

Lopdell House seismic upgrade and heritage restoration



It has been more than ten years since the Lopdell House Development Trust was established to address the need to upgrade and extend Lopdell House in order to meet new building code standards with seismic strengthening and barrier free access. It is therefore proposed to reinstate the original roof terrace, which will be publicly accessible from both Lopdell House and the planned new gallery addition.

The plan is for a regional gallery to nationally accepted standards, providing twice the present exhibition space, new teaching areas, delivery workshop, preparation and storage spaces, and new electrical and air-conditioning services. These cannot be accommodated within the existing Lopdell House.

The proposed new gallery building is a six-level, concrete floor structure utilizing pre-cast concrete rib floor systems generally supported on block work walls or steel beams. The lower three levels are benched into the existing slope below Titirangi Road and the construction of the temporary support requirements for walls in this area.

The construction of stairs and landings between the proposed gallery building and the adjacent Lopdell House will provide protection for the existing building.

The construction of Lopdell House pre-dates seismic codes; it is a category 1 heritage building and required extensive seismic strengthening. The upgrade included the construction of new in situ concrete sheer walls extending the full height of the building. These walls are anchored to the ground via a number of deep bored 500mm concrete piles. The upgrade also includes new concrete floors and retaining walls to part of the second floor, and in situ concrete infills to existing or new openings on several floors.

The Construction of the gallery is underway presently. The project faces numerous difficulties during the phase. Due to very stability sensitive site it gave challenges to the team with respect to construction of the concrete sheer wall to bridge the proposed gallery with the existing building.

When the construction was started it was noticed that the whole foundation just gave way. Initially it was thought that it was due to the difficult site and terrain. Later it was discovered that a unknown deep spring course which was adding to the problem under Grid #3. The engineers went back to the drawing board and came with a new solution of;

1st pumping the raw clay wall with shotcrete. Shotcrete is concrete conveyed through a hose and pneumatically projected at high velocity onto a surface, as a construction technique. Shotcrete undergoes placement and compaction at the same time due to the force with which it is projected from the nozzle. It can be impacted onto any type or shape of surface, including vertical or overhead areas.

This failed miserably and again the wall collapsed!

2nd driving in timber piles, securing mesh and then shotcreting
This also failed and came away underneath!

3rd installing sheet piles and welding them up to the next level foundation on Grid #2, these were to be a temporary measure, i.e. to be removed once the wall on Grid #3 was constructed, however these have been opted to remain in place, as sacrificial support.

The wall has been constructed on Grid #3 now and is to have bulk concrete backfilled behind the wall.

Please find photos of these attached.

More updates will follow as the project progresses. We will follow with more interesting construction methodology tested and tried.



Courtesy: Vijaya Ramakrishna and Andrew Collier- Western Building Control, Auckland Council