

An aerial photograph of Barcelona, Spain, showing the coastline, a sandy beach, and the sea. In the foreground, a modern building with a distinctive, textured, golden-brown facade is visible. To the right, a tall, modern building with a glass and metal facade is partially visible. The sky is blue with some clouds.

envac

A MAGAZINE FROM THE WORLD
LEADER IN AUTOMATED WASTE COLLECTION

CONCEPT

1:03

**NEWS - BARCELONA, A WORLD-CLASS CITY WITH AN ENVIRONMENTAL PROFILE
SEOUL, SOUTH KOREA GOES UNDERGROUND - NORRA ÄLVSTRANDEN, THE IDEAL CITY**



ENVAC TO SUPPLY COMPETENCE AND INNOVATION IN WASTE COLLECTION

It will soon be a full year since the Envac brand was launched. As a result our products and services gained a new and consistent name. It is very pleasing to see how well the name has been accepted and that it has already become widely recognised. I am convinced that this new and more prominent identity will facilitate communication with you and other customers.

Now we are taking a further step in the same direction and launching the Envac Concept. It is my hope that this will make it easier for you to understand what Envac stands for. In Barcelona the vision that automated waste collection should be standard practice in residential areas and commercial centres is now being realised. Our close collaboration with the city is very encouraging. Our development is driven by customers who have the highest standards and ambitions. Envac will stand for expertise and innovation in waste collection. We offer support to customers right from the pilot stage through the entire life of our installations – and systems from Envac last a long time. The first was installed in 1961 and is still in use every day. They are also versatile, since they can be adapted to suit changing needs and demands. One example is the Villa Olímpica in Barcelona. After 15 years in service the system is being extended and at the same time adapted to meet current and future demands for sorting waste at source.

The idea of “the good city” covers many aspects of housing and work. Envac contributes to a better environment in a tangible way. Waste collection by means of our closed, underground system, with twenty-four hour access, means greater convenience, hygiene and safety. When air is made to do the heavy work it not only reduces heavy traffic but also occupational injuries. The benefits are both aesthetic and financial when refuse rooms and refuse bins disappear. 100,000 people in over 30 countries already appreciate this fact. The future solution for waste collection has been proving its value for more than 40 years now!

This first issue of Envac Concept showcases a few examples of how Envac can meet the need for healthy, safe and attractive environments. I hope that it will inspire even more good solutions to the growing problem of waste collection.

Sigvard Karlsson, CEO, Envac Centralsug AB

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View of Barcelona's beaches

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NEWS



PN3 - A NEW-GENERATION OF WASTE INLETS

Envac's new PN3 waste inlet is the basis of a series of new outdoor waste inlets to be presented in the near future. The PN3 was developed to meet increasing demands for design quality, sustainability and user-friendliness. For ease of use and optimal ergonomic design the hatch is placed at a height of 900 mm.

One of the most important aims in the development of the PN3 was to achieve a design which harmonises with its urban surroundings. However good design is about more than appearance. Function is equally important. Among other requirements, the inlet must allow dual inlet doors to be fitted for different sizes of waste bags. It also incorporates Envac's patent volume-controlled waste inlets. This has two practical features. Firstly, it prevents the user from depositing oversize items. Secondly, when combined with a user ID it permits individual billing. The waste inlet is also prepared for use as an electronic notice board or advertising pillar.

Because the mechanism and the storage tank are below ground level, the visible part of the waste inlet can be given a slender form which does not take up unnecessary space on the ground. The ability to place the inlet independently of the main pipe also adds to its flexibility.

The PN3 will be available in most colours and with various models of inlet doors from autumn 2003. Offerings will include round and rectangular inlet doors as well as doors equipped with card readers.

RENOVATION BY ENVAC

Envac USA has received an inquiry for the renovation of important parts of the automated waste collection system installed at Disney World in Orlando, Florida. The renovation work will be carried out during summer 2003.

Envac installed the system back in 1971 and it has been in operation ever since. The underground pipes permit the transport of all types of waste that are generated by visitors and the attractions in the amusement park. The number of visitors can exceed 100,000 a day. Large variations in the number of visitors during the year, and the difficulty of vehicle access to many of the attractions make Envac's underground waste collection system the ideal solution for waste handling at Disney World.

NAME CHANGE FOR RENOVATIONSTEKNIK A/S



Envac Scandinavia has taken over the majority shareholding in the former Renovations-
teknik A/S, which has now changed name to
Envac Danmark A/S. This means that the
company is now part of the Envac Group,
which is a world leader in automated waste
collection. In conjunction with the change of
name it has also been decided to change the
company's telephone number, fax number,
e-mail address and web address. The postal
address remains the same. For more infor-
mation about this please see the back of the
magazine. Envac Danmark A/S will continue
to supply modern waste collection systems,
both mobile and stationary, just as before.
Envac has several installations in Denmark,
including one in Nyhamn that handles all the
waste from domestic and commercial build-
ings, and others in Copenhagen, Århus and
Odense. In total there are around 15,000
households connected to various systems in
Denmark. You are welcome to visit our web-
sites at www.envac.net and www.envac.dk
to find out more about Envac Danmark A/S
and our other subsidiaries.



BARCELONA

a world-class city with
an environmental profile



Barcelona has made major efforts in recent years to adapt its waste collection systems to the

characteristics and needs of each neighbourhood.

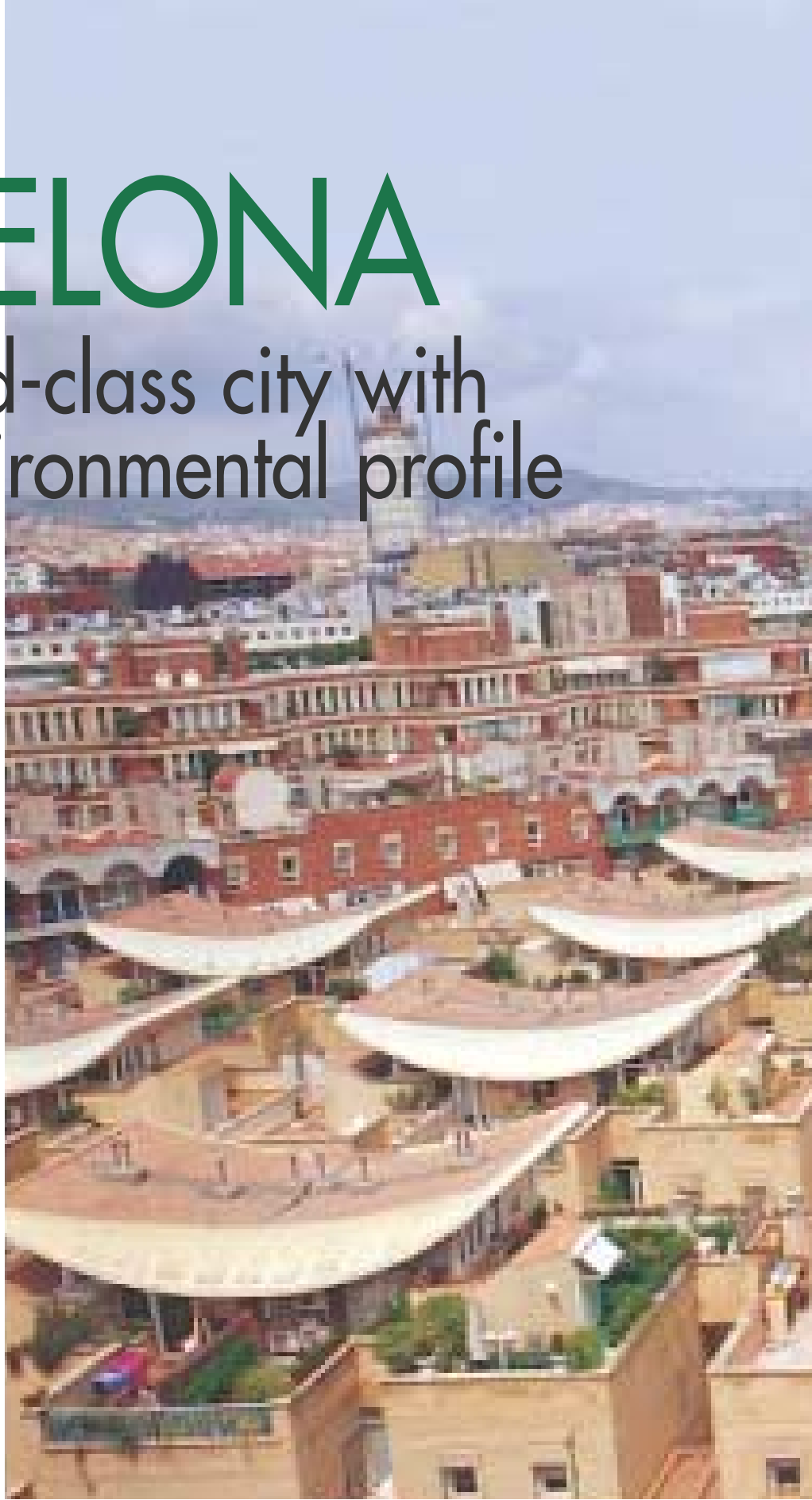
We aim to be a model sustainable city. This necessarily means encouraging separated waste collection, making the process easy for residents, and also adopting the latest technologies in order to reduce smells and noise.

One technology that is being adopted in large parts of our city is the pneumatic collection network. This facilitates residents' participation in the process of waste separation and enables us to achieve high recycling levels.



JOAN CLOS

BARCELONA'S MAJOR





“Barcelona’s future development depends on automated waste collection.” Jordi Salvany, Barcelona City Council’s engineering manager responsible for street cleaning and waste collection, puts it this bluntly in motivating the city’s decision to install automated waste collection systems in the new districts of 22@ and Diagonal Poplenou.



Jordi Salvany

Since Barcelona installed its first underground system for waste transport at Villa Olímpica in 1992, the rate of new installations has escalated. The comprehensive plan for the construction of automated waste collection systems adopted by the City Council in 2002 covers a collection area of 1,075 hectares. When implementation is completed in 2007, up to half a million residents will be connected to an automated waste collection system.

“The advantages of the system to us are so great that we simply can’t afford to be without it,” says Salvany. “Barcelona has a very high density of development — twice as high as London for example. So any ground area we can release is a high priority for us.” The transport network is not the only part of the system that will be buried. The collection stations will also be partly or entirely underground. Barcelona has realised that storing and transporting waste in the streets not only obstructs access, it has negative impact on its image as well. The city’s decision makers therefore quote noise reduction, odour elimination, and improved hygiene in waste management as additional reasons for the big investment in automated waste collection.

Barcelona’s underground waste transport system handles more than just the waste for household. Shops, offices, restaurants, hotels and a variety of other private and public businesses are also connected to the system. Because commercial users’

needs differ from those of householders, a new type of waste inlet has been developed. The new street-side access inlets are of dual use type, with different inlet doors for households and for shops and offices. The larger inlet door for commercial users is designed to take 110-litre plastic bags and requires an electronic key to open it. This provides a way of generating user statistics and in theory could permit the charging of different users at different rates. “The electronic key is individual and identifies the user. This means we can record when people use the system and the type and quantity of waste they drop off on each occasion,” says Ricard Frigola, director of Barcelona’s service and maintenance division.

“Installing automated waste collection systems involve a heavy initial investment compared with manual collection,” Jordi Salvany notes. “So it is important that we pass on part of the capital cost to the households. However, without a positive reception by home owners and tenants our plans could never have advanced as far as they have.”

Automated waste collection is very well accepted by Barcelona residents, due in large measure to extensive information campaigns by public and private organisations. “Occasionally homeowners and tenants even write to our local papers demanding to be connected to the system,” says Albert Mateu, head of Envac’s Barcelona office.



The waste containers are hoisted to ground level and placed on trucks with the aid of heavy cables fastened to ceiling beams. With this technology compact, high-capacity waste collection stations can be built.



Automated waste collection systems are not confined to new suburbs. Like a number of other Spanish cities, Barcelona has realised the value of keeping waste off the streets of its historic central districts. In Ciutat Vella, Barcelona's mediaeval Old Town, two double automated systems which will serve 115,000 residents have been under installation for over a year.

"It is a challenge to install automated waste collection systems in an environment like this," says Envac's Albert Mateu. "Not only do we have to guarantee good access during construction, there are also archaeological requirements we have to observe." During a short period Envac engaged up to eighty archaeologists to carry out excavations before installing the new pipe system. Installation in such a sensitive environment imposes exceptional aesthetic considerations. The character of the city must be more than preserved, it must be accentuated. For this reason the City Council took an active part in the design of the new street-side waste inlets for the area.

Barcelona's commitment to innovative and environmentally friendly infrastructure has had consequences for the development of Envac's automated waste collection systems. In Diagonal Poble Nou, the exclusive new suburb under development in the south-east of the city, a new technical solution to improve collection station container handling is to be unveiled this summer. The collection station building, designed by the renowned Catalan architect Eduard Bru, is located half below ground and equipped with a transport crane for moving containers. The loading and unloading time has been reduced below one minute. The space normally required for container storage and for backing or turning vehicles is minimised.

Solutions developed and tested in Barcelona are being adopted elsewhere in the world. "We have an average of one international visit a week. Visitors are always deeply impressed by how far we have gone in treating waste collection and transport like any other urban utility," Albert Mateu concludes.

A CULTURALLY UNIQUE CITY

In contrast to other cities which are cutting back on their environmental commitments for lack of economic resources, Barcelona regards continuing environmental improvement as a necessity for greater growth and social security.

An extensive environmental action programme has been adopted by the Barcelona City Council. Four main lines of action have been drawn up:

CLEAN CITY. Street cleaning and waste management are the most visible and tangible elements of the sustainability programme. They also have the greatest single effect on residents, since “a cleaner city is cleaner for longer.” The Council has divided the city into four sectors with a separate contractor for each. A unique feature of Barcelona’s arrangements is that each contractor is responsible for both street cleaning and waste collection. The work performed by the contractors is audited annually by the British environmental institute ERCU.

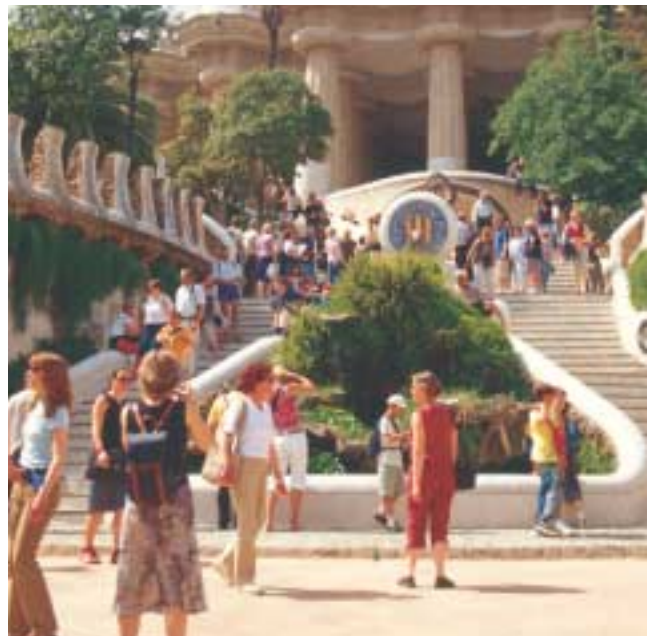
A noteworthy innovation in this connection is Barcelona’s 20,000 wastepaper bins with built-in microchips which indicate whether or not the bin needs emptying.

OPERATIVE CITY. The aim of the Operative City programme is to improve traffic and accessibility conditions. While it is perhaps obvious that good streets and roads with adequate, energy-saving lighting and correct signage are essential for accessibility, the slightest hitch can affect the daily lives of thousands of people.

To further optimise traffic and accessibility a special infrastructure plan has been developed. In the case of new districts such as 22@ and Forum 2004 the aim is for all underground

infrastructure to be accommodated in tunnels to facilitate future maintenance.

Other actions that have been taken include minimising and optimising street signage and installing energy-saving street lighting.





communication are essential to the success of this common enterprise. With this in mind the Barcelona City Council at the end of 2002 entered into a civic contract, based on dialogue and communication, with over 120 associations and organisations. Within the framework of the civic contract, individual cooperation agreements have been concluded with the aim of promoting a clean, sustainable city.

A customer centre has been established to enable Barcelonans to conveniently contact the council's service and maintenance unit. Residents can order free weekly collection of bulky waste, report faults, or inquire about council services by dialling a toll-free number.

Much effort has also been put into communicating the aims of the Agenda 21 programme (www.bcn.es/agenda21) to city residents. Among other things, they can visit the Barcelona Sustainable Resources Centre to obtain information about seminars, educational materials and programmes.

Residents can order free weekly collection of bulky waste, report faults, or inquire about council services by dialling a toll-free number.

ENVIRONMENTAL CITY. The commitment to raising the city's environmental profile involves closer monitoring of activities that impact on air and water quality. A great deal has been spent on upgrading sewerage and draining systems, which often used to be overwhelmed by violent rainstorms and floods.

COMFORTABLE CITY. The focus here is on enabling Barcelona's inhabitants and visitors to enjoy their work and leisure in aesthetically attractive surroundings which provide for both social interaction and the individual's need of peace and quiet. Special rehabilitation programmes have been implemented for beaches and parks.

The "Quiet City" programme comprises laying new sound-absorbing asphalt, special grants for the sound insulation of buildings, and the monitoring of restaurants and bars to improve the city's acoustic environment. Noise reduction is a challenge for all modern cities and particularly for those in the Mediterranean region, where climate and culture favour the extensive use of streets and public spaces.

INVOLVEMENT, EDUCATION AND COMMUNICATION. Improving urban services and enhancing the residential and environment values of the city requires resolute public action. High quality, high motivation and good





Barcelona's
PIONEERING
action
PROGRAMME



Barcelona's strong commitment to stimulating development goes beyond empty words. A variety of active steps have been taken to ensure that programmes are implemented and lead to desired outcomes. Some examples:

The environmental management of the work of the service and maintenance unit complies with an ISO 14001 environmental certification.

•

Since 2001 yearly audits have been carried out by the British environment institute ERCU to verify and document street cleaning and waste collection.

•

In 2002 Barcelona was awarded the Climate Star 2002 by the Climate Alliance, a grouping of European Cities working to counteract global climate change.

•

The City Council in partnership with the Royal Spanish Prize Foundation and

with the assistance of the EU environmental unit has established a prize known as the Barcelona International Award for Urban Innovation. Twenty projects from European countries were presented in 2002, the winner being Hannover, Germany, with a programme for preventive planning in waste management.

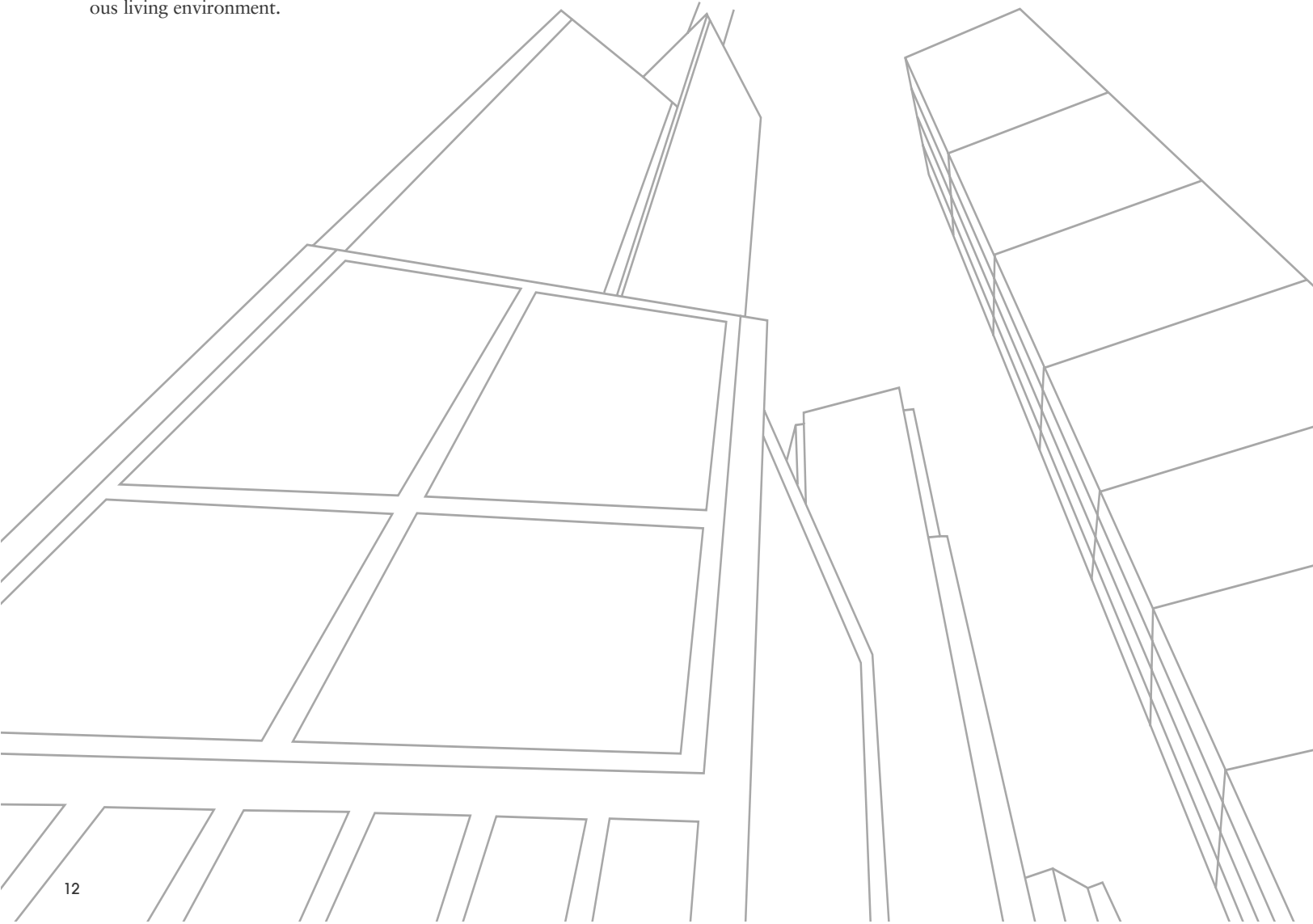




Yongin City goes underground

South Korea is going underground to make its cities greener. Yongin City in South Korea is yet another member of the growing band of cities that is moving away from manual waste collection and instead investing in an automated alternative. The suburb of Seoul, in the province of Kyonggi, is subject to a regional decision that all new building projects involving more than 700 apartments must have an automated waste collection system. The decision is part of a development programme to create a greener city. The ambition is that 30 percent of the area of the city should be green belt. An automated system that is largely hidden underground makes it possible to eliminate many problems such as the movement of noisy refuse trucks between buildings and unpleasant odours from refuse containers. This makes a major contribution to the creation of a cleaner, more attractive and more harmonious living environment.

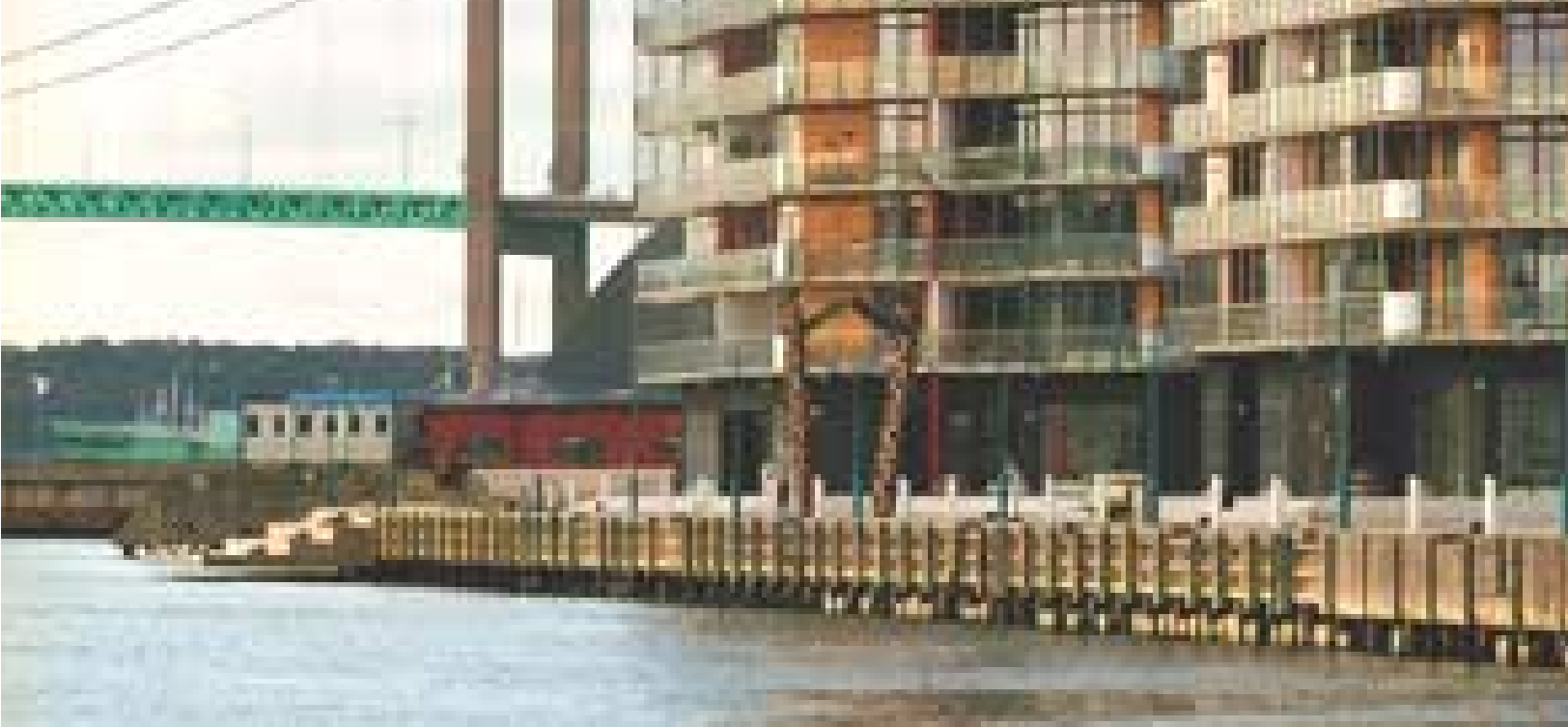
A previously installed system in South Korea has been warmly received. Envac's vacuum-based waste collection system, which has been in service in Yongin Sooji outside Seoul since January 2000, has been a great success. In fact a survey shows that 90 percent of the 10,000 households that are connected, including apartments, schools and offices, etc., are very pleased with the system. This successful development laid the foundation for continuing investment in this type of waste solution. Up to 70 new apartments sites that are now being planned in this steadily growing area will be provided with automated waste collection. The trend in South Korea, and especially in the area around Seoul, is expected to attract similar business in other Asian countries, which would open up an exciting new market for Envac.





Norra Älvstranden

THE IDEAL CITY



“Basically we’re recycling a complete district.” This is how Olle Lindkvist succinctly describes what has been happening over the last couple of years in the former port and shipyard areas along Norra Älvstranden in Gothenburg.

Under the direction of the municipal development company Norra Älvstranden Utveckling AB, of which Olle Lindkvist is construction manager, the old industrial complexes in the area have been cleaned up and restored since the early nineties. Gothenburg, which remained one of the world’s biggest centres of shipbuilding well into the seventies, was not only forced to tackle a significant unemployment problem following the major shipbuilding crisis, but also had to find new uses for abandoned industrial complexes and vacant office buildings. Most of the buildings were never demolished, and many are now listed as representing an important cultural heritage.

There is no denying that there is a strong element of recycling in the way the area is now being used. For example, the 84-metre-high crane from one of three former shipyards is now being used as a lookout platform and take-off point for bungee jumping. Eriksbergshallen, which was formerly a machine shop, is now a popular venue for a variety of cultural events.

According to Olle Lindkvist the aim is that Norra Älvstranden – an area covering 250 hectares of land and 40 hectares of water – should provide opportunities for housing, employment and leisure. Around 6000 apartments and 12,000 jobs will be created here in a setting that combines modern infrastructure and logistics. It is especially important to attract high-tech companies and companies involved in training. Ericsson’s decision to move its entire Mobile Data Design business to Norra Älvstranden has further enhanced interest in the area. The Lindholmen shipyard site is not just the site of an ultramodern office building for Ericsson, but also provides

offices for other high-tech companies, such as Semcon and Sigma. An IT university was opened right next door back in autumn 2001. The university is a joint venture between Göteborg University and Chalmers University of Technology. With the help of Lindholmen Science Park hopes are that Gothenburg can become a leading centre of high technology.

At present, almost half of the ambitious expansion programme has been completed, and the area already has a shopping centre, a theatre, a hotel and a sports centre. A golf course and several restaurants and schools have also been built. Housing and offices are being built at the same time in order to promote the desired integration. Norra Älvstranden Utveckling AB is therefore only selling property and sites to investors who meet the requirements set by the development programme.

Modern housing of a high standard is being built along Norra Älvstranden, and some homes will even have their own berths for small boats. Where ocean-going tankers were built just 30 or so years ago there is now only space for a small repair yard, but there is plenty of space for residents’ leisure boats.

Sustainability is one of the guiding principles for this new but old district of the city, which stretches five kilometres along Älvstranden. This not only applies to the process of restoration and construction, but especially to the way the area is utilised and maintained. It means that demolition rubble, bricks and asphalt are all recycled. Ventilation systems and waste handling are operated so



as to minimise environmental impact and energy consumption. Many of these ideas are also being applied in similar European projects. The waste system is also unique and innovative. Waste collection from households and work places has been integrated as part of the underground infrastructure. This has made it possible to eliminate the use of refuse containers and trucks to collect a large proportion of waste. All the buildings in the area are connected to one of two vacuum systems. Inside the properties, or next to them, there are chutes for depositing up to three waste fractions.

Because the chutes are continuously emptied by the system the irritations of overflowing and smelly refuse containers are a thing of the past. And since the waste is carried by vacuum to one of two terminals in the area the municipal waste collection company now only needs to travel to one location to collect waste, instead of visiting every property. This saves time and energy, and reduces traffic and noise pollution in the area. “The system is very modern, economical and environmentally friendly, and it contributes to the high standard of housing and work places in the area,” says Olle Lindkvist when asked about the choice of waste management system.

Envac is the supplier of both vacuum systems in Norra Älvstranden. Staffan Eriksson, Scandinavian manager for Envac, admits that the investment cost is higher than for conventional waste collection systems. However, the operating costs are considerably lower. This is also confirmed by Per-Olof Carlsson, vice

president of one of four municipal housing companies that are involved in the development of Norra Älvstranden:

“In the long term the system is actually cheaper. And tenants now demand environmentally friendly building and housing.”

The approach taken by Norra Älvstranden Utveckling AB is clearly in tune with the times. Housing is generally rented out before building work has even begun. Having once been an area of Gothenburg where people would not consider living, it is now in great demand, and there is no sign of a decline in interest in moving to this area.

Norra Älvstranden Utveckling AB, which is owned by the City of Gothenburg, is responsible for directing and managing development work in the area, as well as marketing land and properties. The company has its origins in the organisational changes that took place as a result of the ship-building crisis in the late seventies. Work on urban revitalisation in the old shipyard sites began in the mid-eighties.

Waste collection in Norra Älvstranden is achieved with the aid of two stationary systems. A stationary system with a network of 400-mm diameter pipes was installed in the western area around Eriksberg in the early nineties to collect three waste fractions (an incinerable fraction, a paper fraction and a compostable fraction). The system was then successively extended to serve more and more homes. Today, around 1000 apartments are connected, along with offices, hotels, restaurants and shops. In the next few years a further 1050 apartments will be connected. For the central and eastern area, near Lindholmen, a new terminal that can handle up to three fractions (the same as at Eriksberg) was recently brought into service. The pipe network, which is still being constructed, has a diameter of 500 mm.

OUR BUSINESS CONCEPT

We offer efficient and environmentally friendly systems for waste collection. Strong support during planning, installation and operation will guarantee high user availability and flexibility. We strive to be regarded as a reliable long-term partner offering first class quality products.

SERVICES: Feasibility study, Turnkey Installation, Service

APPLICATIONS: Residential, City Centre, Hospital, Kitchen, Airport

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