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1	Q.	Reference: Response to Request for Information NP-NLH-004		
2		Please provide a table that compares the transmission line parameters for the as-		
3		designed structures to the parameters used to verify conformance to the CAN/CSA-		
4		C22.3 No. 60826-10 standard. The response should include the following		
5		parameters:		
6		a) Design overload and strength factors		
7		b) Tower loading cases		
8		c) Wind and weight spans		
9		d) Conductors and OPGW sag and tensions		
10		e) Unbalanced ice loading cases		
11		f) Security loads, including broken conductor loads		
12		g) Clearances under maximum ice and after load		
13				
14				
15	Α.	Engineering for the verification activities has used all of the same design criteria		
16		that were used for the original line design, with maximum wind, maximum ice and		
17		combined wind and ice loads increased as applicable for the verification. The as-		
18		designed analysis used the actual design, so some data, such as wind/weight span		
19		tables are not relevant for the actual design given that they represent planning		
20		information for the initial design.		
21				
22		a) Design overload and strength factors – 0.9 for A-Type and B-Type suspension		
23		towers, 0.8 for C-type, D-Type and E-Type towers, 0.7 for guy wire, 0.7 for		
24		insulator strength.		
25		b) Tower Loading Cases – reference NP-NLH-018 (Revision 1, June 3-15).		
26		c) Wind and Weight Spans – please refer to Table 1 on the following page.		

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1	(d)	Conductor and OPGW sag and tensions – reference NP-NLH-018 (Revision 1,		
2			June 3-15).		
3	e	e)	Unbalanced ice loading cases – reference NP-NLH-061.		
4	f	f)	Security loads, including broken conductor loads - The number of		
5			conductors/ground wires considered in the case of broken wire load is one		
6			conductor at a time for the suspension tower types A and B. Each broken wire		
7			case is considered in a separate combination. For the tower types C, D and E,		
8			broken wire cases are considered for one or two or all of the broken cables. For		
9			the Labrador line portion with electrode conductor, suspension tower types A		
10			and B are designed for one pole and one electrode conductor broken at the		
11			same time. Anti-cascade requirements dictated that a maximum of 20		
12			suspension structures would be permitted between full-tension deadends.		
13	Ę	g)	Clearances under maximum ice and after load - The line is designed for 8.3 m		
14			ground clearance for maximum sag condition with maximum ice after load		
15			condition or maximum temperature after load condition (85 deg C).		
16					
17	9	Spa	an by span ground clearances were not verified as part of the as-designed		
18	â	ana	alysis, as the intent of the process was to confirm the capability of the structures		
19	t	to ۱	withstand loads consistent with the stated return period. However, conductor		
20	t	tensions were confirmed not to exceed maximum allowable limits, and sags did not			
21	i	inc	rease significantly.		

NP-NLH-038 Island Interconnected System Supply Issues and Power Outages

600

-240 480 E1 385

430 470 510

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Min Max

(m)

-220

-300 600

-250 400

-250 400

-240

615

480

Weight

(m)

350

350

Max

Weight Weight

Span Angle Span D. E. Span D. E.

(m)

670 -245 515

420

360 -200 275

420 -220

650 -250 500

750 -300 600

750 -300 600

750 -300 600

520 -270 440

750

460

420 -220 350

460

750 -300 600

770 -295

600

770 -295 615

600 -240 480

-320 600 -240 480

Steel Tower Design Tower Type B Tower Type C Tower Type D Tower Type E Tower Type A Span at Span at 6° at 0° 0° Min Max Min Max Min Wind Span (30%) Wind Span (20*) Wind Wind Wind Wind Span Span Span Span (901 (801) (701) (601) Wind Weight Wind Wind Ref. Wind Wind Min Max Wind Wind Wind Weight Span Angle Weight Span D. E. (45-90-) Weight Span Angle RS Weight Span Weight Weight Wind (0210) Span (10*) (0-0) Weight Weight Span Span (0.45-) Span (45 %) (0413 Span at 6* lœ. Wind Span (01) Span (35*) Span (25%) Span (15) Electr. Inland or Span Span Angle Span D. E. Span Coastal Speed (Y/N) (m) (mm) (km/h) (m) 370 A1 410 465 B1 410 465 465 565 C1 410 460 500 540 -230 590 D1 410 460 500 540 -315 -245 515 E1 410 460 500 540 -315 50 inland 670 105 Y D2 230 A2 255 B1 255 300 280 350 C2 255 290 310 340 -230 265 310 -220 350 E1 255 290 310 340 -300 115 Inland 300 370 290 340 -300 420 135 Y 135 Y Inland 200 A2 220 250 B1 220 250 250 270 C2 220 250 270 290 -250 320 D2 220 250 270 290 -300 360 -200 275 E1 220 250 270 290 -300 135 230 A2 255 300 B1 255 300 280 350 C2 255 310 340 -230 370 D2 265 310 -220 350 E1 255 290 310 340 115 135 Inland 290 290 340 -300 420 -300 Y 360 A1 400 450 B1 400 450 450 550 C1 400 440 490 520 -235 575 D1 400 440 490 520 -325 650 -250 500 E1 400 440 480 520 -325 50 120 Inland Y 50 Ν Coastal 430 A3 475 540 B1 475 540 520 570 C1 475 530 570 620 -300 700 D1 475 530 570 620 -400 750 -300 600 E1 475 530 570 620 -400 120 475 475 520 475 D1 E1 570 620 50 120 Ν Coastal 430 A3 540 B1 540 570 C1 530 570 620 -300 700 475 530 570 620 -400 750 -300 600 475 530 -400 475 520 -300 D1 E1 475 570 620 50 120 Ν Inland 430 **A**1 540 B1 475 540 570 C1 475 530 570 620 700 475 530 570 620 -400 750 -300 600 530 -400 115 Ν Inland 280 A2 310 350 B1 320 360 350 400 C2 310 350 380 410 -250 460 D2 310 350 380 410 -300 520 -270 440 E1 310 350 380 410 -300 150 D1 1 475 475 520 A1 540 B1 540 570 C1 475 530 570 620 -300 700 475 530 570 620 -300 600 E1 475 530 570 620 50 120 N Inland 430 -400 750 -400 275 D2 275 315 320 C2 275 -250 275 310 330 -250 E1 275 310 330 360 115 180 Ν Inland 250 A2 315 B1 380 310 330 360 400 360 -300 460 400 -300 255 D2 310 E1 135 Ν Inland 230 A2 300 B1 255 300 280 350 C2 255 290 310 340 -230 370 255 290 340 -300 420 -220 350 255 290 310 340 -300 180 275 320 C2 -250 D2 E1 275 A2 B1 275 315 275 360 400 275 310 330 -250 310 330 360 115 180 Ν Inland 250 315 380 310 330 360 -300 460 400 -300 475 520 D1 E1 430 **A**1 540 B1 475 540 570 C1 475 530 570 620 -300 475 530 570 -300 600 475 530 570 620 50 120 Ν Inland 700 620 -400 750 -400 A1 485 555 485 555 535 585 485 540 -295 715 D1 485 540 590 640 -295 615 E1 485 540 590 640 50 Inland 440 B1 C1 590 640 -390 770 -390 105 Ν A3 385 440 B1 385 440 440 480 C1 385 470 510 -240 D1 385 430 470 -240 480 E1 385 430 470 510 Ν Inland 350 430 550 510 -320 600 -320 75 130 440 **A**1 485 655 B1 485 555 535 585 C1 485 540 590 640 -295 715 D1 485 540 590 640 -390 -295 615 E1 485 540 590 640 -390 50 Ν Inland 770 105 Ν Inland 350 A3 385 440 B1 385 440 440 490 C1 385 430 470 510 -240 550 D1 385 430 470 510 -320 600 -240 480 E1 385 430 470 510 -320 75 130

510

-240 550 D1

385 430 470 510 -320

Table 1: Wind and Weight Spans 1

Zone

*

1

2a

2b

20

3a

зb

4b

4a

5

6

7a

7b

70

8a

8b

9

10

11a

11b 75 130 Ν

Coastal means rime ice 0.5 g/cm³ for zones 2a,2b,2c,5,7a,7b,7c

350 A3 385 440 B1 385 440 440 490 C1 385 430 470