the environmental terms
- It constitutes the responsible authority for the management of the hazardous waste containing in the C&DW

**Consultative Committee for the Management of Waste**

The Committee pronounces to the Environmental Service in issues related to the permitting of plants for the management of C&DW. Also, it is the main pronounced Authority for setting the technical specifications for the management of C&DW.

**Contractors**

All the contractors must be provided by a permit for the management of C&DW, according to the provisions of the Law of 2002 on Solid and Hazardous Waste.

**Department of Labour Inspectorate Tjakia (Ministry of Labour and Social Insurance)**

It involves only in the cases that waste containing asbestos is generated during the construction or the demolition of a building (the responsible authority for the enforcement of the provisions of the Laws of 1993 and 2000, on asbestos)

b. Authorities and actors involved indirectly in the management of C&DW

**Statistic Service (Ministry of Financial)**

It collects data related to the number of licenses that are issued for the construction of new buildings as well as for the demolition of old buildings.
**Department of Urban Planning (Ministry of Interior)**
The Department is the responsible Authority for the provision of the Urban Planning permit that is necessary for the construction of any plant.

**Local Authorities (Municipalities and Communities)**
The representative of the local authorities express their opinion to the Consultative Committee for the Management of Waste, where they participate (without the right of voting).

**Scientific and Technical Chamber of Cyprus**
It comprises the legal consultant of the Government in technical issues.

**Federation of Employers and Manufacturers**
It will participate in the Organisation that is planned to be established in order to undertake the management of the high priority waste streams in Cyprus.

**Association of Contractors**
It coordinates the activities of the contractors.

**Other Governmental Departments**
Governmental Departments that are involved in the management of the C&DW only in the cases in which the construction of a building is associated with works of these Department. (Department of Public Works, Department of Forest, Water Development Department, Department of Urban Planning etc.). In these cases, an additional permit from these Department must be included in the permit for the management of C&DW.