CHAPTER 14

SHEET STEEL PILING

INTRODUCTION

Steel sheet piling is traditionally furnished as a hot rolled section that can be interlocked together to form continuous walls. Steel sheeting or sheet piling is used in the construction industry on a world wide basis where bank erosion is to be prevented or earth retained, as in the case of trenches, cofferdams, bulkheads and cutoff walls. Comparatively lightweight cold-formed steel sheet sections are being economically used for these purposes where the depths and loads do not exceed strength limitations.

The advantages of steel sheeting include:

1. Units to suit various service conditions.
2. Easy to handle because of light weight and size.
3. Ease and speed of driving.
4. Ample strength for many applications.
5. Resistance to damage to the driving and leading edges.
6. Ability to be readily salvaged and re-used frequently.
7. Ease of storage and shipping.
8. Nestable for compactness in shipping.

Typical cold-formed sheet steel piling products are illustrated in Table 14.1. There are many others types to choose from for other applications. Consult manufacturers for further information.

DRIVING

A hand maul or light pneumatic hammer is satisfactory for driving steel sheeting in a trench where the bottom can be excavated ahead of driving and when the earth loads on the sheeting are light.

Cold-formed sheet steel piling prevents erosion.

If the sheeting is to be driven in advance of excavation or the side pressures are heavy, then heavier equipment, such as a vibrating driver, drop hammer, or a pneumatic pile-driver, will be needed. Under these conditions, the use of heavy equipment will allow for faster driving with less injury to the sheeting. Light equipment for this type of driving tends to batter the top edge of the sheeting and slows driving.

The driving equipment must be capable of supplying ample foot-pounds of energy to move the sheeting easily. A driver that strikes a heavy blow with a low velocity at impact will do the most work with least damage to the sheeting. A driving head can often be supplied by the sheeting manufacturer to aid in driving. A long, heavy sheet pile requires more energy to start it moving than a light, short section.

Soil friction on the sheeting surfaces and force required for penetration are difficult to evaluate. Certainly, selecting the appropriate driving equipment requires knowledge of local conditions and experience with various types of equipment. Vibratory equipment has been found suitable for driving sheeting in some granular soils.

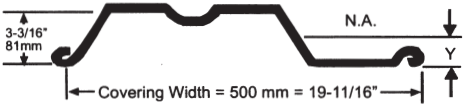
SHORE PROTECTION

Lightweight, inexpensive steel sheeting is now offered as a shore protection package for use in protecting lakeshores and river banks in fresh water applications. Complete with top caps, walers and prefabricated deadmen, as required, these products offer excellent, aesthetic solutions to shore protection concerns.

PROTECTIVE COATINGS

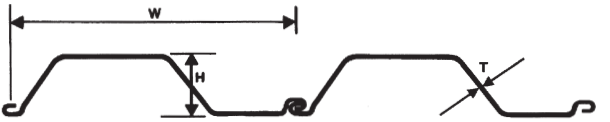
Where the sheeting is permanent, its structural strength and aesthetic appearance can be protected with galvanized or aluminized Type 2 coatings for long life and performance.

Table 14.1 Sectional properties for sheet steel piling

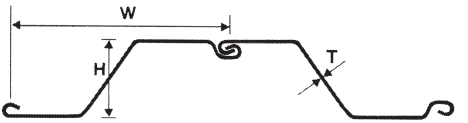


Thickness, mm (in)	Area for Section Width (500mm), mm^2 (in^2)	Y, mm (in)	Moment of Inertia per Section Width (500 mm), mm^4 (in^4)	Modulus per Section Width (500 mm), mm^3 (in^3)	Section Modulus per unit length of Wall, mm^3/m (in^3/ft)	Weight (Fascial Area), kg/m^2 (lb/ft^2)
3.5 (.135)	2375 (3.68)	42.4 (1.67)	$2.57x10^6$ (6.17)	$6.06x10^4$ (3.70)	121.1 (2.25)	38.2 (7.82)
4.2 (.164)	2905 (4.50)	42.8 (1.69)	$3.15x10^6$ (7.57)	$7.36x10^4$ (4.49)	$147.2x10^3$ (2.74)	46.7 (9.56)

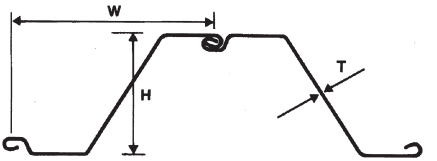
Table 14.1 Sectional properties for sheet steel piling *continued...*



Thickness, T, mm (in)	Height, H, mm (in)	Nominal Width, W, mm (in)	Area for Section Width (500mm), mm² (in²)	Moment of Inertia per unit length of Wall, mm^4/m (in^4/ft)	Section Modulus per unit length of Wall, mm^3/m (in^3/ft)	Weight (Fascial Area), kg/m^2 (lb/ft^2)
4.1 (0.164)	105 (4.12)	500 (19.7)	2830 (4.39)	9.61x10ᵛ (7.02)	178x10ᵛ (3.30)	44.7 (9.17)



Thickness, T, mm (in)	Height, H, mm (in)	Nominal Width, W, mm (in)	Area for Section Width (610mm), mm² (in²)	Moment of Inertia per unit length of Wall, mm^4/m (in^4/ft)	Section Modulus per unit length of Wall, mm^3/m (in^3/ft)	Weight (Fascial Area), kg/m^2 (lb/ft^2)
7.5 (.295)	221 (8.72)	610 (24.0)	6650 (10.3)	$92.5x10^6$ (67.7)	$839x10^3$ (15.6)	85.9 (17.6)



Thickness, T, mm (in)	Height, H, mm (in)	Nominal Width, W, mm (in)	Area for Section Width (673mm), mm² (in²)	Moment of Inertia per unit length of Wall, mm^4/m (in^4/ft)	Section Modulus per unit length of Wall, mm^3/m (in^3/ft)	Weight (Fascial Area), kg/m^2 (lb/ft^2)
12.0 (0.472)	418 (16.47)	673 (26.5)	$13.87x10^3$ (21.5)	$579x10^6$ (424)	$2.76x10^6$ (51.5)	171 (35.0)

Cold-formed steel sheet piling serves as end wall for CSP.