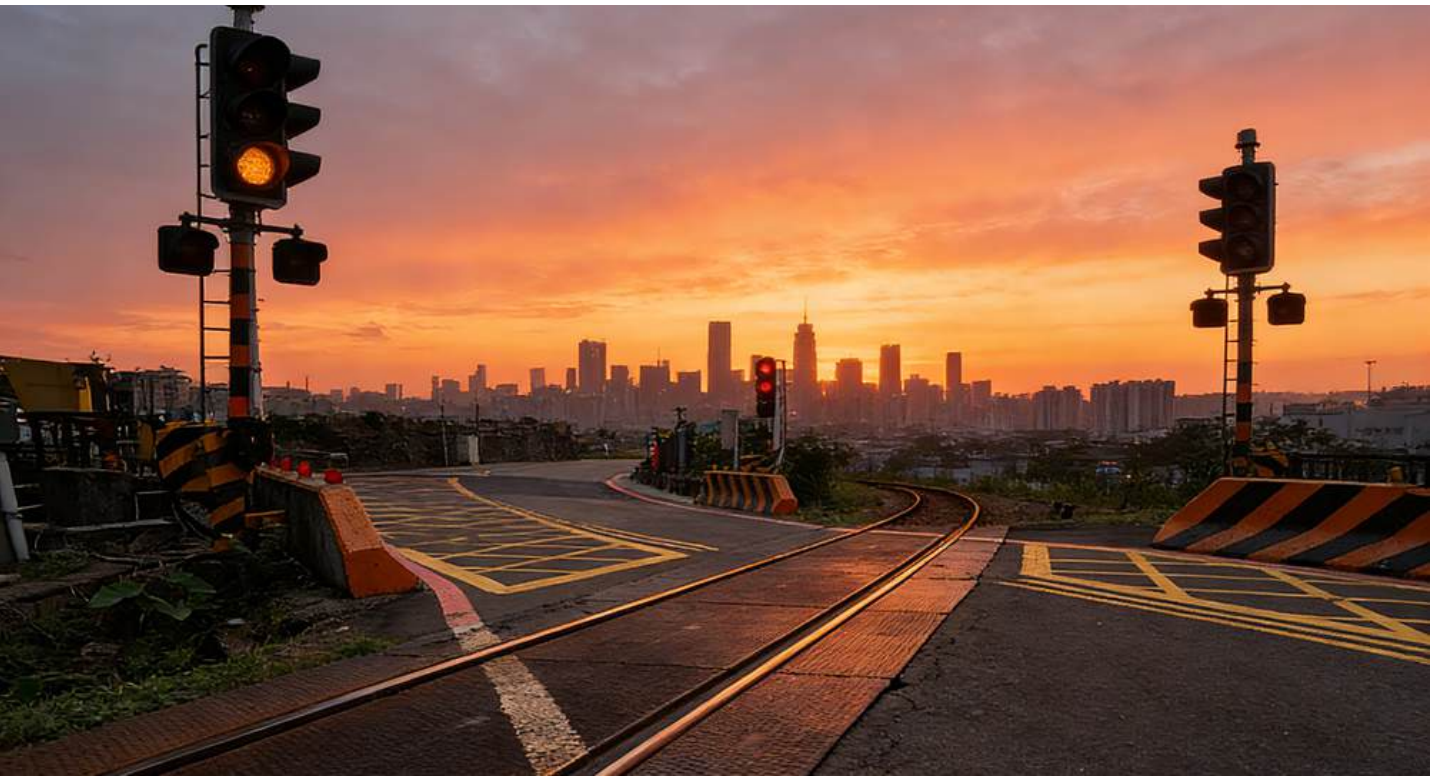
SFFST

Rubber Level Crossing (RLC)

How can we enhance the durability and safety of railway level crossings?
How can railway level crossings be seamlessly integrated into the road infrastructure?
What are the most effective solutions for heavy-duty applications?
How can maintenance frequency be minimized?
And how do these factors collectively impact the overall railway level crossing system?

These are just a few of the critical questions being raised by railway experts worldwide.

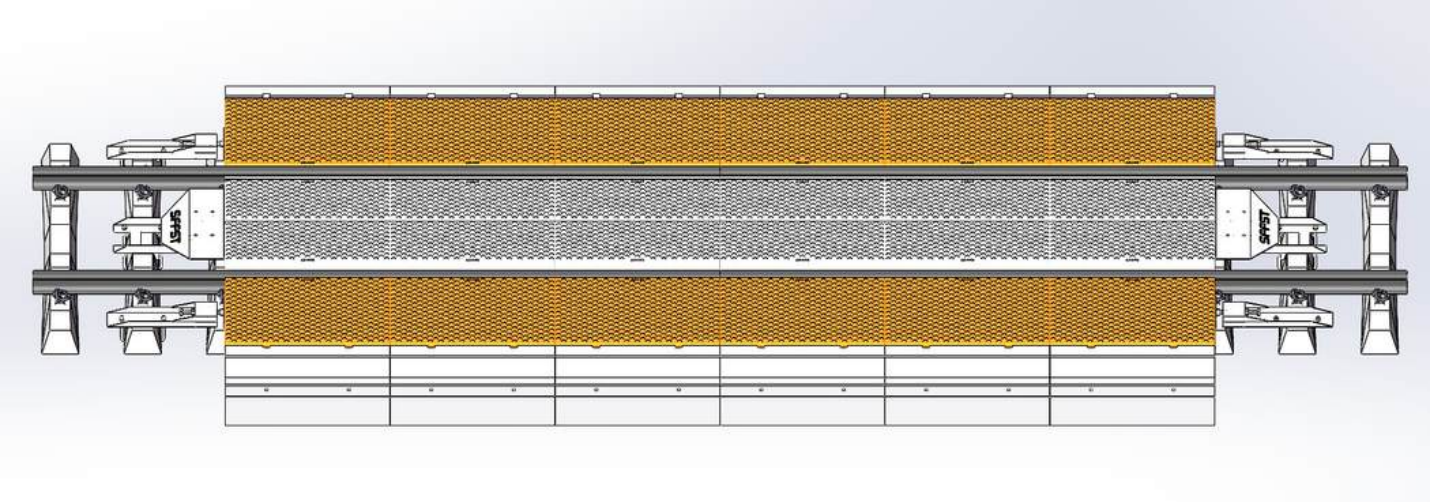


About SFFST

SAFE Rail Fastening System (SFFST), a leading brand in China's rail sector, operates an 50,000 m^2 modern manufacturing base in China, with total investment exceeding RMB 50 million. We specialize in offering comprehensive rail fastening systems and railway engineering equipment for all scenarios including conventional rail, high-speed rail, heavy-haul rail, and metro systems, to provide EPC+M+O entire solutions in rail industry.

About SFFST_RLC

Since pioneering China's first railway rubber level crossing in 1998 and setting the national standard, SFFST has continuously advanced the technology, safeguarding China's railway infrastructure for over two decades. Today, our certified and high-performance rubber level crossing not only serve nationwide but are also exported worldwide, meeting diverse needs for rubber level crossing across global markets.



General Advantages

- Easy Installation
- Optimized Structural Design
- Operational Efficiency
- Durability and Safety Performance
- Electrical Insulation Capability
- Infrastructure Protection
- Adaptability and Sustainability
- Vibration Damping and Noise Reduction
- Skid Resistance

Structural Characteristics

Some products feature a multi-layer composite design, incorporating a metal frame or fiber layer to enhance load-bearing capacity. These products typically measure between 20 and 50 millimeters in thickness, with their length and width customization to meet the specific needs of the crossing. The edges are designed with sloping or grooved sections to facilitate easy connection with the track, and are secured with bolts to ensure stability and prevent displacement.

Service Life

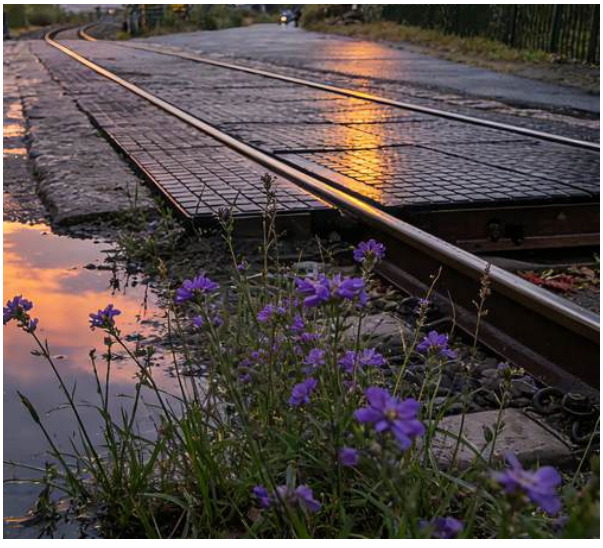
In general, rubber level crossings can be used for 5 years. However, under high load or extreme weather conditions, the service life may be shortened, and the inspection cycle should be shortened and replaced in advance if necessary.

Maintenance

Regularly check for surface wear and cracking and promptly remove debris. Avoid long-term use of overloaded vehicles to reduce the pressure on the paving slab. Increase inspections during extreme weather conditions. If issues such as aging, damage, or loose fasteners are found, replace or repair them promptly.

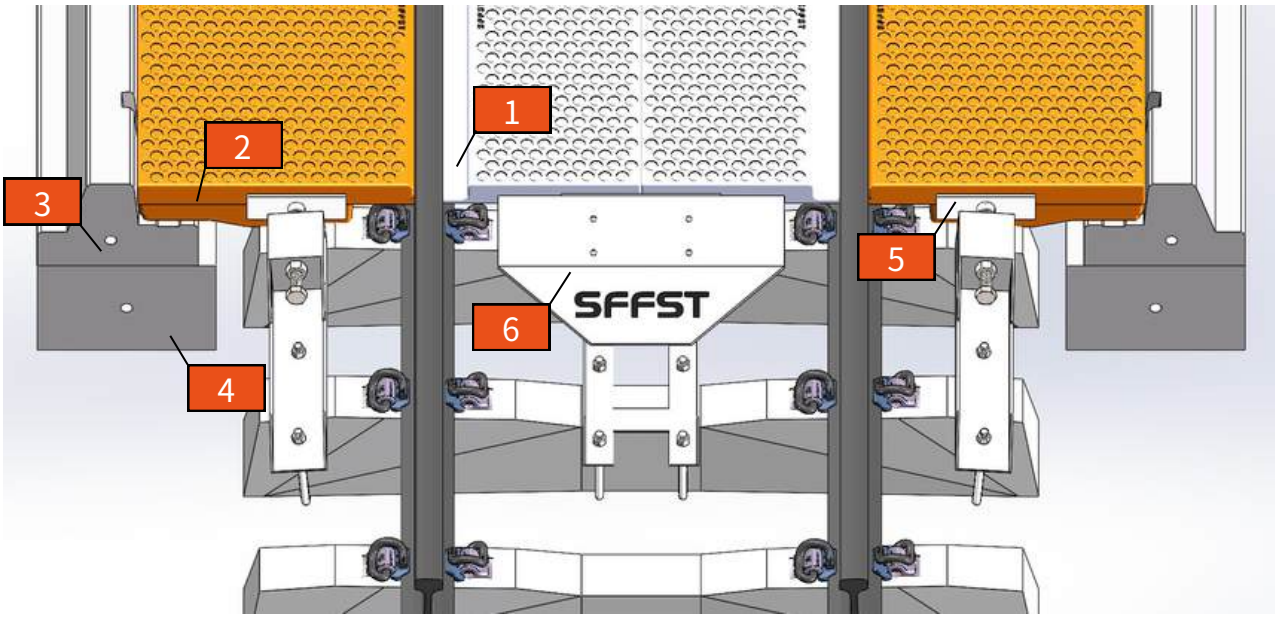
Application

It is applicable to railway and highway crossings, urban light rail circular line crossings, as well as station platforms, station baggage car corridors, freight yards, inside and outside dedicated lines of vehicle maintenance workshops, enterprises and mines dedicated railways and highway crossings.



Datasheet

Parts List					
NO.	Drawing No.	Panel	Material	Qty.	Note
1	SFFST-RLC_TH-IP	Inner Panel	NR & SBR & Fabric	2	
2	SFFST-RLC_TH-OP	Outer Panel	NR & SBR & Fabric	2	
3	SFFST-RLC_TH-CC	Concrete Curb	Concrete	2	
4	SFFST-RLC_TH-CB	Concrete Beam	Concrete	2	
5	SFFST-RLC_TH-OEL	Outer End Lock	Steel	4	per crossing
6	SFFST-RLC_TH-IELWDP	Inner End Lock with Deflector Panel	Steel	2	per crossing



Pre-Installation Preparations

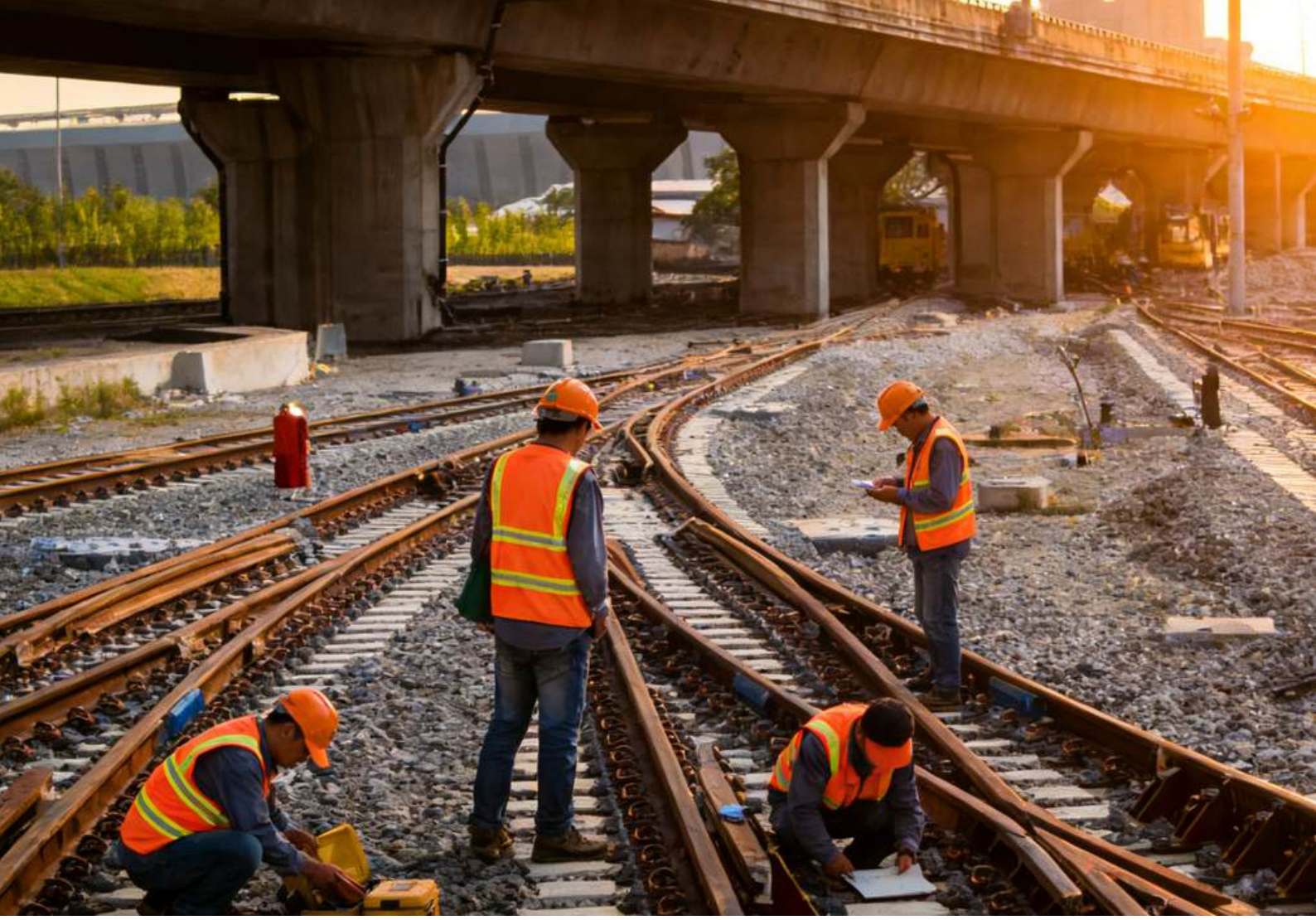
Materials and Tools

Materials:

- Rubber crossing panels that meet design specifications. Verify the quantity and dimensions in advance to ensure they match project requirements.
- Specialized end-lock with deflector plate. Check for physical damage and ensure all components are present and functioning correctly.
- (If necessary) Drainage materials: Permeable geotextile fabric, crushed stone filter media, and waterproof sealant.

Tools:

- Wrenches: Prepare 1-2 sets of open-end and box-end wrenches to fit the locking bolts.
- Measuring tools: Spirit level and tape measure.
- Cleaning tools: Broom.
- Installation tools: Rubber mallet (to avoid damaging the panel surface) and a pry bar (with a soft rubber head to prevent scratching the base or panel).
- (If necessary) Cutting tools: A handheld cutting machine with a diamond saw blade. This is only for on-site panel dimension adjustments. Check the battery and blade sharpness beforehand.



Subgrade Preparation

Subgrade Cleaning:

- Thoroughly sweep the subgrade surface to remove debris (e.g., gravel, leaves), oil stains (which can be cleaned with a special degreaser and then dried), loose concrete, or soil. Ensure the surface is free of any foreign objects that could interfere with installation.

Subgrade Inspection and Repair:

- Strength Check: For a concrete subgrade, use a rebound hammer to check its surface strength. The required strength must be no less than C30. If the subgrade is made of other materials, it must meet the load-bearing requirements specified in the design documents.
- If there are localized depressions, protrusions, or damage, they must be repaired first. Fill depressions with high-strength repair mortar, grind down protrusions, and remove any loose parts from damaged areas before re-pouring or repairing.
- Dimension Verification: Measure the subgrade's length, width, and alignment with the rail to ensure it matches the panel laying area.

Installation Steps

Arrange the concrete sleepers according to design requirements, maintaining a uniform 600 mm center-to-center spacing (as shown in Figure 1). Ensure the sleeper tops are level and evenly spaced. Lay the crossing panels following a "middle to sides" sequence, strictly in the direction shown in Figure 2 to avoid incorrect installation.

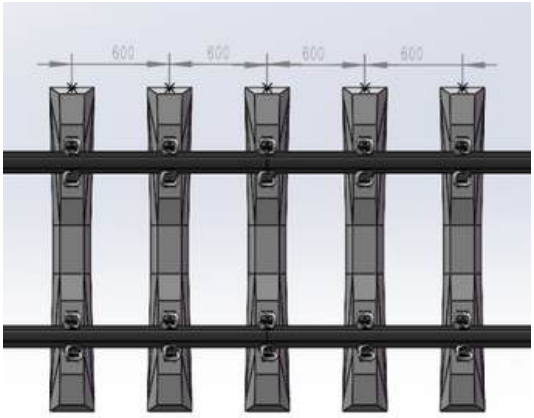


Figure 1

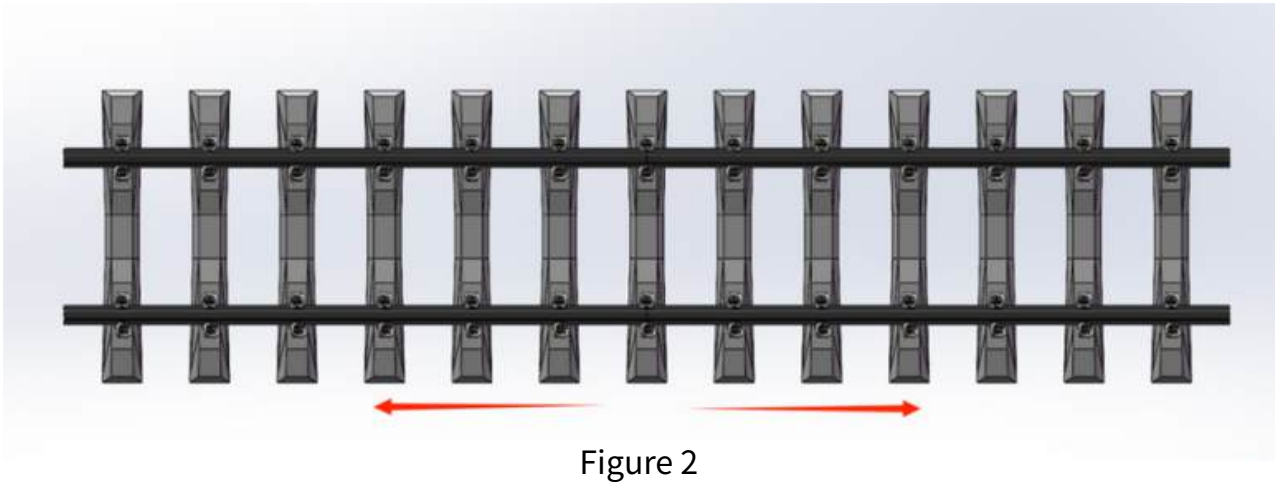


Figure 2

Installation Steps

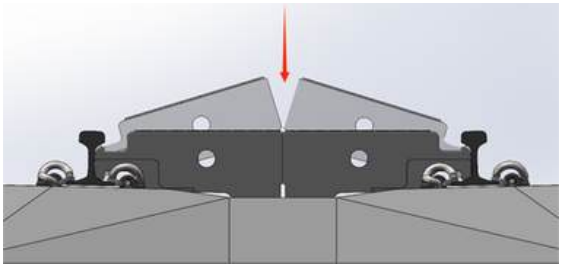


Figure 3

First, place the two inner panels in their designated positions at an angle (as shown in Figure 3), ensuring there are no foreign objects where the panel bottoms contact the concrete sleepers. Then, slowly step on the top of the panels from directly above, or use a rubber mallet to gently tap along the panel edges until the panels are initially in place.

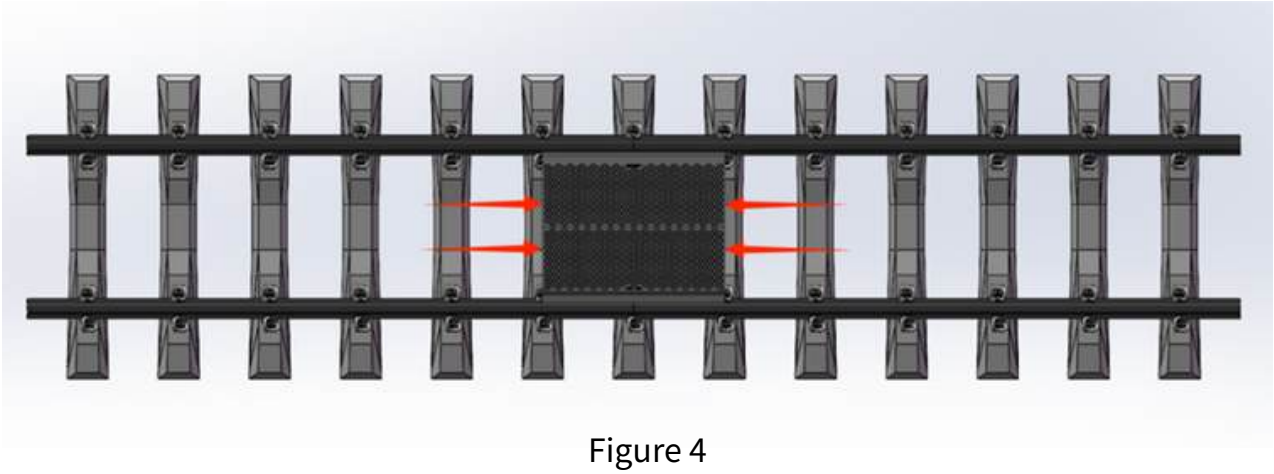


Figure 4

After the panels are initially set, lightly tap the inner panels with a rubber mallet and use a spirit level to ensure both panel tops are on the same plane. The bubble should be centered to confirm there is no height difference. Tap the left and right sides of the inner panels with the rubber mallet (as shown in Figure 4) while using a tape measure to center them between the concrete sleepers.

Installation Steps

Next, place the outer panels at an angle so they initially align with the rail web (as shown in Figure 5).

Once the outer panels are initially positioned, use a rubber mallet to gently tap along their surface (as shown in Figure 6). Using a spirit level, align the panel top with the top of the concrete blocks (as shown in Figure 7), with a deviation of no greater than 3 mm.

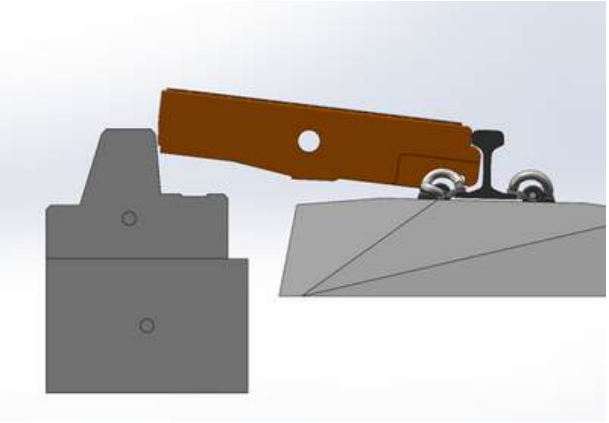


Figure 5

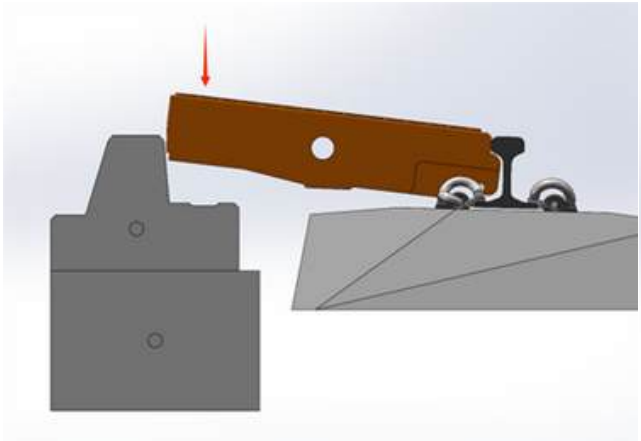


Figure 6

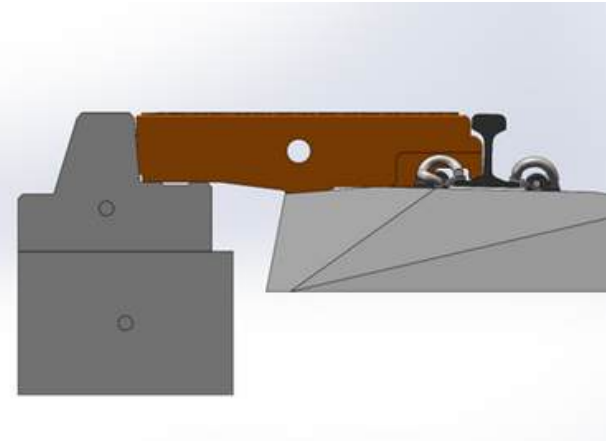


Figure 7

Installation Steps

If excessive friction between the panel and subgrade prevents it from being tapped into place, use a pry bar with a soft rubber head. Gently leverage the panel from the gap at the bottom to pry it into the concrete block, then continue tapping it into position with the rubber mallet (as shown in Figure 8). Do not use excessive force to pry, as this could damage the panel or subgrade.

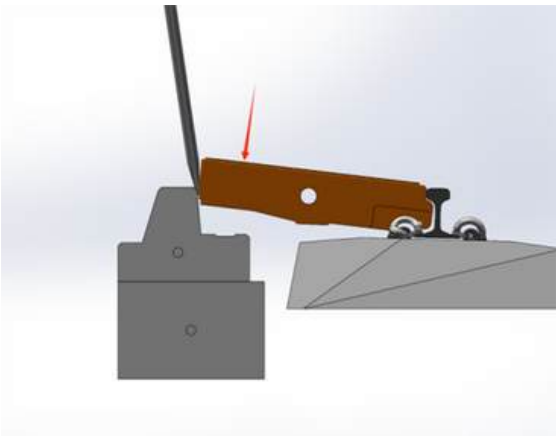


Figure 8

After the outer panel is in place, tap its left and right sides with a rubber mallet (as shown in Figure 9), and use a tape measure to center it between the concrete sleepers. Ensure it is on the same plane as the inner panel. This completes the installation of one set of panels.

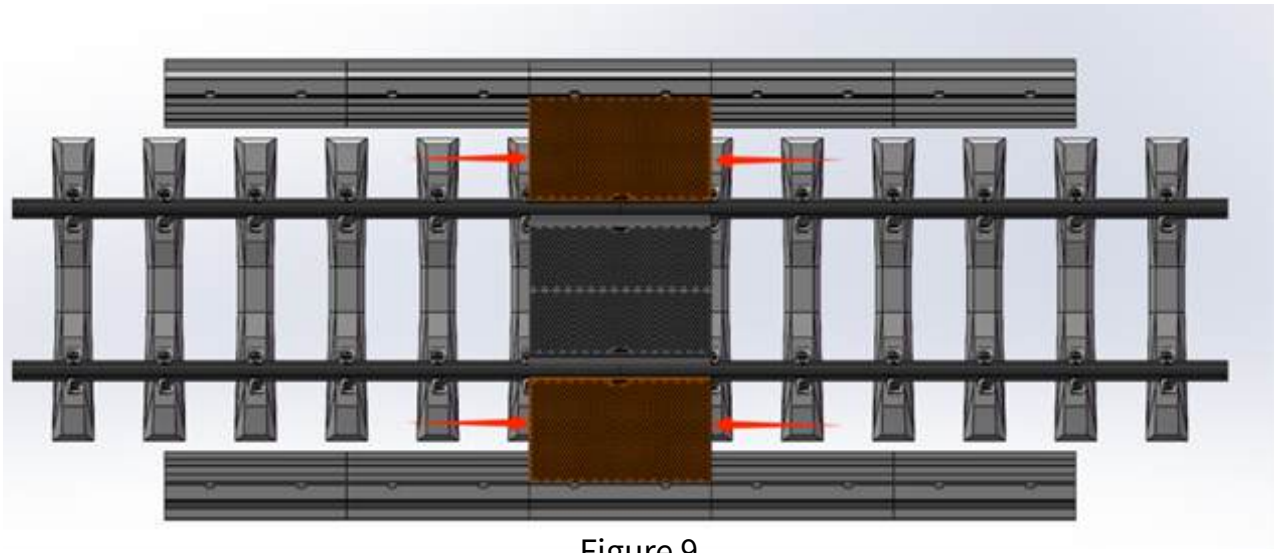
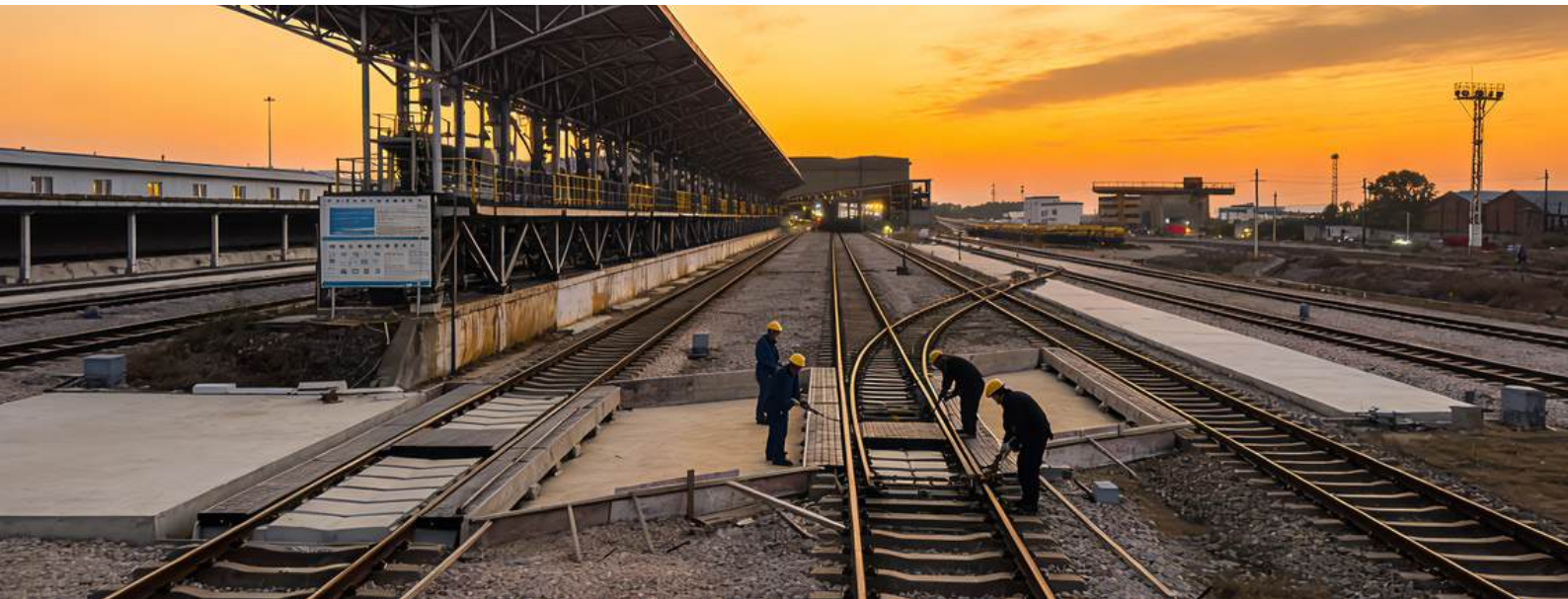


Figure 9



Installation Steps

Install the remaining panels from the middle to the sides using the same "inner → outer" procedure (as shown in Figure 10 and Figure 11). After all panels are laid, tap the side of each panel with a rubber mallet to ensure they are all in close contact with no visible gaps. This completes the installation of all five sets of panels (as shown in Figure 12).

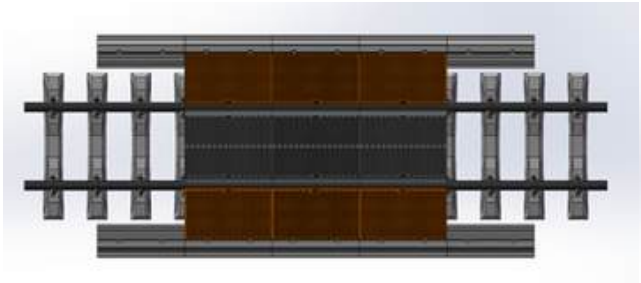


Figure 10

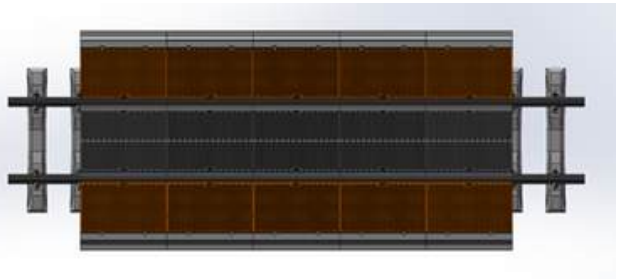


Figure 11

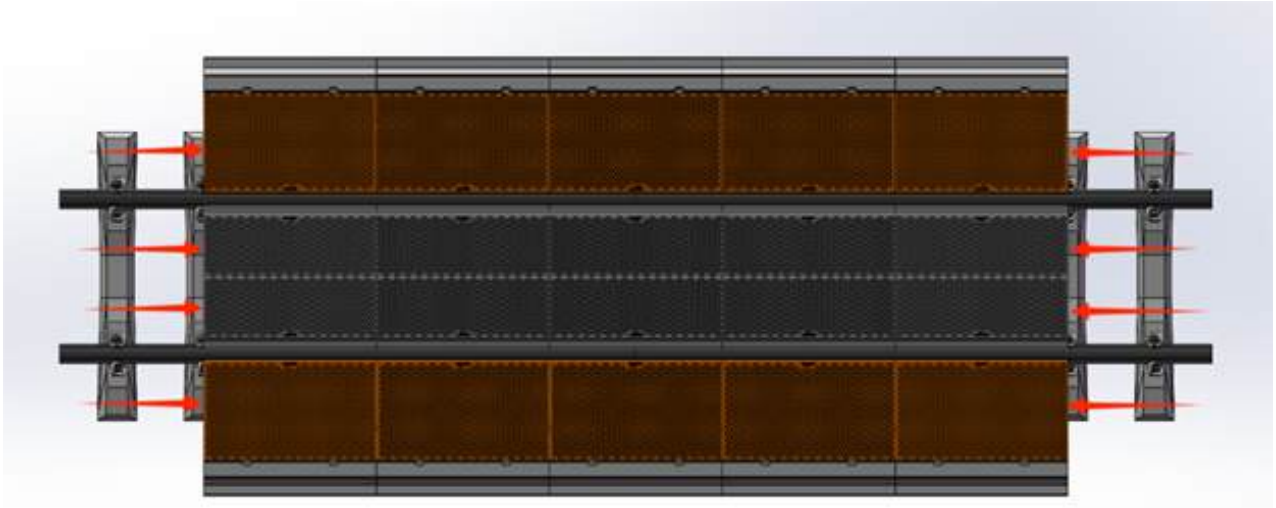
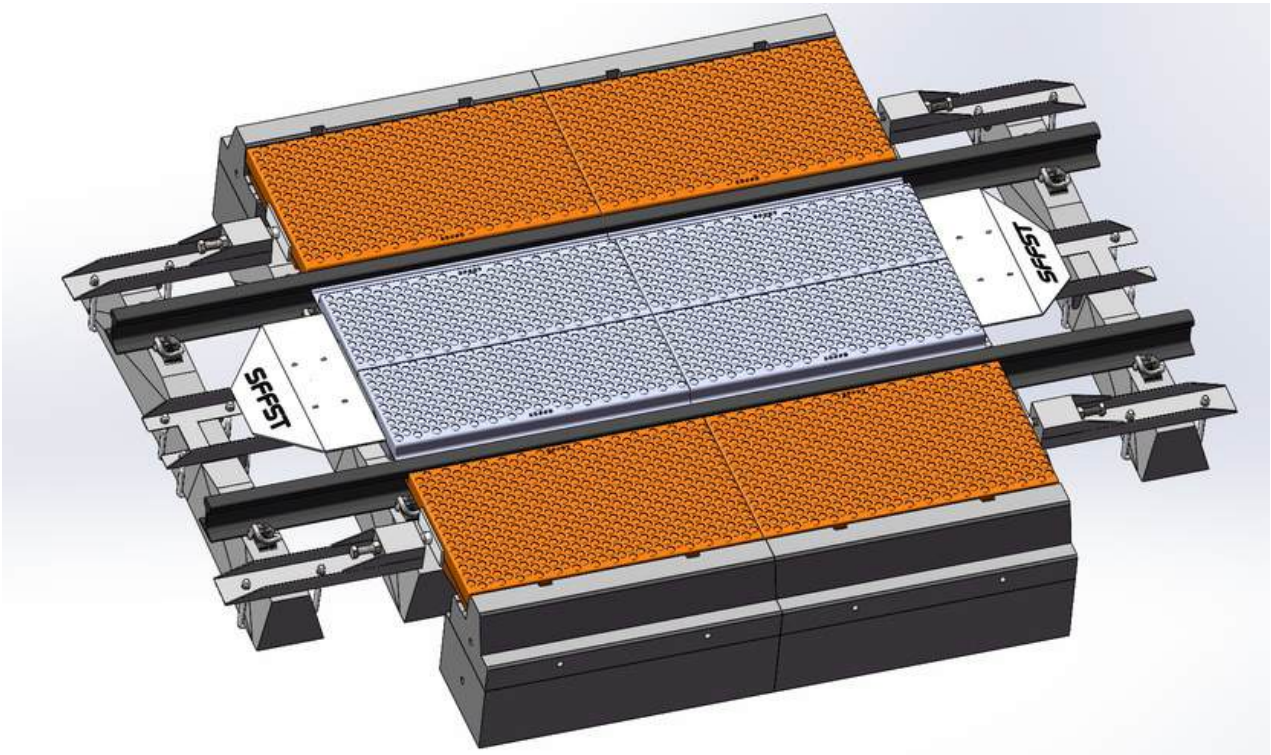


Figure 12

End-Lock with Deflector Plate Installation



- U-Bolt Installation: Insert the U-bolt from the bottom of the concrete sleeper upwards. Ensure the U-bolt opening faces up and the two vertical bars are parallel to the sleeper's sides without tilting or binding. This provides a stable interface for the main locking clip body.
- Main Body Placement: Insert the main locking clip body through the U-bolt opening and place it firmly on the top of the concrete sleeper. Visually inspect and use a tape measure to ensure the front and rear ends of the main body are fully resting on the effective load-bearing surface of the sleeper. Avoid local suspension that could lead to uneven stress.
- Position Adjustment (if needed): If the front end of the locking clip body does not properly rest on the sleeper, use a pry bar with a soft rubber head to gently pry and slowly adjust the sleeper's position until both ends of the main body are stable on the sleeper.
- U-Bolt Tightening: Use an appropriate wrench to tighten the nut on top of the U-bolt clockwise. Maintain the relative position of the U-bolt and the main body during tightening to ensure the nut is not stripped or loose, creating a secure connection between the main body and the concrete sleeper.
- Panel Locking: Use a wrench to turn the large nut on the front end of the main body clockwise until the nut face is in close contact with the side of the panel. Apply an appropriate preload to secure the panel. The panel should show no noticeable displacement or changes in the fit gap. This completes the installation of one locking clip set.

Important Considerations

Installation Requirements

After installing each panel, you must immediately tap its side to ensure it is in close contact with the adjacent panel, with no gaps. Do not lay multiple panels first and then adjust them all at once, as this can cause cumulative deviations that prevent subsequent panels from fitting correctly.

If a panel is difficult to tap into place due to excessive friction, you can spray a small amount of water evenly on the friction points to reduce resistance and then continue tapping it into position. Do not use oily lubricants, as they can contaminate the panel and affect its service life.

During installation, do not place heavy objects (e.g., tools, materials) on the panels to prevent deformation. When using the rubber mallet, control the force to avoid cracking the panel or damaging the subgrade.

Concrete Sleeper Installation Notes

Inspection and Selection: Before laying, inspect each concrete sleeper. Do not use any that are defective, as this could compromise the overall structural stability.

Positioning Accuracy: Lay sleepers along the marked lines on the subgrade. During installation, use a tape measure to verify the center-to-center distance between adjacent sleepers to prevent cumulative errors that could affect panel installation. Do not use a hammer to adjust the level of a sleeper after it has been laid, as this could damage it.

Drainage Control During Construction

When laying the permeable geotextile fabric, ensure there are no tears or wrinkles. Overlapping joints should be sewn with a needle and thread or sealed with waterproof tape to prevent mud and sand from clogging the fabric's pores.

The crushed stone filter media must be clean and free of mud and debris to prevent later settling that could block the drainage channels.

When laying the concrete blocks, check each one to ensure the drainage grooves are clear. Use a drill bit to clear any blocked by cement slurry. Ensure water can seep through the gaps between the blocks into the subgrade drainage system.

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