

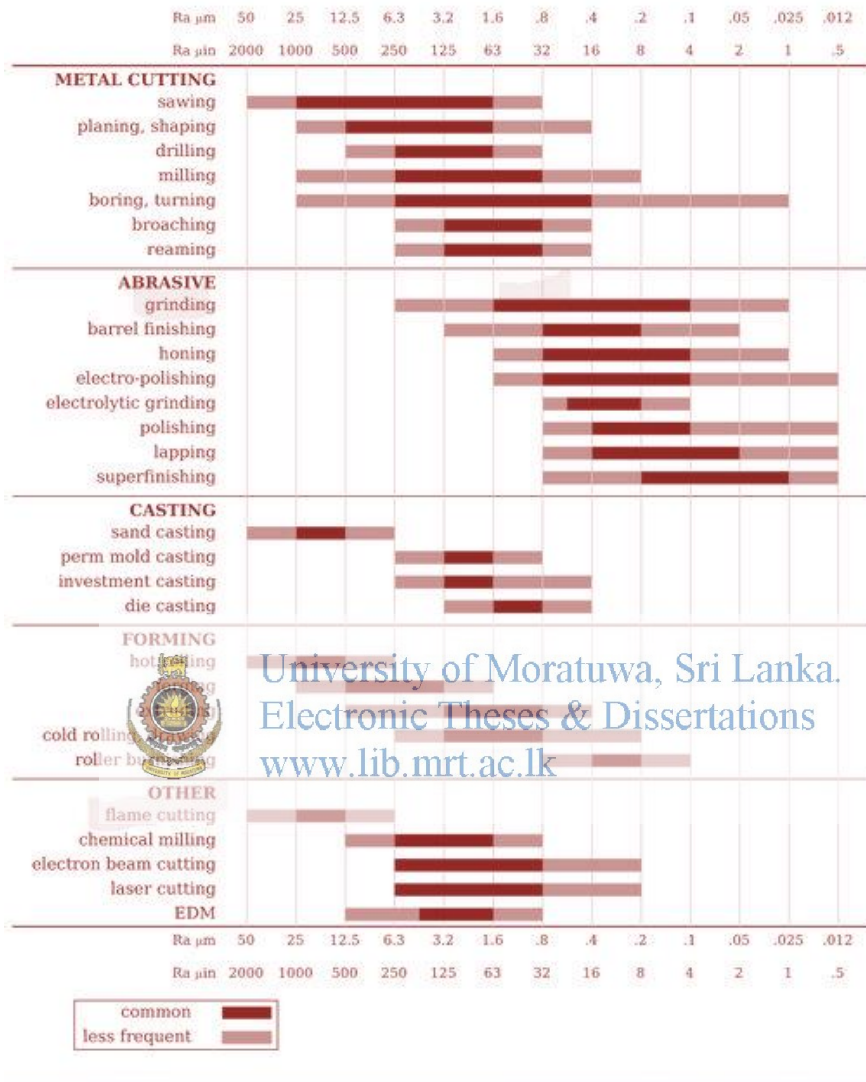
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APPENDIX

APPENDIX 1: Surface roughness values for different materials



Source (Kalpakjian, 6th edition)

APPENDIX 2: Wind Load calculation for the mast

The dynamic analysis procedure set out in the AS 1170.2 -1989 enables the determination of wind forces on the overall structure. The wind force calculation is as follows.

7.1.1.1 Wind load calculation

Design hourly mean wind speed

$$V_z = VM_{(z,cat)}M_sM_tM_i$$

For the site of the project (at 325m: mid height of the mast),

- Basic wind speed, V

$$V = 38.00\text{m/s}$$

(Post disaster speed for Sri Lanka Zone III (Wijeratne & Jayasinghe, 1998))

- Hourly mean wind speed multiplier, $M_{(z,cat)}$



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Terrain category = Category 1

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$$M_{(z,cat)} = 1.07$$

- Shielding multiplier, M_s

$$M_s = 1.00$$

(Without shielding)

- Topographic multiplier, M_t

$$M_t = 1.00$$

(Up wind slope is less than 0.05)

- Structure importance multiplier, M_i

$$M_i = 1.1$$

(Structure which have special post disaster function)

$$V_z = 38 \times 1.07 \times 1.00 \times 1.00 \times 1.1$$

$$V_z = 44.7\text{m/s}$$

Dynamic wind pressure, q_z

$$q_z = 0.6V_z^2$$

$$q_z = 0.6 \times 44.7^2$$

$$q_z = 1.2 \text{ kN/m}^2$$

Hourly mean drag force, F_d acting at $z = 325\text{m}$

$$F_d = C_d q_z A_z$$

Drag coefficient, C_d

$$C_d = 2.2$$

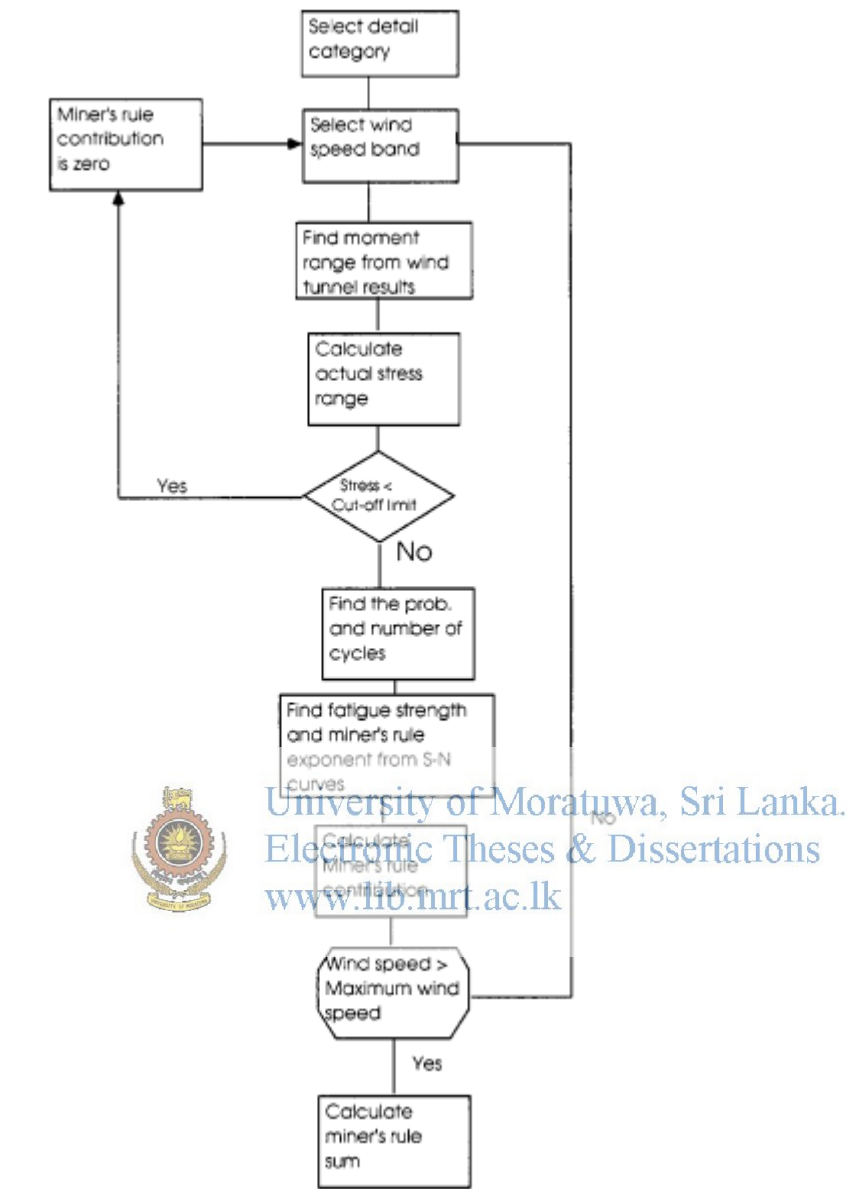
Drag force per area = 2.2×1.2



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Wind force was applied on the structure as an area load.

APPENDIX 3: Fatigue design methodology used in AS4100:1990



Source: (Mendis & Dean, 2000)