

Access Safety Blocks

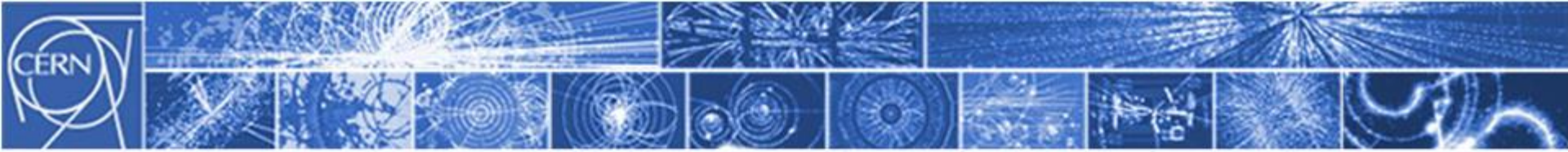
For access into the LHC we trip **safety chain 1** which prevents any circulating beam, and chains 2 and 8 to stop any injection.

A safety chain must be comprised of multiple elements (EIS) of different types to assure redundancy and avoid common mode failures.

We use the warm D3/D4 magnets at points 3 and 7 by cutting the 18kV at their power converters, the ASB are a different “species” of EIS which could stop an injected pulse or circulating electrons.

The ASB cannot stop a circulating beam, but are linked to the LBDS which dumps the beam if the ASB is “not fully open”.

LBDS cannot be qualified to the level of EIS due to its complexity.



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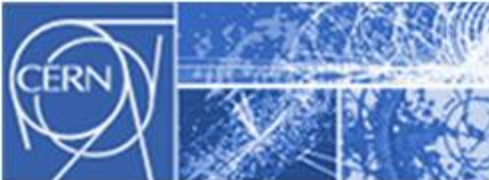
The ASB are standard VAT 100mm vacuum shutters, without vacuum seals. Stainless Steel, 7mm thick. They must not move too quickly, to allow the LBDS to dump any beam.

The blades are equipped with duplicated position switches and any “not fully out” detection is signaled to the LBDS by duplicated paths.

The concern is that in the *remote* event of a failure, part of the shutter blade would be vaporized, damaging nearby equipment. This cannot be avoided, but the consequence can be minimized.

The area downstream of ASB.B1 has the collimators at 100m.

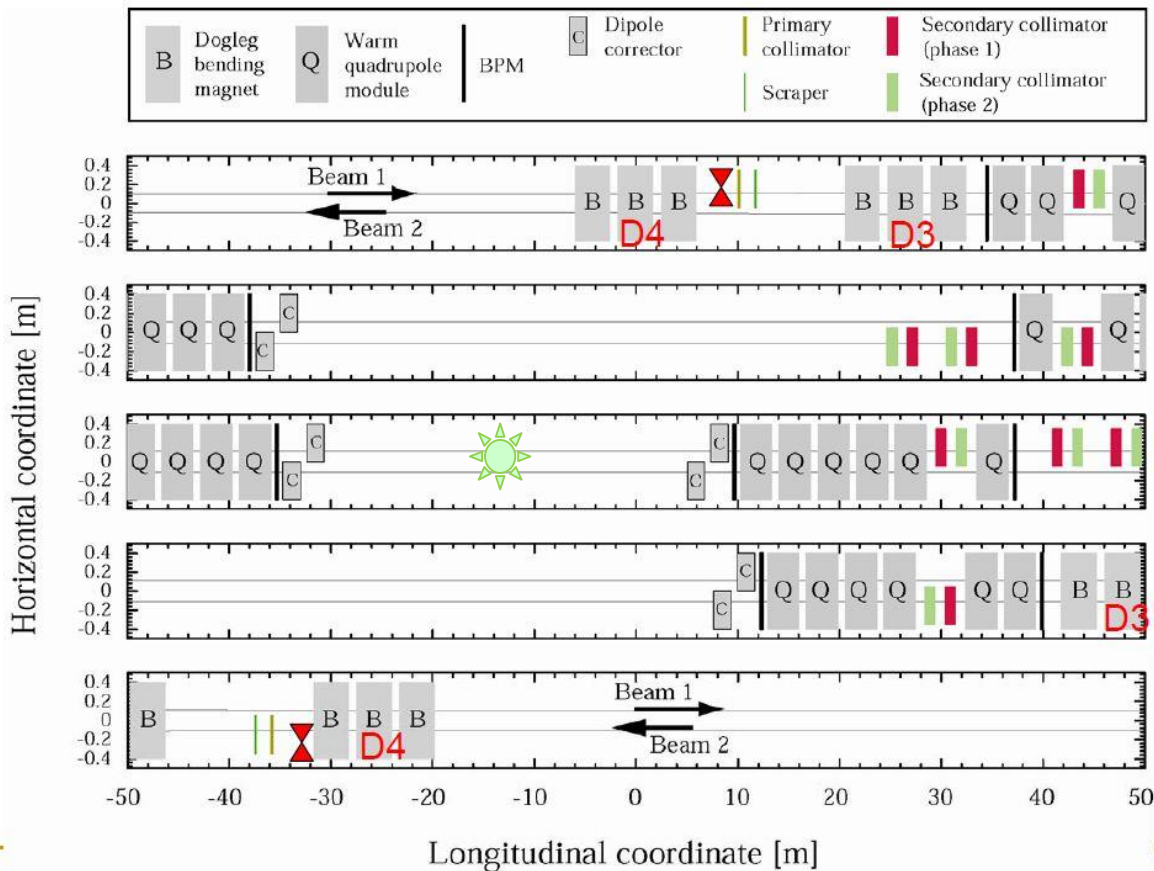
The area downstream of ASB.B2 has warm beam-pipe for over 200m

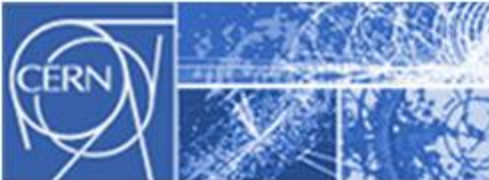


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The requested positions from 2005, the aim was to use the collimators to limit damage and radiation in the event of failure.

IR3 layout and location of Access Safety Blocks

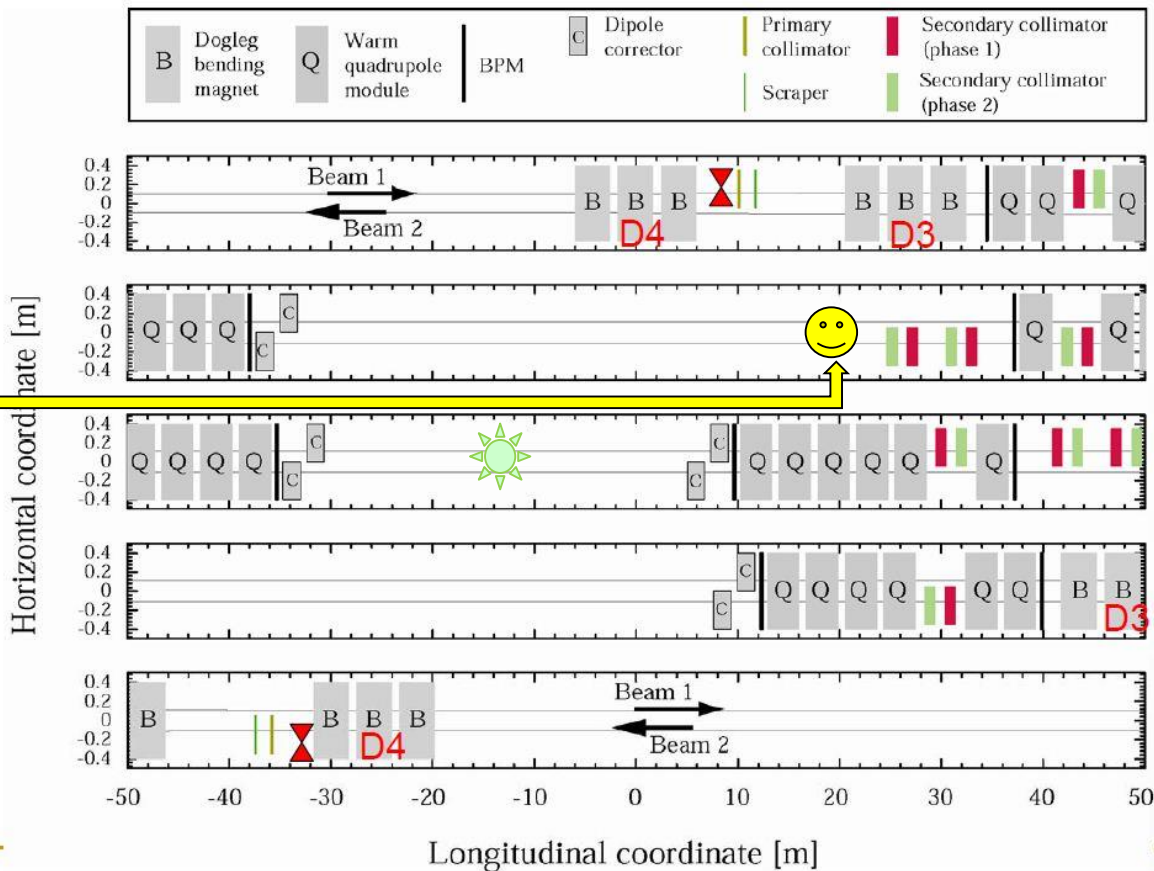




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The blocks are not in the requested positions from 2005, but are both located here:

IR3 layout and location of Access Safety Blocks





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The proposal is to have a symmetric positioning with long clear downstream paths having easily replaced equipment: warm beam-line and BPMs

This uses existing vacuum equipment.

IR3 layout and location of Access Safety Blocks

