

Christchurch City Council

# Building Steelwork Investigation

Final report February 2017

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## **Background**

Christchurch City Council is the regulatory authority responsible for monitoring compliance with the New Zealand Building Code and the provisions of the Building Act 2004 for building and construction done within the city.

This involves processing building consent applications, doing inspections and processing and issuing code compliance certificates. In addition, the Council investigates instances where specific concerns are raised about buildings or construction activities.

## **Basis for the investigation**

In September 2016, a welder who had been employed by an engineering company presented Council with an affidavit claiming substandard welding and steelwork had been done on five Christchurch buildings. In November, another welder who had worked for the same company also provided an affidavit with similar claims that included two more buildings. The affidavits were also given to the news media at the same time.

Both workers stated that they were required to undertake work that they later realised was beyond their training and qualifications. They were concerned that their work would lead to buildings that could fail and mentioned the CTV building collapse

## **The investigation process**

The claims made in the affidavits were investigated by senior Council staff (including a Chartered Professional Engineer) in conjunction with the building owners, the main contractors on site and the structural engineers responsible for the original building design and inspection.

Seven buildings were investigated:

- Three office buildings of five or six storeys
- One industrial building
- One apartment building
- One public building
- One canopy on a school

All of the buildings have code compliance certificates.

The initial check for the Council was to make sure that the buildings were not dangerous or earthquake-prone. From the preliminary checks, it was decided that they were neither of these but it was decided to continue with a thorough investigation to provide a high level of comfort, especially to the public.

The building owners, contractors and engineers were all very cooperative and clearly showed that full Building Code compliance was a priority.

## **Key findings:**

- The complainants had valid concerns and the Council commends them for coming forward with their information.
- They were not however aware of inspections, testing and repairs that happened after they left the sites.

- They also did not always know the structural significance (or insignificance) of the work that they were doing.
- There was nothing to show that any of the buildings were dangerous. With one building the engineers decided after looking at it on site that some minor work would make them more comfortable with the design, so a single strut was added, some welds redone, and some bolts tightened. The risk involved had they not done this would have been buckling of part of the structure under very heavy snow loads, but collapse was unlikely and people were not in danger.
- The inspections, testing and recording of work on all sites meant that the Council is very confident that the buildings comply. The critical parts of the structures were identified during construction and particular care was given to those parts.
- Council staff have looked at examples of building permits and consents over the years and can see that there has been continuous improvement in the care that is taken in recording and approving the construction of buildings.

**Specific claims about the work undertaken:**

1. Welding work had been carried out by people not qualified to do it

*Critical structural welds were subject to inspections and, where necessary, testing by an independent company. Sub-standard welds were fixed before they were signed off by the engineer.*

2. Welding was carried out on threaded rods to base isolators. These were encased in concrete before they could have been inspected

*The base isolator welding was only to hold the steel in place while the concrete was poured so only needed to be non-structural 'tack' welds.*

3. Welding to brackets on the stairs, in stairwells, or to brackets in the lift shafts

*Engineers have confirmed that the identified welding was either temporary or non-structural.*

4. Bending of reinforcement bars in the ramp area

*The engineer for the building in question has confirmed that this is not critical in that building.*

5. Starter bars to precast tilt panels had been cut off where they did not line up with the hole that they were intended to fit in. This occurred on at least 2 occasions

*The panels were not full height and were not part of the main structure of the building. The engineer for the building has confirmed that they still comply with the Building Code even with some bars cut.*

6. 'Head restraints' were not all fitted and welded before plasterboard was installed

*Some of the restraints were installed after the plasterboard was installed and the welder would not have seen those.*

7. Attachment bolts into concrete had been cut short

*Attachment bolts were tested by tightening and where they failed they were replaced.*

8. Some fixings were too close to the edge of concrete panels and blew out the side of the concrete.

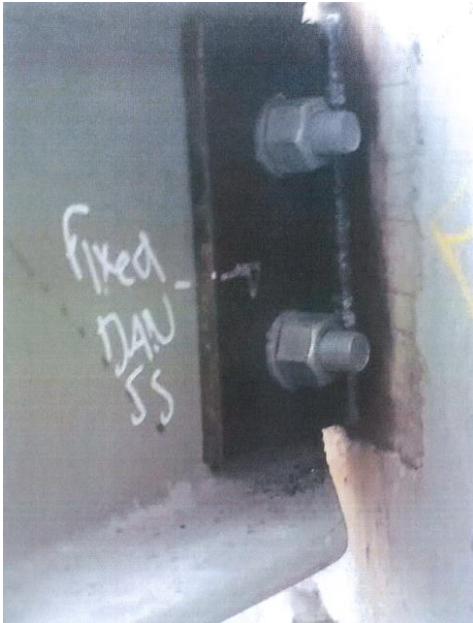
*This was noted and fixed.*

#### **Examples of the level of recording that is now available for many buildings.**

When commercial buildings are built they are subject to a high level of recording, in particular now that digital cameras are so widely available. With at least two of the buildings in the investigation covered in this report there were in excess of 3000 pages of documents provided to the Council as a part of applying for a code compliance certificate. The engineers and construction managers were able to provide even more information where necessary.

Below are some examples from one building where each weld was photographed. It shows an instruction from the engineer (in yellow), along with a verification from the worker when that instruction has been completed (in white). Not every job will use the same methods but it does show how diligent the industry is in checking work.





**What do people do if they have serious concerns about commercial building work?**

The Council takes seriously any issues that are raised. Any inquiry through the Council Contact Centre will be forwarded to a Business Services Officer who deals with customer liaison to be directed to the appropriate staff to follow up.

Alternatively, enquiries can be directed to [customerliaison@ccc.govt.nz](mailto:customerliaison@ccc.govt.nz)