

44 Dartmouth Park Road

Basement Construction Sequence

November 2015

REVISION A

Construction Sequence

The outline construction sequence and temporary works assumed in the design and described in this report will be superseded by the Contractor's construction proposals as they are developed. The Contractor will be required to provide full proposals, method statements and calculations to the engineer prior to the commencement of any works on site and these will be considered in conjunction with the permanent structures and verified as suitable before the works are implemented.

The appointed contractor will be required to provide a detailed works sequence along with their tender submission. An outline construction sequence of the main structural works associated with constructing the new basement works is shown on drawings 1393/113 and 1393/114. They show 12 numbered steps which are explained below, following the enabling works:

Enabling works

- Secure site, erect hoardings, establish welfare facilities, and divert on-site services.

Step 1

- House as existing. Cross section through the centre showing an elevation of the central, load bearing masonry spine wall from ground level to second floor level. Central portion of spine wall is timber stud infill.

Step 2

- Install steel needles and props just above first and second floors. Props should extend down to ground level.
- Locally break out ground floor and underpin flank walls in sequence shown on plans. Provide horizontal props to each underpin. The excavated pits may be backfilled to provide a level working surface but the backfill must not be relied upon to resist the lateral soil pressures, the props must remain in place.

Step 3

- Install additional needles just above ground floor, to span across the proposed excavation for the central column.
- Excavate for central foundation. including working space around foundation pit. Provide lateral props to excavation.
- Cast central mass concrete foundation.

Step 4

- Cut back spine wall at first floor, cut out beam bearings and install mass concrete padstones.

- Install beam at underside of second floor.
- Place flat resin jack on column foundation.
- Install column from flat jack on central foundation to underside of second floor, using splice if needed to aid delivery and installation. Do not pressurise jack.
- Dry pack and wedge beam to underside of wall above at second floor.

Step 5

- Install additional needles just above ground floor, to support spine wall at ground floor and allow it to arch over previous underpinning excavation.
- Cut slot at head of wall and install mass concrete padstones. Leave space to insert new beams. Care must be taken as head of spine wall has no restraint at this point, additional inclined props may be used to stabilise upper portion of wall.
- Install new beams at underside of first floor, connected to central column at one end.
- Dry pack and wedge beams to underside of first floor.

Step 6

- Saw-cut ground floor spine walls vertically back to line of first needle, allowing them to continue to span over the underpinning excavation from flank to needle.
- Break out remainder of ground floor.
- Remove lower strip of spine wall at flanks.
- Install steel beams spanning from padstones to the central column. The padstones transfer load from the beam directly into the underpinning.
- Dry-pack and wedge above ends of beams, only for the extent of the final nib of wall.

Step 7

- Cut back spine wall nibs to extent of dry pack.
- Install steel columns between ground floor steel beams and first floor steel beams.

Step 8

- Pressurise flat resin jack beneath central column to appropriate level then seal it. This will pre-load the central column and reduce the risk of the structure above being damaged due to foundation settlement upon taking load when temporary props are removed.
- Once resin has cured, tighten holding-down bolts and grout any gaps beneath column baseplate.

- The spine wall is now completely supported by new structure so the needles and props may be removed, making good the openings in the walls where the needles passed through.
- Reduce soil level in basement, installing walings and horizontal props across width of building. Excavation should be incremental, installing props progressively as excavation continues to minimise unproved depth of excavation.
- Excavate down to top of toe of underpinning, leaving the underpins embedded in undisturbed ground to provide passive resistance (lateral propping) to lateral pressures at its base.
- When the soil level is fully reduced and propped, excavate local pits for intermediate post footings and cast concrete.

Step 9

- Lay blinding and heave mat under central areas of slab, leaving a 1.0m wide bearing strip at the perimeter where slab bears directly onto the undisturbed soil.
- Place slab reinforcement and cast concrete, with kicker for walls and water stop at joint.

Step 10

- Progressively remove horizontal props and walings, placing wall reinforcement then replace props to outside of wall formwork.
- Cast RC walls.
- Once walls are sufficiently cured, remove formwork and backdrop horizontally. It may be possible to installed inclined props, fixed to surface of basement slab to improve working space.

Step 11

- Install steel posts from basement slab to underside of ground floor steel beams.

Step 12

- Install remainder of ground floor steel beams and Ribdeck slabs.
- Cut away portion of ground floor steel beam in new stair locations.
- Cast concrete onto Ribdeck.
- Once sufficiently cured, remove remaining props.