Project X:
Strip to shell and asbestos removal

A presentation to the

ACHASM ‘Client Lead CH&S Symposium’

21 August 2013
Vacated premises

(Handover to project)
Mothballed premises
(Safe for occupancy)
Background

- The Building was constructed 1954
- Due to be demolished, and subsequently earmarked to be mothballed
- Possible tenanting at a later date
- It was known that asbestos and asbestos containing materials formed part of the structure
- Certain areas of the building house critical support and core business functions
- Certain areas of the building had been locked out
- Later fit-out requires a blank canvas and asbestos free building
- The area under consideration is 6255m² floor area (x 2 for ceiling)
Overview

Project Brief: Strip to shell for mothballing

Project Mandate: Activities may not disrupt either core or back-up services and must be done in a manner which maintains Corporate Social Responsibility Commitments

Cautions: Asbestos

Multiple stakeholders and concurrent projects

Previous projects using water resulted in water egress and certain property damage

Various fines (R1m / hr for downtime to back-up generators)
Planning

1. Walkthrough and Briefing – Jul 2011
2. Submission of project charter
3. Motivation for additional professional consultants
4. Submission of fee quotation and professional services
5. Appointment of HSE Risk Consultancy Services (PROCSA)
6. HSE appointment of necessary consultants (PROCSA)
7. Development of tender for Approved Inspection Authority
8. Tender on National Basis for Approved Inspection Authority (5 x)
9. Selection of AIA
10. Fee negotiations, resulting in discounted fees
11. Appointment of AIA – Sep 2011
13. Tender on national basis for RAC (5 x)
14. Selection of RAC
15. Confirm Plan of Work and Fees
Contractual

PROCSA : Construction Project Manager

PROCSA : CHS Consultant

SACPCMP : Pr. CHSA
National Department of Environmental Affairs (NDEA):
The National Environmental Laws Amendment Act, 14 of 2009.
Gazette 19599 and dated 11 December 1998

National Department of Labour (DoL):
Compensation for Occupational Injuries and Diseases Act, 130 of 1993
Construction Regulations, GNR 1010 of 2003
Lead Regulations, GNR 236 of 2002
Noise-Induced Hearing Loss Regulations, GNR 307 of 2003
Electrical Installation Regulations, GNR 242 of 2009
Electrical Machinery Regulations, GNR 1593 of 1988
Pressure Equipment Regulations, GNR 734 of 2009
General Administrative Regulations, GNR 929 of 2003
General Safety Regulations, GNR 1031 of 1986
Environmental Regulations for Workplaces, GNR 2281 of 1987
Facilities Regulations, 924 of 2004

Chief Directorate DoL: Occupational Health and Safety
Guide to the Asbestos Regulations, OHC1 of 2003
Guide to demolition work in terms of the Asbestos Regulations, OHC6 of 2003
Criteria for Registration as Asbestos Contractor, OHC3 of 2003

Chief Inspectorate DoL: Occupational Health and Safety
Methods for the Determination of Hazardous Substances 3914 of the Health and Safety Executive of the United Kingdom, as revised from time to time (MDHS 39/4)

Association of Construction Health and Safety Management (Recommended guides)
Safety in Design: Standards of Competence
Recommended Guidelines for the Correct Carriage of Asbestos Waste
Recommended Guidelines for Construction Occupational Hazardous Substances assessments
Preliminary Guidance Note on Dust Suppression
Recommended Guidance on Risk Assessments, Notifications, Waivers and Plans of Work
The Contractors Guide to Asbestos Removal
Details

1. Raised access flooring = 45kg/m$^2$
2. Total estimated dry weight (ceiling and flooring) = 90kg /m$^2$
3. Asbestos can only be disposed of at Vissershok = R380 / kg ex transport
4. Several generations of asbestos containing vinyl floor tiles
5. Asbestos containing VFT = <5% asbestos well bound in matrix
6. Three types of asbestos found in flocking on ceilings
   • Used for noise dampening
7. Encapsulated asbestos flocking used at HVAC plant rooms
   • Used as fire break
8. Asbestos fibers are waterproof and carcinogenic (some resist acid)
9. Asbestos fibers split and break easily, quickly becoming ‘uncountable’
10. OEL for Asbestos = 0.2 f / ml = 200 f/l
11. OEL for Fiber Glass = 2 f/ml = 2000 f/l
12. No insurance for asbestos related illnesses or claims (of exposure)
13. 75% chance of substantial water egress
14. Floors cannot support more than 100mm bunded water
Risk Quantification

Risk Profiling

Defensibility
Key concepts

1. Assistance
2. Advice
3. Options
4. Corporate Social Responsibility
5. Defensibility
6. Non-transferable risk
7. Vicarious Liability
8. Agency
9. Monitoring Professional Services and Deliverables
10. Assessing Design Risk
11. Risk Management and Loss Control
12. Clearly defined priorities (1. quality 2. cost 3. time)
13. Project adaptability
14. Project invisibility
15. Team functionality
   1. Mediation (non-antagonistic, third alternative)
   2. Admit mistakes (problem solving, no blame gaming / carpet sweeping)
   3. Encourage discussion
Key controls

1. Work Breakdown Structures
2. Methods and Sequencing
3. Negative pressure environment
4. Glove bags
5. HEPA Filters
6. Continual training and de-briefing (conversant)
7. Ongoing medical surveillance
8. Independent AIA appointment
9. Daily air monitoring and feedback
10. Daily close-out of fiber count changes
11. Access to professional and specialist consultants
Sequence of works

Key of areas (excluding ground floor areas completed beneath areas 1, 5 & 6)

Area 1 - Complete
Area 6 - Current (50%)
SB
SA
Area 4 - Current (90%)
2B - Complete
2A - Complete
3B - Complete
3A - Complete
Sequence of works

- Clear loose items
- Erect 3 stage air-locks
- Apply TSW to carpets
- Seal off HVAC
- Seal off openings
- Install Negative Pressure Unit
Sequence of works

Negative Pressure Environment
Remove floor level plant
Remove drywalls
Double bag drywalls
Remove & double bag floors
R&DB raised access flooring
Sequence of works

- Remove under floor services
- Remove isolated plant
- Removing plant
- Asbestos containing gasket
- Apply wetting agent to floors
- Remove asbestos floor tiles
Sequence of works

Seal openings in floors

Protect services, seal joints

Services and joints

Bitumen prime floor, DPC wall

Apply torch-on where needed

Above activities are concurrent
Sequence of works

2 Layers DPC to windows

4 Layers DPC to floors

2 Layers DPC to Columns

Test NPU (8 dirty, 1 clean filter)

Check that DPC doesn't lift

If DPC lifts, re-seal openings
Sequence of works

Inspect and vacuum ceiling
Loose fibers on ceiling panel
Vacuum ceiling space

Apply TSW and remove tiles
Double bag ceiling tiles
Load bags onto skip
Sequence of works

- Remove light fittings
- Remove ceiling framework
- Remove ceiling hangers
- Wet & remove ceiling anchors
- Vacuum and wet ducts
- Remove ducts
Sequence of works

- Cut ducts into smaller pieces
- Double bag ducting
- Remove heavy ceiling plant
- Glove bag team arrives. Prep team moves to next area.
- Erect negatively pressurized glove bag stripping unit
- Dry asbestos flocking
Sequence of works

1. Wet the flocking
2. Remove limpet asbestos
3. Remove filled asbestos bag
4. Wetted asbestos flocking
5. Double bag asbestos waste
6. Load asbestos waste to skip
Sequence of works

Inspect for residual fibers
Identify residual fibers
High pressure water jetting

Manual scraping of remnants
Continual wet vacuuming
Dismantle the glove-bag
Sequence of works

- Vacuum and remove DPC: walls
- Remove DPC: columns
- Remove DPC: Floors
- Double bag DPC.
- Wet clean floors.
- Dry clean floors
- Glove bag team moves to next area
Sequence of works

Test fiber counts

Clean remnant fibers

Disturb fibers

Clearance testing

Encapsulate ceilings after clearance

Encapsulate floors after clearance
Sequence of works

Dismantle NPU

Relocate NPU to next area.
Prep team moves to next area.

Handover for occupancy
Sequence of works

- 3 stage runoff water filtration
- Clean water to storm water
- Area cleaned daily
- De-dusting
- Shower facility
- Various contamination
- Ongoing air monitoring

HSE Risk Consultancy Services
Corporate and Project Risk Management - Africa and Indian Ocean Islands
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