



bmb+f - Förderschwerpunkt

Astroteilchenphysik

Großgeräte der physikalischen
Grundlagenforschung

Mounting of the muon veto

GERDA Collaboration Meeting

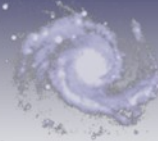
LNGS

November, 10th-13th 2008

Markus Knapp



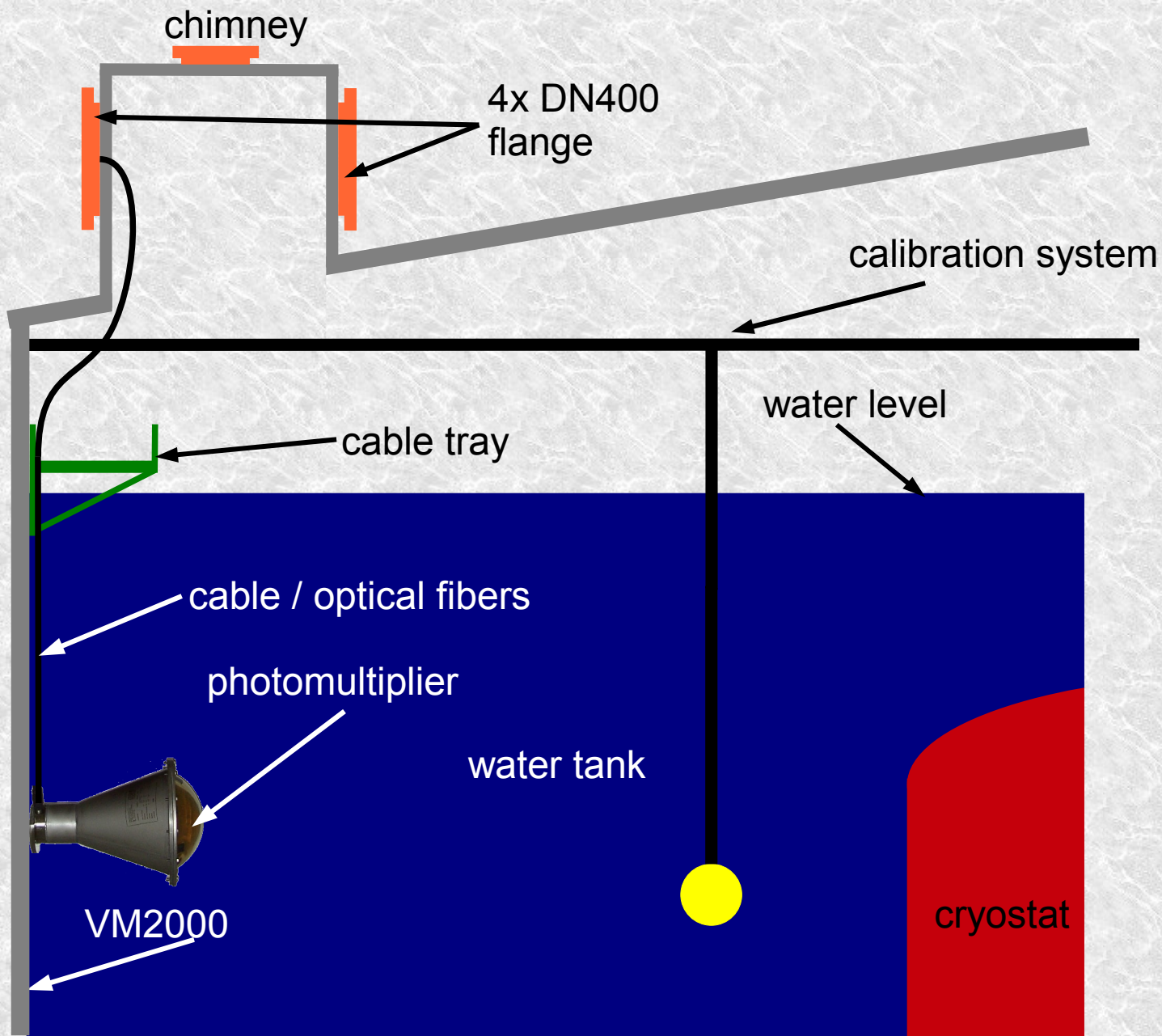
Kepler Center for Astro and Particle Physics



Cherenkov veto

Overview

Overview: Cherenkov veto



Equipment

2 mobile hoisting platforms



Mobile hoisting platform



Mobile hoisting platform

helmet



safty harness



safty shoes



Mobile hoisting platform – Drivers license



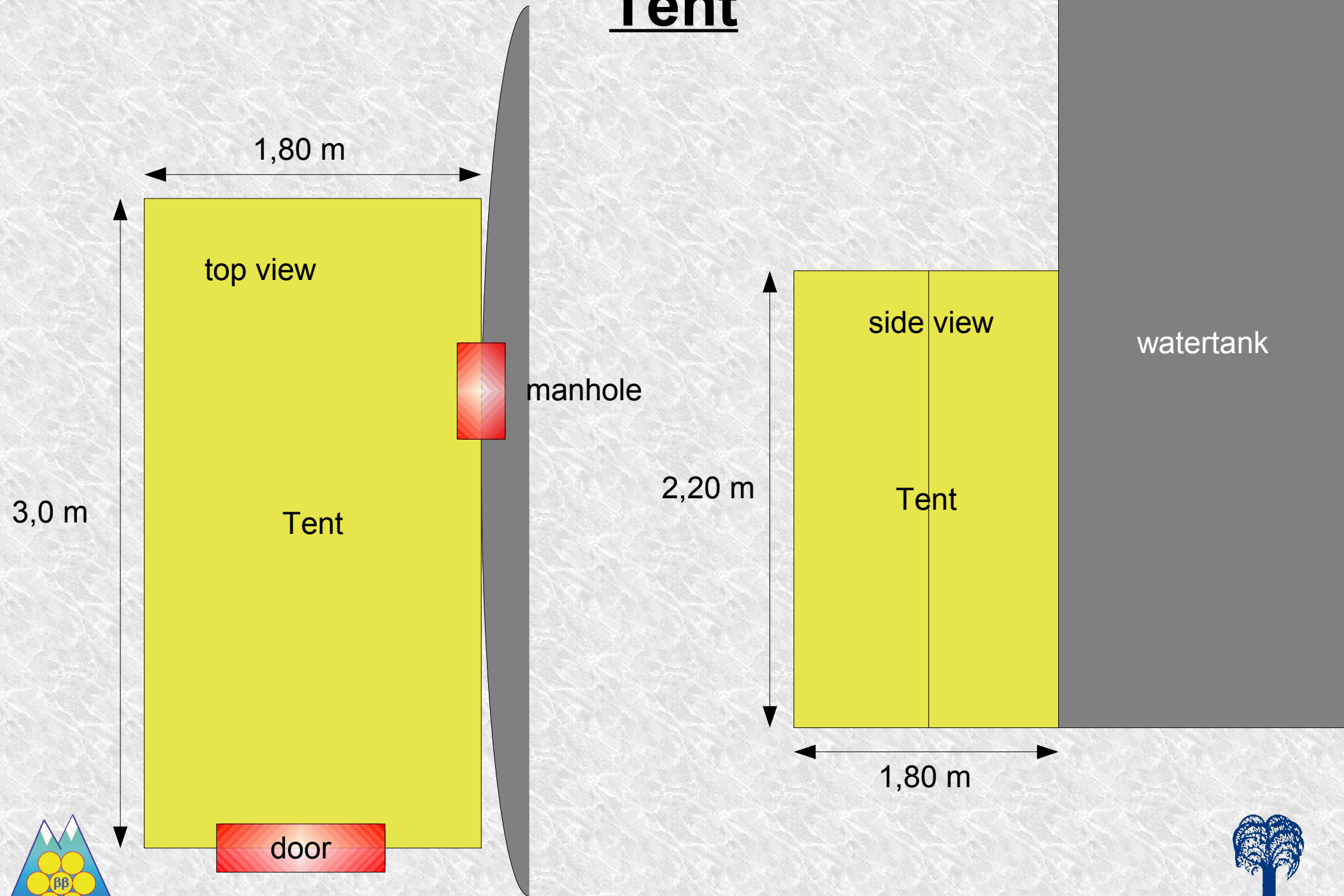
www.ipaf.org



GERDA Meeting, LNGS, November, 10th-13th 2008 - Markus Knapp, University of Tübingen

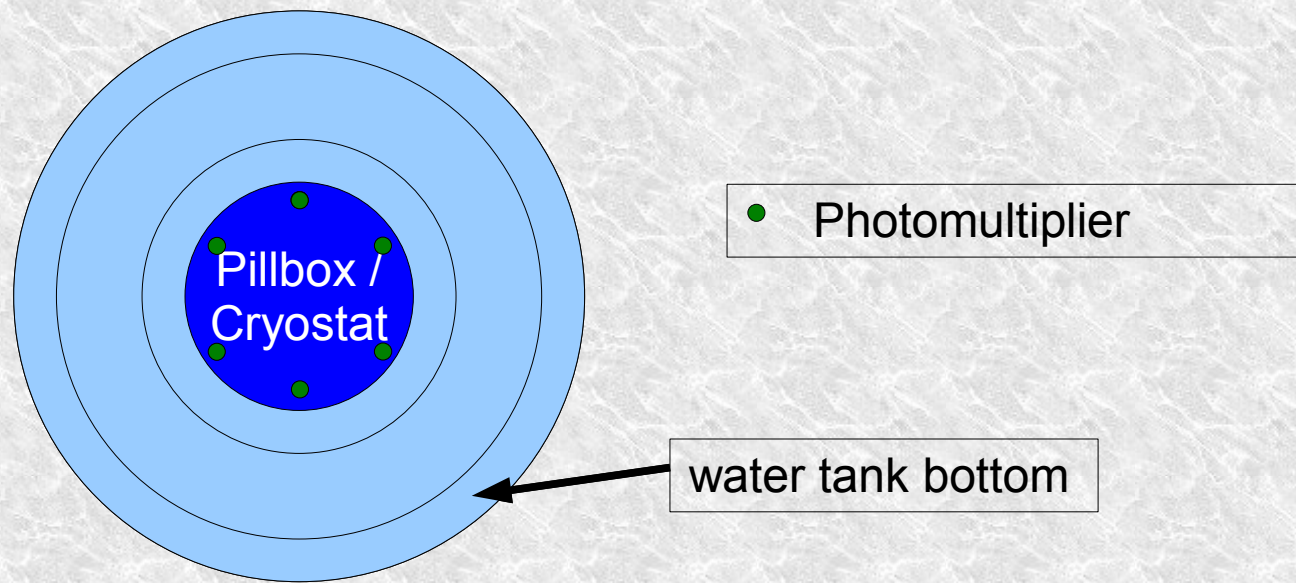


Tent



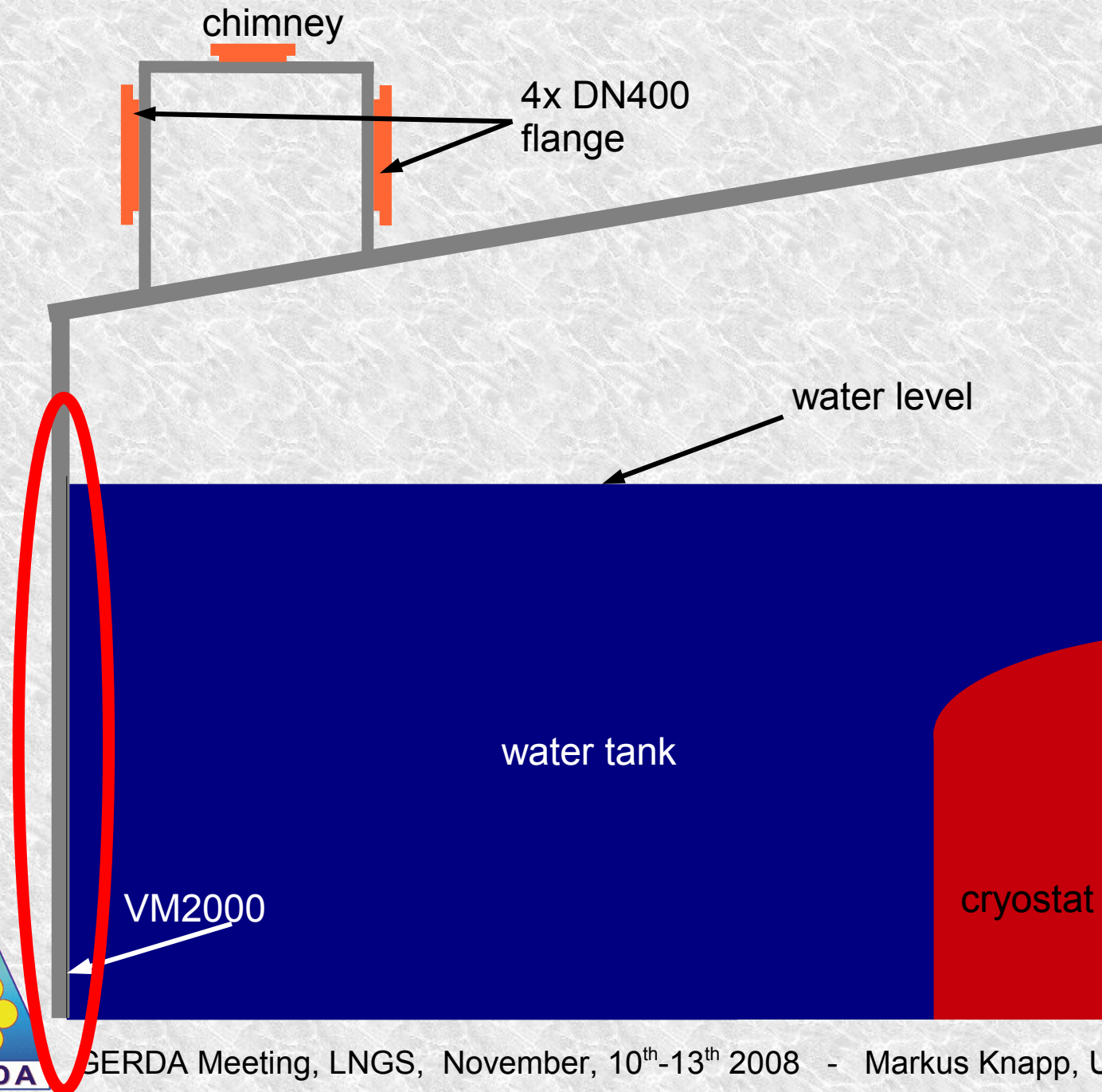
VM 2000

VM2000 for cryostat and pillbox



- We start from a **clean and tested watertank** and an **insulated cryostat**.
- We are ready to **provide the platforms and trained personnel** to wrap the cryostat in VM2000
- Then we will cover the inside of the **pillbox** with VM2000 and mount the six pillbox PMTs
- Their cables will be put inside the pillbox, so that they **do not interfere** with other installation procedures.

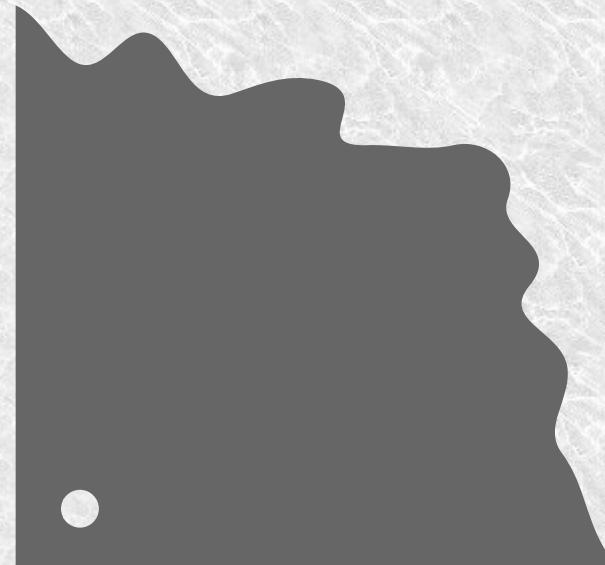
Mounting of VM2000



Mounting of VM2000 – Step 1

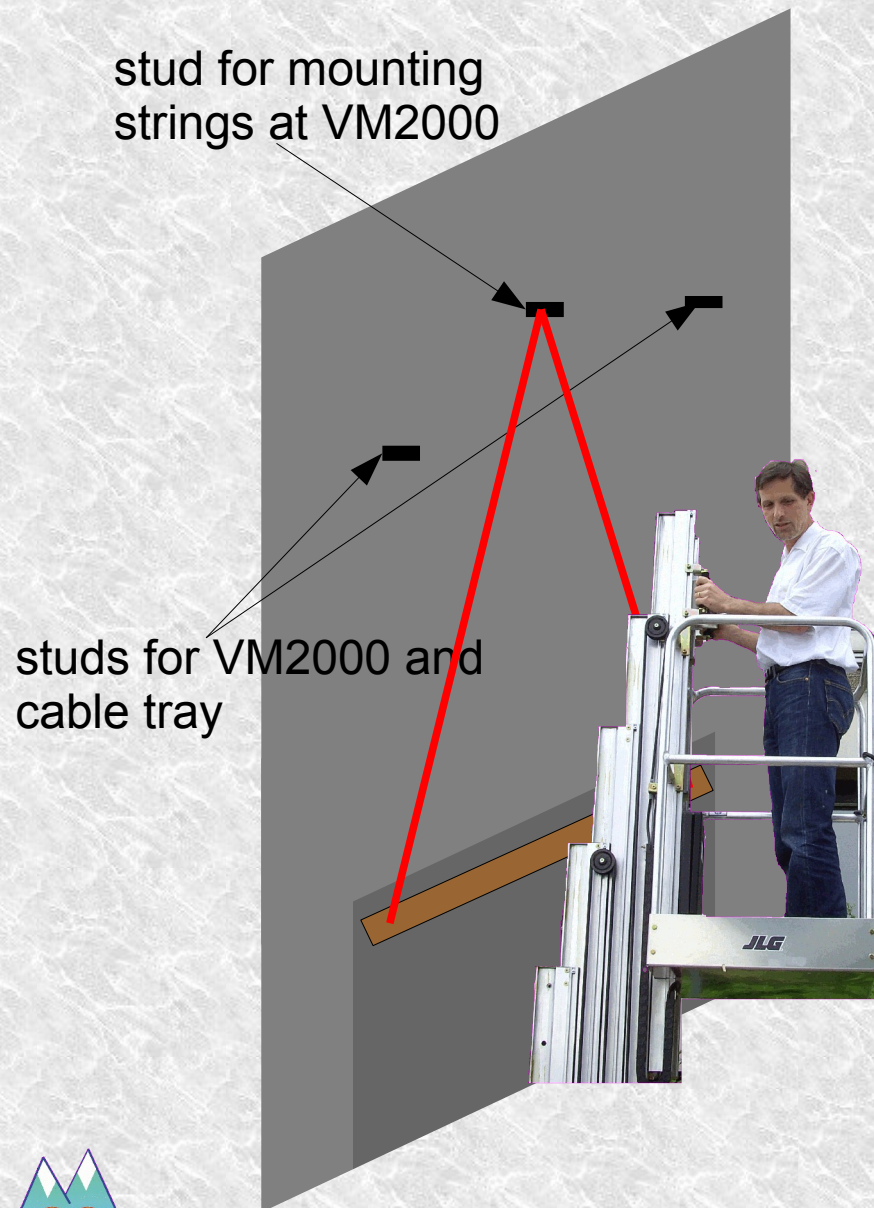
Cut a web of VM2000

800x120 cm² VM2000



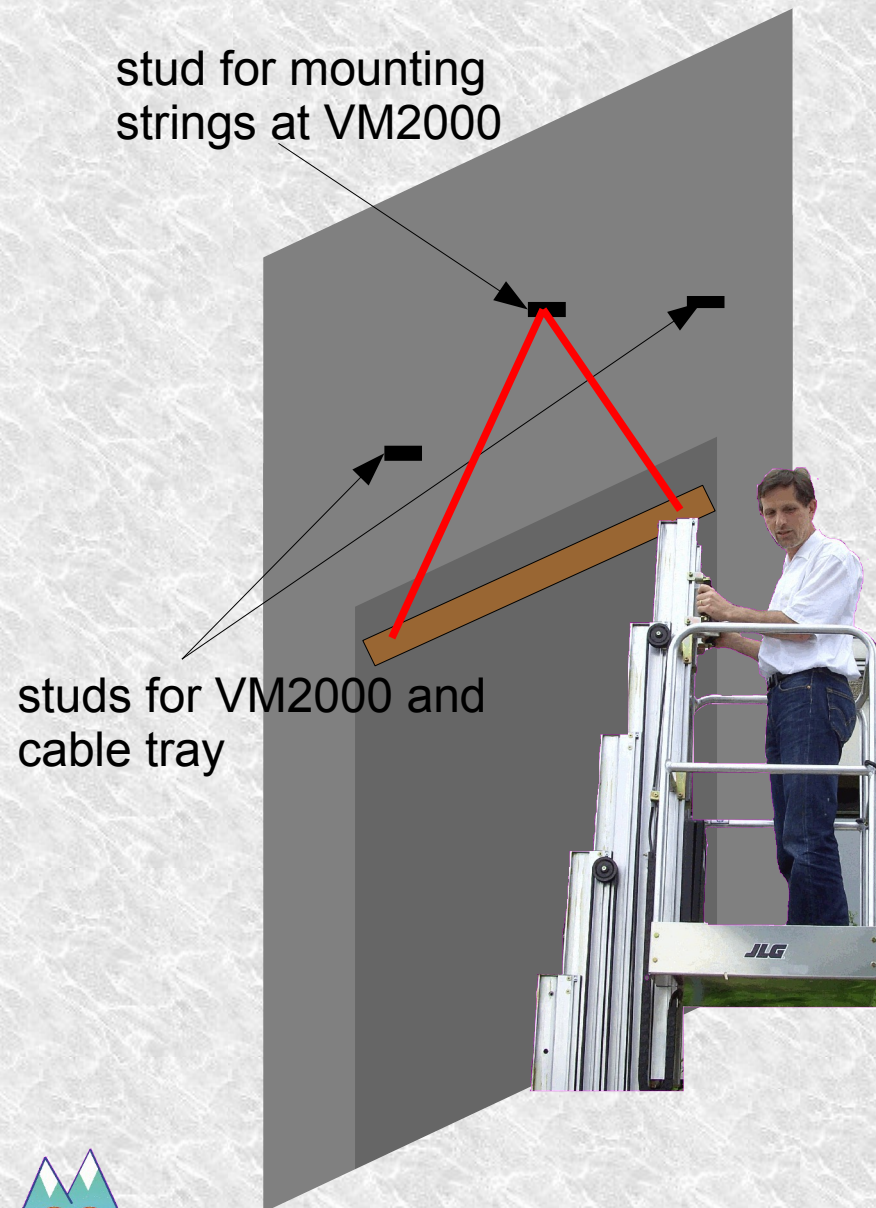
Cut two holes in the upper corners
(ears with enforcement)

Mounting of VM2000 – Step 3



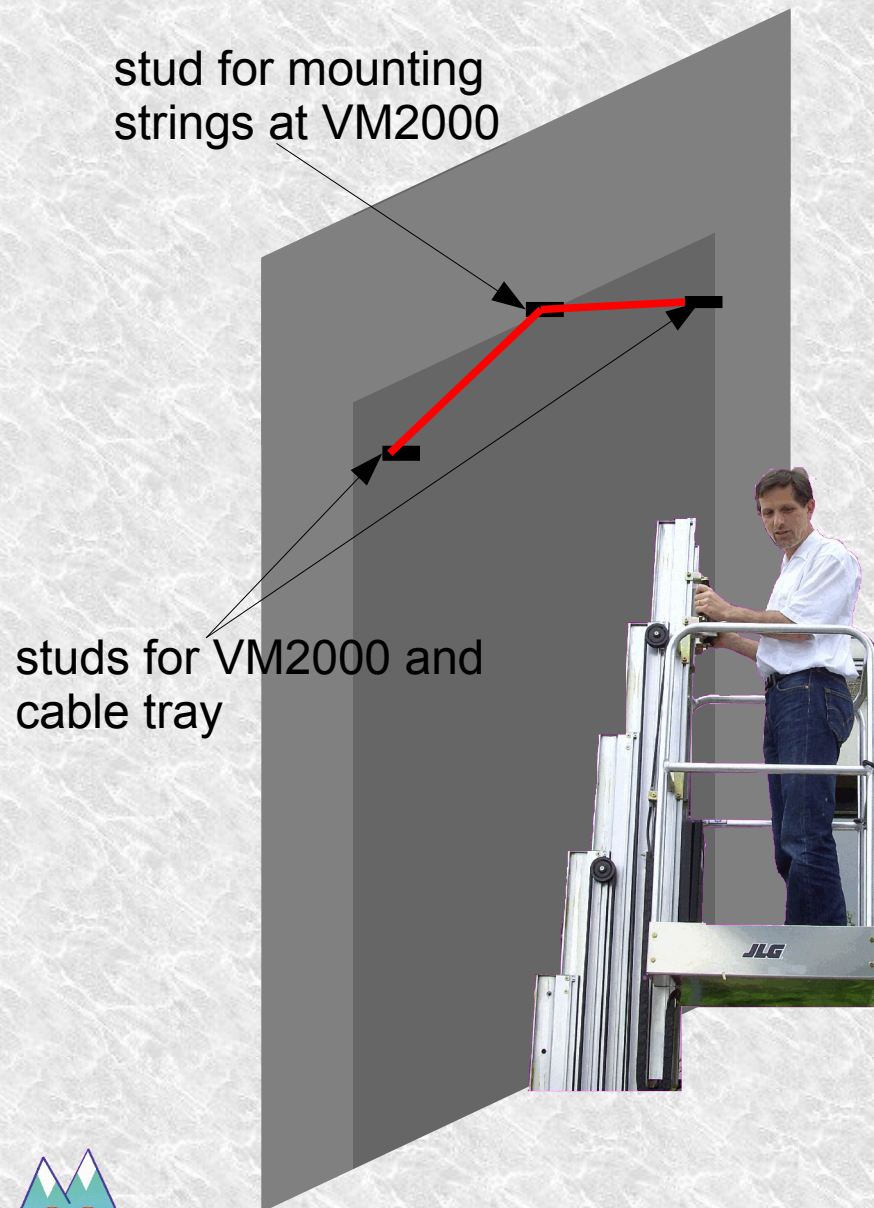
- One assembler will **rise** on height with the hoisting platform
-

Mounting of VM2000 – Step 3



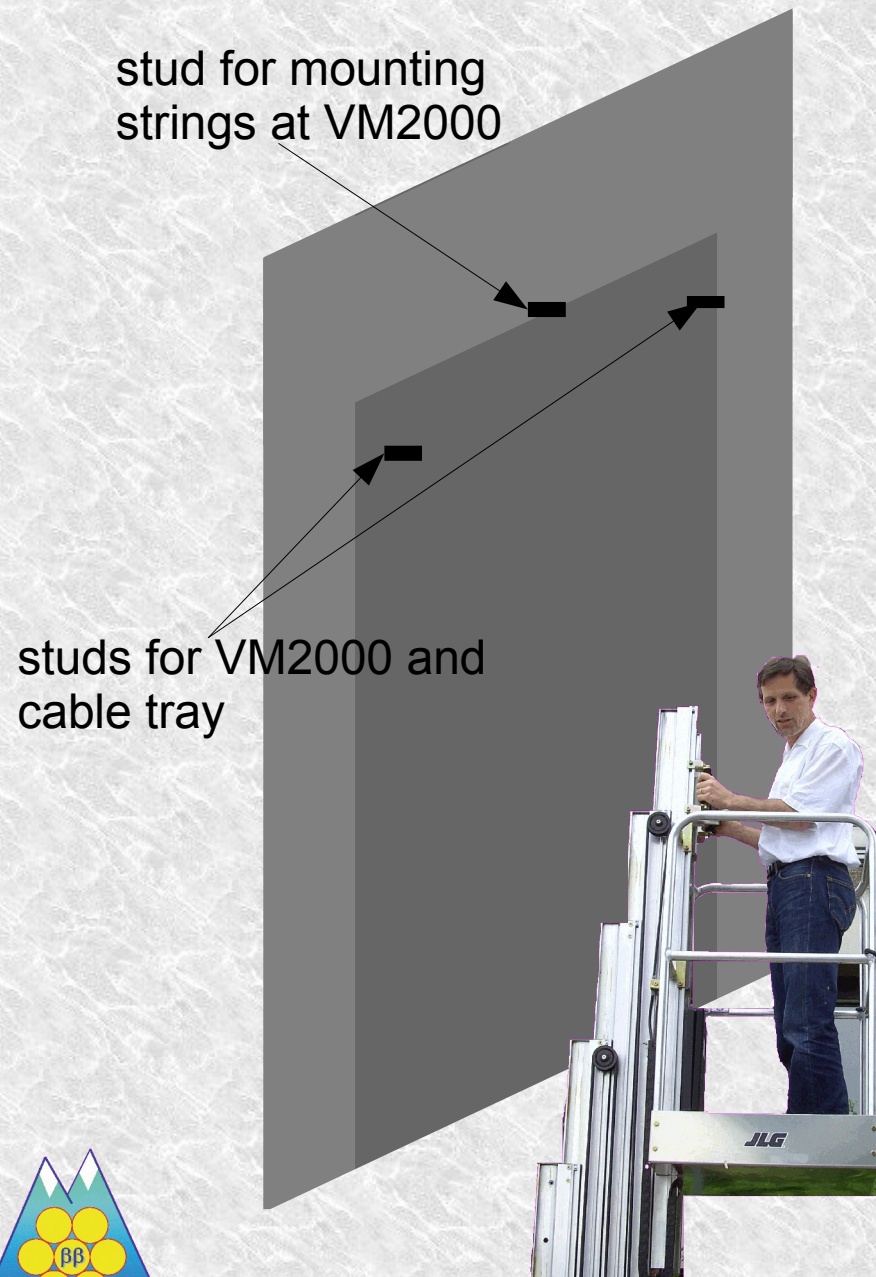
- One assembler will **rise** on height with the hoisting platform
- He will pull the VM2000 up to the two lower studs of the **cable tray**

Mounting of VM2000 – Step 3



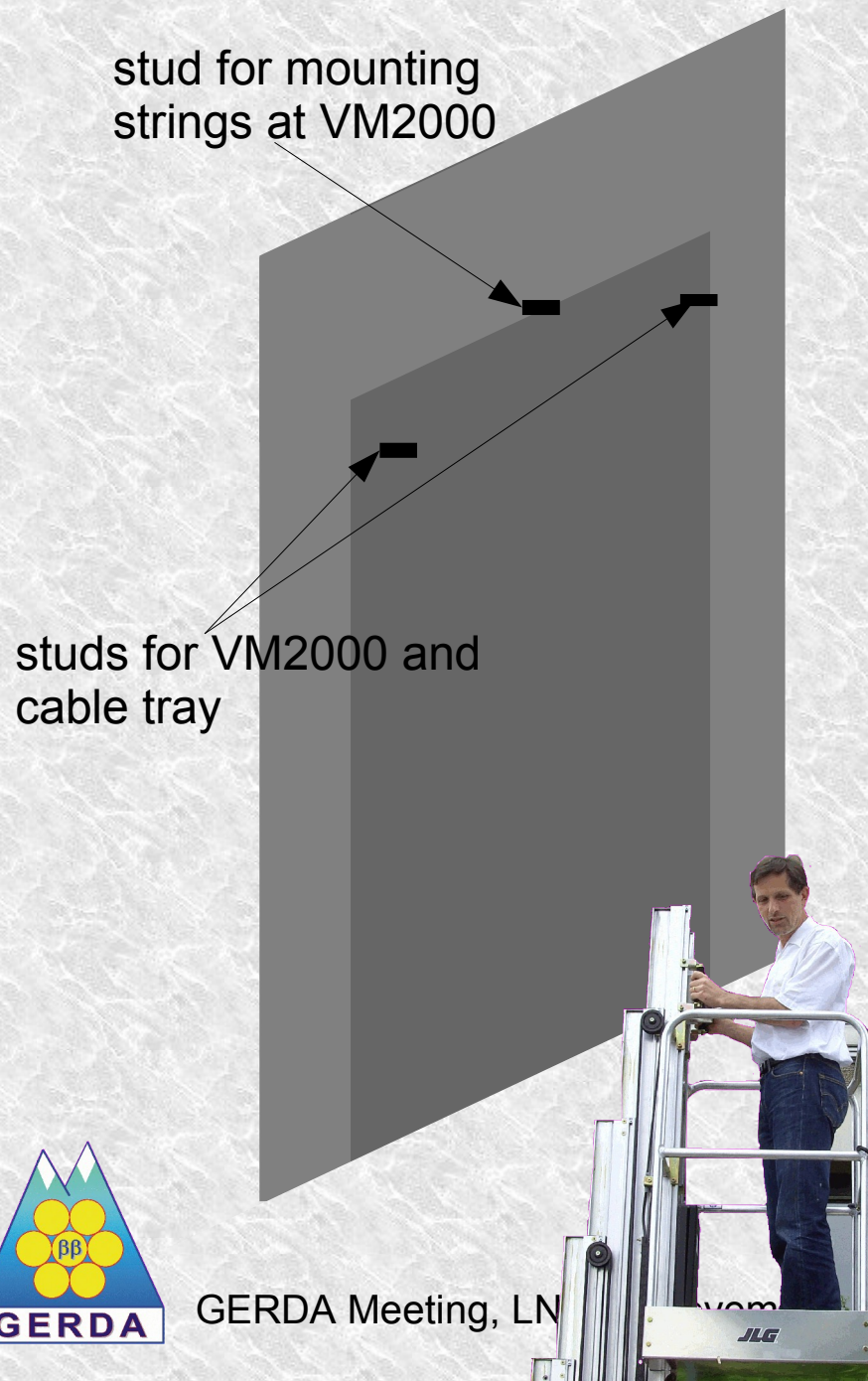
- One assembler will **rise** on height with the hoisting platform
- He will pull the VM2000 up to the two lower studs of the **cable tray**
- and remove the protective layer on the backside **glue and fix** it to the two studs

Mounting of VM2000 – Step 3



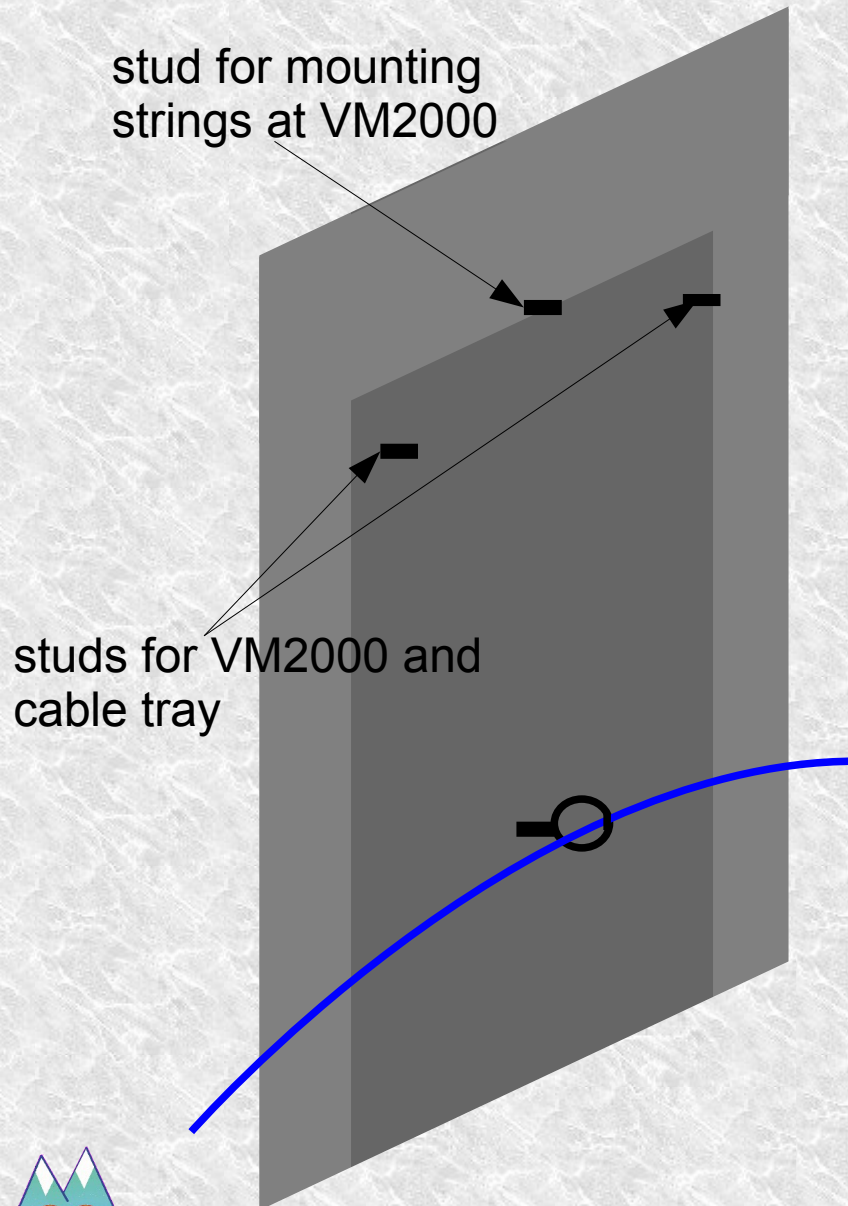
- One assembler will **rise** on height with the hoisting platform
- He will pull the VM2000 up to the two lower studs of the **cable tray**
- and remove the protective layer on the backside **glue and fix** it to the two studs
- Now he will go down and remove the protective layer bit by bit and **glue the VM2000** to the wall

Mounting of VM2000 – Step 3



- One assembler will **rise** on height with the hoisting platform
- He will pull the VM2000 up to the two lower studs of the **cable tray**
- and remove the protective layer on the backside **glue and fix** it to the two studs
- Now he will go down and remove the protective layer bit by bit and **glue the VM2000** to the wall

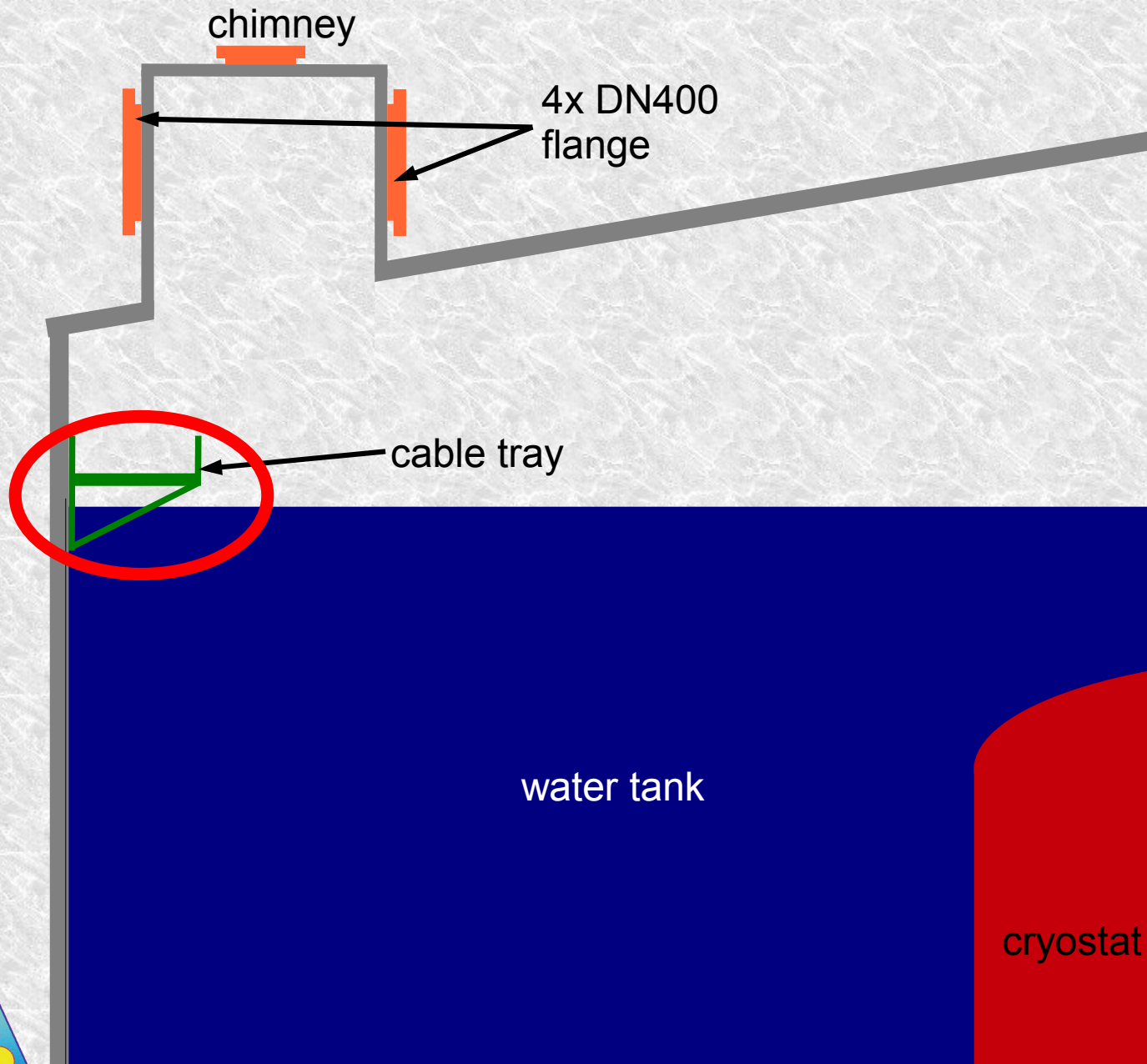
Mounting of VM2000 – Step 3



- One assembler will **rise** on height with the hoisting platform
- He will pull the VM2000 up to the two lower studs of the **cable tray**
- and remove the protective layer on the backside **glue and fix** it to the two studs
- Now he will go down and remove the protective layer bit by bit and **glue the VM2000** to the wall
- Finally a **stainless steel wire** will be drawn around the perimeter of the watertank on middle height, to fix the VM2000 in case of an emergency water drainage.

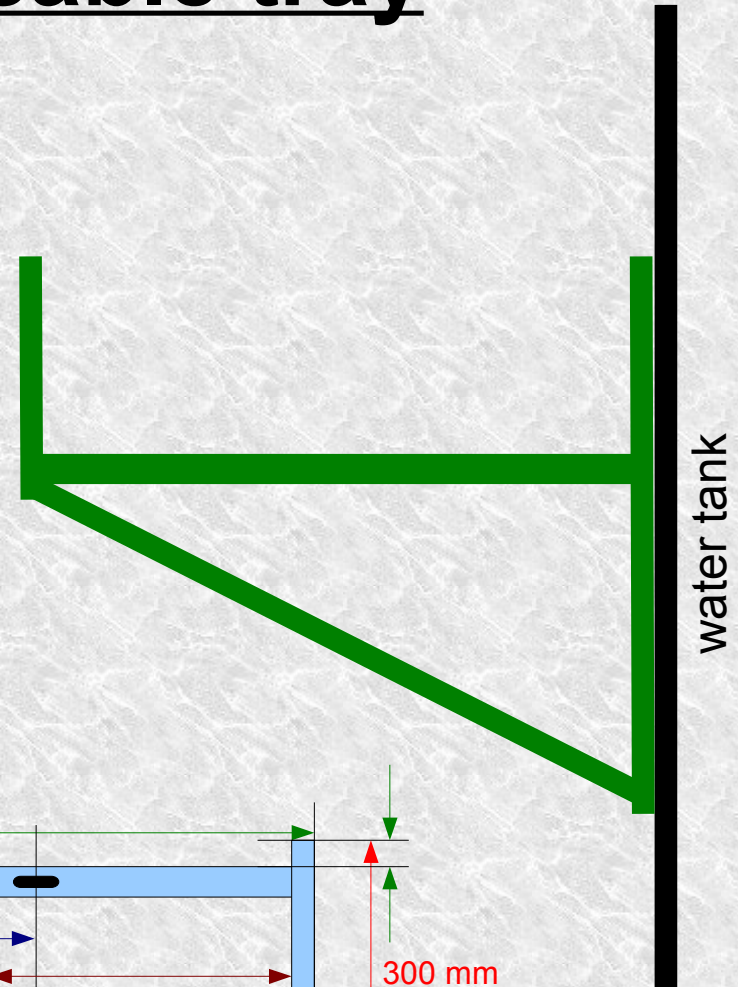
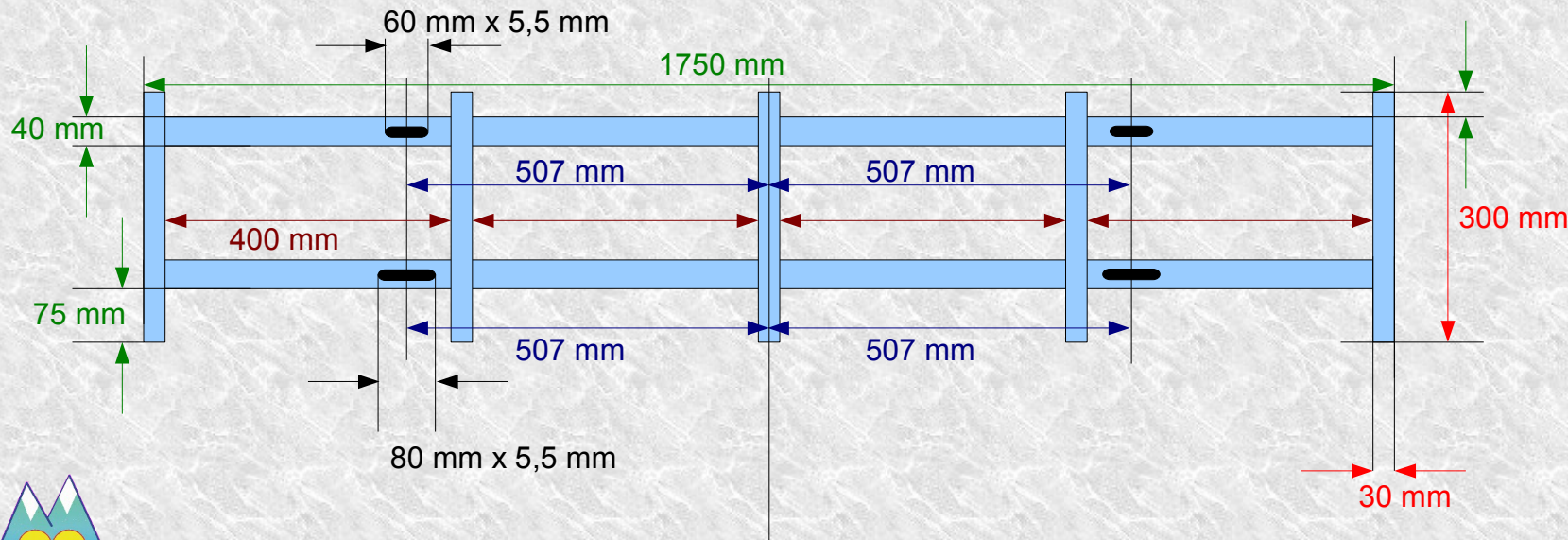
Cable tray

Mounting of the cable tray



Mounting of the cable tray

- 15 segments
(about 175 cm x 30 cm)
- every 24° one segment
- 2 holders for each segment



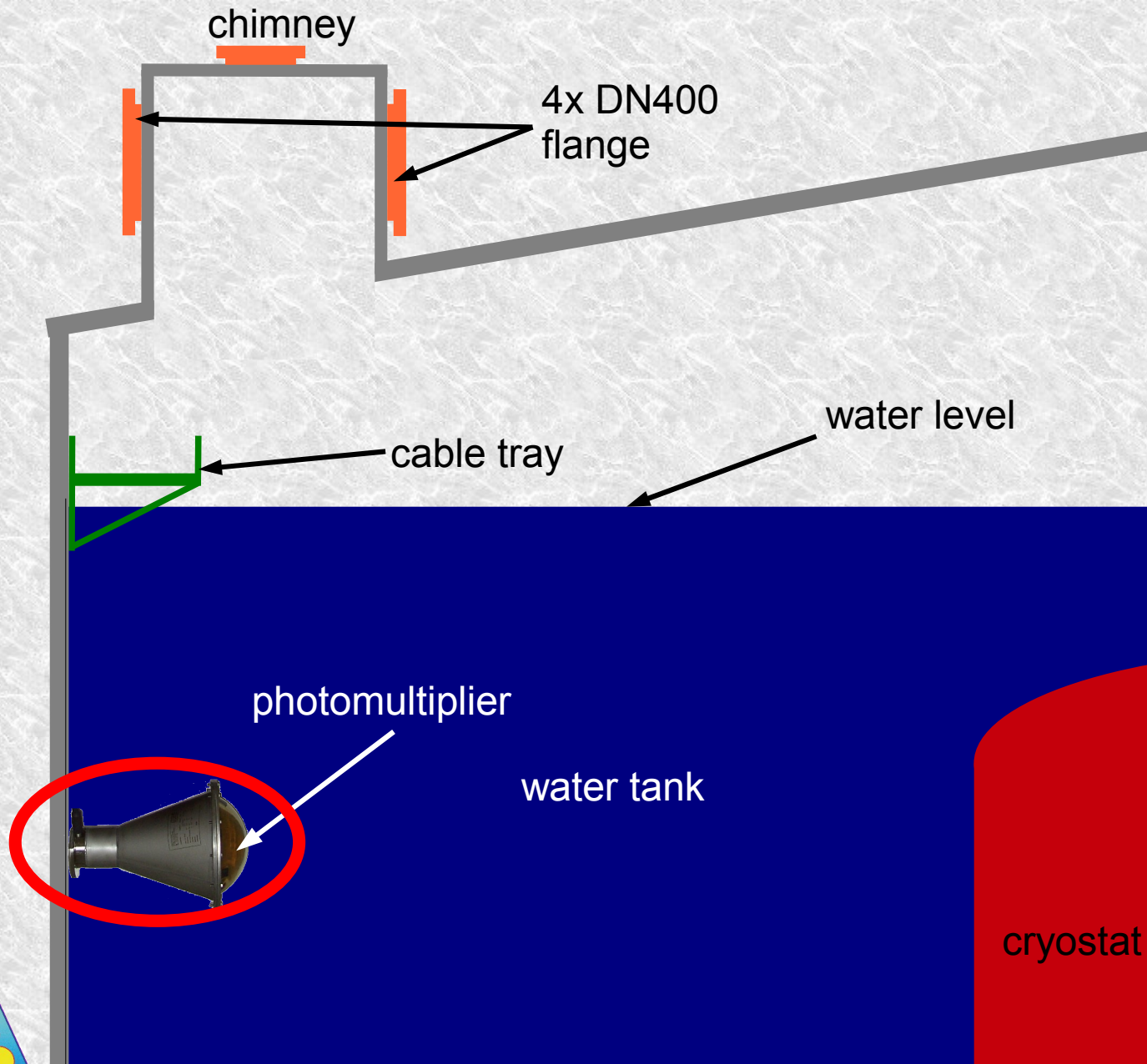
Mounting of the cable tray

- Two assemblers will rise on two hoisting platforms up to the studs for one segment of the cable tray
- The holders will be fixed to the studs
- The main part of the cable tray will be drawn up, using same mounting stud as for the VM2000 and ropes.
- Then the tray will be laid on the holders and fixed



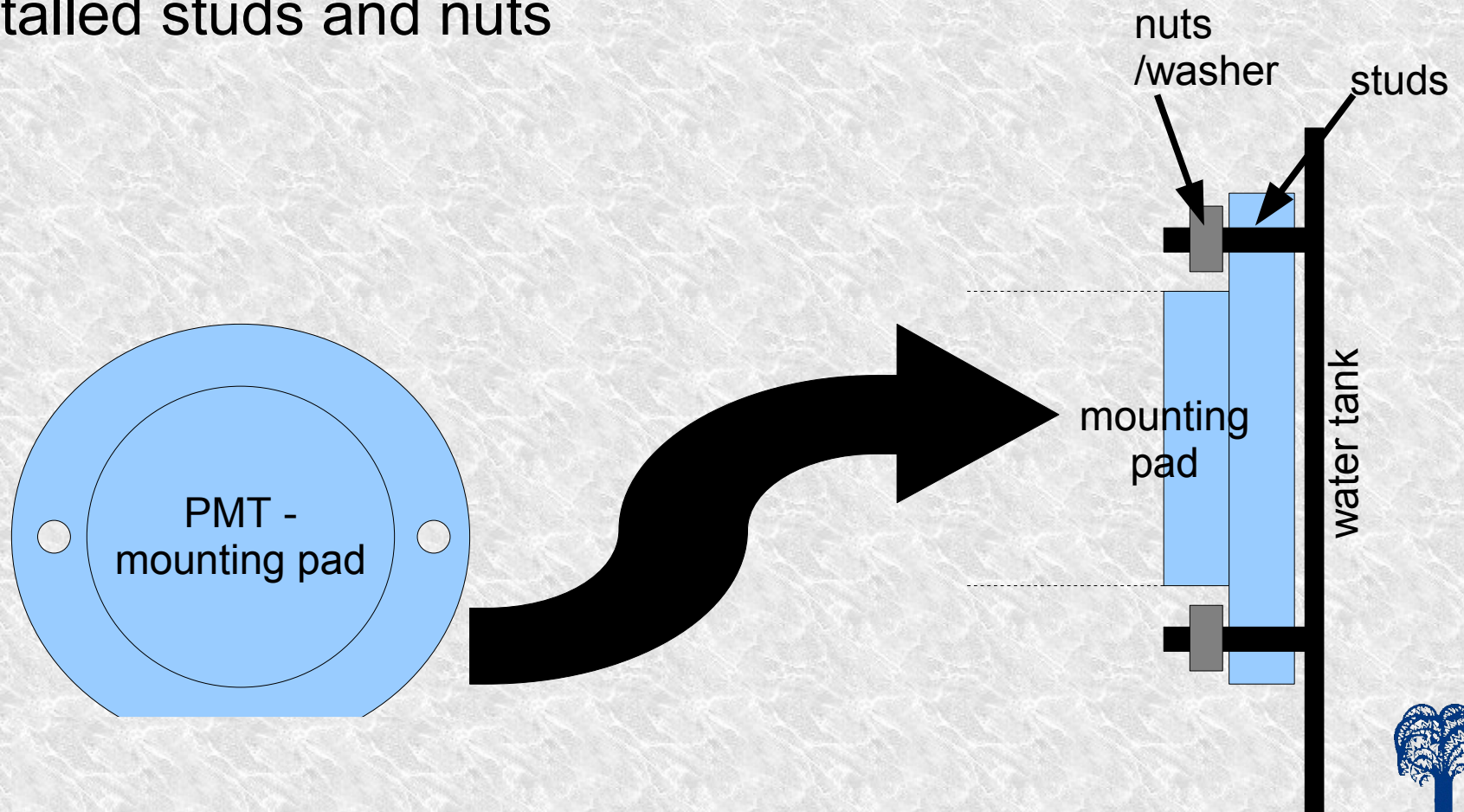
***PMTs &
individual
diodes***

Mounting of PMTs

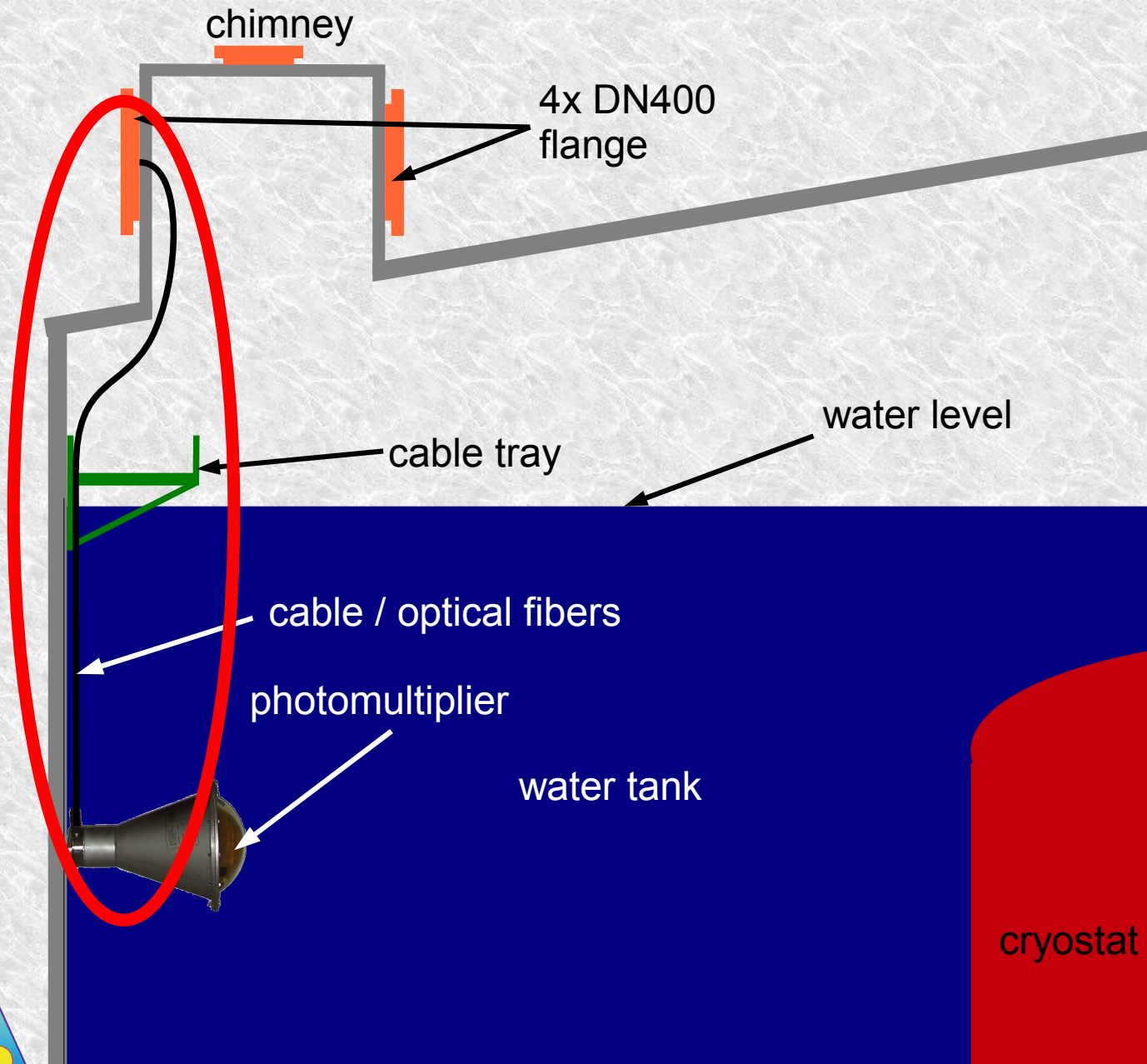


Mounting of PMTs

- PMT will be put in a special box and rise together with assembler on the hoisting platform
- The PMT will be fixed on its position, using the installed studs and nuts



Mounting of cables

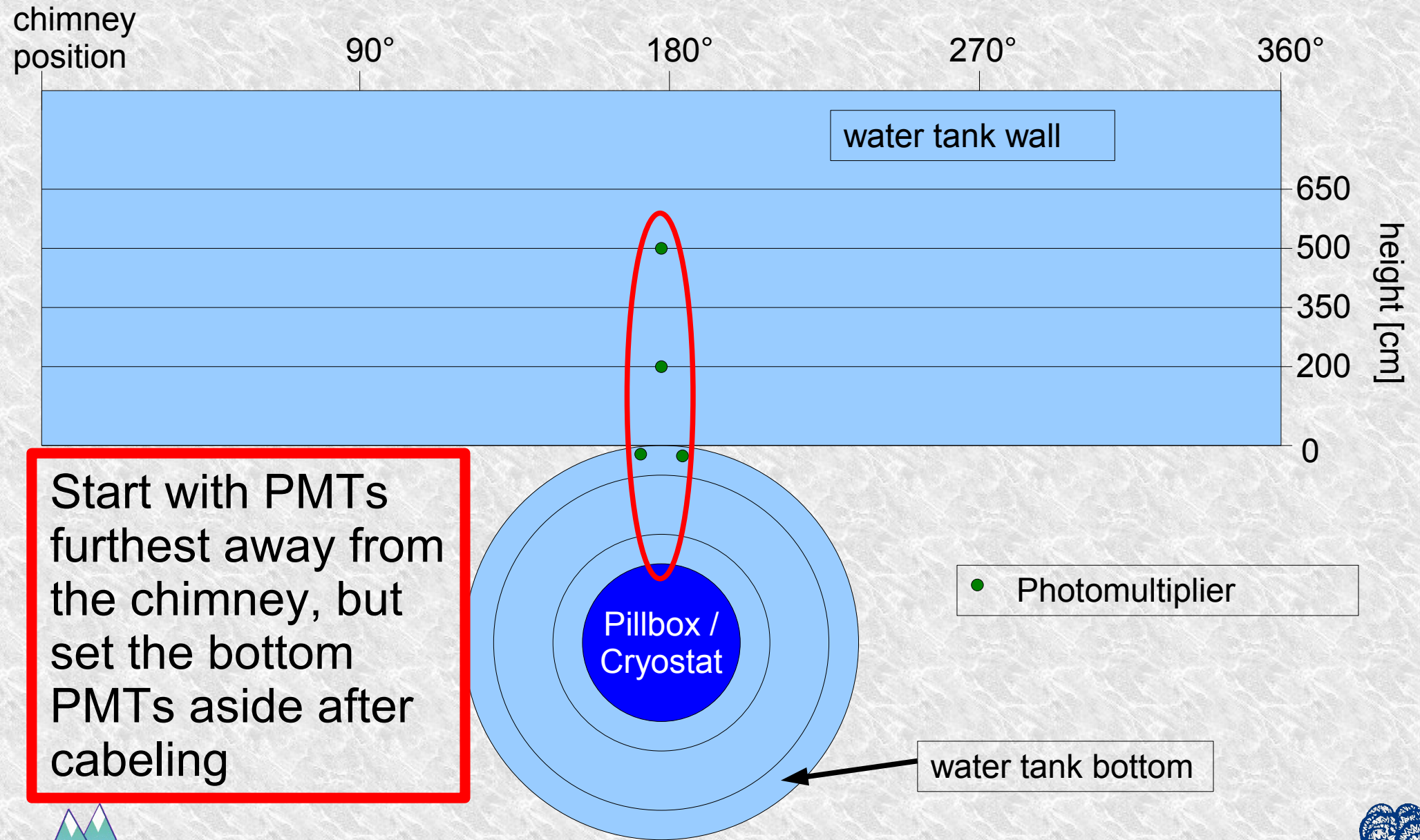


PMT cables & individual diodes

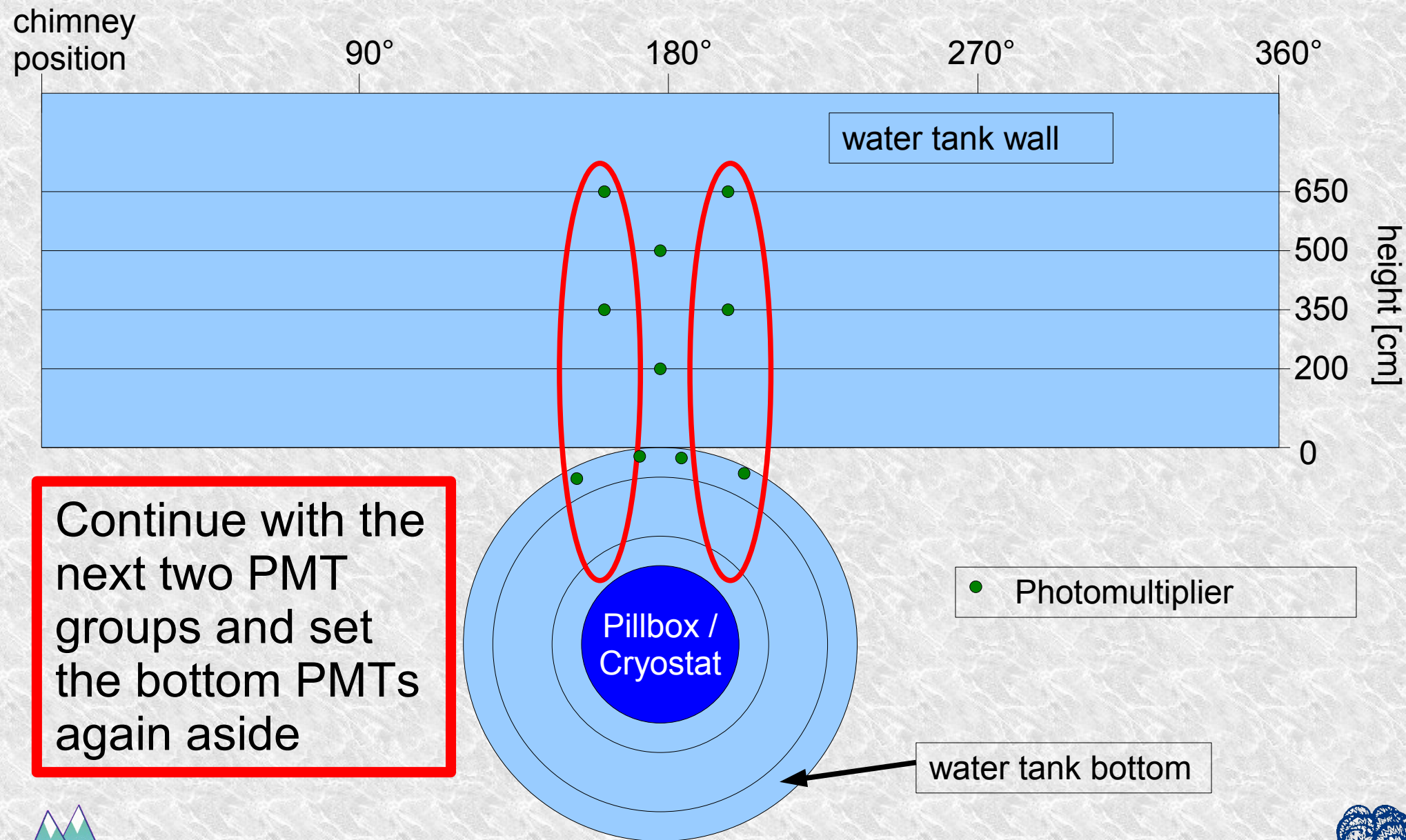
- The cables and the optical fibers of the PMTs will be fed up to the cable tray
- Clamps will fix them on the wall
- They will be pulled over the cable tray to the flanges leading through the chimney



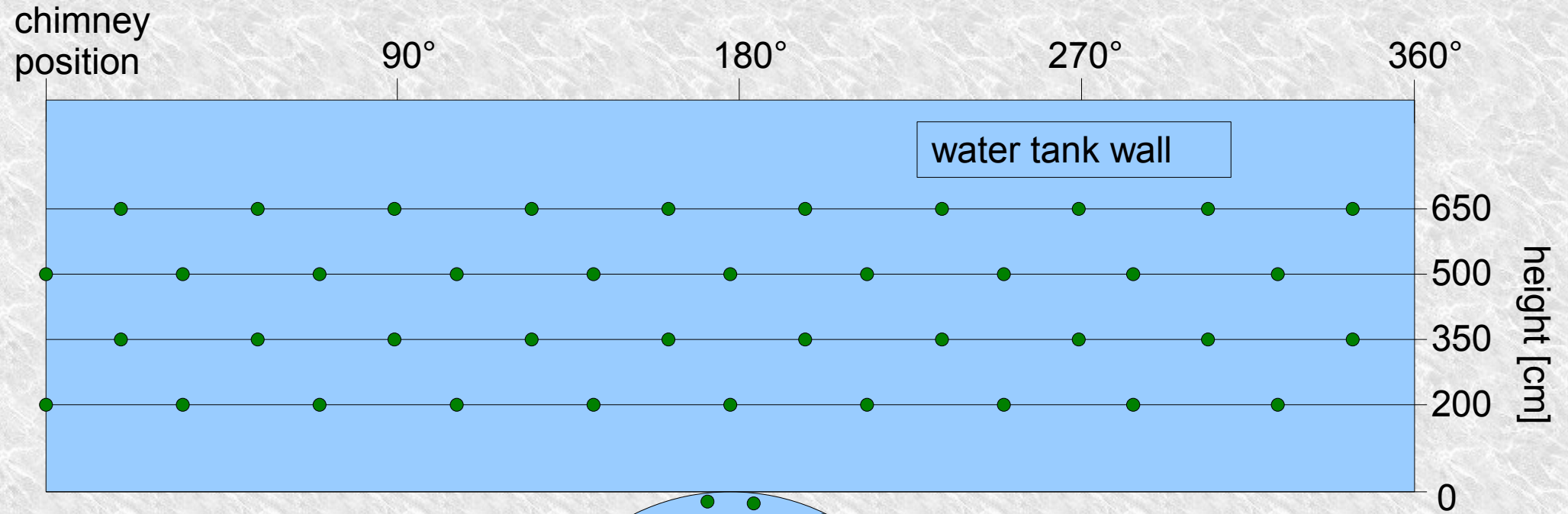
Mounting of PMTs - Sequence



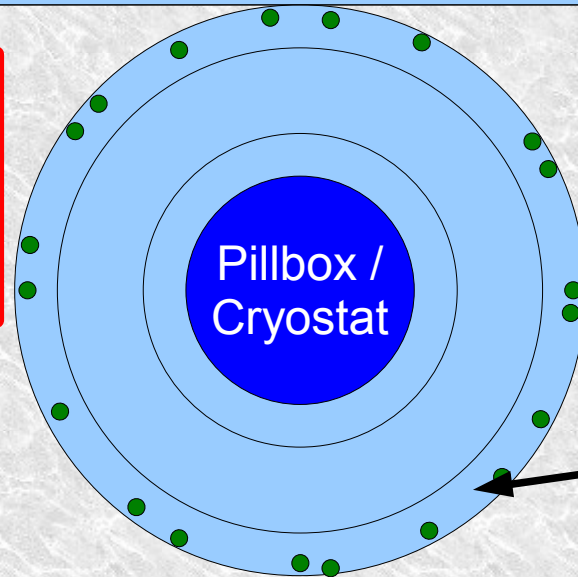
Mounting of PMTs - Sequence



Mounting of PMTs - Sequence



Continue till all
PMTs on the wall
are mounted

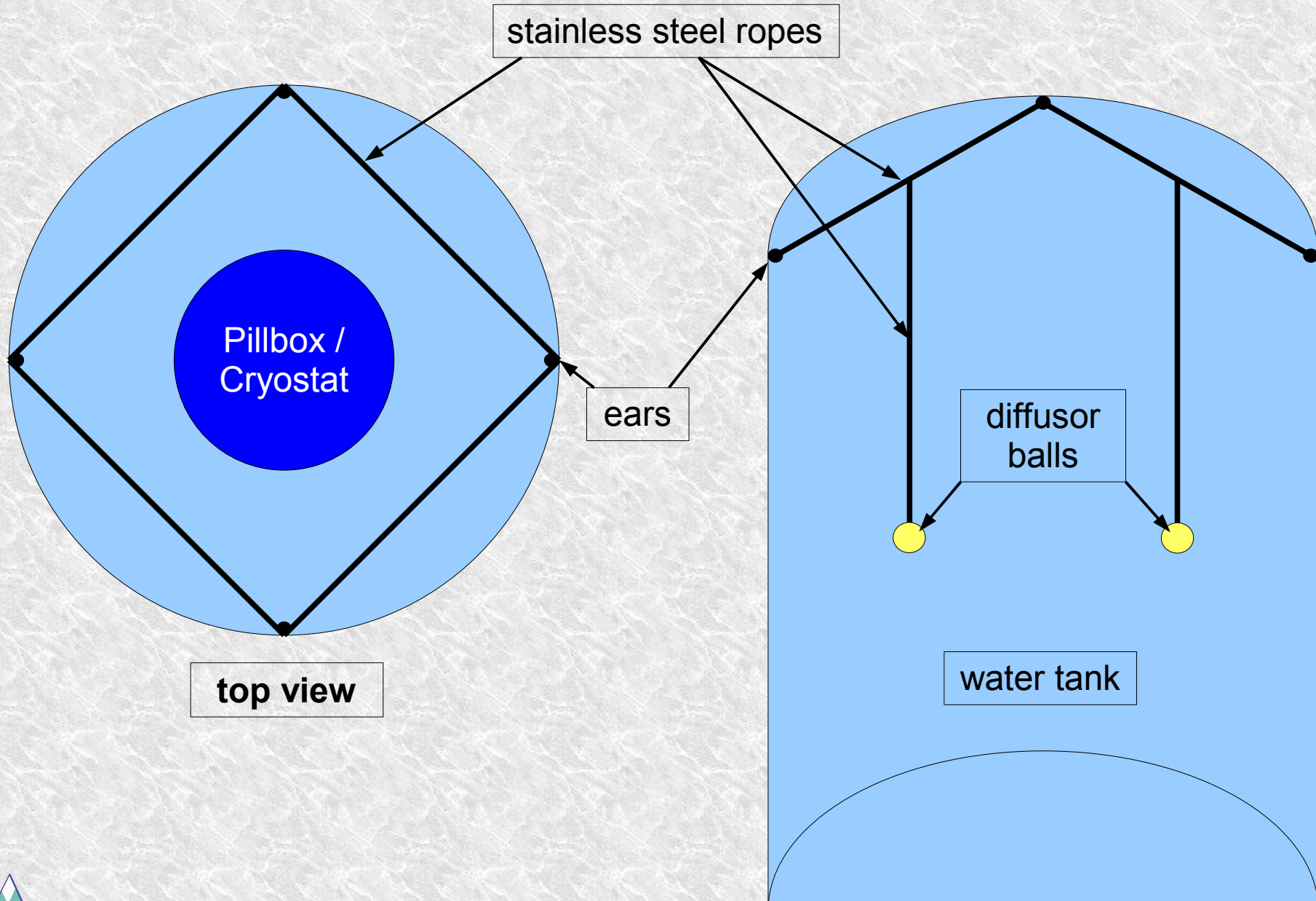


● Photomultiplier

water tank bottom

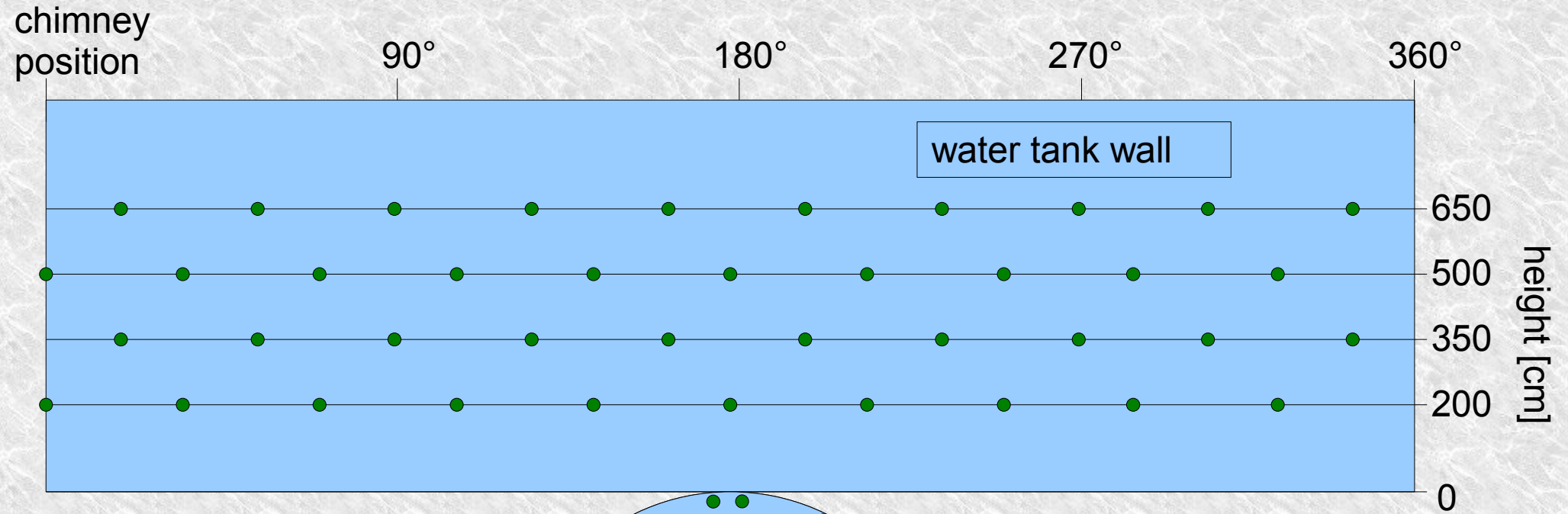
Diffusor balls

Mounting of the diffusor balls

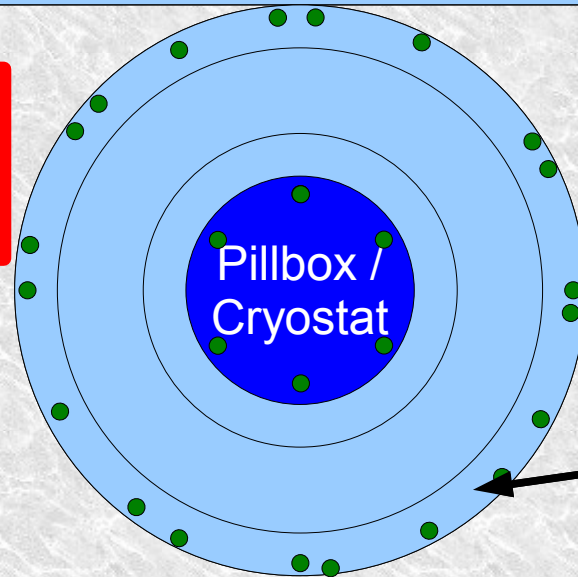


Finishing

Mounting of PMTs - Sequence



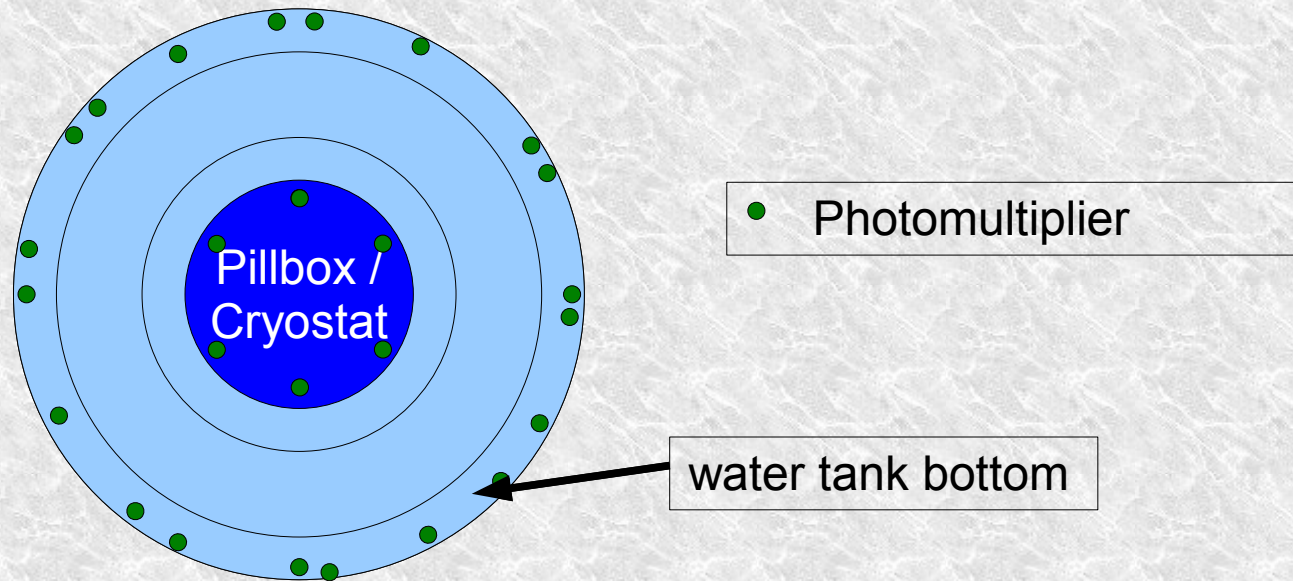
Pull the cables of the pillbox PMTs



● Photomultiplier

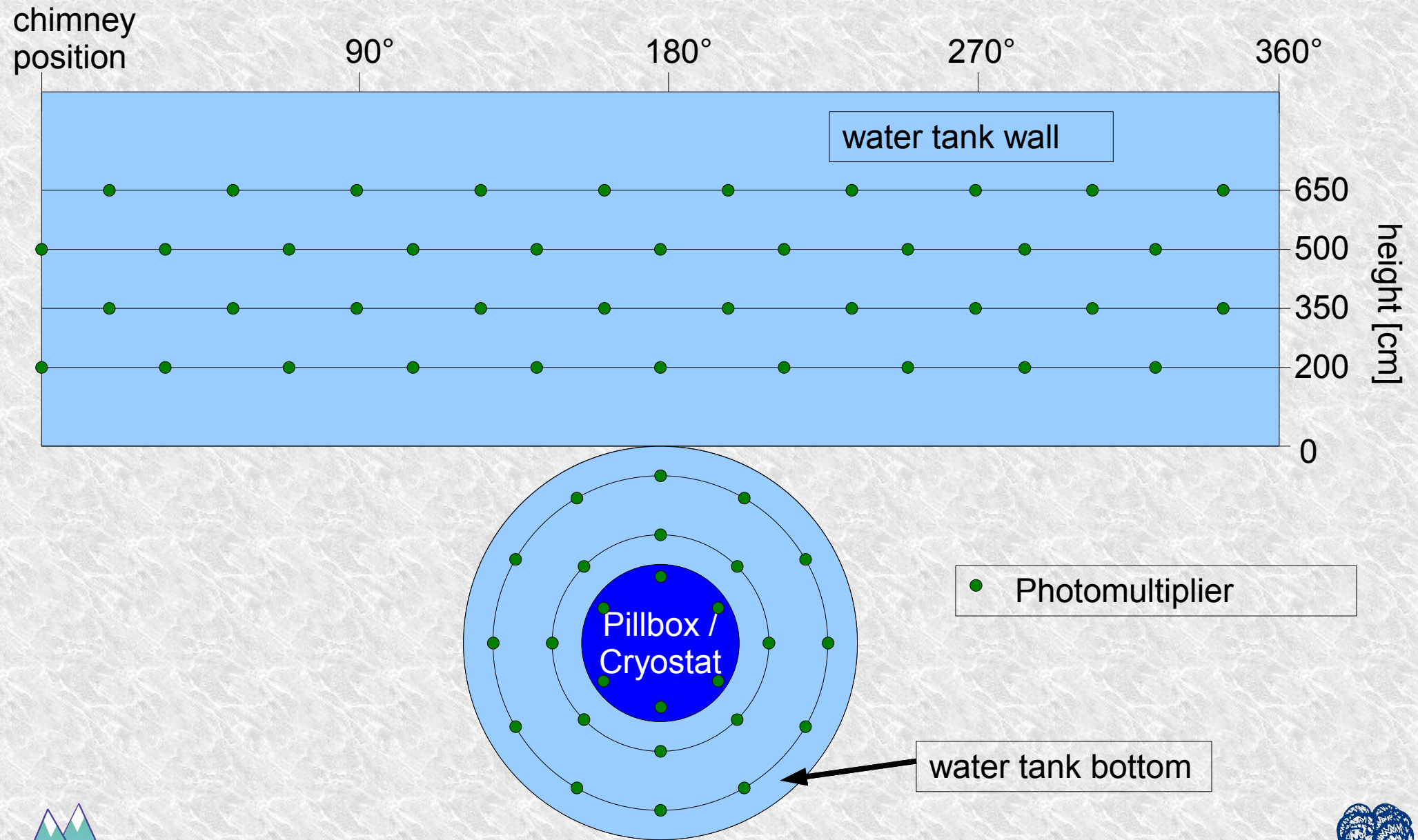
water tank bottom

VM2000 & Bottom PMTs – Finish



- Bring the two hoisting platforms outside.
- Before the final positioning of the bottom PMTs, the floor has to be covered with VM2000.
- Step by step, beginning at the far end of the manhole, VM2000 webs are glued to the floor and the bottom PMTs are positioned.
- From now on, move only on soft pads inside the water tank.

FINISHED !!!



Schedule

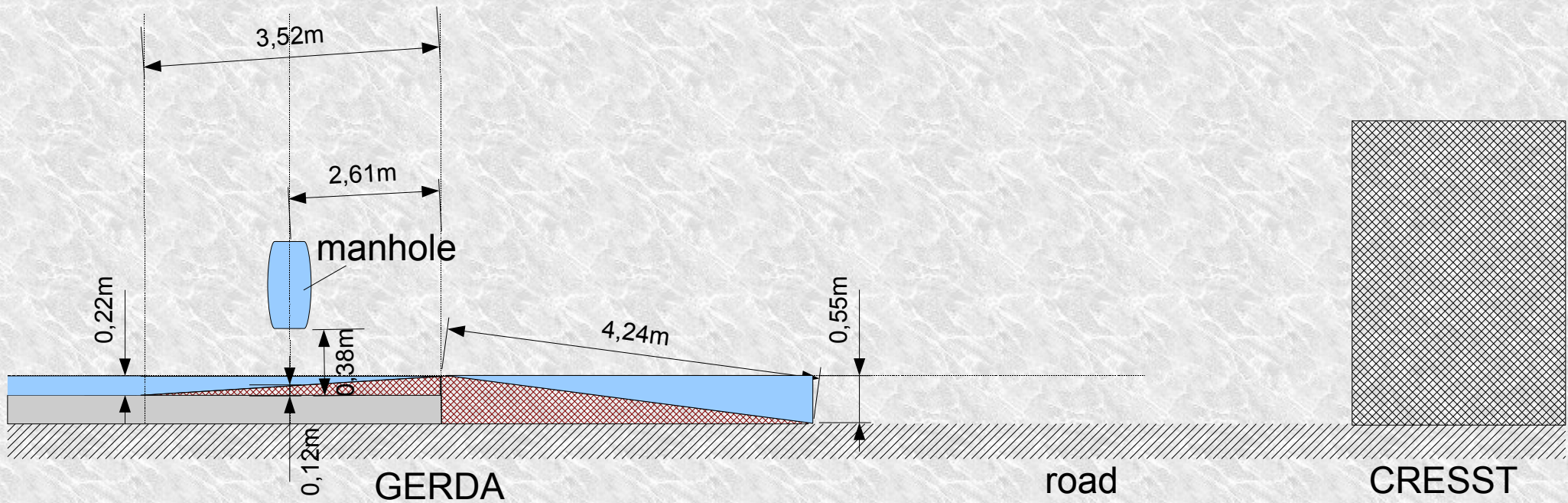
Cherenkov veto schedule

- Beginning as soon as possible
~ CW 2,5,6,7 2009 ???
 - VM2000 : 6 days
 - Cable tray : 2 days
 - PMTs : 15 days
 - Calibration system : 2 days
 - Finishing, water pipe,
floor : 2 days
-
- 4 - 5 weeks

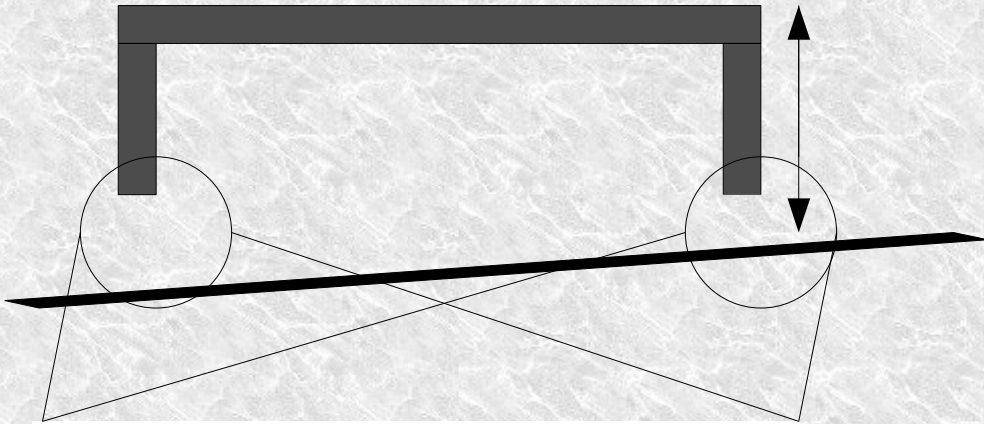


***All information
also given in
GSTTR-08-024***

Moving into the tank

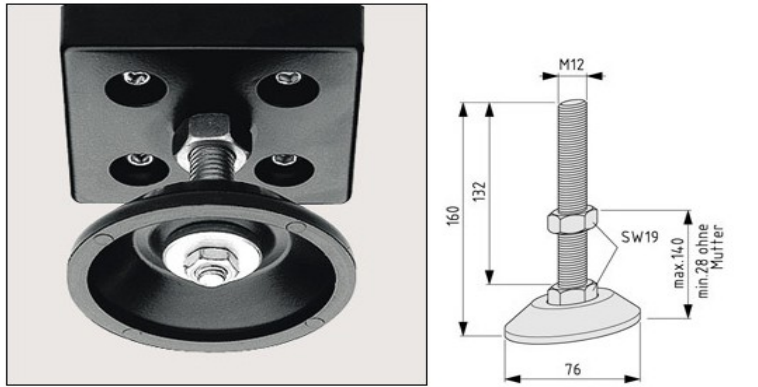


Distance ramp – manhole ~ 0,67m



Item

Stellfuß D80, M12x160 // Artikel-Nummer: 0.0.265.68



Eigenschaften von Stellfuß D80, M12x160

Gewindedurchmesser	=	M12
Gewindelänge	l	= 132 mm
Kraft max.	F _{max.}	= 10.000 N
Durchmesser	d	= 80 mm
Winkel	α	= 7 °
Gewicht [g]	m	= 340 g

Spindel, St, verzinkt
 Fußsteller, GD-Zn, schwarz
 Sechskantmutter DIN 934-M12, St, verzinkt

manhole

