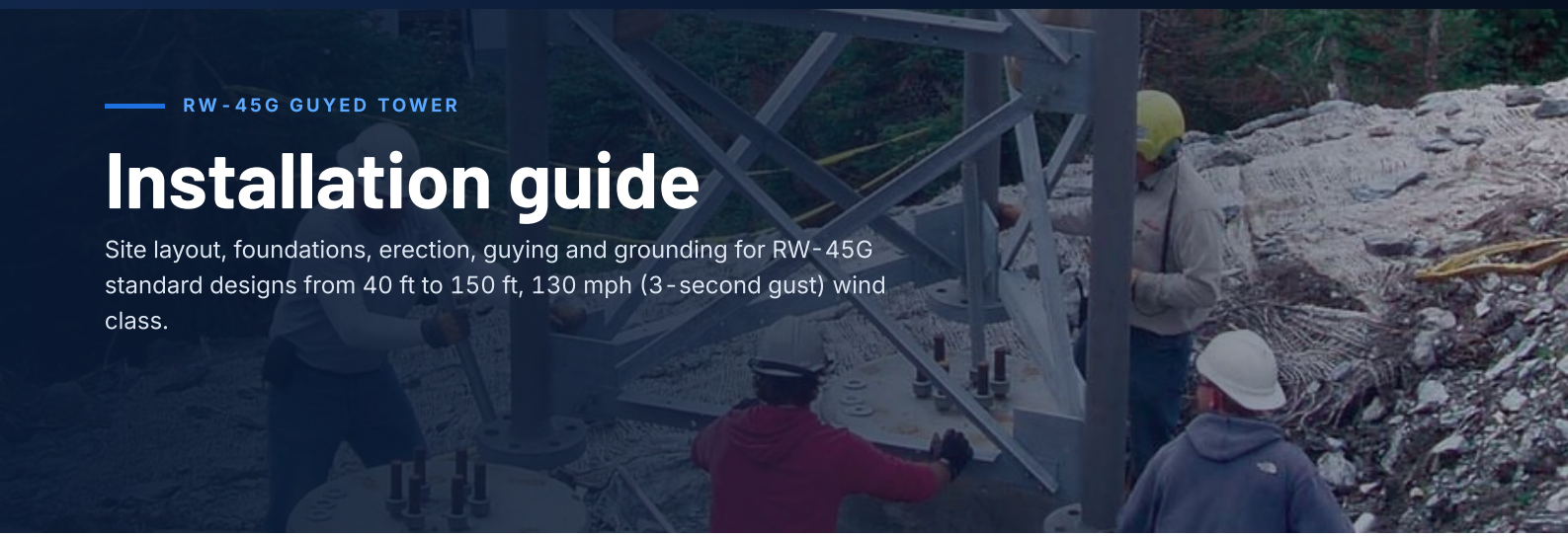


RW-45G GUYED TOWER

# Installation guide

Site layout, foundations, erection, guying and grounding for RW-45G standard designs from 40 ft to 150 ft, 130 mph (3-second gust) wind class.

**40 – 150 ft**
Tower heights covered (12.2 – 45.7 m)

**130 mph**
3-second gust, no ice (TIA-222-G)

**3 anchors**
At 120°, 80% of tower height

**Class I**
ANSI/TIA-222-F and -G structure

STEP 0

## Before you start

Thank you for choosing Rongwell. A careful check of the delivery before anyone climbs saves time on site and prevents costly mistakes. Complete this inspection when the material arrives.

- [ ] Count every item against the packing list: sections, top section, base plate, guy assemblies, strand, anchor rods, templates and hardware.
- [ ] Confirm the assembly drawings and the anchor rod layout drawing are in the delivery.
- [ ] Check that anchor rod and template part numbers match the anchor rod layout drawing.
- [ ] Trial-assemble components on level ground to confirm the assembly sequence.
- [ ] Report shortages, damage or fabrication errors to Rongwell straight away, with photos, so replacements can be shipped.

### Safety first

- The tower must **never stand unguyed**. Keep it guyed with steel guys, temporary or permanent, at all times.
- Never erect or dismantle within falling distance of power or telephone lines.
- Only qualified, experienced crews may erect or dismantle the tower.
- Temporary steel guys are supplied and installed by the erector.
- A climber safety device is required on any structure taller than 10 ft (3 m).

**Rongwell is not responsible** for charges caused by installing the wrong anchor rods, the wrong number of rods or the wrong rod orientation, or for crane, drilling, equipment, crew or mobilization charges. Questions? Write to **contact@rongwelltowers.com** before you start.

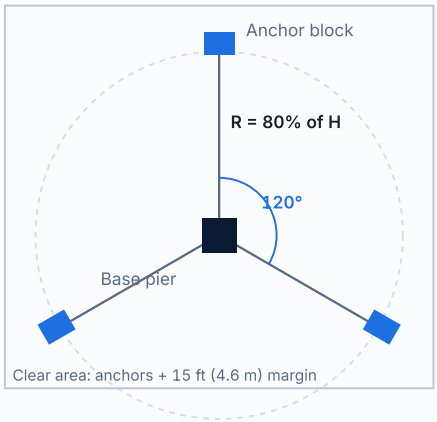
### Contents

| | |
|---|---|
| 1 · Before you start | p. 1 |
| 2 · Site layout and foundations | p. 2 |
| 3 · Erection and guying | p. 3 |
| 4 · Grounding, inspection and maintenance | p. 4 |

STEP 1

# Lay out the site

**Plan view**




Three anchors at 120°. R is measured from the tower base to where the anchor rod enters the ground.

- Set the three anchors 120° apart at an anchor radius of **80% of the tower height**, measured on level ground to the point where each anchor rod enters the earth.
- Keep at least **15 ft (4.6 m)** of clear land around each anchor. A larger area lets you rotate the layout for the best antenna path.
- On restricted sites, custom designs with stronger masts and larger guys can reduce the radius to as little as 40% of the height. Ask Rongwell before changing any radius.
- Guy chord lengths are for level ground. Add 6% for sag and connections when cutting final lengths.
- Roof-top and unusual terrain installations need structurally adequate supports for base and anchor connections, checked by a local engineer against local building codes.

## Guying details · 130 mph

| Height ft (m) | Base pier | Anchor block | Anchor rod | Rod angle |
|---|---|---|---|---|
| **40 (12.2)** | RW-CB1 | RW-AB2 | RW-AR34 | 48° |
| **50 (15.2)** | RW-CB1 | RW-AB2 | RW-AR34 | 48° |
| **60 (18.3)** | RW-CB1 | RW-AB2 | RW-AR34 | 40° |
| **70 (21.3)** | RW-CB1 | RW-AB2 | RW-AR34 | 40° |
| **80 (24.4)** | RW-CB1 | RW-AB2 | RW-AR34 | 40° |
| **90 (27.4)** | RW-CB1 | RW-AB2 | RW-AR34 | 40° |
| **100 (30.5)** | RW-CB1 | RW-AB2 | RW-AR34 | 38° |
| **110 (33.5)** | RW-CB1 | RW-AB2 | RW-AR34 | 38° |
| **120 (36.6)** | RW-CB1 | RW-AB2 | RW-AR34 | 38° |
| **130 (39.6)** | RW-CB2 | RW-AB3 | RW-AR56 | 38° |
| **140 (42.7)** | RW-CB2 | RW-AB3 | RW-AR56 | 37° |
| **150 (45.7)** | RW-CB2 | RW-AB3 | RW-AR56 | 37° |

STEP 2

# Build the foundations

## Foundation and anchor tolerances

| Item | Tolerance |
|---|---|
| Concrete dimensions | ± 1 in (25 mm) |
| Foundation depth | + 3 in (76 mm) / – 0 |
| Drilled foundation out of plumb | 1.0° |
| Projection of embedments | ± ⅛ in (3 mm) |
| Vertical embedments out of plumb | 0.5° |
| Guy radius | ± 5% of specified |
| Anchor elevation | ± 5% of guy radius |
| Anchor rod slope and alignment | ± 1.0° |
| Anchor head out of plumb | 1.0° |
| Guy initial tension | ± 10% of specified |

Guy radius and anchor elevation tolerances cannot be applied at the same time.

## Concrete and reinforcement

- Designs assume ANSI/TIA-222-G presumptive clay soil. Verify the actual soil and frost depth on site; a site-specific study is required for Class III structures.
- Concrete: minimum 4,500 psi (31 MPa) at 28 days, placed against undisturbed soil without segregation.
- Rebar: deformed bars to ASTM A615 Grade 60, 3 in (76 mm) minimum cover. Never weld rebar or embedments.
- Backfill in 8 in (200 mm) layers compacted to 95% of maximum dry density (ASTM D698).
- Set the RW-PP34 pier pin with a 4 in (102 mm) projection; use at least a 2 ft 6 in square or 3 ft round pier with RW-BPC45.
- Install anchors with the part number at the top, at the embedment angle shown. Slope pier tops to drain and chamfer edges ¾ in.

STEP 3

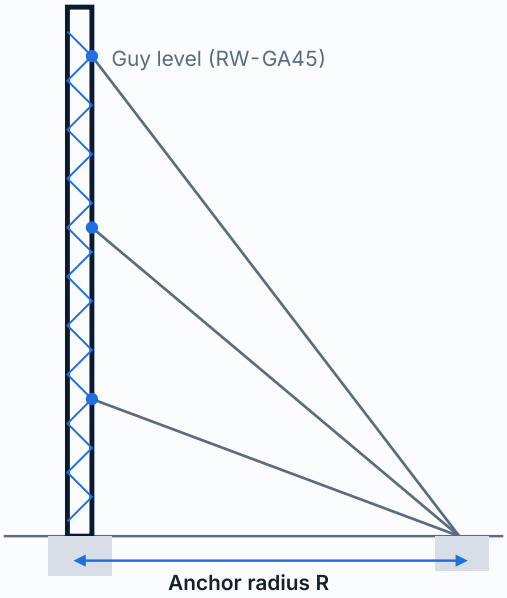
# Erect and guy the tower

1. **Check the foundations.** Concrete must be fully cured. Confirm pier pin projection, anchor positions, rod angles and tolerances against the drawings.
2. **Set the base.** Place the RW-BPC45 base plate over the pier pin, centred on the foundation.
3. **Prepare the sections.** Each section has its part number stamped at the bottom and its joint bolts supplied at the bottom. Always install sections with the stamp facing down.
4. **Stack the first sections.** Join sections with the supplied joint bolt kit and tighten all bolts. Install temporary steel guys as the tower rises, following the erector's lifting plan.
5. **Install guy brackets.** Fit an RW-GA45 guy bracket at every guy level shown on the assembly drawing. Install torque-arm stabilizers (if ordered) as the sections are joined.
6. **Attach the guys.** Use thimbles at every eye, and preformed grips or cable clamps as detailed. Connect each guy to its anchor rod through an eye-and-jaw turnbuckle and equalizer plate where several guys share an anchor.
7. **Tension the guys.** Bring each guy to the initial tension shown on the drawing (values given at 60 °F / 16 °C), within ± 10%. Tension all three guys of a level evenly.
8. **Plumb the tower.** Check verticality in two directions at each guy level and adjust turnbuckles until the tower is plumb and straight.
9. **Lock the hardware.** Run safety wire through every turnbuckle and fit the extra cable clamps supplied.
10. **Finish the top.** Install the top section or top plate, antennas and mounts. Place antennas symmetrically and never exceed the EPA listed for the design.
11. **Remove temporary guys** only after all permanent guys are installed, tensioned and locked.

## Guy hardware, from tower to anchor

| Component | Purpose |
|---|---|
| **Guy bracket RW-GA45** | Connects the guys to the tower legs at each guy level |
| **EHS guy strand** | Extra-high-strength galvanized steel strand, 3/16 to 5/16 in |
| **Thimble** | Protects the strand where it wraps around an eye |
| **Preformed grip / clamps** | Terminate the strand without cutting or heat |
| **Eye-and-jaw turnbuckle** | Adjusts guy tension and tower plumb |
| **Equalizer plate** | Joins two or more guys on one anchor rod |
| **Safety wire** | Locks each turnbuckle against turning |
| **Anchor rod** | Transfers guy load into the concrete anchor block |

**Typical elevation**




Guys meet at the anchor through turnbuckles and equalizer plates. Number of guy levels and heights per the assembly drawing.

## Guy bracket rating

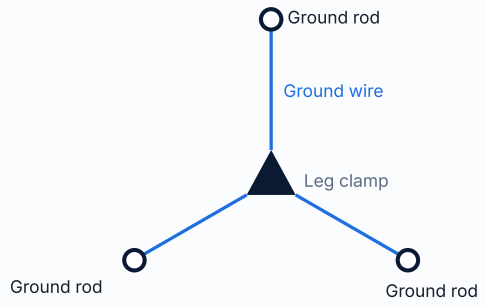
| Standard | Max vertical pull | Max guy |
|---|---|---|
| TIA-222-G | 3.91 kips (17.4 kN) | ¼ in EHS |
| TIA-222-F | 3.40 kips (15.1 kN) | ¼ in EHS |

**Bolt orientation** (nut up or nut down) is the installer's choice unless a drawing says otherwise. **Install the warning plate** RW-ACWS in a highly visible place at the base.

STEP 4

## Ground the tower and anchors

**Base grounding (plan)**




Kit RW-BGK3: three ground rods installed 120° apart at 20 ft (6.1 m) spacing.

- **Base:** install the three ground rods of kit RW-BGK3 at 120° separation and 20 ft (6.1 m) spacing. Bond each ground wire to a tower leg with the supplied leg clamp.
- **Anchors:** install one RW-AGK1 kit at every anchor. Drive the ground rod at least 6 in (150 mm) from the anchor rod and connect it with the supplied clamp.
- Ground every antenna installation in line with local and national codes.
- The purchaser must confirm obstruction marking and lighting meet local, regional and national aviation rules.
- Anchor rod corrosion protection is provided by others. Extra protection may be needed where steel anchors are in direct contact with soil.

STEP 5

## Final inspection

- [ ] All joint bolts installed and tight; every section stamp facing down.
- [ ] Tower plumb and straight in two directions at every guy level.
- [ ] Guy tensions within ± 10% of the drawing values; all three guys of each level even.
- [ ] Thimbles, grips or clamps, turnbuckles and equalizers installed as detailed.
- [ ] Safety wire through every turnbuckle; extra cable clamps fitted.
- [ ] Antenna loading within the EPA of the design and placed symmetrically.
- [ ] Base and anchor grounding complete and bonded.
- [ ] Climber safety device and warning plate installed.
- [ ] Temporary guys removed; site cleaned up.

STEP 6

## Maintenance

Rongwell designs assume that the owner inspects and maintains the tower throughout its life, as a minimum in line with ANSI/TIA-222-G.

| Check | What to look for |
|---|---|
| **Guys** | Tension, broken strands, corrosion, loose clamps |
| **Hardware** | Loose or missing bolts, safety wire in place |
| **Steel** | Plumbness, bent members, damaged galvanizing |
| **Anchors** | Corrosion at ground line, soil movement, drainage |
| **Grounding** | Continuity of wires, clamps and rods |
| **Antennas** | Mount condition, loading still within design EPA |

Need parts, a custom design or an inspection? Contact our telecommunication sales team at **contact@rongwelltowers.com**.

This guide summarizes the RW-45G installation requirements. The assembly drawings delivered with each tower take precedence. Rongwell standard designs do not replace the judgment of a qualified local engineer or compliance with local codes.