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[www.ecopontes.com](http://www.ecopontes.com)

# EcoPontes - Plot and Facility

## 1. Introduction

For the standard requirements for EcoPontes plots and facilities all planning-relevant aspects are presented in this document. The requirements are field-tested and enable consistent planning, implementation and allow standardized operational processes.

## 2. Structural requirements

### 2.1. Space requirements

#### 2.1.1. EcoPontes area

The area required for an EcoPontes center results from the number and size of the containers set up for collection and the pre-treatment processes carried out at EcoPontes.

The minimum container volume to be kept per assumed fraction is calculated according to the following formula:

$$V = \frac{m_i * n}{\rho * 52 * C_w} * peak\ factor$$

*V = Minimum container volume [L]*

*m<sub>i</sub> = mass per inhabitant per year for each fraction [kg/E\*a]*

*n = connected inhabitants (inhabitants in the catchment area of the recycling centre)*

*ρ = bulk density of the respective fraction [kg/L]*

*52 = weeks per year*

*C<sub>w</sub> = collections per week*

*peak factor = ratio between avg. Volumes and peaks, e.g. 1.2 – 1.3 for residual waste*

The calculated minimum volume is divided by the desired container size and rounded up to obtain the required number of containers.

In addition to the floor space of the containers, traffic areas are required for the delivery of material, for maneuvering the collection vehicles as well as for any necessary operating buildings such as administration buildings, staff rooms, workshop, etc.

In order to ensure safe operation, separate delivery and pick-up areas should be provided.

Each container should be clearly marked from all sides according to the fraction to minimize incorrect throws and ensure the highest possible quality of the collected material.

### 2.1.2. Storage area for containers

- (1) The length of the parking area shall include at least the length of the vehicle plus the set-down length and length of the container.
- (2) The width of the storage area corresponds to the width of the containers plus an additional 0.8-1.00 m to enable safe and ergonomic filling of the containers, as well as to ensure that the containers can be set up and set down by the vehicle.
- (3) There should be an additional free exchange space available to ensure a smooth exchange of containers.

If containers with a height of more than 1.5 m are used the delivery area can be designed as a raised discharge ramp. The height of the discharge ramp should be matched to the height of the containers set up. Due to the height, the discharge edge should be sufficiently secured by railings against falling down.

### 2.1.3. Space required for maneuvering the vehicles

The space requirement depends on the number and size of the containers set up, as well as on the size of the vehicles used for collection and their turning circle.

For 7 m<sup>3</sup> settling containers, free maneuvering space of 20.00x4.00 m is required per container storage space. Using e.g., 30 m<sup>3</sup> roll-off containers, the length of the containers must be considered accordingly in the shunting area.

For trouble-free shunting traffic, congestion and waiting areas should be relocated to areas outside the property.

### 2.1.4. Expansion options / additional offers at EcoPontes

Possible additional offers could be, for example, the distribution of compost or biogas bottles. Additional areas should be made available for this purpose.

It would also be advantageous to be able to expand the recycling depot with increasing volumes. Conceivable for this would be, for example, free areas on the property, which could be converted into container stands, if necessary, generously dimensioned stand areas, on which larger containers can be placed, or neighboring plots of land, which can be rented or purchased additionally, if required.

The acceptance of bulky waste or the acceptance of large electrical appliances could also be a conceivable additional offer.

Another additional offer could be small workshops in which employees produce new products from the collected materials through "upcycling" or "waste-to-art".

## 2.2. Enclosure of the property

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The property must be equipped with a suitable enclosure to ensure the restriction of access, the securing of the stored materials and equipment, and to protect stored materials from wind or prevent animals from entering the property.

The enclosure should have a height of at least 2.20 m.

The fence requires lockable gates to restrict access. Sliding gates (electrically operated if necessary) are recommended, as minimal movement areas are required here.

### 2.2.1. Access to the site

- (1) Minimum clearance width: approx. 3.5 m
- (2) The vehicles have a larger turning circle and swerve. Turning at right angles is therefore not possible. In order to allow turning in even from acute angles, the driveway should have a minimum width of 5.10 m.
- (3) Minimum clearance height: approx. 4.00 m

### 2.2.2. Canopy

The delivery area and the container stands can be provided with a roof to protect against sunlight and precipitation. The roof can be manufactured in local customary construction. The minimum set-down height should be maintained for unhindered setting down or unrolling of the containers (4.40 m for skip loaders, 7.50 m for hook loaders).

## 2.3. Load-bearing floor

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The soil should have sufficient load-bearing strength to allow safe driving by trucks. The load capacity of the floor depends on the axle load of the vehicles. As a guideline, about 6 kN/m<sup>2</sup> can be assumed.

A ground reinforcement with concrete, asphalt or pavement ensures safe driving even in precipitation, e.g., in the rainy season.

A gradient of 2 – 2.5% for sealed surfaces is required to ensure reliable runoff of rainwater.

## 2.4. Plot drainage

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A property drainage facility should be connected at the lowest point of the slope. If available, a connection to the public sewer network or to open drainage channels is suitable for this purpose. Local infiltration via a sufficiently dimensioned soil filter/infiltration area or storage in a rainwater cistern is also suitable.

As a basis for the design of drainage systems, a design rainfall donation for a rain event of a statistical frequency of 5 years and a rainfall duration of 5 minutes ( $r(5;5)$ ) should be used.

## 3. Building

The EcoPontes buildings may be designed according to local customary construction methods. Alternatively, sea containers can be converted and set up according to the requirements.

### 3.1. Administration building

In addition to the general administration of the recycling center, areas are required for the following functions: material control, material weighing, processing of payment transactions, etc. Depending on the digital devices, internet access must be available.

### 3.2. Social rooms

The social building should contain the following rooms: changing rooms, sanitary facilities, break areas, etc.

### 3.3. Storage

For storing equipment, such as brooms, shovels, hand scales, containers/baskets, spare parts for minor repairs.

### 3.4. Workshop

A workshop is required for minor repairs and maintenance.

## 4. Additional equipment

### 4.1. Scales

Incoming and outgoing material flows must be reliably weighed and documented. For this purpose, scales are needed.

#### 4.1.1. Hanging scales

- (1) Hanging scales should be used for weighing smaller quantities delivered on foot or by hand cart.
- (2) Digital scales are preferred because they have better readability and are less prone to reading errors.

- (3) Since the target materials have a very low bulk density, accuracy is important for the small quantities during manual weighing. The resolution should not exceed 20g<sup>1</sup>. (This corresponds to an error of approx. +/- 1 PET bottle)
- (4) The capacity of the scale should not exceed 50-80 kg (for lighter deliveries), or 100-300 kg (for heavier deliveries).
- (5) The scale should be hung at a height that allows sufficient distance to the ground, even with weighed bulky plastic bags or large containers, to allow the material to be weighed to hang completely freely on the scale.
- (6) The scale should be attached to a rope or pulley so that it can be lifted along with the weight to make operation as easy as possible

## 5. Power supply

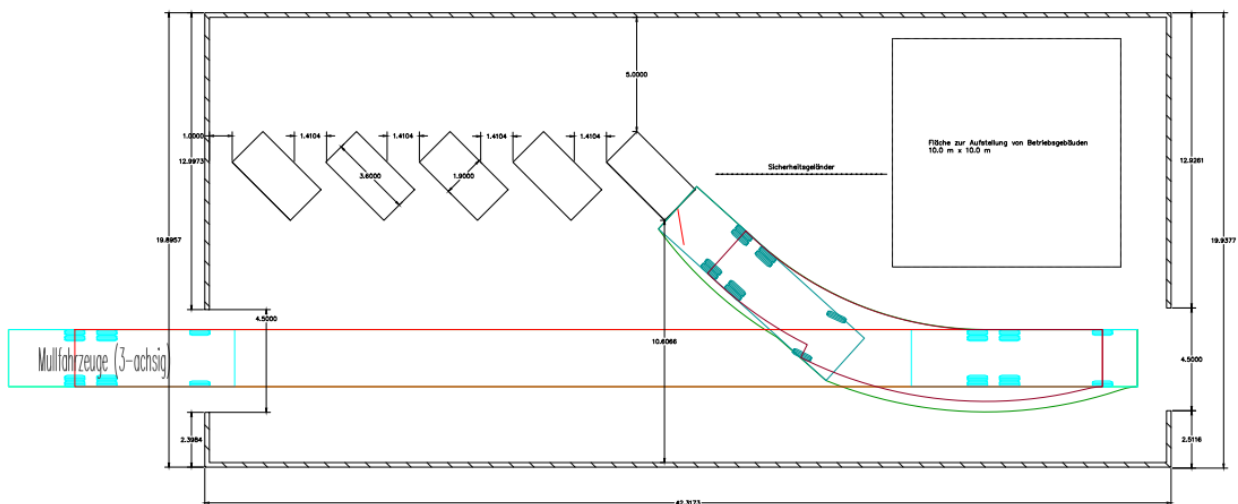
When the location is chosen, the minimum requirements for the power supply depends on the intended operational processes. If the use of machinery e.g., stationary presses or shredders are planned, the electrical power required for this should already be considered. In the best-case scenario, a connection to the public power grid is possible. Electrical protection is provided by a fuse box. If larger electrical consumers are required, it could become necessary to install a transformer and an in-house network on the property. Depending on the reliability of the power supply, it may be necessary to take into account the installation of a power generator. In this case, the necessary fuel supply must also be considered.

## 6. Appendix

### 1.1 Appendix I: Example floor plan with separate entrance and exit and ground-level delivery area

EcoPontes floor plan with trailing curve

Design vehicle: refuse vehicle, 3-axe





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## About Us

**Rodiek & Co GmbH** is a consulting company in the field of waste management, recycling and circular solutions.

It is our Mission to support the development of a functioning circular economy by providing experience and operational knowhow.

Our target regions are low- and middle-income Countries, where waste management and recycling is still in its early stages. Our solutions are tailored to the specific local requirements and needs.

We provide services along the complete value chain from collection over sorting, to treatment and preparation for recycling.

We provide technical support for facilities, including vehicles, machinery as well as material flow management.

We also offer the development of sustainable recycling and energy concepts for local communities, businesses and industries.

As a 100% daughter company of Nehlsen Group, one of the largest German waste management and recycling companies, we can access the operational knowhow and practical expertise from 99 years of waste management and recycling business in Germany.

## GET IN TOUCH

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