

## SITE C CLEAN ENERGY PROJECT

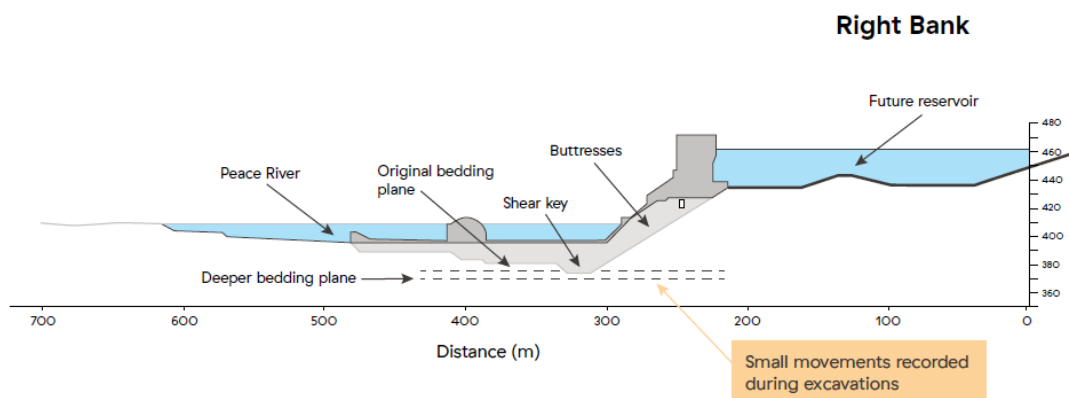
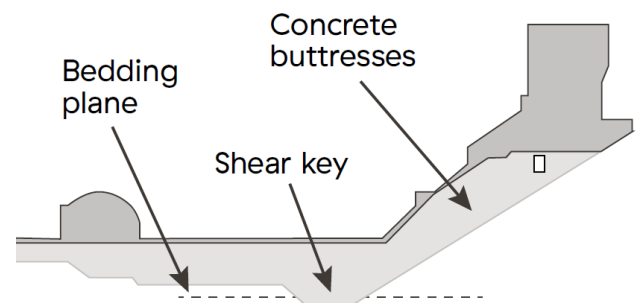
# RIGHT BANK FOUNDATION ENHANCEMENTS

BC Hydro is building Site C for the next 100 years. The engineering process that has been followed throughout the entire project is consistent with international best practices and the highest safety standards and has been reviewed by the independent Site C Technical Advisory Board.

BC Hydro will implement safety measures, reviewed and endorsed by two international experts, to ensure the right bank structures are safe over the long operating life of Site C.

### Foundation issue:

- Large concrete buttresses are being built at Site C. These buttresses, built underneath the powerhouse and spillway, form part of these structures and serve as a deep foundation.
- One of the project's design objectives is to avoid movements of the buttresses, as the concrete structures built on top of them (and the generating equipment that will eventually be installed in the powerhouse) cannot accommodate even small movements without damage. Another design objective is to avoid further movements that could occur when the reservoir is filled, or if excessive water from the reservoir seeps into the bedrock foundation and builds up behind the buttresses.
- The buttresses are built by excavating and replacing the upper layers of rock with roller-compacted concrete. The buttresses are embedded into their bedrock foundations forming a 'shear key,' which acts like a lock to enhance the stability of the hydroelectric concrete structures. The shear key extends the bottom of the concrete structure deeper into the foundation. The key cuts through underlying bedding planes, which enhances the stability of the buttresses.
- During construction of the powerhouse and spillway buttresses, sensitive instruments monitored the bedrock foundation below and behind the buttresses for movements.
- Through this work, BC Hydro identified small movements (millimetres) along a thin bedding plane located below the bottom of the concrete buttresses' shear key.



### The solution:

- BC Hydro has identified a two-part solution to improve the stability of the right bank structures:
  - extend the foundation deeper into the rock
  - reduce water pressure that can build up in the bedrock foundation
- The first part of the solution is to improve the strength of the concrete buttresses beneath the right bank structures by anchoring the buttresses deeper into the rock below.
- Vertical piles (large steel pipes filled with concrete) will extend the function of the shear key by drilling through the deeper bedding plane into the stronger rock below it.
- There will be up to 125 piles installed, each up to 2.5 metres in diameter. The piles will extend the foundation a further 15 to 25 metres into the bedrock.
- The second part of the solution is to improve the water tightness of the approach channel. The approach channel directs water around the earthfill dam and into the generating station. BC Hydro will enhance the approach channel liner and improve drainage to prevent water from seeping into the foundation
- Work on the foundation enhancements is expected to begin this year. BC Hydro expects to complete this work by the end of 2023.
- The safety criteria established by BC Hydro and the project designers for the right bank foundation enhancements are consistent with the dam safety guidelines of the Canadian Dam Association and international best practices. This is confirmed by independent, world-leading dam experts.

