

4.0 Extensions

4.1.3 Level 16

At level 16 (existing roof level), as well as the façade works as discussed previously, there are internal structural alterations required. Due to the removal of the façade elements, the existing level 16 slab is to be demolished, which will be reinstated by a new PT (post-tensioned) slab when the new façade elements are added.

New RC (reinforced concrete) core walls and columns are to be added above level 16 which align with the existing structure below (see the figure to the right).

Key:

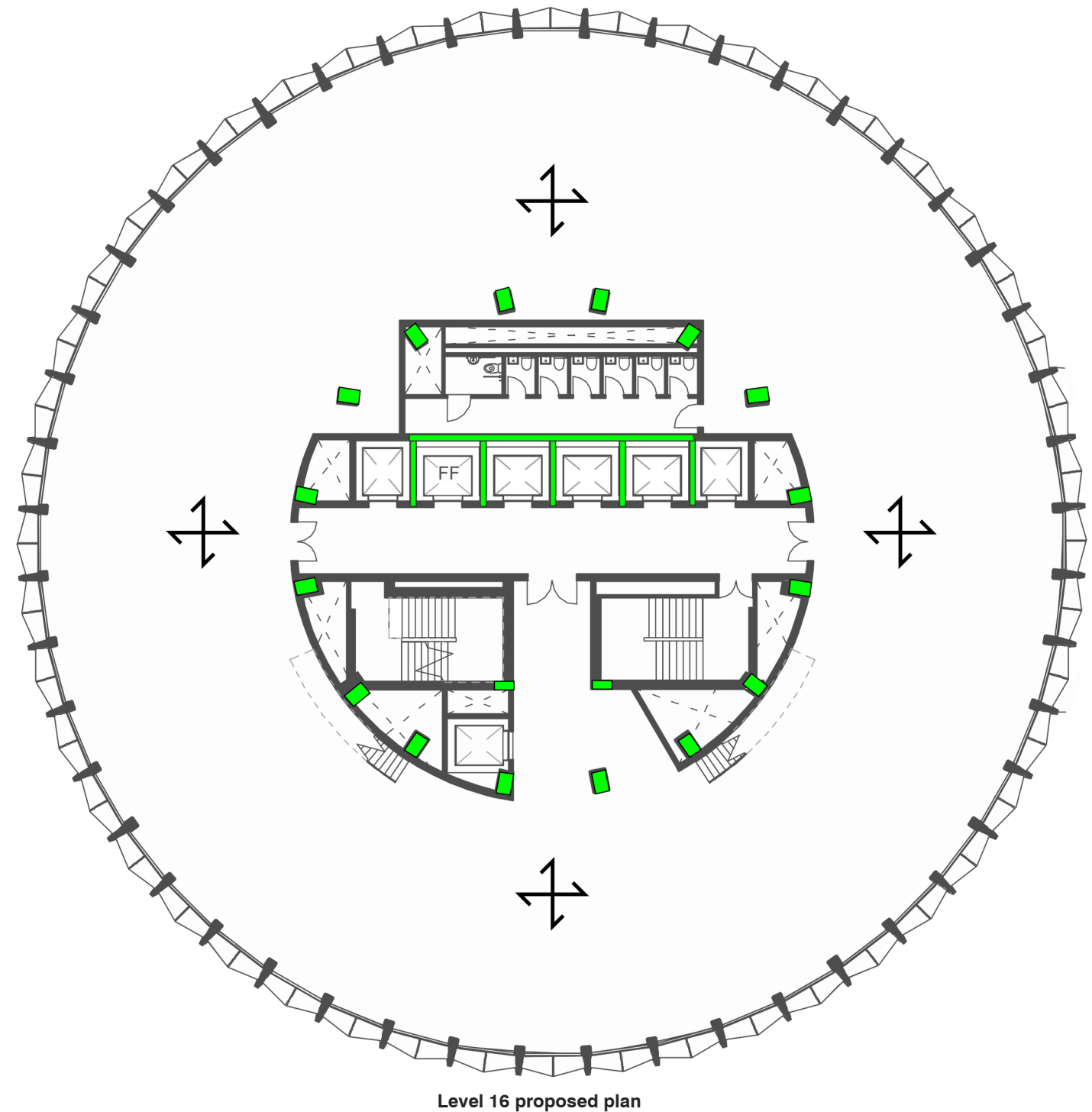
New RC columns to match existing



RC core walls demolished and re-cast from level 16 to 17.



PT flat slab - 300mm thick



4.0 Extensions

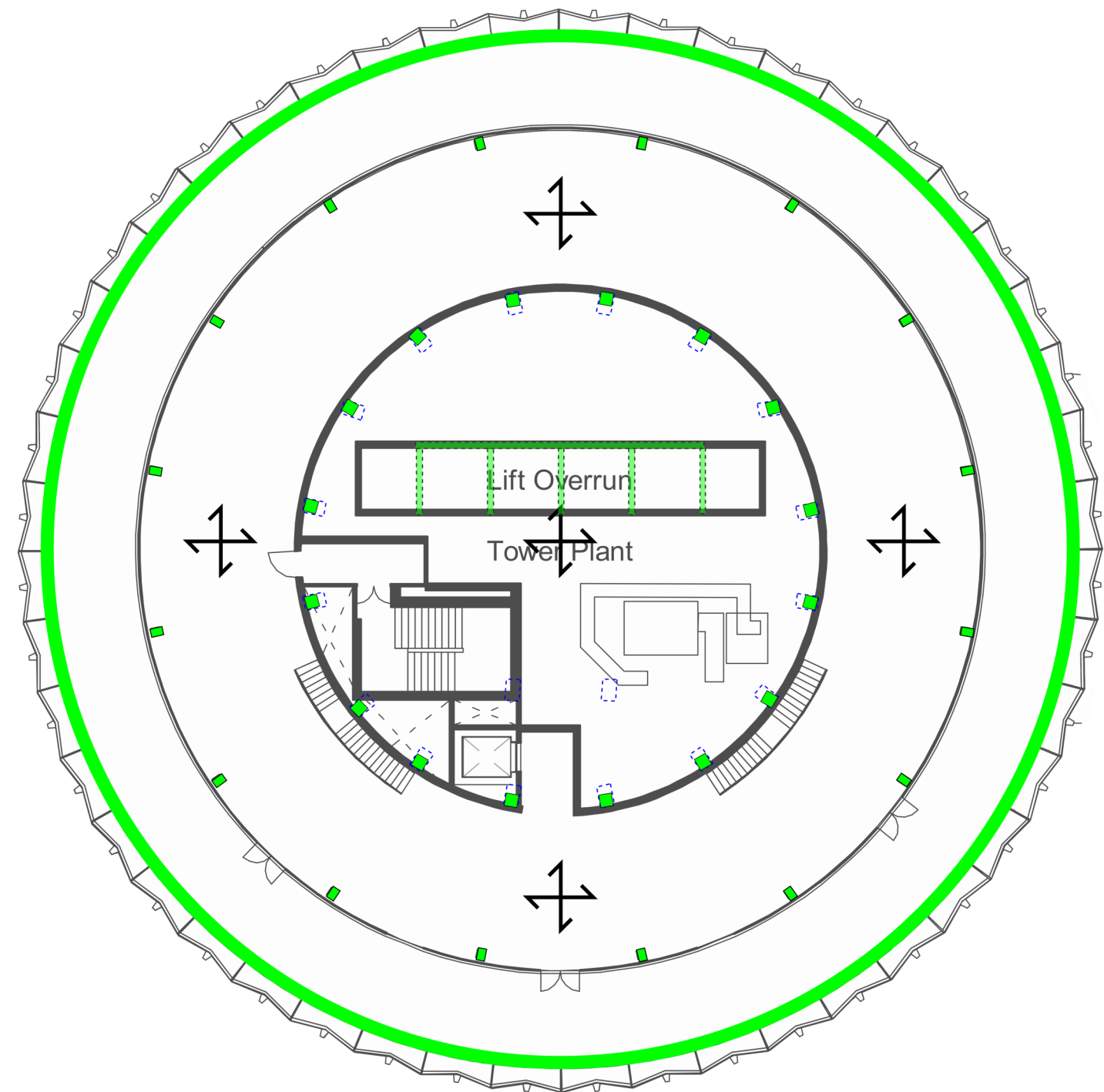
4.1.4 Level 17

The figure to the right shows the proposed structural solution for the concrete scheme at level 17.

A PT (post-tensioned) transfer slab, is supported by the new RC (reinforced concrete) core walls, columns and the outer perimeter ring beam. This transfer slab supports the perimeter in-set columns of the extension at level 17.

Above level 17, RC columns extend up. In the 'inner ring', these columns align with the RC columns below.

Around the outer ring, smaller RC columns are utilised in order to fit with the façade proposals.



Level 17—Concrete option proposed plan

Key:

New RC column below



RC ring beam to connect to precast T units



PT flat slab - 350mm thick



RC core wall (below)



350x350mm RC columns (internal)



300x250mm RC columns (perimeter)

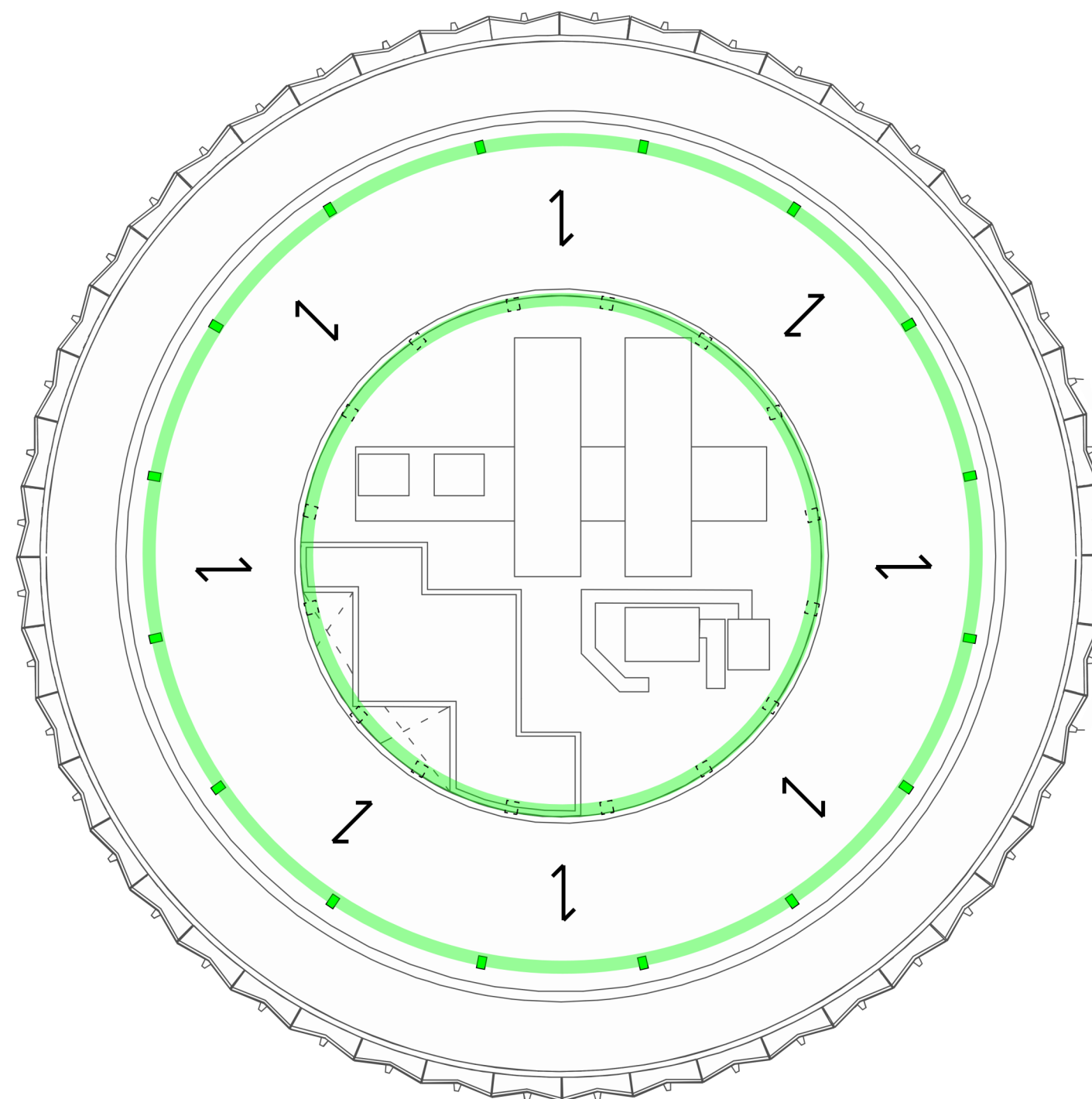


4.0 Extensions

4.1.5 Level 18

The figure to the right shows the proposed structural solution for the concrete scheme at level 18.

RC (reinforced concrete) downstand ring beams span around the inner and outer ring of columns. Between these, an in-situ one-way spanning RC slab spans radially to form the level 18 floor.



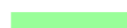
Level 18—Concrete option proposed plan

Key:

200mm thick RC flat slab



New RC downstand ring beam -
400x300mm (100mm below slab)



350x350mm RC columns below (internal)



300x250mm RC columns below (perimeter)



4.0 Extensions

4.2 Kingsway Block

The proposal for the Kingsway block is a single storey extension at existing roof level.

The extension is set-back from the existing building façade as can be seen from the image on the right, necessitating new transfer structures at roof level to transfer the loads from the extension to the existing columns.



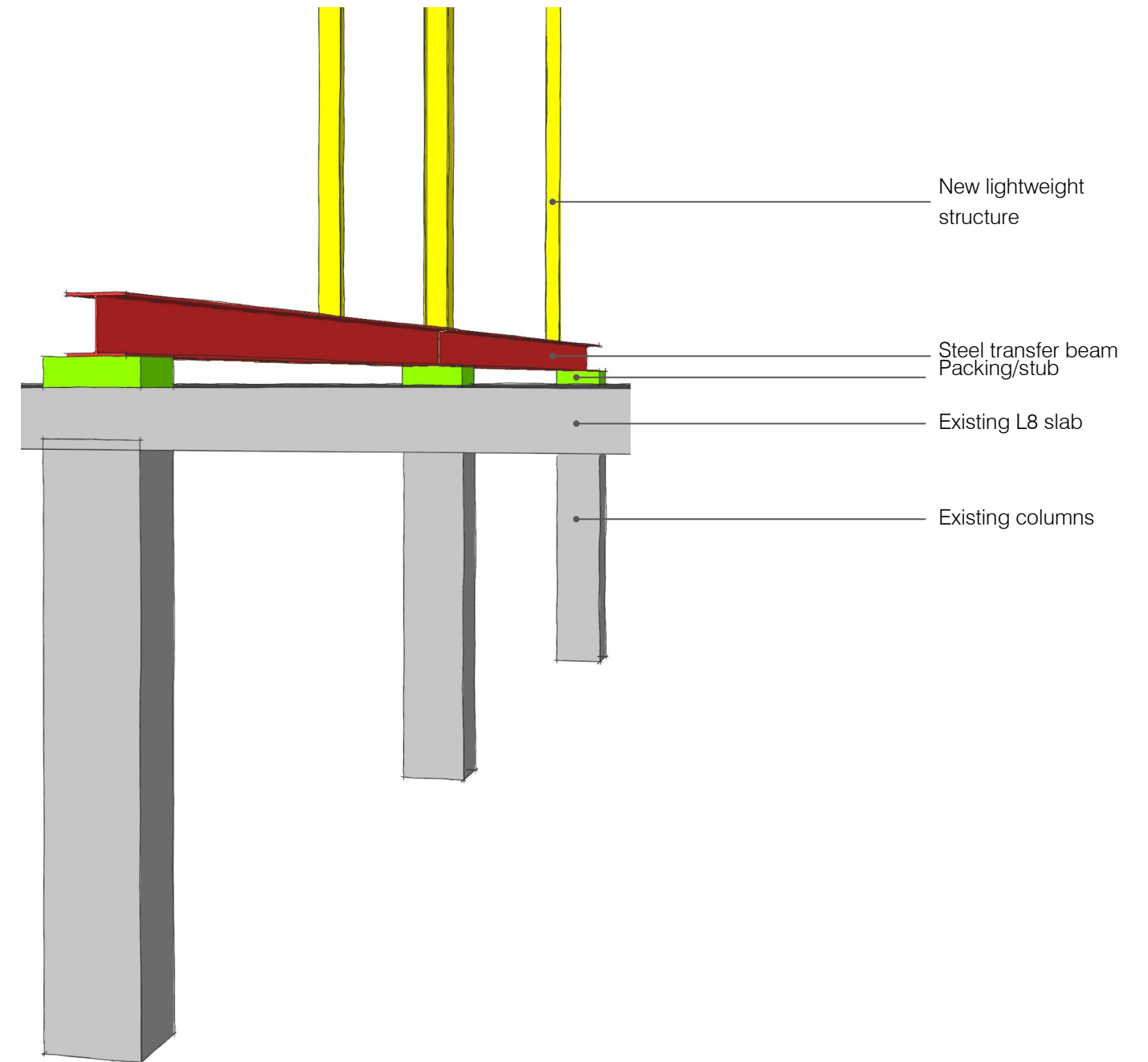
Indicative CGI image of the proposed scheme

4.0 Extensions

4.2.1 Key Drivers

The primary structural design driver for the extension of the Kingsway Block was to keep the additional load to a minimum, ensuring that any strengthening works to the existing structure were minimised.

In order to achieve this, we explored lightweight frame options and proposed the use of transfer beams above the existing roof level in order to transfer the loads from the new structure back to the existing vertical support system below. This is to avoid adding significant increased loading to the existing roof slab. Due to the additional loads, the columns below may require some strengthening works which will be developed in the next stages.



Illustrative Image of Steel transfers beams back to existing structure below (Level 8)

4.0 Extensions

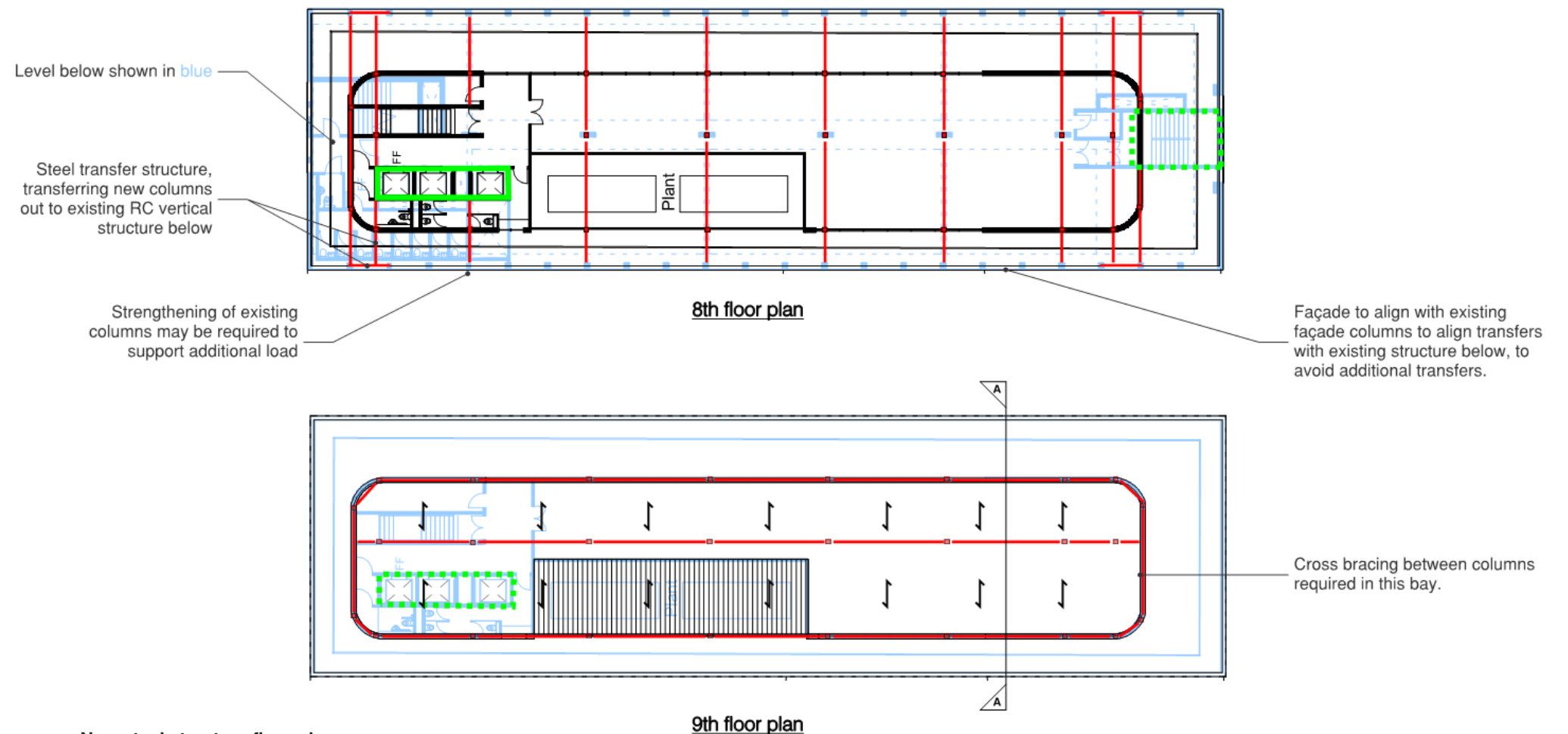
4.2.2 Proposed Solution - Steel

The structure of the extension for the Kingsway Block was chosen to be formed of structural steelwork supporting a precast concrete soffit slab with an in-situ topping.

As shown on the right, above the transfer level, the steel columns are generally positioned along the perimeter of the proposed extension with a row of columns through the middle of the building. This row is aligned with the internal row of existing columns below, meaning that the load transferred to the transfer beams is reduced.

For the roof, a precast soffit slab is proposed as it reduces the need for formwork, gives an instant working platform and allows for a high quality exposed concrete soffit.

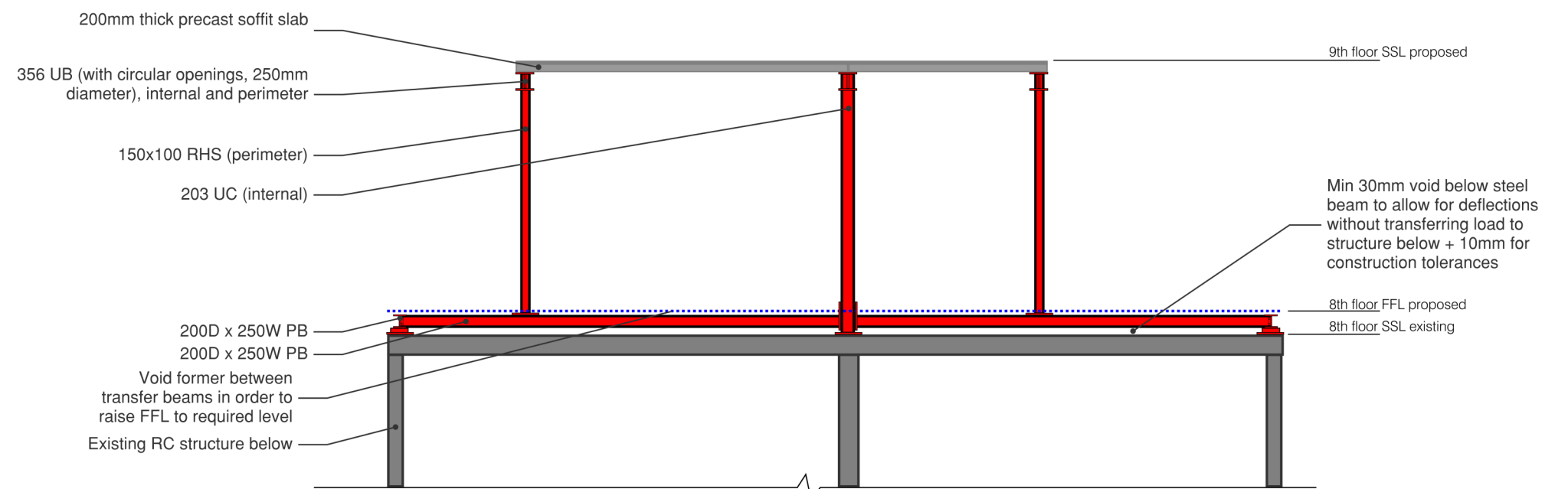
In terms of stability, the lateral load is taken back to the existing core walls by the diaphragm action of the in-situ topping on top of the precast soffit slab. Steel cross bracing will be required in the end bay at the southern end of the building.



New steel structure floor plans

Key:

- New steel column ■
- New steel column below ■
- New steel beam —
- Existing core wall —
- Existing core wall below - - - - -
- Precast soffit slab ←



New steel structure section