ESC STEEL PROVIDES HIGH GRADE STEEL PILING PRODUCTS
TO NORTH AMERICA & SOUTH AMERICA

WWW.ESCSTEEL.COM

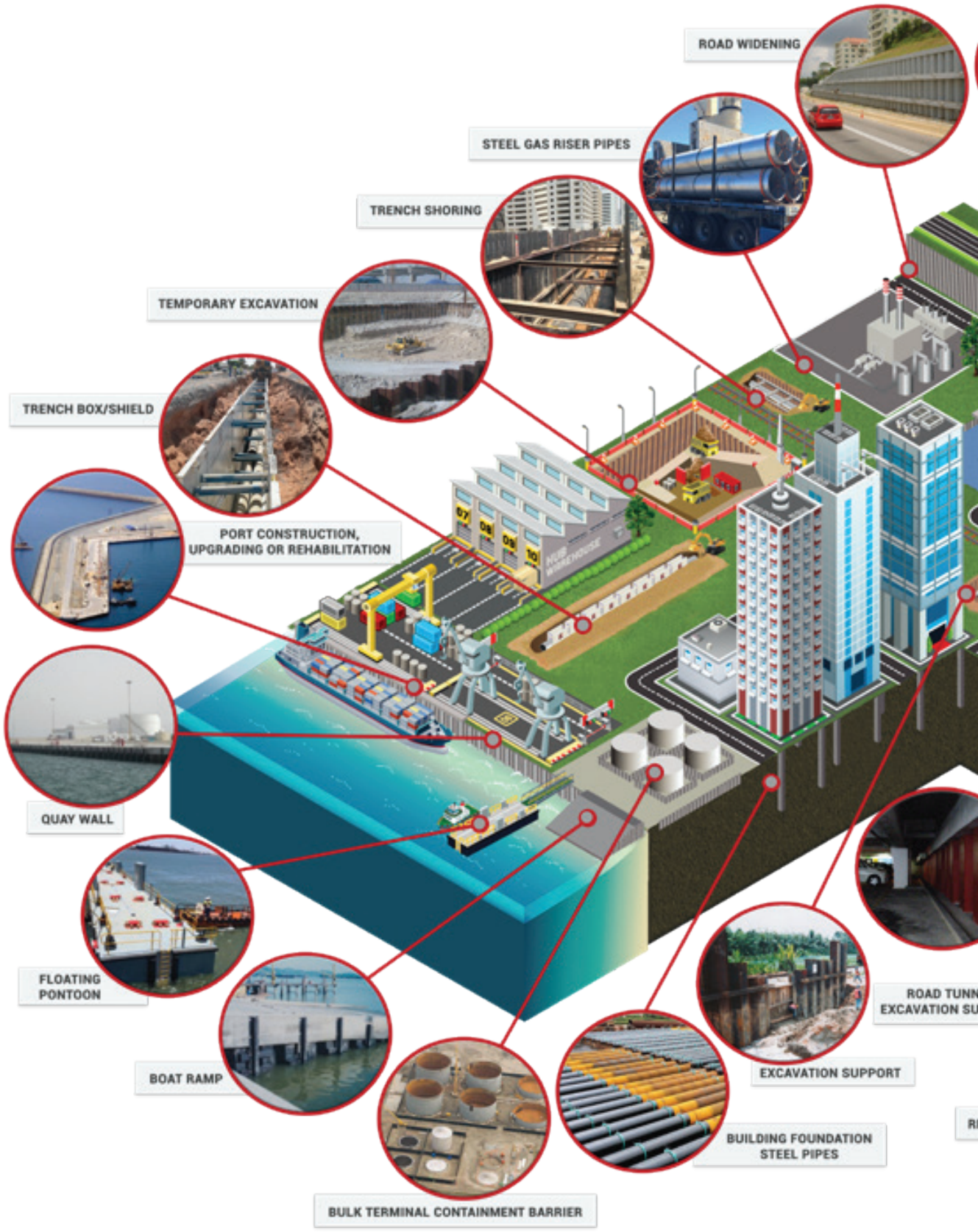
MARINE & FOUNDATION PILING CATALOG

2024 EDITION

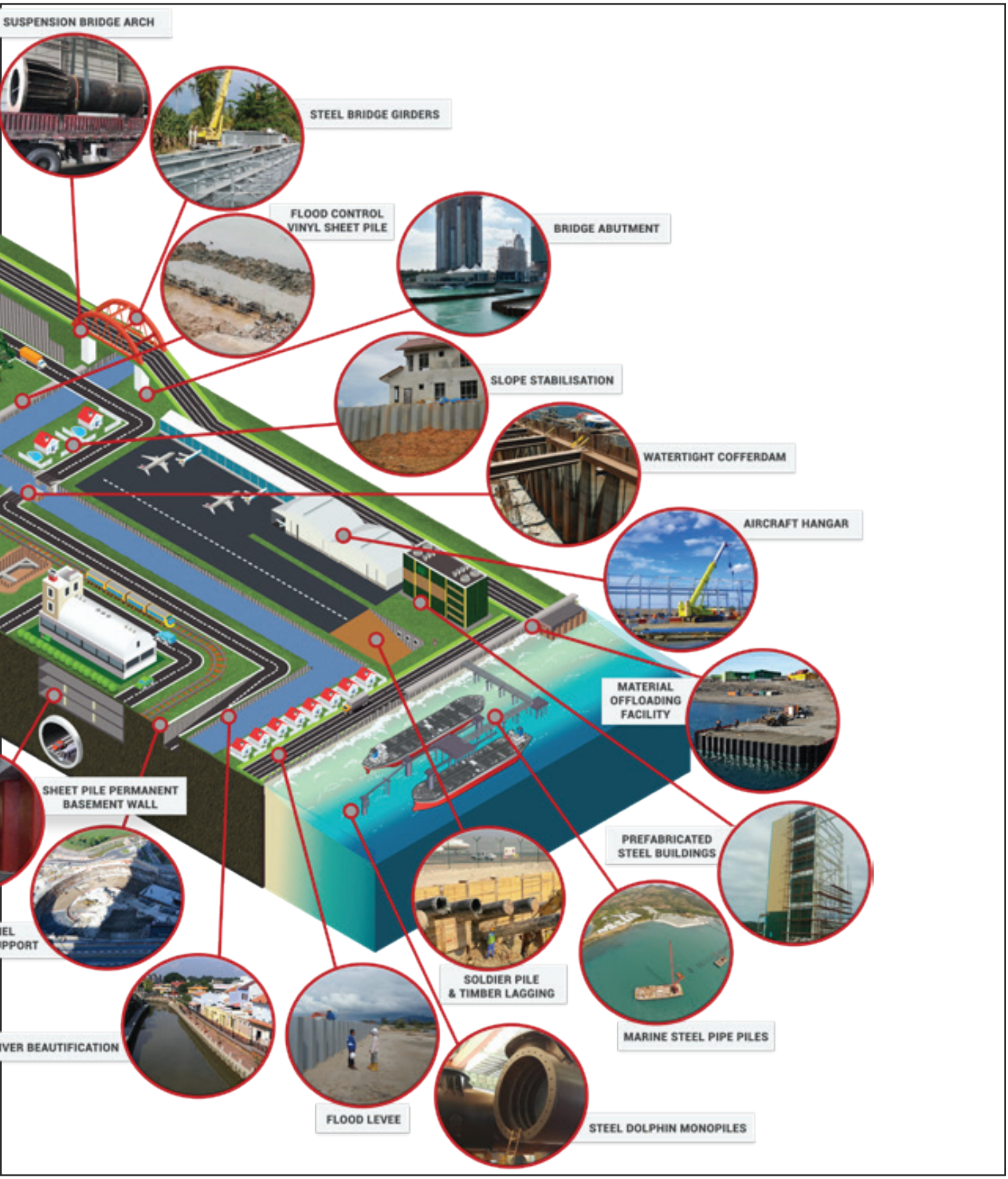
STEEL SHEET PILES
COMBINED WALL SYSTEMS
STEEL PIPE PILES
H PILES
TIE ROD SYSTEMS
PILING ACCESSORIES
CATHODIC PROTECTION
STRUTTING SYSTEM
CORROSION PROTECTION COATINGS

ESC STEEL LLC

DOWNLOAD THE "ESC GROUP" APP



ESC PRODUCT APPLICATIONS
Isometric Map



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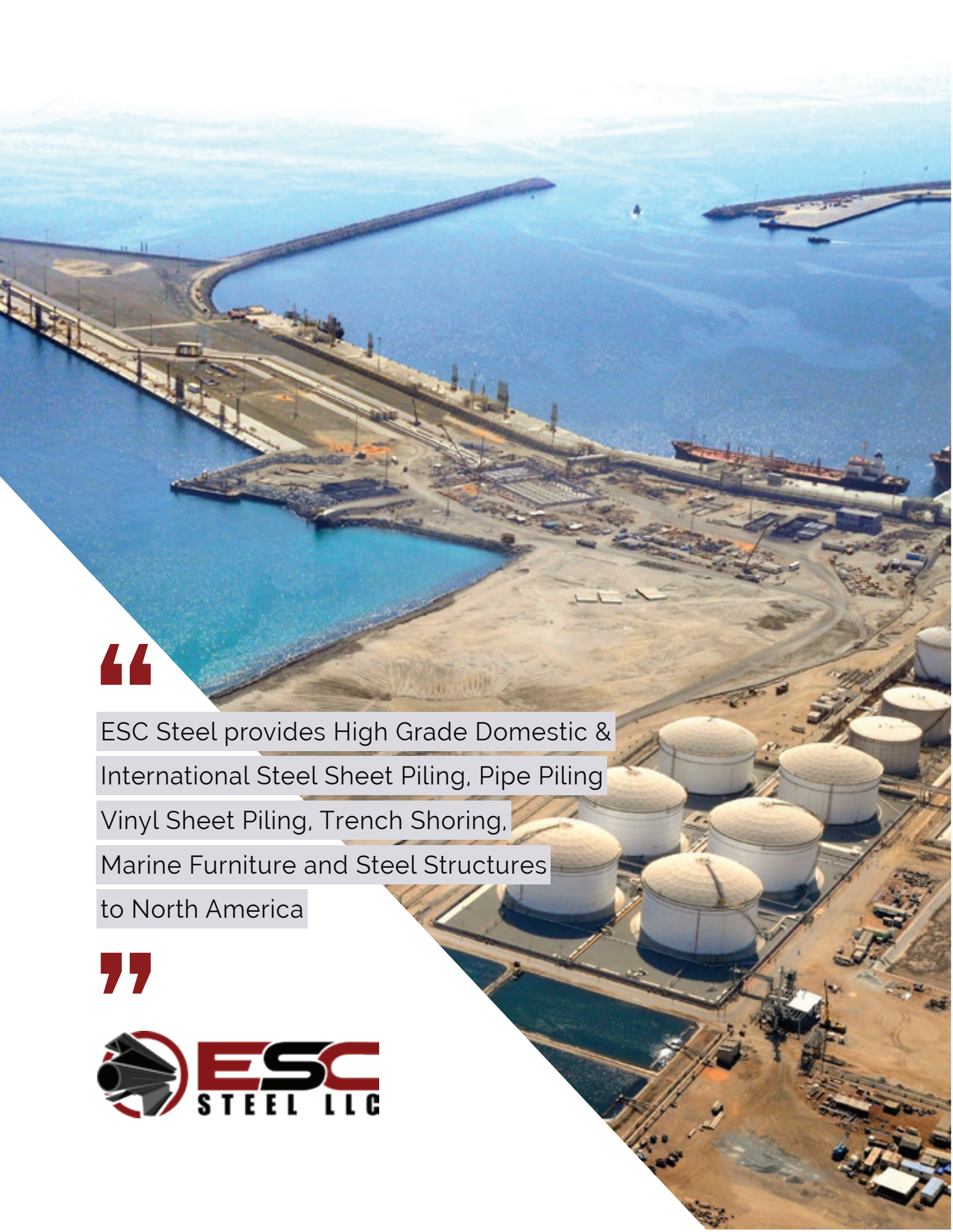

“

ESC Steel provides High Grade Domestic &
International Steel Sheet Piling, Pipe Piling
Vinyl Sheet Piling, Trench Shoring,
Marine Furniture and Steel Structures
to North America

”

ESC
STEEL LLC

About ESC
History

ESC Group continues to achieve significant milestones as it goes beyond 34 years since its first sheet pile was driven at Magnetic Island, Australia in 1986.

The inception of ESC occurred in 1986, when the founding partners envisaged a wide profile sheet pile unlike other traditional sheet piles. ESC's first sheet pile was driven in 1986, in Magnetic Island in the Great Barrier Reef, Australia.

About ESC

Then expansion into Asia in 1991 (firstly Singapore then Malaysia and onto China and more) and set up in the Middle East in 2004. ESC arrived in the USA in 2012.

Now located in twenty (20) countries and counting, ESC has so far established manufacturing and engineering offices in different regions primarily in Asia, the Middle East and North America. This growth through project awards and market footprint spearheaded its recognition and popularity in the global market helping it become one of the foremost trusted products and service providers with delivery of significant projects all over the world.

ESC, over the years, has evolved into an internationally certified organization with full capacity in Engineering and Design, Project

Management, Research and Development, Manufacturing, Supply, and Construction.

Heading up operations in the USA is ESC Steel LLC which is an integral part of the Group and now has locations in both North Carolina and Texas. The activities for the entire of North and South America are coordinated from these offices along with those in Mexico and Brazil.

ESC Global Locations

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ESC Engineering Team
Capabilities

ESC's engineering team provides a responsive service covering various disciplines from geotechnical engineering, civil engineering, manufacturing engineering and materials engineering. Situated in offices at all continents around the world, with a tight-knit communication network, ESC has grown a highly technical team. The experience range of each ESC engineer varies between 1 year all the way up to over 50 years. Technical qualifications include Professional engineers, quality control and project management certification. ESC maintains up-to-date cutting edge software alongside internal and external training.

ESC is adept at conforming to various international design standards, covering European, American and other regional codes. On top of this, ESC is able to conform to client and project specific standards.

As part of its ISO certification, ESC ensures that all documentation is of a globally respected standard. ESC invests in Research & Development all the way from inception to the present. With over 20 global patents, ESC prides itself on developing it's internal technology and contributing to the overall civil engineering industry.

Engineering Capabilities

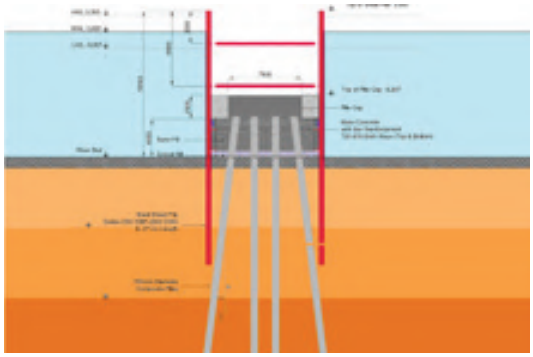
- ✓ Geotechnical Analysis
- ✓ Structural Analysis
- ✓ Full Retaining Wall Detailed Design - Plaxis, ReWARD, D-Sheet Piling
- ✓ Sheet Pile and Combi Wall Design & Optimisation
- ✓ Fabrication Shop Drawings
- ✓ Project Construction Drawings
- ✓ Front End Engineering Design (FEED) & Concept Studies
- ✓ Project Management
- ✓ 3D Visualisation & Animations
- ✓ Research & Development of new materials, configurations and analysis methods
- ✓ Professional Engineering endorsement
- ✓ Forensic Studies of failed structures
- ✓ Global Patents in Sheet Piling Technology
- ✓ Corrosion Protection Design
- ✓ Structural Steel Fabrication Design
- ✓ Marine Systems Components Design
- ✓ Coating System Design

What Our Engineers Say?

"ESC Engineers are all degree qualified and are well equipped to provide high quality engineering service free of charge to complement our product line."

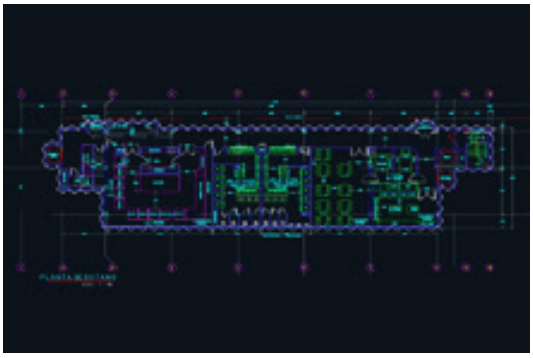
Engineering

Capabilities



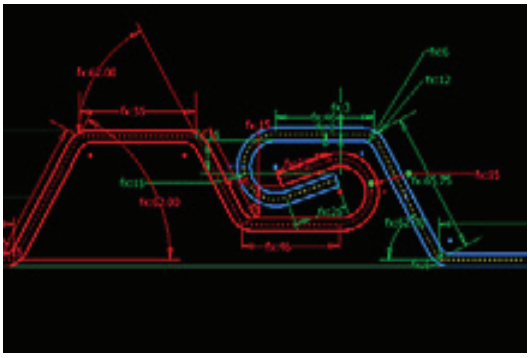
FEASIBILITY STUDIES

ACADEMIC PRESENTATIONS

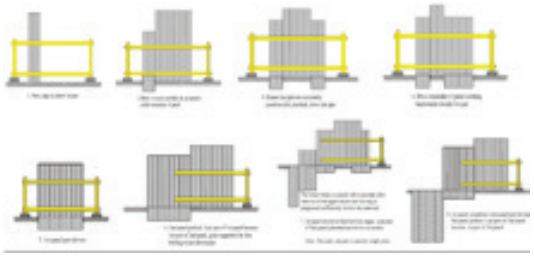


SHEET PILE LAYOUT DRAWINGS

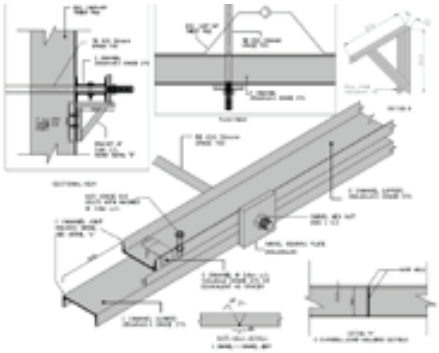
DESIGN QUALIFICATION TESTING



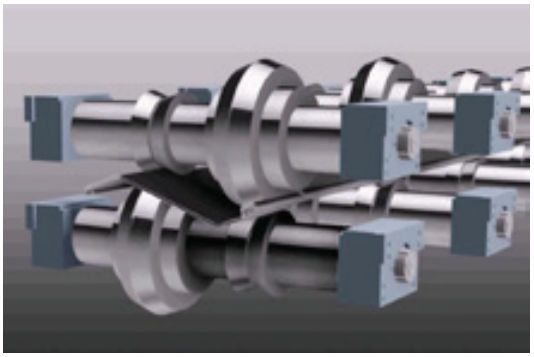
SHEET PILE PROFILE DESIGN



INSTALLATION SEQUENCES
& EQUIPMENT SETTINGS



FABRICATION & ASSEMBLY DRAWINGS



3D VISUALIZATION & ANIMATION

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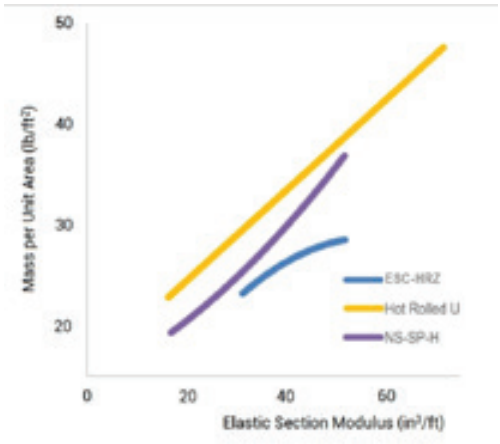
ESC Hot Rolled Sheet Piles
Introduction

The first Hot Rolled sheet pile was manufactured over 100 years ago. To manufacture Hot Rolled Sheet Pile Sections, the raw steel material is heated to over 2192°F (1200°C) upon which is formed to its respective sheet pile profile. Plastic deformation to the finished shape is easier due to the higher temperature during forming. Various interlocks configurations and thicknesses in different sections of the profile are possible.

Various construction configurations can be used for different applications. The interlocked sheet pile walls can be installed to create a rigid barrier for both earth and water. Bending forces and lateral pressures are also resisted by the combined profile. ESC can offer 4 different types of sheet pile which covers virtually all applications for both temporary and permanent usage.

The ESC Advantage

- ✓ Global Supply Network
- ✓ Unparalleled Technical Support
- ✓ Competitive Pricing
- ✓ Free of Charge Design
- ✓ Supplied project volumes between 8—20,000 MT+
- ✓ Full Suite of Sheet Pile Accessories



Note the lines shown above are trend-lines. The individual profiles may lie at points away from this line. Please see the relevant catalog page for exact specifications.

Sheet Pile Profiles

ESC-HRZ SERIES

FL SERIES

PZ SERIES

What Our Engineers Say?

"ESC can offer Hot Rolled Sheet Piles from around the world, to enable a responsive service and swift delivery to your project site."

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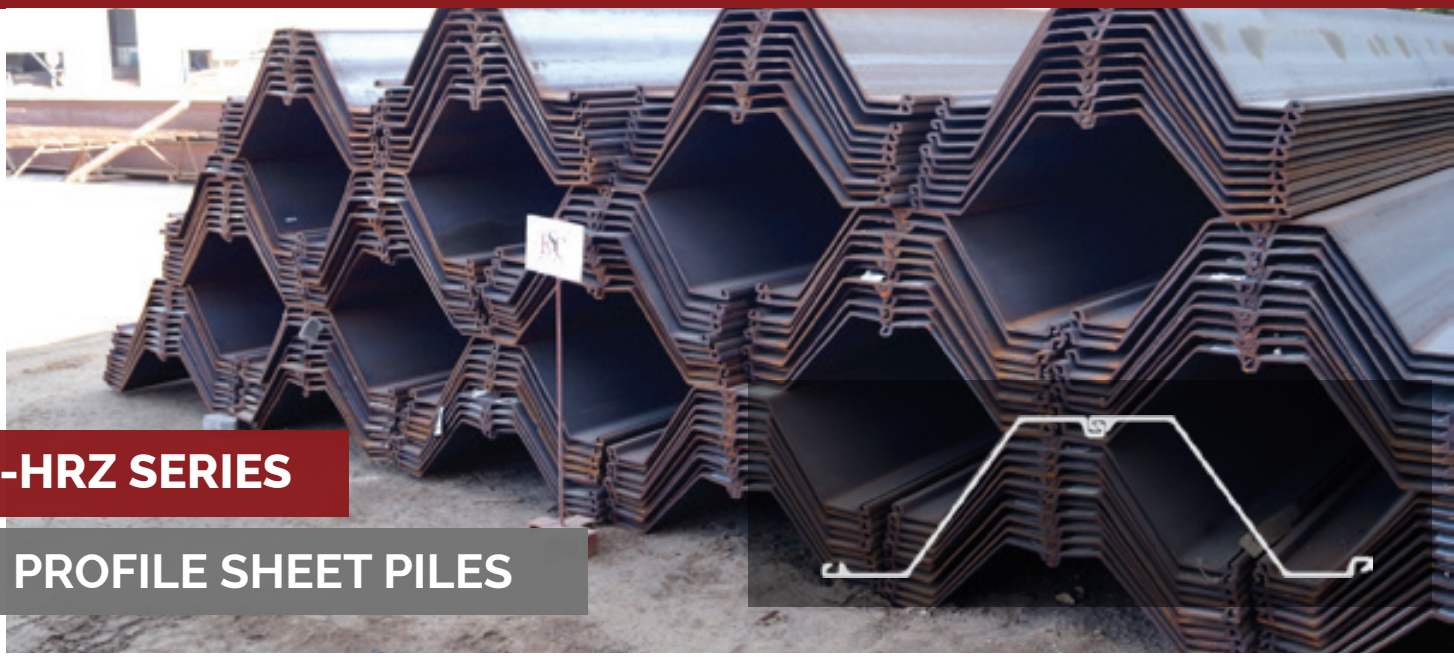
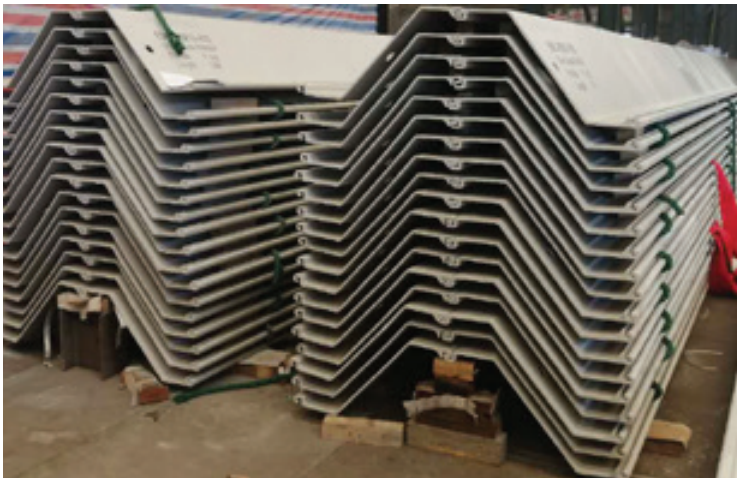


ESC-HRZ SERIES

Z PROFILE SHEET PILES

HOT ROLLED Z SHEET PILE FEATURES A DURABLE INTERLOCK THAT PROVIDES EFFECTIVE WATER TIGHTNESS CAPABILITIES

ESC is proud to present the Hot Rolled ESC-HRZ Profile Sheet Piles. The design features interlocks that are located symmetrically on both sides of the neutral axis. The web is continuous, thus the section modulus and shear load transfer are optimised. The ESC-HRZ sheet pile features a durable interlock that provides effective water tightness capabilities. The profile design has a very competitive strength to weight ratio. Due to a deep profile, the design features a higher Inertia resulting in reduced deflection. This higher inertia together with the option of higher steel grades (62.36 ksi/430 Mpa) provides the most economic solution that meets the performance requirements. The piles are usually shipped in pairs to accommodate faster installation and better alignment.



Order Options	
Steel Grades	ASTM A572 Gr.50, Gr.55, Gr.60 & Gr.65
	Other grades available
Lengths	19.7ft to 101.7ft
	Can be spliced to greater lengths
	Can be produced to project specific lengths
Delivery Options	Single or Pairs
	Pairs either loose, welded or crimped
	Lifting Hole
	By container (38.7ft or less) or Break Bulk
	Corrosion Protection Coatings

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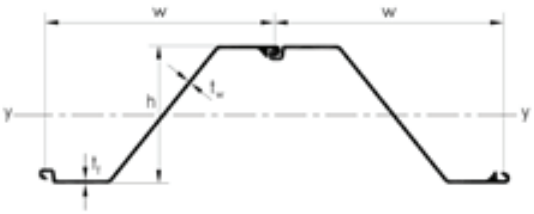

Interlocking Clutch

SECTION	WIDTH	HEIGHT	THICKNESS		CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	Flange (t_f)	Web (t_w)		Per Pile	Per Wall			
	in	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-HRZ12-770	30.338	13.554	0.335	0.335	14.42	48.9	19.4	23	157	6.43
	770	344	8.5	8.5	93	72.8	94.5	1,250	31,300	1.68
ESC-HRZ13-770	30.338	13.554	0.355	0.355	15.1	51.2	20.3	24	164	6.43
	770	344	9	9	97.4	76.2	99	1,300	22,430	1.96
ESC-HRZ14-770	30.338	13.593	0.374	0.374	15.78	53.5	21.2	25	171	6.43
	770	345	9.5	9.5	101.8	79.6	103.4	1,360	23,370	1.96
ESC-HRZ17-700	27.58	16.548	0.335	0.335	14.42	49.3	21.4	32	266	6.46
	700	420	8.5	8.5	93	73.3	104.7	1,740	36,430	1.97
ESC-HRZ18-700	27.58	16.587	0.355	0.355	15.1	51.5	22.4	34	277	6.46
	700	421	9	9	97.4	76.7	109.6	1,810	38,000	1.97
ESC-HRZ19-700	27.58	16.587	0.374	0.374	15.78	53.9	23.5	35	289	6.46
	700	421	9.5	9.5	101.8	80.2	114.6	1,880	39,580	1.97
ESC-HRZ20-700	27.58	16.627	0.394	0.394	16.46	56.2	24.5	36	300	6.46
	700	422	10	10	106.2	83.7	119.5	1,950	41,160	1.97
ESC-HRZ24-700	27.58	18.085	0.441	0.441	18.93	64.4	28	45	408	6.73
	700	459	11.2	11.2	122.1	95.8	136.9	2,440	55,950	2.05
ESC-HRZ26-700	27.58	18.124	0.481	0.481	20.34	69.2	30.1	48	437	6.73
	700	460	12.2	12.2	131.2	103	147.1	2,600	59,840	2.05
ESC-HRZ27-700	27.58	18.163	0.5	0.5	21	71.5	31.1	50	450	6.73
	700	461	12.7	12.7	135.5	106.4	152	2,680	61,640	2.05
ESC-HRZ28-700	27.58	18.163	0.52	0.52	21.75	74	32.2	51	465	6.73
	700	461	13.2	13.2	140.3	110.1	157.3	2,760	63,740	2.05
ESC-HRZ36-700	27.58	19.661	0.591	0.441	123.45	79.8	34.7	67	655	7.15
	700	499	15	11.2	151.3	118.7	169.6	3,600	89,750	2.18
ESC-HRZ38-700	27.58	19.7	0.63	0.481	24.99	85	37	71	693	7.15
	700	500	16	12.2	161.2	126.5	180.7	3,800	94,980	2.18
ESC-HRZ40-700	27.58	19.739	0.67	0.52	26.52	90.2	39.3	74	732	7.15
	700	501	17	13.2	171.1	134.3	191.8	4,000	100,220	2.18
ESC-HRZ42-700	27.58	19.661	0.709	0.552	28.23	96.1	41.8	79	770	7.12
	700	499	18	14	182.1	143	204.2	4,230	105,540	2.17
ESC-HRZ44-700	27.58	19.7	0.749	0.591	29.76	101.3	44.1	83	810	7.12
	700	500	19	15	192	150.7	215.3	4,440	110,940	2.17
ESC-HRZ46-700	27.58	19.739	0.788	0.63	31.29	106.5	46.4	86	848	7.12
	700	501	20	16	201.9	158.5	226.5	4,640	116,160	2.17
ESC-HRZ48-700	27.58	19.818	0.867	0.591	31.47	107	46.6	89	879	7.12
	700	503	22	15	203	159.3	227.6	4,790	120,470	2.17
ESC-HRZ50-700	27.58	19.858	0.906	0.63	32.92	112	48.8	92	915	7.12
	700	504	23	16	212.4	166.7	238.2	4,970	125,360	2.17
ESC-HRZ52-700	27.58	19.897	0.946	0.67	34.43	117.1	51	96	952	7.12
	700	505	24	17	222.1	174.3	249	5,160	130,400	2.17

*excludes internal section of interlock

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ESC-HRZ SERIES

OTHER CONFIGURATIONS

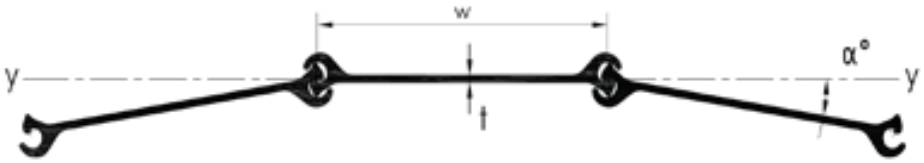
Box King Piles (fabricated out of 4 Z Piles)

Box King Piles (fabricated out of 2 ESC-HRZ Piles & 1 Cold Formed U Pile)

Jagged Wall

ESC-9E Hot Rolled Clutch Interlock (compatible with all ESC-HRZ Sheet Piles)

FL SERIES



The FL Series is a hot rolled straight web sheet pile profile. It features high interlocking clutch strength. It is ideal for circular structures and coffering. The FL Series Sheet Piles can be preassembled as one large cellular unit and dropped in a submerged location, where they can be driven in sequence.

Order Options	
Steel Grades	SYW295, SYW390, SYW430
	SY295, SY390
	S355GP, S430GP
	A572Gr50
Lengths	124.6ft maximum
Delivery Options	By container (38.7ft or less) or Break Bulk

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
FL1	19.69	1.77	0.37	7.42	41.46	25.27	1.66	2.89	4.56
	500	45	9.5	157.2	61.7	123.4	89	396	1.39
FL2	19.69	1.85	0.5	9.28	51.88	31.62	2.25	4.16	4.63
	500	47	12.7	196.7	77.2	154.4	121	570	1.41

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FURTHER DOMESTIC US OPTIONS

ESC-PZ SERIES

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-PZ22	22.0 *559*	9.00 *229*	0.375 *9.50*	6.47 *136.9*	40.3 *60.0*	22.0 *107.4*	18.10 *973*	84.38 *11,500*	4.48 *1.37*
ESC-PZ27	18.0 *457*	12.00 *305*	0.375 *9.50*	7.94 *168.1*	40.5 *60.3*	27.0 *131.8*	30.20 *1,620*	184.20 *25,200*	4.48 *1.37*
ESC-PZ35	22.6 *575*	14.90 *378*	0.600 *15.21*	10.29 *217.8*	66.0 *98.2*	35.0 *170.9*	48.50 *2,608*	361.22 *49,300*	5.37 *1.64*
ESC-PZ40	19.7 *500*	16.10 *409*	0.600 *15.21*	11.77 *249.1*	65.6 *97.6*	40.0 *195.3*	60.70 *3,263*	490.85 *67,000*	5.37 *1.64*

*excludes internal section of interlock

Project References

KAPALAMA TERMINAL, HAWAII

ABU DHABI, UAE

QUAY WALL PROJECT, TAIWAN

ROAD CONSTRUCTION PROJECT, MEXICO

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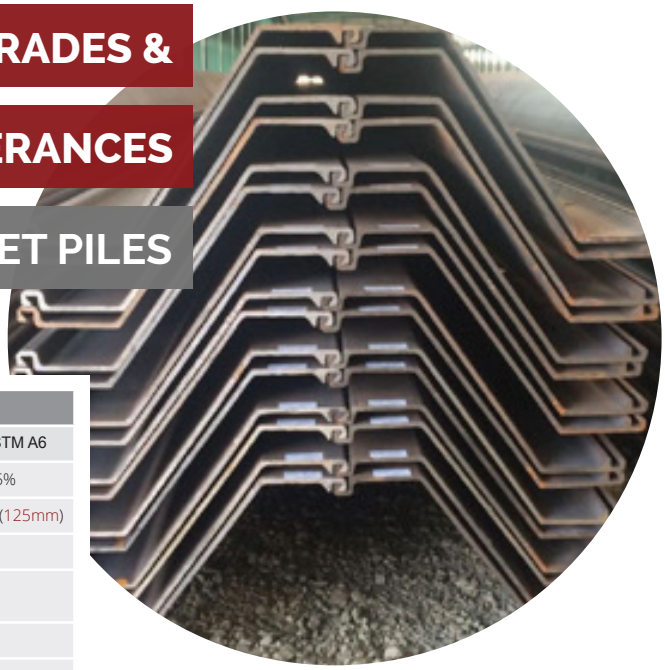
STEEL GRADES & MANUFACTURING TOLERANCES

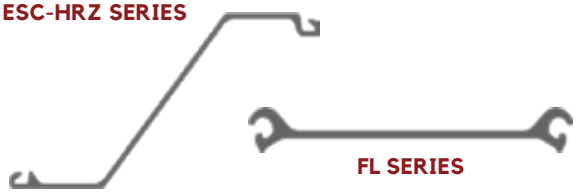
HOT ROLLED SHEET PILES



MANUFACTURING TOLERANCES

COMPONENT	ESC-HRZ SERIES		FL SERIES	
	BS EN10249-2	ASTM A6	BS EN10249-2	ASTM A6
Mass	± 5%	± 2.5%	± 5%	± 2.5%
Length	± 7.87" / 200mm	+ 5" (125mm)	± 7.87" / 200mm	+ 5" (125mm)
Height (≤ 7.87" / 200mm)	± 0.197" / 5.0mm		N/A	
Height (> 7.87" / 200mm & ≤ 11.81" / 300mm)	± 0.236" / 6.0mm		N/A	
Height (> 11.81" / 300mm)	± 0.276" / 7.0mm		N/A	
Thickness (≤ 0.335" / 8.5 mm)	± 0.0197" / 0.5 mm		± 0.0197" / 0.5 mm	
Thickness (> 0.355" / 8.5 mm)	± 6% of thickness		N/A	
Width of Single	± 2% of width		± 2% of width	
Width of Pair	± 3% of width		N/A	
Straightness	±0.2% of the length		±0.2% of the length	
Squareness of Ends	± 2% of the width		± 2% of the width	

ESC-HRZ SERIES



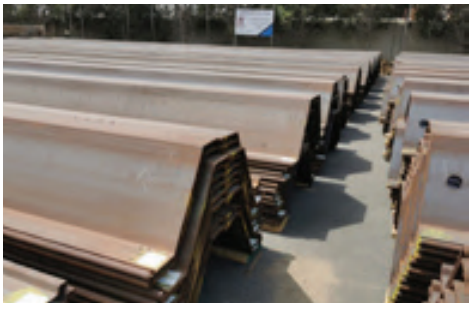
FL SERIES

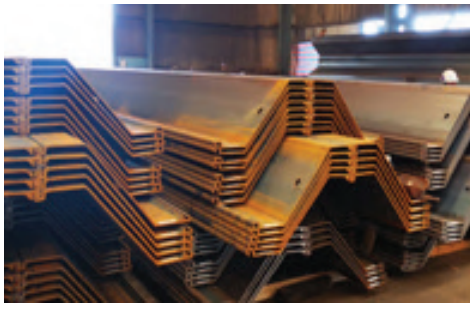
STEEL GRADES

Other Steel Grades are available on request. The Yield Point provided is applicable to thicknesses less than or equal to 0.63in (16mm).

CLASSIFICATION			MINIMUM YIELD STRENGTH		ULTIMATE TENSILE STRENGTH		MINIMUM ELONGATION
Region	Code	Grade	ksi	MPa	ksi	MPa	%
USA	ASTM A252	Grade 1	30	*205*	50	*345*	18
	ASTM A252	Grade 2	35	*240*	60	*415*	14
	ASTM A252	Grade 3	45	*310*	66	*455*	-
	ASTM A572	Grade 42	42	*290*	60	*415*	20
	ASTM A572	Grade 50	50	*345*	65	*450*	18
	ASTM A572	Grade 55	55	*380*	70	*485*	17
	ASTM A572	Grade 60	60	*415*	75	*520*	16
	ASTM A572	Grade 65	65	*450*	80	*550*	15
Canada	CSA 40.21	260W	38	*260*	86	*590*	20
	CSA 40.21	300W	44	*300*	90	*620*	20
	CSA 40.21	350W	51	*350*	94	*650*	19
	CSA 40.21	400W	58	*400*	100	*690*	16

CLASSIFICATION			MINIMUM YIELD STRENGTH		ULTIMATE TENSILE STRENGTH		MINIMUM ELONGATION
Region	Code	Grade	ksi	MPa	ksi	MPa	%
Europe	EN 10248	S240GP	35	*240*	49	*340*	26
	EN 10248	S270GP	39	*270*	59	*410*	24
	EN 10248	S320GP	46	*320*	64	*440*	23
	EN 10248	S355GP	51	*355*	70	*480*	22
	EN 10248	S430GP	62	*430*	71	*490*	20
China	GB/T 700	Q235B	34	*235*	73	*500*	26
	GB/T 1591	Q345B	50	*345*	91	*630*	20
	GB/T 1591	Q345C	50	*345*	91	*630*	21
	GB/T 1591	Q390B	57	*390*	94	*650*	20
	GB/T 1591	Q420B	61	*420*	99	*680*	19
Japan	JIS A5528	SY295	43	*295*	71	*490*	17
	JIS A5528	SY390	57	*390*	78	*540*	15





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ESC Cold Rolled Sheet Piles
Introduction

The cold rolling process involves rolling the sheet pile profile continuously at room temperature. The profile thickness is constant along the width of the profile. Cold Rolling occurs in a continuous section which can be cut at any length. A wide range of widths and depths are achievable. Production schedules are much more flexible than Hot Rolling of Sheet Piles, which can lead to cost-savings due to lower stock requirements and greater project-specific profiles and lengths. ESC can offer one of the thickest sheet piles (0.629 in/16 mm) in the world that can be produced using the cold rolling process without any compromise in structural properties. ESC can offer 4 different types of cold rolled sheet pile profile which covers virtually all applications – for both temporary and permanent usage.

Frequently, ESC Cold Rolled Sheet Piles are used as an effective and equivalent alternative to a Hot Rolled Sheet Pile Profiles, with possible cost savings of over 20% with no compromise in design, quality or strength. ESC Cold Rolled Sheet Piles have successfully been used in most regions globally.

L SERIES

S SERIES

The ESC Advantage

- ✓ Global Supply Network
- ✓ Unparalleled Technical Support
- ✓ Competitive Pricing
- ✓ Free of Charge Design
- ✓ Supplied project volumes between 8—20,000mT
- ✓ Full Suite of Sheet Pile Accessories

What Our Engineers Say?

"We at ESC offer an extremely wide range of Cold Rolled Sheet Pile profiles that are high quality and economical from a design and a price per unit weight perspective."

SHEET PILE PROFILES

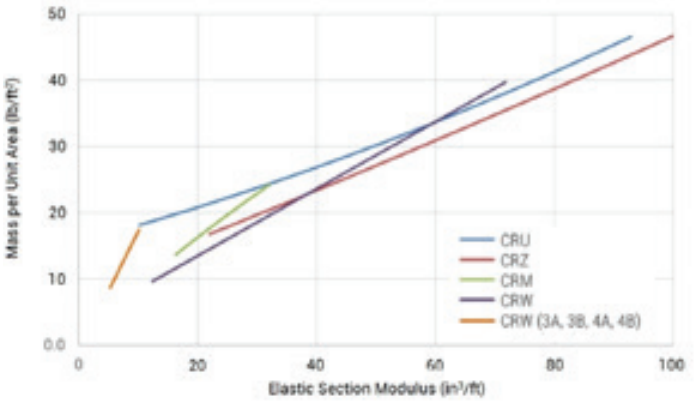
CRZ SERIES

CRW SERIES

JZ, XZ SERIES

Z, EZ, DZ SERIES

Section Modulus Range vs Mass



Note the lines shown above are trend-lines. The individual profiles may lie at points away from this line. Please see the relevant catalog page for exact specifications.

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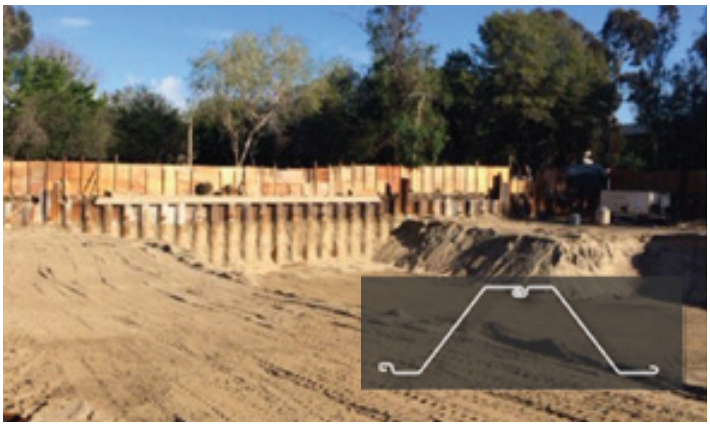
Project References

RETAINING WALL, VIRGINIA, USA

BROOKLYN TEMPORARY WORKS, USA



TIJUANA BASEMENT PARKING, MEXICO

UNDERGROUND PARKING LOT, MEXICO

JOHOR SLOPE PROTECTION, MALAYSIA

PAHANG BRIDGE ABUTMENT, MALAYSIA

SELANGOR SLOPE PROJECT, MALAYSIA

CONTAINMENT BARRIER, NETHERLANDS

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ESC-CRZ SERIES

Z PROFILE SHEET PILES

HIGHEST STRENGTH TO WEIGHT RATIO SHEET PILE IN OUR PRODUCT LINE

ESC is proud to present its Cold Rolled ESC-CRZ Profile Sheet Piles. The design features interlocks that are located symmetrically on both sides of the neutral axis. The web is continuous, thus the section modulus and shear load transfer are optimised. The profile design has a very competitive strength to weight ratio. Due to a deep profile, the design features a higher Inertia resulting in reduced deflection. This higher inertia together with the option of higher steel grades (462.36 ksi/30 Mpa) provides the most economic solution that meets the performance requirements. The piles are usually shipped in pairs to accommodate faster installation and better alignment. A wide range of steel grades are available.

Order Options	
Steel Grades	ASTM A572 Gr.50, Gr.55, Gr.60 & Gr.65
	ASTM A690 Gr.50
	ASTM A588 Gr.50
	ASTM A871 Gr.60 & Gr.65
	ASTM A1018 Gr.50, Gr.60, Gr.70 & Gr.80
	Others available on request
Lengths	114.8ft maximum
	Any project specific length can be produced
Delivery Options	Single or Pairs
	Pairs either loose, welded or crimped
	Lifting Hole
	Grip Plate
	By container (38.7ft or less) or Break Bulk
	Corrosion Protection Coatings

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Interlocking Clutch

SECTION	WIDTH	HEIGHT	THICKNESS		CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	Flange (t_f)	Web (t_w)		Per Pile	Per Wall			
	in	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-CRZ6-600	23.62 600	9.84 250	0.252 6.4	0.252 6.4	4.02 85.0	26.88 40.0	13.66 66.7	11.25 605	55.38 7,562	5.22 1.59
ESC-CRZ6-800	31.5 800	11.81 300	0.236 6.0	0.236 6.0	3.65 77.2	32.59 48.5	12.7 62.0	11.87 638	69.60 9,505	6.3 1.92
ESC-CRZ7-725	28.54 725	11.81 300	0.236 6.0	0.236 6.0	3.74 79.1	30.24 45.0	12.37 60.4	13.58 730	78.55 10,727	5.84 1.78
ESC-CRZ8-725	28.54 725	10.67 271	0.276 7.0	0.276 7.0	4.32 91.4	34.94 52.0	14.69 71.7	15.74 846	84.51 11,540	5.79 1.76
ESC-CRZ11-812	32.0 812.8	12.20 310	0.374 9.5	0.374 9.5	5.89 124.7	53.46 79.55	20.05 97.9	20.11 1,081	122.69 16,755	6.99 2.13
ESC-CRZ12-770	30.31 770	14.17 360	0.343 8.7	0.343 8.7	5.67 120.1	48.78 72.6	19.31 94.3	23.12 1,243	164.32 22,439	6.99 2.13
ESC-CRZ13-770	30.31 770	14.17 360	0.354 9.0	0.354 9.0	5.89 124.6	50.6 75.3	20.03 97.8	24.03 1,292	170.47 23,279	6.99 2.13
ESC-CRZ14	30.31 770	13.39 340	0.382 9.7	0.382 9.7	6.34 134.1	54.5 81.1	21.57 105.3	25.78 1,386	172.79 23,596	6.99 2.13
ESC-CRZ14-770	30.31 770	14.17 360	0.374 9.5	0.374 9.5	6.19 131.1	53.29 79.3	21.08 102.9	25.24 1,357	178.98 24,441	6.99 2.13
ESC-CRZ14-770-10.0	30.31 770	13.58 345	0.394 10.0	0.394 10.0	6.54 138.5	56.27 83.74	22.28 108.8	26.36 1,417	178.99 24,443	7.05 2.15
ESC-CRZ15-750	29.53 750	18.48 469.5	0.305 7.75	0.305 7.75	5.31 112.5	44.52 66.25	18.09 88.34	28.33 1,523	261.81 35,753	7.18 2.19
ESC-CRZ17-700-8.0	27.56 700	16.46 418	0.315 8.0	0.315 8.0	5.94 125.8	46.43 69.1	18.78 91.7	30.89 1,661	254.15 34,706	6.73 2.05
ESC-CRZ17-700-8.7	27.56 700	17.91 455	0.343 8.7	0.343 8.7	6.26 132.5	48.92 72.8	21.3 104.0	32.27 1,735	289.29 39,505	6.99 2.13
ESC-CRZ18-700	27.56 700	17.72 450	0.358 9.1	0.358 9.1	6.54 138.5	51.14 76.1	22.26 108.7	34.22 1,840	304.15 41,534	6.99 2.13
ESC-CRZ18-850	33.46 850	18.50 470	0.374 9.5	0.374 9.5	6.42 135.8	60.88 90.6	21.83 106.6	33.91 1,823	314.04 42,885	7.43 2.27
ESC-CRZ19-700	27.56 700	16.54 420	0.382 9.7	0.382 9.7	6.97 147.6	54.5 81.1	23.73 115.85	35.12 1,888	290.53 39,675	6.99 2.13
ESC-CRZ20-700	27.56 700	16.18 411	0.402 10.2	0.402 10.2	7.34 155.4	57.37 85.37	24.99 122.0	36.33 1,953	294.39 40,202	6.99 2.13
ESC-CRZ20-850	33.46 850	18.50 470	0.394 10.0	0.394 10.0	6.8 143.9	64.51 96.0	23.12 112.9	37.2 2,000	343.16 46,862	7.0 2.28
ESC-CRZ21-660	26.0 660.4	18.11 460	0.374 9.5	0.374 9.5	7.25 153.4	53.46 79.55	24.67 120.45	39.36 2,116	356.54 48,689	6.99 2.13
ESC-CRZ21-700	27.56 700	16.22 412	0.425 10.8	0.425 10.8	7.8 165.2	61.0 90.78	26.56 129.7	38.80 2,086	314.98 43,013	7.02 2.14

*excludes internal section of interlock

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Interlocking Clutch

SECTION	WIDTH	HEIGHT	THICKNESS		CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	Flange (t_f)	Web (t_w)		Per Pile	Per Wall			
	in	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-CRZ22-559	22.01 559	9.84 250	0.374 9.5	0.374 9.5	6.46 136.8	40.32 60	22.0 107.4	18.62 1,001	91.79 12,535	5.28 1.61
ESC-CRZ24-609	24.0 609.6	19.69 500	0.374 9.5	0.374 9.5	7.85 166.2	53.46 79.55	26.73 130.49	46.0 2,473	452.87 61,843	6.99 2.13
ESC-CRZ24-700	27.56 700	18.5 470	0.425 10.8	0.425 10.8	8.23 174.1	64.31 95.7	28.0 136.7	45.27 2,434	418.94 57,210	7.41 2.26
ESC-CRZ26-700	27.56 700	19.29 490	0.457 11.6	0.457 11.6	8.85 187.3	69.15 102.9	30.11 147	48.77 2,622	470.65 64,271	7.41 2.26
ESC-CRZ26-700	27.56 700	19.29 490	0.469 11.9	0.469 11.9	9.08 192.1	70.96 105.6	30.89 150.8	49.89 2,682	481.45 65,746	7.41 2.26
ESC-CRZ26-711	28.0 711.2	17.32 440	0.48 12.2	0.48 12.2	9.26 196.1	73.55 109.46	31.52 153.9	49.55 2,664	429.3 58,624	7.51 2.29
ESC-CRZ27-457	17.99 457	12.99 330	0.374 9.5	0.374 9.5	7.9 167.3	40.32 60	26.89 131.3	30.3 1,629	196.93 26,893	5.28 1.61
ESC-CRZ28-686	27.0 685.8	17.72 450	0.48 12.2	0.48 12.2	9.6 203.3	73.55 109.46	32.69 159.6	53.23 2,862	471.64 64,407	7.51 2.29
ESC-CRZ28-700	27.56 700	19.29 490	0.488 12.4	0.488 12.4	9.45 200.1	73.92 110	32.18 157.1	51.89 2,790	500.44 68,339	7.41 2.26
ESC-CRZ28-700	27.56 700	18.5 470	0.512 13	0.512 13	9.91 209.8	77.48 115.3	33.73 164.7	52.68 2,832	487.45 66,565	7.41 2.26
ESC-CRZ31-660	26.0 660.4	18.5 470	0.48 12.2	0.48 12.2	9.97 211.1	73.55 109.46	33.95 165.75	57.51 3,092	532.23 72,681	7.51 2.29
ESC-CRZ33-635	25.0 635	19.29 490	0.48 12.2	0.48 12.2	10.37 219.6	73.55 109.46	35.31 172.38	61.94 3,330	597.6 81,607	7.51 2.29
ESC-CRZ33-700	27.56 700	19.69 500	0.472 12.0	0.472 12.0	6.60 139.6	51.54 76.7	33.39 163.0	61.1 3,285	607.28 82,929	8.1 2.45
ESC-CRZ36-700N	27.56 700	22.05 560	0.48 12.2	0.48 12.2	10.12 214.3	79.16 117.8	34.45 168.2	67.13 3,609	740.12 101,070	8.07 2.46
ESC-CRZ38-700	27.56 700	22.44 570	0.52 13.2	0.52 13.2	10.95 231.8	85.6 127.4	37.28 182	71.83 3,862	806.6 110,154	8.07 2.46
ESC-CRZ40-700N	27.56 700	22.83 580	0.543 13.8	0.543 13.8	11.45 242.4	89.5 133.2	38.98 190.3	74.64 4,013	853.0 116,486	8.07 2.46
ESC-CRZ42-700N	27.56 700	22.83 580	0.575 14.6	0.575 14.6	12.11 256.4	94.7 140.9	41.23 201.3	78.34 4,212	895.0 122,215	8.07 2.46
ESC-CRZ44-700N	27.56 700	21.26 540	0.567 14.4	0.567 14.4	12.83 271.5	100.3 149.2	43.65 213.1	82.66 4,444	879.6 120,120	8.66 2.64
ESC-CRZ46-700N	27.56 700	22.83 580	0.571 14.5	0.571 14.5	12.67 268.2	99.0 147.35	43.11 210.5	85.99 4,623	981.82 134,076	8.6 2.62
ESC-CRZ48-700	27.56 700	23.23 590	0.591 15.0	0.591 15.0	13.44 284.4	105.0 156.27	45.71 223.2	89.88 4,832	1,046.04 142,846	8.79 2.68

*excludes internal section of interlock

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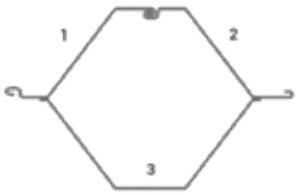
Interlocking Clutch

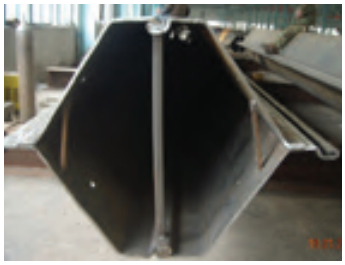
SECTION	WIDTH	HEIGHT	THICKNESS		CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	Flange (t_f)	Web (t_w)		Per Pile	Per Wall			
	in	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-CRZ48-580-14.5	22.83 580	21.26 540	0.571 14.5	0.571 14.5	14.43 305.5	93.5 139.1	49.11 239.8	89.99 4,838	957.54 130,760	8.1 2.47
ESC-CRZ50-580-14.0	22.83 580	22.83 580	0.551 14.0	0.551 14.0	13.92 294.6	90.1 134.13	47.37 231.3	93.69 5,037	1025.23 140,004	8.1 2.47
ESC-CRZ50-700	27.56 700	22.05 560	0.63 16.0	0.63 16.0	14.1 298.5	110.2 164.0	48.0 234.3	93.37 5,020	1,029.43 140,578	8.56 2.61
ESC-CRZ52-700	27.56 700	21.65 550	0.63 16.0	0.63 16.0	14.42 305.2	112.69 167.7	49.07 239.6	97.2 5,226	1,052.6 143,742	8.86 2.7

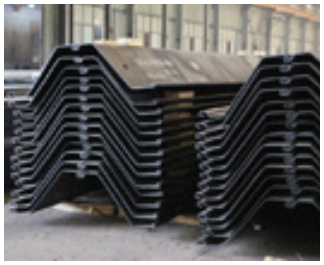
*excludes internal section of interlock

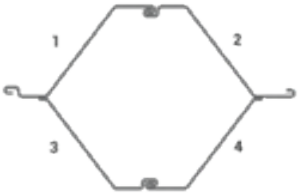
OTHER CONFIGURATIONS



Box King Piles (fabricated out of 2 CRZ Piles & 1 Cold Formed U Pile)



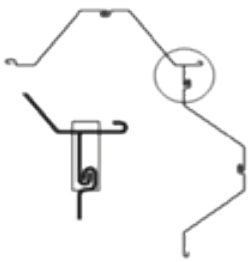




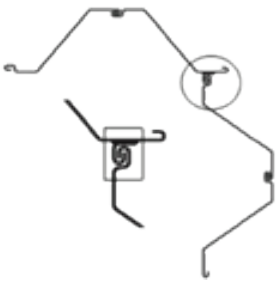
Box King Piles (fabricated out of 2 CRZ Piles)

CORNER PILES

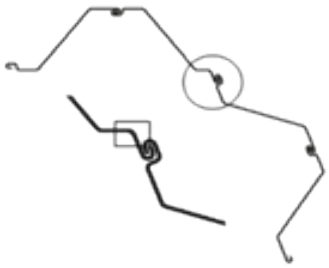
ESC is able to offer 3 options for Corner Pile configurations in the ESC-CRZ Series. Option 1 is frequently used when the installation contractor prefers to create their own corner piles on site depending on the as-driven layout. However this produces wastage on the offcut pile. Option 2 allows welding at the mill or on site and provides the installation contractor with more flexibility on corner pile location. Option 3 provides an option where no welding is required. Option 3 provides increased accuracy at corners that are deviated from the typical 90˚ corner.



OPTION 1
Cut & weld on section from CRZ Sheet Pile



OPTION 2
ESC CR Interlock welded



OPTION 3
Cold Form bending of flange

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FURTHER DOMESTIC US OPTIONS

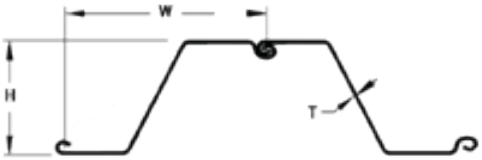
ESC-Z SERIES

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-Z55	24.0 *610*	8.64 *219*	0.217 *5.5*	7.57 *48.8*	25.8 *38.4*	12.9 *63.0*	11.4 *613*	49.7 *6,790*	5.20 *1.59*
ESC-Z60	24.0 *610*	8.66 *220*	0.236 *6.0*	8.26 *53.3*	28.2 *42.0*	14.1 *68.8*	12.4 *667*	54.2 *7,400*	5.20 *1.59*
ESC-Z65	24.0 *610*	8.68 *220*	0.256 *6.5*	8.95 *57.7*	30.6 *45.5*	15.3 *74.7*	13.4 *720*	58.7 *8,010*	5.20 *1.59*
ESC-Z70	24.0 *610*	8.70 *221*	0.276 *7.0*	9.64 *62.2*	33.0 *49.1*	16.5 *80.6*	14.4 *774*	63.2 *8,630*	5.20 *1.59*
ESC-Z75	24.0 *610*	8.72 *221*	0.295 *7.5*	10.3 *66.5*	35.2 *52.4*	17.6 *85.9*	15.6 *839*	67.7 *9,250*	5.20 *1.59*

ESC-EZ SERIES

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-EZ75	25.0 *635*	10.72 *272*	0.295 *7.5*	11.3 *73.0*	38.5 *57.4*	18.6 *90.4*	19.20 *1,030*	103 *14,100*	5.6 *1.71*
ESC-EZ80	25.0 *635*	10.75 *273*	0.315 *8.0*	12.1 *77.9*	41.1 *61.2*	19.8 *96.4*	20.50 *1,100*	110 *15,000*	5.6 *1.71*
ESC-EZ88	25.0 *635*	10.78 *274*	0.344 *8.75*	13.2 *85.1*	44.9 *66.8*	21.6 *105*	22.4 *1,200*	121 *16,500*	5.6 *1.71*
ESC-EZ95	25.0 *635*	10.81 *275*	0.375 *9.5*	14.4 *92.7*	48.9 *72.8*	23.5 *115*	24.4 *1,310*	131 *17,900*	5.6 *1.71*

ESC-XZ SERIES



SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-XZ85	25.0 *635*	14.06 *357*	0.335 *8.5*	13.6 *87.9*	46.4 *69.0*	22.3 *109*	30.2 *1,630*	212 *29,000*	6.03 *1.84*
ESC-XZ90	25.0 *635*	14.09 *358*	0.354 *9.0*	14.4 *93.0*	48.9 *72.7*	23.5 *115*	31.8 *1,710*	225 *30,800*	6.03 *1.84*

*excludes internal section of interlock

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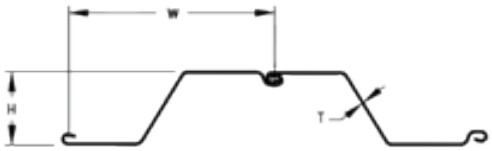
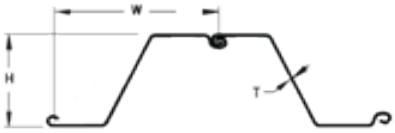
SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-XZ95	25.0 *635*	14.12 *359*	0.375 *9.5*	15.2 *98.2*	51.7 *76.9*	24.8 *121*	33.5 *1,800*	237 *32,400*	6.03 *1.84*
ESC-XZ100	25.0 *635*	14.15 *360*	0.394 *10.0*	15.9 *103.0*	54.2 *80.7*	26.0 *127*	35.3 *1,900*	250 *34,200*	6.03 *1.84*
ESC-XZ105	25.0 *635*	14.17 *360*	0.413 *10.5*	16.7 *108.0*	56.9 *84.7*	27.3 *133*	37.1 *2,000*	263 *35,900*	6.03 *1.84*

ESC-DZ SERIES



SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-DZ80	29.00 *737*	16.44 *418*	0.315 *8.0*	14.47 *93.3*	49.20 *73*	20.40 *99*	31.96 *1,718*	262.72 *35,876*	6.80 *2.08*
ESC-DZ85	29.00 *737*	16.46 *418*	0.335 *8.5*	15.35 *99.0*	52.20 *78*	21.60 *106*	33.86 *1,820*	278.67 *38,055*	6.80 *2.08*
ESC-DZ90	29.00 *737*	16.48 *419*	0.354 *9.0*	16.23 *104.7*	55.20 *82*	22.90 *112*	35.75 *1,922*	294.58 *40,227*	6.80 *2.08*
ESC-DZ95	29.00 *737*	16.50 *419*	0.375 *9.5*	17.15 *110.6*	58.40 *87*	24.20 *118*	37.72 *2,028*	311.22 *42,500*	6.80 *2.08*
ESC-DZ100	29.00 *737*	16.52 *420*	0.394 *10.0*	17.98 *116.0*	61.20 *91*	25.30 *124*	39.49 *2,123*	326.23 *44,549*	6.80 *2.08*
ESC-DZ105	29.00 *737*	16.54 *420*	0.413 *10.5*	18.85 *121.6*	64.20 *95*	26.50 *130*	41.35 *2,223*	341.98 *46,700*	6.80 *2.08*

ESC-JZ SERIES



SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-JZ112	26.5 *673*	16.44 *418*	0.441 *11.2*	20.1 *129.7*	68.2 *101*	30.9 *151*	45.3 *2,430*	374 *51,100*	6.51 *1.99*
ESC-JZ120	26.5 *673*	16.47 *418*	0.472 *12.0*	21.5 *138.7*	73.0 *109*	33.0 *161*	48.5 *2,610*	401 *54,700*	6.51 *1.99*
ESC-JZ127	26.5 *673*	16.50 *419*	0.500 *12.7*	22.7 *146.5*	77.3 *115*	35.0 *171*	51.4 *2,760*	424 *57,900*	6.51 *1.99*

*excludes internal section of interlock

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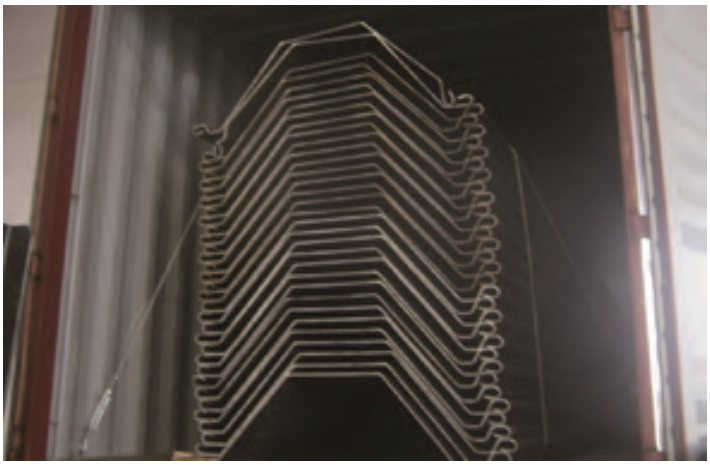
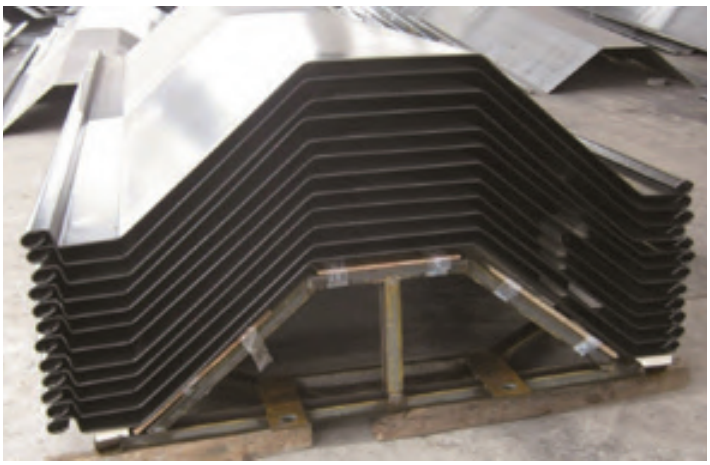
ESC-CRW SERIES

WIDE U/BOX PROFILE SHEET PILES

ECONOMICAL WIDE PROFILE SHEET PILE WITH HALF THE INTERLOCKS OF Z SHEET PILE WALLS

The ESC CRW Series is a wide profile U Sheet Pile which is the widest rolled single sheet pile in the industry. It features the same interlocks as the ESC-CRZ Series, but is equivalent to a paired Z sheet pile. It has a high strength to weight ratio and excellent seepage characteristics as it has the fewest interlocks per unit width. There is a large spectrum in the strength and sizing, allowing the designer to optimise their design to the application. The lower strength range is optimal for cutoff wall applications.





Order Options	
Steel Grades	ASTM A857 Gr. 36, ASTM A572 Gr. 42, Gr.50, Gr.60 & Gr.65
	ASTM A690 Gr.50
	ASTM A588 Gr.50
	ASTM A871 Gr.60 & Gr.65
	Others available on request
Lengths	78.7ft maximum for ESC-CRW6 to ESC-CRW14
	114.8ft maximum for ESC-CRW14 to ESC-CRW34
	Any project specific length can be produced
Delivery Options	Lifting Hole
	Grip Plate
	By container (38.7ft or less) or Break Bulk
	Corrosion Protection Coatings

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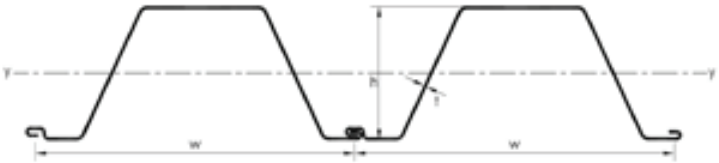

Interlocking Clutch

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-CRW3A	27.56 700	5.75 146	0.16 4	2.64 56	20.7 30.8	9.01 44	4.93 265	14.2 1,945	6.46 1.97
ESC-CRW3B	27.56 700	5.79 147	0.2 5	3.32 70.3	25.94 38.6	11.3 55.2	6.1 328	17.64 2,417	6.5 1.98
ESC-CRW4A	27.56 700	5.83 148	0.24 6	3.97 84.1	31.05 46.2	13.52 66	7.29 392	21.24 2,910	6.46 1.97
ESC-CRW4B	27.56 700	5.87 149	0.28 7	4.57 96.8	35.75 53.2	15.56 76	8.31 447	24.71 3,385	6.4 1.95
ESC-CRW5A	27.56 700	5.91 150	0.31 8	5.29 112	41.4 61.6	18.02 88	9.45 508	28.27 3,872	6.5 1.98
ESC-CRW6	23.62 600	9.88 251	0.20 5.2	4.27 90.4	28.61 42.58	14.54 70.97	12.63 679	63.84 8,718	11.45 3.49
ESC-CRW7	61.42 1,560	13.39 340	0.24 6	3.63 76.9	63.3 94.2	12.37 60.4	13.76 740	97.82 13,400	13.32 4.06
ESC-CRW9	55.91 1,420	16.02 407	0.24 6	3.99 84.5	63.3 94.2	13.58 66.3	18.23 980	157.24 21,540	13.29 4.05
ESC-CRW10	53.15 1,350	17.72 450	0.2 5	3.49 74	52.75 78.5	11.9 58.1	18.04 970	167.61 22,960	13.29 4.05
ESC-CRW11	52.36 1,330	17.72 450	0.24 6	4.26 90.2	63.3 94.2	14.5 70.8	19.72 1,060	198.12 27,140	13.25 4.04
ESC-CRW12A	50 1,270	17.72 450	0.24 6	4.46 94.5	63.3 94.2	15.2 74.2	23.25 1,250	219 30,000	13.29 4.05
ESC-CRW12B	56.3 1,430	15.39 391	0.33 8.5	5.61 118.9	89.71 133.5	19.11 93.3	23.44 1,260	200.02 27,400	13.29 4.05
ESC-CRW13	46.65 1,185	19.69 500	0.26 6.5	5.18 109.7	68.61 102.1	17.63 86.1	25.85 1,390	218.34 29,910	13.29 4.05
ESC-CRW14A	47.05 1,195	18.94 481	0.28 7	5.53 117.2	73.85 109.9	18.84 92	27.16 1,460	294.99 40,410	13.29 4.05
ESC-CRW14B	55.12 1,400	14.84 377	0.37 9.5	6.41 135.7	100.26 149.2	21.81 106.5	26.41 1,420	219.8 30,110	13.29 4.05
ESC-CRW15	50.39 1,280	17.72 450	0.31 8	5.9 125	84.4 125.6	20.09 98.1	27.9 1,500	277.11 37,960	13.25 4.04
ESC-CRW16A	44.49 1,130	19.69 500	0.28 7	5.85 123.9	73.85 109.9	19.91 97.2	29.39 1,580	335.14 45,910	13.29 4.05
ESC-CRW17	51.97 1,320	17.72 450	0.35 9	6.43 136.3	94.95 141.3	21.91 107	31.99 1,720	303.75 41,610	13.29 4.05
ESC-CRW118	49.02 1,245	19.33 491	0.31 8	5.92 125.5	82.4 122.62	20.17 98.5	32.74 1,760	399.12 54,674	12.86 3.92
ESC-CRW19	49.02 1,245	19.33 491	0.33 8.5	6.32 133.8	87.87 130.76	21.5 105	34.97 1,880	425.77 58,325	12.93 3.94

*excludes internal section of interlock

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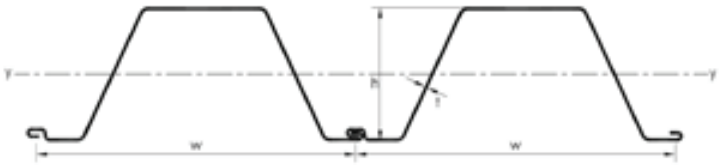
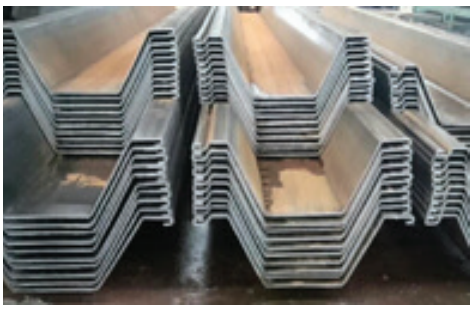


Interlocking Clutch

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-CRW20	49.02	19.37	0.35	6.71	93.37	22.86	37.2	452.57	12.96
	1,245	492	9	142.2	138.95	111.6	2,000	61,996	3.95
ESC-CRW21	49.02	19.37	0.37	7.11	98.91	24.21	39.43	479.52	13.02
	1,245	492	9.5	150.6	147.19	118.2	2,120	65,687	3.97
ESC-CRW22	49.02	19.41	0.39	7.51	104.49	25.58	41.85	506.6	13.06
	1,245	493	10	159.1	155.49	124.9	2,250	69,397	3.98
ESC-CRW24	49.21	19.41	0.41	7.88	110.1	26.85	43.9	533.81	13.12
	1,250	493	10.5	167	163.84	131.1	2,360	73,125	4
ESC-CRW25	49.21	19.45	0.43	8.28	115.75	28.22	46.31	561.16	13.16
	1,250	494	11	175.5	172.25	137.8	2,490	76,871	4.01
ESC-CRW26	49.21	19.45	0.45	8.69	121.44	29.61	48.55	588.61	13.22
	1,250	494	11.5	184.2	180.72	144.6	2,610	80,632	4.03
ESC-CRW27	49.21	19.49	0.47	9.1	127.17	31.01	50.59	616.19	13.25
	1,250	495	12	192.9	189.24	151.4	2,720	84,409	4.04
ESC-CRW28	49.41	19.49	0.49	9.48	132.93	32.28	52.45	643.86	13.32
	1,255	495	12.5	200.8	197.81	157.6	2,820	88,200	4.06
ESC-CRW29	49.41	19.53	0.51	9.89	138.73	33.69	54.68	671.64	13.35
	1,255	496	13	209.5	206.44	164.5	2,940	92,005	4.07
ESC-CRW30	49.41	19.53	0.53	10.31	144.57	35.1	56.73	699.5	13.42
	1,255	496	13.5	218.4	215.13	171.4	3,050	95,822	4.09
ESC-CRW31	49.41	19.57	0.55	10.72	150.44	36.54	58.78	727.46	13.45
	1,255	497	14	227.2	223.87	178.4	3,160	99,652	4.1
ESC-CRW32	49.61	19.57	0.57	11.1	156.35	37.83	60.64	755.51	13.52
	1,260	497	14.5	235.2	232.66	184.7	3,260	103,494	4.12
ESC-CRW34	49.61	19.61	0.59	11.53	162.29	39.26	62.68	783.63	13.55
	1,260	498	15	244.2	241.51	191.7	3,370	107,346	4.13
ESC-CRW35	49.61	19.61	0.611	39.25	168.3	40.7	65	812	13.62
	1,260	498	15.5	253.2	250.42	198.7	3,480	111,208	4.15
ESC-CRW36	49.61	19.65	0.63	12.38	174.3	42.17	66.77	840.08	13.65
	1,260	499	16	262.2	259.38	205.9	3,590	115,079	4.16

*excludes internal section of interlock



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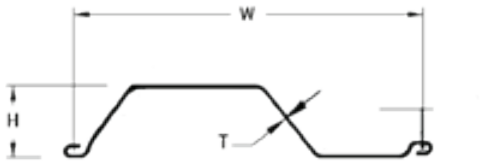
FURTHER DOMESTIC US OPTIONS

ESC-L SERIES



SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-L34	19.7 *500*	4.10 *104*	0.134 *3.4*	3.58 *23.1*	12.5 *18.6*	7.62 *37.2*	2.77 *149*	5.89 *806*	4.20 *1.28*
ESC-L41	19.7 *500*	4.12 *105*	0.164 *4.1*	4.39 *28.3*	15.0 *22.4*	9.17 *44.7*	3.30 *178*	7.02 *961*	4.20 *1.28*
ESC-L45	19.7 *500*	4.13 *105*	0.177 *4.5*	4.47 *30.6*	16.2 *24.1*	9.90 *48.1*	3.62 *195*	7.69 *1,050*	4.20 *1.28*
ESC-L50	19.7 *500*	4.15 *106*	0.197 *5.0*	5.29 *34.1*	18.90 *28.2*	11.50 *56.3*	4.14 *223*	9.82 *1,340*	4.20 *1.28*
ESC-L60	19.7 *500*	4.18 *106*	0.236 *6.0*	6.37 *41.1*	22.3 *33.1*	13.60 *66.1*	4.97 *268*	11.80 *1,610*	4.20 *1.28*
ESC-L65	19.7 *500*	4.20 *107*	0.256 *6.5*	6.90 *44.5*	24.1 *35.8*	14.70 *71.6*	5.38 *290*	12.80 *1,750*	4.20 *1.28*

ESC-S SERIES

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-S64	27.75 *705*	5.91 *150*	0.250 *6.35*	9.97 *64.4*	33.9 *50.4*	14.7 *71.7*	7.89 *424*	24.0 *3,280*	5.90 *1.80*
ESC-S80	27.75 *705*	5.97 *152*	0.313 *8.0*	12.36 *79.7*	42.1 *62.6*	18.2 *88.8*	9.82 *528*	30.0 *4,100*	5.90 *1.80*

*excludes internal section of interlock

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ESC Cold Formed Sheet Piles
Introduction

Cold forming processes are when the steel sheet pile is profiled at room temperature. The profile thickness is constant along the width of the profile. Cold Forming of Sheet Piles is completed in discrete lengths instead of a continuous rolling process. A wide range of widths and depths are achievable. This production process provides the following benefits:

✓ Much greater flexibility in forming dimensions. Cold Forming involves pressing the cut steel plate at various locations, which can be customised by varying the pressing penetration depth. This means that numerous profiles and sizes can be produced without any change of manufacturing equipment. Profile widths can also be much wider, with single sheet piles being over 1.5m width, much wider than any sheet pile produced by rolling processes.

✓ Various interlock configurations - ESC is experienced in the design & manufacture of various interlock systems, such as the EU and BP which uses Pipe & Box sections respectively. These can offer advantages to rolled interlocks from a grouting aspect and also ease of installation.

✓ Lower machinery costs – due to the simplicity of a cold forming production line, these translate to lower production costs especially when it comes to low volume, special profile jobs

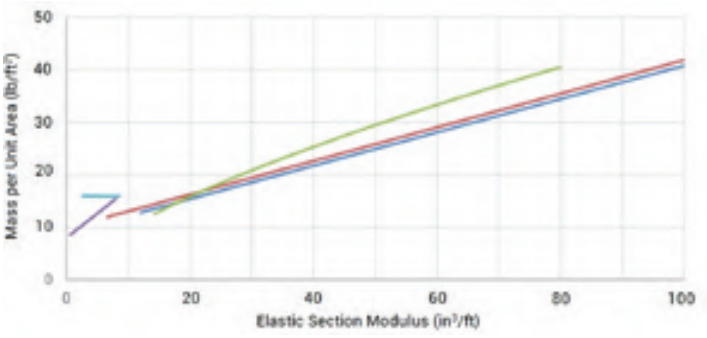
✓ Unlimited number of configurations – numerous variables, such as angle, web width, flange width, interlock size allow a virtually limitless number of configurations to be designed and produced

✓ Corner Pile Production without extra welding or forming

✓ Special Piles can be produced – tapered sheet piles, sheet piles with varying thickness along the length and more can be produced.

The ESC Advantage

- ✓ Global Supply Network
- ✓ Wide Sheet Pile Product Range
- ✓ Competitive Pricing
- ✓ Free of Charge Design
- ✓ Small orders possible
- ✓ Easy to supply special piles, corner piles, tapered piles and more



Note the lines shown above are trend-lines. The individual profiles may lie at points away from this line. Please see the relevant catalog page for exact specifications.

Sheet Pile Profiles

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Project References

DAVIS BASE MATERIAL OFFLOADING FACILITY, ANTARCTICA

JB BASEMENT CAR PARK, MALAYSIA

RUBIS OIL TANK PROTECTION, NETHERLANDS

MALACCA RIVER BEAUTIFICATION, MALAYSIA

KIMANIS POWER PLANT, MALAYSIA

ALTAMIRA, MEXICO

AD TRENCH, UAE

SYDNEY, AUSTRALIA

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ESC-BP SERIES

WIDE U/BOX PROFILE SHEET PILES

A WIDE PROFILE SHEET PILE WITH A BOX INTERLOCKING CLUTCH FOR EASY GROUTING

Designed with an open clutch suitable for post installation grout sealing, the ESC-BP Series sheet pile is ideal for de-watering works, groundwater cutoff walls and pollution control situations. This pile with its light weight wide profile resulting in fewer clutches per unit length of wall provides an attractive commercial proposition for retaining walls and other applications.

Order Options	
Steel Grades	ASTM A572 Gr. 42, Gr.50, Gr.60 & Gr.65
	ASTM A690 Gr.50
	ASTM A588 Gr.50
	ASTM A871 Gr.60 & Gr.65
	ASTM A1018 Gr.50, Gr.60, Gr.70 & Gr.80
	Others available on request
Lengths	46.0ft maximum
	Longer lengths can be spliced (>100ft possible)
	Any project specific length can be produced
Delivery Options	Lifting Hole
	Grip Plate
	By container (38.7ft or less) or Break Bulk
	Corrosion Protection Coatings

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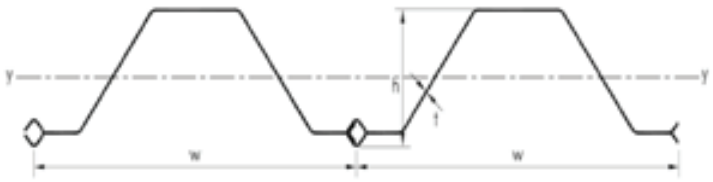

Interlocking Clutch

*excludes internal section of interlock

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-6BP-S	41.85	11.46	0.23	4.33	51.48	14.77	11.16	66.80	9.35
	1,063	291	5.75	91.8	76.60	72.10	600	9,150	2.85
ESC-7BP-S	40.79	12.64	0.23	4.45	51.48	15.13	13.02	82.78	9.35
	1,036	321	5.75	94.2	76.60	73.90	700	11,340	2.85
ESC-8BP-S	39.45	13.86	0.23	4.60	51.48	15.65	14.88	101.47	9.35
	1,002	352	5.75	97.4	76.60	76.40	800	13,900	2.85
ESC-9BP-S	37.44	14.65	0.23	4.84	51.48	16.51	16.74	121.25	9.35
	951	372	5.75	102.6	76.60	80.60	900	16,610	2.85
ESC-10BP-S	35.55	15.31	0.23	5.10	51.48	17.39	18.60	140.53	9.35
	903	389	5.75	108.1	76.60	84.90	1,000	19,250	2.85
ESC-11BP-S	33.54	15.91	0.23	5.40	51.48	18.41	20.46	161.55	9.35
	852	404	5.75	114.5	76.60	89.90	1,100	22,130	2.85
ESC-12BP-S	31.73	16.34	0.23	5.71	51.48	19.46	22.32	181.48	9.35
	806	415	5.75	121	76.60	95.00	1,200	24,860	2.85
ESC-13BP	48.58	17.44	0.31	5.54	72.37	17.88	24.74	206.01	11.38
	1,234	443	7.75	117.4	107.69	87.30	1,330	28,220	3.47
ESC-13BP-S	29.905	16.745	0.227	6.07	51.48	20.66	24	203	9.35
	759	425	5.75	128.5	76.60	100.9	1,310	27,820	2.85
ESC-14BP	47.44	17.95	0.31	5.67	72.37	18.31	26.04	224.04	11.38
	1,205	456	7.75	120.2	107.69	89.40	1,400	30,690	3.47
ESC-14BP-S	28.289	17.06	0.227	6.42	51.48	21.83	26	223	9.35
	718	433	5.75	135.9	76.60	106.6	1,410	30,550	2.85
ESC-15BP	45.98	18.50	0.31	5.85	72.37	19.93	27.90	247.84	11.38
	1,168	470	7.75	124	107.69	97.30	1,500	33,950	3.47
ESC-16BP-S	57.051	21.237	0.305	5.48	84.87	17.86	30	300	13.35
	1,448	539	7.75	116.0	126.30	87.2	1,610	41,080	4.07
ESC-16BP	44.49	19.06	0.31	6.05	72.37	19.52	29.76	273.09	11.38
	1,130	484	7.75	128.2	107.69	95.30	1,600	37,410	3.47
ESC-17BP	42.91	19.61	0.31	6.27	72.37	20.23	31.81	299.96	11.38
	1,090	498	7.75	132.8	107.69	98.80	1,710	41,090	3.47
ESC-18BP-S	54	22.419	0.305	5.77	87.87	18.8	33	355	13.35
	1,376	569	7.75	122.1	126.30	91.80	1,790	48,590	4.07
ESC-18BP	41.65	20.00	0.31	6.46	72.37	20.85	33.48	322.59	11.38
	1,058	508	7.75	136.9	107.69	101.80	1,800	44,190	3.47
ESC-19BP	40.35	20.35	0.31	6.67	72.37	21.52	35.15	346.39	11.38
	1,025	517	7.75	141.3	107.69	105.10	1,890	47,450	3.47
ESC-20BP-S	51.22	23.522	0.305	6.11	87.87	19.91	37	416	13.35
	1,300	597	7.75	129.2	126.30	97.2	2,000	56,920	4.07
ESC-20BP	57.87	20.59	0.38	6.56	107.65	22.32	37.01	359.01	13.48
	1,470	523	9.75	138.9	160.20	109.00	1,990	49,180	4.11
ESC-21BP	56.54	21.18	0.38	6.71	107.65	22.86	39.06	389.97	13.48
	1,436	538	9.75	142.1	160.20	111.60	2,100	53,420	4.11

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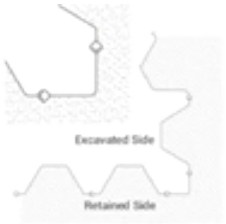
CLASSIFICATION

All sheet piles, excluding the -S Series are class 2 or 3 for grade S355 Grade 50 and below. BP-S Series sheet piles are class 3 for S275 Grade 42 and below in accordance to EN 1993-5:2007. Contact engineering@escsteel.com if further detail is required

Interlocking Clutch

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-21BP-S	37.706	21.04	0.305	7.15	72.37	24.33	39	398	11.38
	957	534	7.75	151.3	107.69	118.8	2,100	54,480	3.47
ESC-22BP-S	48.501	24.389	0.305	6.45	84.87	21.01	41.00	474	13.35
	1,231	619	7.75	136.5	126.30	102.6	2,190	64,940	4.07
ESC-22BP	55.16	21.73	0.38	6.88	107.65	23.43	41.11	422.45	13.48
	1,401	552	9.75	145.7	160.20	114.40	2,210	57,870	4.11
ESC-23BP	54.09	22.13	0.38	7.01	107.65	23.88	42.78	447.86	13.48
	1,374	562	9.75	148.5	160.20	116.60	2,300	61,350	4.11
ESC-23BP-S	35.302	21.552	0.305	7.64	72.37	23.04	43	447	11.38
	896	547	7.75	161.7	107.69	112.5	2,300	61,260	3.47
ESC-24BP	53.03	22.48	0.38	7.15	107.65	24.35	44.45	474.06	13.48
	1,347	571	9.75	151.5	160.20	118.90	2,390	64,940	4.11
ESC-24BP-S	45.665	25.177	0.305	6.85	84.87	22.32	45	538	13.35
	1,159	639	7.75	145.0	126.3	109.0	2,410	73,760	4.07
ESC-25BP	51.57	22.99	0.38	7.35	107.65	25.05	46.87	510.56	13.48
	1,310	584	9.75	155.8	160.20	122.30	2,520	69,940	4.11
ESC-26BP	50.43	23.35	0.38	7.52	107.65	25.60	48.55	539.03	13.48
	1,281	593	9.75	159.3	160.20	125.00	2,610	73,840	4.11
ESC-27BP	49.29	23.66	0.38	7.69	107.65	26.19	50.59	568.52	13.48
	1,252	601	9.75	163	160.20	127.90	2,720	77,880	4.11
ESC-28BP	48.15	23.98	0.38	7.88	107.65	26.83	52.45	599.11	13.48
	1,223	609	9.75	166.9	160.20	131.00	2,820	82,070	4.11
ESC-29BP	47.36	24.17	0.38	8.01	107.65	27.28	53.94	620.06	13.48
	1,203	614	9.75	169.6	160.20	133.20	2,900	84,940	4.11
ESC-30BP	46.18	24.49	0.38	8.21	107.65	27.98	55.99	652.55	13.48
	1,173	622	9.75	174	160.20	136.60	3,010	89,390	4.11
ESC-31BP	51.30	22.01	0.46	8.88	129.25	30.23	57.47	589.48	13.48
	1,303	559	11.75	188.1	192.33	147.60	3,090	80,750	4.11
ESC-32BP	50.24	22.28	0.46	9.07	129.25	30.88	59.52	619.04	13.48
	1,276	566	11.75	192.1	192.33	150.80	3,200	84,800	4.11
ESC-34BP	48.43	22.76	0.46	9.40	129.25	32.03	63.05	670.21	13.48
	1,230	578	11.75	199.2	192.33	156.40	3,390	91,810	4.11
ESC-36BP	46.57	23.15	0.46	9.77	129.25	33.28	66.77	723.80	13.48
	1,183	588	11.75	207	192.33	162.50	3,590	99,150	4.11
ESC-38BP	44.72	23.50	0.46	10.18	129.25	34.67	70.87	780.01	13.48
	1,136	597	11.75	215.7	192.33	169.30	3,810	106,850	4.11

*excludes internal section of interlock

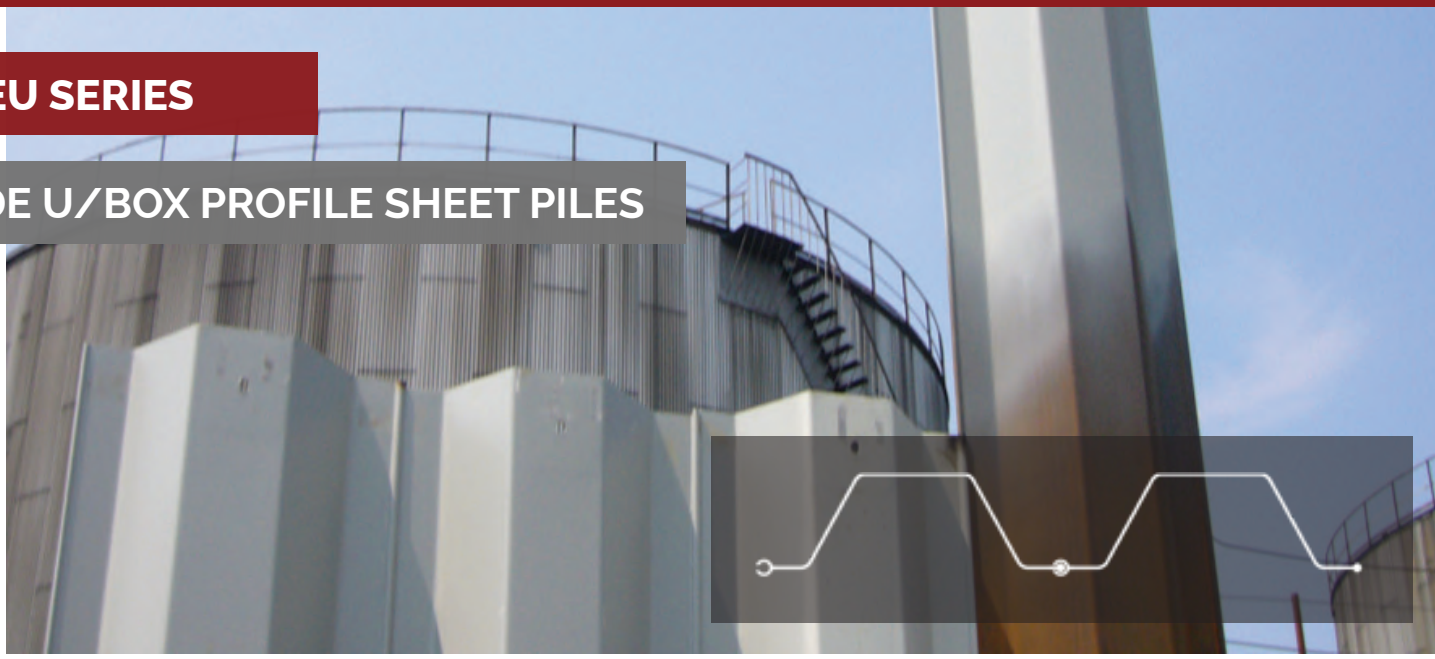


CORNER PILES

Due to the flexibility of the forming process, the ESC-BP Series Sheet Piles can be formed to almost any corner configuration, without requiring any wastage or welding. Note that the interlocks should be orientated toward the retained side as shown in the following figures.

ESC-EU SERIES

WIDE U/BOX PROFILE SHEET PILES

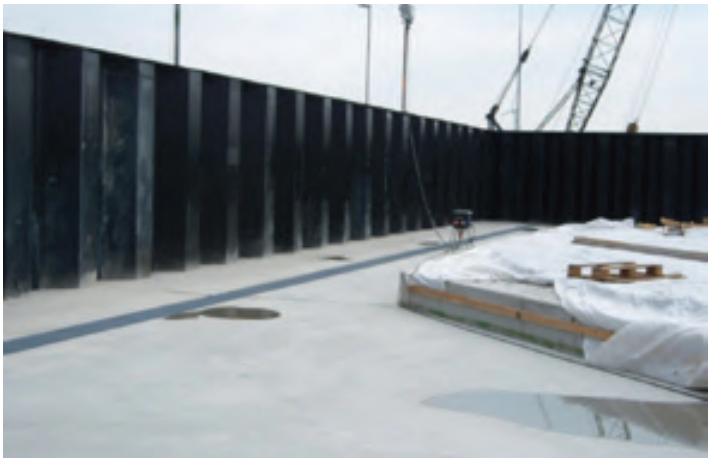


A WIDE PROFILE SHEET PILE WITH A PIPE CLUTCH OFFERING EFFECTIVE ANNULAR SEALING FOR OUTSTANDING FLUID CUTOFF

A wide profile pile utilising a robust ball joint clutch, the ESC-EU Series is efficient in terms of weight and installation costs. It is suitable for temporary and permanent works. The profile is especially effective in marine conditions where strength and installation efficiency are premium considerations.

ESC also offers EU sheet piles made in the USA in standard widths for the North American market.

Order Options	
Steel Grades	ASTM A572 Gr. 42, Gr.50, Gr.60 & Gr.65
	ASTM A690 Gr.50
	ASTM A588 Gr.50
	ASTM A871 Gr.60 & Gr.65
	ASTM A1018 Gr.50, Gr.60, Gr.70 & Gr.80
	Others available on request
Lengths	45.93ft maximum
	Longer lengths can be spliced (>48.42ft possible)
	Any project specific length can be produced
Delivery Options	Lifting Hole
	Grip Plate
	By container (38.7ft or less) or Break Bulk
	Corrosion Protection Coatings



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Interlocking Clutch

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w) in mm	(h) in mm	(t) in mm	in²/ft cm²/m	Per Pile lb/ft kg/m	Per Wall lb/ft² kg/m²	in³/ft cm³/m	in⁴/ft cm⁴/m	ft²/ft m²/m
ESC-EU3	31.5 800	6.73 171	0.23 5.75	3.45 73	30.84 45.9	11.74 57.3	6.14 330	22.19 3,040	6.5 1.98
ESC-EU4	30.31 770	7.4 188	0.23 5.75	3.58 75.8	30.84 45.9	12.19 59.5	7.44 400	28.47 3,900	6.5 1.98
ESC-EU5	29.13 740	8.23 209	0.23 5.75	3.73 79	30.84 45.9	12.7 62	9.3 500	36.94 5,060	6.5 1.98
ESC-EU6	27.17 690	9.33 237	0.23 5.75	3.99 84.6	30.84 45.9	13.6 66.4	11.16 600	50.22 6,880	6.5 1.98
ESC-EU7	28.74 730	8.27 210	0.31 7.75	5.07 107.5	41.4 61.6	17.29 84.4	12.83 690	50.15 6,870	6.59 2.01
ESC-EU8	27.56 700	9.29 236	0.31 7.75	5.3 112.2	41.4 61.6	18.04 88.1	15.07 810	64.61 8,850	6.63 2.02
ESC-EU9	30.31 770	10.28 261	0.31 7.75	5.42 114.9	46.7 69.5	18.47 90.2	16.93 910	81.91 11,220	7.28 2.22
ESC-EU12	45.67 1,160	15.98 406	0.31 7.75	5.36 113.5	69.42 103.3	18.25 89.1	23.25 1,250	190.02 26,030	10.7 3.26
ESC-EU13	44.88 1,140	16.1 409	0.31 7.75	5.45 115.4	69.42 103.3	18.55 90.6	24.18 1,300	198.27 27,160	10.7 3.26
ESC-EU14	43.7 1,110	16.89 429	0.31 7.75	5.6 118.6	69.42 103.3	19.07 93.1	26.23 1,410	221.19 30,300	10.66 3.25
ESC-EU15	41.73 1,060	17.28 439	0.31 7.75	5.86 124.2	69.42 103.3	19.97 97.5	28.27 1,520	245.5 33,630	10.66 3.25
ESC-EU18	55.51 1,410	19.06 484	0.37 9.5	6.24 132.2	98.31 146.3	21.26 103.8	33.48 1,800	308.13 42,210	12.63 3.85
ESC-EU19	54.72 1,390	19.49 495	0.37 9.5	6.33 134.1	98.31 146.3	21.57 105.3	34.78 1,870	324.85 44,500	12.63 3.85
ESC-EU20	53.15 1,350	19.41 493	0.37 9.5	6.51 138	98.31 146.3	22.18 108.3	36.27 1,950	342.66 46,940	12.63 3.85
ESC-EU21	51.97 1,320	20.12 511	0.37 9.5	6.67 141.3	98.31 146.3	22.71 110.9	38.69 2,080	372.74 51,060	12.63 3.85
ESC-EU22	50.39 1,280	20.31 516	0.38 9.75	7.03 149	100.67 149.8	23.96 117	40.92 2,200	406.17 55,640	12.63 3.85
ESC-EU23	50 1,270	20.31 516	0.38 9.75	7.09 150.3	100.67 149.8	24.17 118	42.22 2,270	411.28 56,340	12.63 3.85
ESC-EU24	47.64 1,210	23.03 585	0.38 9.75	7.03 149	100.67 149.8	23.96 117	44.64 2,400	406.17 55,640	11.94 3.64
ESC-EU25	46.46 1,180	22.4 569	0.38 9.75	6.61 140.1	100.67 149.8	22.53 110	46.5 2,500	411.28 56,340	11.48 3.5
ESC-EU26	46.06 1,170	22.28 566	0.38 9.75	7.7 163.2	100.67 149.8	26.23 128.1	48.36 2,600	519.4 71,150	12.63 3.85
ESC-EU27	45.67 1,160	22.6 574	0.38 9.75	8.09 171.5	104.83 156	27.57 134.6	49.85 2,680	563.93 77,250	12.76 3.89
ESC-EU28	50.39 1,280	20.87 530	0.46 11.75	8.72 184.8	124.86 185.8	29.72 145.1	51.34 2,760	522.24 71,540	12.8 3.9
ESC-EU32	54.33 1,380	24.21 615	0.46 11.75	8.9 188.5	137.22 204.2	30.31 148	59.52 3,200	701.97 96,160	14.07 4.29
ESC-EU36	50.79 1,290	25.28 642	0.46 11.75	9.52 201.7	137.22 204.2	32.42 158.3	66.77 3,590	817.16 111,940	14.11 4.3

*excludes internal section of interlock

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SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT		ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile	Per Wall			
	in	in	in	in²/ft	lb/ft	lb/ft²	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	cm²/m	kg/m	kg/m²	cm³/m	cm⁴/m	m²/m
ESC-EU38	49.21 1,250	26.02 661	0.46 11.75	8.9 188.5	137.22 204.2	30.31 148	59.52 3,200	701.97 96,160	12.76 3.89
ESC-EU40	56.69 1,440	23.23 590	0.61 15.5	12.38 262.3	182.58 271.7	42.17 205.9	85.56 4,600	1006.67 137,900	15.55 4.74
ESC-EU46	51.97 1,320	24.49 622	0.61 15.5	12.38 262.3	182.58 271.7	42.17 205.9	85.56 4,600	1006.67 137,900	14.24 4.34
ESC-EU48	50.39 1,280	25.24 641	0.61 15.5	12.76 270.3	182.58 271.7	43.46 212.2	89.28 4,800	1090.55 149,390	14.24 4.34
ESC-EU50	48.82 1,240	25.51 648	0.61 15.5	13.17 279.1	182.58 271.7	44.87 219.1	93 5,000	1153.98 158,080	11.48 3.5
ESC-EU60	41.73 1,060	29.09 739	0.61 15.5	15.41 326.5	182.58 271.7	52.49 256.3	111.6 6,000	1636.51 224,180	13.45 4.1
ESC-EU65	59.06 1,500	29.09 739	0.71 18	14.73 312.1	246.96 367.5	50.18 245	120.9 6,500	1718.06 235,350	11.25 3.43
ESC-EU70	59.06 1,500	29.61 752	0.79 20	16.23 343.9	272.29 405.2	55.3 270	131.69 7,080	1924.21 263,590	11.22 3.42
ESC-EU80	59.06 1,500	30.08 764	0.87 22	18.2 385.5	298.84 444.7	61.97 302.6	148.99 8,010	2205.55 302,130	11.48 3.5

*excludes internal section of interlock

NORTH AMERICAN SIZES

ESC-EU7	55.16 1400	17.85 453	0.22 5.5	3.91 82.8	61.2 91.0	13.3 65.0	13.80 740	143.9 19,710	12.86 3.92
ESC-EU10	55.16 1400	18.95 481	0.25 6.5	4.53 95.91	70.83 105.4	15.42 75.3	18.80 1010	195.0 26,710	12.86 3.92
ESC-EU15	53.19 1,350	20.01 508	0.32 8.0	5.66 119.75	85.3 126.9	19.30 94.0	28.10 1,510	290.0 39,640	12.86 3.92
ESC-EU14-770	60.676 1,540	15.839 402	0.375 9.525	5.79 122.5	99.52 148.1	19.68 96.1	27 1,440	224 30,640	12.83 3.91
ESC-EU19-700	55.16 1,400	18.794 477	0.375 9.525	6.39 135.1	99.52 148.1	21.71 106.0	36 1,930	339 46,480	12.86 3.92
ESC-EU26-700	55.16 1,400	18.912 480	0.500 12.7	8.55 180.9	133.59 198.8	29.08 142.0	49 2,610	460 63,010	12.96 3.95
ESC-EU38-700	55.16 1,400	24.152 613	0.500 12.7	9.86 208.6	154.02 229.2	33.55 163.8	73 3,900	874 119,700	14.93 4.55
ESC-EU48-700	55.16 1,400	25.768 654	0.625 15.875	12.15 257.0	189.77 282.4	41.31 201.7	88 4,740	1132 155,080	14.93 4.55
ESC-EU50-580	45.704 1,160	28.053 712	0.500 12.7	11.90 251.8	154.02 229.2	40.49 197.7	94 5,080	1328 181,880	14.93 4.55

CORNER PILES

The slotted pipe clutch can be orientated at any angle allowing almost any corner configuration, without requiring any wastage or additional welding. For internal corners a special piece can be fabricated with little cost due to the flexibility in the cold forming process. Note that the interlocks should be orientated toward the retained side as shown in the following figures.

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Scan the QR code to watch Trench Pile Installation Video.

ESC-T SERIES

TRENCH SHEETS

THE PERFECT SOLUTION FOR SHALLOW EXCAVATIONS AND TRENCHES

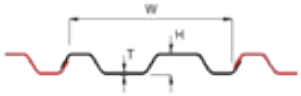
ESC trench sheet products offer a highly efficient retention system for shallow excavations. ESC trench sheet can be used to support earth banks for the safety of construction workers, and are ideal for reinforcement of waterway banks and services trenches. The strength, speed and flexibility of light trench sheets makes it ideal for all forms of temporary and permanent works. The trench piles also offer good durability and ease of installation and extraction allows sustainable construction.

Order Options	
Steel Grades	ASTM A572 Gr. 42, Gr.50, Gr.60 & Gr.65
	ASTM A690 Gr.50
	ASTM A588 Gr.50
	ASTM A871 Gr.60 & Gr.65
	ASTM A1018 Gr.50, Gr.60, Gr.70 & Gr.80
	Others available on request
Lengths	39.3ft maximum
	Any project specific length can be produced
Delivery Options	Lifting Hole
	By container (38.7ft or less) or Break Bulk

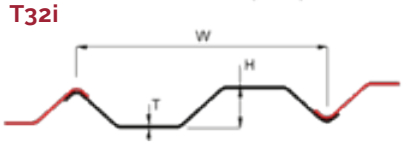
SECTION	WIDTH	HEIGHT	THICKNESS	UNIT WEIGHT		SECTION MODULUS	MOMENT OF INERTIA
	(w) in mm	(h) in mm	(t) in mm	Section lb/ft kg/m	Wall lb/ft² kg/m²	in³ cm³	in⁴ cm⁴
ESC-T24iA	23 ¾ 603.25	2 ¾ 69.58	3/16 4.76	18.8 28.04	9.5 46.38	4.3 70.46	5.8 241.41
ESC-T24iB	23 ¾ 603.25	2 ¾ 69.58	1/4 6.35	25.1 37.35	12.7 62.01	5.6 91.77	7.6 316.34
ESC-T24iC	23 ⅝ 600.08	2 ⅞ 73.03	5/16 7.94	31.7 47.10	16.1 78.61	6.9 113.07	10.0 416.23
ESC-T30iA	30 762	3 ¾ 95.25	1/4 6.35	33.5 49.85	13.4 65.42	10.2 167.15	18.4 765.87
ESC-T30iB	30 762	3 ¾ 95.25	3/8 9.53	50.3 74.85	20.1 98.14	13.9 227.78	26.1 1,086.36
ESC-T32i	32 812.8	4 ½ 114.30	3/8 9.53	50.2 74.71	18.8 91.79	17.3 283.50	38.1 1,585.84

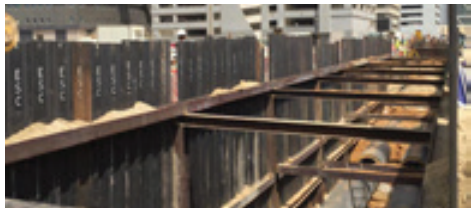
T24i

T30i



T32i

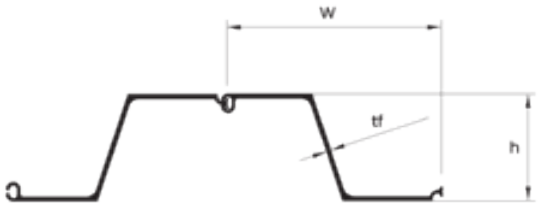




ALUMINUM SHEET PILES

ESC Aluminum sheet piles are generally used for bulkheads, water control structures, and seawalls. Aluminum sheet piling is an excellent option for projects that require serious protection from corrosive elements. Unlike steel, aluminum won't corrode due to sand and water. It won't chip like concrete or wood piles, making them a high-performing, low-maintenance sheet piling material for the marine environment.

Additionally, aluminum sheet piling is one of the most lightweight materials for marine construction needs. Their interlocking corrugated sheets are ideal for many projects, and at ESC, we have the expertise to get you the best piling product at the best possible price.



SERIES	UNIT WIDTH	HEIGHT	FLANGE	UNIT WEIGHT		TOTAL MODULUS	MOMENT OF INERTIA
	(w) in mm	(h) in mm	(tf) in mm	Section lb/ft kg/m	Wall lb/ft² kg/m²	in³/ft cm³/m	in⁴/ft cm⁴/m
APZ500	12.0 304.8	6.0 152.4	0.244 6.2	5.18 7.7	4.99 24.33	9.0 484	27 3,687

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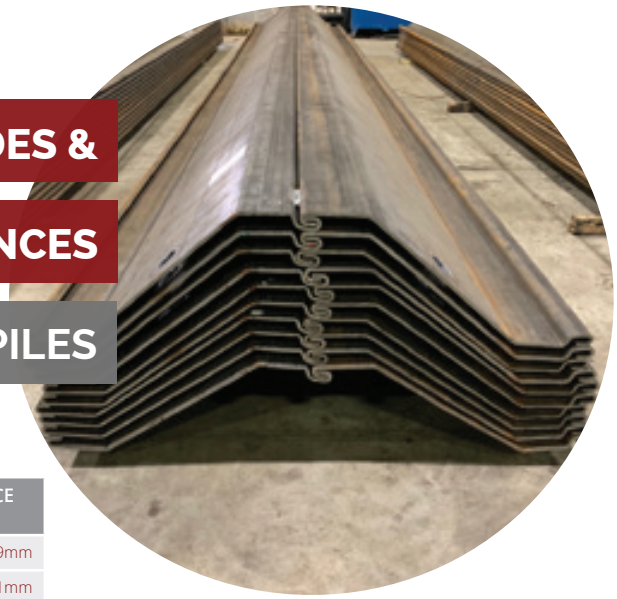
STEEL GRADES & MANUFACTURING TOLERANCES

COLD ROLLED & COLD FORMED SHEET PILES



MANUFACTURING TOLERANCES

COMPONENT	BS EN1024-9	ASTM A6	NOMINAL THICKNESS	TOLERANCE
Mass	± 5%	±2.5%	0.197" / 5mm	± 0.0114" / 0.29mm
Length	± 2.0" / 50mm	+ 5.0" / 127mm	0.236" / 6mm	± 0.0122" / 0.31mm
Height (≤ 7.87" / 200mm)	± 0.157" / 4.0mm		0.315" / 8mm	± 0.0138" / 0.35mm
Height (> 7.87" / 200mm & ≤ 11.8" / 300mm)	± 0.236" / 6.0mm		0.354" / 9mm	± 0.0157" / 0.40mm
Height (> 11.8" / 300mm & ≤ 15.8" / 400mm)	± 0.315" / 8.0mm		0.393" / 10mm	± 0.0157" / 0.40mm
Height (> 15.8" / 400mm)	± 0.394" / 10.0mm		0.472" / 12mm	± 0.0169" / 0.43mm
Width of Single Pile	± 2% of width		0.512" / 13mm	± 0.0181" / 0.46mm
Width of Double Z or Wide U	± 3% of width		0.591" / 15mm	± 0.0181" / 0.46mm
Squareness of Ends	2% of width		N/A	
Straightness	±0.2% of the length			
Squareness of Ends	± 2% of the width			

SHEET PILE MARKING

ESC is able to apply adhesive stickers to its products to provide useful information such as destination, order number, project identifier, client name and others. To enable good traceability, material heat number & pile specification is included as standard.

STEEL GRADES

CLASSIFICATION		MECHANICAL PROPERTIES						CHEMICAL COMPOSITION % (MAX)				
		MINIMUM YIELD STRENGTH		ULTIMATE TENSILE STRENGTH		MINIMUM ELONGATION	IMPACT STRENGTH (CHARPY)	C	Si	Mn	P	S
		ksi	MPa	ksi	MPa	%						
ASTM A36-14	A36	36	*250*	58-80	*400-550*	23	-	0.26	0.40	-	0.040	0.050
ASTM A572-2013a	A572 Gr.42	42	*290*	≥ 60	*≥415*	20	-	0.21	0.40	1.35	0.040	0.050
	A572 Gr.50	50	*345*	≥ 65	*≥450*	18	-	0.23	0.40	1.30	0.040	0.050
	A572 Gr.55	55	*380*	≥ 60	*≥485*	17	-	0.25	0.40	1.35	0.030	0.030
	A572 Gr.60	60	*413*	≥ 75	*≥517*	16	-	0.26	0.40	1.35	0.040	0.050
	A572 Gr.65	65	*450*	≥ 80	*≥550*	15	-	0.23	0.40	1.35	0.030	0.030
ASTM A588	A588 Gr.50A	50	*345*	≥ 70	*≥485*	18	-	0.19	0.30-0.65	0.80-1.25	0.040	0.050
	A588 Gr.50B	50	*345*	≥ 70	*≥485*	18	-	0.20	0.15-0.50	0.75-1.35	0.040	0.050
ASTM A690	A690 Gr.50	50	*345*	≥ 70	*>485*	21	-	0.22	0.40	0.60-0.90	0.08-.015	0.040
ASTM A871	A871 Gr.60 Type I	60	*415*	≥ 75	*>520*	16	15ft-lb [20J] @ 0°F [-18°C] for t<=0.5" [12mm] 15ft-lb [20J] @ -20°F [-29°C] for t>0.5" [12mm]	0.19	0.30-0.65	0.8-1.35	0.030	0.030
	A871 Gr.60 Type II	60	*415*	≥ 75	*>520*	16		0.20	0.15-0.50	0.75-1.35	0.030	0.030
	A871 Gr.60 Type IV	60	*415*	≥ 75	*>520*	16		0.17	0.25-0.50	0.50-1.20	0.030	0.030
	A871 Gr.65 Type I	65	*450*	≥ 80	*>550*	15	15ft-lb [20J] @ 0°F [-18°C] for t<=0.5" [12mm] 15ft-lb [20J] @ -20°F [-29°C] for t>0.5" [12mm]	0.19	0.30-0.65	0.80-1.35	0.030	0.030
	A871 Gr.65 Type II	65	*450*	≥ 80	*>550*	15		0.20	0.15-0.50	0.75-1.35	0.030	0.030
	A871 Gr.65 Type IV	65	*450*	≥ 80	*>550*	15		0.17	0.25-0.50	0.50-1.20	0.030	0.030
ASTM A1018	A1018 Gr.50 Class1	50	*340*	≥ 65	*>450*	16	-	0.23	-	1.50	0.040	0.040
	A1018 Gr.50 Class2	50	*340*	≥ 60	*>410*	16	-	0.15	-	1.50	0.040	0.040
	A1018 Gr.60 Class1	60	*410*	≥ 75	*>520*	14	-	0.26	-	1.50	0.040	0.040
	A1018 Gr.60 Class2	60	*410*	≥ 70	*>480*	14	-	0.15	-	1.50	0.040	0.040
	A1018 Gr.70 Class1	70	*480*	≥ 85	*>590*	10	-	0.26	-	1.65	0.040	0.040
	A1018 Gr.70 Class2	70	*480*	≥ 80	*>550*	10	-	0.15	-	1.65	0.040	0.040
	A1018 Gr.80	80	*550*	≥ 90	*>620*	10	-	0.15	-	1.65	0.025	0.035

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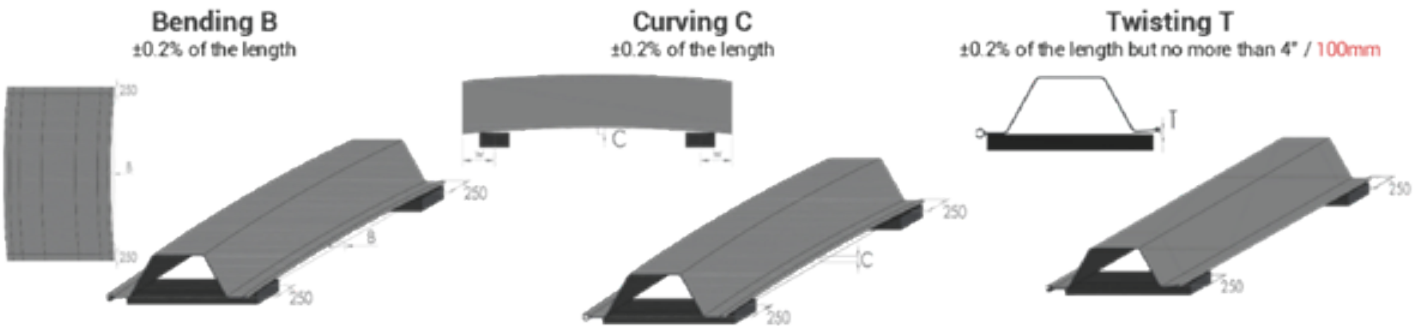
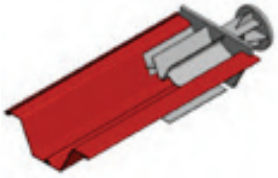
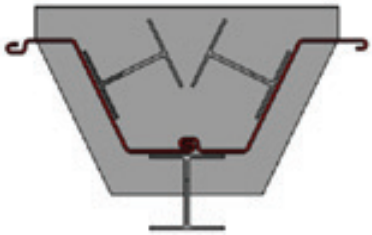


ESC Sheet Piling Accessories
Options

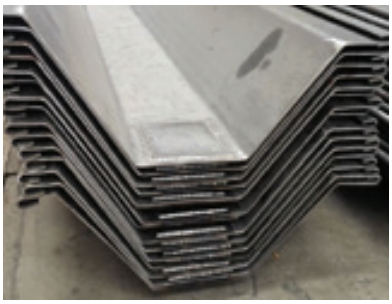
ESC is capable of supplying a wide range of accessories for Sheet Piles. All components that are welded are fabricated as per AWS D1.1 and other standards upon request by client. Featured are some of the typical components that can supplement ESC's sheet piling range.





DESIGN & FABRICATION OF DRIVING CAP

LIFTING HOLES



GRIP PLATE

REMOTE RELEASE LIFTING SHACKLE

SHEET PILING SHOES

CLUTCHES FOR CORNERS

PILING GUIDE

ESC STEEL PIPE PILES

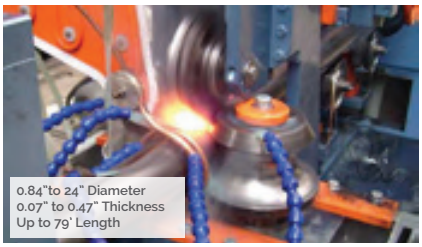
LSAW, SSAW & ERW PIPES

HIGH STRENGTH, ECONOMICAL AND EXCELLENT QUALITY STEEL PIPE PILES DELIVERED TO YOUR EXPECTATIONS

Pipe Piles can be utilised in a multitude of applications: such as building foundations, roads and railways, port construction and more. Utilising 3 different welding and forming processes, ESC can offer a wide range of Pipe Piles at various steel grades, thicknesses and sizes. With our expertise in logistics we have delivered Pipe Piles at over 100mT a piece and 328 ft (100 m) length directly to project sites halfway around the world.

LSAW PIPE

SSAW PIPE



ERW PIPE

PRODUCTION STANDARDS

STANDARD	DESCRIPTION
API 5L	Specification of Line Pipe
API 2B	Specification for the Fabrication of Structural Steel Pipe
ASTM 252	Standard Specification for Welded and Seamless Steel Pipe Piles
ASTM A139	Standard Specification for Electric Fusion (Arc) Welded Steel Pipe
BS EN 10219	Cold Formed Welded Structural Hollow Sections of non-alloy and fine grain steels.
ISO 3183	Steel Pipe for Pipeline Transportation Systems

STEEL GRADES

STANDARD	DESCRIPTION
API5L	X42, X46, X52, X56, X60, X65, X70
API 2W	Gr.50 & Gr.60
API 2H	Gr.42 & Gr.50
ASTM	A572 Gr.42, Gr.50, Gr.60 & Gr.65
Others	Available on request, contact ESC for further information.

QUALITY ASSURANCE GUARANTEED

PIPE AVAILABLE SIZES & MASS PER UNIT LENGTH (lb/ft/kg/m) ESC LSAW PIPE

LSAW PIPE THICKNESS (in/mm)

OUTER DIAMETER (in/mm)	1/4	8/27	3/8	7/16	1/2	9/16	5/8	11/16	3/4	7/8	1	1 1/4	1 3/8	1 1/2	1 3/4	2	2 1/3	2 3/4	3 3/20	3 1/2	3 15/16
	6.35	7.52	9.52	11.13	12.7	14.27	15.87	17.48	19.05	22.22	25.4	31.75	34.9	38.1	44.5	50.8	60	70	80	90	100
16 406.4			62.6 93.2	72.9 108.5	82.9 123.3	92.7 138	102.7 152.8	112.7 167.7	122.3 182	141.5 210.5	160.4 238.7	197.2 293.4	214.8 319.7	232.6 346.1	266.9 397.2	299.4 445.5					
18 457.2			70.6 105.1	82.3 122.4	93.5 139.2	104.8 155.9	116.1 172.7	127.4 189.6	138.3 205.8	160.2 238.4	181.8 270.5	223.8 333.1	244.3 363.5	264.6 393.8	304.3 452.9	342.1 509.1					
20 508			78.6 117	91.7 136.4	104.2 155.1	116.8 173.8	129.4 192.6	142.1 211.5	154.4 229.7	178.9 266.2	203.1 302.3	250.6 372.9	273.6 407.2	296.7 441.5	341.8 508.7	384.9 572.8	445.5 662.9				
24 609.6	63.5 94.5	75.1 111.7	94.7 140.9	110.4 164.3	125.6 186.9	140.8 209.5	156.2 232.4	171.6 255.3	186.4 277.4	216.3 321.9	245.9 365.9	304.1 452.5	332.4 494.6	360.9 537	416.8 620.2	470.5 700.1	546.5 813.2	626 931.5			
30 762	79.5 118.3	94 139.9	118.7 176.7	138.5 206.1	157.7 234.7	176.8 263.1	196.2 292	215.6 320.9	234.5 349	272.4 405.4	310.1 461.4	384.2 571.8	420.5 625.8	457.1 680.2	529.1 787.4	598.8 891	698.2 1,039	803 1,195			
36 914.4	95.6 142.2	113 168.2	142.7 212.4	166.6 247.9	189.8 282.4	212.9 316.8	236.3 351.7	259.8 386.6	282.6 420.6	328.5 488.9	374.2 556.9	464.4 691.1	508.7 757	553.3 823.4	641.6 954.7	727.1 1,082	849.4 1,264	979.8 1,458	1,106.1 1,646		
42 1,066.8	111.6 166.1	132 196.4	166.8 248.2	194.7 289.8	221.8 330.1	248.9 370.4	276.4 411.3	303.9 452.3	330.8 492.2	384.7 572.4	438.3 652.3	544.6 810.4	596.8 888.1	649.6 966.6	754 1,122	855.5 1,273	1,001.3 1,490	1,156.5 1,721	1,308.4 1,947	1,456.9 2,168	1,602 2,384
48 1,219.2			190.8 284	222.8 331.6	253.9 377.9	284.9 424	316.5 471	348.1 518	378.9 563.8	440.8 655.9	502.5 747.8	624.8 929.8	684.8 1,019	745.9 1,110	866.2 1,289	983.8 1,464	1,152.5 1,715	1,333.2 1,984	1,510.7 2,248	1,684 2,506	1,854.7 2,760
54 1,371.6			214.9 319.8	250.9 373.4	286 425.6	321 477.7	356.6 530.6	392.2 583.7	427 635.4	496.9 739.4	566.7 843.3	704.9 1,049	772.8 1,150	842 1,253	978.4 1,456	1,112.2 1,655	1,304.4 1,941	1,510 2,247	1,712.3 2,548	1,911.8 2,845	2,107.4 3,136
60 1,524					318.1 473.3	357 531.3	396.6 590.2	436.4 649.4	475.1 707	553 822.9	630.8 938.7	784.9 1,168	861.5 1,282	938.1 1,396	1,091.3 1,624	1,240.5 1,846	1,455.6 2,166	1,686.7 2,510	1,914.5 2,849	2,139 3,183	2,360.1 3,512
66 1,676.4					350.2 521.1	393.1 584.9	436.7 649.9	480.5 715.1	523.2 778.6	609.2 906.5	694.8 1,034	865.5 1,288	949.5 1,413	1,034.2 1,539	1,203.6 1,791	1,368.9 2,037	1,607.4 2,392	1,863.5 2,773	2,116.8 3,150	2,366.1 3,521	2,612.7 3,888
72 1,829					382.3 568.9	429.1 638.6	476.9 709.6	524.8 780.9	571.4 850.3	665.3 990.1	759.4 1,130	945.5 1,407	1037.6 1,544	1,131 1,683	1,315.8 1,958	1,497.2 2,228	1,759.3 2,618	2,040.9 3,037	2,319.1 3,451	2,593.9 3,860	2,865.4 4,264
78 1,981.2					414.3 616.5	465.2 692.2	516.9 769.2	568.8 846.5	619.4 921.8	721.1 1,073	823.2 1,225	1,025.5 1,526	1,125.6 1,675	1,227.1 1,826	1,428 2,125	1,624.9 2,418	1,910.5 2,843	2,216.9 3,299	2,520.7 3,751	2,821.1 4,198	3,117.4 4,639
84 2,134					446.5 664.4	501.3 746	557.1 829	613.1 912.4	667.7 993.6	777.5 1,157	887.7 1,321	1,106.1 1,646	1,214.3 1,807	1,323.2 1,969	1,540.9 2,293	1,753.9 2,610	2,062.4 3,069	2,394.3 3,563	2,722.9 40,52	3,048.9 4,537	3,370.8 5,016
90 2,280						535.9 797.4	595.5 886.1	655.4 975.3	713.7 1,062	831.3 1,237	948.9 1,412	1,182.7 1,760	1,298.3 1,932	1,415.2 2,106	1,648.4 2,453	1,876.9 2,793	2,207.5 3,285	2,563.7 3,815	2,916.5 4,340	3,266.6 4,861	3,612.7 5,376
96 2,438.4						573.3 853.1	637.1 948.1	701.6 1,044	764.1 1,137	889.7 1,324	1,016.1 1,512	1266 1,884	1,390.4 2,069	1,515.4 2,255	1,765.3 2,627	2,010 2,991	2,364.8 3,519	2,747.8 4,089	3,126.8 4,653	3,502.5 5,212	3,875.4 5,767
102 2,590.8						609.3 906.7	677.4 1,008	745.2 1,109	811.8 1,208	946.2 1,408	1,079.9 1,607	1,346.7 2,004	1,478.4 2,200	1,612.1 2,399	1,877.6 2,794	2,138.3 3,182	2,516.6 3,745	2,924.5 4,352	3,329.1 4,954	3,730.3 5,551	4,128.1 6,143
108 2,743.2						645.4 960.4	717 1,067	789.6 1,175	860.2 1,280	1,002 1,491	1,143.7 1,702	1,426.7 2,123	1,566.4 2,331	1,708.2 2,542	1,990.5 2,962	2,266.7 3,373	2,667.8 3,970	3,101.3 4,615	3,530.7 5,254	3,957.4 5,889	4,380.8 6,519
114 2,895.6							757.3 1,127	834 1,241	907.9 1,351	1,058.4 1,575	1,208.3 1,798	1,506.6 2,242	1,654.5 2,462	1,804.3 2,685	2,102.7 3,129	2,395 3,564	2,819.7 4,196	3,278 4,878	3,733 5,555	4,184.5 6,227	4,632.8 6,894
120 3,048							797.7 1,187	877.6 1,306	956.3 1,423	1,114.2 1,658	1,272.1 1,893	1,587.3 2,362	1,742.5 2,593	1,900.4 2,828	2,214.9 3,296	2,523.4 3,755	2,970.9 4,421	3,454.8 5,141	3,935.2 5,856	4,411.7 6,565	4,885.4 7270,
126 3,200								922 1,372	1,004 1,494	1,170 1,741	1,336.6 1,989	1,667.2 2,481	1,830.5 2,724	1,996.5 2,971	2,327.1 3,463	2,651 3,945	3,122.1 4,646	3,630.8 5,403	4,136.8 6,156	4,638.8 6,903	5,137.4 7,645
132 3,353								966.3 1,438	1,052.4 1,566	1,226.4 1,825	1,400.4 2,084	1,747.9 2,601	1,919.2 2,856	2,093.3 3,115	2,440 3,631	2,780.1 4,137	3,274.7 4,873	3,808.2 5,667	4,339.1 6,457	4,866.6 7,242	5,390.8 8,022
138 3,505									1,100.7 1,638	1,282.2 1,908	1,465 2,180	1,827.8 2,720	2,007.3 2,987	2,189.4 3,258	2,552.3 3,798	2,907.7 4,327	3,425.9 5,098	3,985 5,930	4,540.7 6,757	5,093.8 7,580	5,642.8 8,397
144 3,657.6									1,148.4 1,709	1,338.6 1,992	1,528.8 2,275	1,907.8 2,839	2,095.3 3,118	2,285.5 3,401	2,664.5 3,965	3,036.8 4,519	3,577.1 5,323	4,161.7 6,193	4,743 7,058	5,320.9 7,918	5,896.1 8,774
150 3,810										1,395.1 2,076	1,593.3 2,371	1,987.8 2,958	2,183.3 3,249	2,381.6 3,544	2,776.7 4,132	3,165.1 4,710	3,728.9 5,549	4,338.4 6,456	4,945.2 7,359	5,548.7 8,257	6,148.1 9,149
156 3,962										1,450.8 2,159	1,657.2 2,466	2,067.7 3,077	2,271.4 3,380	2,477.7 3,687	2,888.9 4,299	3,292.8 4,900	3,880.1 5,774	4,515.2 6,719	5,146.8 7,659	5,775.2 8,594	6,400.1 9,524
162 4,115										1,507.3 2,243	1,721.7 2,562	2,148.4 3,197	2,360.1 3,512	2,574.4 3,831	3,001.8 4,467	3,421.8 5,092	4,032 6,000	4,692.6 6,983	5,349.8 7,961	6,003.6 8,934	6,654.1 9,902
168 4,267										1,563.1 2,326	1,785.5 2,657	2,228.4 3,316	2,448.1 3,643	2,669.9 3,973	3,114 4,634	3,549.5 5,282	4,183.2 6,225	4,868.6 7,245	5,551.4 82,61	6,230.1 9,271	6,905.5 10,276

PIPE AVAILABLE SIZES & MASS PER UNIT LENGTH (lb/ft/kg/m) ESC SSAW PIPE

SSAW PIPE THICKNESS (in/mm)

OUTER DIAMTER (in/mm)	13/64 5.16	7/32 5.56	1/4 6.35	5/16 7.93	3/8 9.53	1/2 12.70	5/8 15.88	3/4 19.05	7/8 22.20	1 25.40
14 *355.6*	29.94 *44.56*	32.26 *48.01*	36.75 *54.69*	45.65 *67.93*	54.62 *81.28*	72.16 *107.4*				
16 *406.4*		23.51 *34.99*	42.09 *62.63*	52.32 *77.86*	62.64 *93.21*	84.13 *125.2*				
18 *457.2*		41.63 *61.95*	47.44 *70.6*	58.99 *87.78*	70.65 *105.1*	93.54 *139.2*	116.1 *172.8*			
20 *508*		46.31 *68.91*	52.78 *78.54*	65.66 *97.71*	78.67 *117.1*	104.2 *155.1*	129.5 *192.6*			
24 *609.6*		55.67 *82.84*	63.47 *94.45*	79.01 *117.6*	94.11 *140*	132.3 *196.9*	156.2 *232.4*	186.4 *277.4*		
30 *762*		69.73 *103.8*	79.51 *118.3*	99.02 *147.4*	118.8 *176.7*	157.7 *234.6*	196.3 *292.1*	234.5 *349*	272.4 *405.4*	310 *461.3*
36 *914.4*		83.77 *124.7*	95.54 *142.2*	119 *177.1*	142.8 *212.5*	189.8 *282.4*	236.4 *351.7*	282.6 *420.6*	328.6 *488.9*	374.2 *556.8*
42 *1,066.8*		97.82 *145.6*	111.6 *166*	139 *206.9*	166.9 *248.3*	154.6 *230.1*	276.4 *411.4*	330.7 *492.1*	384.7 *572.5*	438.3 *652.2*
48 *1,219.2*			127.6 *189.9*	159.1 *236.7*	190.9 *284.1*	253.9 *377.8*	316.5 *471*	378.8 *563.7*	440.8 *656*	502.2 *747.3*

SSAW PIPE THICKNESS (in/mm)

OUTER DIAMTER (in/mm)	13/64 5.16	7/32 5.56	1/4 6.35	5/16 7.93	3/8 9.53	1/2 12.70	5/8 15.88	3/4 19.05	7/8 22.20	1 25.40
54 *1,371.6*					215 *319.9*	286 *425.5*	356.6 *530.7*	426.9 *635.3*	496.9 *739.5*	566.6 *843.1*
60 *1,524*					239 *355.7*	318 *473.3*	396.7 *590.3*	475 *706.9*	553.1 *823*	630.7 *938.6*
72 *1,828.8*						382.2 *568.7*	476.9 *709.6*	571.3 *850.1*	665.3 *990.1*	759 *1,129*
84 *2,133.6*						446.3 *664.2*	557.1 *828.9*	667.5 *993.2*	777.6 *1,157*	887.3 *1,320*
96 *2,438.4*							637.2 *948.2*	763.7 *1,136*	889.8 *1,324*	1016 *1,511*
108 *2,743.2*							717.4 *1,068*	859.9 *1,280*	1,002 *1,491*	1,144 *1,702*
120 *3,048*							797.6 *1,187*	958.1 *1,426*	1,114 *1,658*	1,272 *1,893*

PIPE AVAILABLE SIZES & MASS PER UNIT LENGTH (lb/ft/kg/m) ESC ERW PIPE

ERW PIPE THICKNESS (in/mm)

OUTER DIAMETER (in/mm)	0.08 2.1	0.10 2.5	0.13 3.2	0.15 3.73	0.15 3.91	0.16 4.19	0.18 4.55	0.19 4.78	0.19 4.85	0.20 5.08	0.22 5.54	9/32 7.14	0.32 8.08	0.34 8.58	3/8 9.53	0.43 10.97	1/2 12.7	0.59 15.1	0.87 22
1.31 *33.4*	1.09 *1.62*	1.28 *1.91*	1.60 *2.38*	1.83 *2.73*	1.91 *2.84*	2.03 *3.02*	 *3.24*												
1.66 *42.2*	1.40 *2.08*	1.64 *2.45*	2.07 *3.08*	2.38 *3.54*	2.48 *3.69*	2.64 *3.93*	2.84 *4.22*	2.96 *4.41*	3.00 *4.47*	3.13 *4.65*									
1.90 *48.3*	1.61 *2.39*	1.90 *2.82*	2.39 *3.56*	2.76 *4.10*	2.88 *4.28*	3.06 *4.56*	3.30 *4.91*	3.45 *5.13*	3.49 *5.20*	3.64 *5.41*									
2 3/8 *60.3*	2.03 *3.01*	2.39 *3.56*	3.03 *4.51*	3.50 *5.20*	3.65 *5.44*	3.90 *5.80*	4.20 *6.26*	4.40 *6.54*	4.46 *6.63*	4.65 *6.92*	5.03 *7.48*	6.29 *9.36*							
2 7/8 *73*		2.92 *4.35*	3.70 *5.51*	4.28 *6.37*	4.48 *6.66*	4.78 *7.11*	5.16 *7.68*	5.40 *8.04*	5.48 *8.15*	5.72 *8.51*	6.19 *9.22*	7.79 *11.60*							
3.54 *89.9*		3.62 *5.39*	4.60 *6.84*	5.33 *7.93*	5.57 *8.29*	5.95 *8.86*	6.44 *9.58*	6.74 *10.03*	6.84 *10.17*	7.14 *10.63*	7.75 *11.53*	9.79 *14.57*							
4 *101.6*		4.11 *6.11*	5.22 *7.77*	6.05 *9.00*	6.33 *9.42*	6.76 *10.07*	7.32 *10.89*	7.67 *11.41*	7.78 *11.57*	8.13 *12.09*	8.82 *13.12*	11.18 *16.63*	12.52 *18.64*						
4 1/2 *114.3*		4.63 *6.89*	5.89 *8.77*	6.83 *10.17*	7.15 *10.64*	7.65 *11.38*	8.28 *12.32*	8.68 *12.91*	8.80 *13.09*	9.20 *13.68*	9.99 *14.86*	12.68 *18.87*	14.22 *21.17*	18.87 *22.37*					
5 9/16 *141.3*		5.75 *8.56*	7.32 *10.90*	8.50 *12.65*	8.90 *13.25*	9.52 *14.17*	10.31 *15.34*	10.81 *16.09*	10.97 *16.32*	11.47 *17.07*	12.46 *18.55*	15.87 *23.62*	17.84 *26.55*	18.87 *28.08*	20.81 *30.97*				
6 5/8 *168.3*		6.87 *10.22*	8.76 *13.03*	10.17 *15.14*	10.65 *15.85*	11.40 *16.96*	12.35 *18.37*	12.95 *19.28*	13.14 *19.55*	13.74 *20.45*	14.94 *22.24*	19.07 *28.38*	21.45 *31.93*	22.71 *33.80*	25.08 *37.31*	42.56			
8 5/8 *219.1*			11.45 *17.04*	13.31 *19.81*	13.94 *20.75*	14.92 *22.21*	16.18 *24.07*	16.98 *25.26*	17.22 *25.63*	18.02 *26.81*	19.61 *29.18*	25.08 *37.32*	28.26 *42.05*	29.93 *44.55*	33.10 *49.25*	37.84 *56.31*	43.44 *64.64*		
10 3/4 *273*							20.24 *30.12*	21.25 *31.62*	21.55 *32.07*	22.56 *33.57*	24.56 *36.54*	31.46 *46.81*	35.47 *52.79*	37.60 *55.95*	41.61 *61.92*	47.64 *70.89*	54.79 *81.53*	64.54 *96.04*	
12 3/4 *323.9*										26.84 *39.94*	29.23 *43.50*	37.48 *55.78*	42.29 *62.93*	44.84 *66.72*	49.65 *73.88*	56.89 *84.66*	65.50 *97.47*	77.28 *114.99*	
14 *355.6*						24.40 *36.31*	26.47 *39.39*	27.79 *41.36*	28.19 *41.95*	29.51 *43.91*	32.14 *47.83*	41.23 *61.36*	46.54 *69.25*	49.34 *73.43*	54.66 *81.33*	62.65 *93.24*	72.17 *107.40*	85.21 *126.80*	121.63 *181.00*
16 *406.4*						27.93 *41.56*	30.30 *45.09*	31.82 *47.34*	32.28 *48.03*	33.79 *50.28*	36.80 *54.77*	47.24 *70.30*	53.34 *79.37*	56.57 *84.18*	62.68 *93.27*	71.89 *106.98*	82.86 *123.31*	97.92 *145.72*	140.15 *208.56*
18 *457*						31.44 *46.79*	34.12 *50.77*	35.82 *53.31*	36.34 *54.08*	38.05 *56.62*	41.45 *61.68*	53.23 *79.21*	60.11 *89.45*	63.76 *94.88*	70.67 *105.17*	81.09 *120.67*	93.51 *139.16*	110.58 *164.56*	158.60 *236.01*
19.7 *500*								39.23 *58.38*	39.80 *59.22*	41.67 *62.00*	45.40 *67.56*	58.32 *86.78*	65.87 *98.02*	69.88 *103.98*	77.46 *115.27*	88.91 *132.30*	102.56 *152.62*	121.34 *180.57*	174.28 *259.34*
22 *559*								43.90 *65.33*	44.54 *66.28*	46.63 *69.40*	50.81 *75.62*	65.30 *97.17*	73.77 *109.78*	78.27 *116.47*	86.78 *129.14*	99.63 *148.26*	114.98 *171.10*	136.11 *202.54*	195.79 *291.35*
24 *610*											55.50 *82.58*	71.34 *106.15*	80.60 *119.94*	85.52 *127.26*	94.84 *141.12*	108.90 *162.06*	125.71 *187.08*	148.87 *221.53*	214.38 *319.02*

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STEEL GRADES & PRODUCT TOLERANCES

STEEL PIPE PILES

PRODUCT TOLERANCES

STANDARD	API 5L	API 2B	ASTM A252	ASTM A139	BS EN 10219-2	ISO 3183
Outside Diameter D	t≤60" / 1422mm, ±0.5% or ≤0.157" / 4.0mm		±1%	N/A	±1% or ± 0.0394" / 10.0mm	For 6.63" / 168.3mm <D≤ 24.0" / 610mm , ± 0.75% For 24.0" / 610mm <D≤ 60"/ 1422mm, ± 0.5% but ≤0.157" / 4.0mm
Wall Thickness t	<0.59" / 15.0mm, ±10% ≥0.59" / 15.0mm, ±0.059" / 1.5mm		-12.50%	±12.5%	±10% or ±0.0787" / 2.0mm	For 0.197" / 5.0mm < t ≤ 0.591" / 15.0mm, ±10% For >0.591" / 15.0mm ± 0.059" / 1.5mm
Straightness	0.2%L	≤3.175 in 3m length.	0.2%L	N/A	0.2%L	0.2%L
Out-of-roundness	D/t ≤ 75, D < 60" / 1,422mm ± 1.5%, ≤ 0.59" / 15.0mm	≤9.525 in 12m length. ≤L*0.001042 for total length	±2%	±1% within 4" / 100mm of ends	±2%	For D≤60"/ 1422mm & D/t≤75, ± 1.5%D but ≤0.591"/15.0mm
Mass	+10%/-3.5%	For t≤50.8: ≤1%*OD (max 6.35) for T>50.8: ≤T/8 for OD≥1219.2: ≤12.7 provided if circumference tolerance ≤6.35	+15%/-5%	+10%, -5%(t≤0.188" / 4.78mm) or -5.5% (t>0.188"/ 4.78mm)	±6%	+10%/-3.5% For Pipe Wt > 20t, +1.75%/-1.75%
Length L	± 7.87" / 200mm		± 1" / 25mm	±1/2" / 12.7mm	± 7.87" / 200mm	±19.7" / 500mm
Maximum Bead Weld Height	t≤0.512" / 13.0mm, 0.138" / 3.5mm t>0.512" / 13.0mm, 0.177" / 4.5mm		N/A	N/A	t≤0.559" / 14.2mm, 0.138" / 3.5mm t>0.56" / 14.2mm, 0.189" / 4.8	For t≤0.591" / 15.0mm, 0.059" / 1.5mm For 0.591" / 15.0mm<t≤0.984"/25.0mm, 10%t For t>0.984"/25.0mm, 0.098"/2.5mm
Maximum Bead Weld Height	t≤0.512" / 13.0mm, 0.138" / 3.5mm t>0.512" / 13.0mm, 0.177" / 4.5mm		N/A	N/A	t≤0.559" / 14.2mm, 0.138" / 3.5mm t>0.56" / 14.2mm, 0.189" / 4.8	For t≤0.591" / 15.0mm, 0.059" / 1.5mm For 0.591" / 15.0mm<t≤0.984"/25.0mm, 10%t For t>0.984"/25.0mm, 0.098"/2.5mm

Note that for diameters above 55.98 in (1,422 mm), the tolerances are to be agreed between the client and ESC as this size is excluded from the presented standards.

STEEL GRADES

CLASSIFICATION		MECHANICAL PROPERTIES						CHEMICAL COMPOSITION % (MAX)				
		MINIMUM YIELD POINT		ULTIMATE TENSILE STRENGTH		MINIMUM ELONGATION	IMPACT STRENGTH (CHARPY)	C	Si	Mn	P	S
		ksi	MPa	ksi	MPa	%						
API 5L / ISO 3183	L245 / B	36	*245*	≥ 60	*≥415*	23	-	0.26	-	1.20	0.030	0.030
	L290 / X42	42	*290*	≥ 60	*≥415*	23	-	0.26	-	1.30	0.030	0.030
	L320 / X46	46	*320*	≥ 63	*≥435*	22	-	0.26	-	1.40	0.030	0.030
	L360 / X52	52	*360*	≥ 67	*≥460*	21	-	0.26	-	1.40	0.030	0.030
	L390 / X56	57	*390*	≥ 71	*≥490*	19	-	0.26	-	1.40	0.030	0.030
	L 415 / X60	60	*415*	≥ 75	*≥520*	18	-	0.26	-	1.40	0.030	0.030
	L 450 / X65	65	*450*	≥ 78	*≥535*	18	-	0.26	-	1.45	0.030	0.030
	L 485 / X70	70	*485*	≥ 83	*≥570*	17	-	0.26	-	1.65	0.030	0.030
API 2W-06(2012)	API2WGr.50	50-75	*345-517*	≥ 65	*≥448*	18	-	0.16	0.05-0.50	1.15-1.60	0.030	0.010
	API2WGr.60	60-90	*414-621*	≥ 75	*≥517*	16	-	0.16	0.05-0.50	1.15-1.60	0.030	0.010
API 2H-2006	API2HGr.42	42	*289*	≥ 62-82	*≥427-565*	18	-	0.18	0.05-0.40	0.90-1.35	0.030	0.010
	API2HGr.50	50	*345*	≥ 70-90	*≥483-620*	16	-	0.18	0.50-0.40	1.15-1.60	0.030	0.010
ASTM A36-14	A36	36	*250*	≥ 58-80	*≥400-550*	23	-	0.26	0.40	-	0.040	0.040
ASTM A1018	A572Gr.42	42	*290*	≥ 60	*≥415*	20	-	0.21	0.40	1.35	0.040	0.050
	A572Gr.50	50	*345*	≥ 65	*≥450*	18	-	0.23	0.40	1.30	0.040	0.050
	A572Gr.55	55	*380*	≥ 70	*≥485*	17	-	0.25	0.40	1.35	0.030	0.030
	A572Gr.60	60	*413*	≥ 75	*≥517*	16	-	0.26	0.40	1.35	0.040	0.050
	A572Gr.65	65	*450*	≥ 80	*≥550*	15	-	0.23	0.40	1.35	0.030	0.030

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Project References

CARNIVAL CRUISE LINE TERMINAL,
DOMINICAN REPUBLIC

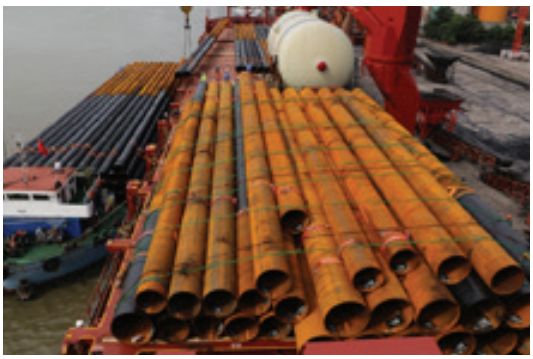
PORT OF TEXAS, USA

COLLINS WHARF, AUSTRALIA

CRUISE SHIP DOCK,
DOMINICAN REPUBLIC

LOUISIANA GRAIN EXPORT TERMINAL,
UNITED STATES

PORT OF BROWNSVILLE, UNITED STATES



LOUISIANA PROJECT, USA

BUNGE PROJECT, LOUISIANA,
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WATCH THE PILING INSTALLATION OF THIS PROJECT

ESC PIPE COMBINATION WALL

PIPE-HRZ, PIPE-CRZ, PIPE-S

PIPE-PIPE SERIES

A Pipe Pile Combination Wall System consists of Steel Pipe Piles that withstand most of the loading and Infill Sheet Piles that transmit pressure loads to the Pipe Piles. Pipe Piles can range in sizing utilising LSAW, SSAW and ERW Pipes.

The Pipe Piles serve two purposes from a structural standpoint, the first being as a retaining member that resists horizontal hydrostatic and earth pressures. The second purpose is to act as a bearing pile, resisting vertical loads. Pipe Pile Combination Walls are generally utilised when a standard series of sheet piles do not have the strength to resist the required design loads. Integration with Tie Back Systems and other anchorages is simple and ESC can offer the full configuration as part of its piling solution package.

Frequently infill sheet piles are not required to be the same length as the king H piles – typically between 60 to 100% of the H Pile length.

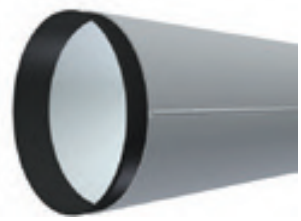
The ESC Advantage

- ✓ Design flexibility of LSAW, SSAW and ERW Pipes
- ✓ Comprehensive Range of Interlocks & Infill Sheet Piles
- ✓ Competitive Pricing
- ✓ Free of Charge Design
- ✓ Ability to supply small and large quantities
- ✓ Full Suite of Components: Tie Rods, Bollards and more

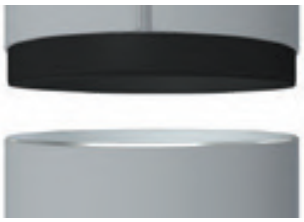
Pipe Pile Splicing

ESC is proud to present it's ESC-PSP Pipe-Pile Splicing Ring, which allows Pipe Piles to be delivered and installed in shorter lengths and spliced as they are driven on site. This can save logistical costs and handling costs.

1. The bottom of the upper Pipe Pile being spliced is pre-fitted and welded with the internal splicing ring that is welded on from the inside and outside.



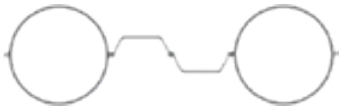
2. The bottom Pipe Pile is also bevelled prior to driving. After driving, the top Pipe Pile is positioned over. The Splicing Ring contains a lead in which helps positioning.



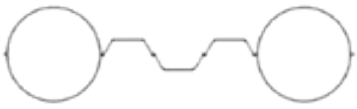
3. The two Pipe Piles are then welded. The full weld preparation is present and the internal splicing ring also acts as a backing strip to enable full penetration single sided welding.

Combined Wall Profiles

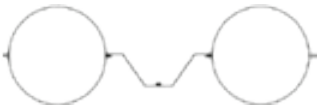
PIPE-ESC-HRZ SERIES



PIPE-U (DOUBLE) SERIES



PIPE-U (TRIPLE) SERIES



PIPE-CRZ SERIES

PIPE-S SERIES

PIPE-PIPE SERIES

PIPE-PIPE INTERLOCKS

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Project References

ESC has provided Pipe Pile Combined Wall Solutions to projects globally. Alongside the material fabrication and delivery, ESC has provided full geotechnical design in accordance with the client's' specifications and also conformance to international design standards. Contained in this catalog are only a few of the configurations possible with the Pipe Pile and Infill Sheet Pile profiles. Please contact our engineering department at **engineering@escsteel.com** to see if a more optimal design can be provided, free of charge. For the projects listed here, ESC has provided various components alongside the Pipe Pile and Sheet Pile materials. These include Tie Rod Systems, Corrosion Protection Coatings, Steel Bollards Anchorage Points and Waling Beams.

OT2 OIL TERMINAL PH1, UAE

VICTORIA HARBOUR EXTENSION, AUSTRALIA

WATCO BREAKWATER BERTHS, USA

OT2 OIL TERMINAL PH2, UAE

KAOSHIUNG PORT, TAIWAN

BARROW ISLAND, AUSTRALIA

ESC-HRZ INFILL SHEET PILES

SECTION	WIDTH	HEIGHT	THICKNESS		CROSS SECTIONAL AREA	WEIGHT	ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	Flange (t_f)	Web (t_w)		Per Pile			
	in	in	in	in	in²	lb/ft	in³/ft	in⁴/ft	ft²/ft
	mm	mm	mm	mm	cm²	kg/m	cm³/m	cm⁴/m	m²/m
ESC-HRZ14-1540	60.676 1,540	13.593 345	0.374 9.5	0.374 9.5	15.78 101.8	107 159.2	128 2,094.4	864 35,990	12.86 3.92
ESC-HRZ19-1400	55.16 1,400	16.587 421	0.374 9.5	0.374 9.5	15.78 101.8	107.8 160.4	161 2,632	1,330 55,412	12.93 3.94
ESC-HRZ26-1400	55.16 1,400	18.124 460	0.481 12.2	0.481 12.2	20.33 131.2	138.4 206	222 3,640	2,011 83,776	13.45 4.10
ESC-HRZ38-1400	55.16 1,400	19.70 500	0.630 16	0.481 12.2	24.98 161.2	170.0 253	324.65 5,320	3,194 132,972	14.30 4.36

*excludes internal section of interlock

COMBINED WALL PROPERTIES **ESC PIPE-HRZ** COMBI WALL

Interlocking Clutch

COMBINATION SECTION (Pipe Pile/Sheet Pile)	PROPERTIES OF PIPE PILE			PROPERTIES OF COMBINED WALL						
	OUTER DIAMETER	PIPE THICKNESS	PIPE (w/ CLUTCH WEIGHT)	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	MASS PER UNIT AREA		CROSS SECTIONAL AREA	COATING BOTH SIDES OF WALL**
							$MASS_{60\%}$*	$MASS_{100\%}$*		
	in	in	lb/ft	in	in⁴/ft	in³/ft	lb/ft²	lb/ft²	in²/ft	ft²/ft
	mm	mm	kg/m	mm	cm⁴/m	cm³/m	kg/m²	kg/m²	cm²/m	m²/m
ESC-P762/HRZ-1540	30.0 762	0.311 7.90	105.4 156.9	93.1 2,362	523 71,584	35 1,879	21.9 106.9	27.4 133.8	8.05 170.5	21.46 6.54
ESC-P762/HRZ19-1400	30.0 762	0.375 9.53	125.5 186.8	87.5 2,222	706 96,690	47 2,538	26.1 127.4	32.0 156.2	9.40 199.0	21.52 6.56
ESC-P914.4/HRZ26-1400	36.0 914.4	0.375 9.53	149.6 222.6	93.5 2,374	1110 152,031	62 3,325	29.9 145.8	37.0 180.5	10.86 229.9	23.62 7.20
ESC-P914.4/HRZ38-1400	36.0 914.4	0.500 12.70	196.5 292.4	93.5 2,374	1,533 210,041	85 4,594	38.3 187.1	47.0 229.7	13.82 292.6	24.48 7.46
ESC-P1066.8/HRZ14-1540	42.0 1,066.8	0.438 11.11	201.1 299.3	105.1 2,667	1,504 206,057	72 3,863	30.3 148.1	35.2 171.9	10.34 219.0	24.61 7.50
ESC-P1066.8/HRZ19-1400	42.0 1,066.8	0.500 12.70	228.5 340.1	99.6 2,527	1,848 253,153	88 4,746	34.4 172.7	40.6 198.1	11.91 252.3	24.67 7.52
ESC-P1066.8/HRZ26-1400	42.0 1,066.8	0.626 15.88	283.2 421.4	99.6 2,527	2,333 319,600	111 5,992	44.2 215.7	50.9 248.3	14.94 316.3	25.20 7.68
ESC-P1066.8/HRZ38-1400	42.0 1,066.8	0.751 19.05	337.5 502.2	99.6 2,527	2,871 393,284	137 7,373	53.0 258.8	61.2 298.9	17.99 380.8	26.05 7.94
ESC-P1219.2/HRZ14-1540	48.0 1,219.2	0.500 12.70	260.7 387.9	111.1 2,819	2,362 323,499	99 5,307	35.1 171.5	39.8 194.1	11.67 247.2	26.18 7.98
ESC-P1219.2/HRZ19-1400	48.0 1,219.2	0.626 15.88	323.3 481.1	105.6 2,679	3,111 426,199	130 6,991	44.1 215.5	49.0 239.4	14.40 305.0	26.25 8.00
ESC-P1219.2/HRZ26-1400	48.0 1,219.2	0.751 19.05	385.6 573.8	105.6 2,679	3,753 514,082	157 8,433	53.3 260.3	59.6 291.1	17.52 370.8	26.77 8.16
ESC-P1219.2/HRZ38-1400	48.0 1,219.2	0.876 22.23	447.6 666.1	105.6 2,679	4442 608,504	186 9,982	62.5 305.3	70.2 343.0	20.64 437.0	27.62 8.42
ESC-P1371.6/HRZ14-1540	54.0 1,371.6	0.563 14.29	328.1 488.3	117.1 2,972	3,535 484,311	131 7,062	40.2 196.4	44.6 217.9	13.11 277.6	27.76 8.46

*$Mass_{60\%}$ refers to a combined wall with a sheet pile length at 60% of the King Pipe Pile Length. $Mass_{100\%}$ refers to equal sheet pile and King Pipe Pile Lengths. Please refer to our 'Useful Equations' section for the formula to calculate other length combinations.

**Coating Area excludes internal area of pipe and interlocks

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COMBINED WALL PROPERTIES **ESC PIPE-HRZ** COMBI WALL

Interlocking Clutch

COMBINATION SECTION (Pipe Pile/Sheet Pile)	PROPERTIES OF PIPE PILE			PROPERTIES OF COMBINED WALL						
	OUTER DIAMETER	PIPE THICKNESS	PIPE (w/ CLUTCH WEIGHT)	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	MASS PER UNIT AREA		CROSS SECTIONAL AREA	COATING BOTH SIDES OF WALL**
							$MASS_{60\%}$*	$MASS_{100\%}$*		
	in mm	in mm	lb/ft kg/m	in mm	in^4/ft cm^4/m	in^3/ft cm^3/m	lb/ft^2 kg/m^2	lb/ft^2 kg/m^2	in^2/ft cm^2/m	ft^2/ft m^2/m
ESC-P1371.6/HRZ19-1400	54.0 1,371.6	0.626 15.88	363.4 540.8	111.6 2,832	4,148 568,259	154 8,286	46.1 225.0	50.7 247.6	14.90 315.4	27.82 8.48
ESC-P1371.6/HRZ26-1400	54.0 1,371.6	0.751 19.05	433.7 645.4	111.6 2,832	4,989 683,437	185 9,966	55.6 271.6	61.6 300.7	18.09 383.0	28.32 8.64
ESC-P1371.6/HRZ38-1400	54.0 1,371.6	0.876 22.23	503.7 749.6	111.6 2,832	5,873 804,479	218 11,731	65.2 318.3	72.5 354.1	21.30 451.0	29.20 8.90
ESC-P1524/HRZ14-1540	60.0 1,524	0.626 15.88	403.5 600.4	123.1 3,124	5,082 696,111	170 9,135	45.6 222.8	49.8 243.2	14.63 309.8	29.33 8.94
ESC-P1524/HRZ19-1400	60.0 1,524	0.751 19.05	481.8 717.0	117.6 2,984	6,375 873,240	213 11,460	55.8 272.5	60.2 294.0	17.70 374.6	29.40 8.96
ESC-P1524/HRZ26-1400	60.0 1,524	0.876 22.23	559.8 833.1	117.6 2,984	7,438 1,018,949	249 13,372	65.7 320.6	71.3 348.2	20.96 443.6	29.92 9.12
ESC-P1524/HRZ38-1400	60.0 1,524	1.000 25.40	637.5 948.7	117.6 2,984	8,540 1,169,897	286 15,353	75.5 368.8	82.5 402.7	24.23 513.0	30.77 9.38
ESC-P1676.4/HRZ14-1540	66.0 1,676.4	0.688 17.46	486.8 724.4	129.1 3,276	7,057 966,666	215 11,533	51.3 250.3	55.2 269.7	16.23 343.6	30.87 9.41
ESC-P1676.4/HRZ19-1400	66.0 1,676.4	0.751 19.05	529.9 788.6	123.6 3,136	8,057 1,103,664	245 13,167	57.8 282.1	62.0 302.6	18.21 385.5	30.940 9.43
ESC-P1676.4/HRZ26-1400	66.0 1,676.4	0.876 22.23	616.0 916.7	123.6 3,136	9,391 1,286,499	285 15,348	67.9 331.7	73.3 357.9	21.54 456.0	31.46 9.59
ESC-P1676.4/HRZ38-1400	66.0 1,676.4	1.000 25.40	701.7 1044.2	123.6 3,136	10,760 1,473,958	327 17,585	78.1 381.3	84.7 413.6	24.89 526.9	32.32 9.85
ESC-P1828.8/HRZ14-1540	72.0 1,828.8	0.751 19.05	578.1 860.2	135.1 3,429	9,518 1,303,860	265 14,259	57.1 278.7	60.9 297.3	17.89 378.7	32.45 9.89
ESC-P1828.8/HRZ19-1400	72.0 1,828.8	0.813 20.64	625.2 930.3	129.6 3,289	10,759 1,473,824	300 16,118	63.9 312.1	67.9 331.6	19.96 422.5	32.51 9.91
ESC-P1828.8/HRZ26-1400	72.0 1,828.8	0.876 22.23	672.1 1,000.2	129.6 3,289	11,610 1,590,426	324 17,393	70.0 341.7	75.1 366.8	22.49 467.2	33.04 10.07
ESC-P1828.8/HRZ38-1400	72.0 1,828.8	1.000 25.40	765.9 1,139.7	129.6 3,289	13,283 1,819,618	370 19,900	80.4 392.7	86.7 423.5	25.48 539.4	33.89 10.33
ESC-P1981.2/HRZ26-1400	78.0 1,981.2	0.876 22.23	728.2 1,083.7	135.6 3,441	14,098 1,931,285	363 19,496	71.8 350.8	76.8 374.8	22.55 477.4	34.610 10.55
ESC-P1981.2/HRZ38-1400	78.0 1,981.2	1.000 25.40	830.0 1,235.1	135.6 3,441	16,115 2,207,507	415 22,285	82.5 403.0	432.4	26.026 550.9	10.81
ESC-P2133.6/HRZ26-1400	84.0 2,133.6	0.876 22.23	784.4 1,167.2	141.6 3,594	16,860 2,309,534	403 21,649	73.6 359.2	78.3 382.1	22.99 486.8	36.19 11.03
ESC-P2133.6/HRZ38-1400	84.0 2,133.6	1.000 25.40	894.2 1,330.6	141.6 3,594	19,258 2,638,145	460 24,730	84.5 412.5	90.3 440.7	26.5 561.4	37.040 11.29

*$Mass_{60\%}$ refers to a combined wall with a sheet pile length at 60% of the King Pipe Pile Length. $Mass_{100\%}$ refers to equal sheet pile and King Pipe Pile Lengths. Please refer to our 'Useful Equations' section for the formula to calculate other length combinations.

**Coating Area excludes internal area of pipe and interlocks

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ESC-CRZ INFILL SHEET PILES

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT	ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pair			
	in	in	in	in^2	lb/ft	in^3	in^4	ft^2/ft
	mm	mm	mm	cm^2	kg/m	cm^3	cm^4	m^2/m
ESC-CRZ14-1540	60.63 1,540	13.58 345	0.39 10.0	33.08 213.4	112.55 167.48	129.87 2,129	904.35 37,642	14.11 4.3
ESC-CRZ19-1400	55.12 1,400	16.57 421	0.37 9.5	32.04 206.7	108.02 160.74	158.91 2,605	1,325.87 55,187	14.30 4.36
ESC-CRZ26-1400	55.12 1,400	18.11 460	0.48 12.2	42.38 273.4	143.40 213.4	221.80 3,636	2,012.65 83,773	14.76 4.5
ESC-CRZ38-1400	55.12 1,400	22.05 560	0.51 13.0	50.20 323.9	170.88 254.28	330.07 5,411	3,642.36 151,607	17.59 5.36
ESC-CRZ48-1400	55.12 1,400	23.23 590	0.59 15.0	61.71 398.1	210.03 312.54	412.79 6,767	4,804.62 199,984	17.59 5.36

*excludes internal section of interlock

COMBINED WALL PROPERTIES ESC PIPE-CRZ COMBI WALL

Interlocking Clutch

COMBINATION SECTION (Pipe Pile/Sheet Pile)	PROPERTIES OF PIPE PILE			PROPERTIES OF COMBINED WALL						
	OUTER DIAMETER	PIPE THICKNESS	PIPE (w/ CLUTCH WEIGHT)	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	MASS PER UNIT AREA		CROSS SECTIONAL AREA	COATING BOTH SIDES OF WALL**
							$MASS_{60\%}$*	$MASS_{100\%}$*		
	in	in	lb/ft	in	in^4/ft	in^3/ft	lb/ft^2	lb/ft^2	in^2/ft	ft^2/ft
	mm	mm	kg/m	mm	cm^4/m	cm^3/m	kg/m^2	kg/m^2	cm^2/m	m^2/m
ESC609.6/ESC-CRZ14-1540	24 609.6	0.25 6.35	73.56 109.47	88.31 2,243	300.75 41,198	25.15 1,352	19.45 94.96	26.66 130.18	7.74 163.91	22.77 6.94
ESC609.6/ESC-CRZ19-1400	24 609.6	0.37 9.52	104.76 155.89	82.80 2,103	472.14 64,677	39.47 2,122	24.87 121.44	32.30 157.72	9.39 198.86	22.97 7.00
ESC609.6/ESC-CRZ26-1400	24 609.6	0.50 12.7	137.73 204.95	82.99 2,108	657.70 90,096	54.98 2,956	32.71 159.7	42.40 207.04	12.36 261.81	23.49 7.16
ESC762/ESC-CRZ14-1540	30 762	0.31 7.92	109.06 162.29	94.29 2,395	521.27 71,407	34.86 1,874	22.73 110.97	29.48 143.95	8.57 181.57	24.31 7.41
ESC762/ESC-CRZ19-1400	30 762	0.37 9.52	128.80 191.67	88.78 2,255	694.39 95,122	46.44 2,497	26.44 129.1	33.37 162.93	9.71 205.63	24.51 7.47
ESC762/ESC-CRZ26-1400	30 762	0.50 12.7	169.80 252.68	88.98 2,260	948.50 129,932	63.43 3,410	34.83 170.05	43.87 214.2	12.79 271.06	25.03 7.63
ESC914.4/ESC-CRZ14-1540	36 914.4	0.37 9.52	152.85 227.45	100.28 2,547	901.73 123,525	50.26 2,702	26.61 129.91	32.96 160.92	9.60 203.29	25.89 7.89
ESC914.4/ESC-CRZ19-1400	36 914.4	0.44 11.13	176.69 262.93	94.76 2,407	1,144.24 156,745	63.76 3,428	30.83 150.53	37.32 182.22	10.87 230.32	26.08 7.95
ESC914.4/ESC-CRZ26-1400	36 914.4	0.50 12.7	201.88 300.41	94.96 2,412	1,360.15 186,322	75.80 4,075	36.68 179.1	45.15 220.45	13.18 279.14	26.61 8.11
ESC1066.8/ESC-CRZ14-1540	42 1,066.8	0.44 11.13	204.80 304.76	106.30 2,700	1,492.31 204,426	71.29 3,833	30.97 151.22	36.96 180.47	10.78 228.3	27.46 8.37
ESC1066.8/ESC-CRZ19-1400	42 1,066.8	0.50 12.7	231.94 345.15	100.79 2,560	1,823.43 249,785	87.10 4,683	35.57 173.68	41.67 203.49	12.15 257.52	27.66 8.43
ESC1066.8/ESC-CRZ26-1400	42 1,066.8	0.62 15.87	288.50 429.31	100.98 2,565	2,297.77 314,763	109.76 5,901	44.79 218.71	52.76 257.61	15.41 326.58	28.18 8.59
ESC1219.2/ESC-CRZ19-1400	48 1,219.2	0.50 12.7	264.02 392.88	106.77 2,712	2,506.27 343,325	104.76 5,632	37.18 181.52	42.94 209.65	12.53 265.47	29.23 8.91

*$Mass_{60\%}$ refers to a combined wall with a sheet pile length at 60% of the King Pipe Pile Length. $Mass_{100\%}$ refers to equal sheet pile and King Pipe Pile Lengths. Please refer to our 'Useful Equations' section for the formula to calculate other length combinations.

**Coating Area excludes internal area of pipe and interlocks

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COMBINED WALL PROPERTIES **ESC PIPE-CRZ** COMBI WALL

COMBINATION SECTION (Pipe Pile/Sheet Pile)	PROPERTIES OF PIPE PILE			PROPERTIES OF COMBINED WALL						
	OUTER DIAMETER	PIPE THICKNESS	PIPE (W/ CLUTCH WEIGHT)	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	MASS PER UNIT AREA		CROSS SECTIONAL AREA	COATING BOTH SIDES OF WALL**
							$MASS_{60\%}$*	$MASS_{100\%}$*		
	in	in	lb/ft	in	in^4/ft	in^3/ft	lb/ft^2	lb/ft^2	in^2/ft	ft^2/ft
	mm	mm	kg/m	mm	cm^4/m	cm^3/m	kg/m^2	kg/m^2	cm^2/m	m^2/m
ESC1219.2/ESC-CRZ26-1400	48 1,219.2	0.62 15.87	328.58 488.96	106.97 2,717	3,142.95 430,541	131.37 7,063	46.78 228.4	54.29 265.11	15.87 336.22	29.76 9.07
ESC1219.2/ESC-CRZ38-1400	48 1,219.2	0.75 19.05	390.99 581.83	106.97 2,717	3,882.45 531,842	162.27 8,724	55.62 271.6	64.38 314.34	18.83 398.93	32.58 9.93
ESC1219.2/ESC-CRZ48-1400	48 1,219.2	0.75 19.05	400.73 596.33	108.42 2754	3,958.51 542,262	165.45 8,895	58.77 286.96	70.00 341.8	20.41 432.36	33.56 10.23
ESC1371.6/ESC-CRZ19-1400	54 1,371.6	0.56 14.3	331.74 493.66	112.80 2,865	3,719.38 509,504	138.18 7,429	42.40 207.05	47.86 233.68	13.98 296.17	30.81 9.39
ESC1371.6/ESC-CRZ26-1400	54 1,371.6	0.62 15.87	368.66 548.6	112.99 2,870	4,164.20 570,439	154.71 8,318	48.55 237.05	55.67 271.82	16.28 344.84	31.33 9.55
ESC1371.6/ESC-CRZ38-1400	54 1,371.6	0.75 19.05	439.10 653.43	112.99 2,870	5,095.47 698,010	189.31 10,178	57.78 282.13	66.07 322.59	19.33 409.53	34.15 10.41
ESC1371.6/ESC-CRZ48-1400	54 1,371.6	0.75 19.05	448.85 667.93	114.45 2,907	5,152.11 705,769	191.41 10,291	60.73 296.55	71.37 348.51	20.82 441.07	35.14 10.71
ESC1524/ESC-CRZ19-1400	60 1,524	0.62 15.87	406.73 605.25	118.78 3,017	5,306.60 726,932	177.44 9,540	47.84 233.57	53.01 258.86	15.50 328.32	32.38 9.87
ESC1524/ESC-CRZ26-1400	60 1,524	0.75 19.05	487.22 725.03	118.98 3,022	6,362.91 871,631	212.77 11,439	58.06 283.48	64.82 316.49	18.97 401.82	32.91 10.03
ESC1524/ESC-CRZ38-1400	60 1,524	0.81 20.65	526.58 783.6	118.98 3,022	7,023.10 962,069	234.84 12,626	63.69 310.97	71.56 349.4	20.95 443.75	35.73 10.89
ESC1524/ESC-CRZ48-1400	60 1,524	0.81 20.65	536.32 798.1	120.43 3,059	7,053.60 966,247	235.85 12,680	66.42 324.33	76.53 373.7	22.34 473.3	36.71 11.19
ESC1676.4/ESC-CRZ19-1400	66 1,676.4	0.69 17.48	490.65 730.13	124.76 3,169	7,346.02 1,006,304	223.31 12,006	53.61 261.75	58.54 285.82	17.12 362.73	33.96 10.35
ESC1676.4/ESC-CRZ26-1400	66 1,676.4	0.75 19.05	535.34 796.63	124.96 3,174	8,025.43 1,099,374	243.96 13,116	59.89 292.42	66.32 323.85	19.41 411.26	34.48 10.51
ESC1676.4/ESC-CRZ38-1400	66 1,676.4	0.81 20.65	578.73 861.21	124.96 3,174	8,814.93 1,207,525	267.95 14,406	65.64 320.49	73.13 357.07	21.41 453.59	37.30 11.37
ESC1676.4/ESC-CRZ48-1400	66 1,676.4	0.81 20.65	588.48 875.71	126.42 3,211	8,823.33 1,208,676	268.21 14,420	68.22 333.1	77.85 380.13	22.73 481.63	38.29 11.67
ESC1828.8/ESC-CRZ19-1400	72 1,828.8	0.75 19.05	581.43 865.22	130.79 3,322	9,866.87 1,351,626	274.95 14,782	59.48 290.41	64.18 313.37	18.78 397.9	35.53 10.83
ESC1828.8/ESC-CRZ26-1400	72 1,828.8	0.81 20.65	630.89 938.82	130.98 3,327	10,704.32 1,466,345	298.27 16,036	65.90 321.77	72.04 351.75	21.09 446.87	36.06 10.99
ESC1828.8/ESC-CRZ38-1400	72 1,828.8	1.00 25.4	771.22 1,147.65	130.98 3,327	13,172.29 1,804,423	367.03 19,733	80.26 391.91	87.41 426.82	25.61 542.49	38.88 11.85
ESC1828.8/ESC-CRZ48-1400	72 1,828.8	1.00 25.4	780.96 1,162.15	132.44 3,364	13,132.39 1,798,957	365.94 19,674	82.57 403.17	91.76 448.06	26.82 568.28	39.86 12.15
ESC1981.2/ESC-CRZ26-1400	78 1,981.2	0.87 22.22	733.47 1,091.48	136.97 3,479	13,941.31 1,909,769	358.59 19,279	72.00 351.55	77.87 380.23	22.81 483.19	37.60 11.46
ESC1981.2/ESC-CRZ38-1400	78 1,981.2	1.00 25.4	835.38 1,243.12	136.97 3,479	15,977.81 2,188,741	410.97 22,095	82.37 402.19	89.20 435.56	26.13 553.68	40.42 12.32
ESC1981.2/ESC-CRZ48-1400	78 1,981.2	1.00 25.4	845.12 1,257.62	138.42 3,516	15,910.12 2,179,468	409.22 22,001	84.55 412.84	93.35 455.79	27.29 578.24	41.40 12.62
ESC2133.6/ESC-CRZ26-1400	84 2,133.6	0.87 22.22	789.59 1,174.99	142.99 3,632	16,679.50 2,284,863	398.37 21,418	73.68 359.79	79.31 387.26	23.23 492.21	39.17 11.94
ESC2133.6/ESC-CRZ38-1400	84 2,133.6	0.87 22.22	789.59 1,174.99	142.99 3,632	16,815.86 2,303,542	401.63 21,593	75.07 366.55	81.62 398.52	23.91 506.55	41.99 12.8
ESC2133.6/ESC-CRZ48-1400	84 2,133.6	0.87 22.22	799.34 1,189.49	144.45 3,669	16,742.52 2,293,496	399.88 21,499	77.23 377.12	85.67 418.29	25.04 530.56	42.98 13.1

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ESC-S INFILL SHEET PILES

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT	ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pair			
	in	in	in	in²	lb/ft	in³	in⁴	ft²/ft
	mm	mm	mm	cm²	kg/m	cm³	cm⁴	m²/m
ESC-S8	56.69	16.30	0.31	7.16	80.10	115.90	23.18	12.43
	1,440	414	7.75	151.8	119.2	1,900	965	3.79
ESC-S10	56.69	16.38	0.38	8.86	99.05	143.96	28.52	12.43
	1,440	416	9.75	187.8	147.4	2,360	1,187	3.79
ESC-S12	56.69	16.65	0.46	10.74	120.09	179.95	35.22	12.53
	1,440	423	11.75	227.6	178.7	2,950	1,466	3.82

*excludes internal section of interlock

COMBINED WALL PROPERTIES ESC PIPE-S COMBI WALL

Interlocking Clutch

PROPERTIES OF PIPE PILE					ESC-S8 INFILL SHEET PILE				ESC-S10 INFILL SHEET PILE				ESC-S12 INFILL SHEET PILE			
PIPE OD	PIPE T	WEIGHT	SYSTEM WIDTH	COATING BOTH SIDES	SYSTEM INERTIA	SECTION MODULUS	MASS PER UNIT AREA		SYSTEM INERTIA	SECTION MODULUS	MASS PER UNIT AREA		SYSTEM INERTIA	SECTION MODULUS	MASS PER UNIT AREA	
							$MASS_{60\%}$*	$MASS_{100\%}$*			$MASS_{60\%}$*	$MASS_{100\%}$*			$MASS_{60\%}$*	$MASS_{100\%}$*
in	in	lb/ft	in	ft²/ft	in⁴/ft	in³/ft	lb/ft²	lb/ft²	in⁴/ft	in³/ft	lb/ft²	lb/ft²	in⁴/ft	in³/ft	lb/ft²	lb/ft²
mm	mm	kg/m	mm	m²/m	cm⁴/m	cm³/m	kg/m²	kg/m²	cm⁴/m	cm³/m	kg/m²	kg/m²	cm⁴/m	cm³/m	kg/m²	kg/m²
36	0.39	149.79	94.88	10.33	999.08	55.71	26.42	31.33	1,027.00	57.20	27.85	33.79	1,057.04	58.87	29.90	37.27
914	10	222.9	2,410	3.15	136,860	2,995	129	153	140,685	3,075	136	165	144,800	3,165	146	182
36	0.47	179.36	94.88	10.33	1,167.64	65.10	30.11	35.02	1,195.56	66.59	31.54	37.48	1,224.68	68.26	33.59	40.96
914	12	266.9	2,410	3.15	159,950	3,500	147	171	163,775	3,580	154	183	167,765	3,670	164	200
36	0.55	208.79	94.88	10.33	1,333.93	74.31	33.79	38.71	1,361.85	75.89	35.23	41.16	1,390.10	77.47	37.27	44.85
914	14	310.7	2,410	3.15	182,730	3,995	165	189	186,555	4,080	172	201	190,425	4,165	182	219
36	0.63	238.09	94.88	10.33	1,498.00	83.51	37.48	42.39	1,525.88	85	38.91	44.85	1,553.29	86.58	40.96	48.33
914	16	354.3	2,410	3.15	205,205	4,490	183	207	209,025	4,570	190	219	212,780	4,655	200	236
40	0.47	199.65	99.21	11.38	1,500.62	75.24	31.33	36.04	1,527.42	76.54	32.77	38.3	1,553.70	77.93	34.61	41.78
1,016	12	297.1	2,520	3.47	205,565	4,045	153	176	209,235	4,115	160	187	212,835	4,190	169	204
40	0.55	232.51	99.21	11.38	1,721.71	86.3	35.23	40.14	1,748.50	87.7	36.66	42.39	1,773.68	88.91	38.71	45.88
1,016	14	346	2,520	3.47	235,850	4,640	172	196	239,520	4,715	179	207	242,970	4,780	189	224
40	0.63	265.17	99.21	11.38	1,940.12	97.28	39.32	44.03	1,966.91	98.58	40.76	46.28	1,990.97	99.79	42.6	49.77
1,016	16	394.6	2,520	3.47	265,770	5,230	192	215	269,440	5,300	199	226	272,735	5,365	208	243
40	0.71	297.7	99.21	11.38	2,155.91	108.07	43.21	47.92	2,182.66	109.46	44.65	50.18	2,205.66	110.58	46.49	53.66
1,016	18	443	2,520	3.47	295,330	5,810	211	234	298,995	5,885	218	245	302,145	5,945	227	262
48	0.55	279.55	107.09	13.48	2,690.82	112.44	37.89	42.19	2,715.60	113.46	39.12	44.44	2,734.40	114.3	40.96	47.72
1,219	14	416	2,720	4.11	368,605	6,045	185	206	372,000	6,100	191	217	374,575	6,145	200	233
48	0.63	319	107.09	13.48	3,045.23	127.22	42.39	46.69	3,070.02	128.34	43.62	48.95	3,087.17	128.99	45.47	52.02
1,219	16	474.7	2,720	4.11	417,155	6,840	207	228	420,550	6,900	213	239	422,900	6,935	222	254
48	0.71	358.24	107.09	13.48	3,396.07	141.92	46.69	51.2	3,420.85	142.94	47.92	53.25	3,436.40	143.59	49.77	56.32
1,219	18	533.1	2,720	4.11	465,215	7,630	228	250	468,610	7,685	234	260	470,740	7,720	243	275
48	0.79	397.42	107.09	13.48	3,743.37	156.43	51.2	55.5	3,768.15	157.45	52.43	57.55	3,782.06	158.1	54.27	60.83
1,219	20	591.4	2,720	4.11	512,790	8,410	250	271	516,185	8,465	256	281	518,090	8,500	265	297
56	0.63	372.83	114.96	15.58	4,463.66	159.96	45.06	49.15	4,486.73	160.7	46.28	51.2	4,496.58	161.08	47.92	54.07
1,422	16	554.8	2,920	4.75	611,460	8,600	220	240	614,620	8,640	226	250	615,970	8,660	234	264
56	0.71	418.79	114.96	15.58	4,988.31	178.75	49.77	53.86	5,011.34	179.58	51	55.91	5,018.93	179.86	52.63	58.78
1,422	18	623.2	2,920	4.75	683,330	9,610	243	263	686,485	9,655	249	273	687,525	9,670	257	287
56	0.79	464.69	114.96	15.58	5,508.40	197.35	54.68	58.78	5,531.47	198.18	55.91	60.62	5,536.79	198.46	57.55	63.69
1,422	20	691.5	2,920	4.75	754,575	10,610	267	287	757,735	10,655	273	296	758,465	10,670	281	311

*$Mass_{60\%}$ refers to a combined wall with a sheet pile length at 60% of the King Pipe Pile Length. $Mass_{100\%}$ refers to equal sheet pile and King Pipe Pile Lengths. Please refer to our 'Useful Equations' section for the formula to calculate other length combinations.

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PROPERTIES OF PIPE PILE					ESC-S8 INFILL SHEET PILE				ESC-S10 INFILL SHEET PILE				ESC-S12 INFILL SHEET PILE			
PIPE OD	PIPE T	WEIGHT	SYSTEM WIDTH	COATING BOTH SIDES	SYSTEM INERTIA	SECTION MODULUS	MASS PER UNIT AREA		SYSTEM INERTIA	SECTION MODULUS	MASS PER UNIT AREA		SYSTEM INERTIA	SECTION MODULUS	MASS PER UNIT AREA	
							$MASS_{60\%}$*	$MASS_{100\%}$*			$MASS_{60\%}$*	$MASS_{100\%}$*			$MASS_{60\%}$*	$MASS_{100\%}$*
in	in	lb/ft	in	ft²/ft	in⁴/ft	in³/ft	lb/ft²	lb/ft²	in⁴/ft	in³/ft	lb/ft²	lb/ft²	in⁴/ft	in³/ft	lb/ft²	lb/ft²
mm	mm	kg/m	mm	m²/m	cm⁴/m	cm³/m	kg/m²	kg/m²	cm⁴/m	cm³/m	kg/m²	kg/m²	cm⁴/m	cm³/m	kg/m²	kg/m²
56	0.87	510.45	114.96	15.58	6,024.03	215.85	59.39	63.49	6,047.10	216.69	60.62	65.54	6,050.17	216.78	62.26	68.4
1,422	22	759.6	2,920	4.75	825,210	11,605	290	310	828,370	11,650	296	320	828,790	11,655	304	334
60	0.63	399.84	118.9	16.63	5,298.74	177.17	46.28	50.18	5,321.04	177.91	47.31	52.02	5,327.07	178.1	48.95	54.89
1,524	16	595	3,020	5.07	725,855	9,525	226	245	728,910	9,565	231	254	729,735	9,575	239	268
60	0.71	449.23	118.9	16.63	5,925.85	198.09	51.2	55.3	5,948.15	198.83	52.43	57.14	5,951.54	198.93	54.07	60.01
1,524	18	668.5	3,020	5.07	811,760	10,650	250	270	814,815	10,690	256	279	815,280	10,695	264	293
60	0.79	498.49	118.9	16.63	6,547.95	218.92	56.12	60.21	6,570.22	219.67	57.34	62.05	6,571.02	219.67	58.98	64.92
1,524	20	741.8	3,020	5.07	896,980	11,770	274	294	900,030	11,810	280	303	900,140	11,810	288	317
60	0.87	547.61	118.9	16.63	7,165.02	239.57	61.03	65.13	7,187.29	240.31	62.26	66.97	7,185.50	240.22	63.9	69.84
1,524	22	814.9	3,020	5.07	981,510	12,880	298	318	984,560	12,920	304	327	984,315	12,915	312	341
64	0.71	479.67	123.23	17.68	6,957.41	217.99	52.43	56.32	6,978.98	218.64	53.66	58.16	6,978.11	218.74	55.09	60.83
1,626	18	713.8	3,130	5.39	953,070	11,720	256	275	956,025	11,755	262	284	955,905	11,760	269	297
64	0.79	532.29	123.23	17.68	7,691.83	241.15	57.55	61.44	7,713.36	241.71	58.78	63.28	7,709.53	241.61	60.21	65.95
1,626	20	792.1	3,130	5.39	1,053,675	12,965	281	300	1,056,625	12,995	287	309	1,056,100	12,990	294	322
64	0.87	584.84	123.23	17.68	8,420.70	263.84	62.67	66.56	8,442.23	264.59	63.9	68.4	8,435.44	264.31	65.33	71.07
1,626	22	870.3	3,130	5.39	1,153,520	14,185	306	325	1,156,470	14,225	312	334	1,155,540	14,210	319	347
64	0.94	637.19	123.23	17.68	9,144.05	286.53	67.79	71.68	9,165.59	287.18	69.02	73.52	9,155.88	286.91	49.97	76.19
1,626	24	948.2	3,130	5.39	1,252,610	15,405	331	350	1,255,560	15,440	337	359	1,254,230	15,425	244	372
72	0.71	540.22	131.1	19.78	9,294.94	258.91	54.89	58.37	9,315.17	259.47	55.91	60.21	9,305.49	259.19	57.34	62.67
1,829	18	803.9	3,330	6.03	1,273,280	13,920	268	285	1,276,050	13,950	273	294	1,274,725	13,935	280	306
72	0.79	599.63	131.1	19.78	10,284.28	286.53	60.21	63.9	10,304.53	287.09	61.24	65.54	10,291.07	286.72	62.87	68.2
1,829	20	892.3	3,330	6.03	1,408,805	15,405	294	312	1,411,580	15,435	299	320	1,409,735	15,415	307	333
72	0.87	658.83	131.1	19.78	11,267.00	313.88	65.74	69.22	11,287.26	314.43	66.76	71.07	11,270.07	313.97	68.2	73.52
1,829	22	980.4	3,330	6.03	1,543,425	16,875	321	338	1,546,200	16,905	326	347	1,543,845	16,880	333	359
72	0.94	717.9	131.1	19.78	12,243.16	341.03	71.07	74.75	12,263.42	341.68	72.09	76.39	12,242.50	341.03	73.52	78.85
1,829	24	1,068.3	3,330	6.03	1,677,145	18,335	347	365	1,679,920	18,370	352	373	1,677,055	18,335	359	385
80	0.79	666.89	138.98	21.85	13,304.76	333.59	62.67	65.95	13,323.85	334.06	63.49	67.58	13,300.34	333.5	64.92	70.04
2,032	20	992.4	3,530	6.66	1,822,570	17,935	306	322	1,825,185	17,960	310	330	1,821,965	17,930	317	342
80	0.87	732.82	138.98	21.85	14,583.90	365.68	68.4	71.68	14,602.99	366.14	69.22	73.32	14,574.89	365.49	70.66	75.78
2,032	22	1,090.5	3,530	6.66	1,997,795	19,660	334	350	2,000,410	19,685	338	358	1,996,560	19,650	345	370
80	0.94	798.67	138.98	21.85	15,855.34	397.58	73.93	77.41	15,874.40	398.04	74.96	79.05	15,841.77	397.2	76.19	81.31
2,032	24	1,188.5	3,530	6.66	2,171,965	21,375	361	378	2,174,575	21,400	366	386	2,170,105	21,355	372	397
80	1.02	864.33	138.98	21.85	17,119.12	429.29	79.67	82.94	17,138.21	429.75	80.69	84.58	17,101.02	428.82	81.92	87.04
2,032	26	1,286.2	3,530	6.66	2,345,085	23,080	389	405	2,347,700	23,105	394	413	2,342,605	23,055	400	425
100	0.87	918.02	159.05	27.1	24,995.31	501.46	73.73	76.6	25,011.99	501.74	74.55	78.03	24,954.79	500.62	75.78	80.08
2,540	22	1,366.1	4,040	8.26	3,424,015	26,960	360	374	3,426,300	26,975	364	381	3,418,465	26,915	370	391
100	0.94	1,000.74	159.05	27.1	27,196.66	545.63	79.87	82.94	27,213.34	545.91	80.69	84.38	27,149.25	544.61	81.92	86.43
2,540	24	1,489.2	4,040	8.26	3,725,570	29,335	390	405	3,727,855	29,350	394	412	3,719,075	29,280	400	422
100	1.02	1,083.26	159.05	27.1	29,387.43	589.53	86.22	89.09	29,404.11	589.9	87.04	90.52	29,333.15	588.5	88.06	92.57
2,540	26	1,612	4,040	8.26	4,025,675	31,695	421	435	4,027,960	31,715	425	442	4,018,240	31,640	430	452
100	1.1	1,165.65	159.05	27.1	31,567.65	633.33	92.36	95.44	31,584.33	633.61	93.18	96.87	31,506.54	632.03	94.41	98.71
2,540	28	1,734.6	4,040	8.26	4,324,335	34,050	451	466	4,326,620	34,065	455	473	4,315,965	33,980	461	482
118	0.87	1,084.68	177.17	31.82	36,991.87	628.96	77.41	80.08	37,006.88	629.24	78.23	81.51	36,921.68	627.75	79.26	83.35
2,997	22	1,614.1	4,500	9.7	5,067,380	33,815	378	391	5,069,435	33,830	382	398	5,057,765	33,750	387	407
118	0.94	1,182.45	177.17	31.82	40,268.08	684.67	84.17	86.84	40,283.04	684.95	84.99	88.06	40,188.65	683.27	85.81	89.91
2,997	24	1,759.6	4,500	9.7	5,516,175	36,810	411	424	5,518,225	36,825	415	430	5,505,295	36,735	419	439
118	1.02	1,280.16	177.17	31.82	43,530.96	740.09	90.73	93.39	43,545.92	740.37	91.55	94.62	43,442.34	738.61	92.57	96.46
2,997	26	1,905	4,500	9.7	5,963,145	39,790	443	456	5,965,195	39,805	447	462	5,951,005	39,710	452	471
118	1.1	1,377.73	177.17	31.82	46,780.55	795.43	97.28	99.94	46,795.56	795.62	98.1	39.94	46,682.81	793.76	99.12	103.01
2,997	28	2,050.2	4,500	9.7	6,408,295	42,765	475	488	6,410,350	42,775	479	195	6,394,905	42,675	484	503

*$Mass_{60\%}$ refers to a combined wall with a sheet pile length at 60% of the King Pipe Pile Length. $Mass_{100\%}$ refers to equal sheet pile and King Pipe Pile Lengths. Please refer to our 'Useful Equations' section for the formula to calculate other length combinations.

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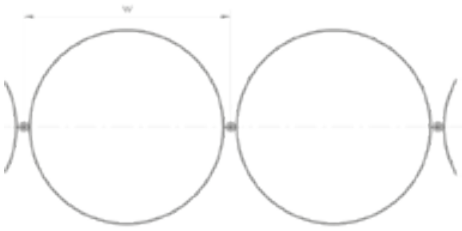
COMBINED WALL PROPERTIES **ESC PIPE-PIPE** COMBI WALL



Interlocking Clutch Options

ESC-PHK **ESC-PCR** **ESC-PB** **ESC-PPP** **ESC-PPT** **ESC-PT**

PIPE-PIPE SYSTEM	OUTER DIAMETER	WALL THICKNESS	COMBINED SYSTEM WIDTH*	CROSS SECTIONAL AREA	PILE WEIGHT	COMBINED WEIGHT	COMBINED SECTION MODULUS	MOMENT OF INERTIA	COATING BOTH SIDES OF WALL**
	in mm	in mm	in mm	in²/ft cm²/m	lb/ft kg/m	lb/ft² kg/m²	in³/ft cm³/m	in⁴/ft cm⁴/m	ft²/ft m²/m
ESC-PB609.6 x 12.7	24 609.6	0.50 12.7	31.10 790	16.57 351.1	125.60 186.9	56.34 275.1	81.97 4,407	980.60 134,329	7.55 2.30
ESC-PB609.6 x 15.9	24 609.6	0.63 15.9	31.10 790	20.04 424.5	156.17 232.4	68.12 332.6	100.87 5,423	1210.26 165,789	7.55 2.30
ESC-PB609.6 x 9.5	24 609.6	0.37 9.5	31.10 790	13.07 276.9	94.68 140.9	44.40 216.8	62.46 3,358	747.10 102,342	7.55 2.30
ESC-PB762 x 12.7	30 762	0.50 12.7	37.09 942	16.94 358.8	157.72 234.7	57.59 281.2	108.74 5,846	165.80 22,713	9.19 2.80
ESC-PB762 x 15.9	30 762	0.63 15.9	37.09 942	20.60 436.5	196.29 292.1	70.08 342.2	134.22 7,216	2006.86 274,913	9.19 2.80
ESC-PB762 x 9.5	30 762	0.37 9.5	37.09 942	13.24 280.5	118.74 176.7	45.02 219.8	82.58 4,440	1234.77 169,146	9.19 2.80
ESC-PB914.4 x 12.7	36 914.4	0.50 12.7	43.11 1,095	17.20 364.4	189.77 282.4	58.51 285.7	135.91 7,307	2438.63 334,059	10.50 3.20
ESC-PB914.4 x 15.9	36 914.4	0.63 15.9	43.11 1,095	21.01 445.1	236.34 351.7	71.48 349	168.11 9,038	3016.54 413,225	10.50 3.20
ESC-PB914.4 x 19.1	36 914.4	0.75 19.1	43.11 1,095	24.79 525.3	282.64 420.6	84.36 411.9	199.63 10,733	3582.12 490,701	10.50 3.20
ESC-PB1066.8 x 12.7	42 1,066.8	0.50 12.7	49.09 1,247	17.40 368.7	221.83 330.1	59.19 289	163.35 8,782	3419.62 468,441	12.14 3.70
ESC-PB1066.8 x 15.9	42 1,066.8	0.63 15.9	49.09 1,247	21.32 451.7	276.46 411.4	72.54 354.2	202.37 10,880	4234.91 580,124	12.14 3.70
ESC-PB1066.8 x 19.1	42 1,066.8	0.40 10.1	49.09 1,247	25.22 534.4	330.76 492.2	85.81 419	233.15 12,535	4381.22 600,167	12.14 3.70
ESC-PB1219.2 x 12.7	48 1,219.2	0.50 12.7	55.12 1,400	17.56 372	253.88 377.8	59.74 291.7	190.97 10,267	4569.08 625,902	13.78 4.20
ESC-PB1219.2 x 15.9	48 1,219.2	0.61 15.5	55.12 1,400	21.56 456.8	316.51 471	114.38 558.5	236.85 12,734	5666.26 776,200	13.78 4.20
ESC-PB1219.2 x 19.1	48 1,219.2	0.75 19.1	55.12 1,400	25.54 541.2	378.87 563.8	86.94 424.5	281.99 15,161	6746.93 924,237	13.78 4.20
ESC-PB1371.6 x 15.90	54 1,371.6	0.63 15.93	61.10 1,552	21.75 460.9	356.63 530.7	33.08 161.5	271.50 14,597	7307.92 1,001,085	15.42 4.70
ESC-PB1371.6 x 19.1	54 1,371.6	0.75 19.1	61.10 1,552	16.46 348.8	359.59 535.1	87.86 429	323.55 17,395	8740.68 1,197,354	15.42 4.70
ESC-PB1371.6 x 22.2	54 1,371.6	0.87 22.2	61.10 1,552	29.84 632.3	490.90 730.5	101.60 496.1	374.85 20,153	10089.34 1,382,101	15.42 4.70
ESC-PB1524 x 15.90	60 1,524	0.63 15.9	67.09 1,704	21.91 464.3	396.75 590.4	74.59 364.2	306.10 16,457	9160.05 1,254,802	16.73 5.10
ESC-PB1524 x 19.1	60 1,524	0.75 19.1	67.09 1,704	26.03 551.5	475.04 706.9	88.60 432.6	365.25 19,637	10485.33 1,436,346	16.73 5.10
ESC-P1524 X 22.2	60 1,524	0.87 22.2	67.09 1,704	30.12 638.2	553.06 823	102.54 500.7	423.47 22,767	12661.22 1,734,414	16.73 5.10

* System Width is indicative for the ESC-PB Series, Other interlock options will have different widths. Contact us at engineering@escsteel.com for more details.

PIPE-PIPE SYSTEM	OUTER DIAMETER	WALL THICKNESS	COMBINED SYSTEM WIDTH*	CROSS SECTIONAL AREA	PILE WEIGHT	COMBINED WEIGHT	COMBINED SECTION MODULUS	MOMENT OF INERTIA	COATING BOTH SIDES OF WALL**
	in mm	in mm	in mm	in^2/ft cm^2/m	lb/ft kg/m	lb/ft^2 kg/m^2	in^3/ft cm^3/m	in^4/ft cm^4/m	ft^2/ft m^2/m
ESC-PB1676.4 x 19.1	66 1,676.4	0.75 19.1	72.32 1,837	26.21 555.3	523.15 778.5	89.21 435.6	407.06 21,885	13,391.35 1,834,432	18.37 5.60
ESC-PB1676.4 x 22.2	66 1,676.4	0.87 22.2	72.32 1,837	30.36 643.2	340.37 506.5	103.34 504.6	472.22 25,388	15,899.38 2,177,997	18.37 5.60
ESC-PB1676.4 x 25.4	66 1,676.4	1.00 25.4	72.32 1,837	34.49 730.7	708.36 1054.1	117.41 573.3	536.59 28,849	17,652.54 2,418,156	18.37 5.60
ESC-PB1828.8 x 19.1	72 1,828.8	0.75 19.1	79.09 2,009	26.37 558.6	571.27 850.1	89.74 438.2	448.99 24,139	16,112.73 2,207,223	20.01 6.10
ESC-PB1828.8 x 22.2	72 1,828.8	0.87 22.2	79.09 2,009	30.55 647.3	665.35 990.1	104.02 507.9	521.08 28,015	18,700.18 2,561,668	20.01 6.10
ESC-PB1828.8 x 25.4	72 1,828.8	1.00 25.4	79.09 2,009	34.73 735.8	759.02 1,129.5	117.00 571.3	592.41 31,850	21,260.15 2,912,349	20.01 6.10
ESC-PB1961.2 x 22.2	77 1,961.2	0.87 22.2	85.12 2,162	30.68 650	720.79 1,072.6	104.59 510.7	384.03 20,647	22,015.62 3,015,838	21.65 6.60
ESC-PB1961.2 x 25.4	77 1,961.2	1.00 25.4	85.12 2,162	34.93 740.1	823.20 1,225.0	118.95 580.8	648.32 34,856	25,205.63 3,452,826	21.65 6.60
ESC-PB2133.6 x 22.2	84 2,133.6	0.87 22.2	91.10 2,314	30.87 654	777.57 1,157.1	105.10 513.2	619.06 33,283	25,918.77 3,550,517	23.29 7.10
ESC-PB2133.6 x 25.4	84 2,133.6	0.87 22.2	91.10 2,314	35.12 744	887.31 1,320.4	119.56 583.8	704.14 37,857	29,488.74 4,039,554	23.29 7.10

ESC Pipe Piling Accessories
Options

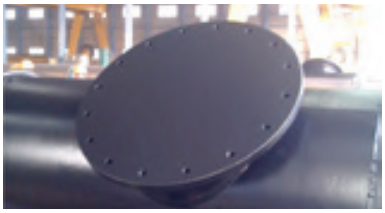
ESC can supply a wide range of welded accessories and markings for Pipe Piles. Shear Keys can be welded internally and externally to provide more rigid embedment. All components are welded as per AWS D1.1 and other standards upon request by client. Featured are some of the typical components that are fabricated or applied to ESC Pipe Piles. Compliance to specific international standards or project requirements can be applied.

PIPE PILE SHOE

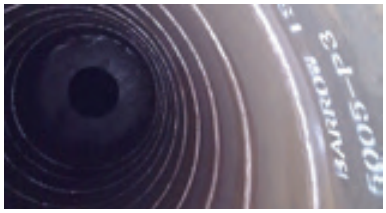
MARKINGS

TIE ROD WELDED CONNECTOR

LIFTING LUG



FENDER FLANGE CONNECTION



INTERNAL SHEAR KEY

EXTERNAL SHEAR KEY

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ESC H COMBINATION WALL

H-HRZ, H-CRZ, H-S SERIES

VIEW OUR PROJECT SHOWCASE VIDEO

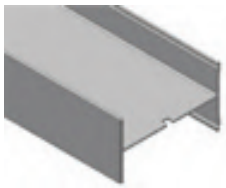
A H Pile Combination Wall System consists of Steel H Piles that withstand most of the loading and Infill Sheet Piles that transmit pressure loads to the H Piles. H Piles can range in sizing from traditional Hot Rolled Beam to fabricated I Beam designed by ESC.

The H Piles serve two purposes from a structural standpoint, the first being as a retaining member that resists horizontal hydrostatic and earth pressures. The second purpose is to act as a bearing pile, resisting vertical loads. H Pile Combination Walls are generally utilised when a standard series of sheet piles do not have the strength to resist the required design loads. Integration with Tie Back Systems and other anchorages is simple and ESC can offer the full configuration as part of its piling solution package. Steel grades can be found in the Cold Formed Sheet Pile Steel Grade section of the catalog. Frequently infill sheet piles are not required to be the same length as the king H piles – typically between 60 to 100% of the H Pile length.

The ESC Advantage

- ✓ Design flexibility of Hot Rolled and Fabricated Beams
- ✓ Comprehensive Range of Interlocks & Infill Sheet Piles
- ✓ Competitive Pricing
- ✓ Free of Charge Design
- ✓ Ability to supply small and large quantities
- ✓ Full Suite of Components: Tie Rods, Walings and more

1. Both Ends of the H Pile are slotted in the flange prior to installation.



2. The ESC-HSP Splicing Assembly is fitted over the bottom end of the top H Pile and fully welded on.

3. Upper H Pile is lifted over and positioned on the already installed H Pile through the flange slot.

4. Once fully aligned, the bottom H Pile is fully welded to the ESC-HSP Splicing Assembly.

H-Pile Splicing

ESC is proud to present its ESC-HSP H-Pile Splicing Assembly, which allows H Piles to be delivered and installed in shorter lengths and spliced as they are driven on site. This can save logistical costs and handling costs.

What Our Engineers Say?

"H Piles can be driven in the most difficult driving conditions due to the high radius of gyration of the section which provides superior stiffness. They can be used in a wide range of applications."

Combined Wall Profiles

H-HRZ SERIES

H-CRZ SERIES

H-S SERIES

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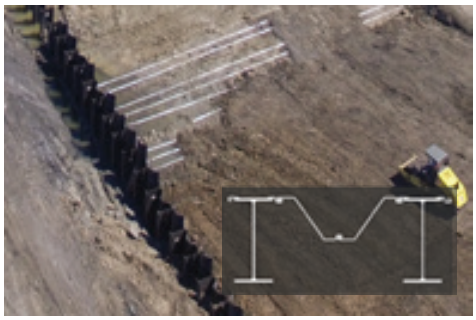
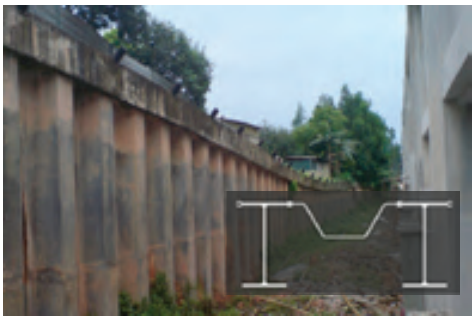
Project References

FUJAIRAH BREAKWATER BERTH, UAE



WATCO BREAKWATER BERTHS, USA



JOHOR BAHRU COMBI WALL, MALAYSIA

OHAU CHANNEL DIVERSION, NEW ZEALAND

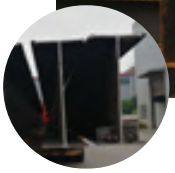
LARKIN LOT BOUNDARY PROTECTION, MALAYSIA

AL JAZEERAH PORT, UAE

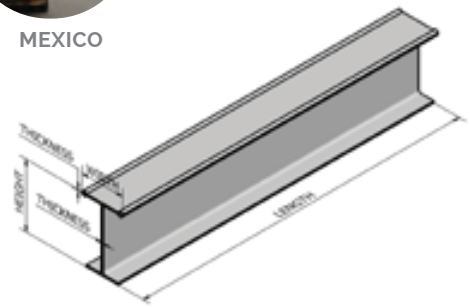
Delivery Tolerances

COMPONENT	H50/20A TO H70/30C	All other ESC H Pile
STANDARD	EN10248	BS EN10249
Mass	± 5%	± 5%
Length	± 7.87" / 200mm	± 1.97" / 50mm
Height	± 0.276" / 7.0mm	± 0.394" / 10.0mm
Thickness (≤12.5mm)	+0.0787" / 2.0mm & -0.0394" / 1.0mm	± 0.0181" / 0.46mm
Thickness (>12.5mm)	+0.0984" / 2.5mm & 0.0591"/-1.5mm	± 0.0181" / 0.46mm
Width	± 2% of width	± 2% of width
Squareness of Ends	2% of width	2% of width
Bending	0.2% of length	0.2% of length
Curving	0.2% of length	0.2% of length
Twisting	0.2% of length but no more than 4" / 100mm	0.2% of length but no more than 4" / 100mm

HAWAII



MEXICO



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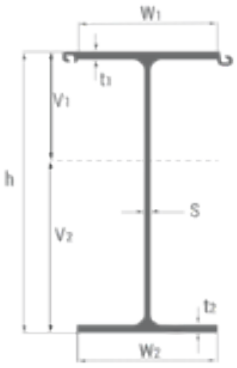
ESC-HRZ INFILL SHEET PILES

SECTION	WIDTH	HEIGHT	THICKNESS		CROSS SECTIONAL AREA	WEIGHT	ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	t_f	t_w		Per Pair			
	in	in	in	in	in²	lb/ft	in³	in⁴	ft²/ft
	mm	mm	mm	mm	cm²	kg/m	cm³	cm⁴	m²/m
ESC-HRZ14-1540	60.676	13.593	0.374	0.374	15.78	107	128	864	12.86
	1,540	345	9.5	9.5	101.8	159.2	2,094.4	35,990	3.92
ESC-HRZ19-1400	55.16	16.587	0.374	0.374	15.78	107.8	161	1,330	12.93
	1,400	421	9.5	9.5	101.8	160.4	2,632	55,412	3.94
ESC-HRZ26-1400	55.16	18.124	0.481	0.481	20.33	138.4	222	2,011	13.45
	1,400	460	12.2	12.2	131.2	206	3,640	83,776	4.10

*excludes internal section of interlock

ESC H PILES WITH HOT ROLLED Z INTERLOCK



SINGLE H PILE... - 1 SERIES												
King Pile Section	h	W1	W2	S	t1	t2	CROSS SECTIONAL AREA	MASS	SECTION MODULUS	MOMENT OF INERTIA	COATING (FRONT)	COATING (BACK)
	in	in	in	in	in	in	in²	lb/ft	in³	in⁴	ft²/ft	ft²/ft
	mm	mm	mm	mm	mm	mm	cm²	kg/m	cm³	cm⁴	m²/m	m²/m
ESC-880A-1H	32.28	18.11	18.70	0.63	0.79	0.87	53.35	184.11	593.65	9,876.27	2.17	10.47
	820	460	475	16	20	22	344.2	273.97	9,732	411,083	0.66	3.19
ESC-880B-1H	32.87	18.11	18.50	0.71	0.87	0.87	57.38	197.82	619.88	10,741.34	2.17	10.53
	835	460	470	18	22	22	370.2	294.38	10,162	447,090	0.66	3.21
ESC-880C-1H	33.94	18.11	18.19	0.79	0.79	0.87	59.04	203.45	646.23	11,352.85	2.17	10.66
	862	460	462	20	20	22	380.9	302.75	10,594	472,543	0.66	3.25
ESC-1080A-1H	42.76	18.11	18.62	0.87	0.79	0.79	68.18	234.62	860.77	19,236.70	2.17	12.20
	1,086	460	473	22	20	20	439.9	349.13	14,111	800,695	0.66	3.72
ESC-1080B-1H	42.72	18.11	18.31	0.87	0.87	0.94	72.01	247.62	949.77	208,50.38	2.17	12.11
	1,085	460	465	22	22	24	464.6	368.48	15,570	867,862	0.66	3.69
ESC-1080C-1H	42.87	18.11	18.31	0.87	1.02	1.02	76.24	262.00	1,015.22	22,703.48	2.17	12.11
	1,089	460	465	22	26	26	491.9	389.88	16,643	944,994	0.66	3.69
ESC-1080D-1H	43.03	18.11	18.39	0.94	1.10	1.10	82.41	283.00	1,097.51	24,530.41	2.17	12.14
	1,093	460	467	24	28	28	531.7	421.13	17,992	1,021,037	0.66	3.7
ESC-1180A-1H	43.62	18.11	18.70	1.02	1.10	1.10	86.57	297.18	1,151.56	25,947.70	2.17	12.27
	1,108	460	475	26	28	28	558.5	442.23	18,878	1,080,029	0.66	3.74
ESC-1180B-1H	43.62	18.11	18.78	1.02	1.18	1.18	89.40	306.81	1,208.53	27,164.37	2.17	12.27
	1,108	460	477	26	30	30	576.8	456.56	19,812	1,130,671	0.66	3.74
ESC-1180C-1H	43.94	18.11	18.27	1.10	1.26	1.26	95.09	326.15	1,273.74	28,956.61	2.17	12.24
	1,116	460	464	28	32	32	613.5	485.34	20,881	1,205,270	0.66	3.73
ESC-1180D-1H	43.98	18.11	18.58	1.10	1.34	1.34	98.24	336.89	1,341.94	30,374.52	2.17	12.27
	1,117	460	472	28	34	34	633.8	501.32	21,999	1,264,288	0.66	3.74

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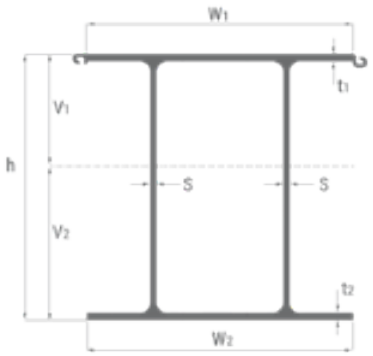
ESC H PILES WITH HOT ROLLED Z INTERLOCK



DOUBLE H PILE... - 2 SERIES												
King Pile Section	h	W1	W2	S	t1	t2	CROSS SECTIONAL AREA	MASS	SECTION MODULUS	MOMENT OF INERTIA	COATING (FRONT)	COATING (BACK)
	in mm	in mm	in mm	in mm	in mm	in mm	in^2 cm^2	lb/ft kg/m	in^3 cm^3	in^4 cm^4	ft^2/ft m^2/m	ft^2/ft m^2/m
ESC-880A-2H	32.28 820	36.69 932	37.60 955	0.63 16	0.87 22	0.87 22	106.44 686.7	364.78 542.82	1,190.54 19,517	19704.15 820,152	3.71 1.13	12.14 3.7
ESC-880B-2H	33.19 843	36.69 932	38.35 974	0.71 18	0.87 22	0.87 22	113.18 730.2	387.72 576.96	1,274.84 20,899	21542.47 896,669	3.71 1.13	12.34 3.76
ESC-880C-2H	34.09 866	36.69 932	39.25 997	0.71 18	0.87 22	0.87 22	115.24 743.5	394.76 587.44	1,340.29 21,972	23108.30 961,844	3.71 1.13	12.57 3.83
ESC-1080A-2H	42.17 1,071	36.69 932	37.44 951	0.87 22	0.79 20	0.94 24	137.90 889.7	471.89 702.22	1,788.09 29,313	38398.80 1,598,285	3.71 1.13	13.75 4.19
ESC-1080B-2H	42.56 1,081	36.69 932	37.44 951	0.87 22	0.94 24	0.94 24	144.10 929.7	492.95 733.56	1,913.88 31,375	41524.43 1,728,384	3.71 1.13	13.78 4.2
ESC-1080C-2H	42.32 1,075	36.69 932	36.81 935	0.87 22	1.10 28	1.10 28	154.12 994.3	527.07 784.33	2,090.23 34,266	45205.51 1,881,603	3.71 1.13	13.68 4.17
ESC-1080D-2H	42.05 1,068	36.69 932	36.69 932	0.87 22	1.26 32	1.26 32	164.53 1,061.50	562.48 837.02	2,273.29 37,267	48816.88 2,031,920	3.71 1.13	13.65 4.16
ESC-1180A-2H	43.23 1,098	36.69 932	38.54 979	0.94 24	1.18 30	1.18 30	169.69 1,094.80	580.04 863.16	2,367.11 38,805	51585.81 2,147,172	3.71 1.13	13.98 4.26
ESC-1180B-2H	43.70 1,110	36.69 932	38.58 980	1.02 26	1.18 30	1.18 30	177.13 1,142.80	605.40 900.89	2,445.00 40,082	53834.52 2,240,771	3.71 1.13	14.04 4.28
ESC-1180C-2H	43.31 1,100	36.69 932	39.29 998	1.02 26	1.34 34	1.34 34	188.50 1,216.10	644.03 958.38	2,667.35 43,727	57807.54 2,406,141	3.71 1.13	14.04 4.28
ESC-1180D-2H	43.74 1,111	36.69 932	39.65 1,007	1.10 28	1.34 34	1.34 34	196.32 1,266.60	670.67 998.02	2,749.21 45,069	60260.66 2,508,248	3.71 1.13	14.14 4.31

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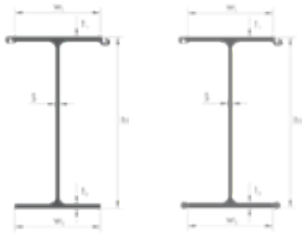
ESZ INFILL SHEET PILES

SECTION	WIDTH	HEIGHT	THICKNESS		CROSS SECTIONAL AREA	WEIGHT	ELASTIC SECTION MODULUS	MOMENT OF INERTIA
	(w)	(h)	t_f	t_w		Per Double		
	in	in	in	in	in²	lb/ft	in³	in⁴
	mm	mm	mm	mm	cm²	kg/m	cm³	cm⁴
ESZ26-1400 Profile	55.16	18.124	0.5122	0.394	38.2	130	222	2,012
	1,400	460	13	10	246.4	193.4	3,640	83,734

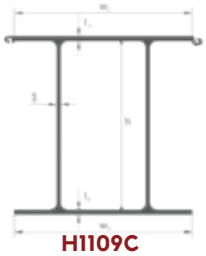
*Water side coating is about 1.95m² per 1m long for 1pc Dual ESZ26-1400 infilling pile.

ESC H PILES WITH HOT ROLLED INTERLOCK



H1109A **H1109B**

SINGLE H PILE												
H Pile Section	h	W_1	W_2	S	t_1	t_2	CROSS SECTIONAL AREA	MASS	SECTION MODULUS	MOMENT OF INERTIA	COATING (FRONT)	COATING (BACK)
	in	in	in	in	in	in	in²	lb/ft	in³	in⁴	ft²/ft	ft²/ft
	mm	mm	mm	mm	mm	mm	cm²	kg/m	cm³	cm⁴	m²/m	m²/m
H1109A	43.695	18.163	18.163	0.827	1.596	1.596	95.67	325.6	1,413	31,985	2.297	11.552
	1,109	461	461	21	40.5	40.5	617.20	484.5	23,161	1,331,310	0.70	3.521
H1109B	43.695	18.163	18.163	0.827	1.596	1.596	98.65	335.7	1,519	33,364	2.297	12.273
	1,109	461	461	21	40.5	40.5	636.43	499.6	24,887	1,388,710	0.70	3.741



H1109C

DOUBLE H PILE												
H Pile Section	h	W_1	W_2	S	t_1	t_2	CROSS SECTIONAL AREA	MASS	SECTION MODULUS	MOMENT OF INERTIA	COATING (FRONT)	COATING (BACK)
	in	in	in	in	in	in	in²	lb/ft	in³	in⁴	ft²/ft	ft²/ft
	mm	mm	mm	mm	mm	mm	cm²	kg/m	cm³	cm⁴	m²/m	m²/m
H1109C	43.695	36.326	36.326	0.827	1.596	1.596	187.66	638.7	2,809	62,460	7.536	13.074
	1,109	922	922	21	40.5	40.5	1,210.70	950.4	46,026	2,599,748	1.162	3.985

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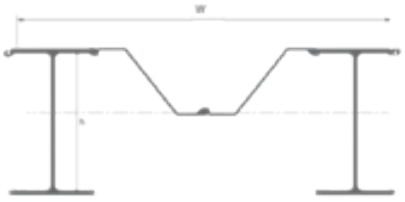
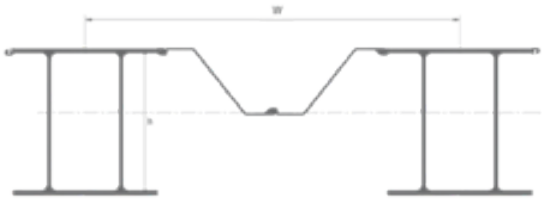
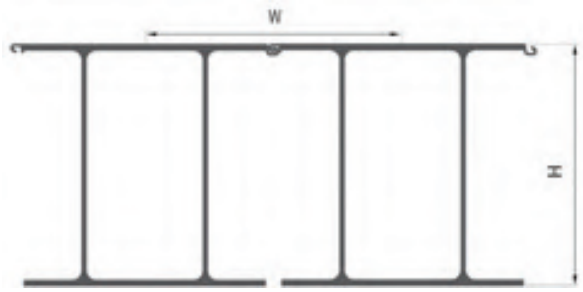




H Pile Section	ESC-HRZ26-1400 INFILL SHEET PILE					ESC-ESZ26-1400 INFILL SHEET PILE				
	SYSTEM WIDTH	MOMENT INERTIA	SECTION MODULUS	$MASS_{60\%}$*	$MASS_{100\%}$*	SYSTEM WIDTH	MOMENT INERTIA	SECTION MODULUS	$MASS_{60\%}$*	$MASS_{100\%}$*
	in	in^4/ft	in^3/ft	lb/ft^2	lb/ft^2	in	in^4/ft	in^3/ft	lb/ft^2	lb/ft^2
	mm	cm^4/m	cm^3/m	kg/m^2	kg/m^2	mm	cm^4/m	cm^3/m	kg/m^2	kg/m^2
H1109C	75.766 1,923	5372 735,874	238 12,802	63.97 312.36	73.54 359.07	75.766 1,923	5372 735,852	238 12,802	62.16 308.42	72.2 352.52
H1109C	75.766 1,923	5590 765,723	255 13,722	65.58 320.21	75.15 366.93	75.766 1,923	5590 765,702	255 13,722	64.77 316.28	73.8 360.37
H1109C	99.93 2,384	8217 1,125,639	371 19,929	91.62 447.38	99.34 485.07	99.93 2,384	8217 1,125,622	371 19,930	90.97 444.21	98.26 479.78



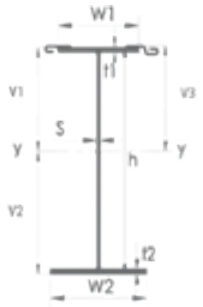
H Pile Section	h	W_1	W_2	S	t_1	t_2	SYSTEM WIDTH	MOMENT OF INERTIA	SECTION MODULUS	MASS (60%)	MASS (100%)
	in	in	in	in	in	in	in	in^4	ft^2/ft	lb/ft^2	lb/ft^2
	mm	mm	mm	mm	mm	mm	mm	cm^4	m^2/m	kg/m^2	kg/m^2
H1109C	43.695 1,109	36.326 922	36.326 922	0.827 21	1.596 40.5	1.596 40.5	38.77 984	19,287 2,642,020	870 46,775	196.26 958.29	197.81 965.85

ESC-CRZ INFILL SHEET PILES

SECTION	WIDTH	HEIGHT	THICKNESS	CROSS SECTIONAL AREA	WEIGHT	ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	(w)	(h)	(t)		Per Pile			
	in	in	in	in²	lb/ft	in³	in⁴	ft²/ft
	mm	mm	mm	cm²	kg/m	cm³	cm⁴	m²/m
ESC-CRZ14-1540	60.63 1,540	13.58 345	0.39 10.0	33.08 213.4	112.56 167.5	129.87 2,129	882.25 36,722	14.01 4.27
ESC-CRZ19-1400	55.12 1,400	16.57 421	0.37 9.5	32.04 206.7	109.03 162.24	158.91 2,605	1,315.95 54,774	14.27 4.35
ESC-CRZ26-1400	55.12 1,400	18.11 460	0.48 12.2	42.38 273.4	144.24 214.64	221.80 3,636	2,009.11 83,626	14.70 4.48

*excludes internal section of interlock

ESC H PILES WITH COLD ROLLED Z INTERLOCK



SINGLE H PILE H...-1 SERIES													
H Pile Section	h	W_1	W_2	S	t_1	t_2	CROSS SECTIONAL AREA	MASS	SECTION MODULUS*	SECTION MODULUS**	MOMENT OF INERTIA	COATING (FRONT)	COATING (BACK)
	in	in	in	in	in	in	in²	lb/ft	in³	in³	in⁴	ft²/ft	ft²/ft
	mm	mm	mm	mm	mm	mm	cm²	kg/m	cm³	cm³	cm⁴	m²/m	m²/m
880A-1C	32.20 818	16.30 414	18.03 458	0.63 16	0.79 20	0.79 20	53.82 347.2	183.46 273	565.65 9,273	648.74 10,635	9,871.85 410,899	1.84 0.56	11.02 3.36
880B-1C	32.40 823	16.30 414	18.46 469	0.63 16	0.87 22	0.87 22	56.92 367.2	193.54 288	620.61 10,174	691.62 11,338	10,750.73 447,481	1.84 0.56	11.12 3.39
880C-1C	33.27 845	16.30 414	18.58 472	0.71 18	0.87 22	0.87 22	60.05 387.4	204.29 304	658.19 10,790	725.47 11,893	11,641.51 484,558	1.84 0.56	11.29 3.44
1080A-1C	42.13 1,070	16.30 414	17.72 450	0.87 22	0.79 20	0.79 20	69.39 447.7	235.87 351	853.63 13,994	957.88 15,703	19,226.41 800,267	1.84 0.56	12.60 3.84
1080B-1C	42.32 1,075	16.30 414	18.50 470	0.87 22	0.87 22	0.94 24	74.18 478.6	252.67 376	981.31 16,087	1,029.31 16,874	21,497.47 894,796	1.84 0.56	12.73 3.88
1080C-1C	42.44 1,078	16.30 414	18.27 464	0.87 22	1.02 26	1.02 26	77.86 502.3	264.77 394	1,035.35 16,973	1,114.96 18,278	23,035.63 958,819	1.84 0.56	12.70 3.87
1080D-1C	43.39 1,102	16.30 414	18.74 476	0.87 22	1.10 28	1.10 28	81.79 527.7	278.21 414	1,137.28 18,644	1,199.26 19,660	25,599.31 1,065,528	1.84 0.56	12.93 3.94
1180A-1C	44.02 1,118	16.30 414	18.31 465	0.87 22	1.18 30	1.18 30	84.44 544.8	287.62 428	1,194.81 19,587	1,265.87 20,752	27,343.69 1,138,135	1.84 0.56	12.93 3.94
1180B-1C	43.98 1,117	16.30 414	17.13 435	0.94 24	1.26 32	1.26 32	88.77 572.7	302.40 450	1,216.22 19,938	1,318.58 21,616	28,119.77 1,170,438	1.84 0.56	12.70 3.87
1180C-1C	44.41 1,128	16.30 414	19.17 487	0.94 24	1.34 34	1.34 34	94.41 609.1	321.22 478	1,382.38 22,662	1,404.59 23,026	31,267.24 1,301,446	1.84 0.56	13.12 4.00
1180C-1C	44.37 1,127	16.30 414	18.35 466	1.02 26	1.42 36	1.42 36	99.11 639.4	337.34 502	1,416.48 23,221	1,460.58 23,944	32,244.48 1,342,122	1.84 0.56	12.93 3.94

* Referring to outer flange, highest value of v1 & v2 ** Referring to outer clutch, v3

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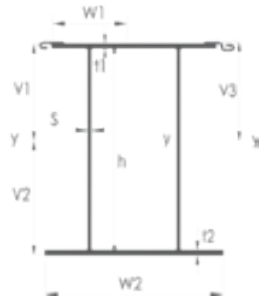
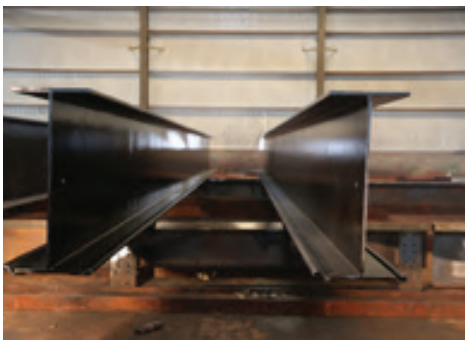
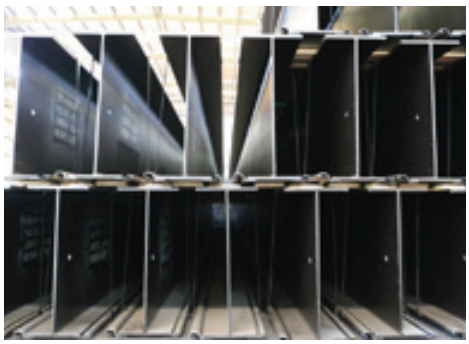
ESC H PILES WITH COLD ROLLED Z INTERLOCK



DOUBLE H PILE H...-2 SERIES													
H Pile Section	h	W_1	W_2	S	t_1	t_2	CROSS SECTIONAL AREA	MASS	SECTION MODULUS*	SECTION MODULUS**	MOMENT OF INERTIA	COATING (FRONT)	COATING (BACK)
	in mm	in mm	in mm	in mm	in mm	in mm	in^2 cm^2	lb/ft kg/m	in^3 cm^3	in^3 cm^3	in^4 cm^4	ft^2/ft m^2/m	ft^2/ft m^2/m
880A-2C	32.32 821	34.84 885	37.28 947	0.63 16	0.79 20	0.87 22	105.87 683	360.19 536	1,216.34 19,940	1,183.22 19,397	19,701.82 820,055	3.38 1.03	13.22 4.03
880B-2C	32.83 834	34.84 885	37.28 947	0.71 18	0.87 22	0.87 22	114.05 735.8	388.42 578	1,278.68 20,962	1,291.13 21,166	21,393.06 890,450	3.38 1.03	13.22 4.03
880C-2C	33.11 841	34.84 885	37.36 949	0.71 18	0.87 22	0.94 24	117.34 757	399.17 594	1,354.44 22,204	1,318.58 21,616	22,559.79 939,013	3.38 1.03	13.22 4.03
1080A-2C	40.43 1,027	34.84 885	35.98 914	0.79 20	1.02 26	1.02 26	140.45 906.1	477.79 711	1,859.34 30,481	1,899.30 31,136	38,429.67 1,599,570	3.38 1.03	13.06 3.98
1080B-2C	42.24 1,073	34.84 885	36.69 932	0.87 22	0.94 24	0.94 24	144.99 935.4	493.25 734	1,927.91 31,605	1,954.38 32,039	41,454.22 1,725,462	3.38 1.03	13.16 4.01
1080C-2C	42.24 1,073	34.84 885	35.43 900	0.87 22	1.10 28	1.10 28	154.32 995.6	525.50 782	2,090.96 34,278	2,139.09 35,067	45,164.07 1,879,878	3.38 1.03	13.02 3.97
1080D-2C	42.80 1,087	34.84 885	38.19 970	0.94 24	1.10 28	1.10 28	164.70 1,062.60	560.45 834	2,276.28 37,316	2,236.99 36,672	48,812.39 2,031,733	3.38 1.03	13.25 4.04
1180A-2C	43.11 1,095	34.84 885	37.56 954	0.94 24	1.18 30	1.18 30	170.00 1,096.80	578.59 861	2,382.23 39,053	2,351.86 38,555	51,575.36 2,146,737	3.38 1.03	13.19 4.02
1180B-2C	43.11 1,095	34.84 885	37.56 954	0.94 24	1.26 32	1.26 32	175.41 1,131.70	596.74 888	2,490.45 40,827	2,449.39 40,154	53,815.57 2,239,982	3.38 1.03	13.16 4.01
1180C-2C	43.50 1,105	34.84 885	38.54 979	0.94 24	1.34 34	1.34 34	182.88 1,179.90	622.27 926	2,639.10 43,264	2,585.67 42,388	57,815.27 2,406,463	3.38 1.03	13.22 4.03
1180C-2C	43.31 1,100	34.84 885	38.39 975	1.02 26	1.42 36	1.42 36	194.14 1,252.50	660.58 983	2,759.46 45,237	2,703.40 44,318	60,249.80 2,507,796	3.38 1.03	13.22 4.03

* Referring to outer flange, highest value of v1 & v2 ** Referring to outer clutch, v3





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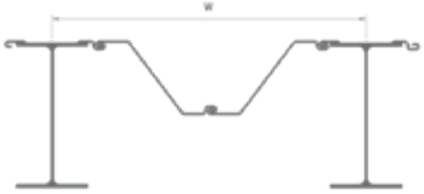
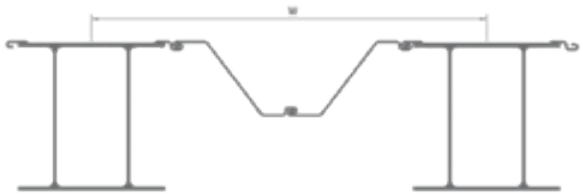
COMBINED WALL PROPERTIES **ESC H-CRZ** COMBI WALL





H Pile Section	ESC-CRZ14-1540 INFILL SHEET PILE					ESC-CRZ19-1400 INFILL SHEET PILE					ESC-CRZ26-1400 INFILL SHEET PILE				
	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	$MASS_{60\%}$*	$MASS_{100\%}$*	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	$MASS_{60\%}$*	$MASS_{100\%}$*	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	$MASS_{60\%}$*	$MASS_{100\%}$*
	in mm	in^4/ft cm^4/m	in^3/ft cm^3/m	lb/ft^2 kg/m^2	lb/ft^2 kg/m^2	in mm	in^4/ft cm^4/m	in^3/ft cm^3/m	lb/ft^2 kg/m^2	lb/ft^2 kg/m^2	in mm	in^4/ft cm^4/m	in^3/ft cm^3/m	lb/ft^2 kg/m^2	lb/ft^2 kg/m^2
ESC-880A-1C	81.38 2,067	1,580.86 216,556	104.25 5,605	42.09 205.5	43.60 212.9	75.87 1,927	1,764.10 241,657	116.32 6,254	44.58 217.7	46.20 225.6	75.87 1,927	1,874.86 256,830	123.54 6,642	50.18 245	51.77 252.8
ESC-880A-2C	99.92 2,538	2,464.33 337,580	148.52 7,985	55.54 271.2	56.77 277.2	94.41 2,398	2,663.16 364,816	165.61 8,904	58.35 284.9	59.64 291.2	94.41 2,398	2,750.99 376,848	165.80 8,914	62.81 306.7	64.12 313.1
ESC-880B-1C	81.38 2,067	1,710.05 234,254	110.39 5,935	43.64 213.1	45.16 220.5	75.87 1,927	1,902.67 260,640	122.83 6,604	46.26 225.9	47.88 233.8	75.87 1,927	2,011.97 275,613	129.88 6,983	51.86 253.2	53.47 261.1
ESC-880B-2C	99.92 2,538	2,666.81 365,316	161.52 8,684	58.90 287.6	60.13 293.6	94.41 2,398	2,877.46 394,172	174.26 9,369	61.89 302.2	63.18 308.5	94.41 2,398	2,965.29 406,204	179.58 9,655	66.36 324	67.67 330.4
ESC-880C-1C	81.38 2,067	1,841.00 252,192	115.13 6,190	45.22 220.8	46.74 228.2	75.87 1,927	2,043.14 279,882	127.78 6,870	47.94 234.1	49.56 242	75.87 1,927	2,152.44 294,855	134.61 7,237	53.51 261.3	55.13 269.2
ESC-880C-2C	99.92 2,538	2,806.49 384,451	171.03 9,195	60.23 294.1	61.46 300.1	94.41 2,398	3,025.29 414,423	184.36 9,912	63.30 309.1	64.61 315.5	94.41 2,398	3,113.12 426,455	189.72 10,200	67.79 331	69.08 337.3
ESC-1080A-1C	81.38 2,067	2,955.99 404,930	147.80 7,946	49.91 243.7	51.43 251.1	75.87 1,927	3,239.13 443,716	161.95 8,707	52.98 258.7	54.60 266.6	75.87 1,927	3,348.43 458,689	167.42 9,001	58.55 285.9	60.17 293.8
ESC-1080A-2C	99.92 2,538	4,706.43 644,717	233.43 12,550	69.69 340.3	70.90 346.2	94.41 2,398	5,036.16 689,885	249.78 13,429	73.30 357.9	74.61 364.3	94.41 2,398	5,123.99 701,917	254.13 13,663	77.78 379.8	79.07 386.1
ESC-1080B-1C	81.38 2,067	3,289.83 450,662	158.08 8,499	52.31 255.4	53.82 262.8	75.87 1,927	3,597.23 492,771	172.85 9,293	55.56 271.3	57.18 279.2	75.87 1,927	2,976.53 407,744	178.10 9,575	61.13 298.5	62.75 306.4
ESC-1080B-2C	99.92 2,538	5,068.54 694,320	239.79 12,892	71.54 349.3	72.77 355.3	94.41 2,398	5,419.40 742,384	256.40 13,785	75.26 367.5	76.57 373.9	94.41 2,398	5,507.24 754,416	260.55 14,008	79.75 389.4	81.04 395.7
ESC-1080C-1C	81.38 2,067	3,515.94 481,636	170.77 9,181	54.17 264.5	55.66 271.8	75.87 1,927	3,839.76 525,995	186.50 10,027	57.53 280.9	59.15 288.8	75.87 1,927	3,949.07 540,968	191.80 10,312	63.10 308.1	64.72 316
ESC-1080C-2C	99.92 2,538	5,512.68 755,161	262.02 14,087	75.37 368	76.57 373.9	94.41 2,398	5,889.47 806,777	279.93 15,050	79.30 387.2	80.61 393.6	94.41 2,398	5,977.31 818,809	284.10 15,274	83.78 409.1	85.07 415.4
ESC-1080D-1C	81.38 2,067	3,892.81 533,261	183.01 9,839	56.14 274.1	57.63 281.4	75.87 1,927	4,244.01 581,371	199.52 10,727	59.66 291.3	61.26 299.1	75.87 1,927	4,353.31 596,344	204.66 11,003	65.21 318.4	66.83 326.3
ESC-1080D-2C	99.92 2,538	5,949.46 814,994	273.61 14,710	79.61 388.7	80.83 394.7	94.41 2,398	6,351.75 870,103	292.11 15,705	83.80 409.2	85.09 415.5	94.41 2,398	6,439.59 882,135	296.15 15,922	88.27 431	89.58 437.4
ESC-1180A-1C	81.38 2,067	4,149.23 568,388	192.77 10,364	57.49 280.7	58.96 287.9	75.87 1,927	4,519.07 619,050	209.94 11,287	61.11 298.4	62.69 306.1	75.87 1,927	4,628.37 634,023	215.02 11,560	66.68 325.6	68.26 333.3
ESC-1180A-2C	99.92 2,538	6,280.24 860,307	287.39 15,451	81.78 399.3	82.98 405.2	94.41 2,398	6,701.85 918,061	306.68 16,488	86.10 420.4	87.39 426.7	94.41 2,398	6,789.68 930,093	310.69 16,704	90.56 442.2	91.87 448.6
ESC-1180B-1C	81.38 2,067	4,263.32 584,016	200.62 10,786	59.68 291.4	61.13 298.5	75.87 1,927	4,641.43 635,813	218.42 11,743	63.45 309.8	65.02 317.5	75.87 1,927	4,750.74 650,786	223.55 12,019	69.02 337	70.59 344.7
ESC-1180B-2C	94.41 2,398	6,548.44 897,046	299.09 16,080	88.88 434	85.20 416	94.41 2,398	6,985.71 956,946	319.06 17,154	88.43 431.8	89.72 438.1	94.41 2,398	7,073.54 968,978	323.08 17,370	92.90 453.6	94.21 460
ESC-1180C-1C	81.38 2,067	4,725.99 647,396	213.04 11,454	62.44 304.9	63.96 312.3	75.87 1,927	5,137.73 703,799	231.61 12,452	66.44 324.4	68.06 332.3	75.87 1,927	5,247.03 718,771	236.54 12,717	72.01 351.6	73.63 359.5
ESC-1180C-2C	94.41 2,398	7,027.29 962,642	315.38 16,956	92.10 449.7	88.25 430.9	94.41 2,398	7,492.51 1,026,371	336.27 18,079	91.65 447.5	92.96 453.9	94.41 2,398	7,580.33 1,038,402	340.21 18,291	96.13 469.4	97.42 475.7
ESC-1180D-1C	81.38 2,067	4,869.65 667,075	221.36 11,901	64.82 316.5	66.33 323.9	75.87 1,927	5,291.82 724,907	240.55 12,933	68.98 336.8	70.59 344.7	75.87 1,927	5,401.12 739,880	245.52 13,200	74.55 364	76.17 371.9
ESC-1180D-2C	99.92 2,538	7,318.75 1,002,568	329.54 17,717	91.63 447.4	92.86 453.4	94.41 2,398	7,800.98 1,068,628	351.26 18,885	96.52 471.3	97.83 477.7	94.41 2,398	7,888.82 1,080,660	355.20 19,097	101.01 493.2	102.30 499.5

*$Mass_{60\%}$ refers to a combined wall with a sheet pile length at 60% of the King Pipe Pile Length. $Mass_{100\%}$ refers to equal sheet pile and King Pipe Pile Lengths. Please refer to our 'Useful Equations' section for the formula to calculate other length combinations.

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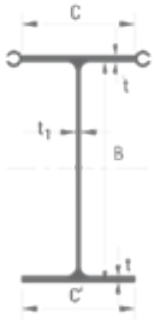
ESC-S INFILL SHEET PILES

SECTION	WIDTH (w)	HEIGHT (h)	THICKNESS (t)	CROSS SECTIONAL AREA	WEIGHT (Per Pair)	ELASTIC SECTION MODULUS	MOMENT OF INERTIA	COATING AREA *(both side per pile)
	in mm	in mm	in mm	in²/ft cm²/m	lb/ft kg/m	in³ cm³	in⁴ cm⁴	ft²/ft m²/m
ESC-S8	56.69 1,440	16.30 414	0.31 7.75	7.16 151.8	80.10 119.2	115.90 1,900	23.18 965	12.43 3.79
ESC-S10	56.69 1,440	16.38 416	0.38 9.75	8.86 187.8	99.05 147.4	143.96 2,360	28.52 1,187	12.43 3.79
ESC-S12	56.69 1,440	16.65 423	0.46 11.75	10.74 227.6	120.09 178.7	179.95 2,950	35.22 1,466	12.53 3.82

*excludes internal section of interlock

ESC H-PILES PROPERTIES PIPE-BAR INTERLOCK



SINGLE H PILE H…-1 SERIES

H Pile Section	B	C	C'	t	t_1	SECTION AREA	MASS	SECTION MODULUS	MOMENT OF INERTIA	COATING (FRONT)	COATING (BACK)
	in mm	in mm	in mm	in mm	in mm	in² cm²	lb/ft kg/m	in³ cm³	in⁴ cm⁴	ft²/ft m²/m	ft²/ft m²/m
H50/20A	19.54 496	7.84 199	7.84 199	0.55 14	0.35 9	21 135.5	71.2 106	112 1,840	1,364 56,840	1.38 0.42	5.77 1.76
H50/20B	19.7 500	7.88 200	7.88 200	0.63 16	.39 10	23 148.5	78.6 117	126 2,070	1,521 63,380	1.39 0.42	5.81 1.77
H50/20C	19.93 506	7.92 201	7.92 201	0.75 19	0.43 11	25.7 165.5	87.4 130	146 2,400	1,746 72,730	1.38 0.42	5.81 1.77
H60/30A	22.93 582	11.82 300	11.82 300	0.67 17	0.47 12	32.3 208.7	110.0 164	227 3,725	3,016 125,660	1.71 0.52	7.32 2.23
H60/30B	23.167 588	11.82 300	11.82 300	0.79 20	0.47 12	35.1 226.7	119.6 178	257 4,205	3,400 141,665	1.71 0.52	7.32 2.23
H60/30C	23.40 594	11.90 302	11.90 302	0.90 23	0.55 14	39.8 256.6	135.7 202	294 4,825	3,879 161,615	1.71 0.52	7.35 2.24
H70/30A	27.24 692	11.81 300	11.81 300	0.79 20	0.51 13	38.08 245.7	129.70 193	319.64 5,240	4,944.35 205,800	1.71 0.52	8.01 2.44
H70/30B	27.56 700	11.81 300	11.81 300	0.94 24	0.51 13	41.80 269.7	142.46 212	366.00 6,000	5,663.89 235,750	1.71 0.52	8.04 2.45
H70/30C	27.72 704	11.81 300	15.35 390	1.02 26	0.51 13	46.25 298.4	157.25 234	461.16 7,560	6,614.08 275,300	1.71 0.52	8.63 2.63
H85/40A	34.33 872	16.81 427	21.93 557	0.63 16	0.55 14	47.94 309.3	163.30 243	562.73 9,225	10,074.88 419,350	2.13 0.65	11.29 3.44
H85/40B	34.49 876	16.81 427	21.93 557	0.71 18	0.55 14	51.00 329	173.38 258	617.32 10,120	10,994.80 457,640	2.13 0.65	11.32 3.45
H85/40C	34.65 880	16.81 427	21.93 557	0.79 20	0.55 14	54.03 348.6	184.13 274	672.22 11,020	11,920.24 496,160	2.13 0.65	11.32 3.45
H90/40A	35.39 899	15.75 400	19.29 490	0.87 22	0.71 18	59.50 383.9	202.27 301	700.59 11,485	12,858.90 535,230	2.03 0.62	10.89 3.32
H90/40B	35.55 903	15.75 400	19.29 490	0.94 24	0.71 18	62.26 401.7	211.68 315	749.69 12,290	13,740.62 571,930	2.03 0.62	10.89 3.32
H90/40C	35.71 907	15.75 400	19.29 490	1.02 26	0.71 18	65.02 419.5	221.09 329	799.10 13,100	14,628.82 608,900	2.03 0.62	10.93 3.33
H100/40A	44.06 1,119	15.75 400	18.11 460	0.87 22	0.63 16	61.29 395.4	208.32 310	864.98 14,180	20,053.31 834,685	2.03 0.62	12.14 3.7
H100/40B	44.21 1,123	15.75 400	18.11 460	0.94 24	0.63 16	63.95 412.6	217.73 324	922.93 15,130	21,372.28 889,585	2.03 0.62	12.17 3.71
H100/40C	44.37 1,127	15.75 400	18.11 460	1.02 26	0.63 16	66.62 429.8	227.14 338	981.19 16,085	22,699.18 944,815	2.03 0.62	12.17 3.71
H110/40A	45.35 1,152	15.75 400	18.11 460	1.02 26	0.79 20	74.06 477.8	252.00 375	1,058.05 17,345	24,914.89 1,037,040	2.03 0.62	12.30 3.75
H110/40B	45.67 1,160	15.75 400	18.11 460	1.18 30	0.79 20	79.39 512.2	270.14 402	1,176.69 19,290	27,710.44 1,153,400	2.03 0.62	12.34 3.76
H110/40C	45.98 1,168	15.75 400	18.11 460	1.34 34	0.79 20	84.72 546.6	288.29 429	1,295.95 21,245	30,540.94 1,271,215	2.03 0.62	12.37 3.77
H110/50A	45.67 1,160	19.69 500	22.05 560	1.18 30	0.87 22	92.10 594.2	313.82 467	1,400.87 22,965	32,851.54 1,367,390	2.36 0.72	13.32 4.06

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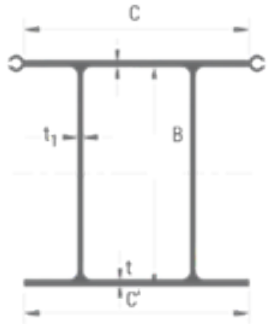
ESC H-PILES PROPERTIES PIPE-BAR INTERLOCK

H Pile Section	B	C	C′	t_1	t_2	SECTION AREA	MASS	SECTION MODULUS	MOMENT OF INERTIA	COATING (FRONT)	COATING (BACK)
	in mm	in mm	in mm	in mm	in mm	in^2 cm^2	lb/ft kg/m	in^3 cm^3	in^4 cm^4	ft^2/ft m^2/m	ft^2/ft m^2/m
H110/50B	45.98 1,168	19.69 500	22.05 560	1.34 34	0.87 22	98.67 636.6	336.00 500	1,546.96 25,360	36,331.45 1,512,235	2.36 0.72	13.32 4.06
H110/50C	46.30 1,176	19.69 500	22.05 560	1.50 38	0.87 22	105.25 679	358.18 533	1,693.36 27,760	39,856.51 1,658,960	2.36 0.72	13.35 4.07

*excludes internal section of interlock



DOUBLE H PILE H…-2 SERIES

H Pile Section	B	C	C′	t	t_1	SECTION AREA	MASS	SECTION MODULUS	MOMENT OF INERTIA	COATING (FRONT)	COATING (BACK)
	in mm	in mm	in mm	in mm	in mm	in^2 cm^2	lb/ft kg/m	in^3 cm^3	in^4 cm^4	ft^2/ft m^2/m	ft^2/ft m^2/m
H50/20A	19.54 496	15.68 398	15.68 398	0.55 14	0.35 9	36.7 236.8	125 186	199 3,265	2,421 100,855	2.36 0.72	6.5 1.98
H50/20B	19.7 500	15.76 400	15.76 400	0.63 16	0.39 10	40.73 262.8	138.4 206	226 3,700	2,718 113,240	2.36 0.72	6.53 1.99
H50/20C	19.93 506	15.84 402	15.84 402	0.75 19	0.43 11	46 296.8	156.6 233	264 4,320	3,146 131,100	2.4 0.73	6.56 2.00
H60/30A	22.93 582	23.64 600	23.64 600	0.67 17	0.47 12	59.4 383.2	202.3 301	417 6,830	5,530 230,410	2.62 0.80	8.37 2.55
H60/30B	23.16 588	23.64 600	23.64 600	0.79 20	0.47 12	64.98 419.2	221.1 329	474 7,770	5,560 231,685	2.66 0.81	8.4 2.56
H60/30C	24.40 594	23.79 604	23.79 604	0.90 23	0.55 14	74.25 479.0	252.7 376	547 8,970	7,216 300,660	2.66 0.81	8.43 2.57
H70/30A	27.24 692	23.62 600	23.62 600	0.79 20	0.51 13	70.87 457.2	241.25 359	591.70 9,700	9,146.56 380,710	2.99 0.91	9.06 2.76
H70/30B	27.56 700	23.62 600	23.62 600	0.94 24	0.51 13	78.31 505.2	266.78 397	682.59 11,190	10,560.19 439,550	3.02 0.92	9.09 2.77
H70/30C	27.72 704	23.62 600	30.71 780	1.02 26	0.51 13	87.20 562.6	297.02 442	811.91 13,310	11,649.60 484,895	3.02 0.92	9.71 2.96
H85/40A	34.33 872	33.62 854	43.86 1,114	0.63 16	0.55 14	90.58 584.4	308.45 459	1,008.33 16,530	18,053.71 751,455	3.58 1.09	12.80 3.90
H85/40B	34.49 876	33.62 854	43.86 1,114	0.71 18	0.55 14	96.69 623.8	329.28 490	1,111.42 18,220	19,794.44 823,910	3.61 1.10	12.80 3.90
H85/40C	34.65 880	33.62 854	43.86 1,114	0.79 20	0.55 14	102.77 663	350.11 521	1,215.43 19,925	21,549.82 896,975	3.61 1.10	12.83 3.91
H90/40A	35.39 899	31.50 800	38.58 980	0.87 22	0.71 18	113.71 733.6	387.07 576	1,290.15 21,150	23,678.68 985,585	3.67 1.12	12.30 3.75
H90/40B	35.55 903	31.50 800	38.58 980	0.94 24	0.71 18	119.23 769.2	405.89 604	1,385.01 22,705	25,380.97 1,056,440	3.67 1.12	12.34 3.76
H90/40C	35.71 907	31.50 800	38.58 980	1.02 26	0.71 18	124.74 804.8	424.70 632	1,479.86 24,260	27,098.04 1,127,910	3.71 1.13	12.34 3.76
H100/40A	44.06 1,119	31.50 800	36.22 920	0.87 22	0.63 16	117.27 756.6	399.17 594	1,614.98 26,475	37,445.85 1,558,620	4.40 1.34	13.55 4.13
H100/40B	44.21 1,123	31.50 800	36.22 920	0.94 24	0.63 16	122.61 791	417.31 621	1,728.74 28,340	40,032.62 1,666,290	4.40 1.34	13.58 4.14
H100/40C	44.37 1,127	31.50 800	36.22 920	1.02 26	0.63 16	127.94 825.4	435.46 648	1,843.12 30,215	42,637.17 1,774,700	4.43 1.35	13.58 4.14
H110/40A	45.35 1,152	31.50 800	36.22 920	1.02 26	0.79 20	142.82 921.4	485.86 723	1,993.18 32,675	46,938.48 1,953,735	4.49 1.37	13.75 4.19
H110/40B	45.67 1,160	31.50 800	36.22 920	1.18 30	0.79 20	153.48 990.2	522.14 777	2,226.50 36,500	52,435.52 2,182,540	4.53 1.38	13.78 4.20
H110/40C	45.98 1,168	31.50 800	36.22 920	1.34 34	0.79 20	164.15 1,059.00	558.43 831	2,461.35 40,350	58,007.52 2,414,465	4.56 1.39	13.81 4.21
H110/50A	45.67 1,160	39.37 1,000	44.09 1,120	1.18 30	0.87 22	178.90 1,154.20	608.83 906	2,674.24 43,840	62,716.42 2,610,465	4.53 1.38	15.09 4.60
H110/50B	45.98 1,168	39.37 1,000	44.09 1,120	1.34 34	0.87 22	192.05 1,239.00	653.86 973	2,963.08 48,575	69,589.85 2,896,560	4.56 1.39	15.12 4.61
H110/50C	46.30 1,176	39.37 1,000	44.09 1,120	1.50 38	0.87 22	205.19 1,323.80	698.21 1,039	3,252.83 53,325	76,556.86 3,186,550	4.59 1.40	15.16 4.62

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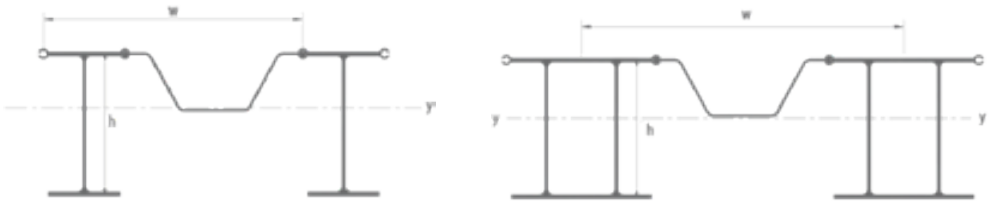
COMBINED WALL PROPERTIES **ESC H-S** COMBI WALL



H Pile Section	ESC-S8 INFILL SHEET PILE					ESC-S10 INFILL SHEET PILE					ESC-S12 INFILL SHEET PILE				
	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	$MASS_{60\%}$*	$MASS_{100\%}$*	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	$MASS_{60\%}$*	$MASS_{100\%}$*	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	$MASS_{60\%}$*	$MASS_{100\%}$*
	in	in^4/ft	in^3/ft	lb/ft^2	lb/ft^2	in	in^4/ft	in^3/ft	lb/ft^2	lb/ft^2	in	in^4/ft	in^3/ft	lb/ft^2	lb/ft^2
	mm	cm^4/m	cm^3/m	kg/m^2	kg/m^2	mm	cm^4/m	cm^3/m	kg/m^2	kg/m^2	mm	cm^4/m	cm^3/m	kg/m^2	kg/m^2
H50/20A-1	67 1,700	417 57,090	34 1,850	20.1 98	27.2 133	67 1,700	456.00 62,525	38 2,025	22.1 108	30.5 149	67 1,710	525.00 71,890	41 2,180	25.2 123	35.8 175
H50/20A-2	75 1,900	542 74,297	49 2,653	26.6 130	33.0 161	75 1,900	578.00 79,155	52 2,800	28.5 139	36.0 176	75.25 1,910	646.00 88,440	55 2,975	31.1 152	40.6 198
H50/20B-1	67 1,700	445 60,905	37 1,990	21.3 104	28.5 139	67 1,700	484.00 66,335	40 2,170	23.3 114	31.7 155	67 1,710	554.00 75,905	43 2,330	26.4 129	36.9 180
H50/20B-2	75 1,900	589 80,732	54 2,888	28.7 140	35 171	75 1,900	625.00 85,590	57 3,040	30.5 149	38.1 186	75.25 1,910	694.00 95,000	60 3,224	33.4 163	42.6 208
H50/20C-1	67 1,700	484 66,360	41 2,190	22.9 112	29.9 146	67 1,700	524 71,785	44 2,365	25 122	33.4 163	67 1,710	596.00 81,590	47 2,535	28.1 137	38.5 188
H50/20C-2	75 1,900	657 90,032	60 3,228	31.5 154	37.9 185	75 1,900	693 94,890	63 3,375	33.4 163	41 200	75.2 1,910	762.00 104,440	66 3,560	36 176	45.5 222
H60/30A-1	71 1,800	672 92,115	51 2,730	25.6 125	32.2 157	71 1,800	710.00 97,240	54 2,885	27.4 134	35.4 173	71 1,810	789.00 108,060	57 3,040	30.3 148	40.3 197
H60/30A-2	82.68 2,100	940 128,830	76 4,097	35.2 172	41 200	82.68 2,100	973.00 133,225	78 4,215	36.9 180	43.6 213	83.07 2,110	1,046.00 143,280	81 4,375	39.3 192	47.7 233
H60/30B-1	71 1,800	737 101,005	56 3,000	27.2 133	33.8 165	71 1,800	775.00 106,130	59 3,150	29.1 142	37.1 181	71 1,810	855.00 117,130	61 3,305	31.9 156	41.8 204
H60/30B-2	82.68 2,100	1,049 143,720	85 4,557	38.1 186	43.8 214	82.68 2,100	1,081.00 148,115	87 4,670	39.7 194	46.5 227	83.07 2,110	1,155.00 158,250	90 4,830	42 205	50.6 247
H60/30C-1	71 1,800	817 111,960	62 3,340	29.7 145	36.5 178	71 1,800	855.00 117,085	65 3,495	31.7 155	39.7 194	71 1,810	937.00 128,315	68 3,655	34.6 169	44.4 217
H60/30C-2	82.68 2,100	1,182 161,960	95 5,122	42.6 208	48.3 236	82.68 2,100	1,214.00 166,355	97 5,240	44.2 216	51 249	83.07 2,110	1,289.00 176,570	100 5,400	46.5 227	55.1 269
H70/30A-1	70.87 1,800	997.40 136,630	64.73 3,480	28.88 141	35.43 173	70.87 1,800	1,034.81 141,755	67.15 3,610	30.72 150	38.71 189	71.26 1,810	1,130.41 154,850	69.84 3,755	33.59 164	43.62 213
H70/30A-2	82.68 2,100	1462.88 200,395	100.85 5,422	40.96 200	46.69 228	82.68 2,100	1,494.97 204,790	102.58 5,515	42.60 208	49.36 241	83.07 2,110	1,583.37 216,900	105.37 5,665	44.85 219	53.45 261
H70/30B-1	70.87 1,800	1118.83 153,265	72.54 3,900	30.92 151	37.68 184	70.87 1,800	1,156.25 158,390	74.96 4,030	32.97 161	40.96 200	71.26 1,810	1,253.63 171,730	77.75 4,180	35.84 175	45.67 223
H70/30B-2	82.68 2,100	1667.36 228,405	114.43 6,152	44.65 218	50.38 246	82.68 2,100	1,699.44 232,800	116.16 6,245	46.28 226	53.04 259	83.07 2,110	1,788.39 244,985	118.76 6,385	48.54 237	57.14 279
H70/30C-1	71 1,800	1,279 175,235	89 4,810	33.6 164	40.1 196	71 1,800	1,317.00 180,365	92 4,950	35.4 173	43.4 212	71.314 1,810	1,426.00 195,400	95 5,110	38.3 187	48.1 235
H70/30C-2	82.68 2,100	1,825 250,000	130 6,987	47.3 231	53.0 259	82.68 2,100	1,857.00 254,395	132 7,090	48.9 239	55.7 272	83.07 2,110	1,52.00 267,360	135 7,240	51.2 250	59.6 291
H85/40A-1	75.98 1,930	1,740.54 238,430	97.56 5,245	32.15 157	38.50 188	75.98 1,930	1,775.51 243,220	99.51 5,350	34.00 166	41.37 202	76.38 1,940	1,913.48 262,120	102.30 5,500	36.66 179	45.88 224
H85/40A-2	94.49 2,400	2,409.58 330,079	136.56 7,342	43.42 212	48.33 236	94.49 2,400	2,437.65 333,925	137.64 7,400	44.85 219	50.79 248	94.88 2,410	2,548.65 349,130	140.06 7,530	46.90 229	54.27 265
H85/40B-1	75.98 1,930	1,885.59 258,300	106.30 5,715	34.00 166	40.14 196	75.98 1,930	1,920.52 263,085	108.25 5,820	35.64 174	43.42 212	76.38 1,940	2,060.75 282,295	110.95 5,965	38.30 187	47.51 232
H85/40B-2	94.49 2,400	2,630.15 360,294	149.02 8,012	45.88 224	50.79 248	94.49 2,400	2,658.22 364,140	150.10 8,070	47.31 231	53.25 260	94.88 2,410	2,769.55 379,390	152.43 8,195	49.36 241	56.93 278

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H Pile Section	ESC-S8 INFILL SHEET PILE					ESC-S10 INFILL SHEET PILE					ESC-S12 INFILL SHEET PILE				
	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	$MASS_{60\%}$*	$MASS_{100\%}$*	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	$MASS_{60\%}$*	$MASS_{100\%}$*	SYSTEM WIDTH	SYSTEM INERTIA	SECTION MODULUS	$MASS_{60\%}$*	$MASS_{100\%}$*
	in	in^4/ft	in^3/ft	lb/ft^2	lb/ft^2	in	in^4/ft	in^3/ft	lb/ft^2	lb/ft^2	in	in^4/ft	in^3/ft	lb/ft^2	lb/ft^2
	mm	cm^4/m	cm^3/m	kg/m^2	kg/m^2	mm	cm^4/m	cm^3/m	kg/m^2	kg/m^2	mm	cm^4/m	cm^3/m	kg/m^2	kg/m^2
H85/40C-1	75.98 1,930	2,031.44 278,280	114.95 6,180	35.64 174	41.78 204	75.98 1,930	2,066.41 283,070	116.99 6,290	37.27 182	44.85 219	76.38 1,940	2,208.62 302,550	119.60 6,430	39.94 195	49.15 240
H85/40C-2	94.49 2,400	2,852.54 390,759	161.49 8,682	48.54 237	53.45 261	94.49 2,400	2,880.62 394,605	162.66 8,745	49.97 244	55.91 273	94.88 2,410	2,992.16 409,885	164.89 8,865	51.81 253	59.39 290
H90/40A-1	74.80 1,900	2,210.40 302,795	120.90 6,500	39.12 191	45.26 221	74.80 1,900	2,245.85 307,650	122.76 6,600	40.76 199	48.33 236	75.20 1,910	2,390.57 327,475	125.74 6,760	43.42 212	52.84 258
H90/40A-2	92.13 2,340	3,194.09 437,546	175.88 9,456	54.27 265	59.39 290	92.13 2,340	3,222.88 441,490	176.89 9,510	55.71 272	61.85 302	92.52 2,350	3,337.82 457,235	179.30 9,640	57.75 282	65.33 319
H90/40B-1	74.80 1,900	2,351.40 322,110	128.71 6,920	40.55 198	46.90 229	74.80 1,900	2,386.84 326,965	130.67 7,025	42.39 207	49.97 244	75.20 1,910	2,532.84 346,965	133.55 7,180	45.06 220	54.27 265
H90/40B-2	92.13 2,340	3,414.76 467,776	187.60 10,086	56.52 276	61.64 301	92.13 2,340	3,443.56 471,720	188.70 10,145	57.96 283	64.10 313	92.52 2,350	3,558.42 487,455	191.02 10,270	60.01 293	67.79 331
H90/40C-1	74.80 1,900	2,493.42 341,565	136.71 7,350	41.98 205	48.33 236	74.80 1,900	2,528.87 346,420	138.57 7,450	43.83 214	51.40 251	75.20 1,910	2,676.03 366,580	141.36 7,600	46.49 227	55.91 273
H90/40C-2	92.13 2,340	3,637.31 498,261	199.50 10,726	58.98 288	64.10 313	92.13 2,340	3,666.10 502,205	200.51 10,780	60.42 295	66.56 325	92.52 2,350	3,780.93 517,935	202.74 10,900	62.46 305	70.04 342
H100/40A-1	74.80 1,900	3,360.77 460,380	145.45 7,820	39.94 195	46.28 226	74.80 1,900	3,607.11 494,125	156.33 8,405	43.21 211	50.79 248	75.20 1,910	3,804.87 521,215	159.12 8,555	45.88 224	55.30 270
H100/40A-2	92.13 2,340	5,313.75 727,911	223.59 12,021	58.16 284	63.28 309	92.13 2,340	5,342.54 731,855	233.62 12,560	59.60 291	65.74 321	92.52 2,350	5,836.65 799,541	250.08 13,445	63.90 312	71.48 349
H100/40B-1	74.80 1,900	3,571.67 489,270	154.75 8,320	41.37 202	47.72 233	74.80 1,900	3,819.29 523,190	165.73 8,910	44.65 218	52.22 255	75.20 1,910	4,018.32 550,455	168.33 9,050	47.31 231	56.73 277
H100/40B-2	92.13 2,340	5,651.38 774,161	237.82 12,786	60.42 295	65.33 319	92.13 2,340	5,680.17 778,105	247.94 13,330	61.85 302	67.79 331	92.52 2,350	6,176.17 846,050	264.31 14,210	65.95 322	73.73 360
H100/40C-1	74.80 1,900	3,783.85 518,335	164.15 8,825	43.01 210	49.15 240	74.80 1,900	4,032.74 552,430	175.03 9,410	46.28 226	53.66 262	75.20 1,910	4,232.94 579,855	177.63 9,550	48.74 238	58.16 284
H100/40C-2	92.13 2,340	5,313.75 727,911	223.59 12,021	58.16 284	63.28 309	92.13 2,340	5,342.54 731,855	233.62 12,560	59.60 291	65.74 321	92.52 2,350	5,836.64 799,540	249.98 13,440	63.90 312	71.48 349
H110/40A-1	74.80 1,900	4,138.15 566,870	176.33 9,480	46.90 229	53.25 260	74.80 1,900	4,173.59 571,725	177.82 9,560	48.74 238	56.32 275	75.20 1,910	4,380.99 600,135	180.89 9,725	51.40 251	60.83 297
H110/40A-2	92.13 2,340	6,208.84 850,526	266.74 14,341	66.97 327	72.09 352	92.13 2,340	6,237.63 854,470	267.38 14,375	68.40 334	74.55 364	92.52 2,350	6,399.65 876,665	269.61 14,495	70.45 344	78.03 381
H110/40B-1	74.80 1,900	4,585.13 628,100	195.39 10,505	49.97 244	56.12 274	74.80 1,900	4,620.57 632,955	196.88 10,585	51.61 252	59.19 289	75.20 1,910	4,829.75 661,610	199.76 10,740	54.27 265	63.69 311
H110/40B-2	92.13 2,340	6,921.32 948,126	296.04 15,916	71.48 349	76.39 373	92.13 2,340	6,950.11 952,070	296.67 15,950	72.91 356	78.85 385	92.52 2,350	7,110.97 974,105	298.72 16,060	74.75 365	82.33 402
H110/40C-1	74.80 1,900	5,037.69 690,095	214.55 11,535	52.84 258	59.19 289	74.80 1,900	5,073.17 694,955	216.04 11,615	54.68 267	62.05 303	75.20 1,910	5,283.74 723,800	218.64 11,755	57.14 279	66.56 325
H110/40C-2	92.13 2,340	7,643.55 1,047,061	325.43 17,496	75.98 371	80.90 395	92.13 2,340	7,672.34 1,051,005	326.06 17,530	77.41 378	83.35 407	92.52 2,350	7,832.10 1,072,890	327.92 17,630	79.26 387	86.84 424
H110/50A-1	78.74 2,000	5,136.86 703,680	219.85 11,820	54.07 264	60.01 293	78.74 2,000	5,170.52 708,290	221.25 11,895	55.71 272	62.87 307	79.13 2,010	5,368.38 735,395	223.76 12,030	58.16 284	66.97 327
H110/50A-2	100.00 2,540	8,014.09 1,097,821	343.34 18,459	78.64 384	83.35 407	100.00 2,540	8,040.62 1,101,455	343.82 18,485	80.08 391	85.61 418	100.39 2,550	8,186.55 1,121,445	345.40 18,570	81.72 399	88.88 434
H110/50B-1	78.74 2,000	5,665.46 776,090	242.08 13,015	57.34 280	63.28 309	78.74 2,000	5,699.15 780,705	243.47 13,090	59.19 289	66.36 324	79.13 2,010	5,897.52 807,880	245.80 13,215	61.44 300	70.45 344
H110/50B-2	100.00 2,540	8,425.89 1,154,231	360.08 19,359	81.10 396	86.02 420	100.00 2,540	8,452.41 1,157,865	360.56 19,385	82.53 403	88.27 431	100.39 2,550	8,597.68 1,177,765	362.05 19,465	84.38 412	91.34 446
H110/50C-1	78.74 2,000	6,200.91 849,440	264.40 14,215	60.83 297	66.76 326	78.74 2,000	6,234.60 854,055	265.79 14,290	62.46 305	69.63 340	79.13 2,010	6,433.23 881,265	267.93 14,405	64.92 317	73.73 360
H110/50C-2	100.00 2,540	9,257.94 1,268,211	393.65 21,164	86.22 421	91.14 445	100.00 2,540	9,284.47 1,271,845	394.13 21,190	87.65 428	93.39 456	100.39 2,550	9,428.61 1,291,590	395.44 21,260	89.50 437	96.46 471

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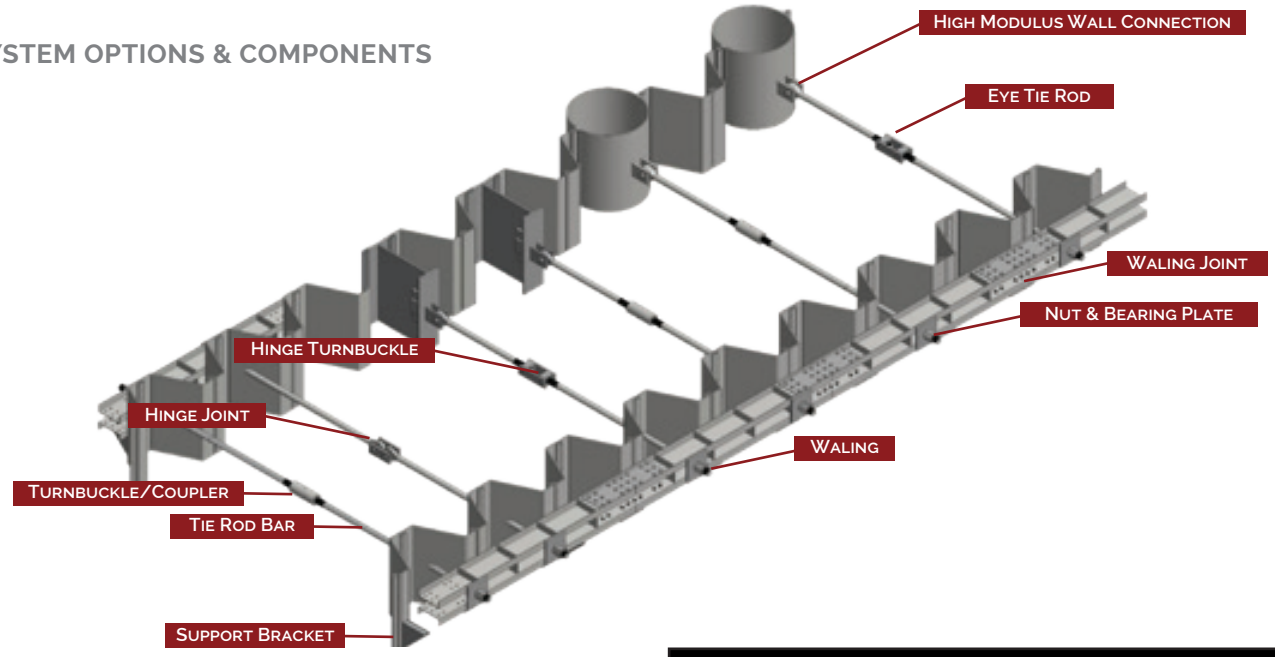
ESC Tie Rod System
Anchorage Systems

ESC is proud to offer a full suite of options for designing, fabricating and supplying full Tie Rod System Assemblies at competitive delivery schedules. Provided in this catalog are the standard sizes for the typical components. On top of this is the flexibility to provide a wide range of steel grades. Project specific requirements can also be catered to such as corrosion protection combinations, high forces, extreme lengths and large expected settlements.

Tie Rod System Configurations

- ✓ Sheet Pile Main Wall tied to Sheet Pile Anchor Wall
- ✓ Sheet Pile Main Wall tied to Concrete Block Anchor Wall
- ✓ H Pile Combi Wall tied to Sheet Pile Anchor Wall
- ✓ Pipe Pile Combi Wall tied to Sheet Pile Anchor Wall
- ✓ Other Special Configurations—Pipe Combi Wall tied to H Pile Combi Wall

SYSTEM OPTIONS & COMPONENTS



What Our Engineers Say?

"Unlike other companies, ESC can design and deliver an entire retaining wall system giving you a hassle-free, one-stop solution with no worries of interfacing issues between sheet pile and tie rod components."

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TIE ROD BAR SIZING - **CUT THREAD**

CODE	THREAD	BAR Ø	MASS	GRADE 460		GRADE 500		GRADE 550		GRADE 650		GRADE 700	
				YL	UL	YL	UL	YL	UL	YL	UL	YL	UL
	in mm	in mm	lb/ft kg/m	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
CT01	1-7/8 x 3/16 M48x5	1-7/8 48	9.55 14.2	147 656	195 869	160 713	208 926	176 784	240 1,069	208 926	272 1,212	224 998	282 1,254
CT02	2-3/16 x 3/16 M56X5.5	2-3/16 56	12.99 19.3	203 905	270 1,201	221 984	287 1,279	243 1,083	332 1,476	287 1,279	376 1,673	310 1,378	389 1,732
CT03	2-11/16 x 11/4 M68X6	2-11/16 68	19.16 28.5	307 1,367	407 1,813	334 1,486	434 1,932	367 1,635	501 2,229	434 1,932	568 2,527	468 2,081	588 2,616
CT04	2-13/16 x 13/4 M72X6	2-13/16 72	21.48 32	349 1,551	462 2,057	379 1,686	493 2,192	417 1,854	568 2,529	493 2,192	644 2,866	530 2,360	667 2,967
CT05	3 x 1/4 M76X6	3 76	23.93 35.6	392 1,746	520 2,315	426 1,898	554 2,467	469 2,088	640 2,847	554 2,467	725 3,226	597 2,657	750 3,340
CT06	3-3/8 x 1/4 M85X6	3-3/8 85	29.93 44.5	500 2,227	664 2,954	544 2,421	707 3,147	598 2,663	816 3,632	707 3,147	925 4,116	762 3,390	957 4,261
CT07	3-9/16 x 1/4 M90X6	3-9/16 90	33.56 49.9	566 2,520	751 3,342	615 2,739	800 3,561	677 3,013	923 4,109	800 3,561	1,046 4,657	862 3,835	1,083 4,821
CT08	3-3/4 x 1/4 M95X6	3-3/4 95	37.39 55.6	636 2,831	844 3,754	691 3,077	899 4,000	761 3,385	1,037 4,616	899 4,000	1,175 5,231	968 4,308	1,217 5,416
CT09	3-15/16 x 1/4 M100X6	3-15/16 100	41.43 61.7	710 3,160	941 4,190	772 3,435	1,003 4,465	849 3,778	1,158 5,152	1,003 4,465	1,312 5,839	1,080 4,808	1,358 6,045
CT10	4-1/8 x 1/4 M105X6	4-1/8 105	45.68 68.0	788 3,507	1,045 4,650	857 3,812	1,113 4,955	942 4,193	1,285 5,717	1,113 4,955	1,456 6,480	1,199 5,336	1,507 6,708
CT11	4-5/16 x 1/4 M110X6	4-5/16 110	50.13 74.6	870 3,872	1,154 5,134	946 4,208	1,229 5,471	1,040 4,629	1,418 6,312	1,229 5,471	1,607 7,154	1,324 5,892	1,664 7,407
CT12	4-1/2 x 1/4 M115X6	4-1/2 115	54.79 81.5	956 4,255	1,268 5,642	1,039 4,625	1,351 6,012	1,143 5,087	1,559 6,937	1,351 6,012	1,767 7,862	1,455 6,475	1,829 8,139
CT13	4-15/16 x 3/8 M125X10	4-15/16 125	64.74 96.3	1,059 4,712	1,404 6,248	1,151 5,121	1,496 6,658	1,266 5,634	1,726 7,682	1,496 6,658	1,956 8,706	1,611 7,170	2,025 9,014
CT14	5-1/8 x 3/8 M130X10	5-1/8 130	70.02 104.2	1,153 5,133	1,530 6,807	1,254 5,580	1,630 7,254	1,379 6,138	1,881 8,370	1,630 7,254	2,131 9,486	1,755 7,812	2,207 9,820
CT15	5-5/16 x 3/8 M135X10	5-5/16 135	75.51 112.4	1,252 5,573	1,661 7,390	1,361 6,058	1,769 7,875	1,497 6,663	2,042 9,086	1,769 7,875	2,314 10,298	1,906 8,481	2,395 10,661
CT16	5-1/2 x 3/8 M140X10	5-1/2 140	81.21 120.8	1,355 6,031	1,797 7,997	1,473 6,555	1,915 8,522	1,620 7,211	2,209 9,833	1,915 8,522	2,504 11,144	2,062 9,177	2,592 11,537
CT17	5-7/8 x 1/2 M150X12	5-7/8 150	93.22 138.7	1,525 6,785	2,022 8,997	1,657 7,375	2,154 9,587	1,823 8,112	2,486 11,062	2,154 9,587	2,817 12,537	2,320 10,325	2,917 12,980
CT18	6-1/8 x 1/2 M155X12	6-1/8 155	99.54 148.1	1,638 7,289	2,172 9,666	1,780 7,923	2,314 10,300	1,958 8,715	2,670 11,884	2,314 10,300	3,026 13,469	2,492 11,092	3,133 13,944
CT19	6-5/16 x 1/2 M160X12	6-5/16 160	106.06 157.8	1,755 7,811	2,327 10,358	1,908 8,490	2,480 11,038	2,098 9,339	2,862 12,736	2,480 11,038	3,243 14,434	2,671 11,887	3,358 14,943
CT20	6-1/2 x 1/2 M165X12	6-1/2 165	112.8 167.9	1,876 8,351	2,489 11,075	2,040 9,078	2,652 11,801	2,244 9,985	3,060 13,617	2,652 11,801	3,468 15,432	2,856 12,709	3,590 15,977

TIE ROD BAR SIZING - **ROLLED THREAD**

CODE	THREAD	BAR Ø	MASS	GRADE 460		GRADE 500		GRADE 550		GRADE 650		GRADE 700	
				YL	UL	YL	UL	YL	UL	YL	UL	YL	UL
	in mm	in mm	lb/ft kg/m	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
RT01	1-7/8 x 3/16 M48x5	1 3/4 45	8.39 12.48	147 656	195 869	160 713	208 926	176 784	240 1,069	208 926	272 1,212	224 998	282 1,254
RT02	2-3/16 x 3/16 M56x5	2 1/16 53	11.64 17.32	203 905	270 1,201	221 984	287 1,279	243 1,083	332 1,476	287 1,279	376 1,673	310 1,378	389 1,732
RT03	2-11/16 x 1/4 M68x6	2 1/2 63	16.46 24.5	307 1,367	407 1,813	334 1,486	434 1,932	367 1,635	501 2,229	434 1,932	568 2,527	468 2,081	588 2,616
RT04	2-13/16 x 1/4 M72x6	2 11/16 68	19.15 28.5	349 1,551	462 2,057	379 1,686	493 2,192	417 1,854	568 2,529	493 2,192	644 2,866	530 2,360	667 2,967
RT05	3 x 1/4 M76x6	2 3/4 70	20.29 30.2	392 1,746	520 2,315	426 1,898	554 2,467	469 2,088	640 2,847	554 2,467	725 3,226	597 2,657	750 3,340
RT06	3-3/8 x 1/4 M85x6	3 1/8 80	26.54 39.5	500 2,227	664 2,954	544 2,421	707 3,147	598 2,663	816 3,632	707 3,147	925 4,116	762 3,390	957 4,261

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CODE	THREAD	BAR Ø	MASS	GRADE 460		GRADE 500		GRADE 550		GRADE 650		GRADE 700	
				YL	UL	YL	UL	YL	UL	YL	UL	YL	UL
	in mm	in mm	lb/ft kg/m	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
RT07	3-9/16 x 1/4 M90x6	3 3/8 85	29.9 44.5	566 2,520	751 3,342	615 2,739	800 3,561	677 3,013	923 4,109	800 3,561	1,046 4,657	862 3,835	1,083 4,821
RT08	3-3/4 x 1/4 M95x6	3 9/16 90	33.53 49.9	636 2,831	844 3,754	691 3,077	899 4,000	761 3,385	1,037 4,616	899 4,000	1,175 5,231	968 4,308	1,217 5,416
RT09	3-15/16 x 1/4 M100x6	3 1/2 95	37.36 55.6	710 3,160	941 4,190	772 3,435	1,003 4,465	849 3,778	1,158 5,152	1,003 4,465	1,312 5,839	1,080 4,808	1,358 6,045
RT10	4-1/8 x 1/4 M105x6	3 15/16 100	41.46 61.7	788 3,507	1,045 4,650	857 3,812	1,113 4,955	942 4,193	1,285 5,717	1,113 4,955	1,456 6,480	1,199 5,336	1,507 6,708
RT11	4-5/16 x 1/4 M110x6	4 1/8 105	45.7 68	870 3,872	1,154 5,134	946 4,208	1,229 5,471	1,040 4,629	1,418 6,312	1,229 5,471	1,607 7,154	1,324 5,892	1,664 7,407
RT12	4-1/2 x 1/4 M115x6	4 5/16 110	50.13 74.6	956 4,255	1,268 5,642	1,039 4,625	1,351 6,012	1,143 5,087	1,559 6,937	1,351 6,012	1,767 7,862	1,455 6,475	1,829 8,139
RT13	4-15/16 x 3/8 M125x10	4 3/4 120	59.67 88.8	1,059 4,712	1,404 6,248	1,151 5,121	1,496 6,658	1,266 5,634	1,726 7,682	1,496 6,658	1,956 8,706	1,611 7,170	2,025 9,014
RT14	5-15/16 x 3/8 M135x10	5 1/8 130	70.02 104.2	1,252 5,573	1,661 7,390	1,361 6,058	1,769 7,875	1,497 6,663	2,042 9,086	1,769 7,875	2,314 10,298	1,906 8,481	2,395 10,661
RT15	5-1/2 x 3/8 M140x10	5 5/16 135	75.53 112.4	1,355 6,031	1,797 7,997	1,473 6,555	1,915 8,522	1,620 7,211	2,209 9,833	1,915 8,522	2,504 11,144	2,062 9,177	2,592 11,537
RT16	5-7/8 x 3/8 M150x12	5 11/16 145	87.09 129.6	1,525 6,785	2,022 8,997	1,657 7,375	2,154 9,587	1,823 8,112	2,486 11,062	2,154 9,587	2,817 12,537	2,320 10,325	2,917 12,980

TIE ROD BAR SIZING - **UPSET THREAD**

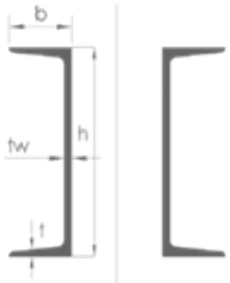
CODE	THREAD	BAR Ø	MASS	GRADE 460		GRADE 500		GRADE 550		GRADE 650		GRADE 700	
				YL	UL	YL	UL	YL	UL	YL	UL	YL	UL
	in mm	in mm	lb/ft kg/m	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
UT01	1-7/8 x 3/16 M48X5	1 9/16 40	6.65 9.9	130 578	172 767	141 628	184 817	155 691	212 942	184 817	240 1,068	198 880	249 1,106
UT02	2-3/16 x 3/16 M56X5.5	1 3/4 45	8.4 12.5	164 732	218 970	179 795	232 1,034	197 875	268 1,193	232 1,034	304 1,352	250 1,113	315 1,400
UT03	2-3/8 x 3/16 M60X5.5	1 15/16 50	10.35 15.4	203 903	269 1,198	221 982	287 1,276	243 1,080	331 1,473	287 1,276	375 1,669	309 1,374	388 1,728
UT04	2-11/16 x 1/4 M68X6	2 3/16 55	12.57 18.7	246 1,093	326 1,449	267 1,188	347 1,544	294 1,307	400 1,782	347 1,544	454 2,019	374 1,663	470 2,091
UT05	2-13/16 x 1/4 M72X6	2 3/8 60	14.92 22.2	292 1,301	388 1,725	318 1,414	413 1,838	349 1,555	477 2,121	413 1,838	540 2,403	445 1,979	559 2,488
UT06	3 x 1/4 M76X6	2 9/16 65	17.54 26.1	343 1,526	455 2,024	373 1,659	485 2,157	410 1,825	559 2,489	485 2,157	634 2,821	522 2,323	656 2,920
UT07	3-3/8 x 1/4 M85X6	2 3/4 70	20.29 30.2	398 1,770	528 2,348	432 1,924	562 2,501	476 2,117	648 2,886	562 2,501	735 3,271	605 2,694	761 3,387
UT08	3-9/16 x 1/4 M90X6	2 15/16 75	23.32 34.7	457 2,032	606 2,695	496 2,209	645 2,872	546 2,430	744 3,313	645 2,872	844 3,755	695 3,093	874 3,888
UT09	3-3/4 x 1/4 M95X6	3 1/8 80	26.54 39.5	519 2,312	689 3,066	565 2,513	734 3,267	621 2,765	847 3,770	734 3,267	960 4,273	791 3,519	994 4,423
UT10	3-15/16 x 1/4 M100X6	3 3/8 85	29.9 44.5	586 2,610	778 3,461	637 2,837	829 3,688	701 3,121	956 4,256	829 3,688	1,084 4,823	892 3,972	1,122 4,994
UT11	4-1/8 x 1/4 M105X6	3 9/16 90	33.53 49.9	657 2,926	872 3,881	715 3,181	929 4,135	786 3,499	1,072 4,771	929 4,135	1,215 5,407	1,001 4,453	1,258 5,598
UT12	4-5/16 x 1/4 M110X6	3 3/4 95	37.36 55.6	733 3,261	972 4,324	796 3,544	1,035 4,607	876 3,899	1,194 5,316	1,035 4,607	1,354 6,025	1,115 4,962	1,402 6,238
UT13	4-1/2 x 1/4 M115X6	3 15/16 100	41.46 61.7	812 3,613	1,077 4,791	882 3,927	1,147 5,105	971 4,320	1,323 5,890	1,147 5,105	1,500 6,676	1,235 5,498	1,553 6,912
UT14	4-15/16 x 3/8 M125X10	4 1/8 105	45.7 68	895 3,983	1,187 5,282	973 4,330	1,265 5,628	1,070 4,762	1,459 6,494	1,265 5,628	1,654 7,360	1,362 6,061	1,712 7,620
UT15	5-1/8 x 3/8 M130X10	4 5/16 110	50.13 74.6	982 4,372	1,303 5,797	1,068 4,752	1,388 6,177	1,174 5,227	1,601 7,127	1,388 6,177	1,815 8,078	1,495 6,652	1,879 8,363
UT16	5-5/16 x 3/8 M135X10	4 1/2 115	54.77 81.5	1,074 4,778	1,424 6,336	1,167 5,193	1,517 6,751	1,284 5,713	1,750 7,790	1,517 6,751	1,984 8,829	1,634 7,271	2,054 9,140

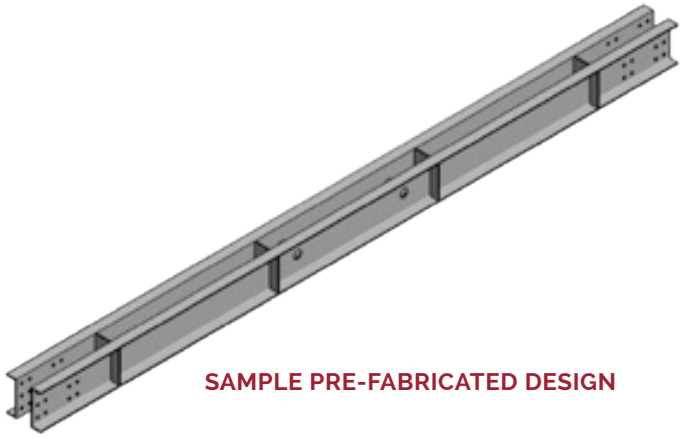
CODE	THREAD	BAR Ø	MASS	GRADE 460		GRADE 500		GRADE 550		GRADE 650		GRADE 700	
				YL	UL	YL	UL	YL	UL	YL	UL	YL	UL
	in mm	in mm	lb/ft kg/m	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
UT17	5-1/2 x 3/8 M140X10	4 3/4 120	59.67 88.8	1,169 5,202	1,550 6,899	1,271 5,655	1,652 7,351	1,398 6,220	1,906 8,482	1,652 7,351	2,160 9,613	1,779 7,917	2,236 9,953
UT18	5-7/8 x 1/2 M150X12	4 15/16 125	64.71 96.3	1,268 5,645	1,682 7,486	1,379 6,136	1,792 7,977	1,517 6,750	2,068 9,204	1,792 7,977	2,344 10,431	1,930 8,590	2,426 10,799
UT19	6-1/8 x 1/2 M155X12	5 1/8 130	70.02 104.2	1,372 6,106	1,819 8,097	1,491 6,637	1,939 8,628	1,640 7,300	2,237 9,955	1,939 8,628	2,535 11,282	2,088 9,291	2,624 11,680
UT20	6-5/16 x 1/2 M160X12	5 5/16 135	75.53 112.4	1,479 6,584	1,962 8,731	1,608 7,157	2,091 9,304	1,769 7,873	2,412 10,735	2,091 9,304	2,734 12,167	2,251 10,020	2,830 12,596
UT21	6-1/12 x 1/2 M165X12	5 1/2 140	81.18 120.8	1,591 7,081	2,110 9,390	1,729 7,697	2,248 10,006	1,903 8,467	2,594 11,545	2,248 10,006	2,940 13,085	2,421 10,776	3,044 13,547

*** Fully threaded bars are available for most sizes as an option for the customer.**

WALING CHANNEL

The Waling Assembly transmits forces from the sheet piling to the anchorage whilst simultaneously aligning and stiffening the wall. ESC offers standard hot rolled channel sections presented, but can also provide full options such as splicing plates and bolt holes. Alternatives that ESC can accommodate to are cold formed channels, or double wide flange beams or as the client requires.





SAMPLE PRE-FABRICATED DESIGN

Section	h	b	t_w	t_2	SECTIONAL AREA	MASS PER UNIT LENGTH	MOMENT OF INERTIA	SECTION MODULUS	COATING AREA
	in mm	in mm	in mm	in mm	in^2 cm^2	lb/ft kg/m	in^4 cm^4	in^3 cm^3	ft^2/ft m^2/m
WC01	7.09 180	2.76 70	0.35 9.0	0.41 10.5	0.05 29.29	15.45 22.99	32.91 1,370	9.27 152	1.97 0.6
WC02	7.87 200	2.87 73	0.28 7.0	0.43 11.0	0.04 28.83	15.21 22.63	42.76 1,780	10.86 178	2.13 0.65
WC03	7.87 200	2.95 75	0.35 9.0	0.43 11.0	0.05 32.83	17.32 25.77	45.98 1,914	11.65 191	2.17 0.66
WC04	8.66 220	3.03 77	0.28 7.0	0.45 11.5	0.05 31.84	16.79 24.99	57.52 2,394	13.30 218	2.33 0.71
WC05	8.66 220	3.11 79	0.35 9.0	0.45 11.5	0.06 36.24	19.12 28.45	61.77 2,571	14.27 234	2.33 0.71
WC06	9.84 250	3.07 78	0.28 7.0	0.47 12.0	0.05 34.91	18.41 27.4	80.70 3,359	16.41 269	2.53 0.77
WC07	9.84 250	3.15 80	0.35 9.0	0.47 12.0	0.06 39.91	21.05 31.33	86.97 3,620	17.69 290	2.56 0.78
WC08	11.02 280	3.23 82	0.30 7.5	0.49 12.5	0.06 40.02	21.11 31.42	114.19 4,753	20.74 340	2.79 0.85

Section	h	b	t_w	t_2	SECTIONAL AREA	MASS PER UNIT LENGTH	MOMENT OF INERTIA	SECTION MODULUS	COATING AREA
	in mm	in mm	in mm	in mm	in^2 cm^2	lb/ft kg/m	in^4 cm^4	in^3 cm^3	ft^2/ft m^2/m
WC09	11.02 280	3.31 84	0.37 9.5	0.49 12.5	0.07 45.62	24.06 35.81	122.96 5,118	22.33 366	2.79 0.85
WC10	12.60 320	3.46 88	0.31 8.0	0.55 14.0	0.08 48.5	25.58 38.07	180.45 7,511	28.61 469	3.12 0.95
WC11	12.60 320	3.54 90	0.39 10.0	0.55 14.0	0.09 54.9	28.96 43.1	193.57 8,057	30.74 504	3.12 0.95
WC12	14.17 360	3.78 96	0.35 9.0	0.63 16.0	0.09 60.89	32.12 47.8	285.27 11,874	40.26 660	3.44 1.05
WC13	14.17 360	3.86 98	0.43 11.0	0.63 16.0	0.11 68.09	35.92 53.45	303.96 12,652	42.88 703	3.48 1.06
WC14	15.75 400	3.94 100	0.41 10.5	0.71 18.0	0.12 75.04	39.59 58.91	422.29 17,577	53.62 879	3.74 1.14
WC15	15.75 400	4.02 102	0.49 12.5	0.71 18.0	0.13 83.04	43.81 65.19	447.92 18,644	56.85 932	3.77 1.15

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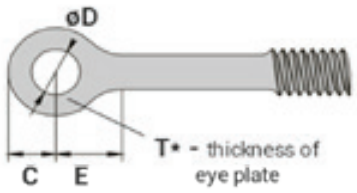
CONNECTION OPTIONS

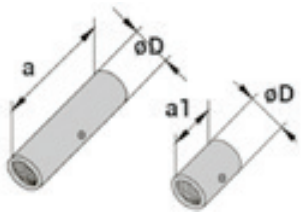
EYE TIE ROD

1. Eye Tie Rods are special bars with upset threads on one end, with the other end of the bar pressed and drilled into a flat eye shape which can be used to connect to a hinge joint or connection plate for high modulus walls.



TURNBUCKLE/COUPLER

2. Turnbuckles and couplers are the most common connections to extend the full assembly length of the tie rod system. Typical adjustment length is 3.54in (90mm), but greater lengths are available on request. The minimum engagement length for full joint strength is one outer diameter.



STEEL GRADES

The standard steel grade for Tie Rod System Connection options is S355 and Grade A572/50. The sizing of components is designed for Grade 550, cut thread. ESC can provide full design options for other grades (Grade 460, 500, 650 & 700) and thread forms.

		EYE TIE RODS				TURNBUCKLE			COUPLER		
THREAD	CODE	C	T*	E	ØD	CODE	a1	D	CODE	a	D
		in mm	in mm	in mm	in mm		in mm	in mm		in mm	in mm
1 7/8 M48X5	ETR01	2 3/16 55	1 7/16 36	3 76	1 9/16 39	TB01	4 5/16 110	3 9/16 90	CP01	11 7/16 290	3 9/16 90
2 3/16 M56X5.5	ETR02	2 3/8 61	1 5/8 41	3 1/4 83	1 3/4 44	TB02	5 1/8 130	3 15/16 100	CP02	12 3/16 310	3 15/16 100
2 3/8 M60X5.5	ETR03	2 11/16 68	1 11/16 43	3 13/16 97	1 15/16 50	TB03	5 1/2 140	4 5/16 110	CP03	12 5/8 320	4 5/16 110
2 11/16 M68X6	ETR04	2 15/16 75	1 13/16 46	4 1/8 105	2 3/16 55	TB04	6 5/16 160	4 3/4 120	CP04	13 3/8 340	4 3/4 120
2 13/16 M72X6	ETR05	3 3/16 81	2 51	4 7/16 113	2 3/8 60	TB05	6 11/16 170	5 1/8 130	CP05	13 3/4 350	5 1/8 130
3 M76X6	ETR06	3 7/16 88	2 3/16 56	4 3/4 120	2 9/16 65	TB06	6 11/16 170	5 5/16 135	CP06	13 3/4 350	5 5/16 135
3 3/8 M85X6	ETR07	3 3/4 95	2 3/8 61	5 1/4 133	2 3/4 70	TB07	7 7/8 200	5 7/8 150	CP07	14 15/16 380	5 7/8 150
3 9/16 M90X6	ETR08	4 101	2 1/16 66	5 9/16 141	2 15/16 75	TB08	7 7/8 200	6 5/16 160	CP08	14 15/16 380	6 5/16 160
3 3/4 M95X6	ETR09	4 1/4 108	2 13/16 71	5 13/16 148	3 1/8 80	TB09	8 11/16 220	6 1/2 165	CP09	15 3/4 400	6 1/2 165
3 15/16 M100X6	ETR10	4 1/2 115	2 13/16 71	6 5/16 161	3 3/8 85	TB10	9 1/16 230	6 7/8 175	CP10	16 1/8 410	6 7/8 175
4 1/8 M105X6	ETR11	4 3/4 121	3 76	6 11/16 170	3 1/2 89	TB11	9 13/16 250	7 5/16 185	CP11	16 15/16 430	7 5/16 185
4 5/16 M110X6	ETR12	5 1/16 128	3 3/16 81	7 178	3 11/16 94	TB12	9 13/16 250	7 1/2 190	CP12	16 15/16 430	7 1/2 190
4 1/2 M115X6	ETR13	5 5/16 135	3 3/8 86	7 5/16 186	3 15/16 100	TB13	10 5/8 270	7 7/8 200	CP13	17 11/16 450	7 7/8 200
4 15/16 M125X10	ETR14	5 5/8 143	3 5/8 92	7 5/8 193	4 1/8 105	TB14	11 7/16 290	8 1/4 210	CP14	18 1/2 470	8 1/4 210
5 1/8 M130X10	ETR15	5 7/8 149	3 13/16 97	7 7/8 200	4 5/16 110	TB15	11 7/16 290	8 11/16 220	CP15	18 1/2 470	8 11/16 220
5 5/16 M135X10	ETR16	6 1/8 156	3 13/16 97	8 1/4 209	4 1/2 115	TB16	11 13/16 300	8 7/8 225	CP16	18 7/8 480	8 7/8 225
5 1/2 M140X10	ETR17	6 3/8 162	4 102	8 7/8 225	4 3/4 120	TB17	12 5/8 320	9 1/4 235	CP17	19 11/16 500	9 1/4 235
5 7/8 M150X12	ETR18	6 11/16 170	4 3/16 107	9 1/8 232	4 15/16 125	TB18	14 3/16 360	9 13/16 250	CP18	21 1/4 540	9 13/16 250
6 1/8 M155X12	ETR19	6 15/16 176	4 7/16 112	9 11/16 246	5 1/8 130	TB19	14 15/16 380	10 1/16 255	CP19	22 1/16 560	10 1/16 255
6 5/16 M160X12	ETR20	7 3/16 182	4 5/8 117	9 15/16 253	5 5/16 135	TB20	14 15/16 380	10 7/16 265	CP20	22 1/16 560	10 7/16 265
6 1/2 M165X12	ETR21	7 7/16 189	4 13/16 122	10 1/4 260	5 1/2 140	TB21	15 3/4 400	10 13/16 275	CP21	22 13/16 580	10 13/16 275

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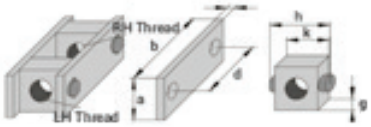
CONNECTION OPTIONS

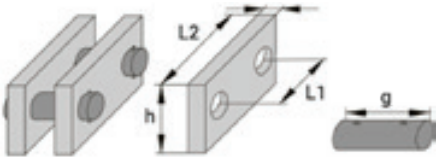
HINGE TURNBUCKLE

3. Hinge Turnbuckles are utilised to account for possible settlement, as the two connection points are hinged.



HINGE JOINT

4. Hinge Joints are generally provided for tie rods with extreme overall lengths or possible settlements. The standard design includes two eye tie rods connected by hinge plates and pins.



		HINGE TURNBUCKLE							HINGE JOINT					
THREAD	CODE	a	b	c	d	g	k	h	CODE	a	D	a	D	D
		in mm	in mm	in mm	in mm	in mm	in mm	in mm		in mm	in mm	in mm	in mm	in mm
1 7/8 M48X5	HT01	3 9/16 90	15 9/16 395	1 3/8 35	9 7/16 240	2 3/16 55	3 15/16 100	8 11/16 220	HJ01	1 3/8 35	3 9/16 90	5 1/8 130	9 1/16 230	6 1/2 165
2 3/16 M56X5.5	HT02	3 15/16 100	16 15/16 430	1 3/4 45	10 1/16 255	2 3/8 60	3 15/16 100	9 7/16 240	HJ02	1 3/4 45	3 15/16 100	5 11/16 145	10 1/4 260	7 1/2 190
2 3/8 M60X5.5	HT03	4 5/16 110	17 12 445	1 3/4 50	10 1/4 260	2 15/16 75	4 5/16 110	9 13/16 250	HJ03	1 3/4 45	4 5/16 110	6 5/16 160	11 280	7 1/2 190
2 11/16 M68X6	HT04	4 15/16 125	19 1/8 485	1 15/16 50	10 5/8 270	3 1/8 80	4 3/4 120	10 5/8 270	HJ04	1 15/16 50	4 15/16 125	6 11/16 170	12 3/16 310	8 1/16 205
2 13/16 M72X6	HT05	5 5/16 135	19 11/16 500	1 15/16 50	11 280	3 1/8 80	4 3/4 120	10 5/8 270	HJ05	1 15/16 50	5 5/16 135	7 5/16 185	13 330	8 1/4 210
3 M76X6	HT06	5 11/16 145	20 1/16 510	1 15/16 50	11 280	3 1/8 80	4 3/4 120	10 5/8 270	HJ06	1 15/16 50	5 11/16 145	7 7/8 200	13 3/16 335	8 7/16 215
3 3/8 M85X6	HT07	6 11/16 170	21 7/8 555	1 15/16 50	11 5/8 295	3 3/4 95	6 11/16 170	12 5/8 320	HJ07	1 15/16 50	6 11/16 170	8 1/4 210	14 15/16 380	8 11/16 220
3 9/16 M90X6	HT08	7 5/16 185	22 1/4 565	1 15/16 50	11 5/8 295	3 3/4 95	6 11/16 170	12 5/8 320	HJ08	1 15/16 50	7 5/16 185	8 7/8 225	16 1/8 410	8 7/8 225
3 3/4 M95X6	HT09	7 7/8 200	23 7/16 595	1 15/16 50	12 305	3 3/4 95	7 1/16 180	13 330	HJ09	1 15/16 50	7 7/8 200	9 7/16 240	16 15/16 430	9 1/16 230
3 15/16 M100X6	HT10	8 7/16 215	24 3/16 615	1 15/16 50	12 3/16 310	4 1/8 105	7 1/2 190	13 3/8 340	HJ10	1 15/16 50	8 7/16 215	10 1/4 260	18 1/8 460	9 1/16 230
4 1/8 M105X6	HT11	9 1/4 235	25 3/8 645	1 15/16 50	12 3/16 325	4 1/8 115	8 1/16 205	14 355	HJ11	1 15/16 50	9 1/4 235	10 13/16 275	19 11/16 500	9 1/4 235
4 5/16 M110X6	HT12	9 13/16 250	25 13/16 655	1 15/16 50	12 5/8 320	4 1/2 115	8 1/16 205	14 355	HJ12	1 15/16 50	9 13/16 250	11 7/16 290	21 1/4 540	9 7/16 240
4 1/2 M115X6	HT13	10 5/8 270	26 15/16 685	1 15/16 50	13 3/16 335	4 15/16 125	8 11/16 220	14 9/16 370	HJ13	1 15/16 50	10 5/8 270	11 13/16 300	22 1/16 560	9 5/8 245
4 15/16 M125X10	HT14	11 5/8 295	28 9/16 725	1 15/16 50	13 9/16 345	5 5/16 135	9 1/16 230	14 15/16 380	HJ14	1 15/16 50	11 5/8 295	12 5/8 320	22 7/16 570	9 13/16 250
5 1/8 M130X10	HT15	12 3/8 315	28 15/16 735	1 15/16 50	13 3/8 340	5 7/8 150	10 1/4 260	16 1/8 410	HJ15	1 15/16 50	12 3/8 315	13 330	24 13/16 630	10 1/16 255
5 5/16 M135X10	HT16	13 3/16 335	29 3/4 755	1 15/16 50	13 9/16 345	6 5/16 160	11 280	16 15/16 430	HJ16	1 15/16 50	13 3/16 335	13 9/16 345	25 9/16 650	10 1/16 255
5 1/2 M140X10	HT17	14 355	30 7/8 785	1 15/16 50	14 3/16 360	6 5/16 160	11 280	16 15/16 430	HJ17	1 15/16 50	14 355	14 355	26 3/4 680	10 1/4 260
5 7/8 M150X12	HT18	15 9/16 395	33 1/4 845	1 15/16 50	15 3/8 390	6 11/16 170	11 7/16 290	17 5/16 440	HJ18	1 15/16 50	15 9/16 395	14 9/16 370	29 1/8 740	10 7/16 265

CORROSION PROTECTION OPTIONS

Corrosion Protection of Tie Rod Systems can be achieved with the following methods or a combination of these methods. Other less common options include encapsulation and Teflon coating.

GALVANIZATION

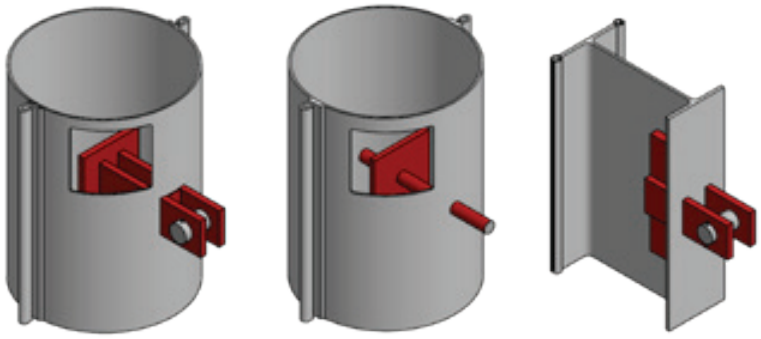
EPOXY COATING

TAPING

Technical Hotline: +1 (980) 689 4388 | engineering@escsteel.com

HIGH MODULUS WALL CONNECTIONS

ESC can design and fabricate a wide variety of Tie Rod connections for both King Pipe & H Piles that are easy to handle and install. Parameters required in the design of the connection are: preferred connection type, King Pile sizing and Tie Rod Bar sizing and strength. Presented are some typical designs but ESC can offer a full suite of options depending on the application and project requirements.



OTHER ACCESSORIES

ESC is able to supply the following accessories in addition to those specified in the previous sections:

The ESC Advantage

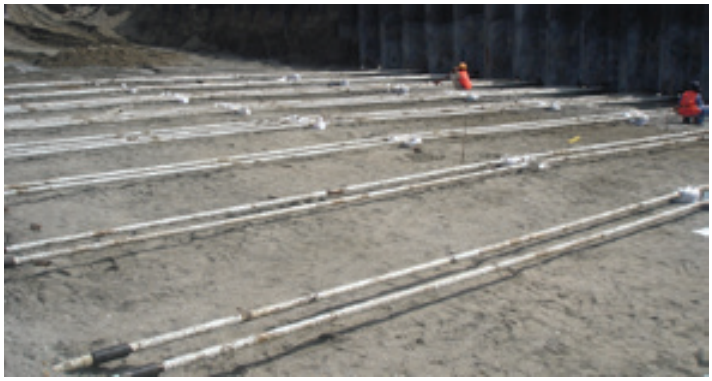
- ✓ Captive Nuts
- ✓ Swivel Nuts
- ✓ Angle Seating
- ✓ Bearing Plates
- ✓ Support Brackets
- ✓ Tie Rod Spreader Beam
- ✓ Washers
- ✓ Spacers (for Z Piles)

TIE ROD SPREADER BEAM

PROJECT REFERENCES

SBB TUGS JETTY, UAE

OT2 OIL TERMINAL, UAE



WATCO BREAKWATER BERTH, USA

JUBAIL SUPPLY BASE, SAUDI ARABIA

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OIL TANK PROTECTION BARRIER WITH FIREPROOF COATING, NETHERLANDS

COATINGS

CORROSION PROTECTION SYSTEMS

ESC is committed to providing high quality Corrosion Protection Systems that prevent corrosion and extend the life of steel structures: whether it be sheet piles, combined walls, tie rod systems or steel structure fabrications.

The ESC Advantage

- ✓ Certified ESC Protective Coating Inspectors
- ✓ State-of-the-Art Coating Application & Inspection
- ✓ Protective Packing included in pricing

WATCH THE ESC PIPE PILE COATING SPRAY APPLICATION PROCESS

COAL TAR EPOXY

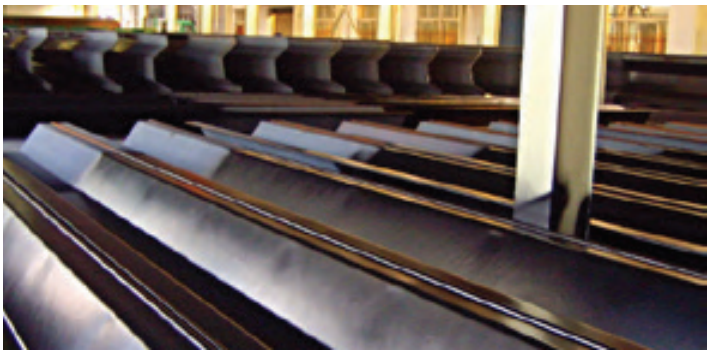
Coal Tar Epoxy (CTE) Coatings are the most commonly utilised corrosion protection for steel sheet piles and common in steel structures, due to their low-cost, high resistance to exposures in sea water, oil and chemicals. ESC can provide competitive solutions to the project requirements. CTE offers excellent water and crude oil resistance, corrosion resistance and good resistance against chemically polluted water. It can be applied and can also cure at low temperatures (below freezing point is possible). CTE also offers good resistance to abrasion. ESC uses internationally recognized coatings qualified to numerous standards. ESC can recommend the most suitable and economical coating system and also ensure that the coating is adequately protected during handling and transportation.

GLASS FLAKE EPOXY COATING

Glass Flake Epoxy Coatings are ideal for applications where there is expected to be impact and high abrasion environments. The product is typically shot blasted to the required surface roughness and then paint is applied via spray. Several layers may be required to obtain the Dry Film Thickness (DFT) specification. ESC applies strict quality controls and careful packing to ensure the coating is in pristine condition when the product arrives on your site.

HOT DIP GALVANIZING & DUPLEX SYSTEMS

Hot Dip Galvanization may be appropriate or required for certain applications. The process of Hot Dip Galvanization involves coating the steel product with a layer of zinc. This is achieved by immersing the steel products in a hot bath of molten zinc producing an aesthetic metallic silver surface. ESC has experience and the strategic partnerships to effectively apply such systems to it's sheet piles, tie rod systems and steel structures. ESC can also offer duplex coating systems, where the steel structure is galvanized then coated.



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ESC CONNECTORS

SPECIFICATION

WATCH COMBINED WALL MANUFACTURING

HOT ROLLED

ESC Hot Rolled Interlocks can be used in a variety of configurations. Note that they can also be used to interlock with non-ESC sheet piles. Please contact **engineering@escsteel.com** for more information.

ESC-6E ESC-6J ESC-9E ESC-9J ESC-9HJ ESC-10HJ

ESC-9J

ESC-10HJ

Compatibility engaging with

Engage with	ESC-6E	ESC-9E	ESC-6J	ESC-9J	ESC-9HJ	ESC-10HJ
ESC-HRZ14-770 to ESC_HRZ38-700	✓	✓	×	×	×	×
Type IIIw & Type IVw	×	×	✓	✓	×	×
NS-SP-10H & NS-SP-25H	×	×	×	×	✓	✓

COLD FORMED

TYPE 1 TYPE 2 TYPE 3

ESC-CR9 TYPE 1

ESC-CR9 TYPE 2 & 3

Compatibility engaging with

Engage with	ESC-CR6	ESC-CR9	ESC-CR12	ESC-CR16
ESC-CRZ11 to ESC-CRZ13	✓	×	×	×
ESC-CRZ14 to ESC-CRZ35	×	✓	×	×
ESC-CRZ26 to ESC-CRZ36	×	×	✓	×
ESC-CRZ36 to ESC-CRZ50	×	×	×	✓
ESC-CRU8 to ESC-CRZ12	✓	×	×	×
ESC-CRU13 to ESC-CRU32	×	✓	×	×
ESC-CRU25 to ESC-CRU29	×	✓	✓	×
ESC-CRU35 to ESC-CRU46	×	×	×	✓

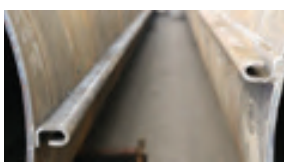
ESC-9J WELDING TO SSAW PIPE

H PILE COLD FORMED INTERLOCK

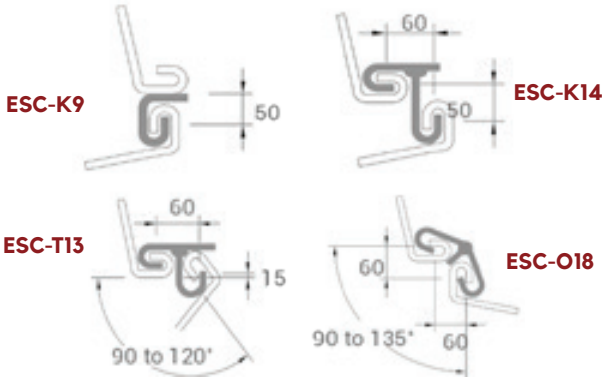
ESC-9E INTERLOCK ON PIPE

INTERLOCK CHECK

WELD PENETRATION INSPECTION



ESC-CR9 INTERLOCK ON PIPE



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Strutting System
Introduction

ESC has been involved in difficult project sites from its inception over 30 years ago. Part of the ESC Sheet Piling Solution has often included full design of the strutting system. Using the in-house expertise of ESC's global network of engineers, ESC is well equipped to design and also fabricate full strutting system assemblies.

ESC's capabilities include:

- ✓ Drafting Services—shop drawing, layout
- ✓ Structural Calculations—completed by certified Professional Engineers
- ✓ Finite Element Analysis
- ✓ Raw Material Procurement
- ✓ Fabrication to international standards and project specific requirements.
- ✓ Inspection & Testing (3rd Party Independent or ESC)
- ✓ Logistics
- ✓ Full Quality Documentation and MDR with full traceability
- ✓ Project Management and Coordination with client & contractors

Strutting System Capabilities

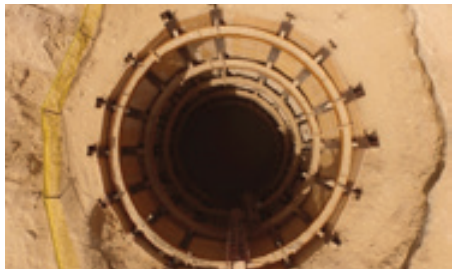
- ✓ Standard Struts
- ✓ Reusable Modular Struts
- ✓ Hydraulically Activated Struts
- ✓ Pipe or Beam Strutting Sections
- ✓ Project Specific Novel Designs

What Our Engineers Say?

"ESC first designed, fabricated supplied and successfully installed its first pre-fabricated strutting system in 1993 adjacent to a Singapore landmark with a 10m excavation depth."

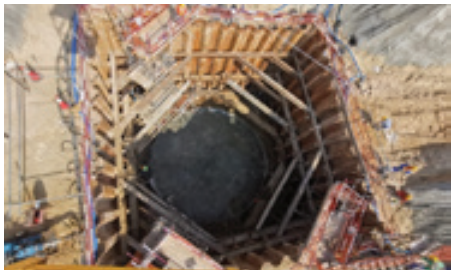
PROJECT REFERENCES

JBCC, MALAYSIA

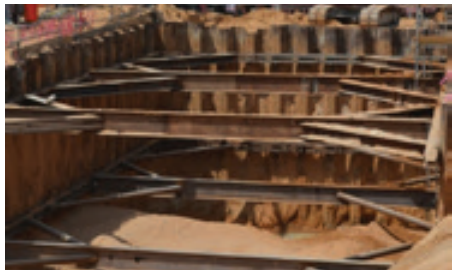


CIRCULAR COFFERDAM, UAE

M.WORLDWIDE BASEMENT, MALAYSIA



STORM WATER PUMP STATION, UAE



SHAH GAS FIELD, UAE

AETNA BUILDING, MALAYSIA

Technical Hotline: +1 (980) 689 4388 | engineering@escsteel.com

WATERTIGHTNESS METHODS & DESIGN

DOWNLOAD DATASHEET

Achieving water tightness of a sheet pile wall can be challenging, given the site conditions, difficulty in sealant applications, high interlock temperatures during driving and other factors. ESC has addressed these issues through its design and extensive experience and is willing to deliver both standard and tailored solutions to project requirements.

SHEET PILE DESIGN

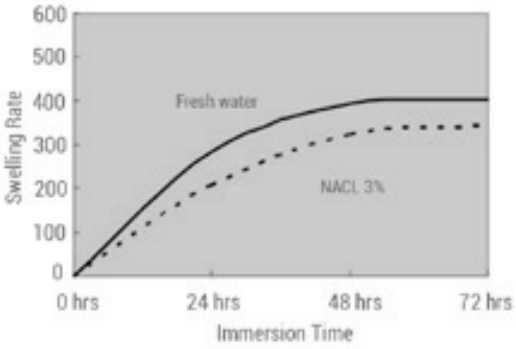
Through either Hot Rolling, which results in a tight fit interlock with a greater number of contact points, or Cold Forming, where the clutch turnover is optimised geometrically, ESC ensures that the sheet pile design allows minimal seepage whilst still providing enough room for easy driving.

ESC offers the widest sheet piles in the world, with up to 70% fewer clutches and thus leak paths compared to a standard U type wall. Tie Backs also typically provide another leak path, which can be mitigated by designing the tieback to act at the retained side of the main wall.

ESC-DPS-500 INTERLOCK SEALANT

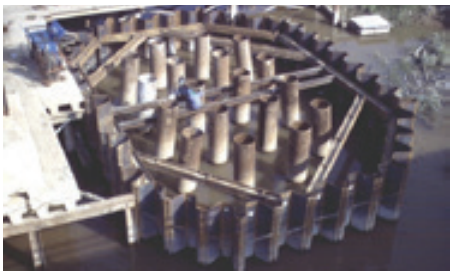
ESC's DPS-500 sealant is a hydrophilic polyurethane which has effective application for sheet pile interlocks. It has a high expansion coefficient with over 400% volume increase.

It is a one component system making it easy to handle and apply. It is both lightweight with good surface adhesion which allows easy application even in confined spaces. It can be applied in virtually all weather conditions. It has been extensively used in both freshwater and seawater environments and swells to about 200% volume in 24 hours or less and over 300% volume within 48-72 hours of immersion.



PROJECT REFERENCES

SG MUDA CUTOFF WALL, MALAYSIA



SABAK BERNAM COFFERDAM, MALAYSIA

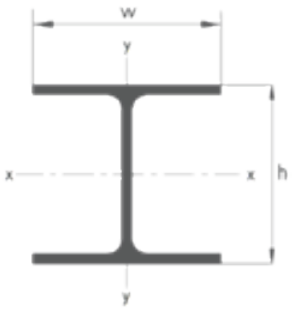
HIGHWAY COFFERDAM, AUSTRALIA

Technical Hotline: +1 (980) 689 4388 | engineering@escsteel.com

ESC HP PILES

SPECIFICATION

ESC HP Piles are standard H shaped bearing piles with an equal web and flange thickness. They can be used in a wide range of applications: from soldier pile with timber lagging walls, foundation structures and battered steel H-Piles.



The ESC Advantage

- ✓ Global supply capability
- ✓ Competitive Pricing for small and large quantities
- ✓ Supply of Splicing Assemblies and Toe Points which can allow extreme lengths to be driven.
- ✓ Experienced in component design and installation
- ✓ Wide Range of Steel Grades available: S235, S275, S355, S420, S460, A572 Gr 42, 50, 60 and other equivalent grades.
- ✓ Range of Lengths available: standard 20ft (6m) & 40ft (12m), others available for larger orders

SECTION	WEIGHT	DEPTH	WEB	FLANGE		SECTIONAL AREA	ELASTIC PROPERTIES						COATING AREA
			THICKNESS	WIDTH	THICKNESS		X - X AXIS			Y - Y AXIS			
		d	tw	bf	tf	A	Ix	Sx	rx	Iy	Sy	ry	
	lb/ft kg/m	in mm	in mm	in mm	in mm	in² cm²	in⁴ cm⁴	in³ cm³	in cm	in⁴ cm⁴	in³ cm³	in cm	ft²/ft m²/m
HP8 HP200	36 54	8.02 204	0.445 11.3	8.16 207	0.445 11.3	10.6 68.4	119 4,953	29.8 488	3.36 8.53	40.3 1,677	9.88 162	1.95 4.95	3.92 1.19
HP10 HP250	42 63	9.7 246	0.415 10.5	10.10 257	0.420 10.7	12.4 80.0	210 8,741	43.4 711	4.13 10.5	71.7 2,984	14.2 233	2.41 6.12	4.83 1.47
	57 85	9.99 254	0.565 14.4	10.20 259	0.565 14.4	16.7 108	294 12,237	58.8 964	4.18 10.6	101 4,204	19.7 323	2.45 6.22	4.91 1.50
HP12 HP310	53 79	11.80 300	0.435 11.0	12.0 305	0.435 11.0	15.5 100	393 16,358	66.7 1,093	5.03 12.8	127 5,286	21.1 346	2.86 7.26	5.82 1.77
	63 94	11.9 302	0.515 13.1	12.1 307	0.515 13.1	18.4 119	472 19,646	79.1 1,296	5.06 12.9	153 6,368	25.3 415	2.88 7.32	5.86 1.79
	74 110	12.10 307	0.605 15.4	12.20 310	0.610 15.5	21.8 141	569 23,683	93.8 1,537	5.11 13.0	186 7,742	30.4 498	2.92 7.42	5.91 1.80
	84 125	12.3 312	0.685 17.4	12.3 312	0.685 17.4	24.6 159	650 27,055	106 1,737	5.14 13.1	213 8,866	34.6 567	2.94 7.47	5.97 1.82
HP14 HP360	73 109	13.6 345	0.505 12.8	14.6 371	0.505 12.8	21.4 138	729 30,343	107 1,753	5.84 14.8	261 10,864	35.8 587	3.49 8.86	6.96 2.12
	89 132	13.8 351	0.615 15.6	14.7 373	0.615 15.6	26.1 168	904 37,627	131 2,147	5.88 14.9	326 13,569	44.3 726	3.53 8.97	7.02 2.14
	102 152	14.00 356	0.705 17.9	14.8 376	0.705 17.9	30.10 194	1,050 43,704	150 2,458	5.92 15.0	380 15,817	51.4 842	3.56 9.04	7.06 2.15
	117 174	14.2 361	0.805 20.4	14.9 378	0.805 20.4	34.4 222	1,220 50,780	172 2,819	5.96 15.1	443 18,439	59.5 975	3.59 9.12	7.12 2.34
HP16 HP410	88 131	15.3 389	0.540 13.7	15.70 399	0.540 13.7	25.8 167.0	1,110 46,201	145.0 2,376	6.56 16.7	349.0 14,526	44.5 729	3.68 9.35	7.52 2.29
	101 151	15.50 394	0.625 15.9	15.80 401	0.625 15.9	29.9 193	1,300 54,110	168.0 2,753	6.59 16.7	412 17,149	52.2 855	3.71 3.71	7.56 2.30
	121 181	15.80 401	0.750 19.1	15.9 404	0.750 19.1	35.8 231	1,590 66,180	201.0 3,294	6.66 16.9	504 20,978	63.4 1,039	3.75 9.53	7.62 2.32
	141 211	16.0 406	0.875 22.2	16.0 406	0.875 22.2	41.7 269	1,870 77,835	234.0 3,835	6.70 17.0	599 24,932	74.9 1,227	3.79 9.63	7.69 2.34
	162 242	16.30 414	1.000 25.4	16.10 409	1.000 25.4	47.7 308	2,190 91,154	269.0 4,408	6.78 17.2	697 29,011	86.6 1,419	3.82 9.70	7.75 2.36
	183 272	16.5 419	1.130 28.7	16.3 414	1.130 28.7	54.1 349	2,510 104,473	304 4,982	6.81 17.3	818 34,047	100.0 1,639	3.89 9.88	7.81 2.38

Presented in this catalog are standards sizes of ESC H Piles. A comprehensive list of sizes and also the full wide flange beam list can be found at **https://www.escsteel.com/wide-flange-beams**

DESIGN & PRODUCTION STANDARDS

SUBJECT	STANDARD	TITLE
Design	BS 5950	Structural use of steelwork in building.
Design	BS EN 1003-5	Design of steel structures - Part 5:Piling.
Manufacturing	API 5L PSL1	Specification for Line Pipe
Manufacturing	API 5L PSL 2	Specification for Line Pipe
Manufacturing	API 2B	Specification for the Fabrication of Structural Steel Pipe
Manufacturing	ASTM A252	Standard Specification for Welded and Seamless Steel Pipe Piles
Manufacturing	ASTM A671	Standard Specification for Electric-Fusion-Welded Steel Pipe for Atmospheric and Low Temperatures.
Manufacturing	ASTM A691	Standard Specification for Carbon and Alloy Steel Pipe, Electric-Fusion-Welded for High-Pressure Service at High Temp.
Manufacturing	EN 10219	Cold Formed Welded Structural Hollow Sections of Non-Alloy and Fine Grain Steels.
Manufacturing	EN 10210	Hot Finished Structural Hollow Section of Non-Alloy and Fine Grain Steels.
Manufacturing	EN 10208	Steel Pipes for Pipelines for Combustible Fluid.
Manufacturing	BS EN 10248	Hot Rolled Sheet Piling of Non Alloy Steels.
Manufacturing	BS EN 10249	Cold Formed Sheet Piling of Non-Alloy Steels
Manufacturing	AS 1163	Structural Steel Hollow Sections.
Manufacturing	AS 1579	Arc-Welded Steel Pipes and Fittings for Water and Wastewater.
Manufacturing	ASTM A139	Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe.
Manufacturing	ASTM A53	Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
Manufacturing	AWWA-C200	Steel Water Pipe-6in. (150mm) and Larger.
Manufacturing	CSA Z245	Canadian Standard - Steel Pipe
Manufacturing	GB/T 3091	Low Pressure Fluid Conveying Welded Steel Pipe
Manufacturing	SY/T 5040	Welded Piling Pipe
Manufacturing	GB/T 9711	Oil and Gas Industry: Steel Pipe for Pipeline.
Welding	AWS D1.1	Structural Welding Code - Steel
Welding	AS 1554.1	Structural Steel Welding - Welding of Steel Structures.
Welding	AS 1554.2	Structural Steel Welding - Stud Welding.
Welding	BS EN 1011	Welding - Recommendations for welding of metallic materials
Welding	CSA W59	Welded Steel Construction (Metal Arc Welding)
Welding	GB50661-2011	Welding of Structural Steel
Welding	JGJ 81	Technical Specification for Welding of Steel Structure.
Coatings	ISO 8501	Preparation of steel substrates before application of paints and related products.
Coatings	ISO 8503	Preparation of steel substrates before application of paints and related products.
Coatings	ISO 12944	Paints and varnishes - Corrosion protection of steel structures by protective paint systems.

USEFUL EQUATIONS

MOMENT CAPACITY

$$M = Z \times \sigma_{yield}\ d$$

PIPE PROPERTIES

$$Mass_{pipe} = 0.024661 \times t \times (D - t)$$

$$I_{pipe\ pile} = \frac{\pi \times [D^4 - (D - 2t)^4]}{640000}$$

COMBINED WALL

$$Mass_{L\%} = 2.5(L_{\%} - 0.6)Mass_{100\%} + 2.5(1 - L_{\%})Mass_{60\%}$$

$$Z_{combi} = \frac{Z_{pipe\ pile}}{w_{combi}} \times \left(\frac{I_{pipe\ pile} + I_{sheet\ pile}}{I_{pipe\ pile}}\right)$$

$$I_{combi} = \frac{I_{pipe\ pile} + I_{sheet\ pile}}{w_{combi}}$$

$$Z_{combi} = \frac{Z_{H\ pile}}{w_{combi}} \times \left(\frac{I_{H\ pile} + I_{sheet\ pile}}{I_{H\ pile}}\right)$$

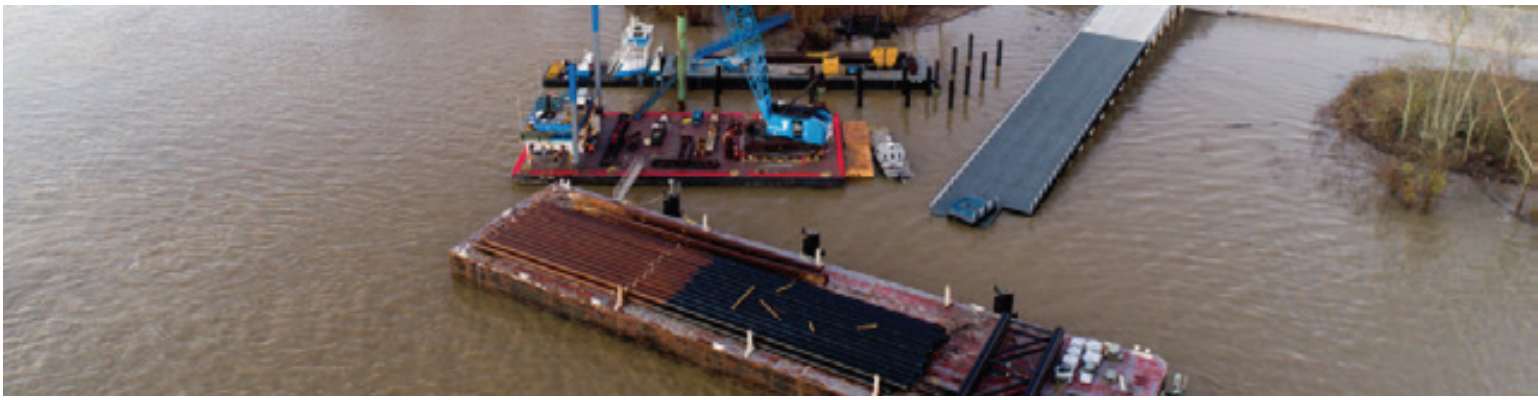
$$I_{combi} = \frac{I_{H\ pile} + I_{sheet\ pile}}{w_{combi}}$$

LEGEND

I	in^3/ft	cm^4/m	Moment of Inertia per unit wall width
Icombi	in^3/ft	cm^4/m	Moment of Inertia of Combined Wall per unit wall width
Isheetpile	in^3/ft	cm^4/m	Moment of Inertia of Sheet Pile per unit wall width
Ipipepile	in^3/ft	cm^4/m	Moment of Inertia of Pipe Pile per unit wall width
Ipipepile	in^4/ft	cm^4/m	Moment of Inertia of H Pile per unit wall width
Z	in^3/ft	cm^3/m	Elastic Section Modulus per unit wall width
Zcombi	in^3/ft	cm^3/m	Elastic Section Modulus of Combined Wall Section per unit wall width
Zsheet pile	in^3/ft	cm^3/m	Elastic Section Modulus of Sheet Pile Section per unit wall width
Zpipe pile	in^3/ft	cm^3/m	Elastic Section Modulus of Pipe Pile Section per unit wall width
ZH pile	in^3/ft	cm^3/m	Elastic Section Modulus of H Pile Section per unit wall width
D	in	mm	Diameter of Pipe Pile
t	in	mm	Thickness of Pipe Pile
wcombi	in	mm	Unit Width of Combined Wall
L%	%	%	Percentage of Infill Sheet Pile Length to King Pile Length
MLpipe	lb/ft	kg/m	Mass per Unit Length of Pipe
Mass100%	lb/ft^2	kg/m^2	Mass per Unit Area of Combined Section with Infill Sheet Pile as 100% of King Pile Length
Mass60%	lb/ft^2	kg/m^2	Mass per Unit Area of Combined Section with Infill Sheet Pile as 60% of King Pile Length
MassL%	lb/ft^2	kg/m^2	Mass per Unit Area of Combined Section with Infill Sheet Pile as L% of King Pile Length
σyield	psi	MPa	Yield Strength of Material
M	kip-ft/ft	kNm/m	Moment Capacity per unit length wall

Technical Hotline: +1 (980) 689 4388 | engineering@escsteel.com

CONVERSION TABLE



METRIC TO IMPERIAL				IMPERIAL TO METRIC				ENGLISH MEASUREMENT	ACTUAL METRIC CONVERSION	SUGGESTED METRIC SIZE
1 cm	=	0.3937	in	1 in	=	2.5400	cm	1/8″	3.18mm	3.0mm
1 m	=	3.2808	ft	1 ft	=	0.3048	m	5/32″	3.97mm	4.0mm
1 cm^2	=	0.1550	in^2	1 in^2	=	6.4516	cm^2	1/5″	5.08mm	5.0mm
1 m^2	=	10.7639	ft^2	1 ft^2	=	0.0929	m^2	1/4″	6.35mm	6.0mm
1 cm^3	=	0.0610	in^3	1 in^3	=	16.3870	cm^3	9/32″	7.14mm	7.0mm
1 m^3	=	35.3149	ft^3	1 ft^3	=	0.0283	m^3	5/16″	7.94mm	8.0mm
1 cm^2 /m	=	0.0472	in2 /ft	1 in2 /ft	=	21.166	cm^2 /m	23/64″	9.13mm	9.0mm
1 N	=	0.2247	lb	1 lb	=	4.4497	N	3/8″	9.53mm	10.0mm
1 N/mm	=	5.7082	lb/in	1 lb/in	=	0.1752	N/mm	7/16″	11.11mm	11.2mm
1 N/m	=	0.0685	lb/ft	1 lb/ft	=	14.5989	N/m	15/32″	11.91mm	12.0mm
1 N/cm^2	=	1.4499	lb/in^2	1 lb/in2	=	0.6897	N/cm^2	1/2″	12.70mm	13.0mm
1 N/m^2	=	0.0209	lb/ft^2	1 lb/ft2	=	47.8968	N/m^2	9/16″	14.29mm	14.0mm
1 N/cm^3	=	3.6827	lb/in^3	1 lb/in3	=	0.27154	N/cm^3	19/32″	15.08mm	15.0mm
1 N/m^3	=	0.0064	lb/ft^3	1 lb/ft3	=	157.1420	N/m^3	5/8″	15.88mm	16.0mm
1 kg	=	2.2046	lb	1 lb	=	0.4536	kg	21/32″	16.67mm	17.0mm
1 kg/m	=	0.6720	lb/ft	1 lb/ft	=	1.4882	kg/m	11/16″	17.46mm	17.0mm
1 kg/m^2	=	0.2048	lb/ft^2	1 lb/ft^2	=	4.8824	kg/m^2	23/32″	18.26mm	18.0mm
1 Metric Tons	=	1.1023	US ton	1 US ton	=	0.9072	Metric Tons	3/4″	19.05mm	19.0mm
1 cm^4	=	0.0240	in^4	1 in4	=	41.6228	cm^4	25/32″	19.84mm	20.0mm
1 cm^4 /m	=	0.007323	in^4 /ft	1 in4 /ft	=	136.5582	cm^4 /m	13/16″	20.64mm	21.0mm
1 cm^3	=	0.0610	in^3	1 in3	=	16.3870	cm^3	7/8″	22.23mm	22.0mm
1 cm^3 /m	=	0.0186	in^3/ft	1 in3/ft	=	53.7631	cm^3 /m	1″	25.40mm	25.0mm
1 Nm	=	0.7373	lb.ft	1 lb.ft	=	1.3563	Nm	1-5/32″	29.39mm	29.0mm
1 Nm/m	=	2.6968	lb.in/ft	1 lb.in/ft	=	0.3708	Nm/m	1-1/4″	31.75mm	32.0mm
								1-5/16″	33.34mm	33.0mm
								1-13/32″	35.72mm	36.0mm
								1-1/2″	38.10mm	38.0mm

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