247 Tottenham Court Rd Methodology

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METHODOLOGY OF THE CONSTRUCTION

OF

247 Tottenham Court Rd

'The Fitzrovia'

1. Site set up & Enabling Works

Pre-Start on site

Following the piling works Kier will have a senior engineer on site as a watching brief of the formation of capping beam and associated corbels for the temporary propping ensuring all QA is correct and construction is correct. The engineer will then check temporary props and monitoring are installed as specification and design before bulk excavation begins. This watching brief will continue through the excavation works and a final check of the blinding heights to allow sign off of the DCUK works.

Through this process the engineer will collate the monitoring results of vibration and movement and forward to Kiers in house engineering team (KPS) for review.

The Kier PM for the construction works will join the scheme around week -8 to start preparing for the gantry installation.

In weeks -6 to week -4 Kier will organize footpath closure for Tottenham Court Road for the forming of the 800 x 500mm concrete plinth and then then additional partial lane closure of the carriageway to allow the steel gantry to be erected oversailing the bus lane. In week -3 the first layer of cabins will be positioned onto the gantry and scaffold walkway commenced. Week -2 will see the scaffold to both layers of the set up completed. Week -1 will have the electric and water temporary services connected to the first layer of cabins. **This will require access to the water supply that DCUK are using as well as the sub-station installed and live supplied by client team.**

During the pre-construction phase Kiers engineer will liaise with WPP (services engineer), Deconstruct UK and UKPN to ensure the sub-station is installed with ducts to the site boundary line and live ready for Kiers site possession date of the 24th September.

In weeks -1 and -2 Kier will liaise with DCUK to form the required pit lane for Kiers work. During this time DCUK will form the permanent corbels and strip foundations to support the façade on Morwell St.

Groundworks and Substructure

The DCUK works have omitted the install of the loading gantry requiring the use of a small crawler crane on site for the initial 3 weeks of the sub-structure works. This will be for loading out reinforcement and drainage initially then potentially the first liner wall concrete pours. The spoil will be removed from the basement lift pits and over dig to cores by way of a conveyor belt.

In week 3 TC 1 will be erected which will then allow vertical elements of the concrete frame to commence. The B2 slab will be formed in 3 pours roughly 250m3 of concrete each pour as well as numerous smaller pours to form lift pits / walls. These pours will be by static pump in the unloading zone on Morwell St. All vertical concrete pours will be using a 1m3 concrete skip on the tower crane hook.

DCUK will jet wash the secant piled wall and blinding leaving it ready for Toureen to apply a liner membrane to the piles and blinding. The lift pits will be excavated along with the pump drainage sets. Both the lift pits will then be formed and a concrete base laid for the pump sets. The bottom mat reinforcement will then be laid, drainage installed, top mat reinforcement installed and then concrete pour to the slab. The liner walls will then be formed working in both directions. Both B1 and B2 slabs will be worked on concurrently.

As the B1 slab and then ground floor slabs are formed the props will be removed to suit the temporary works design ensuring no movement to either highway or adjoining property occurs outside of that permitted within the relevant specifications. As the props are removed any blisters will be repaired and the top layer of props will then involve the removal of the corbels supporting the temporary props. The corbels will be removed using a remote controlled demolition method similar to a Brokk. This will allow the work to be completed safely with no operatives working adjacent to areas where edge protection is missing around these corbels.


Brokk remote controlled demolition plant.

A falsework deck will then be installed for the suspended B1 slab and ground floor slab with reinforcement installed and tied into the capping beam. Care is to be taken to ensure all water proofing details are adhered to and BWIC is formed.

Permits to load will be issued by Kiers engineer for falsework prior to any material being landed on the deck and permit to pour will be given for concrete slab pours once Kier engineer with any statutory authorities have inspected reinforcement install, BWIC, hydrophilic joints and cast in elements for follow on trades.

Superstructure

Just prior to superstructure starting a 2nd tower crane will be erected.

The superstructure will be formed using twin wall concrete panels to form the cores with a hybrid Delta beam PCC plank, PCC columns, with concrete encased steel beams. This process will work on a cycle of approximately 3w / floor with an overlap between floors. Each floor will start at the South end of the building and progressively work North.

Following completion of the 3rd floor PCC planks the structural topping slab which is a 75mm thick insitu concrete slab will start to level 1. The topping slab will have a Halfen type cast in channel to pick up the restraint brackets for the façade panels. This detail will build in tolerance as required for the façade installation.

Once the frame has reached the 6th floor slab roof level the secondary steel elements commence these include the following items.

- Roof plant enclosure
- Perimeter upstand to restrain PCC façade panels to roof and terrace levels
- Riser support steels.
- Support stubs for BMU rail

Following the completion of the above the topping slabs will continue through until completion. During the works continued as built checks will be recorded and surveys carried out for follow on trades.

The system of permit to load and permit to pour will be followed same as the basement box works.

Roofing and Façade

Whilst the frame is being completed the water proofing to ground floor perimeter upstand in a hot melt system and warm roof construction to level 1,2&3 balconies and winter gardens will be installed to allow this work to be in front of the PCC façade install. The 'L' shaped glazing / sliding doors to balconies and winter gardens will be installed following the roofing works to ensure correct laps of water proofing membranes.

Following completion of the plant screen secondary steel work the cranes will be appointed to façade panel installation. The ground floor is formed using pre cast concrete plinths & column pieces with a Basalt facing. The basalt runs slightly into the first floor also. From level 1 to level 5 there is a mixture of 'double punch' panels with a Petersen brick facing to majority of Morwell St and terracotta facing to Tottenham Court Rd, Bayley St and part of Morwell St.

The parapet levels have a scalloped feature to the top and will have a polyester powder coated coping to close the cavity.

All PCC façade panels are made in a yard in Belgium. In the same facility the glazing elements with associated silicone and membranes are installed. The panels are then shipped to the UK and installed onto the façade straight from the wagon bed to final place of use. A span set arrangement will be used to install the panels from within the building line. The area of work will be barriered off as edge protection needs removing during the panel install. Once panels installed it will be reinstated as a gap larger than 200mm will be left from slab edge to face of PCC.

Following completion of the panel install a double wet seal is installed to all horizontal and vertical panel to panel joints externally using rope access. Internally floor level and vertical fire barriers are installed followed by thermal insulation and VCL from the slab edge. Tower crane 2 will also be removed at this time. Once fire breaks and thermal insulation is installed the edge protection will be stacked and removed.

Once TC 2 is removed TC 1 will be used for installing the PCC to this infill and a pump will be used for infilling topping slab in 1 visit.

3 weeks after the pour of the roof level topping slab the finished roof membrane works will commence. Initially this will consist of temporary water proofing over the residential area and around the 2 commercial cores to allow internal fit out to commence. Then the warm deck construction will commence starting in the plant area to the West elevation working Eastwards. Once the roof construction is completed to the plant area the plant screen installation will start while remainder of roof is completed.

Once the plant screen is installed an electrical test and flood test will be completed to the roof. Then the 2No AHU's and 1No life safety generator will be lifted into position using the tower cranes. Roof finishes will then start to the main roof, top steels will be placed to the plant screen and BMU tracks and MEPH installation works commence in the plant area. The install of retractable glazed screen and A.O.V's will also be undertaken at this time.

Once Green roof and slabbing is complete to main roof area the PV array will be installed to the North end of the roof, then 2nd fix of mansafe system, followed by removal of edge protection. Access to this section of roof will then be by permit to enter only with access gates kept locked. The BMU installation can then start without edge protection hindering the operation of this item of plant.

The entrance screens and retail screens will not commence until PCC façade panel install is complete to avoid operatives working below panel install above and the safety risk this introduces.

Fit Out

Residential

Plasterboard for the residential units will be preloaded and stored on the commercial floor plates using canti decks levels 1-3 & terraces level 4 & 5. A 'rat run' will be formed in a party wall adjacent to GL 2. Once the screed is installed a ramp will be used to access safely. The 'rat run' will not be closed up until both the commercial south core and residential metal staircases are installed and the apartments are plastered to reduce the fire load on the building before residential area is reduced to only 1 means of escape.

The first activity in each building will be blockwork and suspended services to the basement levels to allow timely install of risers and SVP's / RWP's to pass through roof slabs for weathering around and removing all water from the building early. Along with setting up of temporary electric and lighting.

The apartments will commence with metal and board 1 side with rips to the other side for screeding. Due to the restricted amount of space in corridors generally we will board the corridor side of party walls. Internally to the apartments the bathroom will take precedence on first side boarding, followed by kitchen, then corridors to ensure critical dimensions are achieved. A flow screed will then be installed with UFH where specified. Early install of screed is required to allow requisite drying time for floor finish application to avoid the additional cost of screed additives or foil backed underlay to finished flooring.

Following screed 48hr drying time the first fix mechanical will commence including MVHR ductwork, then electrical first fix.

A hold point will then be introduced for a void closure inspection. Then internal VCL to external walls and fire stopping to services letter box above apartment front entrance door will be carried out and checked, before Premier Guarantee are invited to inspect 10% of units in each block as their requirements.

The walls and ceilings will then be closed up, down lighters cut out sprinkler heads set to final height. The door linings and window boards will also be installed at this stage. Then FCU's installed and bathroom carcass completed with any false walls and FCU housings built.

Plastering will then commence. During the plastering drying time flat front doors will be installed. After approximately 3-5 days drying time depending on temperature and humidity conditions a mist coat will be applied to walls and ceilings with the plasterer given the opportunity to snag his own work under task lighting. Full paint coat will be applied above / around kitchen units. No mist coat will be applied in tiled areas.

The second fix mechanical then commences this includes bringing UFH up to temperature and then back down again.

Then second fix electrical including all bonding. A dead test is completed and flats energized with lighting left on. Appropriate signage is to be put on each apartment door and keys sighed out under a permit system once apartments have live 240v electric.

Finally, hardwood flooring then second fix carpentry including kitchen and wardrobe installation. At this point the stone worktops will be measured.

A final hold point is now introduced for a pre decoration snag. This is the snag that will set the ultimate standard of the apartment as if not done correctly it's very hard to recover from. The lights must be on (including pelmet lights in kitchens) and pipework must have been tested. At this point every corner is checked for square, every wall is checked for plumb, bowing and imperfections, every door is checked so that we are confident the flat will not have to be damaged after the decoration stage.

Once the flats are of the correct standard they will be released for decoration. Following decoration finals and then a builders clean. Then white goods and finally silicone. At this point water must be on to fill baths prior to silicone to avoid latent defects where silicone debonds when the bath settles when filled with water for the first time.

Commercial Areas

The floor plates will be commenced prior to the cores. The electrical containment and sprinkler pipe work will be pre loaded on to canti decks levels 1-3 and terraces levels 4&5 to allow full lengths to be utilised to reduce the cost of cutting down to fit in a hoist within a lift shaft.

Following completion of the topping slab to each floor the electrical containment will be installed to the soffit using PECO lifts, then sprinkler pipework. Following this once a temporary EPDM has been laid to the full perimeter of the 4th floor slab to prevent water ingress the Independent Wall Lining will be installed and then sealed to ensure a plenum is formed within the floor void. Under floor ductwork is then installed as well as the under floor VRF pipe work and void detection around pre marked pedestal positions.

Finally just prior to the raised access floor being installed the walls forming the separation between supply and extract areas would be installed as well as core perimeter walls. Then the concrete will be sealed and raised access floor installed.

The high level works can then be completed with wiring to lighting and fire alarm with 2nd fixing, then floors will be left until the correct time for a predecoration inspection then decoration, finals and snagging.

Once dusty works have been completed the under floor clean will be completed, aspirated fire system installed, fire line / plenum barriers installed. Then all floor pans repositioned and fan tiles installed.

At this point the floors are ready for decoration.

The cores will not commence until temporary water proofing is complete at roof level. Then lifts will be 1 of the first operations to commence. Then metal and board 1 side to dry lined partitions with pattressing. The risers can then be progressed as well as first fix MEPH to super loo areas. Then void closure inspections fire stopping and second fix dry line. Areas will then be taped and jointed with walls on the main floor plates. Then tiling installed to floors followed by walls, then painting to ceilings followed by joinery including wall paneling and doors will be installed. Temporary locks will need to be installed to these areas.

Super loos will then be 2nd fixed MEPH including vanity units and lighting turned on, FF&E fitted. Areas will not be snagged until nearer the PC date to pick up damage caused through commissioning.

Snagging and Commissioning

Kier will inspect all areas and will ensure they are of the correct quality before offering to clients team for inspection. All areas will be offered with permanent services to allow functionality to be checked during this inspection. The only caveat to this is heating and hot water that will be reliant on commissioning of the ASHP's as a site wide system.

The MEP sub-contractor will commission their selves and once systems are ready for demonstration they will be offered to the commissioning manager for witness. The commissioning manager will witness 100% of life safety systems and 10% of all other systems. They will then over see the compiling of final witnessing packs and issue to client team for a demonstration to them and BCO.

As systems are completed the commissioning will commence. By pass flushing loops will be installed to allow each flat to be flushed and then back flushed separately.

Fire alarm to individual dwellings will be tested as part of functionality and site wide alarm at the end of the scheme.

Cause and effect with black building will be one of the last items completed with BCO and client representative in attendance.

External Works

The external works will consist of repairing any damage to the existing pavement caused through pit lane use or scaffold / gantry erection. There will also be an element paving works to the capping beam width into the new façade line. This predominantly will be Yorkstone paving to match existing.

No other works are currently designed into the scheme.

Handover

The handover process will commence with the snagging of areas ensuring the correct level of detail is applied by Kier to satisfy client requirements.

Following snagging the commissioning works will be completed, then any minor damages repaired as the client team snags are carried out.

Areas will then be offered to the client for desnag. They will then be locked up ready for handover.

We believe PC will take place over 2 days. The first day will be checking all compliance paperwork is in place including relevant sign off such as BCO, building warranty as well as consultant letters of compliance. The second day is a walk of the building from top to bottom with Avison Young, Gardiner & Theobald and CO:RE representative to agree the building is practically complete. A PC certificate is issued, keys handed over.

There is potential to handover sections of the building in phases an example could be the coffee shop area or individual retail areas. The contract currently does not require such sectional completions but Kier would be happy to facilitate if required assuming commissioning site wide systems can be completed.

Similarly soft landing meetings can be held fortnightly, then weekly on the approach to PC to allow any CAT B fit out contractors to get to understand the building and systems within. Kier can facilitate and manage these to assist AY if required.

Following PC a Kier Site Manager will remain on site upon agreement of simple welfare provision with the client to oversee the removal of the welfare and office gantry, completion of any residual snags attached to PC certificate and sign off with the clients team. An assistant design manager will also remain working on the scheme to fully close out O&M information ensuring all as built drawings are included as well as commissioning and witnessing packs of all MEPH systems.