

Façade Report

131 Lonsdale Street, Melbourne CBD

Buildcheck



June 2011

Document Reference and Revision Summary


Title	Façade Survey		
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Author	Mr Clive Austin		
Signature		Date	
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Associated Documents			
1	Plans Numbered 1-4. Each plan representing one elevation		
2	USB containing photographs contained in this report plus addition ones in original resolution.		

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1.0 Overview

A visual and tactile inspection was conducted on all facade elevations of the existing seventeen storey residential apartment building.

The report was commissioned due obtain further information about the condition of the external brickwork, rendered external wall and the condition and configuration of external

2.0 Building Description

The seven storey rectangular building fully occupies the allotment with a footprint of 8m wide and 25m long. The building is an early reinforced concrete and brick building (first part of last century) with the east and west laneways sides and the rear having traditional cement rendered finish.

The front elevation is predominately face brickwork with exception of the ground floor which is rendered, all of the window sills and headers which are rendered and at the 7th floor a rendered band with moulding and dentals and rendered castellated parapet.

The east and west laneway elevations are characterised as having numerous window openings together with a convoluted system of pipe work and storm water discharge pipes.

3.0 Observations & Comment

3.1 Emergency Make safe

On several locations the terracotta mortar bed fixed window sill tiles have or substantially de-bonded from the brickwork and were remaining in position under their own gravity. These tiles were removed due for public safety with most elevations being directly over public spaces.

3.2 Render

The cantilevered concrete balconies have a rendered up stand, which is clearly visible from the photographs and is shown on the attached plans.

It is evident after compiling this report that a very significant proportion of these are drummy and a lesser proportion are also cracked. The render is the traditional sand and cement type with a painted external finish.

It is recommended that in any long term maintenance program for this structures that remedial works be included to this render. Drummy render in itself is the first indication that the deterioration process has commenced, the next phase of is drummy and cracked which means the render is

nearing the end of its useful life. Whilst only a small proportion of the balconies have the coupled signs of cracked and drummy (mostly on the east side), the drummy experience with this material indicates that failure can be expected will occur in the next few years.

Several spalls and other failures, mainly around the corners require immediate attention as they will allow water to penetrate behind the render destabilising. There are also two instances of spalls exposing the reinforcement in the wall behind these require immediate remedial attention to avoid corroding steel further damaging the wall.

3.3 Sealant and Caulking

There are a few locations noted on the elevation where caulking requires renewal to maintain the water fastness of the structure.

3.4 Brickwork

The brickwork and the construction of openings are suffering from workmanship issues from when the building was erected.

The brickwork suffers from misalignment in both the horizontal and vertical planes which can be observed around window openings where the introduction of the window which forces the brickwork to be plumb and level. Here alignment corrections within the mortar bond have had to be made to ensure the correct fit of the window frame. This is most easily seen in a picture refer to #8649 Drop N, Appendix N for one example.

The brickwork is also misaligned vertical where one section has been laid out of plumb and has been corrected by relaying the brickwork off centre, forcing the brickwork to be loaded eccentric and so introducing a tensile force condition.

3.5 Lintels

There are two issues with the lintels which originate back to the original design:

The first case is the unusual and improper design shown in Ph #5172, Drop Q. This is an example of the hit and miss extension of the angle supporting the brickwork. Here the brickwork by design can not be fully always supported so must rely on the tensile bond strength of the mortar where the brickwork misses the lintel. This is contrary to established brickwork design standards and the brickwork does, with crack formation, have the potential to come loose.

Another issue with this design is the welding detail is a poor one with an edge to edge connection for the lintel extension; this detail is susceptible to corrosion and by its geometry weaker than a lapped joint. The engineering principles expressed in this design are called into question, and at a bare minimum a regimented monitoring must be introduced to avoid corrosion introduced failure.

The second issue with the lintels is that some do not have sufficient leg length to fully support the brickwork. One recognised design guideline for lintels is the Clay Brick and Paver Institute Design guidelines which require the brickwork be, at a minimum, supported by 70% of the lintel.

With reference to Refer photo #5176 Drop Q. the brickwork is clearly not fully supported by the lintel it is around 50% supported. Monitoring of the brickwork (mortar joints) over the opening is required as the brickwork is reliant on mortar strength for stability. The formations of horizontal cracks over the opening or vertically up either side of the opening are indicative of an unstable situation and identifying this requires regular monitoring.

3.6 Balcony Soffits

There are numerous balcony slab soffits located at all levels on each of the four elevations. Each individual soffit was tap tested and visually observed for defects, no defects were found with each soffit being in a sound and stable condition.

4 Recommendations Summary

We summarise our recommendations below in order of importance:

1. Window sill tile long term stabilisation program remedial works program
2. Further investigation of brickwork cracking
3. Caulking and sealing works to brickwork openings and joints.
4. Render repairs and stabilisation program
5. Brickwork lintel long term stability works.

5 Appendices

The following is a sample of the photographs taken during the facade inspection and highlight the noteworthy and typical defects found.

Additional photographs are included in the attached files, but not all have been included as they are repetitious by nature of the building.

APPENDIX A DROP A



Ph #5437. Level 17



Ph #5440 Level 17



Ph #5441 Level 17



Ph #5444 Level 17



Ph #5448 Level 16



Ph #5452 Level 16

APPENDIX B DROP B

	
<p>Ph #8527 Level 17</p>	<p>Ph #8528 Level 17</p>
	
<p>Ph #8529 L16 Loose Sill</p>	<p>Ph #8530 Level 16 Soffit</p>
	
<p>Ph #8532. Drummy Render End Panel 70%</p>	<p>Typical Panel Drummy Render. Levels 16,15,14,13,12,11,9,7,6 are all drummy 20-70%</p>

APPENDIX C DROP C

	
<p>Ph #5460 Level 17. Efflorescence in brickwork mortar joints</p>	<p>Ph #5463 Level 17 Efflorescence in brickwork mortar joints</p>
	
<p>Ph #5466 Level 17 Crack in rendered balcony</p>	<p>Ph #8557 Level 17. Efflorescence sill tiles</p>
	
<p>Ph #5467. Level 16 Render crack, results of water ingress behind render</p>	<p>Ph #5469. Level 16 Evidence of efflorescence near balcony projection</p>



Ph #5471. Level 15. Cracking in render



Ph #5473. Level 14 Efflorescence on brickwork. Cracking in render



Ph #8561. Level 14 Cracking & loose render in lower corner balcony



Ph #8564. Level 14 Close of previous photograph



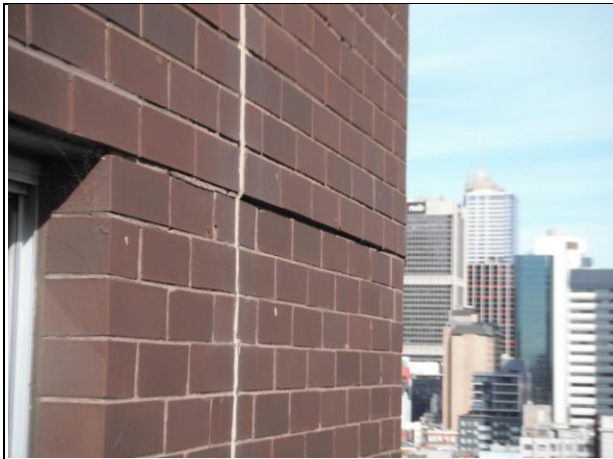
Ph #5475. Level 13 Paint film loss & drummy render



Ph #5480. Level 11. Paint Spalling & Drummy Render

APPENDIX D DROP D – NO PHOTOS

APPENDIX E DROP E



Ph #8571. Lintel. Level 17



Ph #8573. Lintel Level 16



Ph #8575. L16 Lintel Viewed from below



Ph #8576. Lintel L15



Ph #8586 Level 5. Cracking around springing line



Ph #8591 Level 3. Horizontal Brickwork Displacement

APPENDIX F DROP F



Ph #5481 Level 17. Detail of window lintel brickwork support



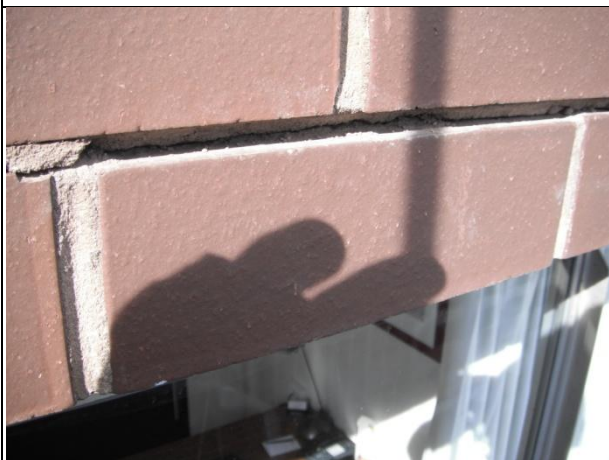
Ph #5484. Level 16 Underneath window tile. Gap opening up



Ph #5493. Level 16. Loose window sill tile



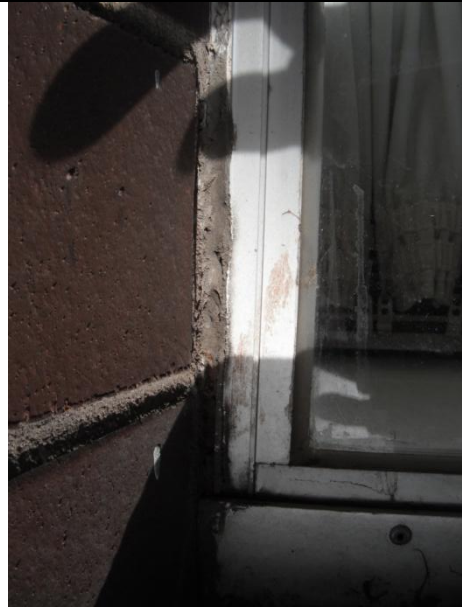
Ph #5487. Brickwork lintel onset of surface corrosion.



Ph #5489. Level 11 Brickwork mortar failure



Ph #5490. Level 9. Loose mortar between bricks and lintel



Ph #5494. Level 13 Inherent issue with partial lintel support when laying bricks. Original construction







Ph #5495. Level 12 Poor quality caulking



Ph #5491. Level 4 Tile loose. Removed for public safety

APPENDIX G DROP G – NO PHOTOS

APPENDIX H DROP H

	
<p>Ph #5100. Level 17 Rendered balcony face 60% drummy & cracked</p>	<p>Ph #5101 Level 16. 30% drummy & cracked</p>
	
<p>Ph #5102 Level 15. 60% drummy and cracked – above drainage outlet</p>	<p>Ph #5103 Level 14. 60% Drummy</p>
	
<p>Ph #5104 Level 13 30% Drummy</p>	<p>Ph #5105 30% Drummy</p>



Ph #8737. Level 9. 45% Drummy



Ph #8740. Level 6. Extremely Drummy



Ph #8741. Level 5 50% Drummy

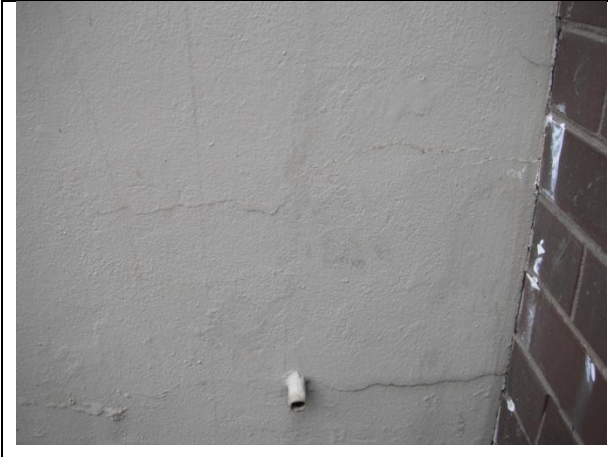


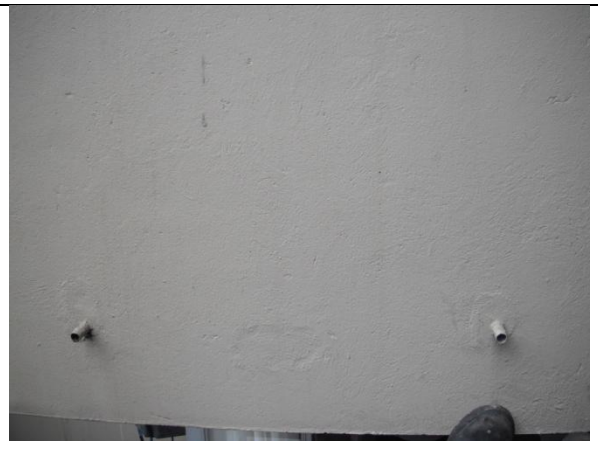




Ph #8742. Level 4. Very Drummy 60%



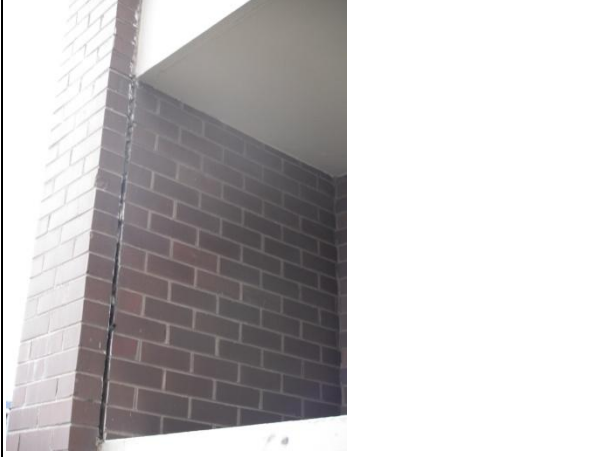
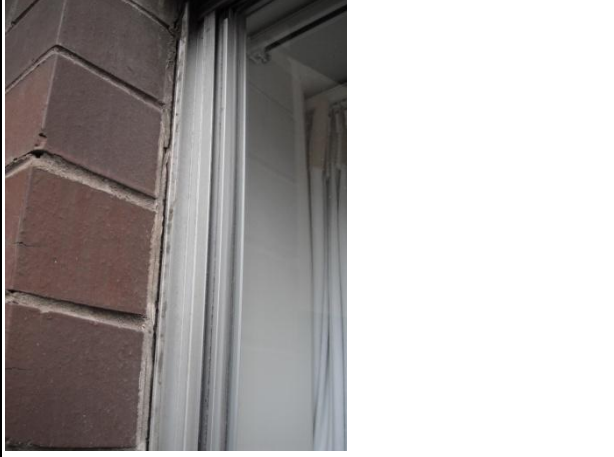




Ph #8743 Level 3. Very Drummy 60%


APPENDIX I DROP I

	
<p>Ph #5115. Level 17. 20% Drummy & 2 cracks</p>	<p>Ph #5118 Level 16 20% Drummy & small crack</p>
	
<p>Ph #5119 L15 10% Drummy Render</p>	<p>Ph #5120 Level 14 20% Drummy Render</p>
	
<p>Ph #5125 Level 8 Drummy Render</p>	<p>Ph #5129 Level 4 30% Render</p>
<p>Ph #</p>	

APPENDIX J DROP J

	
<p>Ph #5498 Level 17 Crack on corner of balcony render</p>	<p>Ph #5499. Level 15. Caulking between window frame & brickwork needs replacing – displaced.</p>
	
<p>Ph #5500. Level 15 Caulking missing from joint</p>	<p>Ph #5501. Level 13. Caulking between brickwork and wall</p>
	
<p>Ph #5502. Level 12. Caulking from joint</p>	<p>Ph #5505 Level 3 – but similar for all other Levels. Drummy render 20-50%.</p>

APPENDIX K DROP K

	
<p>Ph #5163. Level 15 Rendered window header. Note nylon plug used to install window flashing has damaged broken off render</p>	<p>Ph #5165. Level 10 Render Drummy Under Tiles. Approximately 10%</p>
	
<p>Ph #5166 Level 9</p>	<p>Ph #5167. Level 7 10 Drummy in corners. Broken tile</p>
	
<p>Ph #5168. 10 Drummy in corners</p>	<p>Ph #5171. 40% Drummy Render on RHS</p>

APPENDIX L DROP L

	
<p>Ph #8663 Level 16. Render 80% Drummy</p>	<p>Ph 8664. Level 13. 50% Drummy & Cracked</p>
	
<p>Ph #8665. Level 7 Cracked, piece missing</p>	<p>Ph #8667 Level 6 Broken Corner</p>
	
<p>Ph #8668 Level 3 50% Drummy</p>	<p>Ph #8670 Drummy & Cracks</p>

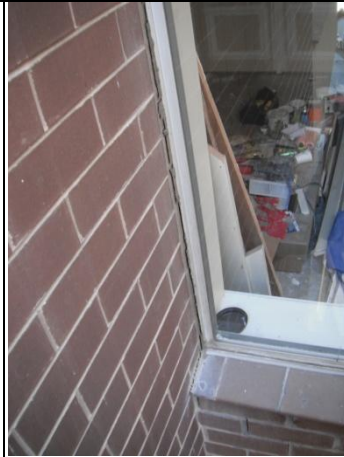
APPENDIX M NO PHOTOS

APPENDIX N DROP N

<p>Ph #8649. Level 17 Out of Level Lintel. Note correction of level with original mortar indicates that it is part of original construction</p>	<p>Ph #8650 Level 16 Poor Window Caulking</p>
<p>Ph #8651. Level 15 Cantilvering Brickwork over steel lintel – reliant on ties for stability?</p>	<p>Ph #8652 Level 15 Loose Corner Sill Tiles – mitred. Adjoining tiles have lost bond and where removed – safety.</p>
<p>Ph #8654. Level 14 Tiles abutting wall – bond broken removed for safety.</p>	<p>Ph #8655 Level 13. Sill Tiles</p>



Ph #8657 Level 12 Surface Rust on exposed window Lintel



Ph #8658 Level 9 Poor Caulking Joint



Ph #8659 Level 5 Sill Tiles Missing



Ph #8660 Level 2 Tiles Missing









Ph #8661. Level 2 Tile Missing



Ph #8662. Level 1 Broken Render Edge. Leak Underneath

APPENDIX O DROP O

	
<p>Ph #8642 Level 17. Spall in render</p>	<p>Ph #8643. Level 17 Large Render Delamination. Exposing reo. In concrete substrate</p>
	
<p>Ph #8747 Level 17 Drummy reapiir – earlier</p>	<p>Ph #8748. Level 16 Cracked & Drummy Render 40%</p>
	
<p>Ph #8749 Level 15 Cracked & Drummy Render</p>	<p>Ph #8750 Level 14 Cracked & Drummy Render 40%</p>



Ph #8751. Level 13 Cracked Render



Ph #8752. Level 12. Cracked & Drummy Render. 30%



Ph #8664 Level 11 Delaminated Render on corner



Ph #8753. Level 11 Cracked & Drummy Render. 70%



Ph #8757 Level 7 Large Crack in render



Ph #8746 Level 3 Cog cracking in brickwork

APPENDIX P DROP P



Ph #8675 Level 10. Horizontal Crack in brickwork.

No other defects worth noting identified during this drop

APPENDIX Q DROP Q

<p>Ph #5172 Level 10. Hit & Miss brickwork lintel support</p>	<p>Ph #5173. Level 9 Hit & Miss Lintel Support. Note the lintel segments have been butt welded onto the edge of the angle. It is hard to discern but they are rotating</p>
<p>Ph #5174 Level 9. Section butt welded on edge to edge. Hit & Miss welding in this instance</p>	<p>Ph #5176. Level 8 Note inadequate lintel breadth leaves brickwork unsupported</p>
<p>Ph #5177. More Lintel bw engagement.</p>	<p>Ph #5179 Level 7.</p>

APPENDIX R DROP R – NO PHOTOS

APPENDIX S DROP S



Ph #5184. Level 17 Drummy Render. Plant growing out of render



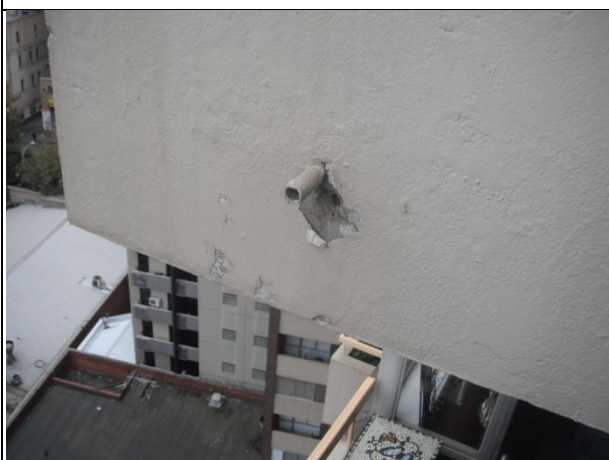
Ph #5518. Level 17. Horizontal Brickwork Crack



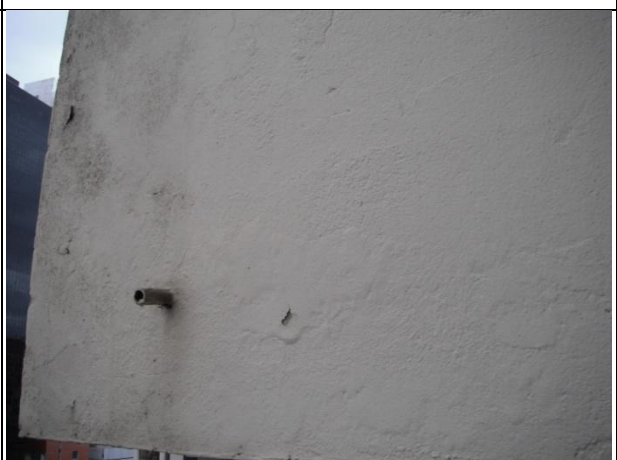
Ph #5519 Level 16 Cracked & Drummy Redner



Ph #5520. Level 16 Cracked & Drummy Render



Ph #5187 Level 15. Spall around drainage outlet



Ph #5521. Level 14. *Drummy Render. 80%



Ph #5188. Level 11 Drummy on top half of wall. 50%



Ph #5189. Level 10 Drummy with significant vertical crack



PH #5523 Level 10 Crack adjoining wall



Ph #5192 Level 6. Drummy & Cracked render 30%









Ph #5194 Level 4 Crack adjoining brickwork



Ph #5525. Significant crack in brickwork

APPENDIX T DROP T

	
<p>Ph #5195 Level 17. Window Lintel Detail</p>	<p>Ph #5196 Level 17 Cracks in balcony render 30% drummy</p>
	
<p>Ph #5197 Level 12 Drummy Render 10%</p>	<p>Ph #5198. Level 11 Drummy Render 20%</p>
	
<p>Ph #5199 Level 10. Render 20% Drummy</p>	<p>Ph #5200. 20% Drummy left hand side towards wall</p>

APPENDIX U DROP U



Ph #5526. Level 16 Bad Caulking



Ph #5527. Level 12 Corroded (Surface) & Lintel Detail




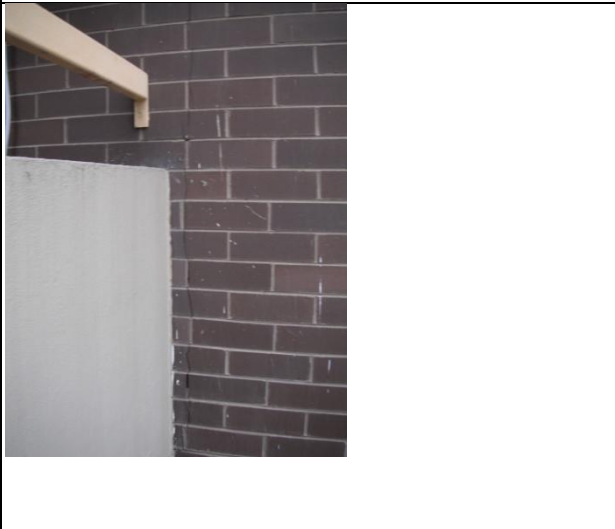




Ph #5528 Level 2 Surface Delamination of bricks


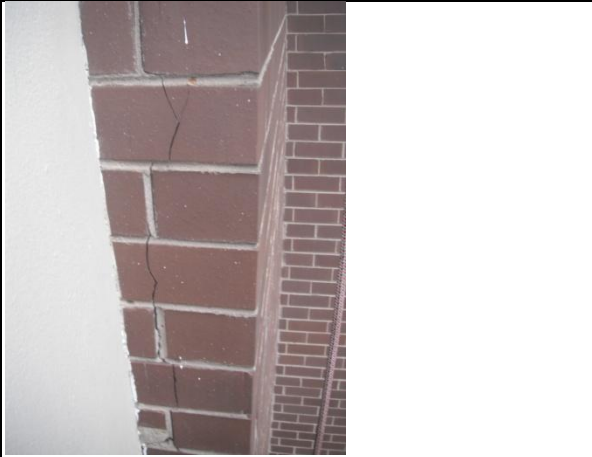

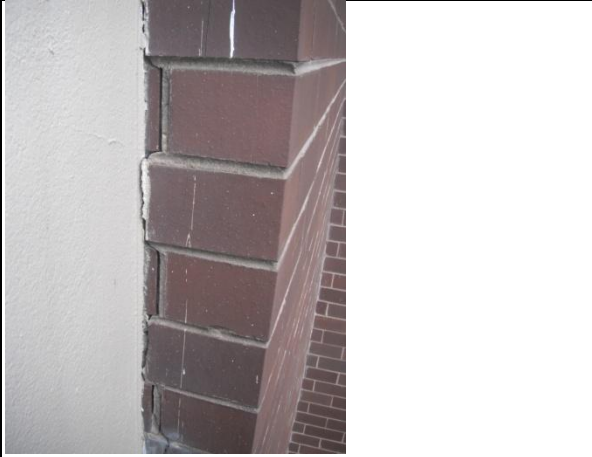
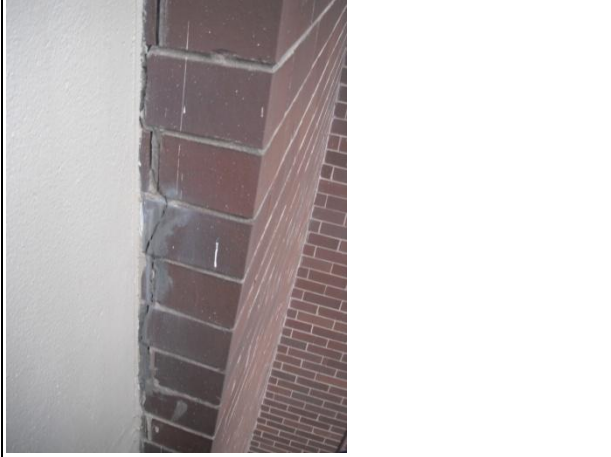

APPENDIX V DROP V

			
<p>Ph #5201. Level 17 Vertical Step Crack in Internal corner of brickwork</p>	<p>Ph #5202. Level 16 Loose Mitre Tile</p>		
			
<p>Ph #5203. Level 14 Loose Tile</p>	<p>Ph #5204. Level 9 Vertical Step Crack in Internal corner of brickwork</p>		
			
<p>Ph #5205 Level 7 Step Crack in brickwork</p>			

APPENDIX W DROP W

	
<p>Ph #5229 Level 17 Crack. Render 50% Drummy</p>	<p>Ph #5530. Level 13 Concrete Spall Corroded Reinforcement Requires repair</p>
	
<p>Ph #5532 Level 10 13 Concrete Spall Corroded Reinforcement Requires repair</p>	<p>Ph #5533 Level 7 Vertical Crack in brickwork</p>
	
<p>Ph 5534 Level 3 Missing render on corner – cause unknown</p>	<p>Ph #5535. Level 2 Crack in render - repaired</p>

APPENDIX X DROP X

	
<p>Ph #5207. Level 17. Mortar missing on number of beds & perpends. Disoriented laying pattern. Note appears original construction not later movement</p>	<p>Ph 5208. Level 8 Through and Through minor crack through brickwork</p>
	
<p>Ph #5210. Level 6 Vertical through & through creacking in brickwork</p>	<p>Ph #5211. Level 6 Cracking in brickwork</p>
	
<p>Ph #5212 Level 7 Delamination & cracking of brickwork</p>	<p>Ph #5213 Level 7 Significant cracking of brickwork</p>

