Project Buildability Case Study

This Case Study documents many of the issues that our team, experienced Façade Contractors, faced on a single residential project in London, all of which could have been avoided if a review of the design intent had been conducted as a part of a Buildability Review exercise.

At the time we were awarded this project our design input was minimal at the preliminary stages of this project, as the project moved on it became clear that the design had many issues that had either been overlooked or not had the buildablity exercise gone through with either the contractor or the client design team. As the project progressed, we were instructed to get more involved with the design and to correct all the resulting issues that arose from the architect and client design team not doing their due diligence at the earliest stages of the contract resulting in catastrophic time and cost liabilities that could have been highlighted and dealt with at much earlier in the project. This would have mitigated these issues and lead to a much timelier and efficient build.

Chimney Flues

- Pumice based flue system fully designed by architect with input of specialist supplier
- Our team began the buildability exercise at the point of ordering the material, right at the start of our involvement and raised queries as to levels & heights
- Structural & Architectural drawings had not been overlaid meaning holes that had been cast in the floor slabs were out of position.
- Flue system no longer feasible.
- We proposed alternate systems which allowed construction to continue to surrounding areas and the roof to allow for water tightness
- Had we been involved at design stage costly variations and additional time would have been avoided

Brick Support System

- CDP item but intent had to be followed
- Drawings had not been overlayed with internal drawings, level and interfacing details were not compatible
- Support system itself was insufficient for required loadings
- Full redesign by our team, lengthy process as approval and signoff needed by architect, engineer & main contractor.
- Lengthy process, additional costs, and additional time

Interface Details

- Various issues arose within the cavity wall including but not limited to:
- Membrane compatibility
- Plenum details were not available
- Balcony spigot placement unclear
- Fire Barrier material compatibility and placement issues
- Waterproofing material and detail
- Cavity Insulation compliance resulting in works being taken down and rebuilt
- All items required our team to either redesign or propose alternate systems for the architect to redesign, taking vast amounts of time and increasing costs

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Porte Cochere and Portico

- Design Intent for these areas was sparce
- Unit sizes were too large and could not be physically or safely installed using the materials specified
- Our team proposed alternate systems using alternate materials in different sized panels upon appointment
- We were over ruled
- We had to design a heavier duty hanging system & purpose made lifting rigs and a working platform to allow these units to be lifted into place and fixed from beneath. This was a huge additional expense and the time taken to devise a working system was significant.

Heights and levels

- Due to a lack of overlaying drawings multiple level clashes occurred
- Window cills & precast window surround did not line up with Balustrade Fixings, which were fixed through formed holes in the window surrounds & cills
- Cavity trays clashed with other trades materials
- Window positions were incorrect on certain elevations meaning that continuous stone bands had to be interrupted rather than run underneath
- Numerous interfacing meeting were held with all contractors to overcome these issues taking up a lot of time and a lot of resources

Existing Brickwork

- Lack of overlaying internal & external drawings & lack of sufficient surveys of existing façade
- Window heads clashed with internal floor levels
- Window heads clashed with existing concrete beams not detected within Structural Engineer's original survey
- Costly variations to remove beams and modify windows unexpectedly.
- Bricks for rebuilding existing elements of work not included in the specification. Our team investigated, matched, and sourced them
- All could have avoided delays if a buildability exercise had been completed earlier.

Bottle Balustrade

- Lack of surveys meant that insufficient substrate was not detected in a timely manner
- Demolition works caused concrete upstand to be weakened meaning the balustrade could not be fixed to it
- Balustrade did not meet with balustrade regulations contained within CDM in terms of height & loadings
- This meant that the balustrade could not be designed and manufactured as the height, loadings and fixing details are all crucial elements in its design.
- These items would have been addressed with a buildability assessment saving costly delays and design changes.

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Chimney Cappings

- Chimney Cappings are the first line of defence against water ingress
- Design failures were significant
- Cappings were designed with dangerous loadings and tipping points which would have resulted in the end units falling off.
- Our team redesigned these units to put their centre of gravity over the chimneys and fixed them to the adjacent capping.
- Flaunching that covers the chimney cap was of insufficient quality and mix ration meaning it drew water in.
- This combined with the holes that the architect wanted in the caps for mechanical fixings meant that the chimneys leaked heavily.
- We advised against both the flaunching and the mechanical fixing holes and were overruled.
- We then had to propose a more substantial flaunching detail which we then installed to stop any leaks.
- These were fundamental errors which were advised against but could have again been avoided by an early-stage buildability appraisal.

In conclusion design interaction between architects, client design teams and contractors can be a daunting and challenging experience, our team can and has circumnavigated this many times in the past. It seems that as the industry progresses these critical design phases are becoming more overlooked with the time and program constraints being imposed. Our team specialises in this area of construction design and build. We can offer design buildability exercise and design liaison package to carry through from preconstruction to handover we can also offer the complete structural build package.