



**FUTURE COASTS AOTEAROA**  
**NATIONAL INSTITUTE OF WATER AND  
ATMOSPHERIC RESEARCH LIMITED  
(NIWA)**

14 June 2023

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## APPENDICES

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### APPENDIX A

CONSTRUCTION COST ASSESSMENT FOR INDIVIDUAL TYPOLOGIES OF RESIDENTIAL AND NON-RESIDENTIAL UNITS

# 1 INTRODUCTION

WT (WT) have been engaged by the National Institute of Water and Atmospheric Research Limited (NIWA) to provide cost inputs into Economic Assessment into the various options that may be implemented to counteract the impacts of sea level rises between now and 2100. The current identified rural lowlands system is being threatened by accelerating sea level rise which is projected in New Zealand to be +0.2-0.3m by 2040 and +0.5-1.0m by 2100.

NIWA have requested WT to prepare indicative cost estimates to raise existing residential and non-residential properties by up to 2m above their current platform levels so that future research can be undertaken to assess the cost benefits of relocating communities inland or to construct some form of coastal defence.

The following building typologies have been assessed in our analysis

Single Storey Residential	Piled Timber Frames Steel/ Timber with concrete floor slab Concrete Floor Slab with Brickwork Facades
2/3 Storey Residential	Piled Timber Frames Steel/ Timber with concrete floor slab Concrete Floor Slab with Brickwork Facades

The residential analysis is to consider 1, 2 and 3 bedroom standard units.

Single Storey Non-Residential	Piled Timber Frames Steel/ Timber with concrete floor slab Concrete Floor Slab with Brickwork Facades
2/3 Storey Non-Residential	Piled Timber Frames Steel/ Timber with concrete floor slab Concrete Floor Slab with Brickwork Facades

The Non - Residential analysis considers small local retail and commercial building with a single storey GFA of 500m<sup>2</sup> and a GFA of 500m<sup>2</sup> for the double storey units with 250m<sup>2</sup> of ground bearing floorplate.

## 2 RELIANCE STATEMENT

1. This Report is prepared for and is addressed to "the Parties" being
  - I. National Institute of Water and Atmospheric Research Limited; or such other entity, assignees, transferees, providers of financial derivatives or individual approved in writing by WT such approval not to be unreasonably withheld (the Addressees).
2. The purpose of this report is to assist the Addressees in the economic assessment of adaption options and the threats and opportunities over time and whether there is value in waiting for more information before an expensive and possibly irreversible investment is undertaken.
3. We confirm that the Parties may rely upon this report for a period of 6 years from the date of this report in connection with the purpose referred to in paragraph 2 above. In giving this confirmation WT is not taken to have assumed any particular duty to advise beyond the provisions of this report, any individual Parties or to consider their circumstances or position.
4. WT also confirms that it is prepared to answer reasonable queries with respect to this Report raised by the Parties.
5. This Report is strictly confidential to the Parties who agree that subject to paragraph 6 below they will not disclose, show, copy, disseminate or give to any other person or entity this report without WT's express written consent, which may be withheld in its absolute discretion. However, if a Party is required by law to disclose the Report, it may do so provided WT is advised in writing (as soon as practicable) after the legal obligation to disclose arises.
6. WT consents to this report being made available to each Party, their employees, directors, officers, affiliates and professional advisers and to disclosure by any Party to the extent required by law or regulation or where requested or required by any judicial or regulatory body.
7. It is the responsibility of the relevant Party to determine the suitability of the Report for its own purposes.
8. WT undertakes no obligation to provide any Party with any additional information nor to update any of the information or opinions contained in the Report, subject to paragraph 4.
9. The Report is subject to the qualifications, assumptions and disclaimers expressed in it and the terms and conditions in the engagement letter.
10. The Report has been compiled from information provided to WT by third parties, however WT does not warrant the accuracy of that information. If the information provided to WT is inaccurate or incomplete, then it may invalidate the conclusions and advice in the Report.
11. Before placing any reliance upon the Report for any purpose, any Party should undertake their own inquiries to ensure that there have been no material changes to the items discussed in the Report.
12. The liability of WT for and in relation to this Report (whether in contract, tort or otherwise) is limited in the aggregate to all Parties both individually and in the aggregate to NZ\$500,000.

## 3 RESIDENTIAL UNITS

### 3.1 HOUSING TYPOLOGIES

We have been asked to provide indicative costs in raising the floor levels of 2 No housing typologies with three differing construction types.

The costs consider a single level dwelling and a 2/3 storey dwelling with the following construction typologies

- Piled Timber Frame
- Concrete pad with steel and timber framing
- Brick/ Concrete Construction

For the purpose of this report, we have considered the GFA to be an average of 106m<sup>2</sup> for the single level building based on the average size of 1, 2 and 3 bedroom units excluding garages.

For the multi-level units, we have considered the lower level to be 52m<sup>2</sup>.

### 3.2 METHODOLOGY ASSUMED

We have spoken to Auckland House Lifting to discuss the different methodologies that would apply to the different typologies and the other factors that would need to be considered. The largest cost difference between the three construction alternatives is whether the existing ground floor can be lifted which only applies to the timber construction option.

With the concrete floor we have assumed that this becomes a sacrificial slab which is left in place with the balance of the house able to be lifted and a new ground floor constructed after the house is in its raised position. This also means that the ground floor internal fitout including walls, doors, internal finishes, and fittings will need to be stripped out and replaced which again adds considerable cost to the options.

The following table demonstrates the methodologies adopted when preparing the different cost options

DESCRIPTION	TIMBER FRAMED	CONCRETE / STEEL	BRICK/ CONCRETE
Disconnect services, drainage, and water supplies	✓	✓	✓
Disconnect house structure from piled foundations	✓		
Disconnect house structure from GF to L1		✓	✓
Cut away existing facades to access subframe/ floor slabs	✓	✓	✓
Remove ground bearing Slab	N/A	N/A	N/A
Strip out ground floor fitout	N/A	✓	✓
Strengthen Floor Structure prior to lifting	✓	N/A	N/A

Brace existing openings prior to lifting	N/A	N/A	N/A
Install steel support beams, hydraulic jacks, and lift house GF 1m	✓	N/A	N/A
Install steel support beams, hydraulic jacks, and lift L1 1m	N/A	✓	✓
Install new timber piles to connect to raised GF slab	✓	N/A	N/A
Install new structure between GF and raised L1	N/A	✓	✓
Install new perimeter foundation for extended brick facade	N/A	N/A	✓
Suspended GF slab including supporting structure on and including polyrock	N/A	✓	✓
Extend facades	✓	✓	✓
Reinstall GF fitout to layout including finishes, fittings, services, and subdividing walls	N/A	✓	✓
Provide steps to new raised entries	✓	✓	✓
Alter drainage to external perimeter for flooding mitigation	✓	✓	✓
Preliminary and General Costs, Margin and 10% Contingency	✓	✓	✓

The above methodology equally applies to the 2/3 storey units albeit with a smaller building footprint. Auckland House Lifters confirmed that the costs would be similar for lifting due to the additional jacks and beams required for the heavier building. Please note that both options require the lifting support to be in place for a period of 4 weeks to enable the new supporting structure to be built.

### 3.3 RESIDENTIAL OPTIONS COSTS MATRIX

TYOLOGY	SINGLE STOREY	COST/M2 FOOTPRINT AREA	2/3 STOREY	COST/M2 FOOTPRINT AREA
Timber Framed Dwelling	\$232,129	\$2,190	\$167,874	\$3,228
Concrete pad/ steel/ timber framed Dwelling	\$412,591	\$3,892	\$256,402	\$4,931
Brick/ Concrete Dwelling	\$432,453	\$4,080	\$273,556	\$5,261

## **COSTS EXCLUDE**

1. GST
2. Decanting costs including rental accommodation
3. Consent Costs
4. Escalation from the date of this estimate (January 2023)
5. Seismic Upgrade to dwellings
6. Repairs to retained facades and roofs – costs assume that existing can be raised without major damage)
7. External works alterations except steps to raised entries
8. Public Infrastructure upgrades
9. Basement/ Undercroft Parking
10. Attached/ separate garages
11. Upgrade of retained raised building to meet current building standards for code compliance
12. Asbestos or other deleterious materials
13. Gas supplies
14. Consent fees, development contributions and the like
15. Works to retaining walls / structures

## **4 NON-RESIDENTIAL UNITS**

We have been asked to provide indicative costs in raising the floor levels of 2 No non-residential type typologies with 3 differing construction types.

The costs consider a single level non-residential unit and a 2/3 non-residential Unit with the following construction typologies

Piled Timber Frame

Concrete pad with steel and timber framing

Brick/ Concrete Construction

For the purposes of this report, we have considered the GFA to be an average of 500m<sup>2</sup> for the single level building due to the limited number of large-scale retail and commercial premises likely to be within the designated rural areas.

For the multi-level units, we have considered the lower level to be 250m<sup>2</sup>.

### **4.1 METHODOLOGY ASSUMED**

We have spoken to Auckland House Lifting to discuss the different methodologies that would apply to the different typologies and the other factors that would need to be considered. The largest cost difference between the 3 construction alternatives is whether the existing ground floor can be lifted which only applies to the timber construction option.

With the concrete floor we have assumed that this becomes a sacrificial slab which is left in place with the balance of the non-residential units able to be lifted and a new ground floor constructed after the building house is in its raised position. This also means that the ground floor internal fitout including walls, doors, internal finishes and fittings will need to be stripped out and replaced which again adds considerable cost to the options.

The following table demonstrates the methodologies adopted when preparing the different cost options:

DESCRIPTION	TIMBER FRAMED	CONCRETE / STEEL	BRICK/ CONCRETE
Disconnect services, drainage, and water supplies	✓	✓	✓
Disconnect structure from piled foundations	✓		
Disconnect structure from GF to L1		✓	✓
Cut away existing facades to access subframe/ floor slabs	✓	✓	✓
Remove ground bearing Slab	N/A	N/A	N/A
Strip out ground floor fitout	N/A	✓	✓
Strengthen Floor Structure prior to lifting	✓	N/A	N/A
Brace existing openings prior to lifting	N/A	N/A	N/A
Install steel support beams, hydraulic jacks, and lift house GF 1m	✓	N/A	N/A
Install steel support beams, hydraulic jacks, and lift L1 1m	N/A	✓	✓
Install new timber piles to connect to raised GF slab	✓	N/A	N/A
Install new structure between GF and raised L1	N/A	✓	✓
Install new perimeter foundation for extended brick facade	N/A	N/A	✓
Suspended GF slab including supporting structure on and including polyrock	N/A	✓	✓
Extend facades	✓	✓	✓
Reinstall GF fitout to layout including finishes, fittings, services, and subdividing walls	N/A	✓	✓
Provide steps to new raised entries	✓	✓	✓
Alter drainage to external perimeter for flooding mitigation	✓	✓	✓

Preliminary and General Costs, Margin and 10% Contingency	✓	✓	✓
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The above methodology equally applies to the 2/3 storey units albeit with a smaller building footprint. Auckland House Lifters confirmed that the costs would be similar for lifting due to the additional jacks and beams required for the heavier building. Please note that both options require the lifting support to be in place for a period of between 16 – 20 weeks to enable the new supporting structure to be built.

#### 4.2 NON-RESIDENTIAL OPTIONS COSTS MATRIX

TYOLOGY	SINGLE STOREY	COST/M2 FOOTPRINT AREA	2/3 STOREY	COST/M2 FOOTPRINT AREA
Timber Framed Dwelling	\$939,169	\$1,878	\$631,952	\$2,528
Concrete pad/ steel/ timber framed Dwelling	\$1,549,710	\$3,099	\$935,925	\$3,744
Brick/ Concrete Dwelling	\$1,719,052	\$3,438	\$1,058,227	\$4,233

#### COSTS EXCLUDE

1. GST
2. Decanting costs including rental accommodation
3. Compensation for Loss of Revenue and Profits for period of works
4. Consent Costs
5. Escalation from the date of this estimate (January 2023)
6. Seismic Upgrade to non-residential units
7. Repairs to retained facades and roofs – costs assume that existing can be raised without major damage)
8. External works alterations except steps to raised entries
9. Public Infrastructure upgrades
10. Basement/ Undercroft Parking
11. Upgrade of retained raised building to meet current building standards for code compliance
12. Asbestos or other deleterious materials
13. Gas supplies
14. Consent fees, development contributions and the like
15. Works to retaining walls / structures

## 5 COSTS OF RESIDENTIAL FACADES

The above costs have assumed that the residential facades are extended to provide an envelope to the increased height of the residential buildings whereas the residential buildings could in theory have an open lower level as is evident in many overseas coastal areas (house on stilts).

This would probably not be a suitable scenario for the non- residential building.

If the façade enclosures are deleted from the costs presented for the residential buildings, then this would reduce the overall costs by building type as follows:

TYPE	CURRENT COST	FAÇADE REDUCTION	REVISED COST	REVISED COST/M2 FOOTPRINT AREA
Timber – single storey	\$232,129	\$60,000	\$172,129	\$1,624/m2
Timber – 2/3 Storey	\$167,874	\$36,000	\$131,874	\$2,536/m2
Concrete/ Steel – single storey	\$412,591	\$60,000	\$352,591	\$3,326/m2
Concrete/ Steel – 2/3 Storey	\$256,402	\$36,000	\$220,402	\$4,239/m2
Concrete// Brick – single storey	\$432,453	\$75,000	\$357,453	\$3,372/m2
Concrete/ Brick – 2/3 Storey	\$273,556	\$45,000	\$228,556	\$4,395/m2

Costs of Non -Residential Building remain as stated above.

## 6 COMPARISON OF COSTS AGAINST NEW BUILD PROPERTIES

Recent subdivisions by major house builders are showing single residential houses being built in rural areas for a range of between \$3,800 - \$4,400/m2.

Large commercial subdivisions would be at a lower range of between \$2,900 - \$3,800/m2

This indicates that to raise existing properties by 2m would only be economic for the single storey and 2/3 storey timber framed residential units with the costs of extending the facades removed from the costs (subject to building consent and code compliance).

## 7 LIMITATIONS OF THE REPORT

The Report and costs are based on a number of assumptions that may be very different to the actual size and number of buildings that are required to be altered.

Auckland House Lifters themselves confirmed that each building will have to be assessed individually to determine the best option available to ensure the works are carried out in an efficient and timely manner with the minimum of disruption.

The Key Assumptions made that will require ratification by further research are:

We have used the 2m floor level rise criteria as identified for the 2100 predicted sea rise levels as to partially raise for 2040 and then again for 2100 would be more uneconomic than to do it once.

Single Storey Dwellings	Assumed floor plate of 106m <sup>2</sup>
2/3 Storey Dwellings	Assumed floor plate of 52m <sup>2</sup>
Single Storey Non-Residential Units	Assumed floor plate of 500m <sup>2</sup>
2/3 Storey Non-Residential Units	Assumed floor plate of 250m <sup>2</sup>

There will of course be efficiencies if there are a large number of units to be raised at any one time with Auckland House Building confirming that they would consider relocating plant and labour to the rural areas if the works were likely to be programmed over a number of years. There is also a limited number of contractors specialising in lifting houses with the majority of the contractors in New Zealand being more into house levelling and foundation repairs.

Typologies of Non- Residential Units has been assumed as small local retail tenancies so if the actual units affected are more along the lines of an Agricultural Barn or Shed then we would expect that demolition and rebuild to be more cost effective than trying to raise the floors.

Similarly, if the units are premises such as office accommodation or supermarkets then the costs/m<sup>2</sup> may be higher than this shown in the Non-Residential Cost Table depending on footprint size, type of construction and extent of internal fit out.

A brief review on Google Maps of the likely areas affected in the Lower Waikato and Kaituna areas is showing that the majority of beach front properties are likely to be family baches which would not be economic to raise whilst the house fronting onto the Lower Waikato and Kaituna Rivers are indicating these to be large purpose-built properties which will be outside of the costs presented in this report.

The report also does not include or consider the following costs:

1. Decanting Costs including costs of temporary accommodation
2. Storage Costs for owners' possessions
3. Escalation from the date of this estimate – depending on a programme of works the escalation over the timescales will be considerable additions to the current costs.
4. Public Infrastructure upgrades required if all houses are raised 1m above current levels
5. Seismic upgrade of existing properties
6. Upgrade of retained raised building to meet current building standards for code compliance

7. Implications of removal and replacement of asbestos (likely to be the case in beachfront baches) or other deleterious materials
8. Availability of suitably qualified construction companies to carry out the works.
9. Gas supplies
10. Consent fees, development contributions and the like
11. Works to retaining walls / structures



# APPENDIX A

CONSTRUCTION COST ASSESSMENT FOR INDIVIDUAL  
TYPOLOGIES OF RESIDENTIAL AND NON-RESIDENTIAL UNITS

FUTURE COASTS AOTEAROA - JANUARY 2023

Calculations	Residential Properties					
	Single Storey			2-3 Storey		
	Timber/ Steel Framd plus Piled	Concrete Pad/ Timber Steel Frame	Brick/ Concrete Construction	Timber/ Steel Framd plus Piled	Concrete Pad/ Timber Steel Frame	Brick/ Concrete Construction
<b>Assumptions Residential</b>						
1. Maximum flood height of 1m requiring properties to be raised by 2m						
2. Residential Properties based on a 2/3 bedroom unit with a average GFA of 106m2 (2 storey option has a GF of 52m2)						
alteration and adaption of immediate around the dwelling for access to raised floor/roof						
4. Assumes that public infrastructure upgrades are excluded						
5. Excludes escalation from the date of this estimate						
6. Assumes that the ground floor fitout for the concrete and brick options will need to be stripped out and replaced as the GF slab is replaced and not raised like the timber option						
7. Single storey units to be 106m2 with a perimeter of 50m						
8. 2 Storey units to be 52m2 per level with a perimeter of 30m						
9. Assumes timber framed house ground floor can be lifted						
10. Concrete pad and Brick Concrete constructed houses to have new suspended GF slabs						
11. Concrete pad and Brick Concrete constructed houses to have GF fitout removed and replaced once new floor slab is in place						
12. Costs include a 10% contingency						
13. All costs exclude GST						
14. Excludes heritage buildings						
15. Excludes costs for decanting the buildings						
16. Excludes rental costs of alternative properties plus rental conytrubutions for disruption						
<b>Residential Cost Plan Service Disconnections</b>						
Disconnect sanitary drainage - kitchen, bathroom x 1,	4	No	\$250	\$1,000	\$1,000	\$1,000
Disconnect sanitary drainage - kitchen, bathroom x 2, WC x 1, Laundry	5	No	\$250	\$1,250	\$1,250	\$1,250
Disconnect power supply and isolate for safety	1	No	\$1,500	\$1,500	\$1,500	\$1,500
Disconnect water supplies - kitchen, bathroom x 1, WC x 1, Laundry	4	No	\$250	\$1,000	\$1,000	\$1,000
Disconnect water supplies - kitchenette x 2, bathroom x 2, WC x 2, Laundry	5	No	\$250	\$1,250	\$1,250	\$1,250
Disconnect Gas Supplies				excluded	excluded	excluded
<b>House Lifting Disconnect Structure</b>						
Disconnect pile founditions from floor structujres	106	m2	\$50	\$5,300	\$0	\$0
Disconnect pile founditions from floor structujres	52	m2	\$50	\$2,600	\$0	\$0
Disconnect steel frame from foundations and floor slab	106	m2	\$50	\$5,300		
Disconnect steel frame from foundations and floor slab	52	m2	\$50	\$2,600		
Break out brickwork façade to access floor slab	50	m2	\$150	\$7,500		\$7,500
Break out brickwork façade to access floor slab	30	m2	\$150	\$4,500		\$4,500
Break up and remove existing ground bearing concrete slab concrete slab (left in place)	106	m2	Excluded	N/A	excluded	excluded
Break up and remove existing ground bearing concrete slab concrete slab (left in place)	52	m2	Excluded	N/A	excluded	excluded
Cut away baseboards around perimeter of house to expose piles and floor structure	50	m2	\$50	\$2,500	\$2,500	N/A
Cut away baseboards around perimeter of house to expose piles and floor structure	30	m2	\$50	\$1,500	\$1,500	N/A
Strip out ground floor fitout	106	m2	\$100	\$10,600	\$10,600	
Strip out ground floor fitout	52	m2	\$100	\$5,200		\$5,200
<b>Strengthening Prior to Lifting</b>						
Strengthen existing floor slabs prior to jacking	106	m2	\$100	\$10,600	N/A	N/A
Strengthen existing floor slabs prior to jacking	52	m2	\$100	\$5,200		
Brace window openings prior to lifting	30.8	m2	\$250	Excluded	excluded	excluded
Brace window openings prior to lifting	42	m2	\$250	Excluded	excluded	excluded
<b>Lifting</b>						
Install steel support beams, hydraulic jacks each end and lift house 2m from current position (based on 4 week hire)	4	Weeks	\$11,000	\$44,000	\$44,000	\$44,000
Install steel support beams, hydraulic jacks each end and lift house 2m from current position (based on 4 week hire)	4	Weeks	\$11,000	\$44,000		
<b>Reinstatement after lifting</b>						
Install timber pile foundations once house lifted	106	m2	\$180	\$19,080	\$19,080	
Install timber pile foundations once house lifted	52	m2	\$180	\$9,360		\$9,360
Install steel columns including new pad foundations	106	m2	\$300	\$31,800	\$31,800	
Install steel columns including new pad foundations	52	m2	\$300	\$15,600		\$15,600
Install perimeter strip foundations for brick extended façade	50	m	\$650	\$32,500		\$32,500
Install perimeter strip foundations for brick extended façade	30	m	\$650	\$19,500		\$19,500
New Ground Floor Slab including polyrock under to lift house 2m and new suspended floor slab	106	m2	\$350	\$37,100	N/A	\$37,100
New Ground Floor Slab including polyrock under to lift house 2m and new suspended floor slab	52	m2	\$350	\$18,200		\$18,200
New Façade to timber framed house	100	m2	\$600	\$60,000	\$60,000	
New Façade to timber framed house 2/3 Storey	60	m2	\$600	\$36,000		\$36,000
Brickwork facade to brick house	100	m2	\$750	\$75,000	N/A	\$75,000
Brickwork facade to brick house 2/3 Storey	60	m2	\$750	\$45,000	N/A	\$45,000
Internal fitout - subdivision, kitchen, finishes, services	106	m2	\$850	\$90,100	N/A	\$90,100
GF only internal fitout	52	m2	\$850	\$44,200		\$44,200
<b>External Access Alterations</b>						
Steps to entry rising 2m	2	No	\$10,000	\$20,000	\$20,000	\$20,000
Raise footpaths, landscaping, fencing, boundary walls			Excluded	Excluded	Excluded	Excluded
Drainage alterations to accommodate new levels	100	m2	\$150	\$15,000	\$15,000	
Drainage alterations to accommodate new levels	50	m2	\$150	\$7,500		\$7,500
<b>Markups</b>						
Contractor P & G				\$8,999	\$15,995	\$16,765
Contractor Margin				\$9,449	\$16,795	\$6,833
Design and Construction Monitoring Fees (7%)				\$12,559	\$22,393	\$23,471
Contingency				\$21,103	\$37,508	\$39,314
Consent Fees				Excluded	Excluded	Excluded
Escalation				Excluded	Excluded	Excluded

<b>TOTAL (excluding GST)</b>	<b>\$232,129</b>	<b>\$412,591</b>	<b>\$432,453</b>	<b>\$167,874</b>	<b>\$256,402</b>	<b>\$273,556</b>
<b>Cost/m2 of GF area only</b>	<b>\$2,190</b>	<b>\$3,892</b>	<b>\$4,080</b>	<b>\$3,228</b>	<b>\$4,931</b>	<b>\$5,261</b>
	<b>Single Storey</b>			<b>2-3 Storey</b>		
	Timber/ Steel Framd plus Piled	Concrete Pad/ Timber Steel Frame	Brick/ Concrete Construction	Timber/ Steel Framd plus Piled	Concrete Pad/ Timber Steel Frame	Brick/ Concrete Construction

Calculations	Non - Residential Properties					
	Single Storey			2-3 Storey		
	Timber/ Steel Framd plus Piled	Concrete Pad/ Timber Steel Frame	Brick/ Concrete Construction	Timber/ Steel Framd plus Piled	Concrete Pad/ Timber Steel Frame	Brick/ Concrete Construction
<b>Assumptions Non - Residential</b>						
1. Maximum flood height of 1m requiring properties to be raised by 2m						
2. Non Residential Properties based on a average floor plate of 500m2						
3. Allows for alteration and adaption of immediate around the building for access to raised floor						
4. Assumes that public infrastructure upgrades are excluded						
5. Excludes escalation from the date of this estimate						
6. Assumes that the ground floor fitout for the concrete and brick options will need to be stripped out and replaced as the GF slab is replaced and not raised like the timber option						
7. Single storey units to be 500m2 with a perimeter of 90m						
8. 2-3 Storey units to be 250m2 per level with a perimeter of 65m						
9. Assumes timber framed non residential unit can be raised intact						
10. Concrete pad and Brick Concrete constructed non residential units to have new suspended GF slabs						
11. Concrete pad and Brick Concrete constructed non residential units to have GF fitout removed and replaced once new floor slab is in place						
12. Costs include a 10% contingency						
13. All costs exclude GST						
14. Excludes Heritage Buildings						
15. Excludes lifting basement carparks						
16. Excludes costs for decanting the buildings						
17. Excludes rental costs of alternative properties plus rental conytrubutions for disruption						
<b>Non - Residential Cost Plan Service Disconnections</b>						
Disconnect sanitary drainage - kitchenette x 3, bathroom x 2,	5	No	\$250	\$1,250	\$1,250	\$1,250
Disconnect sanitary drainage - kitchenette x 5, bathroom x 2, WC x 2,	9	No	\$250	\$2,250	\$2,250	\$2,250
Disconnect power supply and isolate for safety	1	No	\$5,000	\$5,000	\$5,000	\$5,000
Disconnect water supplies - kitchenette x 3, bathroom x 1, WC x 1,	5	No	\$250	\$1,250	\$1,250	\$1,250
Disconnect water supplies - kitchenette x 5, bathroom x 2, WC x 2,	9	No	\$250	\$2,250	\$2,250	\$2,250
Disconnect Gas Supplies				excluded	excluded	excluded
<b>Non Residential Building Lifting Disconnect Structure</b>						
Disconnect pile founditions from floor structujres	500	m2	\$50	\$25,000	\$25,000	N/A
Disconnect pile founditions from floor structujres	250	m2	\$50	\$12,500		\$12,500
Disconnect steel frame from foundations and floor slab	500	m2	\$150	\$75,000	\$75,000	N/A
Disconnect steel frame from foundations and floor slab	250	m2	\$150	\$37,500		\$37,500
Break out brickwork façade to access floor slab	90	m2	\$150	\$13,500		\$13,500
Break out brickwork façade to access floor slab	65	m2	\$150	\$9,750		\$9,750
Break up and remove existing ground bearing concrete slab concrete slab (left in place)	500	m2	Excluded	N/A	excluded	excluded
Break up and remove existing ground bearing concrete slab concrete slab (left in place)	250	m2	Excluded	N/A	excluded	excluded
Cut away baseboards around perimeter of building to expose piles and floor structure	90	m2	\$50	\$4,500	\$4,500	
Cut away baseboards around perimeter of house to expose piles and floor structure	65	m2	\$50	\$3,250		\$3,250
Strip out ground floor fitout	500	m2	\$100	\$50,000	\$50,000	
Strip out ground floor fitout	250	m2	\$100	\$25,000		\$25,000
<b>Strengthening Prior to Lifting</b>						
Strengthen existing floor slabs prior to jacking	500	m2	\$150	\$75,000	\$75,000	
Strengthen existing floor slabs prior to jacking	250	m2	\$150	\$37,500		\$37,500
Brace window openings prior to lifting	94.5	m2	\$250	Excluded		
Brace window openings prior to lifting	136.5	m2	\$250	Excluded		
<b>Lifting</b>						
Install steel support beams, hydraulic jacks each end and lift building 2m from current position (based on 20 week hire) - includes additional façade support beams for lifting	20	Weeks	\$11,000	\$220,000	\$220,000	\$220,000
Install steel support beams, hydraulic jacks each end and lift building 2m from current position (based on 16 week hire) - includes additional façade support beams for lifting	16	Weeks	\$11,000	\$176,000		\$176,000
<b>Reinstatement after lifting</b>						
Install timber pile foundations once non residential property lifted	500	m2	\$250	\$125,000	\$125,000	
Install timber pile foundations once non residential property lifted	250	m2	\$250	\$62,500		\$62,500
Install steel columns including new pad foundations	500	m2	\$300	\$150,000	\$150,000	
Install steel columns including new pad foundations	250	m2	\$300	\$75,000		\$75,000
Install perimeter strip foundations for brick extended façade	90	m	\$1,000	\$90,000		\$90,000
Install perimeter strip foundations for brick extended façade	65	m	\$1,000	\$65,000		\$65,000
New Ground Floor Slab including polyrock under to lift building 2m and new suspended floor slab	500	m2	\$350	\$175,000	\$175,000	
New Ground Floor Slab including polyrock under to lift building 2m and new suspended floor slab	250	m2	\$350	\$87,500		\$87,500
New Façade to timber framed non residential	180	m2	\$600	\$108,000	\$108,000	
New Façade to timber non residential	130	m2	\$600	\$78,000		\$78,000
Brickwork facade to brick non residential	180	m2	\$750	\$135,000		\$135,000
Brickwork facade to non residential	130	m2	\$750	\$97,500		\$97,500
Internal fitout - subdivision, kitchen, finishes, services	500	m2	\$500	\$250,000	\$250,000	
GF only internal fitout	250	m2	\$500	\$125,000		\$125,000
<b>External Access Alterations</b>						
Steps to entry rising 2m	2	No	\$30,000	\$60,000	\$60,000	\$60,000
Raise footpaths, landscaping, fencing, boundary walls			Excluded	Excluded	Excluded	Excluded
Drainage alterations to accommodate new levels	500	m2	\$200	\$100,000	\$100,000	
Drainage alterations to accommodate new levels	250	m2	\$200	\$50,000		\$50,000
<b>Markups</b>						
Contractor P & G				\$36,188	\$59,713	\$66,238
Contractor Margin				\$37,997	\$62,698	\$69,549
Design and Construction Monitoring Fees (7%)				\$55,855	\$92,166	\$102,238
Contingency				\$85,379	\$140,883	\$156,277
Consent Fees				Excluded	Excluded	Excluded
Escalation				Excluded	Excluded	Excluded

<b>Total Costs</b>	<b>\$939,169</b>	<b>\$1,549,710</b>	<b>\$1,719,052</b>	<b>\$631,952</b>	<b>\$935,925</b>	<b>\$1,058,227</b>
<b>Cost Per m2 of GF area only</b>	<b>\$1,878</b>	<b>\$3,099</b>	<b>\$3,438</b>	<b>\$2,528</b>	<b>\$3,744</b>	<b>\$4,233</b>
	<b>Single Storey</b>			<b>2-3 Storey</b>		
	Timber/ Steel Framd plus Piled	Concrete Pad/ Timber Steel Frame	Brick/ Concrete Construction	Timber/ Steel Framd plus Piled	Concrete Pad/ Timber Steel Frame	Brick/ Concrete Construction