

THE BOSKER RANGE OF TRASH RAKES



3000Kg machine under manual operation at a hydro electric power station



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Brackett Green's Bosker range of Trash Rakes provide efficient and high-volume debris removal for all sizes and types of water and waste water intakes. Successful installations range from those at Shanghai's main sewage treatment works in China, to major hydropower stations such as Pitlochry in Scotland and Tarraleah in Tasmania. Worldwide, Brackett Green has installed over 400 Bosker raking machines.



Most medium to large intakes utilise the Bosker Overhead Trash Rake, whilst smaller, intakes that might have previously relied upon manual clearing methods, are well suited to the Bosker Bandit, a compact, yet powerful machine with an extendable, rotating arm. Both Trash Rakes and Bandits may be fitted with rake heads manufactured from a variety of materials selected according to the working environment and each machine offers numerous operating and arrangement options.

All manner of domestic waste and debris can be removed by Bosker equipment. In urban areas this might include plastic sacking, chemical barrels or tyres, whilst in more rural locations, machines often deal with large quantities of riverweeds and floating vegetation. Neither the Bosker Trash Rake or Bandit permanently submerges any moving machinery parts, nor does any serious modifications have to be made to existing civil works to allow these machines to be retrofitted to existing sites. ■

Sunset over an unmanned fully automatic land drainage pumping station.

BOSKER TRASH RAKE

Brackett Green has installed Bosker Trash Rakes at a wide variety of water intakes, where a key objective has been the provision of simple and effective coarse screening. Often acting as the very first screening stage, Trash Rakes offer a vital means of removing large volume, awkward debris such as driftwood and tree trunks from the water protecting critical power generation equipment or down stream pumps.

At very large plants, where debris is extremely heavy multiple bar screens are often employed each with its own, individual raking head assigned to

each screen. At slightly smaller plants, a travelling Trash Rake and trolley assembly can service a multiple screen installation. With either design, the overhead positioning of the Rake's trolley creates the advantage of a clean, and entirely accessible screen deck. Travelling Trash Rakes feature a monorail track, upon which the Rake travels at speeds of up to 20 metres per minute. Pre-programmed stops are arranged so the Trash Rake descends down the bar screen and into the water, where the Rake head's tines open, grab, and then remove the captured debris. ▶



Having filled the gripper with debris, the Trash Rake begins an upward ascent, and cleanly deposits the debris either directly at deck-level, or more commonly, with the advantage of eliminating the need for conveyors, into a strategically positioned skip or container. The Rake then continues its journey to its next predetermined stop, where the cycle is repeated.

All motors for the Bosker range of Trash Rakes are concealed and protected within the Rake's trolley assembly. A hoist motor, which lowers and lifts the Rake's gripper, drives through a gearbox to the main hoist shaft. Cable drums are fitted to this shaft, on which the main lift cables are wound. The Trash Rake's powerpack is a self-contained unit, where core components such as the motor, pump, solenoid valve, filters and pressure relief valve can all be easily accessed for maintenance. All control cabling is

routed through the supporting framework. Hydraulic hose drums which contain the hoses to the grab's close and open rams, are driven by the main hoist motor and feature a spring tension system to ensure a constant and equal cable tension is always maintained. The trolley also contains the travelling motor and hydraulic powerpack.

Depending upon the application, grippers can be produced in a variety of different materials. These vary from stainless steel, which with its non-corrosive properties is well suited to seawater and sewage, to hot-dipped galvanised steel for fresh water environments. A non-spark, aluminium

bronze design is a further alternative for sewage plants where non-sparking materials are mandatory. The table below provides a brief guide to gripper handling criteria.

The supporting framework for the Bosker Trash Rake is constructed from long lasting hot-dipped tubular galvanised steel sections. This structure is tailored to each, individual installation and is always designed to optimise available space, whilst also being aesthetically sympathetic when retrofitted to existing sites, and in order to reduce alterations to civil works the Trash Rake's framework is mounted to existing floors and walls. ■

	Min	Max
Bar Screen Spacing	12mm	300mm
Depth of Bar Screen	1.5 metres	35 metres
Angle of Bar Screen	0°	40°



A Bosker overhead gantry machine operating fully automatically under very heavy debris conditions.



The gantry and grab can be designed to suit any configuration of layout.



For river intakes the grab is galvanised, it can however be constructed in bronze or stainless steel.



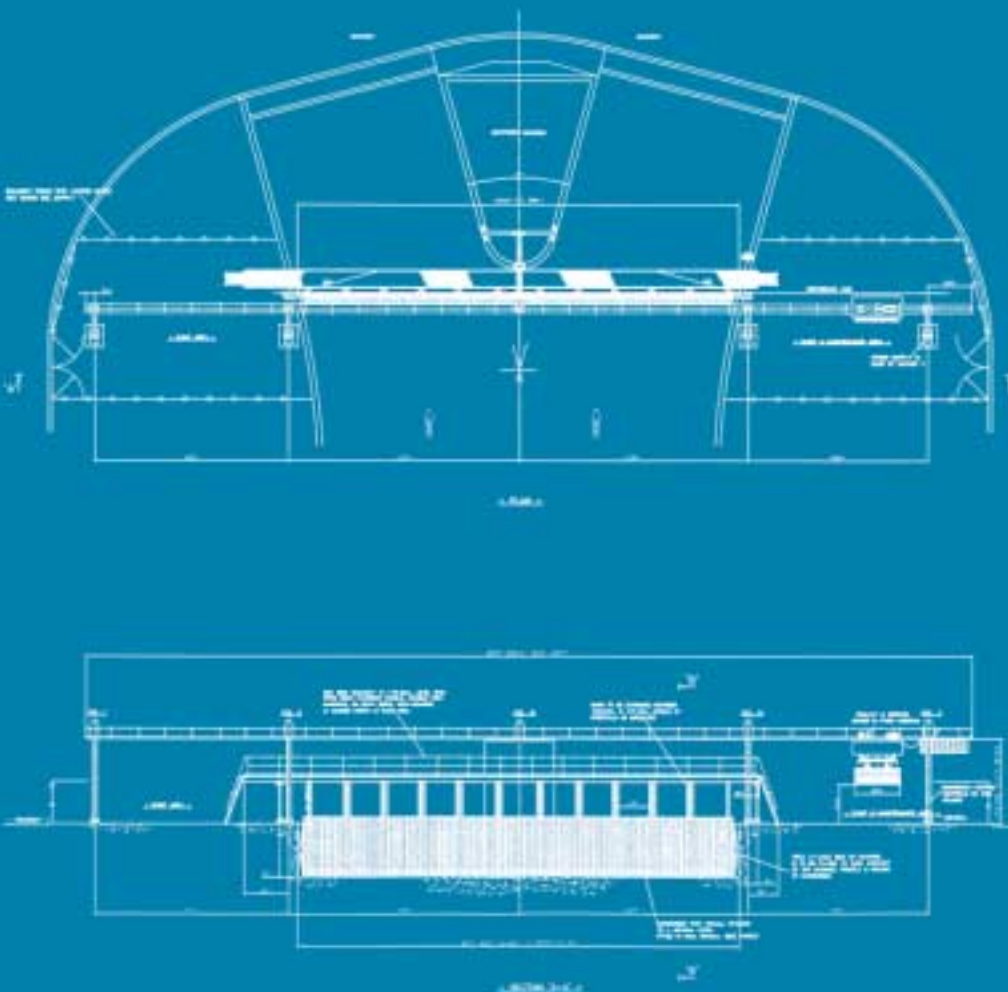
CONCEPT TO REALISATION

Brackett Green have installed Bosker Raking Machines all over the World. Over 400 separate installations are presently operating. Reliability is the basis of all Brackett Greens products, this attribute is essential when installations on Hydro Electric plants are often hundreds of kilometres from operating staff, machines in Tasmania operate for months on end, fully automatically controlled and reporting every function by telemetry systems. Bosker Raking Machines operate in the tropics in Thailand and Malaysia, in +35°C temperatures and in the mountains of Scotland where -20°C is not uncommon.



Lea Marston purification lakes near Birmingham are operated by the Environment Agency. Brackett Green were selected to design, manufacture and install a very complex overhead gantry raking machine with a 3000kg lifting capacity for installation in front of the roadway where the channels diverge.

The drawing below indicates the designs adopted, installation will be complete in 2001.



Brackett Green has offices and manufacturing facilities in the UK, Houston, Milwaukee in USA, Beijing & Shenyang in China, Chennai in India as well as Sydney Australia. Brackett Greens engineers can inspect, advise and recommend the correct machine for any site. Call Brackett Green for the best solution for your site. ■



BOSKER BANDIT

Bandit Raking Machines are the ideal solution for small, often remote intakes such as culverts and land drainage systems. As with Overhead Bosker Trash Rakes, Bandits can be easily retrofitted into existing intakes, and can be operated either by a pre-programmed cycle, manual activation or level differential. The latter option is particularly useful for dealing with the unexpected volumes of debris often caused by severe seasonal conditions.

Bandit Rakes can also be just as successfully applied to alternative sites including river intakes and sewage treatment plants. In such installations, the Rake's grab can be manufactured in different materials according to the nature of the influent. These might include hot-dipped galvanised mild steel, stainless steel or a non-sparking aluminium bronze for sewage applications. Stainless steel, with special coatings to enhance its non-corrosive properties is commonly used for saltwater environments in the Middle East.

Bandit Rakes have the ability to execute turns of up to 270°. This dexterity in movement, combined with an extendable raking arm that is operated by three hydraulic rams, ensures even the most awkward intake can be effectively cleared of rubbish. Like the Bosker Overhead Trash Rake, the tines of the Bandit's grab fully penetrate the intake's bar screens, resulting in even embedded and trapped debris being cleanly removed.

Bandit Rakes deposit rubbish and waste directly into refuse containers that can be immediately transported to recycling or treatment facilities. This feature eliminates the need for additional labour to deal with debris dumped at deck level. ■

Bosker Bandit Rakes are supplied by Brackett Green as a standard 250kg SWL design. A control panel, housed within a GRP or stainless steel kiosk, is included within the package. All rakes



Before a Bandit Raking Machine was installed this bar screen had to be regularly cleaned by hand. After the machine was installed a fully automatic rake keeps the screen clean for 365 days a year every year.



Safe Working Load	250kg
Grab Width Minimum	1.2m
Grab Width Maximum	4m
Maximum Depth of Screen	5m
Minimum Bar Spacing	12mm
Maximum Bar Spacing	200mm
Stroke Length	4.5m (approx)
Dump Height	1.5m (approx)
Dimensions	1 x 2 x 3m (length x width x height)
Hydraulic Motor Size	2.2kW
Hydraulic Working Pressure	200 bar

PLANNING PRODUCTION MANUFACTURE

Services

Brackett Green can provide Service Engineers to install, commission and maintain all of the machines supplied from the Brackett Group. Brackett Green is responsible, reliable and professional in all aspects of the service provided. Our engineers are truly international and readily available, we can visit sites anywhere in the world to advise Maintenance Managers on all aspects or ongoing service requirements, we can if required be available in force during planned shut downs. Brackett Green are able to provide long term agreements covering Spares & Service, these agreements are utilised by Power Plants, Refineries, Water Authorities and many Industrial users.

Please contact us for details, we can relieve you of costly maintenance overheads by providing trained personnel where and when you need them.

Training

As a supplier of Engineered Capital Equipment it is natural for us to offer our end users on-site or in-house training courses. We have skilled instructors available and can train your staff in all aspects of equipment use including detailed instructions for replacement of parts, adjustment and monitoring. These courses can be for individuals on a one to one basis or for groups of up to eight either on site or in our UK or American HQ's. Contact our Spares and Service Managers for details of the courses available.

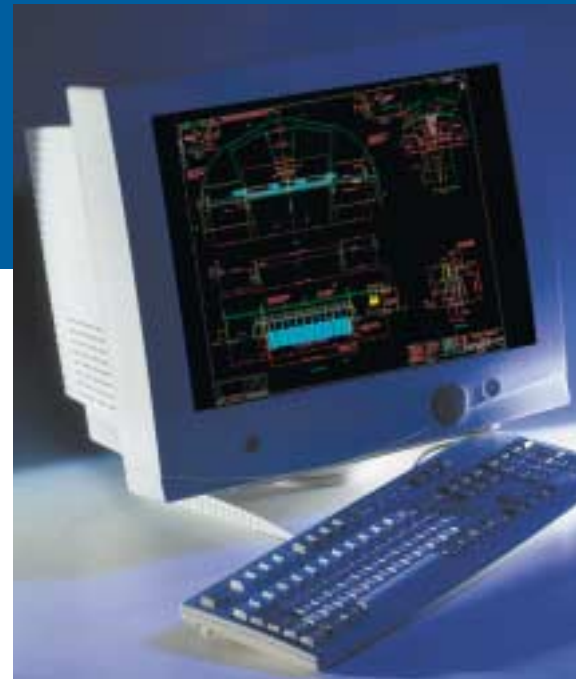
Spares

Brackett Green retain comprehensive records of all machines built, these records can be accessed quickly via the computerised spare parts database held in our Colchester UK, or Houston USA offices. Spares supplied are genuine, guaranteed and backed by our detailed knowledge of all the subsequent modifications or upgrades that may have occurred since the original machines were supplied. Our Spares Managers are available for advice at any time. We can recommend suitable spare parts for holding on site as strategic spares, and of course your long term needs for planned maintenance shut downs.

We provide spares ex-works, delivered to site for installed, you can refer to our Service section for further information on our site services.

Engineering

Brackett Green uses state of the art engineering programmes in it's manufacturing facilities with Pro-Engineer being the basis for the core design & draughting activities, this system in conjunction with our finite analysis package ensures sound engineering is always applied to each project. Brackett Greens modern and spacious facilities are always open for your project. ■

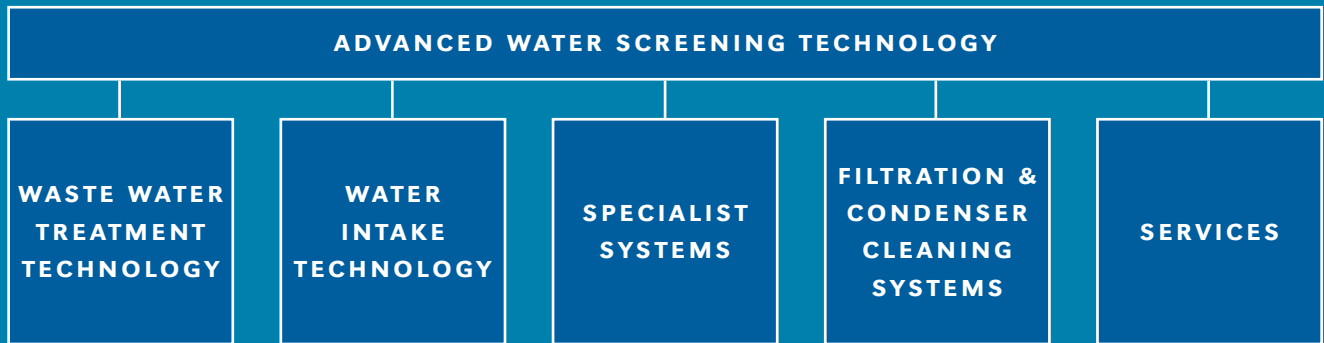


State of the art engineering programmes.



Brackett Green engineers can visit sites anywhere in the world.





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