“Children Built This City” Co-Housing from a Child’s Eye

AB316 Technology Studies 3 - Structure and Construction Assignment

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Project Overview

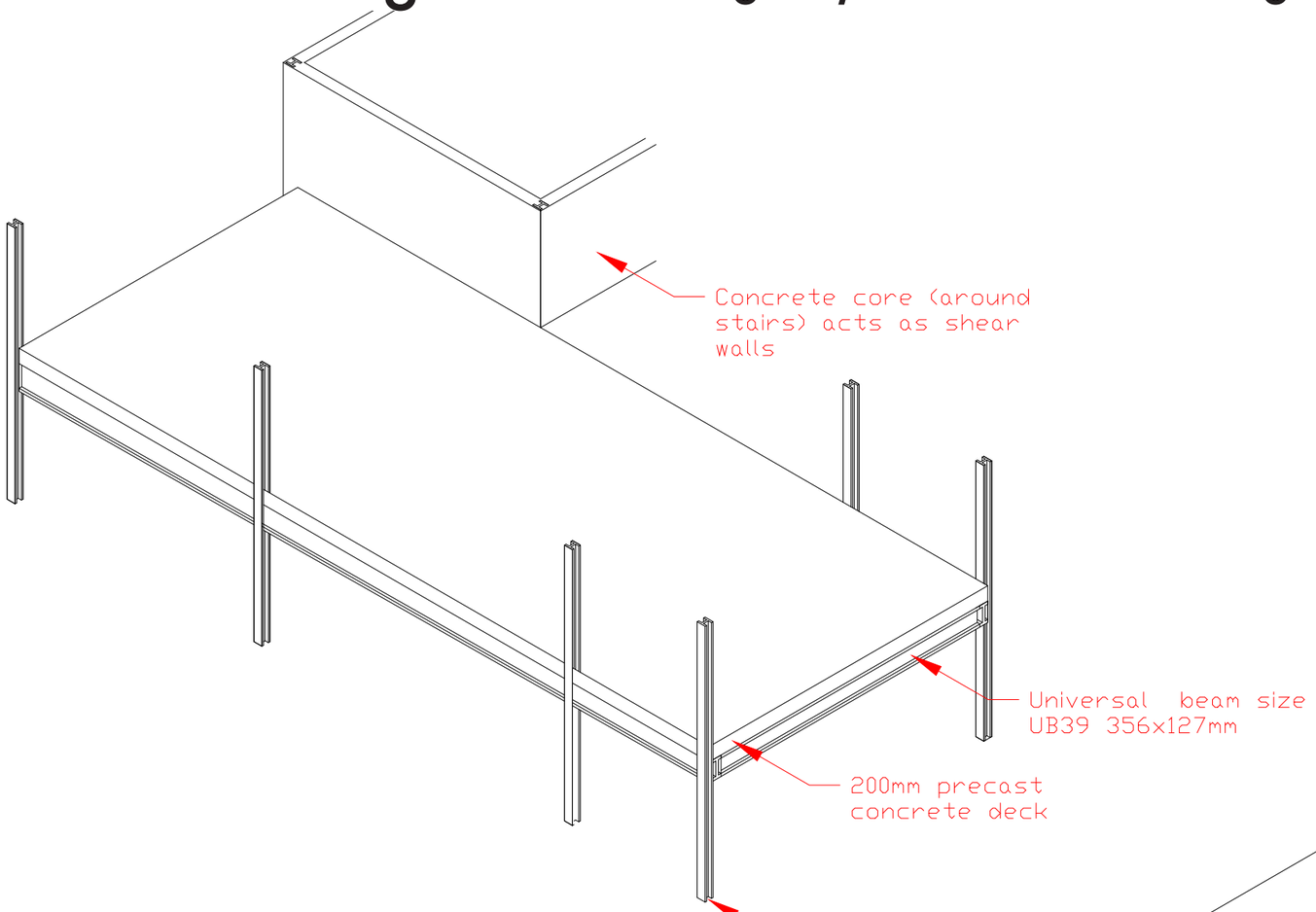
My project is a mixture of duplex flats on the ground floor, with 1-3 bed flats above, and a resident's roof garden. I was aiming to create a scheme that encouraged interaction between multiple generations, hence creating features such as balconies, shared facilities, and a large semi-public square for residents and the public to meet.

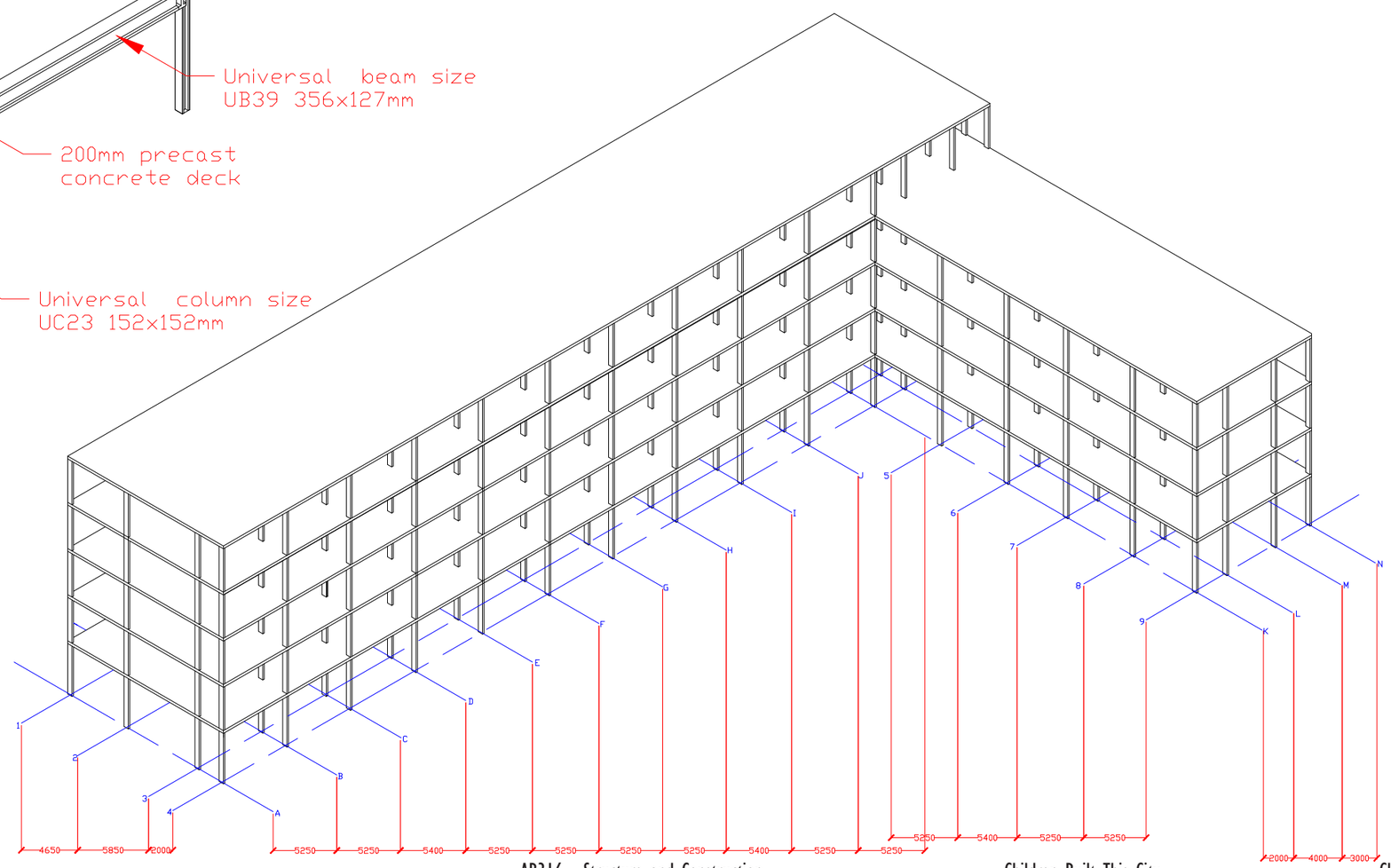
The eastern side of the building has a maximum height of 14.5m, and the longer northern side is at a height of 17.9m.

The vertical circulation cores are away from the main square - bordering either Richmond Street or the tenements.

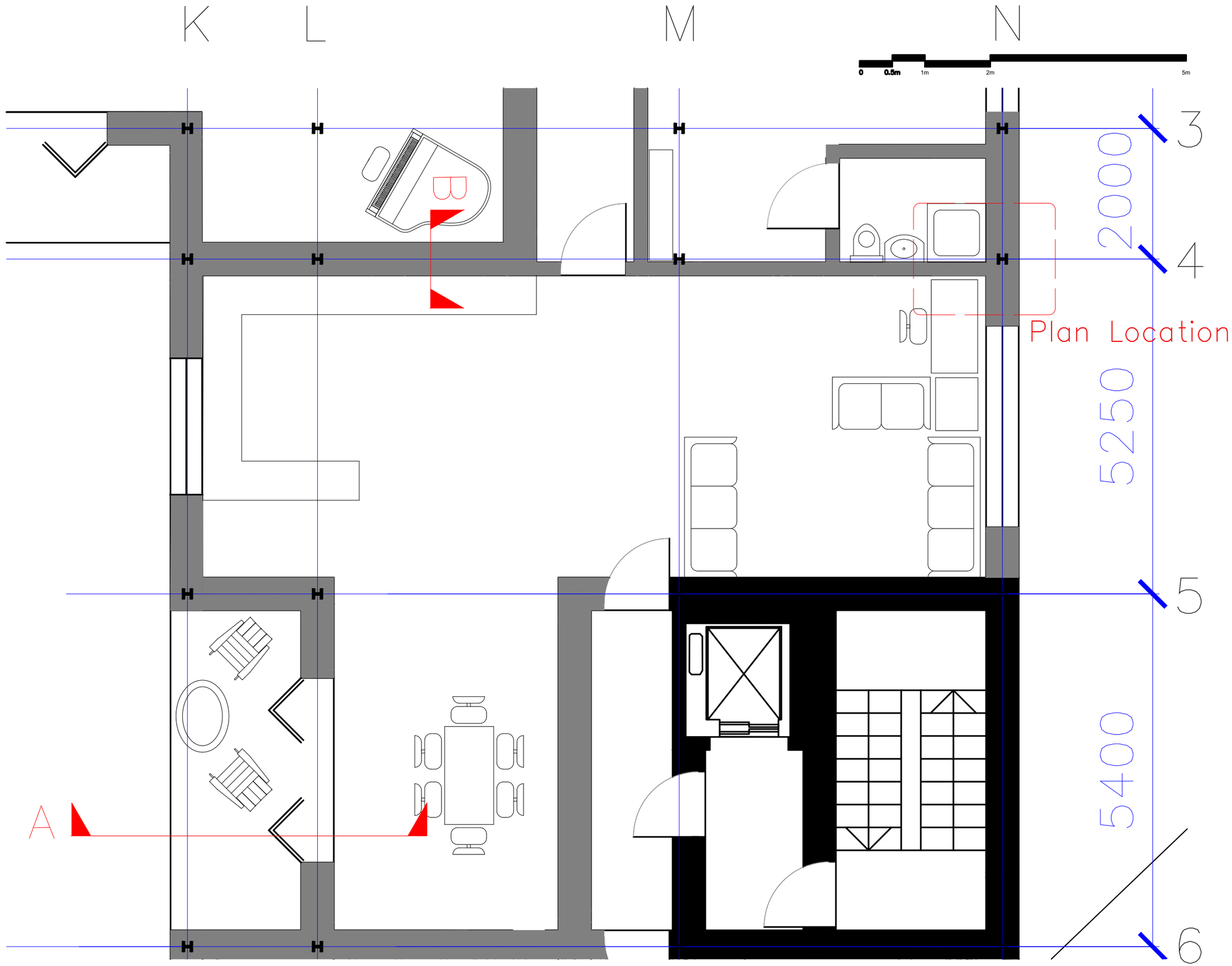
I designed a steel frame building with red facing brick. All but two flats have private outdoor space - for the duplexes this is a garden, and the other flats have recessed balconies looking onto the square, to allow for self-policing and a connection to the wider community.

Structural Diagram Including Bay B-C, 1-4 at a larger scale

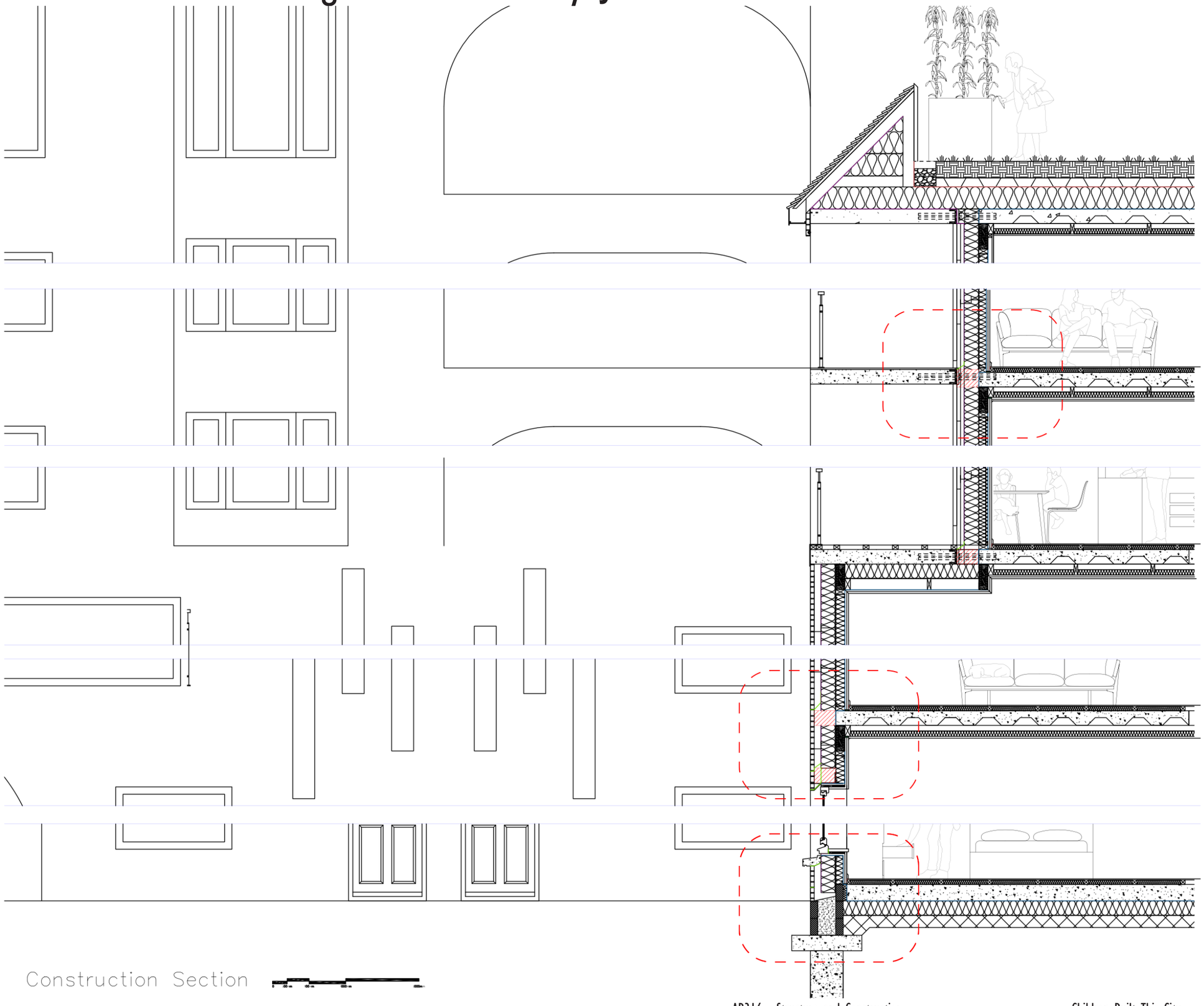




1:50 Part Plan from K3 to N6



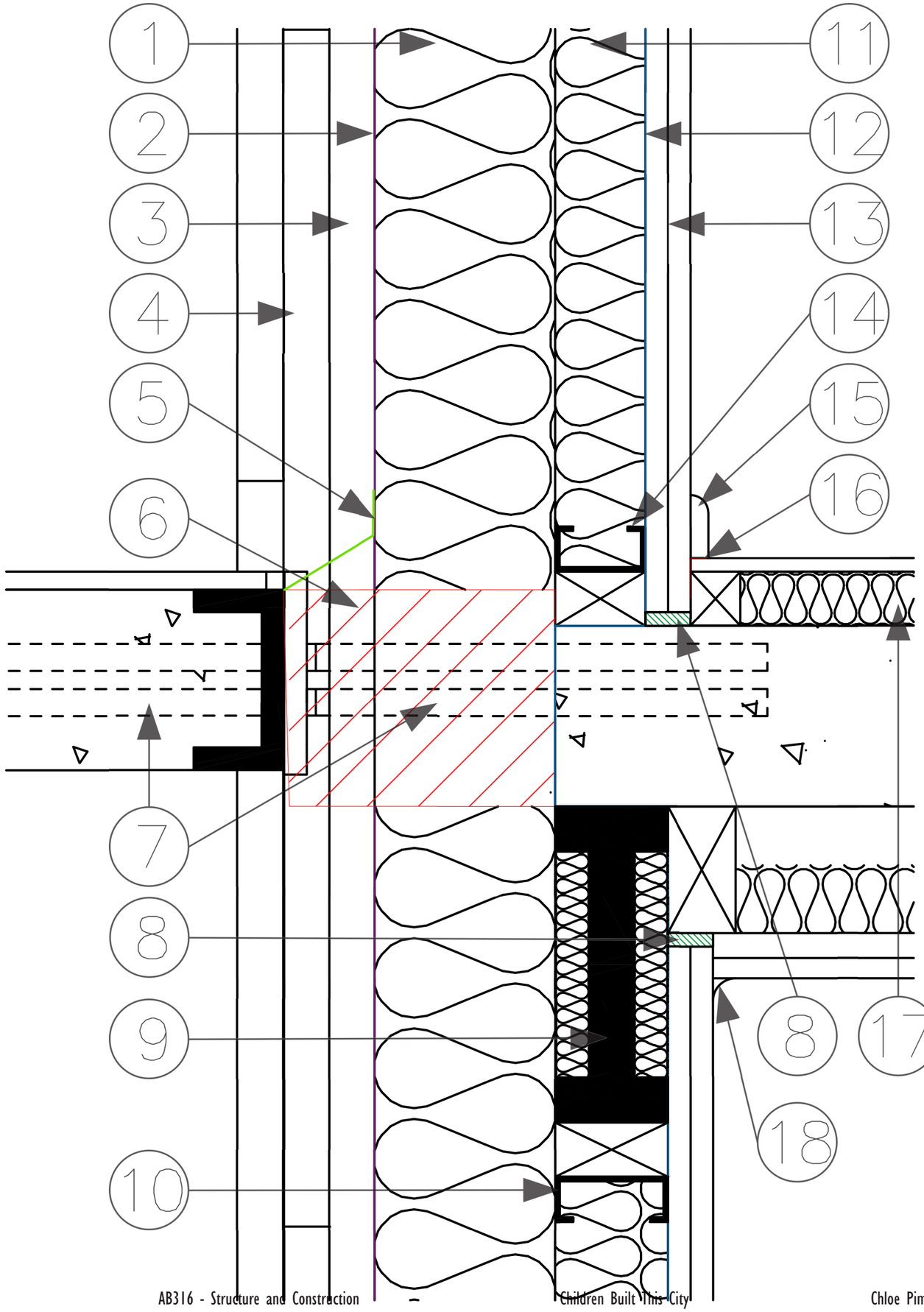
Location Section A including Locations of Key Junctions



Construction Section

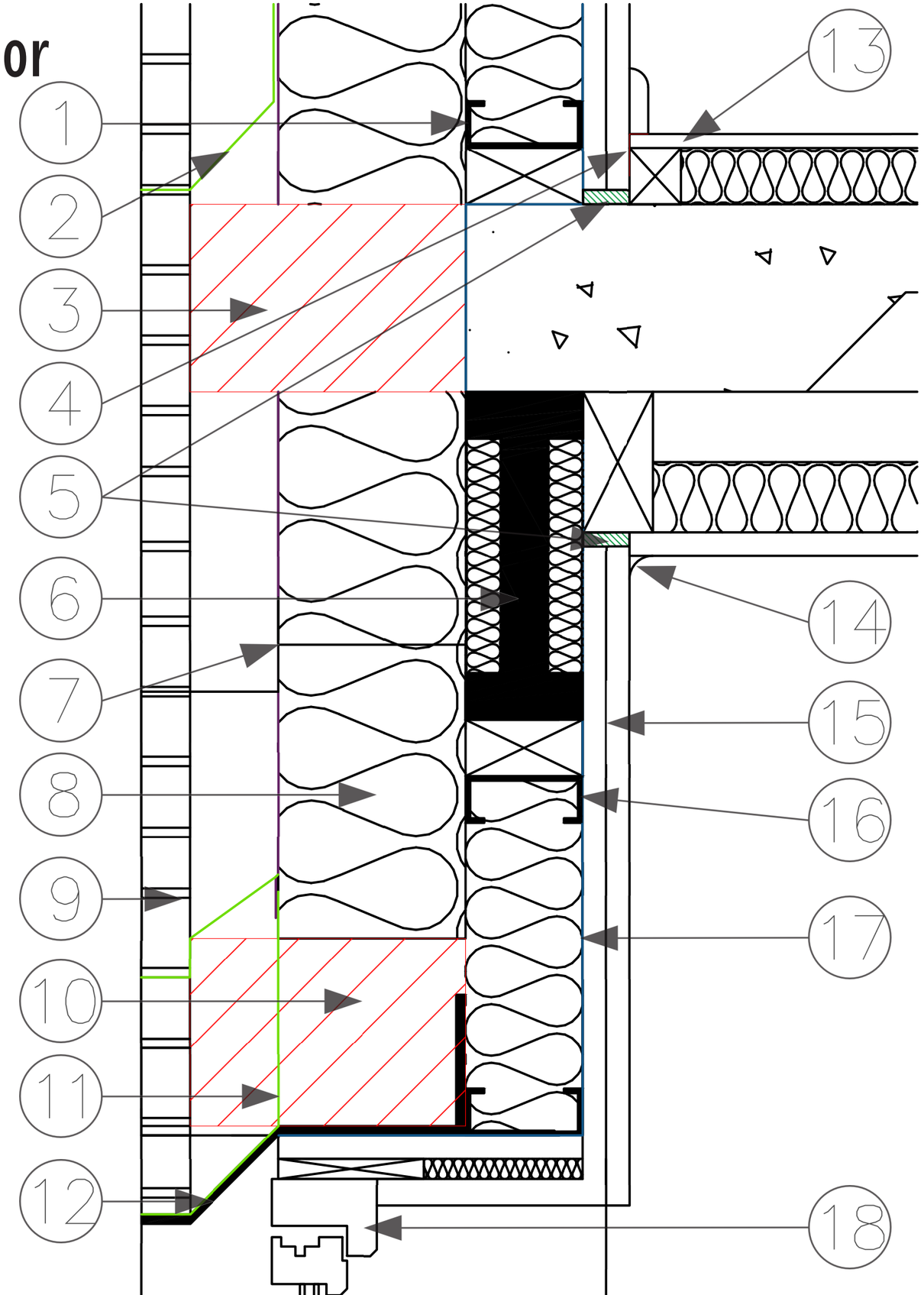
Key External Junction - Balcony

1. 200mm 25kg/m^3, 0.035W/mK mineral wool insulation (such as Knauf Omnifit Slab 35)
2. Breather Membrane
3. 50mm cavity
4. 2 layers of 50mm marine plywood
5. DPC Layer
6. Cavity barrier with short fire resistance
7. Steel rods supporting balcony to minimise thermal bridging
8. Acoustic Sealant
9. Steel Beam 356x127mm, surrounded by 25kg/m^3, 0.035W/mK mineral wool insulation (such as Knauf Omnifit Slab 35)
10. 100mm Steel channels for studwork to sit in
11. 100mm 25kg/m^3, 0.035W/mK mineral wool insulation (such as Knauf Omnifit Slab 35)
12. Low E Vapour Control Layer (R=0.68m^{2}K/W)
13. 2 layers of gypsum based board, 8kg/m^2 each
14. As 10, steel channels for studwork to sit in
15. Skirting Board
16. 5mm resilient flanking strip
17. Floating floor with timber finish
18. Perimeter joints caulked with sealant



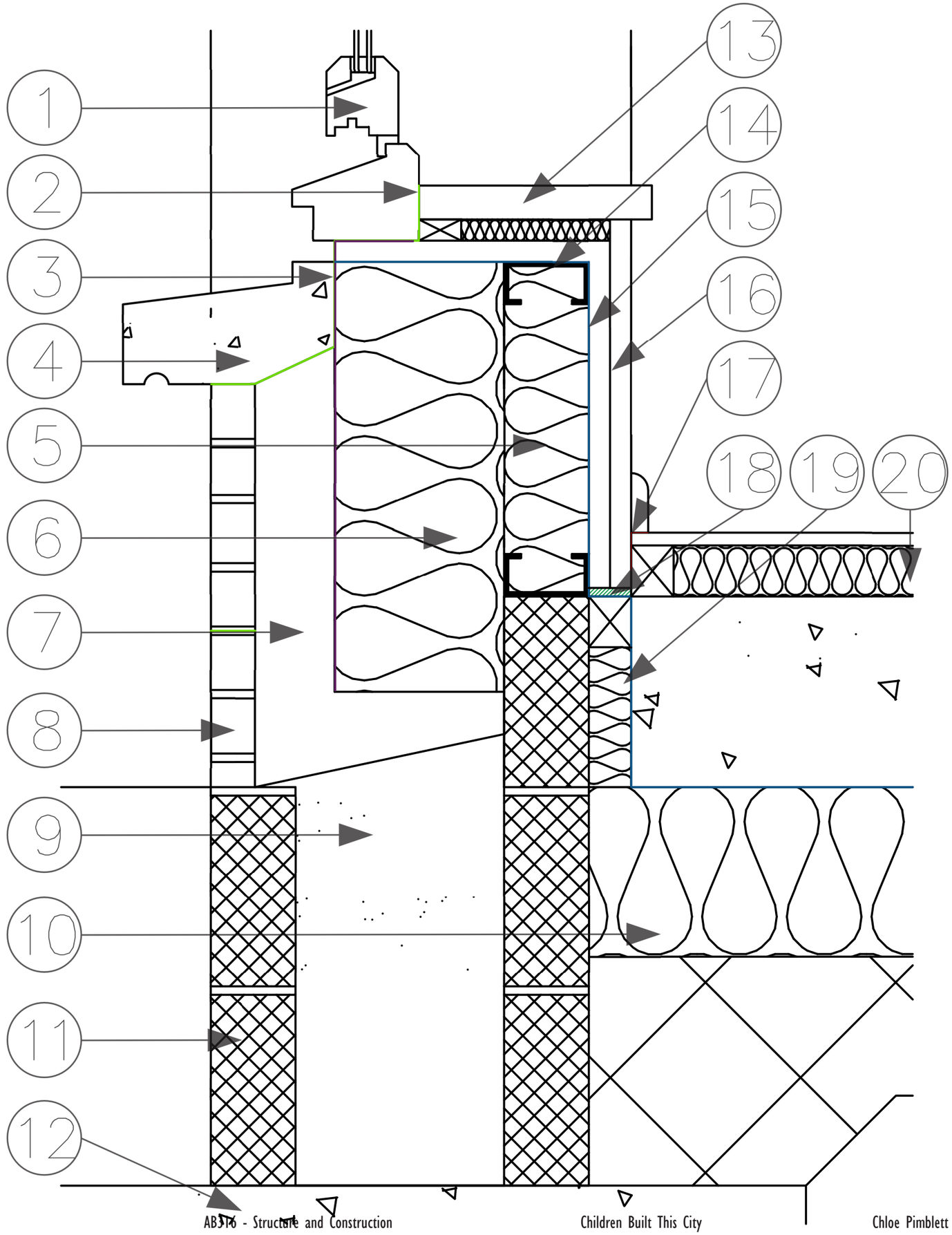
Key External Junction - Intermediate Floor

1. 100mm Steel channels for studwork to sit in
2. 50mm cavity
3. Cavity barrier with short fire resistance
4. 2 layers of gypsum based board, 8kg/m^2 each
5. Acoustic Sealant
6. Steel Beam 356x127mm, surrounded by 25kg/m^3, 0.035W/mK mineral wool insulation (such as Knauf Omnifit Slab 35)
7. Wall tie securing facing brick to steel frame
8. 200mm 25kg/m^3, 0.035W/mK mineral wool insulation (such as Knauf Omnifit Slab 35)
9. Red facing brick (e.g. TBS Old Coach House)
10. Cavity barrier with short fire resistance
11. DPC Layer
12. Steel to support facing brickwork at window head
13. Floating floor with timber finish
14. Perimeter joints caulked with sealant
15. 2 layers of gypsum based board, 8kg/m^2 each
16. 100mm Steel channels for studwork to sit in
17. Low E Vapour Control Layer (R=0.68m^{2}K/W)
18. Window head, all joints caulked with sealant



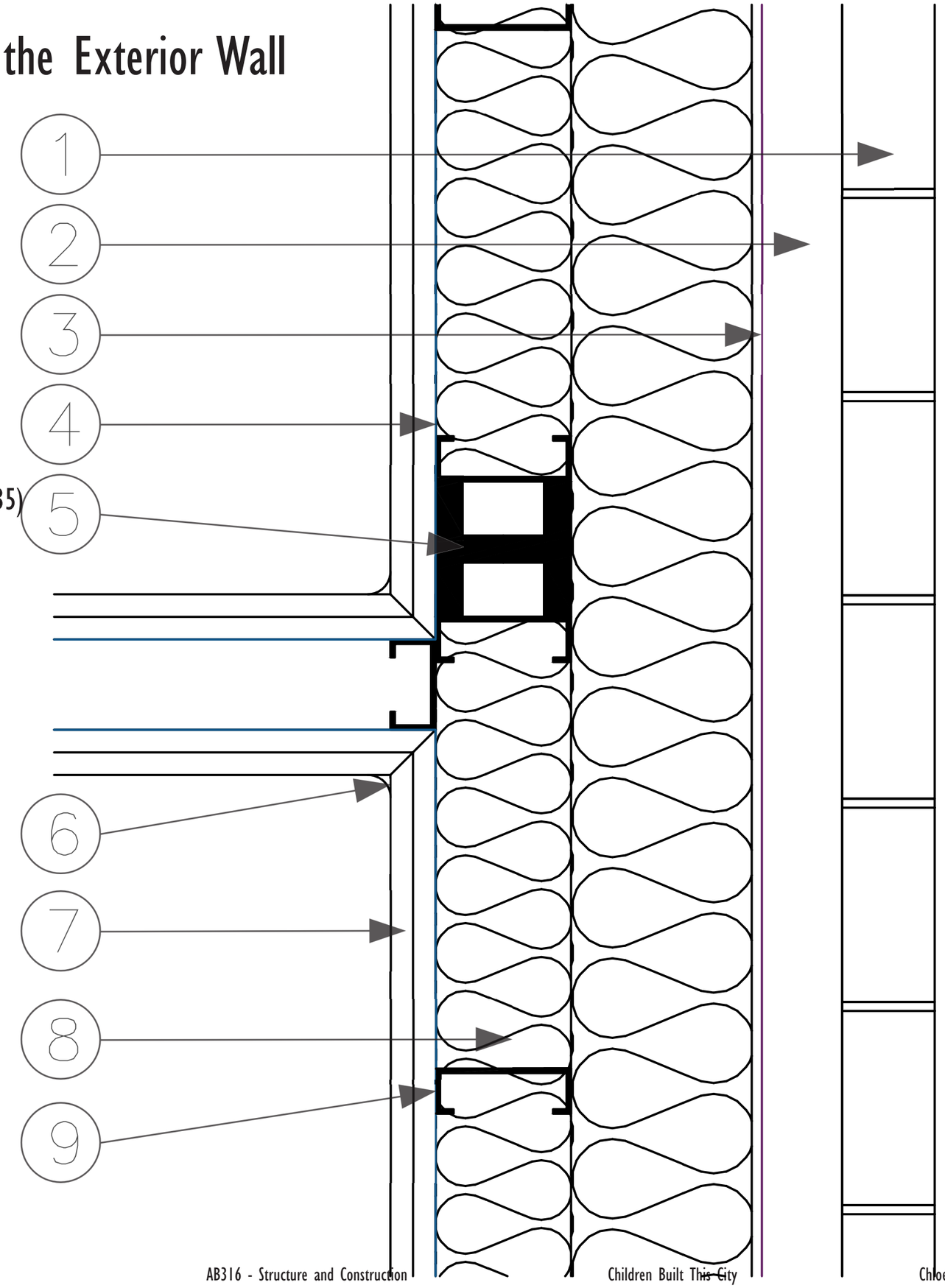
Key External Junction - Foundations

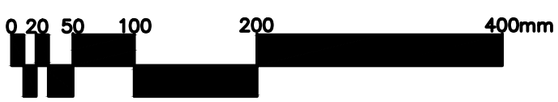
1. Window sill, back of frame caulked with sealant
2. DPC lapped under sill and below window
3. Breather membrane
4. Flashing over concrete sill
5. Steel frame walls filled with 100mm 25kg/m^3, 0.035W/mK mineral wool insulation (such as Knauf Omnifit Slab 35)
6. 200mm 25kg/m^3, 0.035W/mK mineral wool insulation (such as Knauf Omnifit Slab 35)
7. 50mm cavity
8. Red facing brick (e.g. TBS Old Coach House)
9. Sand to finish cavity
10. Rigid insulation below concrete floor slab, covered by VCL and sat on damp proof membrane
11. Thermoblocks to reduce thermal bridging, finishing 150mm above external ground level
12. Concrete pile foundations
13. Sill board with rigid insulation underneath
14. 100mm Steel channels for studwork to sit in
15. Low E Vapour Control Layer (R=0.68m^{2}K/W) continuous from 10
16. 2 layers of gypsum based board, 8kg/m^2 each
17. 5mm resilient flanking strip under skirting
18. Acoustic sealant
19. Perimeter insulation up-stand to prevent thermal bridge
20. Floating floor with timber finish



Plan Detail showing column N4's Location in the Exterior Wall

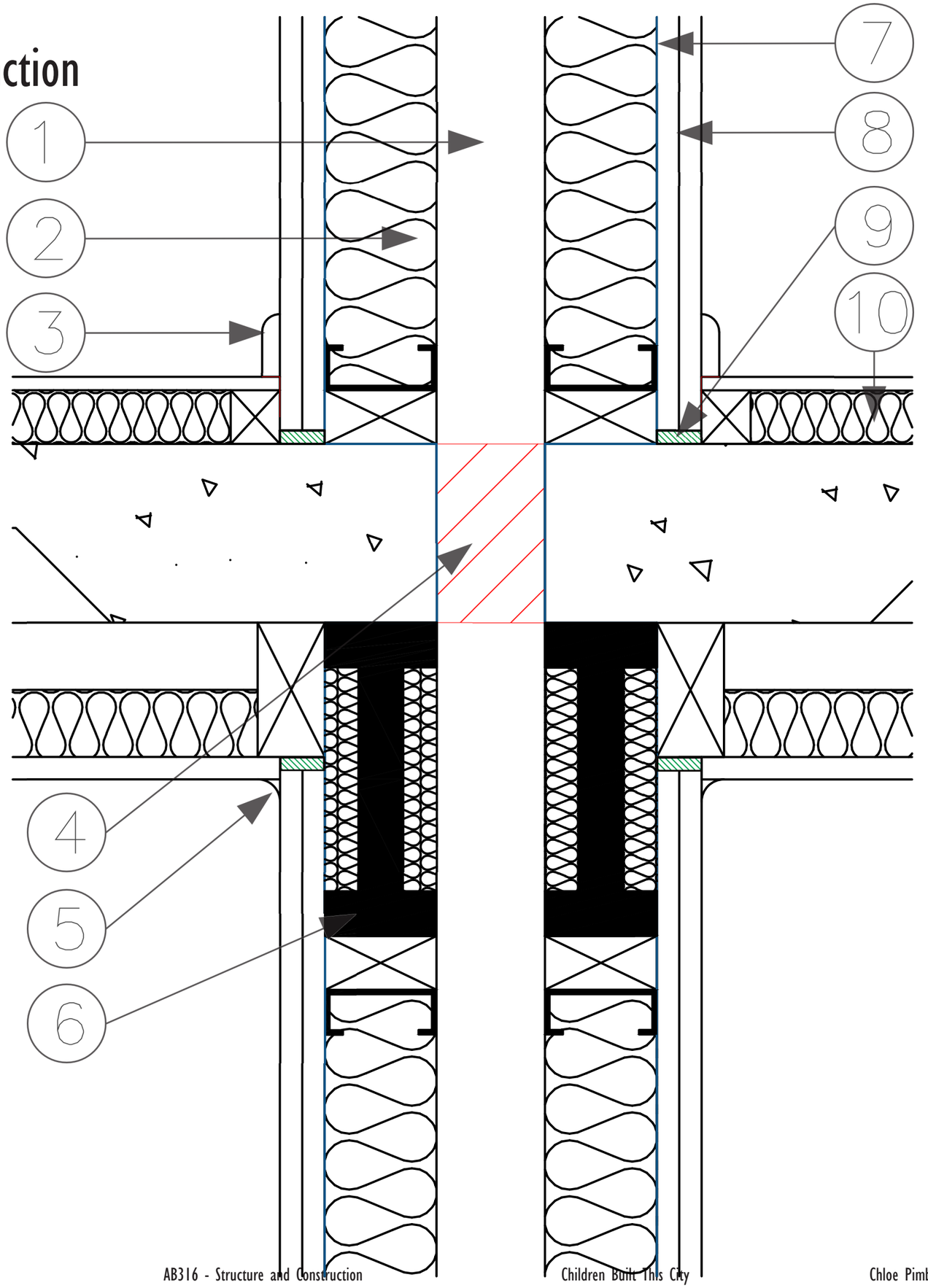
1. Red facing brick (e.g. TBS Old Coach House)
2. 50mm cavity
3. Breather membrane
4. Low E Vapour Control Layer (R=0.68m^{2}K/W)
5. Universal column 152x152mm
6. Perimeter joints caulked with sealant
7. 2 layers of gypsum based board, 8kg/m^2 each
8. 100mm 25kg/m^3, 0.035W/mK mineral wool insulation (such as Knauf Omnifit Slab 35)
9. Steel frame stud walls





Section B through Separating Wall and Floor Junction

1. 50mm cavity
2. Steel frame walls filled with 100mm 10kg/m^2mineral wool insulation
3. 5mm resilient flanking strip under skirting
4. Cavity barrier with short fire resistance
5. Perimeter joints caulked with sealant
6. Steel Beam 356x127mm, surrounded by 25kg/m^3, 0.035W/mK mineral wool insulation (such as Knauf Omnifit Slab 35)
7. Low E Vapour Control Layer (R=0.68m^2K/W)
8. 2 layers of gypsum based board, 8kg/m^2 each
9. Acoustic Sealant
10. Floating floor with timber finish



0 20 50 100 200 400mm