Camber inspection plan for an overhead crane main girder

crane-girder-camber

SHANGHAI MICROCRE OPTICS-MECH TECH CO.,LTD

Telephone: 400-812-7833 | 021-58391850

Address: 1478 Nanfeng Road, Fengcheng Town, Fengxian District, Shanghai, China | Postal code: 201411

Contact email: shanghai@yr17.net

Service email: rockwei@yr17.net

Application template; not a claim of a completed customer project.

Scope

For no-load camber of an overhead crane main girder (22.5 m span, example/teaching data) with a loaded-deflection comparison. With the support and trolley position fixed, the autocollimator profiles the centreline of the top cover plate; camber is evaluated against the endpoint line and re-measured under load for comparison.

Equipment and configuration guidance

• Long-focus photoelectric autocollimator (0.1″ class)

• 250 mm reflector base with equal-span pads (example)

• Test load blocks and support-state confirmation tools

• Temperature and solar-exposure logging

Principle and calculation

Camber f=max(hi−(h0+i·(hn−h0)/n)); with L=250 mm, 1″≈1.212 μm (example/teaching data). Segments are spliced by least-squares registration of the overlap; loaded deflection is the difference between loaded and no-load profiles.

On-site checklist

• Load and support state recorded

• Solar exposure and temperature difference noted

• Reverse-run difference assessed

Suggested records

• No-load camber curve and value

• Loaded deflection comparison

• Environment and support state log

Limitations

Does not replace the rated-load stiffness test or lifting safety assessment; under strong solar gradients the data serve as trend reference only. Girder fatigue and weld condition are outside this plan.

Detailed teaching example

Overhead Crane Girder Camber Inspection · Tutorial Case

Scenario and task

Teaching demonstration, not a real customer project: segmented local profile survey of an overhead crane girder camber on a teaching model; data are instructional settings.

Workflow overview

Model support → End station → Profile steps → Log pitch → Profile evaluation

Preparation and measurement steps

01. Support the girder model at the scaled span on the rig

02. Place the autocollimator at the bridge end with the optical axis along the top flange

03. Move a 200 mm bridge along the top flange step by step

04. Record the pitch reading per segment

05. Cumulate and convert for the camber profile

Teaching example readings

• Bridge span L=200 mm; segment 1 autocollimator reading θ□=+0.8″

• Segment 2 autocollimator reading θ□=+0.4″

• Segment 3 autocollimator reading θ□=-0.2″

Calculation procedure

Height conversion: Δh = L·tan(θ·π/648000)×1000 (μm). Segment 1: 200×tan(+0.8″)=+0.78 μm; Segment 2: 200×tan(+0.4″)=+0.39 μm; Segment 3: 200×tan(-0.2″)=-0.19 μm. Cumulative heights: 0→+0.78→+1.17→+0.98 μm; peak-to-valley PV=+1.17−(+0.00)=+1.17 μm.

Example result and interpretation

Tutorial result PV≈1.17 μm, demonstrating micrometre-level segmented profiling of the girder camber.

Example verification checklist

• Support positions mimic the real span bearings

• Bridge avoids weld zones on the flange

• Model undisturbed during readings

Document generated: 2026-11-16