

## SITE VISIT REPORT NO. 1

<b>Project:</b>	<b>ST. ANDREW'S CHURCH</b> <b>75 SIMCOE STREET, TORONTO</b>	<b>File No.:</b>	J003-001
<b>Owner:</b>		<b>Site Visit Date:</b>	18-Sep-08
<b>Contractor:</b>		<b>Report Date:</b>	20-Sep-08

*On the date shown we visited the project and performed the visual inspection of the structural components, as indicated. The goal of our inspection was only to ascertain the general compliance of the construction with the contract documents. We did not perform any destructive or non-destructive testing, and this report, conclusions and recommendations are based on visual inspection only. Any item or deficiency not specifically noted in this report does not alleviate the contractor from his responsibility of complying with the intent of the contract documents, approved changes, or the requirements of inspection authorities having jurisdiction.*

**Time: 10:00 AM**

**Present: Don Bolton and Nebojsa Ojdrovic**

### 1.1 Observations



One arch with dentils was removed for inspection on south elevation. It appears that it was originally attached with 4 bolts to the underside of the arch, and with additional 3 bolts to the load bearing hidden arch.



It appears that the load bearing cast iron arches were originally designed to rest on brick piers filled within four cast iron pieces: two on the sides and two front pieces (one is removed).



The poor quality of workmanship in constructing the load bearing brick pier is evident. One can only assume that remaining piers are of similar quality.

The contractor shall carefully, without rebuilding, fill empty spaces with mortar and grout, as necessary. Softer lime based mortar with some Portland cement is recommended (Type "O" or similar, to be verified with project Architect).

It appears that inner arches (the right-most one in the photograph) are not at all attached to the steel plate. The restoration of cast iron elements must address this deficiency.



The other, east, side of the load bearing cast iron arch is supported on steel post encased in fairly contemporary looking brick.

The hole in right hand side dental arch is not aligned with the plate below, and this, and many other arches, is not attached to the plate.



The load bearing arch has 3 small holes for bolts that connect it to decorative arch. It will likely be impossible to re-attach decorative arch to load bearing arch.

We recommend that two stainless steel through-bolts connect decorative arch to the big wood beam behind, using large washers and locking nuts on the interior face of the wood beam.



Please note one of three bolts that were connecting decorative arch to the load bearing arch.



It is not clear how the top part of the column is attached to the lower part.

We are seriously concerned that there is no positive connection, and that the connection is actually a hinge. If this is true, then, theoretically, the existing column and arch system is not stable.



A few of the decorative arches are not connected to plates below.



Even when there appears to be a bolt installed between the arch and the plate, the bolt is usually corroded or does not even exit between the L-plate and column capital plate. The fact that there is usually a gap between the exterior decorative cast iron elements and column capital plate indicate that the load is transferred either through steel (cast iron?) column, or brick pier of questionable quality, discussed above.

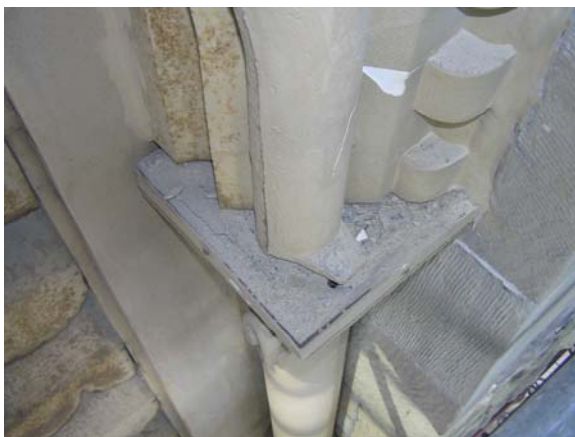


Another such example.



This and the following photograph show steel shim plates between the decorative cast iron elements and column capital plate. These shim plates are not original.

There was obviously some restoration of cast iron decorative arch structure in the past. The extent and quality of workmanship can not be assessed short of complete dismantling.



Please see description with the previous photograph.



It is interesting to note that at several locations column base appears to be lifted from stone base. In this location, we were able to insert a sheet of 8 ½" x 11" cardboard (soft) as shown in photograph.

We are concerned that the columns are not positively attached to the stone base.



There seem to be some thin plates that could have been used to attach column to stone, but the gap between the two is evident.

We recommend further investigation of the whole assembly.



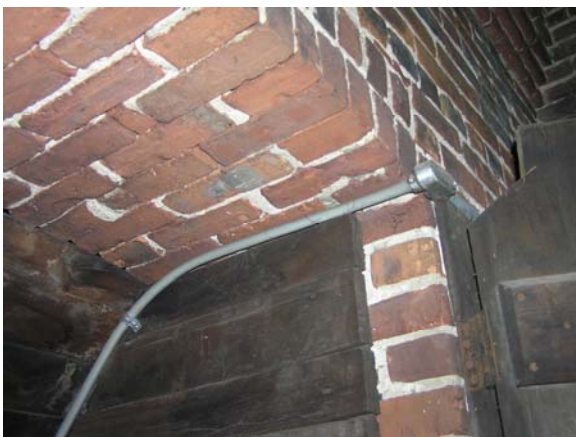
The west side arches do not include decorative exterior dental pieces, and the columns are simpler.



At least in two locations we observed sheet metal “bandage” on part of the column shaft, attached with two adjustable rings. This intervention could not be structural, but is worthwhile exploring further.



A crack has developed from the north end of flat brick arch at the top of stairs within the tower. We suspect that the crack may be a result of insufficient bearing of the brick arch of side walls. Please see also the next photograph with similar bearing condition.



A steel angle L4"x4"x1/4" should be anchored at each side of opening using two 3/4" Hilti HCL leeve anchors per angle, minimum embedment 4". The space between the top flange and brick arch should be filled with masonry mortar.



The void between the side wall and tower wall should be filled with mortar.

## 1.2 Discussion and Recommendations

The nature of load transfer through the cast iron columns and arches is not clear. The construction and attachment to the tower walls is not clear. A few elements are apparently not attached to other cast iron elements or structure. There is a possibility that the system is in fact unstable due to a number of hinges between elements. The whole cast iron decorative assembly appears to be unsafe and may pose danger to general public by falling out of place under the strong wind or earthquake.

Detailed investigation and analysis of cast iron columns and arches is recommended before proceeding with any restoration work.

**OJDROVIC ENGINEERING INC.**

A handwritten signature in black ink, appearing to read 'Nebojsa Ojdrovic', written over a faint, light-colored signature line.

Nebojsa Ojdrovic, Ph.D., P.Eng.