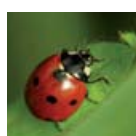


KOHLHAUER PLANTA®



THE “GREEN”  
NOISE BARRIER





## QUALITY OF LIFE REDEFINED

Noise and air pollution are big problems in today's society. Not only do they lower the quality of life, the environment is also suffering to an ever increasing extent.

Although particularly intensive exposure to noise mostly occurs near to railway lines, busy roads, motorways and industrial plants, the private sector, such as sports facilities, kindergartens, schools and hospitals, is also being increasingly affected.

Permanent noise places stress on the human organism. The results of this are often stress symptoms and the associated damage to health, such as hearing problems (e.g. tinnitus) and cardiovascular diseases. A study carried out by WHO in 2007 showed that constant noise is responsible for up to 3 % of all fatal heart attacks in Europe. Other health problems are sleep and concentration disorders and even a weakening of the immune system.

Effective sound protection measures can help to make our environment a little more worth living in. Noise barriers are a wise and necessary solution, because health is our greatest asset.







## IN HARMONY WITH THE SURROUNDINGS

Since noise is mostly perceived to be disturbing only in inhabited areas, people and noise protection meet head-on. Hence, the visual appearance of a noise protection measure also plays an important role alongside its function.

What is called for is an inconspicuous and elegant appearance that blends naturally into the surroundings. Care must be taken in inner-city areas that the noise barrier is narrow and flexible enough to be placed between existing objects, such as buildings or trees.

“Green” noise barriers meet the highest demands here. They absorb sound effectively and the living greenery is visually appealing and has a calming effect on the observer. The use of a wide variety of plants means that no limits are placed on the design.

Furthermore, greened noise barriers significantly improve the microclimate. They form an independent ecological niche in which many microorganisms and small animals, e.g. birds, feel at home.

Environmental compatibility and sustainability combined with a high degree of functionality form the basis of KOHLHAUER **PLANTA** noise barriers. With its service life of over 30 years, an increasing number of planners, landscape architects and authorities are relying on long-term environmental protection with KOHLHAUER **PLANTA**.





## NOISE BARRIERS THAT SET STANDARDS

KOHLHAUER **PLANTA** noise barriers combine appealing looks, environmentally-friendly building and high technical demands in a perfect manner. All KOHLHAUER **PLANTA** noise barriers have been tested by renowned institutes with respect to sound insulation, sound absorption, wind load, freeze-deicing salt resistance, durability etc.

### KOHLHAUER **PLANTA** satisfies the most important requirements for noise suppression:

- The largest proportion of the noise is stopped at the noise barrier in order to achieve the greatest protective effect.
- The sound insulation of the wall is twice as large as the total desired protective effect.
- The sound is absorbed by the noise barrier to a high degree on both sides and is not reflected.

KOHLHAUER **PLANTA** is available in versions for extensive or intensive planting. In the extensive versions, the plants are planted in front of the noise barrier and grow along the integrated trellis. In the intensive planting versions the plants are set directly in the wall, which leads to very dense, attractive growth within a very short period of time. Built-in capillary barriers ensure even distribution of water over the entire height of the wall.

**With or without plants,** KOHLHAUER **PLANTA** captivates with its natural design, which blends harmoniously into any surroundings. The individual range of designs is extended by the free choice of colours for the steel frame construction and the polyethylene protective netting. Due to the well-thought-out element design, the noise barriers can be combined with other KOHLHAUER noise protection modules.

### KOHLHAUER **PLANTA** – the advantages at a glance:

- Excellent noise insulating and high absorption properties
- Special feature: Sound insulation and absorption on both sides of the noise barrier
- Green right from the start – natural looks, even without planting
- Suitable for extensive or intensive planting
- Top quality water retaining rock wool core, protects root growth in summer and winter
- Narrow and lightweight element design with long lifetime
- Very low building and operation costs
- Improvement of the air quality
- Sustainable and 100 % recyclable
- Individual design possibilities
- Can be combined with other KOHLHAUER noise protection elements
- Extremely secure against vandalism and damage







## RECOMMENDED PLANTS ACCORDING TO CLIMATIC ZONES



KOHLHAUER **PLANTA** noise barriers are a synonym for sustainable, environmentally-friendly noise protection solutions worldwide. The selection of plants is based on the location, regional factors and climatic conditions. This ensures that conditions are perfect for the plants and that the greened wall blends into its surroundings in a visually harmonious fashion. The plants illustrated here should be considered to be examples. In planning a KOHLHAUER **PLANTA** noise barrier, regionally suitable plants must be chosen in order to guarantee sustained growth. We recommend that you consult a local expert when selecting the plants.



### Examples of plants

#### A: Temperate climate

Hedera Helix  
Parthenocissus tricuspidata  
"Veitchii"  
Clematis varieties

#### B: Warm temperate climate

Hedera woerner  
Parthenocissus tricuspidata  
Veitchii  
Clematis viticella

#### C: Dry climate

Araujia sericifera  
Bignonia capreolata  
Bougainvillea spectabilis  
Ficus pumila

#### D: Tropical climate

Lantana montevidensis  
Asparagus densiflorus Myers  
Nephrolepis spp. fern

Before



After



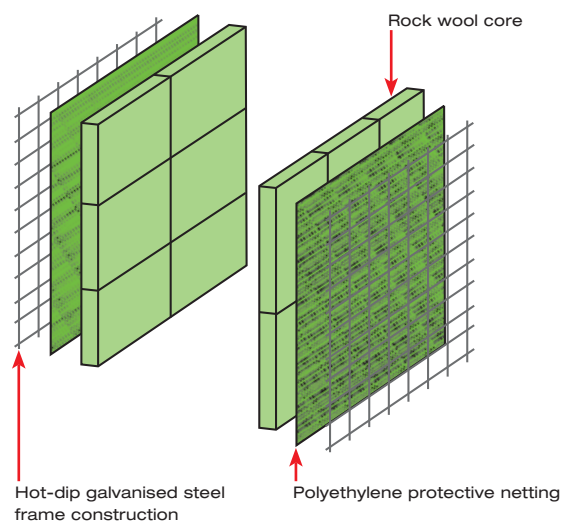
## KOHLHAUER PLANTA CLASSIC 100 AND 200

KOHLHAUER PLANTA Classic 100 and 200 provide for extensive greening within the shortest period of time. Planting takes place in the soil in front of the wall, which guarantees fast climbing thanks to its excellent support possibilities. The design offers the best possible protection against vandalism and graffiti.

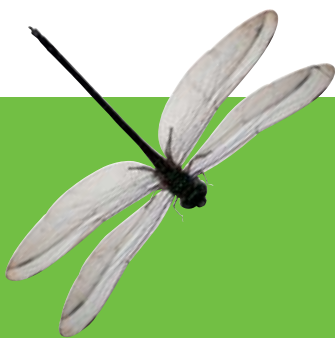
Rainwater is absorbed by the rock wool core and given off to the soil with a long delay. The rock wool core thus not only serves noise reduction, it also serves as a water reservoir for the plants and for cooling when temperatures are high. The water can permeate through to the core of the structure – the plants do not need any artificial watering.

### The advantages

- Excellent noise insulating and high absorption properties on **both sides**
- Water reservoir for the plants
- Long-life construction
- Use of many varieties of plant is possible
- Narrow, lightweight element design
- Planted surfaces improve the microclimate
- Very low building and operation costs
- 100 % recyclable construction
- The construction provides the plants with:
  - a water reservoir
  - cooling through the evaporation of water
- Excellent climbing possibilities for climbers and twiners
- Plant growth protects against graffiti and vandalism
- Fewer plants required per running metre without planting
- Green right from the start – natural looks, even without planting







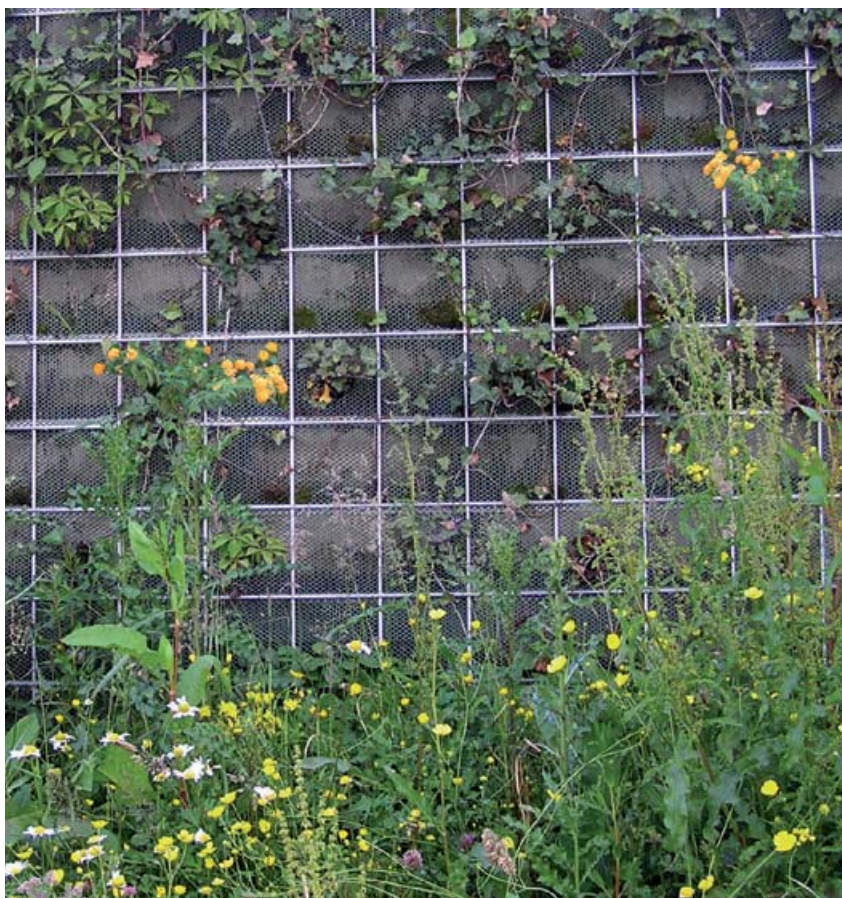
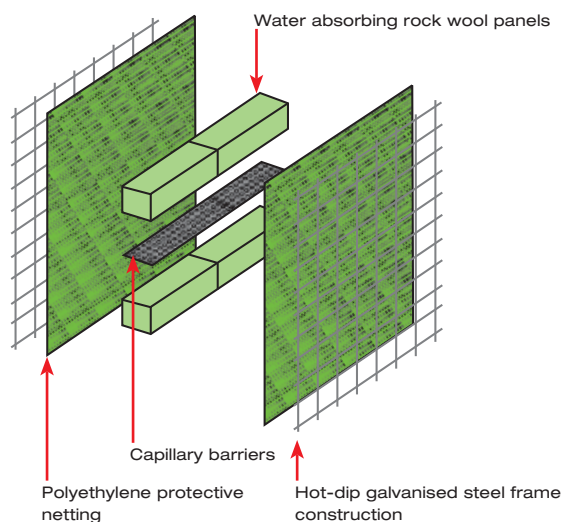
## KOHLHAUER PLANTA CLASSIC 300

KOHLHAUER PLANTA Classic 300 provides for dense, intensive plant growth within a relatively short period of time. In this case the plants are planted directly in the noise protection element. Sound absorbing and insulating on both sides, the greened surfaces allow ecology and functionality to harmonise perfectly. Different plant varieties provide for individual design possibilities. It is recommended to set approx. 6 to 8 plants per square metre.

The core of the noise barrier consists of water-retaining rock wool. Capillary barriers are built into the structure and provide for even distribution of water over the entire height of the wall. The structure of the mineral wool retains water for a significantly longer time than other constructions. Provision should be made for regular watering of the plants. It is recommended to take out a service contract with a local expert in order to guarantee the best possible maintenance of the plants and their watering and fertilising systems.

### The advantages

- Excellent noise insulating and high absorption properties on **both sides**
- Intensive and dense plant growth over the entire surface in a very short period of time
- Long-life plant construction due to recognised, inherently stable plant substrate
- Architectural freedom in the design of the planting
- 100 % recyclable construction
- Improvement of the air quality
- Narrow, lightweight element design
- Very low building and operation costs
- No grass verge necessary
- Unsusceptible to salt and dirt attacks
- Greater volume of water for the plants compared to other constructions





## TECHNOLOGY

The following pages contain the most important technical information about the KOHLHAUER PLANTA noise protection systems. We reserve the right to make changes if these are purposeful and serve our high standards of quality and progress.

### SOUND INSULATION

Group	Insulation $DL_R$
B0	not tested
B1	< 15 dB
B2	15-24 dB
B3	> 24 dB

Outstanding sound insulation is the most important criterion for a good noise barrier. KOHLHAUER PLANTA meets this demand to the full – and on both sides at that.

KOHLHAUER PLANTA noise barriers belong to the best sound insulation class, according to the assessment as per EN 1793-2, (Category B3,  $DLR > 24$  dB) and hence meet the highest noise protection demands.\*

### SOUND ABSORPTION

Group	Absorption $DL_a$
A0	not tested
A1	< 4 dB
A2	4-7 dB
A3	8-11 dB
A4	> 11 dB

In order not just to relocate the noise problem, it is necessary for the sound to be 'swallowed', i.e. absorbed to the greatest extent. There should be no reflection of the sound from the barrier. The German ZTV-Lsw-06 ordinance distinguishes between five categories of sound absorption (see table). All KOHLHAUER PLANTA walls belong to the highly absorbent groups A3 and A4 according to assessment as per EN 1793-1, and hence offer the best possible protection against noise. As in the case of sound insulation, KOHLHAUER PLANTA noise barriers guarantee sound absorption on both sides.\*

\* Our detailed data sheets and test certificates are available on request.

### TECHNICAL DATA

Type	Length x height	Wall thickness
<b>Classic 100</b> Absorption: 11 dB Insulation: 25 dB	3960 x 1000 mm	156 mm
	3960 x 1200 mm	164 mm
	3960 x 1500 mm	
	3960 x 2000 mm	
	3960 x 2200 mm	
<b>Classic 200</b> Absorption: 9 dB Insulation: 28 dB	3870 x 1000 mm*	276 mm
	3870 x 1200 mm*	284 mm
	3870 x 1500 mm*	
	3870 x 2000 mm*	
	3870 x 2200 mm*	
<b>Classic 300</b> Absorption: 10 dB Insulation: 29 dB	3870 x 1000 mm*	338 mm
	3870 x 2000 mm*	

Additional project-specific dimensions are available on enquiry.

\* Standard solution based on 4.0 m dimension between axes (here for IPE 200).  
The length dimension changes accordingly for other post types.

Type	Weight in kg/m <sup>2</sup>
<b>Classic 100</b>	40
<b>Classic 200</b>	50
<b>Classic 300</b>	55







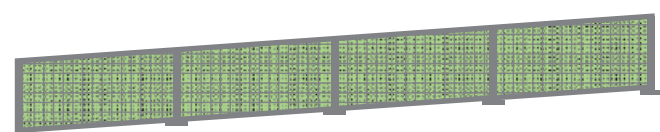
## TYPES OF INSTALLATION



The light and extremely flexible system components adapt themselves outstandingly well to all local conditions. Corners, wide curves and openings in many different shapes offer additional possibilities for design and usage.

All noise protection elements are available in any version up to a size of approx. 8 m<sup>2</sup> for extensive and intensive planting.

### Example of individualised construction

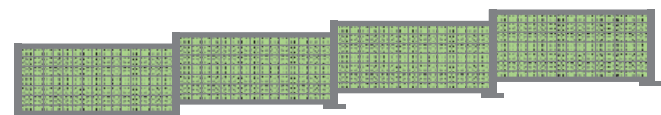


The top side and underside are angled, hence optimally following the course of the road.

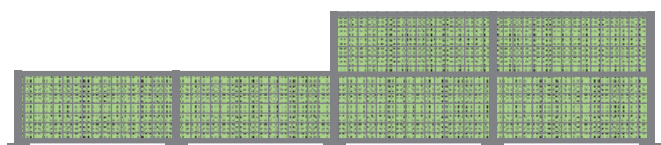
### Examples of standard constructions



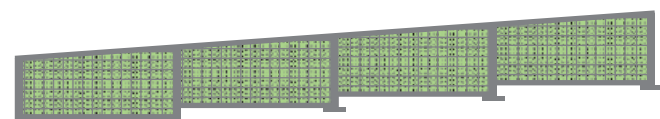
Horizontal with constant height.



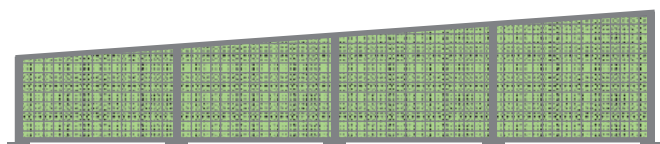
Rising terrain with constant height.



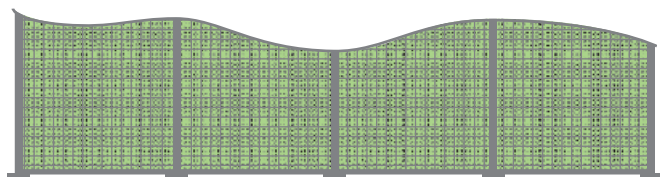
Horizontal with increasing height.



The staggered underside coarsely absorbs unevenness in the terrain, whilst the top side follows the course of the carriageway smoothly.



The increasing height of the wall is achieved smoothly by the angled top edge.



Virtually any individual design can be realised with the KOHLHAUER **PLANTA** system. The combination with standard elements enables a large number of additional design possibilities.



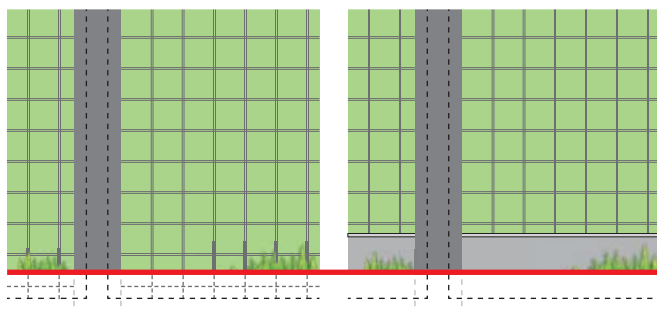
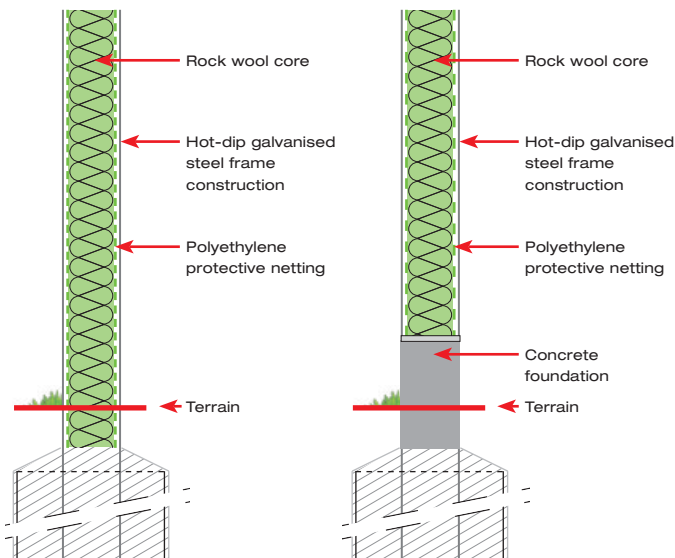


## POSTS

HEA or IPE steel posts are used, depending on statics and the wall version. For mounting in the post chamber (e.g. **PLANTA Classic 100**) or using Z profiles for fixing to the outside (e.g. **PLANTA Classic 200 and 300**).

### Posts according to static/structural requirements

Installation without foundation    Installation with foundation



### Classic 100

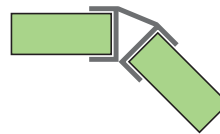
End post



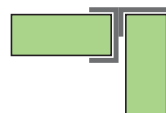
Centre post



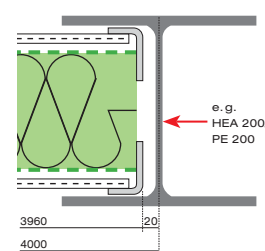
Corner post 45°



Corner post 90°

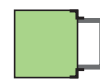


Detailed structure –  
Classic 100



### Classic 200 and 300

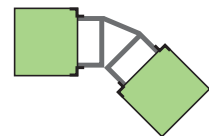
End post



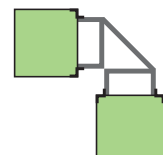
Centre post



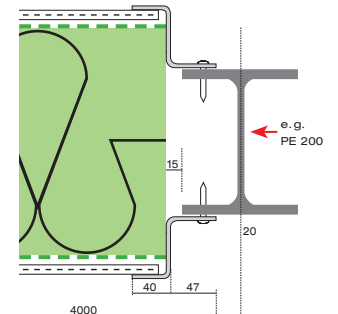
Corner post 45°



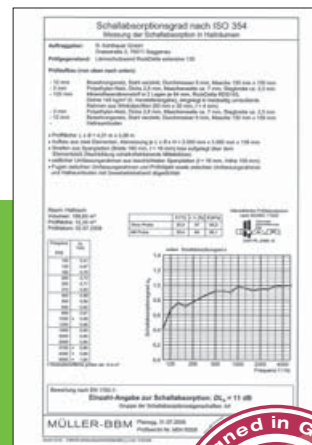
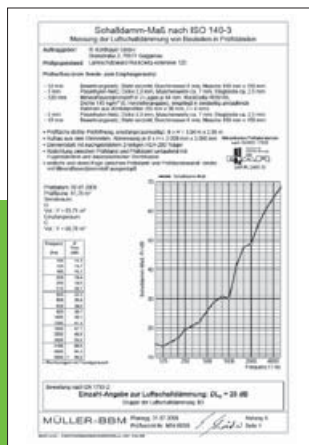
Corner post 90°



Detailed structure –  
Classic 200







## R. KOHLHAUER GMBH

Reinhard Kohlhauser founded the company R. Kohlhauser GmbH in 1993 under the premise of offering “noise protection and more” and proving flexibility and versatility. The name KOHLHAUER has stood for self-developed visionary solutions for over 15 years. Innovative technologies and extensive know-how in the logistics, manufacturing and distribution of high-quality system components for noise protection projects are accorded the highest recognition worldwide.

KOHLHAUER's extensive range of noise protection products is rounded off by competent service in the fields of personal and individual consultation, planning assistance and project management. The product range has been gradually extended according to market requirements. Constructive cooperation with leading raw material manufacturers and suppliers plays a vital role in this. R. Kohlhauser GmbH's distribution partners take care of KOHLHAUER products in more than 20 countries worldwide as of 2009.

R. Kohlhauser GmbH's vision is to solve the problem of noise immission. To reduce the general noise level – for the benefit of everyone.

With KOHLHAUER you are placing your trust in a team of competent development, engineering and production experts in the field of noise protection and environmental management. Together with our customers we want to realise successful projects now and in future.

Let's talk! Totally at ease.



### Product range



Transparent, absorbent to highly absorbent noise protection system with view and anti-glare function.



The double benefit:  
Noise protection combined with sustainable energy generation through solar technology.



**R. Kohlhauser GmbH**

Draisstraße 2

D-76571 Gaggenau

Phone: +49 - 72 25/97 57 - 0

Fax: +49 - 72 25/97 57 - 26

E-Mail: [info@kohlhauser.com](mailto:info@kohlhauser.com)



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

