1. Pre-Installation Preparation

- **Site Inspection**:
    - Verify the supporting structure (e.g., concrete foundations, steel frames) is clean, level, and free of debris. Ensure alignment with engineering drawings and confirm load-bearing capacity requirements (static or dynamic loads).
    - Check environmental conditions: Avoid installation in extreme temperatures (<5°C or >40°C) or high humidity to prevent material degradation.
- **Material Verification**:
    - Inspect **FRP I beams** for cracks, delamination, or uneven surfaces. Confirm dimensions (flange width, web height, length) match specifications.
    - Store beams horizontally on a flat, dry surface with adequate support to prevent bending or twisting.
- **Safety Protocols**:
    - Provide PPE: gloves, safety goggles, respiratory masks, and cut-resistant clothing. Use fall protection systems for elevated installations.

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2. Required Tools and Materials

Category	Tools/Materials
Cutting Tools	Diamond-coated circular saw, fiberglass-specific blades
Fastening Tools	Stainless steel brackets, epoxy adhesive, galvanized bolts, rubber isolators
Alignment Tools	Laser level, measuring tape, spirit level
Surface Prep Tools	Solvent cleaner (acetone), sandpaper (120–400 grit), wire brush

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3. Installation Steps

A. Cutting and Shaping

. Mark cutting lines using a chalk line or marker. Secure the beam in a vise to minimize vibration.

. Cut from the **top flange** using a diamond-coated saw to reduce fiber fraying. Deburr edges with sandpaper.

B. Surface Preparation

. Clean the beam and contact surfaces (e.g., supports, brackets) with a solvent to remove contaminants.

. Roughen smooth surfaces with sandpaper or a wire brush for better adhesive bonding.

C. Mechanical Fastening

. Align the beam with supports using a laser level. Install rubber isolators between the beam and metal surfaces to prevent galvanic corrosion.

. Secure stainless steel brackets at **500–800 mm intervals** along the beam's length. Tighten bolts evenly to avoid warping.

D. Adhesive Bonding (Optional)

. Mix epoxy resin and hardener as per manufacturer ratios. Apply a uniform layer to mating surfaces.

. Press the fiberglass H beam into position and hold for 5–10 minutes. Allow 24–48 hours for full curing.

E. Load Distribution

- Ensure the load is applied vertically to the **web** of the I beam. Avoid off-center or lateral loads exceeding design limits.

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4. Key Considerations

- **Load Limits**:
    - Do not exceed the manufacturer's rated axial or bending capacity. Reinforce joints and connections with additional brackets for heavy loads.
- **Environmental Compatibility**:

- FRP I beams resist corrosion but degrade under prolonged UV exposure. Apply UV-resistant coatings for outdoor use.

- **Thermal Expansion**:
  - Maintain a **3–5 mm gap** between beams and adjacent structures to accommodate expansion/contraction.

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5. Prohibited Actions

- Do not weld, grind, or expose FRP beams to open flames.
- Avoid dragging sharp or heavy objects across the surface to prevent structural damage.
- Never install beams with visible defects (e.g., cracks, delamination).

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6. Maintenance Guidelines

- **Cleaning**:
  - Clean with mild detergent and water. Avoid abrasive chemicals or high-pressure washing.
- **Inspections**:
  - Check brackets, bolts, and adhesive joints annually for loosening or corrosion. Replace damaged components immediately.

This guide emphasizes safe handling, precise alignment, and compliance with structural requirements for FRP I beams. Always follow manufacturer specifications and local building codes.