

HUTT HOSPITAL

**Report on General Observations
of Seismic Restraints for Building Services in:**

Heretaunga Block

Emergency Department & Theatre Block

Clock Tower Block and,

Care Block

For

HUTT VALLEY DISTRICT HEALTH BOARD

Report prepared by

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1. Introduction

This report has been prepared by Advanced Building Services to comment on the general observations from a brief walk around some of the buildings on the site looking specifically at seismic restraints of building services.

Due to time constraints and the sheer size of Hutt Hospital, it was not possible to do a full and complete observation of all areas in all blocks.

This report can therefore only offer to provide a general assessment of the level and extent of seismic restraints for services for those buildings visited, but is expected to be representative of buildings with services installations of similar vintages.

The services considered are generally; plant and equipment, ducting, piping, and electrical cables and cable trays.

We also comment on what we consider should be the importance level of the various building services, and this may affect the priority of the programming for any subsequent seismic remedial works.

2. Building Importance Levels and Services Importance Levels

Following a major earthquake, it is critical that hospitals can operate as normally as possible to treat potentially vast numbers of casualties.

Hospitals, hence, have an importance of Level 4, and this is for theatres and triage centres.

Many of the buildings on the site will likely be used for triage and so any building that is structurally satisfactory, could be considered as a Level 4 Building.

Therefore, the seismic restraints of services within those buildings needs to be robust to ensure there is no loss of essential services and minimal loss of utility to other less essential services. This will ensure that the building can continue to operate as normally as possible after an event.

We would consider the priority of services to be in the following order:

Essential services: Medical gases, electricity, patient lifts, drainage and water, to all buildings, and air conditioning to theatres

Less essential services: Air conditioning and heating services to spaces other than theatres, sprinkler services, comms

The above is listed as a guide and each block and space may have differing requirements.

3. General Observations of Existing Services Seismic Restraints

A walk around was conducted on 13th October 2017 of Heretaunga, Clock Tower, Emergency Department & Theatre blocks, and including the Oncology basement and the standby generator plant.

In addition, we have had some experience with other blocks and we have commented on these where possible.

The observations have been tabled in the attached sheets with marked up photos and comments.

The results for the observations are generally as follows:

ED & Theatre Block.

As this is a relatively new block, constructed around 6 years ago, we expected to see a high level of seismic restraints for all services.

It is also a base isolated building and, therefore, this reduces the seismic accelerations during an event.

In general, there was a high level of seismic bracing of all services.

However, there were cases where there were deficiencies, and as this building includes multiple theatres, we believe the seismic bracing of all services needs to be fully robust to ensure that there is a high chance that all the services will survive a substantial event.

There needs to be a thorough review of all the services to ensure that the essential services are not damaged by any essential or less essential services that are not fully restrained.

On a scale of 0 – 10, with 0 being no seismic bracing and 10 being fully compliant to NZS 4219, we would consider this building to be around the 8 mark.

Heretaunga Block

As this is one of the older blocks with most current services installed in the last 30 years, we expected to see a lower level of seismic restraints for all services.

In general, this was the case and there was a relatively low level of seismic bracing of services including essential services.

The power cables in the basement, including HV and essential cables, were the main area of concern. There were a high number of cables all together, not fully restrained and with sprinkler piping and heads in close proximity.

The level of seismic restraints to the water piping and drainage was also low, and these are regarded as essential services.

We viewed one in-ceiling area in one of the patient floors, and the services were all located within very close proximity to each other and this would not comply with NZS 4219.

We believe the seismic bracing of all services needs to be fully robust to ensure that there is a high chance that all the services will survive a substantial event.

There needs to be a thorough review of all the services to ensure that the essential services are not damaged by any essential or less essential services that are not fully restrained.

On a scale of 0 – 10, with 0 being no seismic bracing and 10 being fully compliant to NZS 4219, we would consider this building to be around the 3 mark.

Clock Tower Block

As this is a relatively old block, constructed around 70 years ago, with most current services installed in the last 30 years, we expected to see a low level of seismic restraints for all services.

In general, the building had some areas with excellent restraints likely to be from the era of the Ministry of Works design days, but some there was potential for associated piping to be damaged and this would lead to disruption after an event.

Seismic bracing of all services needs to be fully robust to ensure that there is a high chance that all the services will survive a substantial event.

There once again needs to be a thorough review of all the services to ensure that they are all restrained and, in particular, that the essential services are not damaged.

On a scale of 0 – 10, with 0 being no seismic bracing and 10 being fully compliant to NZS 4219, we would consider this building to be around the 5 mark.

4. Conclusions and Recommendations

In general, the level of seismic services bracing within the newer buildings appeared relatively good.

In addition, base isolated buildings also offer a reduced chance of damage to restrained services.

However, as they are most effective at dampening out high horizontal accelerations events, there can still be damage for events with higher amplitudes rather than high accelerations, and so restraints and especially clearances around services should still be installed in accordance with NZS 4219.

In general, the level of seismic services bracing within the older buildings was relatively poor, and to ensure continuity of service after an event, seismic bracing of services will be required.

As the hospital is such a large site with numerous buildings, it will be up to hospital management to decide the priority on which buildings are upgraded. They will also need to form a priority list for what are the essential services in each block.

We would recommend that all services located close to essential services are properly restrained, and not just the essential services. This is because non-restrained non-essential services could damage essential services and seriously affect the operation of a building after an event.

We would also note that as hospitals are a 24/7 operation, the actual remediation of the seismic restraints would need to be carefully considered in the patient areas. The solutions may very well be dependent on how they can be installed, and so a high level of cooperation between the designers and contractors will be essential to ensure satisfactory outcomes.

We trust that this report provides you with the general information you required.

If you agree with us on any of the recommendations we would be happy to discuss further.

If you have any queries in relation to the above, please don't hesitate to contact us.

Kind regards,

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