

Elevational Treatment

The southern facade of Block B has been re-imagined to take into consideration cleaning & maintenance and health & safety requirements. The base of the projecting fins has been raised to the 3rd floor due to access difficulties for cleaning & maintenance of the high-level commercial glazing in close proximity to the Network Rail boundary. The original location of the horizontal members restricts vertical lift of a mobile platform, therefore requiring access via a telescopic platform from closer to the Network Rail boundary and the associated exclusion zones around their power cables, which is likely to be an issue with Network Rail. Visually, the revised horizontal rail height ties in with the shadow gap at 3rd floor level of Block B provided by the recess channel detail within the brickwork, and creates a clear differentiation between the commercial and residential uses.

In addition to the above, the Structural Engineer requires changes to the consented Planning scheme, as set out below:

The current planning elevational treatment incorporates fin structures which rise from 1st floor level to the projecting main building roof over. These fins project from the façade by varying depths due to the saw tooth nature of the elevation. The upper levels project circa 2m, where these are part of the balcony and by a depth of circa 3m, below 3rd floor level. The fins below 3rd floor drop down to the 1st floor level where a horizontal member is installed which follows the saw tooth profile of the roof and these provide a horizontal tie to the fins. The arrangement of the building means that the fins are exposed to the prevailing South Westerly Wind.

The cladding to these fins was shown in the planning details as an expanded metal lath cladding and continues full height on the building. Through the design development and in consultation with the NHBC the apertures within the cladding have reduced in size to eliminate requirements for inspection and maintenance, resulting in a greater degree of solidity which in turn attracts a greater wind load.

The balconies between the 3rd floor and roof level provide support horizontally at the respective balcony levels. The horizontal forces from the fins are applied to the balcony structure which acts as a horizontal diaphragm and transfer the loads back to the main building via the balcony connectors.

Structurally at 1st and 2nd floor level a series of cantilever steel arms were proposed, these arms were supported vertically from the balcony structures at 3rd floor via hangers and bolted to the slab edge with a post fixed 'structurally rigid' connection to provide rotational stiffness to the fins.

The lateral member cantilevering from the façade to be installed at 1st and 2nd floor levels will be formed from a UB section laid flat and profiled to the fin shape, which will be post fixed to the slab edge.

At first floor level where the horizontal member is provided the loads applied to the cantilever arms a generated from the wind load applied to half a storey of exposed fin above this level. The horizontal member ties the tip of the cantilever which restrains the end of the fin, reducing the lateral deflection which in turn reduces the forces in the connection and the effects of fatigue on the fin structure.

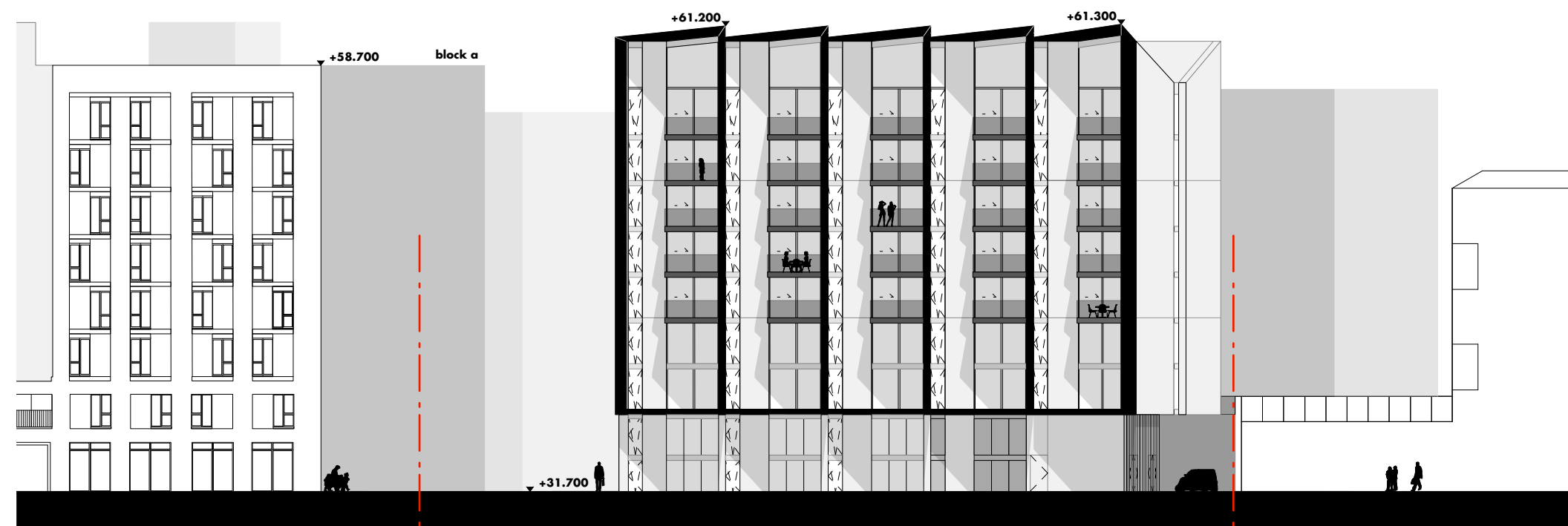
At second floor level the wind load increases due to height and in addition the cantilever arms support a panel projecting half a storey below this level, which effectively doubles the applied wind load to the cantilever arm at 2nd floor.

The planning concept doesn't include a tie at 2nd floor level which allows the fins to deflect to a greater degree, which induces higher forces and moments at the connection and also increases the risk of fatigue in the steel section over the life of the building. The connection moment increases by a factor of 1.75 and the lateral deflection increases by a factor of 3.2. With the increase in the connection forces the post fixed connection to the slab edge becomes unviable within the constraints of the architecture.

BDC have requested amendments to the planning design concept to introduce an additional horizontal tie is provided at this level to help to control the movements at the tip of the fin and reduce the forces and moments applied to the slab edge via a steel to concrete connection.



South Elevation of Block B as HGP proposed design



**South Elevation of Block B
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