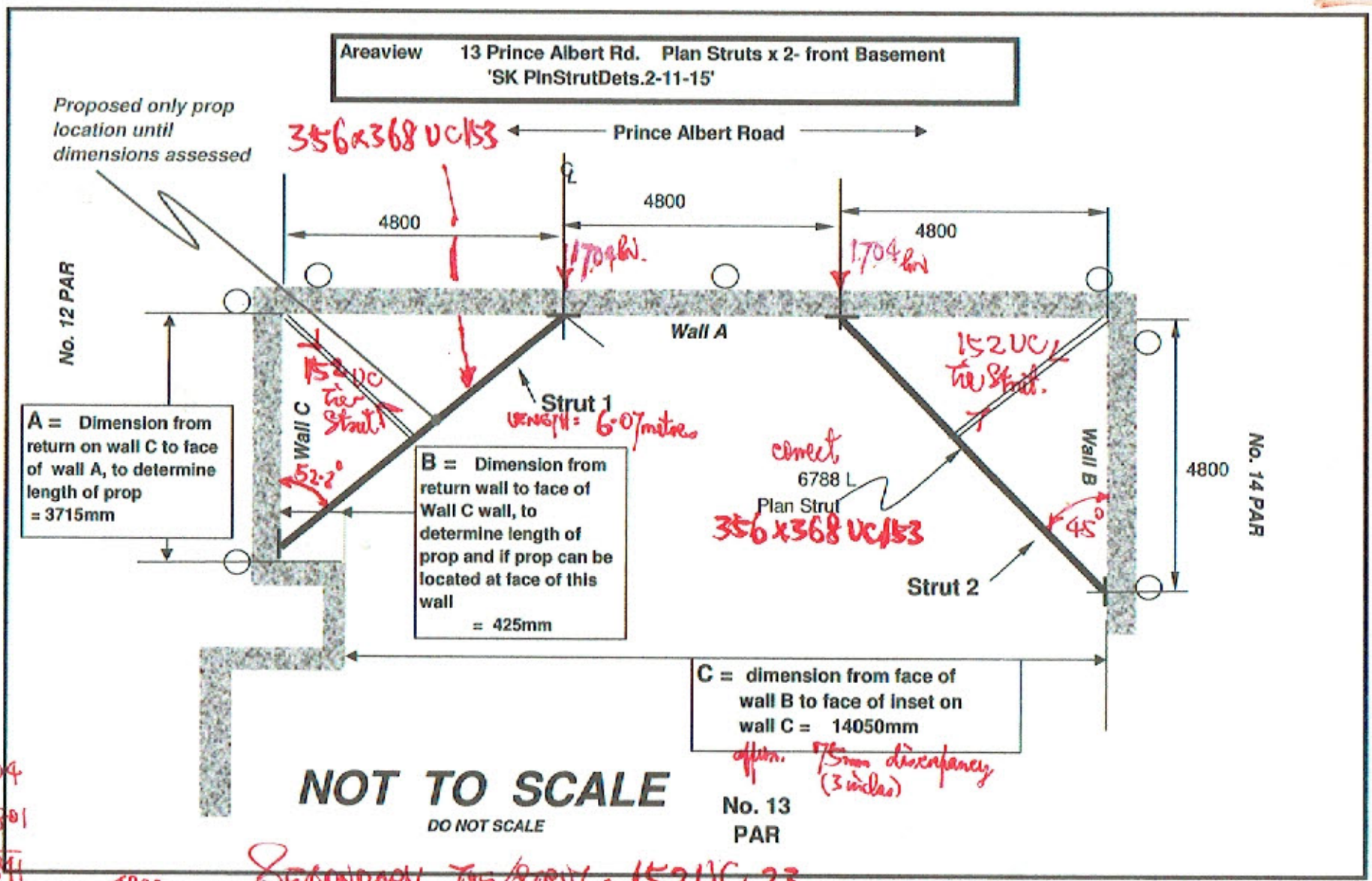
4.8m x 3 = 14.4m.

187mm to 14400mm
to 97.96

re 3rd Nov. 2015
PRINCE ALBERT



PLAN STRUT TO INTEGRAL WALING BEAM 1 of 7

4.8² = 23.04
3.715² = 13.801
36.841

4800
3715
6070

14.4
− 0.425
13.975m

SECONDARY TIE/STRUT = 152UC 23
MAIN PLAN STRUT = 356 x 368 UC 153 with GUSSET PLATES AT END PLATES BOLTED TO WALLS.

PLANSTRUT TO INTEGRAL WALING BEAM 2 of 7

13

WT & L Chartered Engineers Building Design Consultants	Project: 13 PRINCE ALBERT ROAD				Job Ref.: 2014-138	
	Section: HIDDEN WALING BEAM DESIGN ALONG PAVEMENT				Sheet no./rev.	
	Calc. by: WT	Date: NOV14	Chk'd by: GC	Date: NOV14	App'd by:	Date:

UPDATED on 5th NOVEMB 2015

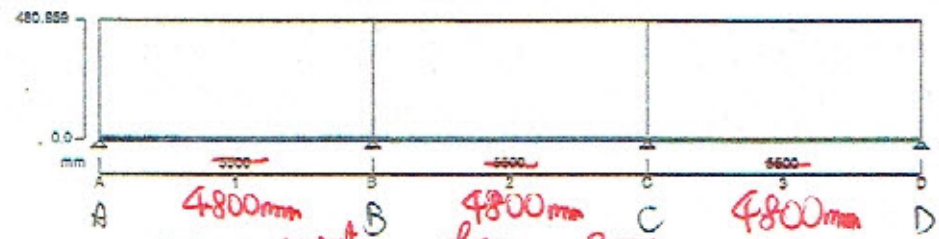
SPAN LENGTH REDUCED TO 4.8 mtrs according to SITE DIMENSIONS.

RC BEAM ANALYSIS & DESIGN (BS8110) INTEGRAL WALING BEAM AT 4.4 m BELOW FRONT BASEMENT ROOF SLAB ; NEAR PAVEMENT ALONG PRINCE ALBERT RD

RC BEAM ANALYSIS & DESIGN BS8110 — CEDDS calculation version 2.1.11

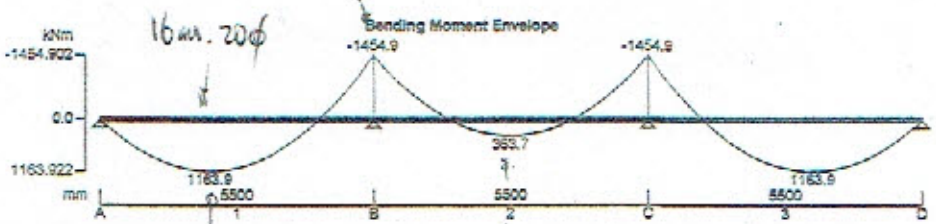
323 kN/m × 1.4

Load Envelope - Combination 1



4800mm measurement from SITE.

Bending Moment Envelope



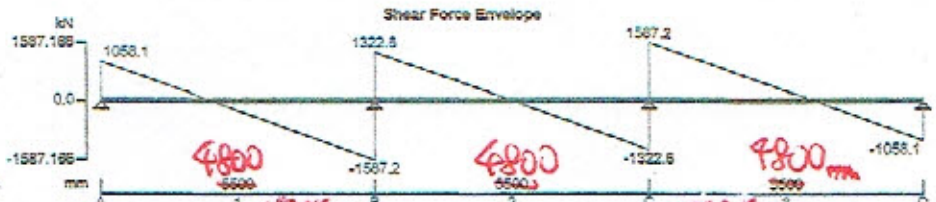
16 no. 20ϕ

15 no. 25ϕ (112 c/c)

16 no. 25ϕ

16 no. 20ϕ T&B.

Shear Force Envelope



1704 kN

2078 kN

check

1704 kN

2078 kN

accept.

Applied load magnitudes & EFFECTS at ULTIMATE LIMIT STATE.

LOAD MAGS & RESULTS at ULTIMATE LIMIT STATE.

Support conditions

Support A	Vertically restrained	
	Rotationally free	
Support B	Vertically restrained	
	Rotationally free	
Support C	Vertically restrained	
	Rotationally free	
Support D	Vertically restrained	
	Rotationally free	

0.55 × 323 × 11 = 1959 kN

0.6 × 323 × 11 = 2132 kN

U.L.S. LOAD FACTOR 1.4

Applied loading

Dead self weight of beam × 1

Dead full UDL 323 kN/m — characteristic

1.4 × 323 = 453 kN/m at ULTIM. LIM. STATE

Load combinations

Load combination 1	Support A	Dead × 1.40
		Imposed × 1.60

Characteristic

323 kN/m × 4.8 metres × 1.1 = 1704 kN.

interaction product coeff.

PLANSTRUT TO INTEGRAL WALING BEAM (3 of 7)

WT&L Chartered Engineers Building Design Consultants	Project: 13 PRINCE ALBERT ROAD				Job Ref.: 2014-138	
	Section: HIDDEN WALING BEAM DESIGN ALONG PAVEMENT				Sheet no./rev.: 14	
	Calc. by: WT	Date: NOV14	Chk'd by: GC	Date: NOV14	App'd by:	Date:

	Span 1	Dead × 1.40
		Imposed × 1.60
	Support B	Dead × 1.40
		Imposed × 1.60
	Span 2	Dead × 1.40
		Imposed × 1.60
	Support C	Dead × 1.40
		Imposed × 1.60
	Span 3	Dead × 1.40
		Imposed × 1.60
	Support D	Dead × 1.40
		Imposed × 1.60

Analysis results

Maximum moment support A;	M_{A_max} = 0 kNm;	M_{A_red} = 0 kNm;
Maximum moment span 1 at 2200 mm;	M_{s1_max} = 1164 kNm;	M_{s1_red} = 1164 kNm;
Maximum moment support B;	M_{B_max} = -1455 kNm;	M_{B_red} = -1455 kNm;
Maximum moment span 2 at 2750 mm;	M_{s2_max} = 364 kNm;	M_{s2_red} = 364 kNm;
Maximum moment support C;	M_{C_max} = -1455 kNm;	M_{C_red} = -1455 kNm;
Maximum moment span 3 at 3300 mm;	M_{s3_max} = 1164 kNm;	M_{s3_red} = 1164 kNm;
Maximum moment support D;	M_{D_max} = 0 kNm;	M_{D_red} = 0 kNm;
Maximum shear support A;	V_{A_max} = 1058 kN;	V_{A_red} = 1058 kN
Maximum shear support A span 1 at 425 mm;	$V_{A\_s1\_max}$ = 854 kN;	$V_{A\_s1\_red}$ = 854 kN
Maximum shear support B;	V_{B_max} = -1587 kN;	V_{B_red} = -1587 kN
Maximum shear support B span 1 at 5086 mm;	$V_{B\_s1\_max}$ = -1383 kN;	$V_{B\_s1\_red}$ = -1383 kN
Maximum shear support B span 2 at 414 mm;	$V_{B\_s2\_max}$ = 1118 kN;	$V_{B\_s2\_red}$ = 1118 kN
Maximum shear support C;	V_{C_max} = 1587 kN;	V_{C_red} = 1587 kN
Maximum shear support C span 2 at 5075 mm;	$V_{C\_s2\_max}$ = -1118 kN;	$V_{C\_s2\_red}$ = -1118 kN
Maximum shear support C span 3 at 425 mm;	$V_{C\_s3\_max}$ = 1383 kN;	$V_{C\_s3\_red}$ = 1383 kN
Maximum shear support D;	V_{D_max} = -1058 kN;	V_{D_red} = -1058 kN
Maximum shear support D span 3 at 5075 mm;	$V_{D\_s3\_max}$ = -854 kN;	$V_{D\_s3\_red}$ = -854 kN
Maximum reaction at support A;	R_A = 1058 kN	
Unfactored dead load reaction at support A;	R_{A_Dead} = 756 kN	
Maximum reaction at support B;	~~R_B = 2910 kN~~	
Unfactored dead load reaction at support B;	~~R_{B_Dead} = 2078 kN~~	1704 kN
Maximum reaction at support C;	~~R_C = 2910 kN~~	
Unfactored dead load reaction at support C;	~~R_{C_Dead} = 2078 kN~~	1704 kN.
Maximum reaction at support D;	R_D = 1058 kN	
Unfactored dead load reaction at support D;	R_{D_Dead} = 756 kN	

Rectangular section details

Section width;	b = 1800 mm
Section depth;	h = 475 mm

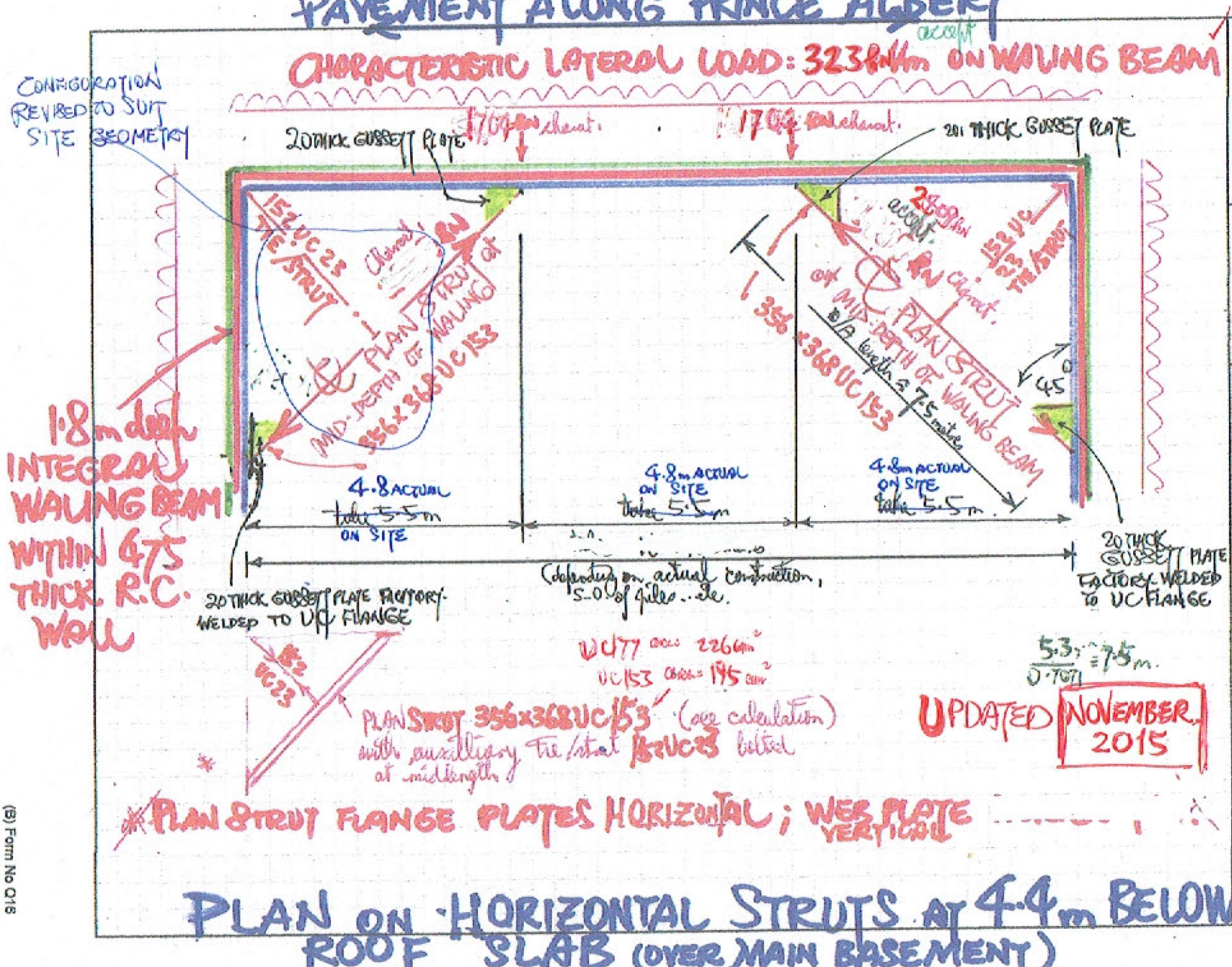
Characteristic "internal support" reaction

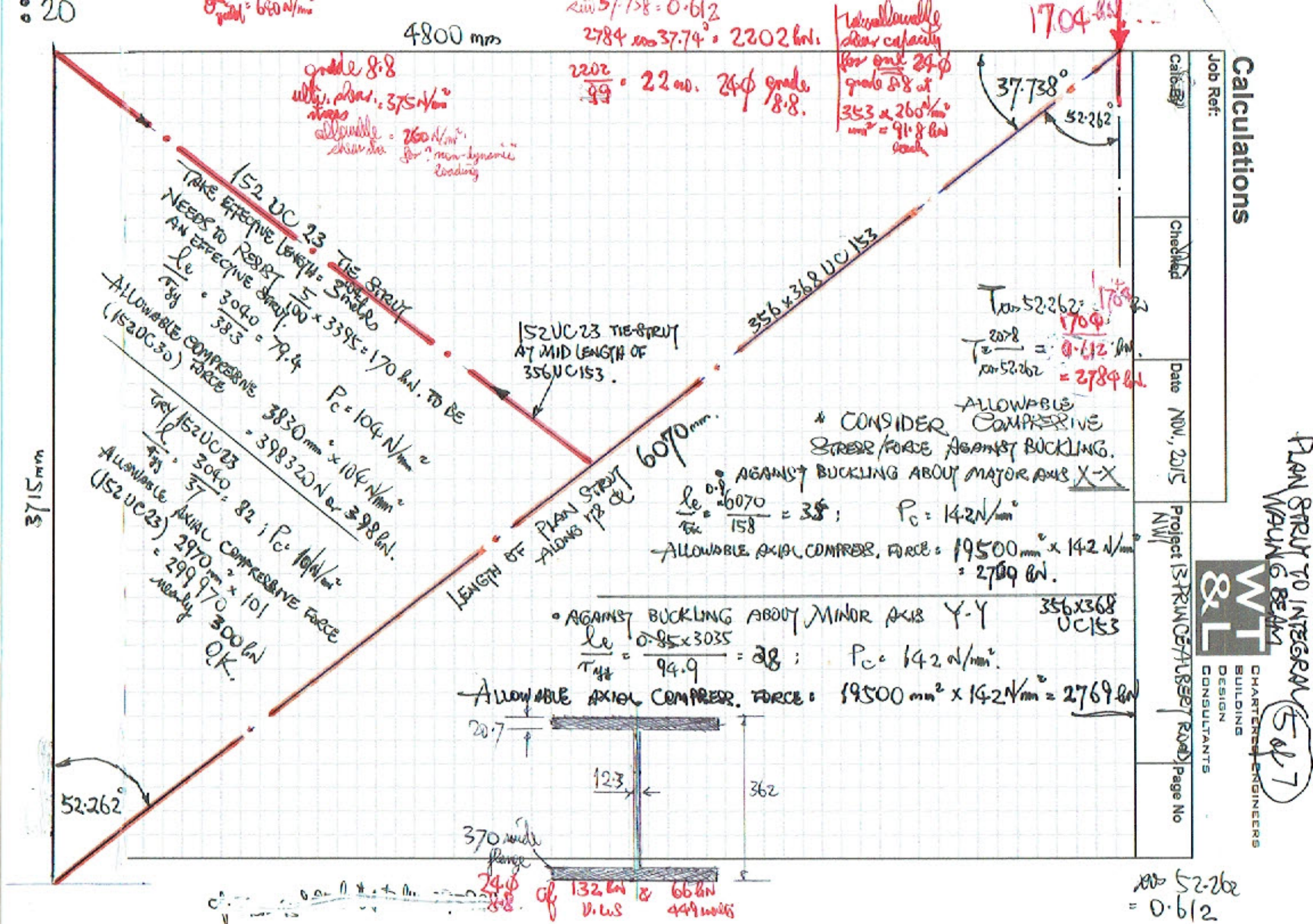
323 kN/m × 4.8m × 1.1 reaction coeff = 1704 kN

2078 kN = 323 kN/m × 6.433 metres

6.433m / 5.5m = 1.17

PAVEMENT ALONG PRINCE ALBERT





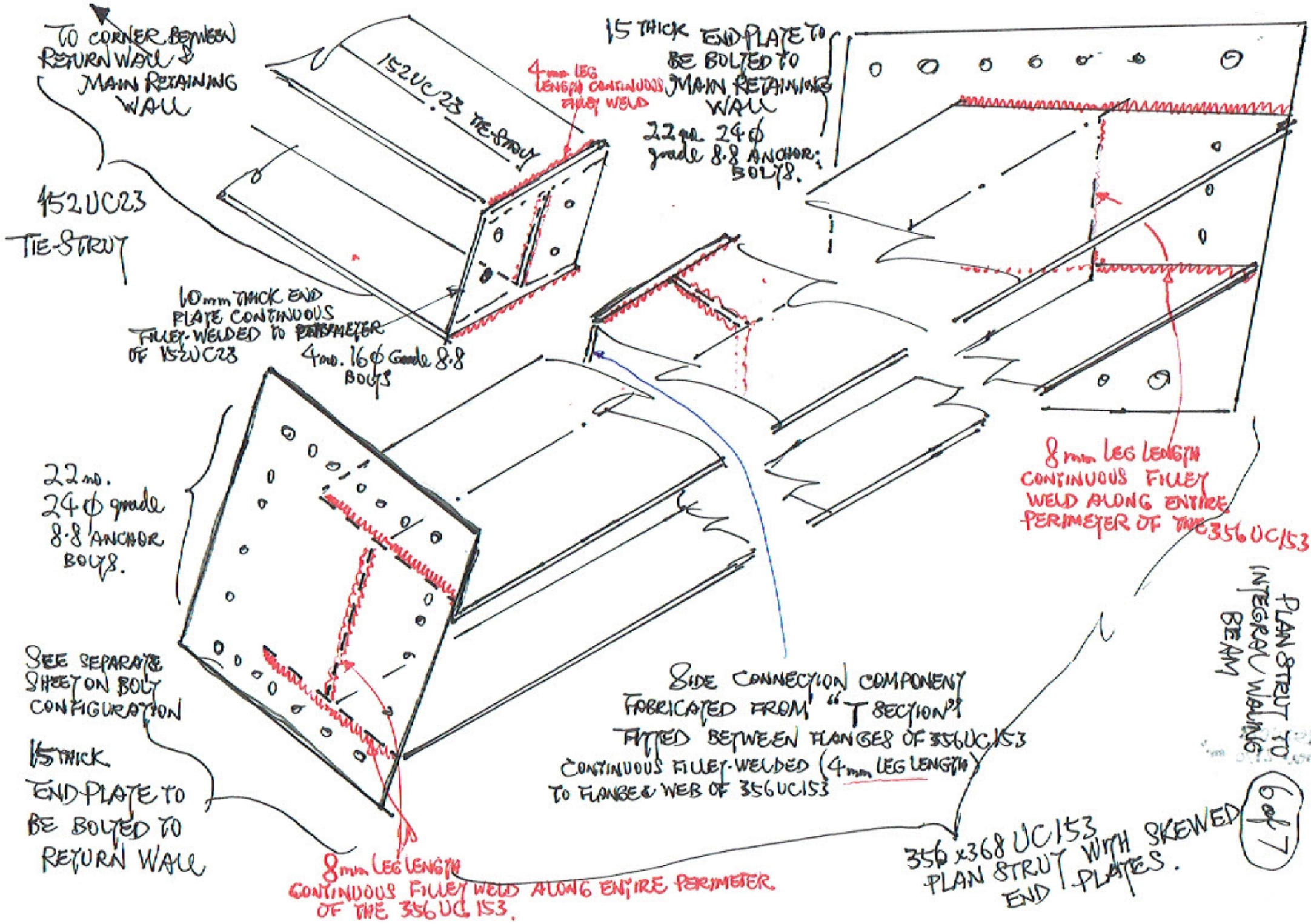
Calculations

Job Ref:

Calc By | Checked | Date NOV., 2015 | Project 15 PRINCE AUBERT ROAD NW1 | Page No

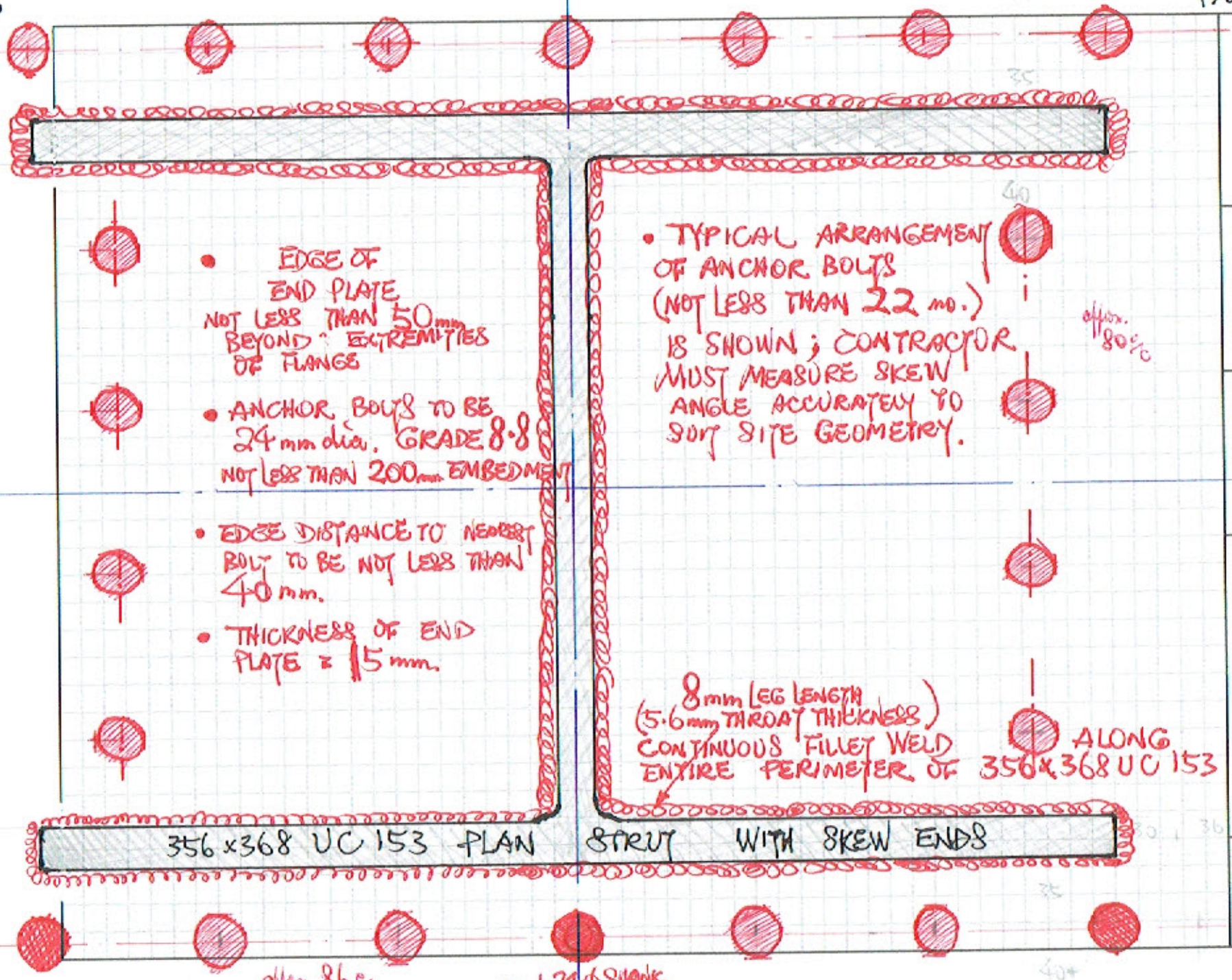
W T & L CHARTERED ENGINEERS BUILDING DESIGN CONSULTANTS

PLAN STRUT TO INTEGRAL WALING BEAM (Sh 7)


TO CORNER BETWEEN RETURN WALL & MAIN RETAINING WALL
152UC23 TIE-STRUT
152UC23 TIE-STRUT
4mm LEG LENGTH CONTINUOUS FILLET WELD
15 THICK END PLATE TO BE BOLTED TO MAIN RETAINING WALL
22 no. 24ϕ grade 8.8 ANCHOR BOLTS.
10mm THICK END PLATE CONTINUOUS FILLET-WELDED TO PERIMETER OF 152UC23
4 no. 16ϕ Grade 8.8 BOLTS
22 no. 24ϕ grade 8.8 ANCHOR BOLTS.
8mm LEG LENGTH CONTINUOUS FILLET WELD ALONG ENTIRE PERIMETER OF THE 356UC153
SEE SEPARATE SHEET ON BOLT CONFIGURATION
15 THICK END PLATE TO BE BOLTED TO RETURN WALL
SIDE CONNECTION COMPONENT FABRICATED FROM "T SECTION" FITTED BETWEEN FLANGES OF 356UC153 CONTINUOUS FILLET-WELDED (4mm LEG LENGTH) TO FLANGE & WEB OF 356UC153
8mm LEG LENGTH CONTINUOUS FILLET WELD ALONG ENTIRE PERIMETER OF THE 356UC153.
356x368 UC153 PLAN STRUT WITH SKEWED END PLATES.
PLAN STRUT TO INTEGRAL WALING BEAM
6 of 7

370x1.4142 = 523 261

25



Calculations

Job Ref:

Skew End Plate to Plan Strut

24φ 26φ HOLES.

Checked

Date Nov, 2015

Project 13 PRINCE AUBERT ROAD

Page No

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PLAN STRUT TO INTEGRAL WALING BEAM

7 of 7

1.4 x 24 = 34 mm.

Bolt c/c = 2.5 x 24 = 60 mm