Melting the Eiffel Tower

The Eiffel Tower is 324 metres tall, and stands on a square base measuring 125 by 125 metres.

The main structure is wrought iron, which has a density of $7850 \text{ kg/m}^3$.

The construction of the Eiffel Tower is a feat of architectural engineering – the lattice structure gives enormous strength and stability while only needing a relatively small amount of iron to do so.

The weight of the metal structure of the Eiffel Tower is 7300 tonnes. What is the total volume of the iron used, to the nearest cubic metre?

If the entire metal structure of the Eiffel Tower were to be melted down to form a cuboid with the same size base as the base of the tower (125 by 125 metres), what would the height of this cuboid be?
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\[
\text{Density} = \frac{\text{Weight}}{\text{Volume}} \quad \Rightarrow \quad 7850 = \frac{7300000}{\text{Volume}}
\]

\[
\text{Volume} = \frac{7300000}{7850} = 930\,\text{m}^3 \text{ to the nearest } \text{m}^3
\]

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\[
\text{Volume} = \text{length} \times \text{width} \times \text{height}
\]

\[
930 = 125 \times 125 \times h \quad \Rightarrow \quad 930 = 15625h
\]

\[
h = \frac{930}{15625} = 0.0595\,\text{m} = 5.95\,\text{cm} \text{ to 2 d.p.}
\]