

*Column Bars Cutting Plan*

<i>For <math>\phi 16</math></i>		<i>Unit: m</i>	
<i>Cutting Pattern</i>	$\frac{\text{Length}}{\text{Pos}}$	<i>Scrap</i>	<i>No.</i>
$\frac{5.40}{13}$ $\frac{5.40}{13}$		1.20	40
$\frac{4.20}{2}$ $\frac{4.20}{2}$ $\frac{3.55}{1}$		0.05	156
$\frac{4.20}{2}$ $\frac{4.20}{2}$ $\frac{2.75}{9}$		0.85	80
$\frac{4.20}{2}$ $\frac{4.20}{2}$ $\frac{1.60}{10}$ $\frac{1.60}{10}$		0.40	64
$\frac{4.20}{2}$ $\frac{4.20}{2}$		3.60	78
<i>Total number of required 12m</i>			<b>418</b>
<i>Total Waste Rate (%)</i>			<b>8.57%</b>

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<i>For <math>\phi 18</math></i>		<i>Unit: m</i>	
<i>Cutting Pattern</i>	$\frac{\text{Length}}{\text{Pos}}$	<i>Scrap</i>	<i>No.</i>
$\frac{5.50}{7}$ $\frac{5.50}{7}$		1.00	36
$\frac{4.30}{3}$ $\frac{4.30}{3}$ $\frac{2.75}{15}$		0.65	16
$\frac{4.30}{3}$ $\frac{4.30}{3}$ $\frac{1.70}{8}$		1.70	88
$\frac{4.30}{3}$ $\frac{3.55}{14}$ $\frac{3.55}{14}$		0.60	10
$\frac{4.30}{3}$ $\frac{4.30}{3}$		3.40	63
<i>Total number of required 12m</i>			<b>213</b>
<i>Total Waste Rate (%)</i>			<b>16.28%</b>

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<i>For <math>\phi 20</math></i>		<i>Unit: m</i>	
<i>Cutting Pattern</i>	$\frac{\text{Length}}{\text{Pos}}$	<i>Scrap</i>	<i>No.</i>
$\frac{5.90}{5}$ $\frac{5.90}{5}$		0.20	60
$\frac{4.70}{4}$ $\frac{4.70}{4}$ $\frac{2.15}{6}$		0.45	70
$\frac{2.15}{6}$ $\frac{2.15}{6}$ $\frac{2.15}{6}$ $\frac{2.15}{6}$ $\frac{2.15}{6}$		1.25	10
<i>Total number of required 12m</i>			<b>140</b>
<i>Total Waste Rate (%)</i>			<b>3.33%</b>