





**Application: Flood Mitigation &
Riverbank Protection**

Section: SHZ12-1 Hot Rolled Sheet Piles

According to Standard MS 2674-1&2: 2017



INTRODUCTION

SG SHEET PILING SDN. BHD. is a Malaysian-based Foundation Solutions company specializing in Flood Mitigation, Civil, Infrastructure, Ports, Waterfront Development, Power Generation projects in the Asian Region

The company offers a wide range of steel sheet pile products, capable of meeting all the requirement of the modern and sophisticated civil works and in line with the most evolved needs in terms of both quality and performance.

The company has continuously rising on the growth chart and setting high quality standards. Our product range includes steel sheet piles in various width from 400mm to 900mm, combined wall system, complete anchorage tie back system, strutting system and accessories.

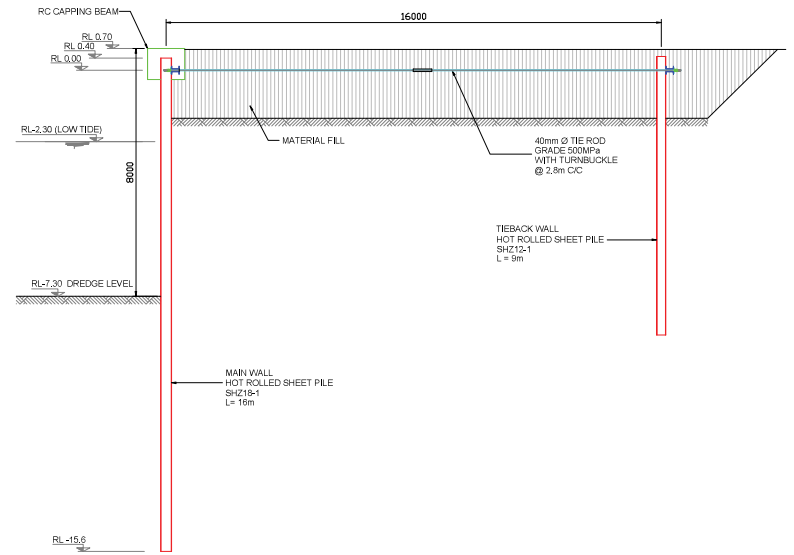
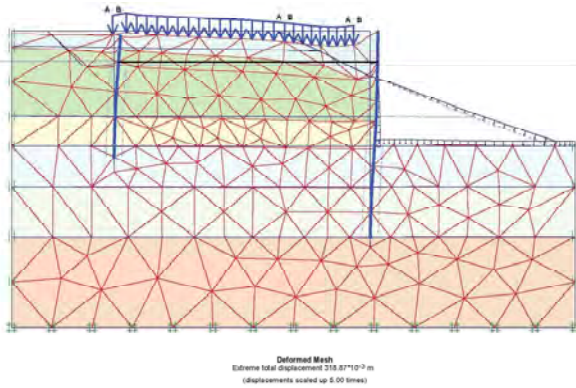
At SG Sheet Piling, we provide our technical design services to the local consultant or client on project feasibility, scheme selection and detailed design. We value add to the products we supply by customizing the products for each project. Customization includes special steel grade requirements, specific lengths and fabrication on request.

The group's vision is to be the Malaysia's leading supplier of steel sheet piles for Construction, Oil and Gas industry benchmark through the excellence of its people, its innovative approach and overall conduct. Underpinning this vision is a performance culture committed to aspiration targets, safety and social responsibility and continuous improvement.

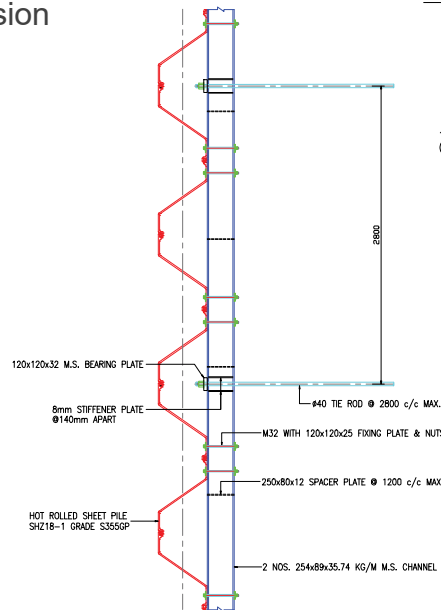


Design & Engineering Support

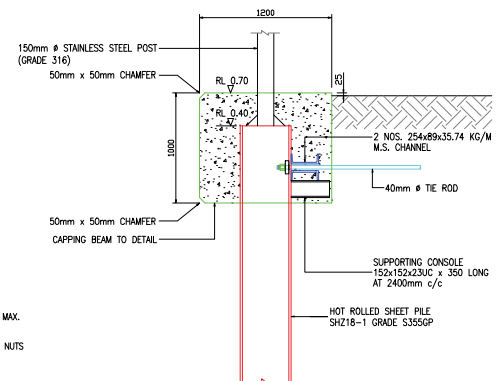
- Our dedicated and experienced engineering professionals able to provide analysis and calculations on new proposal or design optimization
- Shop drawings with plan and sections, construction detailing such as tie rod, waler and capping beam
- Assistance and recommendations on pile installation methods and driving equipment
- Fabrication corner piles and special corner sections
- Protection methods against corrosion by coating, encased in concrete, cathodic protection



Anchored Sheet Pile Wall Design



Tie Rod / Sheet Pile Wall Connection Details



RC Capping Beam Details



SHZ Hot Rolled Sheet Piles

MALAYSIAN STANDARD MS 2674

MS 2674-1:2017 Hot rolled steel sheet piling of non alloy steels

– Part 1: Technical delivery conditions

MS 2674-2:2017 Hot rolled steel sheet piling of non alloy steels

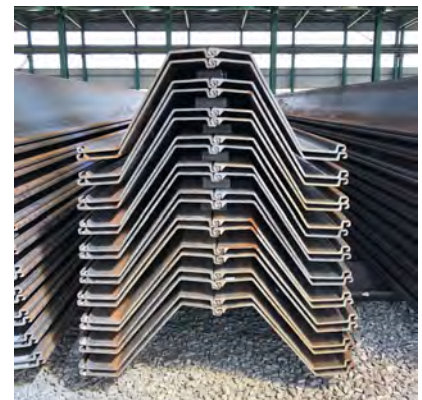
– Part 2: Tolerances on shape and dimensions

European Standard BS EN 10248

Available Steel Grade: S270GP / S355GP / S390GP / S430GP

The SHZ series, a section with large flange thickness giving excellent static properties, proven qualities and highly accepted by local consultants and authorities, has the following advantages:

- Excellent cost-effectiveness, reduce the overall project cost
- Higher inertia for reduced wall deflection
- Suitable for permanent structures: river bank protection, flood control, waterfront projects, quay wall, wharfs etc.



Hot rolled SHZ piles are stocked in our warehouse in Malaysia

Section	Width b	Height h	Thickness Flange/Web	Sectional Area	Weight	Weight	Moment of Inertia	Section Modulus
	mm	mm	mm	cm ² /m	kg/m	kg/m ²	cm ⁴ /m	cm ³ /m
SHZ 12-1	770	343.5	8.6/8.5	120.8	72.8	94.5	21496	1252
SHZ 12-2	700	314.2	8.6/8.5	123.5	67.9	97	18971	1208
SHZ 13-1	770	344	9.1/9.0	126.5	76.2	99	22433	1304
SHZ 13-2	700	315.2	9.6/9.5	135	74.2	105.9	20611	1308
SHZ 14-1	770	344.5	9.6/9.5	132.2	79.6	103.4	23370	1357
SHZ 14-2	700	316.2	10.6/10.5	146.4	80.5	114.9	22262	1408
SHZ 17-1	700	420	8.5/8.4	132.8	73.3	104.7	36425	1735
SHZ 17-2	630	374	8.5/8.5	141.2	69.8	110.8	31300	1675
SHZ 18-1	700	420.5	9.1/9.0	139.1	76.7	109.6	38001	1807
SHZ 18-2	630	375	9.5/9.5	153.7	76	120.7	33860	1805
SHZ 19-1	700	421	9.6/9.5	145.4	80.2	114.6	39578	1880
SHZ 19-2	630	376	10.5/10.5	172.7	82.2	130.5	36410	1935
SHZ 20-1	700	421.5	10.1/10.0	151.7	83.7	119.5	41155	1953
SHZ 20-2	630	377	11.0/11.0	172.7	85.4	135.6	37730	2005
SHZ 24-1	700	459	12.0/9.0	162.9	89.5	127.9	55870	2435
SHZ 24-2	700	459.2	11.3/11.2	174.4	95.8	136.9	55949	2437
SHZ 26-1	700	460	13.0/10.0	176	96.7	138.1	59810	2600
SHZ 26-2	700	460.2	12.3/12.2	187.4	103	147.1	59843	2601
SHZ 27-1	700	460.7	12.8/12.7	193.6	106.4	152	61641	2676
SHZ 28-1	700	461	14.0/11.0	189.1	103.9	148.4	63750	2765
SHZ 28-2	700	461.2	13.3/13.2	200.4	110.1	157.3	63740	2764
SHZ 36-1	700	499.2	15.1/11.2	216.1	118.7	169.6	89753	3596
SHZ 38-1	700	500.2	16.1/12.2	230.2	126.5	180.7	94984	3798
SHZ 40-1	700	501.2	17.1/13.2	244.4	134.3	191.8	100219	3999
SHZ 42-1	700	499.2	18.1/14.0	260.2	143	204.2	105453	4228
SHZ 44-1	700	500.2	19.1/15.0	274.3	150.7	215.3	110942	4436
SHZ 46-1	700	501.2	20.1/16.0	288.5	158.5	226.5	116159	4635
SHZ 48-1	700	503.2	22.1/15.0	290	159.3	227.6	120467	4788
SHZ 48-2	580	482	19.2/15.1	307.2	139.9	241.1	115712	4801
SHZ 50-1	700	504.2	23.1/16.0	303.4	166.7	238.2	125358	4973
SHZ 52-1	700	505.2	24.1/17.0	317.2	174.3	249	130403	5162

HOT ROLLED SHEET PILE: SHZ SECTION

MALAYSIAN STANDARD MS 2674 : 2017

- Extremely competitive section modulus to weight ratio
- Solid resistance against deflection
- Good installation performance
- Proven qualities of the Larssen Interlock
- Permanent solution for Riverbank Protection, Waterfront Development, Jetty, Reclamation, etc.

Tolerances on shape and dimensions of hot rolled sheet pile SHZ sections according to MS 2674-2:2017

Designation	Tolerances
Mass ¹⁾	± 5%
Length, L	± 200 mm
Height, h	h ≥ 300mm: ± 7 mm
Thickness, t	t ≤ 8.5mm: ± 0.5 mm t > 8.5mm: ± 6%
Width single pile, b	± 2% b
Width double pile, 2b	± 3% 2b
Straightness, q	≤ 0.2% L
Ends out of square	± 2% b

¹⁾ From the mass of the total delivery

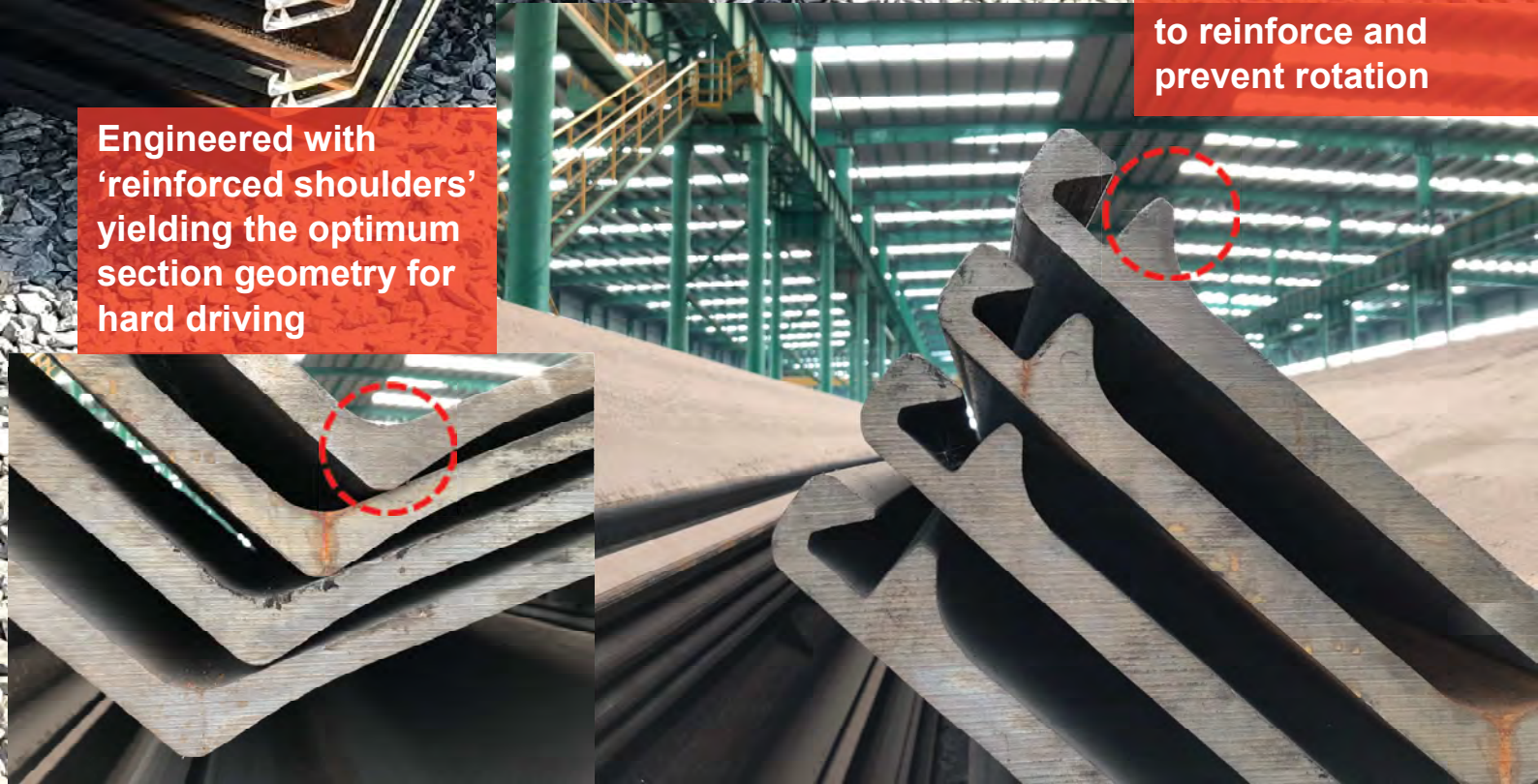
Steel grades of hot rolled sheet pile SHZ sections according to MS 2674-1:2017

Steel grade	Min. yield strength	Min. tensile strength	Min. elongation	Chemical composition (% max)					
	MPa	MPa	%	C	Mn	Si	P	S	N
S240GP	240	340	26	0.25	-	-	0.050	0.050	0.014
S270GP	270	410	24	0.27	-	-	0.050	0.050	0.014
S320GP	320	440	23	0.27	1.70	0.60	0.050	0.050	0.014
S355GP	355	480	22	0.27	1.70	0.60	0.050	0.050	0.014
S390GP	390	490	20	0.27	1.70	0.60	0.050	0.045	0.014
S430GP	430	510	19	0.27	1.70	0.60	0.045	0.045	0.014



Stronger Hot Rolled Interlock with Thumb to reinforce and prevent rotation

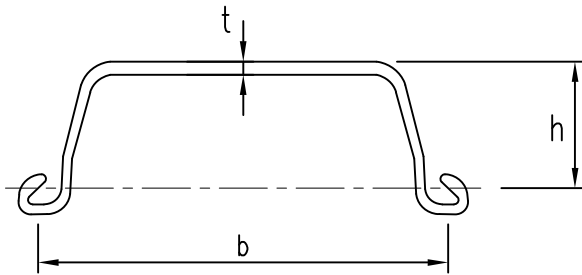
Engineered with 'reinforced shoulders' yielding the optimum section geometry for hard driving



JIS HOT ROLLED SHEET PILES



JIS Hot Rolled Sheet Piles



- JIS U-type sections have been widely used for various types of permanent and temporary structures, and one of the most familiar sheet piles among designers as well as users.
- Type II, III, IIIA, IV, VL and VIL are solidly designed. These sections are especially suitable for repeated use, and have acquired high market acceptance from users.
- JIS U-type sections offer section modulus ranging from 874cm³ to 3820cm³ per linear meter of wall.

Section	Width b mm	Height h mm	Thickness t mm	Sectional Area cm ²	Weight kg/m	Weight kg/m ²	Moment of Inertia cm ⁴ /m	Section Modulus cm ³ /m
II	400	100	10.5	61.18	48.0	120	8740	874
III	400	125	13.0	76.42	60.0	150	16800	1340
IIIA	400	150	13.1	74.40	58.4	146	22800	1520
IV	400	170	15.5	96.99	76.1	190	38600	2270
VL	500	200	24.3	133.80	105.0	210	63000	3150
VIL	500	225	27.6	153.00	120.0	240	86000	3820
IIW	600	130	10.3	78.70	61.8	103	13000	1000
IIIW	600	180	13.4	103.90	81.6	136	32400	1800
IVW	600	210	18.0	135.30	106.0	177	56700	2700

Standards

JIS A 5528 (hot-rolled steel sheet piles) or

JIS A 5523 (hot-rolled steel sheet piles for welding)

Grade SY 295 or SYW 295

Grade SY 390 or SYW 390



DURABILITY OF STEEL SHEET PILES

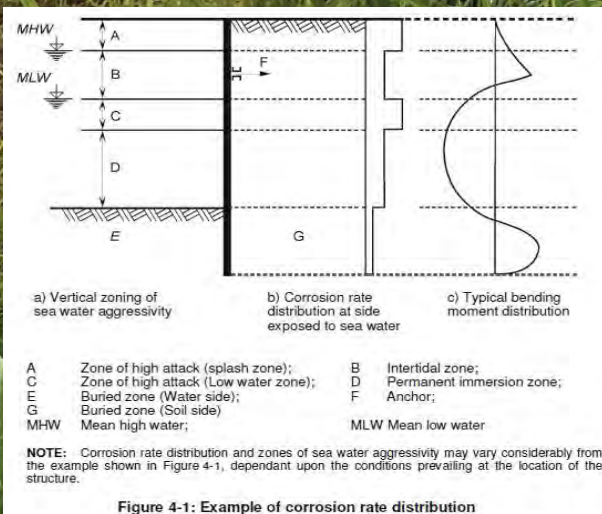


Figure 4-1: Example of corrosion rate distribution

Eurocode 3 - Design of steel structures - Part 5: Piling has tabulated the loss of steel thickness due to corrosion for the exposure in different environments

Table 4-1: Recommended value for the loss of thickness [mm] due to corrosion for piles and sheet piles in soils, with or without groundwater

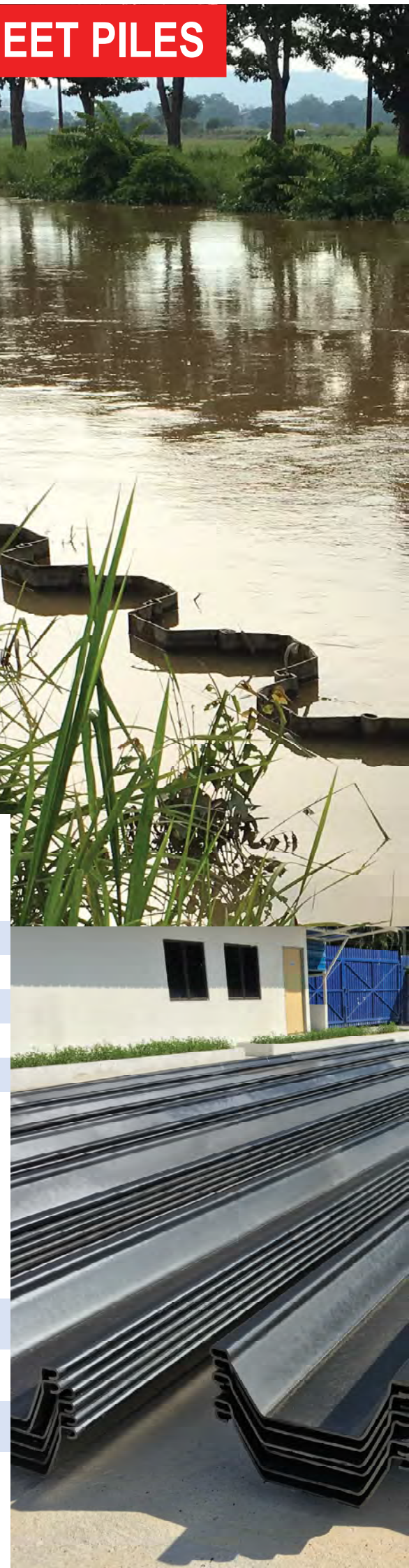
Required design working life	5 years	25 years	50 years	75 years	100 years
Undisturbed natural soils (sand, silt, clay, schist,)	0.00	0.30	0.60	0.90	1.20
Polluted natural soils and industrial sites	0.15	0.75	1.50	2.25	3.00
Aggressive natural soils (swamp, marsh, peat,)	0.20	1.00	1.75	2.50	3.25
Non-compacted and non-aggressive fills (clay, schist, sand, silt,)	0.18	0.70	1.20	1.70	2.20
Non-compacted and aggressive fills (ashes, slag,)	0.50	2.00	3.25	4.50	5.75

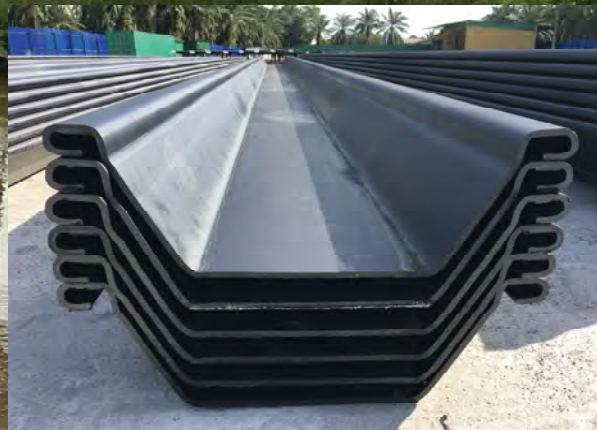
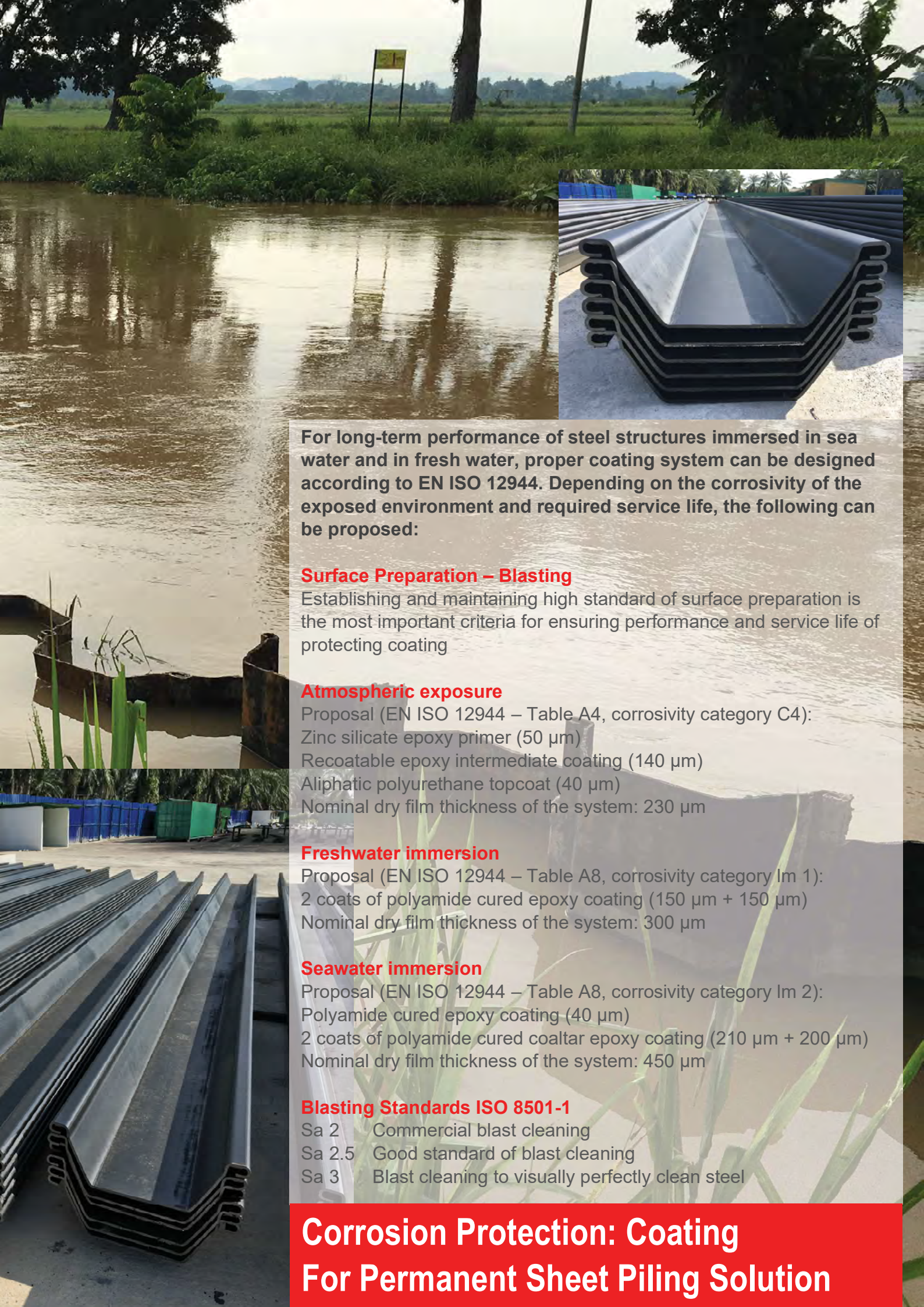
- Notes:
- Corrosion rates in compacted fills are lower than those in non-compacted ones. In compacted fills the figures in the table should be divided by two.
 - The values given for 5 and 25 years are based on measurements, whereas the other values are extrapolated.

Table 4-2: Recommended value for the loss of thickness [mm] due to corrosion for piles and sheet piles in fresh water or in sea water

Required design working life	5 years	25 years	50 years	75 years	100 years
Common fresh water (river, ship canal,) in the zone of high attack (water line)	0.15	0.55	0.90	1.15	1.40
Very polluted fresh water (sewage, industrial effluent,) in the zone of high attack (water line)	0.30	1.30	2.30	3.30	4.30
Sea water in temperate climate in the zone of high attack (Low water and splash zones)	0.55	1.90	3.75	5.60	7.50
Sea water in temperate climate in the zone of permanent immersion or in the intertidal zone	0.25	0.90	1.75	2.60	3.50

- Notes:
- The highest corrosion rate is usually found in the splash zone or at the low water level in tidal waters. However, in most cases, the highest bending stresses occur in the permanent immersion zone, see Figure 4-1.
 - The values given for 5 and 25 years are based on measurements, whereas the other values are extrapolated.





For long-term performance of steel structures immersed in sea water and in fresh water, proper coating system can be designed according to EN ISO 12944. Depending on the corrosivity of the exposed environment and required service life, the following can be proposed:

Surface Preparation – Blasting

Establishing and maintaining high standard of surface preparation is the most important criteria for ensuring performance and service life of protecting coating

Atmospheric exposure

Proposal (EN ISO 12944 – Table A4, corrosivity category C4):

Zinc silicate epoxy primer (50 μm)

Recoatable epoxy intermediate coating (140 μm)

Aliphatic polyurethane topcoat (40 μm)

Nominal dry film thickness of the system: 230 μm

Freshwater immersion

Proposal (EN ISO 12944 – Table A8, corrosivity category Im 1):

2 coats of polyamide cured epoxy coating (150 μm + 150 μm)

Nominal dry film thickness of the system: 300 μm

Seawater immersion

Proposal (EN ISO 12944 – Table A8, corrosivity category Im 2):

Polyamide cured epoxy coating (40 μm)

2 coats of polyamide cured coaltar epoxy coating (210 μm + 200 μm)

Nominal dry film thickness of the system: 450 μm

Blasting Standards ISO 8501-1

Sa 2 Commercial blast cleaning

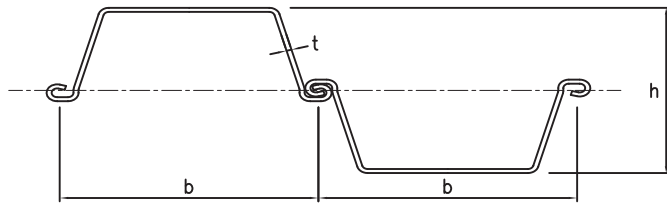
Sa 2.5 Good standard of blast cleaning

Sa 3 Blast cleaning to visually perfectly clean steel

**Corrosion Protection: Coating
For Permanent Sheet Piling Solution**

Cold Formed Sheet Piles

SGU Section



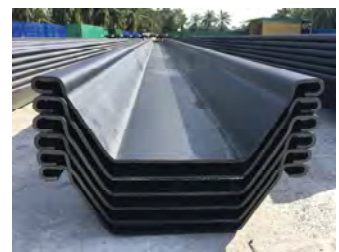
The Advantages of SGU section cold formed sheet piles are:

- SGU section cold formed sheet piles are widely used in both permanent and temporary structures
- Suitable for repeated usage because of their simple configuration and high rigidity
- Easy fixing of tie rods
- They are easy to handle and easy to store
- Wide range of up to 4645cm³/m

Section	Width b mm	Height h mm	Thickness t mm	Sectional Area cm ² /m	Weight kg/m	Weight kg/m ²	Moment of Inertia cm ⁴ /m	Section Modulus cm ³ /m
SGU 5-1	600	150	9.5	119.7	56.4	94	3825	510
SGU 5-2	600	150	10	126.1	59.4	99	4050	540
SGU 6-1	600	280	6	89.6	42.2	70.3	8960	640
SGU 7-1	600	300	6	93.4	44	73.3	10350	690
SGU 7-2	600	340	6	98.1	46.2	77	12665	745
SGU 8-1	600	340	6.5	103.3	48.7	81.1	13260	780
SGU 8-2	600	325	7	109.9	51.8	86.3	13406	825
SGU 8-3	600	355	7	113	53.4	89	14821	835
SGU 8-4	750	320	6	87.1	51.3	68.4	13200	825
SGU 9-1	600	360	6.5	105	49.5	82.5	16920	940
SGU 9-2	600	330	7.5	120.6	56.8	94.7	15097	915
SGU 9-3	750	320	7	101.7	59.9	79.9	15120	945
SGU 10-1	600	370	7	114.4	53.9	89.8	19610	1060
SGU 11-1	600	380	7.5	123.3	58.1	96.8	22230	1170
SGU 11-2	600	360	8	131.6	62	103.3	19980	1110
SGU 12-1	600	360	8.5	140.2	66	110	21980	1220
SGU 12-2	600	310	9	137.6	64.8	108	18600	1200
SGU 12-3	600	310	9.5	144.6	68.1	113.5	19220	1240
SGU 12-4	500	360	8	144	56.5	113	20790	1155
SGU 12-5	700	440	7.5	123	67.6	96.5	26620	1210
SGU 12-6	600	360	9	148.6	70	116.7	22248	1236
SGU 12-7	450	360	10	184	65	144.4	22482	1249
SGU 13-1	675	420	7.5	124	65.6	97	27090	1290
SGU 13-2	600	310	10	152.9	72	120	19530	1260
SGU 13-3	500	355	9	154.6	60.7	121.4	22454	1265
SGU 13-4	700	440	8	131.2	72.1	103	28600	1300
SGU 13-5	700	400	10	159.8	87.8	125.4	26800	1340
SGU 13-6	500	340	10	167.9	65.9	131.8	22100	1300
SGU 13-7	600	360	10	163.5	77	128.3	22590	1255
SGU 13-8	575	360	10	165.9	74.9	130.3	24225	1347
SGU 14-1	750	445	8	132	77.8	103.7	31372	1410
SGU 14-2	675	435	8	133.2	70.6	104.5	30559	1405
SGU 15-1	675	420	8.5	142	75.3	112	31920	1520
SGU 15-2	500	360	10	176.6	69.3	138.6	26280	1460
SGU 16-1	750	440	9	146.4	86.2	115	35310	1605
SGU 16-2	400	290	11.5	203.8	64	160	22693	1565
SGU 16-3	600	380	9.5	156.7	73.8	123	30400	1600
SGU 16-4	700	450	9	151	83	118.6	36000	1600
SGU 16-5	650	480	8	142.7	72.8	112	39120	1630

Cold Formed Sheet Piles

SGU Section



Section	Width b mm	Height h mm	Thickness t mm	Sectional Area cm ² /m	Weight kg/m	Weight kg/m ²	Moment of Inertia cm ⁴ /m	Section Modulus cm ³ /m
SGU 17-1	750	430	9.5	151	89.1	119	35905	1670
SGU 17-2	500	420	12	224	88	176	34860	1660
SGU 17-3	650	480	8	140	71.5	110	39840	1660
SGU 17-4	600	440	8.5	154	72.5	121	36850	1675
SGU 18-1	750	460	9	150.3	88.5	118	40940	1780
SGU 18-2	400	310	12	220.7	69.3	173.25	27668	1785
SGU 18-3	600	430	9.5	165.4	77.9	129.8	38700	1800
SGU 20-1	750	460	10	164.4	96.8	129	46115	2005
SGU 20-2	600	440	10	177	83.5	139	44440	2020
SGU 20-3	600	450	10.5	185	87.5	145.8	45675	2030
SGU 20-4	500	450	10	197.5	77.5	155	45000	2000
SGU 20-5	750	480	10	167.3	98.5	131.3	49440	2060
SGU 20-6	650	540	8	150.1	76.6	117.8	56025	2075
SGU 21-1	750	480	10	169.3	99.7	133	49920	2080
SGU 21-2	600	480	9.5	173.9	81.9	136.5	49440	2060
SGU 22-1	600	500	10	186.6	87.9	146.5	55000	2200
SGU 23-1	750	480	10.5	173.4	102.1	136.1	54600	2275
SGU 23-2	650	540	9	168.7	86.1	132.5	62640	2320
SGU 25-1	750	470	11.5	188.2	110.8	147.7	58750	2500
SGU 25-2	600	440	11.5	200	94.2	157	55000	2500
SGU 25-3	500	420	12	223	88.8	177.6	52500	2500
SGU 26-1	750	451	12	192	113.2	151	58179	2580
SGU 26-2	500	430	12.5	236	92.7	185.4	54825	2550
SGU 26-3	650	540	10	186.2	95	146.1	69120	2560
SGU 27-1	600	470	11.5	206.8	97.4	162.3	62980	2680
SGU 28-1	600	480	12	216	101.9	169.8	68160	2840
SGU 30-1	500	420	14	262	103	206	63840	3040
SGU 32-1	600	452	14	244	114.9	191.5	72320	3200
SGU 32-2	600	520	13	242	114	190	83200	3200
SGU 32-3	750	605	11	204	120	160	95893	3170
SGU 32-4	700	560	12	222	122	174	90860	3245
SGU 35-1	700	560	13	240	132	188	97944	3498
SGU 35-2	750	608	12	226	133	177	105336	3465
SGU 37-1	750	610	13	243	143	191	114344	3749
SGU 40-1	750	610	14	263	155	207	123373	4045
SGU 40-2	700	560	15	280	154	220	111300	3975
SGU 43-1	750	610	15	283	167	223	132309	4338
SGU 46-1	750	615	16	302	178	237	142834	4645

Tolerances on shape and dimensions of cold formed sheet pile are based on standard BS EN 10249-2.

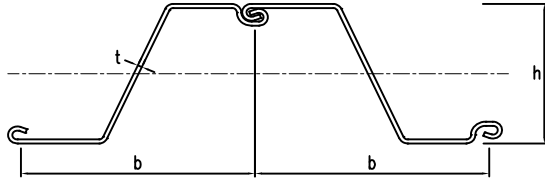
Available Steel Grade:

BS EN 10025: S235 / S275 / S355 / S390 / S420 / S460

Low Corrosion Steel: ASTM A690 Marine Steel Grade (345 / 390 / 430)

Cold Formed Sheet Piles

SGZ Section



The Advantages of SGZ section cold formed sheet piles are:

- SGZ section cold formed sheet piles have the highest ratio of strength to weight, they are most economical where bending resistance is a determining factor
- Suitable for use in permanent structures
- Wide range of up to 5226cm³/m
- Maximum length up to 35m

Section	Width b mm	Height h mm	Thickness t mm	Sectional Area cm ² /m	Weight kg/m	Weight kg/m ²	Moment of Inertia cm ⁴ /m	Section Modulus cm ³ /m
SGZ 11-1	575	260	8.8	128.7	58.1	101	14300	1100
SGZ 11-2	575	260	9.5	144	62	113	14320	1140
SGZ 12-1	670	302	8.5	126	66.1	99	18120	1200
SGZ 12-2	770	344	8.5	120	72.6	94	21414	1245
SGZ 12-3	575	260	10.2	145.8	65.8	114	15600	1200
SGZ 13-1	670	303	9.5	137	72	107.5	19695	1300
SGZ 13-2	770	344	9	126	76.1	98.8	22360	1300
SGZ 13-3	575	260	10.8	150	67.9	118	16250	1250
SGZ 14-1	670	304	10.5	148.9	78.3	116.9	21280	1400
SGZ 14-2	770	345	9.5	131.5	79.5	103.2	23374	1355
SGZ 14-3	770	345	10	137	82.9	107.7	24236	1405
SGZ 14-4	650	320	8	120	61	93.8	22080	1380
SGZ 15-1	700	420	7	112.8	62	88.6	31080	1480
SGZ 16-1	575	350	8.5	136.3	61.5	107	28000	1600
SGZ 17-1	630	379	8.5	137.1	67.8	107.6	31592	1666
SGZ 17-2	700	420	8.5	133	73.1	104.4	36330	1730
SGZ 17-3	575	350	9	142	64.3	111.8	28875	1650
SGZ 17-4	575	370	9	148	66.9	116	31912	1725
SGZ 17-5	575	350	9.5	149	67.3	117	29750	1700
SGZ 17-6	675	430	8.5	141.4	74.9	111	36679	1706
SGZ 18-1	630	380	9.5	150	74.4	118	34200	1800
SGZ 18-2	700	420	9	139.2	76.5	109	37800	1800
SGZ 18-3	575	350	9.8	154	69.5	120.9	30625	1750
SGZ 18-4	575	350	10	159	71.9	125	31500	1800
SGZ 18-5	675	420	9	150	79.5	117.8	37905	1805
SGZ 18-6	630	381	10	157	77.8	123	35624	1870
SGZ 18-7	700	440	9	141	77.5	110.7	40546	1843
SGZ 18-8	640	385	8	127	64	100	34939	1815
SGZ 19-1	630	381	10.5	163	81	128.6	36957	1940
SGZ 19-2	700	421	9.5	145.6	80	114.3	39363	1870
SGZ 19-3	675	390	10	157.8	83.6	123.9	36367	1865
SGZ 20-1	700	421	10	152	83.5	119	41048	1950
SGZ 23-1	575	350	11	181	81.8	142.3	40600	2320
SGZ 24-1	700	459	11.2	174	95.7	136.7	55768	2430
SGZ 24-2	575	350	11.5	189	85.1	148	42000	2400

Cold Formed Sheet Piles

SGZ Section

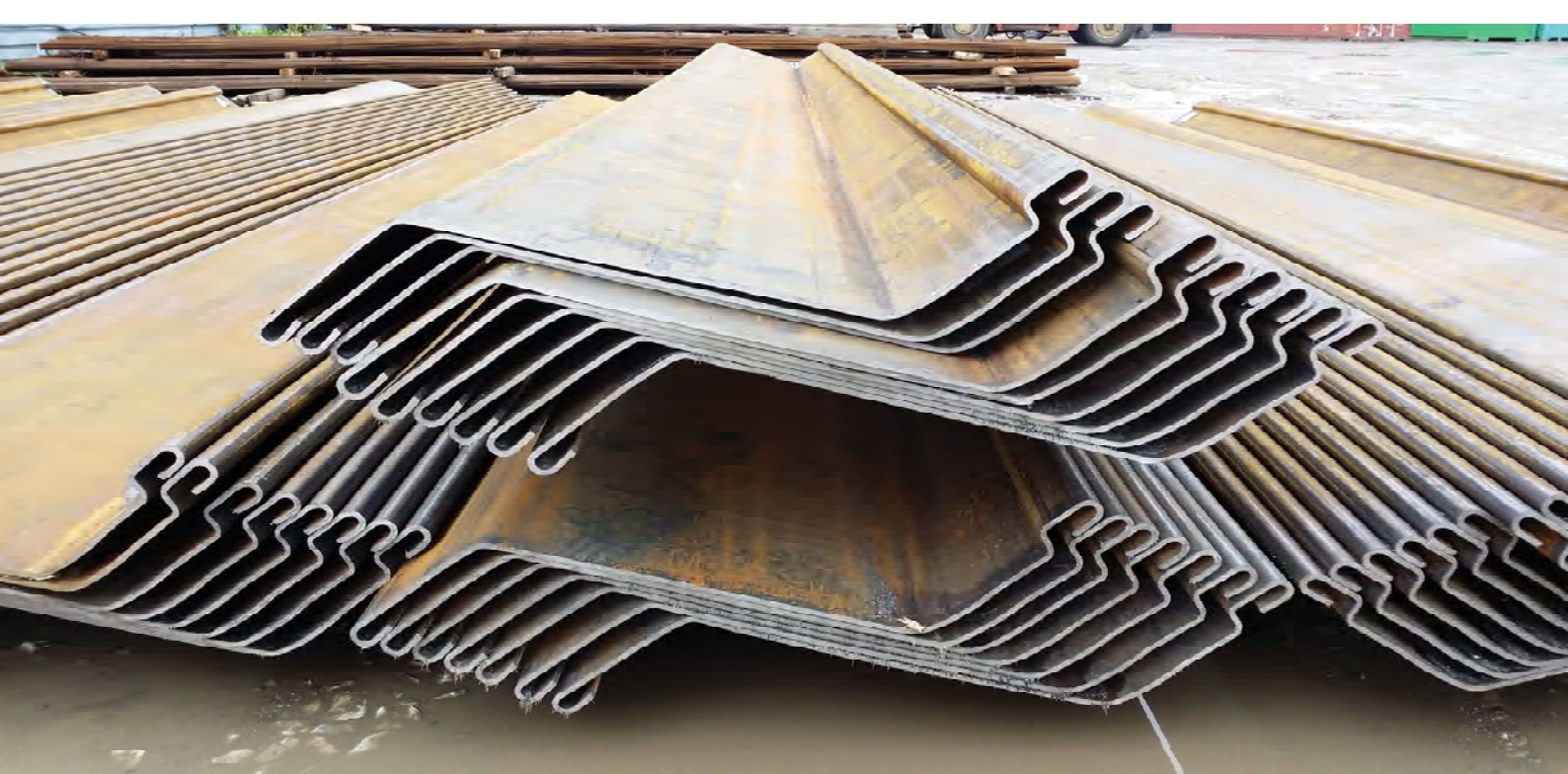
Section	Width b mm	Height h mm	Thickness t mm	Sectional Area cm ² /m	Weight kg/m	Weight kg/m ²	Moment of Inertia cm ⁴ /m	Section Modulus cm ³ /m
SGZ 25-1	630	480	10.5	185	91.5	145	59040	2460
SGZ 25-2	575	350	12	193.6	87.4	152	43400	2480
SGZ 25-3	575	350	12.5	197	89.1	155	44450	2540
SGZ 25-4	675	430	11.5	182.5	96.7	143	60240	2510
SGZ 26-1	630	470	11.5	198	97.9	155	61218	2605
SGZ 26-2	700	460	12.2	187	102.9	147	59800	2600
SGZ 26-3	575	350	12.5	201	90.9	158	44625	2550
SGZ 26-4	575	350	13	206	93.3	162	45500	2600
SGZ 26-5	675	430	12	191	101.2	150	55900	2600
SGZ 27-1	675	460	12	200	106.1	157	62100	2700
SGZ 28-1	630	440	12.5	212	105	167	60720	2760
SGZ 28-2	700	461	13.2	200	110	157	63618	2760
SGZ 34-1	675	485	12	211.7	112.1	166.2	83057	3425
SGZ 35-1	675	485	12.8	218	115.9	171.7	84875	3500
SGZ 36-1	675	485	13.2	225.5	119.5	177	87300	3600
SGZ 37-1	700	499	13.5	226	124.2	177.4	92439	3705
SGZ 37-2	675	485	13.8	234	124.1	183	89725	3700
SGZ 38-1	675	485	14	240	127.2	188	91665	3780
SGZ 39-1	700	560	13.5	240	131.9	188	109200	3900
SGZ 41-1	700	560	14	254	139.5	199	114660	4095
SGZ 46-1	580	540	15	292	132.6	229	124200	4600
SGZ 48-1	580	570	15.5	307	139.6	240.7	137085	4810
SGZ 50-1	580	580	16	322	146.7	253	145580	5020
SGZ 52-1	700	550	16	305.2	167.7	239.6	143742	5226

Tolerances on shape and dimensions of cold formed sheet pile are based on standard BS EN 10249-2.

Available Steel Grade:

BS EN 10025: S235 / S275 / S355 / S390 / S420 / S460

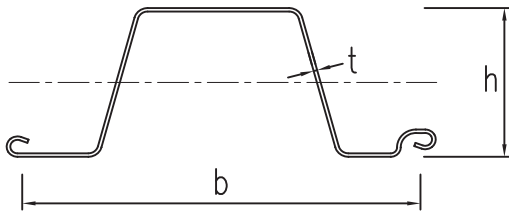
Low Corrosion Steel: ASTM A690 Marine Steel Grade (345 / 390 / 430)



Cold Formed Sheet Piles

SLL Section

The Advantages of SLL section cold formed sheet piles are:



- SLL section cold formed sheet piles are specially designed for canalization, permeability cut off wall and riverbank protection structure
- The joint of the SLL section is left-right asymmetric and allows one-directional installation, ease of piling and handling

Section	Width b mm	Height h mm	Thickness t mm	Sectional Area cm ² /m	Weight kg/m	Weight kg/m ²	Moment of Inertia cm ⁴ /m	Section Modulus cm ³ /m
SLL 2-1	700	146	4	56.1	30.8	44	1945	266
SLL 2-2	900	155	4	53.2	37.7	41.8	2415	284
SLL 3-1	700	147	5	70.3	38.6	55.2	2427	330
SLL 3-2	700	148	6	84.1	46.2	66	2907	392
SLL 4-1	600	250	3.5	60.9	28.7	47.8	5883	470
SLL 4-2	700	149	7	98.1	53.9	77	3352	450
SLL 5-1	700	150	8	112.1	61.6	88	3814	508
SLL 5-2	705	152	8	113.1	62.6	88.8	3950	519
SLL 5-3	750	250	4	63.6	37.4	49.9	6582	526
SLL 5-4	600	250	4	69.7	32.8	54.7	6711	537
SLL 6-1	700	251	5	82.5	45.4	64.8	8408	670
SLL 6-2	750	251	5	81	47.7	63.6	8441	672
SLL 7-1	921	252	6	91.2	65.9	71.6	9941	789
SLL 7-2	750	252	5.7	93.8	55.2	73.6	9604	763
SLL 8-1	750	252	6	98.1	57.8	77	10138	804
SLL 8-2	750	252	6.2	101.4	59.7	79.6	10470	830
SLL 9-1	750	253	7	115.2	67.8	90.4	11810	933
SLL 9-2	900	253	7	107.6	76	84.5	11607	917
SLL 9-3	700	311	5.5	99.4	54.6	78	14634	939
SLL 9-4	900	312	7	92.9	65.6	72.9	13931	893
SLL 10-1	750	254	8	131.5	77.4	103.2	13345	1050
SLL 10-2	900	254	8	122.8	86.8	96.4	13138	1034
SLL 10-3	900	313	7	109.2	77.2	85.7	16317	1042
SLL 11-1	750	255	9	150.2	88.4	117.9	15256	1196
SLL 11-2	900	255	9	140	98.9	109.9	14983	1175
SLL 11-3	700	312	6.5	117.7	64.7	92.4	17327	1108

Tolerances on shape and dimensions of cold formed sheet pile are based on standard BS EN 10249-2.

Available Steel Grade:

BS EN 10025: S235 / S275 / S355 / S390 / S420 / S460

Low Corrosion Steel: ASTM A690 Marine Steel Grade (345 / 390 / 430)

Tie Rods

Available Steel Grade

Tension Grade	Nominal Diameter mm	Min Yield Strength MPa	Min Tensile Strength MPa	Min Elongation %	Reduction of Area %	Impacting Energy J				
						20°C	0°C	-20°C	-40°C	-50°C
345	20 - 210	345	470	21	50	34	34	34	27	-
460	20 - 210	460	610	19	50	-	50	45	34	27
550	20 - 180	550	750	17	50	-	39	39	27	27
650	20 - 150	650	850	15	45	-	34	34	27	27



Steel Sheet Piling Projects



Quay Wall of Port Facilities



Press-in Method by Silent Piler



Waterfront Development



Flood Mitigation Project by JPS

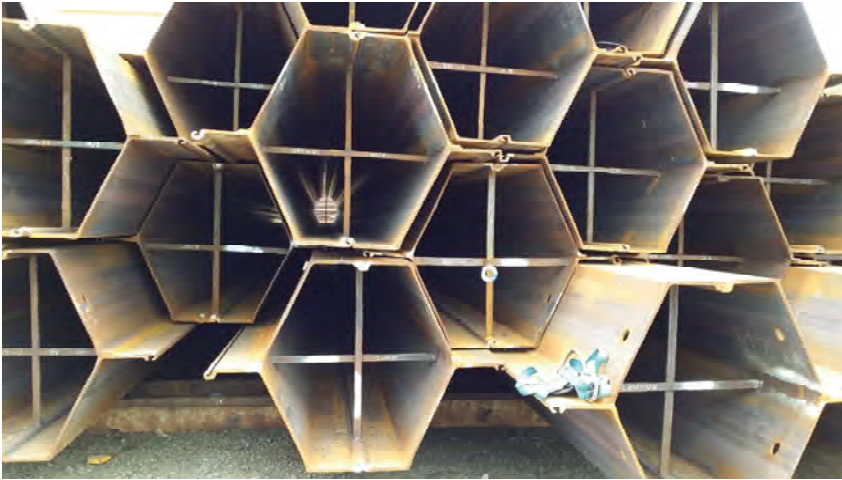


Temporary wall for Civil Excavation



Permanent wall for Water Treatment Plant

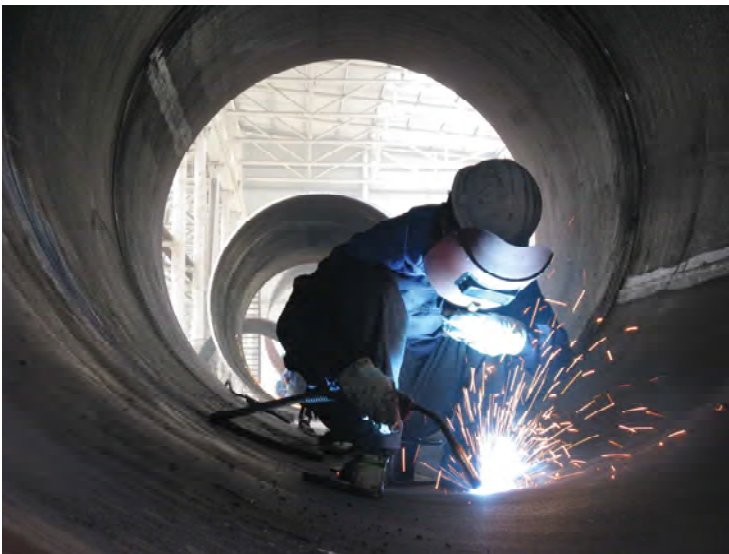
Steel Sheet Piling Projects



Special fabrication works – box piles section



Dry Film Thickness (DFT) of the Corrosion Protection System



Quality Assurance on Project



Sheet pile connector C9



State-of-the-art blasting and coating facilities in our factory

Application

PORT
WHARF
JETTY
TERMINALS
BREAKWATER
RIVER PROTECTION
FLOOD CONTROL
SEAWALL
RECLAMATION
BRIDGES
COFFERDAM
INTAKE AND OUTFALL

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