Saturday 13 April 2013
Ref 130413

Waverley Council
Cnr of Bondi Road and Paul Street
BONDI JUNCTION NSW 2022
Ph 9369 8018
Attention Steve Gillett
Business Services and Property Div

Dear Sir

BOOT FACTORY (Mothballed) COMMERCIAL BUILDING CIRCA 1892
27-29 SPRING STREET BONDI JUNCTION

In response to our phone discussion last Thursday 11 April, this confirms our inspection of the Boot Factory commercial building on Friday 12 April 2013 morning accompanied by yourself and Fiona Chan.

Prior to the technical visual inspection of the Boot Factory structure that consisted of the external facades and the interior throughout all room enclosures and open spaces, we studied our last report (27 November 2012 to Waverley Council) and photographic evidence together with perusing previous reports regarding the condition. The results of this technical Inspection determined the building continues to deteriorate and with noticeable movements to this three-storey high structure, comprising of the following residential-like construction:

(A) The building construction design is similar to a residential-like-wall and floor construction.

(B) Brick walls exist generally only to the perimeter of the building facade.

(C) The perimeter walls are not cavity brick construction (that provide a superior durable building).

(D) Both suspended interior floor system completely through to the roof construction are timber construction and supported on timber posts and not the superior brick, concrete columns or walls or steel piers, that increases the stability of structures.
A list of our concerns follows for your attention regarding ongoing deterioration of the Boot Factory:

1. Roof stormwater leaks from rust corroded roof guttering causing water migration internally including from wind driven rain into the three-storey brick wall structure that is not constructed to prevent water penetrating to the interior. Evidence of internal seepage has increased noticeable with wall staining to all elevations except for the more protected elevation immediately adjacent to the Mill Hill colonnade access.

2. Remedial steel tie rods recently installed by laying on top of the timber floors and extending through and connected to the front and rear facade walls (to assist in resisting wall movements as the timber floor beams suffer deteriorating structural wet rot condition), were discovered loose to both top floors, requiring them to be retightened during our inspection. These steel rods were found loose on our previous inspection last October.

3. Existing brick wall cracking to the upper internal brick walls has slightly increased to all four internal elevations, including a new horizontal crack has developed in the mortar joints adjacent the kitchen sink to the wall adjacent to the Mill Hill colonnade access and to the rear wall overlooking the adjacent Office Works roof. Steel tie rods could not be installed to the top of the upper level walls hence the timber roof frame structure is undergoing distress and/or the top of the rear western wall are becoming flexible adjacent the Office Works roof.

4. Thorough termite inspections that would require removing plasterboard wall linings for the purpose to inspect the timber supports to the floor system, have not been implemented as we have recommended a number of times.

CONCLUSIONS

1. Water migrating through the external walls and from the roof area contributes to weakening the mortar joints strength within the non-cavity perimeter brick walls. Additionally wet structural rot to the ends of the large timber floor joints concealed into pockets in the external walls which is not the mode of construction with modern buildings including modern construction consist of concrete slab floors that provide superior stability to the structure and for fire rating safety.

2. Loose steel tie rods is a result of ongoing wall movements.

3. Cracking is slightly increasing including new cracking developing is as a result of building movements stemming from the foundations supports of the building structure.

4. Structural termite damage was previously identified in the large timber floor beams. Until wall linings are removed and proper termite inspection, assessment of any damage cannot be carried out.

5. The construction wire fence barricade to three sides of the Boot Factory structure, would not prevent adjacent building damage or safety for the community that we have observed around the area in close proximity of the Boot Factory during each and every inspection we have carried out since 2007, should the foundations beneath the external walls of the building collapse. The method to prevent any type of collapse, which usually occurs unexpectedly, would require structural steel bracing of the facade walls. As damaged underground stormwater drainage systems contribute to foundation material movements, it would be prudent to investigate if the surface water around the Boot Factory and the roof rainwater downpipes penetrating the ground at the base of the perimeter walls, are connected into sound underground stormwater drainage pipe systems. This includes the connection to the main stormwater pipeline assumed in Spring Street.
6. In summary, the Boot Factory building is in structurally unsafe condition as the brick walls have continued to settle and rotate outwards and inwards, including increased cracking since installing temporary wall supports in recent years.

7. Our $1,000,000 estimate to repair the building is not a rebuild nor modernisation, nor to make compliance with NCC 2013 BCav1.

8. Sydney’s unprecedented rains and winds would continue to have a detrimental effect on the shell structure including continue to allow water to penetrate the structural timber floor beams including the already unsatisfactory foundations and brickwalls. As it is not economical viable, and includes more structural bracing as time progresses, demolishing the Boot Factory building now will provide a safer adjacent community.

RECOMMENDATIONS

1. Work needs carrying out to prevent rainwater penetrating the structure that is causing further deterioration of the structure and components that aid in the building stability. Work requires a new box gutter the full width behind front parapet and rainwater head at north-east front.

2. Monthly inspections required to the steel tie rods, and tightened as required.

3. Ongoing monitoring for cracking is necessary with inspections reduced to quarterly inspections per year. Steel tie rods to be included in these quarterly inspections.

4. Remove plasterboard wall linings against internal side of the perimeter brick walls to determine if concealed termites are tracking from the ground floor concrete slab into the upper timber floor structure. Qualified and experience termite Inspector to provide thorough inspection and followed up by a termite control operator that would include prevention measures in line with the termite Inspector’s recommendations.

5. A licensed plumber experienced in stormwater management control and drainage, to be briefed by Building Diagnosis Centre to carry out physical examination of the design and document as built and assess physical condition of the underground stormwater drainage system around the Boot Factory and extending to the connection in Spring Street and/or to other areas where discovered. We would require approximately four periodic Inspections during this process including instructing the plumber to excavate the drainage and ground beside the building for initial preliminary study of the foundation soil.

6. Increase protection to the Mill Hill colonnade access is urgently necessary as a safety measure. The fire exit for the basement of this building is adjacent to the rear corner of the Boot Factory that must remain clear. Protection may be possible with solid hoarding extending down to the gate entrance including residential side and identified with warning signs.

7. Alternatively, to the above and as the above does not include substantial and permanent rectifications, demolition of the Boot Factory building is necessary allowing for a purposely built viable structure.

Yours faithfully

BUILDING DIAGNOSIS CENTRE PTY LIMITED

[Signature]

Robert Speirs-Ferrar
FAIB MMBA MBDA

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09 April 2013
Ref 130409

Waverley Council
Cnr of Bondi Road and Paul Street
BONDI JUNCTION NSW 2022
Ph 9356 8018

Attention Greg Worner
Manager Business, Services & Property Division

Dear Sir

BOOT FACTORY (the Mothballed Building) CIRCA 1892
27-29 Spring Street Bondi Junction

In response to our phone discussion yesterday and followed by your email and report attached titled "Engagement Strategy – The Boot Factory" dated April 2013, this confirms the described physical structural conditions in the report correctly reflect our opinions mentioned in our reports to Council since August 2007.

In summary, the Boot Factory building is in structurally unsafe condition as the brick walls have continued to settle and rotate outwards and inwards, including increased cracking since installing temporary wall supports in recent years. Our $1,000,000 + estimate to repair the building is not a rebuild nor modernisation, nor to make compliance with NCC 2013 BCav1. Sydney’s unprecedented rains and winds would continue to have a detrimental effect on the shell structure including continue to allow water to penetrate the structural timber floor beams including the already unsatisfactory foundations. As it is not economical viable, and includes more, structural bracing as time progresses, demolishing the Boot Factory building now will provide a safer adjacent community. Please note the Boot Factory is now due for a further periodic structural assessment.

BUILDING DIAGNOSES CENTRE PTY LIMITED

Director / Principal
Robert Speirs-Ferrari FAIB MMBDA MBDA
Fellow chartered and accredited building expert
BCA-NSW Chapter Building Designer
Assessor and project mentor
MDesign UTS

Dip. Bld & Constr MBA
Liq. Builder Cert
Liq. Asbestos Cert

Partner - architecture investigations
David tender nonarchitect architect
Chartered Architect Reg. 2121
B Arch UTS, Grad Dip UEM (UTS)

Access and egress for disability
David tender nominated architect
Chartered Architect Reg. 2121 ABBDA
B Arch UNSW, Grad Dip UEM (UTS)

Consulting Group

ENGINEERING
Robert C. Springhill BE, MIE, Assl. C/Eng.(NPER)
Consulting Structural & Civil Engineer
B.E (Civil) UOW, Registered NPER 3 -
Certified Practicing Engineer
Assessor Centre (Civil & Structural)
Corporate Member Institute of Engineers Austraila No 52223

Scott Dallal MBE (Aust) C/Eng., NPER
Consulting Structural Engineer
B E (CIV), UTS, Dip. Eng. PEng.
Certified Practicing Engineer
Corporate Member Institute of Engineers Australia No 254804

John T Dowies BE FIE (Aust) NPER No 1512202
Senior Design Structural & Civil Engineer

Shoisy Irwin
Senior Civil Design Engineer
BC Civil

COUNCIL REGULATIONS BCA & PCA
ENERGY EFFICIENCY - BCA SECTION J
Grand Harvington MAHER 290070
Cald selectively panelising (URS),
Accredited Building Surveyor (RIP1070)

ENVIRONMENTAL - ASBESTOS
Patrick James BSc, ARMH, FIQ
Environmental & OHS Consultant

HERITAGE & CONSERVATION
John Glucklin BSc, MA (Syd), C/Eng, MIE (Aust)
DIAPSIDATION INSPECTION REPORT ON BOOT FACTORY CIRCA1892 (Mothball Building)

27-29 Spring Street Bondi Junction

In accordance with your October instructions, Robert Speirs-Ferrari inspected the Boot Factory during dry weather on 18 October 2012 accompanied by Council officer Steve Gillett. Photographic evidence as attached, highlights increased deterioration and structural movement of the front and rear facade walls since last recorded on 21 August 2011.

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PH 0402 0140 0408 511 216 POSTAL PO BOX 1187 MANLY 1855 186 Warringah Road Beacon Hill 2100

E info@buildingdiagnosis.com.au Web www.buildingdiagnosis.com.au
IMPORTANT CONSTRUCTION ELEMENTS OF THE THREE-STOREY BOOT FACTORY

1) Our ongoing assessment over the last 5 years (initial assessment in August 2007) identified the 120 year old Boot Factory (Circa 1892) was constructed prior to the Local Government Act 1919 (NSW) Building Ordinance. The structure is generally unaltered with exception to the 1986 renovations that included concrete fire stair, two toilet rooms and bolting timber cleats to the sides of certain timber floor beams suffering wet rot damage (timber beams are embedded in the internal face of the perimeter walls). The ground floor is concrete construction although may have been originally a heavy duty timber warehouse floor, as the first and second floors have remained with original timber floor beams and flooring.

2) The Boot Factory construction comprises only external 350mm thick masonry brick walls (no internal bracing walls) to the ground floor level and 230mm thick to both upper level masonry brick walls. The external walls suffer cracking and erosion of the bricks and mortar joints. A wall cavity was not constructed inside the walls and therefore the walls are solid allowing water migration through to the interior carrying coastal atmospheric salts into the bricks and mortar joints. Mortar joint composition is non structural strength lime/sand/crushed shell contributing to the erosion that exists in the walls and the wet rot to the ends of the timber floor beams and the remedial work with the timber cleats.

3) Corrugated steel roof covering is secured to a timber frame hip roof construction. Across the front elevation pre-August 2007 stainless steel stays and an angle bracket extending from the roof frame secures the concrete rendered 230 mm thick masonry brick gable wall. The 230 mm brick gable is part of the parapet construction that extends across the front to conceal the roof box gutter.

4) A typical example of a pre-1919 mode of masonry brick wall construction of the Boot Factory is the timber bearer plates constructed (sandwiched) into the rear and front internal portion of the external masonry brick walls. The sandwiched timbers bare plates practice is a potential for dislodgement of the front parapet construction if movement continues and if termite infestation occurs. Termite damage has been observed in some of the timber construction within the men’s toilets located south-east front corner (below the brick parapet), and to the large timber floor beams elsewhere in the building. The ‘sandwiched timber’ mode of construction ceased with the Local Government Act 1919 and replaced with reinforced concrete tie beams for a building of this type.

5) The three-storey high external masonry brick walls sustained major bowing outwards more noticeable to the front elevation wall as the timber floor beams were not structurally connected to provide lateral support. Structural steel tie rods were also common but not applied to secure / stabilise both front and rear walls against movement. The timber floor beams to not provide any structural connection. Water has penetrated due to the typical pre-1919 wall construction, causing wet rot damage that had inadequate repairs in 1986. A transparent penetrating waterproofing product was applied in 1997 and was unsatisfactory as moisture continued to migrate internally. The above-mentioned timber cleats are also rotting as the external face is not waterproofed by a waterproof membrane paint over cement rendered.
RECENT ECONOMICAL MOTHBALL WORKS – STRUCTURAL ATTEMPT TO CONTROL MOVEMENTS

6) Our assessments since August 2007 brought about the propping beneath the ends of the timber floor beams in December 2008/2009 when the Boot Factory was bring 'mothballed'.

7) In March 2010 our assessment detected movement continued in the front and rear masonry brick walls, hence the front wall was secured to the back wall via steel tie rods in an attempt to control the movement and provide increased safety against the walls spreading.

8) In August 2011 our assessment of the Boot Factory structure did not exhibit any serious change since the 2010 assessment, except this inspection was after recent rain and water had penetrated and saturated the rear wall and the floor carpet. Termite damage increased to the northern side timber floor beam, resulting in our advice to demolish the plasterboard wall linings to the ground floor partition wall as termite invasion was suspected entering from the concrete slab floor area via cracks or a gap at the wall junction.

CURRENT CONDITION AT 18 OCTOBER 2012

9) The bowing outwards to the front facade masonry wall has increased at the first, and second floor junctions, observed with the ‘out of plumb’ brickwork and worst at the second floor junction when comparing to the severe ‘out of plumb’ gable and parapet wall. Photographs 1, 2 and 3 are location shots previously taken.

10) Other evidence of movement include:

10.1 Cement render dislodgement and falling to the ground as reported by Council officer. Photograph 4

10.2 Cracking exists/Increased to the internal face of the second floor level wall above and below windows i.e. photograph 5 cracking extends from the timber window head to the underside of the timber bearer beam in the wall. Photograph 6 diagonal cracking extends beneath the window to the floor direction (left of wall mounted fire extinguisher). Photographs 7 and 8 above and below the twin windows.

10.3 The steel tie rods installed in March 2010 connecting both the front and rear walling have become extremely loose and possibly detached due to tension stresses caused by the bowing outward wall movements (3 at the 1st floor level and 4 at 2nd level, and one behind stairwell door has moved 100 mm). Photographs 9 to 14.

11) Water penetrating through the non-waterproofed external perimeter masonry brick wall has increased although the carpet that was saturated previously had been removed from the timber floor construction. Photographs 15 to 17.

12) A strong musty moist odour lingers throughout the interior. This damp condition is a concern as termite activity will increase. Advise further plasterboard wall linings to the internal partition walls be demolished and a thorough inspection.
carried out by an experienced detailed and accredited termite Inspector. Particular areas in photographs 18 to 20.

13) The importance of a termite free interior to the Boot Factory structure is paramount as the internal partition walls to the ground and first floor levels including the timber hip framed roof construction assist to brace and stabilise the perimeter masonry brick walls.

CONCLUSION

14) The Boot Factory external masonry brick three storey high wall to the front facade with of pre-Local Government Act 1919 (NSW) construction has continued to bow outwards at the first floor level and more so at the second floor level.

15) The cement rendered gable brick wall is restrained at the very top via the stainless steel rods tied into the timber roof framing, although the wall is 'hinging' at some point to the upper facade location. The expected horizontal cracking could not be detected as the inspection was visual from ground level and without a cherry picker.

16) Cement rendering over the front facade wall features are dropping to the ground even though previous loose sections were physically removed by the remedial builders at the time of the 2010 works.

17) Cracking is slightly increasing to the inside wall face of the front wall above and below the second floor windows.

18) Plasterboard wall linings to the ground floor and first floor partition walls have not been removed for termite prevention, nor a licensed accredited termite Inspector has not assessed for termite activity as recommended in our previous inspections.

19) The internal partition walls assist to provide lateral support bracing to the perimeter external masonry brick walling. Their sound condition is equally paramount for the safety of the Boot Factory structure.

20) Moisture still penetrates through the non-waterproof external wall faces that increase the risk for termite invasion to the timber floor beams and wall framing partitions.

RECOMMENDATIONS

1) RM Watson remedial builders installed the steel tie rods and should be notified to discuss on site immediately the loose and sheared rods with the author of this report.

2) Certain plasterboard wall linings to the internal partition walls need to be demolished for an inspection immediately by an accredited licence termite Inspector.

3) Subject to our findings of RM Watson anticipated works, the front and rear facade walls are probably requiring vertical and horizontal steel framework bolted and welded externally and needled internally with steel diagonal bracing supports.

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4) Ongoing periodic inspections are necessary, as the Boot Factory structure continues to suffer movement as it does not comply with current Building Code of Australia, Australian Standards and requires major works and expense.

5) For clarification contact Robert Speirs-Ferrari direct number 0408 911 210 and ferrari@buildingdiagnosis.com.au. Refer to following photographic evidence.

**Robert Speirs-Ferrari** FAIB MMBA MBDA
M.Cape(UTS), GradDip. Desgn, GradCert. Desgn, Architect. Cert.,

Director/Head Forensic Building Engineering + Project management
Consulting Forensic Diagnostic Construction Specialist *(Defect and Damage Analysis)*

BUILDING DIAGNOSIS CENTRE PTY LIMITED
Design and Construction Forensic Experts, Project Managers, Assessors & Litigation Support

Photographic evidence follows
Photograph 01 Boot Factory eastern front elevation suffering bowing outwards of the walls

Photograph 02 Boot Factory eastern front elevation suffering bowing outwards of the walls
Photograph 03 Boot Factory braced parapet wall eastern front elevation suffering bowing outwards at the base

Photograph 04 Boot Factory eastern front elevation cement render pieces falling to the ground due to movement
Photograph 05 Boot Factory internal eastern wall fracture cracking right side extending from window to top plate

Photograph 06 Boot Factory internal eastern wall diagonal cracks over 6 courses 0.5 - 1mm
Photograph 07 Boot Factory internal eastern wall face over twin windows over 5 courses high

Photograph 08 Boot Factory internal eastern wall cracking 1 mm below window over 10 courses to floor
Photograph 08 Boot Factory steel tie rods loose due to water movements.

Photograph 10 Boot Factory steel tie rods loose due to water movements.
Photograph 11 Boot Factory steel tie rods loose due to water movements

Photograph 12 Boot Factory steel tie rods loose due to water movements or rods have stripped
Photograph 13 Boot Factory external tie rod brackets unamaged and brickwork

Photograph 14 Boot Factory rear western external tie rod brackets unamaged and brickwork
Photograph 15 Boot Factory increased damp penetrating walls to interior

Photograph 16 Boot Factory increased damp penetrating walls to interior
Photograph 17 Boot Factory carpet removed due to being saturated from water penetration.

Photograph 18 Boot Factory internal damp conditions causes deal environment for termite invasion - termite damage in floor beams.
Photograph 19 Boot Factory internal damp conditions causes deal environment for termite invasion - termite damage in floor beams

Photograph 20 Boot Factory internal damp conditions causes deal environment for termite invasion - termite damage from timber frame over stack pipe
29 September 2011
Our Ref RSF110929

Waverley Council
Cnr of Bondi Road and Paul Street
BONDI JUNCTION NSW 2022
Ph 9369 8000

Attention Steve Gillett
Business Services and Property Div

Dear Sirs,

BOOT FACTORY CIRCA1892 – Mothballed Building
27-29 Spring Street Bondi Junction

In accordance with your recent instructions, Robert Speirs-Ferrari inspected the Boot Factory building during dry weather on 21 September 2011 accompanied by Council officer Paul Watson. Photographic evidence was taken of the increasing deterioration.

HISTORY GENERAL

Our initial inspection and report on this building by Robert Speirs-Ferrari commenced on 22 November 2007 (accompanied by Paul Watson). Our services continued which included our consulting structural design engineers headed by Robert Speirs-Ferrari.

Our services included periodic inspections and assessment reports; evaluating previous research and reports; evaluating previous recommended work that some had been carried out; preparing structural drawings; preparing detailed specifications for remedial work necessary to certify the building ‘fit for purpose’ for safe occupancy.
Building Diagnosis Centre Pty Ltd

29 September 2011 - Boot Factory

The boot factory building suffered poor dilapidation condition and was and still is in disrepair. Major repairs and remedial work performed approximately 15 - 20 years earlier have deteriorated.

HISTORY CONDITION

The following is an overview of the building condition. The condition includes repairs, maintenance and remedial work undertaken to prolong the life of the building. Although these above mentioned works have not provided or achieved the necessary improvements for compliance with BCA and Australian Standards. Refer to heading ‘Current Deterioration Rate’ for deterioration occurring to the boot factory structure since submitting our last reports in 2010:

1. Wall movements and cracking –

   1.1 Concerns that poor foundations supporting the building is one likely cause of extensive wall movements (with some cracking) resulting in bowing outwards and inwards of the perimeter masonry walls.

   1.2 Another cause of the perimeter wall movement would have occurred as it is assumed no internal partition wall bracing existed (or was suitable) prior to the modern partitions that have been installed.

   1.3 However, the current internal timber frame partition walls that are likely to have occurred in the last 20 years have provided a certain degree of bracing to the perimeter masonry walls, although is insufficient.

   1.4 The poor designed timber floor system that originally would have been providing stability to the external perimeter masonry walling, ceased providing stability once the ends of the embedded timber floor joists commence to suffer wet-rot. This wet-rot occurred due to the moisture penetrating through the solid brick walling (without a cavity) and as the joist ends were embedded within the solid masonry wall that is not water resistant.

   1.5 Floor joists built into the brick walls are supported on timber sole bearing plates which is uncommon practice. This methodology is illegal since Ordinance 70 arrived from local government act 1919. Due to this long outdated methodology it has further provided the opportunity for the wall movements. The brick walls to the mid-level are constructed on top of these timber sole bearing plates hence were partly concealed together with the ends of the timber joists within the brickwork. This mode of construction is 19th century and early 20th century building techniques constructing brickwork on top of timber sole bearing plates embedded within the brick walls. This provides no connection to the brickwork above and below the timber plates, hence allows for lateral movements when timber floors are connected to same. It is also dangerous if wet rot occurs and termite activity causes structural damage.

   1.6 The leaning and cracked front brick gable parapet wall originally had no lateral bracing against tipping over. Stainless steel bracing that was installed approximately 15 years ago was found to be inadequate for the purpose intended. Please note that the recent works last year by RM Watson have strengthened the connections.
2. Moisture penetrating the solid masonry walls causing wet-rot to occur to the ends of the embedded deep timber floor joists. Water also occurs on the inside face of the perimeter masonry walls due to leaking around the timber windows, via the cracks and generally via the porous brickwork. The front concealed box gutter deterioration further allows water to seek into the roof timber structure and the porous solid masonry wall (without a cavity). Moisture is contributing to the cracking causing the rust corrosion of the steel arch bars of the windows.

3. Major previous remedial work that appeared to stem from a very thorough investigations some 15-20 years prior by an engineering professor, were undertaken to the ends of the timber joists by the installation of timber blocking (fish plates) and steel rods extending into the porous masonry brick walls. These timbers have also suffered from timber rot decay where they are concealed inside pockets of the ‘solid’ (without cavity) porous masonry brick walls. Details of this work are as follows:

3.1 The work consisted of timber blocking known as ‘fish plates’ that are secured to the sides of damage timbers or at floor joints to retain the original strength.

3.2 These fish plates were bolted beside the ends of the rotting deep timber floor joists.

3.3 Additionally undersized bolt anchors that were not adequately connected to the sides of the fish plates and remaining sound timber floor joists were embedded into the walls to retain stabilization to the perimeter walls via the deep floor joists.

3.4 The timber joists continued to suffer wet-rot decay coupled with insufficient work to the timber joists to provide support to the perimeter external masonry walls.

3.5 The joists were not continuous from front to back of the building hence movement would have been occurring at these junctions and at junctions over beams that were not adequately secured.

3.6 Unfortunately the remedial work failed and in time has proven to be an unsatisfactory remedy.

4. Wall cracking is a result of the above perimeter masonry wall movements and insufficient internal bracing including the rust corrosion expansion of the steel arch bars embedded in the walls over all windows to the three-storey building.

5. Eroding brickwork and mortar joints has occurred especially the upper level walls extending above the adjoining rooflines of buildings including the Office works building.

6. Cracking and loose cement render was dislodging off the walls including corroding and loose fire sprinkler systems fitted externally over all windows. Please note that the dislodging cement render was removed during last year's make-safe works.

7. Roof downpipes and wall mounted light fittings were also unstable at the wall connection. Please note that these items were included during last year's make-safe works.

8. Termite infestation occurred in the male toilets concealed within the sewer duct stack although this was non-destructive damage.
2010 MAKE-SAFE WORK

Before the building could be considered ‘fit for purpose’ for safe occupancy, in 2009/2010 we specified extensive remedial work for a 10 year period subject to a review for a longer-term. Due to economic reasons and the need for the boot factory building to be immediately made safe, Council request us to specify short-term ‘make-safe’ work which commenced in October last year. Due to the nature of the work it required the boot factory building to be vacant.

Due to the poor state of disrepair with sections in dangerous conditions including those hereunder, the following ‘make-safe’ work occurred:

1. Boarded-up timber windows that were in dangerous and loose condition due to wet-rot and non-compliant, as sections were unsafe and could easily break off the walls when being operated by the tenants.

2. Serious and bulky remedial construction work originally to permanently stabilize the building perimeter walls and floor system. However, to mothballed building short-term ‘make-safe’ work occurred using steel jacks to support the softwood oregon deep timber floor joists 1 m from the perimeter walls via timber beams whilst large timber beams were bolted to the inside face perimeter walls to stabilize the freestanding exterior walls via the strengthened floor system. The steel jacks are still present today and will remain so indefinite until the building is permanently rectified and/or extensively updated or demolished. This remedial make safe work is to support the timber floor system from collapsing internally which would in turn forced external walls to fall outwards.

3. Included in this wall bracing required steel rods that were welded and threaded into the front and rear perimeter walls at the 1st and 2nd storey floor levels. Extensive amount of external bricks were removed as voids required grouting to form fully solid perimeter wall at the point of the steel tie rod attachment.

4. Internal timber support beams bearing the weight of the floor system required steel plates to link the beam junctions including bolts into the deep floor joists at the overlaps.

5. Increased suitability of the gable parapet bracing.

CURRENT DETERIORATION RATE

Photographic evidence as attached.

1. Increase corrosion to the steel fire sprinkler heads shields that are dislodging including the fixings are corroding into the brick walls. Replacing or removal of the shields are necessary to avoid falling to the ground.

2. Water penetration causing high level of damp to the internal face of the walls are occurring. The carpet is wet against these walls from the dripping water which in turn causing the ends of the timber joists to remain wet. As the building is now locked up there is no air circulation hence wet-rot would be attacking the
structural ends of the existing timber joists. However, the large timber beams bolted to the inside face of the walls will provide added protection but not indefinite.

3. One location this will at ground floor level the brickwork within the window opening is extensively cracking and a portion of brick is likely to displace to the ground. This is caused by the ongoing corrosion of the steel arch bars. It is difficult to detect if this is occurring on the southern side of the building (against the council’s property) due to the close proximity of both buildings. For the moment the damage brickwork on the northside should be rebuilt to support the weight of the steel arch bar and from further dislodgement.

4. Some horizontal minor cracking has developed to the upper story West wall just below ceiling level. Inspection is required every 3 months to this item.

5. Additional hairline cracks have developed in the front eastern wall to the 2nd and 3rd levels. This is currently acceptable although should be inspected at the same time with the crack in item 4 above.

6. The ground floor office on the northside has suffered with termite infestation and damage to the floor joists against the northern masonry wall. At the time we removed some plasterboard wall linings to the partition that adjoins the masonry pier that aids in supporting the floor system. We were able to detect that one floor joist suffers structural damage. This area was pointed out in our 2010 inspection and termite attack has occurred in this interim period. Recommend a termite eradicate inspector provides a thorough examinations which will include removing the wall linings to the partition and checking behind the timber stud that is in vertical connection to the pier. We should inspect after the investigations and/or during subject to the termite inspectors findings.

7. Due to the amount of water penetrating the building it is advisable that the power is switched off the mains so as there is no live electricity within the building. Consideration should be given if there is any electronic fire detection devices.

For any clarification and further input, please contact Robert Speirs-Ferrari direct phone number 0408 911 210 and to ferrari@buildingdiagnosis.com.au.

Yours sincerely
BUILDING DIAGNOSIS CENTRE PTY LIMITED

Robert Speirs-Ferrari FAIB MMBA MBDA
Director of Projects
Fellow Chartered and Accredited Consulting Design & Building Engineering Practitioner
Refer to attached photographic report.
Photograph 03 Boot Factory - general overview of Western elevation and rubbish

Photograph 04 Boot Factory - overview of sprinkler heads with corroding metal shields
Photograph 05  Boot Factory - close-up of metal shield that is not supported by the sprinkler head

Photograph 06  Boot Factory - close-up of metal shield that is partly supported by sprinkler head
Photograph 07  Boot Factory - typical shield not properly supported and rusting around sprinkler head and wall fixings

Photograph 08  Boot Factory - stress crack brickwork in north window ground floor opening
Photograph 09  Boot Factory - close-up of stress cracking due to rust corrosion steel arch bar above.

Photograph 10  Boot Factory - water penetrating the interior just inside the entrance doorway.
Photograph 11  Boot Factory - overview of 2010 make safe works to ground floor

Photograph 12  Boot Factory - close-up of make safe work and water staining emanating from wall beam
Photograph 13  Boot Factory - overview of typical make safe propping works

Photograph 14  Boot Factory - evidence of termite damage in floor joists against North wall ground floor
Photograph 15  Boot Factory - close-up of termite evidence as mentioned above

Photograph 16  Boot Factory - zoomed in close-up of termite damage splitting and hollow
Photograph 17  Boot Factory - physical structural intrusion revealed structural termite damage

Photograph 18  Boot Factory - physical structural intrusion revealed structural termite damage
Photograph 19  Boot Factory - wall panelling removed no evidence of termite ingress

Photograph 20  Boot Factory - mid floor North corner rainwater penetrating walls
Photograph 21 Boot Factory - rainwater penetrating from new make safe timber beam

Photograph 22 Boot Factory - rainwater dripping onto carpet edge over timber floor structure
Photograph 23  Boot Factory - typical photograph of water dripping in carpets

Photograph 24  Boot Factory - rainwater dripping from floor system above and from window sill
Photograph 25  Boot Factory - water dripping on carpet into timber floor structure beneath window

Photograph 26  Boot Factory - close-up of water dripping to carpet and floor system
Photograph 27  Boot Factory - rainwater dripping onto window sill and to carpet and power point below

Photograph 28  Boot Factory - close-up of power point receiving water drips.
Photograph 29  Boot Factory - top floor level overview of make safe propping and steel tie bracing

Photograph 30  Boot Factory - top floor level overview of make safe propping and steel tie bracing
Photograph 31  Boot Factory - previous water stains to West wall although currently dry

Photograph 32  Boot Factory - horizontal crack in mortar joint 2 courses below ceiling level in West wall
Photograph 33  Boot Factory - diagonal cracking on South end extending to the horizontal cracking in West wall

Photograph 34  Boot Factory - diagonal cracking on North end extending to the horizontal cracking in West wall
Photograph 35  Boot Factory - overview of East wall at upper floor level suffering cracking

Photograph 36  Boot Factory - close-up of diagonal cracking North side extending from floor to window corner
End of Photographs
Update report Our Ref 101110

10 November 2010

Waverley Council
Cnr of Bondi Road and Paul Street
BONDI JUNCTION NSW 2022
Ph 9369 8000
Attention Steve Gillett
Business Services and Property Div

Dear Sir

BOOT FACTORY CIRCA1892 – Final Project Inspection
27-29 Spring Street Bondi Junction

Further to our last update dated 30 September 2010, this confirms my final inspection of 18 October 2010 at the Boot Factory accompanied by Steve Gillette and a pest inspector contractor.

1. The building has been stripped out hence it is vacant and gives a clearer opportunity for assessing the structure.
2. We still consider the current works is to provide short-term stability whilst the Boot Factory is in mothball suspension for up to 9 months.
3. The RM Watson works has provided the required further stability until a decision is made to upgrade or redevelop the building site.
4. We were able to further assess the bowing of the front wall to the Boot Factory structure. This was carried out by a string bob line attached to the top of the wall that gave a very good visual indication of the wall movements. The wall is severely bowing outwards at the 2nd floor level and tapers back being plum to the ground level whilst the parapet above the top level is leading inwards towards the roof direction. It was quite disturbing to visualise the amount of movement. Including some additional cracking that has occurred at random to the top front wall area.
5. However, in saying this, due to the vacant internal shell, we realised that the office partitions that are attached through the centre of the middle floor from front to back are of substantial construction and thickness and would be providing a brace to these front and rear walls.

6. As there is no recent movement evidence at the junction of the partitions and the masonry walls indicates that there is no movement occurring currently. This will not negate the need to provide the strengthening to the building if it is to be reused. Just on this matter, as you are aware we have been engaged and attending meeting with Smart Design Studios and currently issued our recommendations for structural design for the proposed concepts they have produced for the purpose to upgrade the building for reuse.

We expressed our opinion that the proposed upgrading would be in the order of $5,000,000 and that does not include purchasing part of the land adjacent if Council agreed to an extension to the side wing and would not include the hefty improved hydraulic drainage services that the quantity surveyors will be costing up.

7. The termite contractor mentioned he has carried out certain tests to the structural timber floor over the northern ground floor offices and found there was no evidence of termites or damage. However, we are concerned that the termite contractor did not advise or carry out any investigation of the partition walls and the timber floor joists beams that are concealed by the wall linings and ceiling linings.

8. We recommend that a strip of wall lining be removed to one side of the partition that makes contact with the northern masonry wall to allow the termite contractor to carry out a full inspection for termite activity and any damage. Additionally that the ceiling section adjoining the partition wall be also partly removed against the masonry northern wall for a similar full inspection for termite activity and any damage sustained.

9. For convenience sake, we have reiterated here that two welds need to be improved to the 1st/2nd floor rights adjacent to the kitchen sink. This is part of the RM Watson works.

Please contact the undersigned if necessary on 9402 0140, 0408 911 210, or questions to ferrari@buildingdiagnosis.com.au.

Yours sincerely,
BUILDING DIAGNOSIS CENTRE PTY LIMITED

Robert Speirs-Ferrari FAIB MMFA MBDA
Director of Projects
 Fellow Chartered and Accredited Consulting Design & Building Engineering Practitioner

M. Design (UTS), Post-Grad.Dip Design (UTS)
Post-Grad.Cert Design & Tech (UTS)
Architectural Heritage Cert., (UTS)
Building Construction Cert., (UTS)
Chartered Building Professional FAIB No. 9241-97
Accredited Building Consultant MBDA No. 30796-76
Building Designer MBDA No. 462-67
Licensed Builder No. 396/23/1975 & 1987
Licensed Asbestos Inspector 206471AS2
13 November 2009
Our Ref WC:SGUJ091113v1

Waverley Council
Crn of Bondi Road and Paul Street
BONDI JUNCTION NSW 2022

Attention Steve Gillett
Business Services and Property Div

Dear Sir

"MOTHBALL" THE BOOT FACTORY BUILDING CIRCA1892

27-29 Spring Street Bondi Junction

This confirms our discussions including with Greg Wemer in council chambers meeting room on 11 November 2009, to consider further options and subsequent requirements and cost involved if the boot factory building were vacated "mothballed" for a probable period of 9 months to possibly 5 years and alternatively for occupancy until 2011.

History

Our initial inspection report dated 22 November 2007 recommended that structural steel beams are installed to connect the timber floor systems to the front and rear masonry walls, to provide support to the floors and stability to the walls. We have issued further reports of comprehensive nature including that of 8 May 2009.

Although some 'make safe' works have been carried out for short term to temporarily stabilise the rotting and loose windows (the short term period has elapsed), our comprehensive recommendations to provide long-term safety and stability (10 years and with certain conditions) provided in our 8 May 2009 report, have not been carried out. Therefore, it is our considered opinion the structural building stabilisation works are excessively overdue.

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Emergencies Ph 0403 011 210

POSTAL PO BOX 1187 MANLY NSW 1815
Ph 0808 15 68
Skype 8007 15 68
91 Allambie Road Allambie Heights
info@buildingdiagnosis.com.au
www.buildingdiagnosis.com.au
Furthermore, the design and construction of the 117-year old boot factory building is non-compliant in its original design and construction and current condition, to satisfy safe building criteria against the Building Code of Australia, and the applicable Australian Standards. Therefore, it is our considered opinion the building is considered unsafe in its present state for the occupants and the public in the surrounding external areas of the building.

**Mothball the boot factory building**

The question is asked to consider further options and subsequent requirements and cost involved if the boot factory building were vacated "mothballed" for a probable period of 9 months to possibly 5 years.

It is our considered opinion, to lock up the building 'mothball' would require the same 'make safe' work whether it be for 9 months or 5 years.

We have discussed further options and subsequent requirements and costs with our engineers and with BuildSense Solutions who have provided information and costing to us previously for the three-storey boot factory building.

We have provided three options. Option 1 is considered to meet the maximum five-year period. Option 2 is our earlier recommendation repeated hereunder hence would far exceed five years. However, the original works cost of $103,930 has increased to $135,000. Option 3 for a maximum occupancy period until 2011.

Refer to the following three options:

**Option 1: $91,930 (subject to final structural design engineer’ drawings)**

A. Install 7 steel bracing rods at 1.5 m spacing within the cavity of the deep timber floor joists to first and second floor levels, and at roof level connecting the front and rear walls via external steel plates.

B. Prior to installing the above steel bracing rods, remove one brick to the front and rear walls of each proposed rod location, and grout fill the cavity wall (at this corbel brick location) to stop this portion of the wall from failing under loads.

C. Install seasoned hardwood wall plates beneath the floor system and the roof ceiling joists to front and rear walls, and secure to the ends of the timber floor joists with steel brackets.

D. Project contract administration, supervision and structural engineers’ design, and certification.

E. As the external solid masonry brick walls are not waterproofed, periodic building inspections will be required for the 1st, 3rd and 5th years. This fee is not included in the above costs.

**Option 2: $135,000**

A. Steel beams and bracing previously recommended in our 8 May 2009 report item 3 a) including structural design and certification.
B. Project contract administration and supervision to the above as previously recommended in our 8 May 2009 report item 3 b).

C. Steel rod bracing at two upper floors and ceiling level, project contract administration, supervision and structural design and certification as previously recommended in our 8 May 2009 report item 3 c).

D. As the external solid masonry brick walls are not waterproofed, periodic building inspections will be required for the 1st, 3rd and 5th years. This fee is not included in the above costs.

Option 3: $183,530

A. The services mentioned in option 1 from A to D ($91,930).

B. Two post-construction survey inspections of the works would be required six months and 12 months after completion ($1,600)

C. The unsafe windows require scaffolding and cherry picker for new timber window sashes, window sash stays, and replace glazing as necessary ($90,000).

Additional 'make safe' requirement

A. As part of mothballing the building, installing waterproof timber ply sheets to all windows including scaffolding. $24,000.

B. Option 2 if carried out would render the building safe for up to 10 years however for this length of time other works would need to be carried out 1 to a value of $523,321 (includes $201,212 for new aluminium windows).

C. Moreover, if the more long-term option 2 is chosen, would allow the building to be occupied for up to 10 years. However, additional work would be necessary if this 10 year system was chosen. The work would include the unsafe windows would not be boarded up but scaffolding and cherry picker is necessary for new window sashes, window sash stays, and replace glazing as necessary to a cost of $90,000. However, unlike the new aluminium windows as mentioned in 'B' above, further ongoing costs would be necessary to maintain and repair the timber windows.

Conclusion

1. To carry out options 1, 2 or 3 would require the occupants to vacate for the duration period of the required work. Including the required work mentioned in item 'C' heading 'Additional make safe requirements'. If it is to be mothballed then only the waterproof timber ply sheets to all windows is necessary.

---

1 Periodic inspections and as mentioned in our 8 May 2009 report page 2 item B 1 and 2 for $523,321 (includes $201,212 for new aluminium windows). Note the BuildSense Tender dated 16 April 2009 number 9263cost mentioned here may have escalated since May 2009.
2. If option 2 long-term steel beams were installed, together with item 'C' under heading 'Additional make safe requirements' (estimate of $225,000), the building could be reoccupied. Although ongoing maintenance as mentioned for option 2 'D' above is still required to the timber windows and periodic inspections surveys of the building structure by building experts.

3. However, the above-mentioned estimate in item 2 for $225,000 does not take into consideration the necessary repairs and waterproofing to the other areas to the exterior including the fire sprinkler system. The cost estimate of these works (excluding the aluminium windows) is $322,111 being a total cost estimate for the external building walls of $547,111 for a 10 year period (due to the propose internal supports of steel construction).

4. If the 10 year period to stabilise and repair the building was chosen, then additional work is necessary being the new aluminium windows at a current cost of $201,212, and the interior upgrade as mentioned on page 2 and 3 of the 8 May 2009 report (items 'C' and 'D' estimate at $218,000). This is a total of $419,212.

The reason for these additional works is due to the windows will continue to deteriorate, are not energy efficient, and the interior will be damaged during the course of the structural stabilisation. In any event, if a 10 year option was chosen the interior renovation would be necessary due to the current wear and tear condition and the expected damage during the course of the works.

5. If the 10 year period steel beam stabilisation system is chosen, including the external waterproofing and fire sprinkler works, the estimate cost is $547,111 as mentioned in item 3' above. The total major costs for a 10 year plan to bring the building to an acceptable occupancy level, is in the order of $966,323 excluding say $100,000 for air-conditioning.

6. It is our considered opinion: spending $1 million would be considered uneconomical when the building would not comply with the Building Code of Australia and the applicable Australian Standards. Especially as a low-level finish new building is estimated at $552,860 as mention in page 3 Item F) 1 a) of our 8 May 2009 report.

7. In conclusion, the boot factory building is currently unfit and unsafe for occupancy. The building should have been vacated soon after us issuing the first report some 24 months ago. The 'make safe' work mentioned in this report cannot be carried out to the building whilst being occupied. The sensible option 2 for the preferred 10 year long-term stabilisation 'make safe' works mentioned in the conclusion items 2 and 3 above total cost is $547,111.

8. However for the short term 2011 option 3, although expensive at $183,530 is considerably less expensive than option 2.

9. It is our considered opinion, as the building would still not comply with BCA etc, and the cost estimate for a low finish level building is $552,960, we consider option 2 mentioned in 7 above ($547,111) to be uneconomical to repair and maintain the boot factory building. As well as this expense, there are internal renovation expenses and for essential services that will put the
total cost at $1,000,000. In our previous reports, the history of this building shows that it requires reassessments and major works every 10 years.

Recommendation

1. A speedy approach is necessary to make a decision to vacate the defective unsafe dilapidated boot factory building and immediately commence the 'make safe' work system to 'mothball' the building in a manner as mentioned in the report for $115,930 (option 1 and item A heading 'Additional 'make safe' requirement').

2. Alternatively, for the building to maintain safe until 2011, option 3 for $183,530 is necessary.

3. If the boot factory building is to maintain a safe condition for the 10 year long-term, then rectifying the structural deficiencies and addressing the serious deterioration of the structure is necessary for a cost of $1,000,000.

4. However, serious consideration to be given to demolish the boot factory building as it is uneconomical to repair, provided there are no other reasons from this occurring, as the cost estimate for a low finish level building is $552,980.

Yours faithfully

BUILDING DIAGNOSIS CENTRE PTY LIMITED

[Signature]
Robert Speirs-Ferrari FAIB MMBA MBDA
PRINCIPAL CONSULTANT/DIRECTOR
M. Design (UTS), Post-Grad Dip Design (UTS)
Post-Grad Cert Design & Tech (UTS)
Architectural Heritage Cert., (UTS)
Chartered Building Professional FAIB No. 9021-97
Accredited Building Consultant MMBA No. 39720-76
Building Designer MBDA No. 452-97
Licensed Builder No. 38673-1975 & 1987, Licensed Asbestos Inspector 209476AS2
The Boot Factory
27-33 Spring Street
Bondi Junction

Inspection and Review of
Proposed Rectification Measures

for Waverley Council

19th August 2009

091530
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1.0 INTRODUCTION

At the request of Waverley Council, Taylor Thomson Whitting was commissioned to undertake a review of reports and rectification measures proposed by Building Diagnosis Centre and their structural consultants, Craig and Rhodes.

The extent of the review undertaken was to inspect and comment upon the general condition of the building, to review reports produced by the Building Diagnosis Centre and to review the rectification measures designed and documented by Craig and Rhodes.

All descriptions, references to conditions and other details are a general guidance only and are given as our opinion but any interested parties should not rely on them as statements or representations of fact and must satisfy themselves as to the correctness, quantity, costs, etc of each of them.

The particulars set out in this report are for the exclusive use of Waverley Council and are copyright and the property of Taylor Thomson Whitting (NSW). No responsibility or liability is accepted as a result of the use of this report by any other party, and is not to be used for any other purpose.

2.0 SCOPE OF REVIEW

In order to form our opinion on the reports and rectification measures, the following level of review was undertaken:

- Building inspection, both visual and photographic of accessible areas.
- Existing structural documentation for the existing building was unavailable.
- Existing reports dated 22nd November 2007, 13th November 2008 and 22nd February 2009 by Building Diagnosis Centre were reviewed.
- Facades were inspected from ground level.
- Design analysis or calculations were carried out on the proposed rectification measures.
- Survey levels on floors were not taken.
- Surveys of wall verticality were not undertaken.
- String line measurements were not taken.
- Measurements of structural items were not undertaken.
- Materials testing was not carried out.

The level of review undertaken is limited to what is recorded in the following pages of this report.

Only visual assessment of accessible areas of the extent of defects was undertaken from floor level and this report does not cover detailed measurement of defects. The ceiling space was not inspected.

This report does not cover issues such as drainage, services, plant, cladding, waterproof membranes, asbestos, fitouts or architectural items.
Cladding, sealants or waterproof membranes were not inspected and thus water tightness in this respect was not assessed and our comments are general in nature and are limited to observed water leaks only.

3.0 DESCRIPTION OF BUILDING STRUCTURE

The Boot Factory was constructed in the late 19th century. It has load-bearing external brick walls and a timber framed floor and roof structure internally. More recently, a reinforced concrete fire stair has been constructed in the north-western corner of the building.

The timber floor joists have been built into the external masonry walls which appear to have been constructed without cavities.

4.0 BUILDING INSPECTION

Mr Steffen Schuetze from the Sydney office of Taylor Thomson Whitting carried out the site inspection of the building on 3rd August 2009.

The inspection was undertaken externally from ground level and internally from floor level. The roof and the ceiling space were not inspected.

At the time of the inspection, temporary propping supporting the floor joists was in place throughout the building. The structural adequacy of the temporary propping system has not been reviewed.

During the inspection it was noted that:

- a significant proportion of the timber joists embedded in the external walls exhibited signs of decay
- the northern façade displayed visually significant bowing
- signs of water ingress were evident
- a split timber bearer had been recently repaired

5.0 REVIEW OF REPORTS BY BUILDING DIAGNOSIS CENTRE

The Building Diagnosis Centre reports reviewed expressed serious concern about the condition of the timber joists where they are embedded within the external walls. We agree that there are a significant number of joists that are displaying signs of decay due to long-term moisture effects.

The reports stated that the external walls are reliant on the building's timber floor structures for lateral restraint and that the degraded condition of the embedded joists and their steel connectors has led to uncertainty about the degree of restraint currently provided. We agree that the degree of restraint currently provided by the timber floor structures is uncertain. The visible bowing of the northern external wall is considered to be a possible symptom of a lack of sufficient lateral restraint.

The reports recommend that remedial works be undertaken in the form of bolt-fixing steel channels below the joists. We agree in principle that this course of action is
prudent in order to maintain the integrity of the floor structure and the stability of the external walls.

The extent of the joists’ decay is unknown due to the concealed ends. The remedial measures may not be required in all locations indicated by the Building Diagnosis Centre.

If not already undertaken, a thorough independent pest and rot inspection by State Forests inspectors may help reduce the extent of remediation required. Based on similar previous projects, we expect such an inspection to cost approximately $5000. This cost could be offset if areas of flooring are found to be sound.

The report review was undertaken in a general sense only and does not imply any formal endorsement of the reports’ content. Full legal responsibility for the content of the reports continues to reside with the authors, Building Diagnostic Centre.

6.0 REVIEW OF STRUCTURAL DRAWINGS BY CRAIG AND RHODES

TTW have reviewed the drawings S01 to S04 detailing the remedial floor support issued on 18th February 2009.

The drawings show galvanised steel channels bolt-fixed under the existing joists at the internal and to the northern and southern external walls. We agree in principle that this form of remediation will provide vertical support to the joists whilst restoring the lateral support required by the northern and southern external masonry walls where it has been compromised by decay.

A number of comments and queries on the detailing of the structural elements were forwarded to Craig and Rhodes and to Building Diagnostic Centre.

It was noted that the drawings do not show any structural remediation to the roof structure and TTW have been advised that the structural adequacy of the roof structure will be assessed following further site investigations. If strengthening of the roof structure’s connection to the walls is warranted, consideration should be given to using the standard deemed-to-satisfy details contained in Appendix C of AS3826 Strengthening Existing Buildings for Earthquake.

The drawings also do not show any strengthening of the connection between the floors and the eastern and western external walls, where the joists are parallel with the walls. Again, consideration should be given to using the standard deemed-to-satisfy details contained in Appendix C of AS3826.

We believe that the extent of remediation could possibly be reduced if some areas of timber joists are found to be sound by independent expert inspection by State Forests (refer above).

It was noted that the documentation calls for every joist to be sawcut at the face of the external walls to prevent future moisture ingress and degradation of the joists. This removes any redundancy from the floor support structure and the wall bracing. It may be preferable to leave intact any joists that are found to be unaffected by rot. If joists are sound but strengthening for earthquake loading is considered to be required, consideration should be given to using the standard deemed-to-satisfy details contained in Appendix C of AS3826.
Craig and Rhodes advised that the structural remediation was designed for a typical office live loading of 3kPa. We believe that it may be preferable to design the works for a live loading of 5kPa to allow for possible future changes in building usage.

The drawing review was undertaken in a general sense only and does not imply any formal checking or confirmation of the design’s structural adequacy. Full design responsibility continues to reside with the structural engineers, Craig and Rhodes.

7.0 CONCLUSIONS

Taylor Thomson Whitting has inspected the building at 27-33 Spring Street, Bondi Junction, known as The Boot Factory. We have also reviewed three reports by Building Diagnostic Centre and structural documentation by Craig and Rhodes detailing proposed remediation measures.

The following additional investigation or review is considered appropriate:

- thorough independent expert pest and rot inspection of all embedded timber floor joists, floor bearers and of the timber roof structure
- where joists are sound yet strengthening required, the adoption of standard AS 3626 deemed-to-satisfy details may be preferable/cheaper than the structural steel solution
- the connection of the eastern and western walls to the floor structures should be assessed for adequacy
- inspection and assessment of roof structure should be undertaken to determine if additional structural remediation is required
- structural remediation should be designed for 5kPa live loading to allow for possible future building usage.

If the degraded timber joists and the masonry walling are provided with an alternative means of support via structural remediation, based on the level of this review there is no evidence to suggest that the building will not continue to be suitable for its intended use.

We have not carried out a full design check of the existing structure as full documentation was not available.

Prepared by:
TAYLOR THOMSON WHITTING (NSW) PTY LTD

Authorised by:
TAYLOR THOMSON WHITTING (NSW) PTY LTD

STEFFEN SCHUETZE
Associate Director

DAVID CAROLAN
Director

P:\2009\0919\1091520\Reports\TTW090819 The Boot Factory Structural Inspection Report.ss.doc
GENERAL

1. These drawings shall be read in conjunction with all other drawings, specifications and other instructions issued for the works. Any discrepancies shall be referred to the architect immediately for resolution.
2. Dimensions shall not be obtained by scaling.
3. Dimensions for setting-out and all existing works shall be verified by the builder.
4. The builder shall at all times observe recognised good building practice, conforming to all relevant Codes. He shall maintain the works in a safe and stable condition at all times.
5. Tress laid out and/or fixing points for roof leads to be approved by engineer before construction.

STRUCTURAL STEELWORK

1. All workmanship and materials shall be in accordance with AS4000 and AS1554 except where varied by the contract documents.
2. Unless otherwise noted, all steel shall be:
   - Grade 25A hot rolled plates, angles 100x100 EA or 125x125 UA and shall:
   - Grade 369 for abs, ucl's, pcf's and larger angles.
   - Grade 369 for wb's and wc's.
   - Grade 355 for rhs, shs and rhs.
   - Unless otherwise noted, all welds shall be full penetration welds from 1A6XX electrodes. All welds shall be category 07, all bolts M16 commercial grade and all cleats and gussets 4mm plate.
   - For bolts other than as noted above, the following notation is used: Bolts designated by the number, diameter, grade and tightening procedure. e.g. A4.4 M16 0.5 denotes 4 bolts M16 0.5
diameter grade bolts, snug tight.
   - M10 8/8 TF denotes 6 no. M6x20 high strength structural bolts fully tensioned in a single joint.
   - M12 8/8 TF denotes 6 no. M12x25 high strength structural bolts fully tensioned in a bearing joint (see slip elbow).
   - Commercial grade bolts shall conform to AS1111 and AS4100. High strength structural bolts shall conform to AS3552 and AS4100. Welds shall conform to AS1554 and welding electrodes to AS1553.
   - Structural steelwork shall have the following surface treatment in accordance with AS1210 and the specification:
     - All embedded structural steelwork shall be hot-dip galvanised or equivalent.
     - All exposed structural steelwork shall be galvanised or equivalent.
     - All welds shall be tensioned and made good with a zinc-rich paint.

TIMBER

1. All timber design, materials and construction to be to AS1720.1 and AS1720.2.
2. Softwood to be minimum stress grade F7 u.e.
3. Hardwood to be minimum stress grade F14 u.e.
4. External timber to be either hardwood, natural minimum durability, Class 2 or AS1720.3 or preservative treated pine of equivalent durability.
5. All timber is to be identified by branding or certification by an approved authority, branding to include:
   - Stress grade
   - Method of grading
   - "restrained" or "s".
   - The certification mark of the product certification program
7. All dimensions apply to finished sizes.
8. Tolerances on finished timber are as stated in AS2082, AS1148, AS3569 as appropriate.
9. All joints and natches are to be minimum 25mm away from loose knots, severe splitting grain, gum veins and other significant defects.
10. All bolts shall be M16, grade 8.8 bolts with hexagonal heads u.e. Bolt holes to be drilled to exact bolt size. Washers under bolt heads and nuts to be minimum 2.5 times bolt diameter. All bolts and nuts are to be hot dip galvanised.

BLOCKWORK

1. Brickwork shall comply with all relevant Australian Codes, and shall be articulated accordingly unless noted otherwise.
2. A vertical joint shall be provided immediately above any discontinuity in support (e.g. where a new footing bolts against a pre-existing footing).

COMMENTS

1. These plans and designs are the property of Craig & Rhodes. They must not be used, reproduced or altered wholly or in part by others without written consent.

CERTIFICATE & CERTIFICATION

1. The person signing hard copies of these drawings certifies that these drawings comply with the requirements of the relevant Authorities, SAA Codes, Australian Standards and the Building Code of Australia.
FIRST FLOOR FRAMING PLAN
SCALE 1:100

- Denotes direction of existing 250x50 timber floor joists. Contact engineer if otherwise.

SECOND FLOOR FRAMING PLAN
SCALE 1:100

- Denotes direction of existing floor joists. Contact engineer if otherwise.

For Tender Only
Not to be used for construction
JOIST SUPPORT DETAIL - EXTERNAL WALL

NOTE 1:
The builder must measure exact spacing of joists prior to fabricating 400x500x8mm plates to ensure accurate positioning of plates beside existing timber floor joists.

ELEVATION A - EXTERNAL WALL

NOTE:
Max spacing of Hilti 'Mas-Her' rod with Hilti 'Hyg' injection mortar (min. 125 embedment into brickwork).

END PLATE DETAIL - EXTERNAL WALL

FOR TENDER ONLY

NOT TO BE USED FOR CONSTRUCTION
08 May 2009
Our Ref WC:SG/L/090508

Waverley Council
Cnr of Bondi Road and Paul Street
BONDI JUNCTION NSW 2022
Ph 9369 8000.
Attention Steve Gillett
Business Services and Property Div

Dear Sir

INITIAL FEASIBILITY STUDY: BOOT FACTORY CIRCA 1892
Local Heritage Building 27-29 Spring Street Bondi Junction

This confirms the writer’s meeting last Monday 4 May 2009 at the Council Chambers building with yourself and Greg Worner, discussing the repairs, maintenance and rectification works mentioned in our Building Survey & Specification 1 and the tender cost supplied by BuildSense Solutions 2.

The necessary works to the Boot Factory structure were analysed together with the associated costs, including ongoing costs to maintain the structure possibly to a substantial amount of work in 10-years and thereafter, due to the ongoing corrosion and deterioration of this 117-year building.

---

1 Dated 20 March 2009 Project No. WC/S/090320 v1 and aimed at providing an extended life serviceability of the Boot Factory to 30 years

2 Tender dated 16 April 2009 tender number 9263

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Whether the building could be occupied during the course of the works, and if other necessary upgrading to the interior of the building is feasible and satisfy occupation.

A) Current occupancy

1. The ground floor could remain occupied, even if Council decided to continue with the works that would include the installation of the steel beams to support the junction of the timber floor joists to the interior front and rear walls. Although there would be inconvenienced to the occupants during the course of the works.

2. The first and second floors would need to be vacated due to further ‘make safe’ temporary works.

3. The ‘make safe’ works is the installation of approximately four (4) steel rods per floor level, that would extend front to back in tension on top of the timber flooring, bolting completely through the front and rear walls with steel plates to either side.

4. This is a safety requirements to tie the floor joists and building together, whilst a decision was being made to continue with the full works especially the installation of the steel beams as mentioned in item 1 above.

B) Summary costs for repairs, maintenance and rectification works

1. BuildSense Solutions cost for the extensive works that includes the installation of new aluminium windows $458,981.

2. Project contract administration and supervision as per BDC advise $64,340 ³.

3. The following costs:

   a) BuildSense Solutions cost in their tender 5 March 2009 for the above-mentioned installation of steel beams $72,930, and structural design engineer’s costs and certification $5,000;

   b) In addition to a) above, project contract administration and supervision $5,000;

   c) Installation of the steel rods at both upper floor levels include project supervision $18,000, and and structural design engineer’s costs and certification $3,000.

   Totals of 3 a) - c) costs $103,930.

Total costs for above three items: $627,251.

C) Upgrading of interior

1. Soundproofing between both timber floors $60,000.

2. Fire services $25,000.

³ Consulting service advice dated 20 April, 2009
3. Refurbished kitchens $15,000.
4. New carpets throughout three levels $26,000.
5. Painting interior $15,000.
6. Refurbished toilets $15,000.
7. Project contract administration and supervision $15,000.

Total costs for above seven items: $171,000. (Air conditioning option $100,000)

D) Design documentation and approvals

1. Architectural DA and CC drawings $20,000.
2. Structural engineering drawings $20,000.
3. Council DA and CC fees $7,000.

Total costs for the above three items: $47,000.

E) GRAND TOTALS AND ESTIMATES

Item B) $827,251

Item C) $171,000 plus an optional $100,000 for AC

Item D) $47,000

Total $845,251 plus an optional $100,000 for AC.

F) NEW BUILDING COST

Due to the above-mentioned costs for repairs, maintenance, replacement and upgrading, we obtained an estimated construction costs per square metre rate for the Sydney area for a building of 1 to 4 levels 4.

1. As a new construction guide, a three level commercial open plan office building including air-conditioning and a lift for a replacement building of the same size 144 m² per floor (432 m² total) as the Boot Factory, falls in the following price range:

   a) Low level of finish per m² $1,280 is a replacement estimate cost of $552,960

   b) Medium level of finish per m² $1,510 is a replacement estimate cost of $662,320

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4 From BMT & ASSOC Pty Ltd Quantity Surveyors and Property Depreciation Consultants, Level 20, Tower 2, Darling Park 201 Sussex Street Sydney NSW 2000, PO Box N314 Grosvenor Place NSW 1220, phone 02 9241 6477.
c) High level of finish per m² $2,224 is a replacement estimate cost of $960,768

2. The above cost estimates does not include plans and approvals, demolition of the existing building or removal of rubble, any work associated with areas external to the footprint of the building, and is for a reasonably flat site with easy access.

3. The cost for demolition and rubble removal, and Council approved plans is estimated $100,000.

CONCLUSIONS

The Building Diagnosis Centre has carried out inspections and investigations on the condition and components of the Boot Factory structure since 2007. We have produced a number of reports and specifications, and have studied the past history of conditions and works when perusing the council’s file. We offer the following opinion:

1. If the Boot Factory building is going to remain, the grand total costs and estimates in item E) with air conditioning is $945,251.

2. The high-level finish for a new building of the same size and floor levels as the existing Boot Factory is $960,768.

3. It is clear from both above figures that it would be uneconomical to repair, maintain, replacements and upgrading the existing Boot Factory building.

4. Compared to the construction cost estimate for a new modern and complying building, it would be feasible to demolish the current Boot Factory building.

5. Moreover, demolition would be considered especially as the current Boot Factory building with all of the above mentioned works carried out, would:
   a) still not comply with the DDA and BCA;
   b) has poor access and without a lift;
   c) requiring ongoing high annual maintenance and inspections; and
   d) the possibility of carrying out all again most of the above mentioned works in 10 years and thereafter - due to the ongoing corrosion and deterioration of this 117 year building.

RECOMMENDATIONS

Ignoring for the moment that the fact that the Boot Factory building has a local heritage listing, it is our opinion it is not economically sound to continue with work to retain the building, as the work and future works will not produce the same level of new condition and level of high finish, as a new building with high-level finish and complying with DDA and BCA requirements.

Additionally, a new building is likely to be trouble-free for 30 years without requiring significant maintenance and repairs. If the highest level of finish and construction is decided, then a new building should be reasonably trouble-free for 30 years and more likely for 50 years without serious maintenance.
1. It is our opinion should the Boot Factory building remain for any period, recommend for structural safety reasons according to our consulting design engineers, the following work and costs is necessary immediately:
   a) Structural 'make safe' work and costs mentioned in paragraph B) 3 c), page 2 - costs $21,000.

2. If the Boot Factory building is not demolished in three months, recommend the following work and cost is necessary in three months time:
   a) The next level of structural 'make safe' work and costs mentioned in paragraph B) 3 a) – b), page 2 - costs $62,930.

3. If items 1 and 2 above of the recommendations are not carried out, recommend the immediate following, and further work is necessary:
   a) The occupants of the building should vacate immediately.
   b) The temporary props currently installed to the bottom at the ends of the deep timber floor joists against the walls should remain until the Boot Factory building is demolished.
   c) The Boot Factory building to have a detailed inspection each month, observing any tell-tale signs of movement from its existing position that would require existing positions and components to be documented so as to have a basis to allow for future monthly inspection reports.

4. Item 3 c) above is a critical recommended action and negligence would not be considered an excuse not to perform the work. If inspections were not carried out and satisfactory, demolition of the Boot Factory building would need serious consideration.

For clarification of the above facts and opinions, please contact Robert Speirs-Ferrari on 9907 1688 or 0408 911 210

Yours faithfully
BUILDING DIAGNOSIS CENTRE PTY LIMITED

Robert Speirs-Ferrari
Director FAIB WMBA MBDA
Project Manager & Forensic Diagnostician
Thursday, November 13, 2008
Our Ref WC:SG/L/081113

Waverley Council
Cnr of Bondi Road and Paul Street
BONDI JUNCTION NSW 2022
Ph 9369 8000
Attention Steve Gillett
Business Services and Property Div

Dear Sir

STRUCTURAL WET-ROT TIMBER DAMAGED FLOOR JOISTS / WINDOWS
Boot Factory – Heritage Listed Building

This confirms our phone discussions yesterday with respect to the above-mentioned described matter, and your e-mail list of questions in response to our initial assessment report dated 22 November 2007. Please note we issued a concept design and construct costs in a letter dated 4 December 2007.

We understand you require our response to your below questions as a matter of urgency.

QUESTIONS

1 - Is the building currently stable and safe to be occupied?

   a) It is our opinion; the building is not currently stable and safe to be occupied.
2 - Is the work to reinstate the required bracing sufficient to render the building safe to occupy until further works can be undertaken? (Point 7 in Conclusions of your report)

a) The remedial work for installation of steel beams as mentioned under our recommendations (page 4) will provide proper bracing to render the building safe. This work is not a temporary solution but a permanent solution to reinstate the building stability in a better position than originally.

b) Included in the recommendations is further exploratory work to determine the condition of other timber joists that are embedded into the wall at the front end of the building. It is highly likely that these will require similar steel beams’ connections for strength and stability to adequately providing a safe environment.

3 - What are the time frames for the works to be conducted and am I correct in assuming the building will not be able to be occupied while this work is being done?

a) Immediately. Our 22 November 2007 report item 7 page 3 mention the work is urgent and under recommendations it was to be carried out immediately.

b) We are still of the same view and are quiet alarmed that some form of remedial work or bracing has not been already implemented.

c) With respect to occupancy, the required work cannot be satisfactory or safely carried out whilst it being occupied. Therefore, the building needs to be vacated.

4 - In terms of life span of the building and its ongoing occupancy, what other things should be investigated as possible upcoming problems?

a) Our initial report dated 22 November 2007 mentioned that the timber window frames have dangerous deterioration that could result in the windows falling into the street below. For safety and long-term durability including to meet current energy efficient building design, we recommend installing aluminium window frames with E-glass.

b) The installation of steel beam sections secured to the masonry brick walls and the ends of sound deep timber floor and roof joists beams as mentioned above. We recommend that instead of timber beams embedded in the masonry brick walls, galvanised steel brackets be secured into the masonry brickwork to eliminate all timber extending into masonry brickwork.

c) The application of a suitable long-term waterproofing to the upper solid 230 mm masonry brick walls and the 350mm ground level external walls.

CONCLUSION

The work mentioned above that was also mentioned in our initial report of 22 November 2007 requires immediate attention. For this to occur the building needs to be vacated. Stage 1 is to continue with the further investigations to the structure and staged 2 is the commencement of designing for the remedial works. Our previous
correspondence of 4 December 2007 of the concept structural design and budgetary costs would then be updated. With respect to the budgetary costs for the remedial works, we would provide a specification and acquire actual costs from a couple of reliable contractors.

We are available to discuss the strategies and operations with you immediately.

We await your response.

Yours faithfully
BUILDING DIAGNOSIS CENTRE PTY LIMITED

Robert Speirs-Ferrari
Director FAIB MIIBA MBDA

Project Manager & Forensic Diagnostician
M Design (UTS), Grad Dip (UTS) BDA
Accredited MBA Building Consultant
Fellow Australian Institute of Building
Consulting Chartered Building Professional
Licensed Builder, Licensed Asbestos Inspector
Tuesday, 4 December 2007

Our Ref PW/WC/LU071122/RSF

Waverley Council
Crn of Bondi Road and Paul Street
BONDI JUNCTION NSW 2022
Ph 9369 8000

Attention Paul Watson
Property maintenance officer
Business Services and Property Div
W 9369 8241, M 0420 968 295, F 9387 1820
paulw@waverley.nsw.gov.au

Dear Sir

Budgetary estimates to the recommendations in 22.12.2007 Report
The Boot Factory – Heritage Listed Building

In response to your email instructions today, please find below our budgetary estimates for each item as requested.

The Recommendations

Recommend the following remedial work to be carried out immediately:

1. Installed a heavy-duty coated galvanized structural steel channel beam providing support to both levels of deep timber floor joists systems and roof joists system. Budgetary estimate $20,000

2. Fabrication of beams shall include end steel brackets for fixing on to side walls and vertical steel brackets placed to suit the spacings of the deep timber floor joists and roof joists for bolting. The steel brackets to be fabricated to extend away from the rear wall to provide improved connections into sound masonry and timber joists beams. Fabricate gussets to the channel as necessary. Budgetary estimate $10,000

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Professional Indemnity/Public Liability insurance is limited under Professional Standards Legislation Act 1994 (NSW)
3. Beams to be secured onto the rear masonry wall with Ramset Chemset™
Injection systems using 316 stainless steel threaded anchors. A vapour
barrier sheet shall separate the beam from the masonry. Budgetary
estimate $3,000

4. Dissect the deep timber floor and roof joists beams from the wall to avoid
further water ingress creating wet rot contamination. Replace any that are
unsuitable. Budgetary estimate $10,000

5. Determine if the existing steel brackets are necessary to be re-secured in
to the sound deep timber joists beams. Budgetary estimate $2,000

6. Investigate the conditions and connections at the opposite ends of all deep
timber floor joists and roof joists. Provide similar supports and connections
mentioned above and or alternative solutions as necessary. Budgetary
estimate TBA note: $45,000 if identical work as above is required

7. A structural detailed design and specification is required for the above in
accordance with sound engineering and construction practices. Budgetary
estimate $15,000. Project certification inspections allow budgetary estimate
$5,000

8. Further investigations with the aid of a cherry picker is required to
determine the overall condition of the timber window frames and/or what
timber window frames need to be replaced, glazing stability, and for the
purpose to discuss an acceptable procedure and application for
waterproofing the solid masonry. Scope of work not defined at this stage,
Range $15,000 to $50,000

To discuss any item, please contact Robert Speirs Ferrari on 9907 1688, 0408 911
210, Fax 9939 5889 or email your response to ferrari@buildingdiagnosis.com.au.

[Signature]

Robert Speirs Ferrari FAIB MMBA MBDA
Consulting Chartered Building Professional
Director Project Coordinator

BUILDING DIAGNOSIS CENTRE PTY LIMITED
Professional Consulting Group
ASSESSORS AND PROJECT MANAGERS
Thursday, 22 November 2007
Our Ref PW:WC/J/071122/RSF

Waverley Council
Crn of Bondi Road and Paul Street
BONDJUNCTON NSW 2022
Ph 9369 8000
Attention Paul Watson
Property maintenance officer
Business Services and Property Div
W 9369 8241, M 0420 968 295, F 9387 1820
paulw@waverley.nsw.gov.au

Dear Sir

Assessment Report for Corrosion: rainwater penetration wet-rot
The Boot Factory – Heritage Listed Building

In response to your instructions of 2 August 2007 to inspect and make an initial assessment of the subject building. This confirms that Robert Speirs-Ferrari accompanied by Paul Watson, carried out a walk-through inspection of the same date, during hot and dry weather conditions.

The purpose of the consignment is to establish the soundness of the waterproofing of the rear solid masonry wall; any effects it is having on the structure; to what level of dilapidation condition exists; whether or not it is safe to occupy; and whether there is any requirement for repairs and maintenance or more serious rectifications.

We Report As Follows
Our walk-through visual observations, inspection and forensic assessment, found the following disturbing poor dilapidation conditions to the suspended timber floor structure and to the wall tracing system. The building is a late 19-century heritage three-storey masonry construction, consisting of approximate 350 mm thick solid masonry ground floor walls and approximate 230 mm thick solid masonry walls to both upper levels. A photographic report of six pages is attached.
Rear Internal Wall Condition

1. The masonry mortar joints are not suffering corrosion fretting and there is no obvious movement cracking.

2. Water penetrates through the solid masonry, due to obvious evidence of paint blistering and water stained paintwork to the walls and the deep timber floor joists in contact or penetrating the wall.

3. Dampness also penetrates at floor level after being observed when moving an office desk out from the wall. This is saturating the carpet covering and causing rotting.

4. Dampness evidence also exists emanating from timber window frames, and in blank wall sections without openings.

5. Wet rot is occurring at the ends of the deep timber joists where they contact the wall face. In many locations, previous attempts to strengthen the timber floor joists have been carried out by the installation of timber cleats secured to the sides of the damaged floor joists.

6. Mild steel brackets extending into the solid rear masonry wall are bolted to the sides of some deep timber floor joists, and in places where the timber cleats have been installed. These steel brackets provide stability bracing support via the timber floor joists to the rear wall of the building.

7. The steel brackets have been repaired / replaced, but due to their concealment within the solid masonry wall, damage caused by corrosion is unknown to the imbedded ends within the wall. It is anticipated that corrosion damage would exist to the ends of the steel brackets.

Rear External Wall Condition

8. Assessments were carried out from the ground and through one window at the 1st floor level. Although not a water penetration problem, at least two window sashes close to this window are suffering from wet rot, and one is quiet dangerous that could displace off the wall. A window pane is also not secured and the hinges to a sash are loose.

9. The masonry mortar joints are not suffering corrosion fretting and there is no obvious movement cracking.

10. The masonry and mortar joints have been previously sealed with a waterproofing solution. The condition and hazard areas where water penetrates are as follows:

A) Waterproof coating to the masonry has deteriorated at random;

B) The masonry has the usual crevices and cracks as expected with heritage walls including in the mortar joints that would dramatically reduce the waterproofing ability;

C) All gaps against the timber window frames in contact with the masonry were not waterproof filled prior to the protective coatings, and;
D) Protective paint coating to the tops of the splayed corbel ledges in a number of locations has fretted due to faulty workmanship of the surface preparations and coating applications.

Conclusions

1. The forensic survey inspection to the rear three-storey solid external masonry wall show sufficient evidence, that the waterproofing to the external face of the heritage masonry, has failed - was not properly prepared to receive the clear waterproofing application. Gaps in mortar joints, the typical crevices / cracked bricks, opened joints against timber window frames contributed to water penetrating through the solid masonry structure (that is without a cavity).

2. Even though the masonry wall preparation was not satisfactory, the clear waterproofing application would not provide a satisfactory long-term waterproofing solution (10 years), due to the above-mentioned wall deficiencies.

3. The imbedded steel brackets have at some previous stage been repaired, replaced or altered. Due to them being concealed, we can only speculate they would be suffering with some level of rust corrosion. Normally brackets of the anticipated size would not cause sufficient expansion that would expand and lift the masonry apart as would occur with rust corroding steel lintels imbedded over windows and doors.

4. The deep timber floor joists are affected with wet rot. This is due to being in contact with the internal face of the rear wall and embedded into wall pockets most likely at the time of construction. The joists would have been subject to long-term water and moisture attack that is causing the wet rot. Again, due to them being embedded and concealed out of sight, we can only speculate that they would be suffering more serious wet rot within the wall pockets.

5. For stability, the 230 mm solid masonry wall to both upper levels, rely structurally on the deep timber floor joists as bracing stability. Solid connections at the ends of the deep timber floor joists with the steel brackets including their soundness and imbedded into the wall is equally important. The top of the ground floor 350 mm solid masonry wall is also reliant upon the deep timber floor joists for sound connection for the overall structural integrity.

6. The results of our initial investigations questions the stability of the rear heritage solid masonry wall due to deficiencies in the bracing provided by the deep floor joists and their questionable connections within the wall. The clear protective waterproof coating is not providing the required waterproofing. Some windows are in poor condition and are unstable.

7. It is our opinion urgent remedial work is required to properly reinstate the required bracing for occupancy safety and to the community, as well as bracing against earthquake tremors - the last Newcastle earthquake tremors caused damage and wall movement to similar age and condition buildings.
Recommendations

Recommend the following remedial work to be carried out immediately:

1. Installed a heavy-duty coated galvanised structural steel channel beam providing support to both levels of deep timber floor joists systems and roof joists system.

2. Fabrication of beams shall include end steel brackets for fixing on to side walls and vertical steel brackets placed to suit the spacings of the deep timber floor joists and roof joists for bolting. The steel brackets to be fabricated to extend away from the rear wall to provide improved connections into sound masonry and timber joists beams. Fabricate gussets to the channel as necessary.

3. Beams to be secured onto the rear masonry wall with Ramset Chemset™ Injection systems using 316 stainless steel threaded anchors. A vapour barrier sheet shall separate the beam from the masonry.

4. Dissect the deep timber floor and roof joists beams from the wall to avoid further water ingress creating wet rot contamination. Replace any that are unsuitable.

5. Determine if the existing steel brackets are necessary to be re-secured in to the sound deep timber joists beams.

6. Investigate the conditions and connections at the opposite ends of all deep timber floor joists and roof joists. Provide similar supports and connections mentioned above and or alternative solutions as necessary.

7. A structural detailed design and specification is required for the above in accordance with sound engineering and construction practices.

8. Further investigations with the aid of a cherry picker is required to determine the overall condition of the timber window frames and/or what timber window frames need to be replaced, glazing stability, and for the purpose to discuss an acceptable procedure and application for waterproofing the solid masonry.

To discuss any item, please contact Robert Speirs Ferrari on 9907 1688, 0408 911 210, Fax 9939 5889 or email your response to ferrari@buildingdiagnosis.com.au.

Robert Speirs-Ferrari FAIB MMBA MBDA
Consulting Chartered Building Professional
Director Project Coordinator

BUILDING DIAGNOSIS CENTRE PTY LIMITED
Professional Consulting Group
ASSleshootRS AND PROJECT MANAGERS

Photographic record follows:
Photograph 031 The Boot Factory

Photograph 032 The Boot Factory

END OF PHOTOGRAPHS