TIE RODS

The Biggest Steel Piling Manufacturer in China

Nanjing Grand Steel Piling Co.,Ltd

INTRODUCTIONS

Nanjing Grand Steel Piling Co., Ltd. is the exclusive combination of designing, manufacturing, testing of steel tie rods in China. With 4 professional product lines namely forging product line, heat treatment line, machine-work line and surface treatment line, our annual production capacity exceeding 35 thousand tons.

Some of our intentional leading level equipments in the product line like 15m ultra-long electric heating mantles,15m large-sized ball blast machines, automatic numerical control machines, and 2500t, 2000t,1000t,500t forging machines designed and manufactured by ourselves.

Grand Piling Can produce the most comprehensive tie rod system in the world,Diameter from 20mm to over 300mm, Steel grade from S235 S460 up to S1030(minimum yield strength 1030Mpa).Quantity from 2500 tons in Pakistan Qasim port project, to only 3 pieces in UK Poole comb wall system, there is no order too big or too small for us. We can supply tie rod with our sheet piling, pipe pile in a package, we are also pleased to supply tie rod only(By calculation of anchor force, distance between two adjacent tie rods,angles,soil conditions etc,our engineers team will design the most proper tie rod to suit your project)

APPLICATIONS

Tie Rod systems can be used for marine and geotechnical applications like coffer dam, sheet pile wall and retaining walls. Retaining load is transferred from wall through waling and tie rod, dead man or pressure grouted anchorage into the ground. The load of tie rods and tie backs may be transferred through a dead man or pressure-grouted anchor into the surrounding ground. For pressure-grouted anchorages the minimum load transfer length can be presumed to equal the bond length along the drill hole surface.

QUALITY

We have been in the piling industry for over 15 years, send us your project drawings, or the soil parameters ,surrounding conditions, our engineers will design the most economical tie rod system for your projects

All our products and systems follow strict quality guidelines in accordance with BS EN ISO 9001.Nanjing Grand Steel Piling has its own in house testing facility where tensile testing and anchorage testing is carried out on the bar and threaded connections to ensure the system meets the specifications . The process of thread rolling is faster than cut threading and the thread roll life is also extended. These advantages, combined with the ability to use smaller diameter bars, makes this manufacturing process a much more sustainable and efficient process than cut threading.

PRODUCTION PROCESS

From Very beginning of Material ordering until the final finished Products, Every procedure is under control and traceable as per ISO 9001 system. Product quality and delivery time are 100% guaranteed.

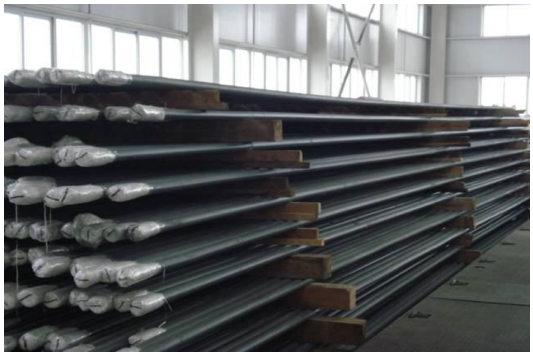
Materials Cutting: Preparing the materials for the tension rod, bearing plates, nuts, turnbuckles.etc

Upset Ends Forging for the tie rod shank, so that threads can be made on

Heat Treatment and Eye Ends Forging

Adjust Bending of tie rod shank and Machinery of anchor

Breaking Load Testing of the whole tie rod system



Sand Blasting and Painting

Final Testing:Production dimensions and paint thicness etc

Packing and loading into containers

CLASSIFICATIONS

Nanjing Grand Steel Piling can produce almost any kind of tie rod,different connections,different ends,Length adjustment,Vertical movable rods..etc.But Generally for tie rod in steel piling industry all over the world,most commonly used types are as below.

Clasifications by connection methods

Turnbuckle/coupler and Hinge Joint

Turnbuckle/coupler and 2 Hinge joints

Turnbuckles/coupler and Cardan Joint

Turnbuckle/coupler and 2 Cardan Joints

Note:Other joint types such as HInge Turnbuckles,T-head connection are also available,please send your project drawings or contact our engineers for help

Clasificaltions by end finish

Both ends Fork Terminations

Fork Termination and Spade Termination

Both ends Spade Termination

Spade Termination and Rod Terminaions

Clasificaltions by steel grade

Tension Grade	Normal Diameter	Min Yield Strength	Min Tensile Strength	Elongaton
	mm	Mpa	Mpa	%
S235	20-300	235	375	26
S355	20-300	355	510	21
S460	30-250	460	610	19
S550	30-250	550	750	17
S650	40-230	650	850	15
S700	40-230	700	900	15
S830	40-230	830	1030	10

T joint ends for HZ combinwalls

Turnbuckles waiting to dry after painting

COMMONLY USED SIZES

Thread Size	ΦD (mm)	Weight (kg/m)	Grade 460		Grade 500		Grade 550		Grade 650		Grade 700	
			YL(Kn)	UL(Kn)	YL(Kn)	UL(Kn)	YL(Kn)	UL(Kn)	YL(Kn)	UL(Kn)	YL(Kn)	UL(Kn)
M48x5	40	9.86	578	767	628	817	691	942	817	1068	880	1106
M56x5.5	45	12.48	732	970	795	1034	875	1193	1034	1352	1113	1400
M60x5.5	50	15.41	903	1198	982	1276	1080	1473	1276	1669	1374	1728
M68x6	55	18.65	1093	1449	1188	1544	1307	1782	1544	2019	1663	2091
M72x6	60	22.2	1301	1725	1414	1838	1555	2121	1838	2403	1979	2488
M76x6	65	26.05	1526	2024	1659	2157	1825	2489	2157	2821	2323	2920
M85x6	70	30.21	1770	2348	1924	2501	2117	2886	2501	3271	2694	3387
M90x6	75	34.68	2032	2695	2209	2872	2430	3313	2872	3755	3093	3888
M95x6	80	39.46	2312	3066	2513	3267	2765	3770	3267	4273	3519	4423
M100x6	85	44.54	2610	3461	2837	3688	3121	4256	3688	4823	3972	4994
M105x6	90	49.94	2926	3881	3181	4235	3499	4771	4135	5407	4453	5598
M110x6	95	55.64	3261	4324	3544	4607	3899	5316	4607	6025	4962	6238
M115x6	100	61.65	3613	4791	3927	5105	4320	5890	5105	6676	5498	6912
M125x10	105	67.97	3983	5282	4330	5628	4762	6494	5628	7360	6061	7620
M135x10	115	81.54	4778	6336	5193	6751	5713	7790	6751	8829	7271	9140
M140x10	120	88.78	5202	6899	5655	7351	6220	4882	7351	9613	7917	9953
M150x12	125	96.33	5645	7486	6136	7977	6750	9204	7977	10431	8590	10799
M155x12	130	104.19	6106	8097	6637	8628	7300	9955	8628	11282	9291	11680
M160x12	135	112.36	6584	8731	7157	9304	7873	10735	9304	12167	10020	12596
M165x12	140	120.84	7081	9390	7697	1006	8467	11545	1006	13085	10776	13547

Note:

1. YL stands for yield strength of the tie rod. UL stands for the ultimate tensile load of the tie rod. Yield and ultimate tensile loads are un-factored.
2. Above table are only commonly used size, we can also produce tie rod in 20mm diameter, and up to over 300mm.Steel grade S235 S355 S835 S1080 are also available upon request
3. Our tie rod is upset threads, making the best use of bar.

PAINTINGS

Steel elements may be oversized to allow for loss of cross sectional area due to corrosion. Depending on the ground conditions EN 14199 is suggesting the following loss of thickness of bare steel in the ground may beconsidered:

Soil condition	Coresponding soil corrosiveness	Yearly loss of steel due to corrosion [mm]
Undisturbed natural soils (sand, silt, clay, schist,…)	Low	0.012
Polluted natural soils and industrial grounds	Medium	0.030
Aggressive natural soils (swamp, march, peat,…)	Medium	0.033
Non-compacted, non-aggressive fills (clay, schist, sand, silts,...	Medium	0.022
Non-compacted and aggressive fills (ashes, slag...	High	0.058

The values above are for guidance only. Local conditions should be considered and suitable values taken into account.
According to British Standard BS 8002 “Earth Retaining Structures” provision should be made for corrosion of tie rods of not less than 0.05 mm/year.

Most popular anti-corrosion methods are:

1. Zinc rich epoxy paint,thickness normally between 60-100um
2. Hot dig Galvanizing

   Minimum average zinc thickness 85um (or 610gram per m) standard:S729:1971

   Hot-dip galvanization has a long track record for being a good corrosion protection to steel.
3. Denso Wrapping

   Denso tape is a grease impregnated tape that provides technical and cost advantages over traditional duct and grout or sacrificial corrosion methods
4. Above plus PVC pipe protction

PROJECT PHOTOS

HUDONG—ZHONGHUA SHIPBUILDING GROUP


The Qasim port project in Pakistan


Rekjavik Harbour,Iceland


Wharf Port Moresby PNG

European Cup Stadium Warsaw,Poland

Wailings

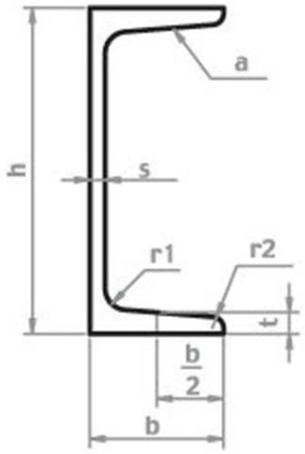
WALINGS

Walings transmits forces from sheet piling to anchorages.It is simultaneously used for aligning and stiffening the wall.Additional forces thus resulting can not be determined accurately. Walings made of two spacer connected channel sections are prefered because they can be fixed centrally by waling bolts to the wall.The problems of handling and assembling can be minimised by using this arrangement.Other variations of waling section can be used such a parir of H beams or possibly a capping beam and H beams combination..Necessary walling joints should be locaed in the respective zero points of moments

Nanjing Grand Steel Piling Co.,Ltd carries regular stock of 40,000 tons for hot rolled U steel channel and H beams.Shipment immediatly .Length are normally 6m 9m and 12m.Steel grade in S235 and S355.Grand Piling can do all fabrication works in its China factory,like drill holes,painting,welded back to back doubles,fabrications of support console,spacers,with bolts and nuts.So that clients only need to assembly easily at construction site.Grand steel piles have exported walings all over the world.Give us a call,and we will do all thing for you.

We can do all waling fabrication works,like dill holes,weld back to back,supporting console,spacers,splice plate,all in package.

U CHANNEL STEEL

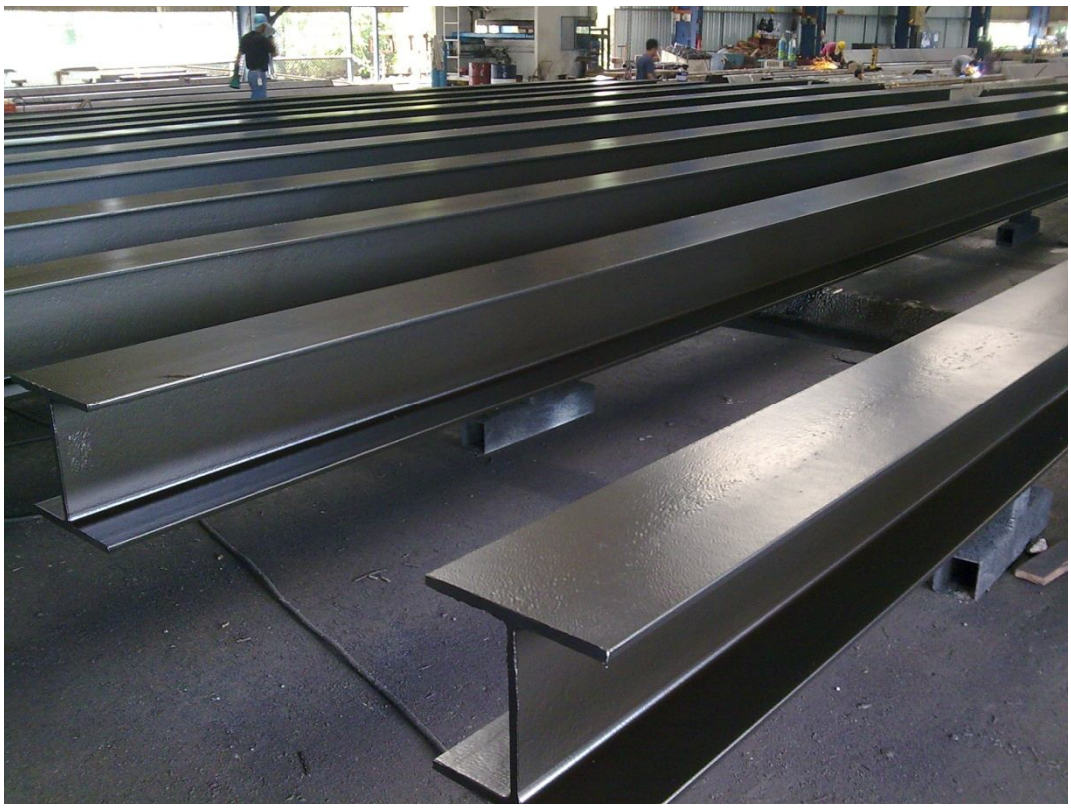


Size	Dimensions						Sectional Area	Weight	Modulus of Section
	h	b	s	t	r1	r2			
	mm	mm	mm	mm	mm	mm	cm^2	kg/m	cm3
GP5	50	37	4.5	7	7	3.5	6.93	4.44	10.4
GP6.3	63	40	4.8	7.5	7.5	3.75	8.45	6.64	16.1
GP6.5	65	40	4.3	7.5	7.5	3.75	8.6	6.8	17
GP8	80	43	5	8	8	4	10.23	8.1	25.3
GP10	100	48	5.3	8.5	8.5	4.25	12.75	10	39.7
GP12	120	53	5.5	9	9	4.5	15.4	12.1	57.7
GP12.6	126	53	5.5	9	9	4.5	15.7	12.32	62.1
GP14-6	140	58	6	9.5	9.5	4.75	18.52	14.54	80.5
GP14-8	140	60	8	9.5	9.5	4.75	21.32	16.8	87.1
GP16	160	63	6.5	10	10	5	21.97	17.24	108
GP18-7	180	68	7	10.5	10.5	2.25	25.7	20.2	141
GP18-9	180	70	9	10.5	10.5	5.25	30	23	152
GP20-7	200	73	7.0	11	11	5.5	28.8	22.7	178
GP20-9	200	75	9	11	11	5.5	32.8	25.8	191
GP22-7	220	77	7	11.5	11.5	5.75	31.85	25	218
GP22-9	220	79	9	11.5	11.5	5.75	36.3	28.5	234
GP24-7	240	78	7	12	12	6	34.3	26.86	254
GP24-9	240	80	9	12	12	6	39	30.7	274
GP24-11	240	82	11	12	12	6	43.9	34.4	293
GP25-7	250	78	7	12	12	6	35	27.41	270
GP25-9	250	80	9	12	12	6	40	31.4	282
GP25-11	250	82	11	12	12	6	45	35.3	295
GP27-7.5	270	82	7.5	12.5	12.5	6.25	39.3	30.84	323
GP27-9.5	270	84	9.5	12.5	12.5	6.25	44.7	35.1	347
GP27-11.5	270	86	11.5	12.5	12.5	6.25	50.1	39.4	372
GP28-7.5	280	82	7.5	12.5	12.5	6.25	40	31.5	340
GP28-9.5	280	84	9.5	12.5	12.5	6.25	45.6	35.83	366

GP28-11.5	280	86	11.5	12.5	12.5	6.25	51.3	40.3	393
GP30-7.5	300	85	7.5	13.5	13.5	6.75	43.9	34.5	403
GP30-9.5	300	87	9.5	13.5	13.5	6.75	49.9	39.2	433
GP30-11.5	300	89	11.5	13.5	13.5	6.75	55.9	43.9	463
GP32-8	320	88	8	14	14	7	48.5	38.1	475
GP32-10	320	90	10	14	14	7	55	43.1	509
GP32-12	320	92	12	14	14	7	61.3	48.2	543
GP36-9	360	96	9	16	16	8	61	42	660
GP36-11	360	98	11	16	16	8	68.2	53.5	703
GP36-13	360	100	13	16	16	8	75.3	60	746
GP40-10.5	400	100	10.5	18	18	9	75.1	59	879
GP40-12.5	400	102	12.5	18	18	9	83	65.3	932
GP40-14.5	400	104	14.5	18	18	9	91.1	71.5	986

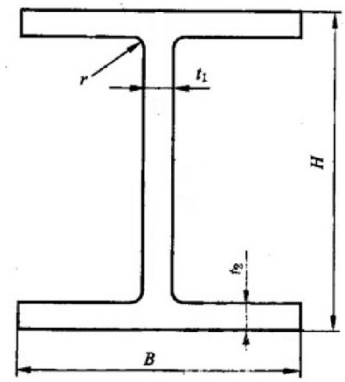
Notes:

1. For H beams and channel steels,We always have 6m 9m 12m in stock,steel grade are S235 and S355,over 40,000 tons stock,Immediately shipment.
2. We can drill holes on channels,welded back to back with spacers.we also can supply splice plates,bolt/nuts.support console,etc,so that you can assemble easily at jobsite.
3. You give us the bending moment,tie back load,distance between two adjacent tie rods,etc,we will make proper wailings



Hot Rolled H beams being painted in our works

H BEAMS



Size	Dimensions					Sectional Area	Weight	Moment of Inertia	Modulus of Section
	H	B	t1	t2	r				
	mm	mm	mm	mm	mm	cm^2	kg/m	cm^4	cm^3
GPH0-100	100	50	5	7	10	12.16	9.54	192	38.5
GPH0-125	125	60	6	8	10	17.01	13.3	417	66.8
GPH1-100	100	100	6	8	10	21.9	17.2	383	76.5
GPH1-150	150	75	5	7	10	18.16	14.3	679	90.6
GPH1-125	125	125	6.5	9	10	30.31	23.8	847	136
GPH1-148	148	100	6	9	13	27.25	21.4	1040	140
GPH1-175	175	90	5	8	10	23.21	18.2	1220	140
GPH2-198	198	99	4.5	7	13	23.59	18.5	1610	163
GPH2-200	200	100	5.5	8	13	27.57	21.7	1880	188
GPH2-150	150	150	7	10	13	40.55	31.9	1660	221
GPH3-194	194	150	6	9	16	39.76	31.2	2740	283
GPH3-248	248	124	5	8	13	32.89	25.8	3560	287
GPH3-250	250	125	6	9	13	38.87	29.7	4080	326
GPH3-175	175	175	7.5	11	13	51.43	40.3	2900	331
GPH4-298	298	149	5.5	8	16	41.55	32.6	6460	433
GPH4-200	200	200	8	12	16	64.28	50.5	4770	477
GPH5-300	300	150	6.5	9	16	47.53	37.3	7350	490
GPH5-244	244	175	7	11	16	56.24	44.1	6120	502
GPH5-200	200	204	12	2	16	72.28	56.7	5030	503
GPH6-346	346	174	6	9	16	53.19	41.8	11200	649
GPH8-294	294	200	8	12	20	73.03	57.3	11400	779
GPH8-350	350	175	7	11	16	63.66	50.0	13700	782
GPH8-250	250	250	9	14	16	92.18	72.4	10800	867
GPH9-250	250	255	14	14	16	104.7	82.2	11500	919
GPH9-400	400	150	8	13	16	71.12	55.8	18800	942
GPH10-396	396	199	7	11	16	72.16	56.7	20000	1010

GPH12-294	294	302	12	12	20	108.3	85	17000	1160
GPH12-400	400	200	8	13	16	84.12	66	23700	1190
GPH12-450	450	150	9	14	20	83.41	65.5	27100	1200
GPH13-340	340	250	9	14	20	101.5	79.7	21700	1280
GPH13-446	446	199	8	12	20	84.95	66.7	29000	1300
GPH13-300	300	300	10	15	20	120.4	94.5	20500	1370
GPH14-300	300	305	15	15	20	135.4	106	21600	1440
GPH15-450	450	200	9	14	20	97.41	76.5	33700	1500
GPH15-500	500	150	10	16	20	98.23	77.1	38500	1540
GPH17-496	496	199	9	14	20	101.3	79.5	41900	1690
GPH19-500	500	200	10	16	20	114.2	89.6	47800	1910
GPH19344	344	348	10	16	20	146	115	33300	1940
GPH20-390	390	300	10	16	24	136.7	107	38900	2000
GPH22-506	506	201	11	19	20	131.3	103	56500	2230
GPH23-350	350	350	12	19	20	173.9	137	40300	2300
GPH23-596	596	199	10	15	24	121.2	95.1	69300	2330
GPH25-482	482	300	11	15	28	146.4	115	60800	2520
GPH25-388	388	402	15	15	24	179.2	141	492	2540
GPH26-440	440	300	11	18	24	157.4	124	56100	2550
GPH26-600	600	200	11	17	24	135.2	106	78200	2610
GPH29-394	394	398	11	18	24	187.6	147	56400	2860
GPH29-488	488	300	11	18	28	164.4	129	71400	2930
GPH30-606	606	201	12	20	24	153.3	120	91000	3000
GPH33-400	400	400	13	21	24	219.5	172	66900	3340
GPH35-400	400	408	21	21	24	251.5	197	71100	3460
GPH35-585	585	300	12	17	28	174.5	137	103000	3530
GPH40-588	588	300	12	20	28	192.5	151	118000	4020
GPH45-414	414	405	18	28	24	296.5	233	93000	4490
GPH46-594	594	302	14	23	28	222.4	175	137000	4620
GPH50-692	692	300	13	20	28	211.5	166	172000	4980
GPH56-428	428	407	20	35	24	361.4	284	119000	5580
GPH58-700	700	300	13	24	28	235.5	185	201000	5760
GPH64-792	792	300	14	22	28	243.4	191	254000	6400
GPH73-800	800	300	14	26	28	267.4	210	292000	7290
GPH78-890	890	299	15	23	28	270.9	213	345000	7760
GPH82-458	458	417	30	50	24	529.3	415	187000	8180
GPH91-900	900	300	16	28	28	309.8	243	411000	9140
GPH109-912	912	302	18	34	28	364.0	286	498000	10900
GPH120-498	498	432	45	70	24	770.8	605	298000	12000

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