Prefabrication Instructions for SJL Steel Structures in India

Table of Contents

Preface

Due to the project spanning China and India, the steel structures are designed in modular segments to facilitate sea transportation and on-site installation. To ensure that the steel structures can be accurately prefabricated by construction personnel after delivery to the site, this document provides detailed instructions combining images and text descriptions for the following steel structures.

Preparation Before Fabrication

Before starting prefabrication, the following basic tools and equipment must be prepared:

- Distribution box, welding machine, electrodes
- Angle grinder, 10-meter tape measure, square
- Laser level, crane
- Fabrication platform, auxiliary steel plate and profile materials

---

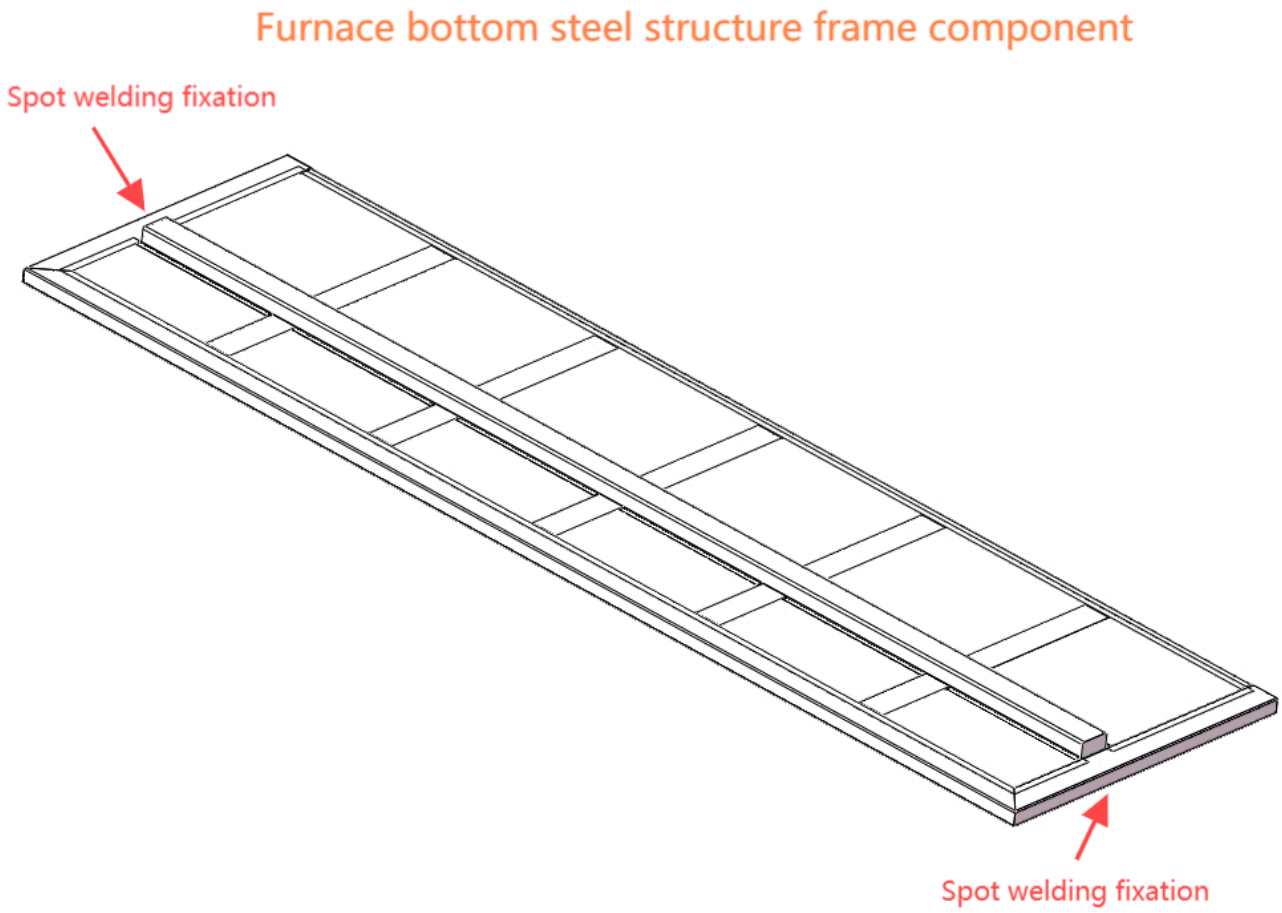
Prefabrication Phase

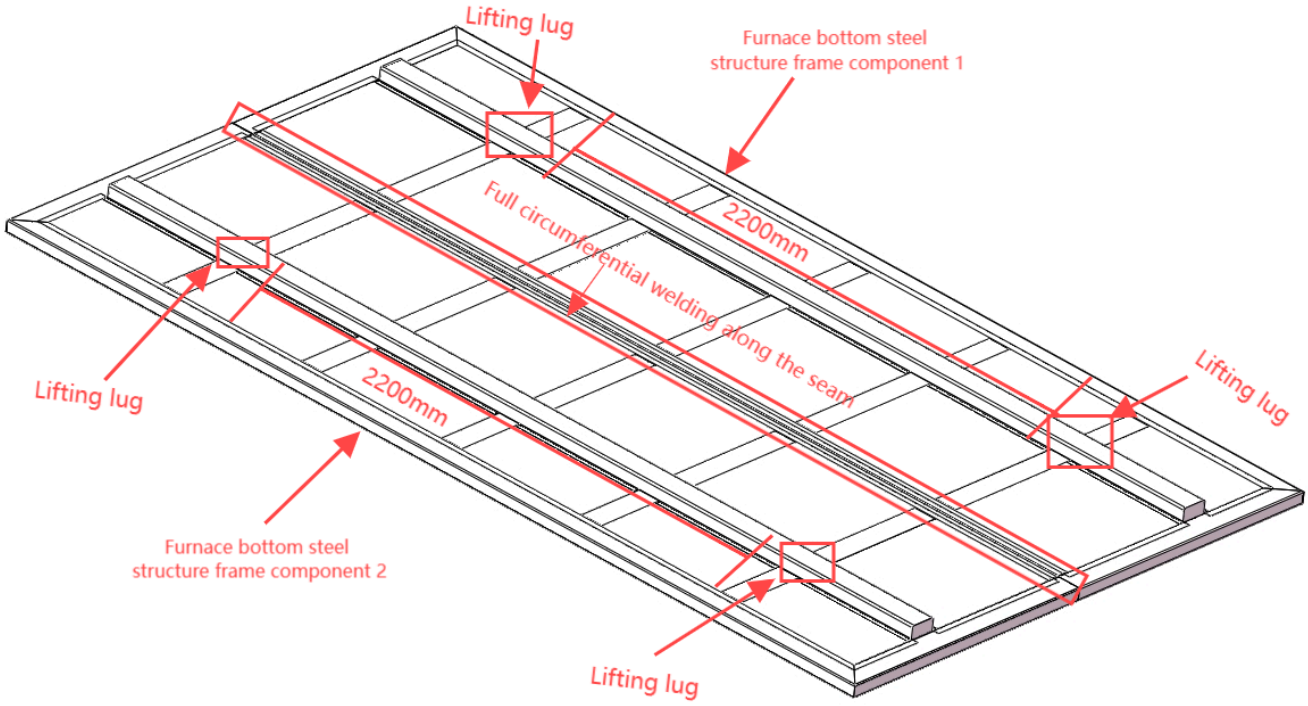
1. Furnace Bottom Steel Structure

The furnace steel structures in this project are divided into two types: **30T Furnace Bottom Steel Structure** and **15T Furnace Bottom Steel Structure**. The segmentation and prefabrication welding methods are consistent for both types.

Prefabrication Steps

1. Place the furnace bottom steel structure frame components on the fabrication platform and spot weld both ends to fix their positions.
2. Dock another furnace bottom steel structure frame component.
3. Use measuring tools to check dimensions, diagonals, and flatness, ensuring compliance with the drawing requirements before spot welding for fixation.
4. Perform final prefabrication welding, with full circumferential welding along the seam in the middle.





Quantity and Drawings

- **30T Furnace Bottom Steel Structure**: Quantity 6 units, refer to drawing [SKSYD2-06-01].
- **15T Furnace Bottom Steel Structure**: Quantity 4 units, refer to drawing [SKSYD2-06-01(X)].

Post-Processing

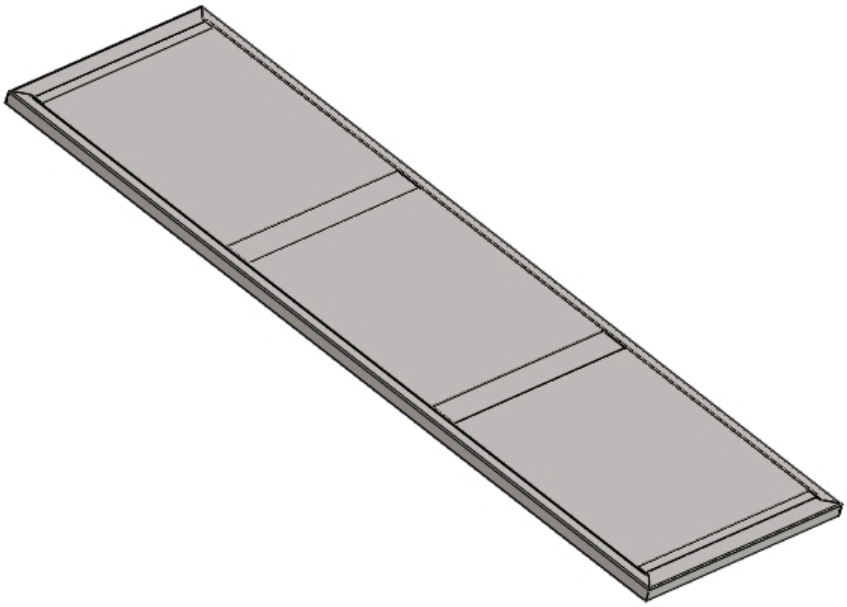
- After prefabrication welding, due to the need for back-side welding and lifting transfer, lifting lugs (made of steel plates with a thickness ≥ 10mm) must be welded on the main beam of the furnace bottom. The distribution of lifting lugs can refer to the red line distance in the example image.
- Upon completion of welding, the welds must be ground flat, especially the bottom welds, which must not protrude above the plane. The weld areas should be coated with anti-rust primer.
- After painting, place the structure in the storage yard for natural aging, awaiting installation.

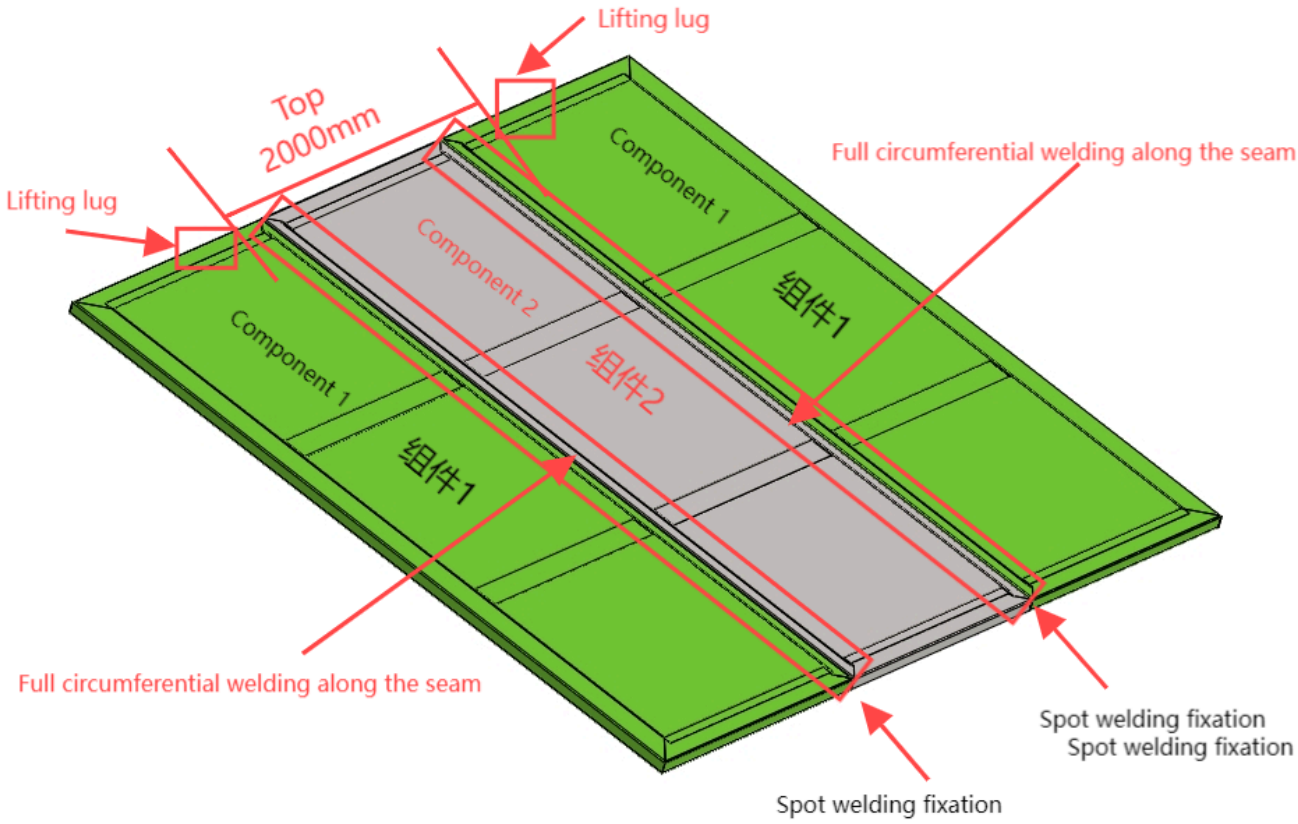
2. Rear Wall Steel Structure

The rear wall steel structure in this project is applicable to both **30T** and **15T** furnace types, using a universal design.

Prefabrication Steps

1. Place Rear Wall Steel Structure Component 2 on the fabrication platform and spot weld both ends to fix its position.
2. Attach one Component 1 on each of the left and right sides.
3. Use measuring tools to check dimensions, diagonals, and flatness, ensuring compliance with the drawing requirements before spot welding for fixation.
4. Perform final prefabrication welding, with full circumferential welding along the seam in the middle.





Quantity and Drawing

- **Rear Wall Steel Structure**: Quantity 10 units, refer to drawing [SKSYD2-02-01].

Post-Processing

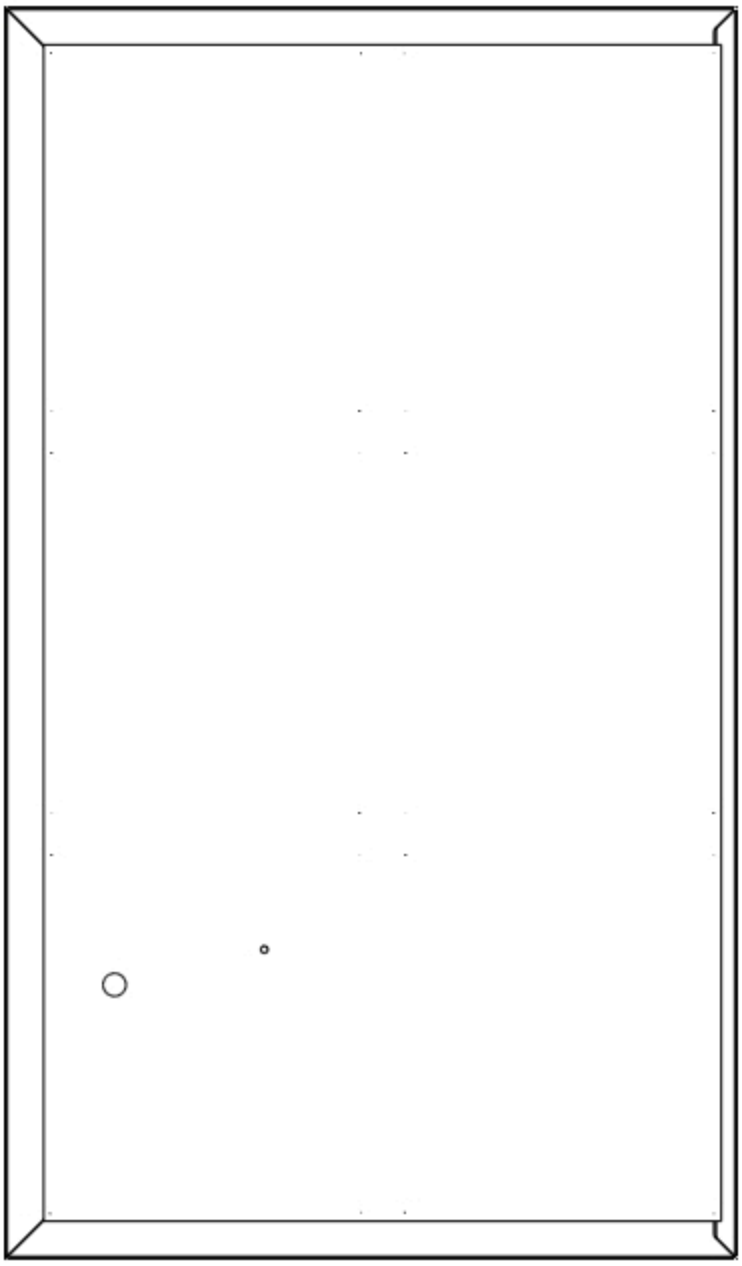
- After prefabrication welding, due to the need for back-side welding and lifting transfer, lifting lugs (made of steel plates with a thickness ≥ 10mm) must be welded on the top of the sealing plate side of the rear wall steel structure. The distribution of lifting lugs can refer to the red line distance in the example image.
- Upon completion of welding, the welds must be ground flat, especially the butt welds, which must not protrude above the frame plane. The weld areas should be coated with anti-rust primer.
- After painting, place the structure in the storage yard for natural aging, awaiting installation.

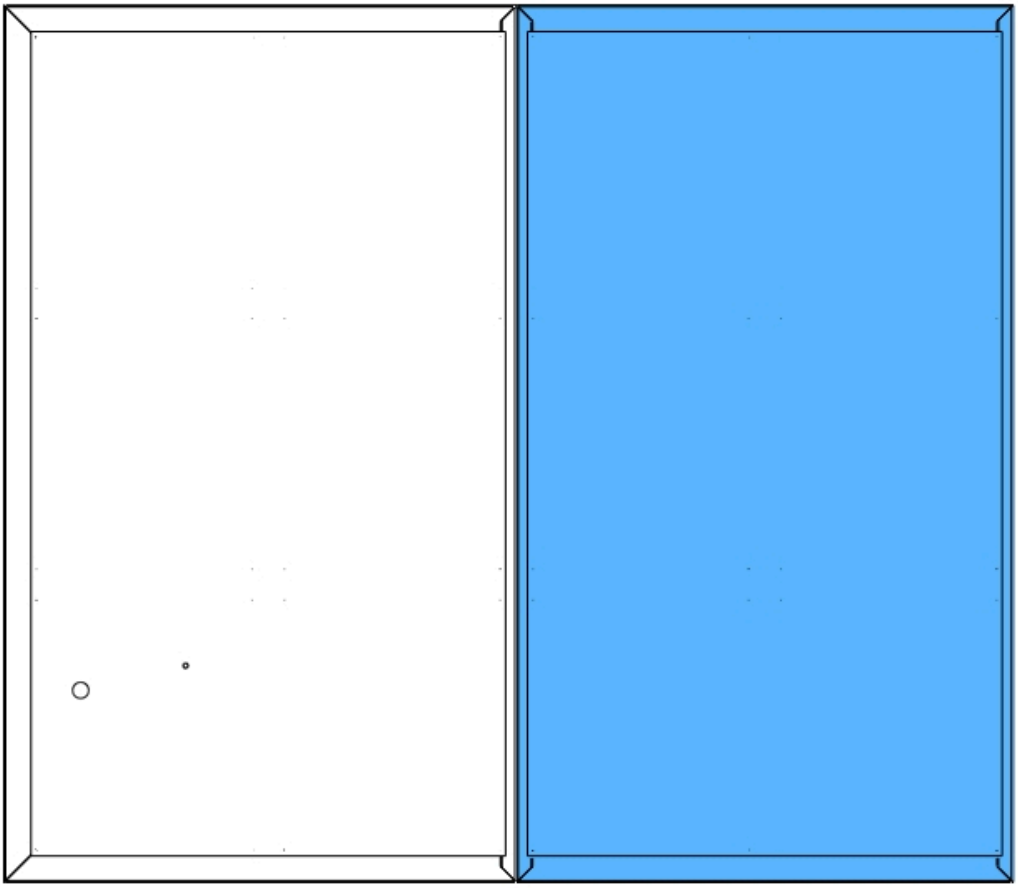
3. Side Wall Steel Structure

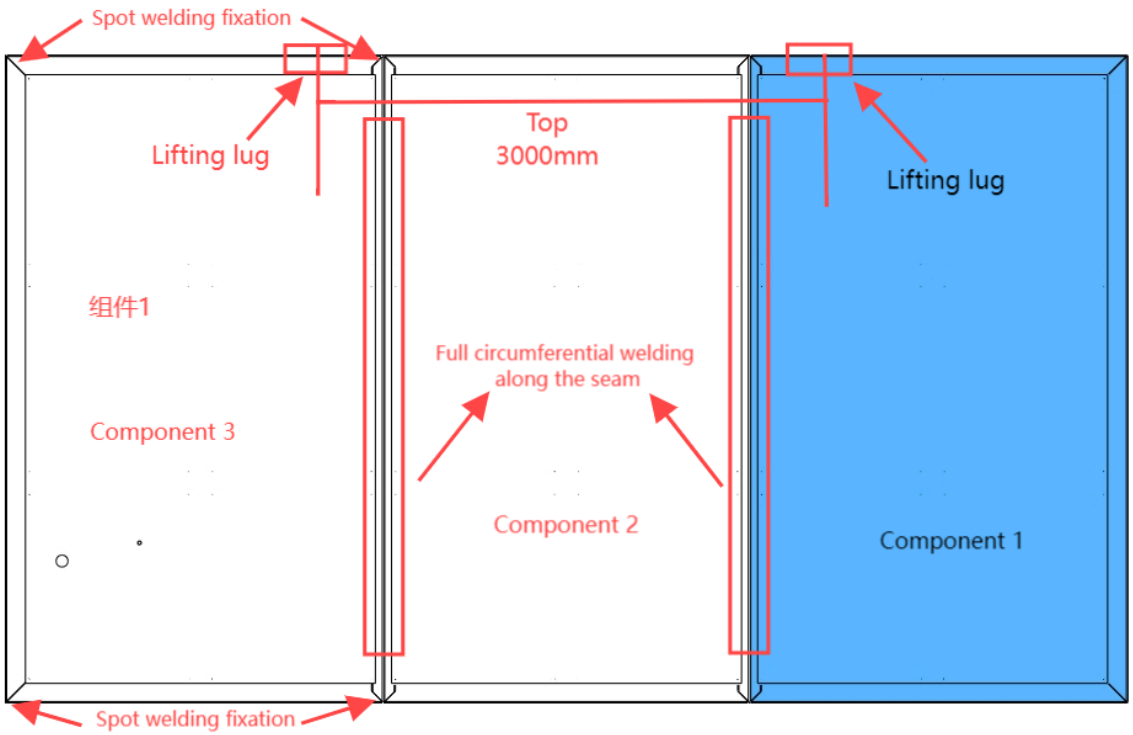
The side wall steel structures in this project are divided into **30T Side Wall Steel Structure** and **15T Side Wall Steel Structure**. The number of segments and prefabrication welding quantities are as per the fabrication drawings.

Prefabrication Steps

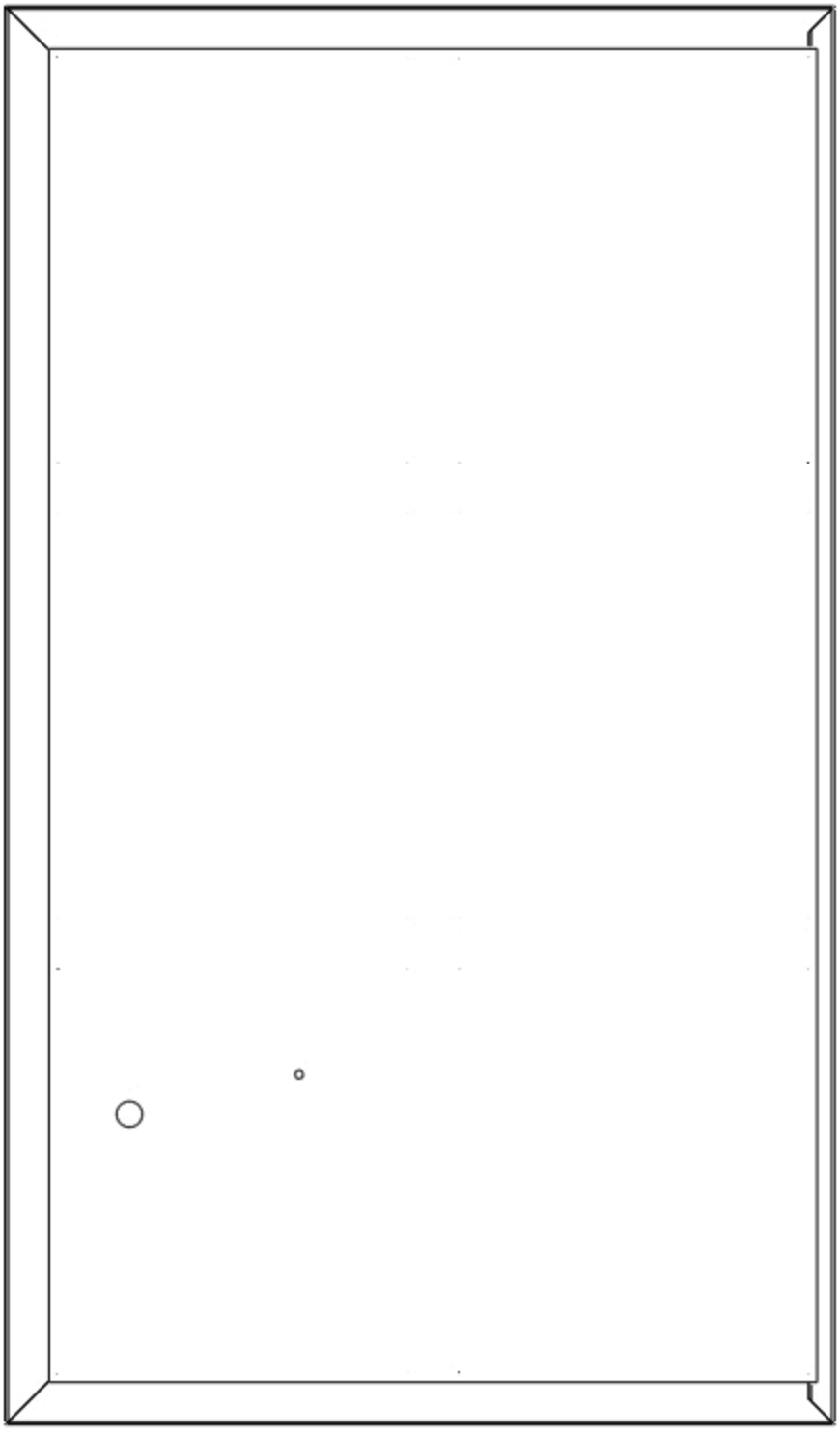
- **30T Side Wall Steel Structure**:
    i. Place Side Wall Steel Structure Component 3 (with holes for orientation confirmation) on the fabrication platform and spot weld both ends to fix its position.
    ii. Sequentially place Components 2 and 1 to the right.
    iii. Use measuring tools to check dimensions, diagonals, and flatness, ensuring compliance with the drawing requirements before spot welding for fixation.
    iv. Perform final prefabrication welding, with full circumferential welding along the seam in the middle.

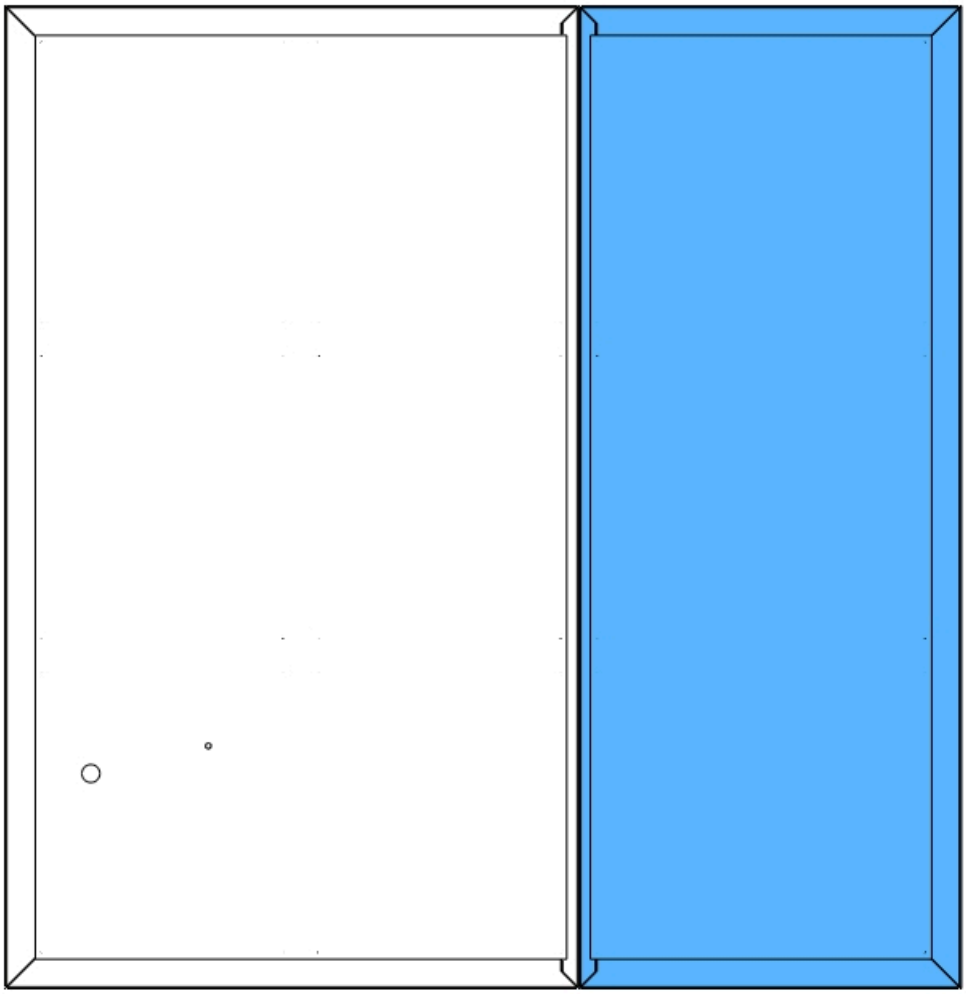






- **15T Side Wall Steel Structure**: The construction method is the same, with the difference being that the number of components is reduced to 2, where Component 3 is a universal component.





Special Notes

The side wall steel structure has left and right distinctions but shares the same structure and fabrication method, making it a symmetrical fabrication.

Quantity and Drawings

- **30T Side Wall Steel Structure**: Quantity 3 units, refer to drawing [SKSYD2-03-01].
- **30T Side Wall Steel Structure (Symmetrical)**: Quantity 3 units, refer to drawing [SKSYD2-03-01].
- **15T Side Wall Steel Structure**: Quantity 2 units, refer to drawing [SKSYD2-03-01X].
- **15T Side Wall Steel Structure (Symmetrical)**: Quantity 2 units, refer to drawing [SKSYD2-03-01X].

Post-Processing

- After prefabrication welding, due to the need for back-side welding and lifting transfer, lifting lugs (made of steel plates with a thickness ≥ 10mm) must be welded on the top of the sealing plate side of the side wall steel structure. The distribution of lifting lugs can refer to the red line distance in the example image.
- Upon completion of welding, the welds must be ground flat, especially the butt welds, which must not protrude above the frame plane. The weld areas should be coated with anti-rust primer.
- After painting, place the structure in the storage yard for natural aging, awaiting installation.

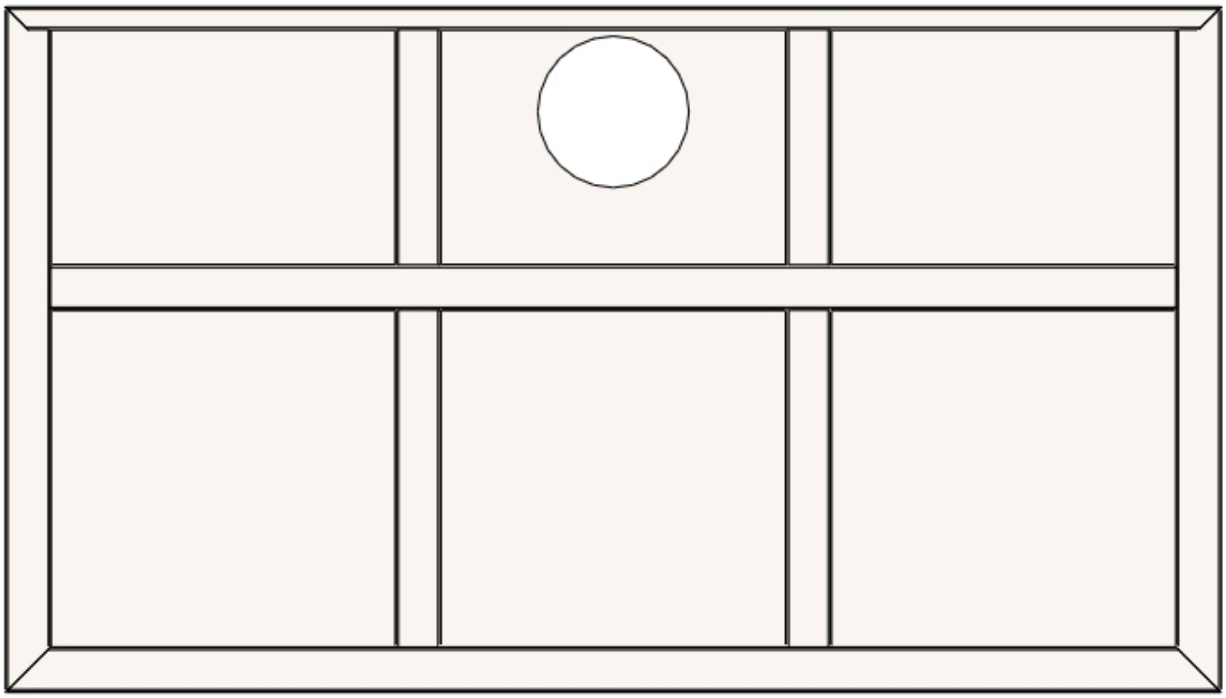
---

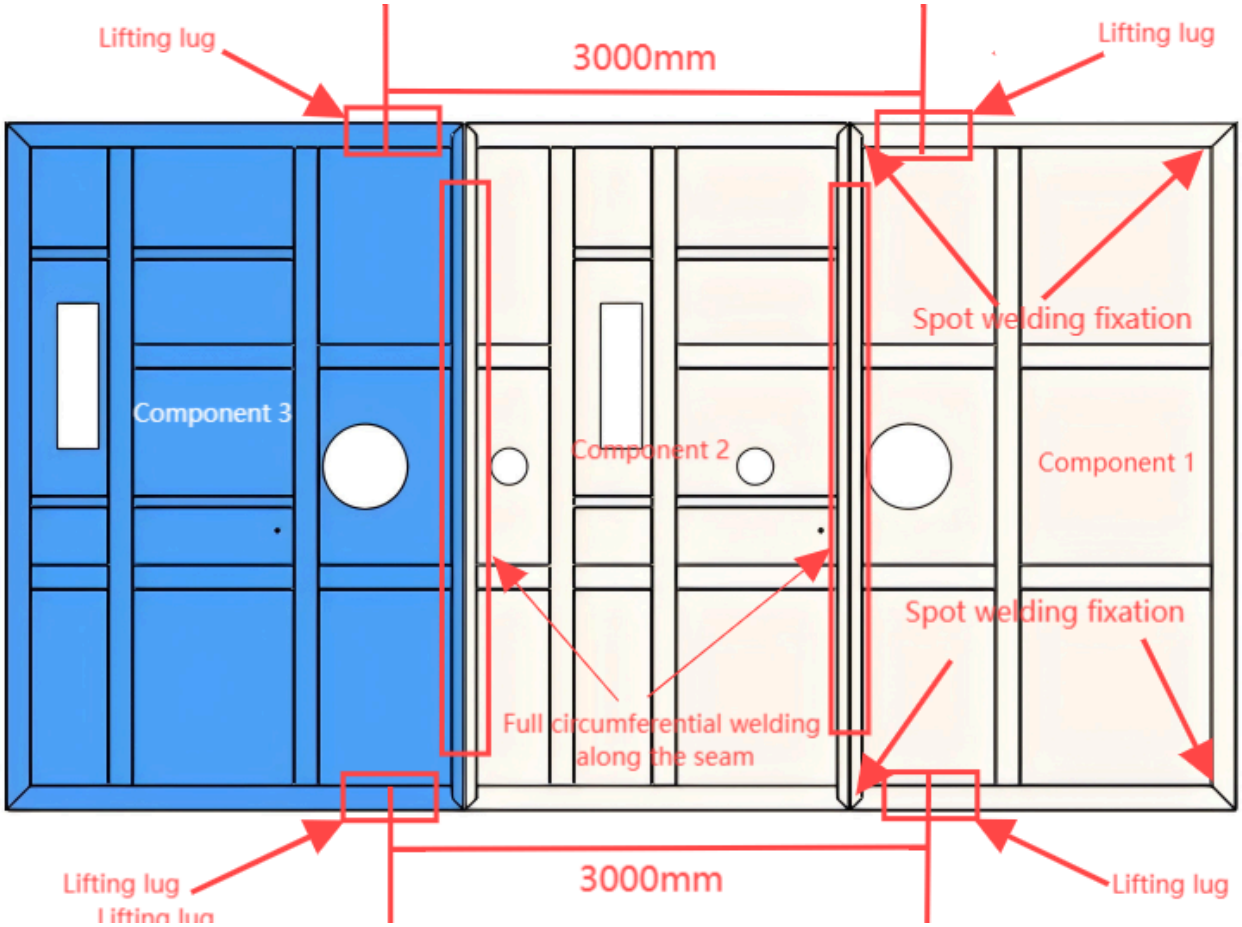
4. Furnace Top Steel Structure

The furnace top steel structures in this project are divided into four types: **30T Furnace Top Steel Structure (H+L)** and **15T Furnace Top Steel Structure (H+L)**. The number of segments and prefabrication welding quantities are as per the fabrication drawings, and attention must be paid to verifying the corresponding hole sizes during assembly and welding.

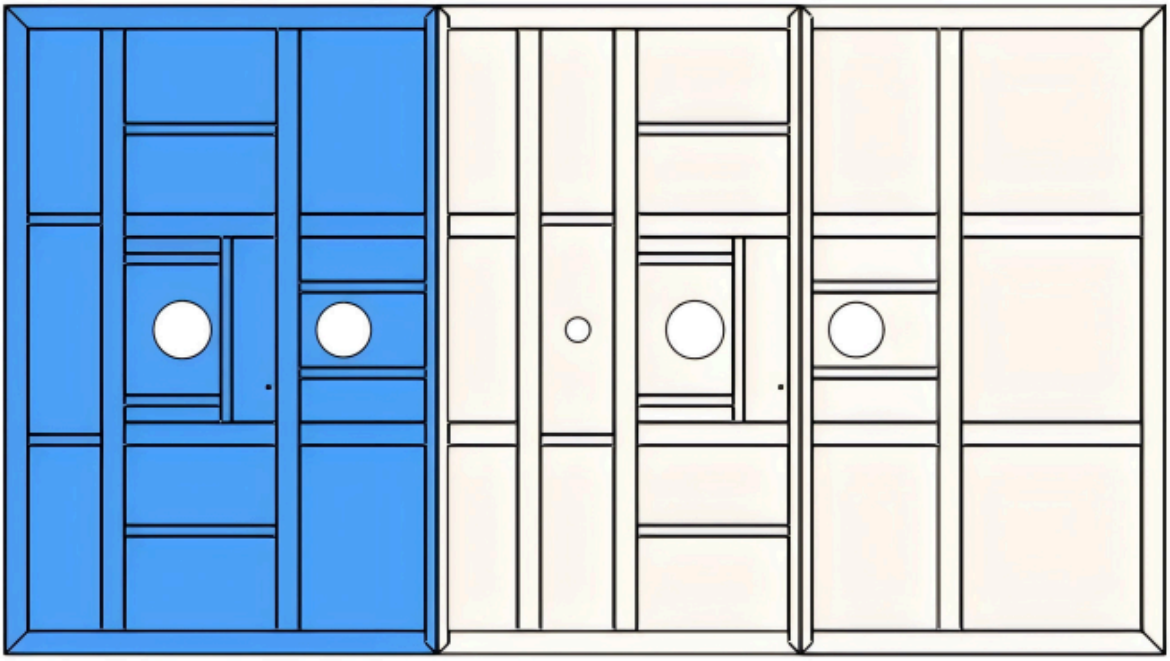
Prefabrication Steps

- **30T Furnace Top Steel Structure (H)**:
  i. Place Furnace Top Steel Structure Component 1 on the fabrication platform and spot weld both ends to fix its position.
  ii. Sequentially place Components 2 and 3 to the left.
  iii. Use measuring tools to check dimensions, diagonals, and flatness, ensuring compliance with the drawing requirements before spot welding for fixation.
  iv. Perform final prefabrication welding, with full circumferential welding along the seam in the middle.

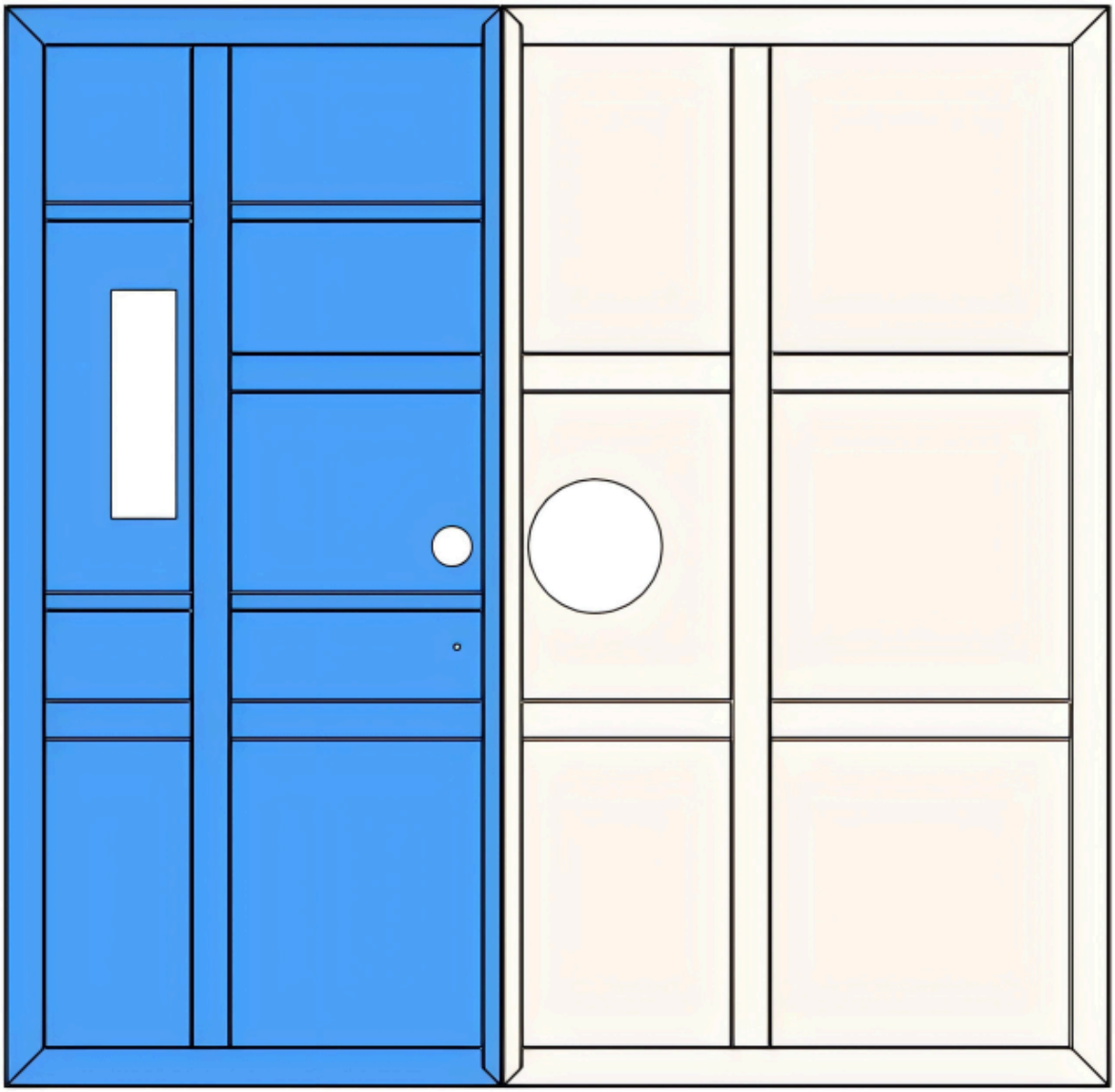




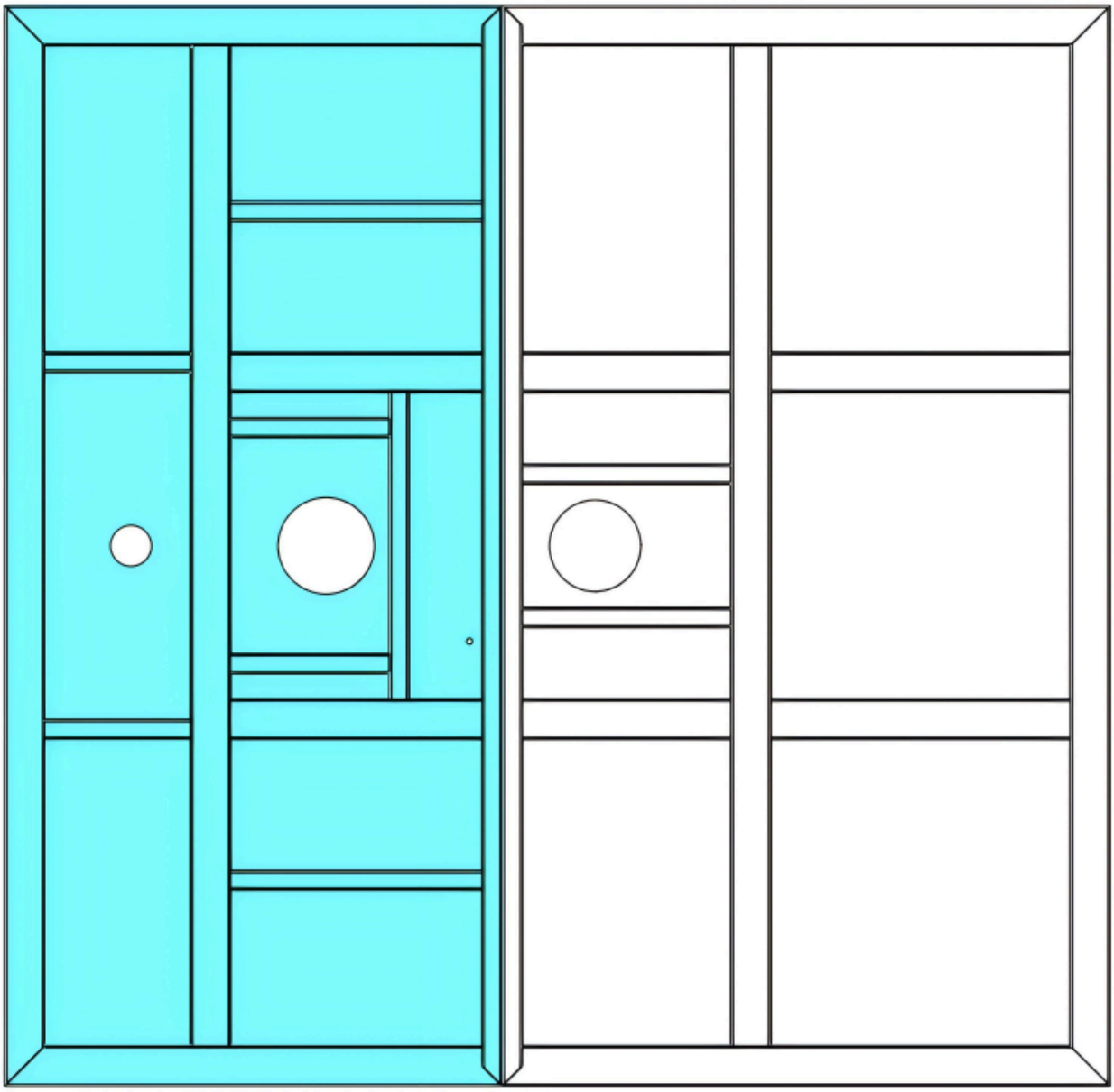
- **30T Furnace Top Steel Structure (L)**: The construction method is the same, with the difference being that the centerline hole size changes to φ366/φ386.



- **15T Furnace Top Steel Structure (H)**: The construction method is the same, with the difference being that the number of components is reduced to 2, and the total length is shortened.



- **15T Furnace Top Steel Structure (L)**: The construction method is the same, with the difference being that the number of components is reduced to 2, and the total length is shortened.



Quantity and Drawings

- **30T Furnace Top Steel Structure (H)**: Quantity 1 unit, centerline hole size φ535, refer to drawing [SKSYD2-05-01(H)].
- **30T Furnace Top Steel Structure (L)**: Quantity 5 units, centerline hole size φ366/φ386, refer to drawing [SKSYD2-05-01].

- **15T Furnace Top Steel Structure (H)**: Quantity 1 unit, centerline hole size φ535, refer to drawing [SKSYD2-05-01(X-H)].
- **15T Furnace Top Steel Structure (L)**: Quantity 3 units, centerline hole size φ366/φ386, refer to drawing [SKSYD2-05-01(X-L)].

Post-Processing

- After prefabrication welding, due to the need for back-side welding and lifting transfer, lifting lugs (made of steel plates with a thickness ≥ 16mm) must be welded on both sides of the furnace top steel structure in the width direction. The distribution of lifting lugs can refer to the red line distance in the example image.
- Upon completion of welding, the welds must be ground flat, especially the butt welds, which must not protrude above the frame plane. The weld areas should be coated with anti-rust primer.
- After painting, place the structure in the storage yard for natural aging, awaiting installation.

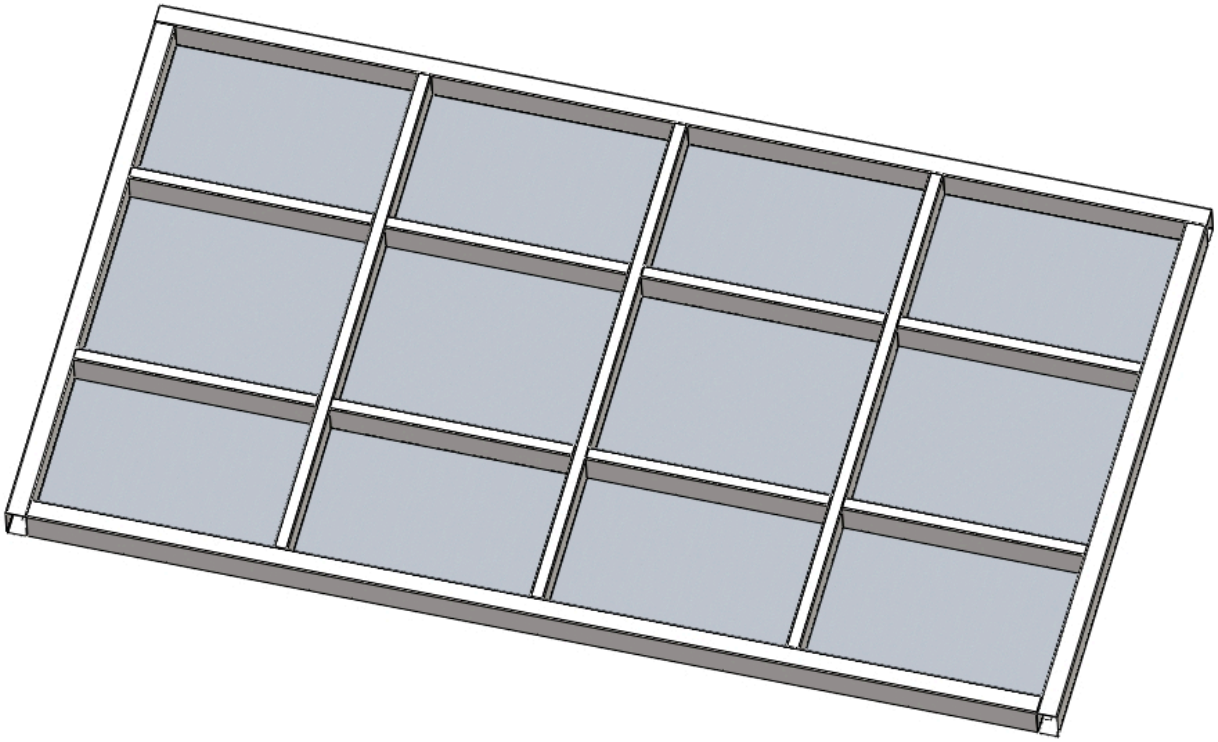
---

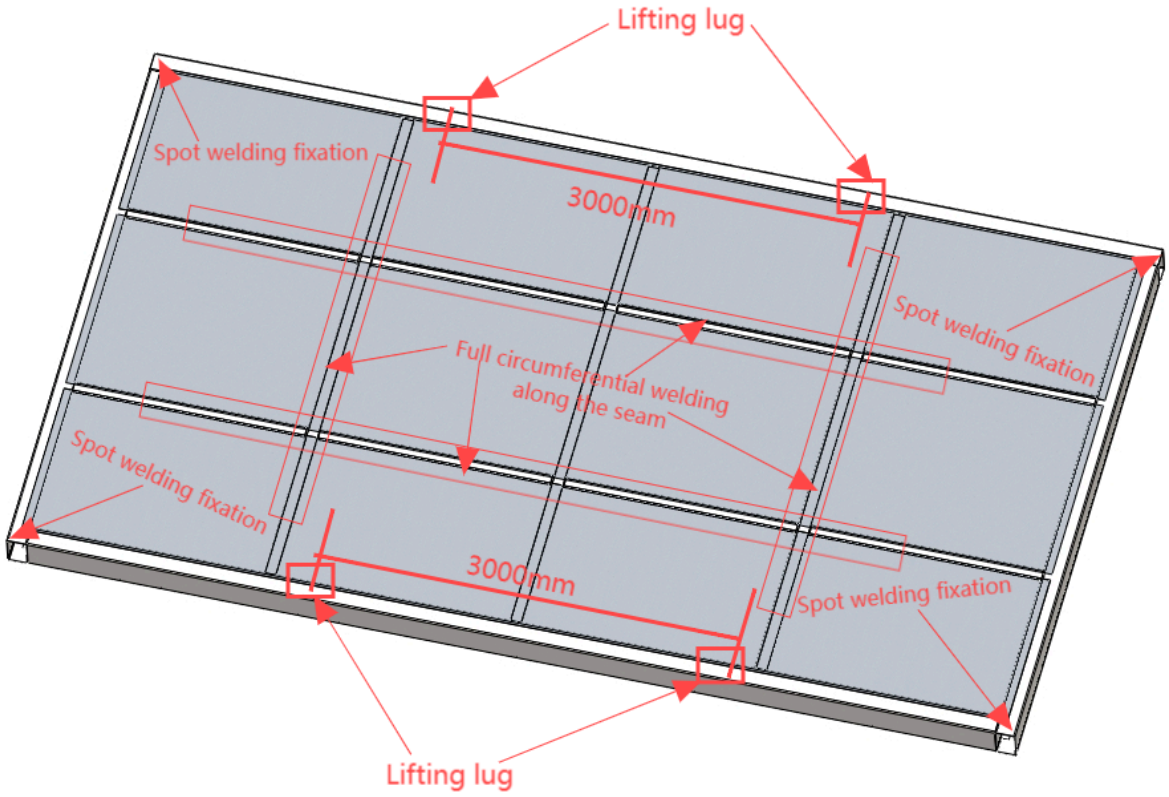
5. Intermediate Wall Steel Structure

The intermediate wall steel structures in this project are divided into **30T Intermediate Wall Steel Structure** and **15T Intermediate Wall Steel Structure**. As the intermediate wall serves as a shared wall for dual-furnace configurations and is installed centrally, on-site assembly welding is adopted to ensure welding quality and overall integrity. All components have been cut to specified dimensions and only need to be fabricated according to the drawing dimensions.

Prefabrication Steps

1. After assembling as per the drawing, use measuring tools to check dimensions, diagonals, and flatness, ensuring compliance with the drawing requirements before spot welding for fixation.
2. Perform final frame welding and sealing plate welding, with the sealing plate requiring full circumferential welding.




Lifting lug
Spot welding fixation
3000mm
Spot welding fixation
Full circumferential welding
along the seam
Spot welding fixation
3000mm
Spot welding fixation
Lifting lug

Quantity and Drawings

- **30T Intermediate Wall Steel Structure**: Quantity 3 units, refer to drawing [SKSDYG-ZG-01].
- **15T Intermediate Wall Steel Structure**: Quantity 2 units, refer to drawing [SKSYD2-ZG-01X].

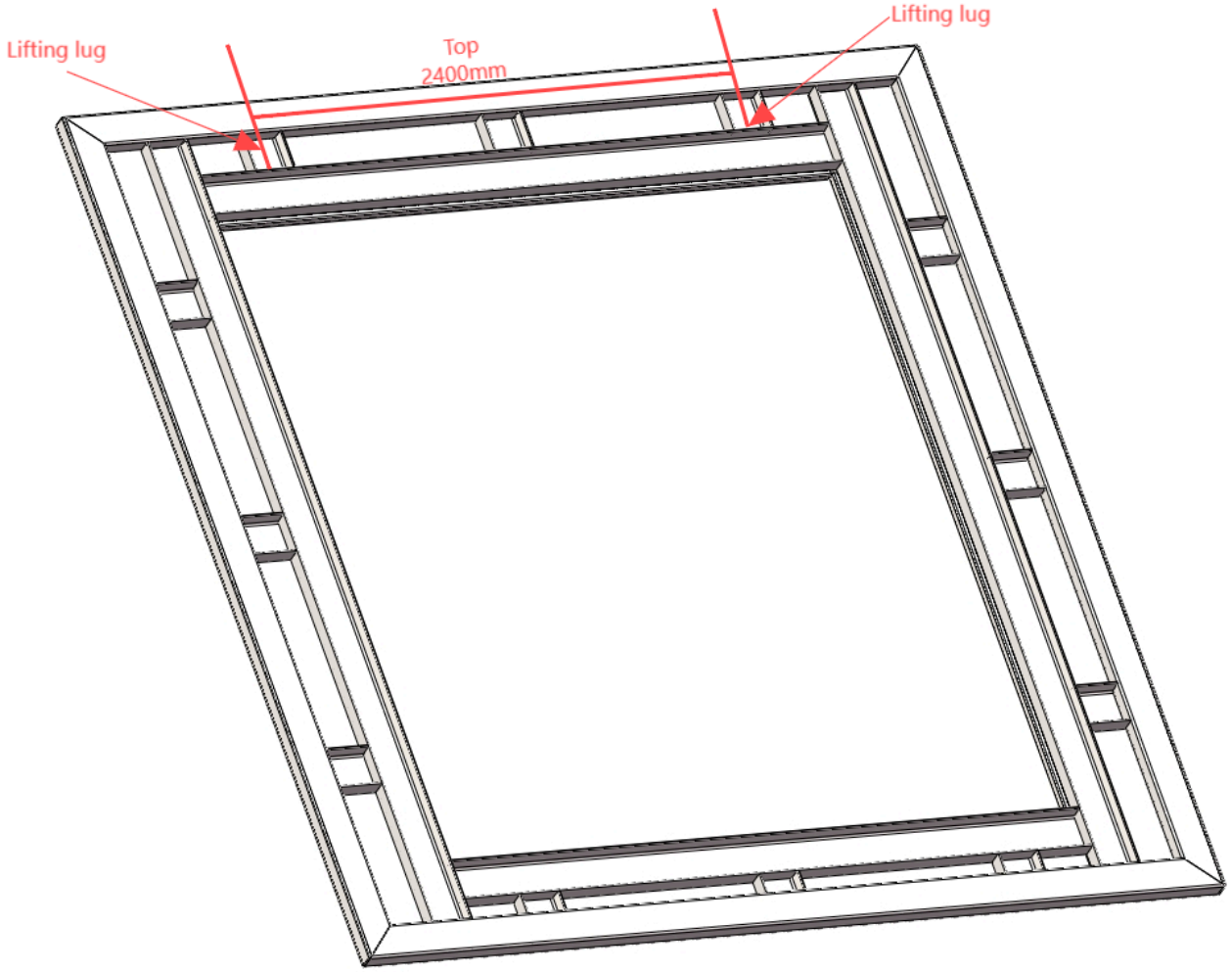
Post-Processing

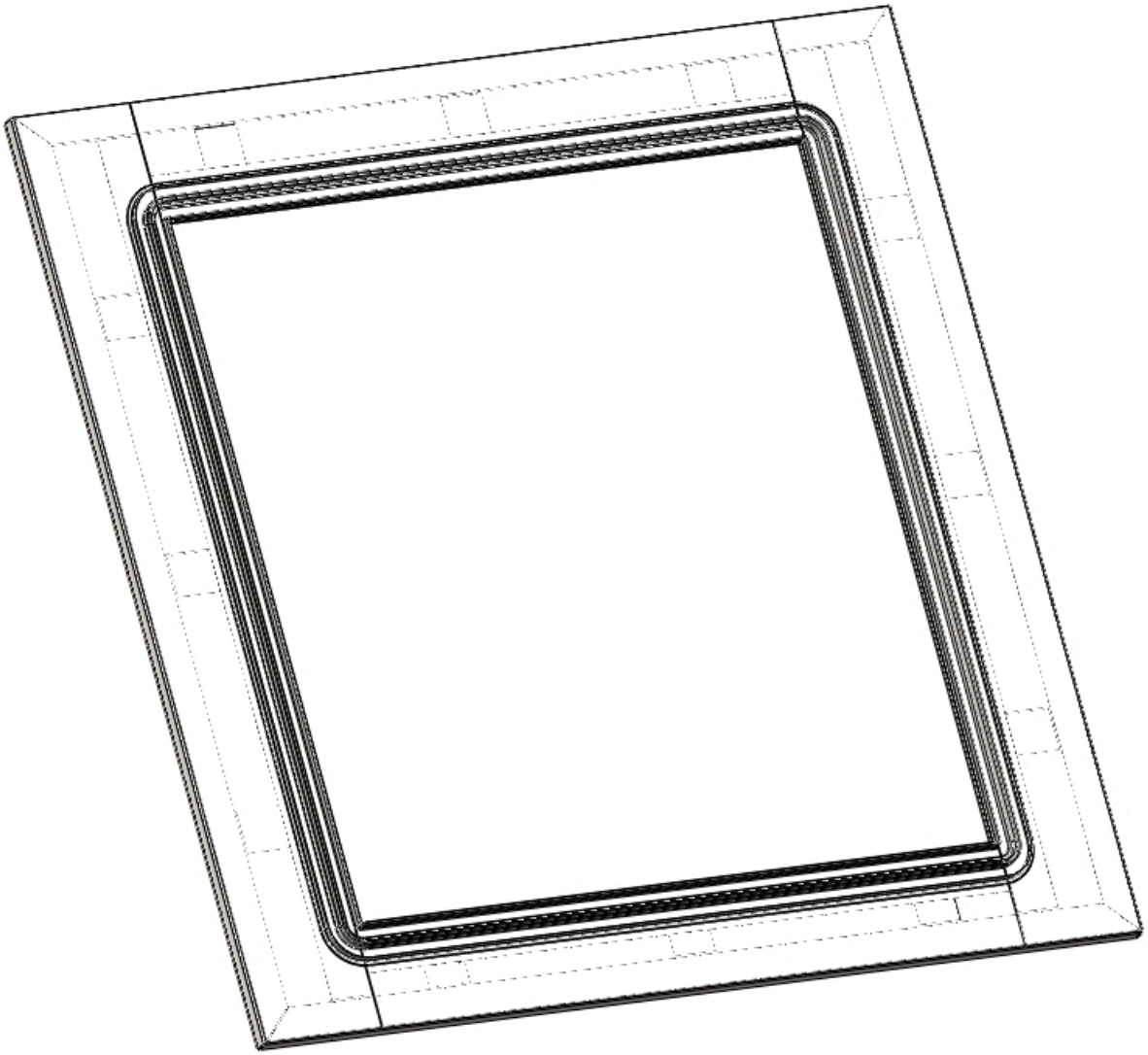
- After fabrication and welding, due to the need for back-side welding and lifting transfer, lifting lugs (made of steel plates with a thickness ≥ 16mm) must be welded on the top area of the sealing plate side. The distribution of lifting lugs can refer to the red line distance in the example image.
- Upon completion of welding, the welds must be ground flat, free of defects or porosity, and shape correction must be performed.
- Finally, perform overall grinding and rust removal, apply gray anti-rust paint, and place the structure in the storage yard for natural aging, awaiting installation.

---

6. Front Wall Steel Structure

The front wall steel structure in this project is a universal design. As the front wall serves as a sealing surface, it must ensure flatness and verticality. To ensure welding quality and overall integrity, on-site assembly welding is adopted. All components have been cut to specified dimensions and only need to be fabricated according to the drawing dimensions.


Lifting lug
Top
2400mm
Lifting lug



Quantity and Drawing

- **Front Wall Steel Structure**: Quantity 10 units, refer to drawing [SKSDYG-01-01(G)].

Post-Processing

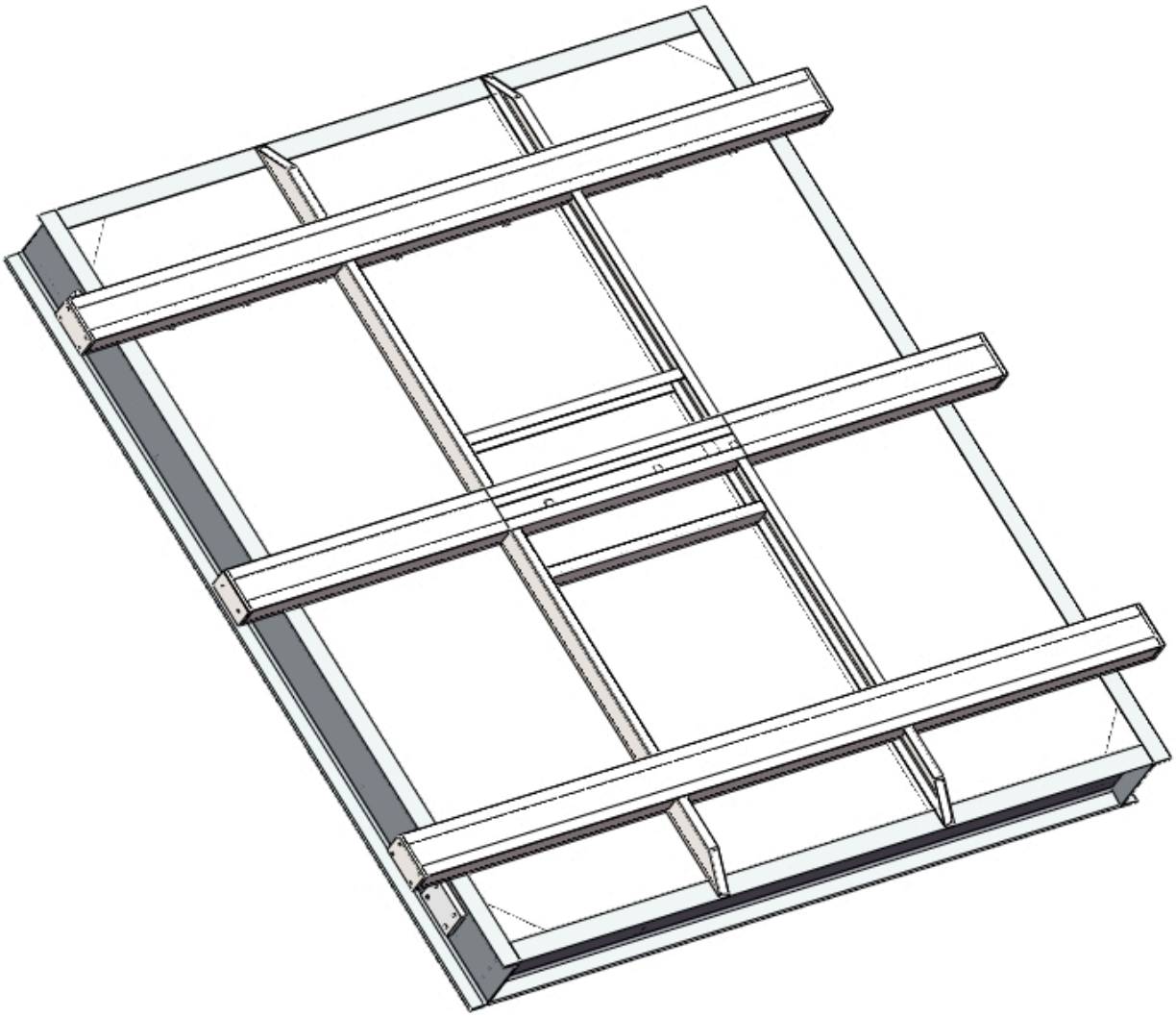
- After fabrication and welding, due to the need for back-side welding and lifting transfer, lifting lugs (made of steel plates with a thickness ≥ 10mm) must be welded on the top area of the square tube channel side. The distribution of lifting lugs can refer to the red line distance in the example image.
- Upon completion of welding, the welds must be ground flat, free of defects or porosity, and

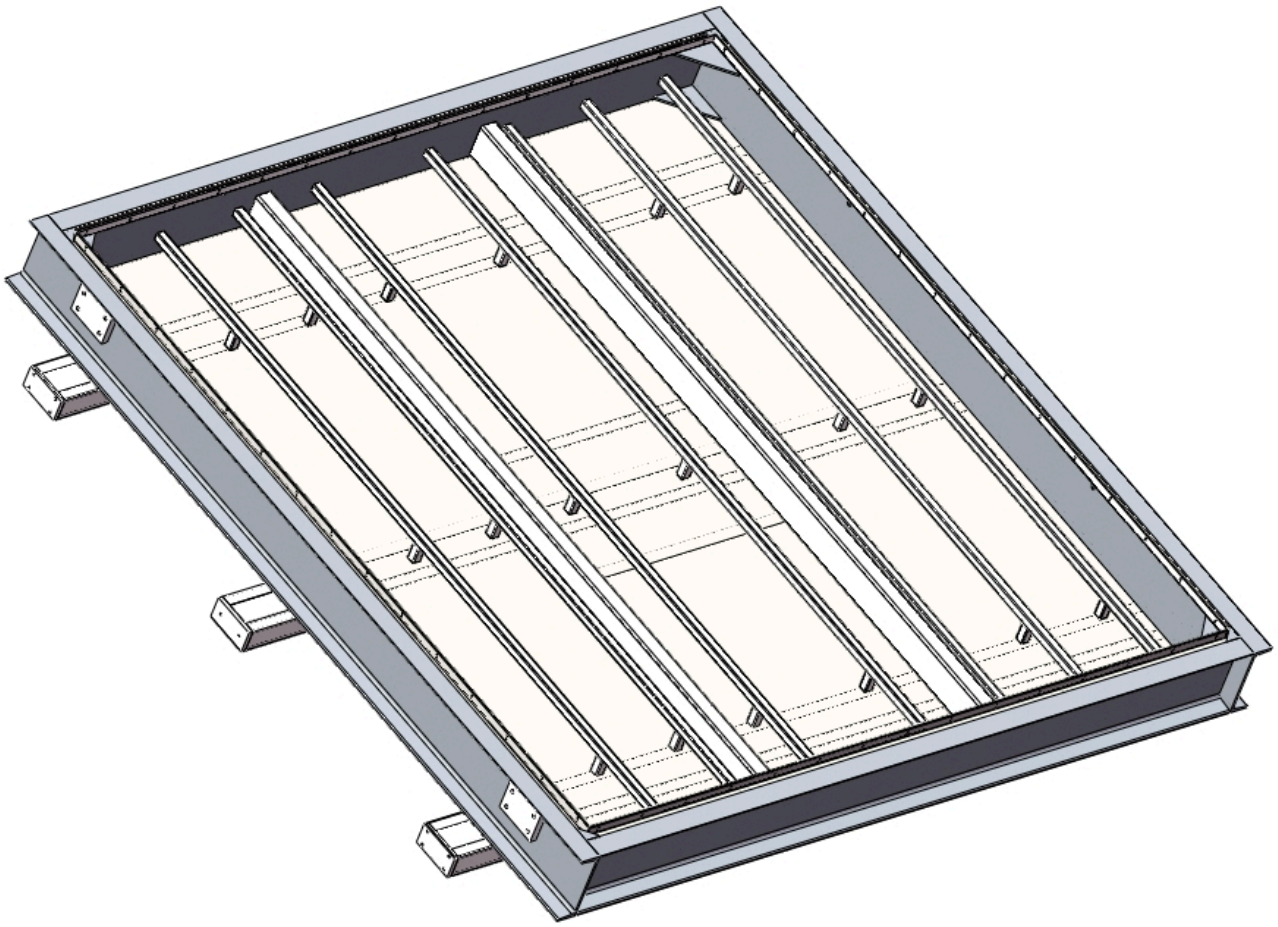
shape correction must be performed.
- Finally, perform overall grinding and rust removal, apply gray anti-rust paint, and place the structure in the storage yard for natural aging, awaiting installation.

---

7. Furnace Door Steel Structure

The furnace door steel structure in this project is a universal design. As the furnace door serves as a moving component requiring opening/closing and sealing functions, the steel structure must ensure flatness and verticality. To ensure welding quality and overall integrity, on-site assembly welding is adopted. All components have been cut to specified dimensions and only need to be fabricated according to the drawing dimensions.





Quantity and Drawing

- **Furnace Door Steel Structure**: Quantity 10 units, refer to drawing [SKSYD2-M01-01(G)].

Special Notes

Special attention must be paid to the diagonal alignment between the furnace door frame and the furnace door keel to ensure flatness between the two.

Post-Processing

- Upon completion of welding, the welds must be ground flat, free of defects or porosity, and shape correction must be performed.
- Finally, perform overall grinding and rust removal, apply gray anti-rust paint, and place the structure in the storage yard for natural aging, awaiting installation.

General Requirements

- **Welding Quality**: Welds must be ground flat, free of defects or porosity, and bottom welds must not protrude above the plane.
- **Lifting Lugs**: Each steel structure must have lifting lugs welded for lifting and transfer, with thicknesses of ≥ 10mm or ≥ 16mm depending on the structure.
- **Anti-Corrosion Treatment**: Welds must be coated with anti-rust primer, and some structures require gray anti-rust paint.
- **Natural Aging**: After welding and painting, place the structure in the storage yard for natural aging, awaiting installation.

Additional Information

For the fabrication of the above seven steel structures, if there are any unclear details or further guidance is needed, please feel free to contact us.