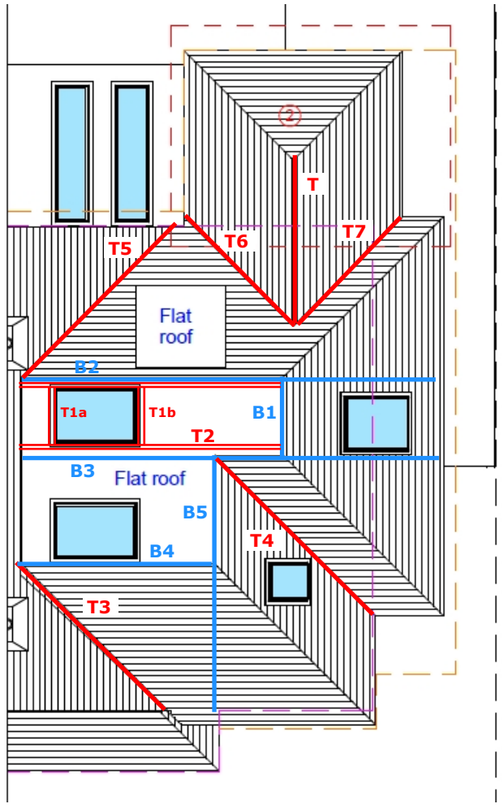

FLAT ROOF JOISTS: Use 47x195mm C24 @ 400mm c/c.
Double up around flat roof lights

SLOPING ROOF RAFTERS: Use 47x195mm C24 @ 400mm c/c all around
Double up around sloping roof lights and triple up under dormer cheeks.

HIP RAFTERS, VALLEY RAFTERS T6, T7 & RIDGE T: Use 47x220mm C24
VALLEY RAFTERS T3 - T5: Use 178x102x19 UB S275

BEAM B1: Use 178x102x19 UB S275
BEAM B2 & B3 (CRANKED): Use 178x102x19 UB S275 with 450x100x215mm deep concrete padstone left side only
BEAM B4: Use 178x102x19 UB S275 with 300x100x140mm deep concrete padstone left side only
BEAM B5 (CRANKED): Use 178x102x19 UB S275 with 350x100x215mm deep concrete padstone bottom side only

NOTE 1: Contractor to take site measurements prior to ordering steels
NOTE 2: Sloping roof rafters to be tied at eaves
NOTE 3: Dormer flat roof joists can be 47x150mm C24 @ 400mm c/c

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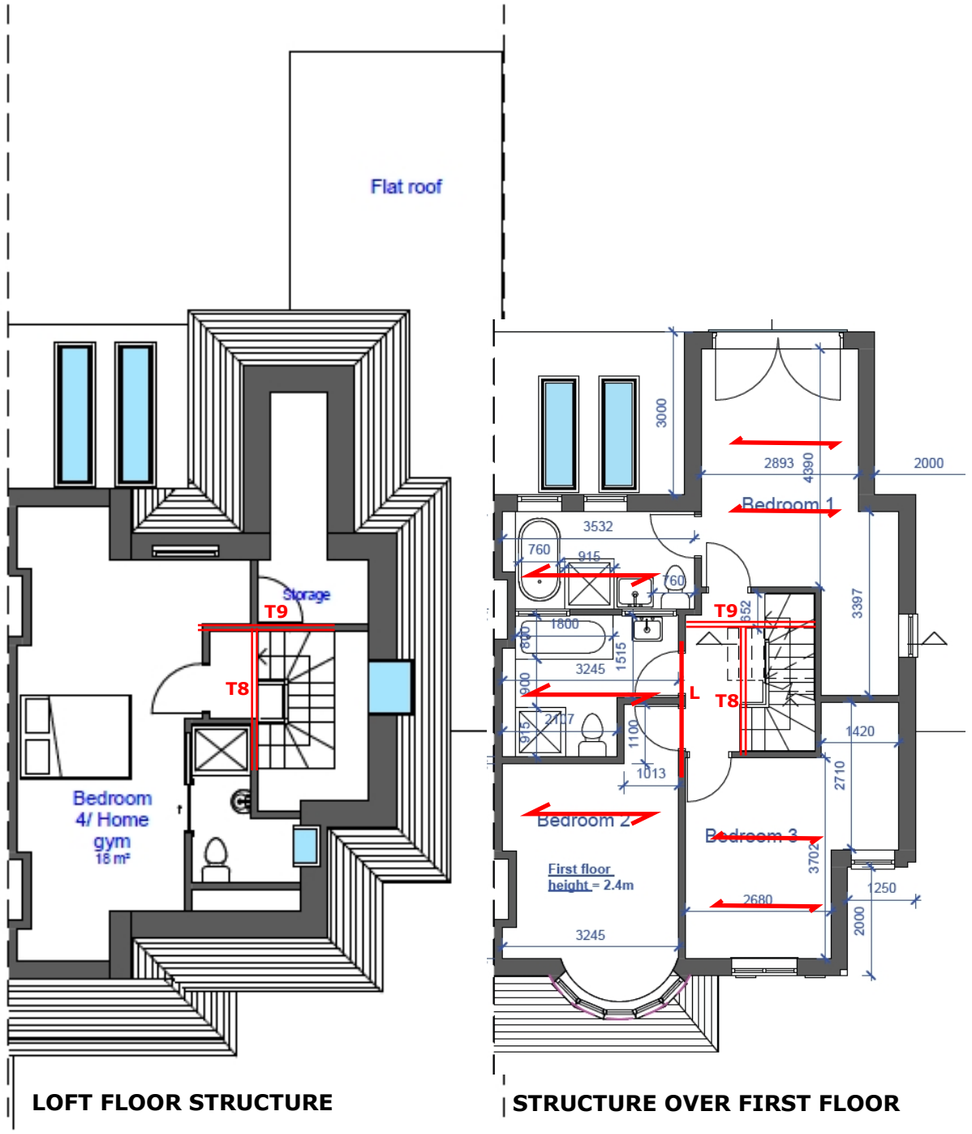
Client:	Project:	Title:	Drawn by:	Checked by:
xxxx	LOFT, REAR & SIDE EXTENSION LONDON N20	LOFT ROOF STRUCTURE	GV	
			Sheet: 1	Date: 06/11/2023



LOFT FLOOR STRUCTURE

STRUCTURE OVER FIRST FLOOR

LOFT FLOOR JOISTS: Use 47x170mm C24 @ 400mm c/c oriented as shown
Double up under internal stud work

T8 & T9: Use doubled-up 47x170mm C24

INTERNAL STUDWORK: Use 47x100mm C24 studs @ 400mm c/c

NOTE 1: Floor joists to be built off existing internal wall

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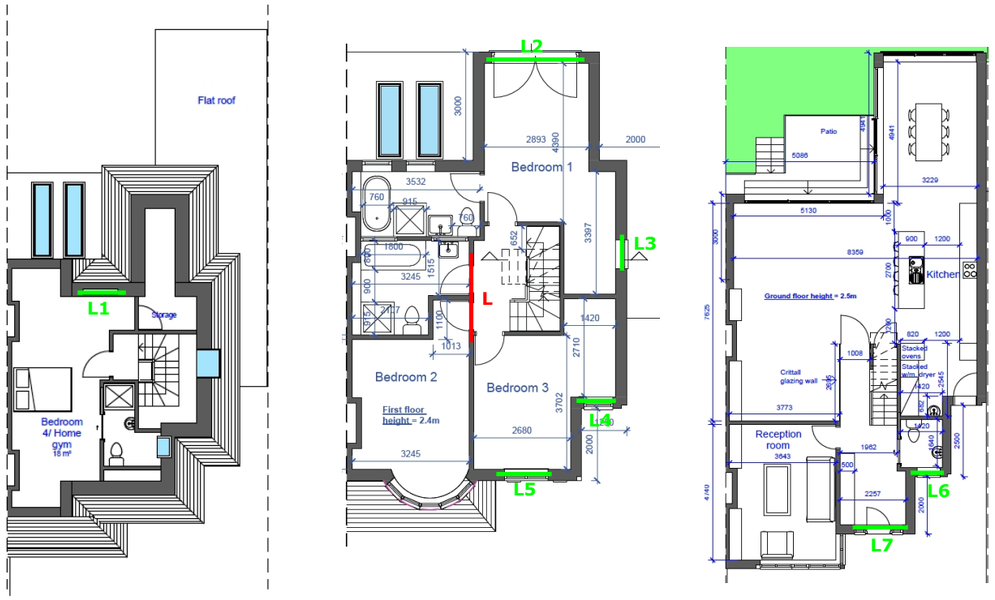
xxxx	LOFT, REAR & SIDE EXTENSION LONDON N20	LOFT FLOOR STRUCTURE	GV	
			Sheet: 2	Date: 06/11/2023



LINTEL L: Use 178x102x19 UB S275 with 300x100x140mm deep concrete padstone both ends

LINTEL L1: Use doubled-up 47x170mm C24

LINTEL L2 - L5: Use standard duty catnic lintel (or equivalent)

LINTEL L6 & L7: Use heavy duty catnic lintel (or equivalent)

FIRST FLOOR DOOR LINTELS: Use doubled-up 47x170mm C24

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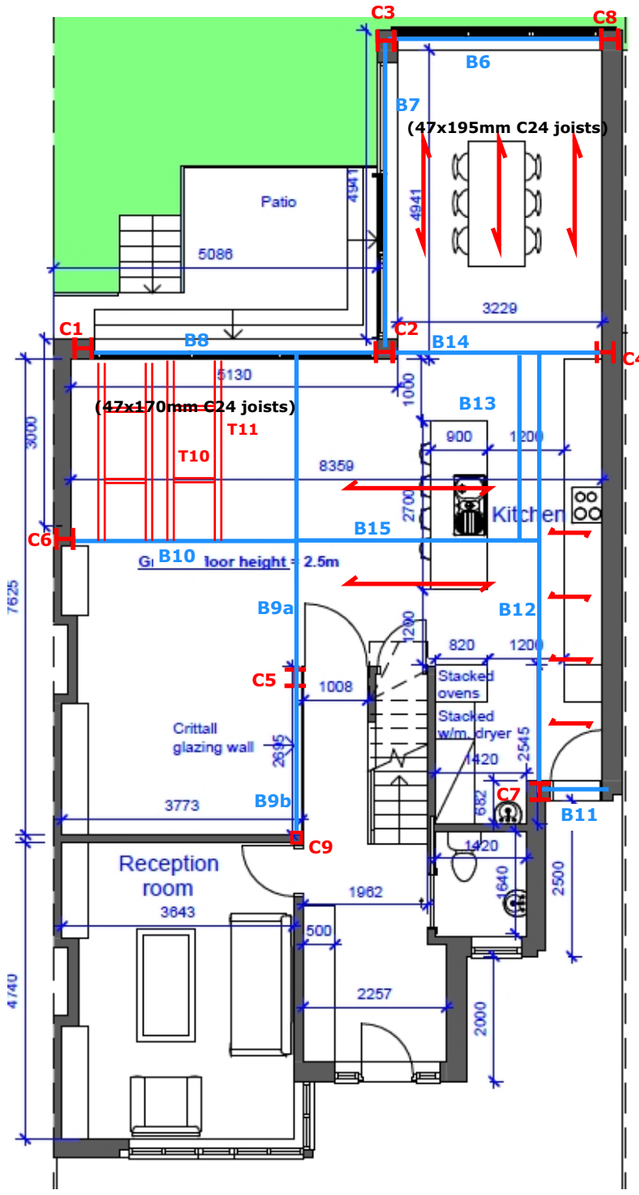
xxxx	LOFT, REAR & SIDE EXTENSION LONDON N20	LINTEL DETAILS	GV	
			Sheet: 3	Date: 06/11/2023

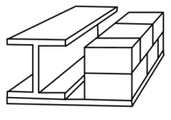


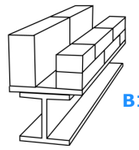
BEAM B6 & B7: Use 203x102x23 UB S275 with 6mm thick S275 welded bottom plate
BEAM B8: Use 254x146x43 UB S275 with 6mm thick S275 welded bottom plate.
BEAM B9a: Use 254x254x73 UC S275
BEAM B9b: Use 254x102x28 UC S275
BEAM B10: Use 203x203x46 UC S275 with 10mm thick S275 welded top plate
BEAM B11: Use standard duty catnic lintel (or equivalent). Contractor to confirm column C7 does not interfere with bearing for catnic. Any issues to be raised with Structural Engineer.
BEAM B12: Use 305x305x97 UC S275
BEAM B13: Use 203x203x46 UC S275 with 10mm thick S275 welded top plate
BEAM B14: Use 254x254x73 UC S275 with 10mm thick S275 welded top plate
BEAM B15: Use 203x203x46 UC S275

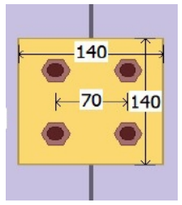
FIRST FLOOR JOISTS: Use 47x170mm C24 oriented as shown

LEFT REAR EXTENSION ROOF JOISTS: Use 47x170mm C24 @ 400mm c/c
Double up around roof lights (T10, T11)
RIGHT REAR EXTENSION ROOF JOISTS: Use 47x195mm C24 @ 400mm c/c
SIDE EXTENSION ROOF JOISTS: Use 47x150mm C24 @ 400mm c/c

NOTE 1: Connect B9a to B9b using 140x140x10mm thick S275 web plate with 4 No. M16 bolts. Both beams to be supported by C5 top plate. Connection is not load bearing.
NOTE 2: Use 10mm thick S275 top plate on beam B9a if supported masonry wall is 300mm thick


B6/B7/B8


B10/ B13/ B14



B9a to B9b web plate

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Client:	Project:	Title:	Drawn by:	Checked by:
xxxx	LOFT, REAR & SIDE EXTENSION LONDON N20	BEAM STRUCTURE OVER GROUND FLOOR	GV	
			Sheet: 4	Date: 06/11/2023

COLUMN C1: Use 152x152x23 UC S275 with welded top and bottom plates
TOP PLATE: Use 400x200x10mm thick S275 bolted to bottom flange of beam B8 with 4 No. M16 grade 8.8 bolts
BOTTOM PLATE: Use 400x400x10mm thick S275 bolted into new footings with 4 No. M20x400mm holding down bolts with anchors, set in resin
PAD FOOTING: Use 2x0.6x0.8m deep C30 concrete footing parallel to boundary line

COLUMN C2: Use 152x152x37 UC S275 with welded top and bottom plates
TOP PLATE: Use 500x250x10mm thick S275 bolted to bottom flange of beam B8 with 4 No. M16 grade 8.8 bolts and bolted to bottom flange of B14 with 4 No. M16 grade 8.8 bolts
BOTTOM PLATE: Use 400x400x10mm thick S275 bolted into new footings with 4 No. M20x400mm holding down bolts with anchors, set in resin
PAD FOOTING: Use 1.2x1.2x0.8m deep C30 concrete footing

COLUMN C3: Use 152x152x23 UC S275 with welded top and bottom plates
TOP PLATE: Use 400x150x10mm thick S275 bolted to bottom flange of beam B7 with 4 No. M16 grade 8.8 bolts
BOTTOM PLATE: Use 400x400x10mm thick S275 bolted into new footings with 4 No. M20x400mm holding down bolts with anchors, set in resin
PAD FOOTING: Use 0.8x0.8x1m deep C30 concrete footing

COLUMN C4: Use 152x152x37 UC S275 with welded top and bottom plates
TOP PLATE: Use 400x250x10mm thick S275 bolted to bottom flange of beam B14 with 4 No. M16 grade 8.8 bolts
BOTTOM PLATE: Use 400x400x10mm thick S275 bolted into new footings with 4 No. M20x400mm holding down bolts with anchors, set in resin
PAD FOOTING: Use 1.2x1.2x0.8m deep C30 concrete footing

COLUMN C5: Use 203x203x46 UC S275 with welded top and bottom plates
TOP PLATE: Use 500x250x10mm thick S275 bolted to bottom flange of beam B9a and B9b with 4 No. M16 grade 8.8 bolts
BOTTOM PLATE: Use 400x400x10mm thick S275 bolted into new footings with 4 No. M20x400mm holding down bolts with anchors, set in resin
PAD FOOTING: Use 1.2x1.2x0.8m deep C30 concrete footing

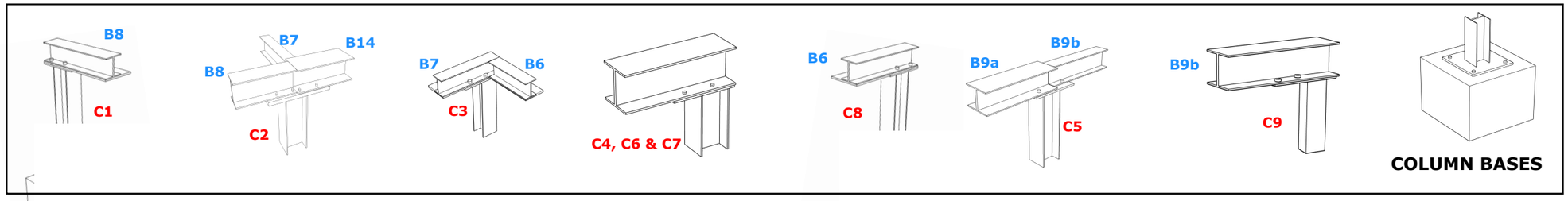
COLUMN C6: Use 152x152x23 UC S275 with welded top and bottom plates
TOP PLATE: Use 400x200x10mm thick S275 bolted to bottom flange of beam B10 with 4 No. M16 grade 8.8 bolts
BOTTOM PLATE: Use 400x400x10mm thick S275 bolted into new footings with 4 No. M20x400mm holding down bolts with anchors, set in resin
PAD FOOTING: Use 2x0.6x0.8m deep C30 concrete footing under column parallel to boundary line.

COLUMN C7: Use 152x152x37 UC S275 with welded top and bottom plates
TOP PLATE: Use 400x300x10mm thick S275 bolted to bottom flange of beam B12 with 4 No. M16 grade 8.8 bolts
BOTTOM PLATE: Use 400x400x10mm thick S275 bolted into new footings with 4 No. M20x400mm holding down bolts with anchors, set in resin
PAD FOOTING: Use 1.2x1.2x0.8m deep C30 concrete footing

COLUMN C8: Use 152x152x23 UC S275 with welded top and bottom plates
TOP PLATE: Use 400x150x10mm thick S275 bolted to bottom flange of beam B7 with 4 No. M16 grade 8.8 bolts
BOTTOM PLATE: Use 400x400x10mm thick S275 bolted into footing with 4 No. M20x400mm holding down bolts with anchors, set in resin
PAD FOOTING: Use 0.8x0.8x1m deep C30 concrete footing

COLUMN C9: Use 100x100x3.6 HF SHS S355 with welded top and bottom plates
TOP PLATE: Use 300x100x10mm thick S275 bolted to bottom flange of beam B9b with 4 No. M16 grade 8.8 bolts
BOTTOM PLATE: Use 400x400x10mm thick S275 bolted into new footings with 4 No. M20x400mm holding down bolts with anchors, set in resin
PAD FOOTING: Use 0.8x0.8x1m deep C30 concrete footing

NOTE 1: Columns to be resin bolted to masonry with M12's @ 600mm vertical centres
NOTE 2: Rear extension column lengths may required modification depending on results of foundation investigation



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Client:	Project:	Title:	Drawn by:	Checked by:
xxxx	LOFT, REAR & SIDE EXTENSION LONDON N20	GROUND FLOOR COLUMNS	GV	
			Sheet: 5	Date: 06/11/2023

PAD FOOTING BEARING CHECKS

C1 & C6

Unfactored load	$F=41$	kN
Foundation length	$L=0.6$	m
Foundation width	$B=2$	m
Foundation depth	$D=0.8$	m
Bearing capacity	$q=100$	kNm^{-2}
Design resistance	$R_d = qLB$	
	$R_d=120$	kN
Self-weight of concrete	$= 24\ LBD$	
Design load	$E_d = F+24\ LBD$	
	$E_d=64$	kN
	$< R_d$	OK

C3, C8 & C9

Unfactored load	$F=19$	kN
Foundation length	$L=0.8$	m
Foundation width	$B=0.8$	m
Foundation depth	$D=0.8$	m
Bearing capacity	$q=100$	kNm^{-2}
Design resistance	$R_d = qLB$	
	$R_d=64$	kN
Self-weight of concrete	$= 24\ LBD$	
Design load	$E_d = F+24\ LBD$	
	$E_d=31.3$	kN
	$< R_d$	OK

C2, C4, C5 & C7

Unfactored load	$F=112$	kN
Foundation length	$L=1.2$	m
Foundation width	$B=1.2$	m
Foundation depth	$D=0.8$	m
Bearing capacity	$q=100$	kNm^{-2}
Design resistance	$R_d = qLB$	
	$R_d=144$	kN
Self-weight of concrete	$= 24\ LBD$	
Design load	$E_d = F+24\ LBD$	
	$E_d=139.6$	kN
	$< R_d$	OK

NEW STRIP FOOTING: Use 0.6x0.8m deep C30 strip footing under new cavity walls

NOTE 1: Contractor to expose existing foundation to the rear extension and liaise with Structural Engineer to discuss suitability to support proposed rear extension. Brickwork and concrete slab is cracked. Foundation details may need to be altered depending on the results of the foundation investigation.

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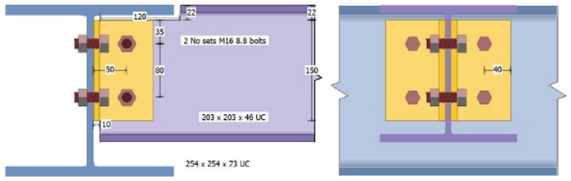
Client: xxxx	Project: LOFT, REAR & SIDE EXTENSION LONDON N20	Title: FOUNDATION DETAILS	Drawn by: GV	Checked by:
			Sheet: 6	Date: 06/11/2023

B13 TO B14

Use 2no 150mm long 90x90x10 angle cleats 2no sets of M16 8.8 bolts at 80 mm centres

ANGLE CLEAT PLATE CONNECTION

150mm long 90 x 90 x 10mm angle cleats

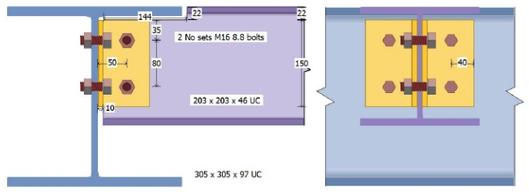


B15 TO B12

Use 2no 150mm long 90x90x10 angle cleats 2no sets of M16 8.8 bolts at 80 mm centres

ANGLE CLEAT PLATE CONNECTION

150mm long 90 x 90 x 10mm angle cleats



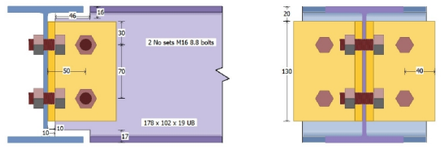
B1 TO B2/B3, B4 TO B3, B3 TO B5

CONNECTION RESISTANCE 50.4kN > 6.9kN = MAX DESIGN LOAD

Use 2no 130mm long 90x90x10 angle cleats 2no sets of M16 8.8 bolts at 70 mm centres

ANGLE CLEAT PLATE CONNECTION

130mm long 90 x 90 x 10mm angle cleats

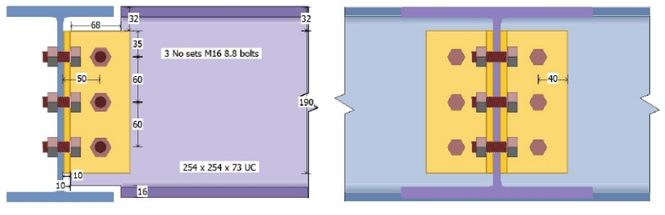


B9b TO B8

Use 2no 190mm long 90x90x10 angle cleats 3no sets of M16 8.8 bolts at 60 mm centres

ANGLE CLEAT PLATE CONNECTION

190mm long 90 x 90 x 10mm angle cleats

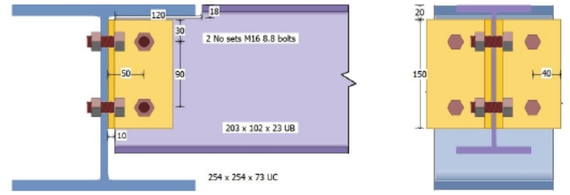


B7 TO B14

Use 2no 150mm long 90x90x10 angle cleats 2no sets of M16 8.8 bolts at 90 mm centres

ANGLE CLEAT PLATE CONNECTION

150mm long 90 x 90 x 10mm angle cleats

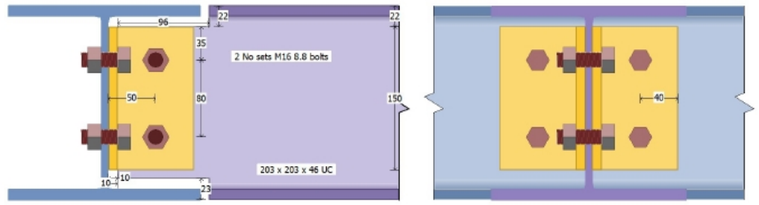


B13 TO B15

Use 2no 150mm long 90x90x10 angle cleats 2no sets of M16 8.8 bolts at 80 mm centres

ANGLE CLEAT PLATE CONNECTION

150mm long 90 x 90 x 10mm angle cleats

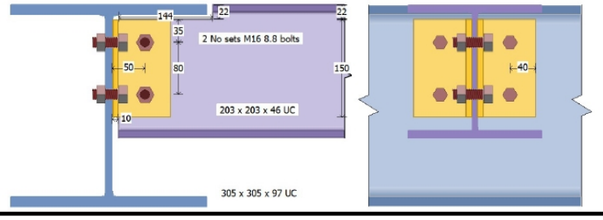


B10/B15 TO B9

Use 2no 150mm long 90x90x10 angle cleats 2no sets of M16 8.8 bolts at 80 mm centres

ANGLE CLEAT PLATE CONNECTION

150mm long 90 x 90 x 10mm angle cleats

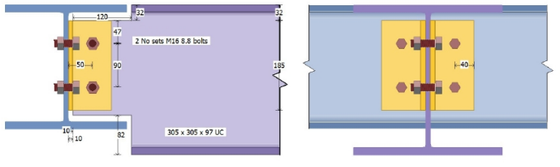


B12 TO B14

Use 2no 185mm long 90x90x10 angle cleats 2no sets of M16 8.8 bolts at 90 mm centres

ANGLE CLEAT PLATE CONNECTION

185mm long 90 x 90 x 10mm angle cleats



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Client:	Project:	Title:	Drawn by:	Checked by:
xxxx	LOFT, REAR & SIDE EXTENSION LONDON N20	CONNECTION DETAILS	GV	
			Sheet: 7	Date: 06/11/2023