

End Bearing Piles

End bearing piles are designed to transfer the load of above ground structures directly to either bedrock or to a permanent ice layer through the end bearing surface of the pile. The pile acts like a column which bears directly on the bedrock or permanent ice layer. End bearing piles to bedrock are often used for large structures. However, they can be considered costly or impractical if the structure load is high, if the soil is bouldery, or transportation to the site is a challenge. The type and size of the pile will be determined by the available materials, cost, labor, and site conditions. Piling foundations have advantages because they can be constructed with minimum disturbance to the thermal regime and also isolate the structure from seasonal changes. Piles can be timber, concrete, steel, or composites. Height adjustment mechanisms can be integrated into the foundation to account for differential settling of the piles.

End bearing piles to the permanent ice layer are used throughout arctic regions. While engineering calculations will dictate the proper sizes and depths of end bearing piles to the permanent ice layer, the depth of piles are generally equal to at least twice the active layer thickness, and preferably more so in order to resist heave forces coming from the active layer during the winter. These foundation types are at risk of potential climate change impacts to permafrost.



