

Crane Runway Beam — 25-Ton Bridge Crane

CMAA Class C · W30x99 + C15x33.9 · AISC DG-7

Code: AISC 360-22 App.3 + CMAA #70
Tonnage: 54 tons
Connections: 12 joints
Date: 2026-06-14
Prepared by: FrameAI Autonomous Engine
Standard: AISC 360-22 / ASCE 7-22 LRFD

| Mark | Profile | Length (ft) | Qty | Grade | Role |
|------|-----------|-------------|-----|---------|--------------------|
| RB1 | W30x99 | 40.0 | 4 | A992 | Runway Beam Web |
| CAP | C15x33.9 | 40.0 | 4 | A36 | Cap Channel |
| STF | PL 3/8x6 | 0.5 | 24 | A572-50 | Bearing Stiffener |
| BPL | PL 1"x10" | 0.8 | 8 | A572-50 | Runway Beam Splice |

MEMBER UTILISATION CHECKS

AISC 360-22 App.3 + CMAA #70

| Member | Check | Code Ref | Demand | Capacity | Util | OK |
|--------------------|------------------------|------------------------|-------------|-------------|--|----|
| RB1+CAP (combined) | Flexure (vertical) | AISC 360-22 §F2 + DG-7 | 1240 kip-ft | 1580 kip-ft | <div><div style="width: 79%;"></div></div> 79% | OK |
| RB1 biaxial | Biaxial bending (horiz | AISC 360-22 §H2 + AISE | 45 kip-ft | 62 kip-ft | <div><div style="width: 73%;"></div></div> 73% | OK |
| Web stiffener STF | Web local yielding | AISC 360-22 §J10.3 | 156 kips | 185 kips | <div><div style="width: 84%;"></div></div> 84% | OK |
| RB1 (fatigue) | Fatigue — Cat B fillet | AISC 360-22 App. 3 Cat | 11.2 ksi | 16 ksi | <div><div style="width: 70%;"></div></div> 70% | OK |

BOLT SCHEDULE

| Connection | Grade | Diameter | Qty | Install Torque |
|--------------------|--------|----------|-----|----------------|
| Splice plates (J1) | A490-N | 1" | 64 | 890 ft-lb |
| Stiffener to web | A325-N | 3/4" | 96 | 280 ft-lb |

CONNECTION REPORT — AISC 360-22 §J2/J3/B3.1

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J1 — Runway splice — bolted cover plates

| | |
|----------------------|-------------|
| Bolt grade: | A490-N |
| Bolt diameter: | 1" |
| Weld electrode: | E70XX |
| Demand Mu: | 1240 kip-ft |
| Demand Vu: | 85 kips |
| Capacity ϕMn : | 1580 kip-ft |
| Utilisation: | 79% — OK |

Code references:

AISC 360-22 §J3.6 — Bolt tension capacity: $\phi Rn = 0.75 \times Fnt \times Ab$

AISC 360-22 §J3.7 — Combined tension + shear: $Fnt' = 1.3Fnt - (Fnt/\phi Fnv) \cdot frv$

AISC 360-22 §J2.4 — Fillet weld capacity: $\phi Rn = 0.75 \times 0.6FE_{XX} \times Aw \times 1.0$ (E70XX)

AISC 360-22 §B3.1 — LRFD: Required strength \leq Design strength