Given: \( A = \pi r^2 \), \( \rho_2 = \rho_1 \), \( A_2 = 2 A_1 \), \( L_2 = 2 L_1 \), and \( V_2 = V_1 \).

Find the ratio \( \frac{E_2}{E_1} \) of the electric field in the conductors.

A) \( \frac{E_2}{E_1} = 2 \).

B) \( \frac{E_2}{E_1} = 1 \).

C) \( \frac{E_2}{E_1} = \frac{1}{2} \).
Using Ohm’s law, we have

\[
\frac{E_2}{E_1} = \frac{\left( \frac{V_2}{L_2} \right)}{\left( \frac{V_1}{L_1} \right)}
\]

\[
= \frac{L_1}{L_2}
\]

\[
= \frac{1}{2}
\]

Answer C.

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