



ROYAL

SMIALS

**Are we taking
responsibility for a
safe and comfortable
living environment for
today and tomorrow?**



Development
and conservation
for a better
quality of life.



Why is Royal Smals such a significant organisation? Our mission is to contribute in creating a safe and comfortable environment for today and tomorrow. Each day, every one of us believes that we have to make a difference and contribute in making this happen.

This stems from the family character, principles and values within our company. For over 125 years we have been fulfilling our ideals and creating great benefits for our environment, clients and community. We have become a highly respected Dutch Royal company and are an international leading company in water management. Our aim is to become the most recognised worldwide expert in our profession. We truly care and would like to help you and the environment. We are a creative, professional and dedicated team. We are Royal Smals.

We care for
human well being.



We care for our
living environment
and well being.



In the domain of international water management we are taking care of every aspect. From dredging, engineering, researching, dewatering and the supply of raw materials for land/area development and the construction industry.

We care for
nature.



We care for
water, flora and fauna.





Smart use of
dredged sludge
into new sustainable
constructions.

We believe that a true solution for water management can only be realised with a clear view and an integrated approach. It all starts with a certain problem, for example lack of nautical draft, contamination or hydraulic issues in waterways. Royal Smals can solve these problems with the best possible methods, innovative processes, necessary equipment and skilled personnel. We take care of all aspects of the work. Our company thrives on finding solutions for the most complex and specialist work.

We can turn around a problem in a new value chain. For example sludge into raw construction material. With our specialised dredging and innovative dewatering capabilities, we make this happen. We can deliver smart solutions with great benefits, together with our expertise, from the beginning to the end process, we can help.

**Innovative work
with re-used sludge.**



**Our expertise provides
clever solutions with
great benefits for
the environment.**



Throughout the process we continually seek even better solutions. Smart dredging adds value to the living environment.

**Specialised dredging and
dewatering of contaminated soil.**



Water related works with state of the art highly specialised equipment.

We provide the best dredging and transportation equipment. All equipment is available to hire together with personnel if required. Inland waterway transport is also one of our services.

We have an extensive and well-equipped range of equipment: small and medium scale deep suction dredgers, cutter suction dredgers and bucket wheel dredgers. Suction depths from 0,5 up to 60 metres are feasible. All equipment is transportable by road. These dredgers can be disassembled and can be operated in both open water and in enclosed borrow pits.

In addition, we have available various types of auxiliary equipment, including barges, barge loading pontoons, screening pontoons, booster stations, sand transport pumps, submersible dredge pumps, tugs, floating pipelines and crane barges.



Deep suction
dredger 'Maas'.



**Our extensive range
of equipment is
also for hire.**



We provide a wide range of mechanical and hydraulic dredging and transport equipment, with or without personnel, for small to seaworthy projects.

Cutter head
600 mm.



Sand loading pontoon
'Grevelingen'.



Vision creates synergy in a living environment.



For the valuable realisation of new areas and living environments, we need the participation of stakeholders and governments. To achieve success, we have to cooperate and manage the road to success, with many people, from case studies, development processing to realisations. Having created a clear vision, we have to work together on feasibility studies, authorisations, environmental interests, engineering and profound integrated planning and procedures.

From a vision to realisation requires our long term involvement (10-20 years). Furthermore, we need to manage many execution processes for excavating the raw materials, the area development, administration, management and exploitation. In some cases we have initiated a plan and taken responsibility for the entire project development including realisation and daily management.

Valuable
recreational living.



**Purpose and
quality of life
always prevails.**



Projects are carried out in line with the clients needs. At the same time, we never lose sight of the contribution we can make for today and tomorrow.

Valuable
economical life.



Synergy in
living environment.



Proud to be a respected
family company with
strong core values.



The Dutch Royal Seal of Approval is granted.



We are very honoured that we have been presented with this award for our 125 years Jubilee. It underlines our integrity and continuity and the importance of our company in our business.

The Smals family business was established in 1885. Today, the fifth generation is a proud, dedicated shareholder of the company and strong values have carried us through the generations. We, of course, treat our clients, partners and society with respect and the utmost integrity. The company was awarded the prestigious Royal in 2010 for its progressive landscaping and technological vision. We have now become the internationally known brand, Royal Smals.

The company runs several international businesses. Our core activity is specialised dredging activities and the extraction and processing of raw construction materials for the industry. Our own laboratory provides expert advice and analysis and supports our research & development activities. We have been certified with the CO2 conscious certificate, ISO 9001, ISO 14001 and VCA (SCC)**. Continuous improvement and guarantees go hand in hand with a professional company.



Skillful services
provided in
exclusive marinas.



Cannes, in the Côte d'Azur, is one of the most exciting famous cities, attracting people and celebrities from all over the world, especially promenade 'La Croisette' with its marina. Impressive yachts of 80 metres are docked here regularly. To improve and extend the quay and facilities we delivered all the dredging/depth expertise with the best possible integrated solutions.

Together with contracting partner Eco Systems de Dragage for our client Vinci, the worlds largest construction company, we carried out this complex work at the famous Quay 21-22. We carefully placed 500 metres of underwater pipelines so that the yachts were able to remain in place and the marina kept open. Divers secured these pipelines to prevent any damage. The dredged material was separated into 3 subflows: course material (rock, stones, debris, etc.), sand (which was re-used as beach material) and sludge fraction. Two huge mobile basins were installed to keep the sludge liquid and homogeneous. After adding polymer into the liquid sludge the material was pumped into decanter units.

Finally, dewatered in a filter belt press, the dewatered sludge was transported by trucks to a landfill site.

Vinci Construction

Where
Port Pierre Canto Marina, Cannes, Côte d'Azur, France

Volume
8,000 m³ Dredging
25,000 m² Dredging

Equipment
10" Cutter Suction Dredger
RTK-GPS + Dredge Monitoring System

Social/economical value
Major port development
New port facilities
New deeper quays
Beach material



The sludge was stored in 2 large basins on the quay.



Seaworthy dredgers
tidal proof with
RTK-GPS.



The Port of Esbjerg, in the West of Denmark, is the country's largest seaport, with 80% of the Danish offshore industry. There is a large measure of synergy between the traditionally strong oil & gas industry and the new growing wind turbine industry. The Southern part of the port is extended for the growth in offshore operations.

For the contract from Rohde Nielsen A/S, we made our contribution to this expansion with our heavy hydraulic dredging work. We dredged 500,000 m³ of sand and then sprayed this onto the port site through a floating pressure hose. For this project we used one of our seaworthy dredges, equipped with the RTK-GPS system to enable us to deal with the tides. To optimise the dredging process and the output production, multibeam surveys were done regularly in short intervals. This data was uploaded for concentrated dredging purposes.

The dredger was towed from the Port of Rotterdam to Denmark. Following an audit by the Danish Maritime Authority, work could commence. With its coastal certificate and fully flexible floating hoses, the dredger is outstandingly suited to ports and coastal areas.

Port of Esbjerg

Where
Offshore Port, Esbjerg, Denmark

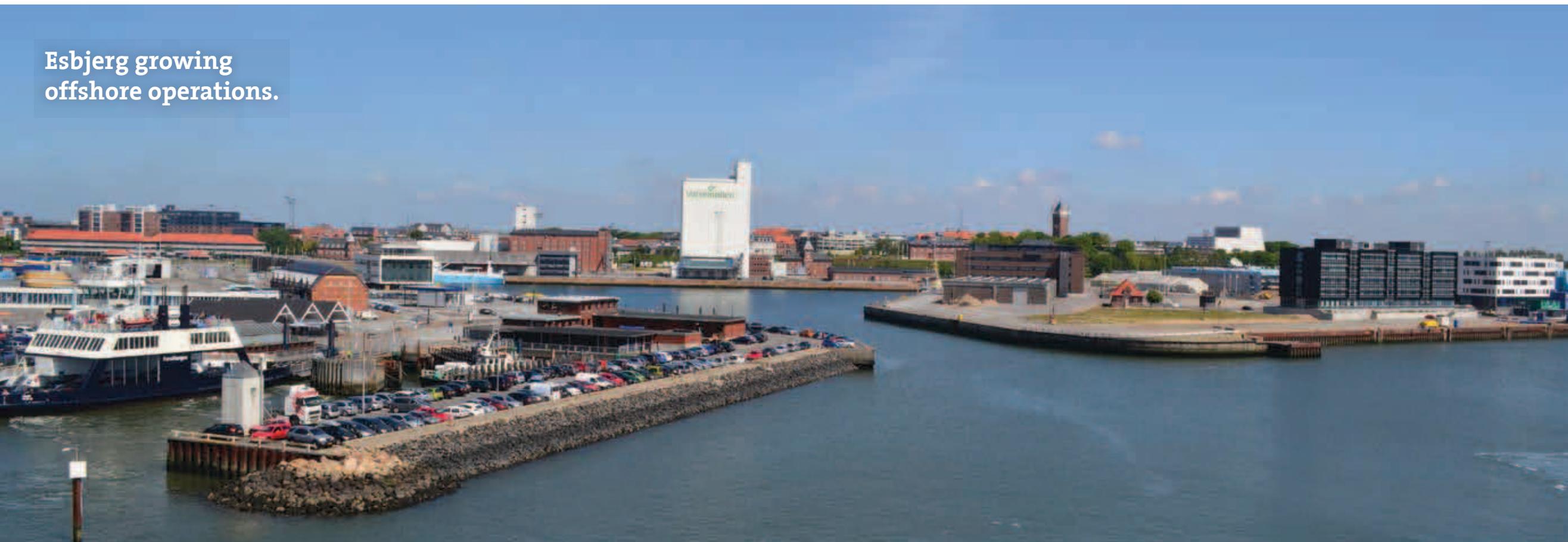
Volume
500,000 m³ Sand

Equipment
Seaworthy Large Dredger
RTK-GPS
1,000 metres Floating pressure hose

Social/economical value
Growing offshore operations



Esbjerg growing offshore operations.



**Innovative sludge re-use
with the unique sustainable
Baleen Dewatering System®.**



The Netherlands has many cities and villages with urban water which are still contaminated with sludge. Before undertaking dredging works, we try to find environmental and economically interesting solutions by maximising the use of the sludge into valuable resources.

In the city of Borculo, several ponds and canals were mechanically dredged by using floating bulldozers. Special slurry trailers transported the dredged material and this was pumped into a temporary dewatering site, next to the city centre. After dehydration, the dewatering site was separated into 2 flows: re-usable sand (raw construction material) and (fertile) soil. Finally, we cleaned the canal 'De Berkelzomp' using a unique hydraulic method. The dredged material was 'stored' into geotextile containers. These were used to restore the poor condition of the embankment of the waterway.

Significant cost savings, development and reinforcement of the existing shoreline and embankment were achieved.

Water board Rijn en IJssel

Where

Borculo Berkelland, The Netherlands

Volume

35,000 m³ Sludge

Equipment

8" Cutter Suction Dredger

RTK-GPS

Floating bulldozers, trucks and cranes

Dewatering site, Geotextile containers

Social/economical value

Restoration of embankment

Creation of more bio diversity in the ponds and waterways

Increasing recreation possibilities

Providing a safe and healthy urban and natural environment



Unique geotextile containers with re-used sludge.



Hydraulic small scale dredging.



Emergency cleaning of oil contaminated soil on the River Rhine.



Major industrial harbours and rivers are often confronted with many serious environmental problems with contaminated sludge. There is much more to be done to ensure the continuing quality of life and nature. In Wiesbaden, West Germany, the banks and bottom of the River Rhine were polluted with thick oil particles which were spilt due to a leakage of cooling oil from a chemical plant.

We cleaned the banks and bottom of the river using hydraulic dredging together with a specially developed sweep head. Alongside a quay wall we pumped the contaminated materials into a 2,000 m³ hopper barge where huge geotextile containers were installed. Polymer and Iron Chloride were injected to speed up the dewatering.

Finally, all oil and slurry was stored in several hopper barges of 2,000 m³ each and, with a cascade solution, the free water flow was pumped through an active carbon filter system before being pumped back into the River Rhine. The barges were transported to a special reclamation factory where the geotextile and dewatered oil sludge were separated for rehandling.

Arcadis Germany

Where

River Rhine, Wiesbaden, Germany

Volume

70,000 m² Contaminated materials

Equipment

10" Hydraulic Cutter Suction Dredger

Special designed sweep head

RTK-GPS for accurate positioning

Geotube dewatering

4 Hopper barges of 2,000 m³ each

Social/economical value

Restoring and cleaning of river and banks

Creating more bio diversity

Providing a safe and healthy urban and natural environment



**2,000 m³ hopper barges
with geotextile container.**



Dredging 24/7 in a nature reserve park to reduce the amount of orthophosphate.



Lake Teterow is situated in a nature park, approximately 200 km North from Berlin, in former East Germany. It is a beautiful shallow lake measuring 1,500 acres with an average of 4 metres depth. Restoring Lake Teterow is a perfect example of where we do valuable work in rural nature and reduce the amount of orthophosphate, locked in its sludge.

From dusk until dawn 24/7, our dredger constantly pumped its mixture into one of the 12 dewatering basins. To achieve the highest accuracy, we used the RTK-GPS and a Dredge Monitoring System. A Multicat was used to assist the dredger in repositioning its anchors and the extension of the (floating) pipeline.

To reduce the amount of dissolved orthophosphate, we used inhouse designed environmental friendly dispensing units. These solar powered units inject poly aluminium chloride into the 3 precipitation basins. Samples were taken frequently, and proven by lab testing, that the remaining pumping water contained less than 80 µg of orthophosphate.

Stadt Teterow

Where
Lake Teterow, Germany

Volume
160,000 m3 Silt with high content of phosphate
200,000 m2 Restoration of Lake Teterow

Equipment
10" Cutter Suction Dredger
RTK-GPS + Dredge Monitoring System
Deposit 12 dewatering basins 6,000 metres from lake
7,000 metres HDPE pipes

Social/economical value
The natural mineral balance of the lake restored
Ecological impact on flora and fauna



**Frequent analysis
of water quality.**



**High accuracy with
our RTK-GPS.**



Cleaning and
isolating phosphorus
contamination.



After World War II, huge amounts of calcium phosphate and other phosphorus related chemical waste had been dumped into the Rattlechain Lagoon in Oldbury. High levels of health and safety regulations were adhered to.

The bottom of the lagoon was first flattened. Due to the high level of phosphate in the water, the cutter suction dredger not only dredged soil, but also huge amounts of algae. To solve the problem of cludging, we equipped our dredger with a vegetation shredder. After 5 months of dredging and flattening operations, a huge geomembrane of more than 45,000 m² was laid and completely covered the lagoon and its slopes.

Truckloads of capping material, mostly sand and recycled concrete, were tipped onto the site. The material was mixed with water and, by using a powerful gravel booster unit, the liquidised material was pumped on a spreading pontoon for its final destination as a capping layer to isolate the phosphorus contamination.

Group De Cloedt

Where
Oldbury/Birmingham, England

Volume
40,000 m² Lagoon with phosphorus sludge

Equipment
10" Hydraulic Cutter Suction Dredger,
with special vegetation shredder head
RTK-GPS
Spreading pontoon, pumps, excavators

Social/economical value
Restoring mineral balance in lagoon
Creating more bio diversity
Providing a safe and healthy urban and natural environment



Work on site.



Specialised mechanical equipment and dredging major waterways, canals and harbours.



Eemskanaal and Oosterhornkanaal were contaminated with high concentrations of mercury. Remove all contaminated soil was our given assignment. The on spuds positioned dredger is equipped with a RTK-GPS controlled environmental grab to gain maximum accuracy. This ensures clean extracted material which is not the case when using a conventional grab.

The hopper barges transported all material to the special silt disposal location at 'Ijsseloog' where a hopper dredger unloads the sludge barges within 2-3 hours. After the barges were emptied from the contaminated soil, the remaining dumped garbage (motorcycles, bikes, etc.) was separately cleaned and transported to an authorised solid waste facility.

The dredging operations were complicated due to the excessive shipping traffic. Nevertheless, with the right project management, we also succeeded in completing the dredging operations within the agreed contract period, with no delay for other vessels.

Groningen Province

Where
Eemskanaal/Oosterhornkanaal, The Netherlands

Volume
45,000 m³ Soil

Equipment
Self-propelled grab dredger
Supported hopper barges
Suction dredger
RTK-GPS

Social/economical value
Cleaning contaminated channels
No delay for shipping traffic



**Barge unloaded
by hopper dredger.**



**Self-propelled
grab dredger.**

Challenging
cleaning work in
strong tidal seaports.



Husum is a German seaport, well known for its tourism, exhibitions, wind industry and shipyard. The shipyard bottom was polluted with TBT (antifouling). This was an extraordinary challenge because Husum is a seaport with strong tidal currents, up to more than 4,00 metres.

The 'Husumer Locks' protects the inner city from flooding during spring tides and extreme weather conditions. During our dredging operations, the locks were closed to ensure a stable water level in the harbour. Due to this, 2 powerful water pumps (with a capacity of 15,000 m³ per hour) were installed to discharge the current of two small rivers into the harbour. All dredged sediment was pumped and stored into geotextile dewatering containers. Two computerised high output Polymer Units were operational to inject dry polymer (flocculates) into the dewatering containers to optimise the dewatering process.

Huge amounts of silt was dewatered on the storage site. Finally, more than 45,000 m³ of contaminated silt was dewatered and stored.

Landesbetrieb für Küstenschutz, Nationalpark und Meeresschutz Schleswig-Holstein

Where
Husum Seaport, Germany

Volume
45,000 m³ Polluted silt

Equipment
Cutter Suction Dredgers
Survey vessel with a dual frequency echo sounder
600 metres Pipelines and dozens of valves
Telescopic cranes

Social/economical value
Major port development
Restoring and cleaning of harbour, creating more bio diversity
and providing a safe and healthy urban environment



**Storage of dewatered silt
in geotextile containers.**



**Extremely complex
transport and dredging
in mountainous regions.**



We are used to handling complex projects. In this case, our creative, professional, dedicated organisation was certainly put to the test. How to safeguard the transport of 250 tonnes on difficult mountain terrain? A 15% gradient rising to 2,000 metres in height, without dropping, coming to a standstill or sliding backwards? And next, how to dredge without disturbing the running hydroelectric power installation? And where should the 70,000 m³ volume of sand and gravel be stored?

Large amounts of sand, gravel and sludge from the mountains are a threat to the reservoirs and turbines of hydroelectric power plants. Turbulence had to be prevented around the suction mouth and the pronounced difference between the water levels had to be taken into account. Spraying the volume of 70,000 m³ on land was not permitted. Therefore, the material had to be stored in an underwater depot, especially provided for this purpose.

The depot was realised in the middle of the lake, a long distance from both the inlet/outlet of the hydroelectric power station and the downstream outlet. A 450 metres floating discharge pipe was used, in combination with a spreading pontoon.

Tiroler Wasserkraft AG

Where

Kühtai power station, Lake Langental, Austria

Volume

70,000 m³ Sand and gravel

Storing in underwater depots

Equipment

Large Suction Dredger, 35 metres depth

Inhouse designed rotary wheel trencher, 1.8 metres

RTK-GPS

Social/economical value

Damage control

Less maintenance costs

Saving in energy prices



Dredging on a lake
without turbulence.



Inhouse designed 1.8 metres
rotary wheel trencher.



Ambitious work,
heavy equipment for
major port expansions.



At the North Sea side, Eemshaven is the main energy port of The Netherlands and very important within Northwest Europe. It provides approximately 8,000 MW energy production, international energy supply and intensive offshore wind industry. This Energy Park plays an essential role in the European living environment, both socially and economically.

The expansion of Eemshaven was a very ambitious project and we were very pleased to be able to deliver our contribution. We worked 24/7 with our dedicated team and heavy equipment to realise all the work within a short period of time. After only two days, our largest suction dredger was fully operational.

An electrical powered submersible pump (4,500 m³ mixture per hour) was put into operation so that we were able to pump the sand relatively cleanly and quietly. We could work very sustainably and deliver high volumes with the best possible performance. A tolerance of 30 cms was achieved with a specially designed drag head. The material flow was sprayed into the assigned areas behind the quay walls for industrial expansion.

Groningen Seaports

Where
Eemshaven Energy Park, The Netherlands

Volume
500,000 m³ Sand
3.5 kms High-pressure pipelines
4,500 m³ Pumped per hour

Equipment
Seaworthy Deep Suction Dredger
Electrical powered submersible pump

Social/economical value
Contribution to sustainable energy production,
work and well being
New area for industrial expansion



**High-pressure pipelines over 3.5 kms,
pumping 4,500 m³ mixture per hour.**



**Expertise in a variety
of small and large
embankment works.**



Water engineering constructions within the Dutch infrastructure are world famous. Royal Smals is becoming increasingly involved in design and construction work. In Europe we undertake a large number of embankment works. This is crucial for the safety and quality of existing and new living environments.

We undertake heavy embankment works and sheet piling from the waterside, with profiles as well as pipes. We are specialised in pile driving activities, the realisation of nature friendly banks, depositing and embankment renovations. Embankment constructions made from steel, concrete or wood can be erected whatever the circumstances.

Royal Smals has expertise in installing zinc constructions and depositing materials and provides the necessary equipment. We work closely together with all governing bodies.

Several water boards

Where
The Netherlands and Germany
Social/economical value
Nature friendly banks
Embankment renovation and improvement
Safety for living environments



Special embankment work for several constructions.



Nature friendly embankment development and realisation.



Production of
high quality
sand and gravel,
serving the industry.



Sand and gravel are vital components for our society and economy. The recovery and process of these crucial resources is one of the core activities of Royal Smals. Our sand and gravel is used mainly as a basic material for construction and infrastructure. We extract and upgrade raw materials to the highest quality required to serve the industry. Royal Smals has the state of the art equipment for this specialised work.

Sand and gravel is produced and loaded into ships with volumes of up to 1,200 tonnes per hour and directly shipped to destination. Royal Smals sets the standard for production of high quality sand and gravel and washes, screens, sorts and mixes to the exact specification required by its customers.

Our inhouse engineered equipment enables us to produce 50 different types of sand within the 0 – 4 mm category. To assure high quality at all times, a sample of sand is checked every 30 seconds and determined for its grain size distribution. This system is patented. This type of quality management and control ensures top quality products and services for our customers.

Royal Smals

Where

Kalle, Landkreis Grafschaft Bentheim, Germany
Wipplingen, Landkreis Emsland, Germany
Kraaijenbergse Plassen, Cuijk, The Netherlands
Heeswijkse Kampen, Cuijk, The Netherlands
Over de Maas, West Maas en Waal, The Netherlands
Grensmaas, Province of Limburg, The Netherlands

Volume

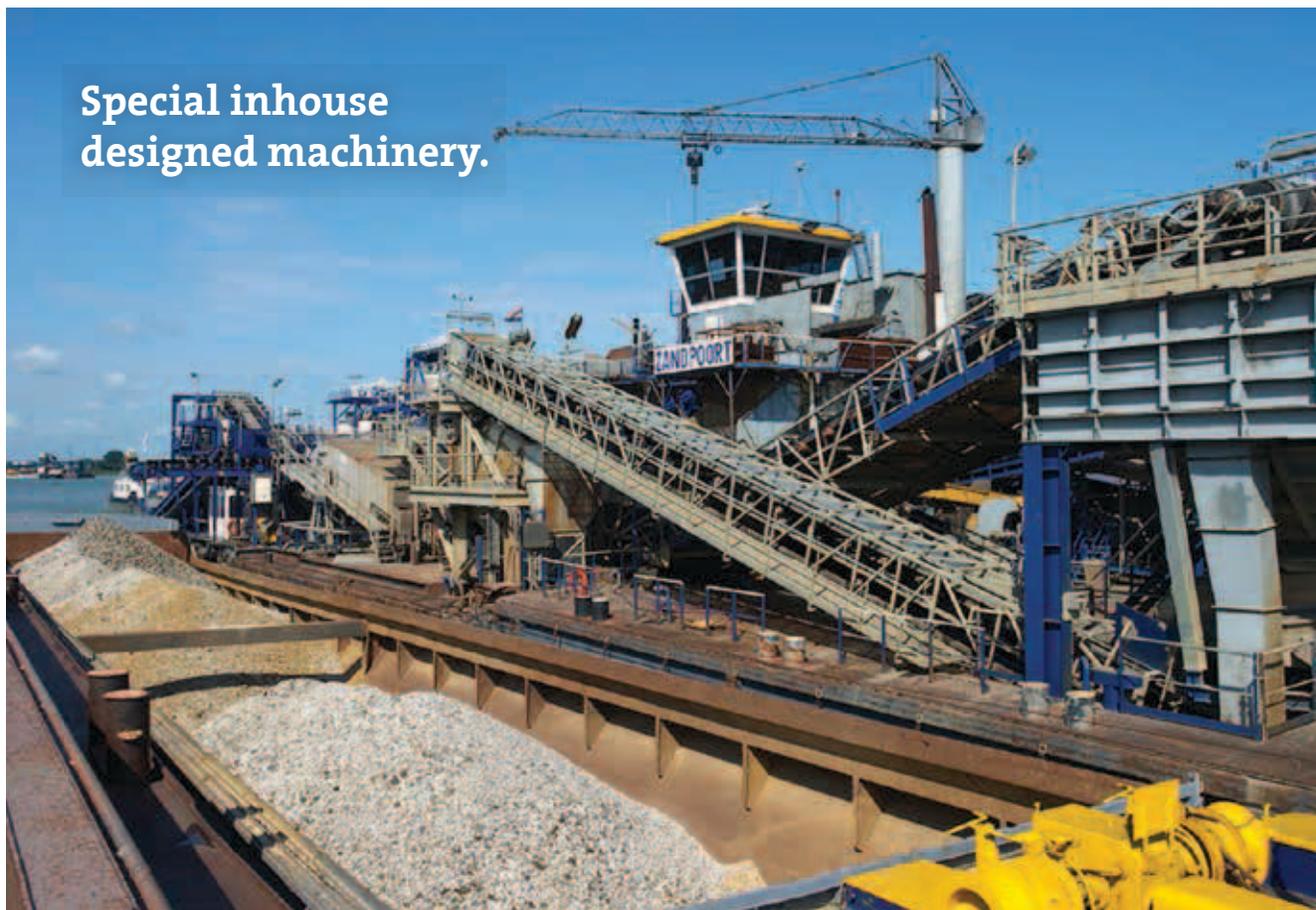
4 – 5,000,000 tonnes/year of industrial sand, gravel, special sands, filling sands and clay

Equipment

Inhouse designed and dedicated machinery and equipment for upgrading natural resources into high-quality construction materials, such as suction dredgers and floating production equipment

Social/economical value

Supplying the Dutch and German construction and concrete industry



New living environments,
waterside homes, nature
and recreation.



Resort Marina Oolderhuske is also called 'The pearl of the Maasplassen'. Royal Smals created this unique area in beautiful surroundings. It is perfectly situated in the heart of 3,000 hectares of large artificially created lakes nearby Roermond, in the South of the Netherlands. The marina is the perfect stay for both short and long vacations exploring the rivers and canals.

This beautiful resort is a wonderful holiday destination and houses a luxury marina, floating houses, also called 'Marina's' and villa's. It also has a harbour, a 5 star camping site, tennis courts, a golf driving range and, of course, a good restaurant. The area is situated conveniently within 10 kilometers of the German and Belgian borders making it an attractive destination for vacations.

This resort along the river Meuse was developed and built by Royal Smals. The area was literally 'born out of gravel'. Whilst the area was dredged for gravel to serve the building industry, the park was developed and built on the initiative and responsibility of Royal Smals. In creating this resort, Royal Smals showed its vision in realising a totally new landscape offering an abundance of features for consumers.

Royal Smals

Where

Roermond, along the River Meuse, The Netherlands

Facilities

80 Floating houses

200 Villa's

Marina for 300 yachts

Camping site

Driving range

Tennis courts

Restaurant

Remarkable

The resort is a paragon for landscape development

Uniquely situated and extremely well equipped

The 'Marina's' move with the river tide

Integrated vision, area development and extraction of raw construction materials



Re-use of all dredged materials for new land.



Over 40 years,
one of the most
prestigious operations
in The Netherlands.



This is absolutely the most respected sustainable case of Royal Smals. In 45 years, the 'Kraaijenbergse Plassen' is one of the best integrated rural area developments ever to be undertaken in The Netherlands. It is one of the largest extractions of raw materials and earth removal operations connected to the inland river system network. What used to be an area of meadows and cows is now used for homes, recreation and nature.

Together with the local council, residents and other stakeholders, we developed a plan for a total area of 1,200 hectares. This beautiful residential area where houses can be reached by car and boat has been realised. We created beaches, mooring sites, landmarks and nature areas. The total water/shore line created has a length in excess of 25 kilometers. The development gives special attention to the natural habitat of the badger. With the extraction of raw materials in combination with area development, a fund was set up for ongoing maintenance. The fund is nowadays managed by the local council. In this case we have shown that it is possible to deal with many environmental aspects, interested communities and the government. This is a great example of how we are taking responsibility for a better future.

Royal Smals

Where
Kraaijenbergse Plassen, The Netherlands

Social/economical value
1,200 hectares of which 500 hectares of water
and 25 kilometers of shoreline created

New living environment, recreational and nature areas

Development of housing, creation of new watersides,
shores, beaches, mooring places, wetlands, islands,
bird habitat and resort sites

Production of 120,000,000 tonnes of industrial sand
to serve the construction industry

Environmental impact evaluated: far better than expected



New recreation
and nature.



**Together with you,
we are very pleased
to be able to take
responsibility for a
safe and comfortable
living environment.**



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