

Alternatives to Structural Flood Defences

- Stopbanking reduces flood risk by keeping floodwater out thereby reducing the frequency with which floods are likely to damage property and/ or endanger life;
- The alternative approach is to lessen the consequences of a flood event by reducing the potential for property damage/ drowning.

Consequence Reduction

- Can be passive or more active risk reduction strategies;
- Generally involve one or more approaches:
 - Planning measures;
 - Flood-proofing at risk buildings;
 - Raising at risk buildings;
 - Removing buildings from the floodplain.
- Options that focus on reducing the consequences generally do not lessen infrastructure impacts eg State Highway closure, sewer infiltration etc.

Planning Tools

- At present Horizons' Regional Plan (One Plan) contains policies around natural hazards avoidance, requiring Territorial Authorities to ensure (amongst other things) that new development is not exposed to flood hazard greater than a 200 year Return Period;
- Such measures largely only limit the increase in risk.

Pipes & Cables

Ensure that all entry points for TV/satellite & telephone cables, pipes drains are all sealed with appropriate foams or compounds to prevent the ingress of water.

Walls

Ensure that walls are in good order. Repair any broken or crumbling bricks and re-point the mortar up to the anticipated flood level. If standing water is expected then treat the wall with a good quality waterproofing agent.

Door Barriers

Many variations of door barriers exist from DIY to professionally installed. Some use permanent back frames whilst some fit between openings and others using virtually invisible screw fixings. A range of Flood Proof Doors are starting to appear on the market.

Garage Door Barriers

Barriers for wider openings such as garages and patio doors are available from a number of suppliers. Some are available in a single cover whilst others employ a joining system.

House Tanking



Air Brick Covers

A selection of air brick covers are available for DIY or professional installation. They will all need to be put into place before the flood waters arrive. Please remember to remove them afterwards.

Air Brick Replacement

Airbrick Replacement is designed to allow air to pass through, but not water, and will replace the standard airbrick.

Basements & Cellars

Protection of basements cellars and raised floors is essential to prevent water ingress behind the barriers you have installed. A number of solutions are available from full tanking to simple waterproof applications. A survey is essential in order to address the problem with the correct solution.

Sewage Flooding

Sewage will find its way into a property through downstairs toilets and showers/baths. The fitting of non-return or backflow valves will help to prevent this.

Pumps

Protection of under floor area from water ingress, beneath foundation and via groundwater movement. A submersible pump should be installed with outlet above maximum flood level. Pump can be fitted with a battery to ensure performance during power outage.

House Raising



House Raising

- Christchurch Drainage Board developed a programme following the 1976 floods aimed at reducing flood risk along the Heathcote River, similar in context to Anzac Parade;
- CDB provided half the cost of the raising, the other half met by the property owner;
- Resulted in around 50 houses being raised.

House Raising

- Not without limitations which in general are:
 - Physical limits of raising a house;
 - Practicalities of living in a raised house;
 - Would residents in a raised house stay or go in a flood;
 - Need for safe egress;
 - Public Health aspects;
 - Best suited to houses on the margins of a floodable area.

Removing Houses from the Floodplain

- Very preliminary work indicates that to purchase and remove all of the affected properties (close to 100) from the Anzac Parade part of the floodplain would cost around \$23M;
- In reality such an approach would involve a combination of raising houses on the margins that have safe egress and acquiring those exposed to significant depths of inundation ie \$23M would be an upper bound;
- Central government very reluctant to become involved, sets a substantial precedent, hence track record;
- How would such a project be funded?



Kelso
1851-1941

Historical information and a map of the Kelso area.

KELSO

Flockton Basin Christchurch

- Natural basin extending across the suburbs of St Albans, Shirley and Mairehau;
- Primary CCC response to spend in excess of \$50M on mitigation works;
- Those properties with a residual flood risk <10 year RP will have individual assessments with the option of voluntary purchase, effecting mitigation works (likely house raising) and then selling the property;
- Few properties, more frequent but shallower flooding with little flow, CCC public health responsibilities, large rating base.