

Honister Slate Mine Borrowdale

Stop 1 Honister Borrowdale Volcanics

Honister slate is part of the Borrowdale Volcanic Group.

Island Arc (back Arc) volcanoes spewed out andesite and pyroclastic material in an extensional basin. This was quickly weathered and deposited in a deep water environment (believed to be a lake due to the total lack of fossils). These andesite derived sediments were then regionally metamorphosed creating its cleavage.

It contains layers of pyroclasts as well as rip up clasts and flame structures. It displays graded bedding and the colour variation is a consequence of grain size.

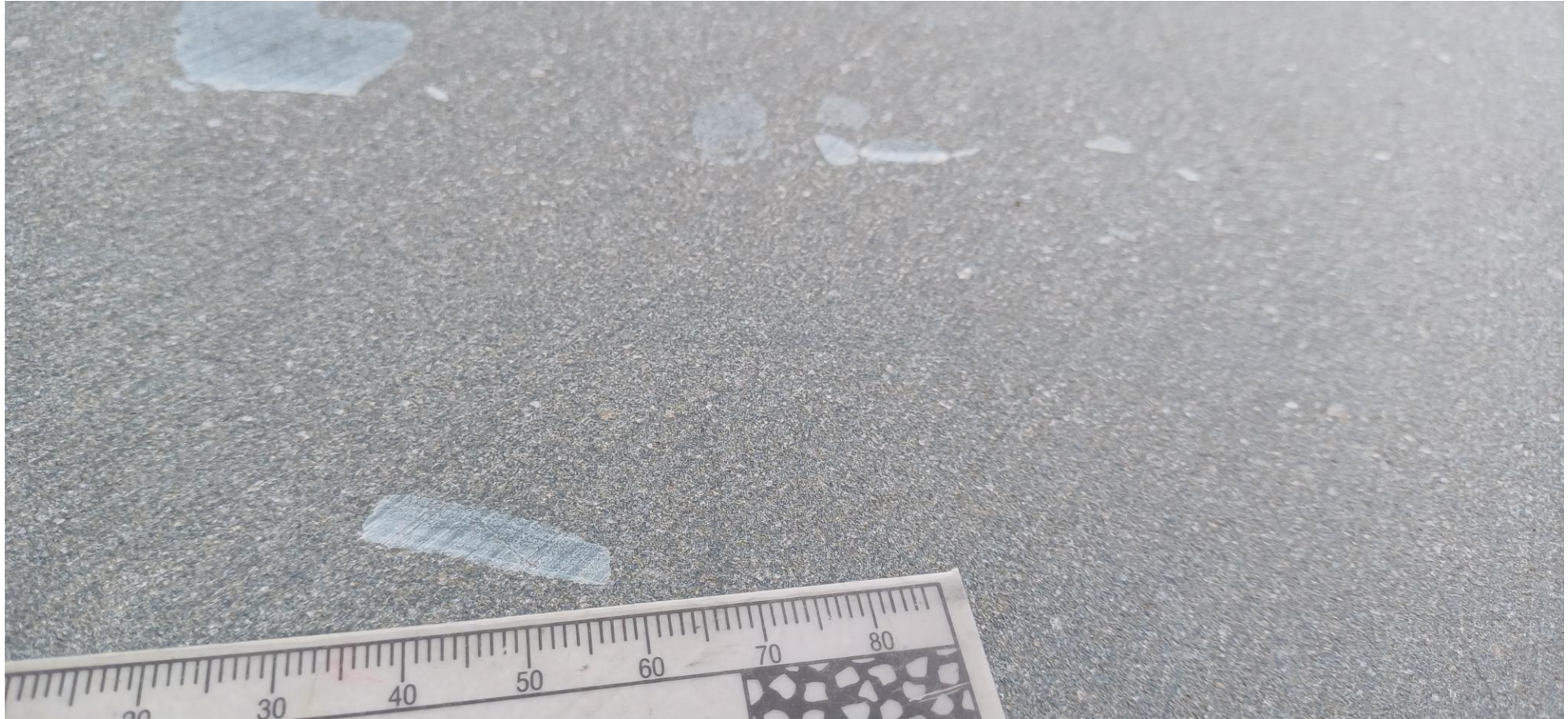


Stop 1 Honister Borrowdale Volcanics

The bedding in these clasts indicate that they are rip up clasts



Stop 1 Honister Borrowdale Volcanics



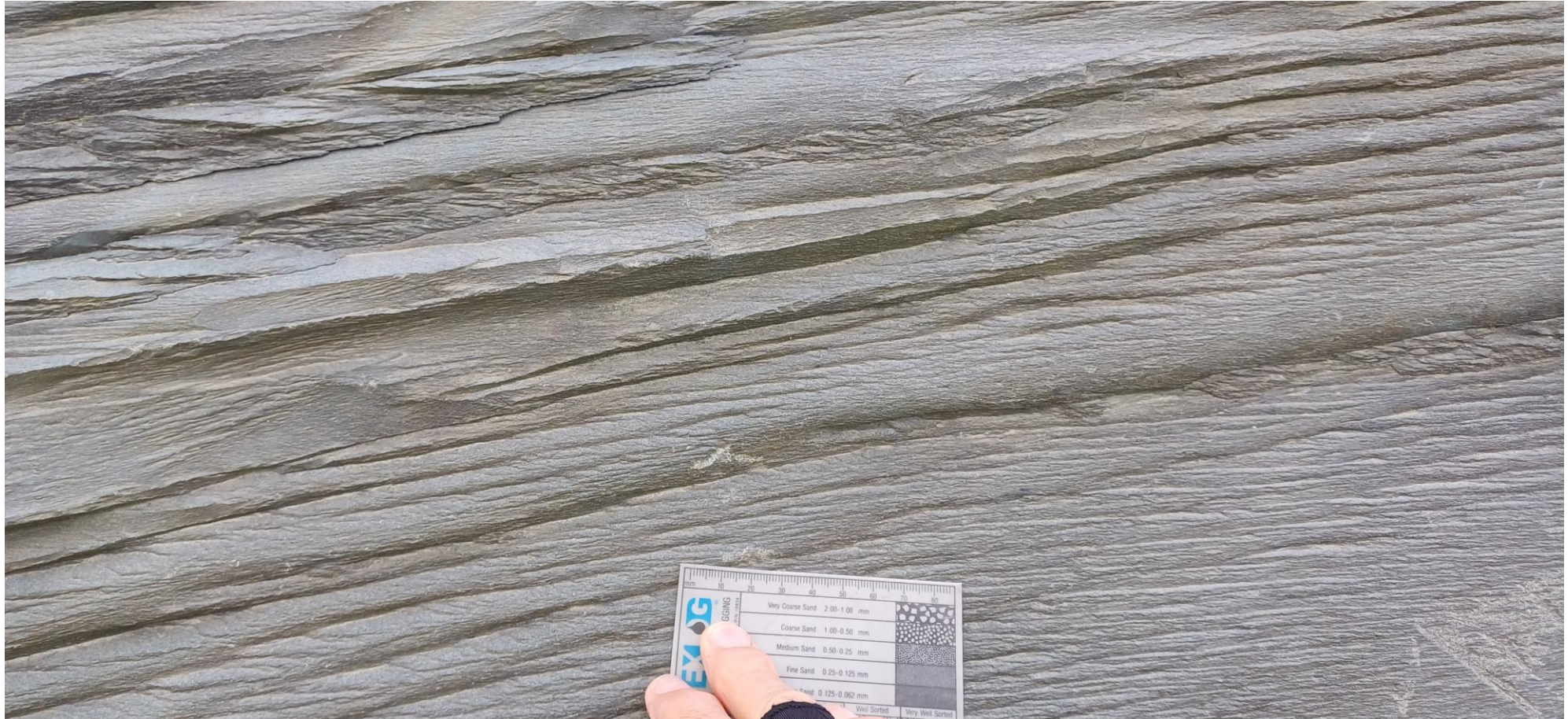
Stop 1 Honister Borrowdale Volcanics

Finer angular and tabular clasts in a layer marking an event



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Cross section through a slab reveals the bedding and cleavage



Stop 1 Honister Borrowdale Volcanics

Mini clasts highlighted on a wet surface

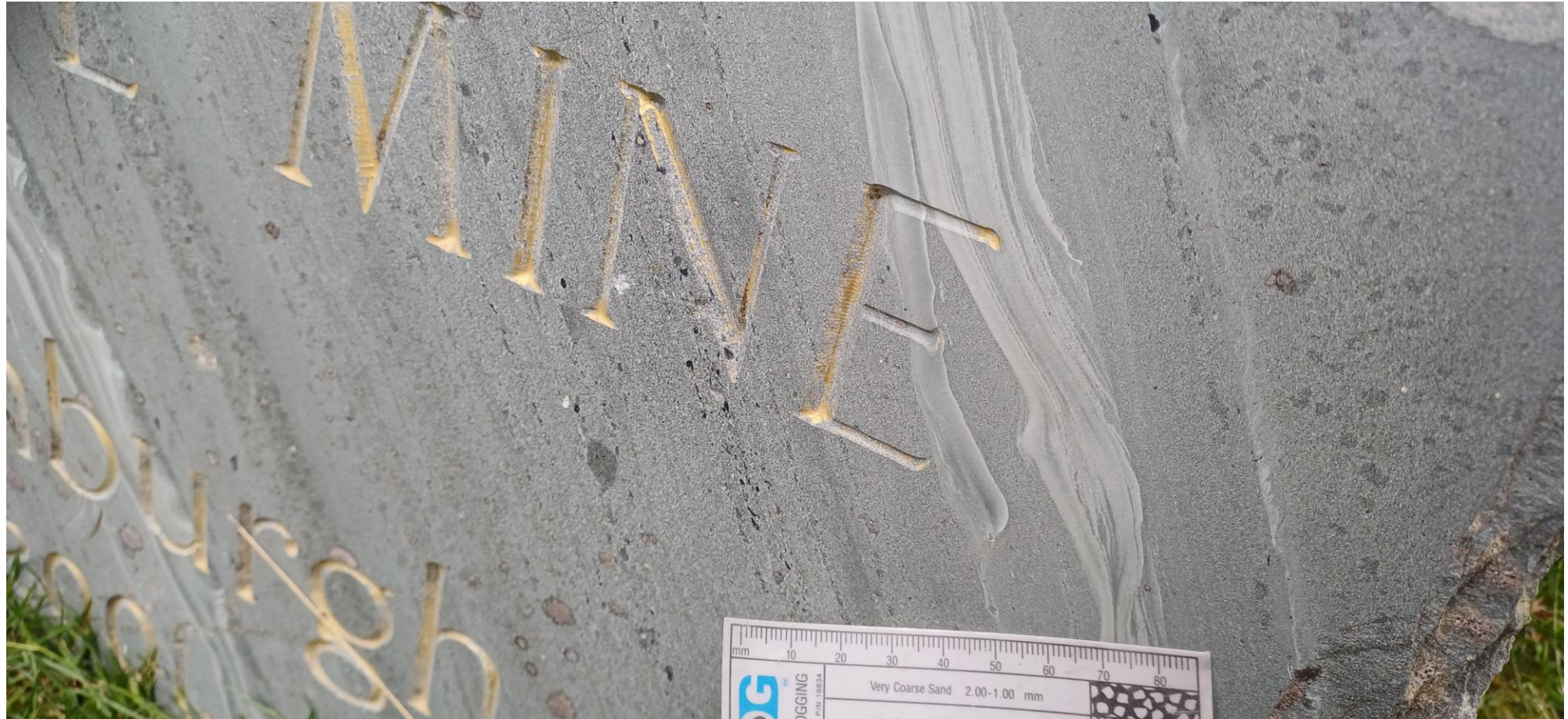


Stop 1 Honister Borrowdale Volcanics

Bedding, clasts, flame structures and channel fill can all be recognised on this cleaved polished surface



Stop 1 Honister Borrowdale Volcanics



STEP SLATE MINNA
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Duke of Edinburgh
AUGUST 1800

Stop 2: Pepperite Blocks



Stop 2: Pepperite Blocks



Stop 2: Pepperite Blocks



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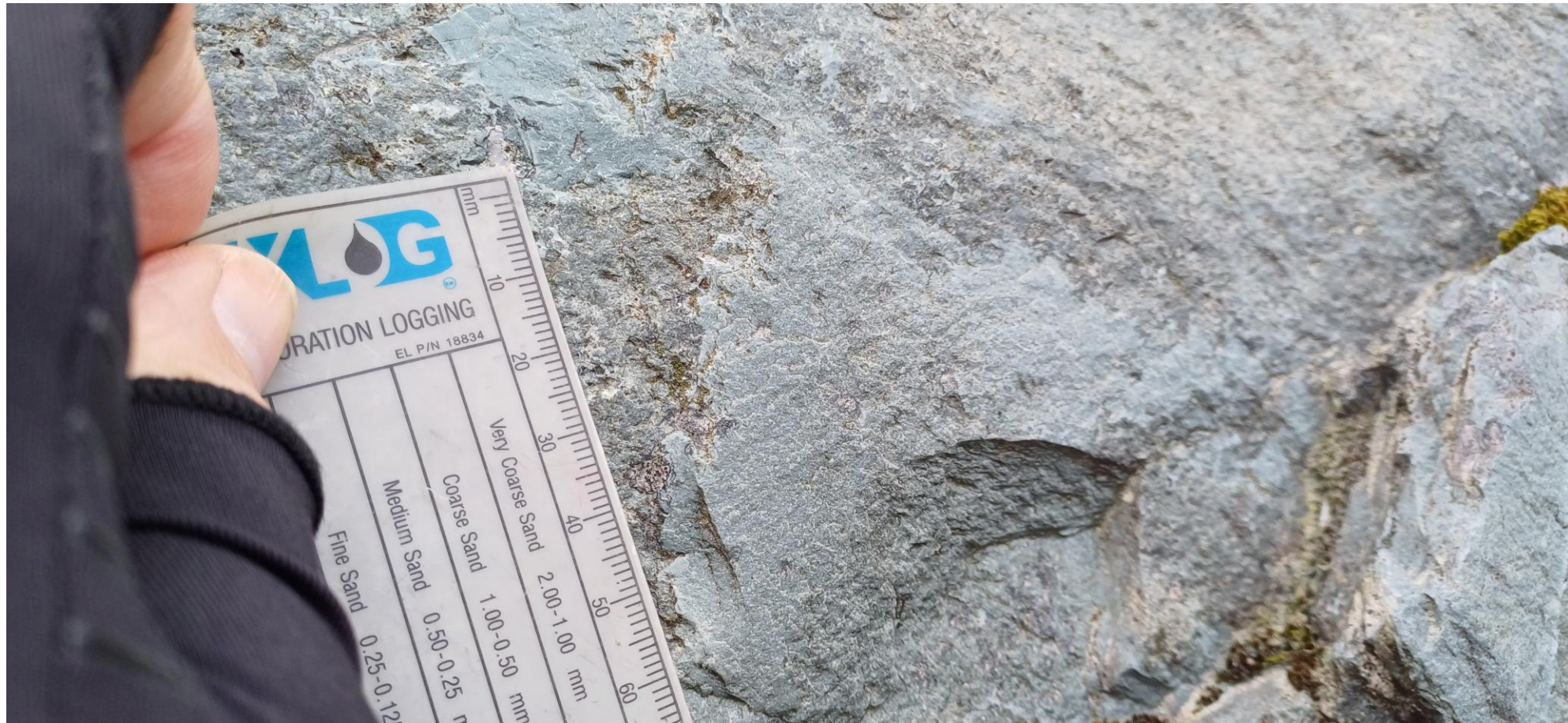


Stop 2: Pepperite Blocks



Stop 2: Pepperite Blocks

The host rock (lighter coloured grey) is mixed with the intrusive magma. There are no chilled or baked margins. The intermixing of the host and intrusive rock indicates that the host rocks were water saturated and only semi consolidated causing a “explosion” to enable the mixing of the two materials in this manner



Stop 2: Pepperite Blocks



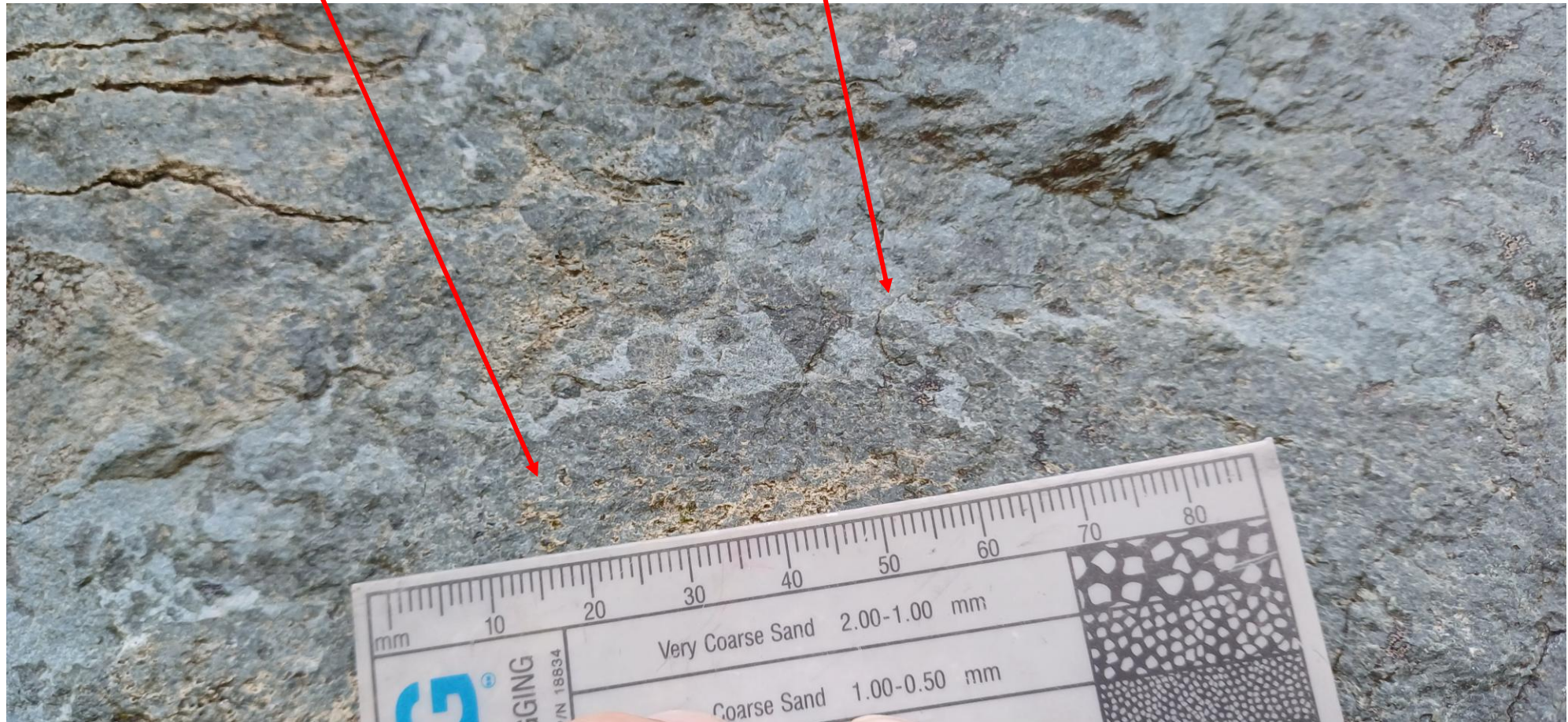
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Andesite Lava

Host Rock – Honister slate



Stop 2: Pepperite Blocks



Vesicular lava infilled with amygdales



Stop 2: Pepperite Blocks



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Some of the lava clasts are rounded whereas others are more irregular



Stop 2: Pepperite Blocks



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- Lots of lava clasts interspersed within the host rock



Stop 2: Pepperite Blocks

View from Honister Craggs down into Borrowdale



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View from Honister Craggs down into Borrowdale



Stop 2: Pepperite Blocks



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Stop 3 Hopper quarry



Stop 3 Hopper quarry



Stop 3 Hopper quarry

Partly infilled. Nice exposure in situ of the top of the sill.

Pale sediment is fine grained next to the sill. Lot of variation in the clast morphology of sill material . The sediment is relatively homogeneous



Stop 3 Hopper quarry



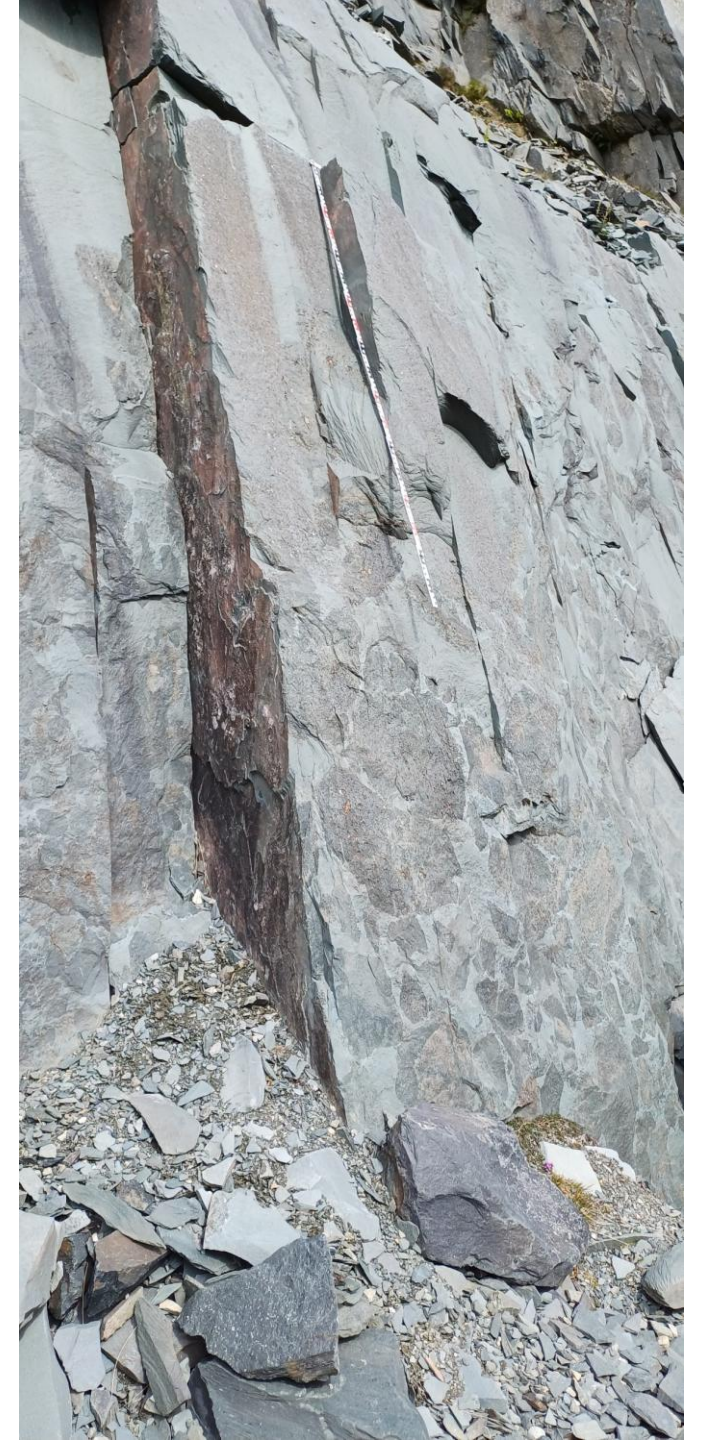
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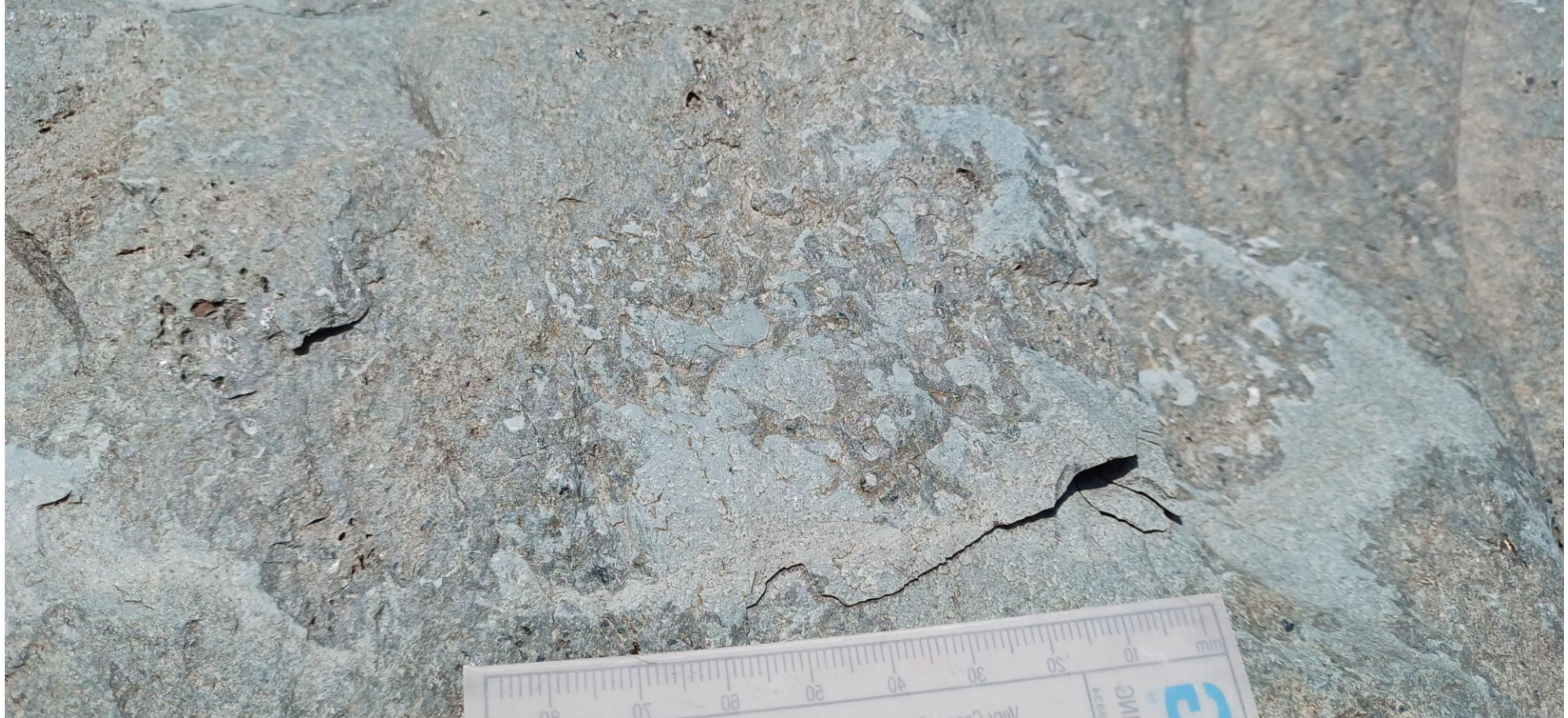
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Large quartz lined fault plane is a normal fault



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Large quartz lined fault plane is a normal fault



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Stop 4: Dobby quarry

Base of a different sill overlying the Honister Slate (seen on the right of the quarry).

The “Climbing wall” to the left is all Honister Slate

The base of the sill is vesicular whereas the andesite itself is not. There is a mixing of the base of the lava and the sediment. It is a relatively narrow zone in comparison to the Hopper Quarry contact



Stop 3 Hopper quarry



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Stop 3 Hopper quarry

