Solution 1

Eiffel Tower height: 324 m

Geomag rod length: 0.027 m (the internet says they can be compressed when used, but I'll neglect that in my calculations)

Geomag Weights and Measures

Rod Caliper length	27.00mm	1.080in	distance between the extreme outer edges of the bar
Sphere Diameter	12.70mm	0.500in	note that this unit conversion is exact
Geometric Distance	38.84mm	1.530in	distance between centers of spheres
Dimple Depth	0.43mm	0.017in	depth that sphere impinges past end of rod
Pentagon Panel Weight	3.00g	0.106oz	
Square Panel Weight	1.82g	0.064oz	
Diamond Panel Weight	1.44g	0.051oz	
Triangle Panel Weight	0.62g	0.022oz	
Rod Weight	4.70g	0.166oz	Measured with 100 on household scales
Ball Weight	8.60g	0.303oz	

Eiffel tower weight: 7300000 kg of iron
We have these weights and measures of geomags:

Estimate that we use about a 4:1 rod to bearing ratio to reconstruct the tower. Now, convert the 7300000 kg of iron to a 4:1 ratio of geomags:

$$\frac{4\ \text{rods}}{1\ \text{bearings}} \cdot \frac{4.7\text{g}}{8.6\text{g}} = \frac{18.8\text{g}}{8.6\text{g}} = \frac{2.19\text{g}}{1\text{g}} \cdot 1\text{kg} = \frac{2.19\ \text{kg rods}}{1\ \text{kg bearings}}$$

Now, split that 7300000 kg into the 2.19kg:1kg ratio. That gives us 6,040,532.44 kg rods and 1259467.57 kg of bearings. Now, convert that back into number of rods and bearings.

Number of rods: 1,285,219,668.09
Number of bearings: 146449.717442

Round…

Number of rods: 1,285,219,669
Number of bearings: 146450

Solution 2

If we actually made it out of the rods and bearings it would undoubtably collapse. Instead, let's just melt down some bearings.

7,300,000 kg eiffel tower = n * 0.0086 kg ball bearing

where n = number of ball bearings

solve…

n = 62780 ball bearings

Number of rods: 0
Number of bearings: 62780