

Dams threaten Amazon Basin

The Amazon basin could suffer irreparable damage if a significant number of hydroelectric dams are built as planned, causing environmental scientists to push for alternative renewables.

In a study by 10 universities and research centres, scientists found that the impacts of 140 built dams and potential impacts of a further 428 planned dams would damage the 6Mkm² basin irreparably.

Instead, researchers argued for less environmentally damaging modular renewable schemes such as wind and solar farms to be built.

“Large dams are not only economically unviable but also environmentally detrimental,” said co-author of the study Atif Ansar.

“Evidence suggests that modular solutions including wind, solar, and on-site combined heat, cooling, and power plants provide compelling alternatives, both financially and environmentally.”

The findings were published in the journal *Nature*. Previous analysis by researchers had shown the costs of constructing dams was too high to provide good value financially, but the ecological impacts had not been measured.

For the first time, scientists have used a dam environmental vulnerability index (DEVI) which quantifies the negative ecological impacts of dams. In the study, scientists urged the energy sector to join planning and management initiatives aimed at protecting the basin.

TALKING POINT

Will work in trenches soon become out of date as the industry seeks new, safer construction methods? asks John Patch

In the last five years there have been 217 fatalities in the construction sector with a significant number attributed to excavations or activities associated with excavations.

The biggest killer remains falls from heights, predominantly from or through roofs. It could be argued, therefore, that excavations do not present a major problem, except that the statistics hide an underlying issue which is that there are thousands of injuries and tens of thousands of near misses from trench and excavation incidents on an annual basis.

One of the underlying issues is hazard recognition; if you're on a roof, there is no doubt that it is hazardous; if you're down a hole, that same risk-aversion does not necessarily kick-in.

Furthermore, the installation of temporary works for deep excavations, that is excavations over 1m deep (as defined by the Health & Safety Executive) requires training, experience and knowledge. A poll of five universities, five construction colleges and five construction-based training organisations revealed a significant gap in excavation temporary support training; in fact, of the 15 surveyed only two provided trench support training.

The residential, commercial and industrial sectors are the areas where most excavations are carried out, either for

drainage or foundations. The drainage industry has done significant work to reduce frictional resistance of pipes to facilitate lower pipe gradients resulting in shallower, therefore safer, excavations.

The foundations industry

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believes that a more proactive approach should be taken with foundation excavation; indeed there are many organisations who believe that trenches deeper than 1.5m should, and could, be a thing of the past.

That is fairly radical stuff.

After all, the foundations sections of the guidance documents of the major warranty providers still quote 2.5m as the depth threshold below which foundations should be “engineered”. This threshold was brought in decades ago. Crucially, these guidelines consider it appropriate to apply “custom and practice” to excavation depths down to 2.5m. There are even depth calculator apps, which encourage anybody, qualified or not, to design an

excavation depth up to 2.5m deep.

The Association of Specialist Underpinning Contractors (ASUC) has recently committed to raising that threshold from 2.5m to 1.5m. ASUC's members, which started with basement contractors but more recently include contractors from the growing engineered foundations sector, are committed to safer, sustainable and cost effective design and construction of foundations for all buildings and structures.

In this day and age of safer methods of construction, competency assessments, increased responsibilities for designers, we should not, and must not continue to dig deep trenches where viable alternatives readily exist.

And we invite those people and organisations in positions of power, authority and influence to help to spearhead this exciting transition from outdated methods of construction to modern, safer and environmentally friendlier methods of construction.

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