

**Technical Specification for Fabrication and Installation
of Highway Steel Bridge**

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of Highway Steel Bridge**

20

2018

2017 0 87

2017

		13		1	2	3
4	5	6	7		8	9
10		11	12	13		

100024

1		
2		
2.1		
2.2		%
3		
3.1		
3.2		
3.3		
3.4		{
3.5		{
3.6		}
3.7		}
4		
4.1		8
4.2		9
4.3		11
4.4		13
4.5		14
4.6		18
4.7		20
5		
5.1		22
5.2		23
5.3		31
6		00/ 00
6.1		00/ 00
6.2		34
6.3		40

6.4	47
6.5	50
7	
7.1	
7.2	52
7.3	55
7.4	57
7.5	59
8	{
8.1	{
8.2	{
8.3	{
9	}
9.1	{
9.2	{
9.3	{
9.4	{
9.5	{
9.6	}%
10	}
10.1	{
10.2	{
10.3	{
10.4	{
10.5	{
10.6	{
11	}
11.1	{
11.2	
11.3	%
11.4	

11.5	+
11.6	+ %
11.7	+
11.8)
12	++
12.1	++
12.2	++
12.3	
13	(
13.1	(
13.2)
13.3	+
13.4	
A	
B	
C	(
D	
E	
F	+
G	%
H	00%
J	%
K	%
L	% %
M	+

1

1.0.1

1.0.2

1.0.3

1.0.4

1.0.5

1.0.6

1.0.7

2

2.1

2.1.1 member

2.1.2 plate unit plate element

2.1.3 part

2.1.4 manufacturing segment

2.1.5 assembled in advance

2.1.6 test assembling

2.1.7 Install the segmental

2.2

2.2.1
B
B
F
U
F

2.2.2

T

3

3.1

A

EN 10204 3.2

3.2

GB/T 2970

3.2.1

1

3.2.1

1	Q345qC Q345qD Q345qE	GB/T 714	
2	Q370qC Q370qD Q370qE		
3	Q420qD Q420qE Q420qF		
4	Q460qD Q460qE Q460qF		
5	Q500qD Q500qE Q500qF		
6	Q345qNHD Q345qNHE Q345qNHF		
7	Q370qNHD Q370qNHE Q370qNHF		

8	Q420qNHD Q420qNHE Q420qNHF		
9	Q460qNHD Q460qNHE Q460qNHF		
10	Q500qNHD Q500qNHE Q500qNHF		
11	Q550qNHD Q550qNHE Q550qNHF		
12	Q345B Q345C Q345D Q345E	GB/T 1591	

3.3.1

3.3.1

3.6

JT/T 722

3.7

694

JT/T

4

4.1

4.1.1

1

2

3

4

5

6

4.1.2

BIM

4.1.3

4.1.4

4.1.5

4.1.6

4.1.7

4.2

4.2.1

1

2

3

4

5

6

7

2

32mm

3

4.2.2

4.2.3

1

4.2.3

2 4.5
 3 HV350

4.2.3

1		25 m	50 m	GB/T 1031
2			1000mm 1 1.0mm	B
3		1.0mm		
4		0.05t t	2.0mm	

3 Q370 Q370 HV350

4.2.4

12mm
 2mm 1mm 2mm
 20mm 20mm
 40mm 20mm 40mm
 40mm 10mm
 4
 200mm

4.2.5

2.0mm

4.2.6

R2mm

R2mm

4.2.7

4.2.8

B

4.3

4.3.1

4.3.2

-12

4.3.3

600 800

Q420qE TMCP TMCP+

750

Q500qE TMCP TMCP+

700

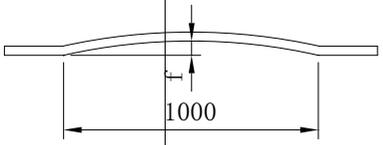
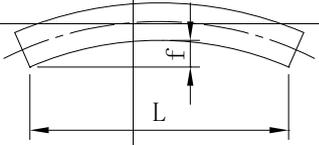
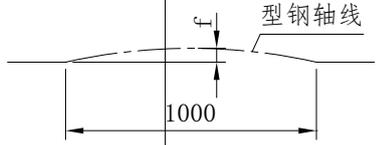
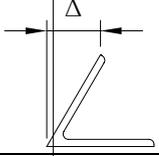
Q370qE TMCP TMCP+

800

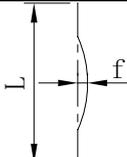
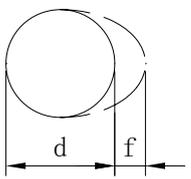
-5
G

900

(mm)

	
L ≤ 8m	
L > 8m	
	

0.5
Δ

8		$f = 1.0/1000$	
9		$f = 3d/1000$	

4.4

4.4.1 Ra25μm
3mm HV350

4.4.2 Ra12.5μm
0.01t t 0.3mm

4.4.3

4.4.4

4.4.5

1

2

2

3

4

5

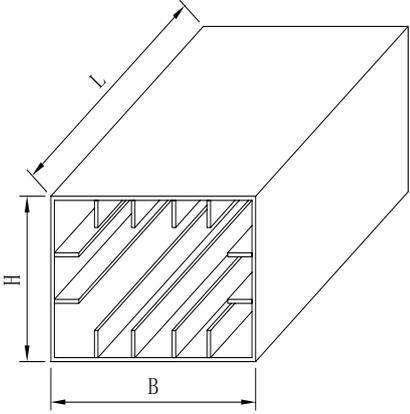
6

7

4.4.5

4.4.5

mm

1	L	2.0	
2		0.5	
3		0.25/ 42m2	
		0.4/ 42m2	
4		Ra12.5 m	
5		1/10000	

" + " " "

2

4.5

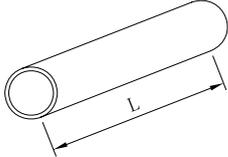
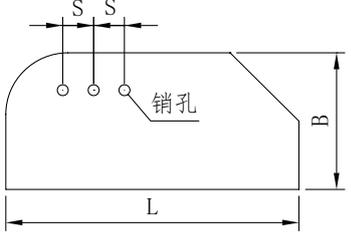
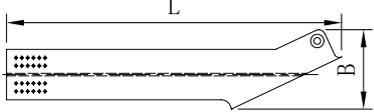
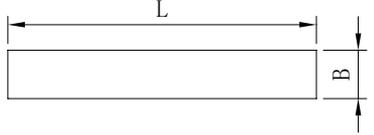
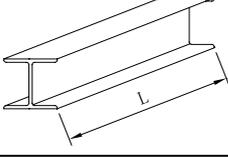
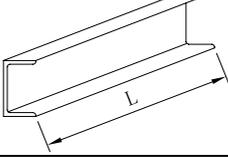
4.5.1

4.5.1

4.5.1

(mm)

1	U	L	2.0	
		B ₁	+3.0 0	
		B ₂	1.5	
		H ₁ H ₂	1.5	
		H ₁ -H ₂	2.0	
		L/1000	6.0	
			3.0	
2		L	2.0	
		B	2.0	
3		L B	2.0	
		S ₁	2.0	
		S ₂	1.0	
		L ₁ -L ₂	5.0	
4		L	2.0	
	B		2.0	
			1.0	
		S ₁	2.0	
		S ₂	1.0	
	5		L	
		B	1.0	
			3.0	
6		L	2.0	
		B	2.0	
7		L	2.0	
		B	2.0	

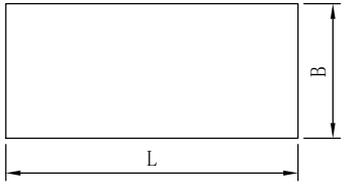
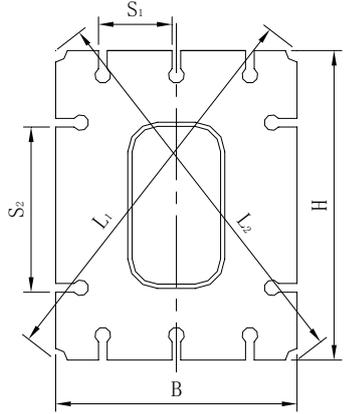
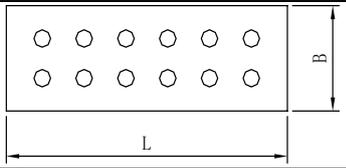
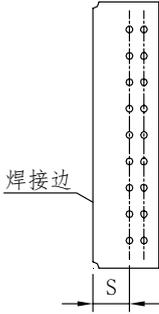
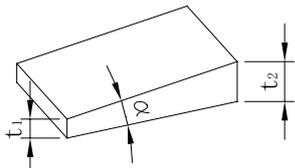
		L	3.0		
8		L B	2.0		
		S	2.0		
			2.0		
9		L B	2.0		
			2.0		
			1.0		
10		L	2.0		
		B	2.0		
11		L	2.0		
			2.0		
		L	1.0		
12			3.0		
			2.0		
		L	2.0		

4.5.2

4.5.2

4.5.2

(mm)

1		L		2.0	
		B		+2.0 0	
				2.0	
B					
2		B 1000	+0.5 0		
		B 1000	+1.0 0		
		H		0 -1.0	
				1.0	
		H 1000	0.5		
		H 1000	1.0		
S ₁ S ₂		1.0			
3		L B	2.0		
4					
5			2.0		
6		t ₁ t ₂		1.0	
				0.05	

4.6.4

4.5.1

4.6.3 mm

1	M8	10	+0.5 0
2	M10	12	+0.5 0
3	M12	14	+0.5 0
4	M16	18	+0.5 0
5	M20	22	+0.7 0
6	M22	24	+0.7 0
7	M24	26	+0.7 0
8	M27	29	+0.7 0
9	M30	33	+0.7 0
10	M30	33	+1.0 0

U mm

4.6.4

4.6.4

4.6.4 mm

1				
	0.04			

4.7

4.7.1

4.2

4.7.2

1mm

4.7.3

B

4.7.4

4.2.3

4.7.5

4.2.4

4.7.6

4.2.5

4.7.7

4.7.8

4.3.6

4.7.9

0.01t

0.3mm

Ra12.5μm

4.7.10

4.7.11

4.5.1

4.7.12

4.5.2

4.7.13

4.5.3

4.7.14

4.6.3

4.7.15

4.6.4

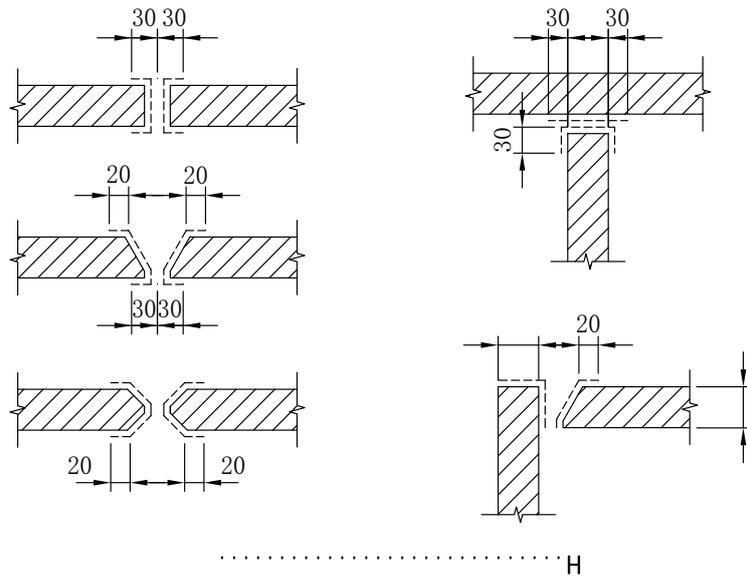
4.7.16

Ra25μm

4.7.17

4.4.5

5.1.3



) "%'

aa

5.1.4

2

0.1mm

5.1.5

5.2 组装

5.2.1

U

U

5.2.2

5.2.3

80mm

T

5.2.4

400mm

150mm

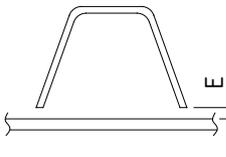
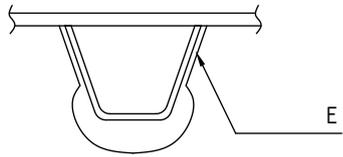
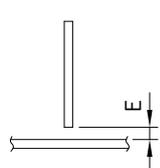
5.2.5

5.2.6

5.2.6

5.2.6

mm

		5.2.6	mm
1	U	0.5 1.0	
	U	2.0	
2		1.0	
	f	1.0	



5.2.7

5.2.8

5

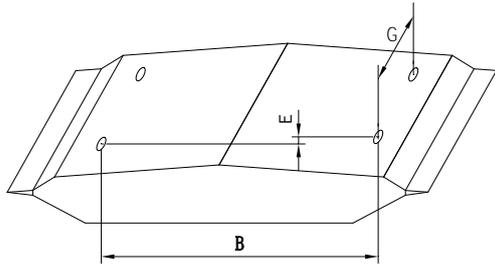
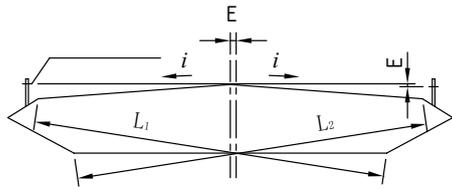
5.2.9

5.2.9

5.2.9

mm

1		0.5	t 25		
		1.0	t 25		
2	a	w 2.0			
3		1.0			
4		2.0			
5	H	w 2.0			
6	L	w 2.0			
7		w 2.0			
8	B ₁ B ₂	2	w 5.0		2.0
		4	w 6.0		
		6	w 8.0		
9		3.0			
		w 3.0			
10		w 2.0			
11	f	5.0			
12	B	w 4.0			
13	S	w 3.0			

14		w 2.0		
15	L_1-L_2	4.0		
		5.0		
16	i	w 0.1%		
17		w 1.0		

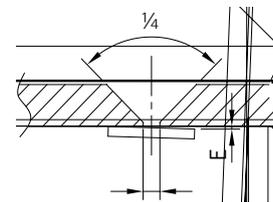
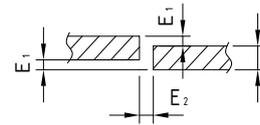
5.2.10

5.2.10

5.2.10

mm

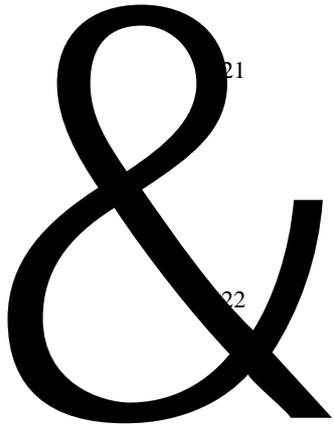
1	1	t 25	0.5
		t 25	1.0
2	2		1.0
			1.0
3		¼	w 5.0v



5

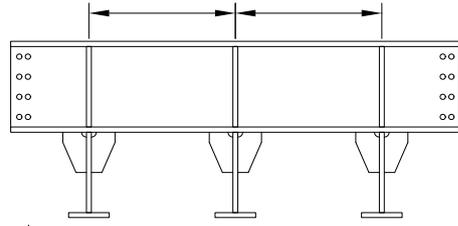
0

7		H	w 1.0	
			w 2.0	
8		B	w 1.0	
			w 2.0	
9		L ₁ -L ₂	2.0	
10			1.5	
11	B ₁ B ₂	B ₁		
		B ₂	+1.5 0	
12		L ₁	+1.5 0	
13		H H ₁ H ₂	+1.5 0	
14			w 2.0	
15			0.1v	
16	S		w 1.0	
			w 2.0	
17			0.1v	
18			w 3.0	
19			0.5	
		B	+1.0 0	
20		H 2m	+2.0 0	
		H 2m	+4.0 0	
21		H	+1.5 0	



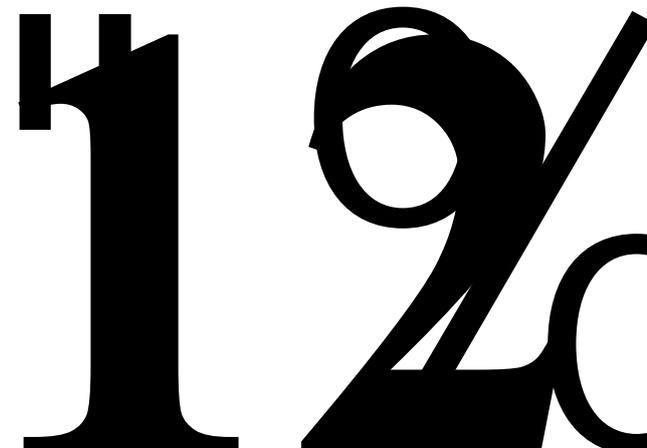
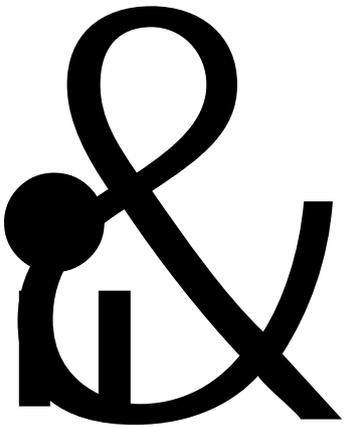
21

S w1.0



22

S w2.0



5.2.12				mm
1		L		
		B	w2.0	
		H	w2.0	
		D	3.0	
		\dot{z}	3.0	
2			2.0	
		S	w2.0	
3			3.0	
4			w1.0	

5.3 检验

5.3.1

5.1.2

5.3.2

5.1.3

5.3.3

5.1.4

5.3.4

5.2.9

5.3.5

5.2.10

5.3.6

5.2.11

5.3.7

5.2.12

5.3.8

6.2.8

6

6.1

6.1.1

6.1.2

6.1.3

6.1.4

6.2

6.2.1

6.2.2

6.2.3

6.2.4

6.2.5

6.2.6

6.2.7

6.2.8

6.2.9

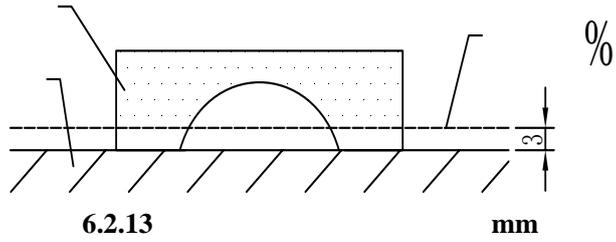
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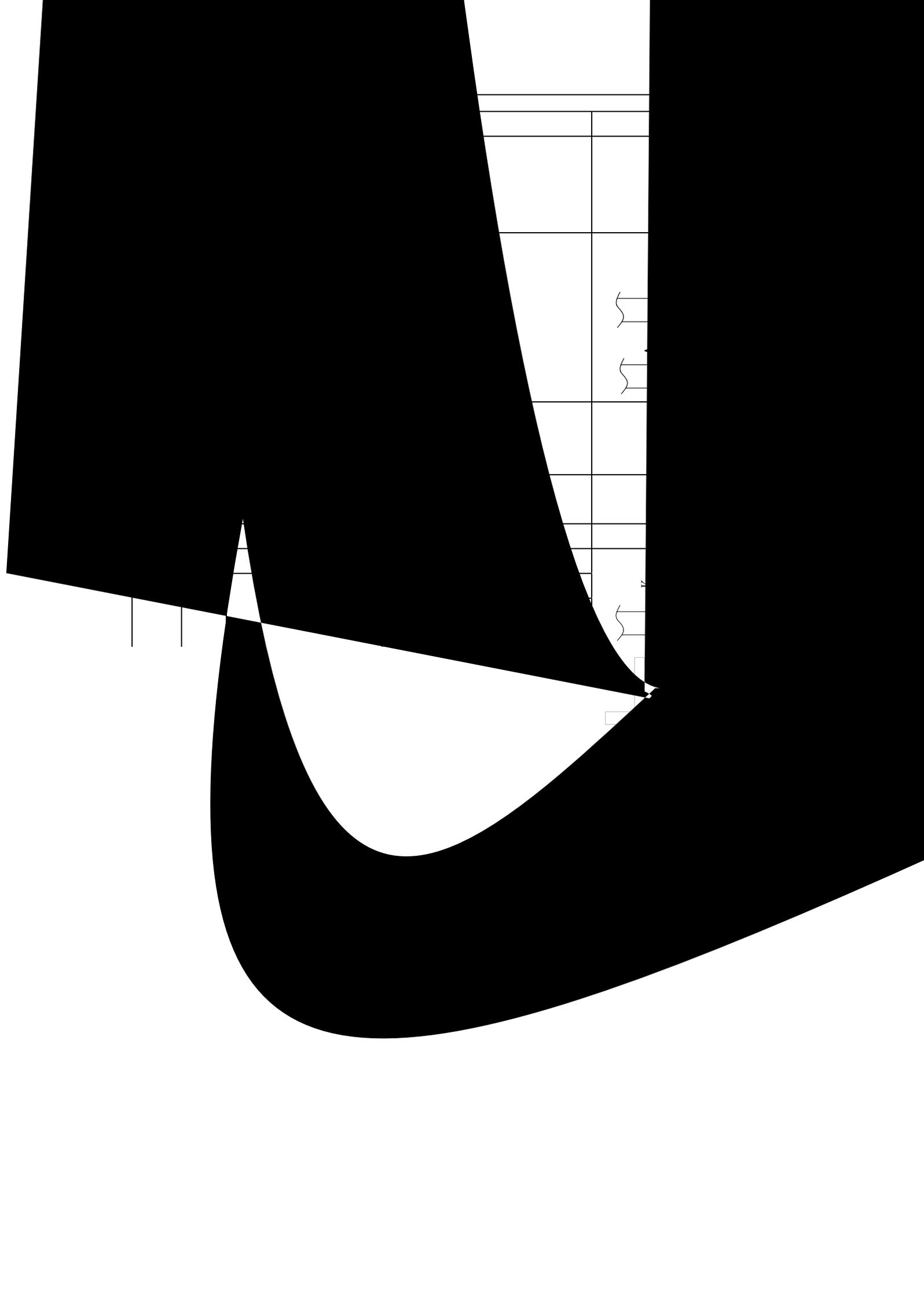
6.2.11

6.2.12



6.2.14

6.2.14 mm



6.2.15

6.2.16

6.2.16

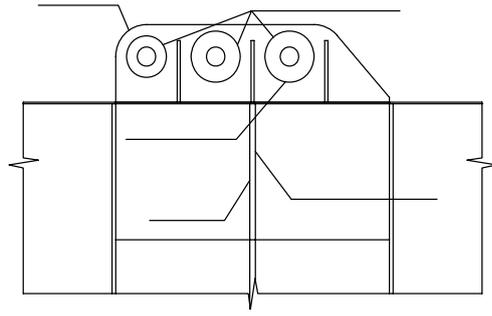
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6.3.6

6.3.6

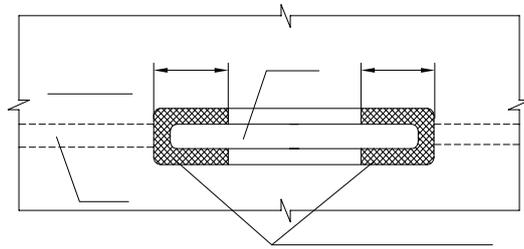
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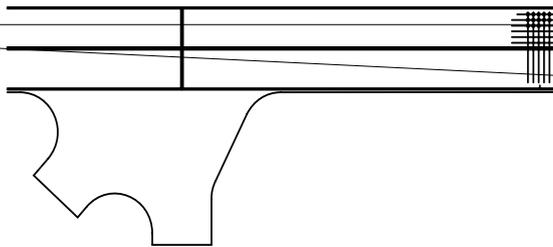


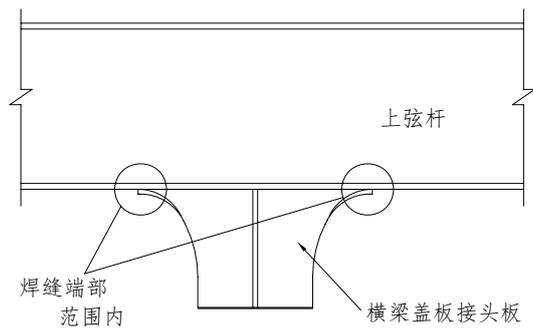
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6.3.14

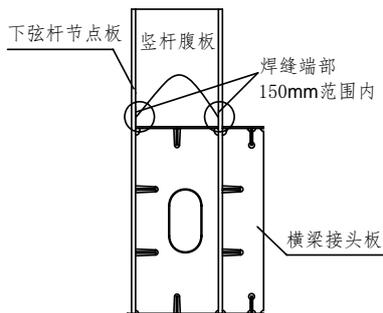
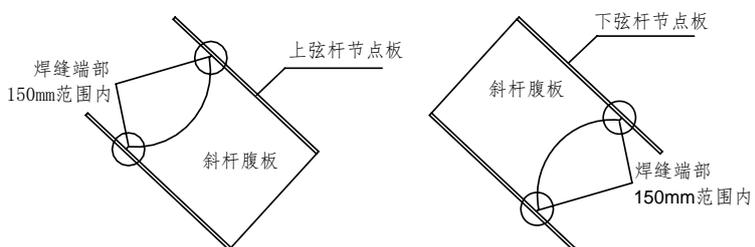


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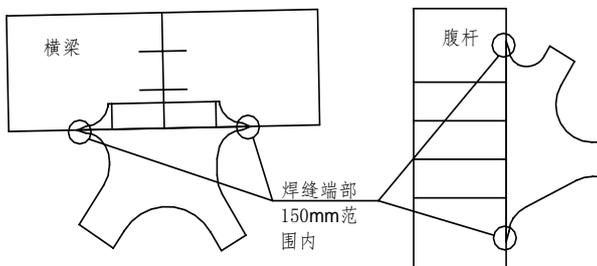




6.3.14-3



6.3.14-4



6.3.14-5

ü

ü

ü

6.4

6.4.1

6.4.2

6.4.3

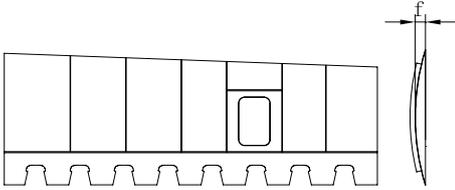
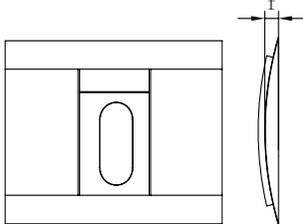
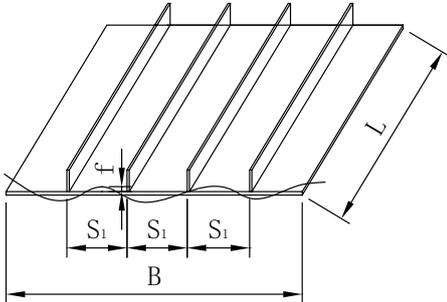
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6.4.4

6.4.4

mm

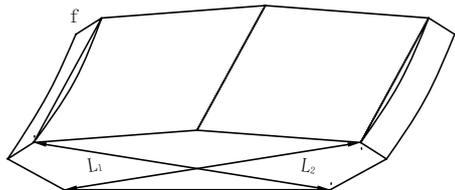


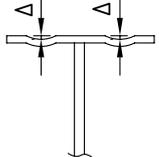
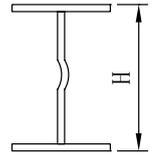
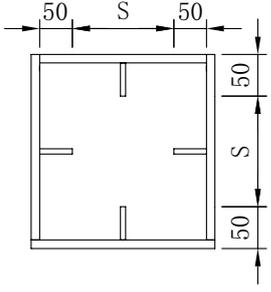
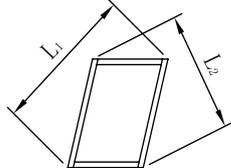
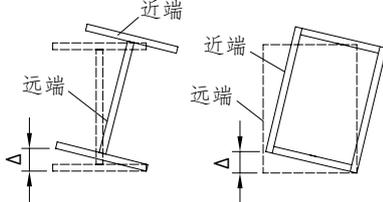
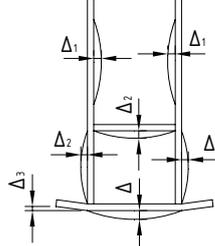
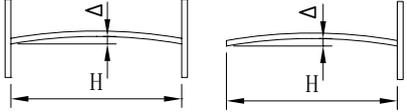
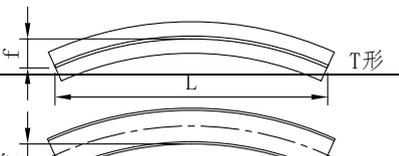
					
					
					

6.4.5

6.4.5

mm

				
				
				 <p>S: 孔群部位宽度</p>
				
				
				
				
				

6.4.7

6.4.7

mm

6.5

6.5.1

6.5.2

6.5.3

6.5.4

7

7.1 一般规定

7.1.1

7.1.2

7.1.3

7.2 预拼装

7.2.1

5 1

20m 3+1 2+1

7.2.2

7.2.3

7.2.3

7.2.3

mm

1	L		$\pm 2n \pm 20.0$	n
2	B	2	± 5.0	
		4	± 6.0	
		6	± 8.0	
3	H	H 2m	± 2.0	
		H 2m	± 4.0	
4			± 5.0	
5			± 3.0	
6			1.0	
7			4.0	
			8.0	
8			5.0	
9			+10.0 -5.0	L m
10			$3.0+0.1L_m$ 6.0	L_m 3 m
11			1.0	
12	f		2.0	
13			± 1.0	
14			5.0	

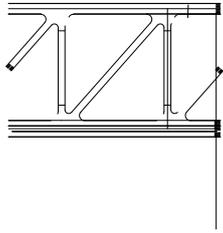
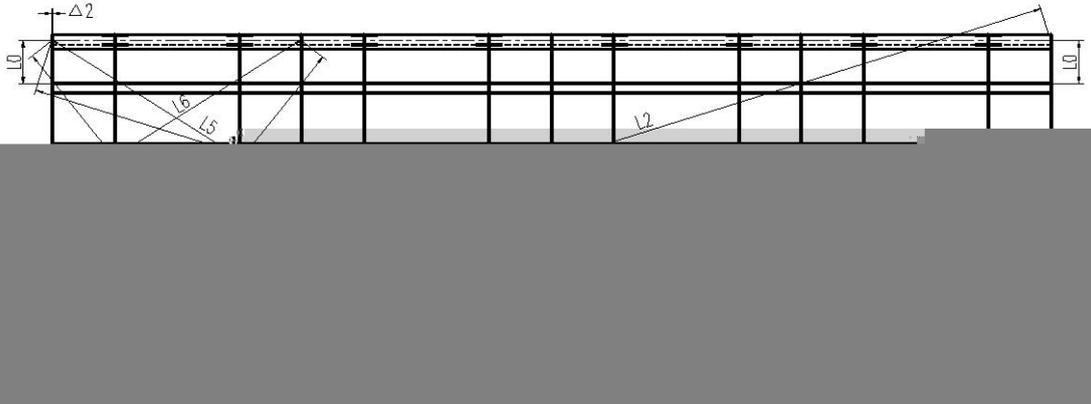
7.2.4

7.2.4

7.2.4

mm

1	L		$L/10000$ 10.0	
2	L1		± 3.0	
3	L2		± 5.0	
4	1/2	h	± 2.0	
5	1		5.0	
1 5				

			
6		10.0	
7	2	5.0	
8	L1-L2	$5+(n-1)$	n
	L3-L4	5.0	
	L5-L6	3.0	
9	L0	2.0	
7 9			
			
10	H	± 3.0	
11	B1	± 3.0	
	B	± 5.0	
12	B2	± 5.0	
13	L1-L2	3.0	
	L3-L4	5.0	
14	L5-L6	3.0	

		L7-L8	5.0	
15	H1		+5.0 0	()
16	H2 H3		± 5.0	
17		60mm	± 3	
		60mm	± 5f/100 10.0	
18			± 5.0	
19			± 8.0	
20			1.5	
21			3.0	

7.3 钢塔预拼装

7.3.1

7.3.2

1

2

3

4

0.04mm 1/3

5

5

6

7.3.2 7.3.2 mm

1	L	$\pm 2.0 \times n$	n
2		1.0/6000	
3		2.0 Φ	

4	0.2mm	25
5	100	
1.0mm		
6	7.3.3	

7.3.3 mm

1		L	$\pm 2.0 \times n$	n
2			1.0/6000	
3			2.0	3.0mm
4			50 40 25	
5		D	3.0	
6			± 3.0	
7		B1 B2	± 2.0	
8			2.0	

7.3.4

7.4 试拼装

7.4.1

15

7.4.2

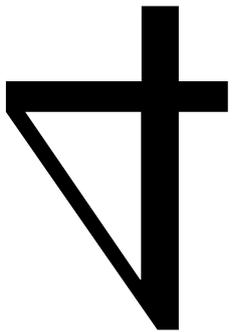
7.4.3

7.4.4

20%

2

10%



7.4.5

7.4.6

100%

0.75mm

100%

1.0mm

100%

0.75mm

100%

1.5mm

7.4.7

75%

0.2mm

25%

7.4.8

7.4.8

7.4.8

mm

1

± 2.0

2

± 2.0

—

3

l/5000

l

4

4.0

			± 2.5
			± 5.0

7.4.9

7.4.9

7.4.9

mm

1	H	± 2.0	H 2m
		± 4.0	H 2m
2	L	± 8.0	
3		± 15.0	
4		± 3.0	—
5		+10 -3.0	
6		L/5000	L
7		2.0	
		2.0	
		8.0	
		4.0	—
8		3.0	—
9		4.0	—
10		5.0	—
11		3.0	

7.4.10

7.5 检验

7.5.1

7.1

7.2

7.5.2

7.3

7.5.3

7.4.4

7.5.4

7.5.5

7.4.6

7.5.6

7.4.7

7.5.7

7.4.8

7.4.9

8

8.1 一般规定

8.1.1

8.1.2

1

2

3

4

5

6

7

8

9

8.1.3

0.1m²

1.5%

8.1.4

8.2 成品尺寸

8.2.1

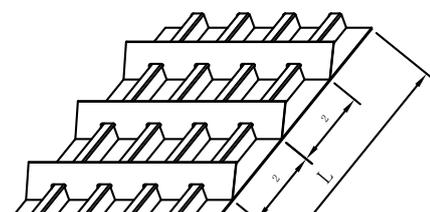
8.2.1

8.2.1

mm

1

± 2.0
4.0



			3.0	
			2.0	
2		L	± 2.0	
		B	± 2.0	
		L_1-L_2	5.0	
		f	1/1000	
		f	2.0	
3			± 2.0	
		L_1-L_2	5.0	
		f	2.0	
		f	2.0	
4		L B	± 2.0	
		f	S ₁ /250	
			3.0	

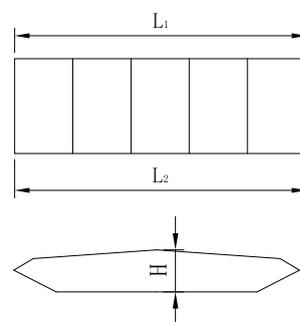
8.2.2

8.2.2

8.2.2

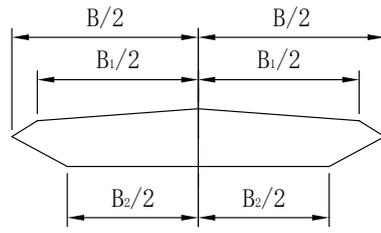
mm

	L_1	
1	L_2	± 2.0
2	H	± 2.0



$B_2/2$

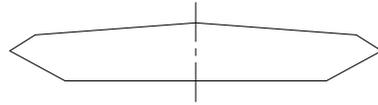
6 ± 4.0

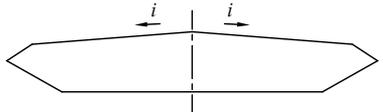
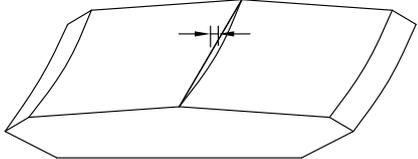


5

$L_1 - L_2$

6.0



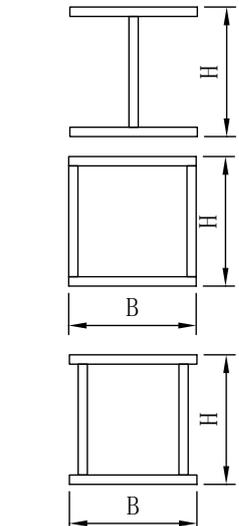
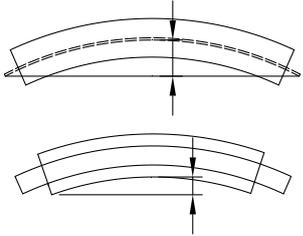
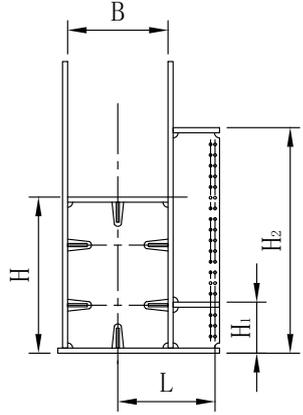
10		$\pm 0.1\%$	
11	f	$3.0+0.1L$	

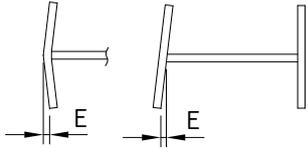
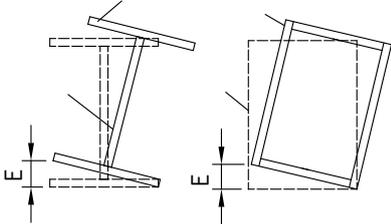
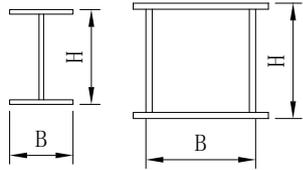
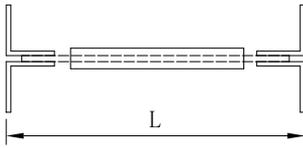
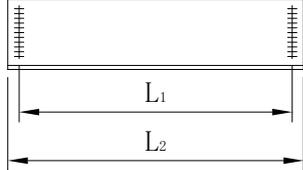
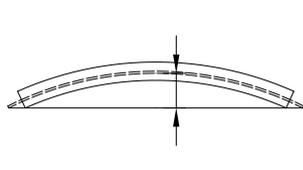
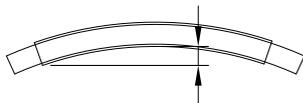
8.2.3

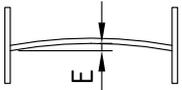
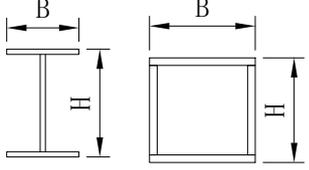
8.2.3

8.2.3

mm

1	H	-0.5 -2.0 ± 1.0		
2	B	± 1.0 ± 2.0	2m	
3	L	± 4.0		
4		2.0 1000 3.0 1000		
5		2.0 L 4000 3.0 4000 L 16000 5.0 L 16000		
6	B	+1.5 0		
7	H	± 1.0		
8	H ₁ H ₂	± 1.5		

9		L	± 2.0		
10			0.5	600	
			1.5		
			1.0	600	
			1.5		
11			3.0		
12		H	± 1.0	2m	
		± 1.5			
13		B	± 2.0		
			± 1.0		
14		L	+0.5 -1.5		
			± 1.5		
15		L	$L_1 \pm 1.0$	L_1	
			$L_2 \pm 5.0$		
16		f	3.0	100mm	
17		f	+3.0 0		

18			$h/500$	5.0	
19		H	± 1.5		
20		B	± 2.0	2m	
21		L	± 5.0		
22			2.0		

6

"

B"

17

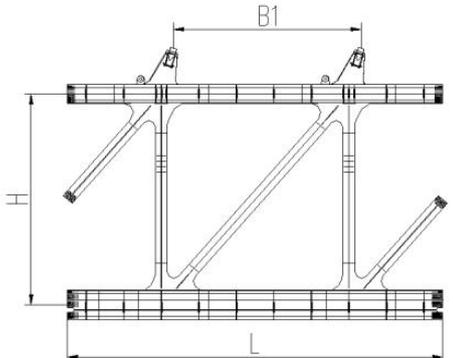
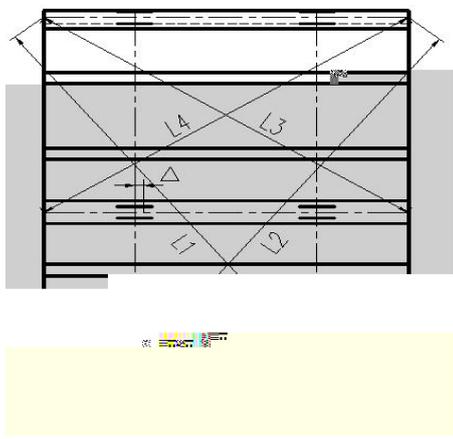
h

8.2.4

8.2.4

8.2.4

mm

1	H	± 2.0	2	
2	L	± 1.0		
3	B1	± 3.0		
4		3.0		
5		3.0		
6		L1-L2 5.0		
		L3-L4 3.0		

7		B1 ± 2.5	2	
		B:± 5.0		
8		L1-L2 3.0		
		L3-L4 5.0		
9		H1 +5.0 0	()	
10		B2 ± 5.0		
11		± 5.0		
12		± 6.0		
13		3.0		

8.2.5

8.2.5

8.2.5

mm

1	L	± 8.0	
2		± 15.0	
3	H 2m	± 2.0	
	H 2m	± 4.0	
4		+0.5 -1.5	
5		± 1.5	
6		± 1.0	
7		± 1.5	
8		3.0	100mm
9		+3.0 0	

10	f	+3.0 0	
		10.0 -3.0	
11		4.0	
12		h/350	8.0
13		h/500	5.0
14		0.5	
		1.5	

8.2.6

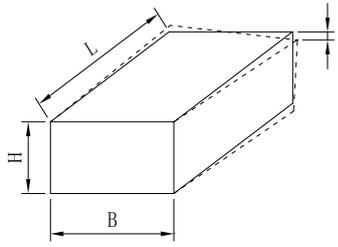
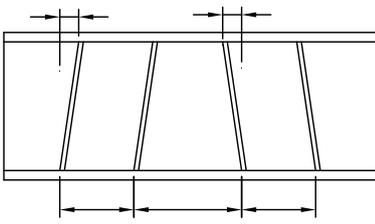
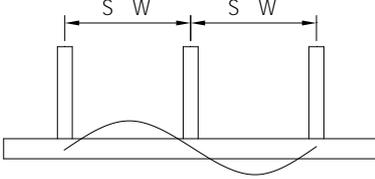
4.6.2 4.6.3

8.2.7

8.2.7

8.2.7

mm

1	L	± 2.0		
2	H	± 2.0		
3	B	± 2.0		
4	D	3.0		
5		3.0		
6		2.0		
7	S	± 2.0		
8		3.0		
9		W/300	W S	
		S/500		
		2.0		

8.3 检验

8.3.1

6.4.4

8.2.2

8.2.3

8.2.4

4.6.2

4.6.3

8.2.7

8.3.2

9

9.1

9.1.1

9.1.2

9.1.3

9.1.4

9.1.5

9.2

9.2.1

9.2.2

μ

9.2.3

9.3

9.3.1

9.3.2

9.3.3

9.3.4

9.3.5

9.3.6

9.3.7

9.4

9.4.1

9.4.2

9.4.3

9.5

9.5.1

9.5.2

9.6

9.6.1

9.6.2

9.6.3

9.6.4

9.6.5

9.6.6

9.6.7

10

10.1

10.1.1

10.1.2

10.1.3

10.2

10.2.1

10.2.2

10.2.3

10.2.4

2

10.2.5

10.3

10.3.1

10.3.2

10.3.3

10.3.4

10.3.5

10.3.6

10.3.7

10.4

10.4.1

10.4.2

10.4.3

10.5

10.5.1

80%

10.5.2

10.5.3

10.5.4

10.5.5

10.3

10.5.6

50kg

10.6

10.6.1

0%

10.6.2

0%

11

11.1

11.1.1

11.1.2

0/0

0/0



9
9 (

9%

11.2

11.2.1

%

11.2.2

%

(

%

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11.2.3

%

11.3

11.3.1

11.3.2

%

%

11.3.3

%

11.3.4

11.3.5

%

(
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%

11.4

11.4.1

11.4.2

%

4C (

C

%

B)%
%

%^o

)

%

11.4.3

%

11.4.4

%

U

11.4.5



%

(

)

11.4.6

%

%

11.5

11.5.1

11.5.2

%

(
)

+

%



%

)

%

11.5.3



(

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%

(

11.5.4

%

%U

(

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(
(+ +
)

(

(

11.6

11.6.1

11.6.2

5.2.1

11.6.3

G

%

11.6.4

%

11.6.5

%

11.6.6

%

(

11.6.7

%

11.7

11.7.1

(

11.7.2

11.1 11.2

%

11.7.3



%

11.7.4

%

U

11.8

11.8.1

11.8.2

11.8.3

10m

5mm

11.8.4

%

(

11.8.5

11.3.5

11.8.6

%

S

S

12

12.1

12.1.1

12.1.2

12.1.3

12.2

12.2.1



12.2.3

12.2.4

12.2.5

12.3

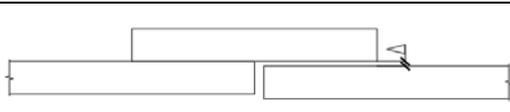
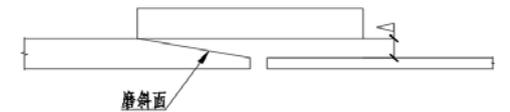
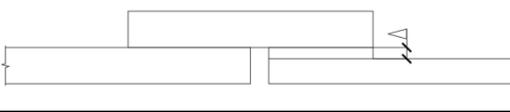
12.3.1

12.3.2

12.3.3

12.3.4

12.3.4

12.3.5

12.3.6

12.3.6-1

$$I_U = \vec{B}$$

12.3.6-2

12.3.7



□ □ □ □ □ □ □

12.3.8

μ μ

13

13.1

13.1.1

13.1.2

0/
0

" " " "

A+

13.1.3

13.1.4

%

13.1.5

%

(

)

13.2.2

>

>

>

%

>

>

>

13.2.3

%

%

19)

13.2.4

%

19) +

13.2.5

13.2.4

13.2.6

> (> %

19)

13.3

13.3.1

%

(

%

13.4

13.4.1

%

13.4.2

%

+

%

13.4.4

%

A

A.1

A.1.1

10% 1 10

A.1.2

A.1.3

5

A.1.4

8

A.1.5

A.2

A.2.1

1								
2	C	Si	Mn	P	S			
3		Rel			Rm	A		180
KV2	Z							

4

5 Z

Z

A.2.2**A.2.1****A.2.3**

1

2

C Si Mn P S Ni

Rel

Rm

A

KV2

3

C Si Mn P S Ni

Rel

Rm

A

KV2

4

C Si Mn P S Ni

Rel

Rm

A

KV2

5

P S

A.2.4

1

C Si Mn P S

2

Rel

Rm

A

A.2.5

:

1

2

3

4

5

6

A.2.6

1

2

1

2

3



- 4
- 5
- 6
- 7
- 8
- 9

3

6

A.3

A.3.1

A.3.2

A.3.3

- 1
- 2
- 3
- 4
- 5
- 7

7

7

B

B.0.1

B

B

1			1.0mm
			1.0mm
		5.0mm	
2			2.0mm
			2.0mm
3			
4			0.8mm
			0.8mm
			4.0mm
			4.0mm
			0.5mm
			0.5mm
			1mm
			1mm

B.0.2

B.0.3

C

C.1

C.1.1

C.1.2

C.1.3

C.1.4

1

2

3

4

5

6

2mm

10%

10

-2mm

2mm
(mm)

7

20

8

9

10

11

Q370

Q370

C.1.5

T

C.2

C.2.1

C.2.2

T

C.2.2

	C.2.2	T	mm
1	t 16	0.5t 1.5t	— t—
2	16 t 25	0.75t 1.5t	
3	25 t 80	0.75t 1.3t	

C.2.2

C.2.2

C.2.3 T

C.2.3

	C.2.3 T	mm	
1	6.5 6.5	8 12	12 16
2	8 8	10 16	16 24
3	10 10	14 24	20 40
4	12 12	20	28

C.2.3

10mm

0.75 1.5

10mm

10mm

C.2.3

28mm

C.2.4

600mm

CO₂

400mm

C.2.5

C.3

C.3.1

6.2.12

1

C.3.2

C.3.3

U

C.3.4

C.3.5

C.3.5

C.3.5

1			1	GB/T 2650 91F (
			1	
			1	
			6	
			1	
2			1	
			6	
			1	
3	T		1	
			1	

1

=180

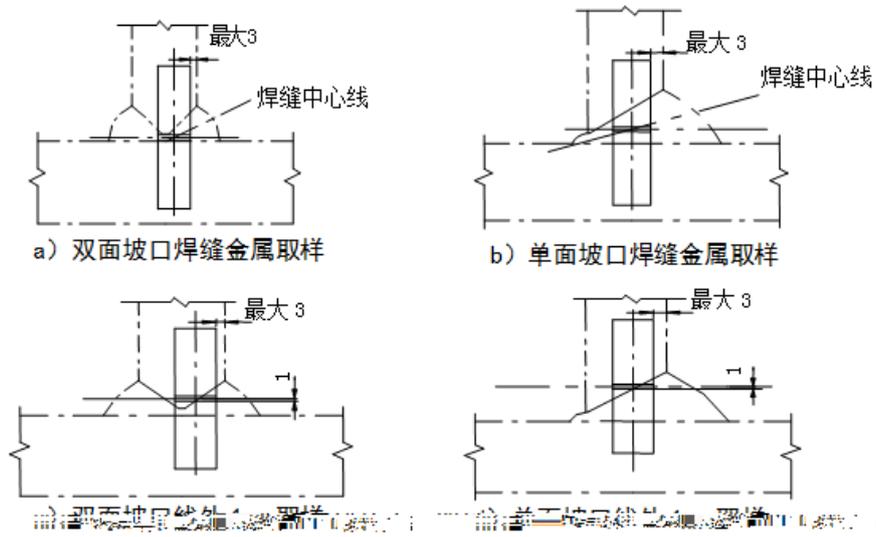
10mm

2

1.0mm

3

1mm
 3 12mm 8mm
 4 t 28mm C.3.5



C.3.5

C.3.5

C.3.5

											()	
1			1	1	—	3	—	3	—	—	1	1
	T		—	1	—	—	—	—	—	—	—	1
2	BS5400		1	—	—	3	—	3	2	2	—	1
			—	—	—	—	—	—	—	—	—	1
3	JIS Z 3040		—	—	—	—	—	—	2	2	—	—
		t 19	2	—	3	—	3	—	2	2	—	—
		t 19	2	—	3	—	3	—			—	—
4	AWS		2	—	—	5	—	5	—	—	4	—
		T	—	—	—	—	—	—	—	—	—	3

10mm

C.3.6

1

2

15%

3mm

3

C.3.6

3

0.7

3

6

3

2

0.7

0.5

C.3.6

	1			2			3			4		
	Q345q			Q370q			Q420q			Q500q		
	C	D	E	C	D	E	C	D	E	C	D	E
	0	-20	-40	0	-20	-40	0	-20	-40	0	-20	-40
	34J			41J			47J			54J		

1

2 20mm

27J

4

HV380

5

ISO 15614-1 2004

HV380

C.3.7

2.0 U

C.3.8

C.4

C.4.1

1

2

3

4

5

6

D

D.1

D.1.1

D.1.2

D.1.3

GB/T 10433

D.1.4

1 Q370

2

3

4

5

10%

1s

0.2s

1s

0.1s

6

1mm

7

15

D.2

D.2.1

D.2.2

6.2.12

D.2.3

6

3

30

3

D.3

D.3.1

30

3

2

1

D.3.2

GB/T 10433

3

2

1

D.4

D.4.1

1

2

3

4

5

6

E

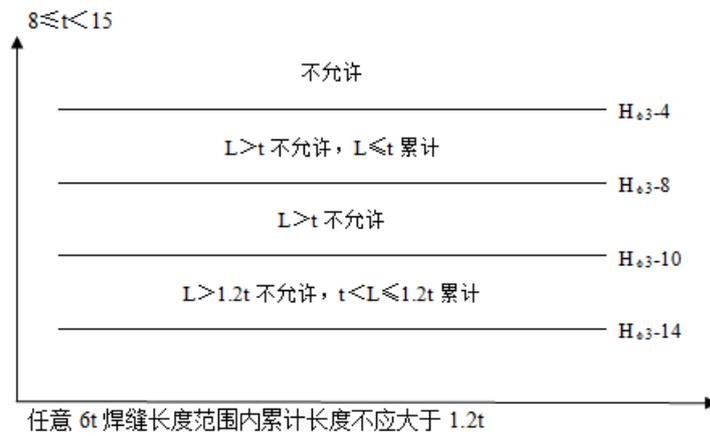
GB/T 11345

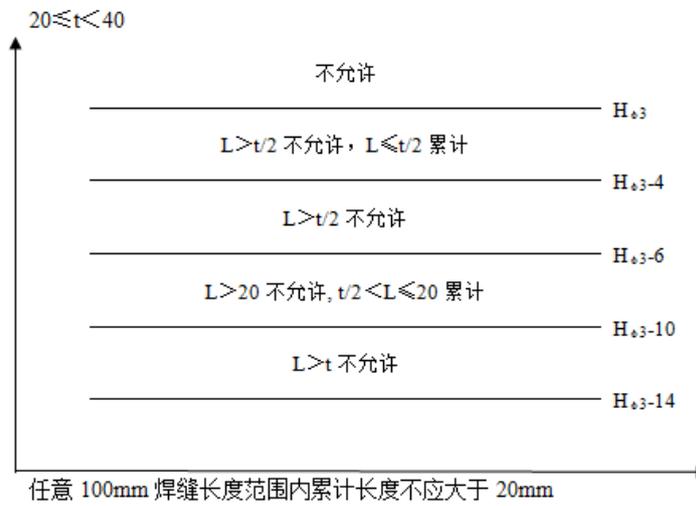
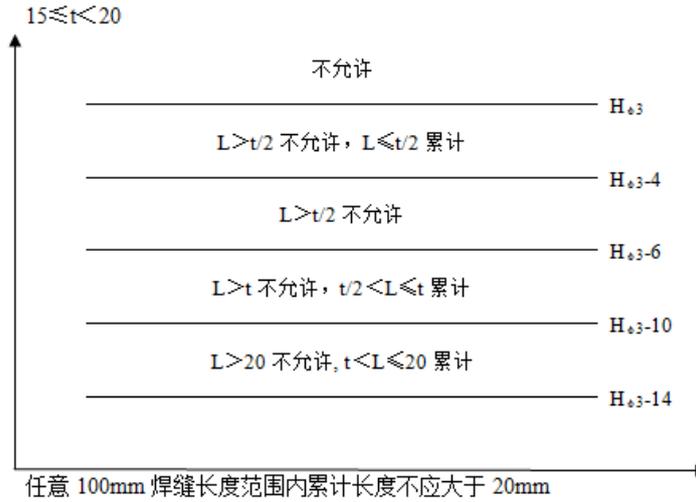
GB/T 29712

E.0.1

1	3mm		—
2			
3		10mm	5mm
4			
L		t	

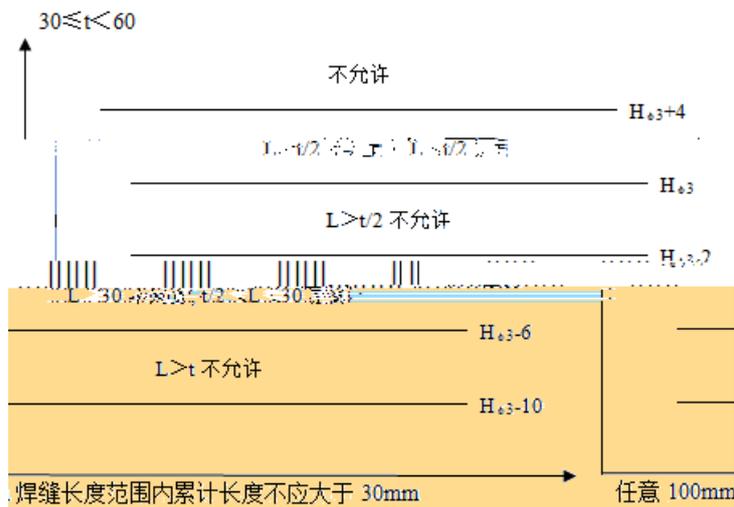
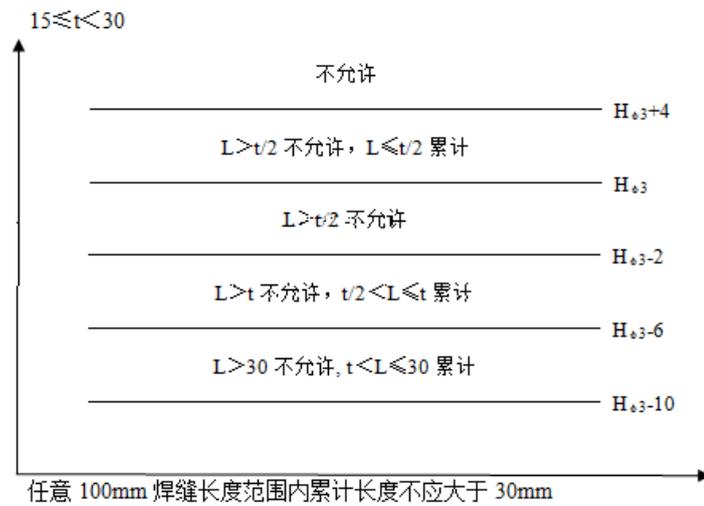
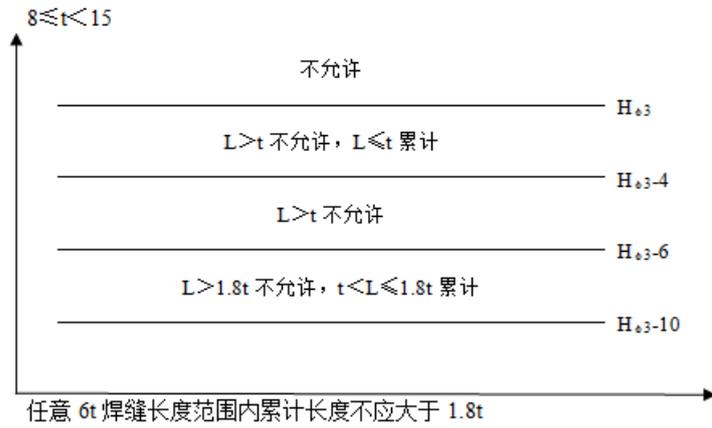
1 2





2

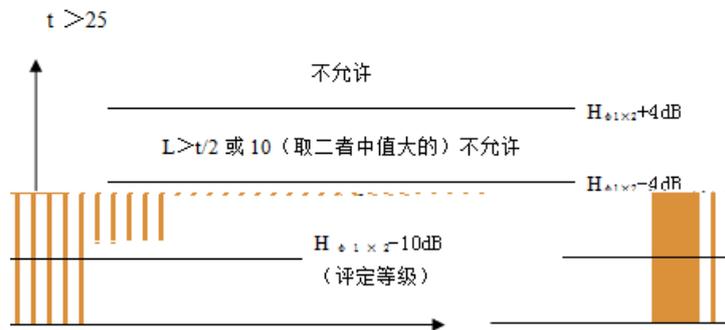
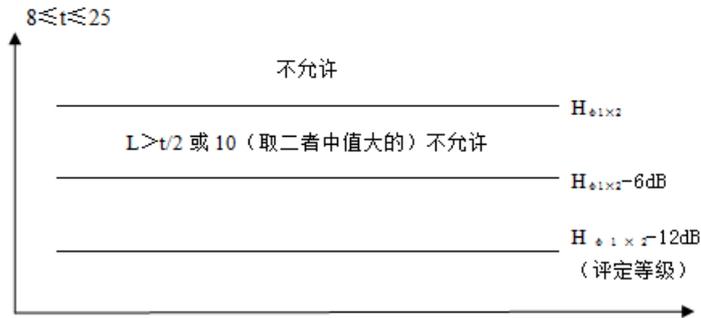
%





E.0.2

1			
2	10mm	5mm	
3		E.0.1	3
4			



E			mm			
			GB 11345-89	JB 4730-2005	JIS Z 3060-2002	
1		10 56	8 300	8 120	18	18 60
2		t/4 8	t/3 10	t/3 10	6	t/3
3		t/2 10	2t/3 12	2t/3 12	9	t/2

F

□ □ □ □ □ □ □ □

F.0.1

F.0.3

F.0.4

F.0.2

t

F.0.3

1

1

3

2

F.0.3-1

F.0.3-1

mm

	1	2
t	25	25
	10 10	10 20

3

F.0.3-2

F.0.3-2

	1	2	3	4	5	6	7
mm	1	1 2	2 3	3 4	4 6	6 8	8
	1	2	3	6	10	15	25

4

F.0.3-3

F.0.3-3

mm

1	t 25	0.5
2	t 25	0.7

5

6

)
0%

¹/₀

0%

F.0.3-4

	1			2
mm	10 10			10 20
t mm	10	10 15	15 25	25
	3	6	9	12

8

t/2

9

10

2

3

F.0.3-5

F.0.3-5

F.0.3-5

F.0.3-5

mm

	t		
1	t 12	4	6L 12t t
2	T 12	t/3	

L

GB/T3323-2005

5mm

10

F.0.4

F.0.5

G

GB/T

26951

GB/T 26952

G.0.1

10mm

G.0.2

G.0.3

G.0.3

G.0.3

G.0.3

G.0.3

mm

1	L=	L 1.5
2	d=	d 3

G.0.4

H

GB/T 18851

GB/T 26953

H.0.1

10mm

H.0.2

H.0.3

H.0.3

H.0.3

(mm)

1	L=	2
2		6

J

U

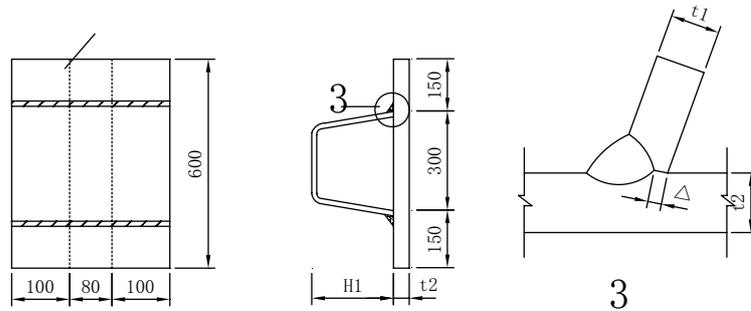
100
0.4mm

J.0.1

1000mm U 65%~80%
25mm 50mm

J.0.2

U 3
UT 80% J.0.2
U 70% U



J.0.2 U

K

K.1

K.1.1

K.1.2

K.1.3

K.1.4

K.1.5

K.1.6

K.1.7

K.1.8

K.2

K.2.1

K.2.1

		μ
		\pm

K.2.2

K.2.2

	$\%$	$($	$:$
	$($	$($	$:$

K.2.3

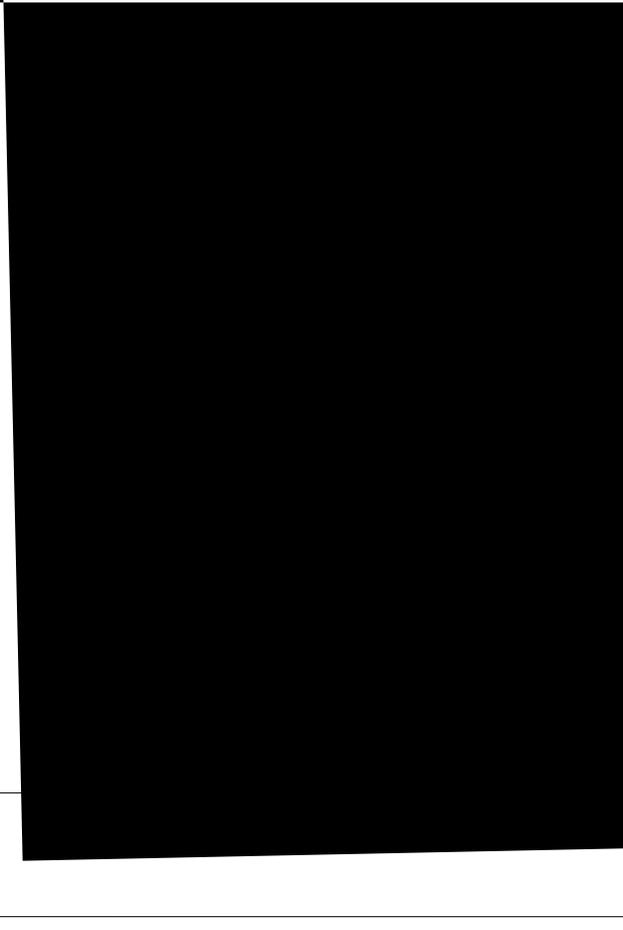
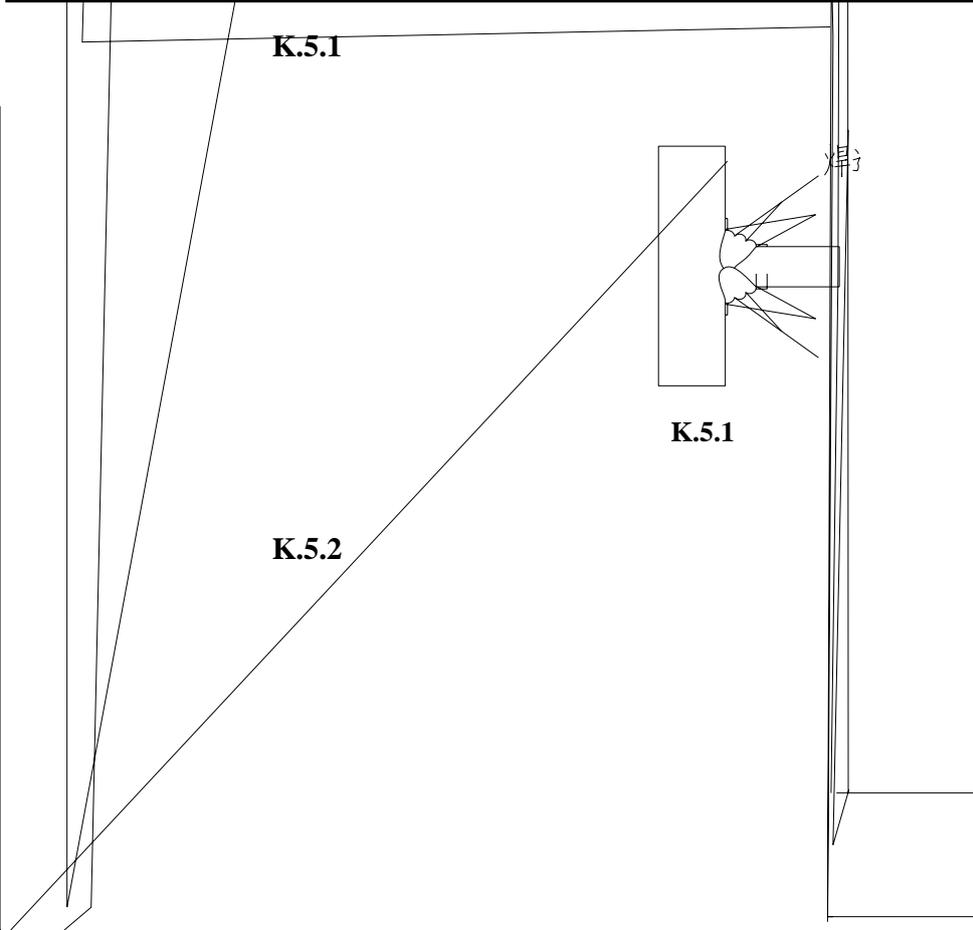
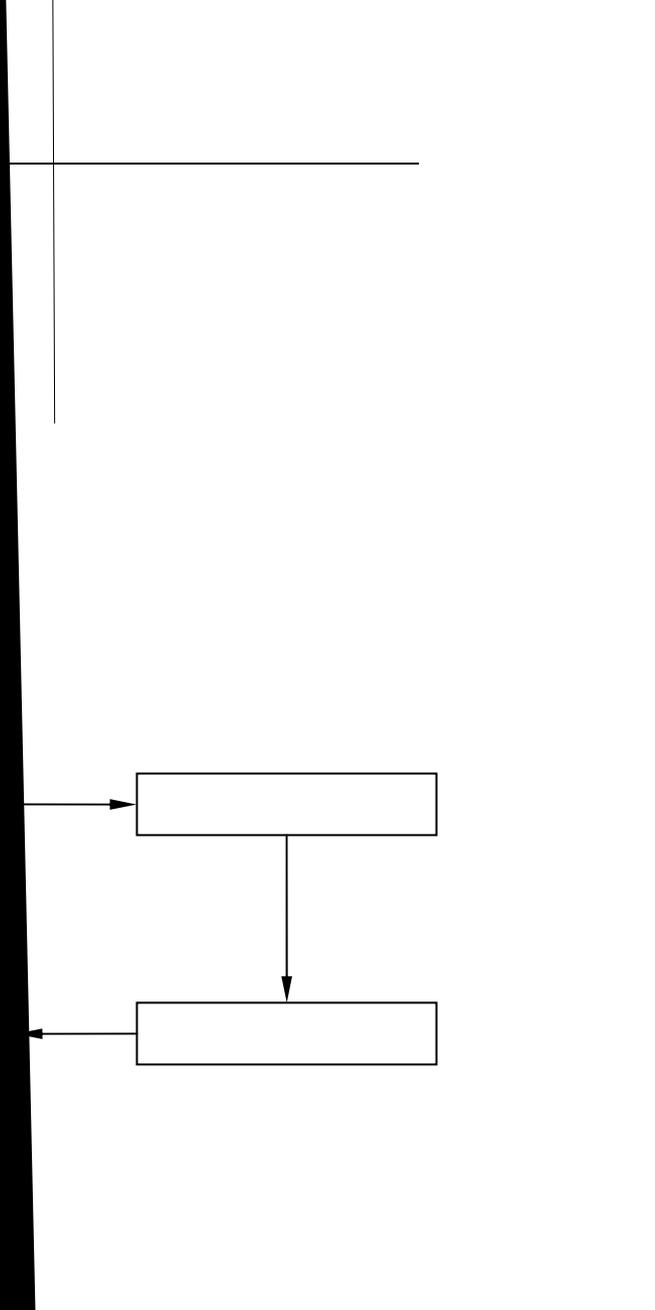
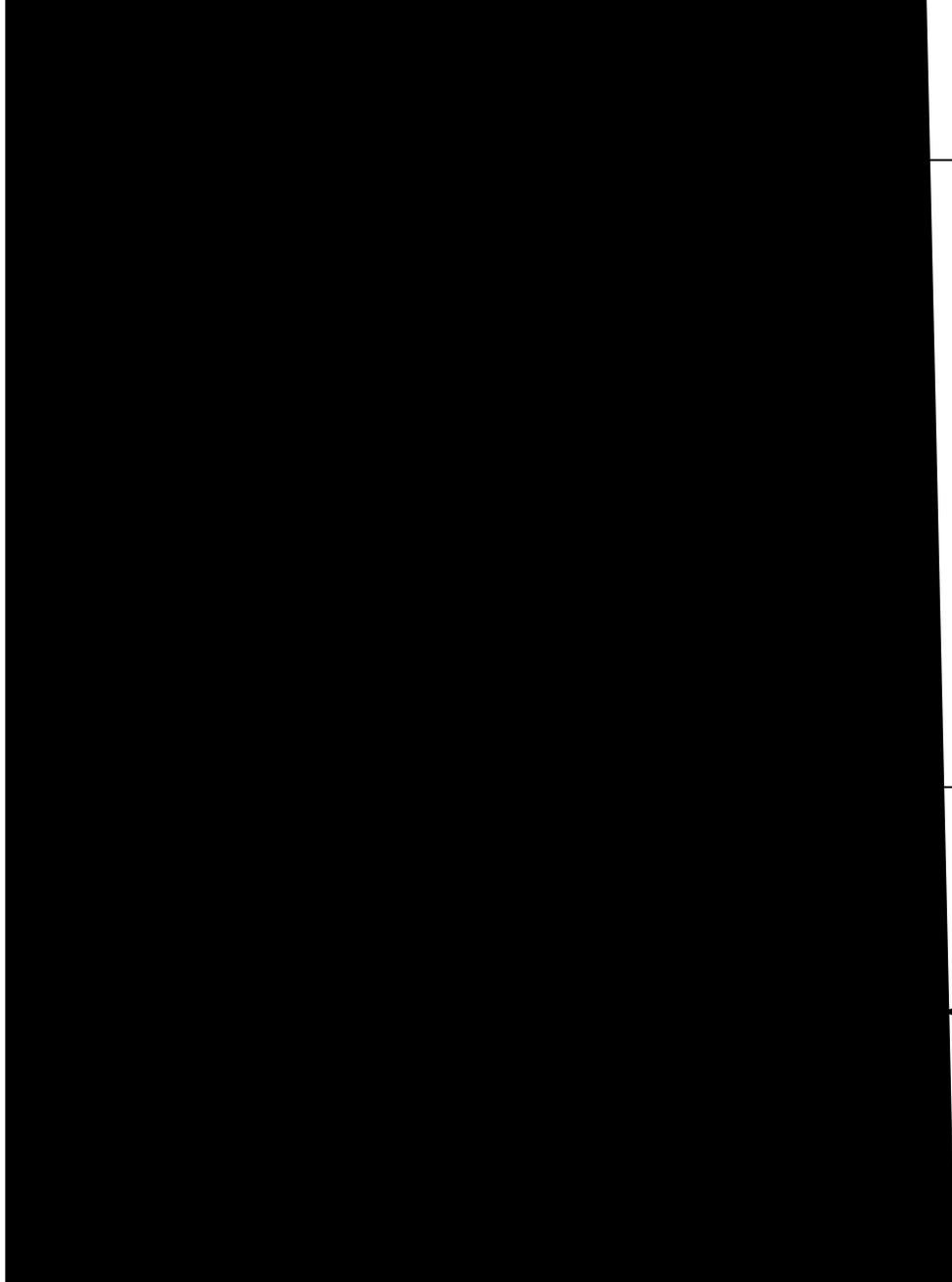
K.2.3

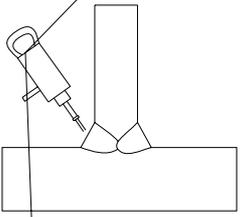
K.3

K.3.1

K.3.2

K.3.3





K.5.2

K.5.3

K.5.4

K.5.4

K.5.5

L

L.1

L.1.1

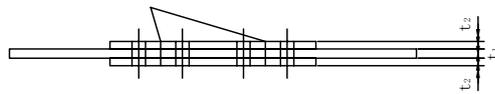
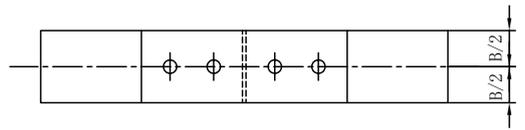
2000t

2000t

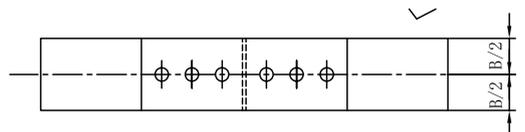
3

L.1.2

L.1.2



S



T

L.1.2

L.2

L.2.1

1%

L.2.2

2%

L.2.3

L.2.4

L.2.5

L.1.2

L.2.6

t1 t2

B

L.2.6

L.2.6

mm

	d	B
1	16	60
2	20	75
3	22	80
4	24	85

L.3

L.3.1 f

$$= \frac{\cdot \Sigma B}{\cdot}$$

N—

kN 3

m—

m=2

P—

kN 3

M

M.1

M.1.1

M.1.2

M.1.3

M.1.4

M.1.5

M.1.6

M.1.7

M.2

M.2.1

50cm

5

30cm

M.2.2

M.2.3

M.2.4

M.2.5

M.2.6

M.2.7

M.3

M.3.1

0.110 0.150 A 0.010

M.3.2

M.3.3

M.3.4

8

M.3.5

P

M.3.5

				M.3.5		KN				
				M12	M16	M20	(M22)	M24	(M27)	M30
	10.9S	P	Max	66	121	187	231	275	352	429
			Min	54	99	153	189	225	288	351
	8.8S		Max	55	99	154	182	215	281	341
			Min	45	81	126	149	176	230	279

M.3.6

M.3.7

2h

M.3.8

M.3.9

M.3.10

M.3.11

1

2

M.4

M.4.1

1

50%

2

3

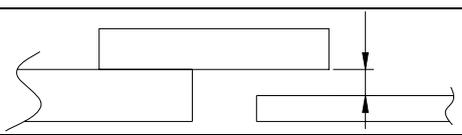
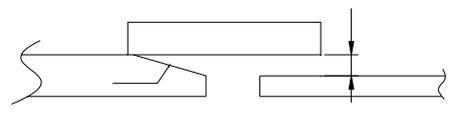
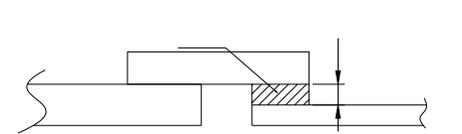
4

5

6

M.4.1

M.4.1

1		1.0mm
2		1.0 3.0mm 1 10 1.0mm
3		3.0mm 3mm

5

1.2

M.4.2

M.4.3

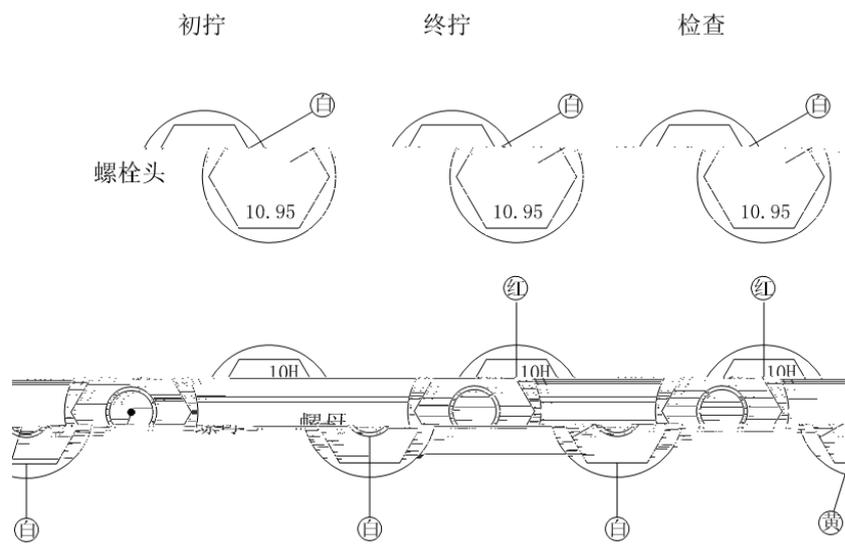
M.4.4

M.4.5

M.4.6

M.4.7

) (M.4.7



M.4.7

M.4.8

	T_c	K	D	P_c
T_c -		N	m	
K-			,	
D-			mm	
P_c -			kN	M.4.8

M.4.8

kN

1	d	M22	M24	M27	M30
2	P	200	230	300	370
3	P _c	220	253	330	407

M.4.8

P_c = 1.1 X

P

L 65mm

P_c=P**M.4.9****M.5****M.5.1****M.5.2**

24h

M.5.3

100%

10%

2

1

M.5.4

3

M.5.5

, 1

M.5.6

1

2 0.3

M.5.7

1

2

3 4 24

4 5

20

80 10% 2

2

5

30

0.9 1.1TC , ,

2

0.9 1.1

6

10 ~30

0.9Tch 1.05Tch

$\frac{H}{B}$

Tch- Nm

K-

P-

d- mm

7

1

1

2

3

4

2