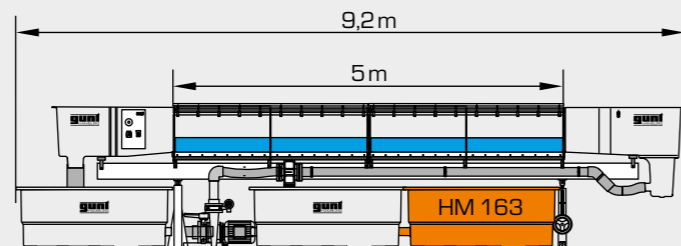


HM 162 / HM 163 Experimental flume 309 x 450mm / 409 x 500mm

HM 162 and HM 163 – used worldwide by satisfied customers

The length of the experimental section is between 5m and – with further HM 16x.10 extension elements – a maximum of 12,5m. The closed water circuit contains two water tanks and a powerful pump. Depending on the desired length, additional water tanks HM 16x.20 are required (see drawings).



Experimental flume, length of the experimental section 5m
HM 162 / HM 163

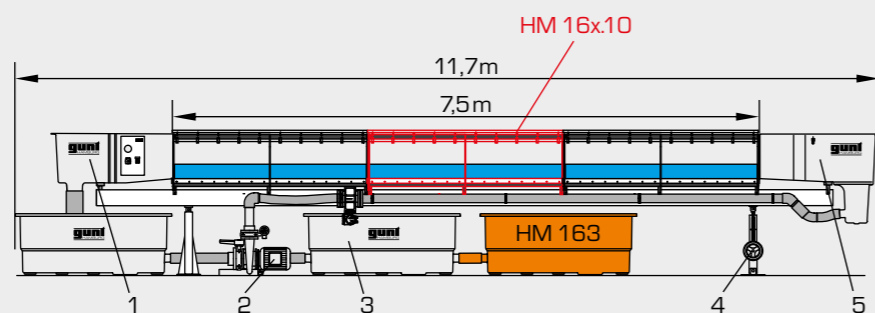


HM 162 Switch cabinet with touchscreen

Used together with the comprehensive selection of additional accessories a wide range of topics within the field of open-channel flow can be demonstrated and investigated. These accessories include control structures, discharge measurement, losses due to changes in cross-section, waves and sediment transport.

The experimental flumes are operated via a touch screen with intuitive user interface. By means of an integrated router, the flumes can alternatively be operated and controlled via an end device. The user interface can also be displayed on additional end devices (screen mirroring).

- 1 outlet element with switch cabinet,
- 2 pump,
- 3 water tank,
- 4 height-adjustable support incl. flume inclination adjustment,
- 5 inlet element

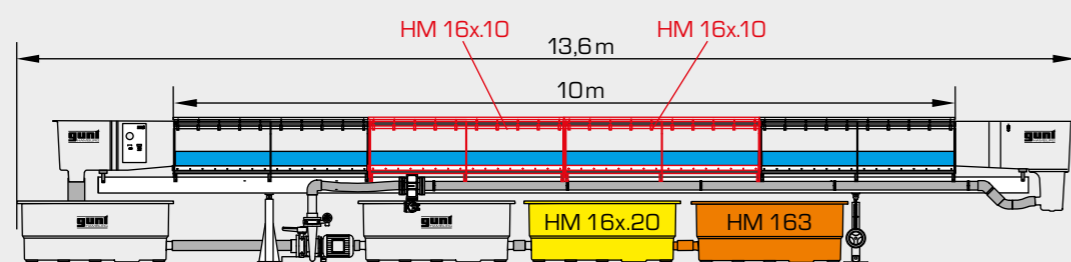


Experimental flume, length of the experimental section 7,5m
HM 162 + 1x HM 162.10

HM 163 + 1x HM 163.10



HM 163 with an experimental section of 7,5m

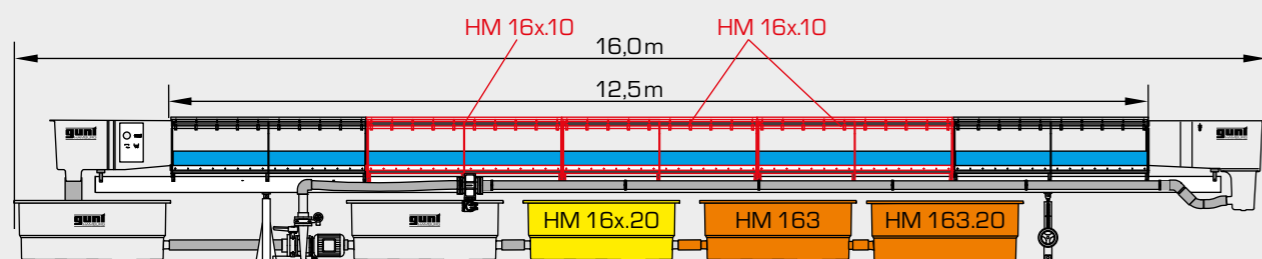


Experimental flume, length of the experimental section 10m
HM 162 + 2x HM 162.10 + 1x HM 162.20

HM 163 + 2x HM 163.10 + 1x HM 163.20



HM 162 with an experimental section of 10m



Experimental flume, length of the experimental section 12,5m
HM 162 + 3x HM 162.10 + 1x HM 162.20

HM 163 + 3x HM 163.10 + 2x HM 163.20

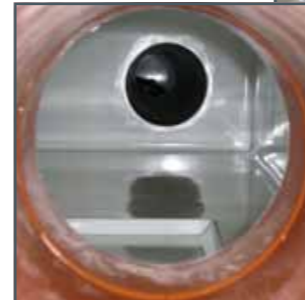


HM 163 with an experimental section of 12,5m

HM 162/HM 163 Experimental flume A few impressions



Demonstrations for the customer



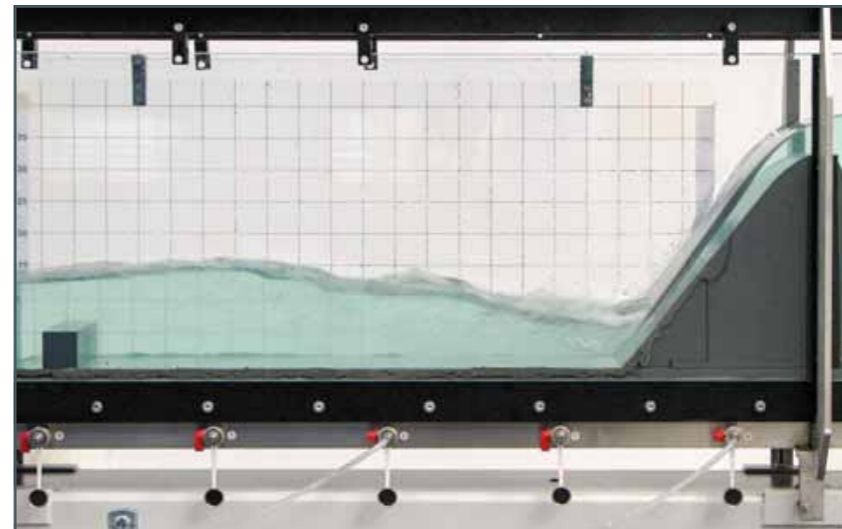
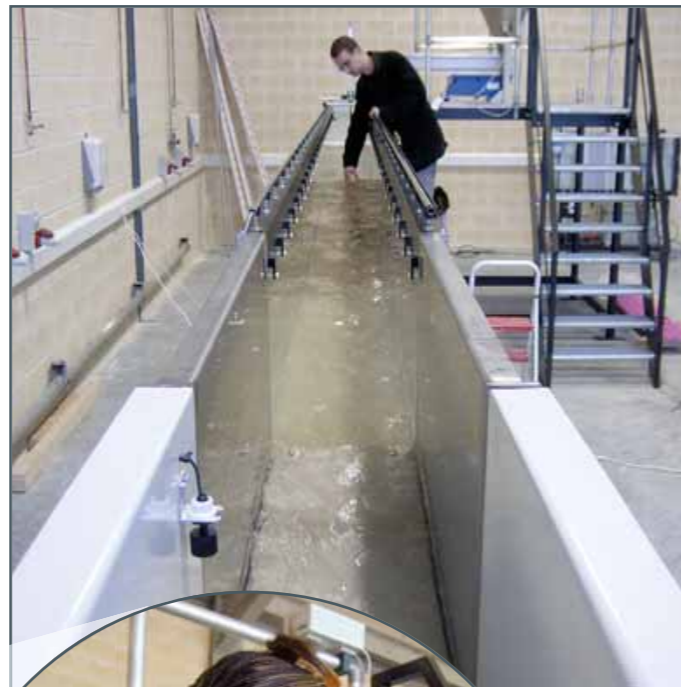
Glimpse into
the water tank



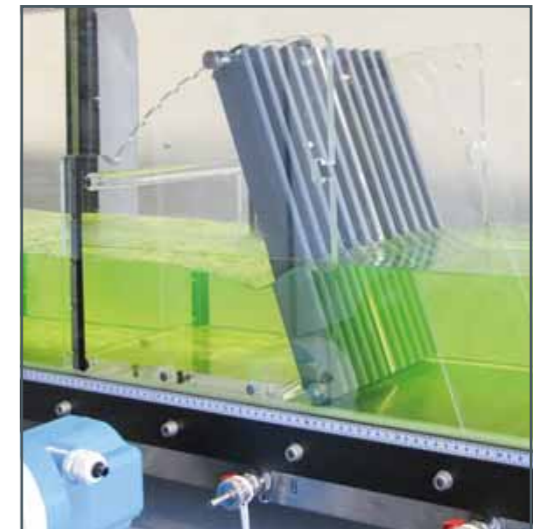
Siphon weir
in action



Culvert



Ogee-crested weir with a sill



Rake



Operating the sluice gate



Aerated plate weir (side view)



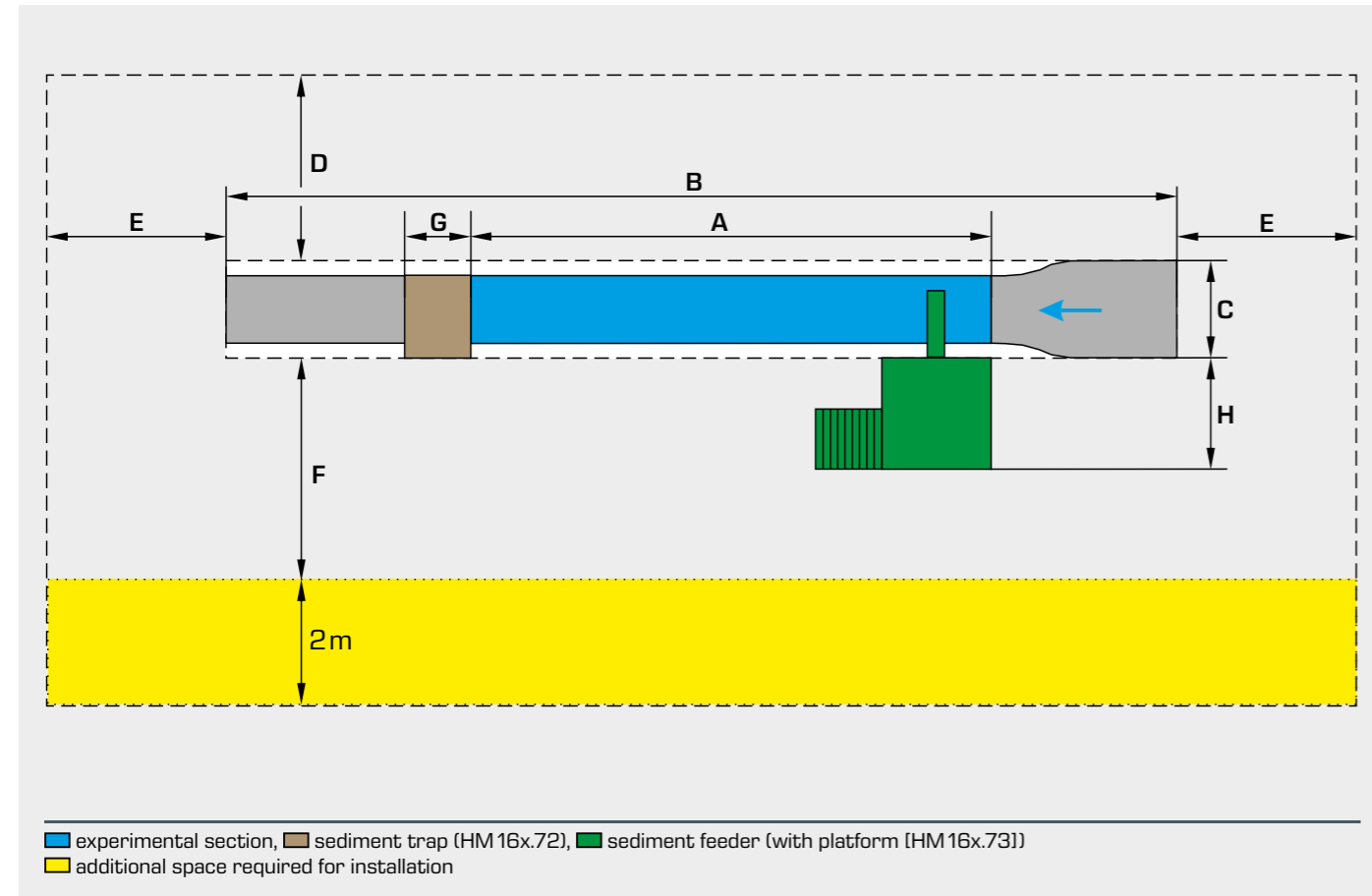
Radial gate

GUNT experimental flumes Laboratory design

The following table lists the space requirements of all GUNT experimental flumes including the water tank.

GUNT will gladly undertake the precise laboratory planning for you to set up the experimental flumes.

A lifting device is recommended when placing larger models in the experimental sections of HM 161.



	A	B (excl. G)	C	C (incl. G)	D	E	F	G	H	Height B (excl. H)	Height B (incl. H)	Required room height
HM 160	2,5m 5,0m	4,3m 6,9m	0,7m		1,0m	1,5m (>1 m)	2,0m			1,35m	1,80m	2,3m
HM 162/ HM 163	5,0m 7,5m 10,0m 12,5m	9,2m 11,7m 13,6m 16,0m	1,0m 1,0m 2,2m 2,2m	2,2m 2,2m 2,2m 2,2m	1,0m	1,5m (>1 m)	2,5m	1,0m	1,7m	2,20m	2,90m	with sediment feeder: min. 4,5m
HM 161	16,0m	22,0m	4,0m	4,0m	2,0m	1,5m (>1 m)	1,0m	1,0m	in C incl.	2,70m	3,70m	with sediment feeder: min. 5m

Installation requirements

This section provides some tips for planning a laboratory in which an experimental flume is going to be set up:

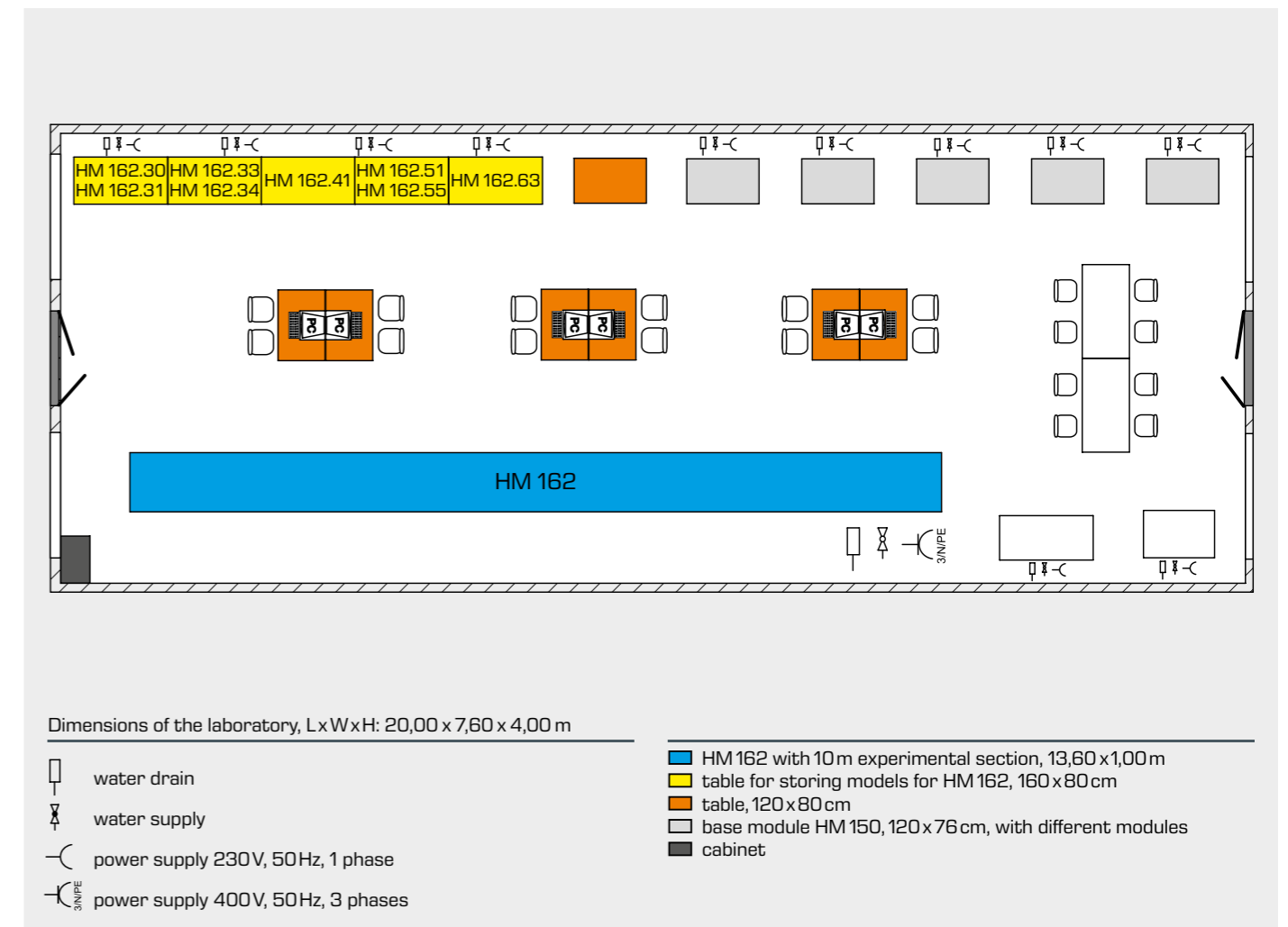
- the laboratory should be on the ground floor
- the floor must have sufficient load capacity
- the floor and the skirting area of the walls should be water-resistant
- the transportation routes to and within the laboratory must be spacious
- the water supply and drains must be big enough for larger amounts of water
- the two larger experimental flumes HM 162, HM 163, and HM 161 require three-phase alternating current

An example of laboratory planning

The drawing below shows the planning for a laboratory that contains the experimental flume HM 162 (10m long experimental section), a few other GUNT units on fluid mechanics and workstations for the students.

In this case the models for HM 162 are stored on tables.

A small cabinet in the corner contains tools and can be used to store instruction manuals.

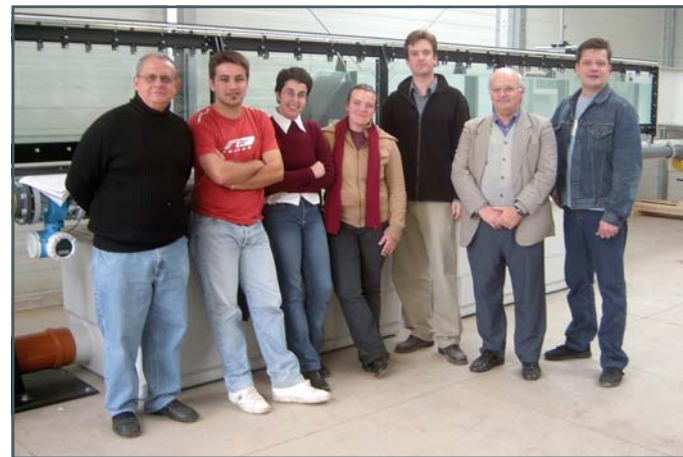


GUNT experimental flumes are being used all around the world

Below is a selection of customers who are using a GUNT experimental flume. There is at least one GUNT experimental flume in each of these countries, often there are several flumes in use at other colleges and universities within the country.



...in Malaysia with HM 162



...in Spain with HM 162



...in Spain with HM 160



...in Bangladesh with HM 161



...in Indonesia with HM 162



Africa

- École Nationale Supérieure d'Hydraulique (ENSH; HM 162), Algeria
- Instituto Superior Politécnico de Tecnologias e Ciências (ISPTEC; HM 163), Angola
- TU Berlin Campus El Gouna (HM 162), Egypt
- University of Asmara (HM 160), Eritrea
- Haramaya University (HM 162), Ethiopia
- École Nationale d'Ingénieurs (HM 160), Mali
- Rivers State University of Science and Technology (HM 160), Nigeria

America

- Centro Universitário Luterano de Palmas (CEULP/ULBRA; HM 160), Brasil
- Concordia University (HM 162), Canada
- Universidad Central de Chile (HM 162), Chile
- UCR Universidad de Costa Rica (HM 162), Costa Rica
- Escuela Superior Politecnica del Litoral (ESPOL; HM 162), Ecuador
- Instituto Tecnológico Agropecuario No. 10 de Torreón (008.161BL), Mexico
- Universidad Peruana de Ciencias Aplicadas (HM 162), Peru
- Burlington County College (HM 160), USA
- Universidad Católica Andres Bello (UCAB) (HM 160), Venezuela

Asia

- Herat University (HM 162), Afghanistan
- Military Institute of Science & Technology (MIST; HM 161), Bangladesh
- Institute Technology Brunei (ITB; HM 162), Brunei
- City University of Hong Kong (HM 162), China
- Indian Institute of Technology of Roorkee (ITT) (HM 162), India
- Universitas Bandar Lampung (HM 162), Indonesia
- Qom University (HM 162), Iran
- University of Technology (HM 160), Iraq
- University Teknologi PETRONAS (HM 162), Malaysia
- Far Eastern University (HM 160), Philippines
- Taif University (HM 162), Saudi Arabia
- Institute of Technology University of Moratuwa (ITUM; HM 160), Sri Lanka
- Burapha University (HM 161), Thailand
- American University of Sharjah (HM 160), UAE

Flinders University (HM 160), Australia

Europe

- University of Cyprus (HM 162), Cyprus
- Aalto University (HM 161), Finland
- Centre de Formation Hydraulique d'EDF (HM 163), France
- Bundesanstalt für Wasserbau (HM 163), Germany
- Rezekne Higher Education Institution (HM 160), Latvia
- Warsaw Agricultural University (HM 162), Poland
- Politécnico de Viseu (HM 162), Portugal
- Moscow State Construction University (MGSU; HM 162), Russia
- Slovak University of Technology (STU; HM 163), Slovakia
- Universidad de la Laguna (ULL; HM 162), Spain
- Okan University (HM 160), Turkey
- University of Southampton (HM 161), UK

...and many more

Assembly of GUNT experimental flumes using the example of HM 162



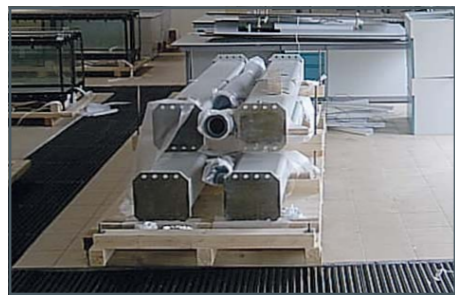
Inlet element, outlet element and flume supports



Elements of the experimental section



Water tank and piping



The carrier (bottom left) is assembled from separate elements (left) and placed on the flume supports using a forklift (right). The flume supports are bolted into the floor (centre).



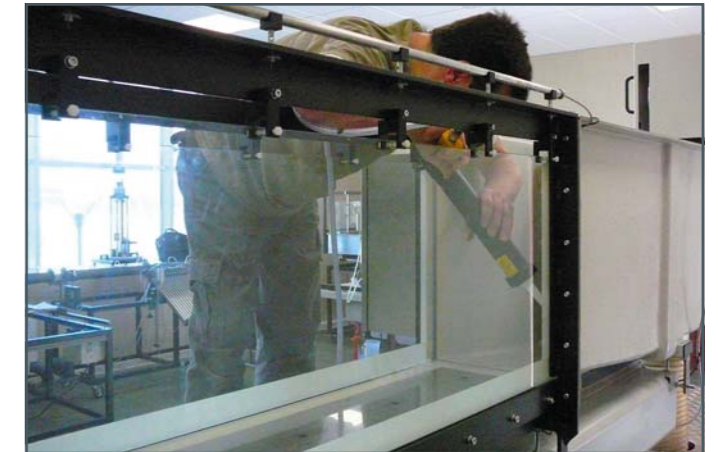
Jacking support for inclination adjustment



The experimental section element is placed on the carrier with a forklift, aligned and installed.



The inlet element is raised onto the carrier, aligned and connected to the experimental section.



Then the experimental flume is sealed.



Last but not least is work on the wiring (left). Then the water tank is aligned and connected to the pipeline system (right).



Once installation is complete the system is commissioned; this photo shows the process with the broad-crested weir.

GUNT experimental flumes are set up and commissioned by experienced staff on site. This ensures that you can focus on your experiments right from the word go.



This fully assembled experimental flume is located at the Universiti Teknologi PETRONAS (UTP) in Ipoh, Malaysia.