

1 Design Check

This will need at least one design check for a general format of the equations, reference and set out.

All units are [kN, mm]

1.1 Preliminary Design of Members

Will start with the same member sizes as Aurecon (for both 9m and 10m EBFs).
 Ductility, $\mu = 5.75$.

Member	Designation	Category	λ_e
Active Link	360UB57	1	25
Collector Beam	360UB57	2	30
Column	310UC137	2	30
Brace	250UC73	3A	40

1.1.1 Active Links (360UB57)

From NZS3404; link length:

$V^* = 442\text{kN}$

$$e \leq 1.6M_s/V_v \quad (\text{Cl 5.12.1.2})$$

$$M_s = 303\text{kN} \text{ (Capacity Tables)}$$

$$V_v = 0.6 \times f_{yw} \times d \times t_w = 0.6 \times 320 \times 359 \times 8 = 551\text{kN} \text{ (Cl 6.5.3)}$$

$$0.8\text{m} \leq 0.880\text{m}$$

OK

From NZS3404; link shear strength:

$$\phi V_v \geq V^* \quad (\text{Cl 6.5.3})$$

$$\phi V_v = 0.9 \times V_v = 0.9 \times 551 = 496\text{kN}$$

$$496\text{kN} \geq 442\text{kN}$$

OK

From NZS3404; link web slenderness:

$$\lambda_e \leq \lambda_{eq} \quad (\text{Cl 12.8.3})$$

$$\lambda_{e1} = 25 \text{ (page 1)}$$

$$\lambda_e = d_1/t_w = 338\text{mm}/8\text{mm} = 41.6$$

$$41.6 \not\leq 25$$

NOT OK

Above doesn't pass the check, but that doesn't matter for this example.

ADOPT 360UB57 FOR ALL ACTIVE LINKS

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PLACEHOLDER
L O G O

1.1.2 Collector Beam (360UB57)

And so on...