



MORRISON HERSHFIELD

Post-Construction Audit

Tapestry

750 West 12th Avenue
Vancouver, British Columbia



Presented to:

Mr. Paul McGuire
Concert Properties Ltd.
9th Floor, 1190 Hornby St.
Vancouver, BC V6Z 2K5

Report No. 5075201.00

October 2, 2008

M:\PROJ\5075201\02 - NURSES RESIDENCE\MFP-NURSES RESIDENCE
POST-CONSTRUCTION AUDIT SEPT 25_08.DOC

TABLE OF CONTENTS

	Page
1. INTRODUCTION	1
1.1 Terms of Reference	1
1.2 Scope of Work	1
1.3 Limitations	1
2. BUILDING DESCRIPTION AND HISTORY	3
2.1 Building Envelope Systems	3
2.1.1 Walls	4
2.1.2 Windows Systems	6
2.1.3 Balconies and Eyebrows	7
2.1.4 Roofs and Roof Decks	9
2.1.5 Parking Garage	11
3. SUMMARY AND CONCLUSION	14

APPENDIX A: Photographs

1. INTRODUCTION

1.1 Terms of Reference

Morrison Hershfield (MH) was retained by Concert Properties to undertake a visual review of the current condition of the building envelope for the building located at 750 West 12th Avenue, Vancouver, BC.

This report documents the results of our review. The results reported herein are based on information provided by Concert and observations noted during construction (MH was retained by Concert as the Building Envelope Professional for the Tapestry project) as well as the on-site visual reviews of common areas and three units. MH notes that these units were chosen by Bob Patrosa of Concert. The selected areas reviewed do not represent a total listing of all locations with deficiencies nor do they imply all similar locations or items to be deficient.

1.2 Scope of Work

The purpose of our involvement was to conduct a visual review of the building envelope components (where accessible) to determine current condition, maintenance requirements and assembly performance (refer to MH proposal dated March 20, 2007). Matthew Pel of MH performed the visual review of both interior and exterior elements on September 25, 2008 and was accompanied by a representative from Concert. The weather at the time of the fieldwork assignment was rainy, with a temperature of approximately 12°C.

1.3 Limitations

Our review was based on a visual inspection. Unless specifically noted in this report, testing, detailed analysis or design calculations were not conducted, nor were they within the scope of this review. Specifically, design calculations were not conducted to confirm the adequacy of the structural components. Also, the wall assembly was not specifically analyzed for its conformance with fire code regulations.

Any comments or conclusions within this report represent our opinion, which is based upon our field review of physical conditions and our past experience. This review is limited to technical, construction and performance items.

Some of the findings herein are based on a random sampling and others are based on a visual review of the surface conditions. Deficiencies, which may exist but were not observed and recorded in this report, were not apparent given the level of study undertaken.

In issuing this report, MH does not assume any of the duties or liabilities of the designers, builders or owners of the subject property. Owners, prospective purchasers, tenants or others who use or rely on the contents of this report do so with the understanding as to the limitations of the documents reviewed, the general visual inspection undertaken and understand that MH cannot be held liable for damages which may be suffered with respect to the purchase, ownership or use of the subject property.

2. BUILDING DESCRIPTION AND HISTORY

The building complex consists of two concrete structures. These are the east facing and the north facing building. The east facing building is a ten-storey building in which the structure of an existing concrete building was retained and redetailed. The north building is a six-storey building over a 2 storey below grade parking garage which is shared with both buildings. The project architect was Nigel Baldwin Architect Inc. The design was issued for development permit in 2004 and the project was complete in September 2007.

The above grade floors of the buildings consist of (new or existing) reinforced concrete slabs, columns and walls. The exterior walls are mainly of painted poured concrete and brick cladding with areas of existing stone cladding on the east building (ground floor).

Punched windows and window wall is used throughout both building, with a small area of curtain wall at the main entrances.

The north building's main roof is a conventional flat roof consisting of waterproofing membrane over recovery board, insulation vapour barrier and steel deck. The roof over the east building is a green roof over insulation, waterproofing membrane and concrete slab. The parking garage areas are comprised of either landscaping or pavers over rigid insulation, waterproofing membrane and concrete deck. The exposed decks over conditioned space are made up of pavers over rigid insulation, waterproofing membrane and concrete deck. The exposed balconies and concrete eyebrows are waterproofed with a liquid-applied urethane traffic coating.

2.1 Building Envelope Systems

Our recommendations are summarized in the following table. Each item has been categorized according to the type of deficiency:

- **Category D** – A construction deficiency exists, in our opinion, when the observed conditions in the building complex differ significantly from the intent of the design drawings and specifications provided for review, from the applicable codes and standards, or from good construction practice, given that these documents are not deficient.
- **Category M**– A maintenance deficiency exists, in our opinion, when the observed conditions in the building complex are caused by general wear and tear on building components and equipment, or when they concern an item that has not received routine service, adjustments and/or cleaning.
- **Category I** – A deficiency exists, in our opinion, where no clear decision can be made as to whether the problem is a design, construction or maintenance

deficiency. Repairs to correct the deficiency or further investigation, e.g., test openings or material/component testing, is generally required.

Refer to Appendix A for photographs taken during our review.

Items identified as construction deficiencies should be brought to the attention of the appropriate company for satisfactory correction (general contractor and trades). Our review did not allow for a complete visual review of all walls of the complex, in particular the upper walls where access is limited. Therefore, as a general rule we recommend that the extent of the deficiencies be confirmed. We have provided recommendations for addressing deficiencies in the tables below, under "Corrective Action".

2.1.1 Walls

The exterior wall claddings for the buildings consist of painted architectural concrete walls and mass concrete walls with new and existing stone or brick veneer. All exterior cold joints in the concrete have been detailed with crystalline waterstop. External vertical and horizontal reveals were cast into the concrete such as at window jambs and slab edges. All vertical reveals are detailed with bond breaker and sealant.

The assembly behind the new stone/brick veneer is mass concrete. These walls are built according to the rainscreen principle, and incorporate an air cavity and a moisture barrier (vapour permeable trowel-on membrane or paint) on the concrete back-up wall to promote drainage and drying potential. The existing stone veneer clad walls lack drainage between the stone clad and the inner concrete walls—but is mostly located on the ground floor, under an overhang.

The new exterior concrete walls are insulated with one inch of rigid insulation between the concrete and the steel studs and batt insulation within the steel studs. This wall type incorporates a polyethylene vapour barrier. The existing exterior concrete walls are insulated with spray polyurethane foam, which also acts as a vapour barrier.

During our visual review, we looked at the exterior walls of the building. MH was provided access to the upper roof areas (both buildings) as well as units 313 (east building), 307 (east building), 404 (north building). Access was also provided to all ground floor common areas and main entranceways.

The following table summarizes the deficiencies observed at the wall assemblies:

Item/ Photo	Category	Description	Corrective Action
1	D	East Building - Exposed concrete soffit is not completely painted adjacent to entry doors north elevation – ground floor	Paint concrete soffit as required.
2	D	East Building – Filler cap located at the northwest corner is unfinished.	Install access/cover plate over filler cap.
3	I	East Building – Concert requested MH to review the existing mechanical room at the upper roof area. Extensive crack repair has been completed to the concrete walls. A small ledge below the parapet flashing is a horizontal surface and may lead to water ingress.	The horizontal ledge could be detailed with a urethane traffic membrane and painted to match adjacent colour. Concert mentioned that one small leak was recorded below the mechanical room. Although no link was made between the leak and the concrete ledge, installing the traffic membrane and sealant cant is good practice.
4	I	East Building – MH understands that recent repairs were complete to the mechanical room (crack repair). Additional painting is required over crack repairs	Repaint as required when weather conditions are favorable.
5	D	East Building – Paint is damaged on the concrete planter at the 2 nd floor roof deck (west elevation).	This is cosmetic only. Repaint as required.

Item/ Photo	Category	Description	Corrective Action
6	D	North Building – Water ingress was observed below an exhaust vent in the roof top mechanical room.	The source of the water ingress is unclear. The exterior sealant should be reviewed and replaced if required. Repair any cracks in the concrete that may have developed (louver grill may need to be removed). A gum flashing can be installed above the vent to limit the amount of water running down the face of the vent.
7	I	East Building – The canopy over the on the amenity room (northeast corner) is leaking between the canopy gutter and the exterior stone cladding.	It is unclear if the gutter is blocked or the water is not being directed into the gutter. Further review is required.

2.1.2 Windows Systems

Punch windows, window wall (9000 series) and balcony swing door (9500 series) both manufactured by Starline Windows are used throughout the buildings at Tapestry. The aluminum frames are thermally broken. The glazing units are double-glazed sealed units installed from the exterior and held in place with aluminum stops. The window configuration includes a combination of fixed, casement and awning type units. A deflection header system is incorporated into the top of the frame to allow for movement in the concrete structure and window assembly. All accessories for the windows (flashing, couplers, break shapes etc.) were supplied by Starline Windows. For further detail refer to the window shop drawings as provided by the manufacturer.

Other window systems installed on the building include a curtain wall glazing system installed on the ground floor at the lobby. Similar to the windows, the curtain-wall incorporates rainscreen principles.

The rough openings for all window systems in the buildings are protected with a self-adhesive waterproof membrane. The membrane is sealed to the window frame on the interior to provide air barrier continuity. The membrane is protected by metal flashing at the sill and jambs on the exterior. The membrane at the bottom of the window opening provides the main egress

plane for incidental water in the window frame. Weep holes in the window frame and under the window frame allow water to exit the window system.

The following table summarizes the deficiencies observed at the wall assemblies:

Item/ Photo	Category	Description	Corrective Action
8	I	East Building – The exterior sealant installed to the exterior door at the north elevation (ground floor) is discoloured.	This is an aesthetics issue and does not effect the performance of the sealant. The discolouration is from the sealant touching the roofing membrane. This was observed at various locations through out the project. The only ways to remove staining is to cover or cut back membrane can reinstall sealant.
9	D	East Building – The window sill flashings at various locations (MH noted condition on west elevation) are dislodged.	Flashings should be repositioned and secured or clipped together to prevent future movement.

2.1.3 Balconies and Eyebrows

The projecting balconies are not over conditioned space. A few terraces are located over conditioned space, these are treated as roofs and are covered with concrete pavers and/or landscaping (refer to section 2.1.4).

The balconies are provided with aluminum guardrails, with tempered glass panels, secured through the top of the concrete deck or into the inside face of the concrete upstand around the balcony perimeter. Drainage is achieved with slope on the concrete directing water typically to the outside edge of the balconies or to scupper drains.

The balcony membrane is a liquid applied urethane pedestrian traffic coating which was applied on the deck surface and up the balcony perimeter. The same membrane was used to cover the eyebrows.

For the same locations described under the wall section, MH reviewed the surface condition of the balcony, railing connections and scuppers. No deficiencies related to the balcony were noted or reported by Concert at the time of this review.

The following table summarizes the deficiencies observed at the wall assemblies:

Item/ Photo	Category	Description	Corrective Action
10	I	North Building – Concert informed MH that at various locations the traffic membrane installed to the top floor eyebrows is scraped. The areas the membrane is damaged is where access rope are dropped over the side of the building.	The damage observed to the traffic membrane is not significant and is outside the building envelope. The traffic membrane should be repaired as required to prevent further damage. All eyebrows require edge protection when ropes are used for swing stage and bosun chair drops.
11	M	Both Buildings – Dryer exhaust vents are collecting lint.	Dryer ducts should be reviewed and cleaned on a regular basis as outlined in the maintenance manual issued to the strata.
12	D	East Building – The large concrete eyebrow over the children's play area is back-sloped to interior drains. The drains are provided with a flat debris screen which is dropped into the drain body. Excessive debris and ponding water was observed at all drain locations.	Appropriate debris screen screens should be provided and secured to the drain body.

2.1.4 Roofs and Roof Decks

The main roofing system for the East Building is a conventional system with a two-ply styrene-butadiene-styrene (SBS) membrane. Roof insulation is tapered to provide slope to the drains.

The main roof for the North Building consists of an inverted roofing assembly on concrete roof slab with landscaped green roof. The roofing system includes the following assembly: growing medium, on filter fabric/roof barrier, on insulation, on drainage mat, on waterproofing membrane, on concrete slab. The roof is accessible only for maintenance purposes. The slabs are sloped towards internal roof drains. There are overflow scuppers in the concrete upstand providing emergency drainage.

The roof decks for both buildings consist of a hot rubber membrane installed to concrete slabs. The membrane is protected with drainage mat, roof insulation, filter fabric and pavers. The concrete slabs are sloped to roof drains throughout the decks.

The podium is waterproofed with hot rubber membrane applied onto concrete slab and up the exterior walls. The waterproofing system includes the following assembly: soft growth landscape or pavers, on filter fabric, on drainage course, on drainage mat, on granulated protection board, on waterproofing membrane, on concrete slab. Drainage achieved with a slope on the concrete directing water towards roof drains.

The children play area is complete with waterproofing membrane, protection board, drainage mat, insulation, filter fabric and soil/play features.

MH reviewed the both upper roof area as well as the roof decks on level 2 (east building) and level 4 (north building – unit 414). The table below summarizes our findings.

Item/ Photo	Category	Description	Corrective Action
13	D	East Building – Ponding water was observed at each drain location on the east facing roof deck (3 rd floor). MH removed one debris screen and noted that the ponding water freely drained. Slots are provided in the clamping ring, however no slots are provided in the debris screen causing the water to build up approx 1/2" before drainage is achieved.	Provide corresponding slots in the debris screen and clamping ring to allow water to freely drain. This is typical for all drains on conventional roof assemblies.
14	I	East Building – Ponding water was observed draining off the top floor eyebrows to the roof deck below.	Drainage is achieved to the edge of the eyebrows. Areas of increased flow are caused by low areas in the assembly.
15	I	East Building – Efflorescence was observed on the underside of the roof top mechanical room. This concrete slab is existing and the efflorescence may be from past.	Mechanical roof slab should be monitored on a regular basis. Contact consultant if efflorescence increases.

Item/ Photo	Category	Description	Corrective Action
16	M	East Building – Bird droppings were noted on the upper roof and mechanical roof. Bird droppings can lead to membrane damage.	Roof areas with exposed membrane (cap sheet) should be periodically reviewed and cleaned.
17	D	North Building – Roof drains at the upper green roof are framed with wood ties and filled with gravel ballast.	Gravel should be removed from drain locations so they can be periodically reviewed for problems and ensure free drainage.
18	D	North Building – One overflow scupper was noted along the exterior concrete parapet (east elevation) that appears to be incomplete. The scupper hole is partly covered with concrete.	If required the overflow scupper should be provided with appropriate roof tie-ins. If not required, ensure hole is patched (patch'n'plug) and painted to match adjacent parapet.
19	M	North Roof – Vegetation is growing in the gravel buffer zone between the green roof and the exterior parapet wall.	Gravel areas on the green roof area should be reviewed periodically. All vegetation should be removed from gravel areas.
20	D	North Building – The gum edge flashing detail along the roof deck perimeter is starting to fail. The sealant is cracking and debonding at various locations.	Remove and replace gum edge sealant as required.
21	M	Vent Shafts – Debris is collecting in the bottom of the vent shafts and ponding was observed in the bottom.	Review vent shafts and clear debris as required. Ensure drains are clear and free draining.

2.1.5 Parking Garage

The below grade existing foundation walls are cast-in-place concrete. The walls incorporate a PVC water stop at the vertical cold joints, and crystalline slurry at the horizontal cold joints. Asphalt emulsion damproofing is installed on the outside of the foundation walls. A few moisture sensitive rooms have

cold applied water proofing on their wall. At these locations, drainage mat was incorporated and is positively lapped to shed water away from the building. Clear pea gravel is present along the entire parking perimeter

The table below summarizes our findings.

Item/ Photo	Category	Description	Corrective Action
22	I	<p>MH observed cracks and signs of water ingress (i.e. efflorescence) on the interior of the parkade walls at the following parking stalls; 09, 68, 72, 86, 92, 96, 97, 101, 151 and 168. Some cracks appear to have been repaired from the interior with an crystalline slurry.</p> <p>MH was unable to determine if this staining was present from the time of construction or recent moisture ingress. No signs of active water leakage were present in these locations.</p>	<p>These areas should periodically monitored for further staining and/or leaks.</p> <p>If any water ingress is noted these cracks be routed and dry packed using a crystalline slurry (i.e. Xypex).</p>
23	D	<p>MH observed staining on the parkade slab above parking stall 95. Staining was observed on the ground directly below the staining on the ceiling. This may suggest this is an active leak</p>	<p>Cracks to be routed and dry packed using a crystalline slurry (i.e. Xypex).</p>
24	D	<p>Missing thermal insulation to the underside of the concrete slab was observed above parking stall 25. The insulation is missing above the duct work.</p>	<p>Install spray thermal insulation as required.</p>
25	I	<p>A crack has developed in the concrete slab in the BC Hydro electrical service area.</p>	<p>A structural engineer should review the crack and provide comments.</p>

Item/ Photo	Category	Description	Corrective Action
26	D	The parging installed to the concrete wall at parking stall 86, 157 and 164 is not adhered to the foundation wall. Cracks and debonded parging was observed. This appears to be a previous crack repair.	Removed cracked or debonded parging and reinstalled with appropriate patching compound as required.
27	D	Some cracking in the traffic membrane adjacent to the entrance ramp was observed. There appears to be a corresponding crack in the concrete slab.	Concrete crack should be monitored and the traffic membrane be repaired as required.

3. SUMMARY AND CONCLUSION

In general, the building appears to be performing in accordance with the original design intent. Many of the deficiency items identified relate to the original construction, while other items include aesthetic concerns or maintenance measures. Although most of them have not led to any problems so far, they should be addressed as soon as possible. Our review did not allow for a complete visual review of all areas in the complex. Therefore, as a general rule we recommend the extent of the deficiencies be confirmed where indicated.

It is considered good practice for the Strata to undertake a building envelope review within the two to five years. This will provide a regular update of the building envelope in terms of performance and will mitigate the risk of undetected failures. A review should also be conducted prior to the expiration of the five year warranty in September 2012.

MORRISON HERSHFIELD LIMITED



Matthew Pel
Building Science Consultant



Sophie Mercier, P.Eng.
Principal

APPENDIX A:

Photographs

Tapestry - Post Construction Audit

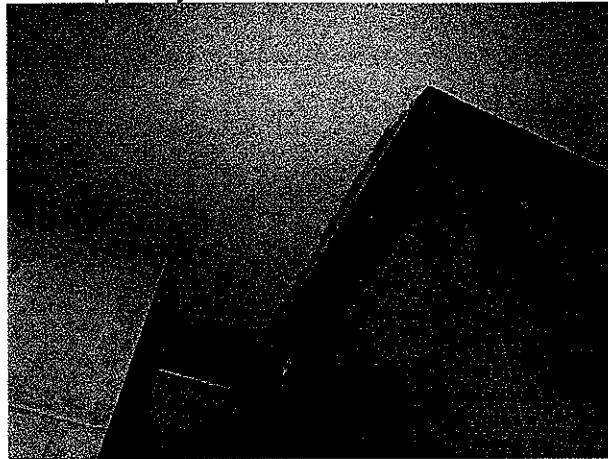


Photo 01.JPG



Photo 02.JPG

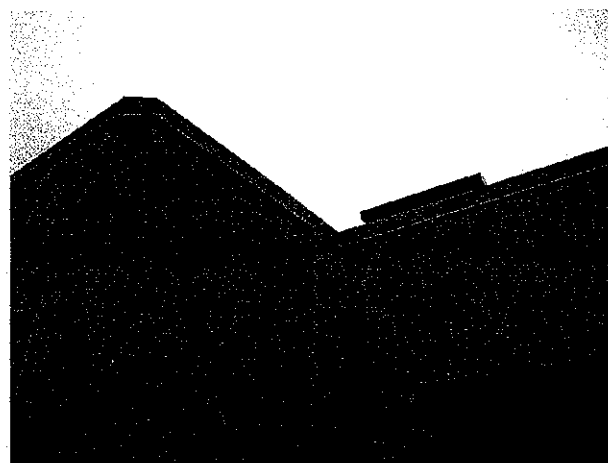


Photo 03.JPG

Tapestry - Post Construction Audit



Photo 04.JPG

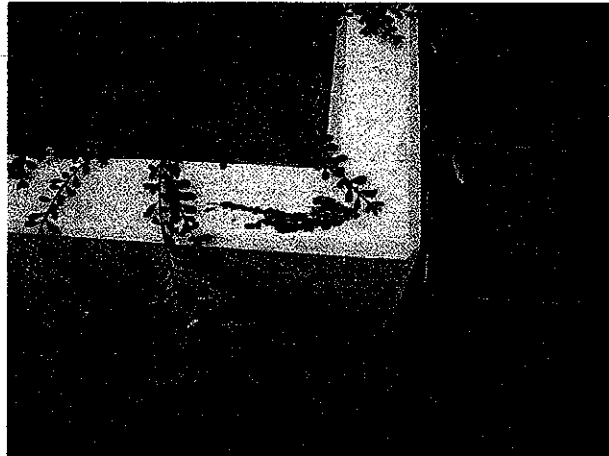


Photo 05.JPG



Photo 06.JPG

Tapestry - Post Construction Audit



Photo 07.JPG

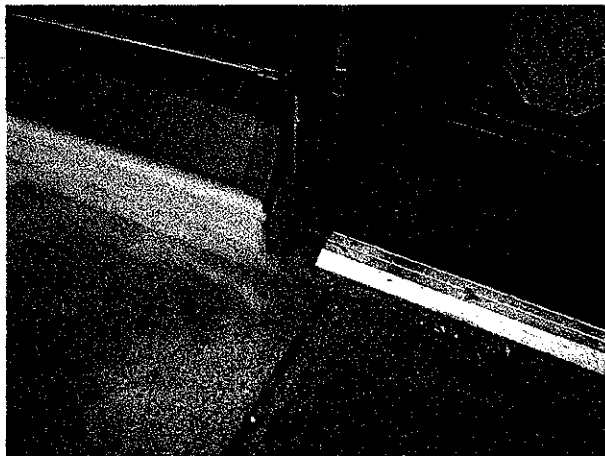


Photo 08.JPG

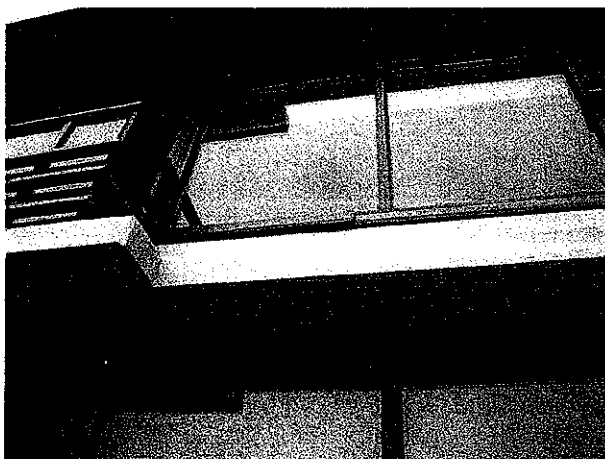


Photo 09.JPG

Tapestry - Post Construction Audit

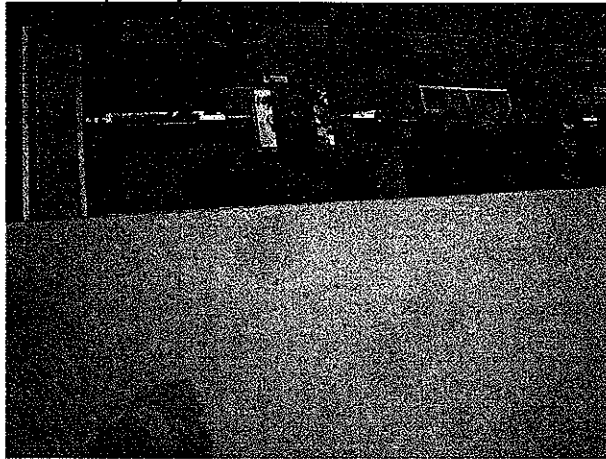


Photo 10.JPG

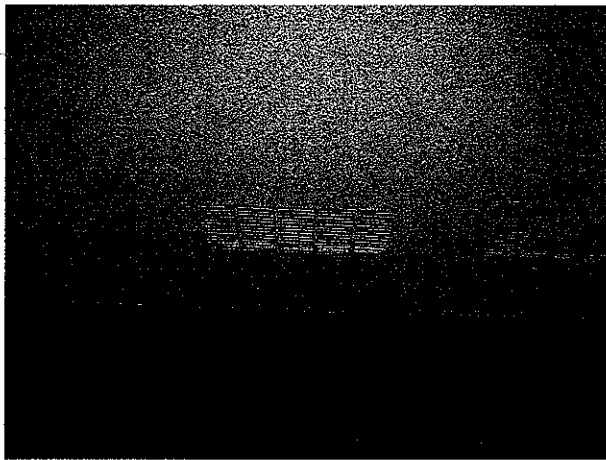


Photo 11.JPG



Photo 12.JPG

Tapestry - Post Construction Audit

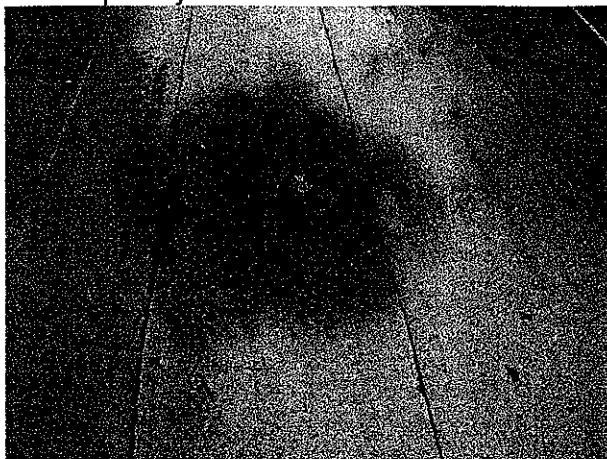


Photo 13.JPG



Photo 14.JPG

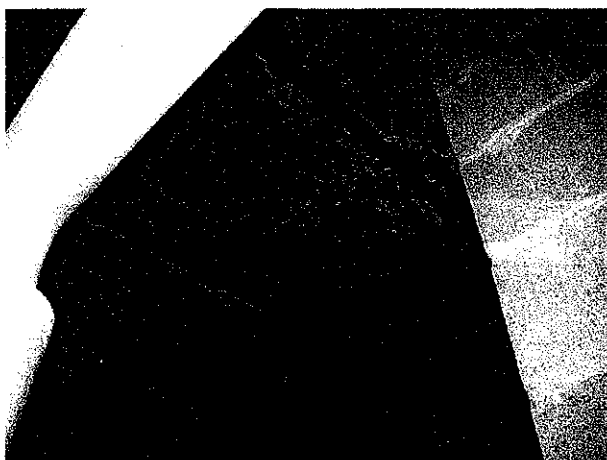


Photo 15.JPG

Tapestry - Post Construction Audit



Photo 16.JPG

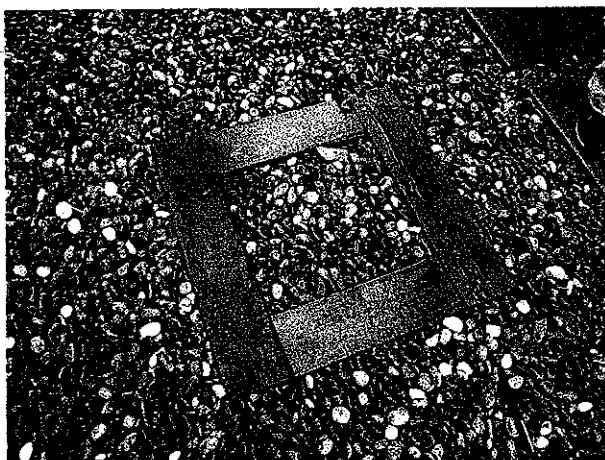


Photo 17.JPG



Photo 18.JPG

Tapestry - Post Construction Audit

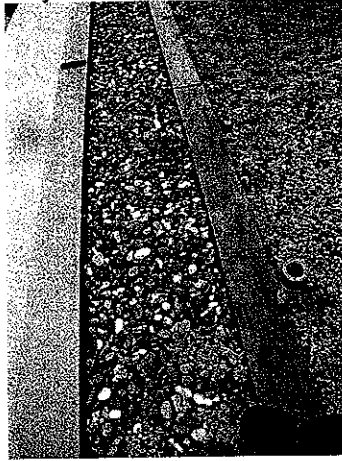


Photo 19.JPG

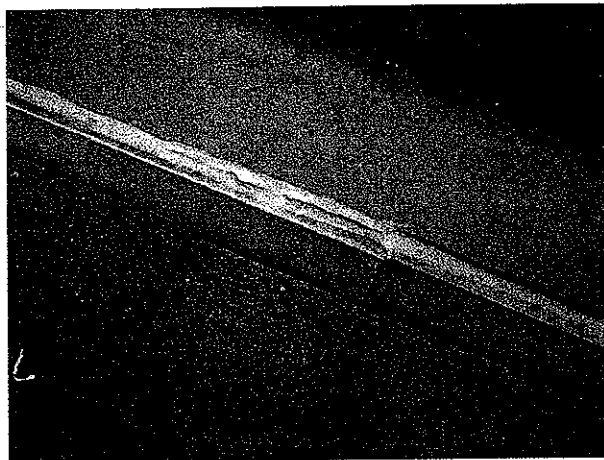


Photo 20.JPG



Photo 21.JPG

Tapestry - Post Construction Audit



Photo 22.JPG

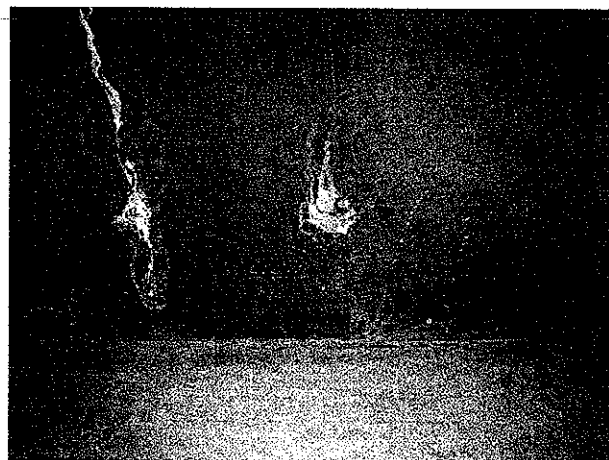


Photo 23.JPG

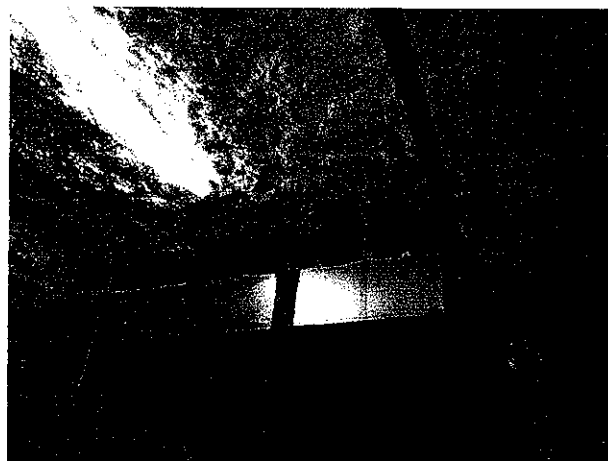


Photo 24.JPG

Tapestry - Post Construction Audit

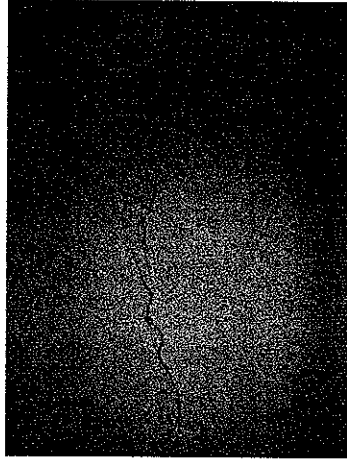


Photo 25.JPG



Photo 26.JPG

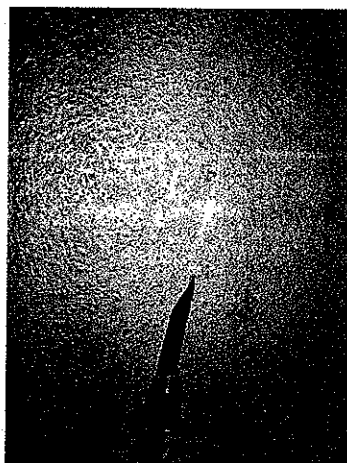


Photo 27.JPG