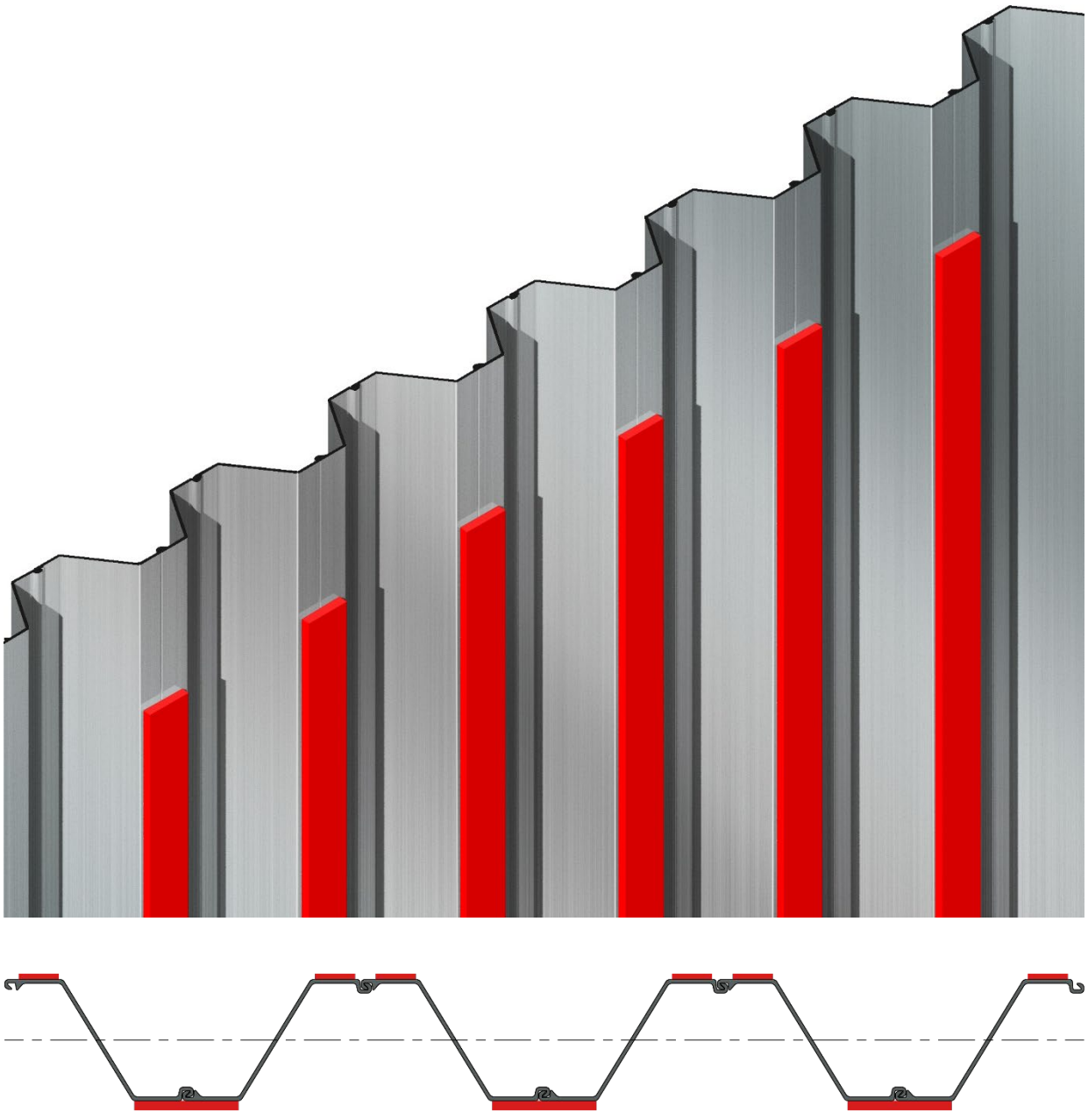
# HIGH MODULUS Z SHEET PILE WALL

**- Robust and Resilient Wall System with High Cost Efficiency -**



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# Chapter 1 Introduction

The purpose of this document is to provide model practice guidelines for the design of the High Modulus Z Sheet Piles to be installed, using the Press-in Piling Method.

The Press-in Piling Method is commonly used worldwide because of its very quiet operation, ultra-low vibration, and flexibility of sizes to suit different wall properties and subsoil conditions.

The main attributes of the High Modulus Z Sheet Piles are efficiency of physical properties and versatility. The efficiencies of physical wall properties can be optimized in view of the flexibility of plates size for the ground conditions and the form of the loading.

# Chapter 2 Wall Configuration

High Modulus Z Sheet Pile is a combined retaining wall with great bending stiffness, which incorporates the following elements.

High Modulus Z Sheet Pile Wall

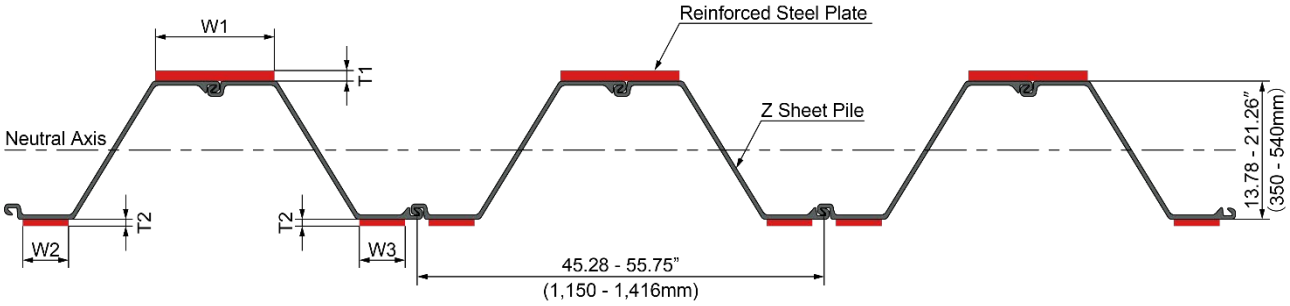


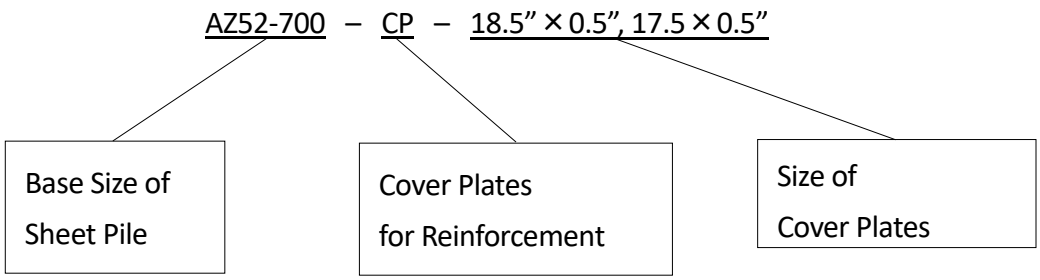

Figure 1. Wall Configuration

# Chapter 3 Wall Properties

The high modulus Z sheet piles are installed to a depth necessary to achieve the required passive toe resistance to reach static equilibrium with an adequate factor of safety.

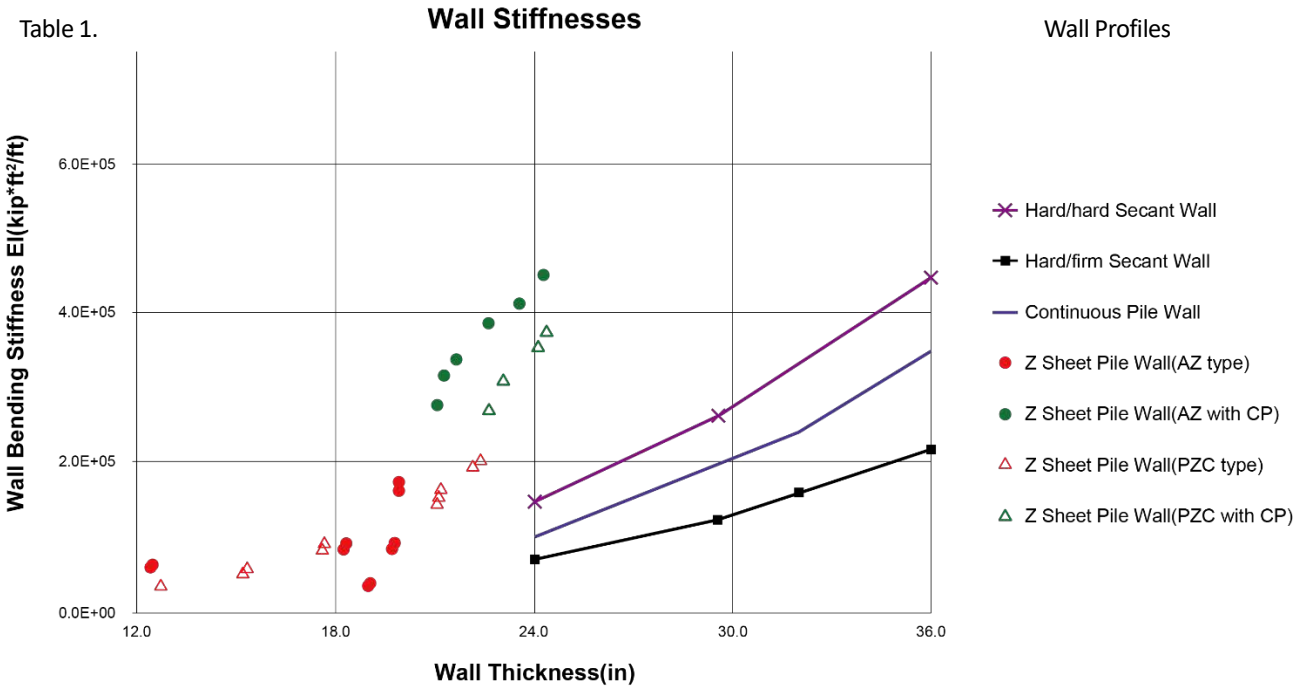
## 3-1 Denomination of the Steel Plates

The profiles of the High Modulus Z Sheet Pile Walls are related to their dimension as follows: -




## 3-2 Comparison Table of High Modulus Z Sheet Pile Wall and RC Wall

Table 1.



# Chapter 4 Retaining Wall Design

## 4-1 General

Both the steel sheet pile and steel plates act as the primary structural element of the wall. In order to have an economically efficient wall design, the steel plates should only be placed along the depths of the wall where the moment and lateral deflections are the highest. In most cases, the steel plates can be connected to the sheet pile through fillet welds. The size and length of the welds will depend on the stresses produced by the lateral soil loads for each specific case.

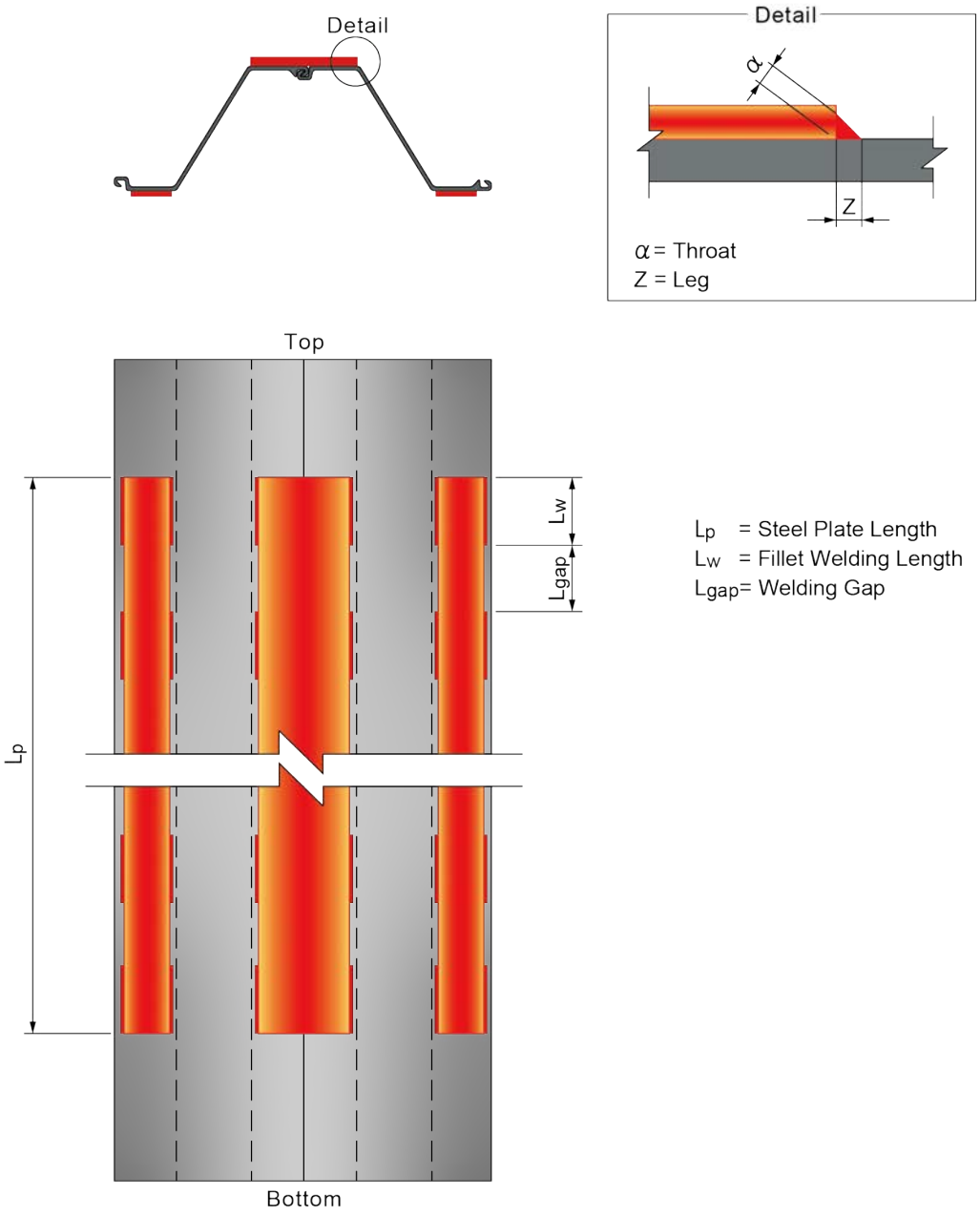



Figure 2. Welding Configuration

## 4-2 Embedded Depth of High Modulus Z Sheet Pile Wall

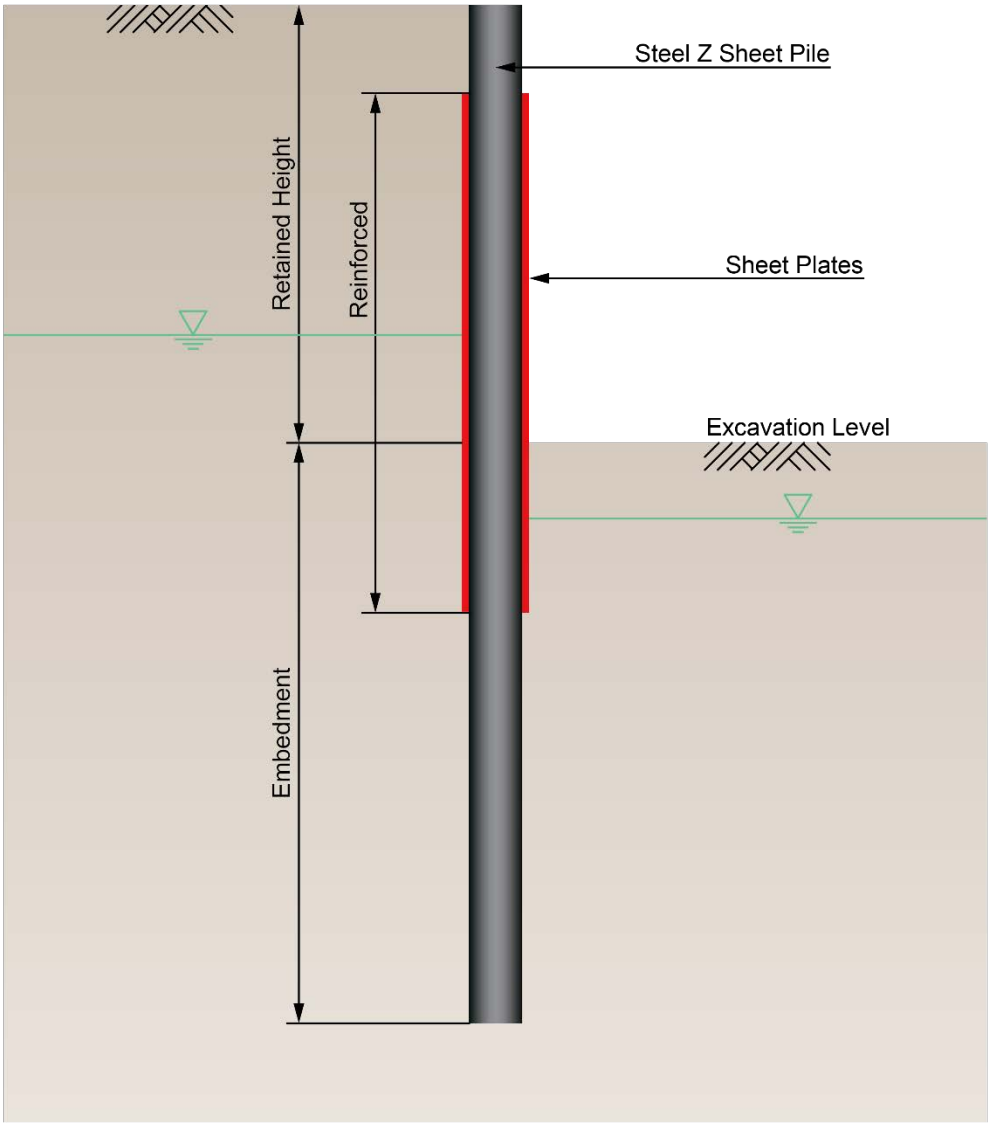



Figure 3. Cross Section (Retaining Wall)

### 4-2-1 Embedded Depth of High Modulus Z Sheet Piles $D_{pri}$

Limit equilibrium methods can be used to assess the required embedded depth of sheet piles. The methods use an approach based on soil and groundwater parameters that tend towards worst credible values and assume that the full strength of the ground is mobilized uniformly around the wall so that the wall is at the point of collapse.

Design parameters could govern the embedded depth of the High Modulus Z Sheet Piles are:

- stratigraphy;
- soil unit weight;
- soil strength ($c_u$, c', ϕ');
- groundwater levels;
- surcharge loads;
- horizontal impact loads;
- retained height;
- durability/corrosion rates; and
- propped or cantilevered.

## 4-3 Durability

The effective life of the High Modulus Z Sheet Pile Wall depends upon the combined effects of imposed stresses and corrosion.
Performance is clearly optimised where low corrosion rates exist at positions of high imposed stresses.

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