



Anlage **A**
Annexe **A**
Appendix **A**

Diagrammsammlung zur Beurteilung der Fahrsicherheit
 von Güterwagen mit zwei Radsätzen mit Blatttragfedern
 mit linearer Kennlinie

Recueil de diagrammes permettant d'apprécier
 la sécurité de circulation des wagons à 2 essieux
 équipés de ressorts à lames à raideur constante

Set of diagrams enabling the running safety of 2-axle wagons fitted
 with leaf springs of constant stiffness

Tragfederbauarten

Types de ressorts de suspension

Types of suspension springs

Teil - Partie - Part 1:	8 lagig / 1 400 mm	$c_z = 0,86 \text{ kN/mm}$
Teil - Partie - Part 2:	9 lames / 1 400 mm	$c_z = 0,97 \text{ kN/mm}$
Teil - Partie - Part 3:	8 leaves / 1 200 mm	$c_z = 1,37 \text{ kN/mm}$

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Änderungen - Mises a jour - Revisions

Änderungsanzeige - Modificatif - Amendment

Nr. – N° No.	vom - du date	Nr. – N° No.	vom - du date

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Teil 1

Partie 1

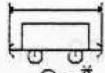
Part 1

Tragfedern 8 lagig / 1 400 mm

Resorts de suspension 8 lames / 1 400 mm

Suspension springs 8 leaves / 1 400 mm

$$c_z = 0,86 \text{ kN/mm}$$



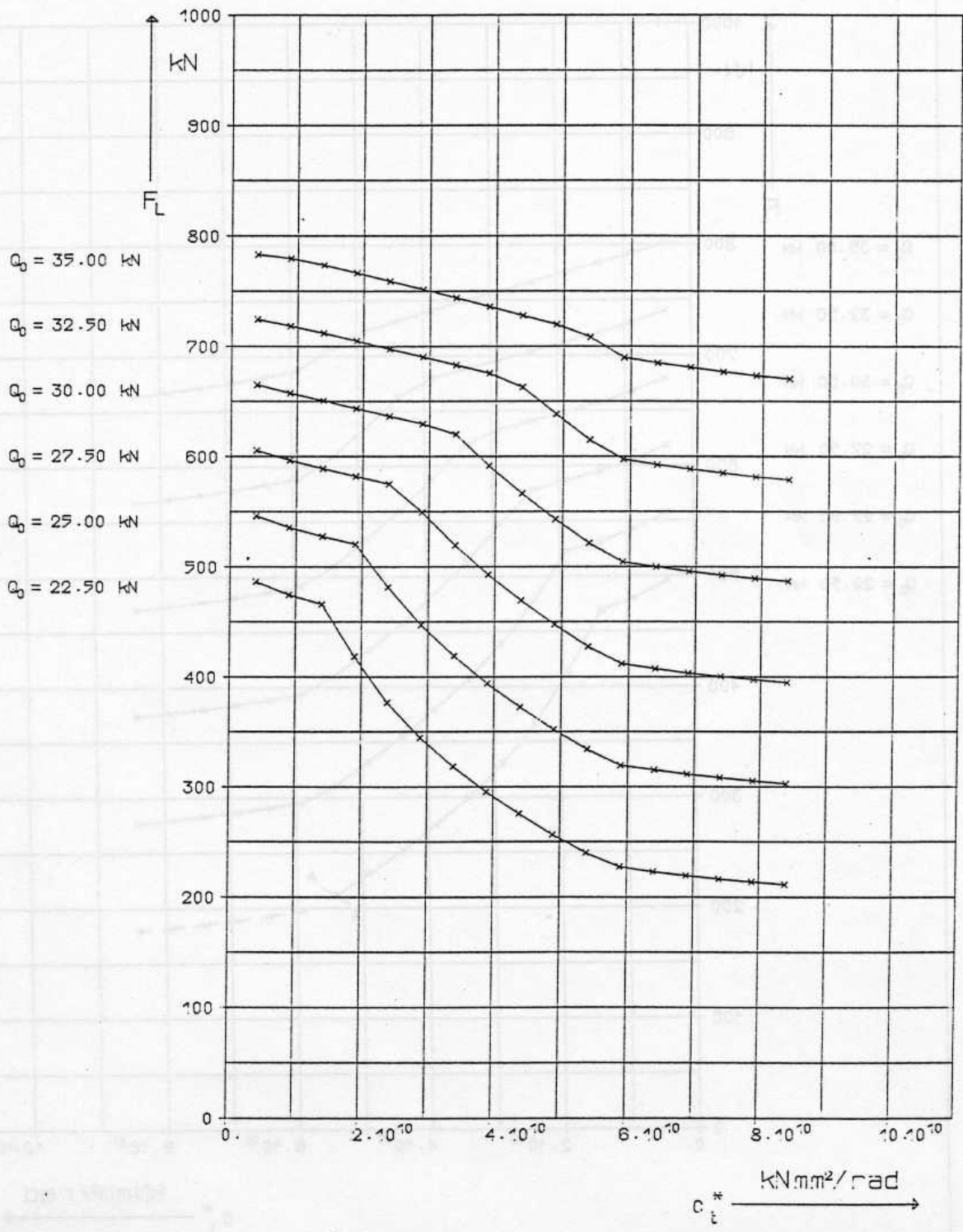
$$h_0 = 9500 \text{ mm}$$

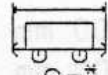
$$2a^* = 5500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





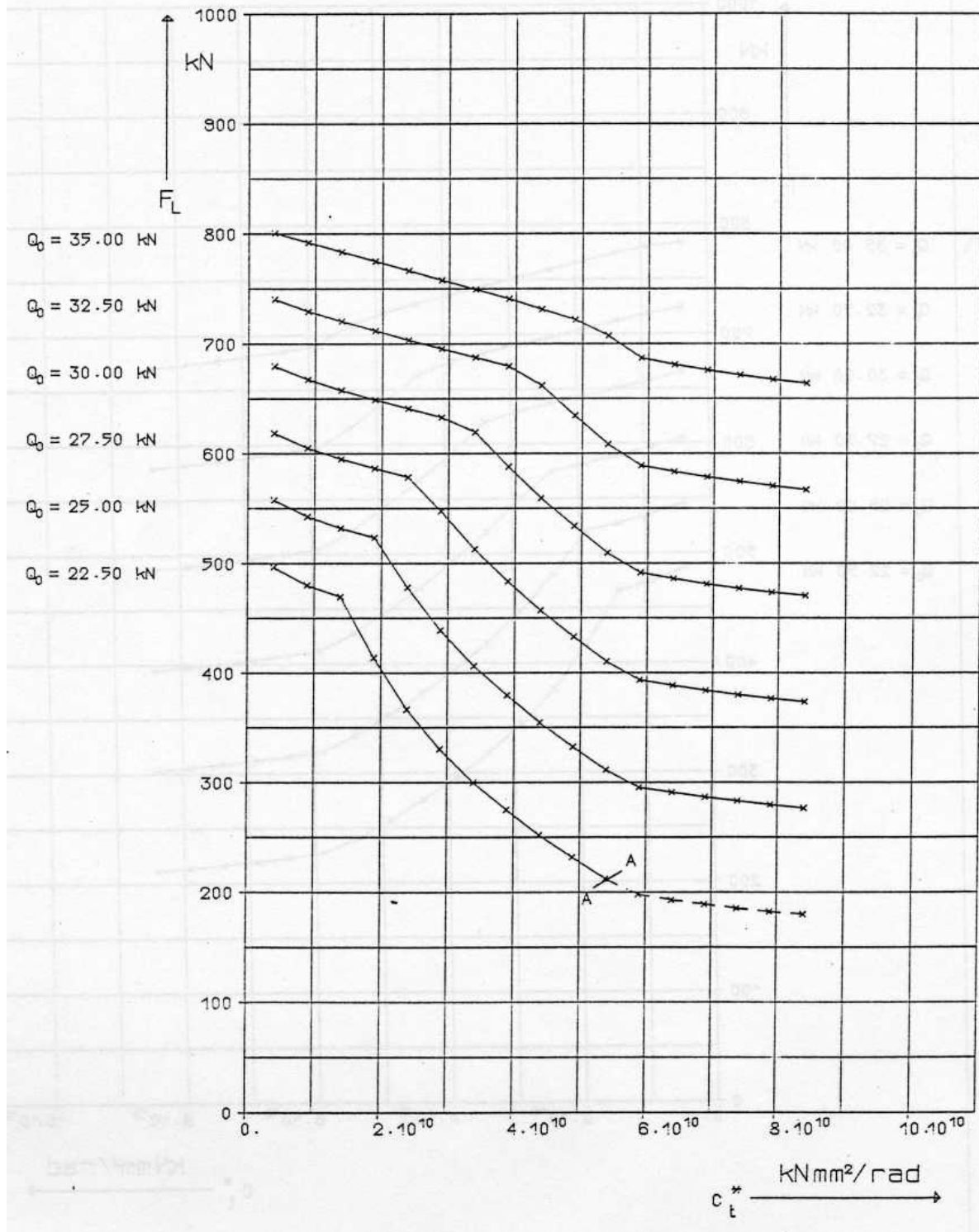
$$b = 9500 \text{ mm}$$

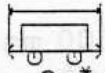
$$2a^* = 6000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





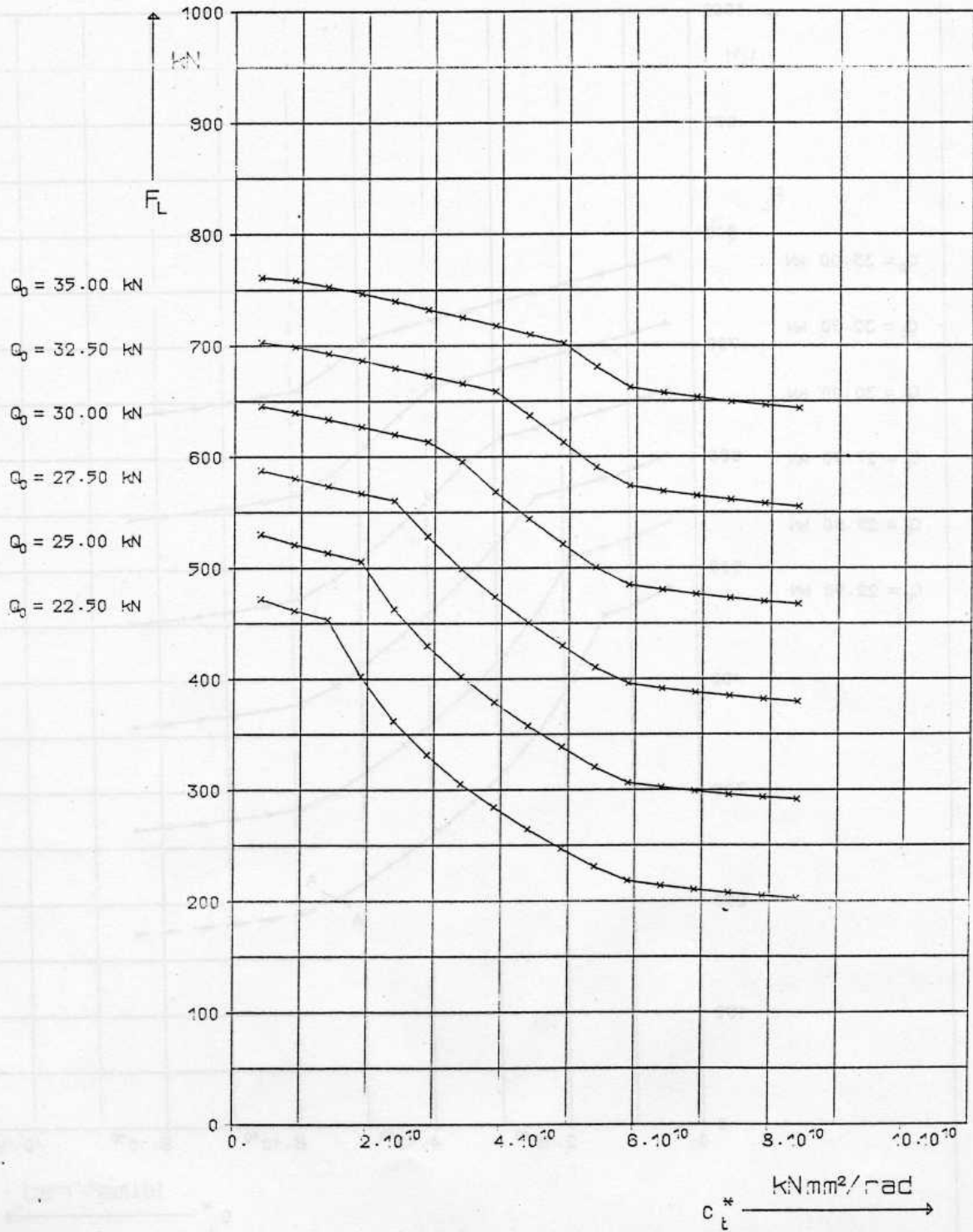
$$10000 \text{ mm}$$

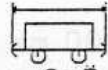
$$2a^* = 5500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





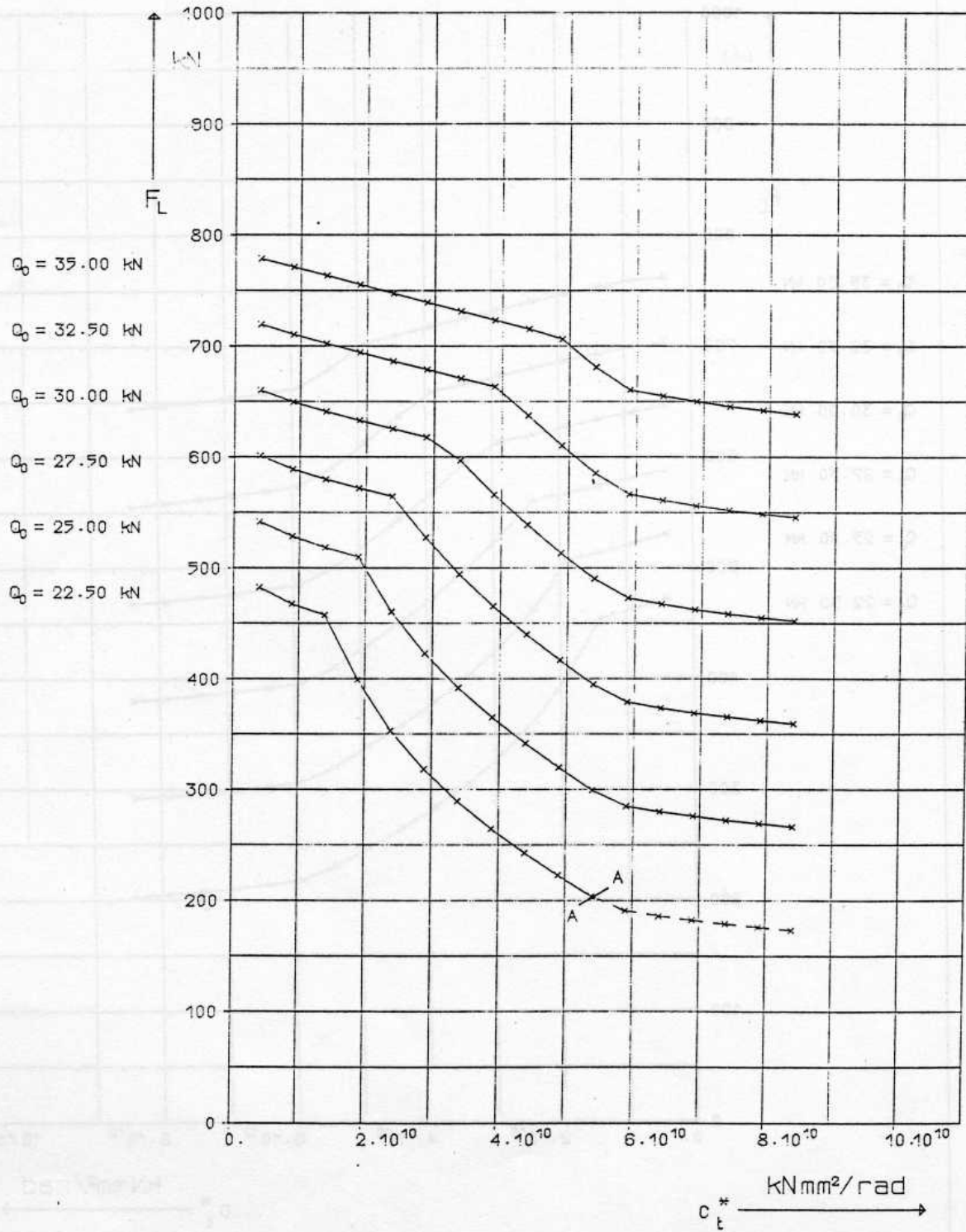
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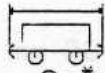
$$2a^* = 6000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





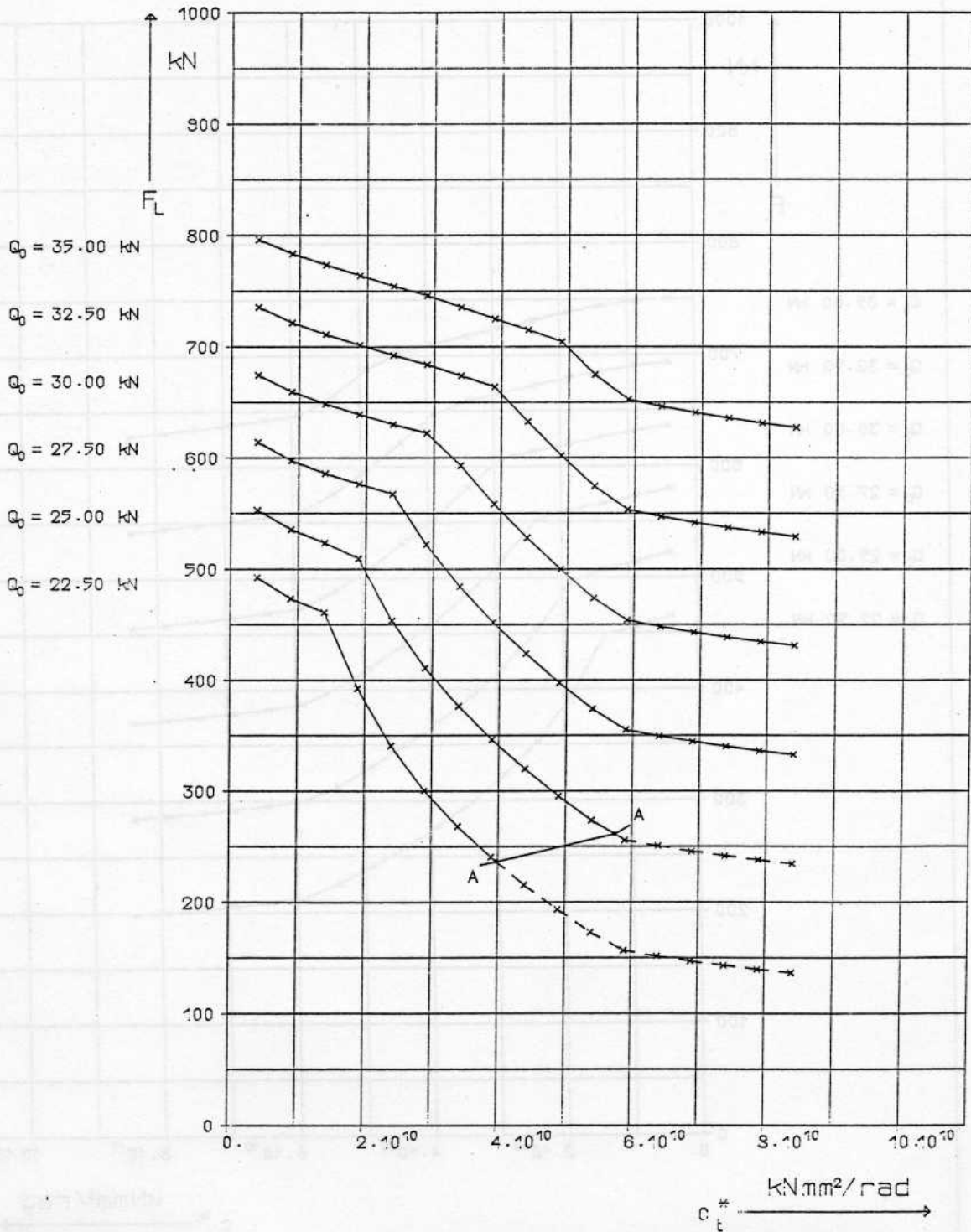
$$L = 10000 \text{ mm}$$

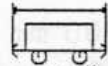
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





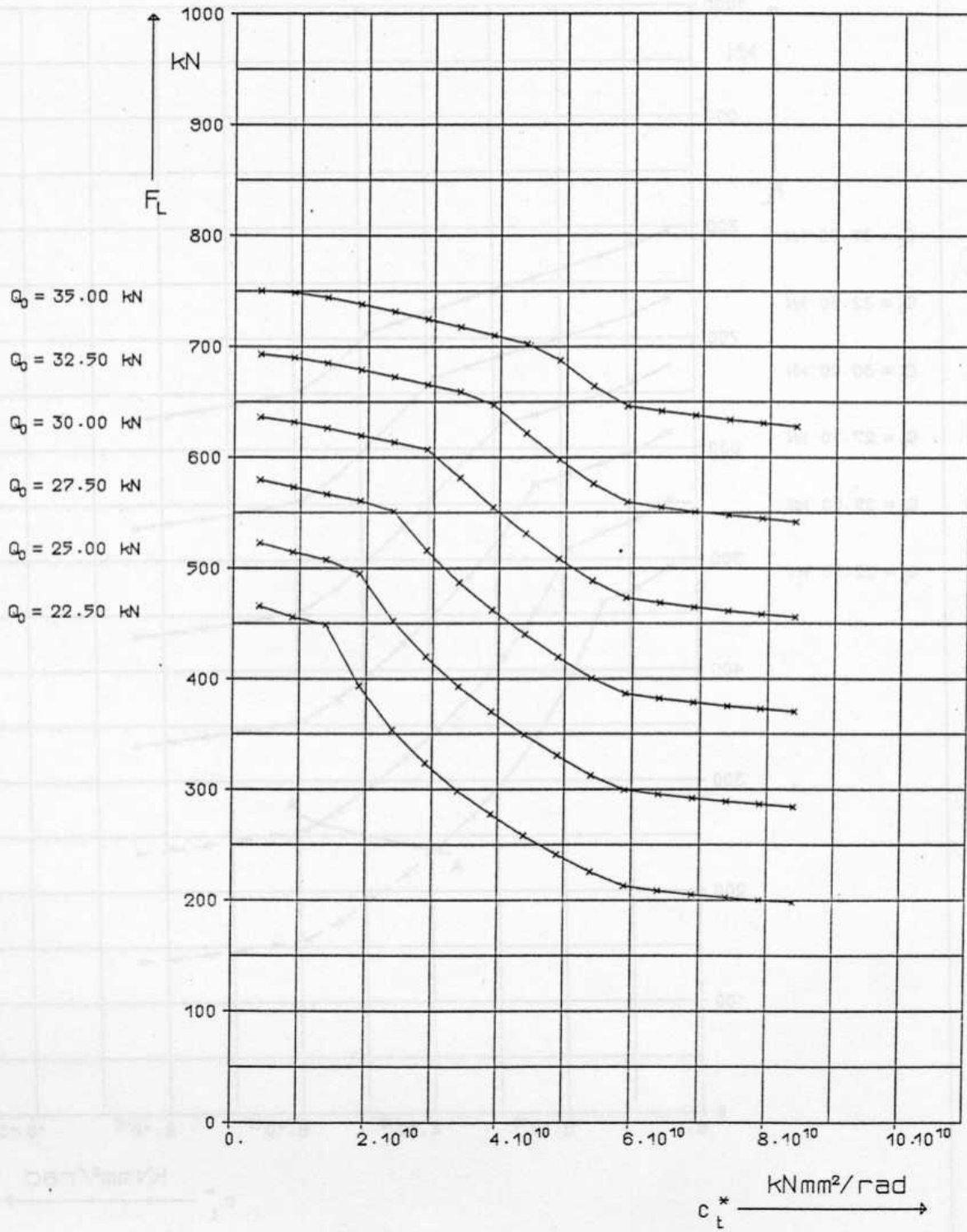
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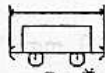
$$2a^* = 5500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

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$$0.15 \leq \Delta q_0 \leq 0.23$$





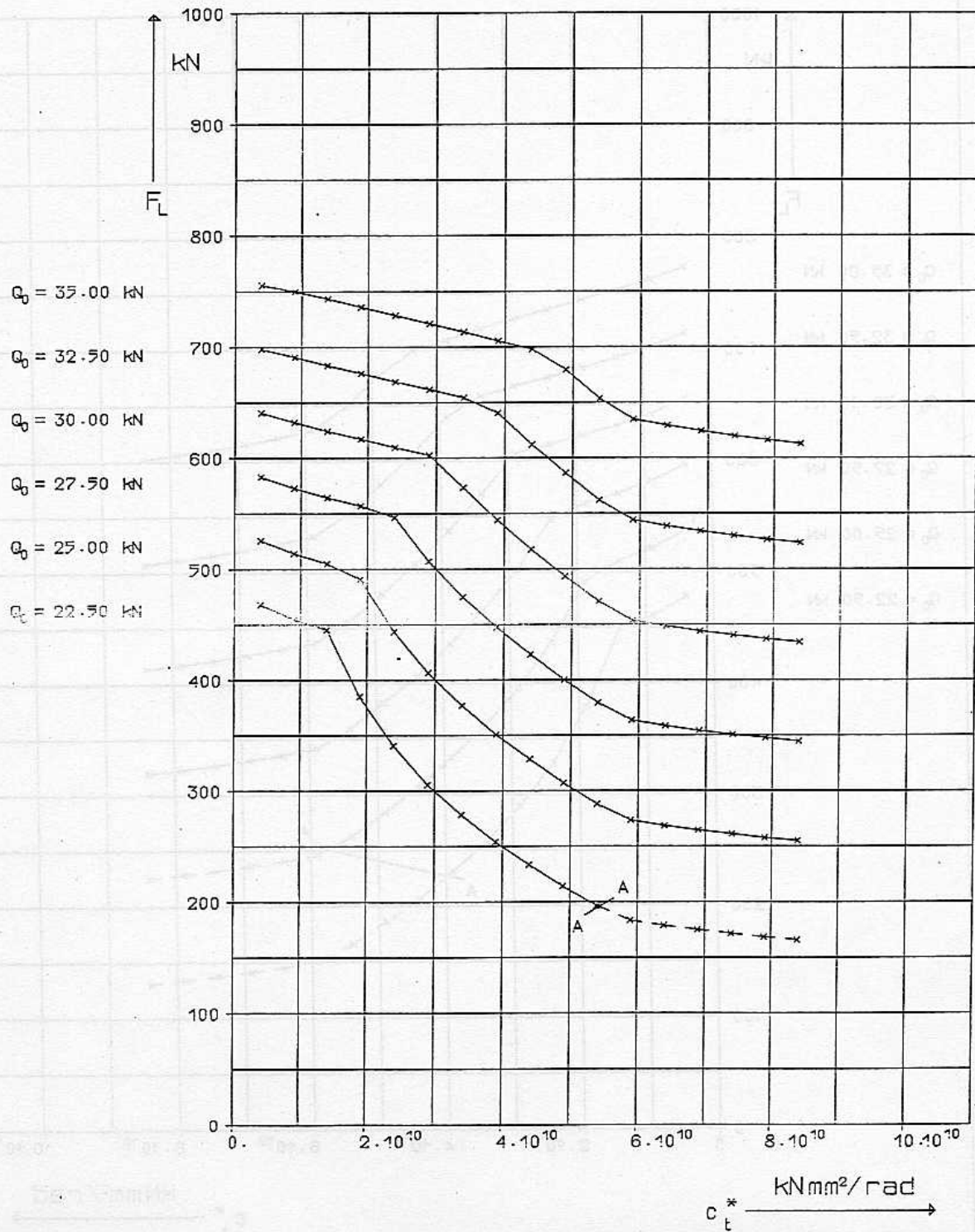
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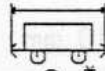
$$2a^* = 6000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,86 \text{ kN/mm}$$





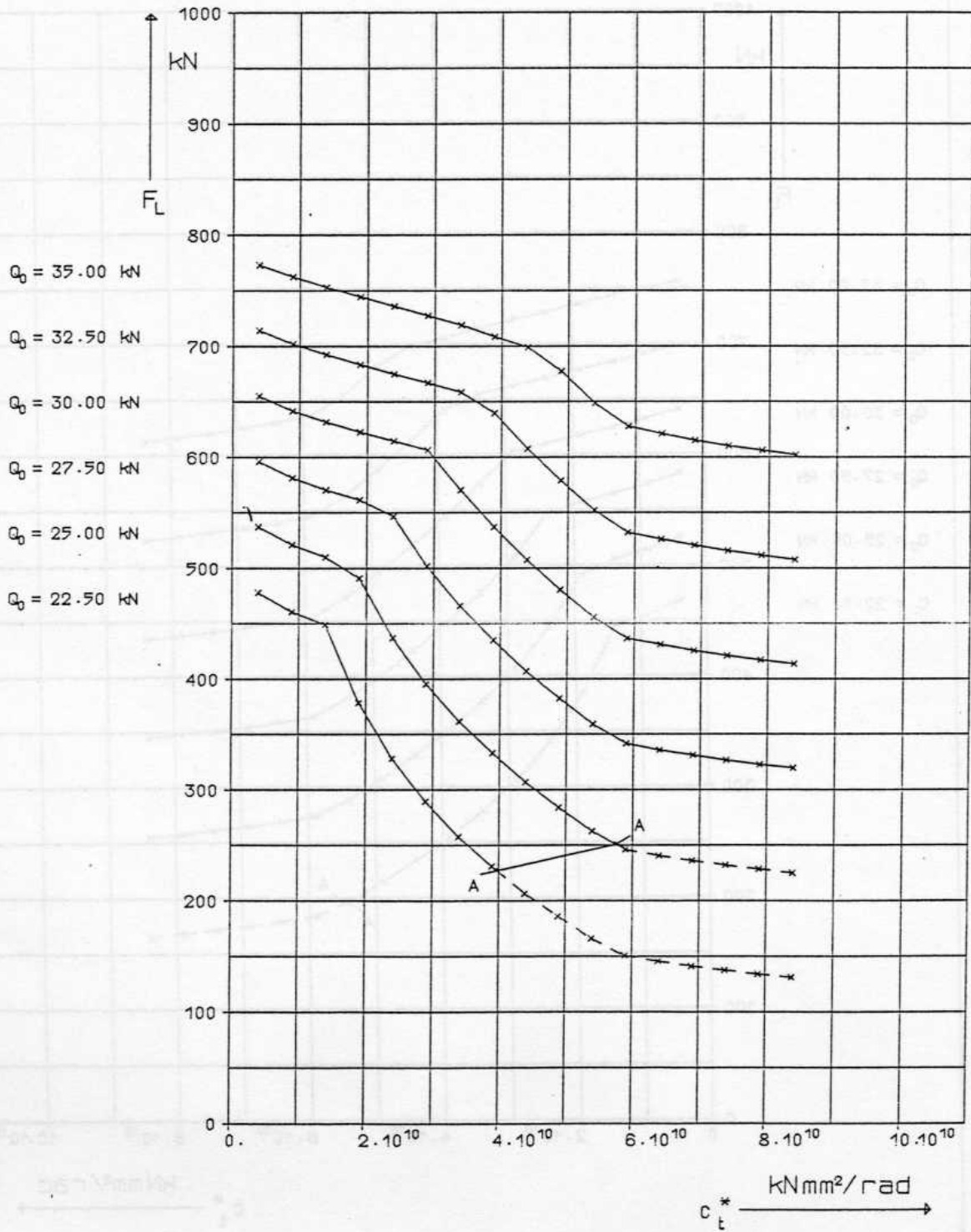
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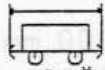
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





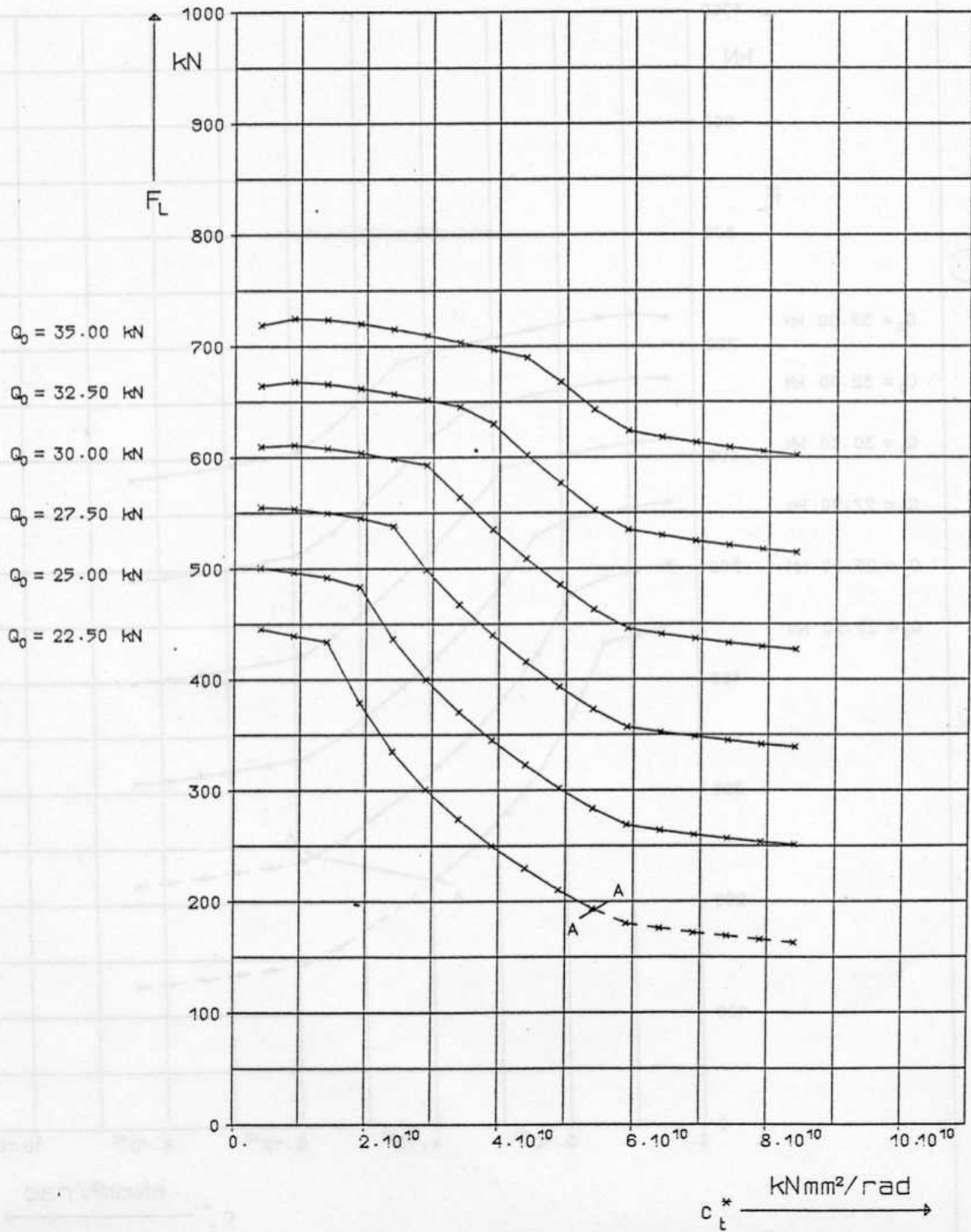
$$h_0 = 11000 \text{ mm}$$

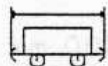
$$2a^* = 6000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,86 \text{ kN/mm}$$





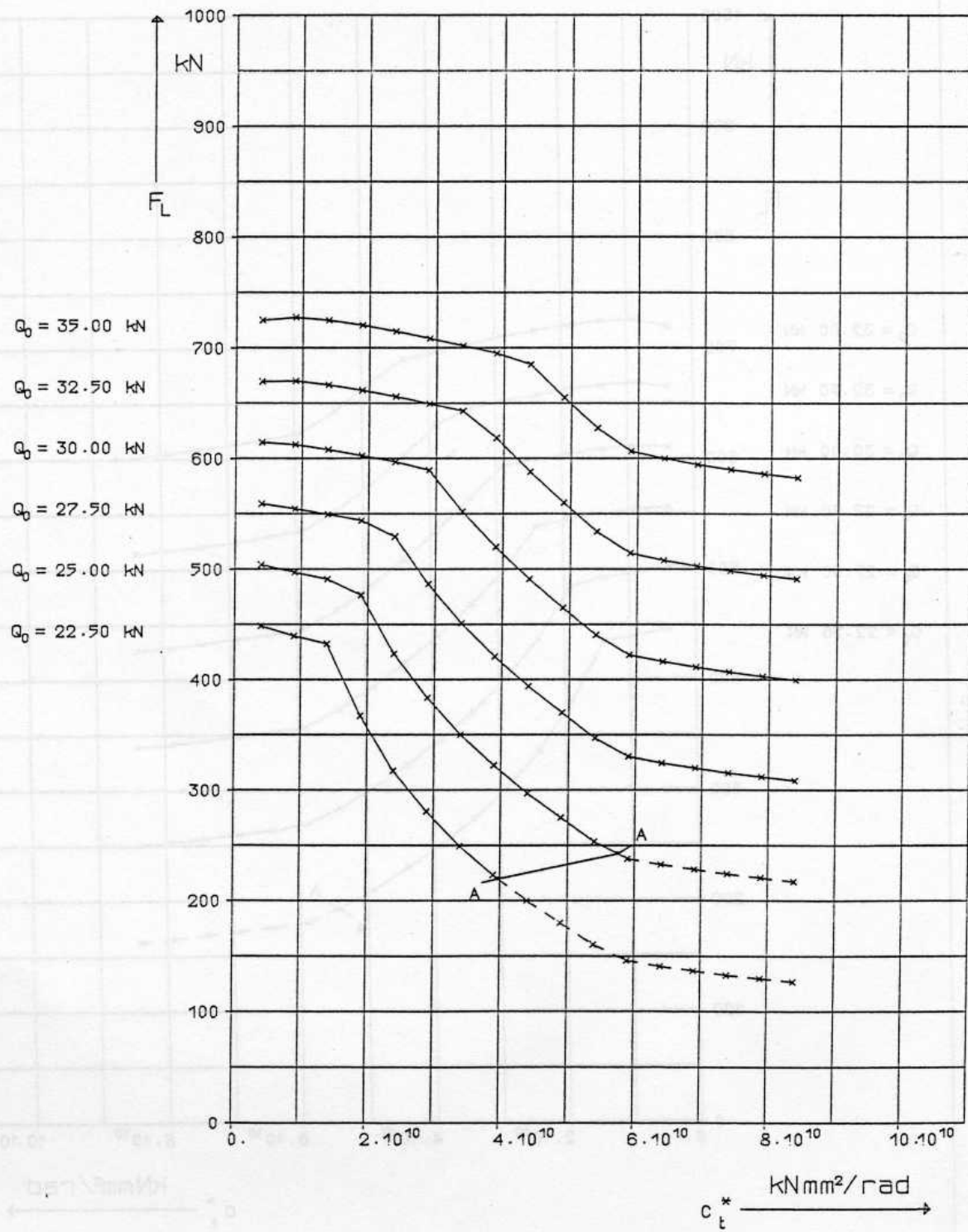
$$2a^* = 11000 \text{ mm}$$

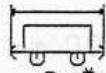
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





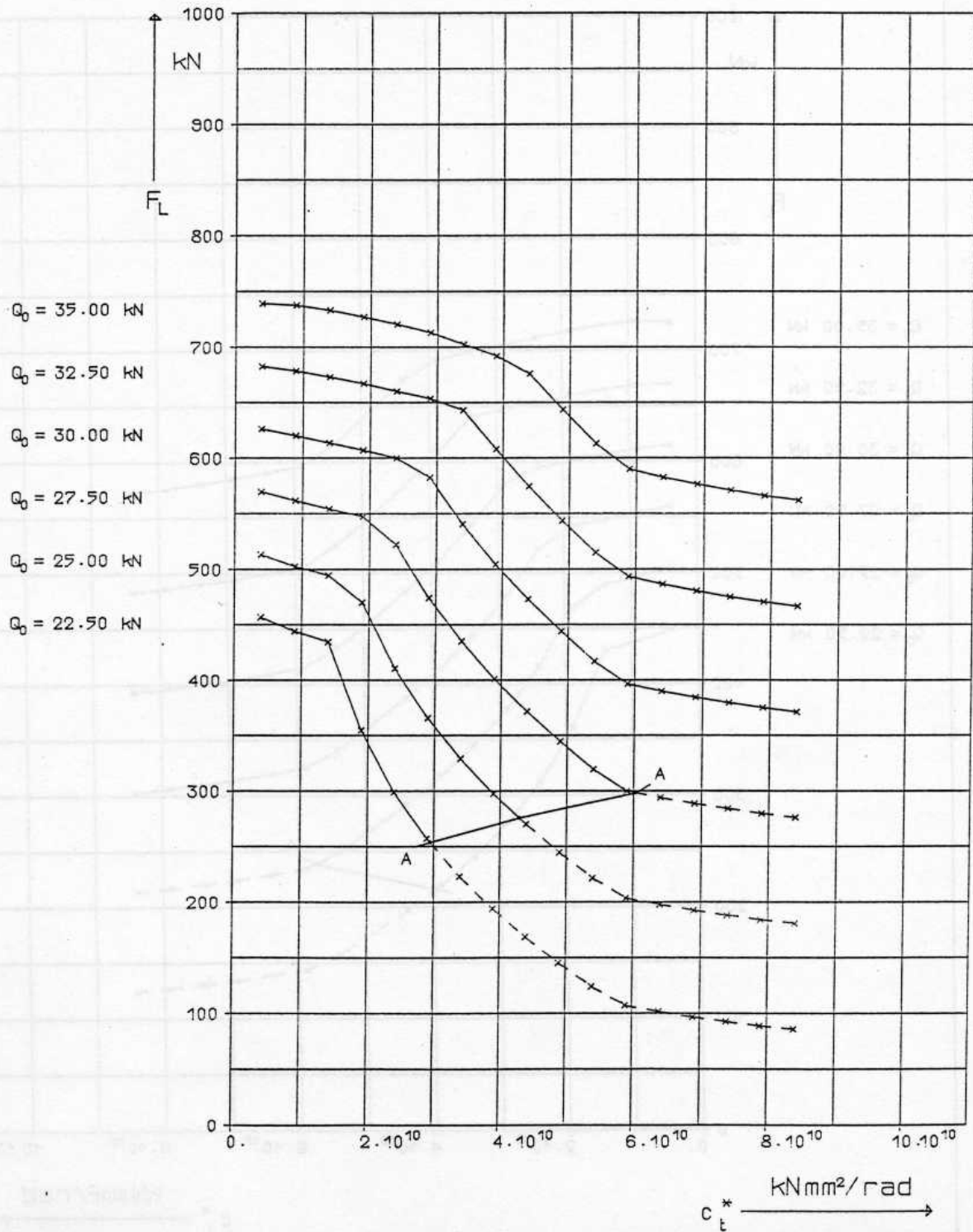
$$2a^* = 11000 \text{ mm}$$

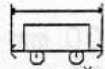
$$2a^* = 7000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,86 \text{ kN/mm}$$





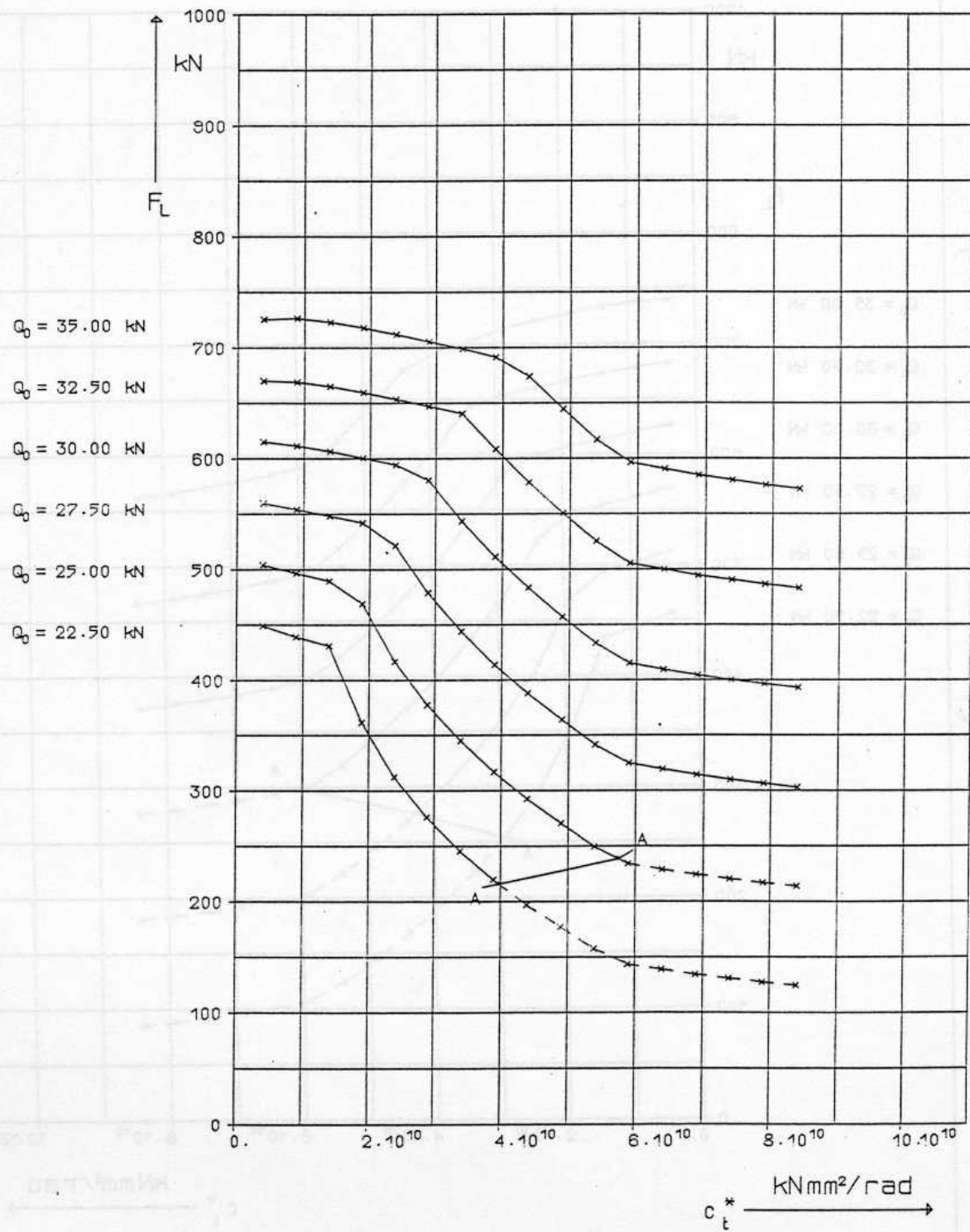
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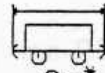
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





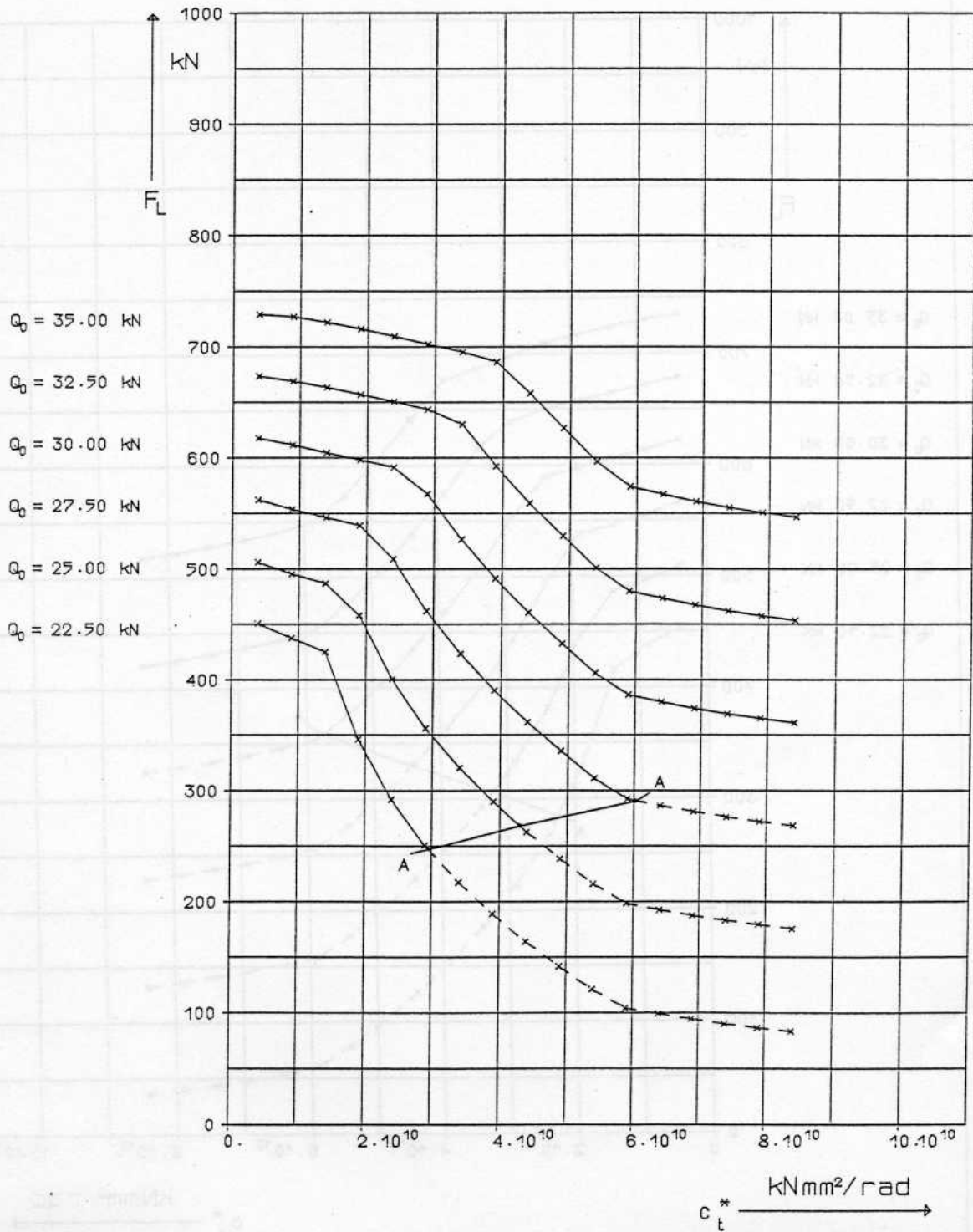
$$2a^* = 11500 \text{ mm}$$

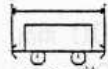
$$2a^* = 7000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





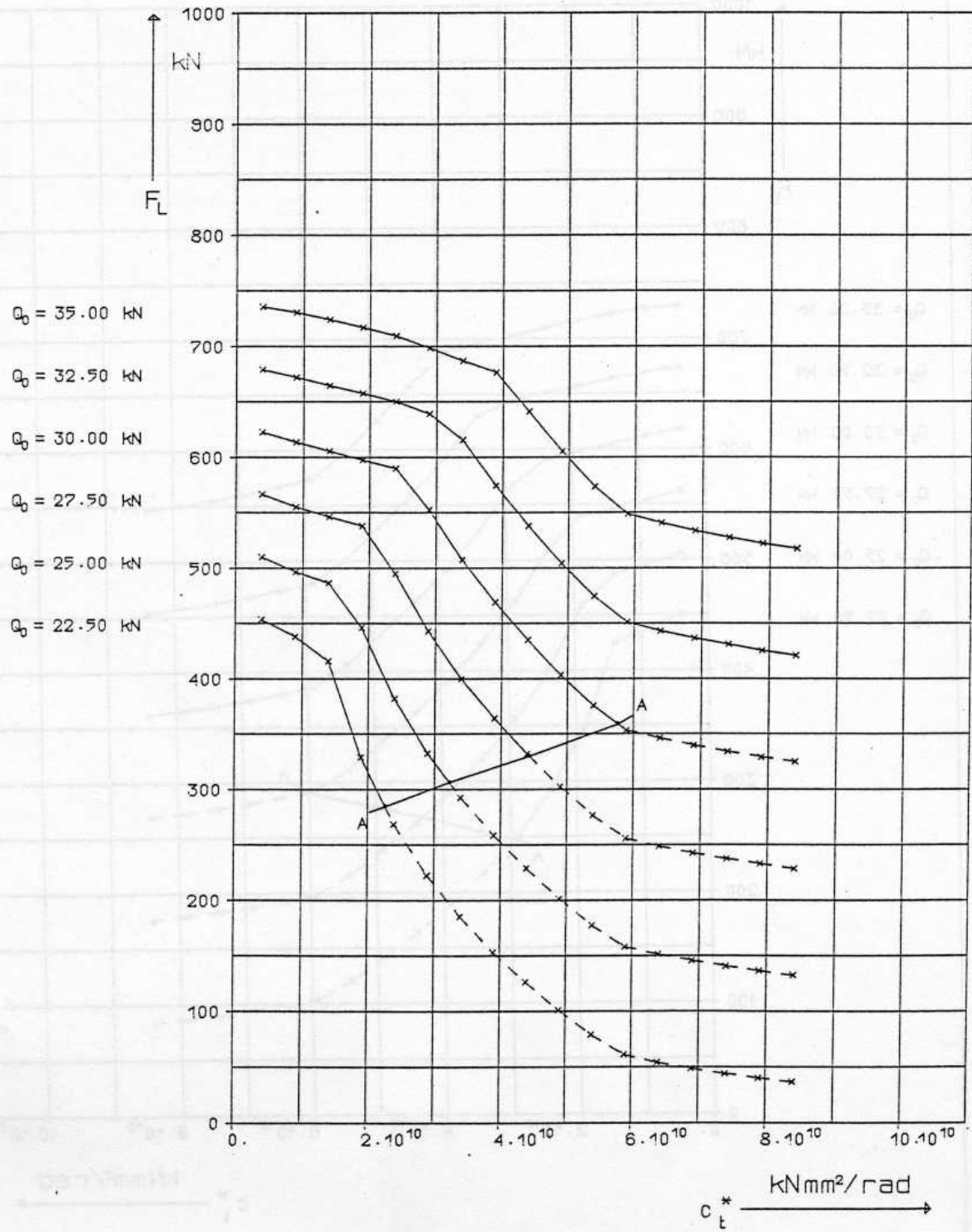
$$2a^* = 11500 \text{ mm}$$

$$2a^* = 7500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,86 \text{ kN/mm}$$



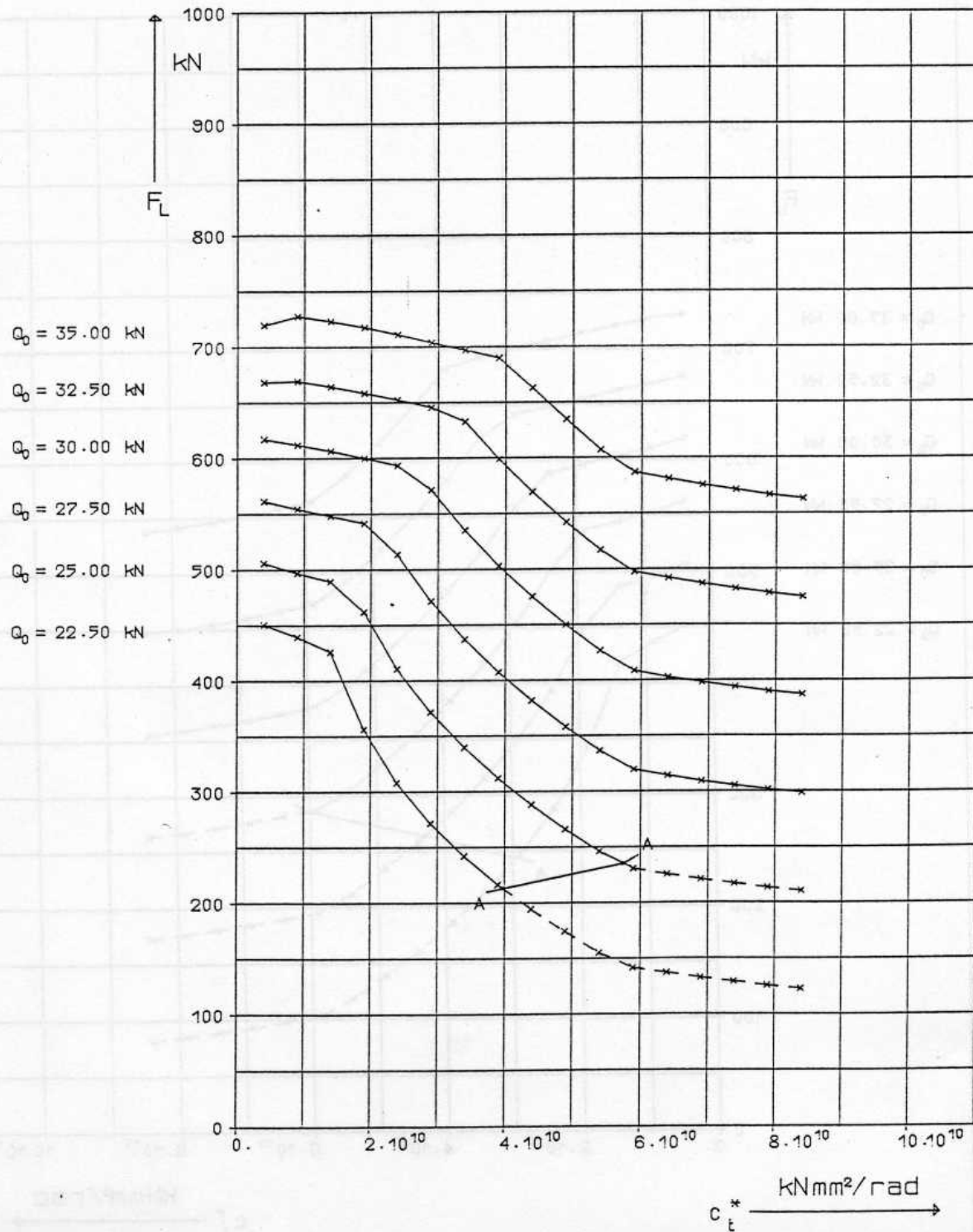
$$\boxed{} = 12000 \text{ mm}$$

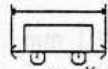
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





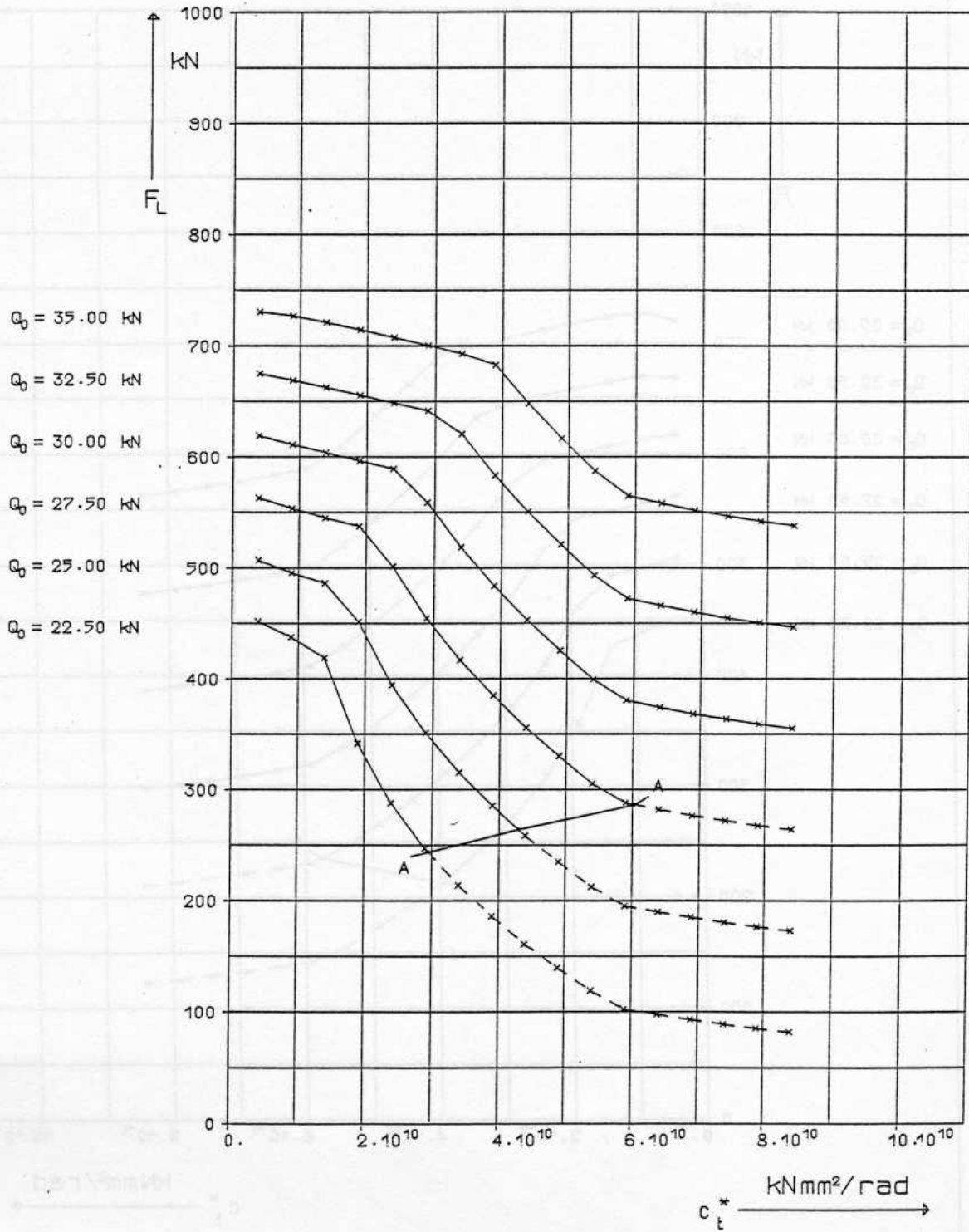
$$2a^* = 12000 \text{ mm}$$

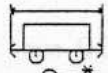
$$2a^* = 7000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





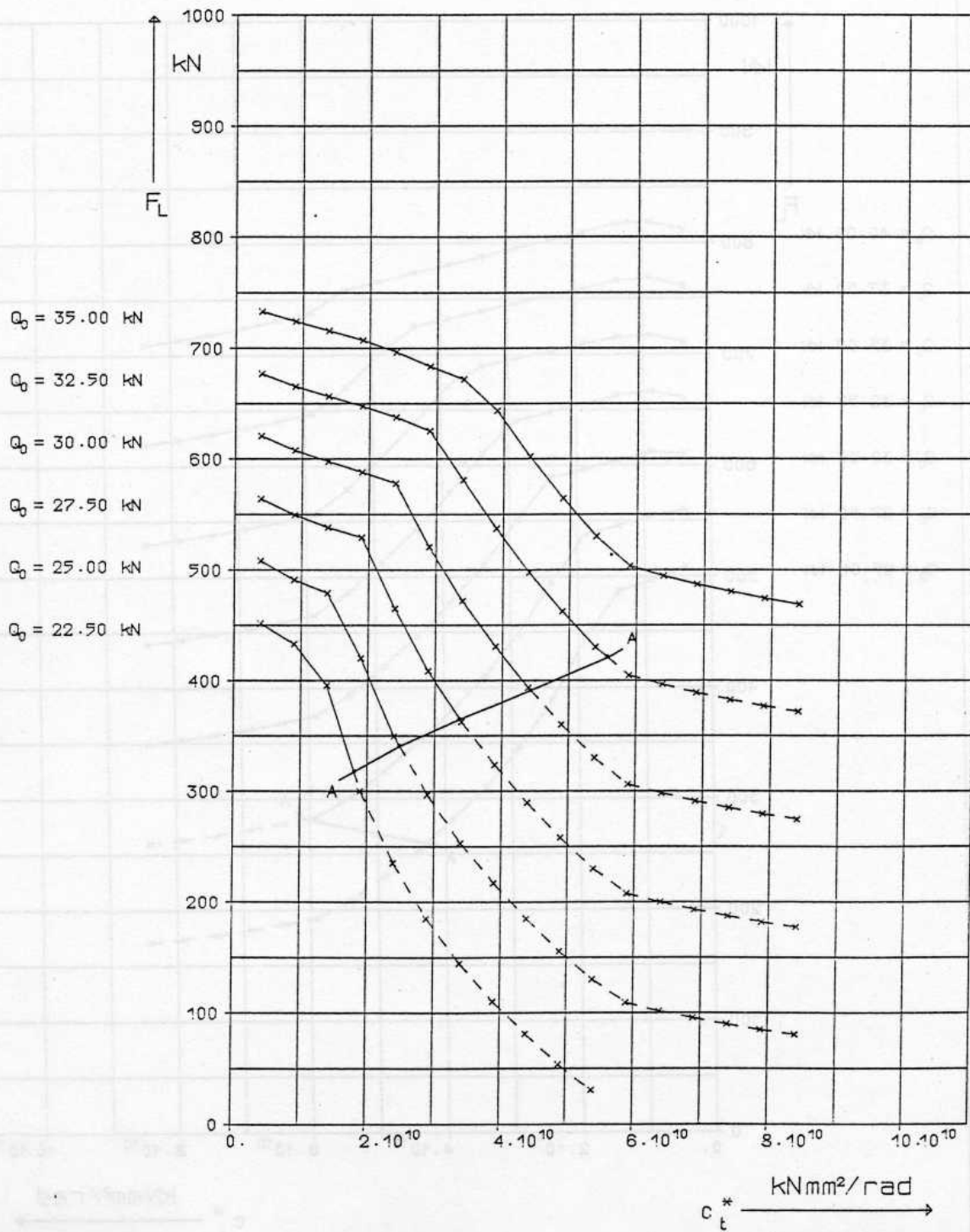
$$2a^* = 12000 \text{ mm}$$

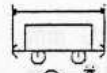
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





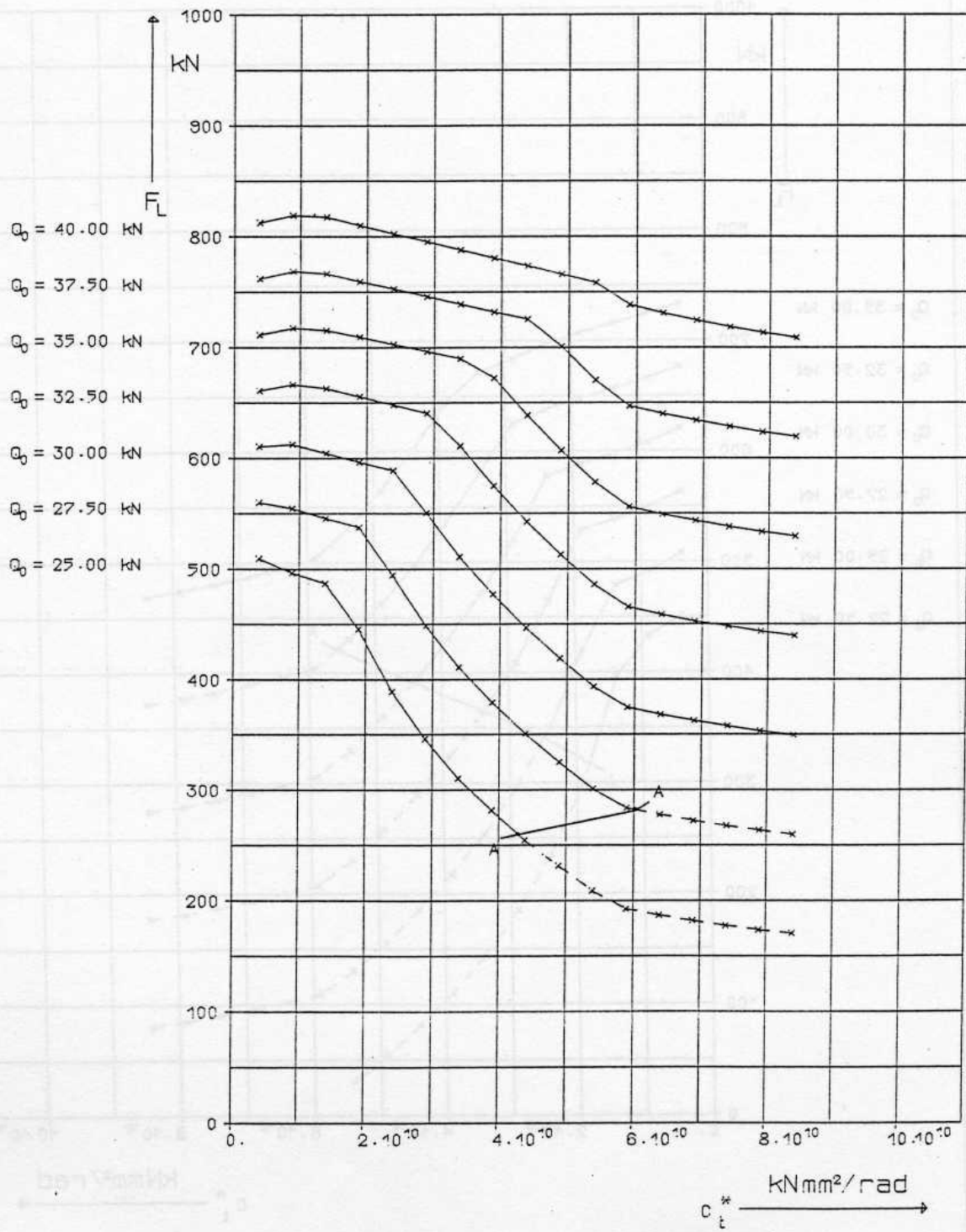
$$2a^* = 12500 \text{ mm}$$

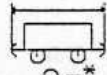
$$2a^* = 7000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





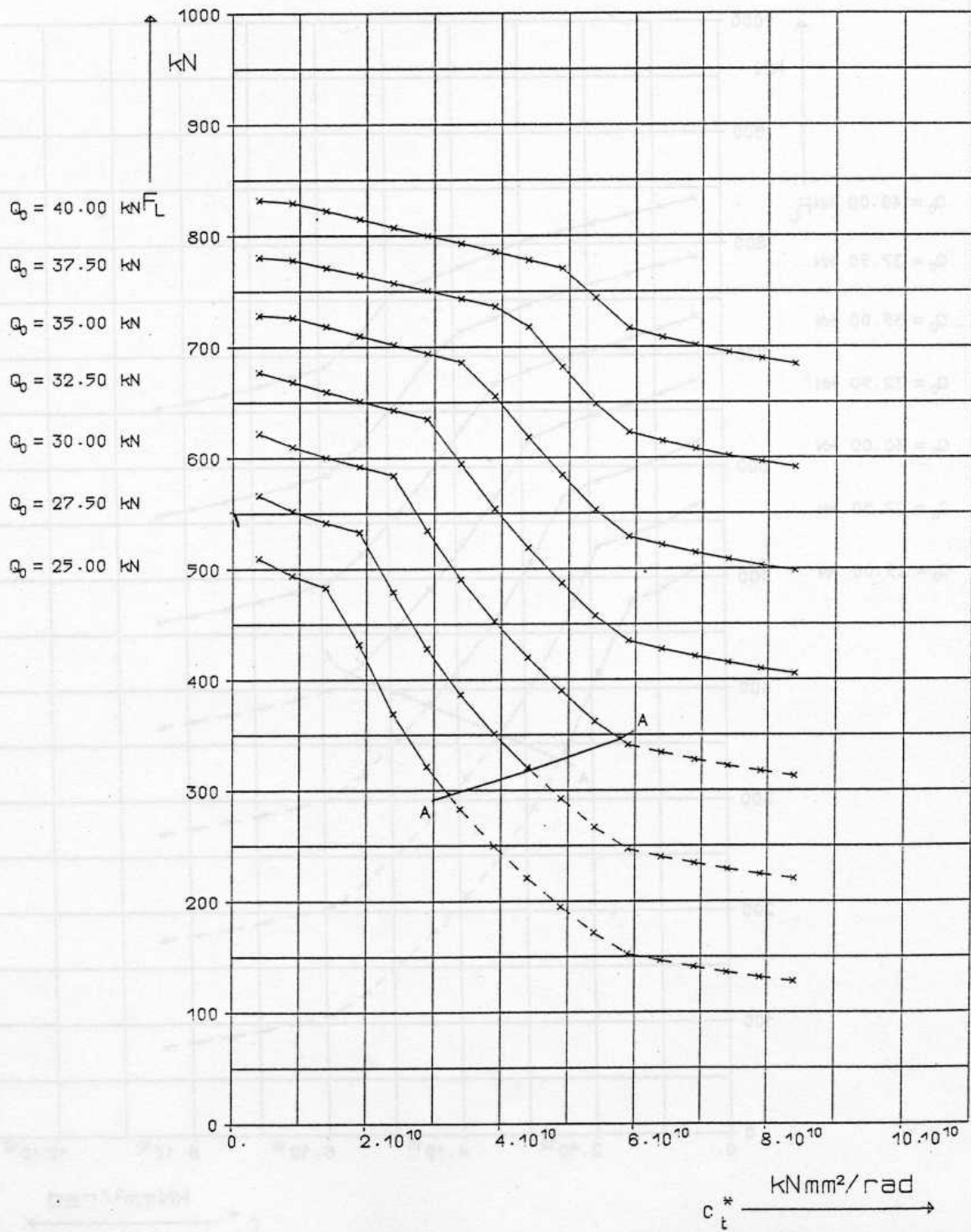
$$2a^* = 12500 \text{ mm}$$

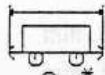
$$2a^* = 7500 \text{ mm}$$

$$\Delta \sigma_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta \sigma_0 \leq 0.23$$





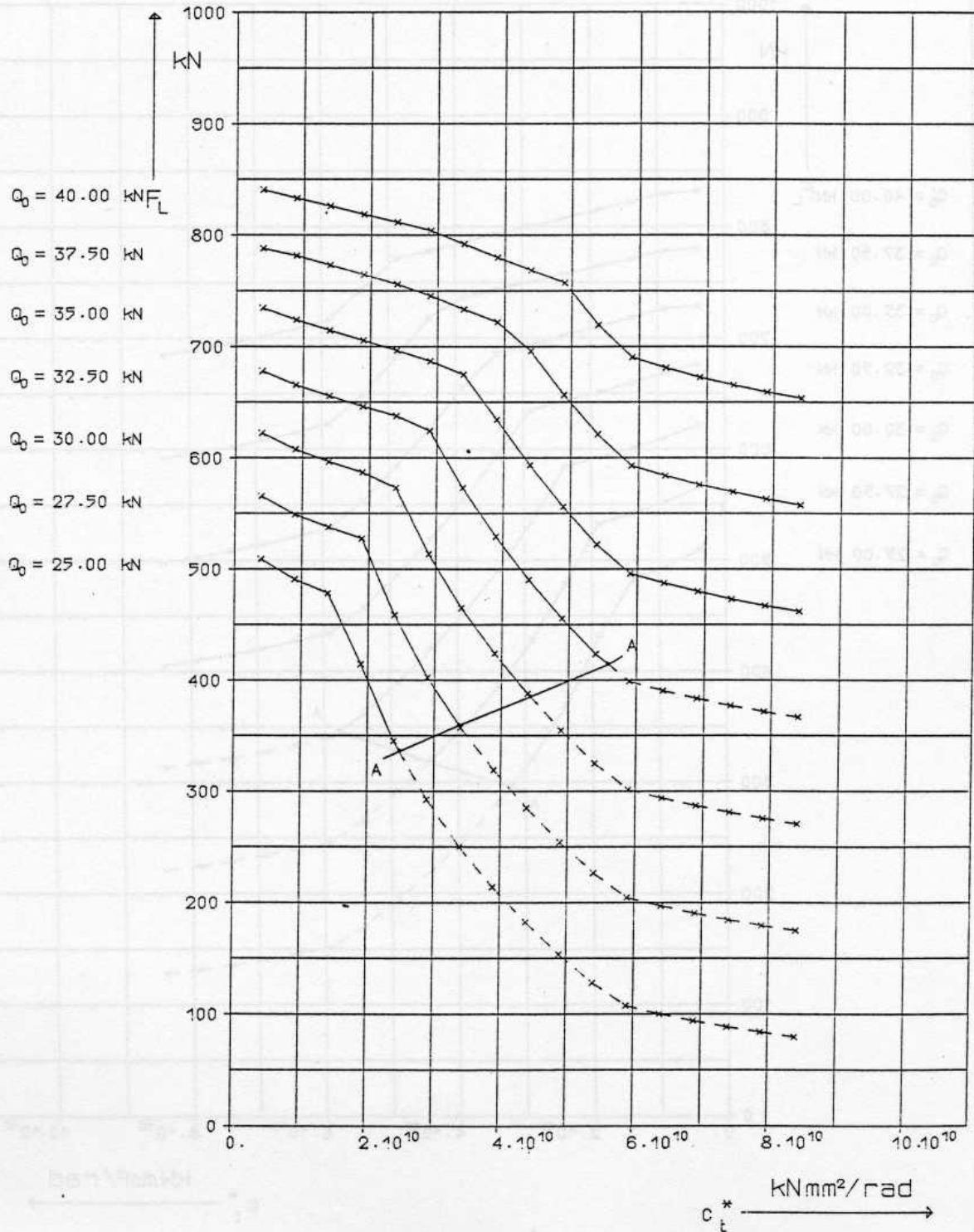
$$h = 12500 \text{ mm}$$

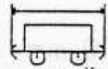
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,86 \text{ kN/mm}$$





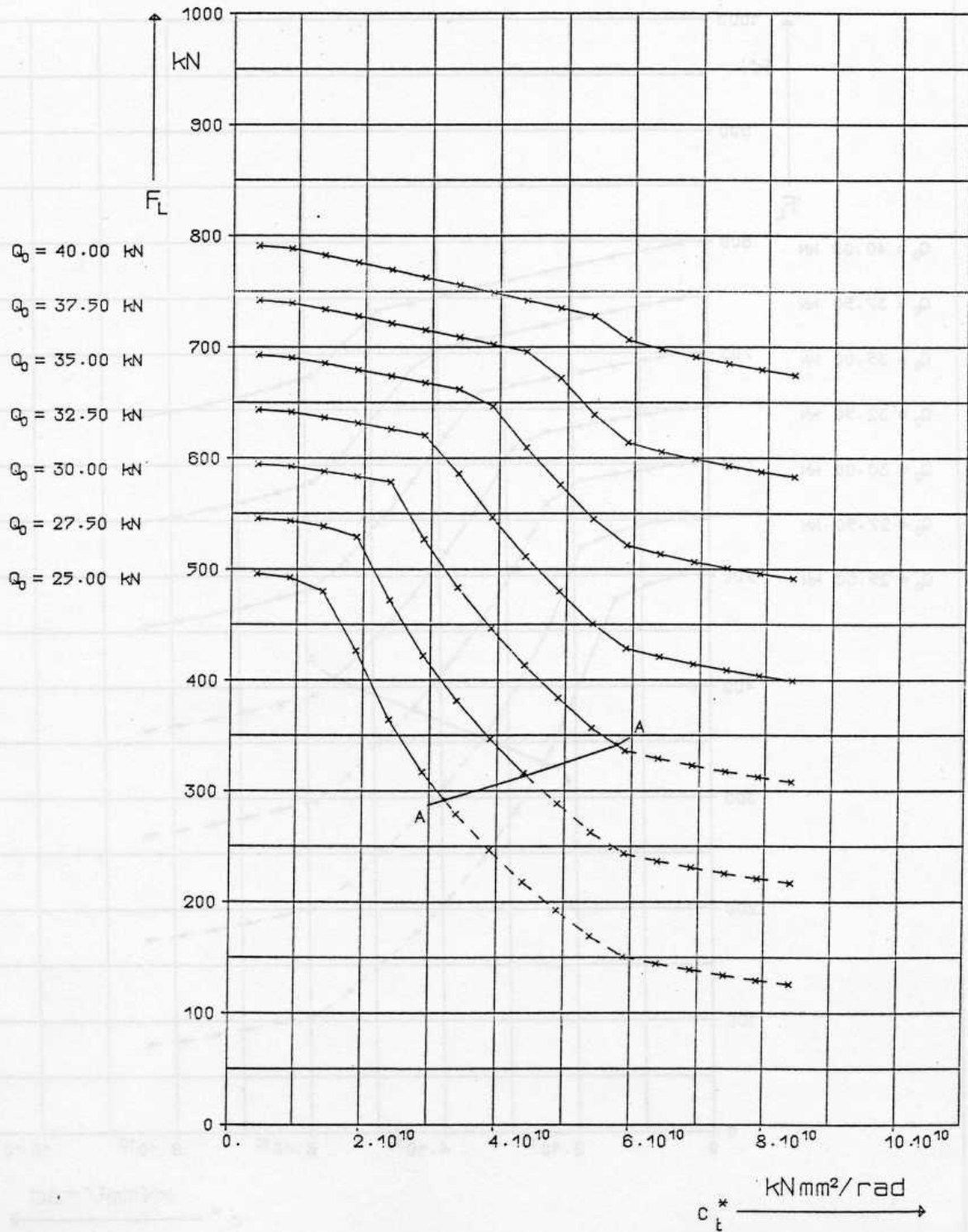
$$2a^* = 13000 \text{ mm}$$

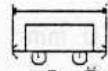
$$2a^* = 7500 \text{ mm}$$

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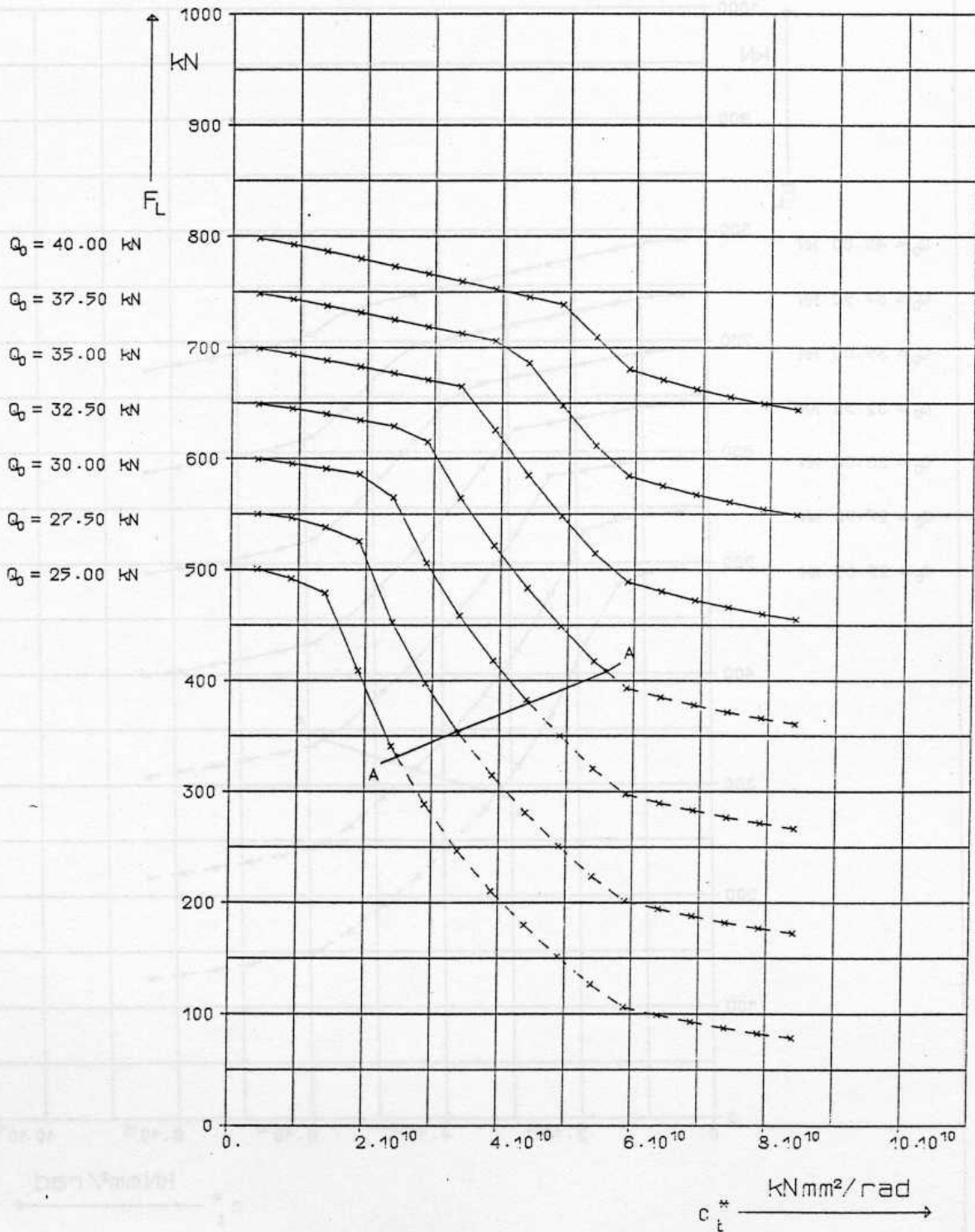
$$2a^* = 13000 \text{ mm}$$

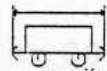
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





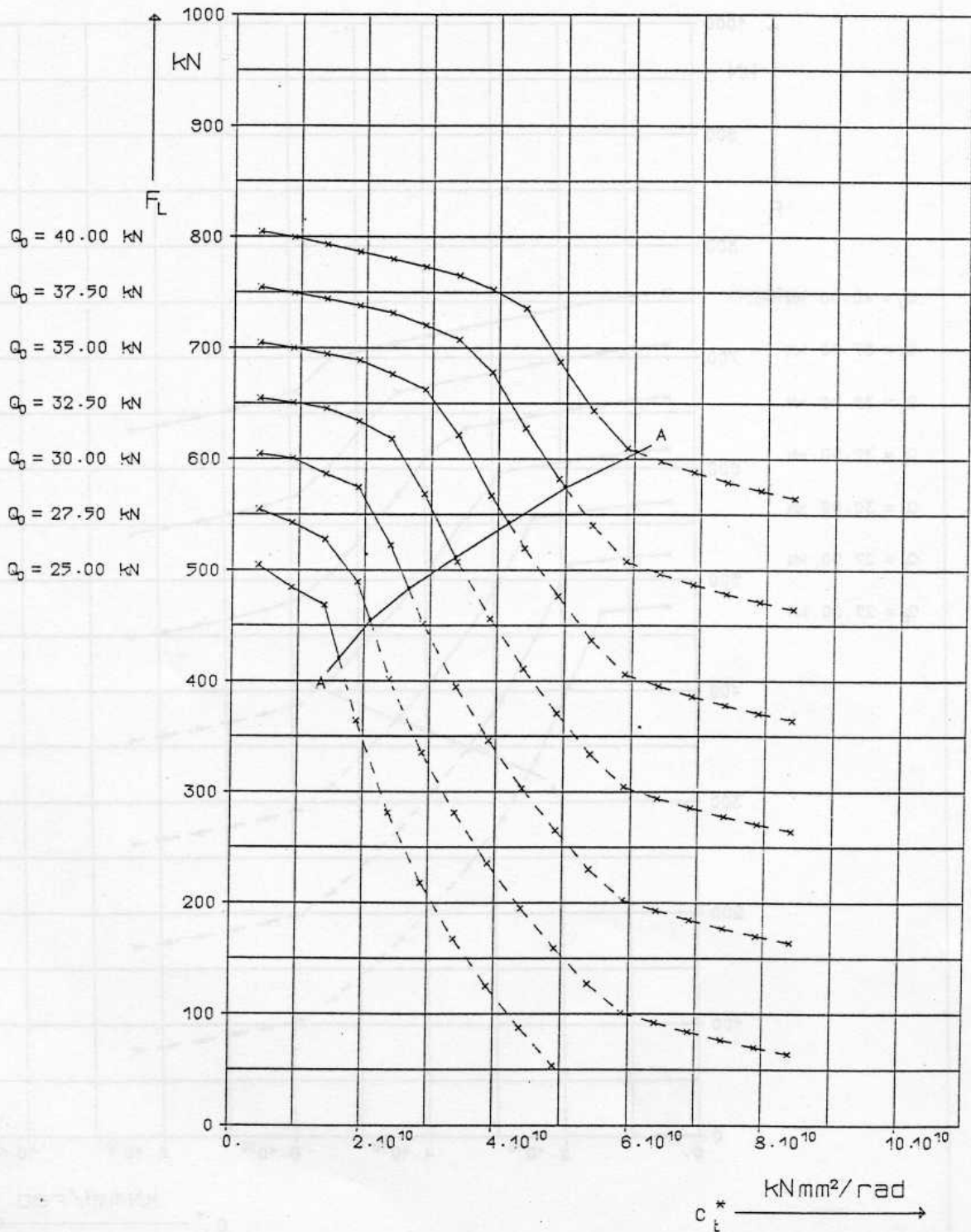
$$2a^* = 13000 \text{ mm}$$

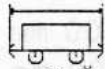
$$2a^* = 9000 \text{ mm}$$

$$\Delta a_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta a_0 \leq 0.23$$



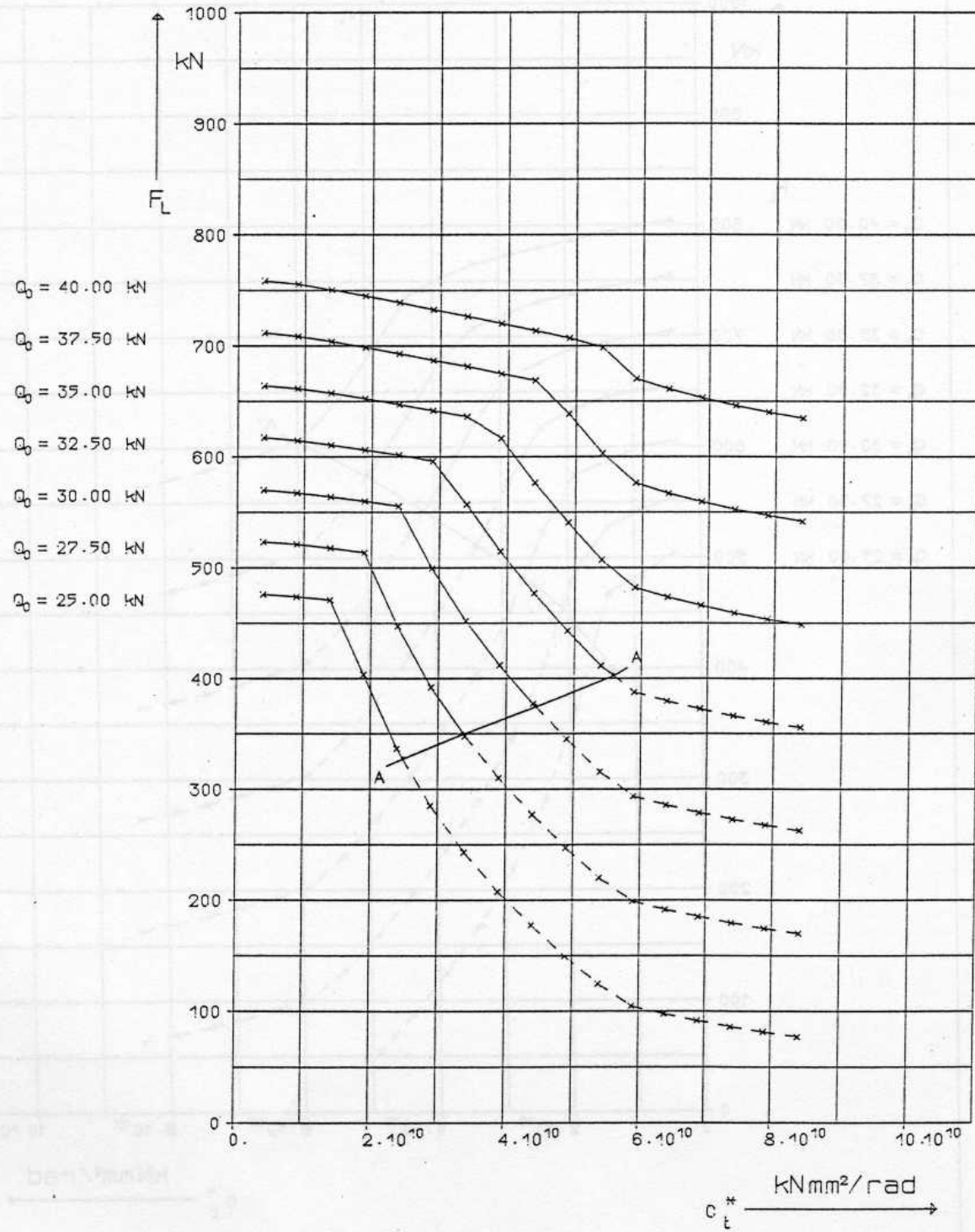


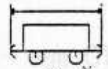
$$2a^* = 8000 \text{ mm}$$

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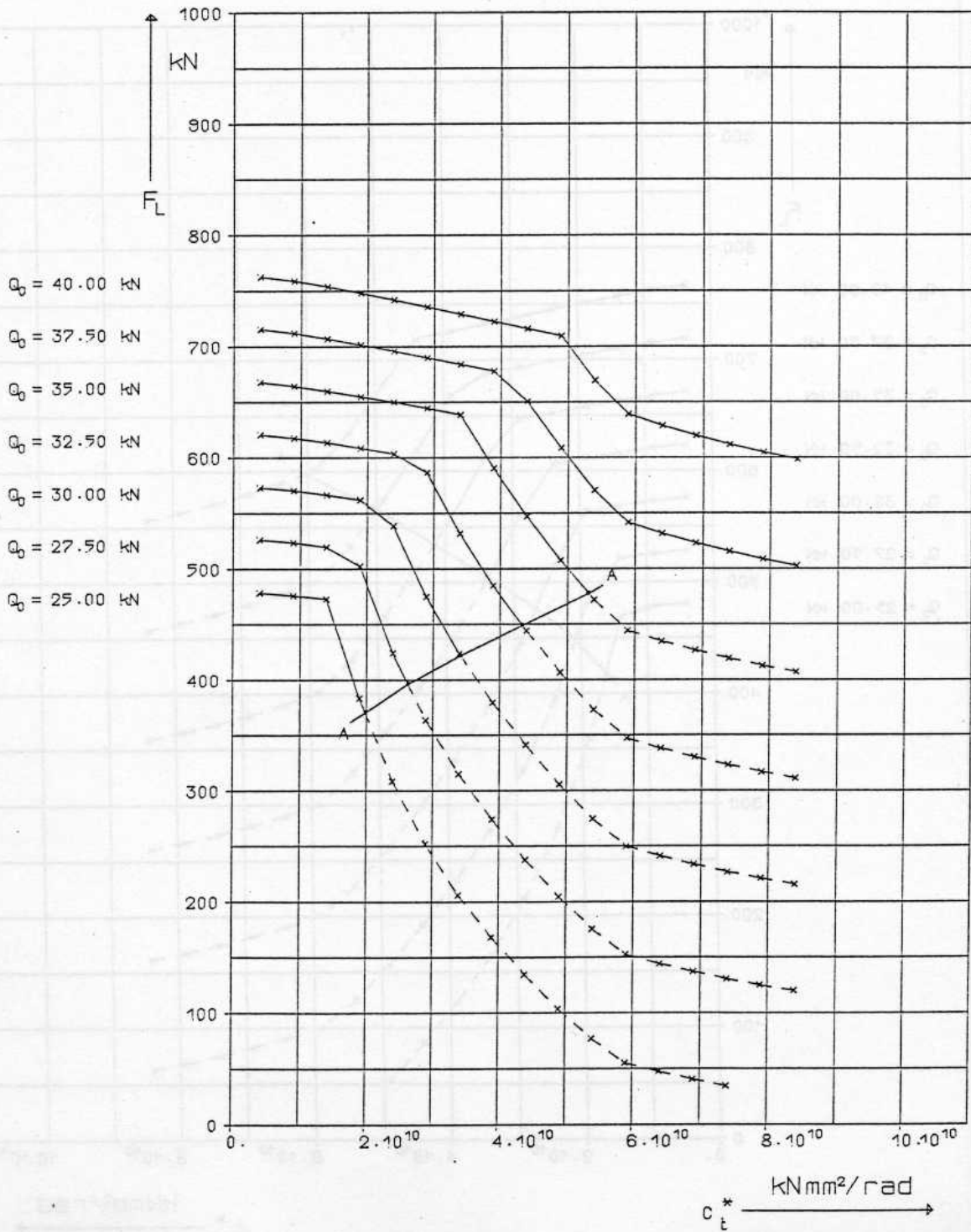
$$2a^* = 13500 \text{ mm}$$

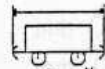
$$2a^* = 8500 \text{ mm}$$

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$$0,15 \leq \Delta q_0 \leq 0,23$$

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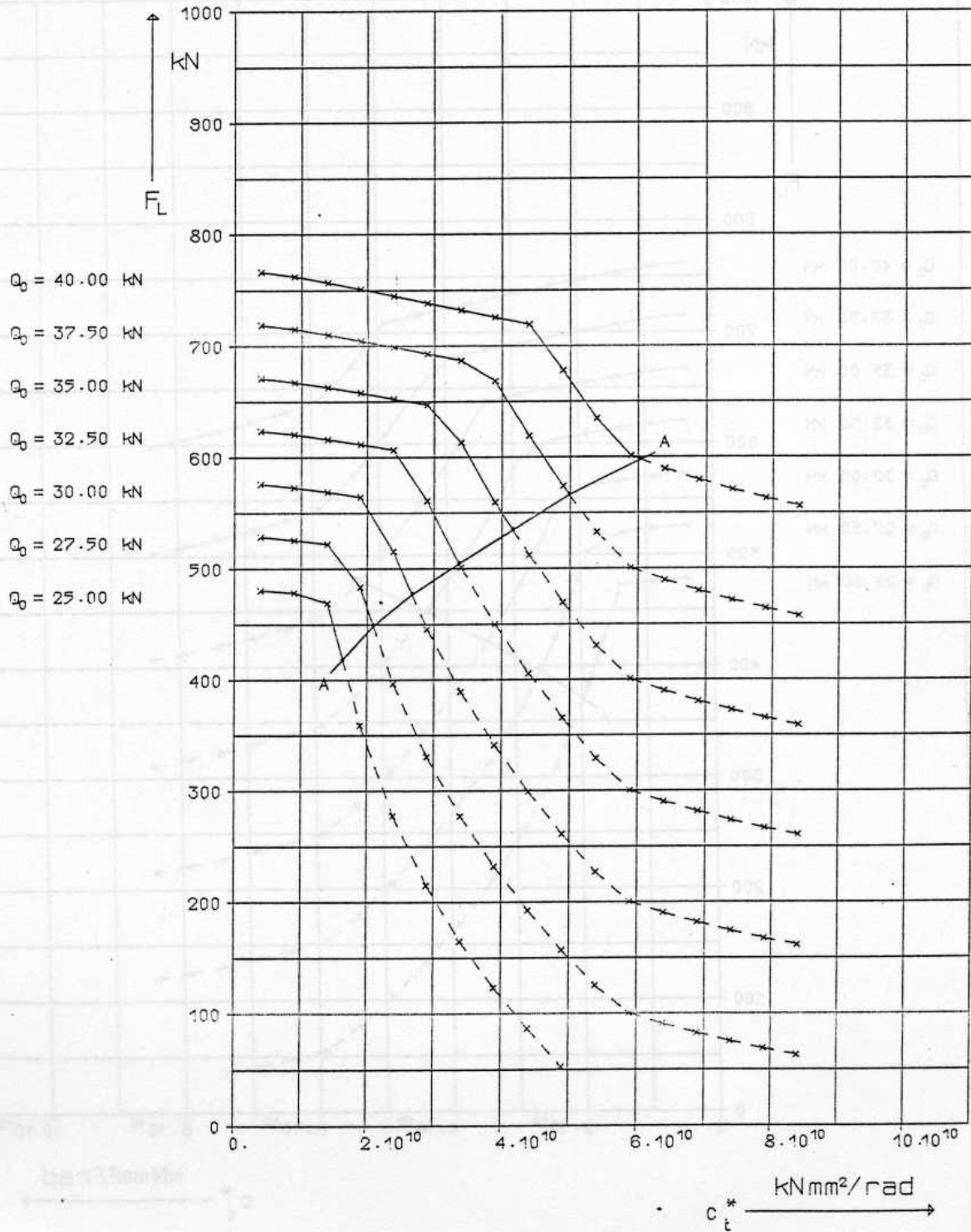
$$2a^* = 13500 \text{ mm}$$

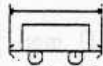
$$2a^* = 9000 \text{ mm}$$

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$$c_z = 0.86 \text{ kN/mm}$$

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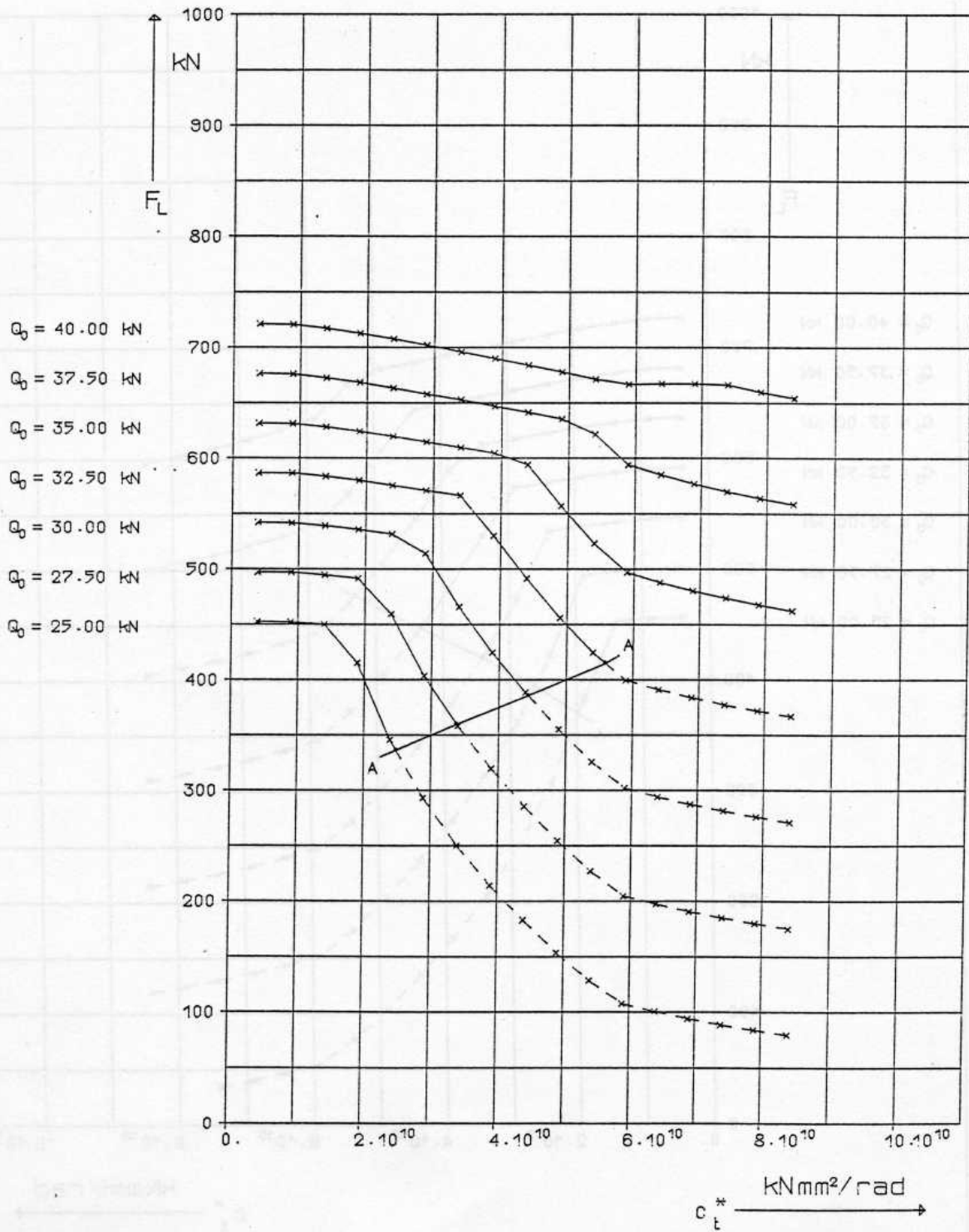


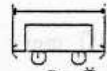
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





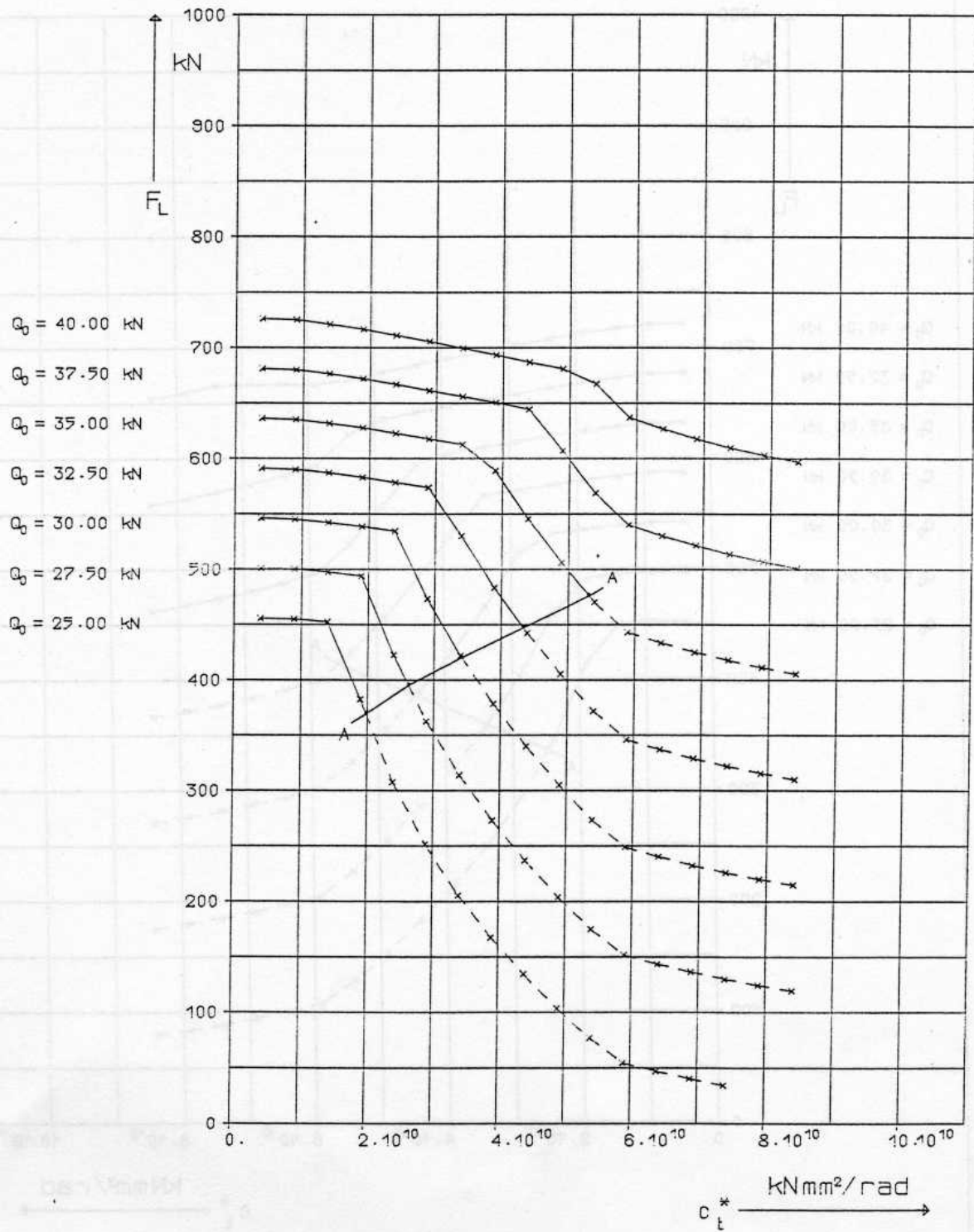
$$h = 14000 \text{ mm}$$

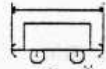
$$2a^* = 8500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$c_z = 0.86 \text{ kN/mm}$$





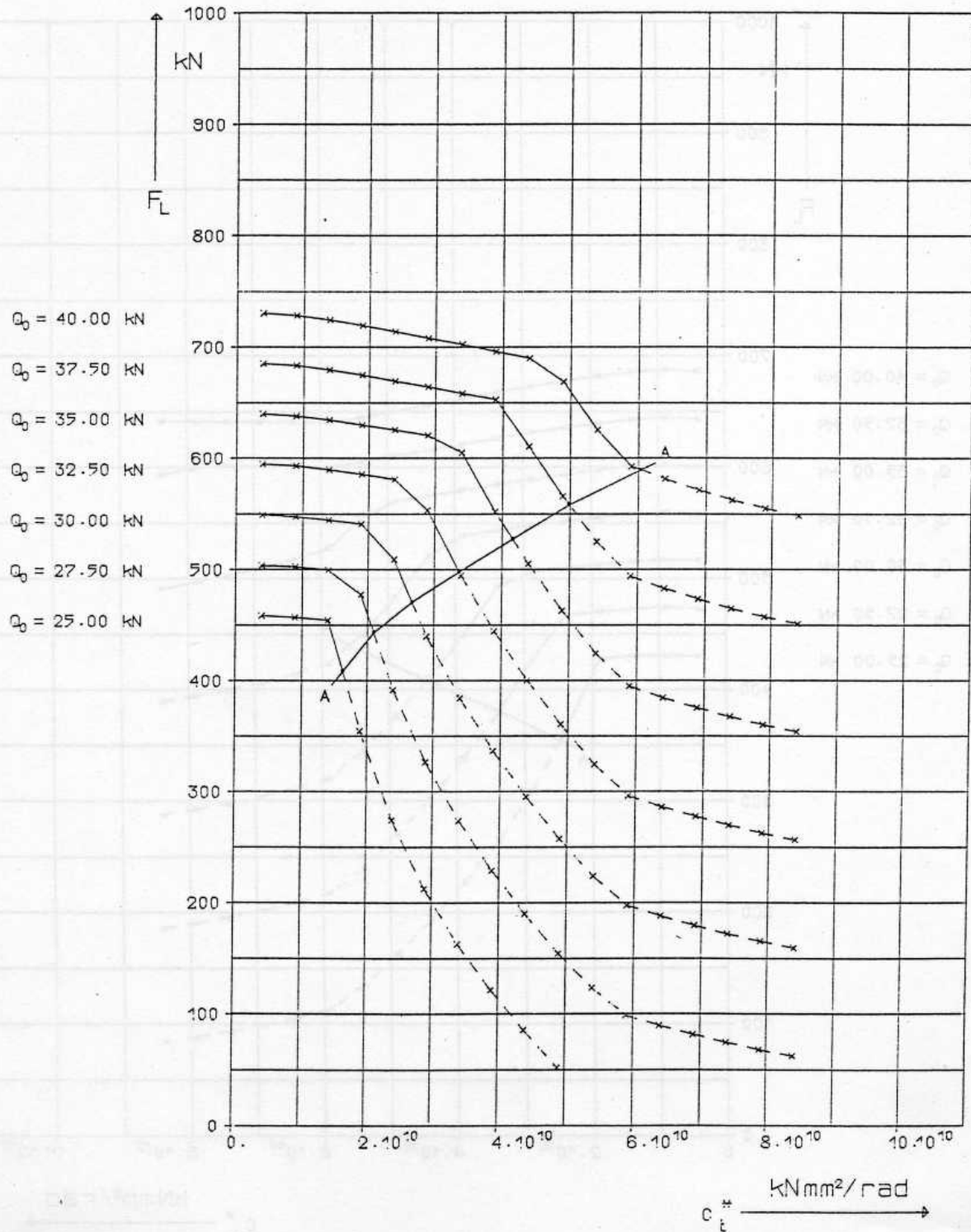
$$2a^* = 14000 \text{ mm}$$

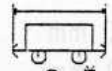
$$b = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,86 \text{ kN/mm}$$





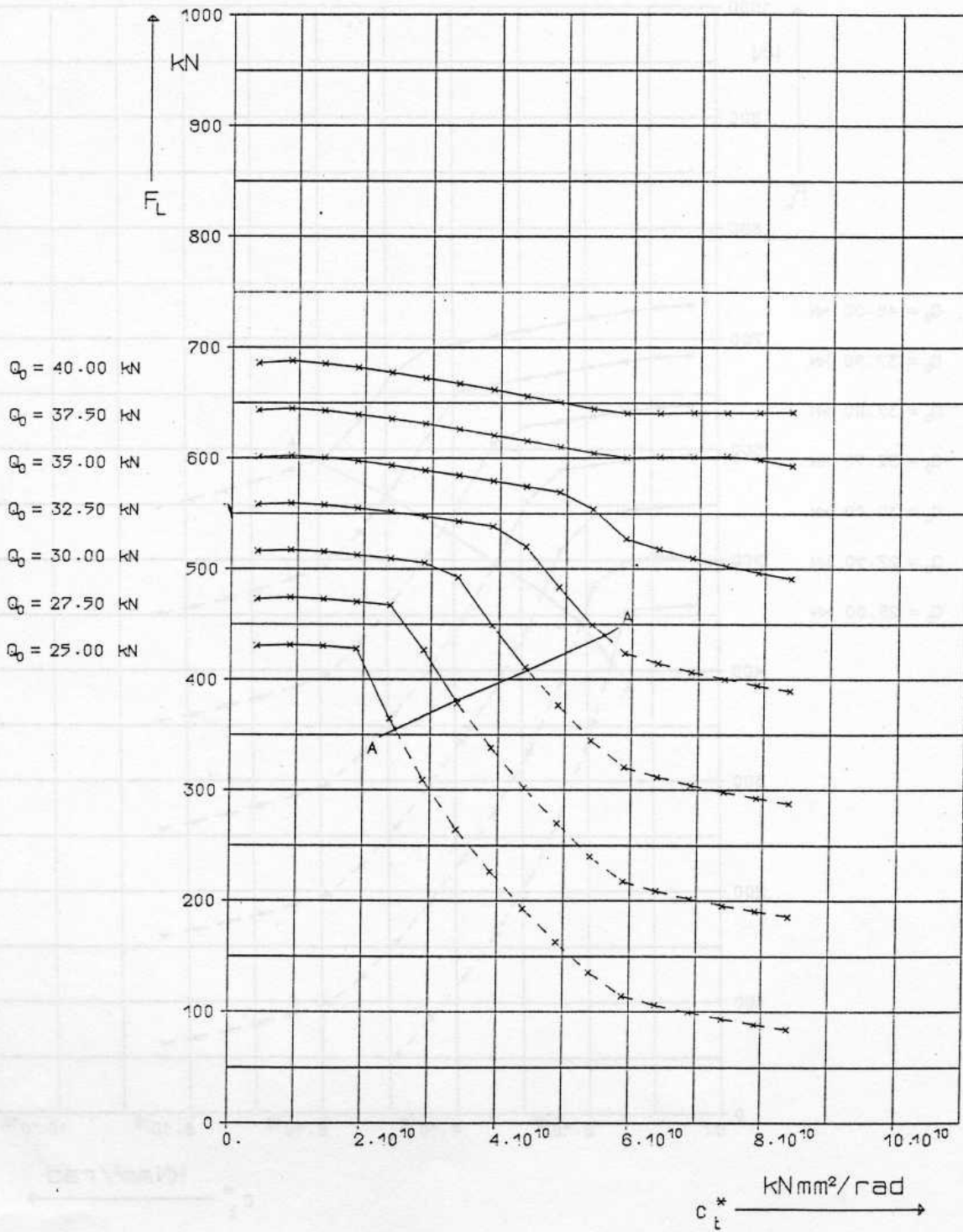
$$h_0 = 14500 \text{ mm}$$

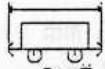
$$2a^* = 8000 \text{ mm}$$

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$$0,15 \leq \Delta q_0 \leq 0,23$$

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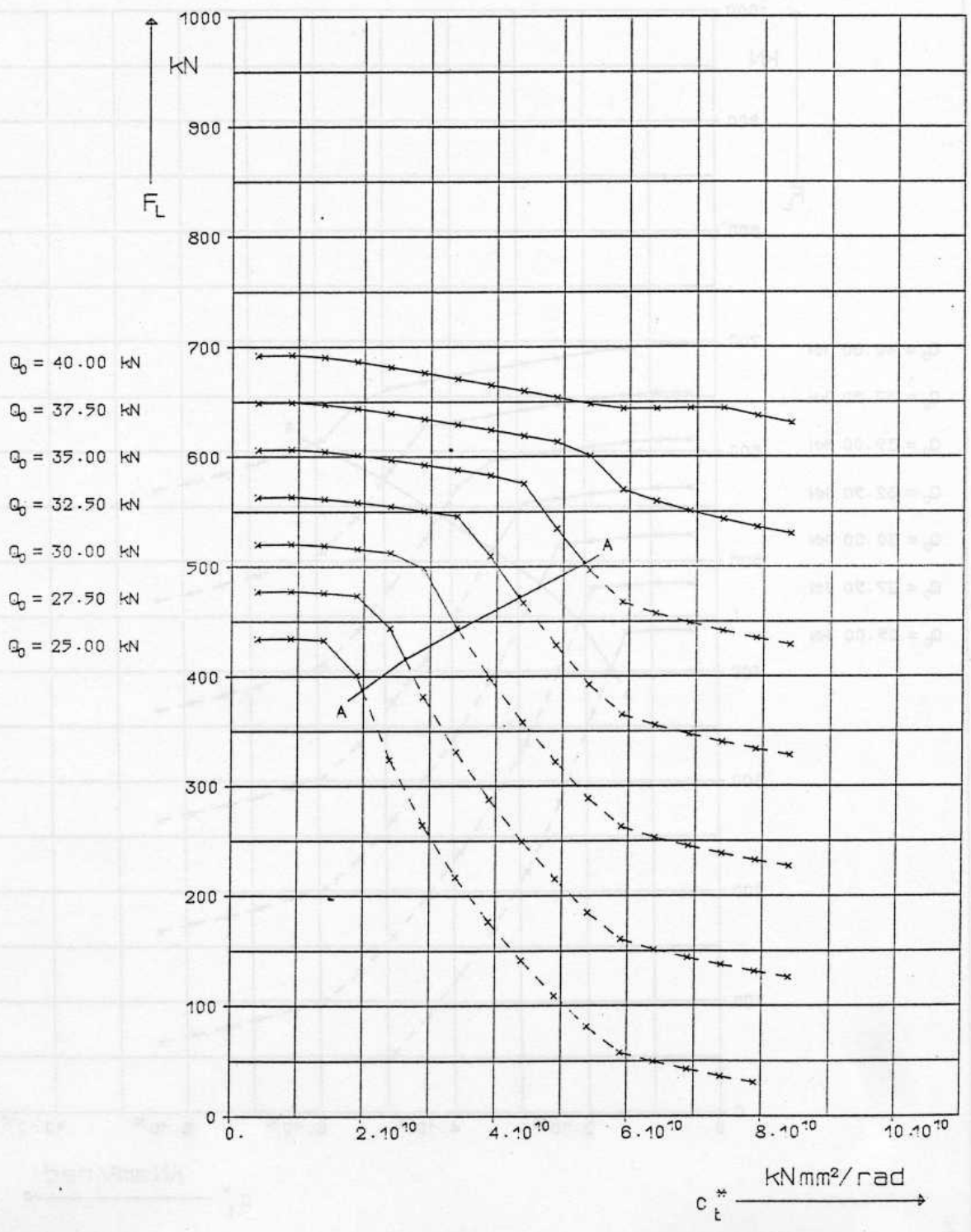
$$= 14500 \text{ mm}$$

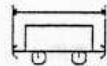
$$2a^* = 8500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,86 \text{ kN/mm}$$





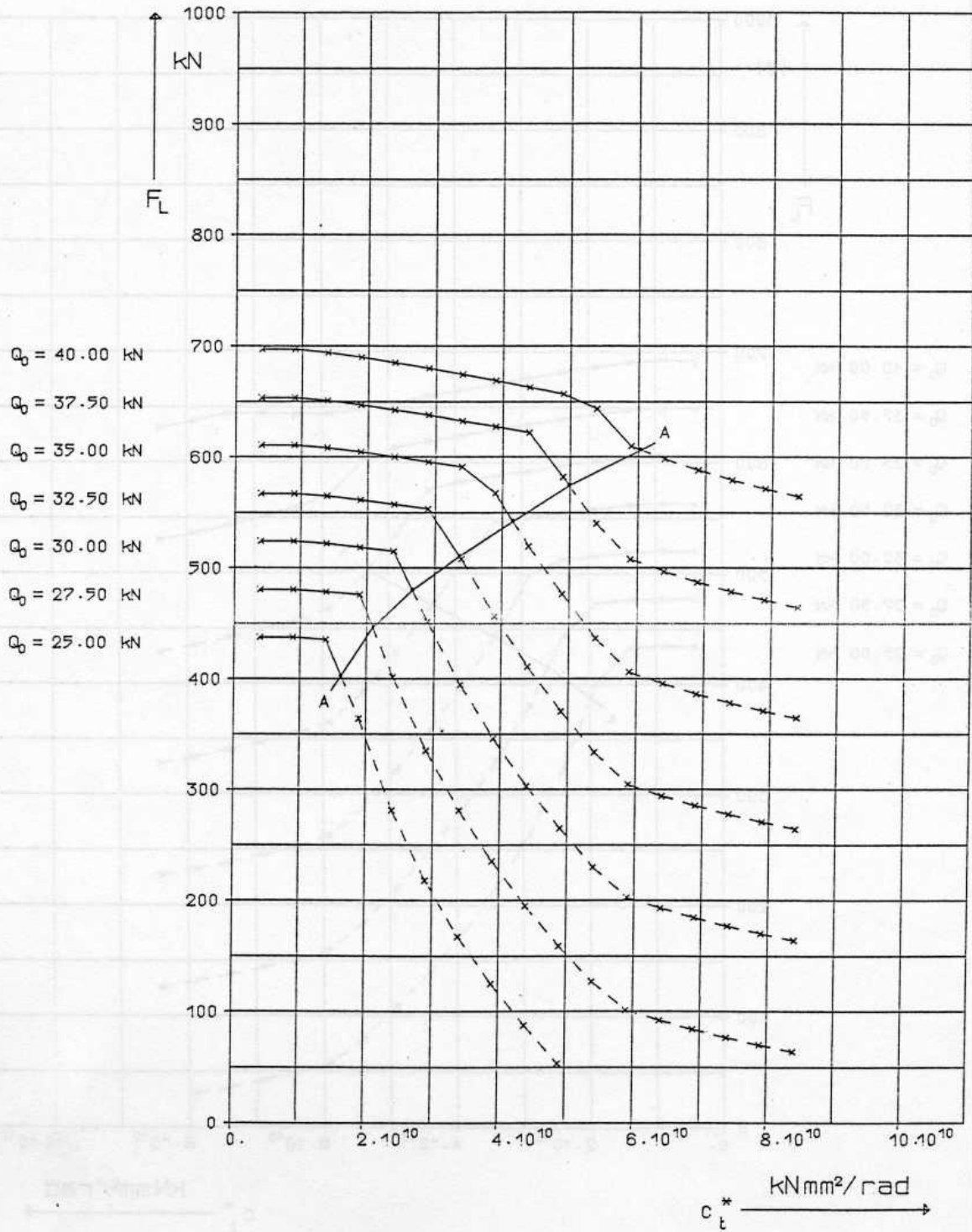
$$2a^* = 14500 \text{ mm}$$

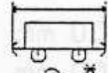
$$2a^* = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





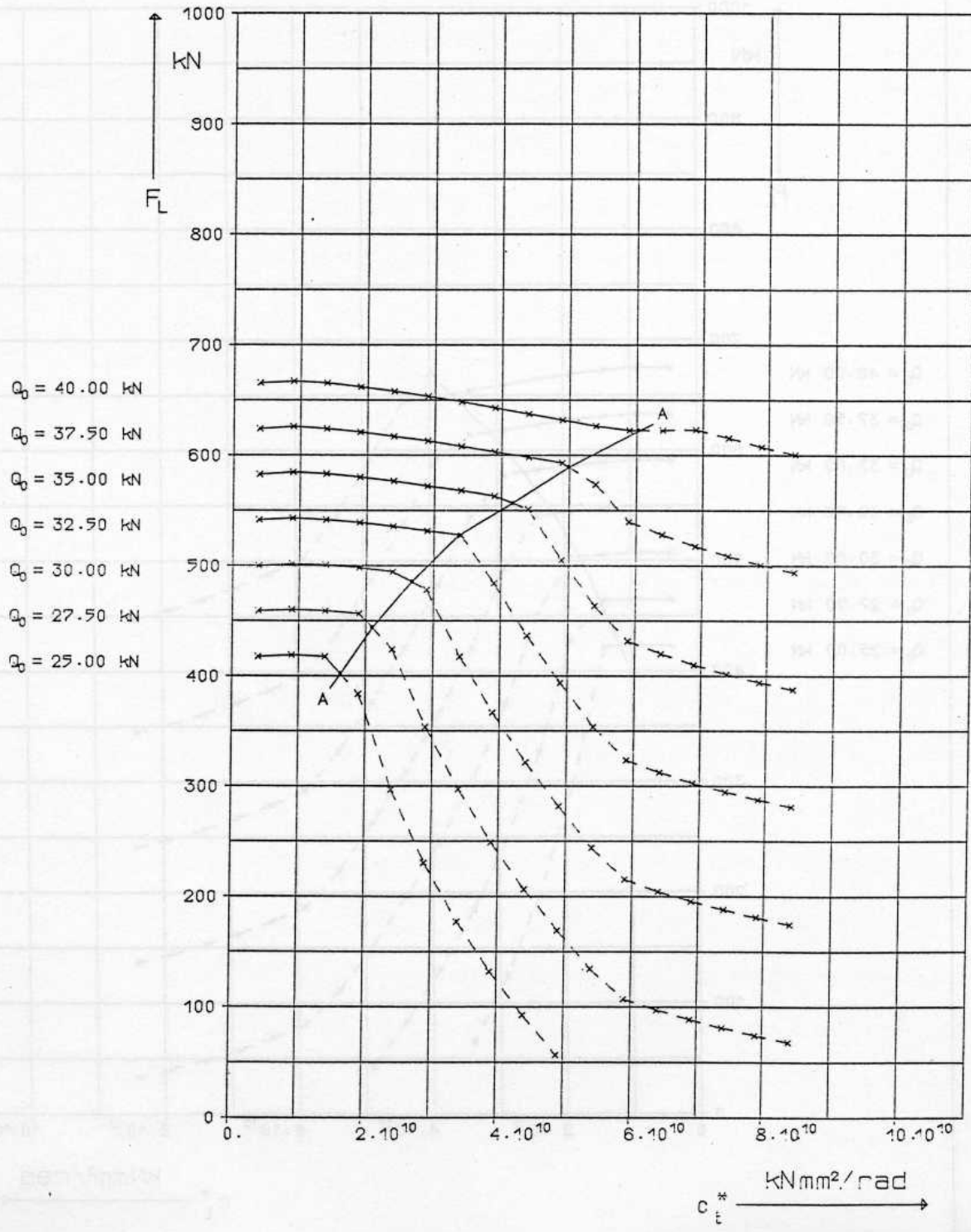
$$2a^* = 15000 \text{ mm}$$

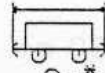
$$2a^* = 9000 \text{ mm}$$

$$\Delta q_0 = F(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





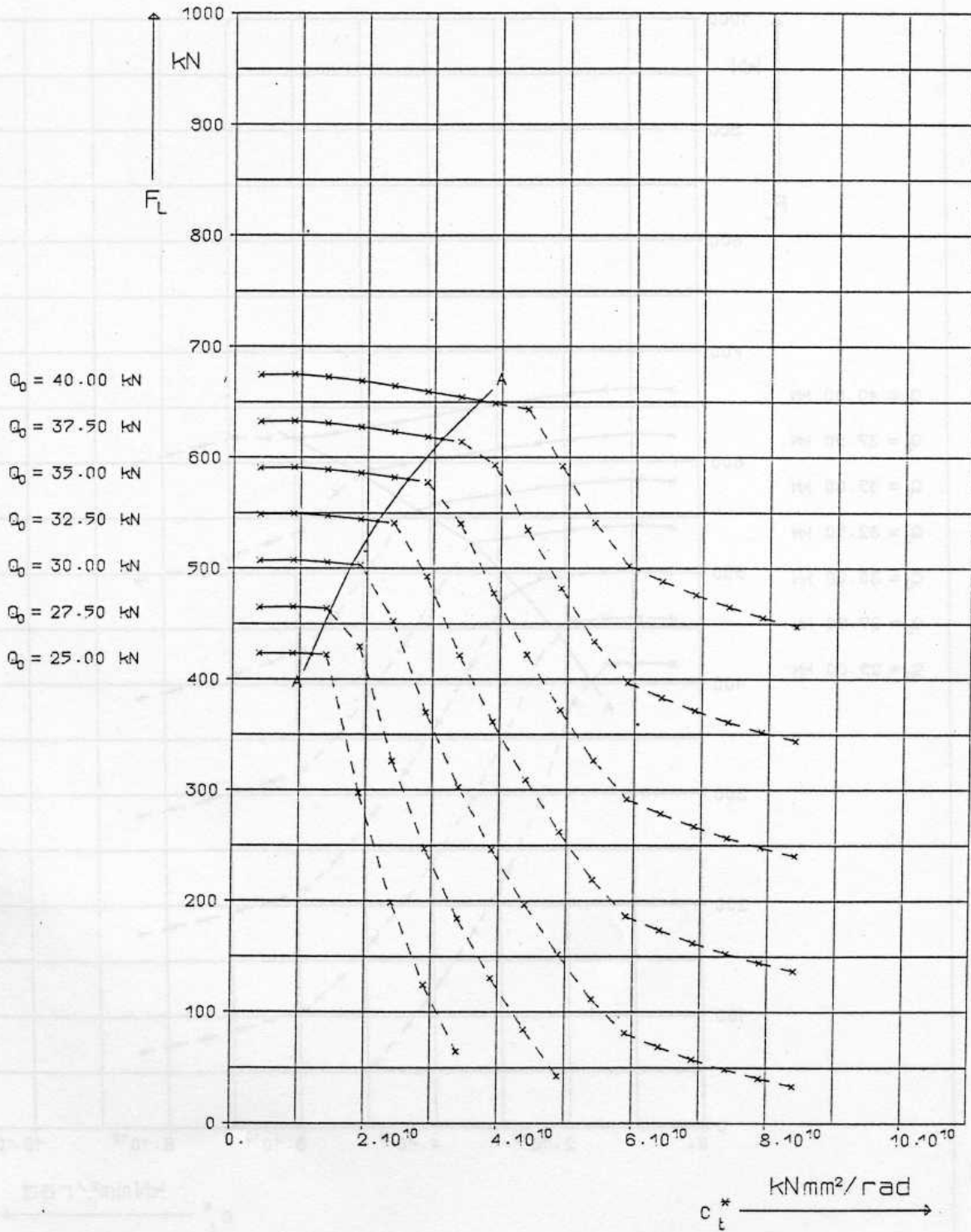
$$2a^* = 15000 \text{ mm}$$

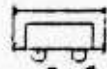
$$2a^* = 10000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





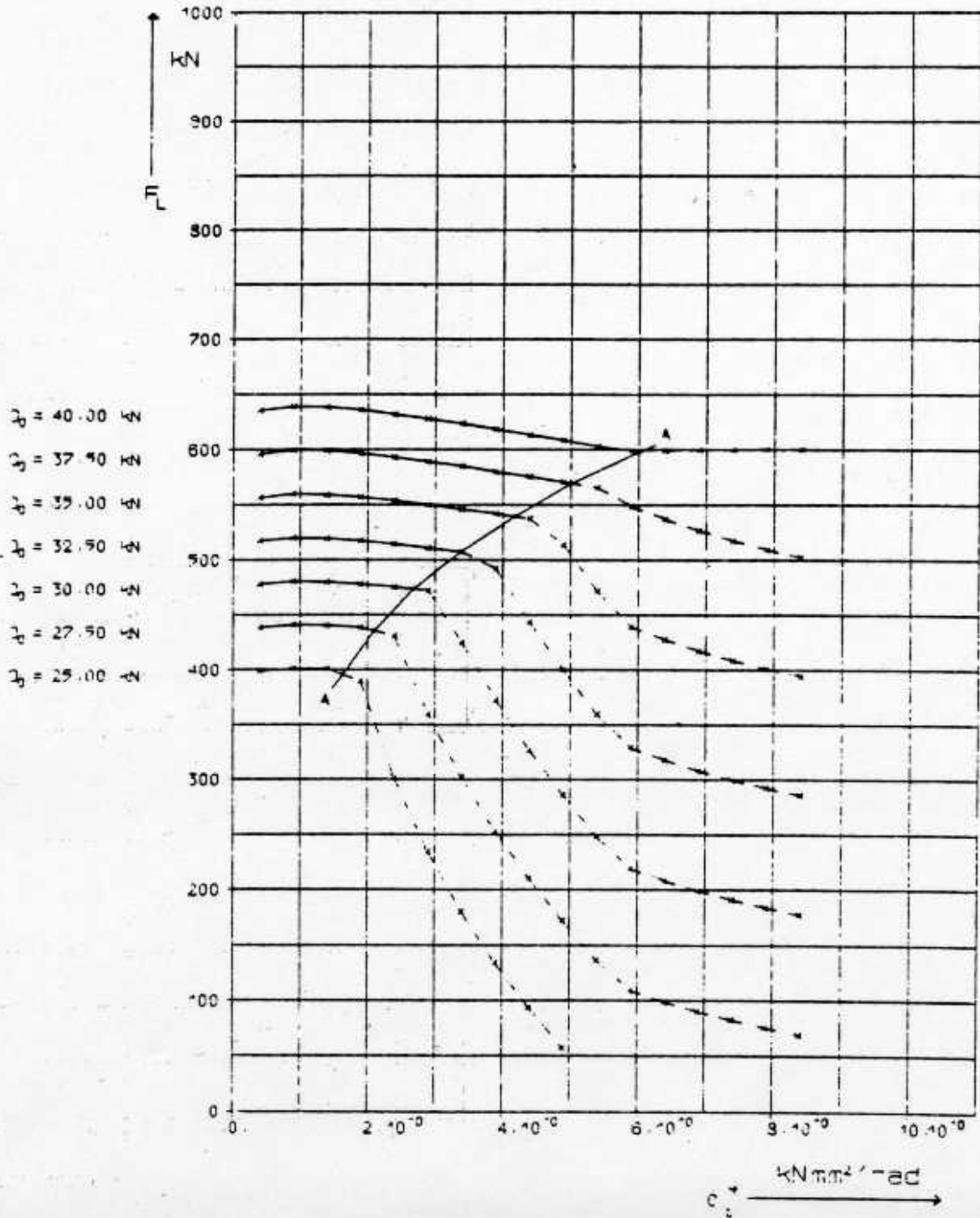
$$= 15500 \text{ mm}$$

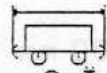
$$2a^* = 9000 \text{ mm}$$

$$\Delta a_0 = f(c_2^*)$$

$$c_2 = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta a_0 \leq 0.23$$





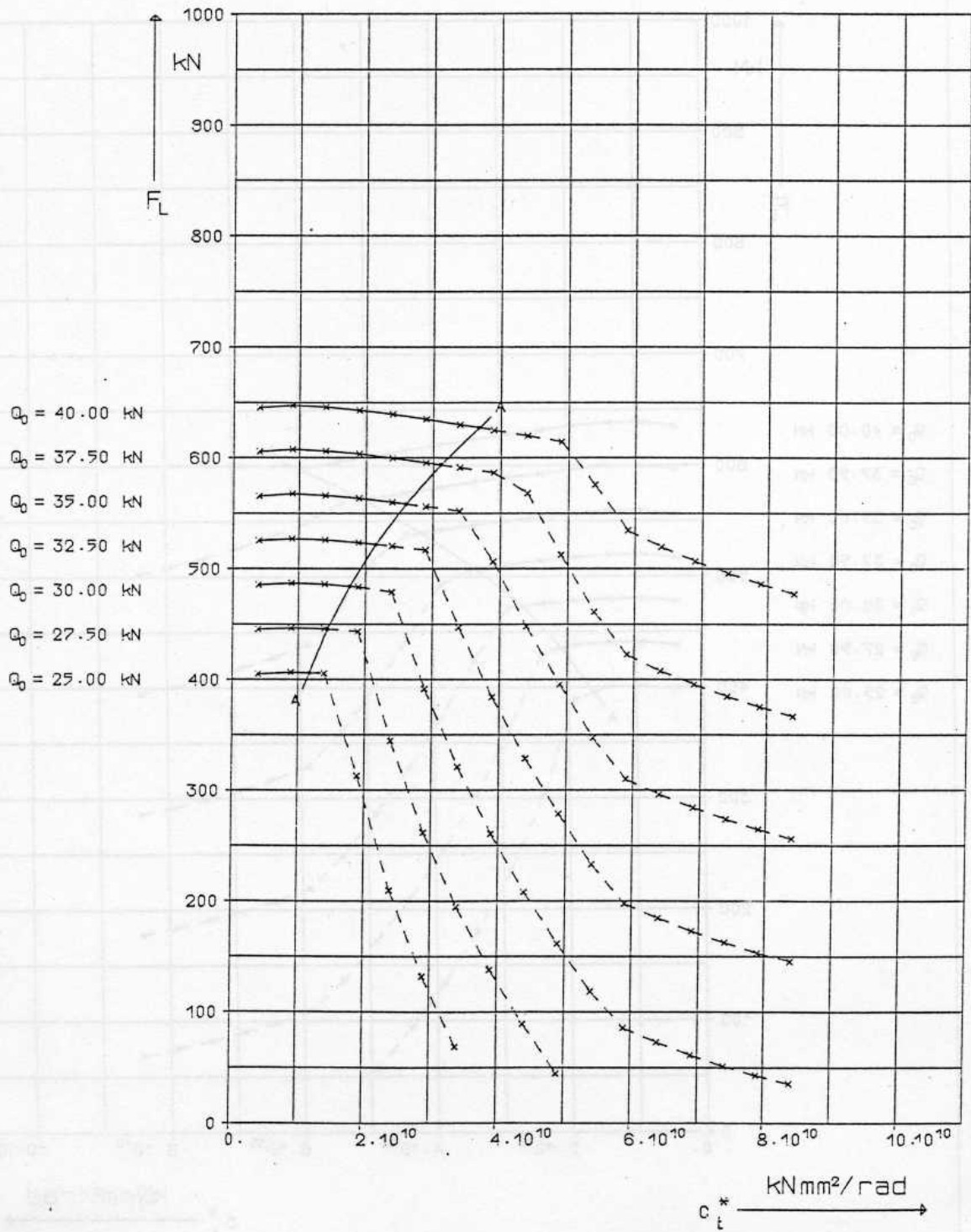
$$h = 15500 \text{ mm}$$

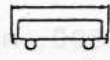
$$2a^* = 10000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.86 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





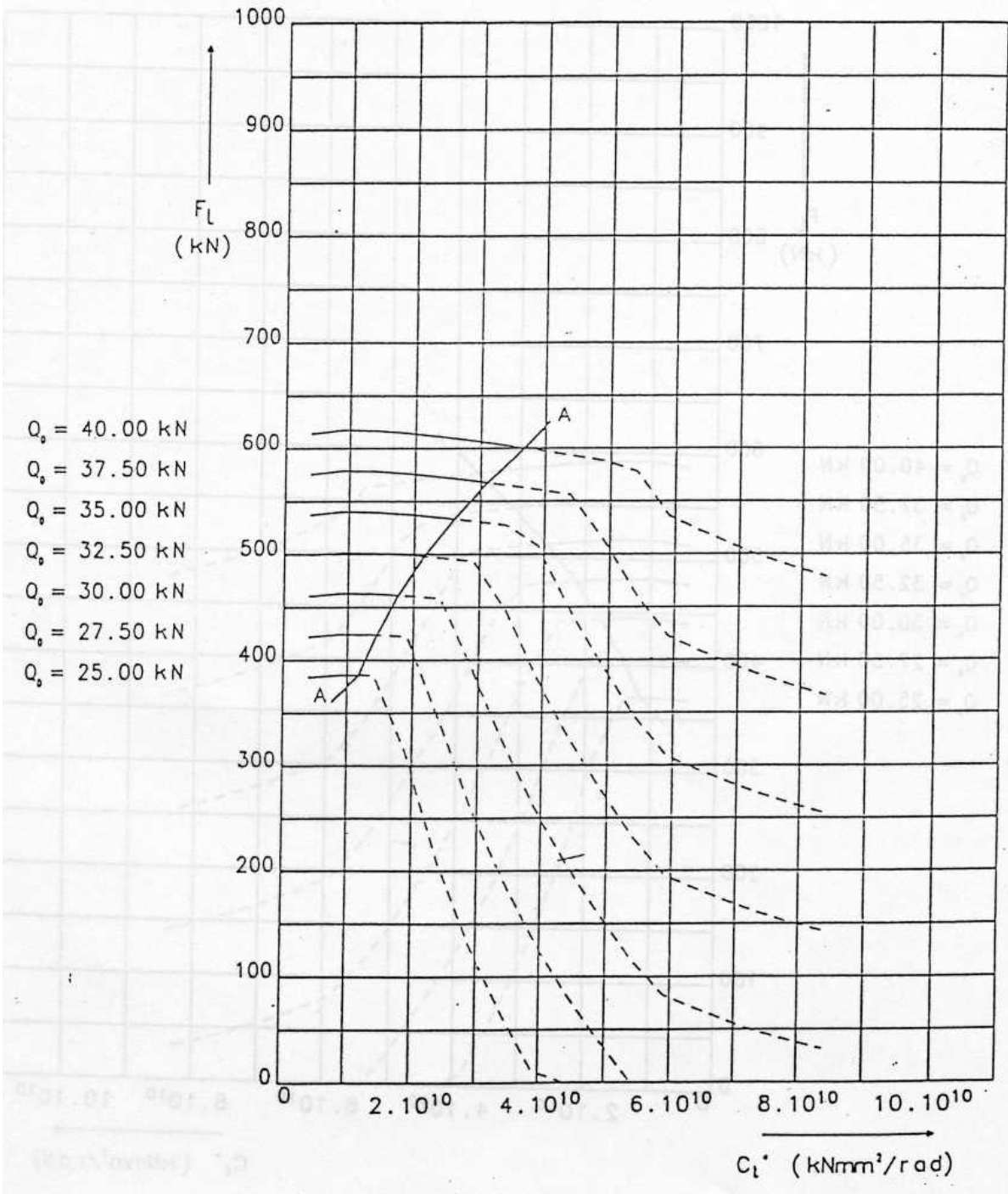
$$= 16000. \text{ mm}$$

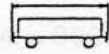
$$2a^* = 10000. \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$C_z = 0.86 \text{ kN/mm}$$





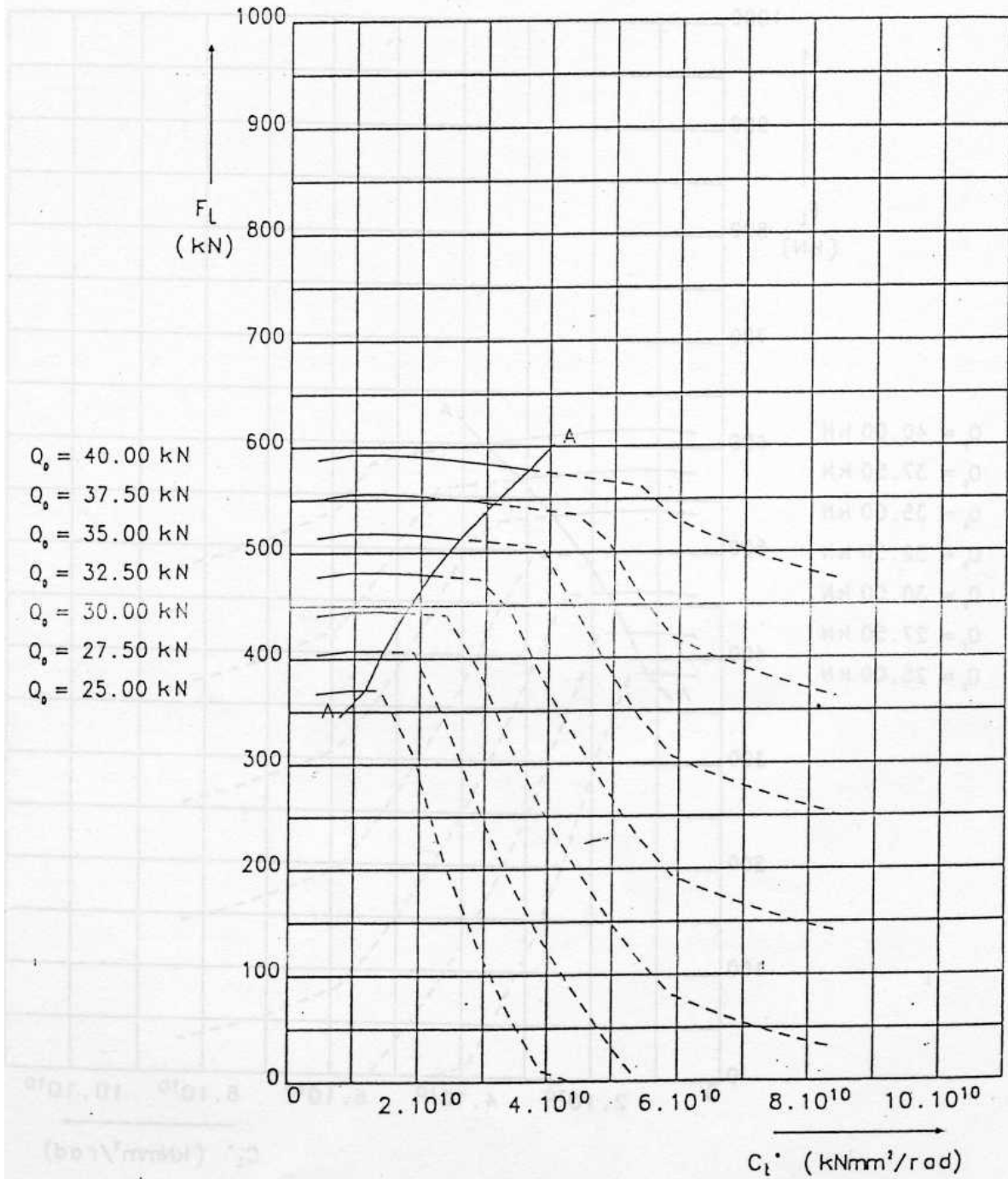
$$2a^* = 16500 \text{ mm}$$

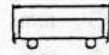
$$2a^* = 10000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$C_Z = 0.86 \text{ kN/mm}$$





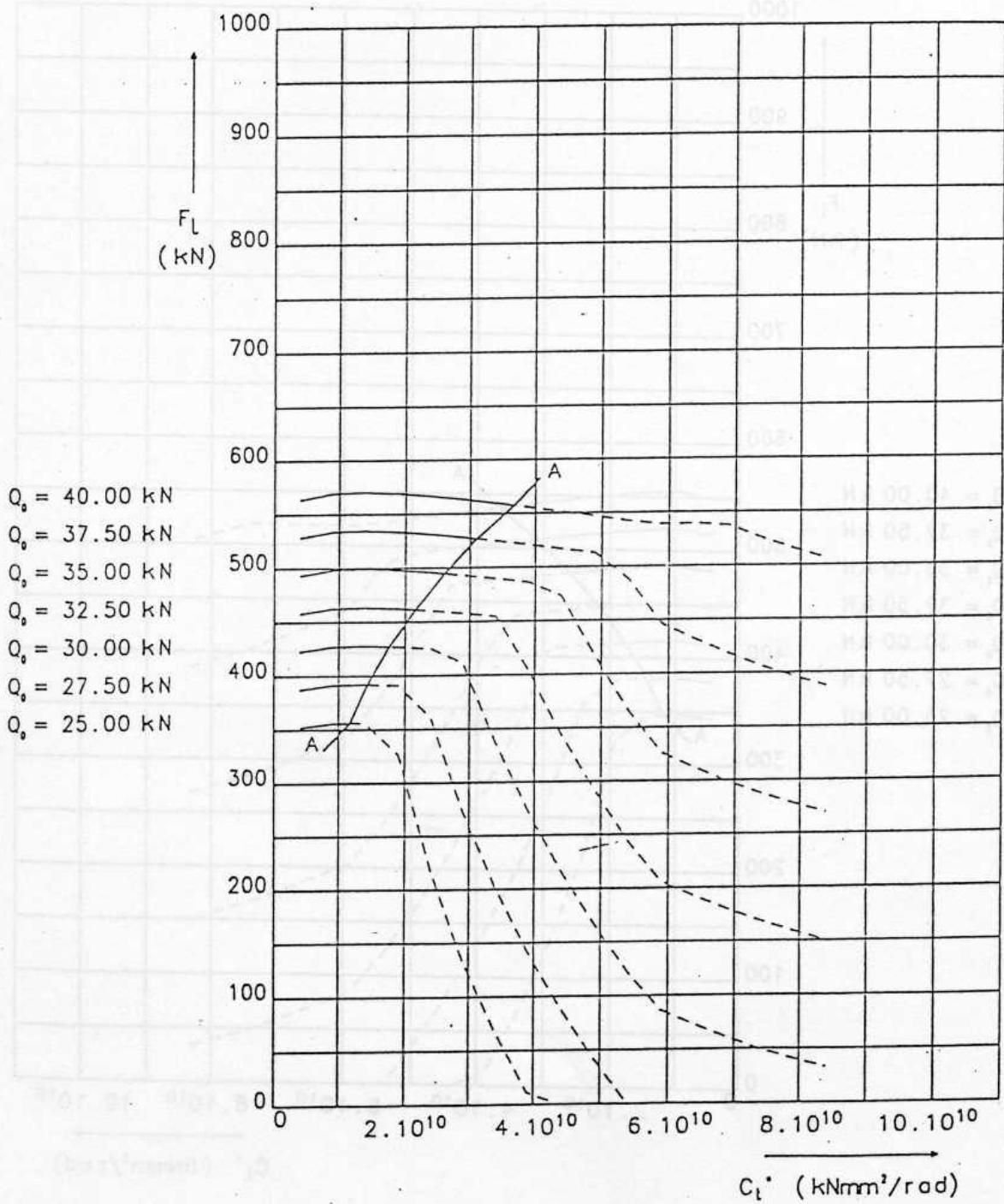
$$= 17000. \text{ mm}$$

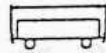
$$2a^* = 10000. \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$C_z = 0.86 \text{ kN/mm}$$





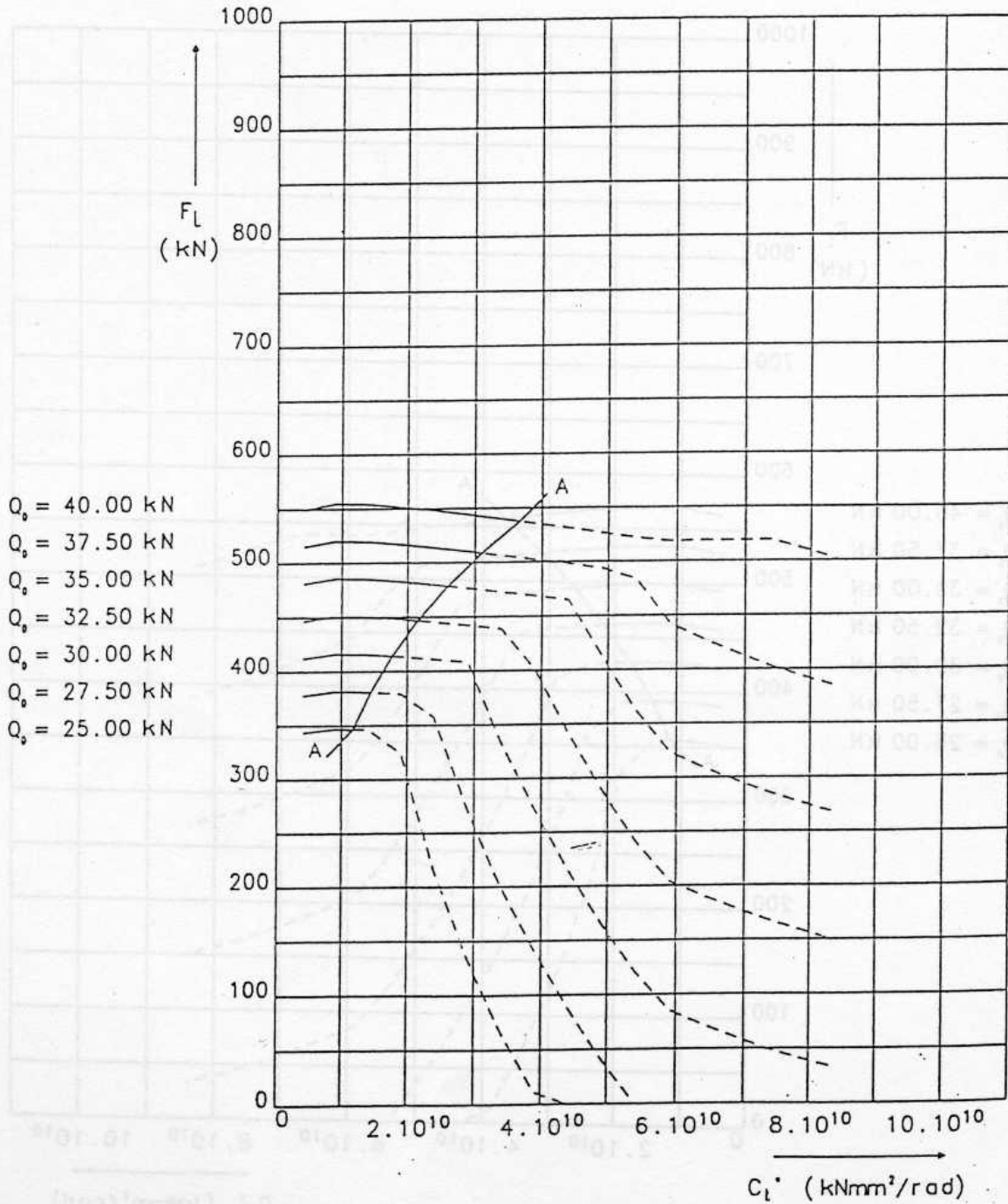
$$= 17300. \text{ mm}$$

$$2a^* = 10000. \text{ mm}$$

$$\Delta q_0 = f(c_t)$$

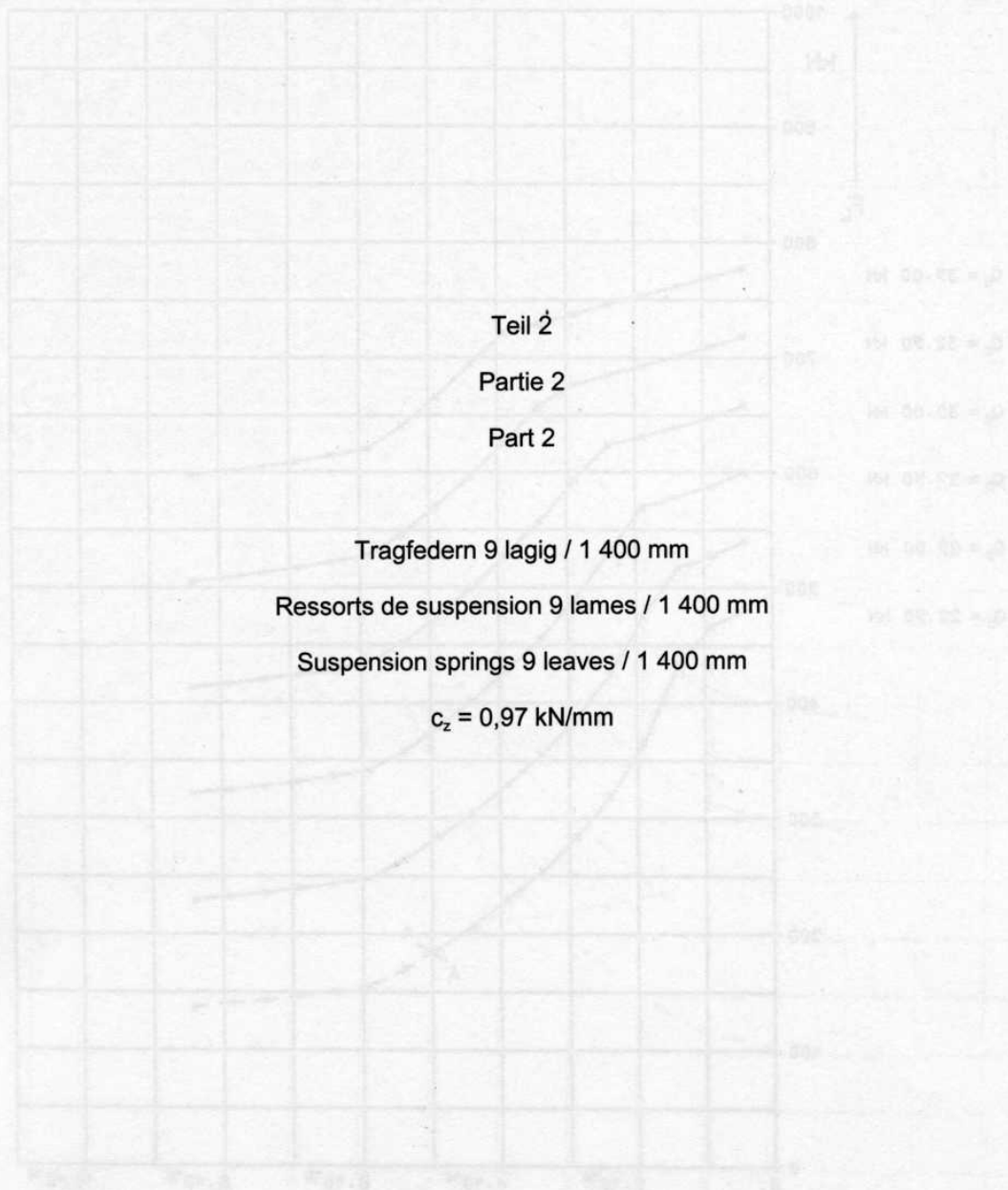
$$0.15 \leq \Delta q_0 \leq 0.23$$

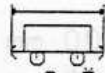
$$C_Z = 0.86 \text{ kN/mm}$$





Anlage **A**
Annexe **A**
Appendix **A**





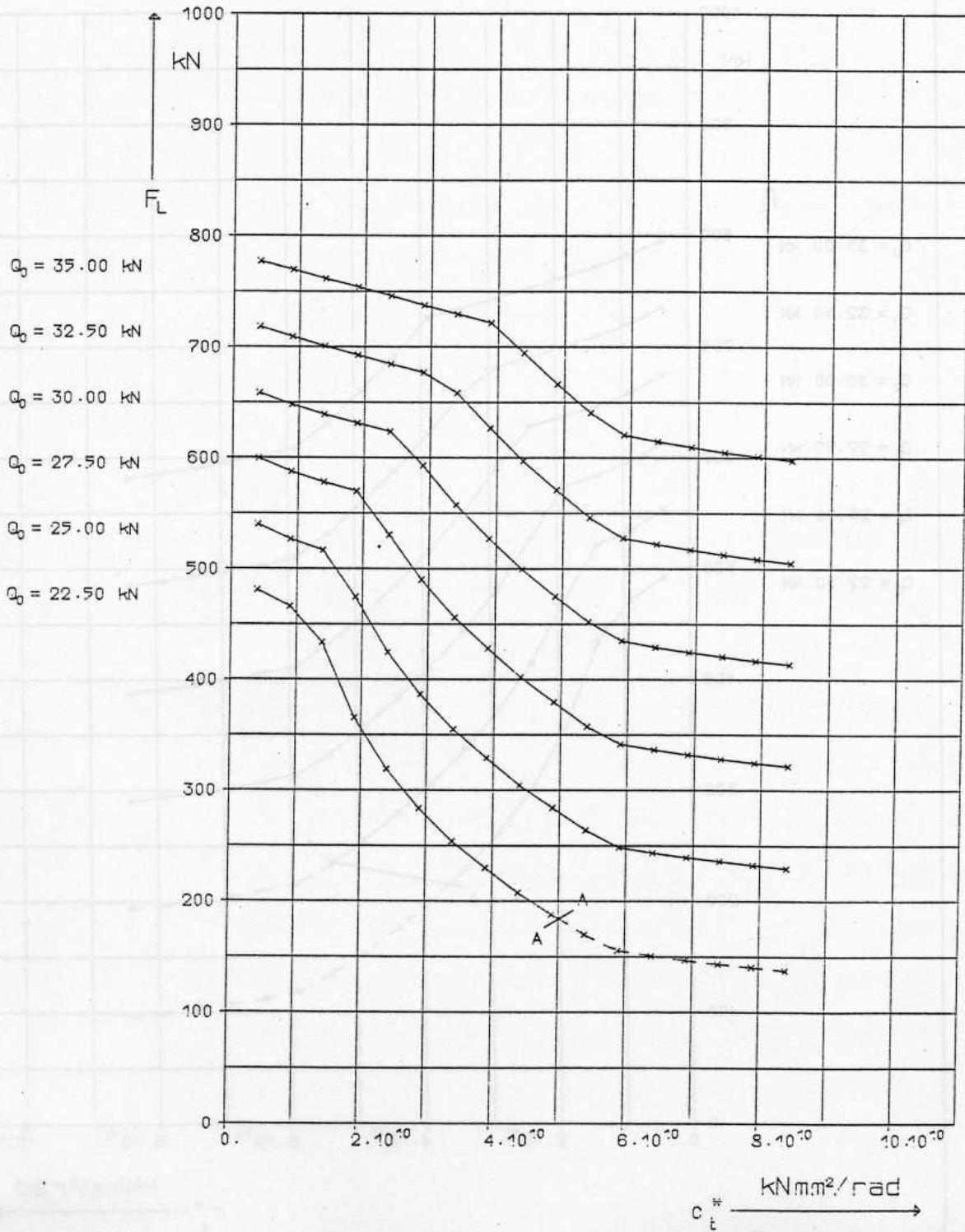
$$2a^* = 9500 \text{ mm}$$

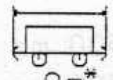
$$2a^* = 5500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





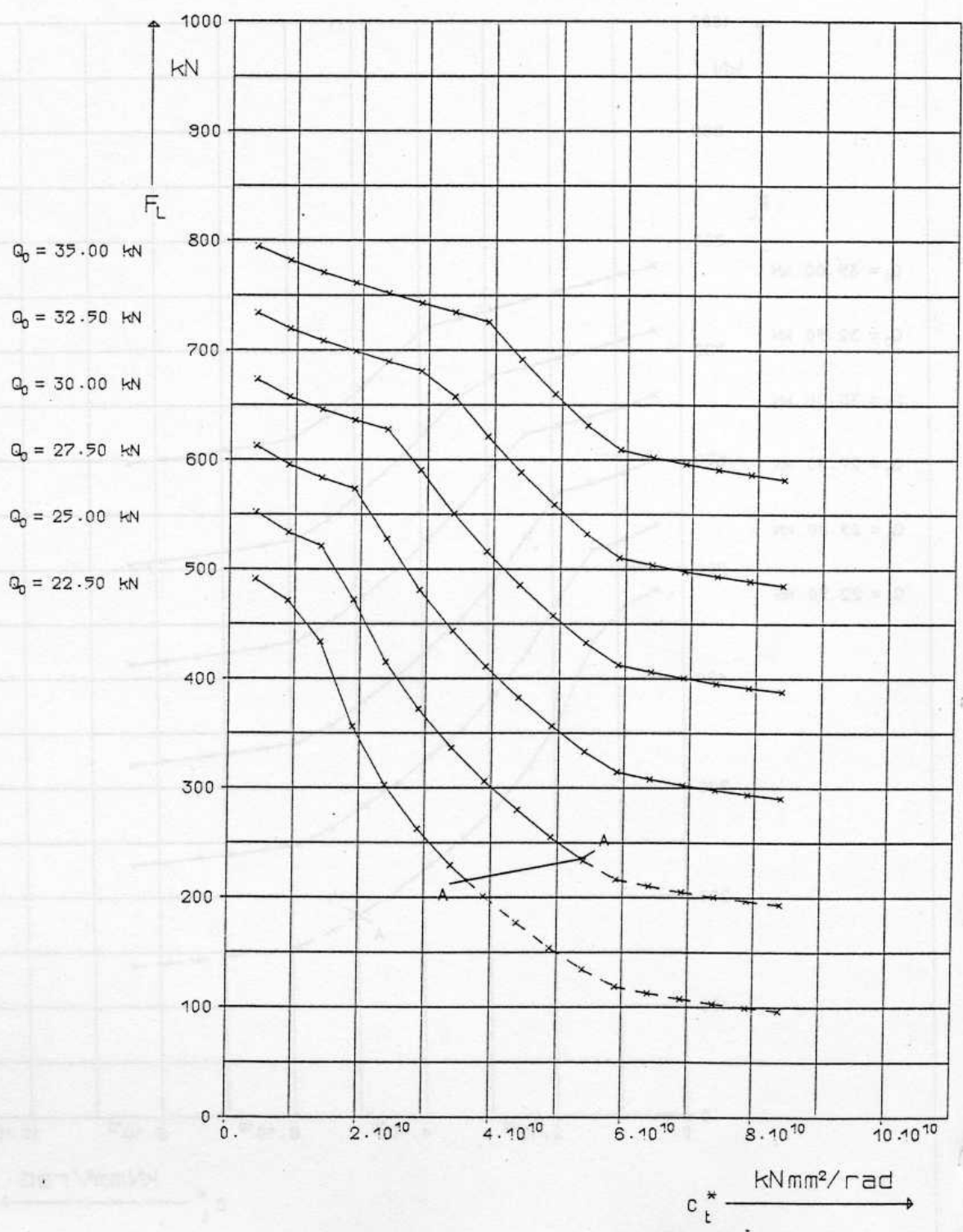
$$b = 9500 \text{ mm}$$

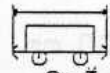
$$2a^* = 6000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,97 \text{ kN/mm}$$





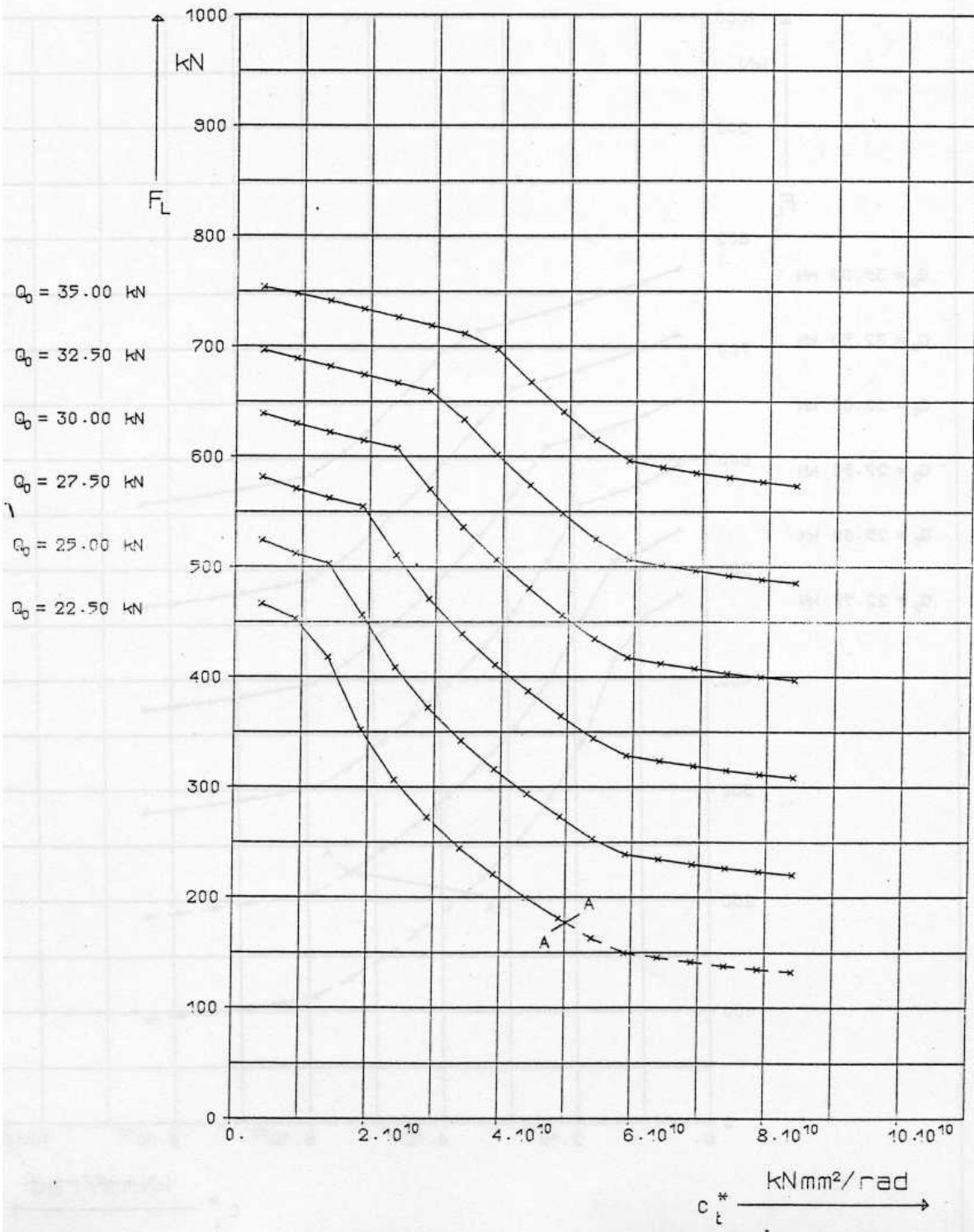
$$2a^* = 10000 \text{ mm}$$

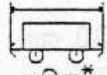
$$2a^* = 5500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





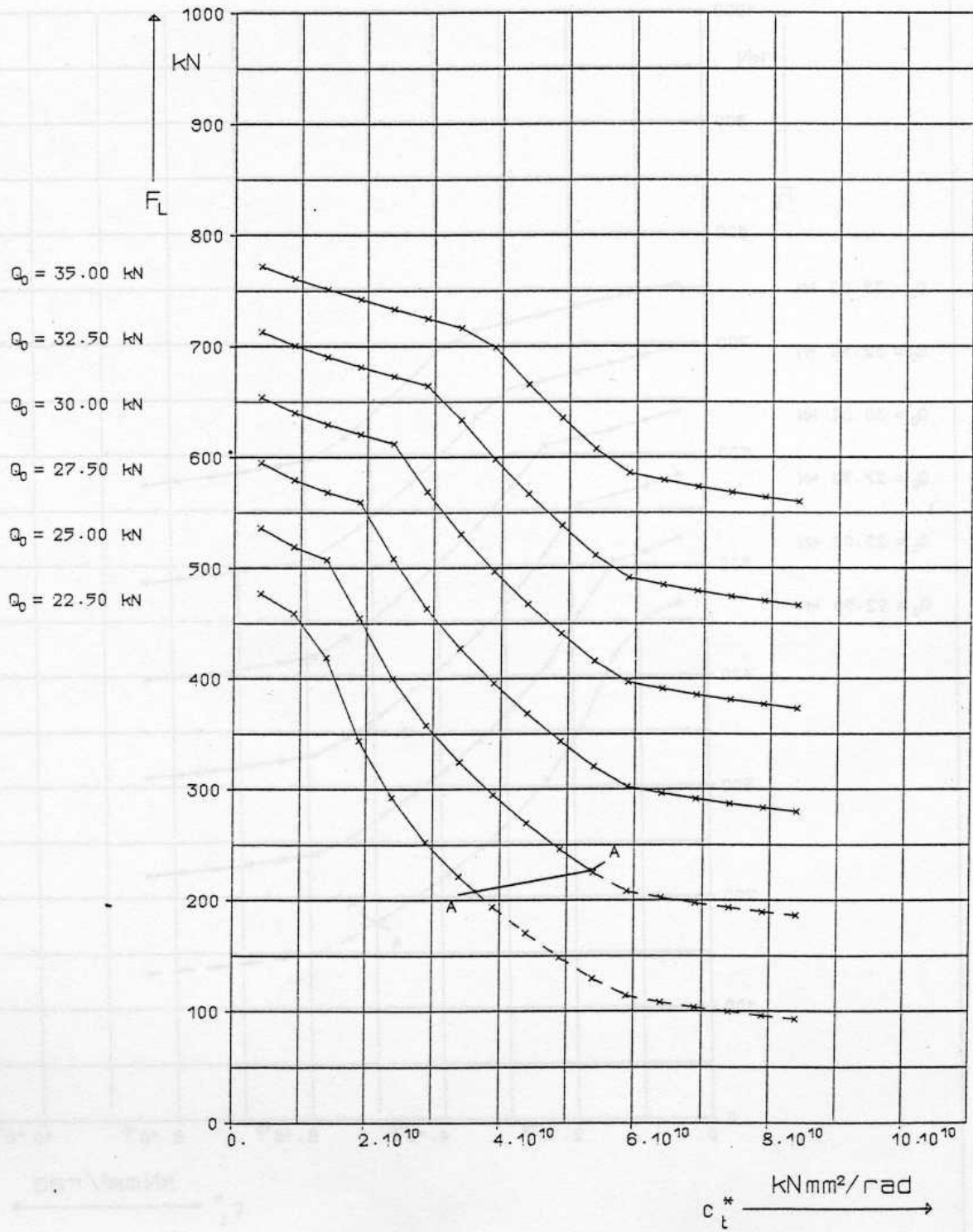
$$h = 10000 \text{ mm}$$

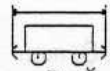
$$2a^* = 6000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





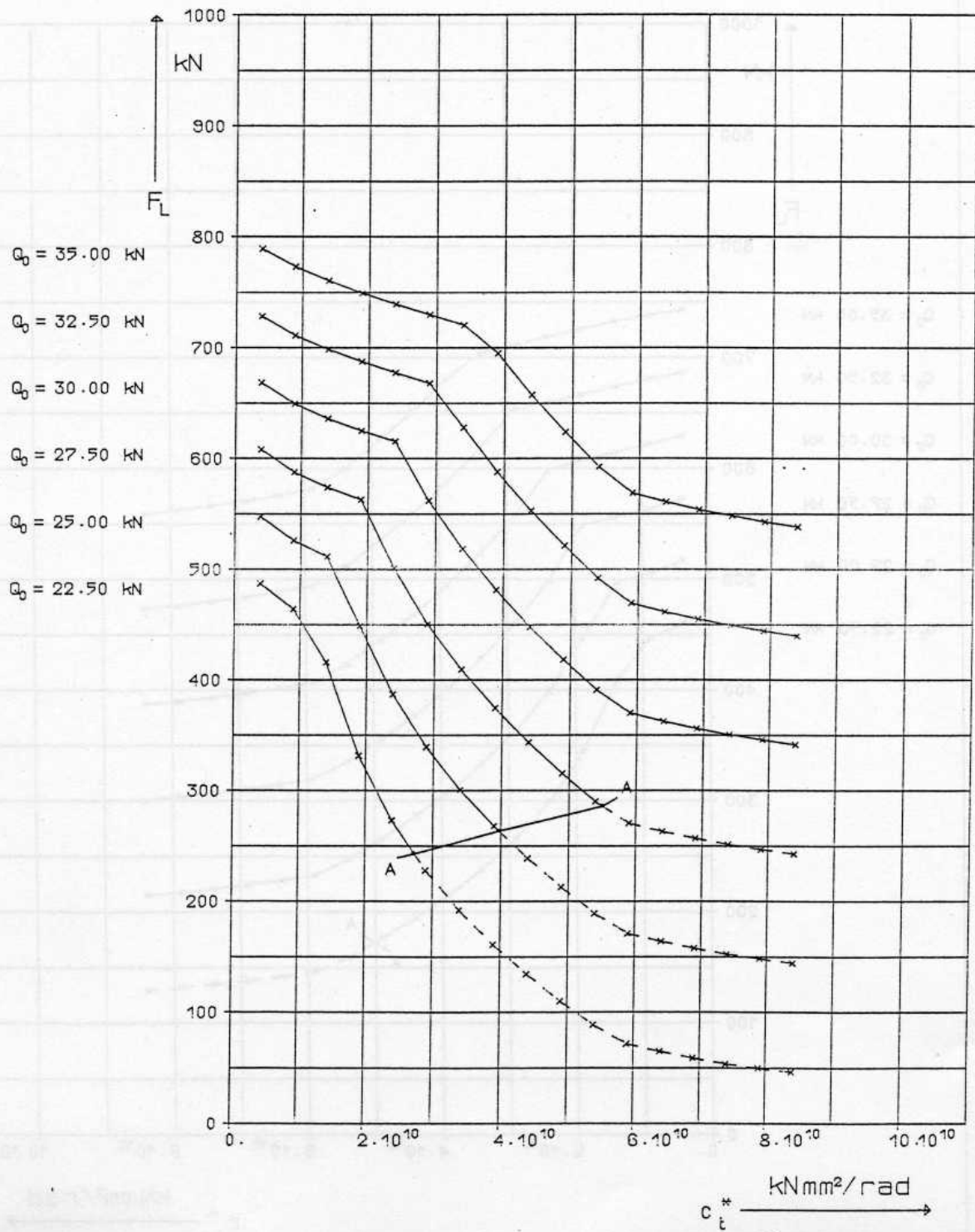
$$h = 10000 \text{ mm}$$

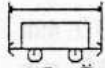
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,97 \text{ kN/mm}$$





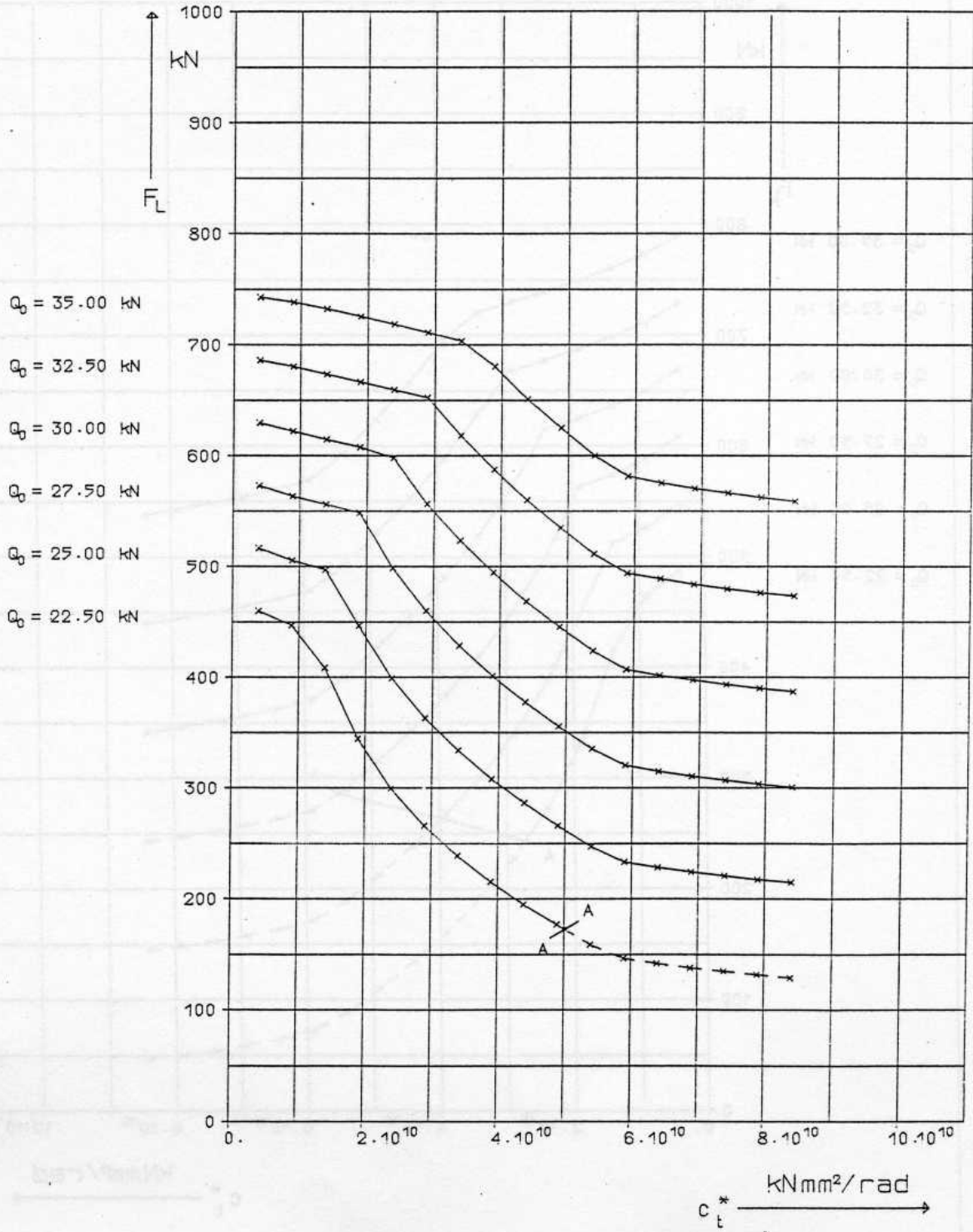
$$h_0 = 10500 \text{ mm}$$

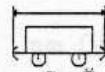
$$2a^* = 5500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$



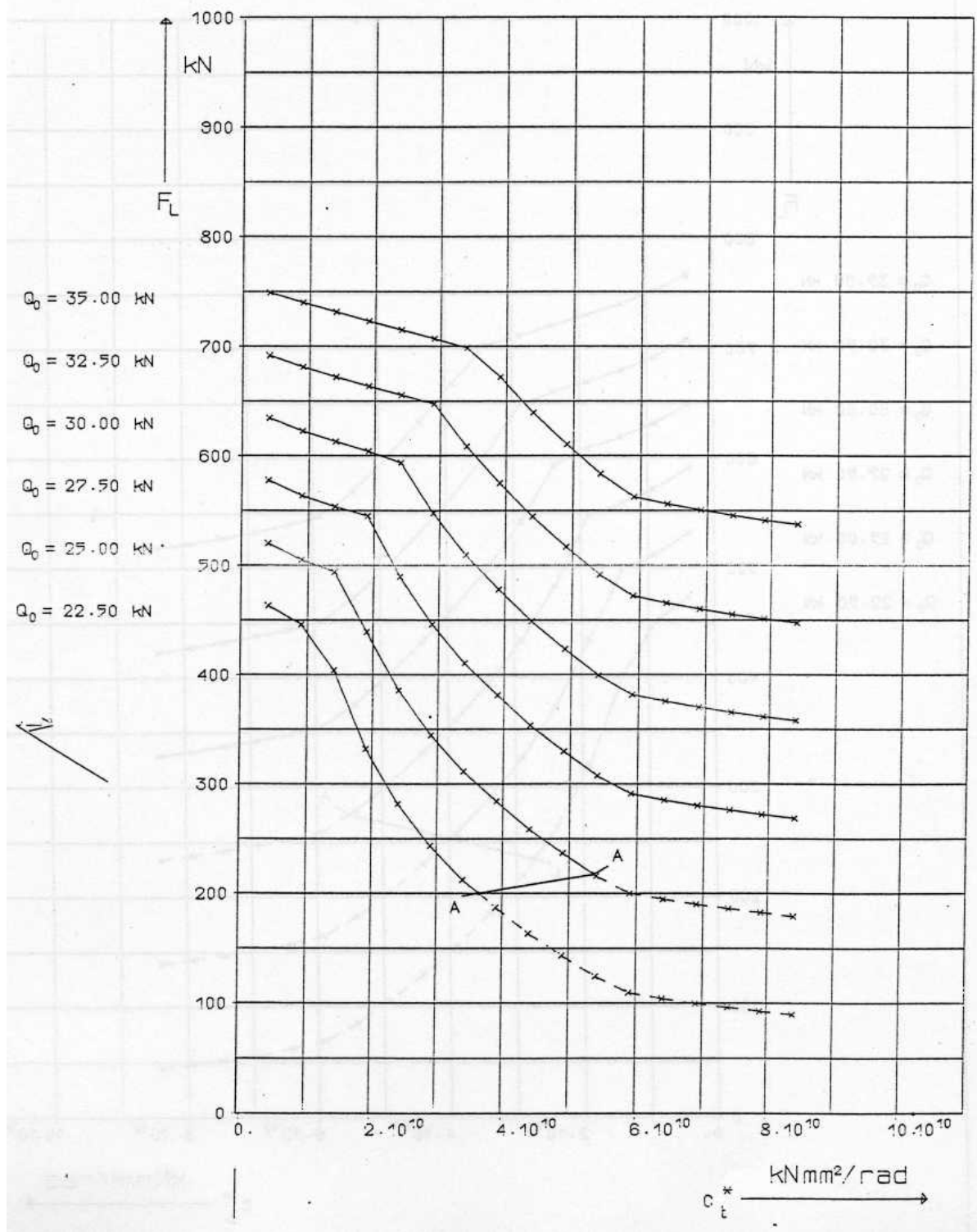


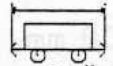
$$2a^* = 6000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





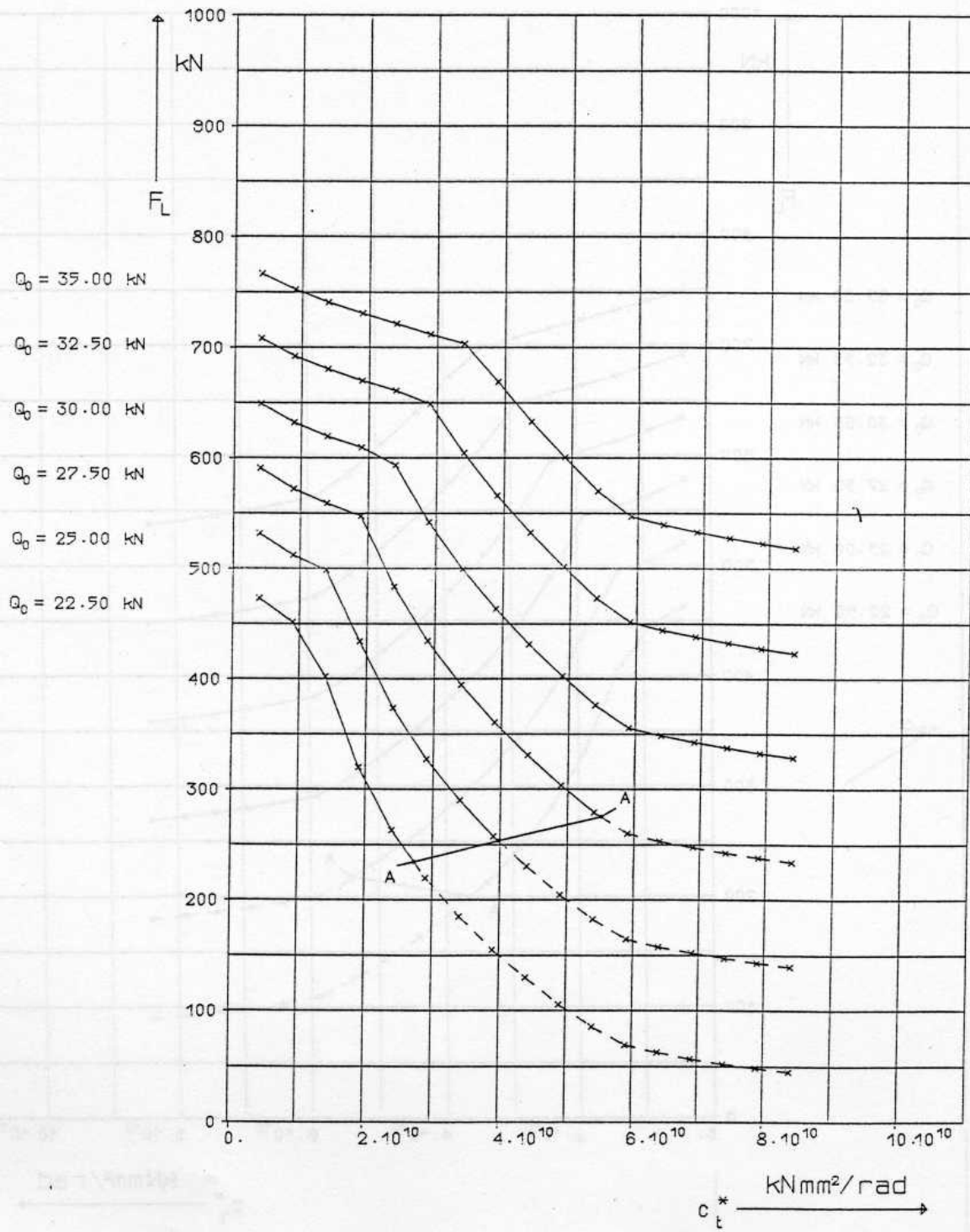
$$h_0 = 10500 \text{ mm}$$

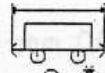
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,97 \text{ kN/mm}$$





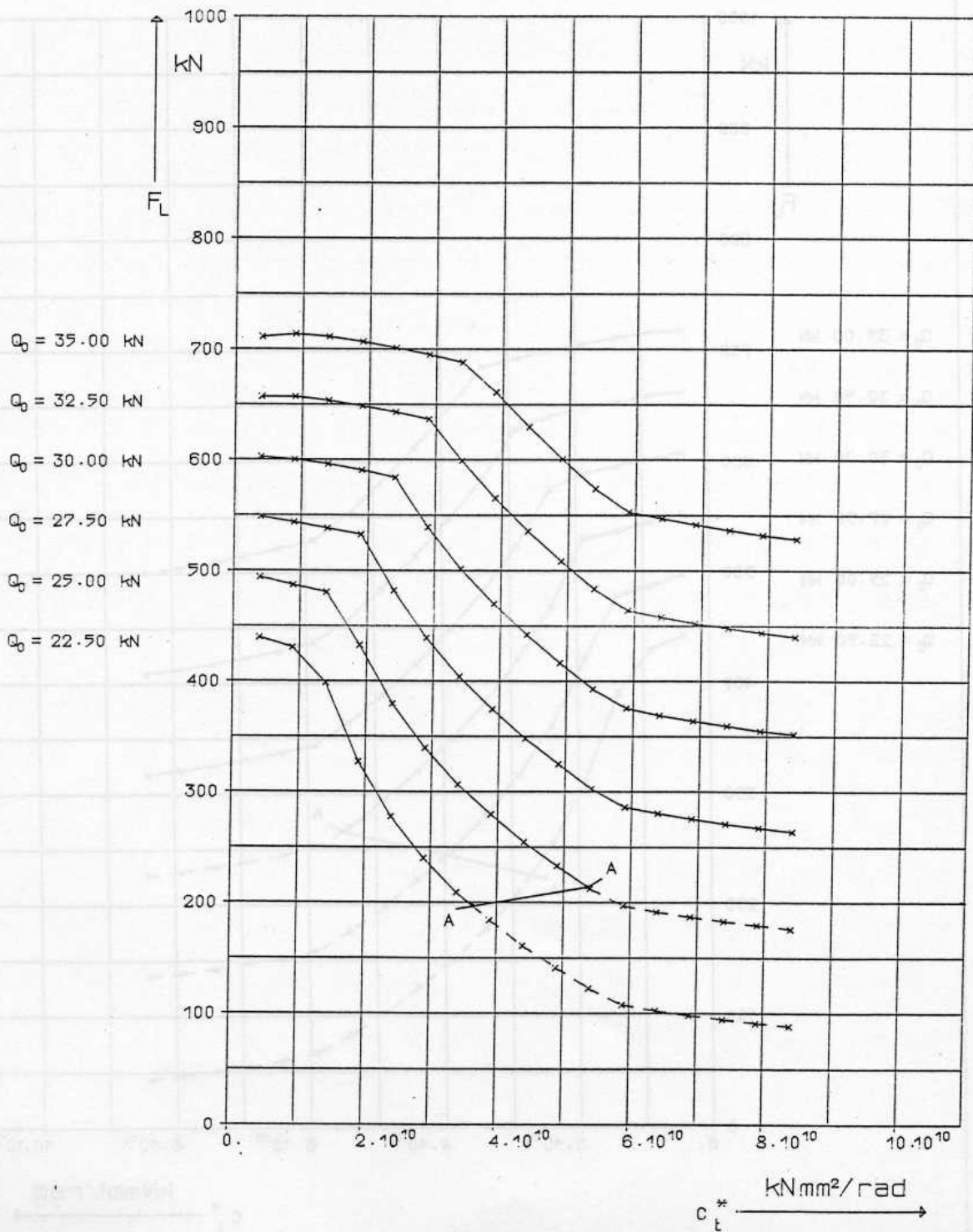
$$2a^* = 11000 \text{ mm}$$

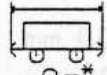
$$2a^* = 6000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





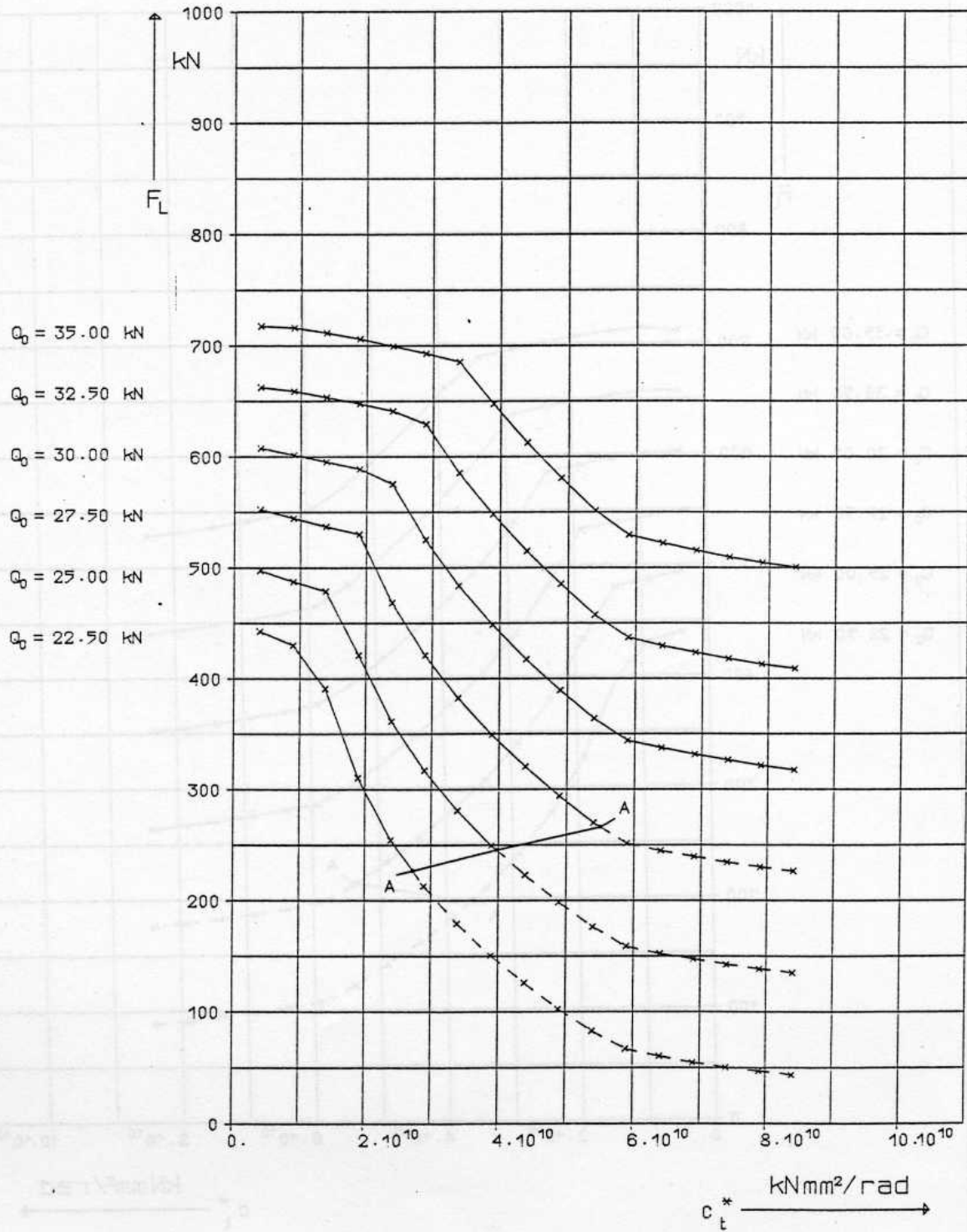
$$2a^* = 11000 \text{ mm}$$

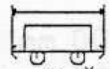
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





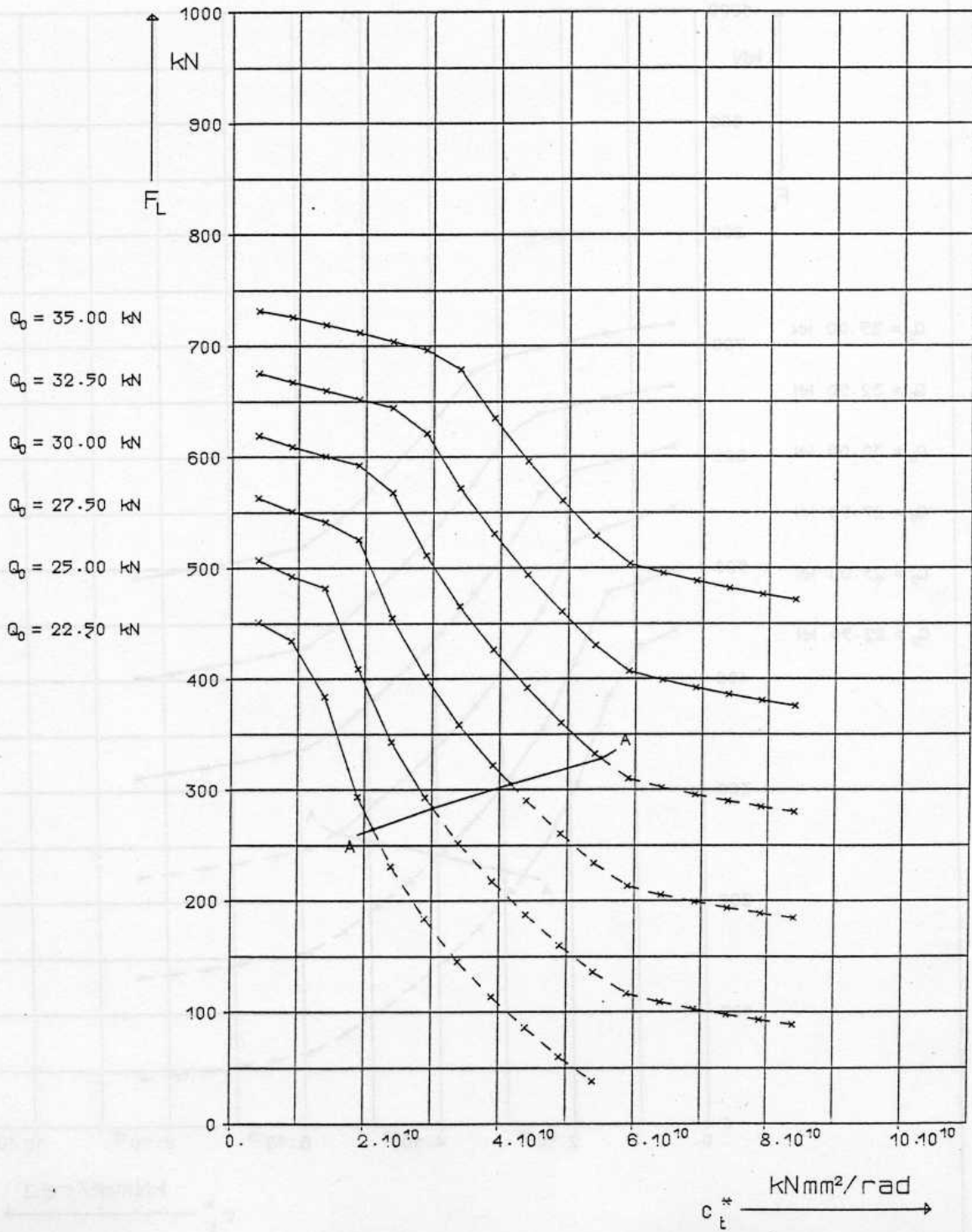
$$h = 11000 \text{ mm}$$

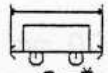
$$2a^* = 7000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





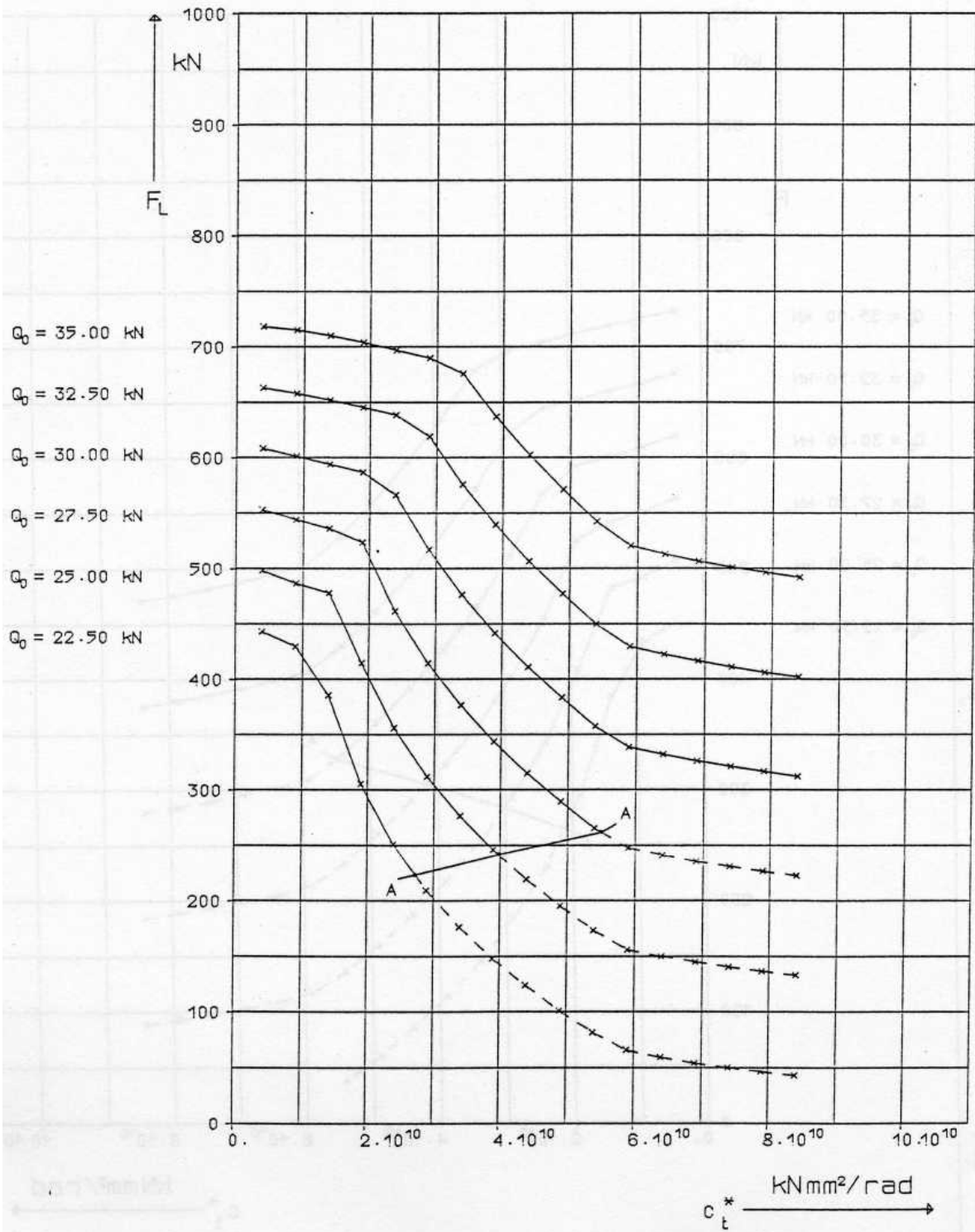
$$h_0 = 11500 \text{ mm}$$

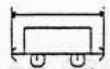
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,97 \text{ kN/mm}$$





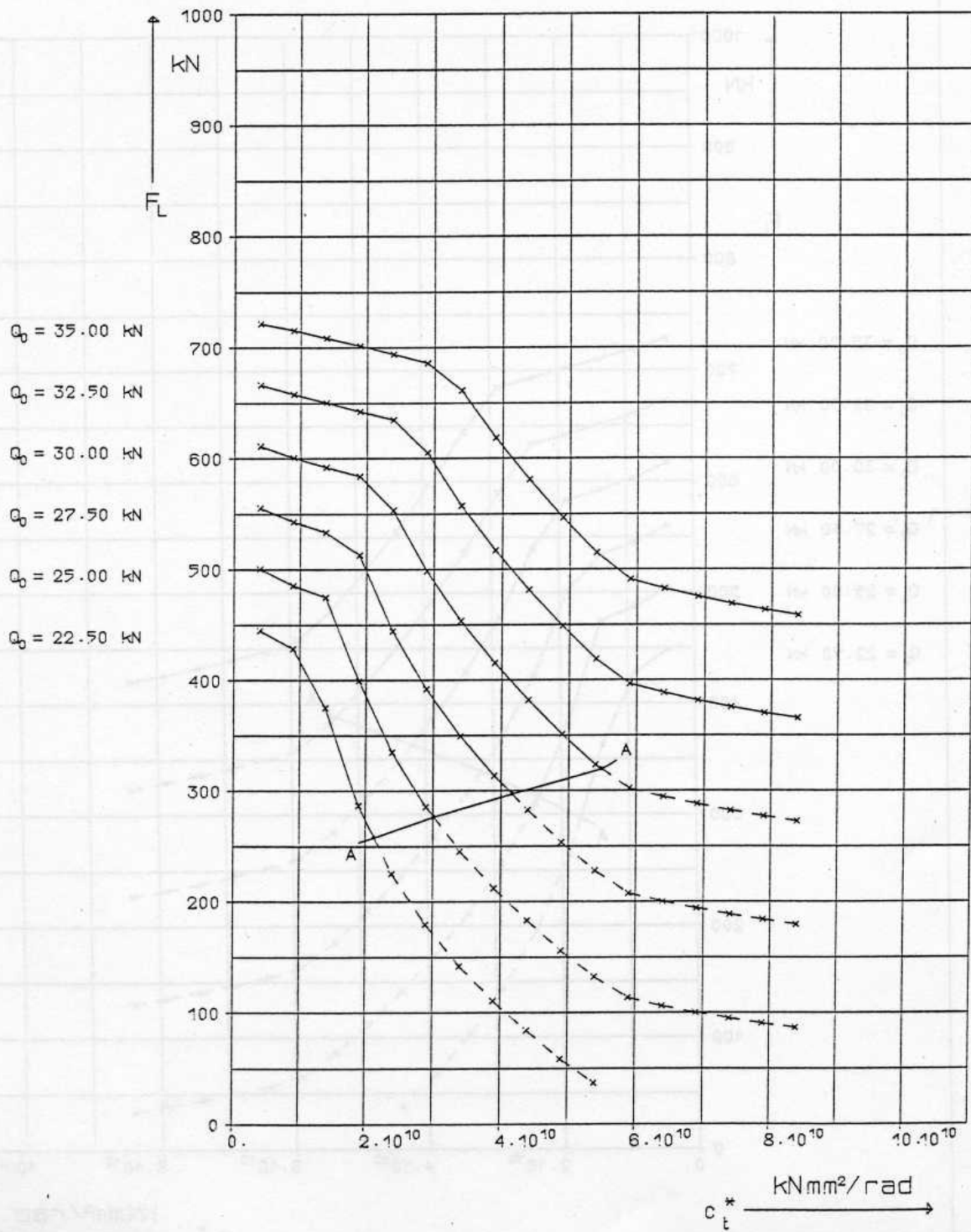
$$h_0 = 11500 \text{ mm}$$

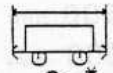
$$2a^* = 7000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,97 \text{ kN/mm}$$





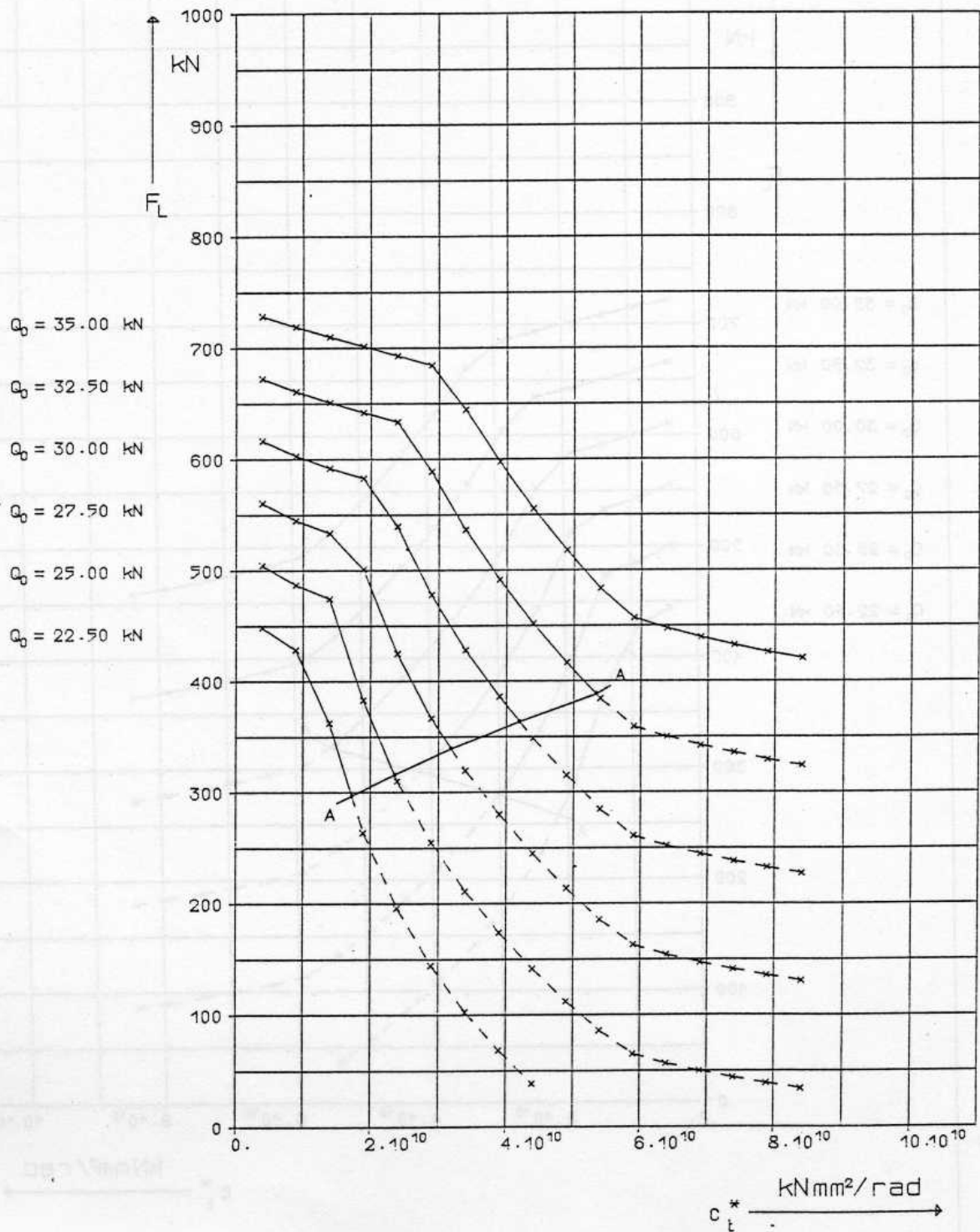
$$2a^* = 11500 \text{ mm}$$

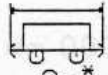
$$2a^* = 7500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,97 \text{ kN/mm}$$





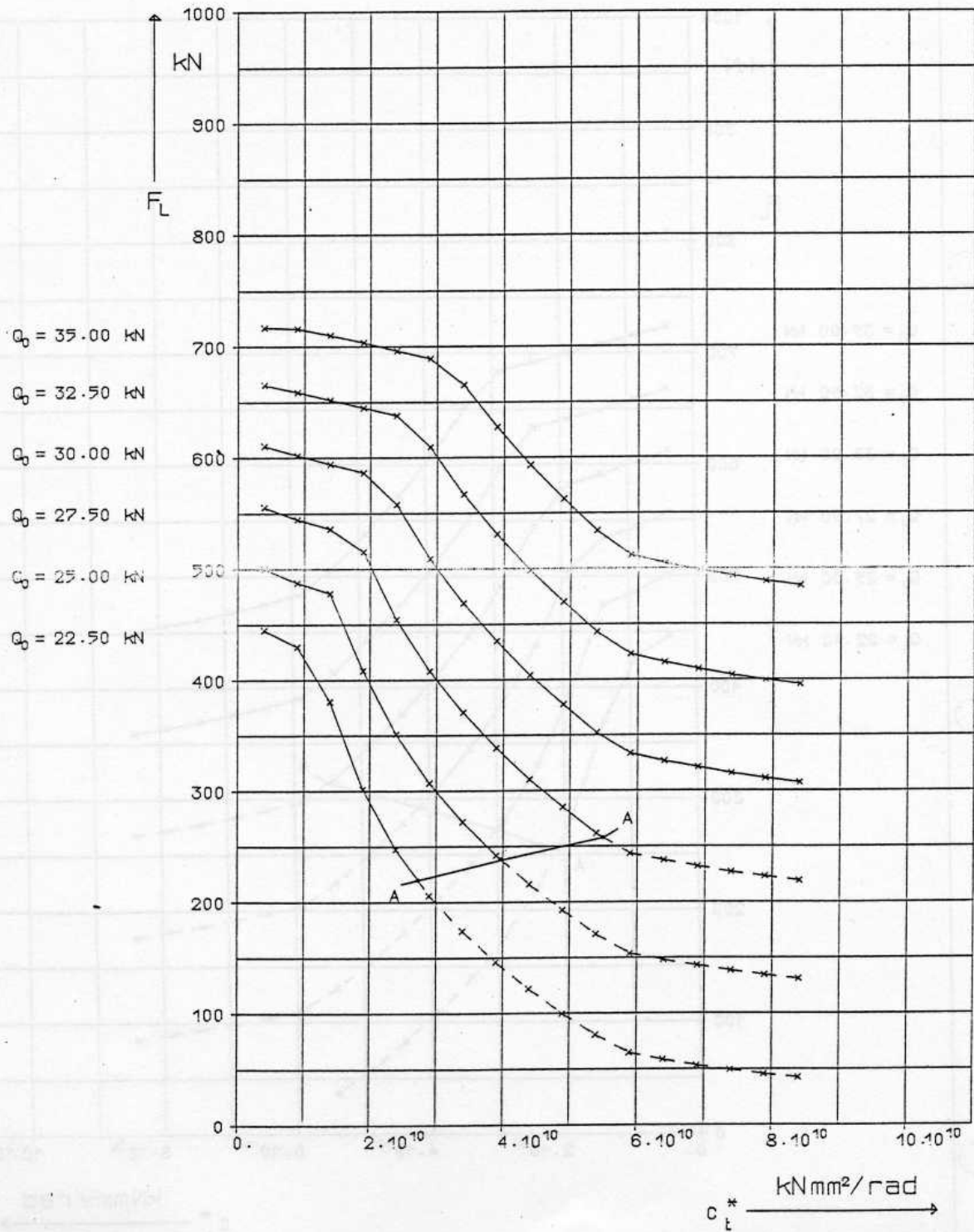
$$2a^* = 12000 \text{ mm}$$

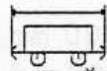
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





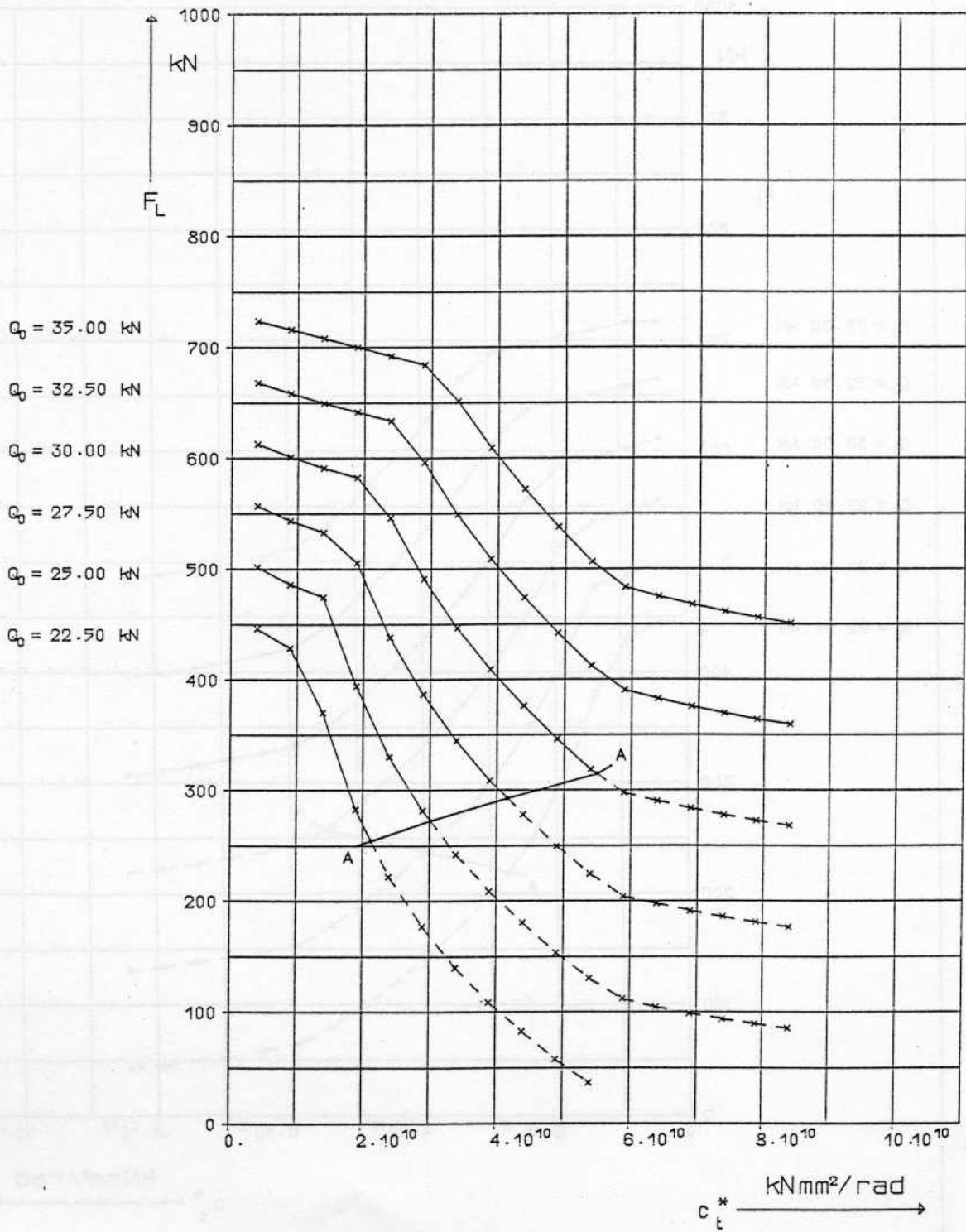
$$2a^* = 12000 \text{ mm}$$

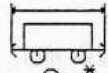
$$2a^* = 7000 \text{ mm}$$

$$\Delta q_0 = f(c_{t}^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





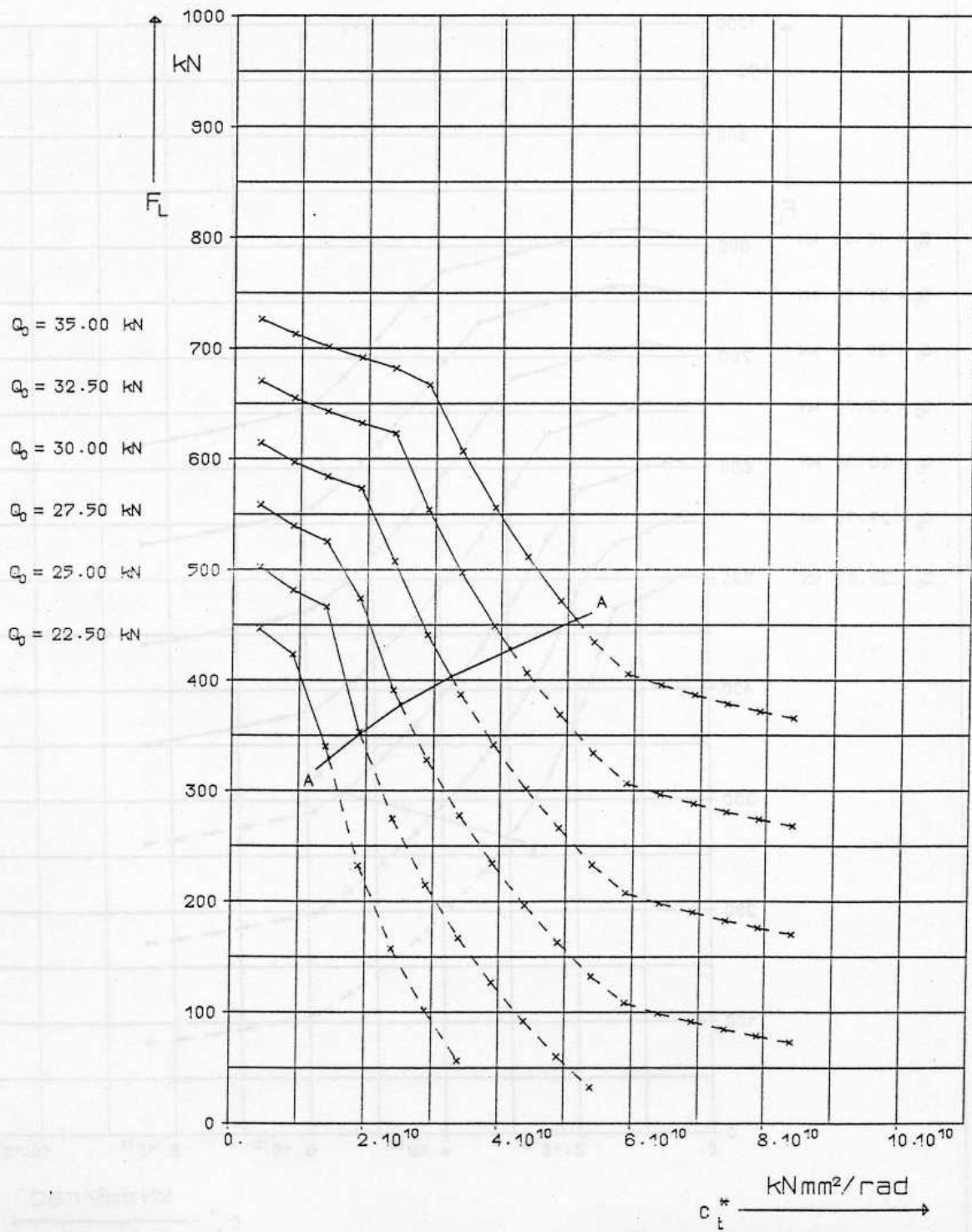
$$b = 12000 \text{ mm}$$

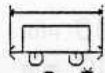
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





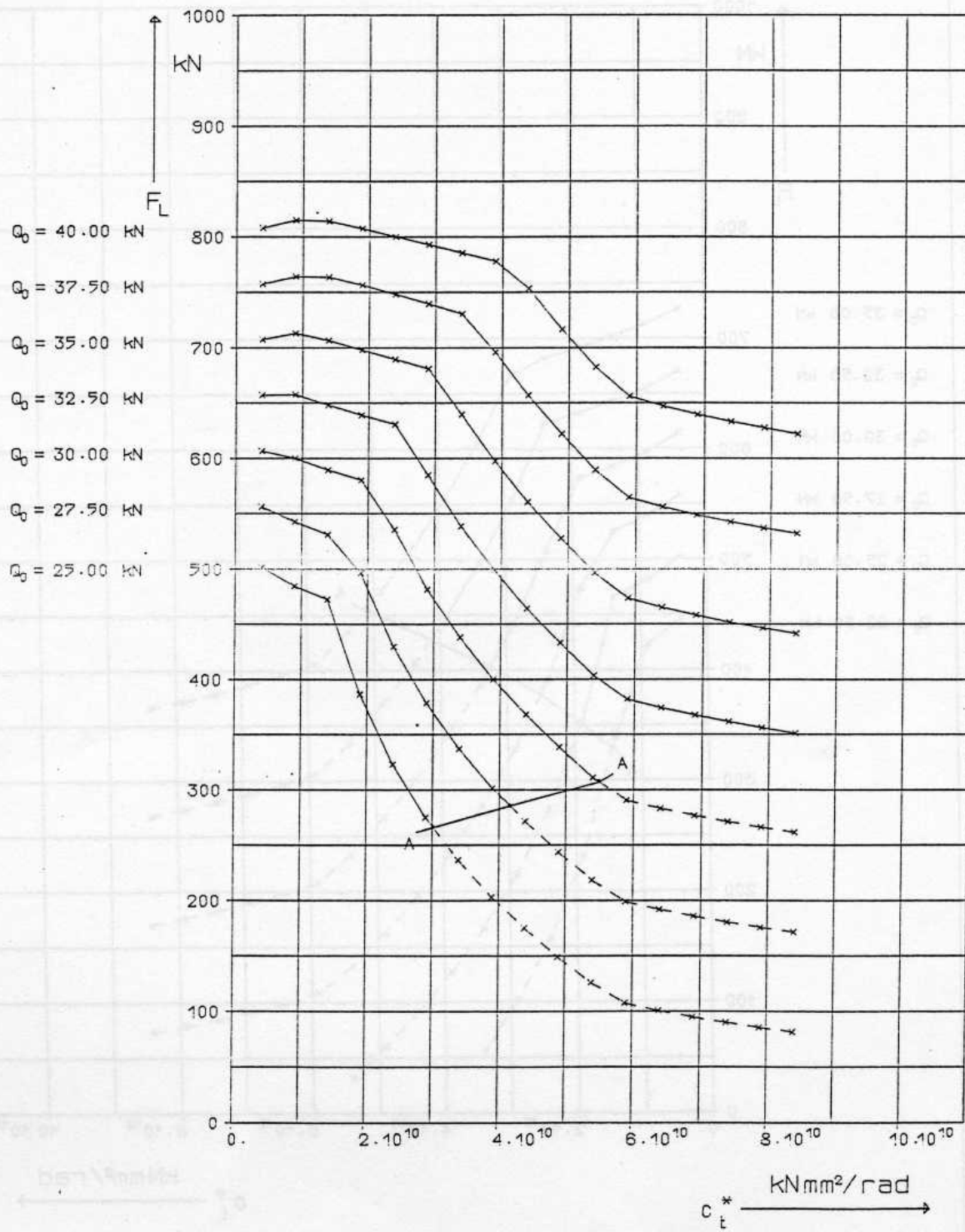
$$2a^* = 12500 \text{ mm}$$

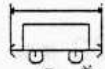
$$2a^* = 7000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





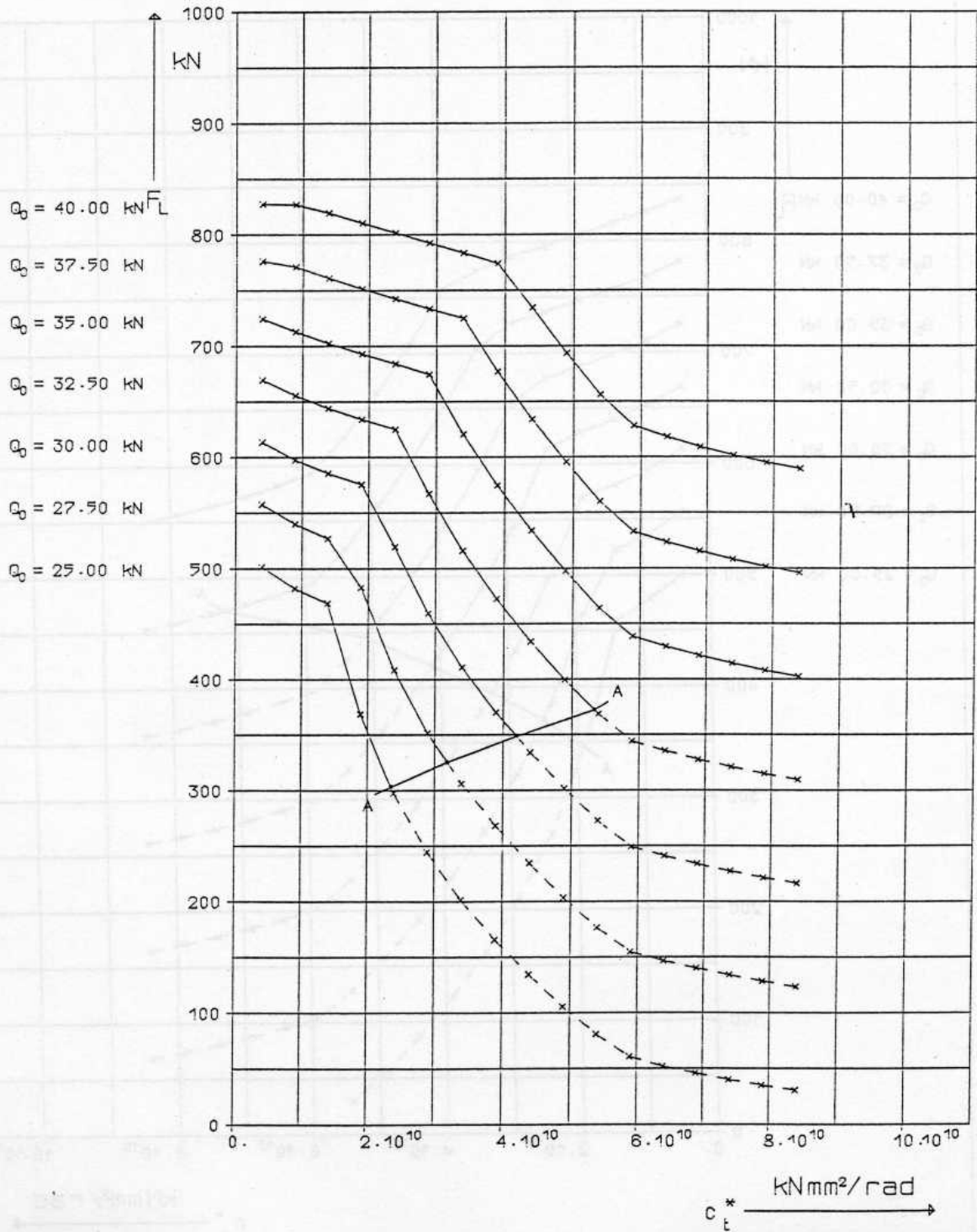
$$L = 12500 \text{ mm}$$

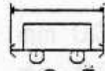
$$2a^* = 7500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





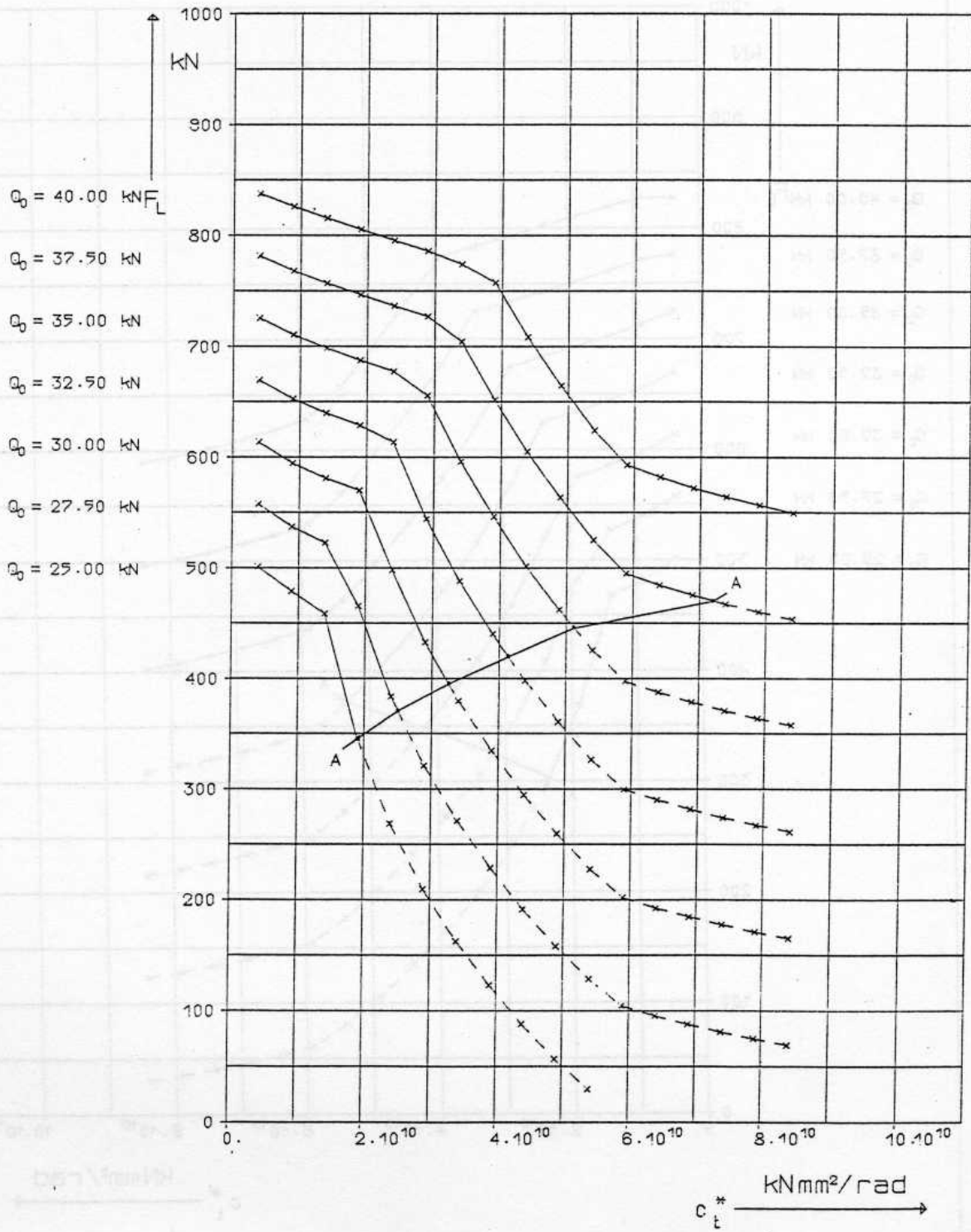
$$h = 12500 \text{ mm}$$

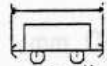
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$



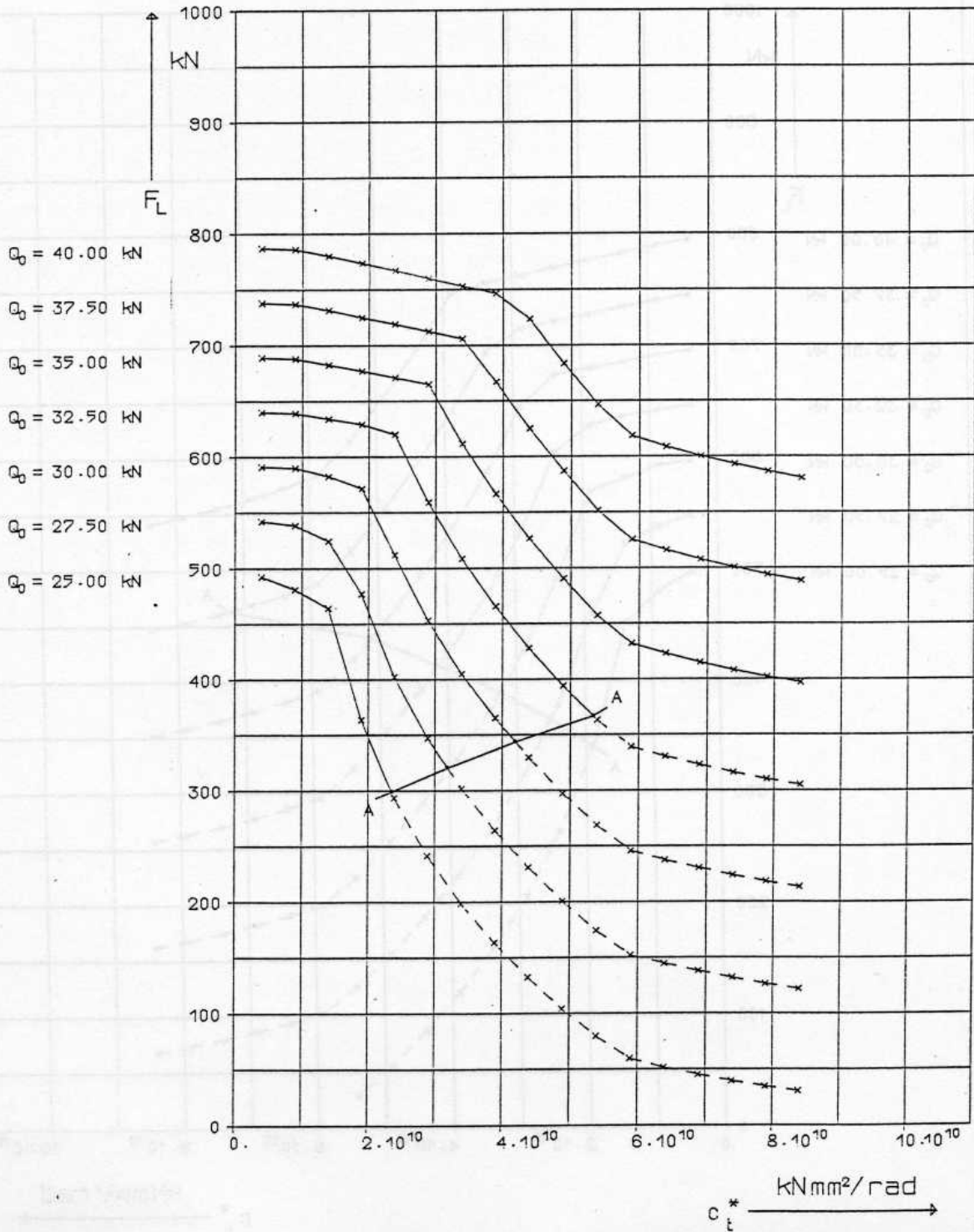


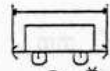
$$2a^* = 7500 \text{ mm}$$

$$c_z = 0.97 \text{ kN/mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





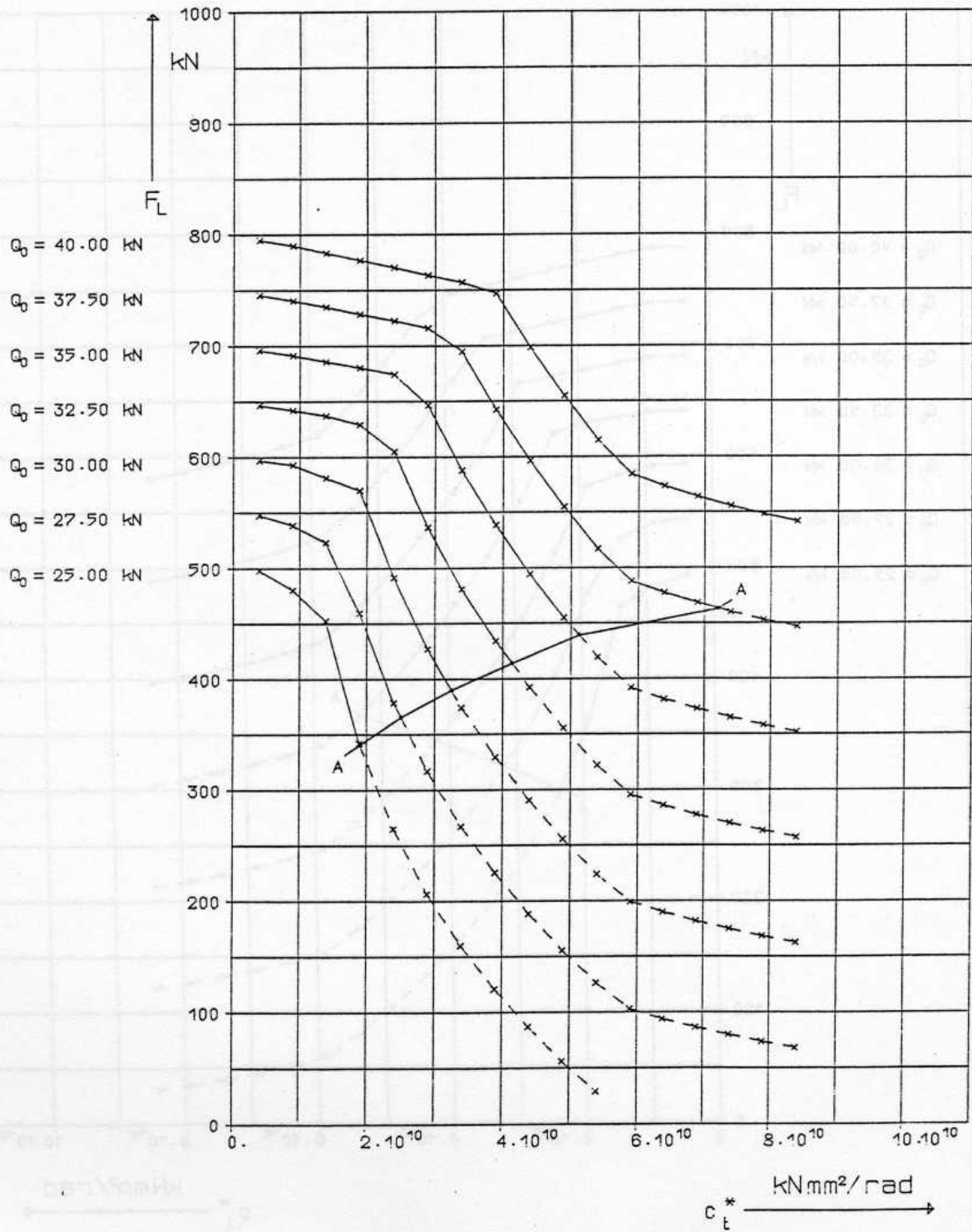
$$h = 13000 \text{ mm}$$

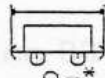
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$c_z = 0.97 \text{ kN/mm}$$





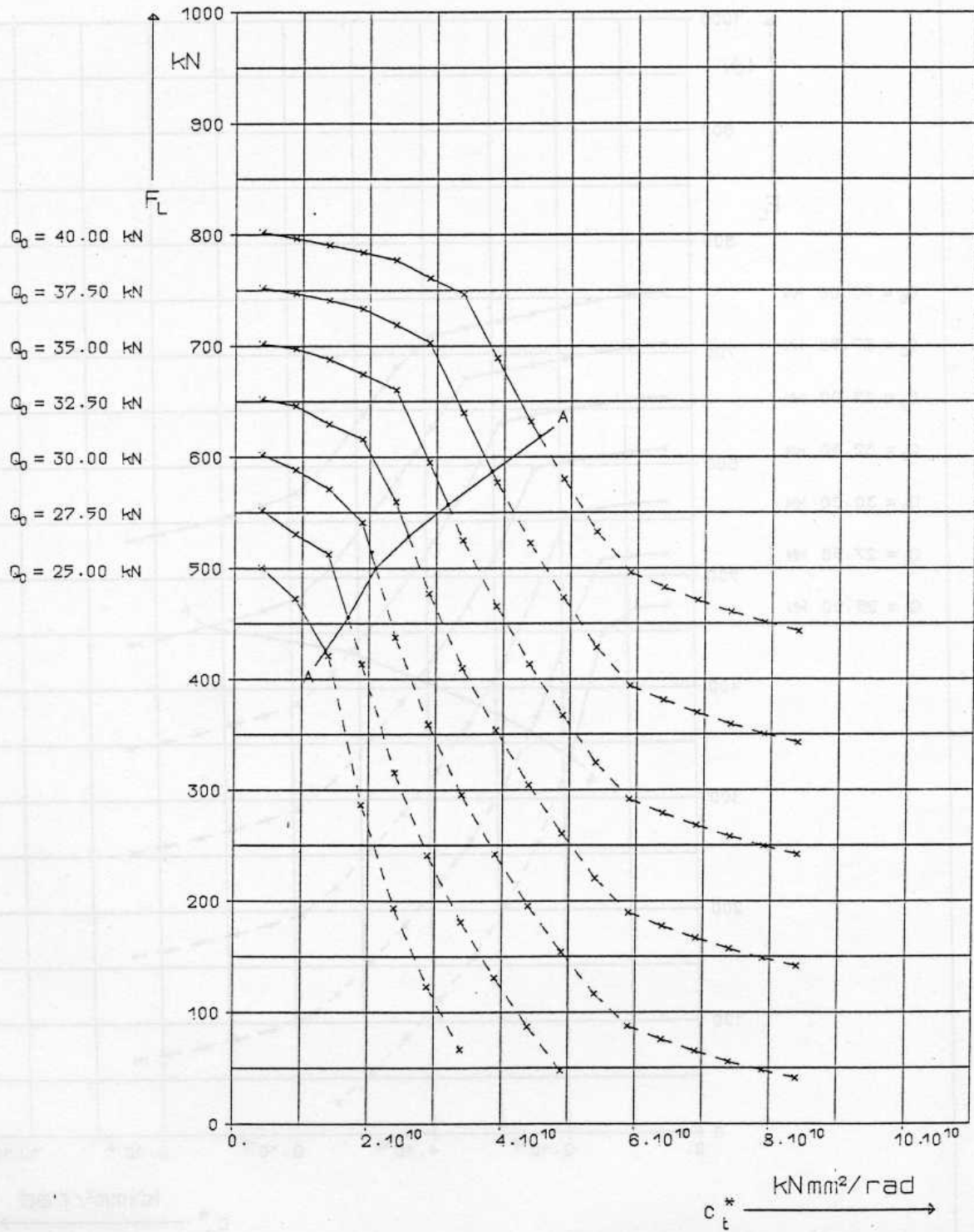
$$2a^* = 13000 \text{ mm}$$

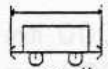
$$2a^* = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$



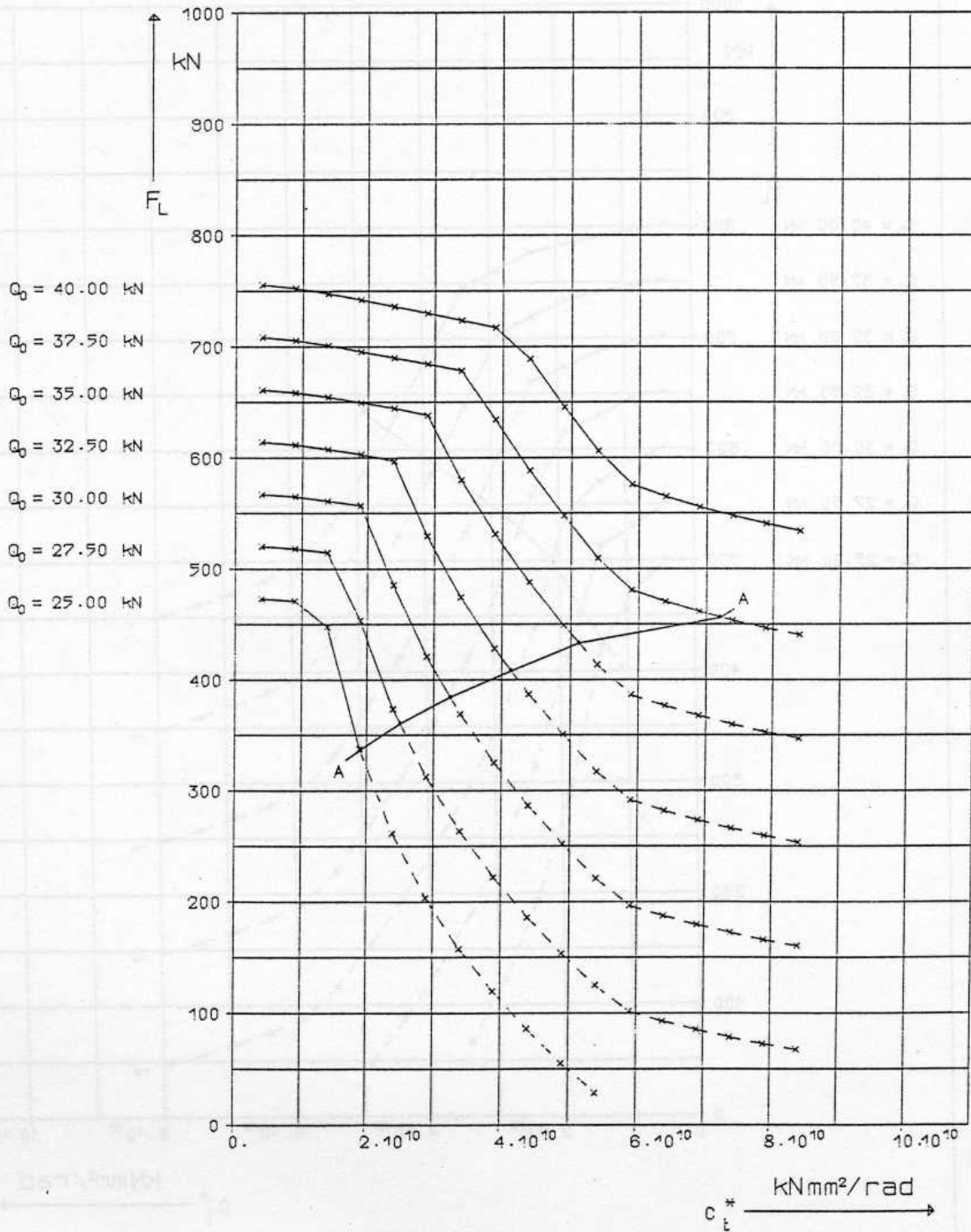


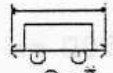
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = F(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





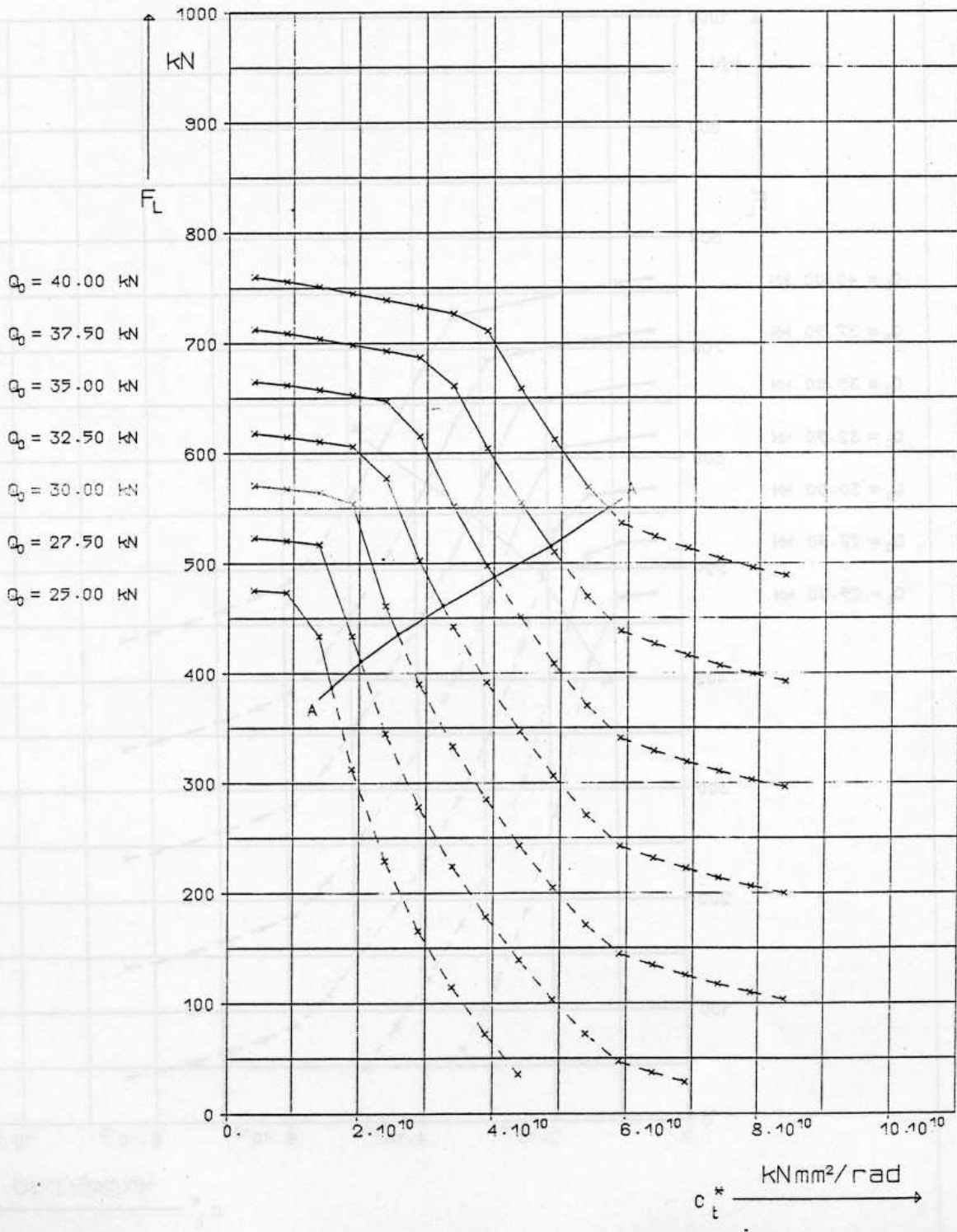
$$2a^* = 13500 \text{ mm}$$

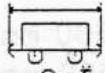
$$2a^* = 8500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





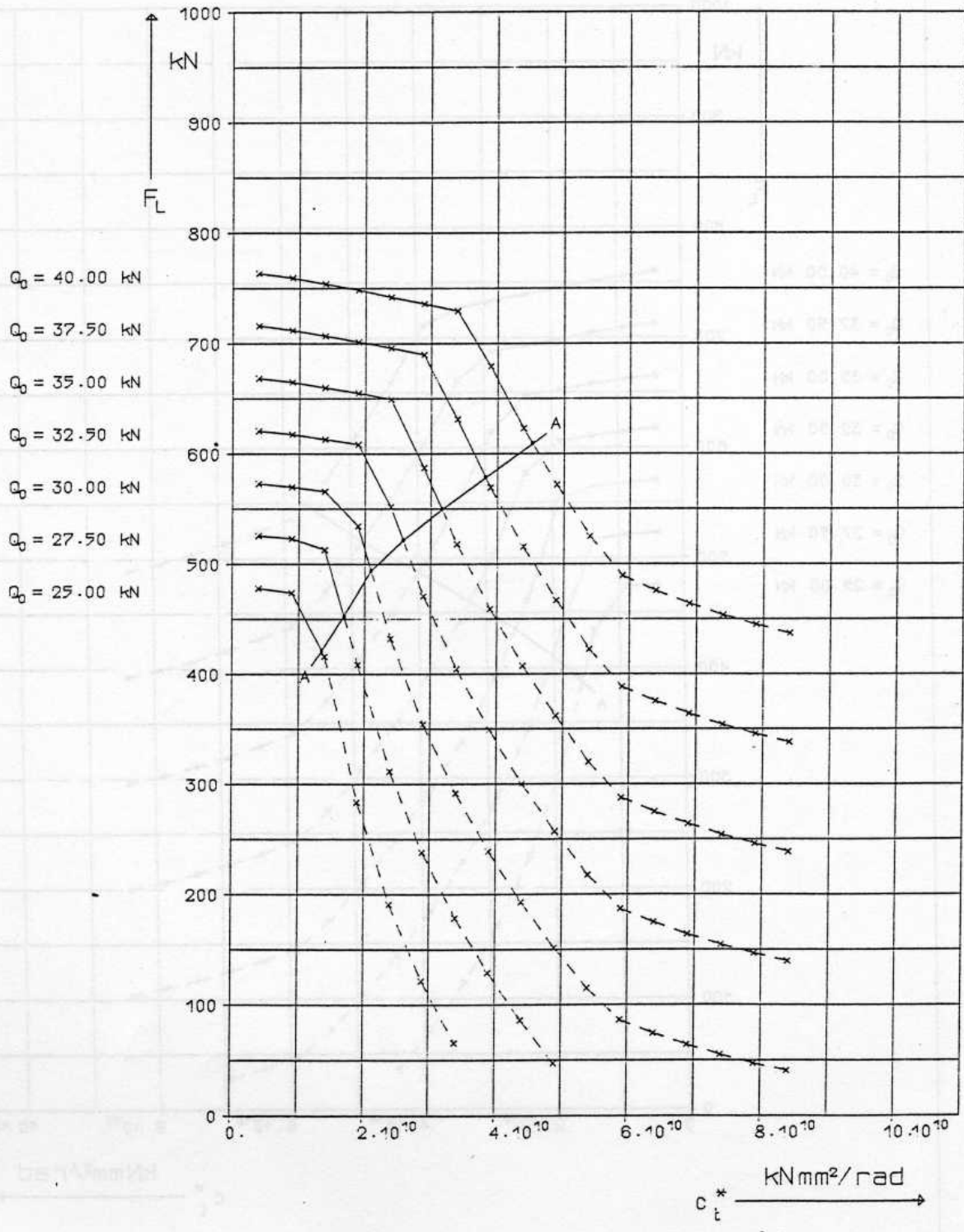
$$2a^* = 13500 \text{ mm}$$

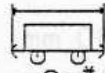
$$2a^* = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





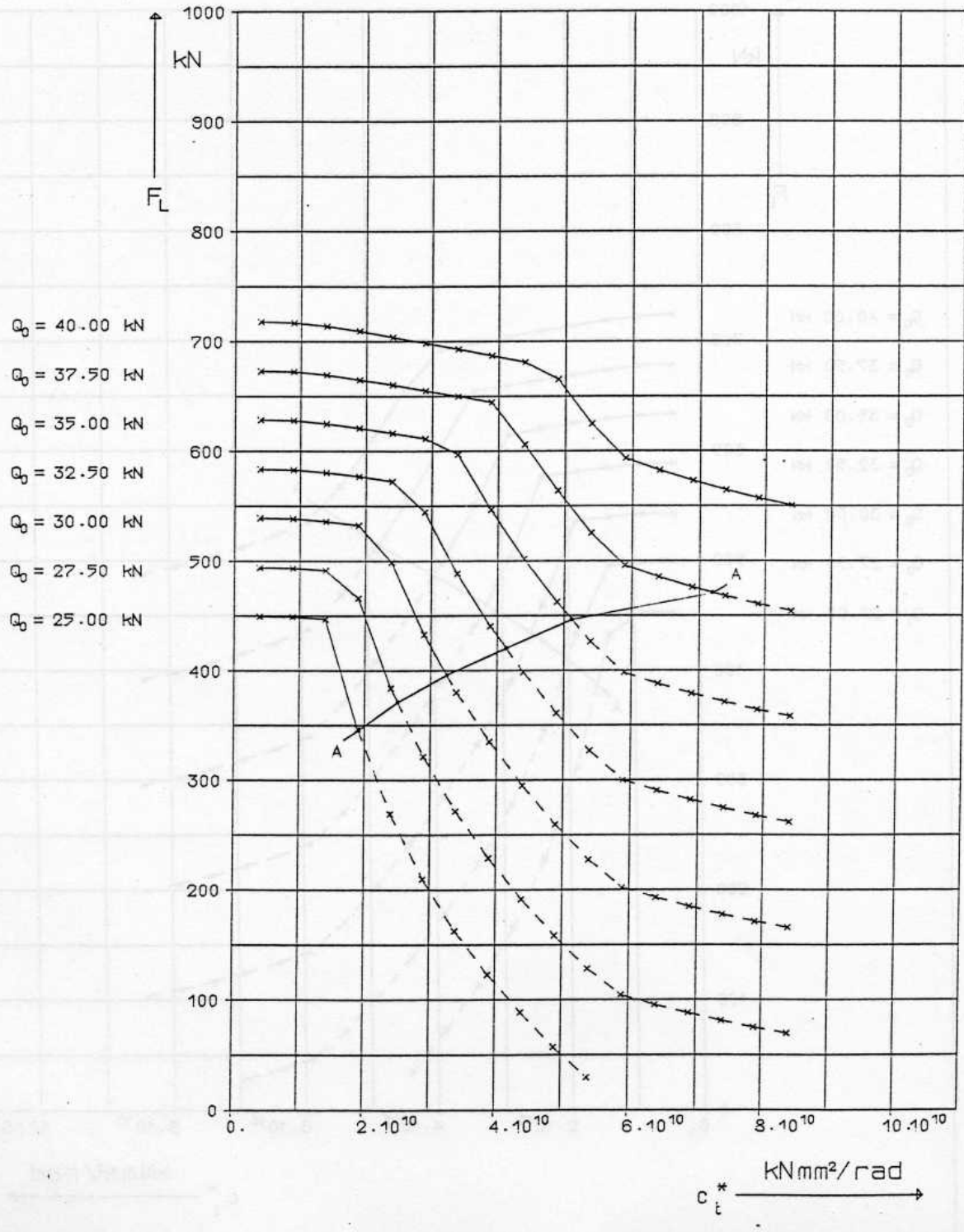
$$b = 14000 \text{ mm}$$

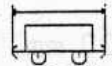
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_{t}^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





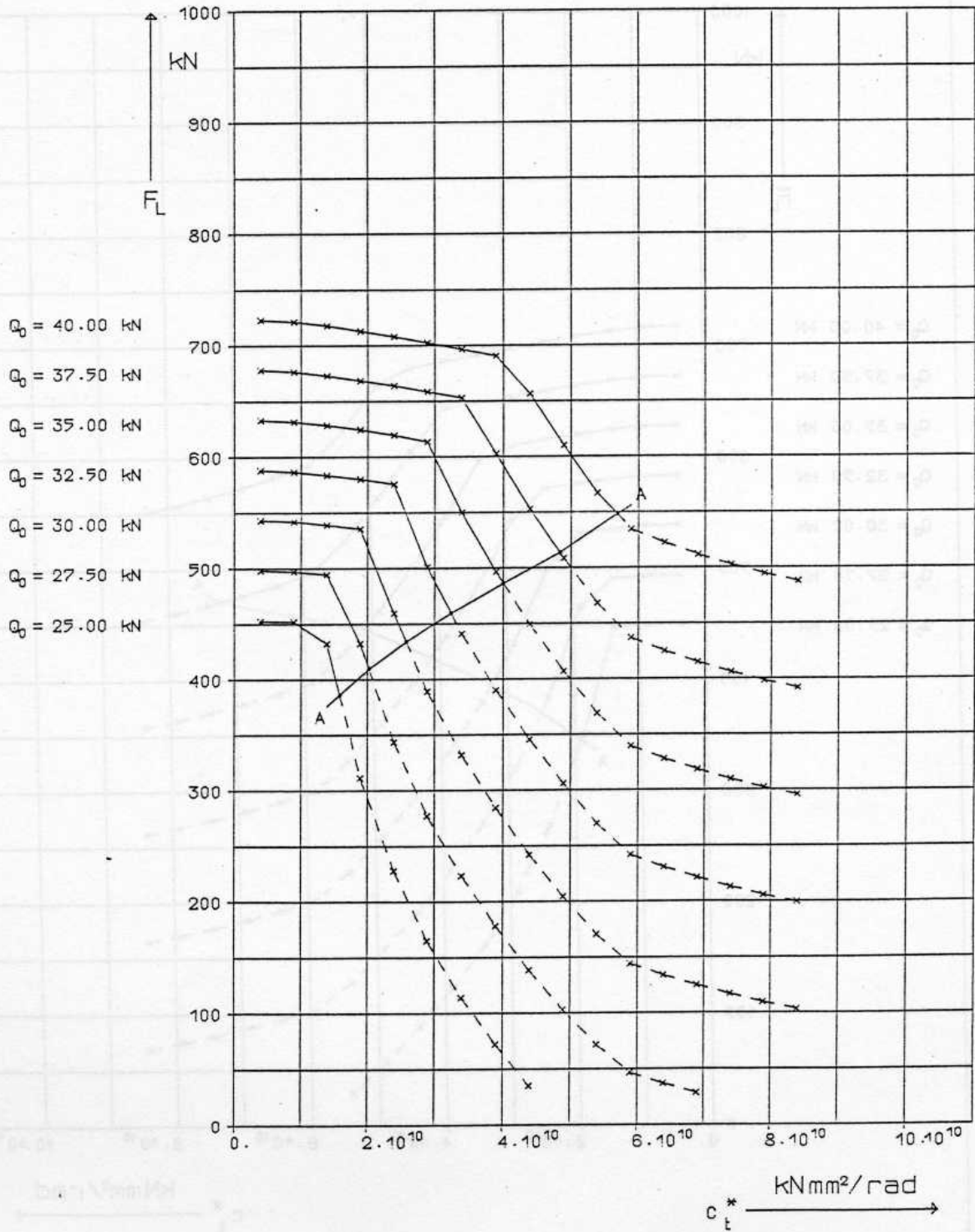
$$h_0 = 14000 \text{ mm}$$

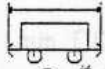
$$2a^* = 8500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 0,97 \text{ kN/mm}$$





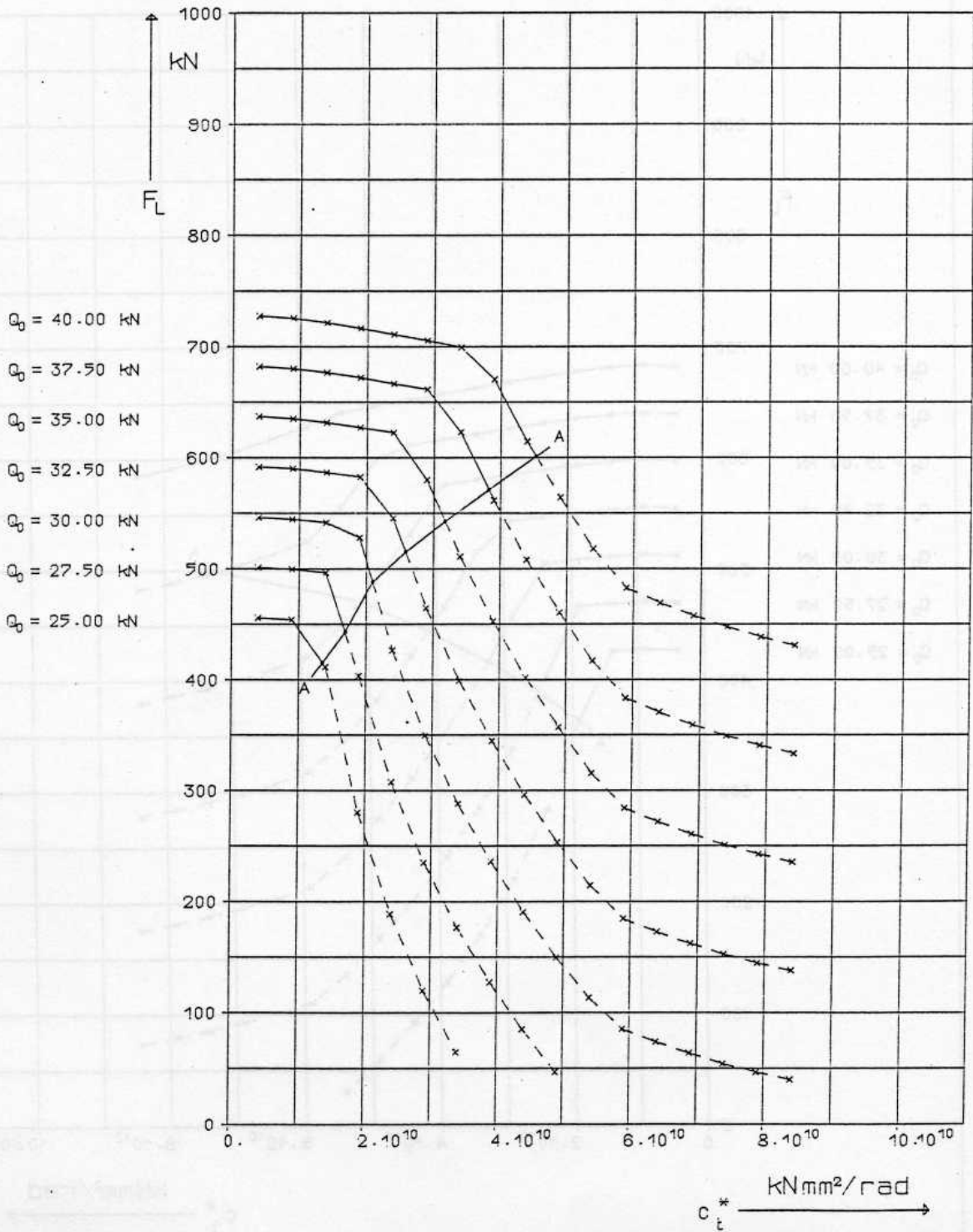
$$h = 14000 \text{ mm}$$

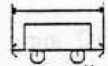
$$2a^* = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





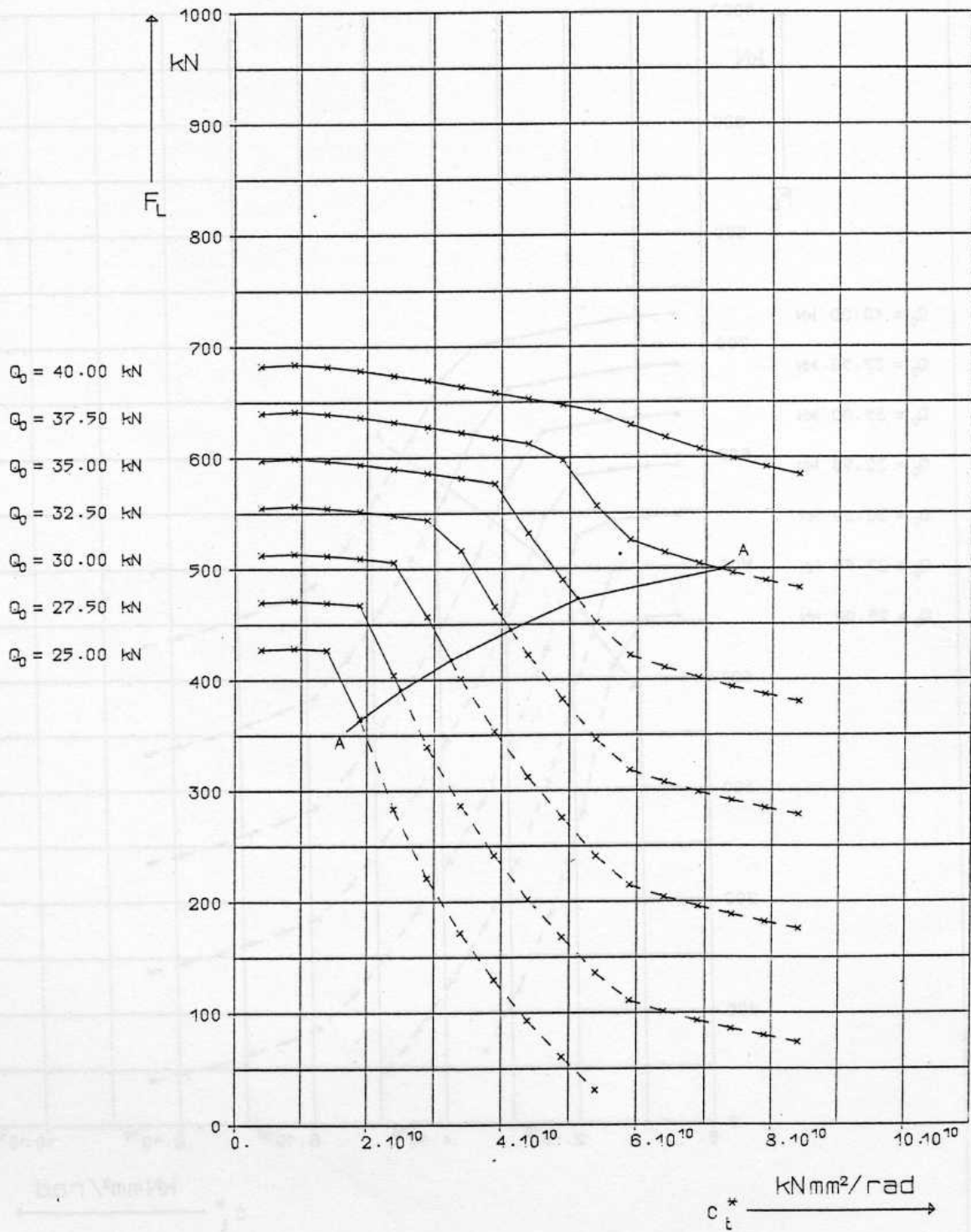
$$h_0 = 14500 \text{ mm}$$

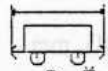
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





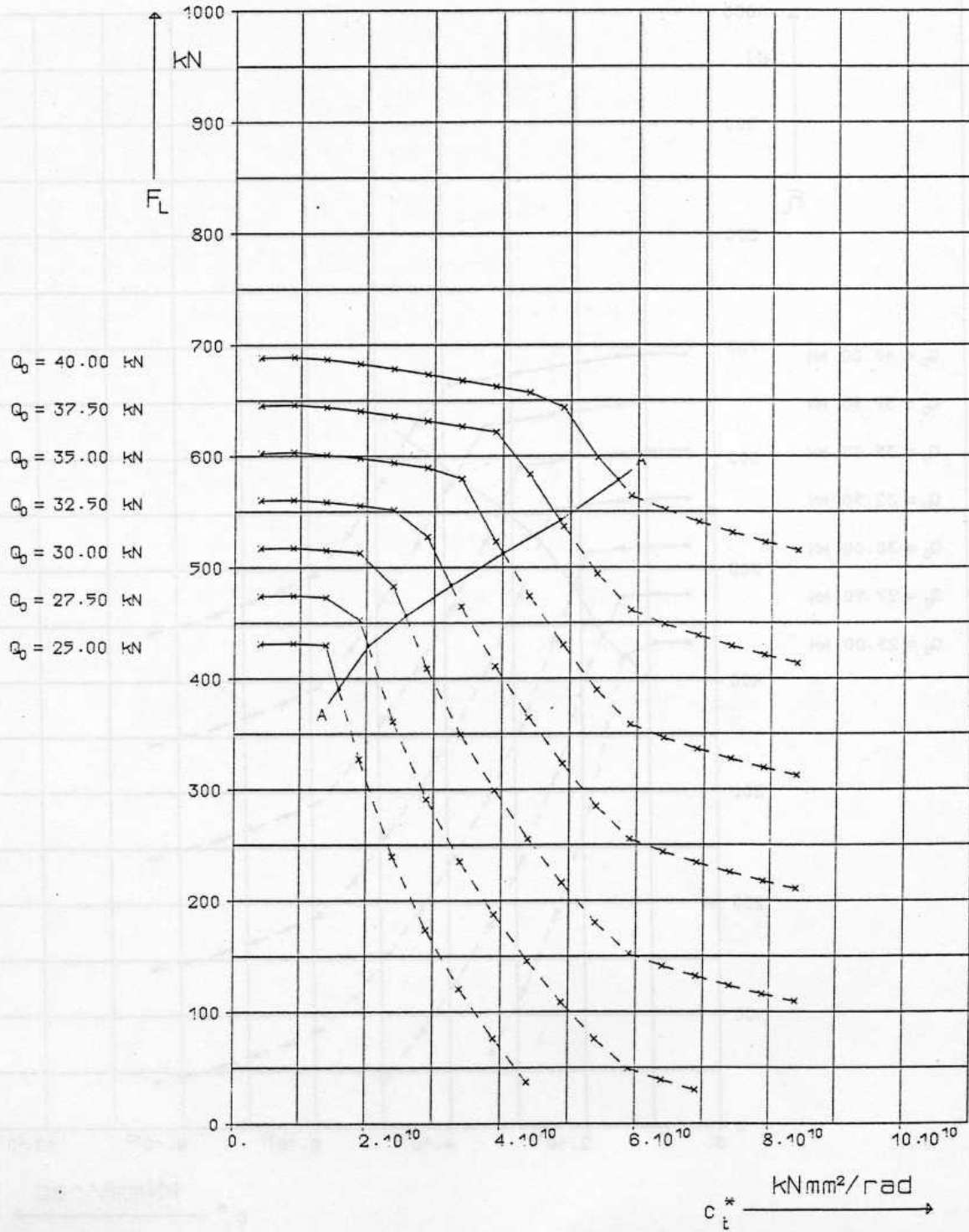
$$2a^* = 14500 \text{ mm}$$

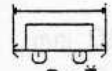
$$h_0 = 8500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$c_z = 0.97 \text{ kN/mm}$$





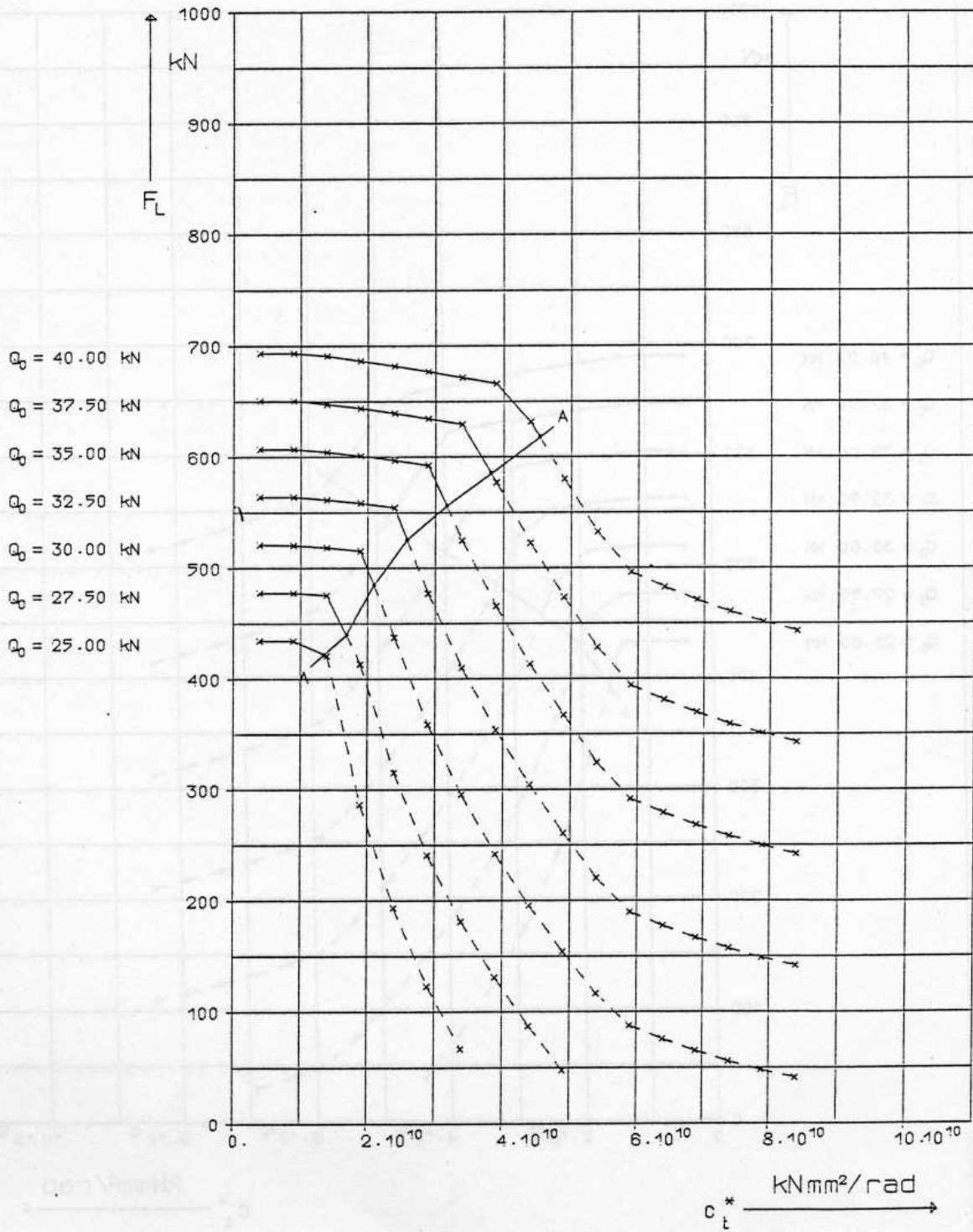
$$2a^* = 14500 \text{ mm}$$

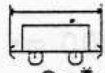
$$2a^* = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





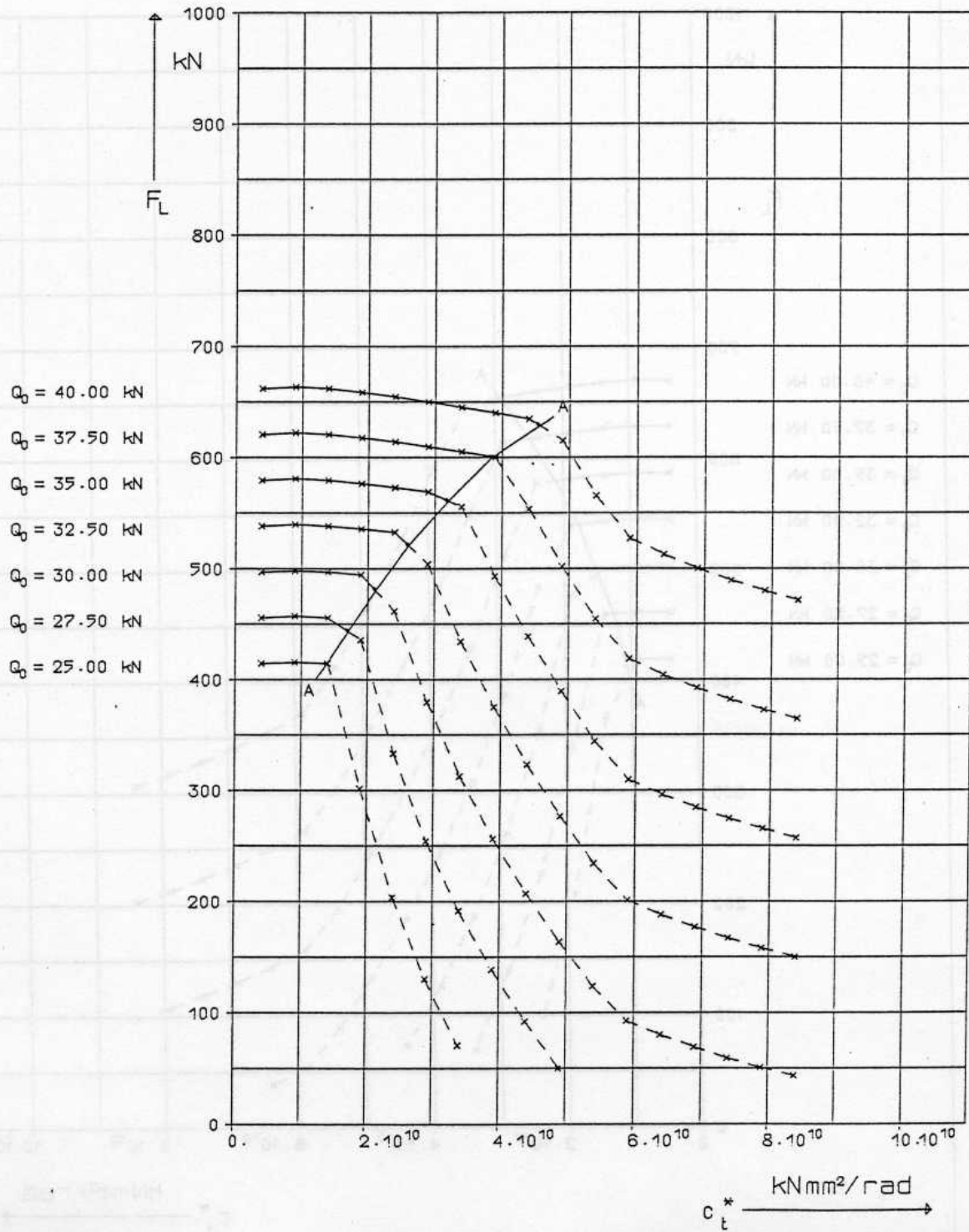
$$2a^* = 15000 \text{ mm}$$

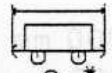
$$2a^* = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





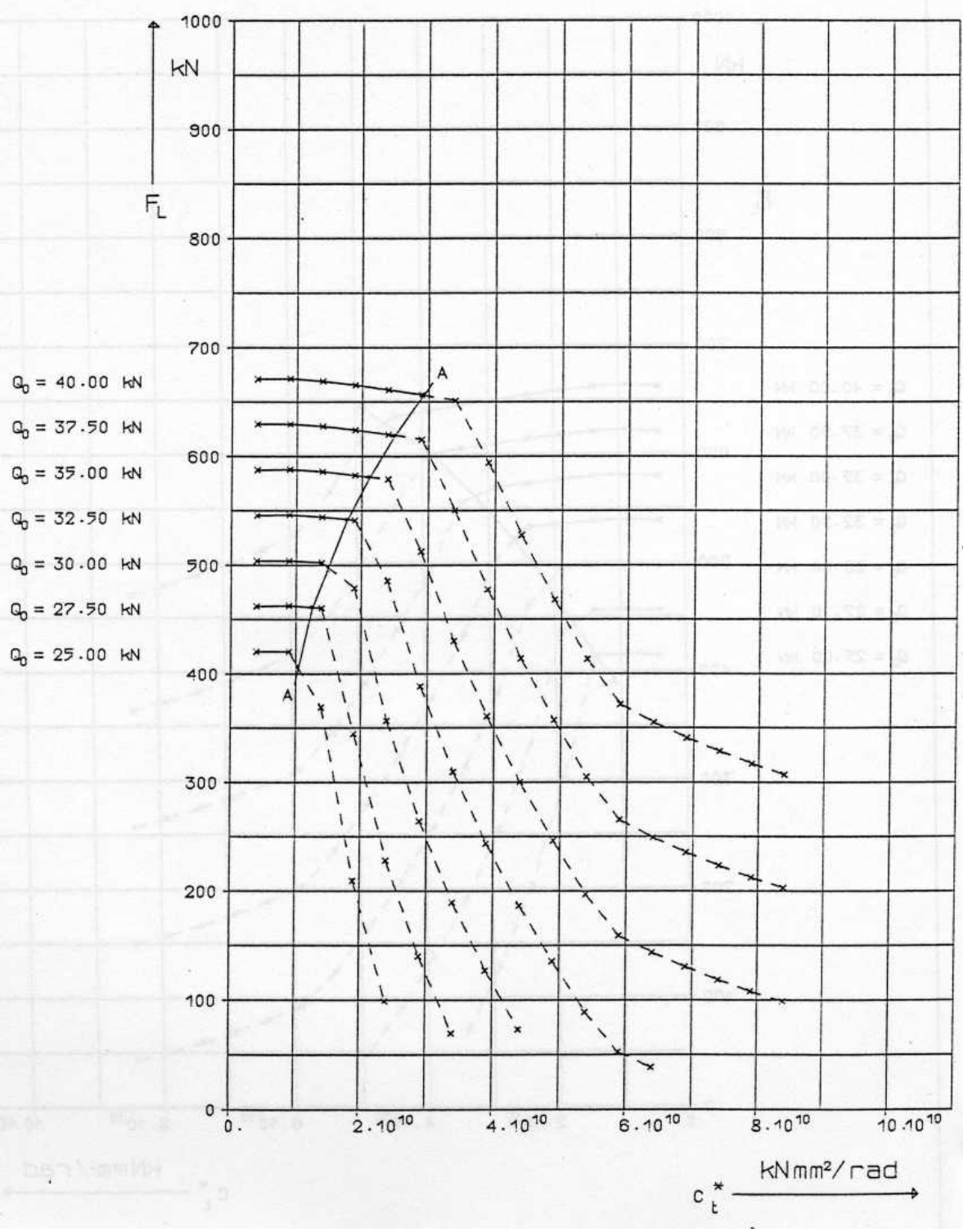
$$2a^* = 15000 \text{ mm}$$

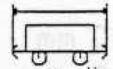
$$2a^* = 10000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$



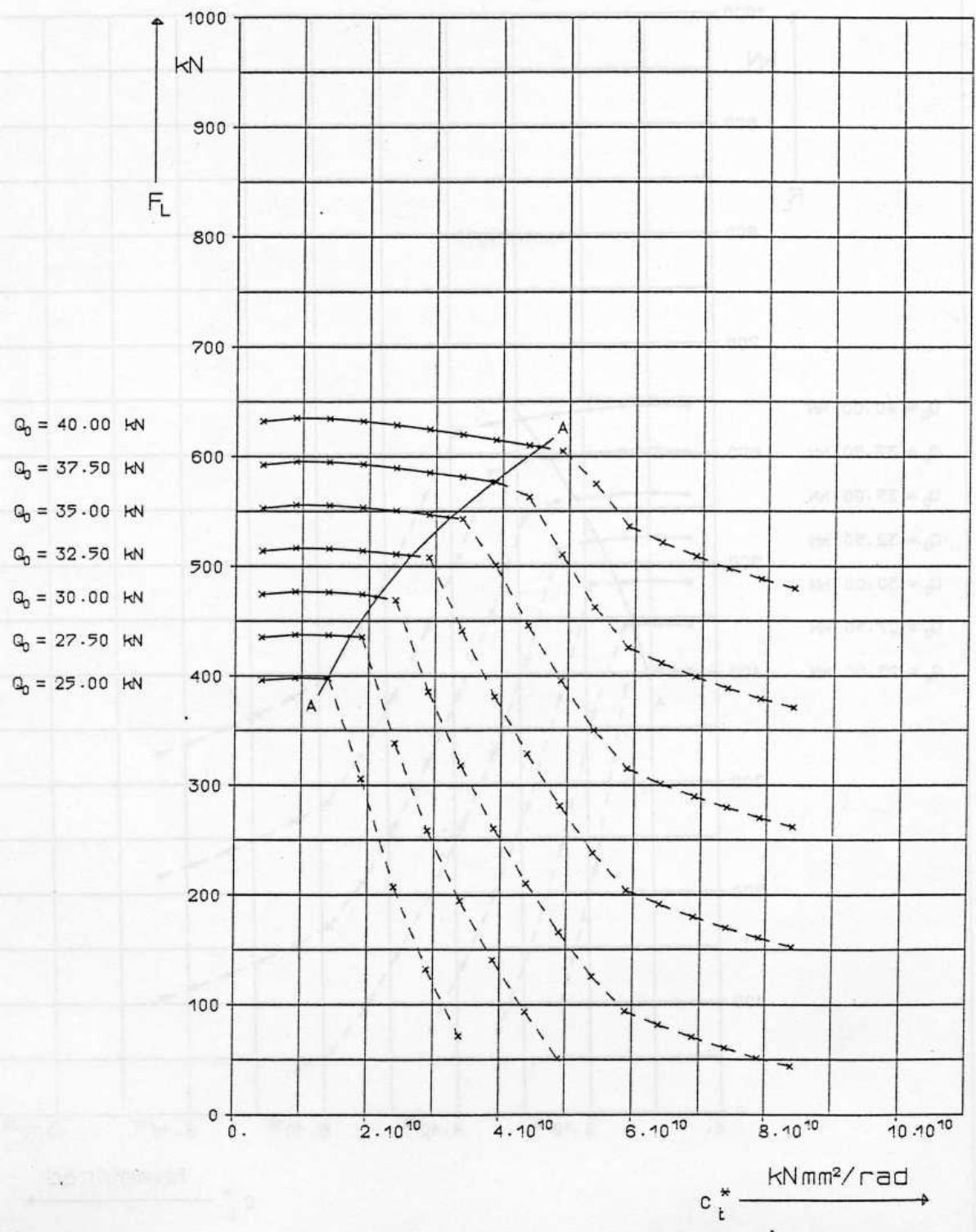


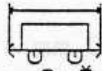
$$2a^* = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 0.97 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





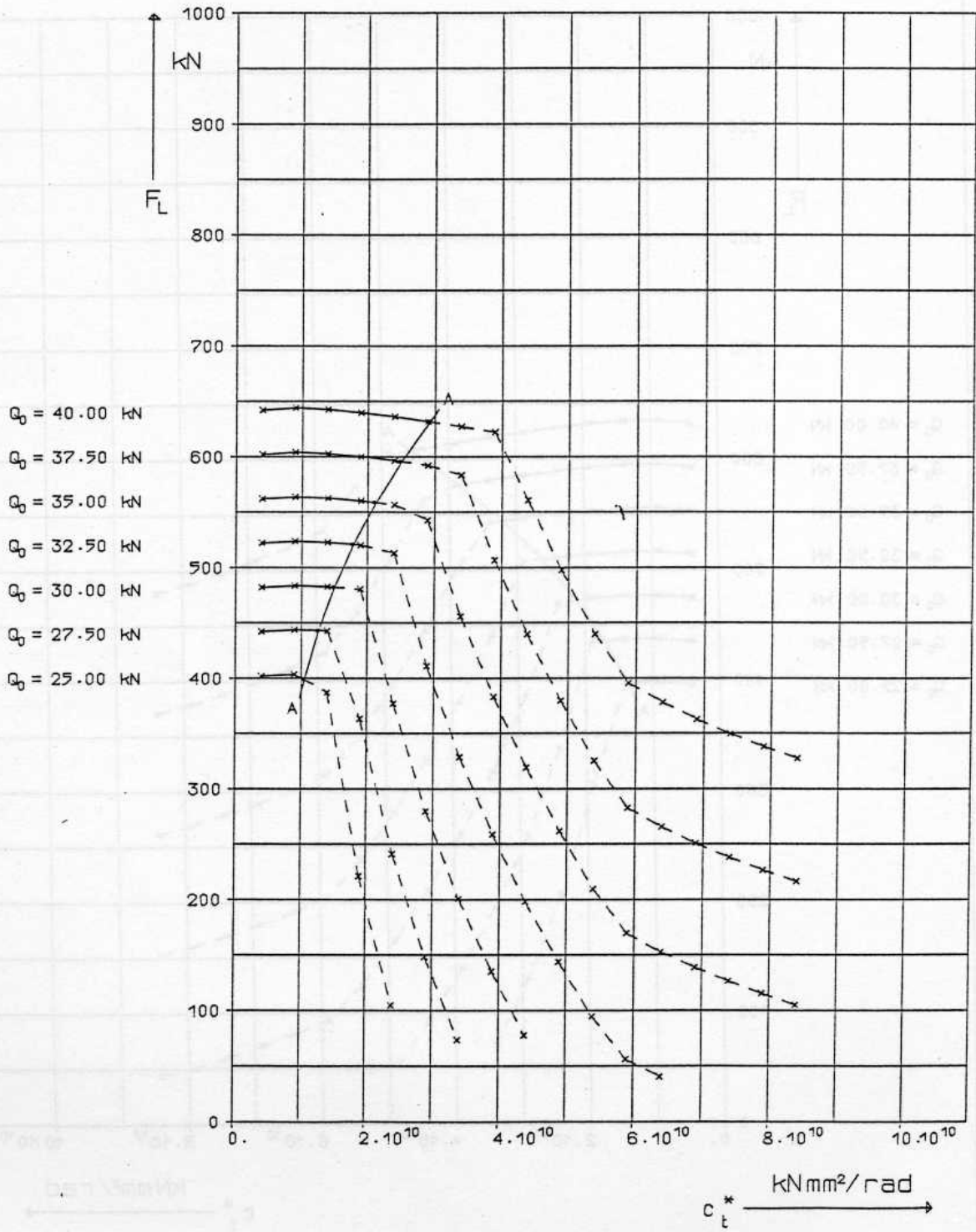
$$h = 15500 \text{ mm}$$

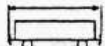
$$2a^* = 10000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

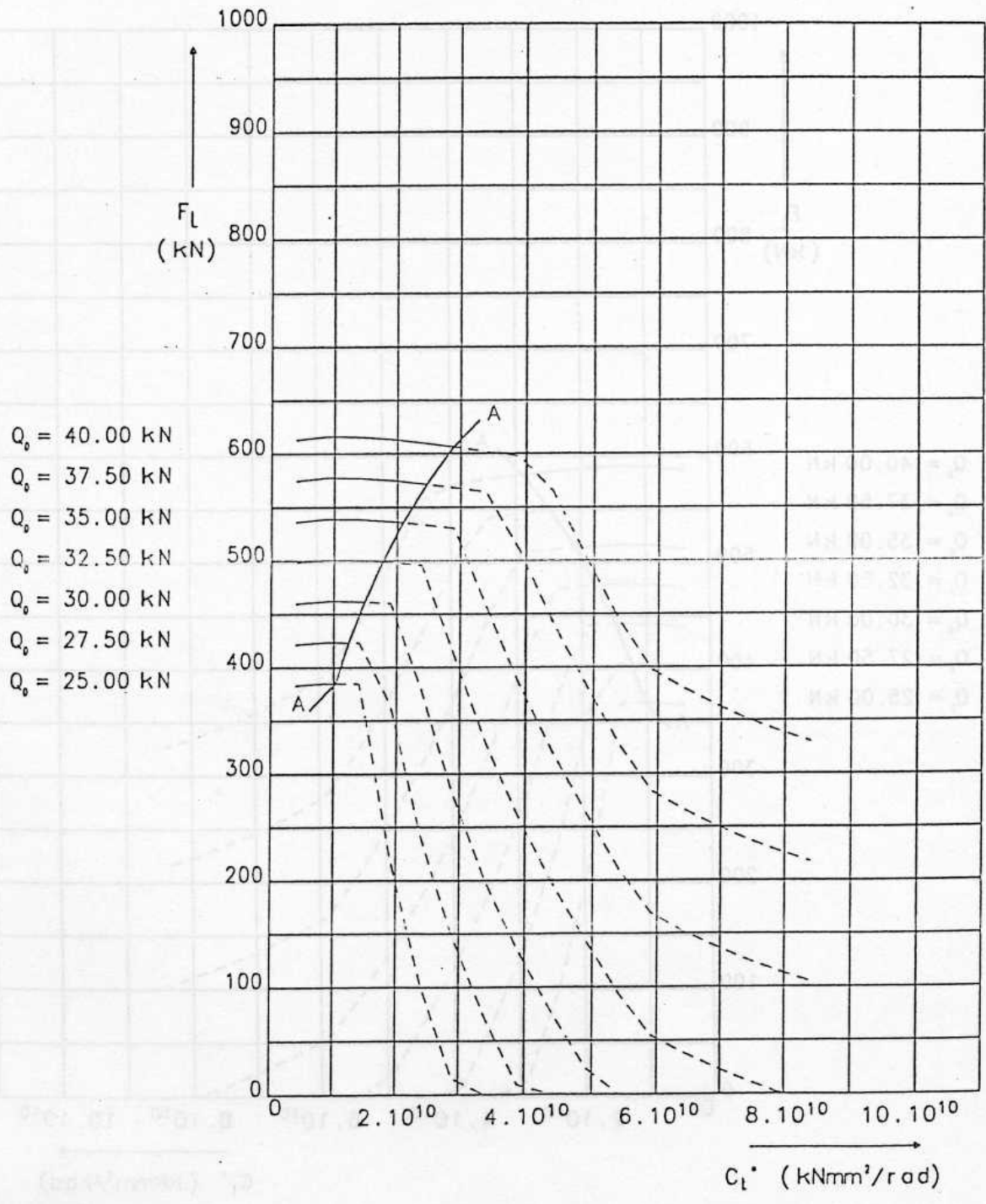
$$c_z = 0.97 \text{ kN/mm}$$

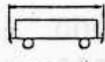
$$0.15 \leq \Delta q_0 \leq 0.23$$





$2a^* = 16000. \text{ mm}$
 $2a^* = 10000. \text{ mm}$
 $\Delta q_0 = f(c_t^*) \quad 0,15 \leq \Delta q_0 \leq 0,23$
 $C_z = 0.97 \text{ kN/mm}$





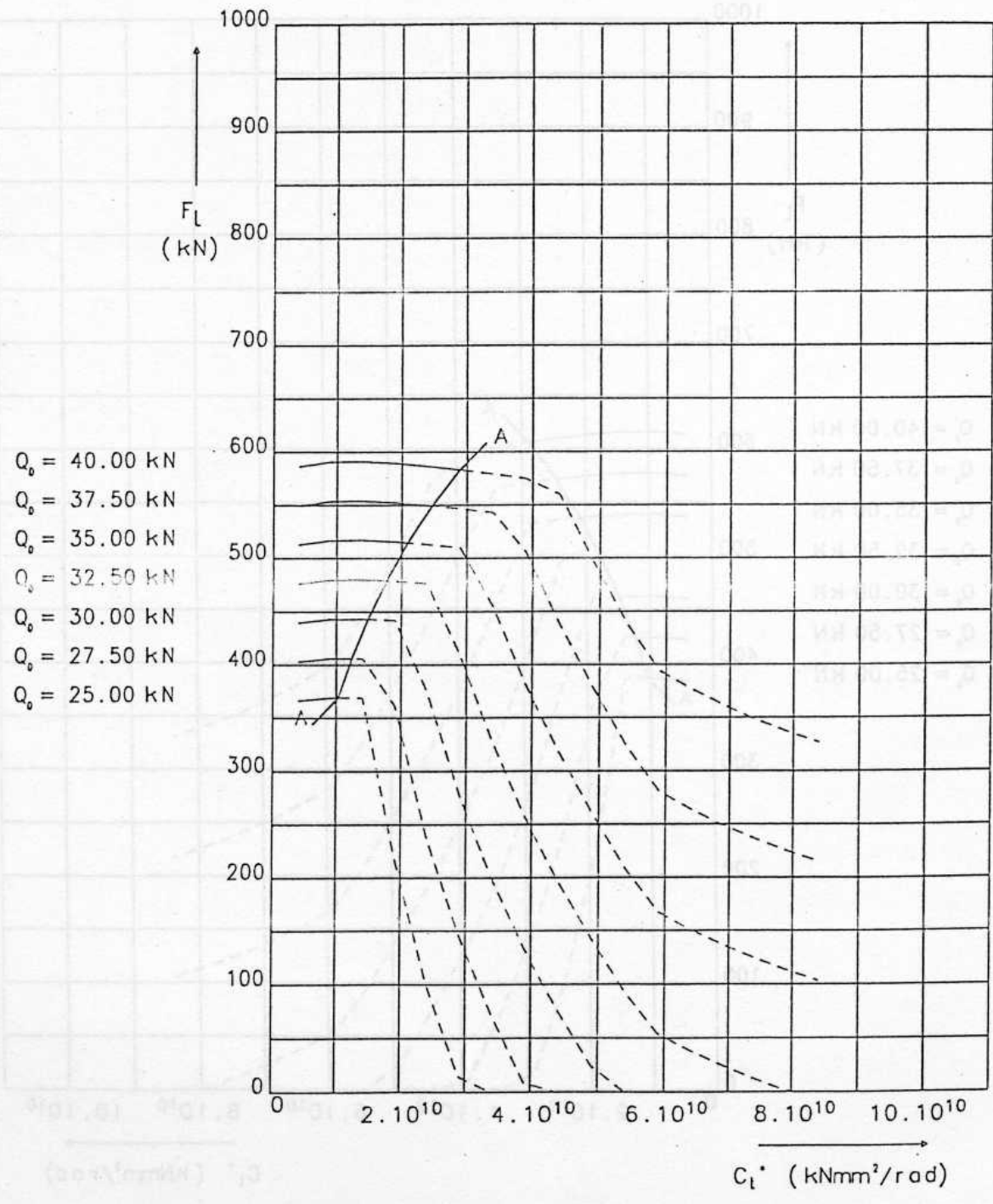
$$2a^* = 16500. \text{ mm}$$

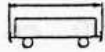
$$2a^* = 10000. \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$C_z = 0.97 \text{ kN/mm}$$





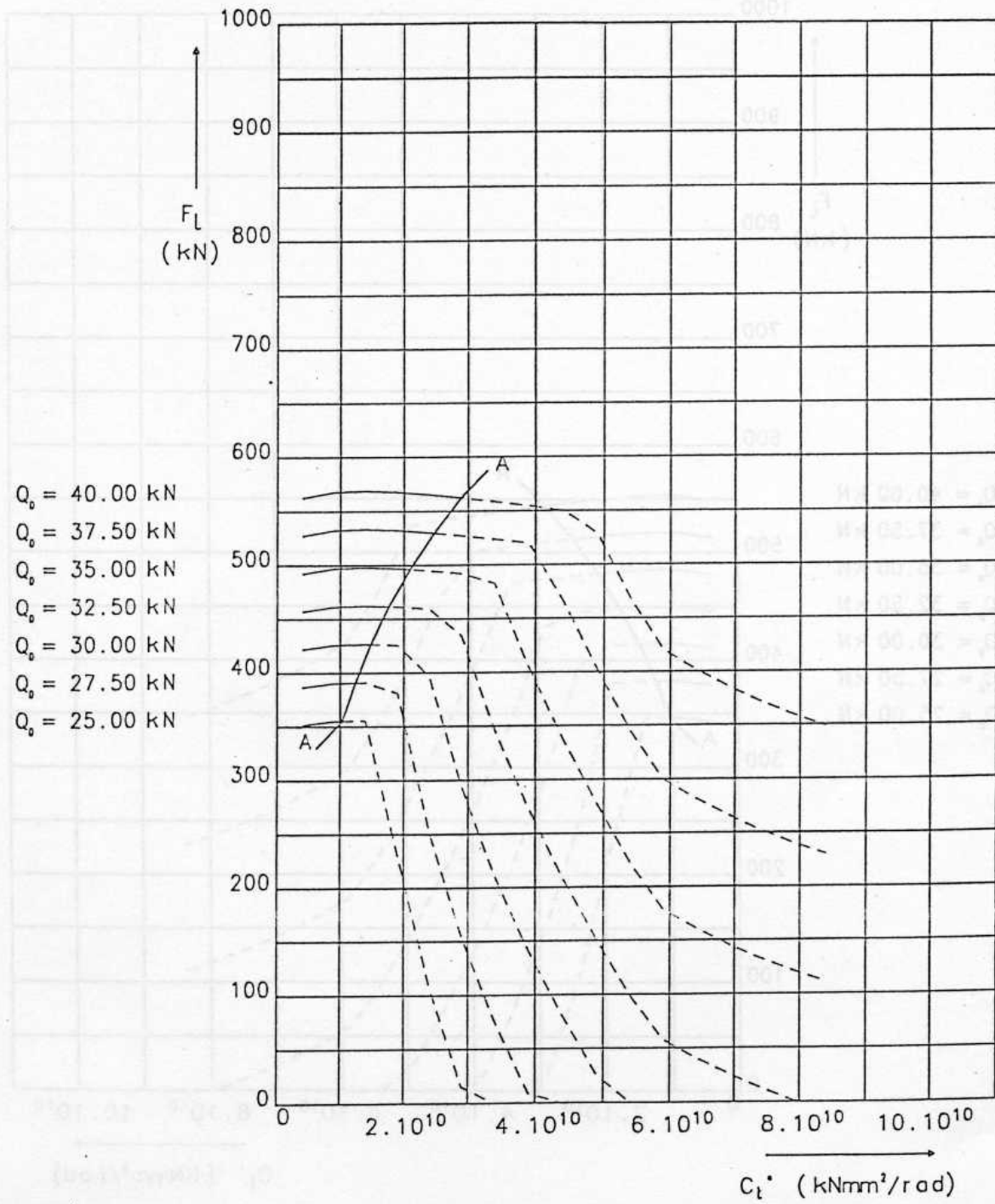
$$= 17000. \text{ mm}$$

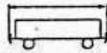
$$2a^* = 10000. \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$C_z = 0.97 \text{ kN/mm}$$





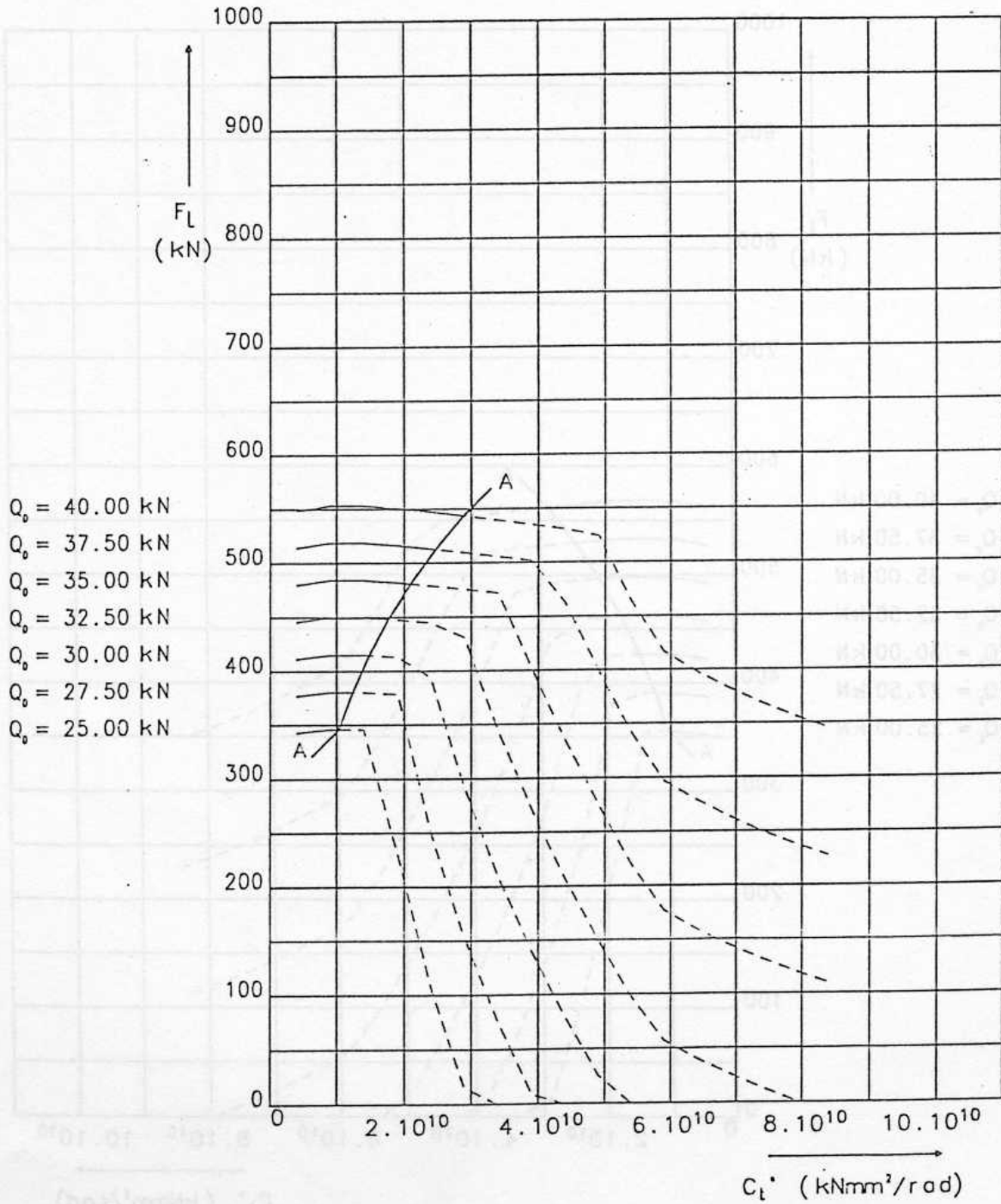
$$= 17300. \text{ mm}$$

$$2a^* = 10000. \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

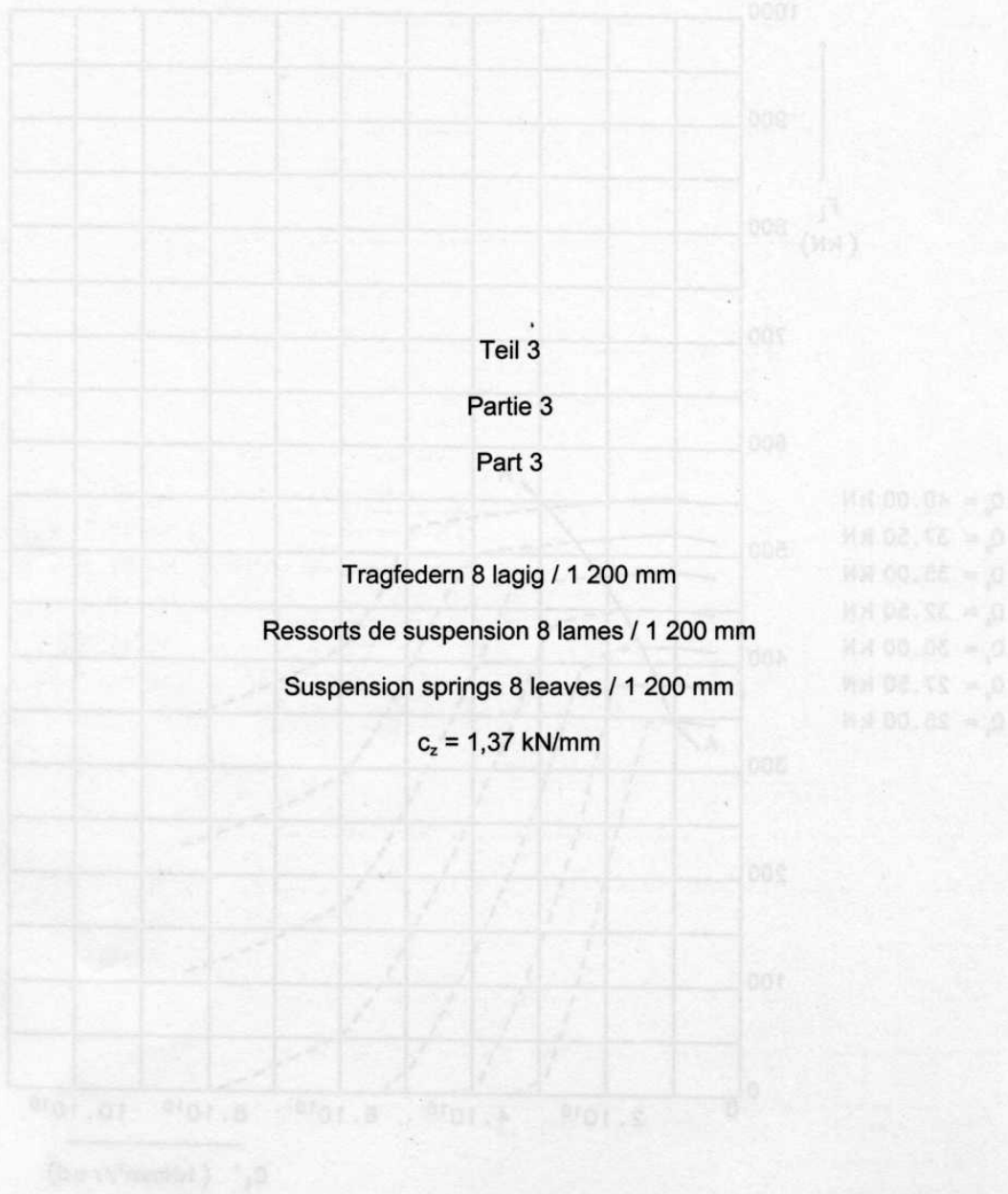
$$0.15 \leq \Delta q_0 \leq 0.23$$

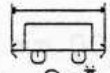
$$C_z = 0.97 \text{ kN/mm}$$





Anlage A
Annexe A
Appendix A



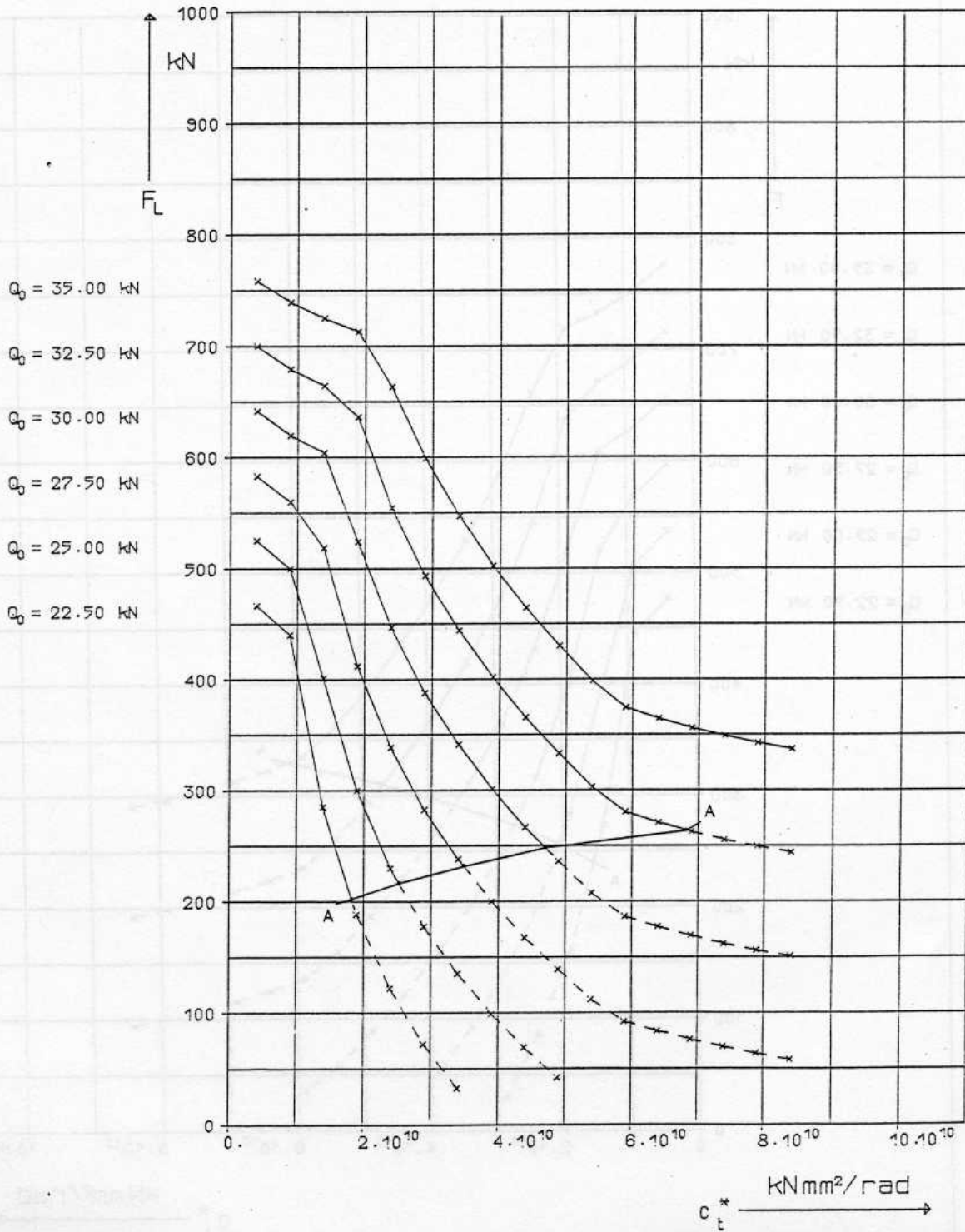


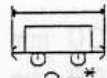
$$2a^* = 5500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$



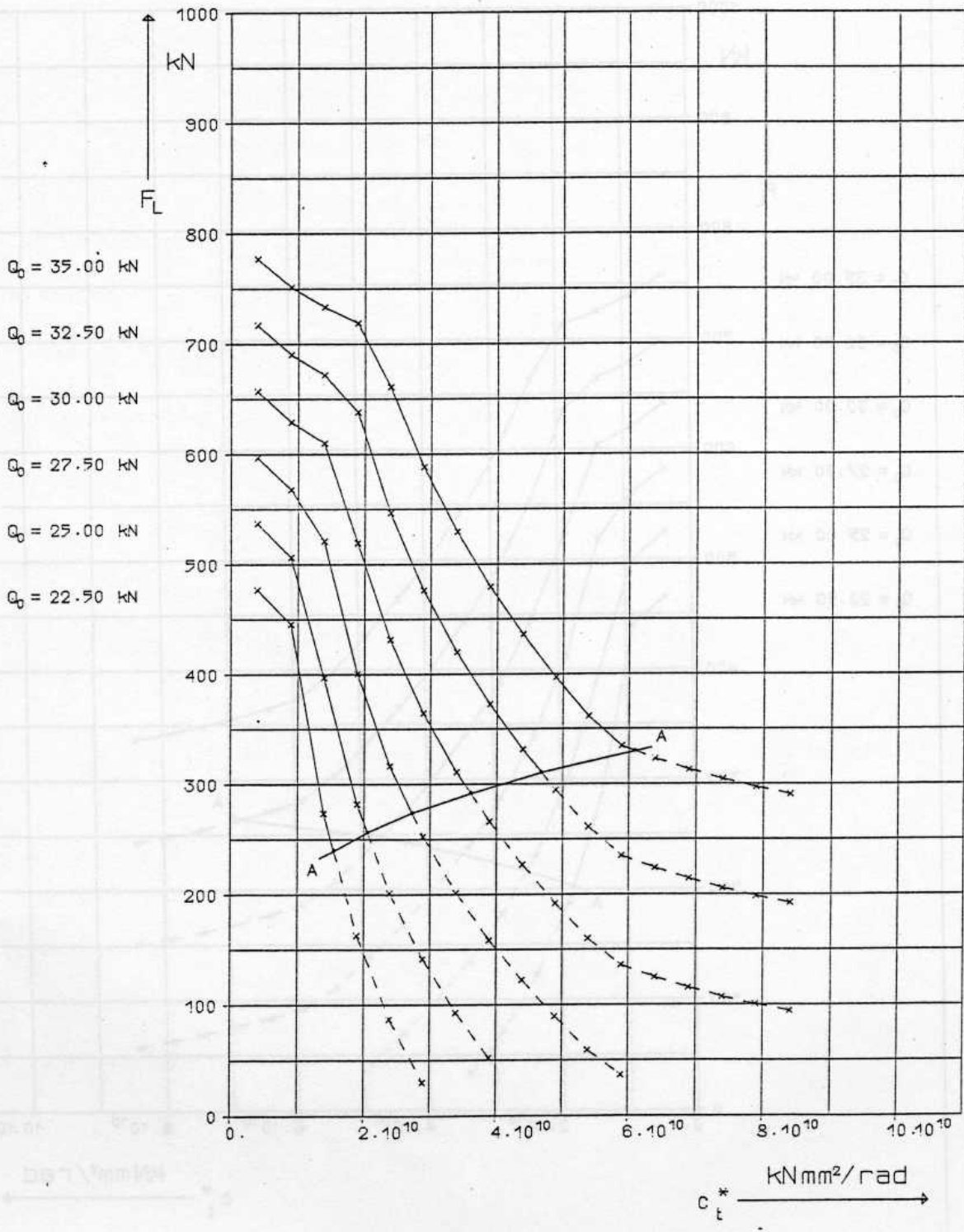


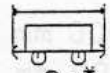
$$2a^* = 6000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





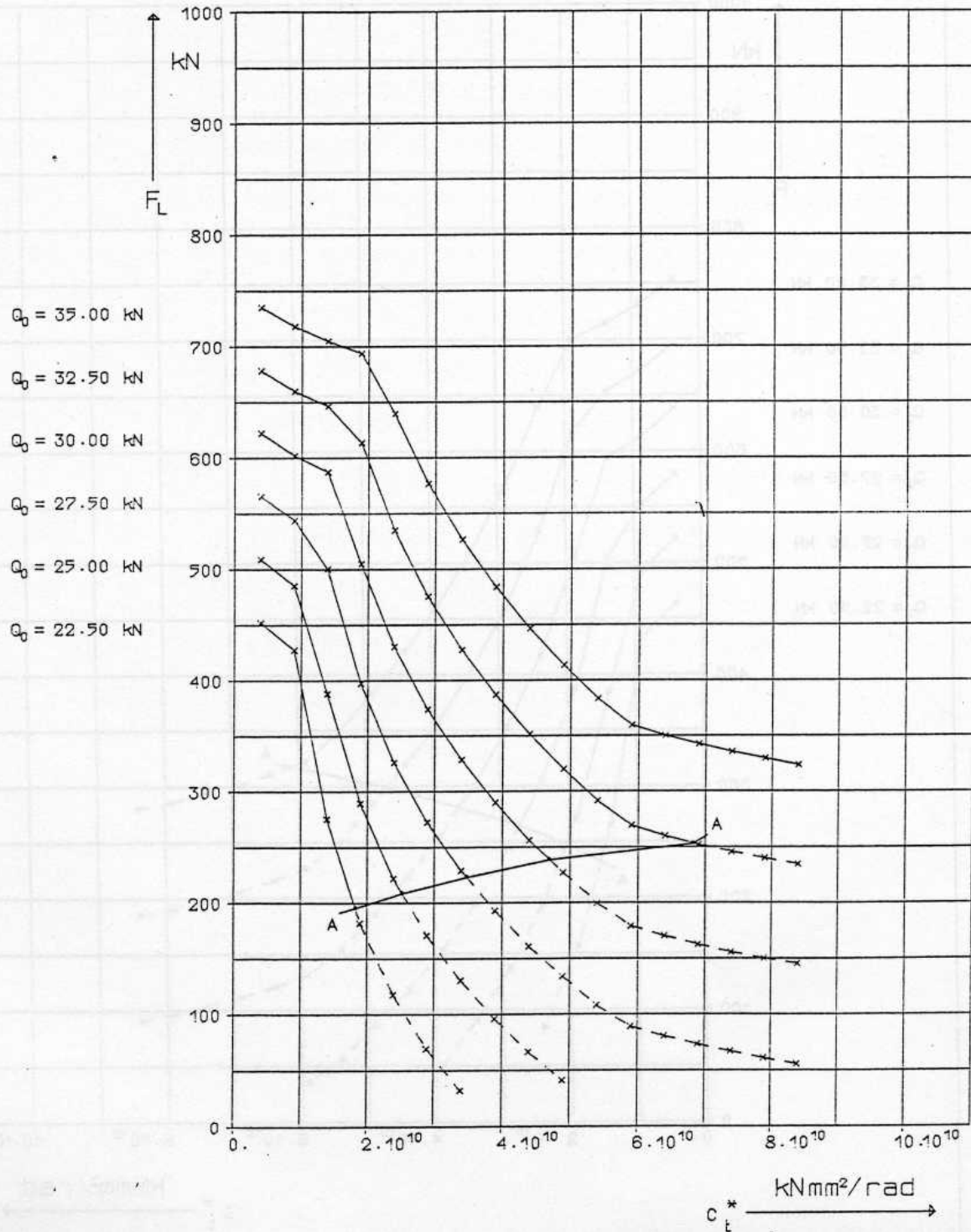
$$2a^* = 10000 \text{ mm}$$

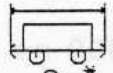
$$2a^* = 5500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





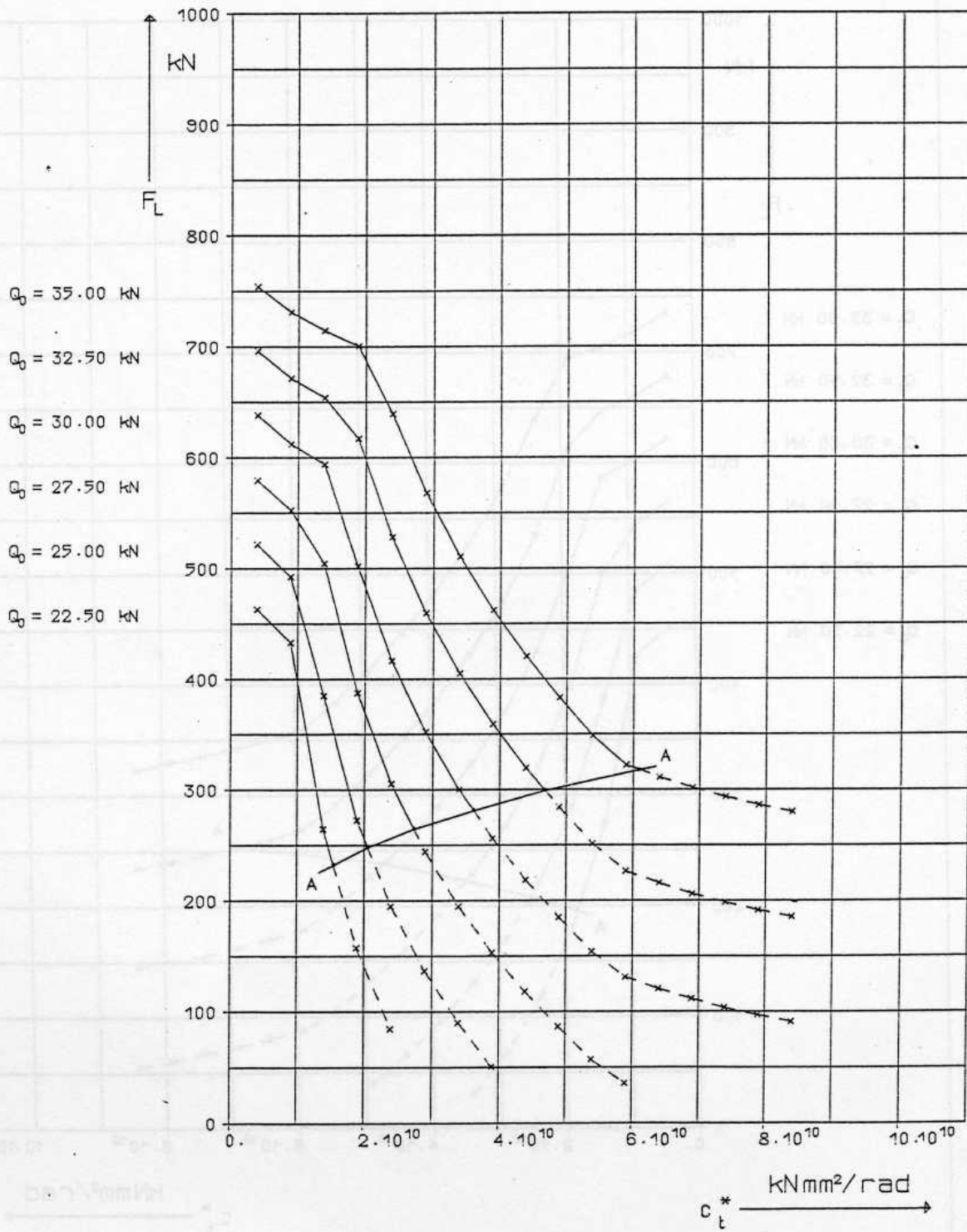
$$2a^* = 10000 \text{ mm}$$

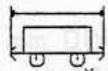
$$2a^* = 6000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





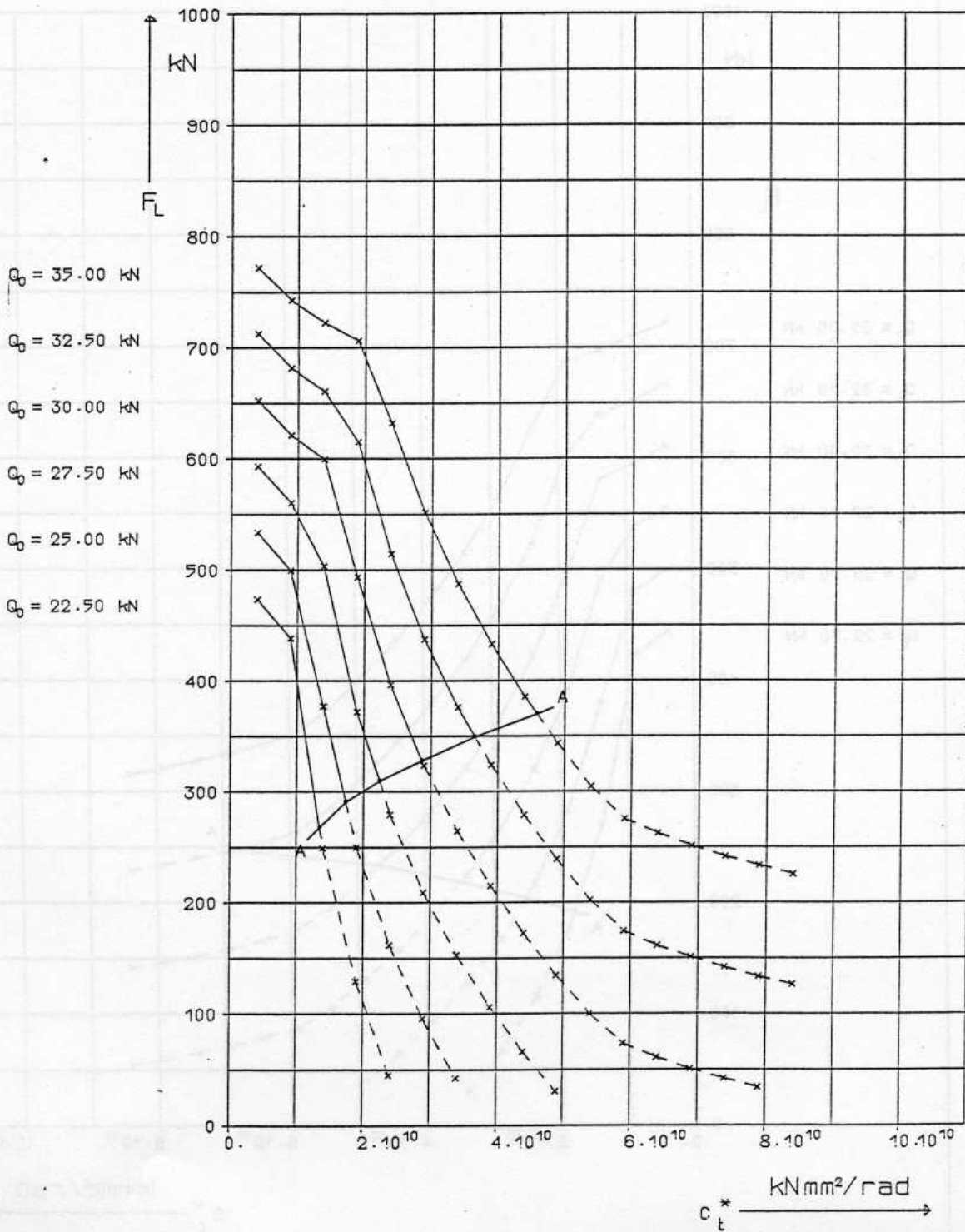
$$h = 10000 \text{ mm}$$

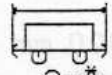
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$c_z = 1.37 \text{ kN/mm}$$





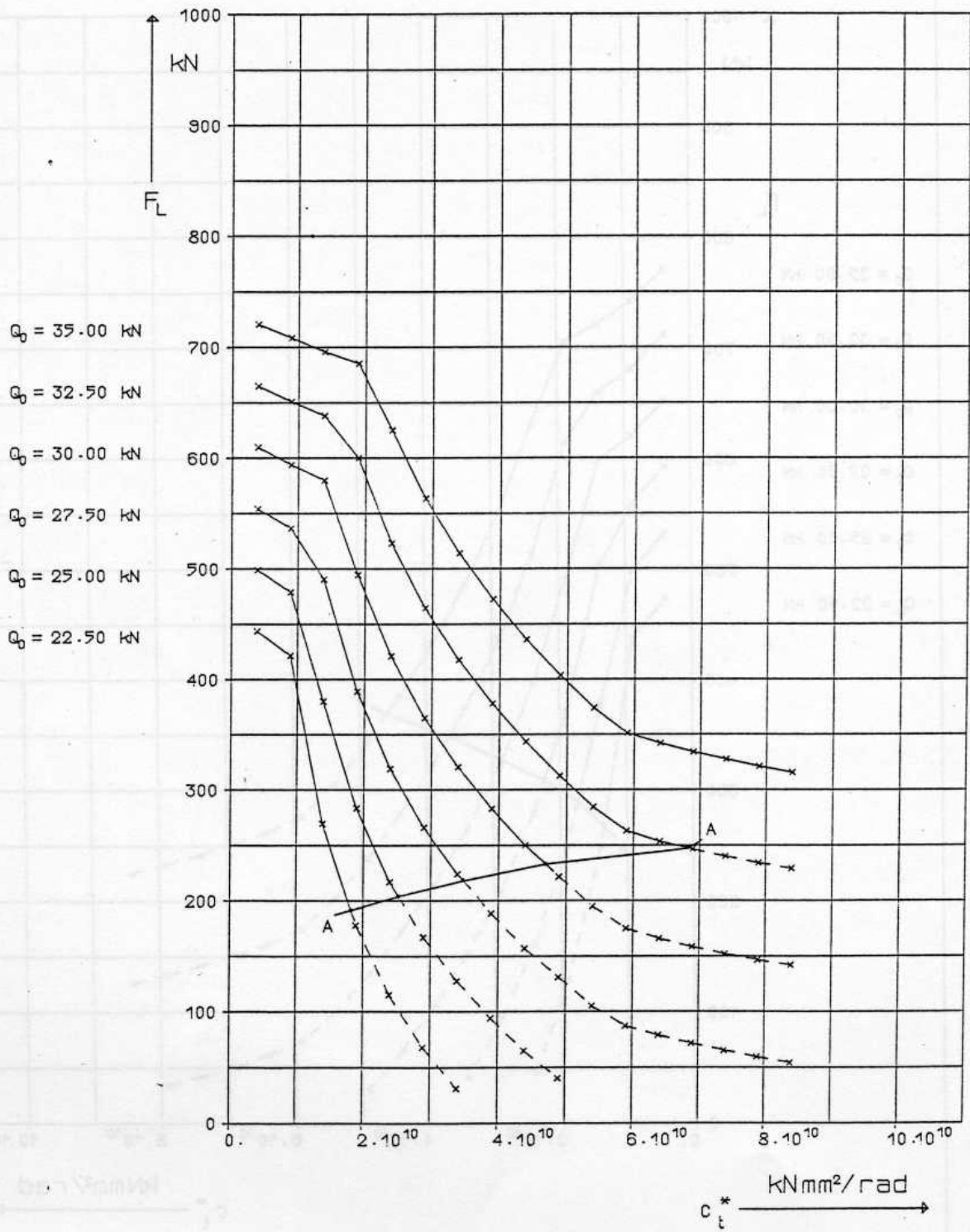
$$2a^* = 10500 \text{ mm}$$

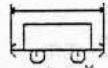
$$2a^* = 5500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





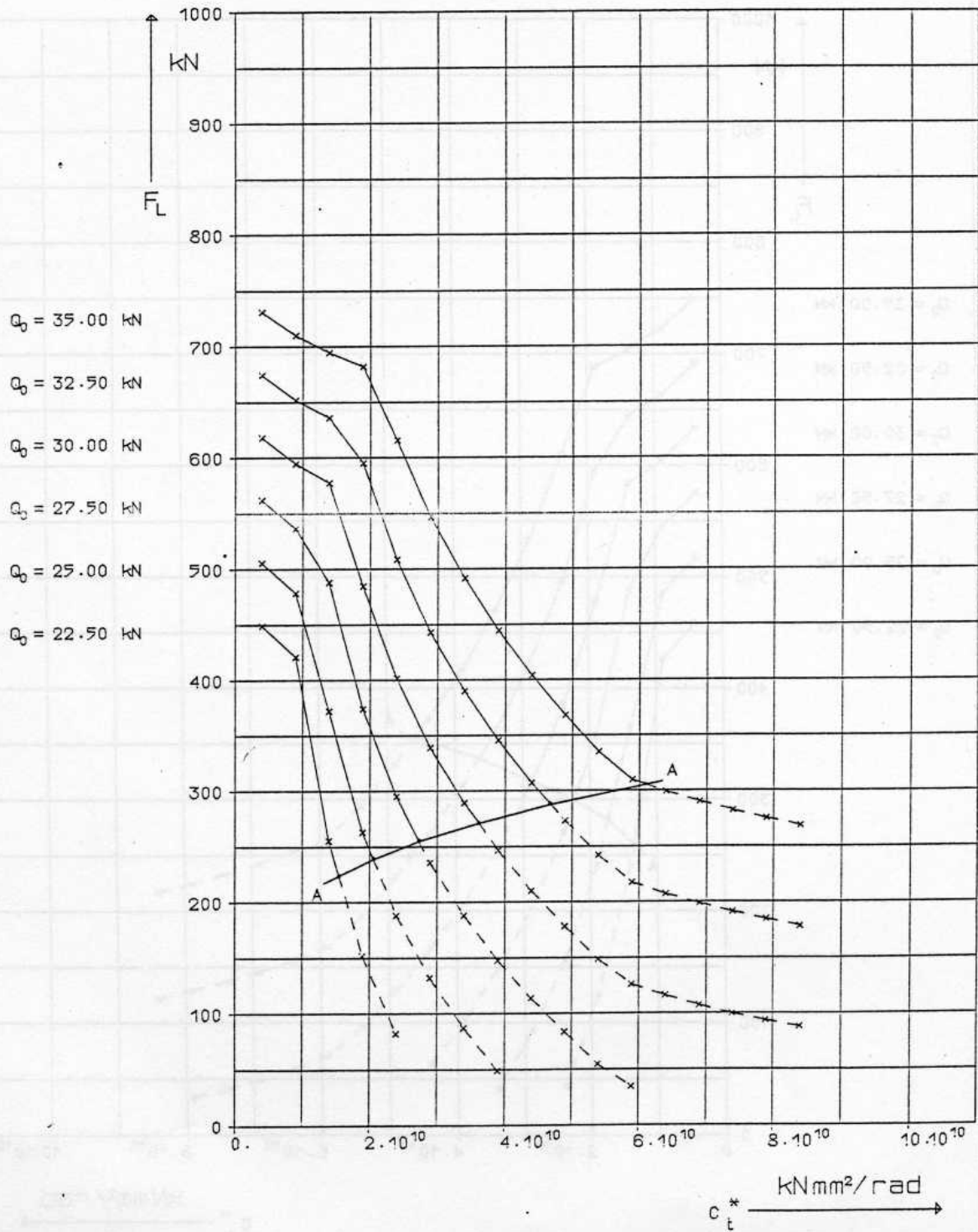
$$2a^* = 10500 \text{ mm}$$

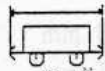
$$2a^* = 6000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





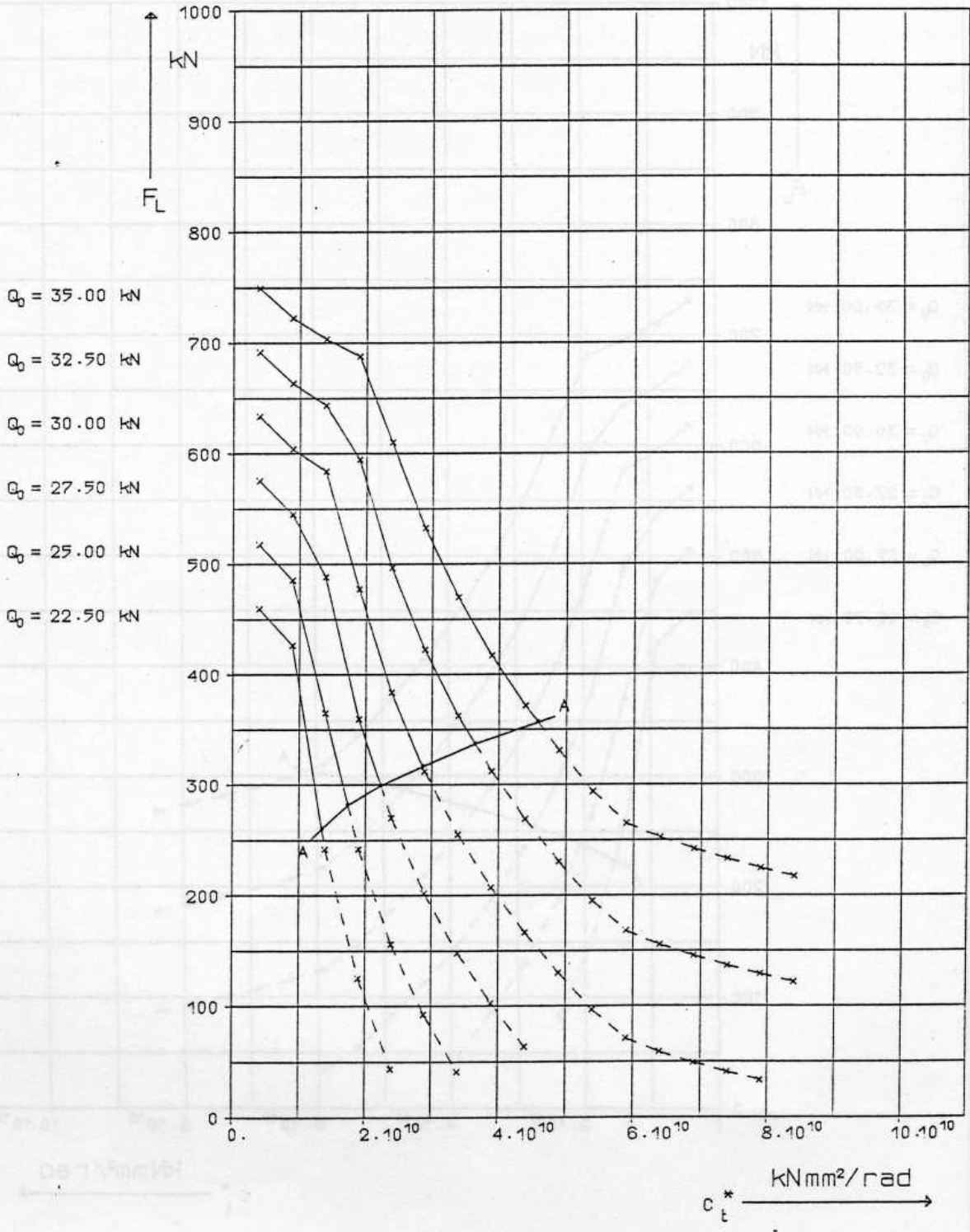
$$h = 10500 \text{ mm}$$

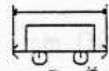
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 1.37 \text{ kN/mm}$$



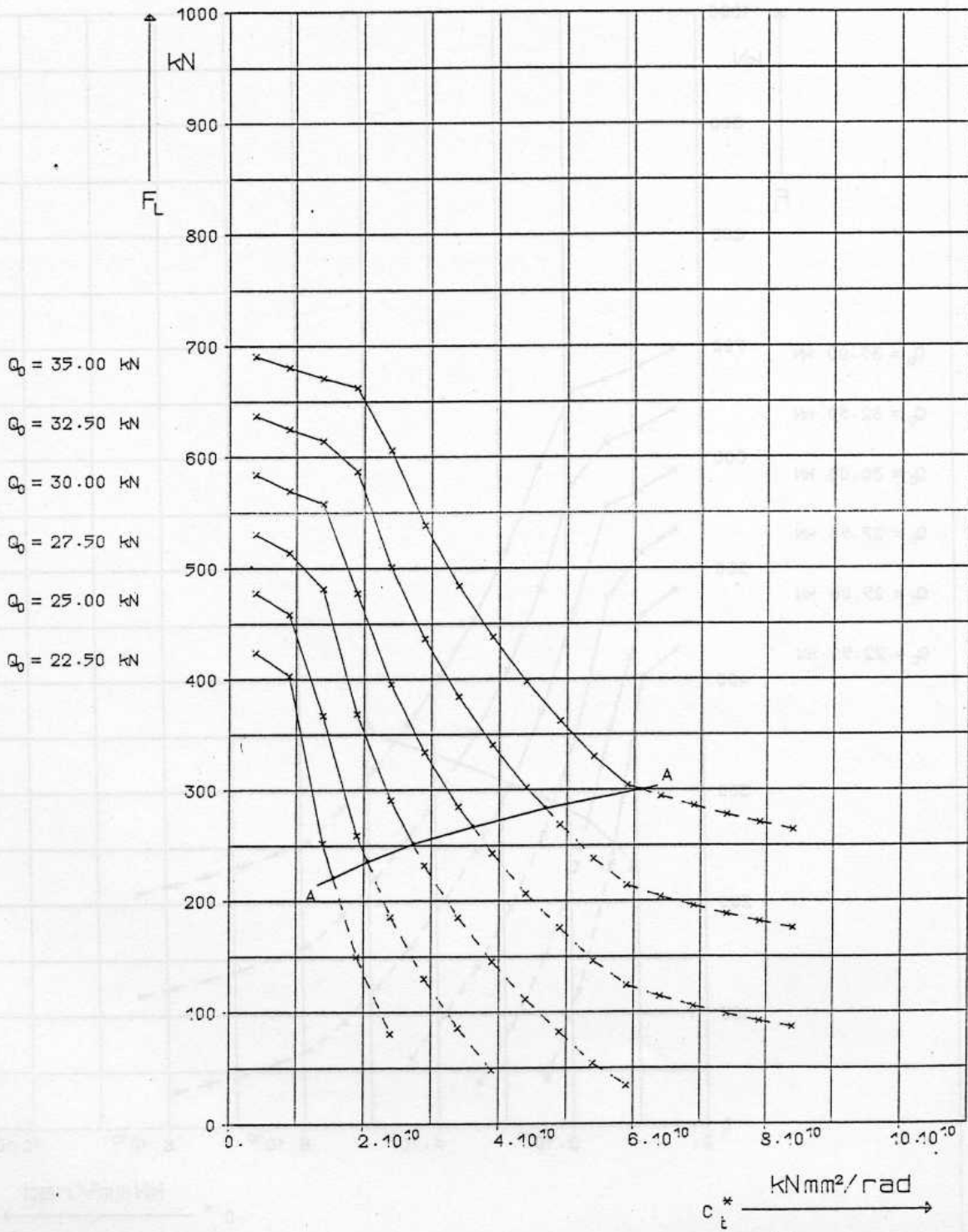


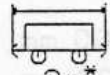
$$2a^* = 6000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





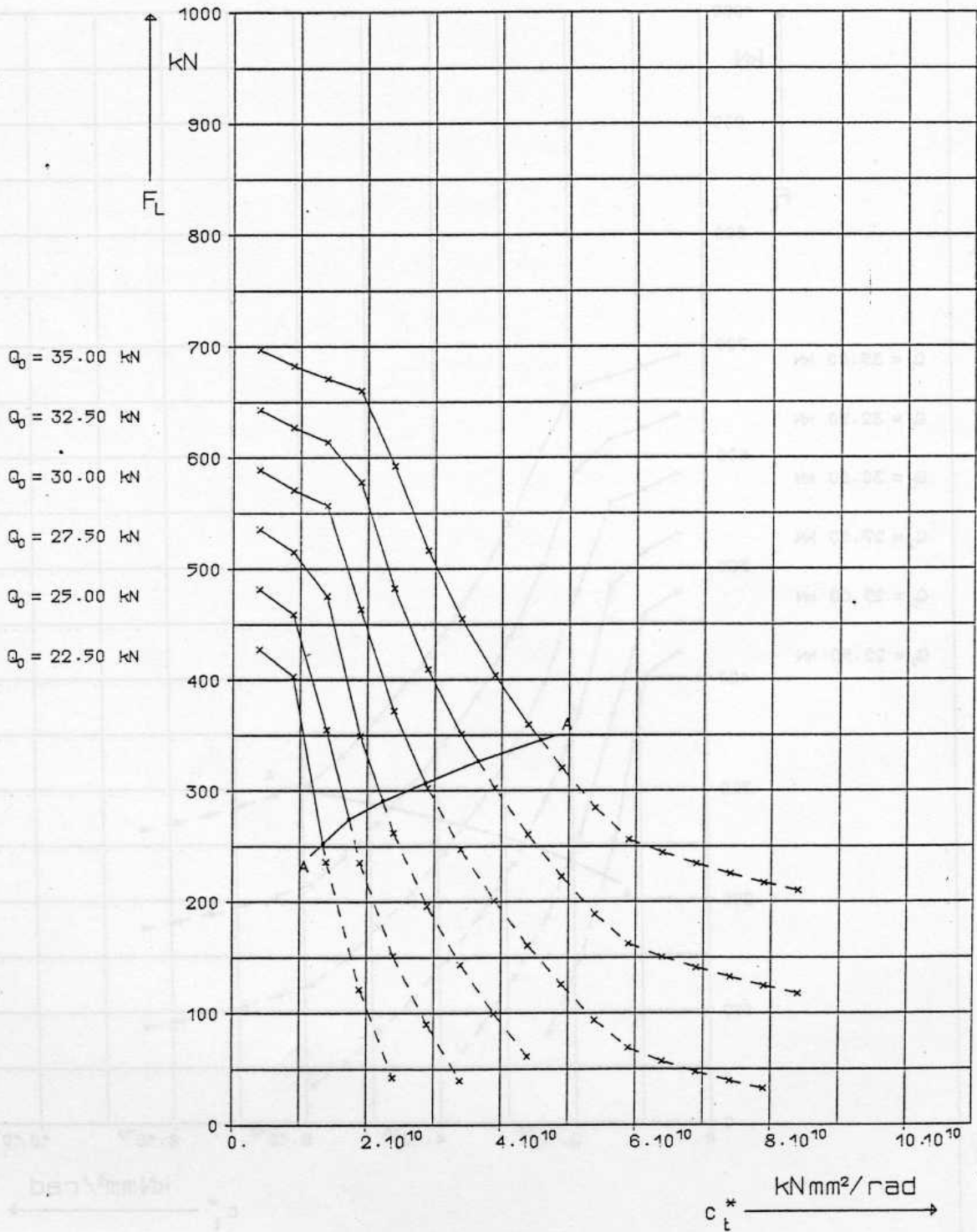
$$2a^* = 11000 \text{ mm}$$

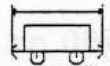
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





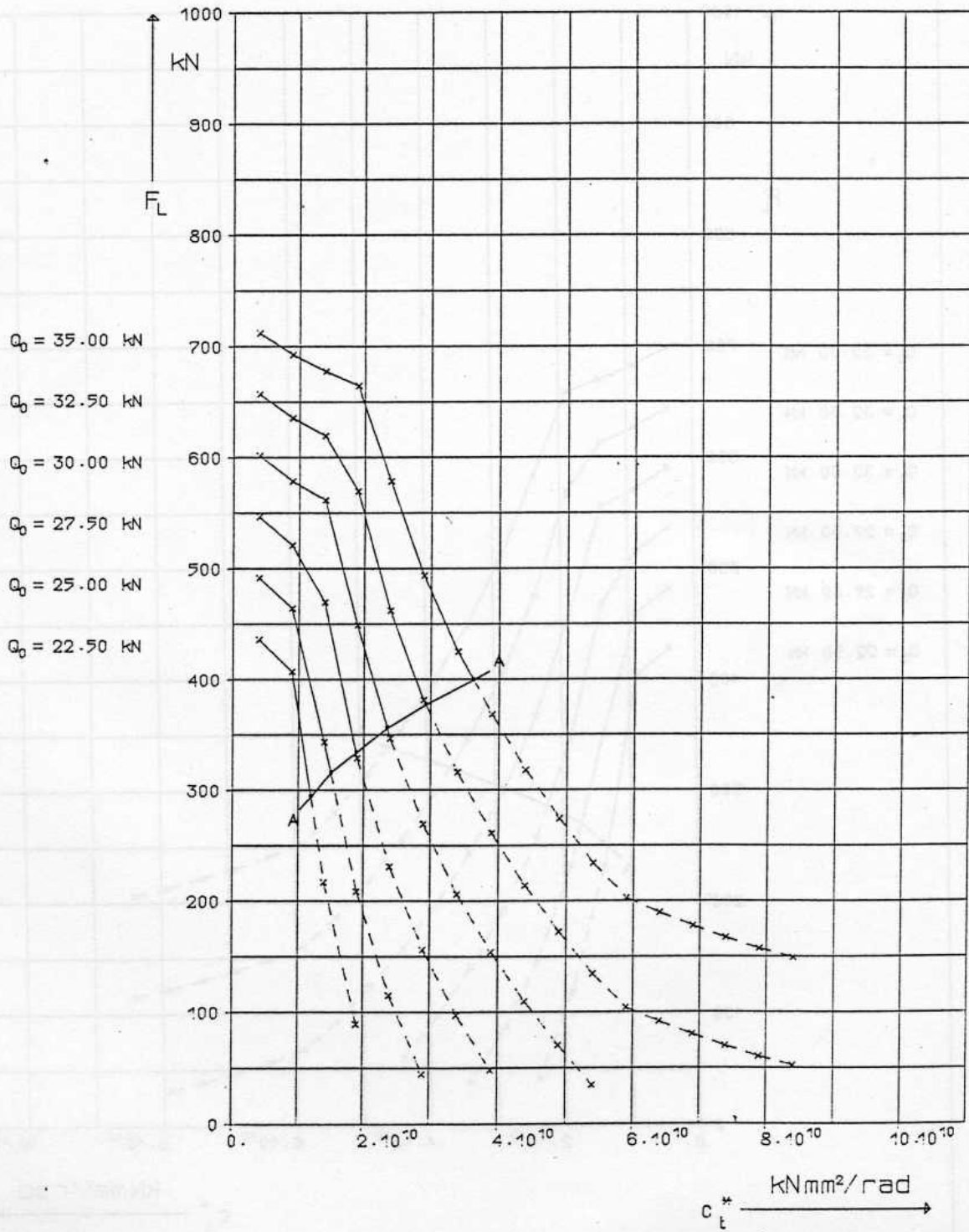
$$h_0 = 11000 \text{ mm}$$

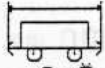
$$2a^* = 7000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$



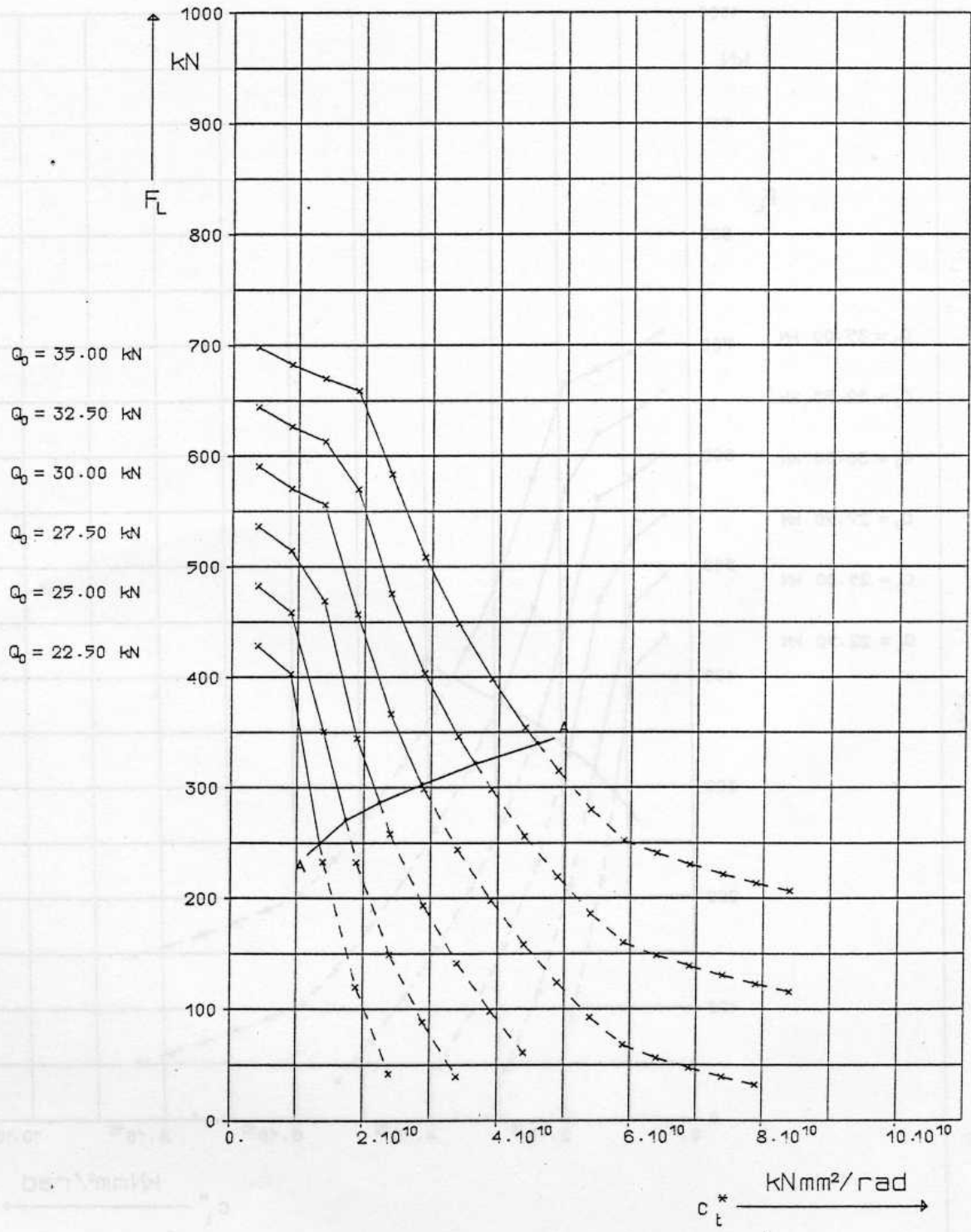


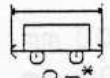
$$h_0 = 11500 \text{ mm}$$

$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*) \quad 0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 1,37 \text{ kN/mm}$$





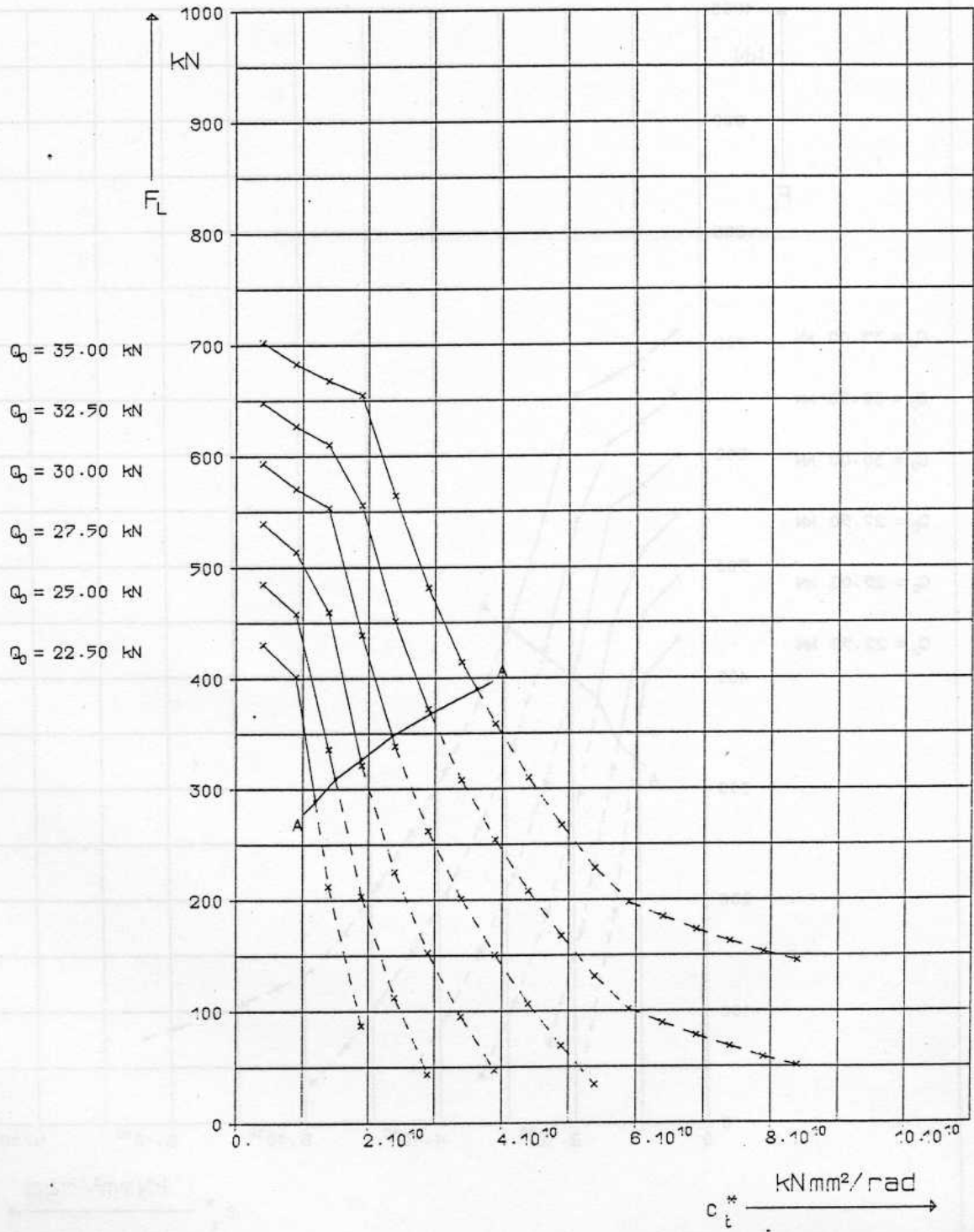
$$b = 11500 \text{ mm}$$

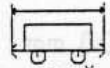
$$2a^* = 7000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





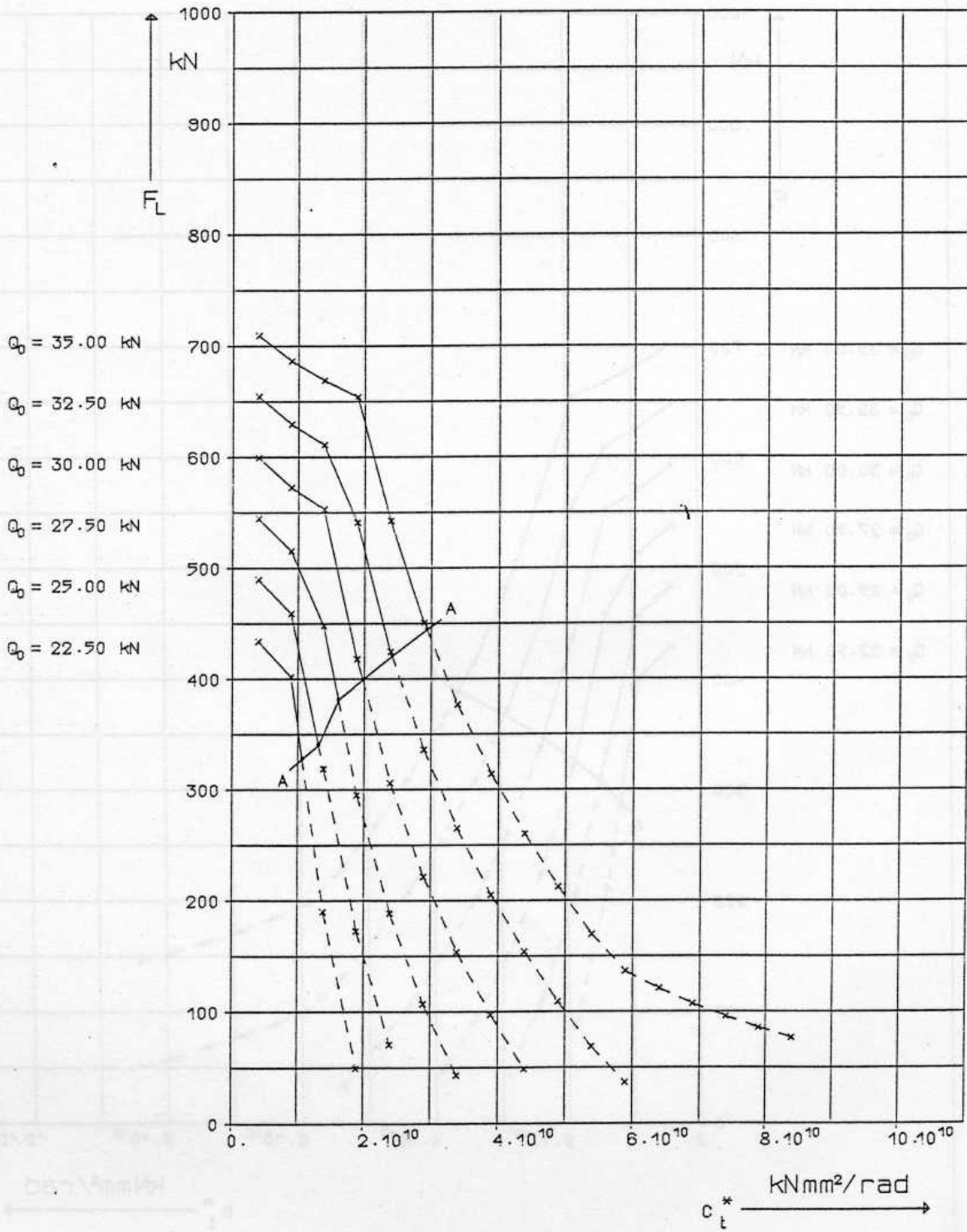
$$2a^* = 11500 \text{ mm}$$

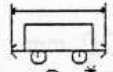
$$2a^* = 7500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





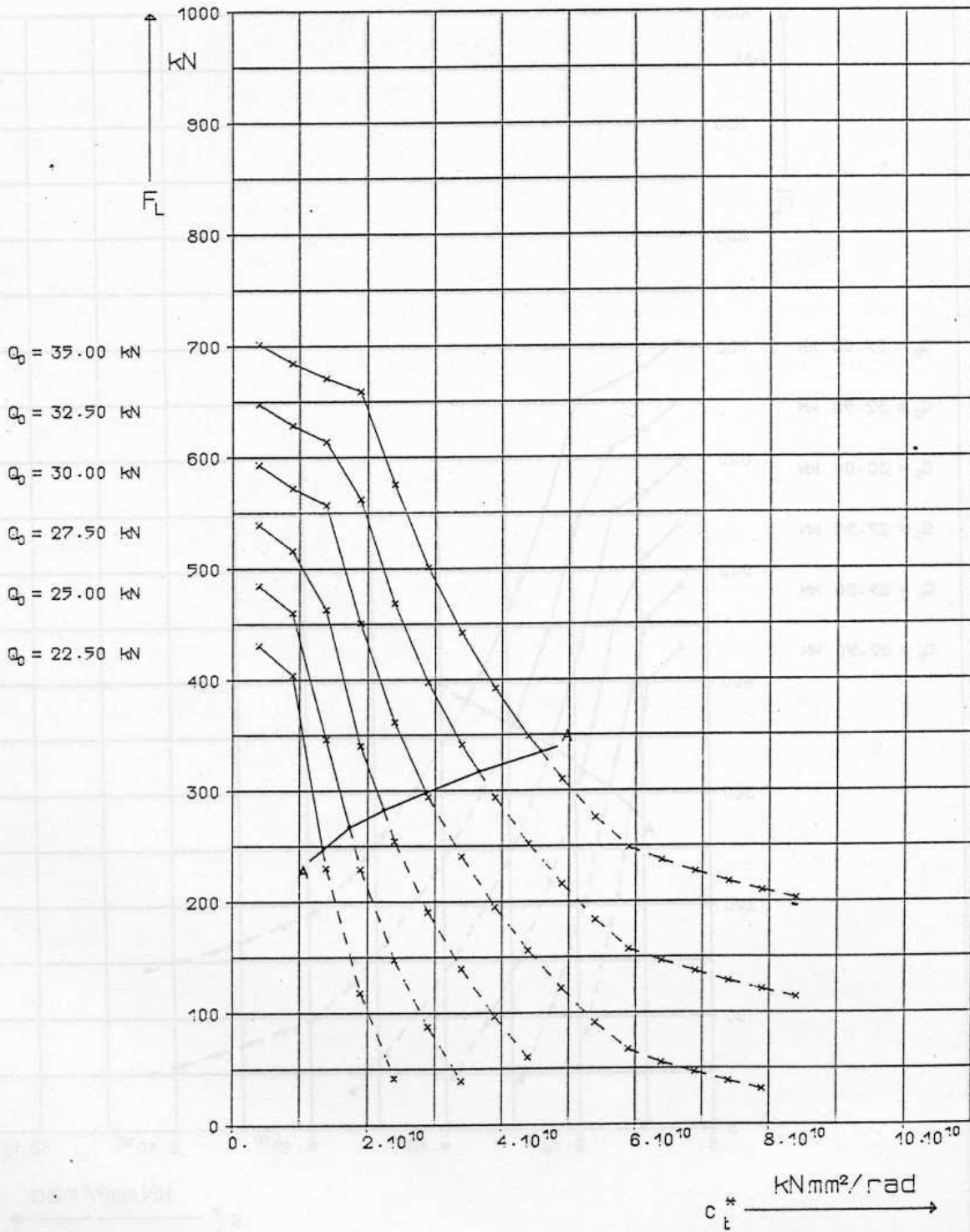
$$h_0 = 12000 \text{ mm}$$

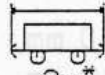
$$2a^* = 6500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 1,37 \text{ kN/mm}$$





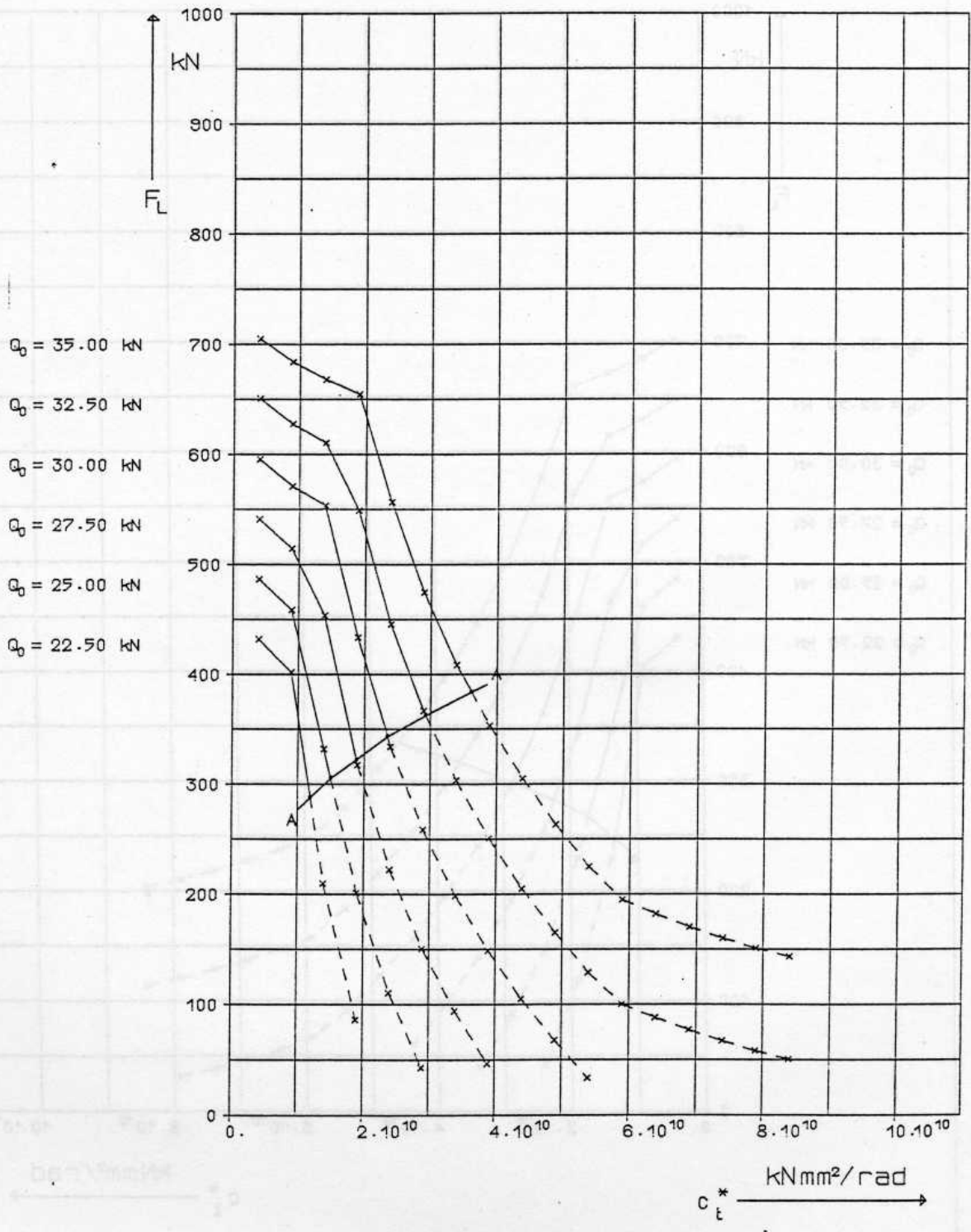
$$b = 12000 \text{ mm}$$

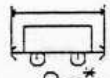
$$2a^* = 7000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$c_z = 1.37 \text{ kN/mm}$$





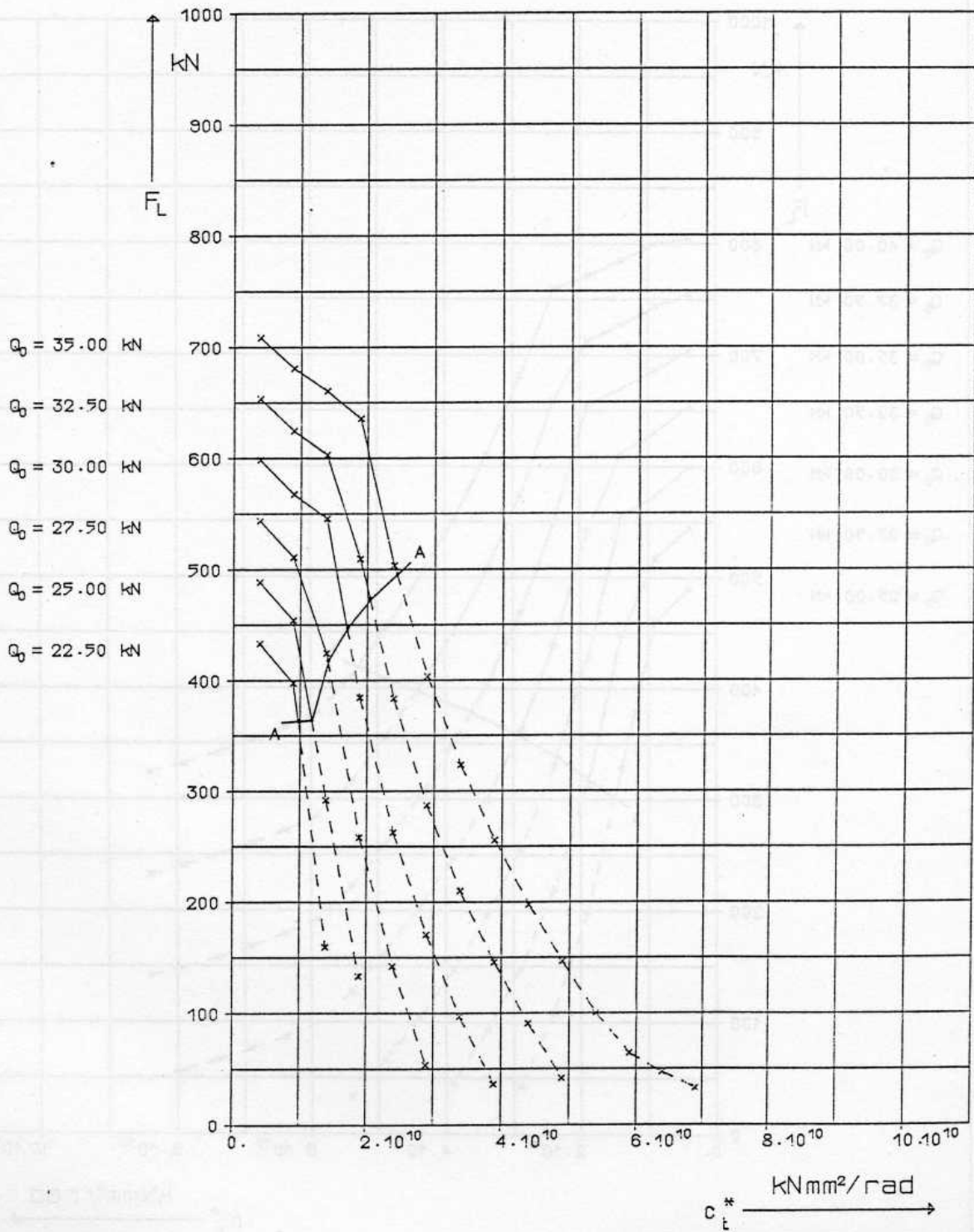
$$2a^* = 12000 \text{ mm}$$

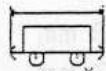
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





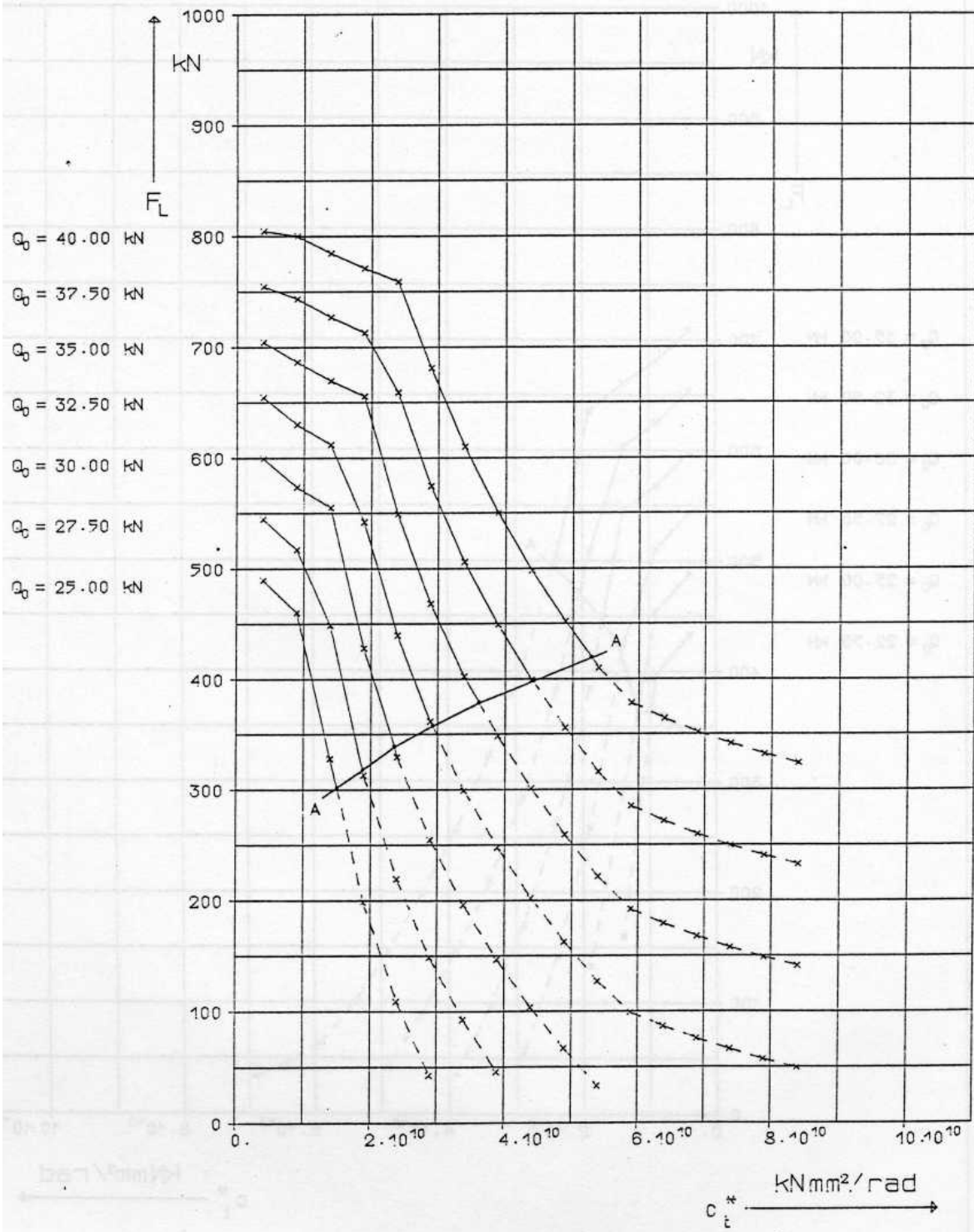
$$2a^* = 12500 \text{ mm}$$

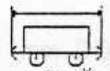
$$2a^* = 7000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,19 \leq \Delta q_0 \leq 0,23$$

$$c_z = 1,37 \text{ kN/mm}$$





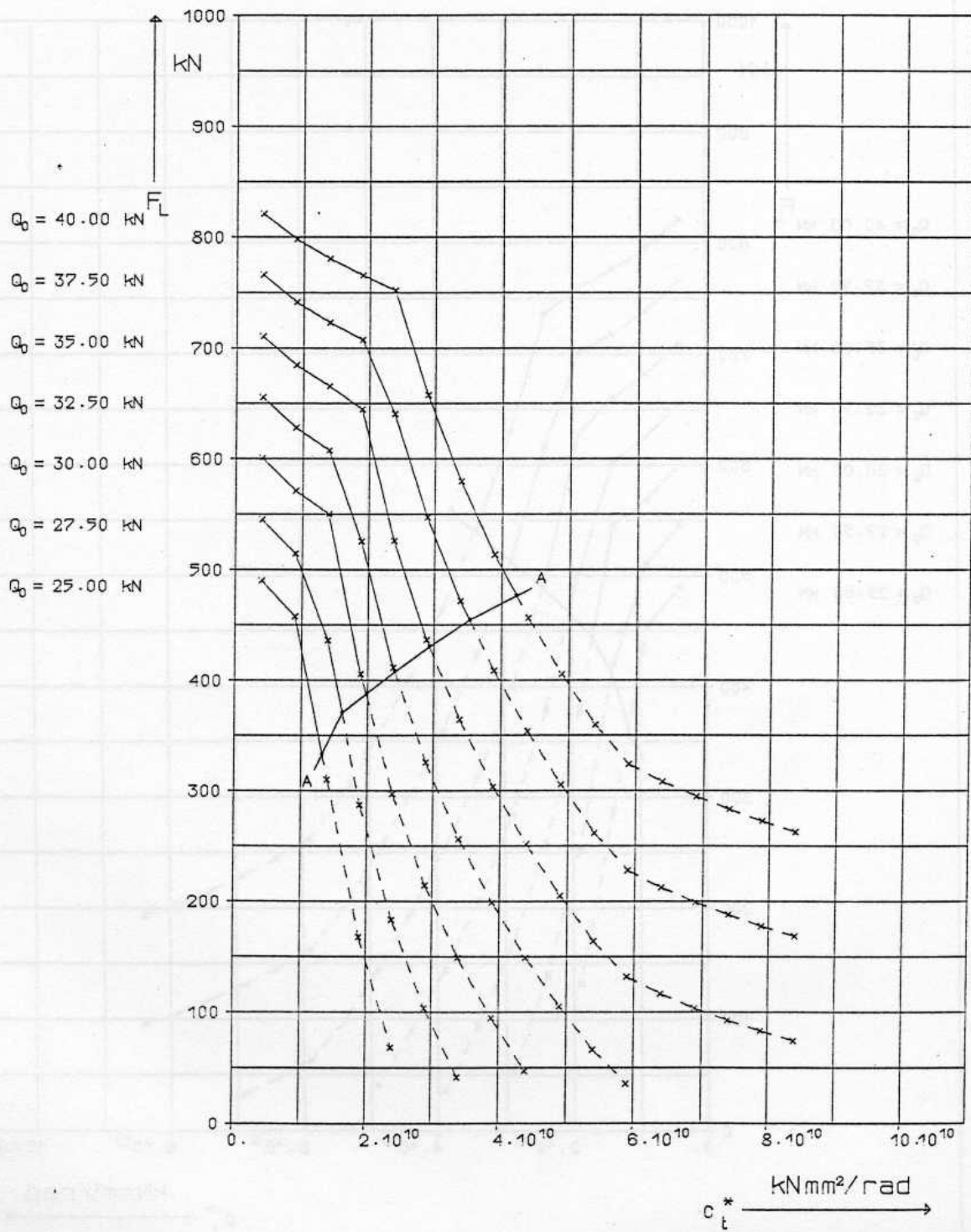
$$2a^* = 12500 \text{ mm}$$

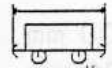
$$2a^* = 7500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





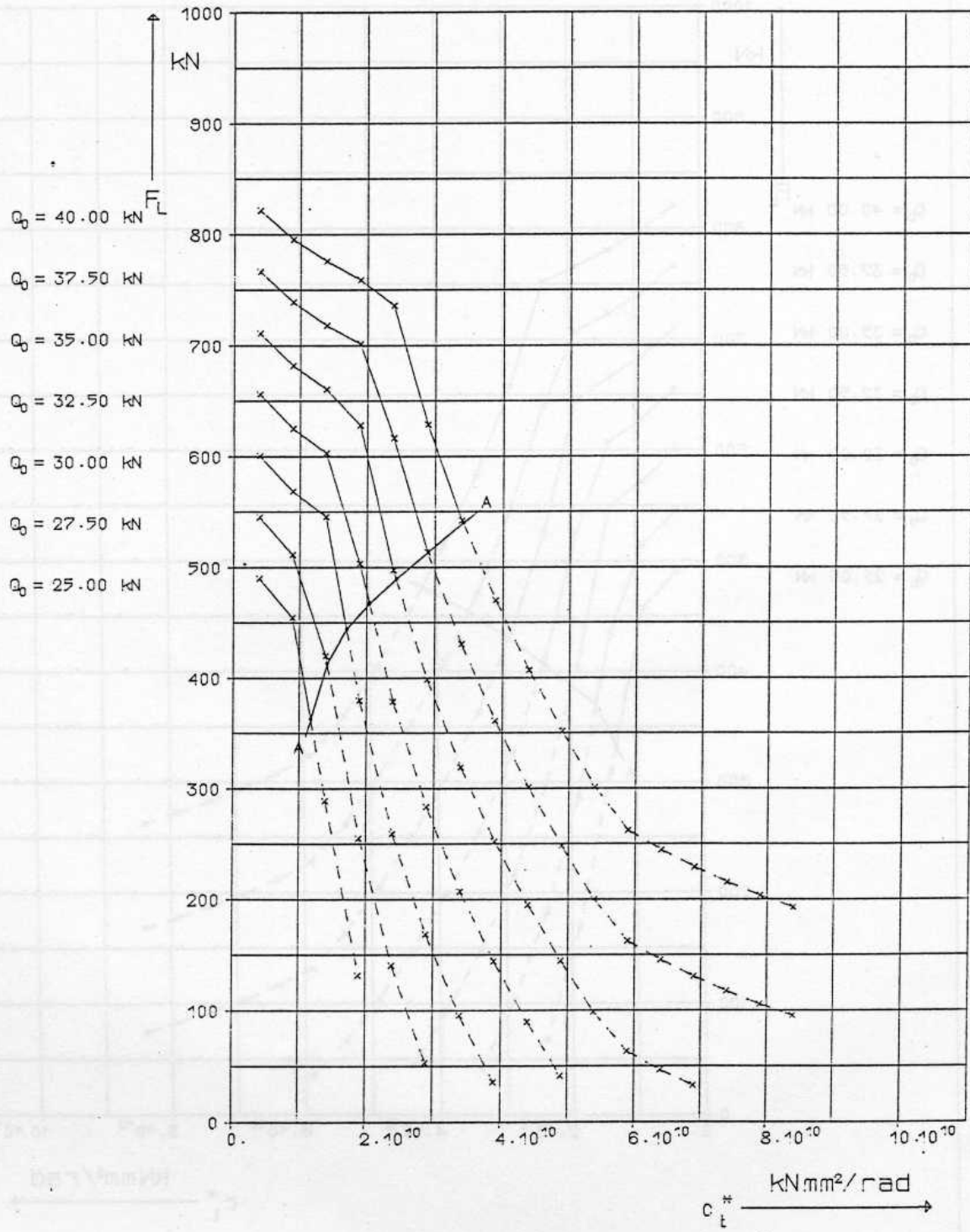
$$h_0 = 12500 \text{ mm}$$

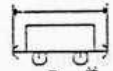
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





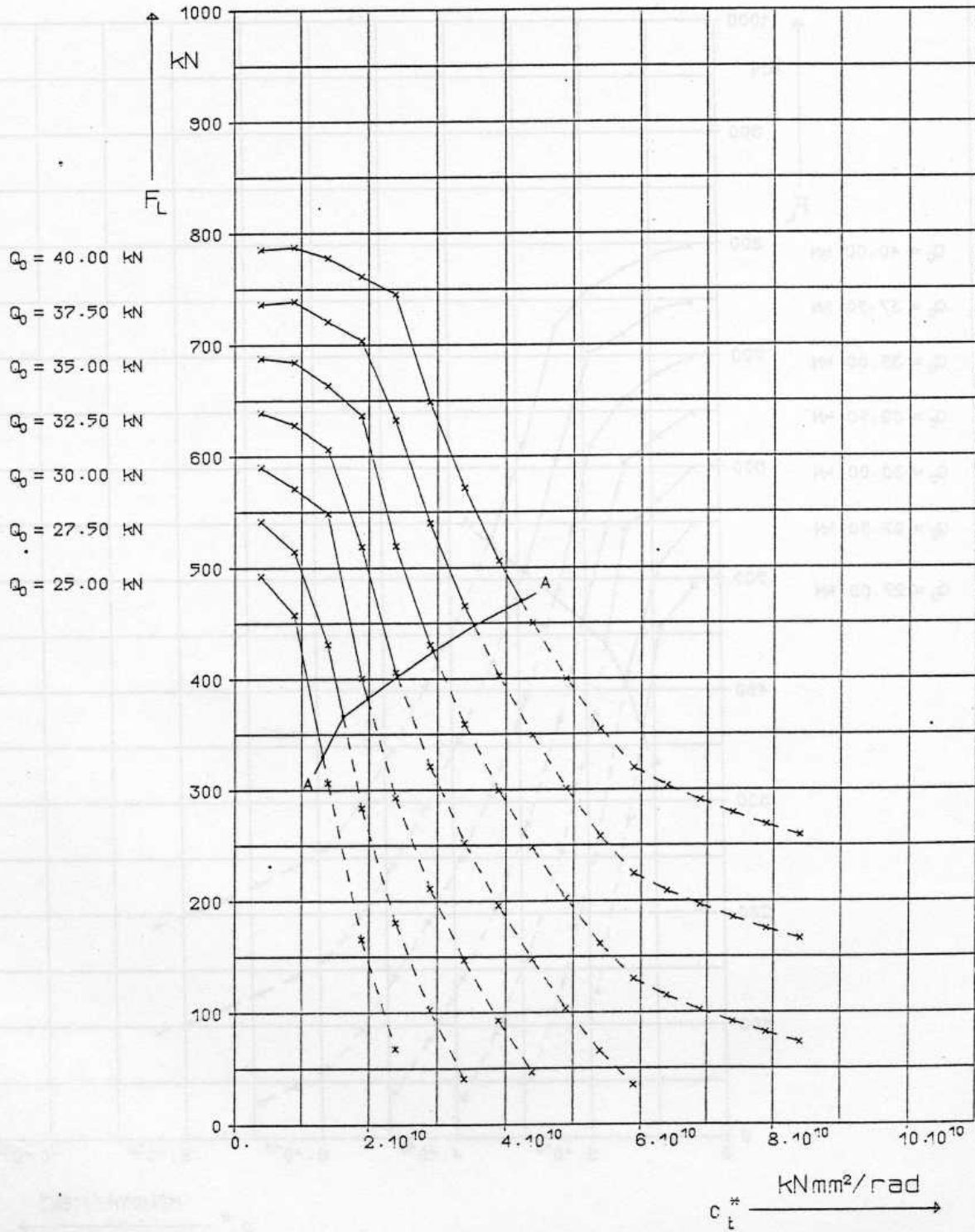
$$2a^* = 13000 \text{ mm}$$

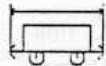
$$2a^* = 7500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





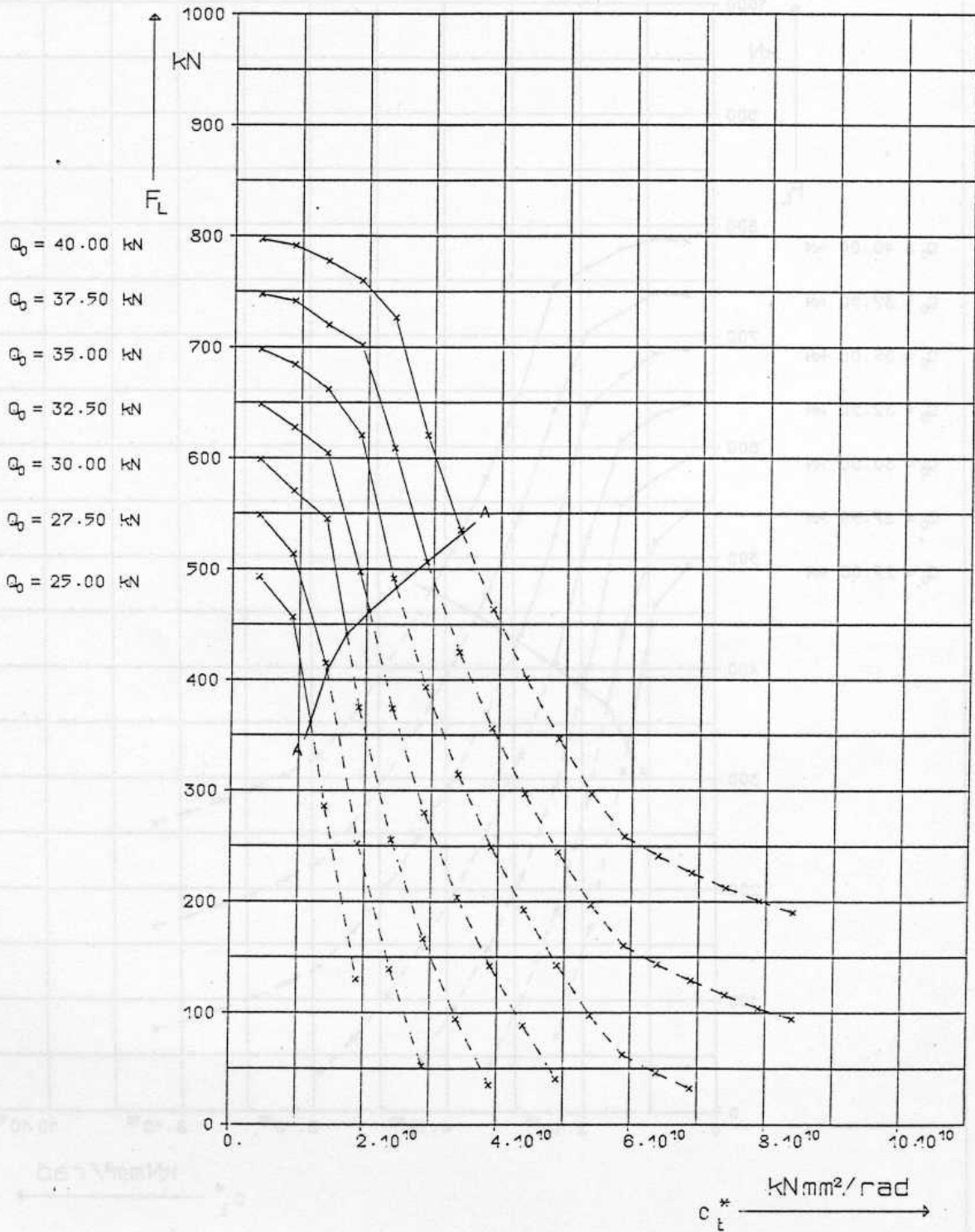
$$2a^* = 13000 \text{ mm}$$

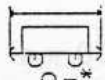
$$b = 8000 \text{ mm}$$

$$\Delta \alpha_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta \alpha_0 \leq 0.23$$





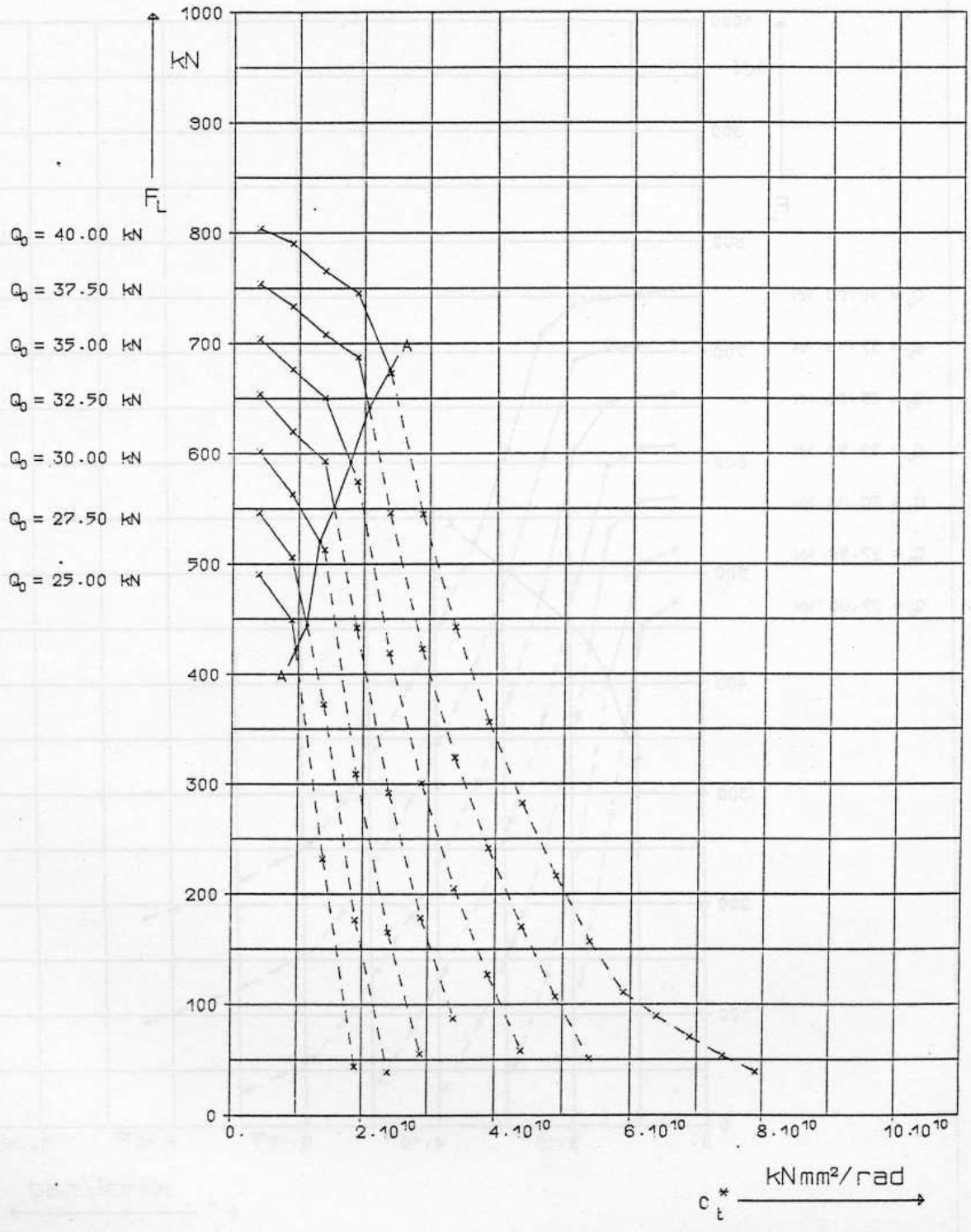
$$2a^* = 13000 \text{ mm}$$

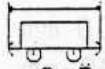
$$2a^* = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





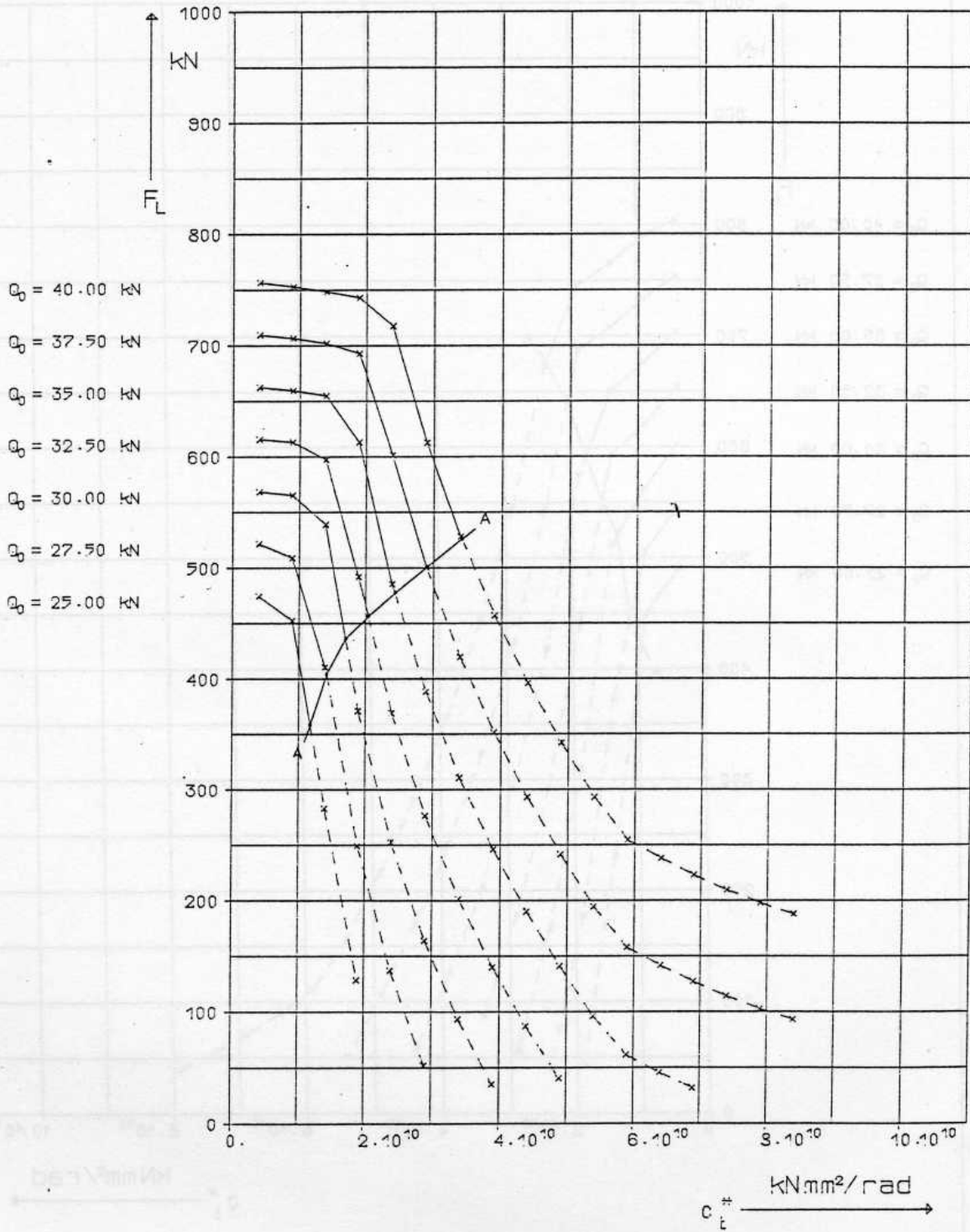
$$2a^* = 13500 \text{ mm}$$

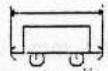
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





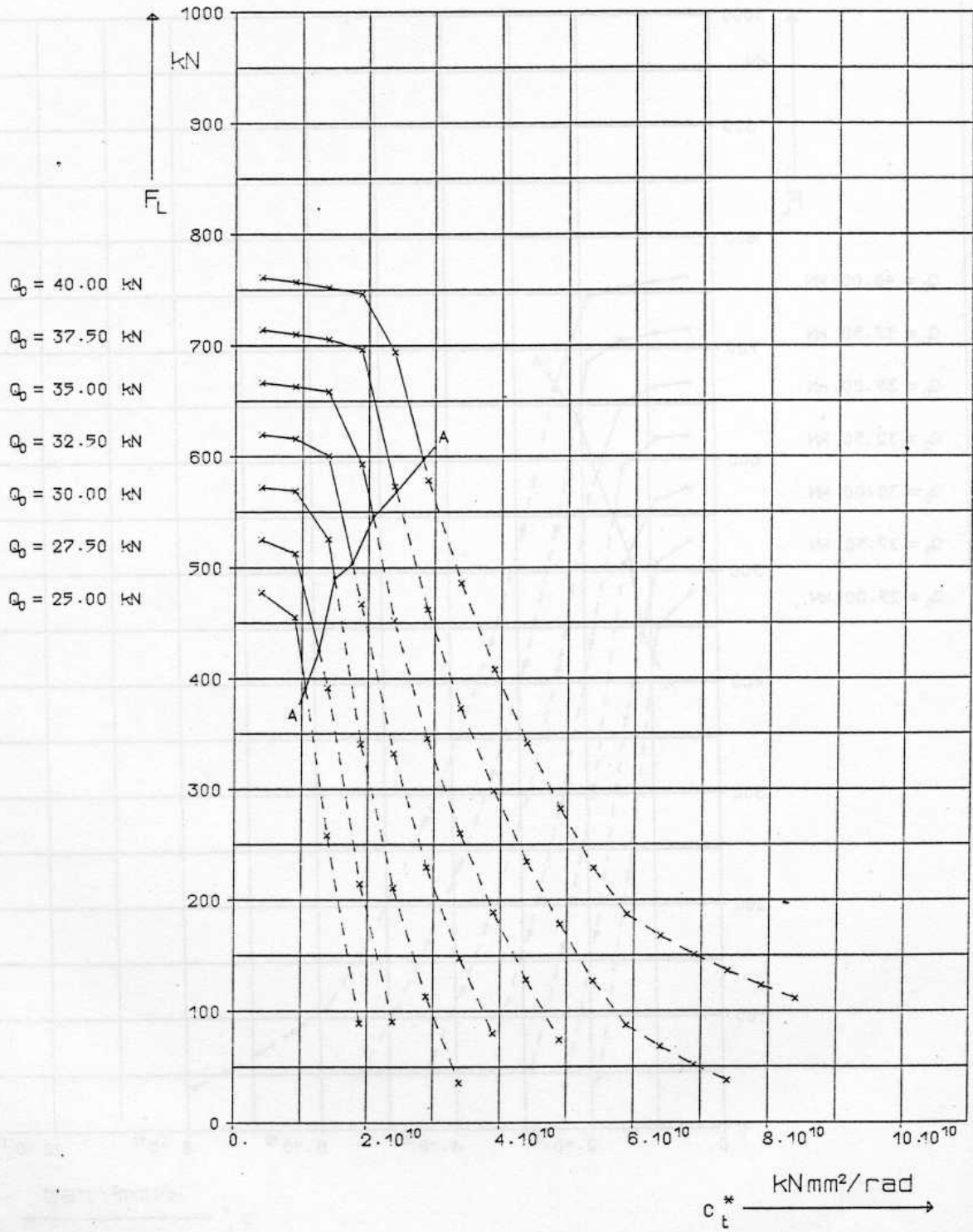
$$h = 13500 \text{ mm}$$

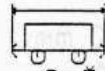
$$2a^* = 8500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





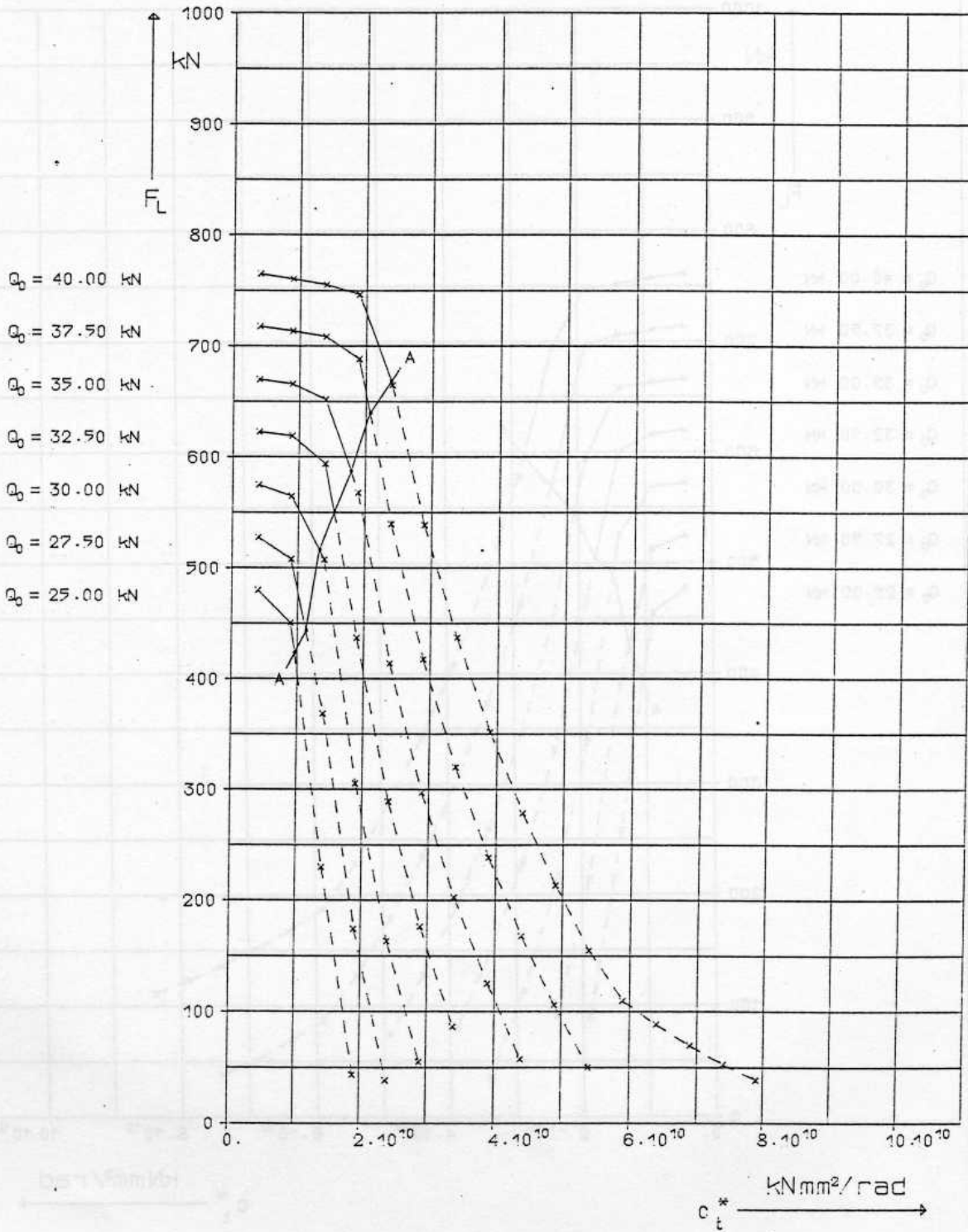
$$b = 13500 \text{ mm}$$

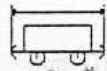
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





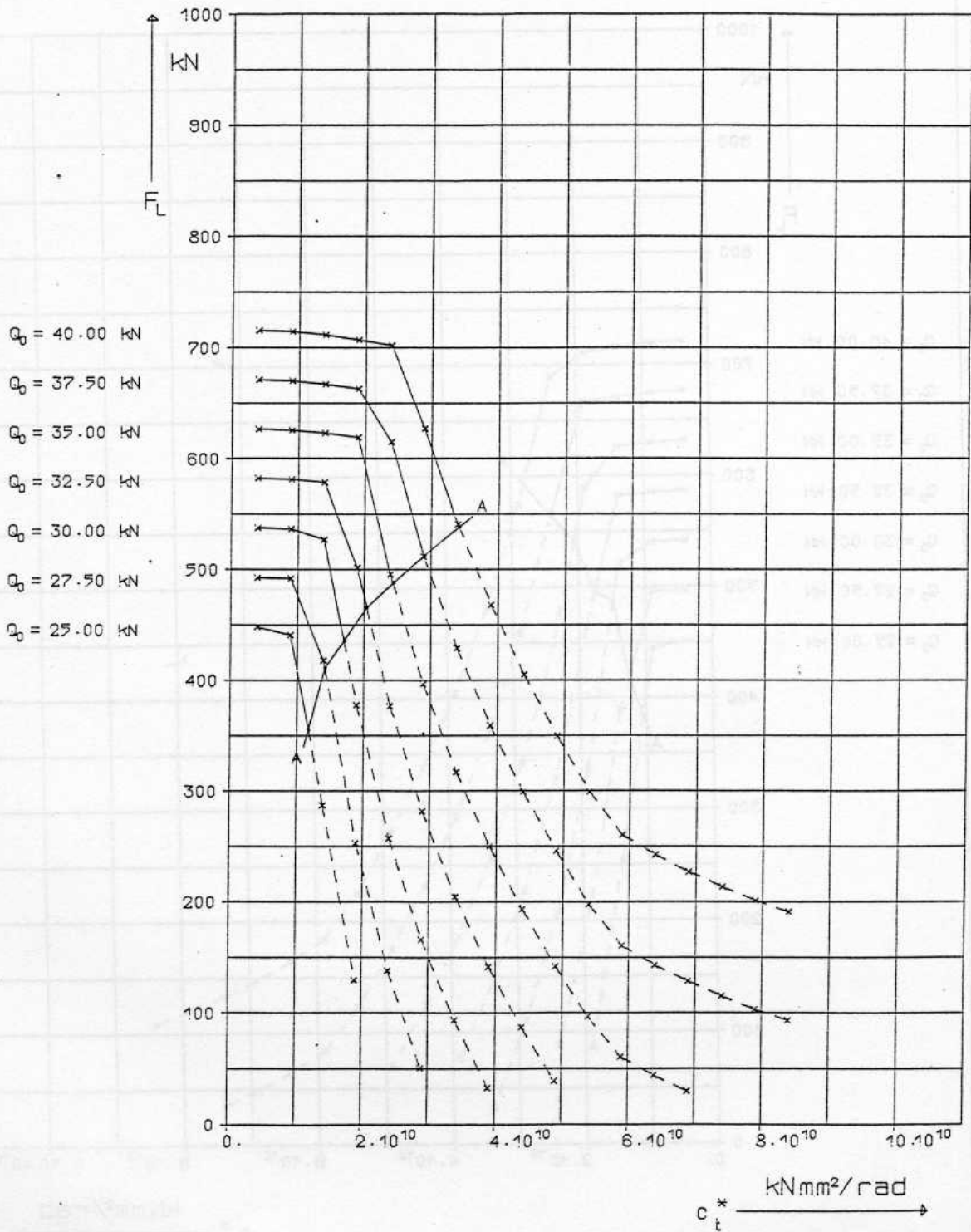
$$2a^* = 14000 \text{ mm}$$

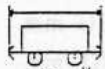
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





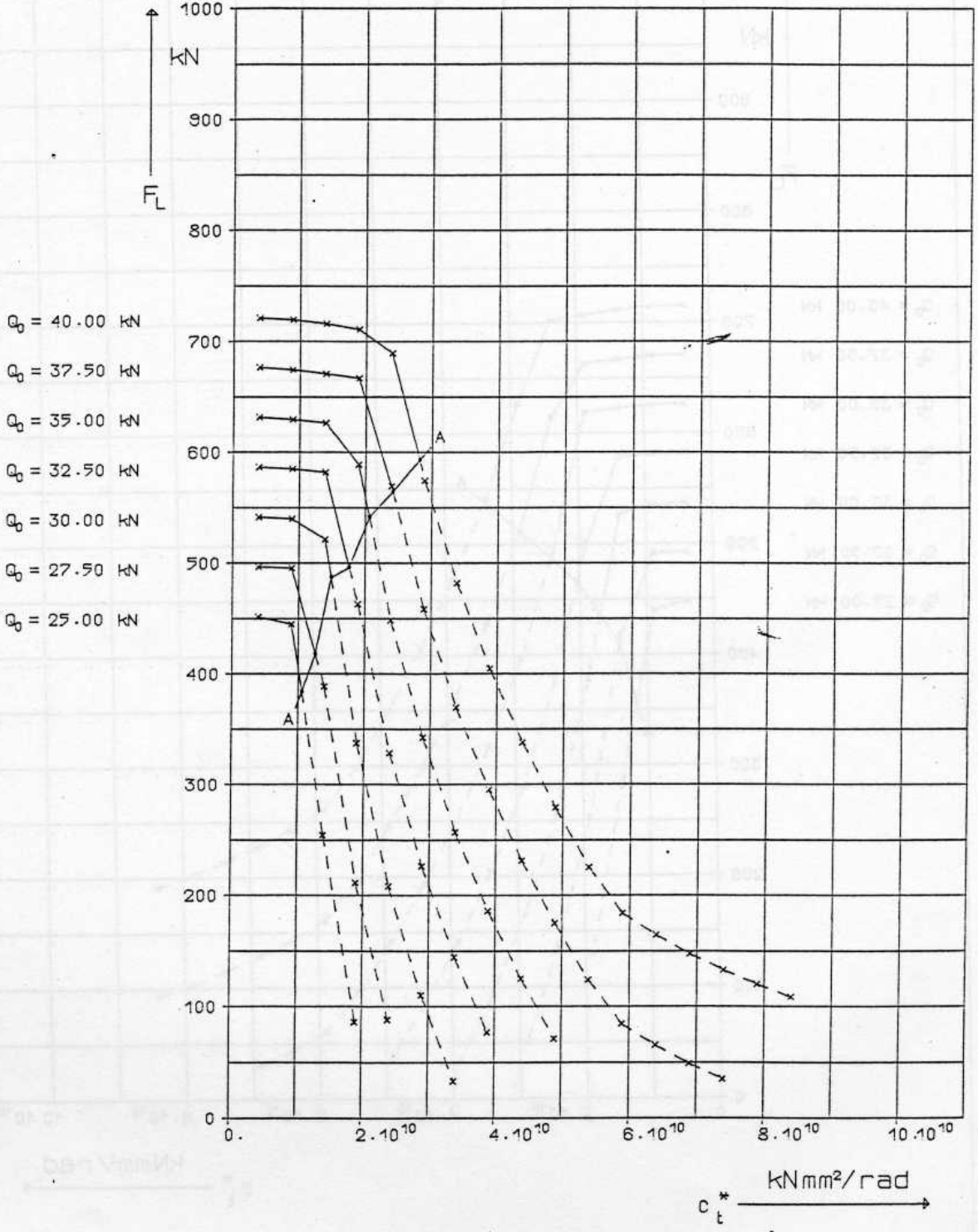
$$2a^* = 14000 \text{ mm}$$

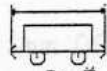
$$2a^* = 8500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





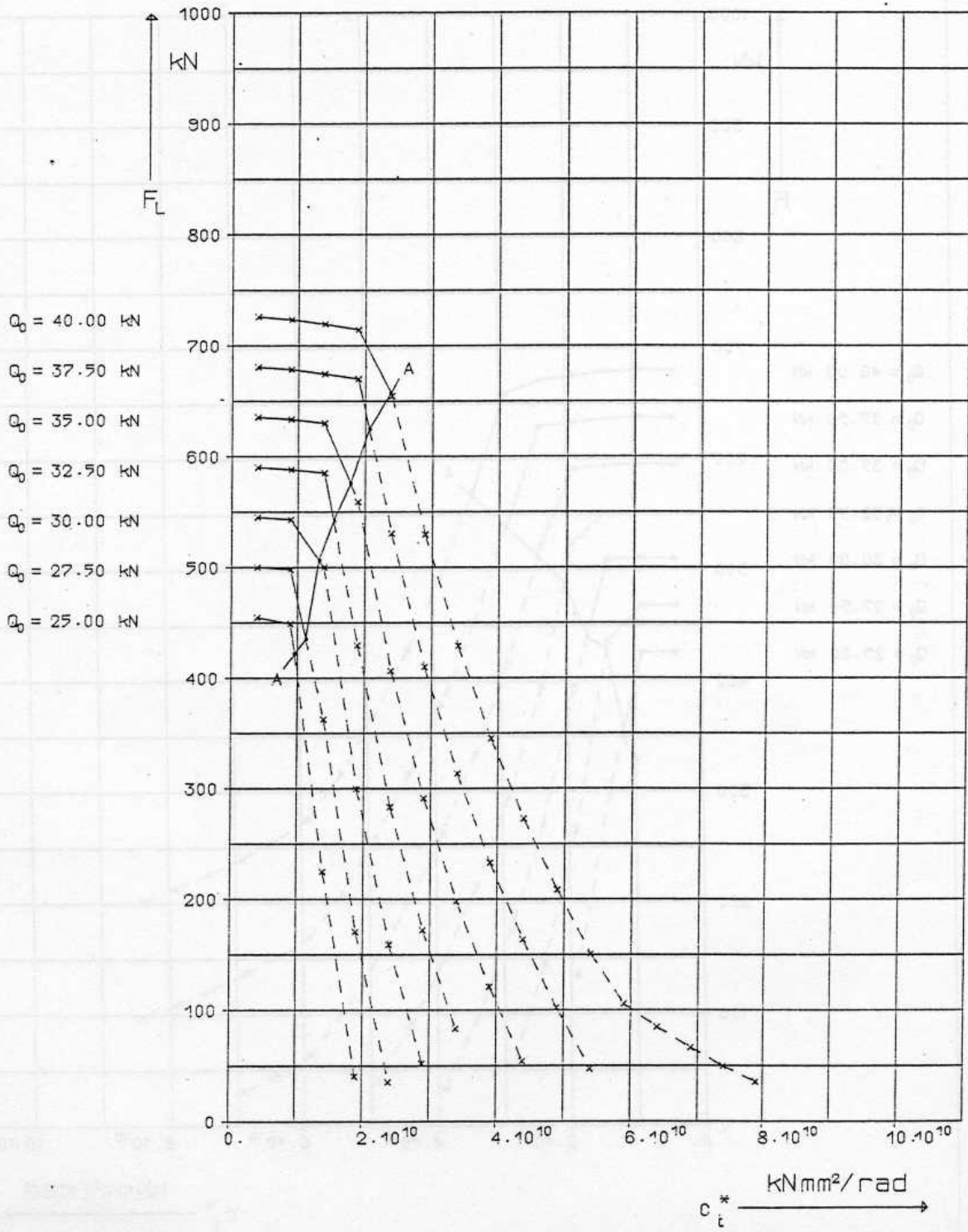
$$2a^* = 14000 \text{ mm}$$

$$b = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$



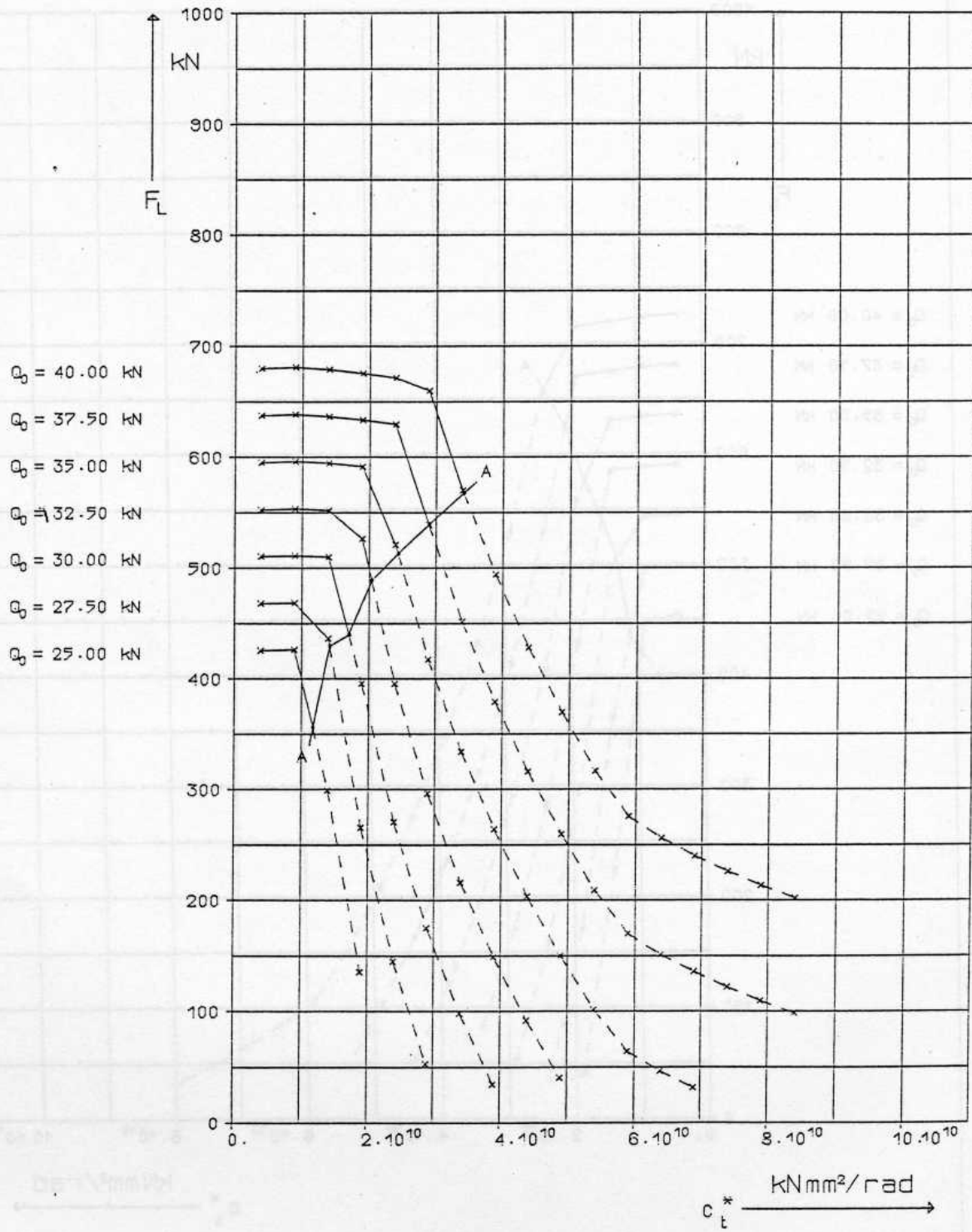
$$\boxed{} = 14500 \text{ mm}$$

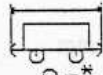
$$2a^* = 8000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





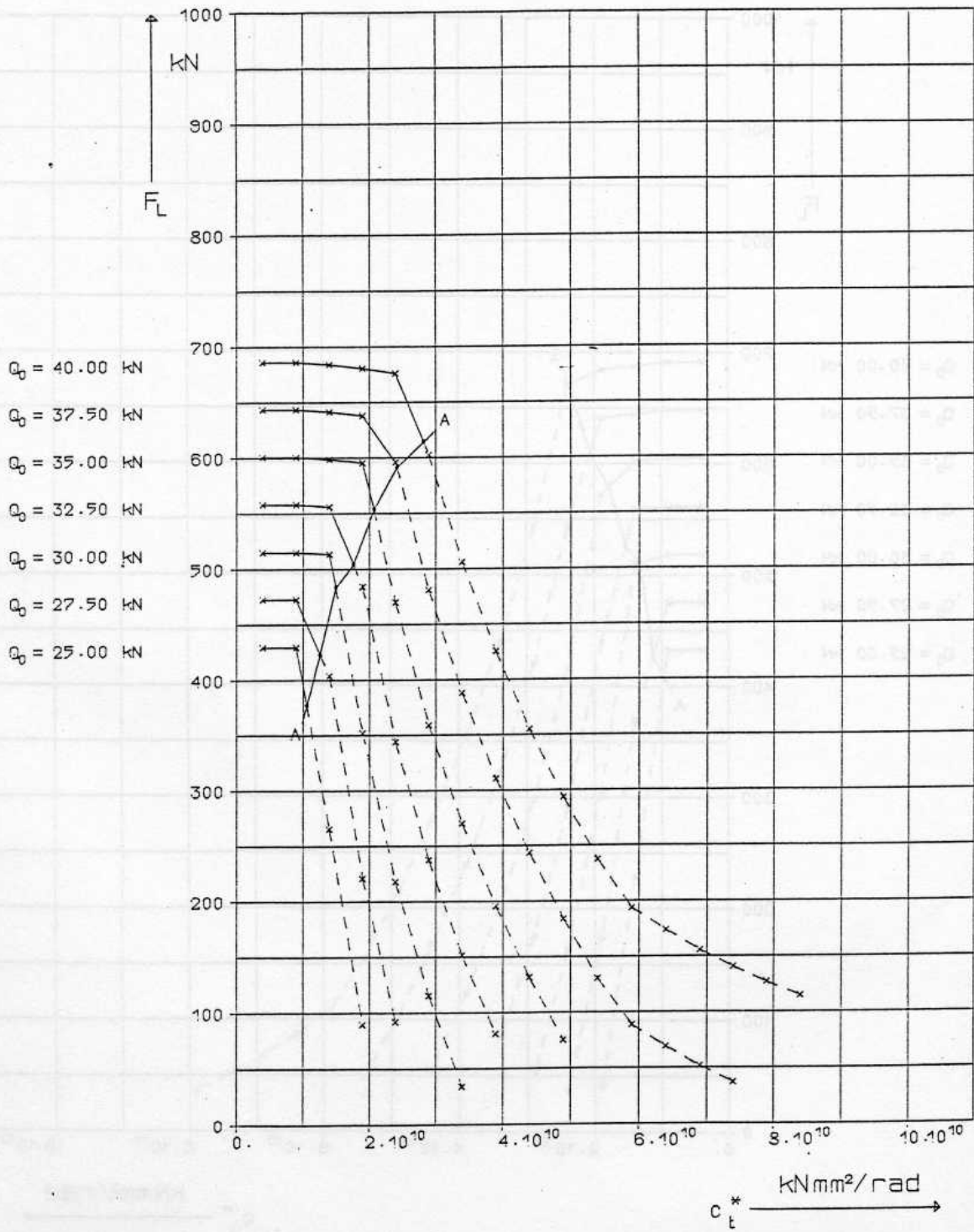
$$2a^* = 14500 \text{ mm}$$

$$b = 8500 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 1,37 \text{ kN/mm}$$



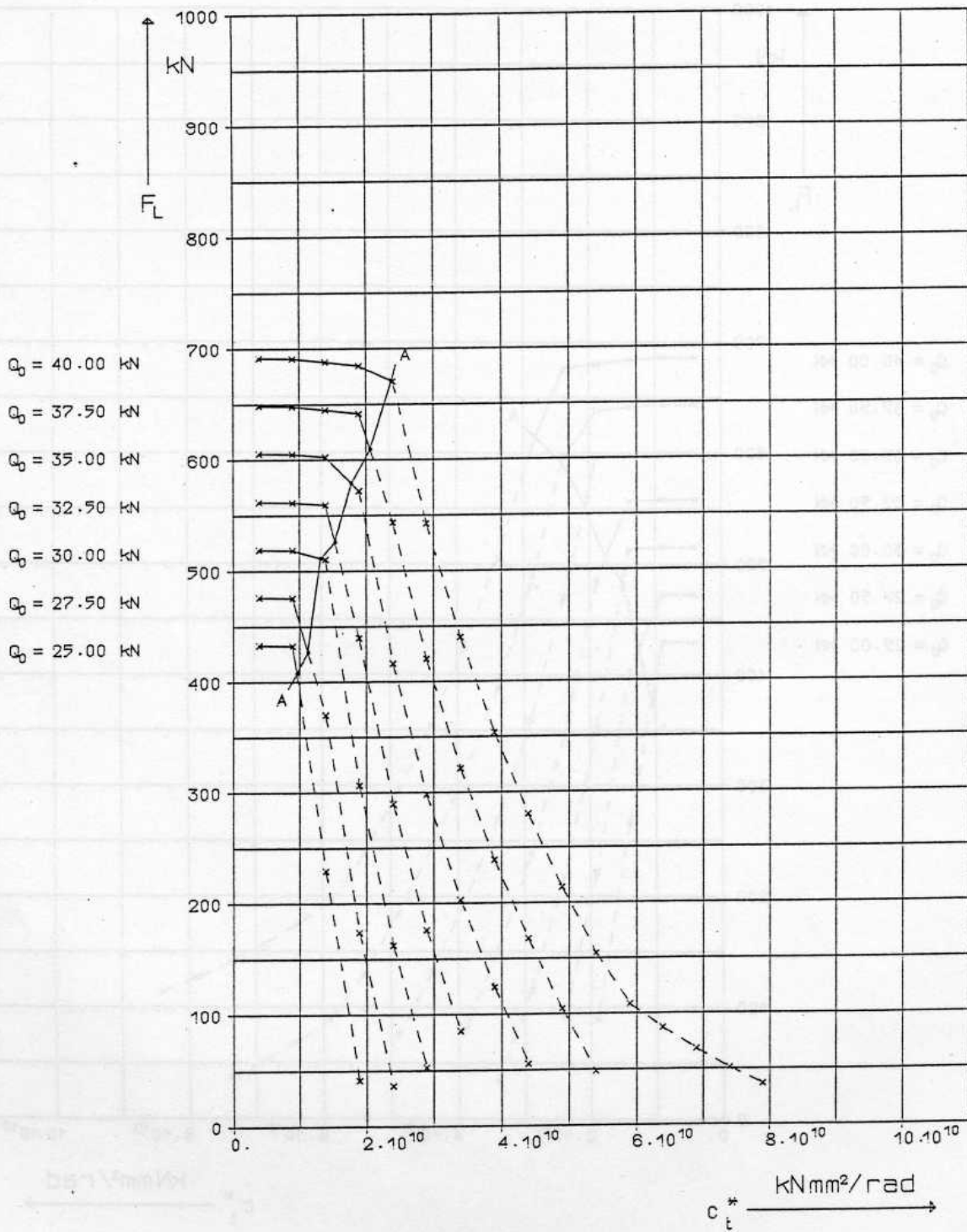
$$\boxed{} = 14500 \text{ mm}$$

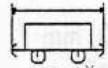
$$2a^* = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





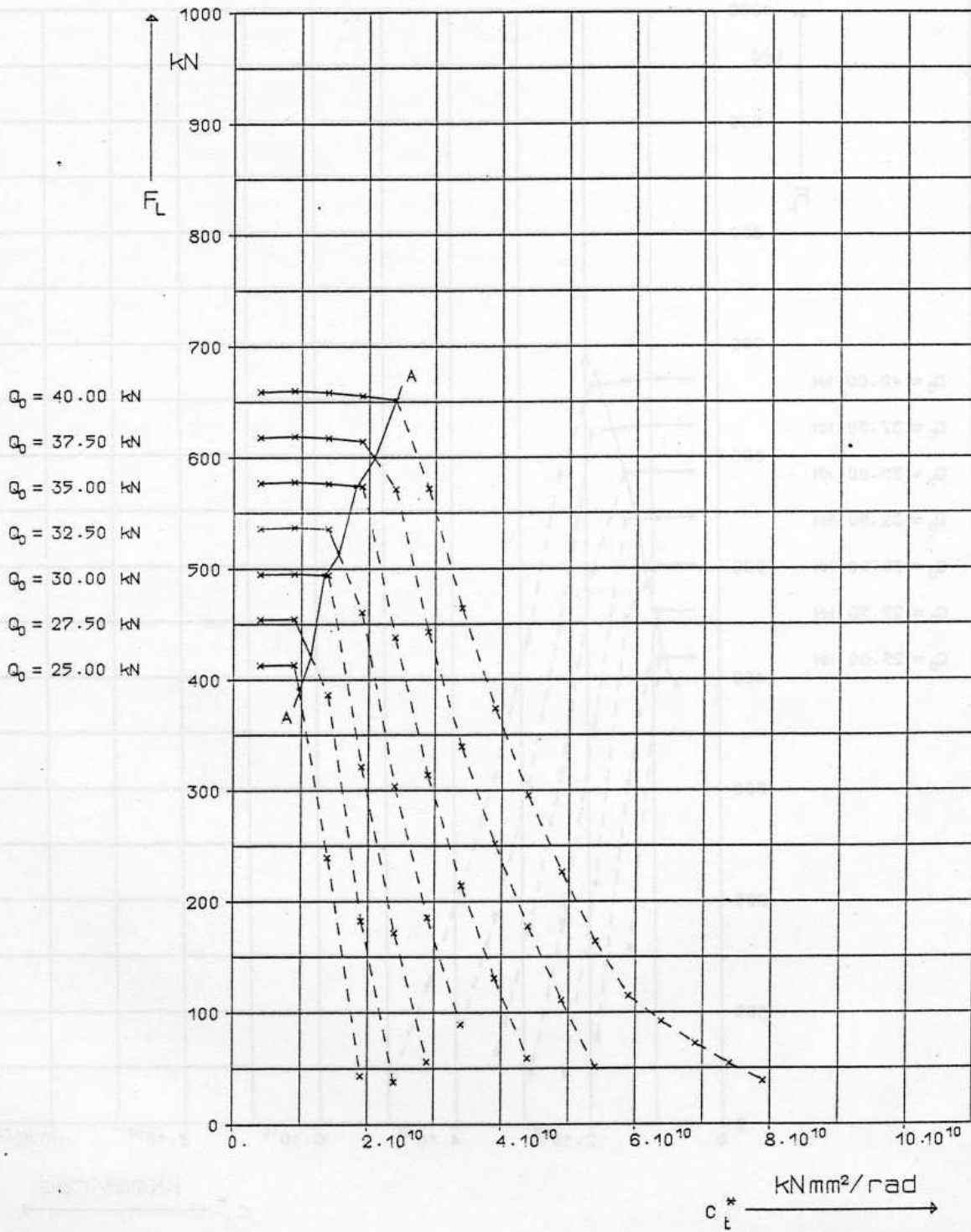
$$h_0 = 15000 \text{ mm}$$

$$2a^* = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0,15 \leq \Delta q_0 \leq 0,23$$

$$c_z = 1,37 \text{ kN/mm}$$



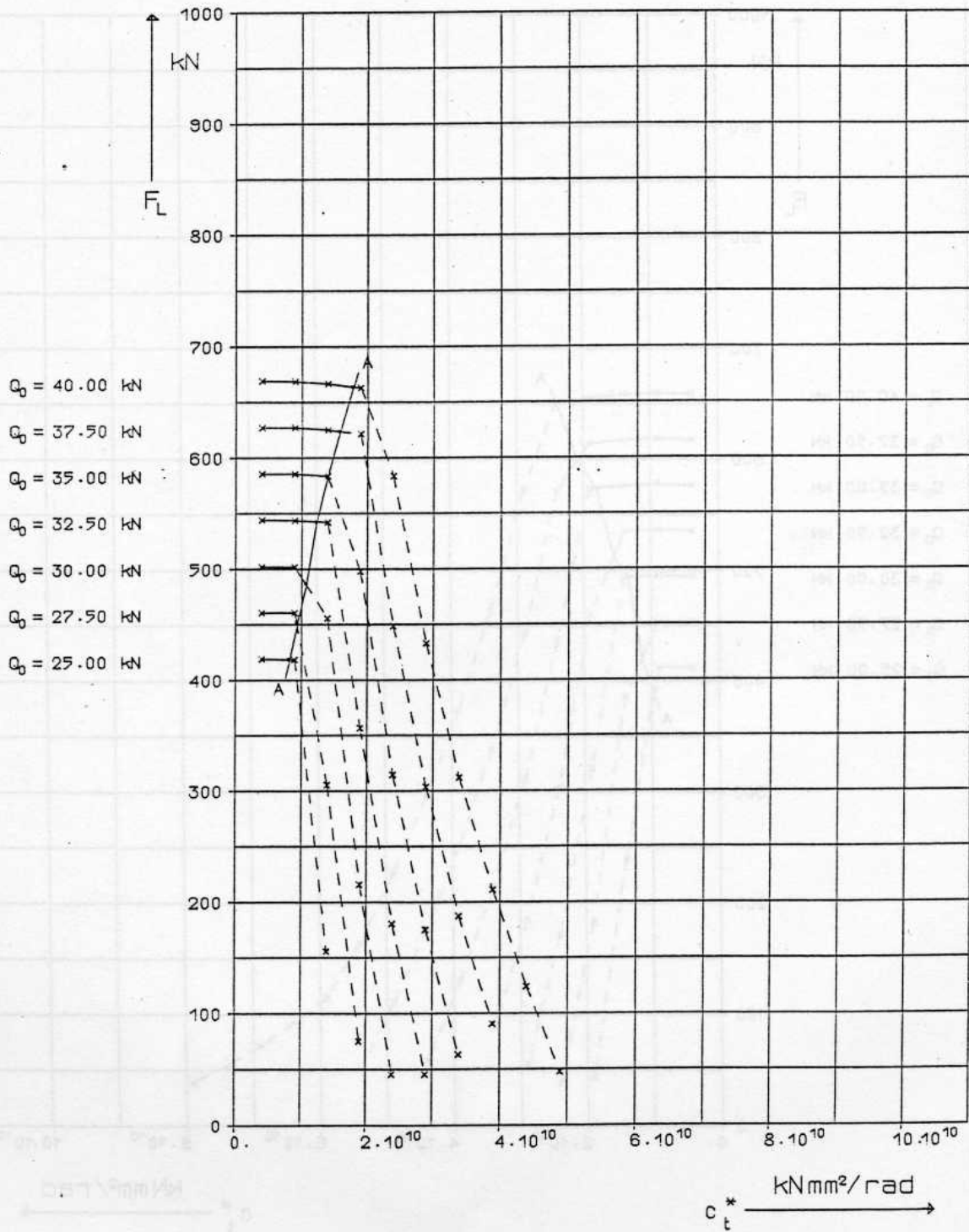
$$\frac{b}{a} = 15000 \text{ mm}$$

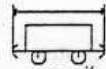
$$2a^* = 10000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





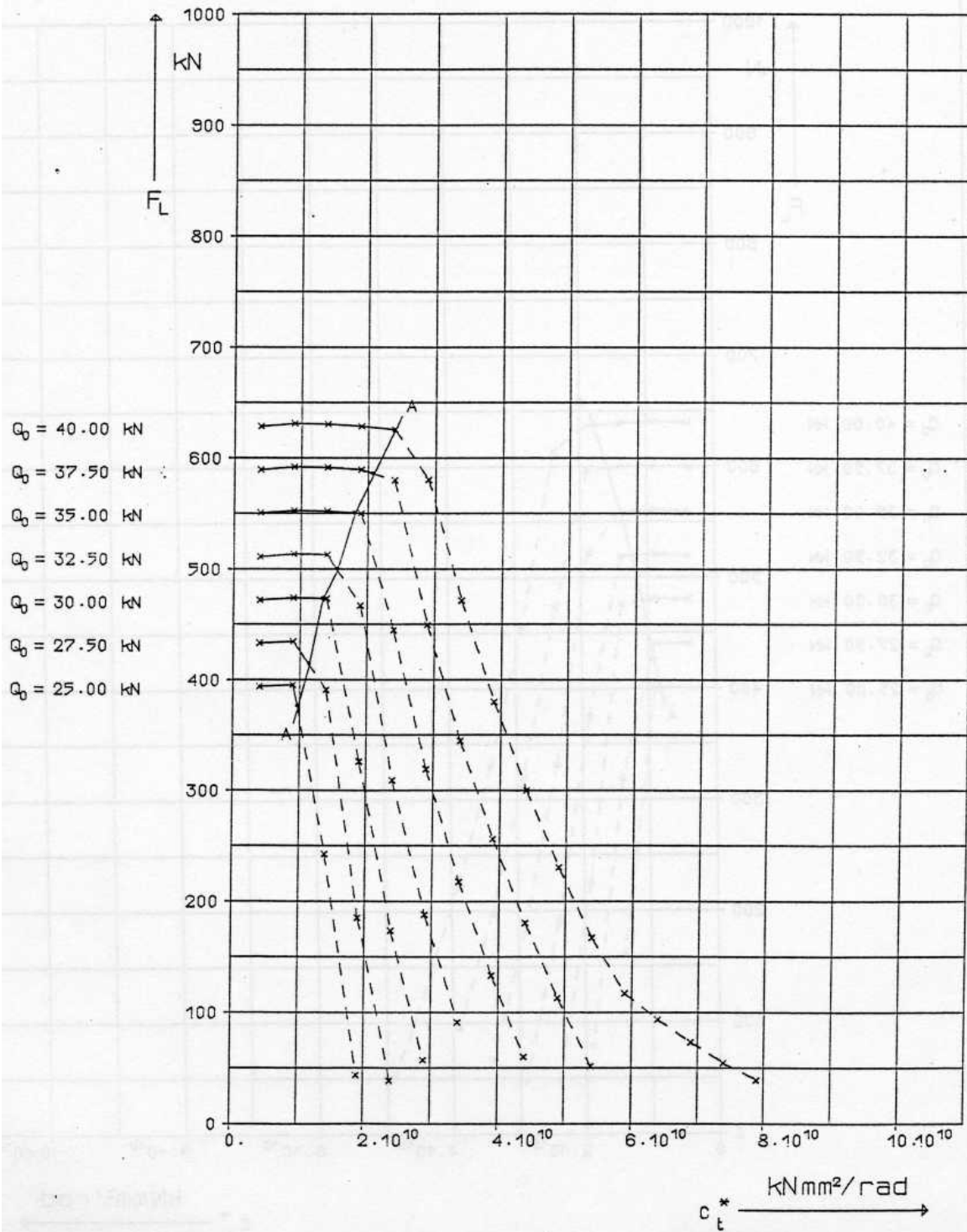
$$2a^* = 15500 \text{ mm}$$

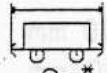
$$2a^* = 9000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





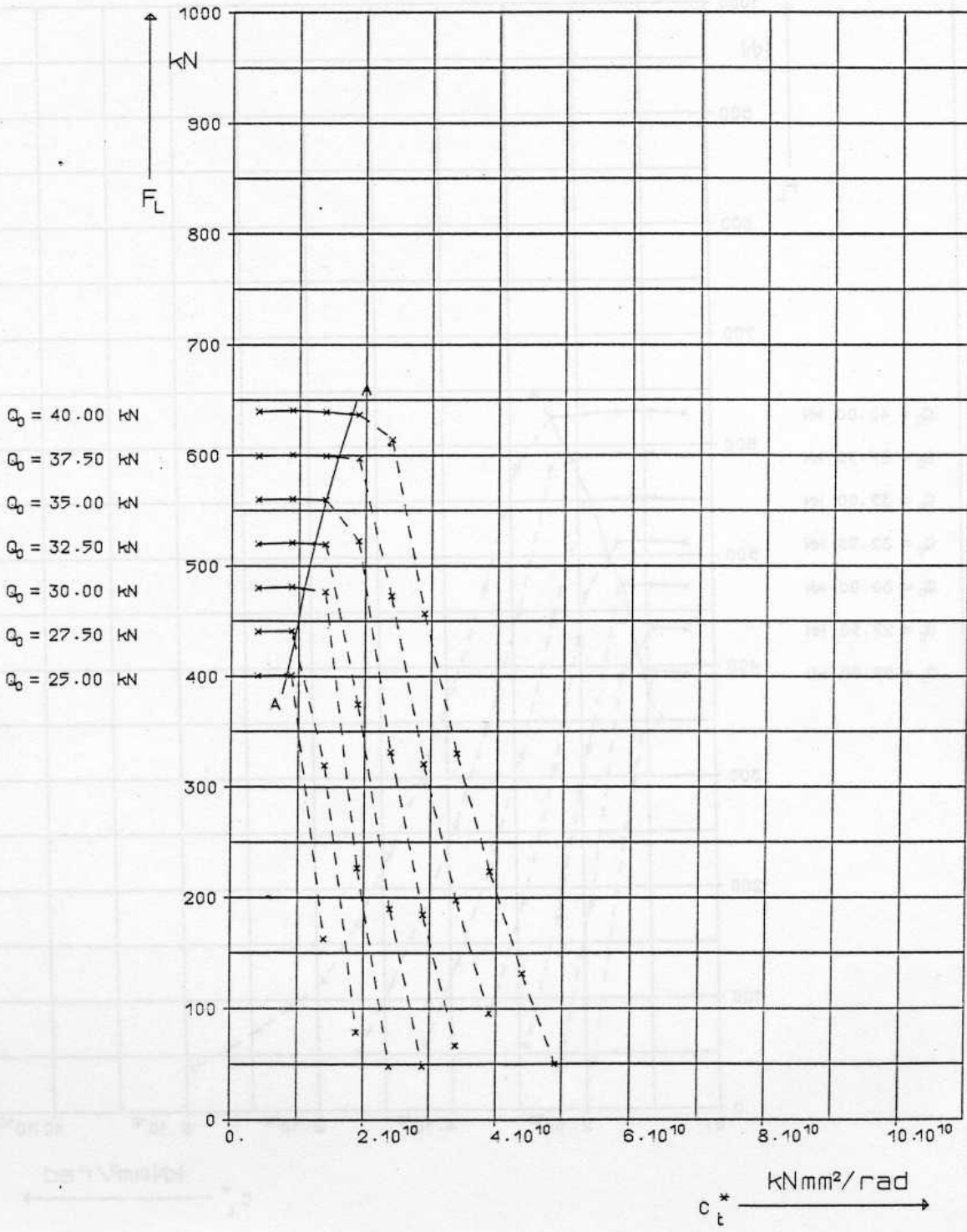
$$2a^* = 15500 \text{ mm}$$

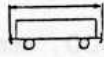
$$2a^* = 10000 \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$c_z = 1.37 \text{ kN/mm}$$

$$0.15 \leq \Delta q_0 \leq 0.23$$





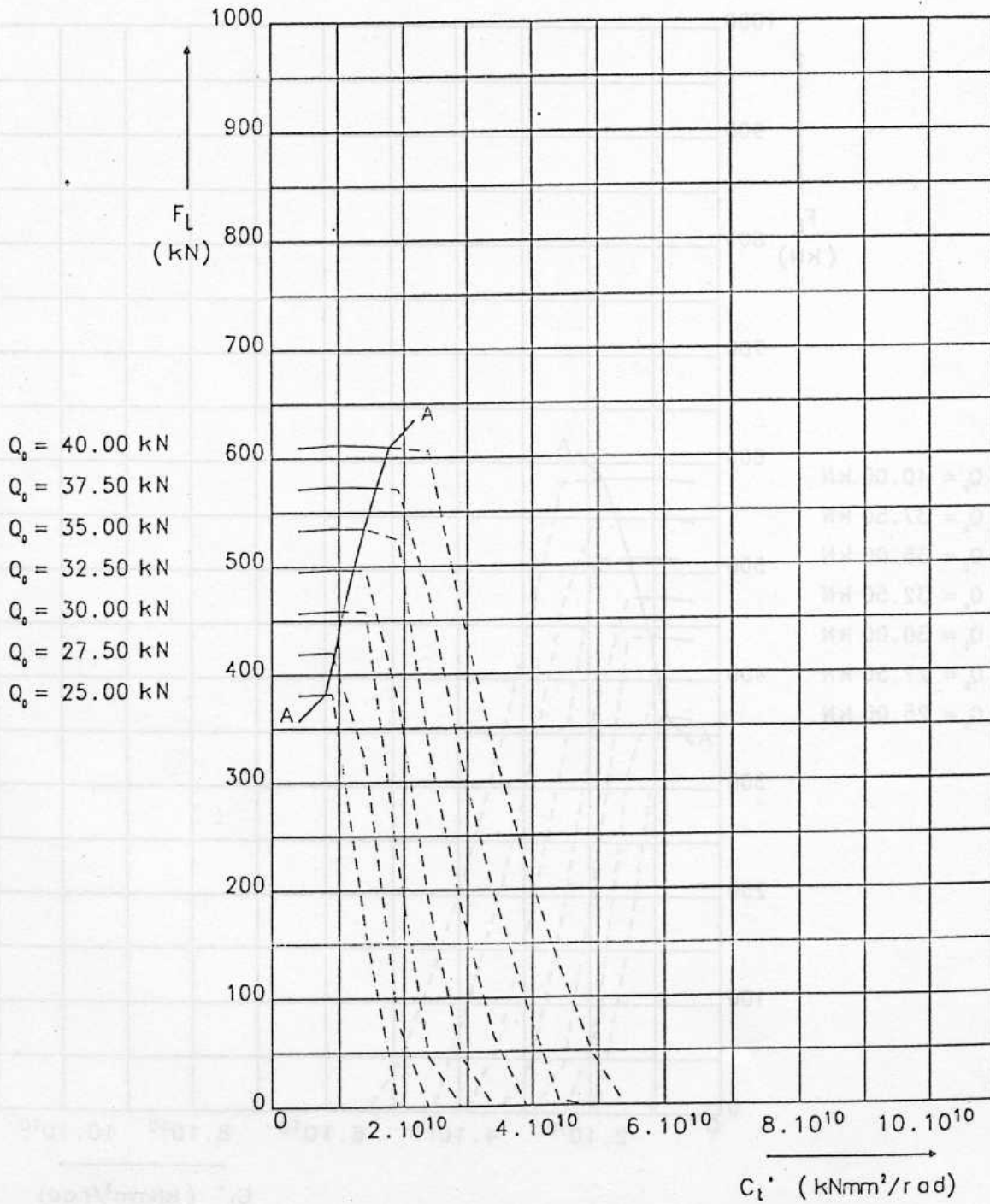
$$= 16000. \text{ mm}$$

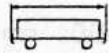
$$2a^* = 10000. \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$C_z = 1.37 \text{ kN/mm}$$





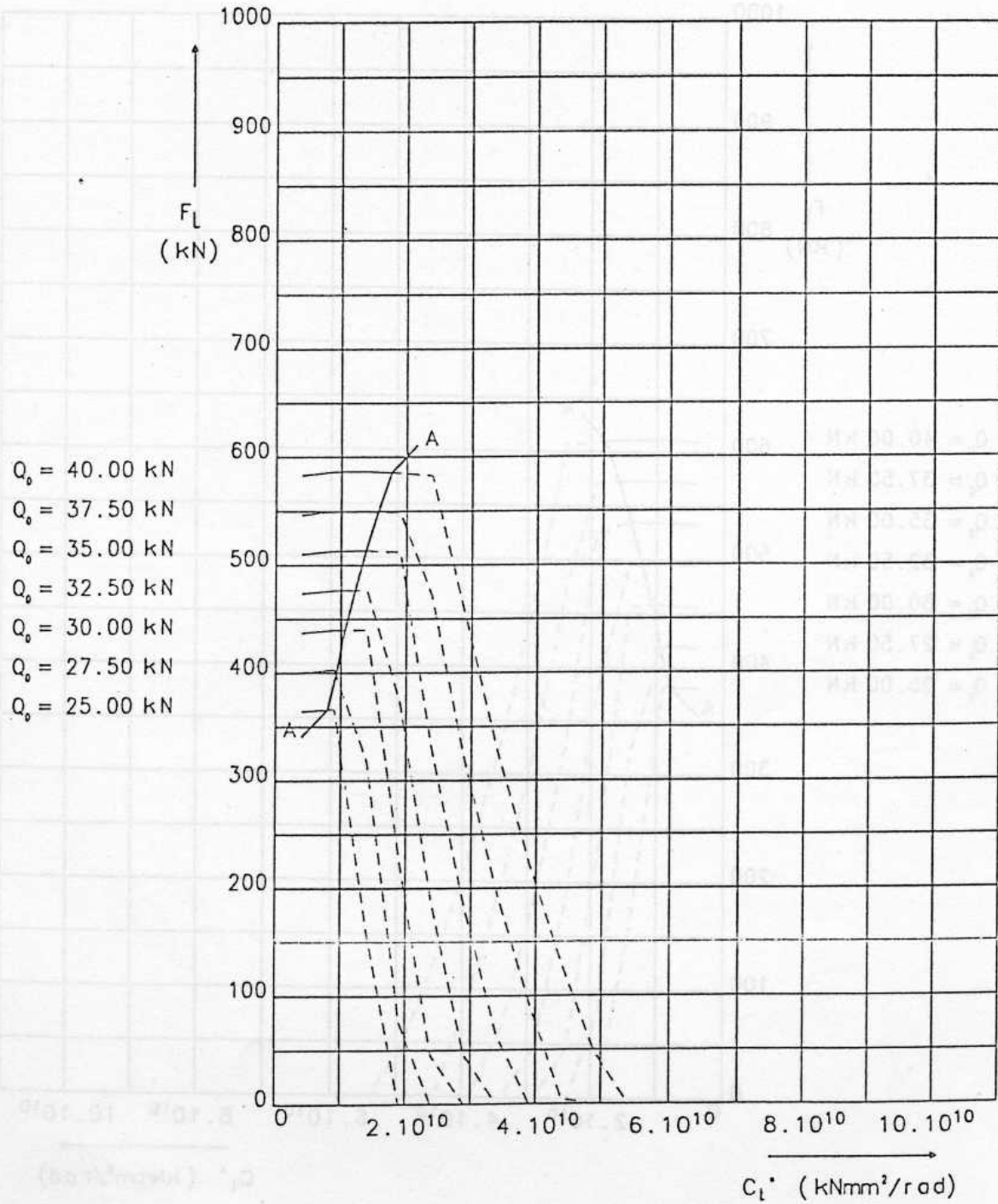
$$2a^* = 16500. \text{ mm}$$

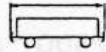
$$2a^* = 10000. \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$C_z = 1.37 \text{ kN/mm}$$





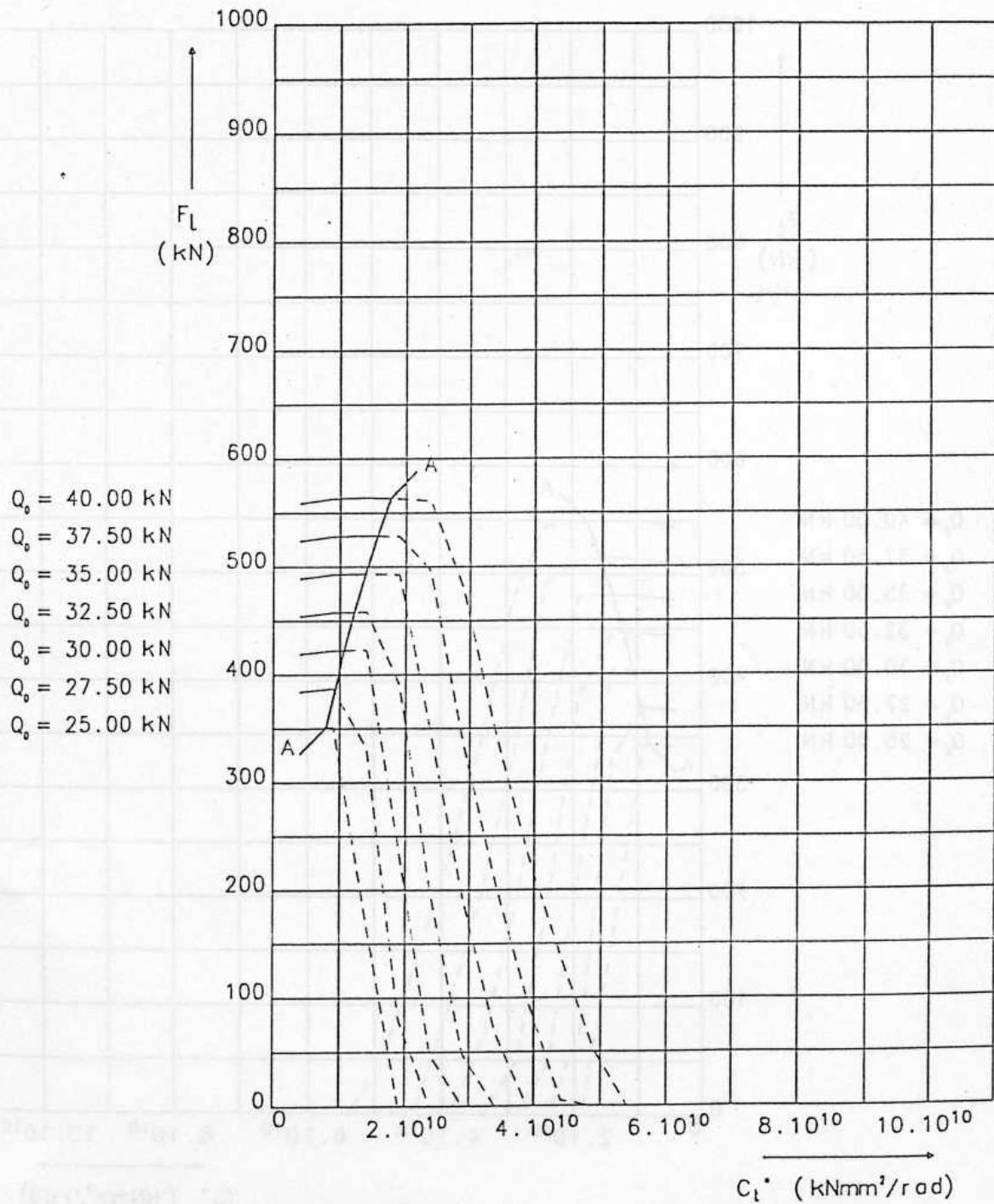
$$= 17000. \text{ mm}$$

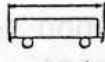
$$2a^* = 10000. \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$C_z = 1.37 \text{ kN/mm}$$





$$2a^* = 10000. \text{ mm}$$

$$h = 17300. \text{ mm}$$

$$\Delta q_0 = f(c_t^*)$$

$$0.15 \leq \Delta q_0 \leq 0.23$$

$$C_z = 1.37 \text{ kN/mm}$$

