

Parapet  
collapse  
along Pacific  
St.



Unsafe  
parapet  
removed  
along sides of  
building.

Photo 1 shows the entire Pacific St parapet lost due to collapse.

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# Engineering Report

## Wards Bakery Parapet Collapse

### 800 Pacific Street, Brooklyn

## **EXECUTIVE SUMMARY**

800 Pacific St, Brooklyn, aka "Wards Bakery", dating from 1907, is a large 4 and 5 story "through block" building with multiple sections and wings which served as Pechter's bakery for 90 years. Constructed from steel beams and columns supporting cinder concrete slabs, the complex was clad in architectural non load-bearing tan brick and ornamented with white glazed terracotta blocks creating gently arched windows with projecting cornices and parapet walls. "Terracotta," manufactured to simulate cut stone, is a sculptured, cast and fired hollow clay unit, most typically larger than brick. Much used in New York during the mid to late 1800's, terracotta was often intricately carved and mass produced for many ornamental cornices and façades.

As part of the extensive Atlantic Yards Redevelopment, 800 Pacific St., a vacant and deteriorated warehouse, is planned to be demolished to grade. At the time of the April 26, 2007 collapse, a specialty contractor was removing asbestos-laden material that had been applied many years previously to the interior face of the parapets and roofing surfaces. Work was 90% complete on the Pacific Street side of the complex and involved removal of cementitious and tar coatings from the interior side of the 7' high brick parapets using scrapers and light duty electric chipping hammers when 200' of the Pacific Street parapet fell +/- 55' to grade.

While no one was killed or even injured, the risk to the public from such a collapse prompted the Department of Buildings to undertake an inquiry into the cause of the collapse. The task was led by the Department of Building's Forensic Engineering Unit.

The Forensic Engineering Unit has concluded that the parapet collapse was caused by structural deterioration from years of water infiltration into the steel support system on which the parapet was constructed. Forest City Ratner had been apprised of the deterioration of the façade and the parapet, but the extent of the deterioration and the risk of collapse had apparently not been communicated to the crew that had been assigned the task of removing tar and asbestos coatings from the rear of the parapet. As a result of the deteriorated conditions, even the relatively passive construction activities involved in removing the coatings precipitated the collapse of the terracotta tiles and the bricks on which they were mounted.

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### **Background: Construction History**

Based on Italianate architecture, the bakery was designed to have a monumental appearance when viewed from afar. Ornamental white glazed terracotta blocks were used to frame the large windows. Steel angle frames were placed behind the 7' high parapet to support signage announcing the bakery.



Photo 2: Photo of Wards Bakery circa 1955, ( Office of Metropolitan History )

The Dean Street façade on the opposite side of the complex is slightly smaller than the Pacific Street wing, was differently configured. The façade has similar architectural features but is finished in running bond brick (see photo 3 below).



Photo 3: Dean Street façade of Wards Bakery, circa 1955.( Office of Metropolitan History)

## **800 Pacific St: Parapet Condition Documentation:**

Record of Deteriorated Façades: Years ago, long term structural integrity problems with the exterior walls resulted in the Pacific St signage braces being cut down to roof level. Department records show that structural deficiencies with the façade date back at least to the early 1990's, with numerous violations for "Failure to Maintain" posted on the property. The DOB BIS system indicates that eighteen months prior to Thornton Tomasetti's conditions report, a heavy duty sidewalk bridge "public protection" scheme was placed along both Pacific and Dean Street.

Interviews with the current building owners indicate that the deterioration to the façade had been documented in a report they had commissioned and submitted to the New York State Office of Historic Preservation in August 2006, nine months prior to the collapse. The authors of the August 2006 report, Thornton Tomasetti Consulting Engineers, clearly state that the façade on both Pacific and Dean Street were in very poor structural condition. The report states in part:

Based on the damaged facade on the building described above there would need to be extensive repairs and renovations required bringing the façade to within current safety and code requirements. A majority of the façade's glazed terracotta is damaged (i.e. glaze spalls, cracks, etc.) and can not be repaired and therefore would need to be replaced. The primary cause of the damaged glazed terracotta façade is water infiltration and saturation. This is evident in the roof parapets as seen in Photos No. 1 and 6. The vertical cracking of the glazed terracotta façade at the column locations is evidence of corrosion of the steel framing, specifically the steel columns. The glazed terracotta façade would need to be fully removed at these locations in order to properly clean and paint the steel with corrosive inhibiting paint. The manner in which the glazed terracotta façade is typically removed is not a delicate operation and will most likely cause collateral damage to the surrounding undamaged glazed terracotta façade given its approximately 100 year old age. At the based of the building along Pacific and Dean Streets, the façade has been painted over either to cover graffiti or to cover and protect the damaged glazed terracotta façade. The window sill heights would need to be lowered approximately 1'-0" to 3'-0" per current code requirements for the installation of the new windows. Replace the damaged façade's glazed terracotta and lowering the window sills would be an enormous undertaking and would require replacing on the order of 85% of the glazed terracotta facade. While it is technically feasible to repair and renovated the façade, to do so would be impractical and unrealistic.

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## **Causes of Collapse:**

Corrosion of structural steel: Reviews of the façade indicate that long term water infiltration through the terracotta and brick led to long term corrosion of the structural steel frame located between 4" to 8" behind the face of the building (see Photo 4 below).



Photo 4 shows the close relationship between structural steel and ornamental façade

As steel becomes saturated with rain water, steel rusts. As it rusts, the steel increases in volume. This increase in volume creates pressure against the brickwork fixed to the steel. Over a period of years, this “jacking” action eventually can snap the exterior brickwork and the brick falls off the building to grade.



Photo 3 shows failed brick on façade.

This exterior wall deterioration is frequently encountered (and repaired) with similarly constructed steel framed buildings in New York City. Parapets and cornices are especially susceptible to failure due to the fact that they are exposed to weather on both interior and exterior faces. Also, cornices project from the building face, creating an overturning effect on the parapet if not securely tied to the roof and floor structure.

## **Removal of the Pacific Street sidewalk bridge prior to parapet collapse**

As part of the NYC Department of Buildings requirements for a demolition permit, all utility services into a building need to be turned off and capped. We understand that in the process of locating all the sewer cut offs into the building, it was necessary to temporarily remove the sidewalk shed to allow the street to be cut open and cap the sewers. As related to us by Gateway Demolition, Department of Environmental Protection records indicated a third sewer connection that was not found in the building basement. DEP suggested a narrow trench be cut along Pacific Street, under the shed, to determine if and where the sewer connection existed. In order to access the exploratory trench along Pacific Street, the shed was removed. Given the deteriorated condition of the façade and parapet, the asbestos removal should not have proceeded without protective measures in place.

## **Conclusions and Recommendations**

Based on the steel and concrete building's nearly one hundred years of exposure to the elements, the corrosion of the roof support steel, and the building's decades of deferred maintenance, it is not surprising that the entire 200' length of the Pacific St parapet fell to grade under the stress of the relatively passive construction procedure of removing tar and cementitious coatings from the parapet's rear. The potential for an imminent failure of the parapet and façade should have been apparent to the owner and the demolition contractor from the façade's deteriorated condition and/or from the Thornton Tomasetti report that documented the condition of the façade and the parapet. Review of the asbestos and tar abatement procedure leads us to conclude that even the light loads of the scrapers and chipping guns were sufficient to propagate losses of large areas of the façade.

Based on the parapet failure, the owner's engineer and demolition contractor are now "front ending" removal of the remaining portions of the parapets prior to the remaining asbestos abatement. This procedure should have been adopted earlier. The remainder of the building can be safely demolished with usage of standard demolition techniques and safeguards.

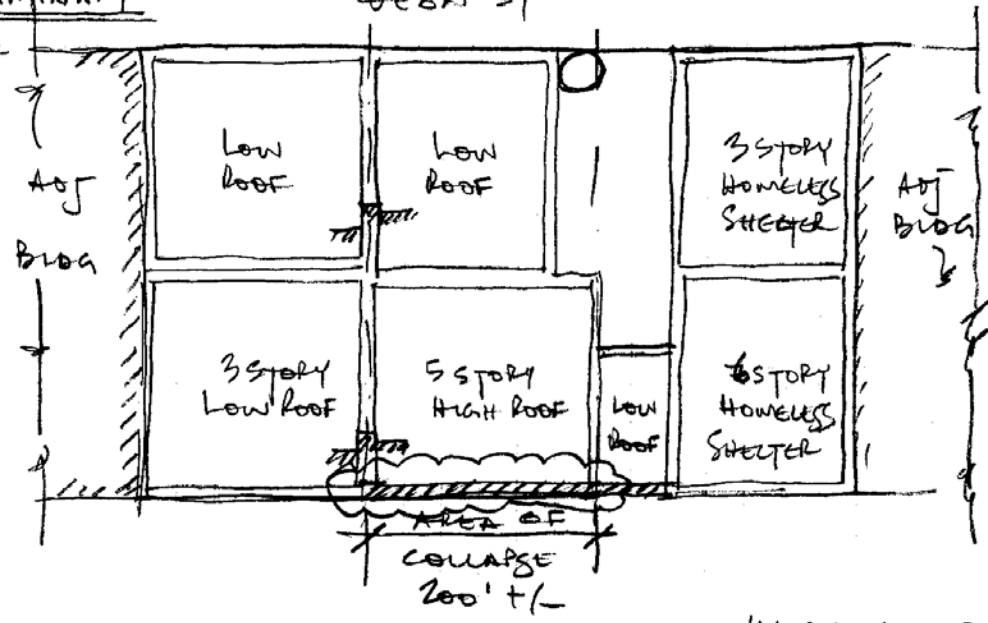
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FEVSK  
PRELIMINARY  
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800 PACIFIC ST BLDG NY  
AKA WARDS BAKERY  
DEAN ST



WORK UNDERWAY

