

Ring System Scaffolding Ø60.2mm Instruction Manual

The site superintendent and supervisor engineer must read and execute referring to this manual before erection.



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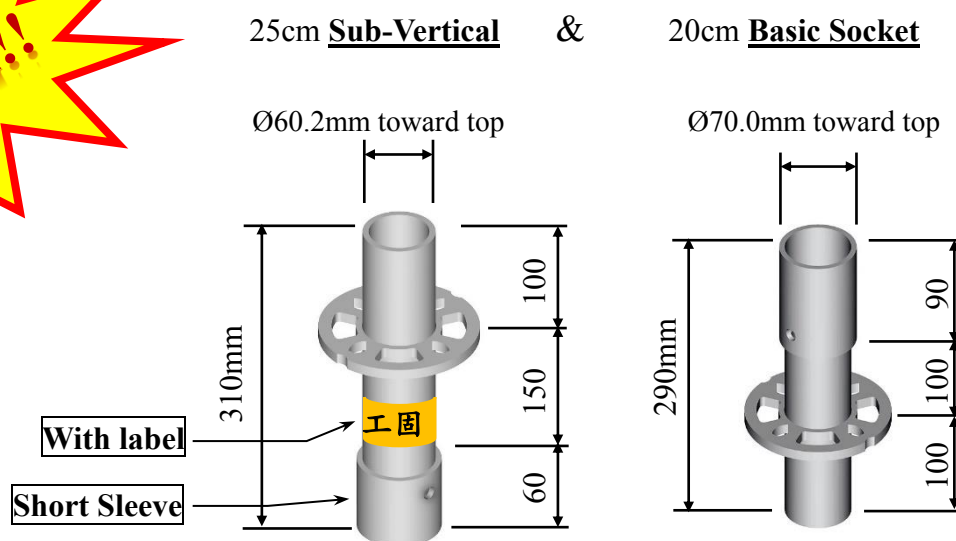


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※Quick Tips:

- **Sub-Vertical**: with **yellow label**.
- The sleeve of **Sub-Vertical** is shorter than **Basic Socket**.
- **Sub-Vertical** is for top of shoring.
- **Basic Socket** is for bottom of shoring.

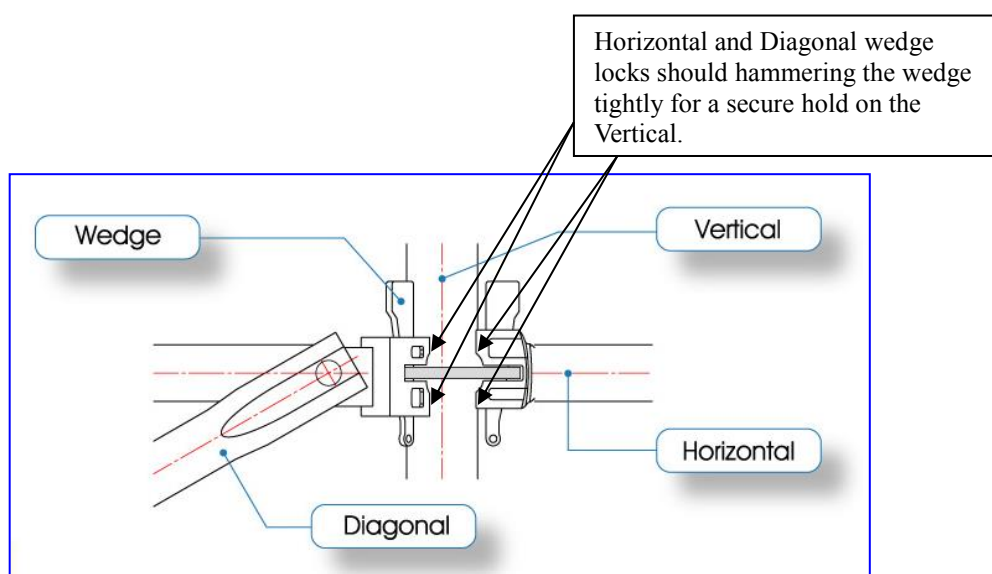
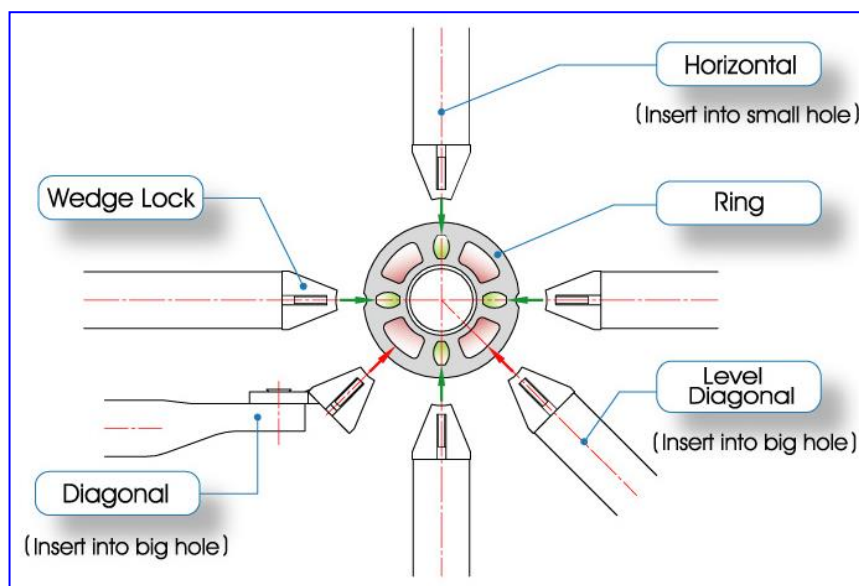
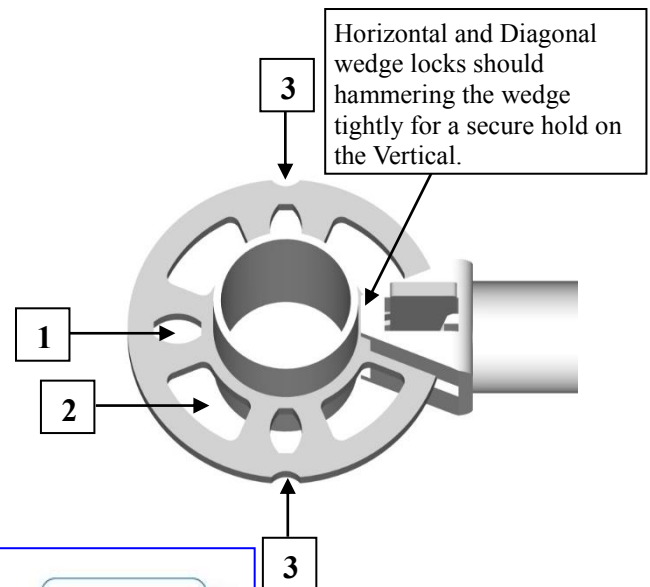
Please refer to page 5 、 6 、 14 for more details.



Assembly Diagram:

1. Small holes: 4 holes for Horizontal assembly.
(fix the wedge locks on ring and hammer the wedges tightly)
2. Big holes : 4 holes for Diagonal or Level Diagonal
Diagonal assembly (fix the wedge locks on ring and hammer the wedges tightly)
3. Alignment point: for Verticals assembly in alignment.

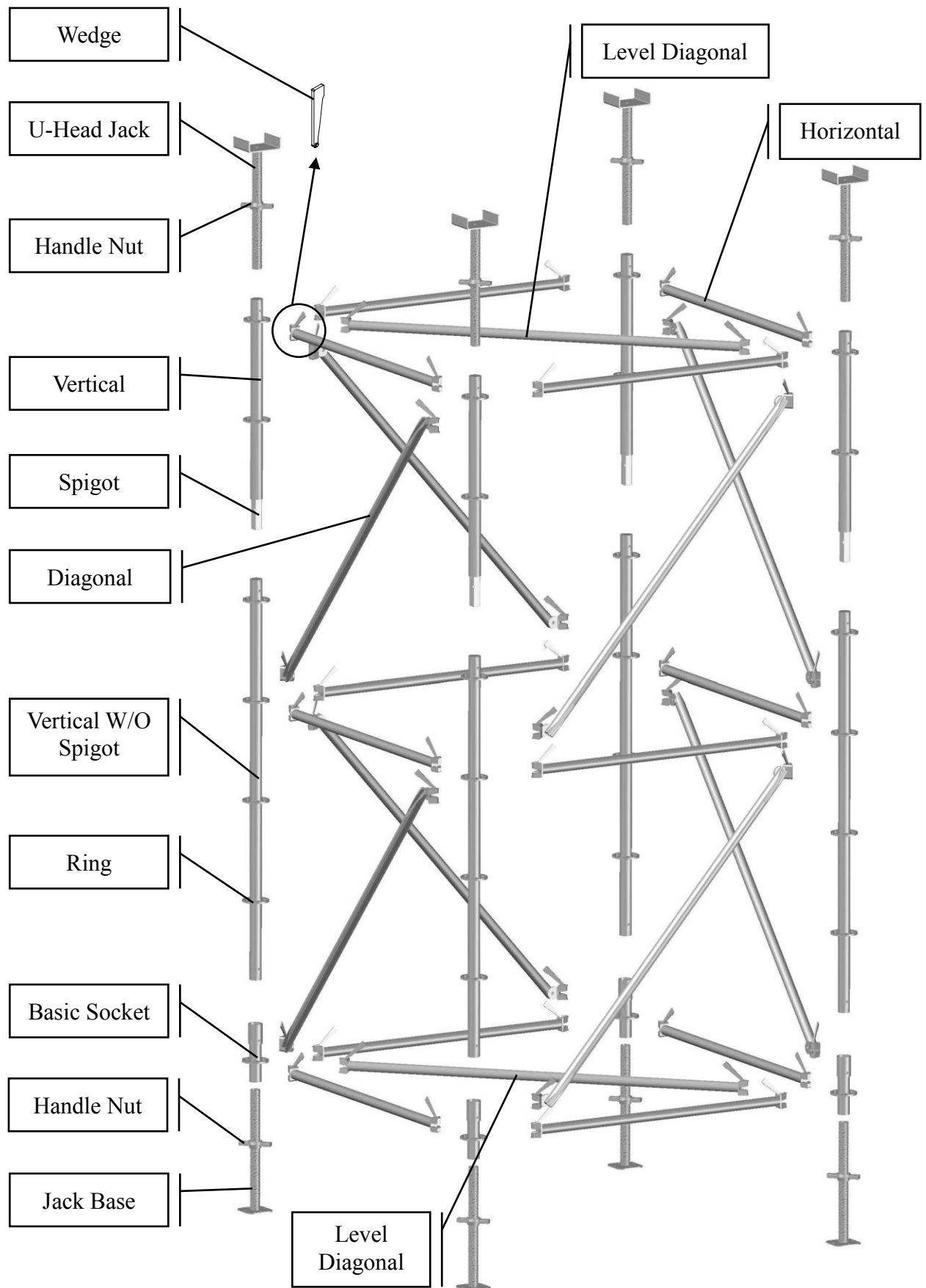
(U-Clip to secure firm connection of Verticals while lifting up)



Attention: Please adjust Horizontals or Diagonals until no visible gap between Wedge Locks and Verticals



Component Overview:



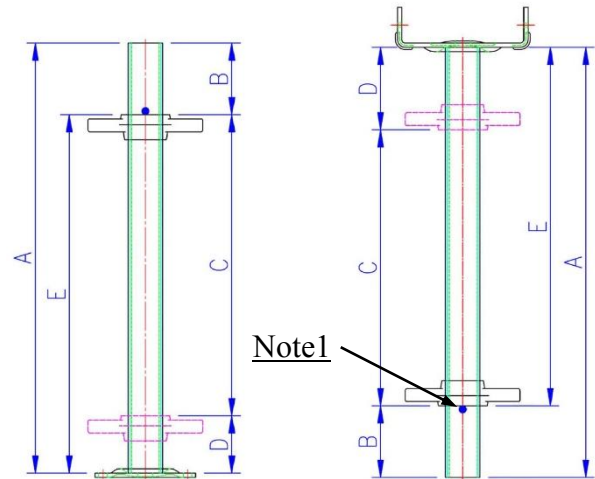


Dimensions and Specifications:

1. U-Head Jack and Jack Base:

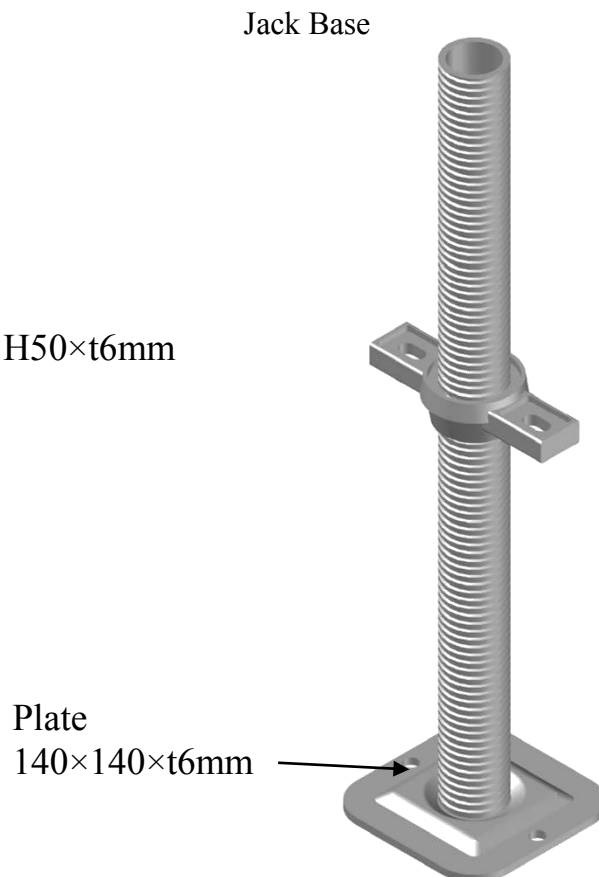
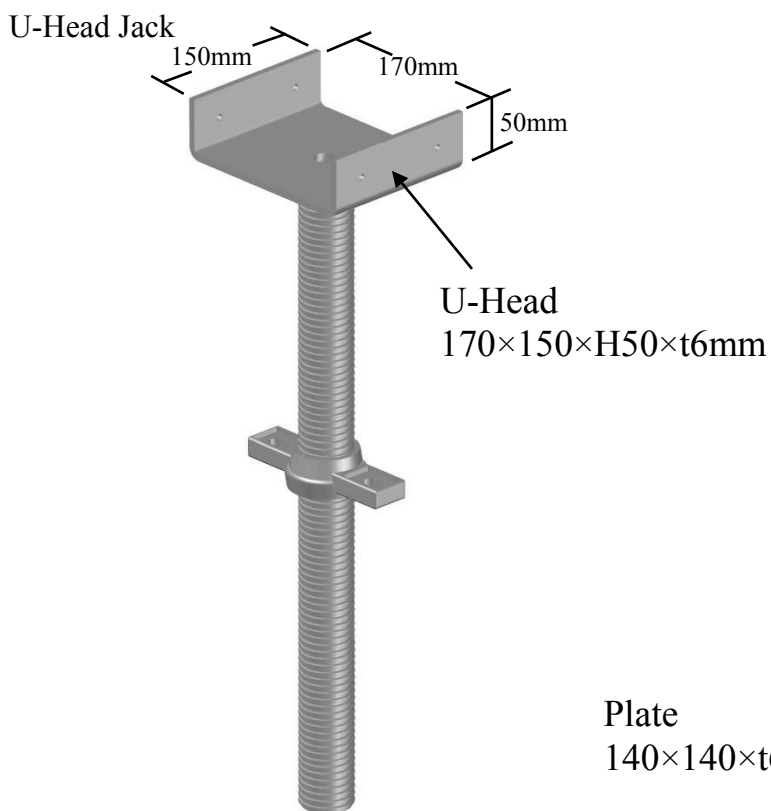
To adjust the Scaffold height.

Note 1 : Jack Base with a stop to prevent the Handle Nut from getting out and to ensure connection with Vertical over 150mm for safe load bearing.



All dimensions are basic on “mm” unit:

Adjustable Length Dimension		U-Head Jack			Jack Base		
(A)	(B)	Max.(E)	Min.(D)	Adjustable (C)	Max.(E)	Min. (D)	Adjustable (C)
600	150	400	80	320	400	80	320

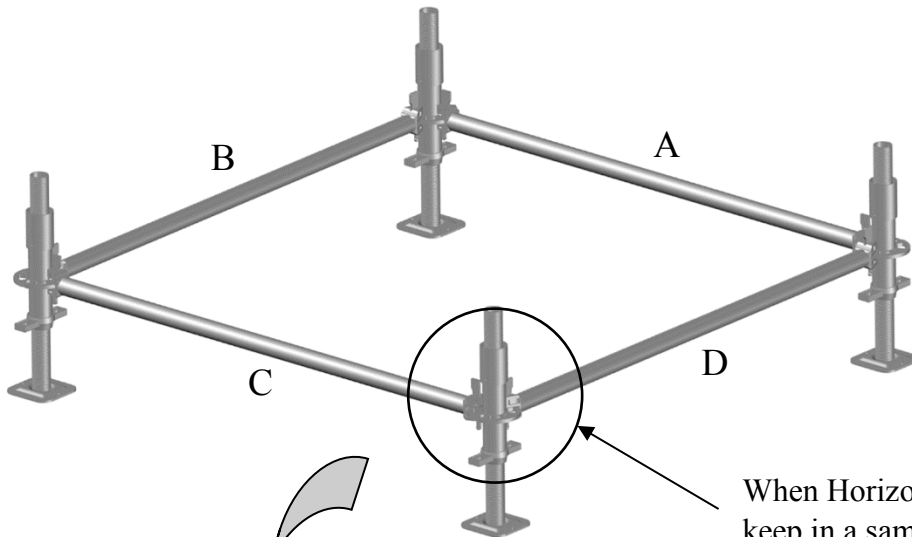


The tube dimension is $\text{Ø}48.2 \times 600\text{mmL} \times t5\text{mm}$. Material: STK 400.
The Handle Nut material is FCD450.

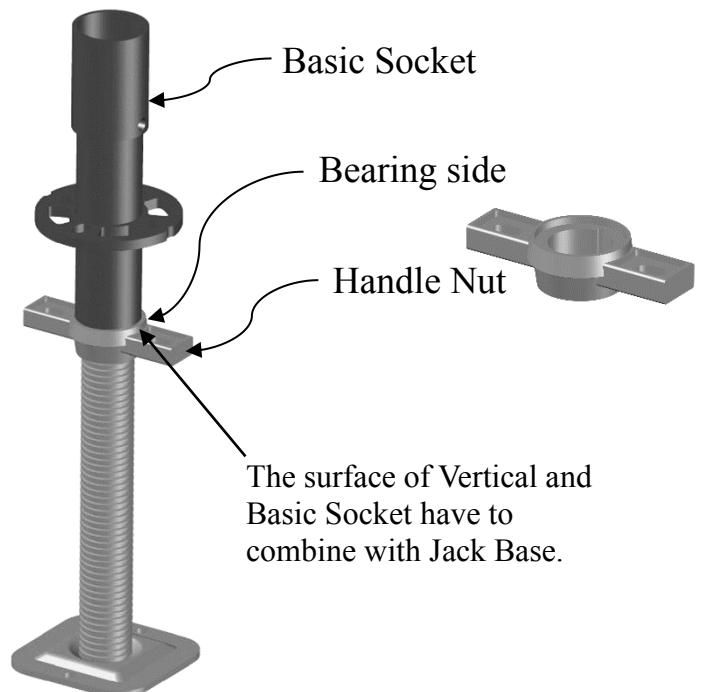
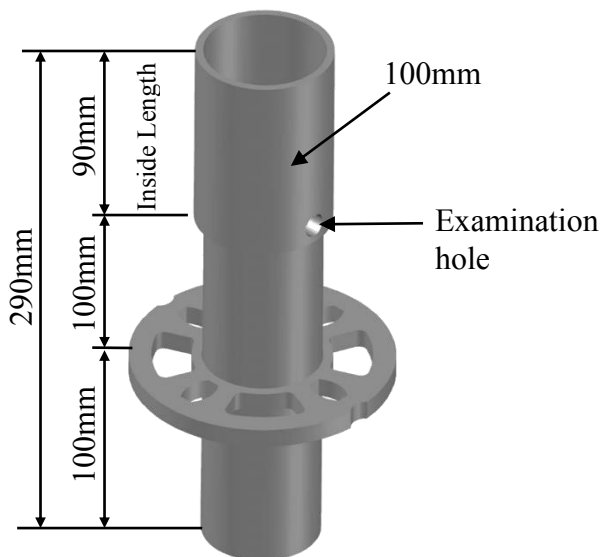


2. Basic Socket:

- For Horizontal connection to form a stable foundation.
- Material: STK 500
- Pipe $\phi 60.2\text{mm} \times T:3.2\text{mm}$
- L: 200mm divided by Ring from the middle.



When Horizontal A、B、C、D,
keep in a same height. It will make
Vertical in a great load bearing.



***Basic Socket usually use on the Jack Base and adjust the horizontality after first layer of Horizontal completed. There will no necessary to measure horizontality of scaffold again.**



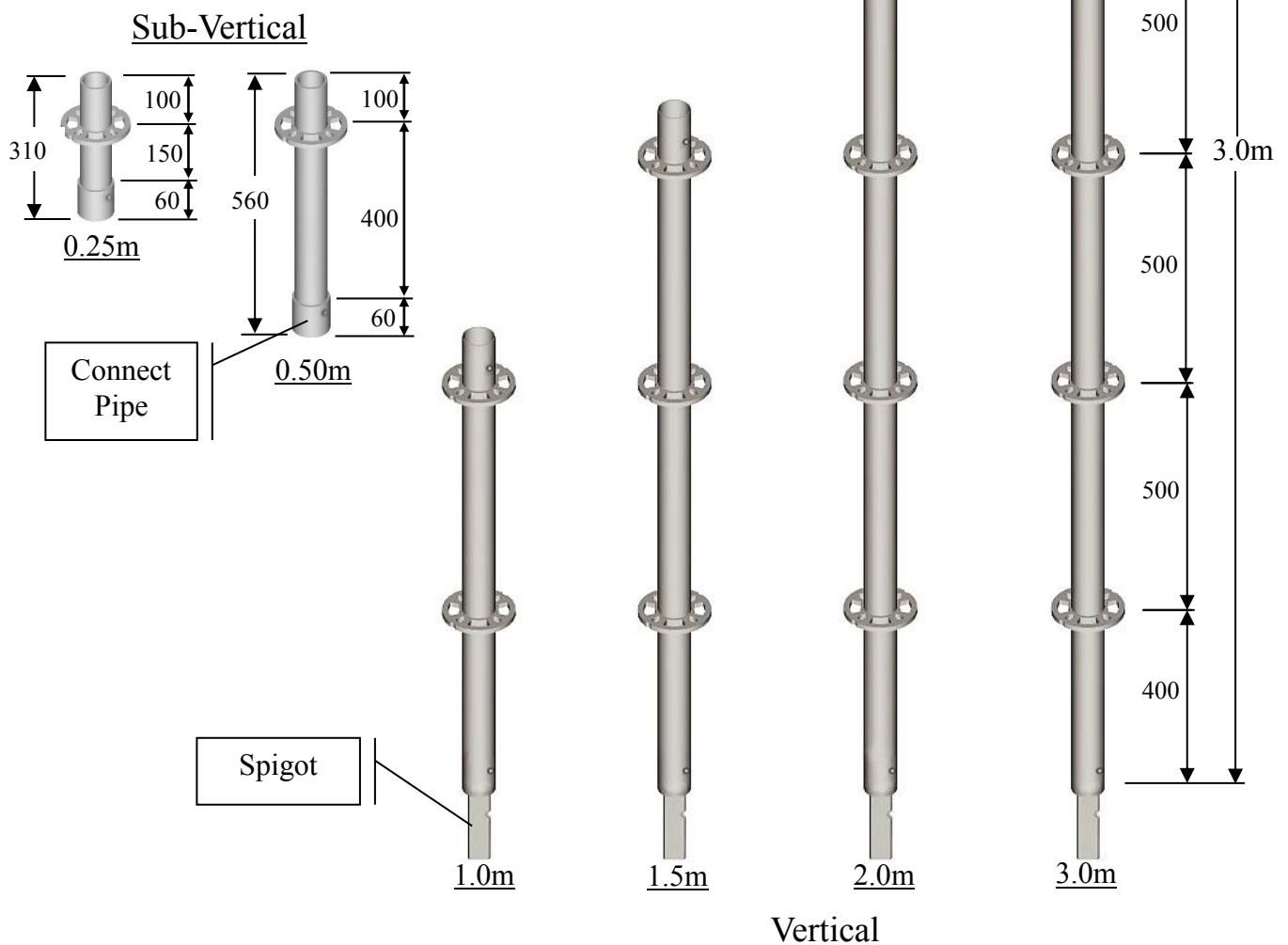
3. Vertical and Sub-Vertical:

I —Vertical and Vertical without Spigot :

- Vertical is the main support of the entire system connected by Spigot.
- Vertical (without Spigot) is only used on the first connection with Basic Socket.
- Material is used STK 500.
- Length: 1.0m, 1.5m, 2.0m, 3.0m
- Pipe: $\phi 60.2\text{mm} \times T: 3.2\text{mm}$
- Distance between rings: 500mm

II —Sub-Vertical :

- To ease the adjustments of shoring height, especially in big alterations.
- Material is used STK 500.
- Length: 0.25m, 0.5m
- Pipe $\phi 60.2\text{mm} \times T: 3.2\text{mm}$

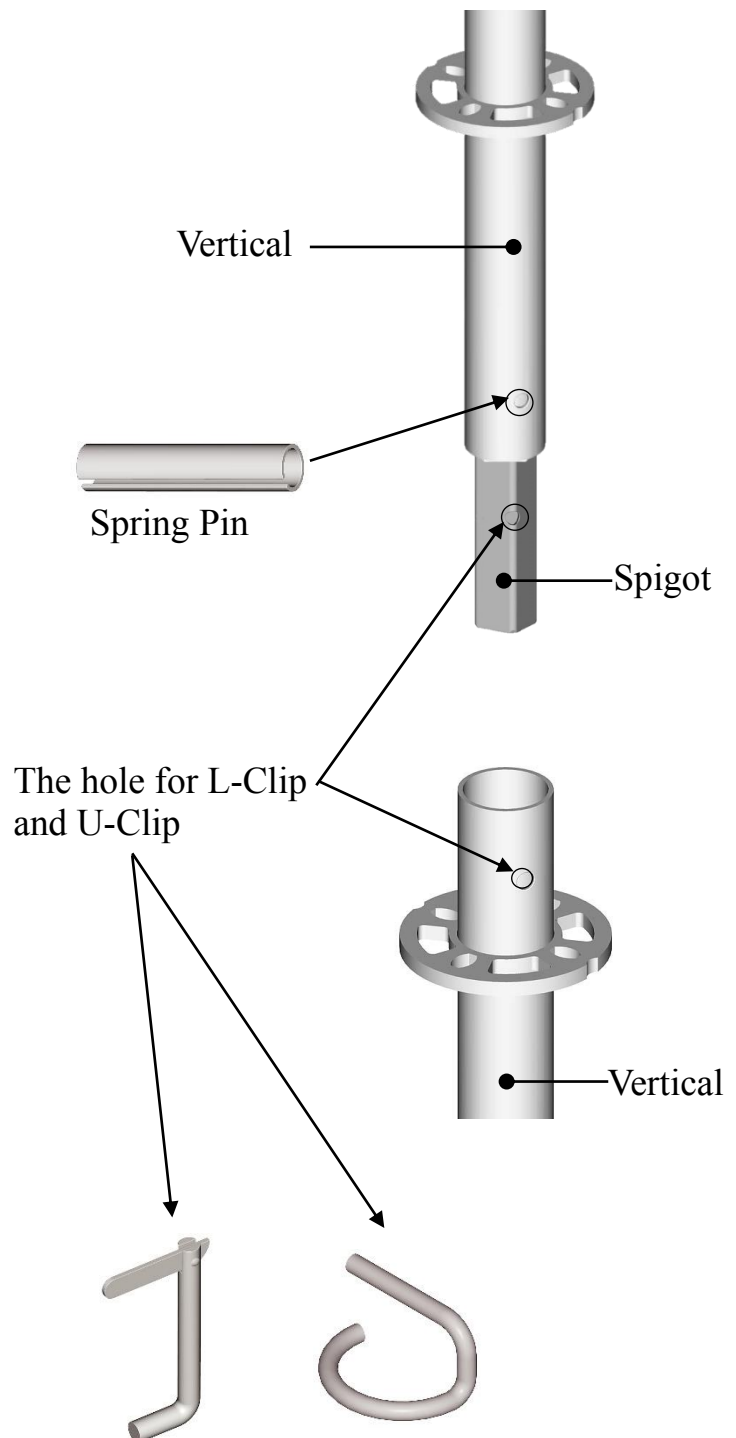
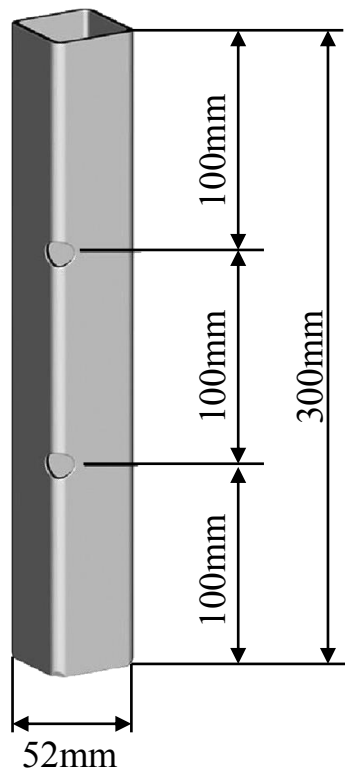


***Vertical W/O Spigot only uses with Basic Socket**



4. L-Clip and U-Clip:

Two Verticals are connected by a Spigot and secured by a L-Clip or U-Clip to avoid wind shift or slippage.

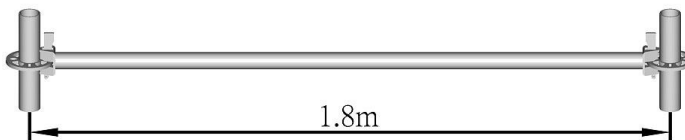
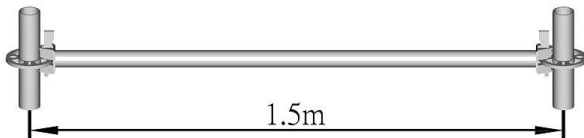
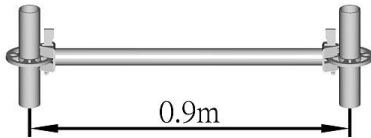
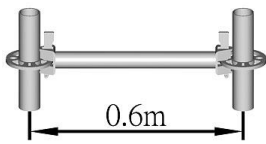


1. For **Shoring**, no clip needed.
2. For **Access** and **Working Platform** (Ø60.2mm System), clip is a must.

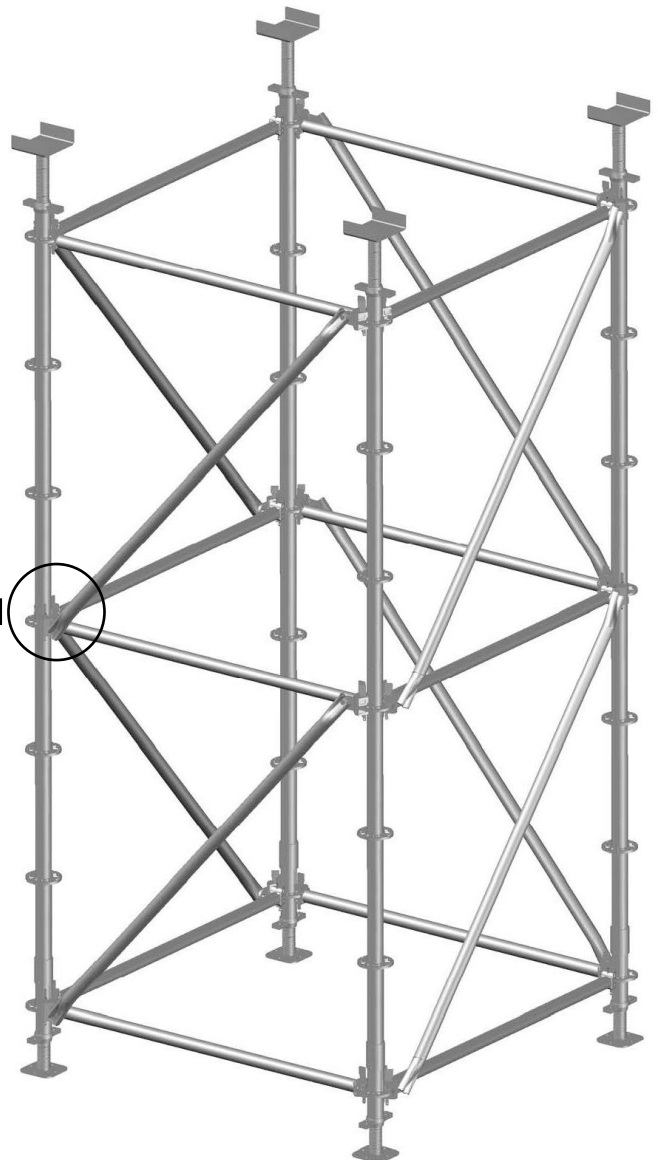
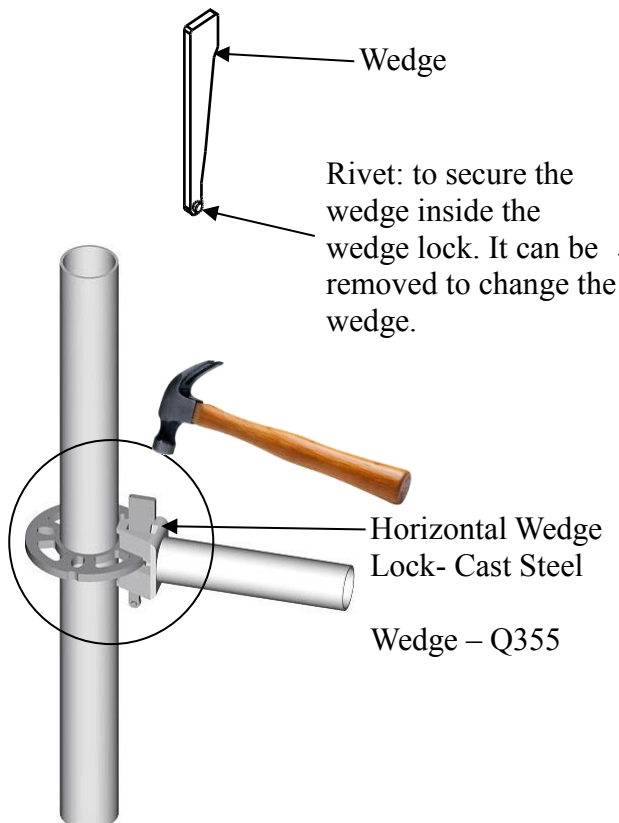


5. Horizontal:

Mainly use to distribute force evenly between Verticals.



- Connecting: Wedge Lock fixed on Ring.
- Material is used STK 500
- Pipe: $\phi 48.6\text{mm} \times T:2.3\text{mm}$
- Length: 0.6m, 0.9m, 1.2m, 1.5m, 1.8m, 2.4m. Special sizes can be done as customer's request.

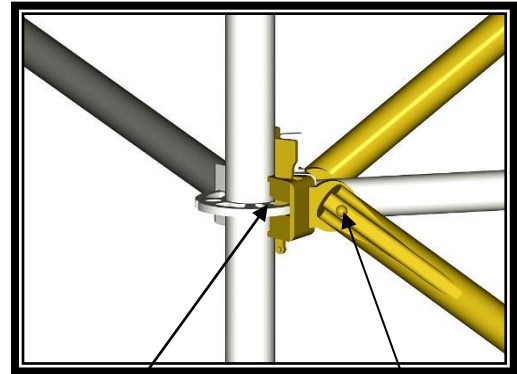
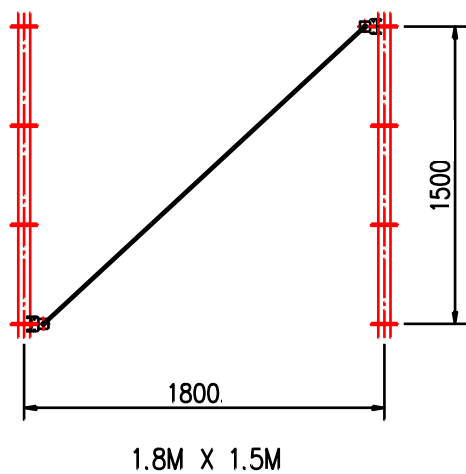
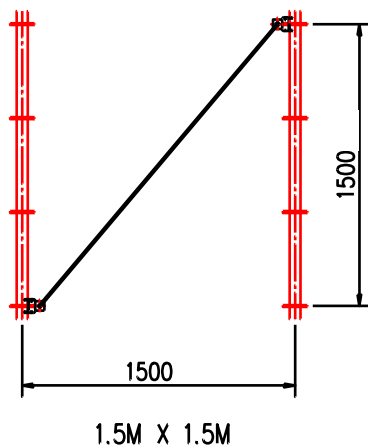
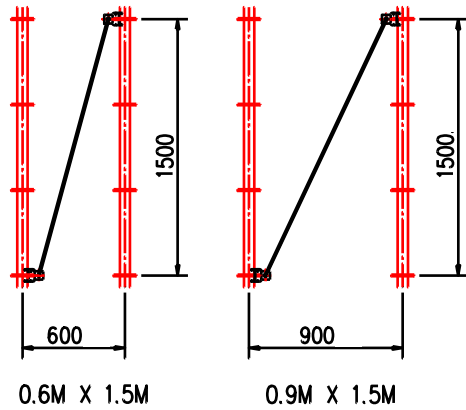


***Horizontal wedge locks to be fixed by inserting the wedge into the small hole of ring and hammering the wedge tightly for a secure hold on the Vertical.**

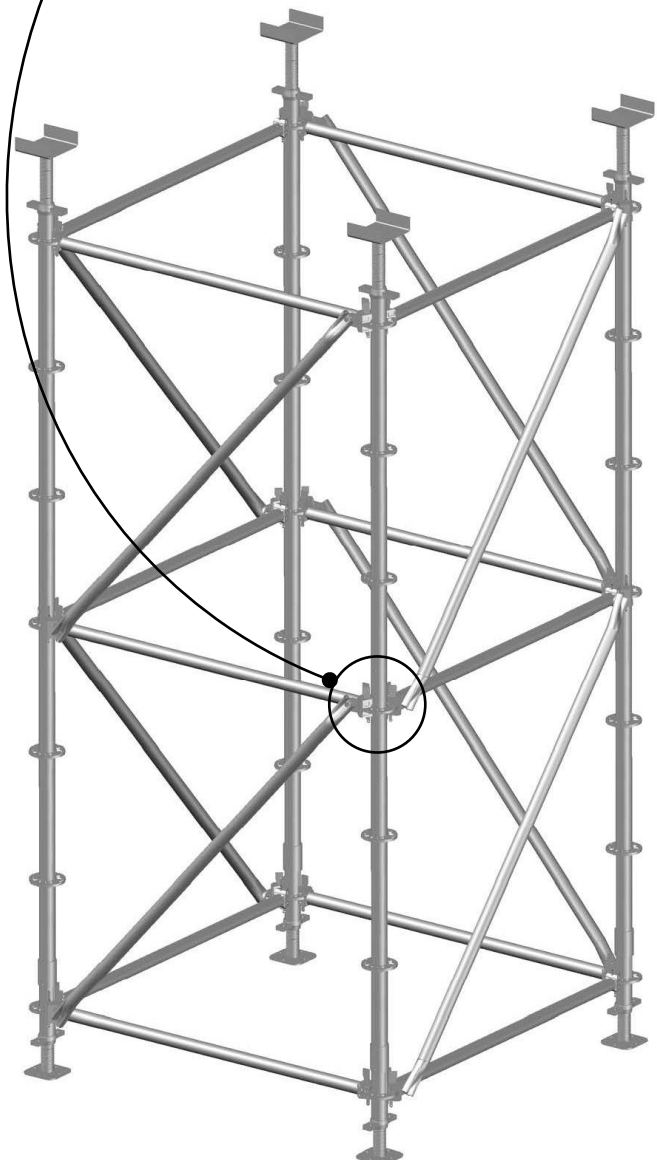


6. Diagonal:

The Diagonal is a part to fix the effective length of Vertical for enhancing the load-carrying capacity and keep the entire system from deformation. The pipe is $\phi 48.6\text{mm} \times T: 2.3\text{mm}$. Material is STK 500. Mainly dimensions are L: 0.6, 0.9, 1.5, 1.8m x H: 1.0m and L: 0.6, 0.9, 1.5, 1.8, 2.4m x H: 1.5m.



Diagonal Wedge Lock -FCD450
Rivet Wedge - Q355

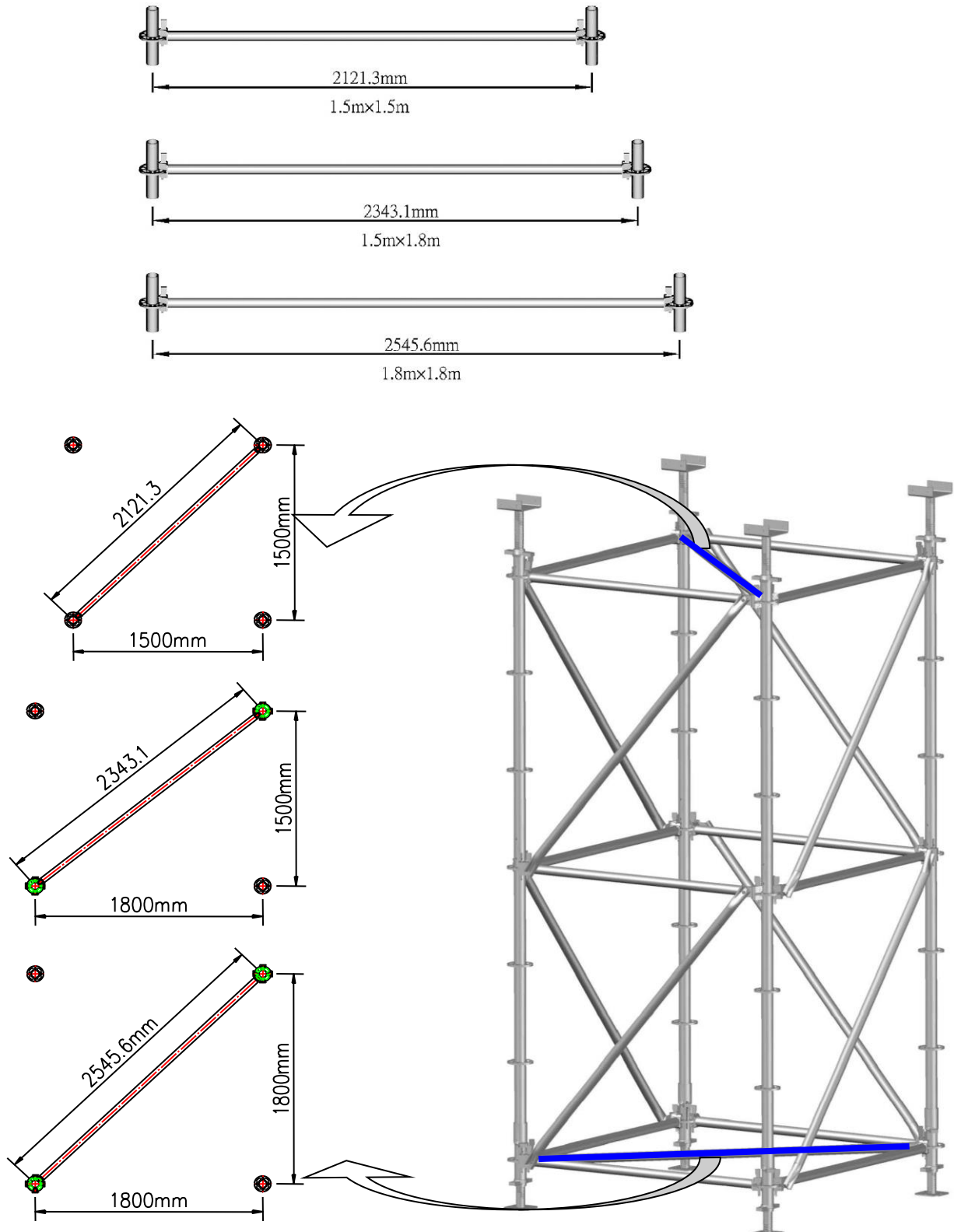




7. Level Diagonal:

The Level Diagonal is a part to restrict the scaffold in a foursquare (90° at each angle), excellent steadiness for high shoring. For the connecting, it's the same as Horizontal but in level diagonal direction.

The pipe is $\phi 48.6\text{mm} \times T:2.3\text{mm}$, Material: STK 500. Mainly dimension are 1.5m x 1.5m, 1.5m x 1.8m, 1.8m x 1.8m.





Erection Procedures:

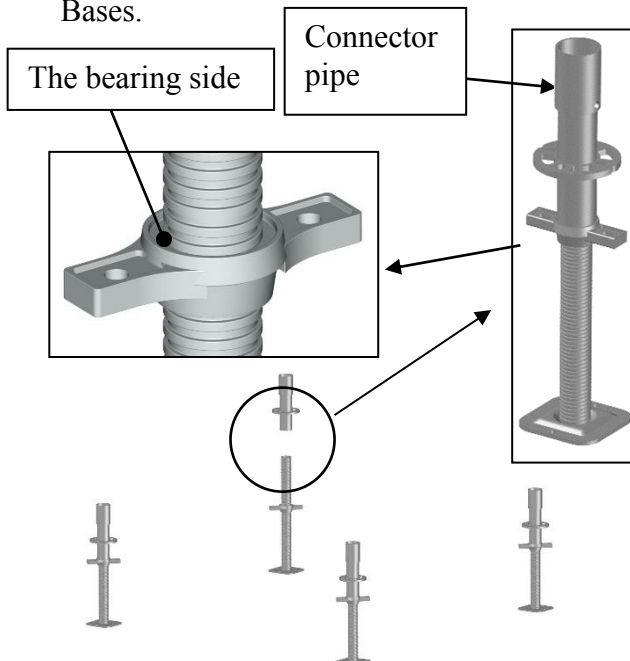
1. Jack Base

According to the design drawing, put Jack Bases in position.



2. Basic Socket

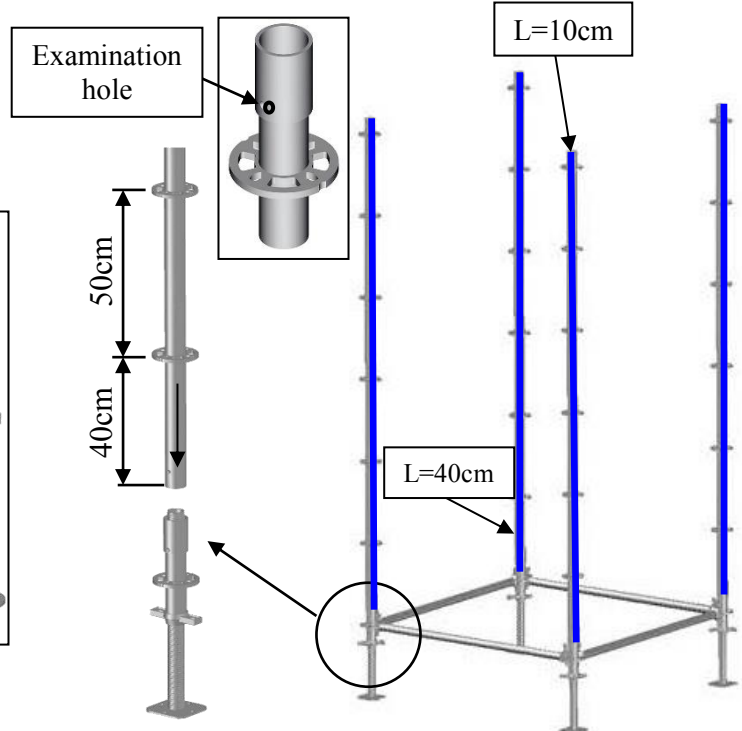
The Basic Socket to be put onto the Jack Bases.



4. Vertical without Spigot

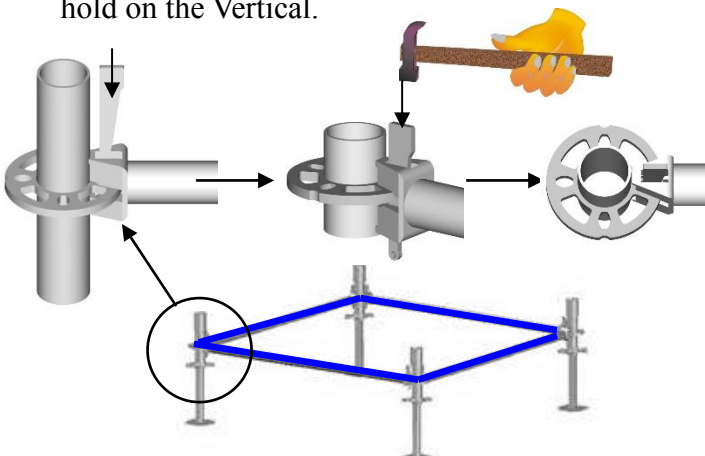
Insert the long side of Vertical W/O Spigot into Basic Socket. The examination hole is to ensure Verticals W/O Spigot match tightly with the bottom of connector pipe of Basic Socket.

※Vertical W/O Spigot is only used on the first layer. Vertical is used from the second layer.



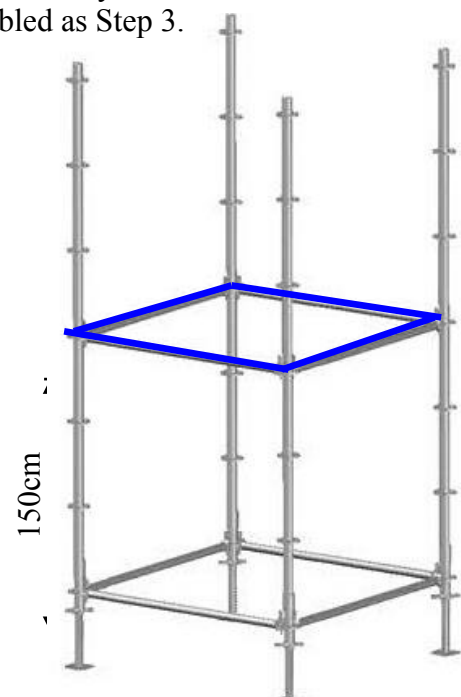
3. The first layer of Horizontal

Horizontal wedge locks to be fixed by inserting the wedge into the small hole of ring and hammering the wedge tightly for a secure hold on the Vertical.



5. The second layer of Horizontal

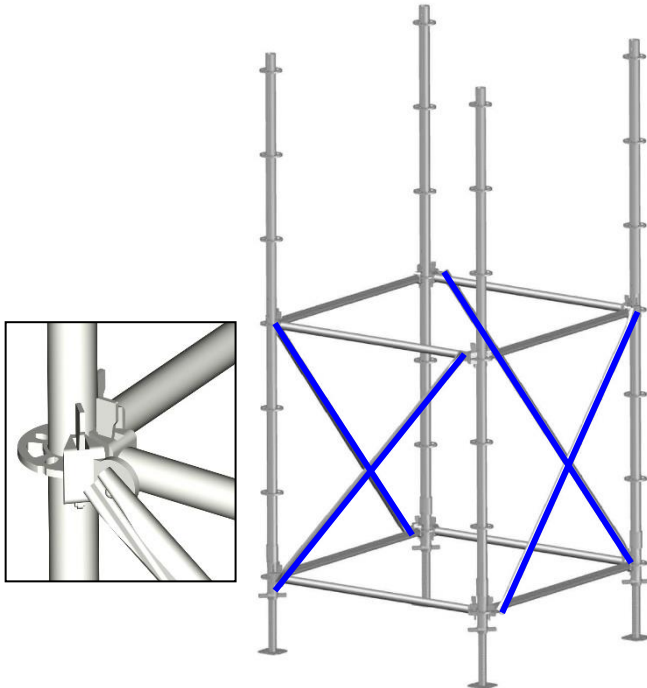
The second layer of Horizontals to be assembled as Step 3.





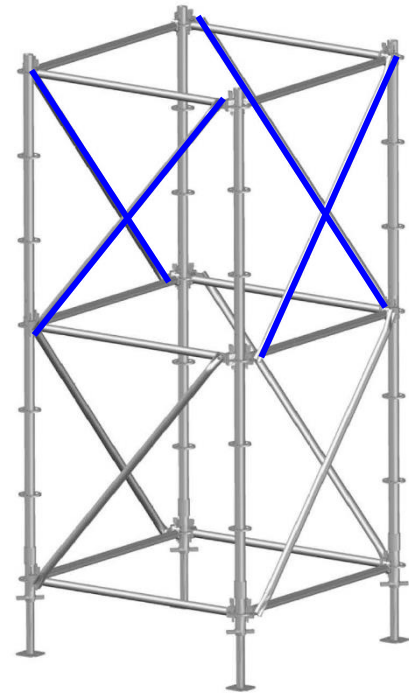
6. The first layer of Diagonal

Diagonal wedge locks to be fixed by inserting the wedge into the big hole of ring and hammering the wedge tightly for a secure hold on the Vertical. **Attention:** Diagonals must be fixed in the same direction.



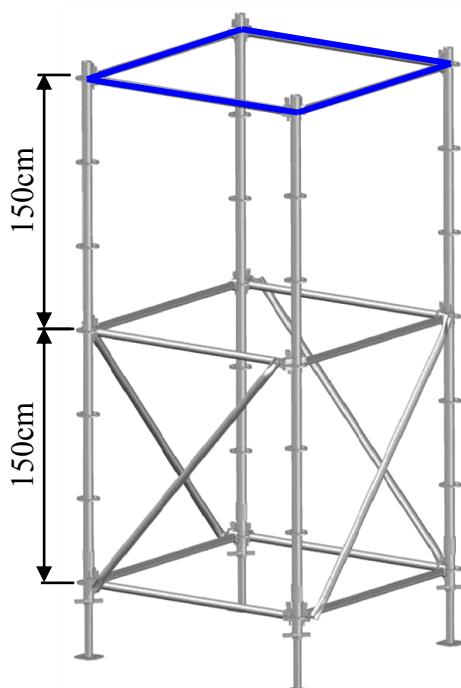
8. The second layer of Diagonal

The second layer of Diagonals to be assembled **in the same direction** as Step 6.



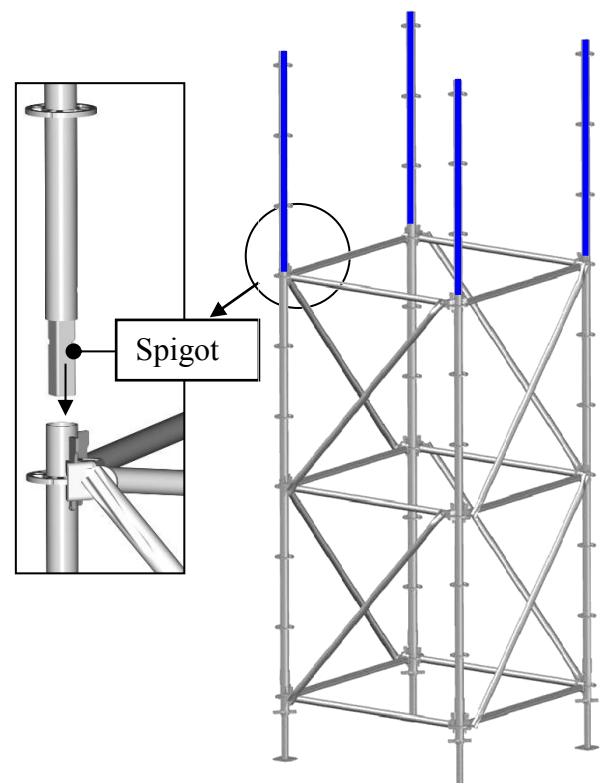
7. The third layer of Horizontal

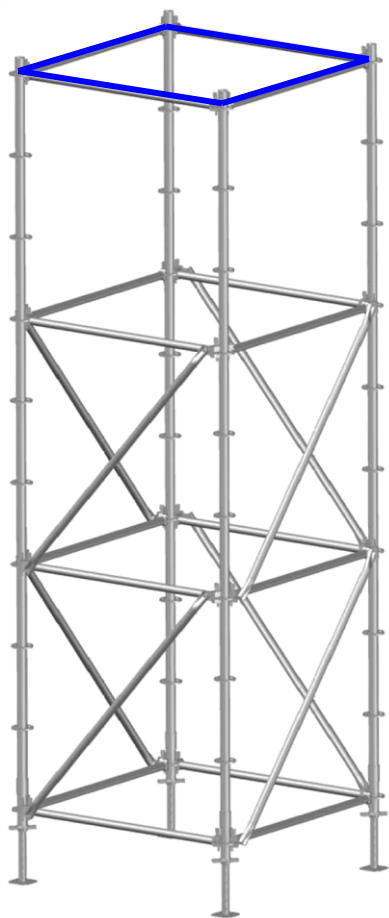
The third layer of Horizontals to be assembled as Step 3.



9. Vertical

Assemble two Verticals with the Spigot (as illustrated below).

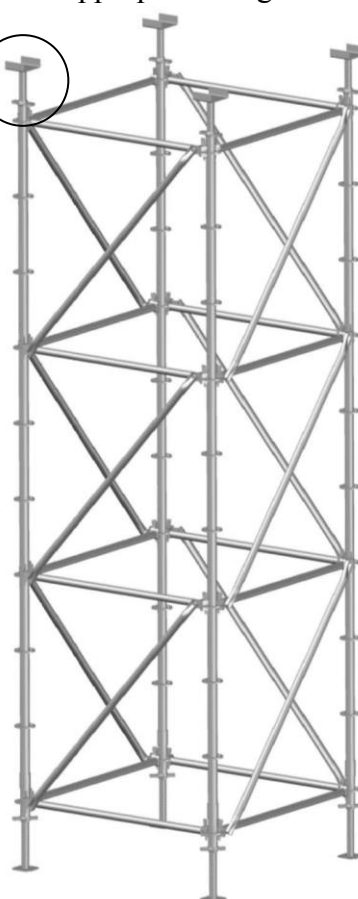
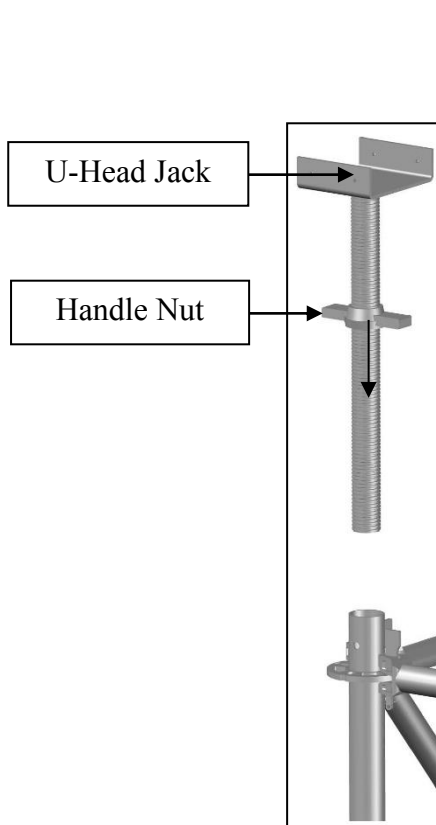
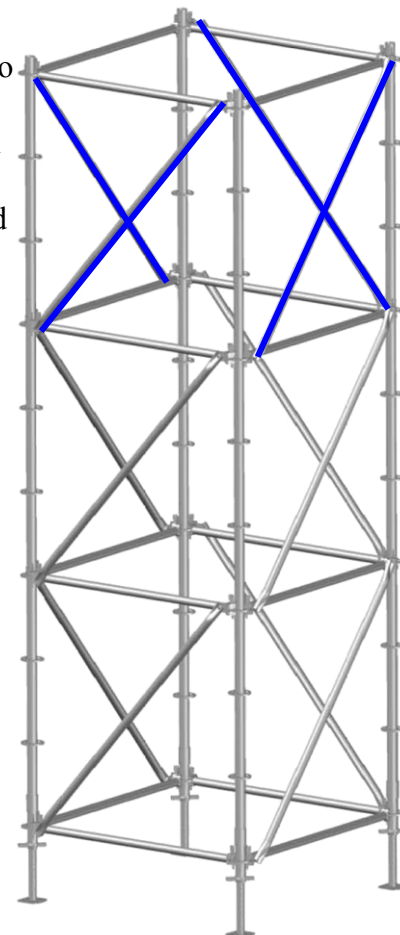




- ⇐ **10. The fourth layer of Horizontal**
The fourth layer of Horizontals to be assembled as Step 3.
※ Horizontals are spaced 150cm apart from each other. Every layer space must be controlled within 150cm.

- ⇒ **11. The third layer of Diagonal**
The third layer of Diagonals to be assembled as Step 6. On account of the 2 sides of Diagonal are fixed with different Verticals and Verticals on the top are assembled with Diagonals, the whole tower is kept from fall-apart without the need of Clips while being lifted by crane.

- ↓ **12. U-Head Jack**
Put the U-Head Jack into the Vertical, and adjust handle nuts to the appropriate height.



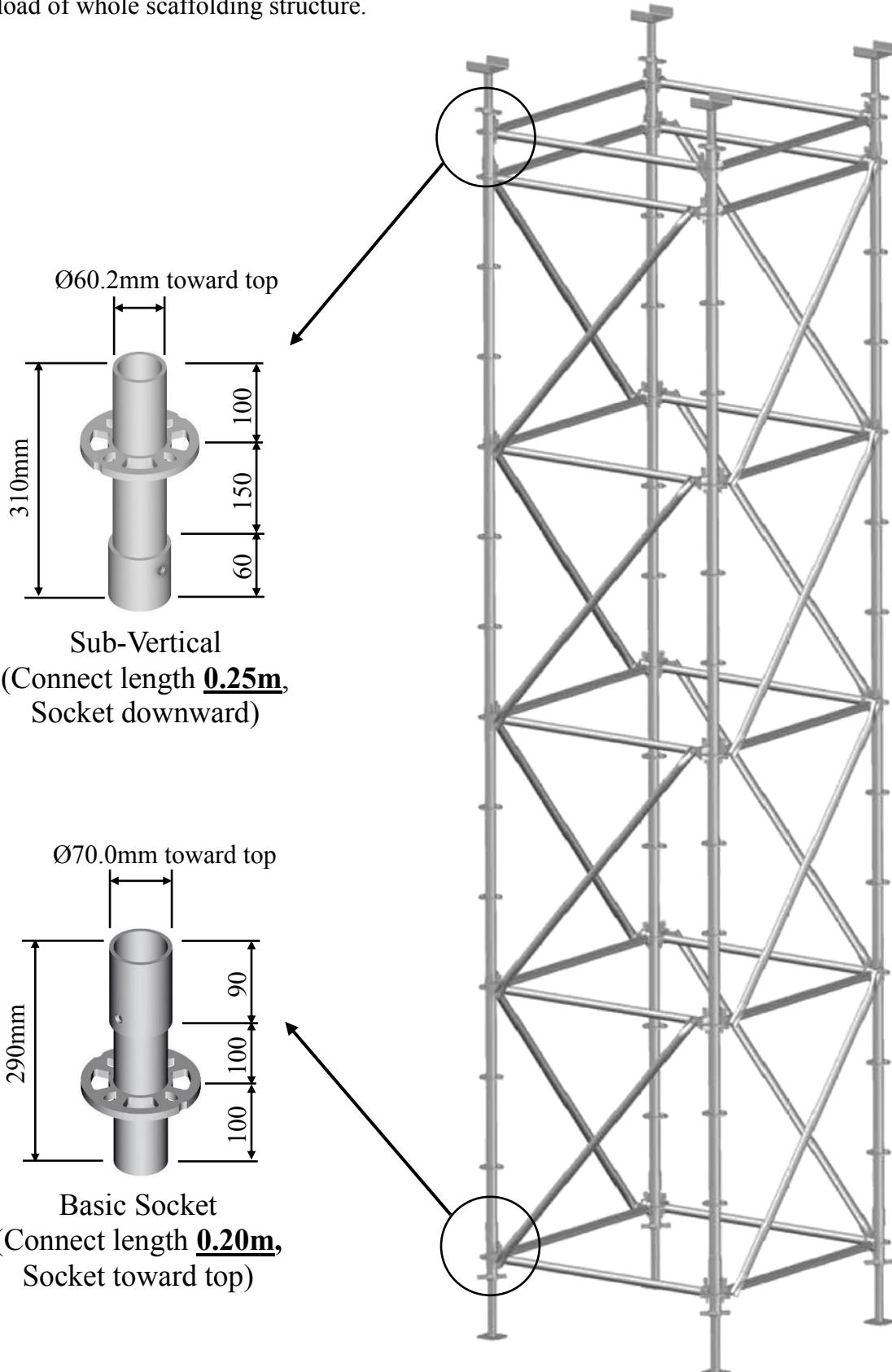
Remark:
The assembly method in this manual is based on the basic way of assembly with every component of Ring System Scaffolding Ø 60.2mm. Every component has different specification for the use in different projects and can only be used as the design drawing.



Instructions and Precautions:

(a) The difference between Sub-Vertical (0.25m) and Basic Socket (0.2m)

Pay attention to the difference and position of Sub-Vertical & Basic Socket while assembling. If misusing, it will cause the difficulty of assembly with Horizontal and Diagonal and affect the stability and safety load of whole scaffolding structure.



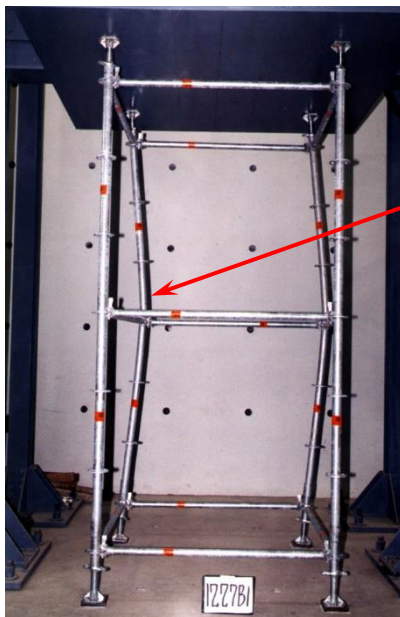


(b) With or Without Diagonal

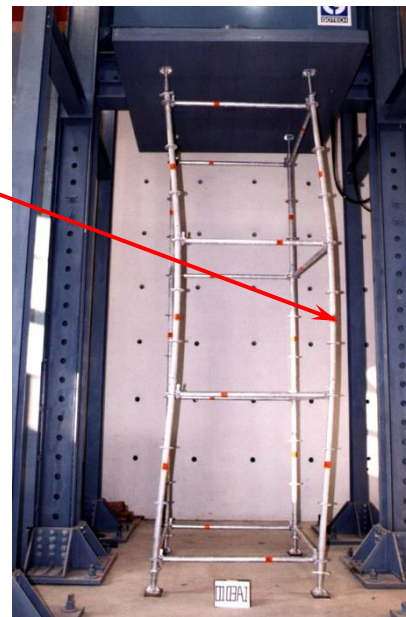
A tower with or without Diagonal has a big effect on the loading capacity of Ring System Scaffolding. According to a report from Yunlin University, the loading capacity of a 2-story tower without Diagonals is 49% less than the one with Diagonals; and for a 3-story tower without Diagonals, the loading capacity is 28.6% compared to the one with Diagonals. It also causes different damage on structure.

As shown below (1) and (2), the whole structure of the tower without Diagonals is buckling damaged. As shown below (3) and (4), the story of the tower with Diagonals is buckling damaged.

Due to the great effect on loading capacity of a tower with or without Diagonals, a careful calculation for the project is necessary when one considers building towers without Diagonals.

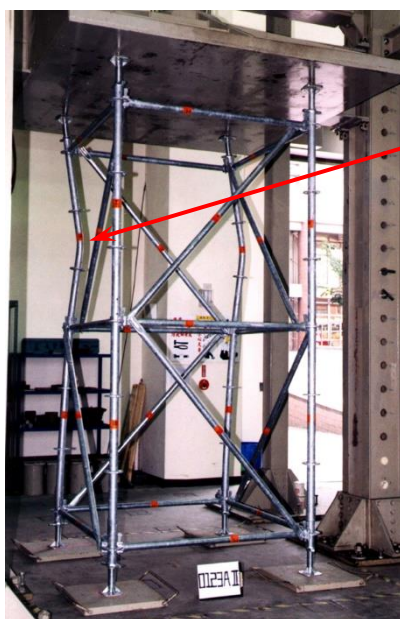


(1) The experiment of two-story without Diagonal.

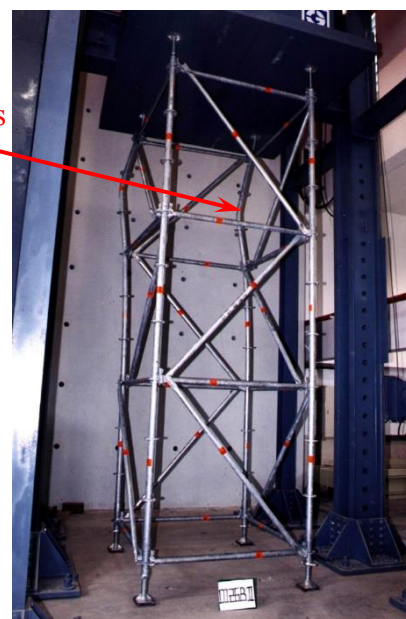


(2) The experiment of three-story without Diagonal.

Destruction
of entire
frame body
buckling.



(3) The experiment of two-story with Diagonals



(4) The experiment of three-story with Diagonals.

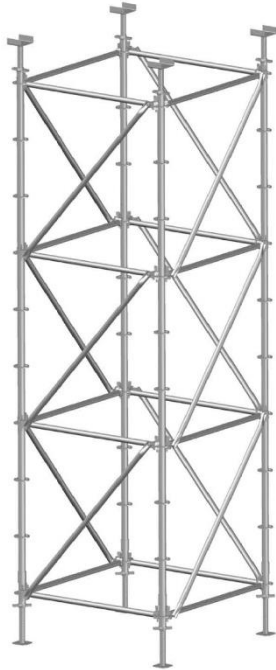
The Vertical's
buckling
damage



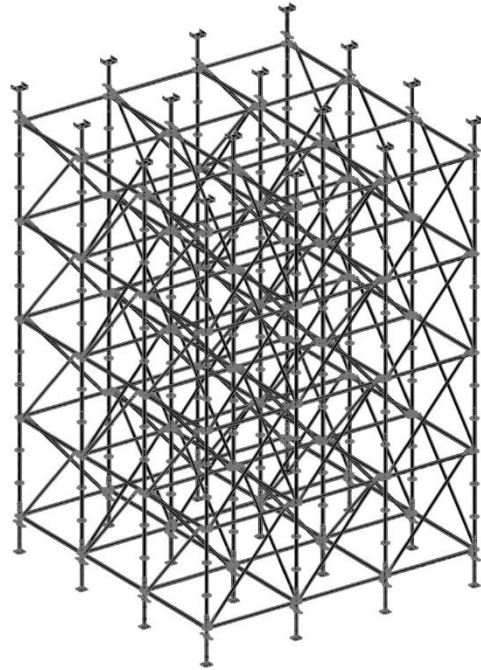
(c) Diagonals direction effect on the Capacity

The Diagonals can be assembled by any direction. However, according to the report from Yunlin University, the result showed that loading capacity is 10% less when Diagonals are fixed in different direction.

We suggest fixing diagonals in the same direction, as shown (5), in order to have the best loading capacity. In addition, in that way, the towers can be built as shoring prop as shown (6) & (7).



(5) Diagonals be fixed in the same direction



(6) The multi-combined way to be shoring prop



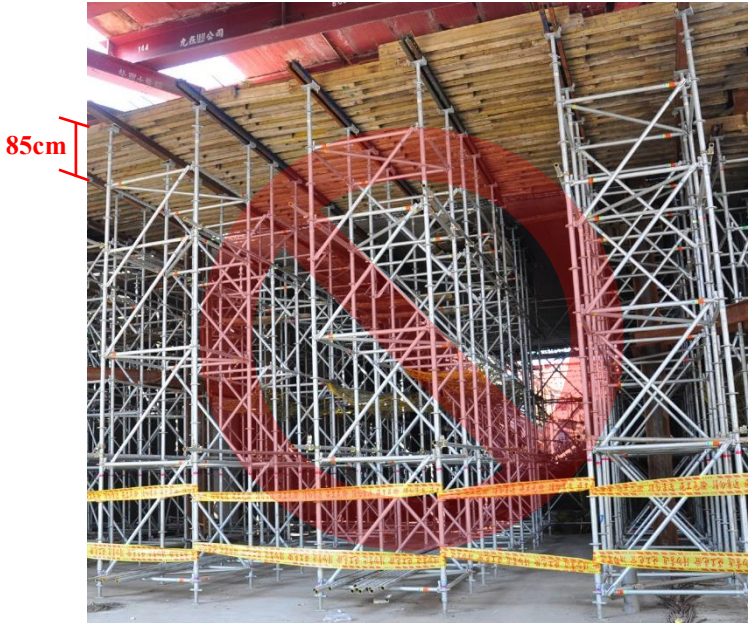
(7) Diagonal configuration in the same direction.



(d) The effect with cantilevered length to the capacity

The larger overhang, the smaller bearing strength will be. Therefore, except the maximum adjustable length of Jack Base and U-Head Jack, the assembly of Horizontals on the top and bottom is necessary in order to have the best loading capacity.

The maximum adjustable length of Jack Base and U-Head Jack is *no longer than 40cm.*



(8) False: The cantilevered length is too long (over 50cm) to keep safety load.

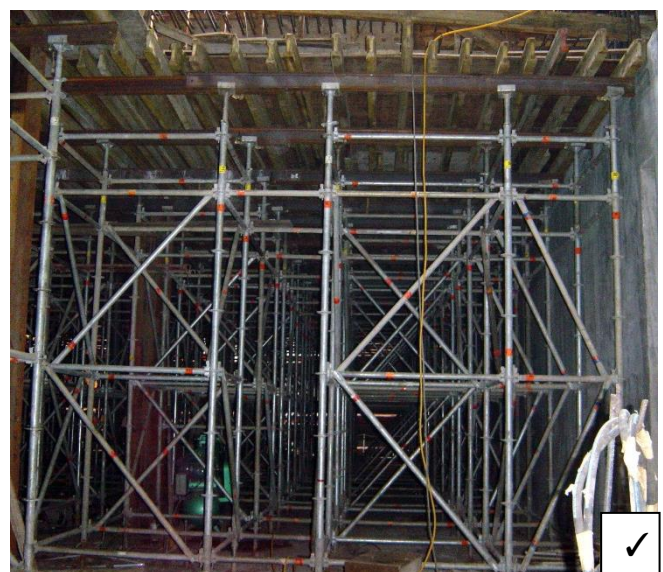


(9) Assembly of Horizontals on the top to make the cantilevered length shorter (less than 50cm).

In addition to have an easier way to adjust the height, we use Sub-Vertical to meet the needs of the structure space. Therefore, the height of the story on the top is often shorter than 150cm. In this case, we suggest assembling the Horizontal on the top.



(10) Story Height: Less than 150cm, assemble Horizontals.



(11) Story Height: Less than 150cm, assemble Horizontals.



(e)Sloping Slab

When shoring a Sloping Top, there are gaps between Sloping surface and Jack Base or U-Head Jack. Swivel U-Head Jacks or triangle timber chamfer strips are necessary to prevent the low loading capacity caused by Eccentric Loading of Jack Base or U-Head Jack, as shown below (12) to (15) below.



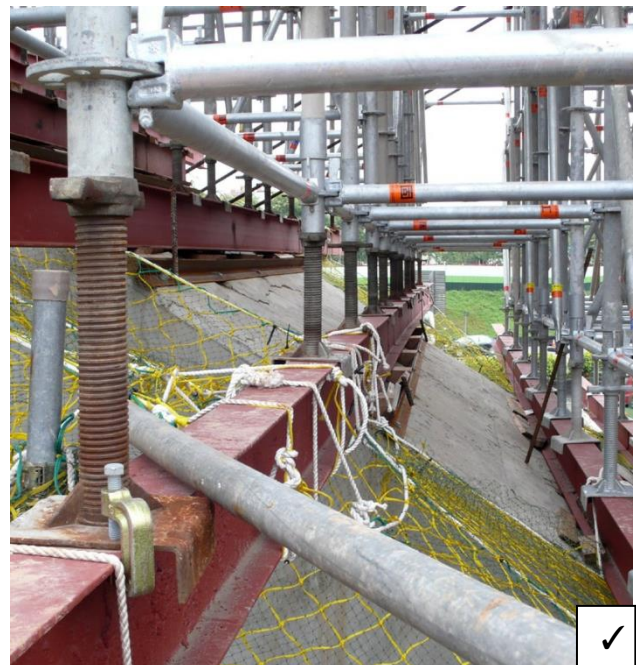
(12) Rotatable U-Head



(13) Use the steel/wood wedge on the U-Head Jack



(14) Use the triangle-timber chamfer strips under Jack Base



(15) Use H beam on the slope



Contrast between the Correct and NG cases:

Before the work begin, it's necessary to consider the construction type, engineer site situation and the formwork materials to design the construction drawing and to do the detailed calculation.

Please pay attention to the point of assembly scaffolding as below :



No assembly of Diagonal. The tower is crooked before Concrete pouring concrete.



Assemble Diagonal for reinforcement.



The factory construction without Diagonal, caused the bending after concrete pouring.



Assemble Diagonals in every story.



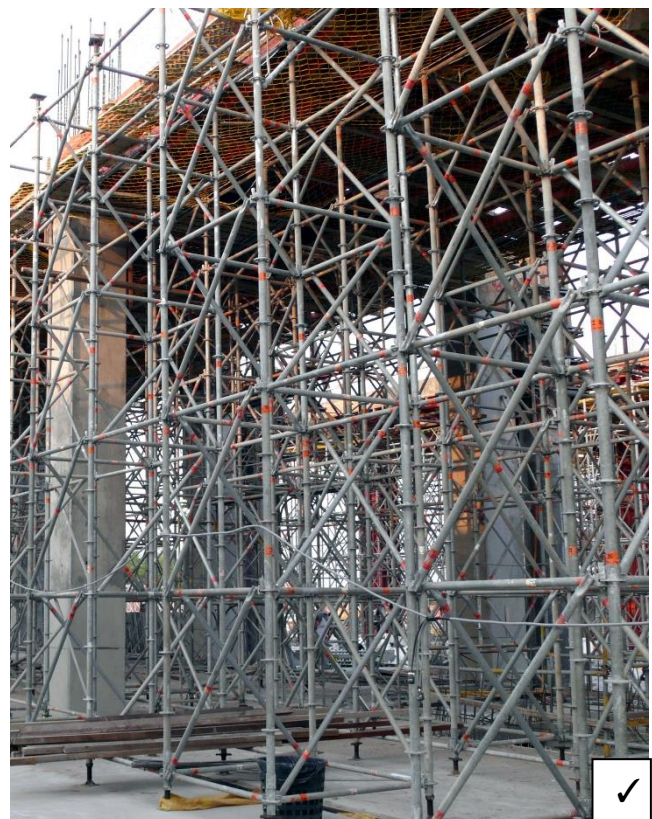
Lack of Diagonal for one story.



Assemble the Diagonal in every story.



In order to save materials with the wrong assembly for 2 meter high.



Every story's height fixed at 1.5m.



There are no Horizontals on the top.



Assemble Horizontal on the top for reinforcement.



There are no Horizontal on the bottom.



Assemble Horizontal on the bottom for reinforcement.