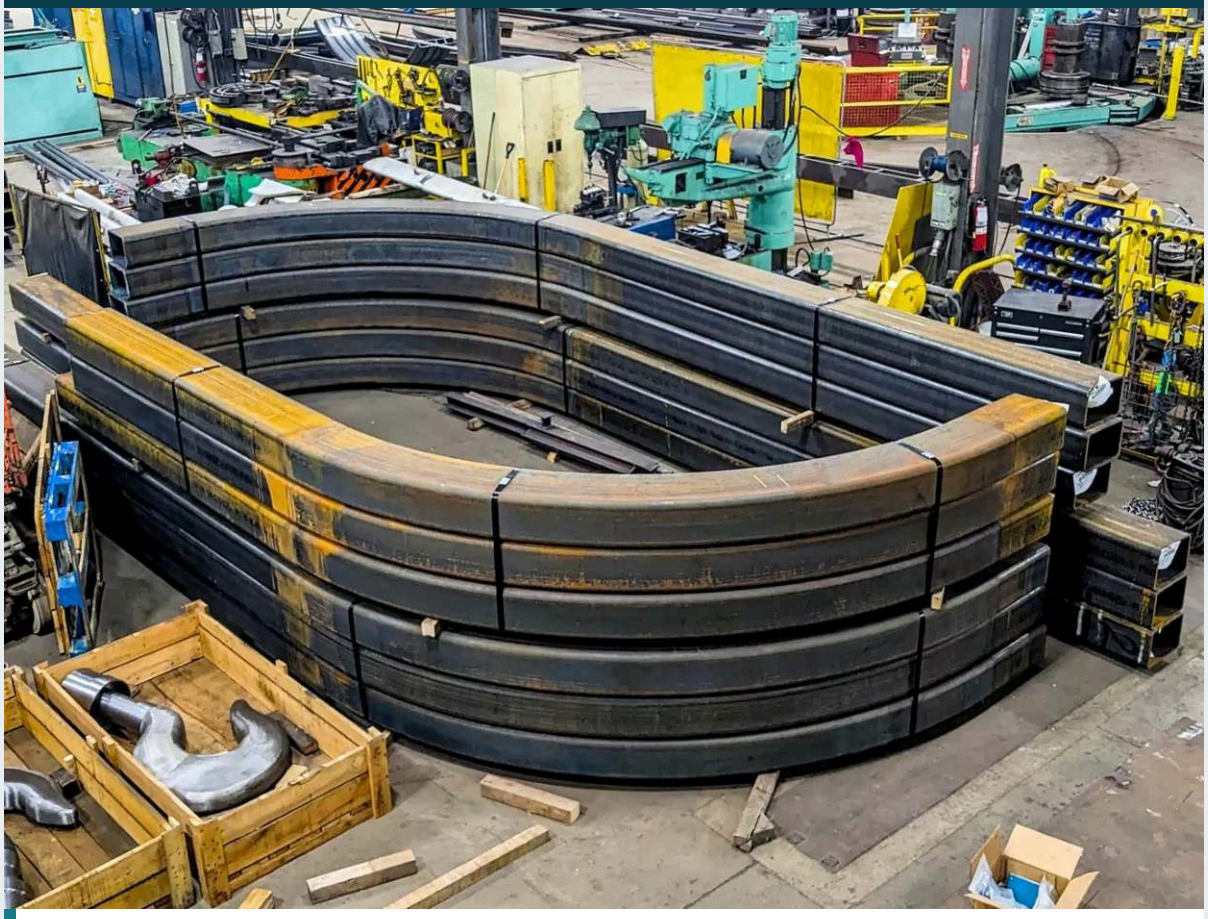
KUBES STEEL

VOLUME 1 · ISSUE 5 SPRING 2026

A KUBES STEEL EDUCATIONAL SERIES

STRAIGHT TALK ON CURVED STEEL

PART 1 OF 3 · GET THE GEOMETRY RIGHT



GET THE GEOMETRY RIGHT

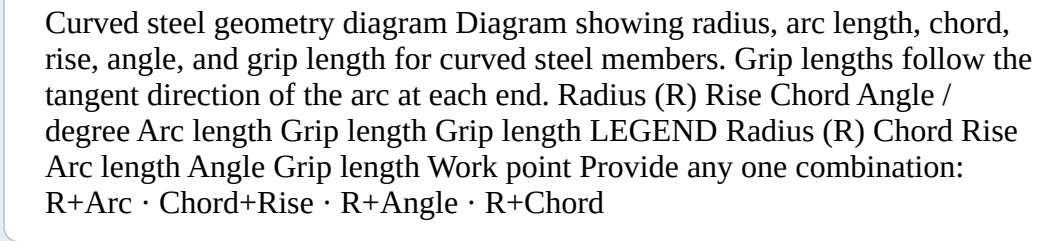
How to Spec Curved Steel So Your Bender-Roller Doesn’t Come Back With Questions

Curved steel projects fail at the specification stage far more often than they fail on the shop floor. Getting the geometry right on your drawings — before anything is ordered or

rolled — is the single most important thing you can do to keep your project on schedule and on budget. Here's what you need to know.

THE GEOMETRY — KNOW YOUR TERMS

Every curved member is fully defined by just a few dimensions. The diagram below shows all the key terms. You only need to provide **one valid combination** — we calculate everything else from there.



✓ VALID COMBINATIONS

- Radius + Arc length
- Chord + Rise
- Radius + Angle/degree
- Radius + Chord

⚠ KEY RULES

All dims from the same work points

Don't over-dimension — conflicting dims cause RFIs

Include grip lengths in overall member length

ALWAYS SPECIFY THE BENDING ORIENTATION

EASY WAY

Bending about the **weak axis** — the member curves in the plane of its web. Think of a W-shape curving like a banana when viewed from the side. Generally less distortion, more straightforward to roll.

HARD WAY

Bending about the **strong axis** — the member curves in the plane of its flanges. More demanding on the material and the equipment. Always call this out clearly on the drawing — never assume it's obvious.

THE MOST COMMON SPEC MISTAKES WE SEE

1. **OVER-DIMENSIONING WITH CONFLICTING GEOMETRY**
   Providing radius, chord, rise, AND arc all on the same drawing when they don't mathematically agree. Pick one valid combination and let us calculate the rest.

2. **NO BENDING ORIENTATION SPECIFIED**
   Easy way or hard way — every drawing needs to say. Don't assume it's obvious. It often isn't, especially on non-standard sections.

3. RADIUS TIGHTER THAN THE SECTION CAN ACHIEVE

Minimum bend radii vary by section size, wall thickness, and bending method. Call us before you finalize the drawings if you're not sure — it's a 5-minute conversation that can save days of redesign.

4. FORGETTING TO ACCOUNT FOR GRIP LENGTHS

The curved portion of a member doesn't start and end at the cut ends — there are straight grip lengths at each end. Miss these and your overall member length will be wrong and the piece won't fit.

WHEN THE GEOMETRY IS RIGHT



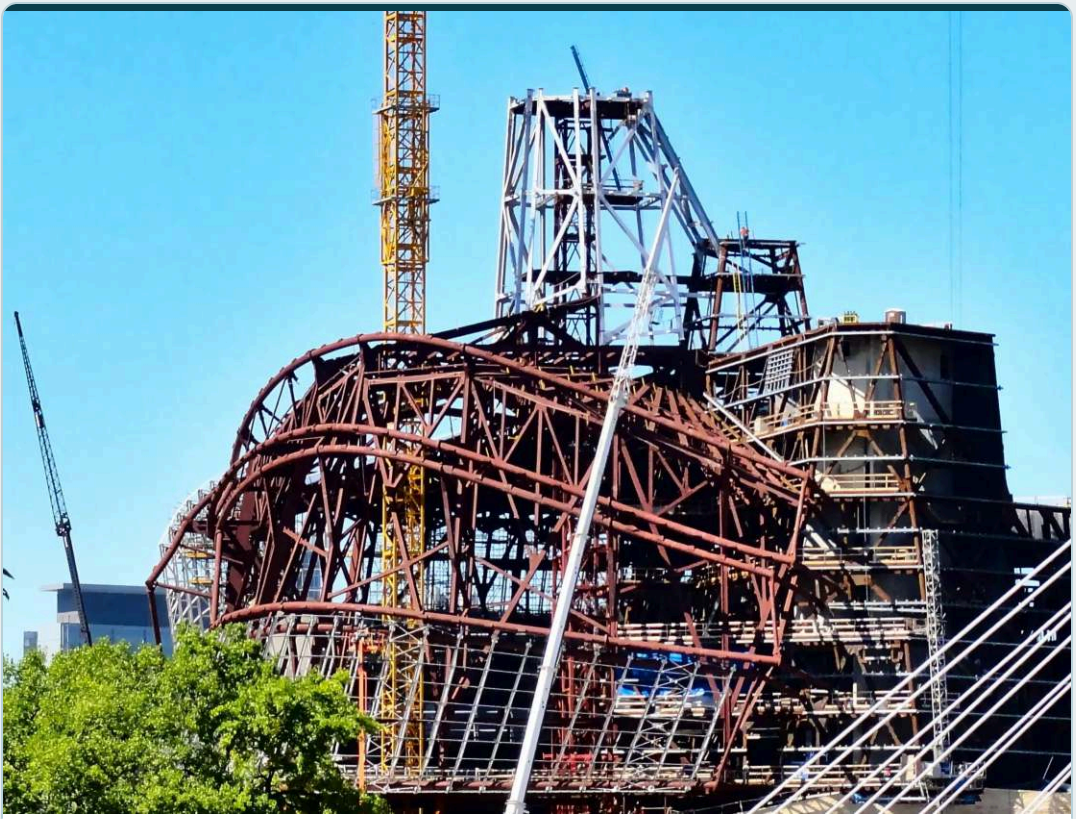
Architectural curved roof structure

Curved structural roof beams being erected on site. Every piece rolled to a consistent radius from clean drawings.



St. Lawrence Market, Toronto

Elegant arched structural framing on site. Every piece arrived right the first time.



When the geometry is right, this is what we can produce — dozens of identical curved sections all rolled to the same precise radius, stacked and ready for delivery. Every piece in this bundle matches. That only happens when the spec is unambiguous from the start.

KUBES STEEL · VOLUME HSS ROLLING · STRUCTURAL SECTION BENDING

CURVED STEEL DRAWING CHECKLIST

- ✓ One valid geometry combination (R+Arc, Chord+Rise, R+Angle, or R+Chord)
- ✓ Bending orientation specified (easy way or hard way)
- ✓ All dimensions from the same work points
- ✓ Grip lengths identified and included in overall member length
- ✓ Section size and material grade confirmed
- ✓ Connection plates, stiffeners, or end details noted

Not sure if your drawings cover all of this? Send them to us before you finalize — a quick review costs nothing and can save days downstream.

COMING UP — PART 2 OF 3

Curved Steel Is Easier to Design Than You Think

AISC Design Guide 33 changed how engineers design curved members — and most structural engineers don’t know about it yet. Next issue we’ll break down what it means for your next project and why curved steel no longer has to mean added design complexity.

Have a Curved Steel Project Coming Up?

Send us your drawings early and we’ll review the geometry with you — no charge, no obligation.

SEND YOUR DRAWINGS →

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