

DURBROW ASSOCIATES / ENGINEERING CONSULTANTS

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LLOYD B. DURBROW, P.E.
ALBERT F. LESAGE, P.E.

RICHARD W. DALL, P.E.
RUTH E. DEFREEST, P.E.

July 10, 1991

Mr. John Rasys
Dept. of Public Works
P.O. Box 849
Burlington, VT 05401

Re: Memorial Auditorium
Burlington, VT

Dear Mr. Rasys:

On June 19, 1991, we visited the Memorial Auditorium building to review brick and precast concrete deterioration of the exterior walls. Our observations were done from the ground, second floor windows on the east side and from the roof.

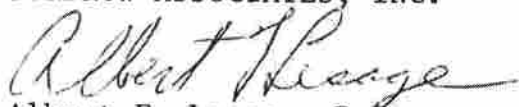
The deterioration appears to be caused by moisture and water penetration through the brick wall at cracks, flashing areas and caulked joints which have split open. Most of the concrete precast at the roof level is in good condition, however intermediate horizontal concrete bands have deteriorated badly, especially at corners of pier projections. The brick is also soft and spalled in these areas as well as others. The deterioration appears to be caused by water penetration combined with freeze-thaw cycles.

At this time, it is our opinion that the roof precast concrete will have to be removed and the brick parapet rebuilt, at least in part, to repair the deterioration and prevent further occurrences.

Durbrow Associates, Inc. is in the process of preparing a proposal to provide plans and specifications for the repair work. We will attempt to have that in your hands within a week. The work to be performed is specialized in architectural caulking and flashing details. We are not aware of any local engineers with this expertise and as such will be presenting our proposal using Joseph S. Zajchowski, Architect, as the prime consultant. Mr. Zajchowski specializes in roofing, flashing and caulking type of problems and has the required experience to develop adequate solutions.

Please call if you have any questions.

Very truly yours,
DURBROW ASSOCIATES, INC.


Albert F. Lesage, P.E.

AFL/LPR

JOSEPH S. ZAJCHOWSKI

A R C H I T E C T

1240 airport parkway

south burlington, vermont 05403

(802) 863-6863

August 8, 1991

Steve Goodkind, City Engineer
P.O. Box 849
Burlington, VT 05402-0849

Dear Mr. Goodkind:

I have visited the Memorial Auditorium building with Al Lesage of Durbrow Associates, and reviewed the brick and pre-cast concrete deterioration. I am in agreement with the evaluation of damage as described in Mr. Lesage's letter to Mr. Rasys dated July 10, 1991. In addition, it was noted that a few pieces of the pre-cast parapet cap have moved and shifted out of position.

Since there are no known drawings of the existing building, we cannot determine the details of construction - that is, are the pre-cast caps anchored with pins or just set in mortar, are the various flashings, through flashing or just set into a reglet, what is the core of the wall, and other such similar questions.

In order to answer some of the above questions, we wish to suggest the following. That the city hire a local reputable contractor to perform some exploratory work, such as remove a few sections of the pre-cast concrete, and/or masonry to better evaluate the construction details. We, as architects representing the city could be at the site while such exploratory work is being done, and determine which portions of caps and/or wall should be removed. We would observe the existing construction and develop drawings showing the wall details.

After observing the conditions and determining the construction, we could better evaluate the extent and cause of the damage, and then proceed to write a specification and provide any necessary sketches for correcting the present situation.

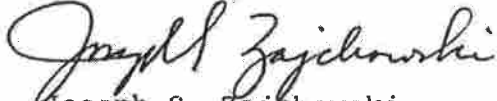
I think that the cost of the exploratory work by a contractor and our time for observation could be performed at an hourly basis. If the city feels they wish to proceed in this manner, we could approximate a cost.

Upon completion of this work, we would be happy to propose a lump sum or a not to exceed compensation for services to develop construction documents for performing the corrective work. Our services could also include accepting and evaluating contractors' bids, and subsequently construction inspection.

Durbrow Associates would be involved with us, to investigate and solve any apparent structural problems, and to verify, where necessary, any questionable structural integrity.

We would be happy to meet with you and discuss in more detail any of the above described procedures. Hopefully we can get together in the near future. Thank you for the opportunity of submitting this proposal.

Yours truly,

A handwritten signature in cursive script that reads "Joseph S. Zajchowski".

Joseph S. Zajchowski
Architect

JSZ/tlc

p.c. John Rasys
Al Lesage

JOSEPH S. ZAJCHOWSKI

A R C H I T E C T

1240 airport parkway

south burlington, vermont 05403

(802) 863-6863

August 30, 1991

Mr. Steven Goodkind, City Engineer
City of Burlington
P.O. Box 849
Burlington, VT 05402-0849

Dear Mr. Goodkind:

In response to Mr. Alberry's request for an estimate cost and professional fee for the exploratory work involved in the above project, we have proceeded as follows.

We viewed the problem at hand with Mr. Farrington of Farrington Construction and discussed the proposed exploratory work with him. He said that his company could do the removal and then replacement of pre-cast concrete pieces and brickwork as required to investigate the deteriorating conditions and to determine the actual wall construction for a not to exceed cost of \$2,000.00 or whatever portion of that amount required to arrive at a determination of the parapet condition.

We, as the architects would be at the site for the approximate time of 2 days, during the course of the removal and replacement work and record all observed conditions, and write a report on these observations. We would perform our services at an hourly rate of \$65.00 per hour with a not to exceed cost of \$1,200.00.

Therefore, it appears that the total cost of the exploratory work would be in the vicinity of \$3,000.00.

If you have any questions on the above, please contact us. Hopefully we will be able to provide services for you regarding the above work.

Yours truly,



Joseph S. Zajchowski
Architect

JSZ/tlc

p.c. Lee Alberry
Dave Farrington

JOSEPH S. ZAJCHOWSKI

A R C H I T E C T

1240 airport parkway

south burlington, vermont 05403

(802) 863-6863

September 19, 1991

Mr. Steven Goodkind, City Engineer
City of Burlington
P.O. Box 849
Burlington, VT 05402-0849

RE: Memorial Auditorium Weathering Analysis

Dear Mr. Goodkind:

On September 9, 1991, Mr. Brown and myself went to the site, the roof of Memorial Auditorium to direct and observe the exploratory investigation of the parapet wall around the roof perimeter.

Contractor, was directed to remove six (6) sections of cast stone coping to allow observation of construction details and the condition of materials.

The same basic condition was found where all 6 cast stone coping caps were removed. The conditions and details are as follows:

- Parapet wall is constructed of solid brick and is a nominal 12" thick wall. (Photo 1 and 2, and Sketch A).
- Wall is capped with a continuous through wall lead cap flashing turned down approximately 1 1/4" at each face of wall, creating a drip edge. (Sketch A and B).
- The through wall flashing is continuous over entire parapet, that is over both horizontal and vertical planes of parapet. It is jointed by interlocking U joints forming a continuous piece.
- In 2 or 3 instances the through wall flashing was torn, pretty much at right angles to its length. Where this had occurred, it was apparent that the cast stone coping had moved, lengthwise., pulling the lead flashing and tearing it. (Photo 1).
- In all instances the mortar course between the lead flashing and coping cap was completely decomposed and could be brushed off like loose sand. From observation of coping caps that were not removed, the condition of mortar beneath them appears to be the same as for those which were removed. (Photo 3, 4, and 5).

- In nearly all instances the joints between sections of coping were in very poor condition, with deteriorated mortar, and those that had been caulked, with split caulking and poor improper caulking. (Photo 5 and 6).
- At the coping removed at the south wall, the aluminum counter flashing installed during the single ply roofing installation had been placed over the lead through wall flashing. This would allow water seeping through the coping and coping joints to run down behind the single ply roofing where it has pulled away from the building wall. (Sketch B and Photo 7).

In addition to the observations made above, as a result of the exploratory work performed, there were other points of deterioration observed through visual examination, such as:

- The obvious cast stone deterioration of some of the coping caps, and of the decorative cast stone band around the building perimeter and the second band at main pilasters. (Photo 8 through 15).
- Cracked brick, mortar joints, and many open joints in cast stone band around building. (Photo 16 and 17).
- A badly deteriorated chimney at the northwest corner of roof. (Photo 18, 19, and 20).
- Open joints in cast stone and brickwork, and deteriorated steel lintel at lower level windows on south side. (Photo 21).
- Deteriorating steel lintels and windows at various areas around building. Photo 22 and 23).

As a result of the exploratory work, we feel that though there has been water percolation through the coping and coping joints, this was only a minor cause of the upper wall deterioration of the building. Though there definitely had been leaking through the coping cap and cap joints, causing the decomposition of the mortar beneath the coping cap, we feel that from all appearances, the lead through wall flashing protected the parapet and upper wall from water damage through this avenue. We strongly feel that the damage to coping, cast stone bands and substantial efflorescence on both interior and exterior faces of walls had been caused through years of weathering of the exterior face of wall causing very porous mortar joints, open joints in cast stone bands, and from a very substantial water infiltration problem from a previous leaky roof.

Our main observation was of the upper portion of wall in the vicinity of the roof, however, as a general observation of the building there are many other areas of deterioration noted, such as open joints in the cast stone band over the lower level windows, very rusted and corroded steel lintels, rusted steel windows, brick joints requiring pointing etc.

If we were to consider the entire building for restoration, some general thoughts for corrective work at this point would be:

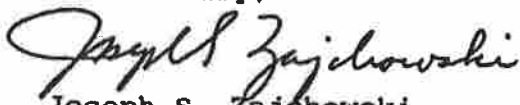
- Re-set all cast stone coping and repair pieces that are damaged.
- Repair all portions of cast stone bands that are decomposed.
- Re-mortar all joints in cast stone coping and bands and seal with a long life sealant.
- Re-point any masonry mortar joints that require pointing.
- Replace steel lintels whose condition dictates replacement.
- Replace or repair steel windows as necessary - many are rusted, many are leaking.
- After cleaning all masonry by a non abrasive cleaning method, seal all masonry and cast stone with a water repellent coating.
- Perform corrective work to single ply roofing, especially at wall flashing where material is pulling away from wall attachment.

We trust that this report will give you a good insight on the existing problems and an overview on corrective suggestions.

Enclosed also are two groups of photos. One group marked with numbers which are referenced in this report, and a second group of additional photos for your use.

Hopefully we may be able to serve you in the future in executing construction documents for the renovation of this project, or for other work that the City of Burlington may need.

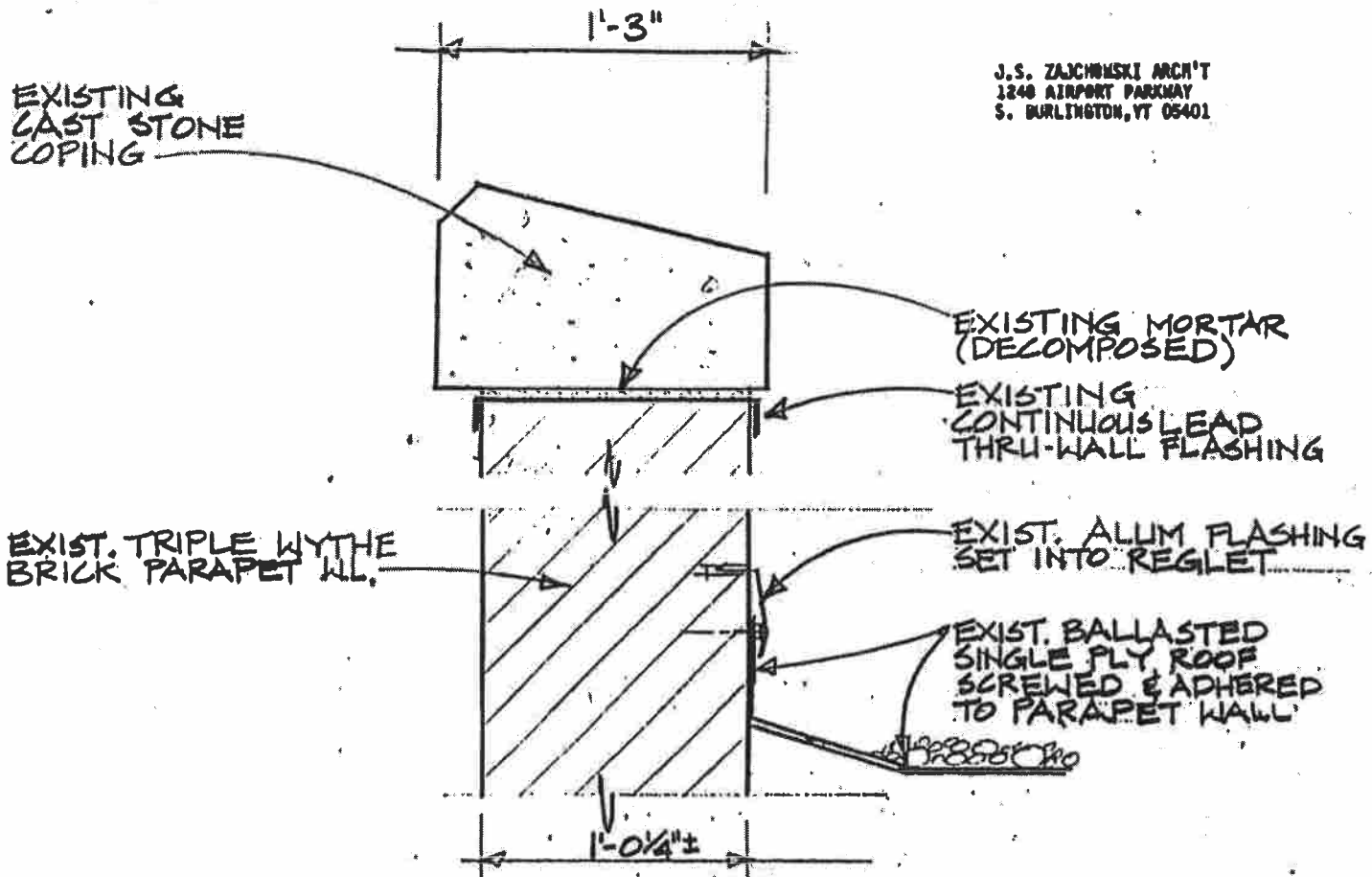
Yours truly,



Joseph S. Zajchowski
Architect

JSZ/tlc

J.S. ZAJCZYNSKI ARCH'T
1240 AIRPORT PARKWAY
S. BURLINGTON, VT 05401



EXISTING
CAST STONE
COPING

EXISTING MORTAR
(DECOMPOSED)

EXISTING
CONTINUOUS LEAD
THRU-WALL FLASHING

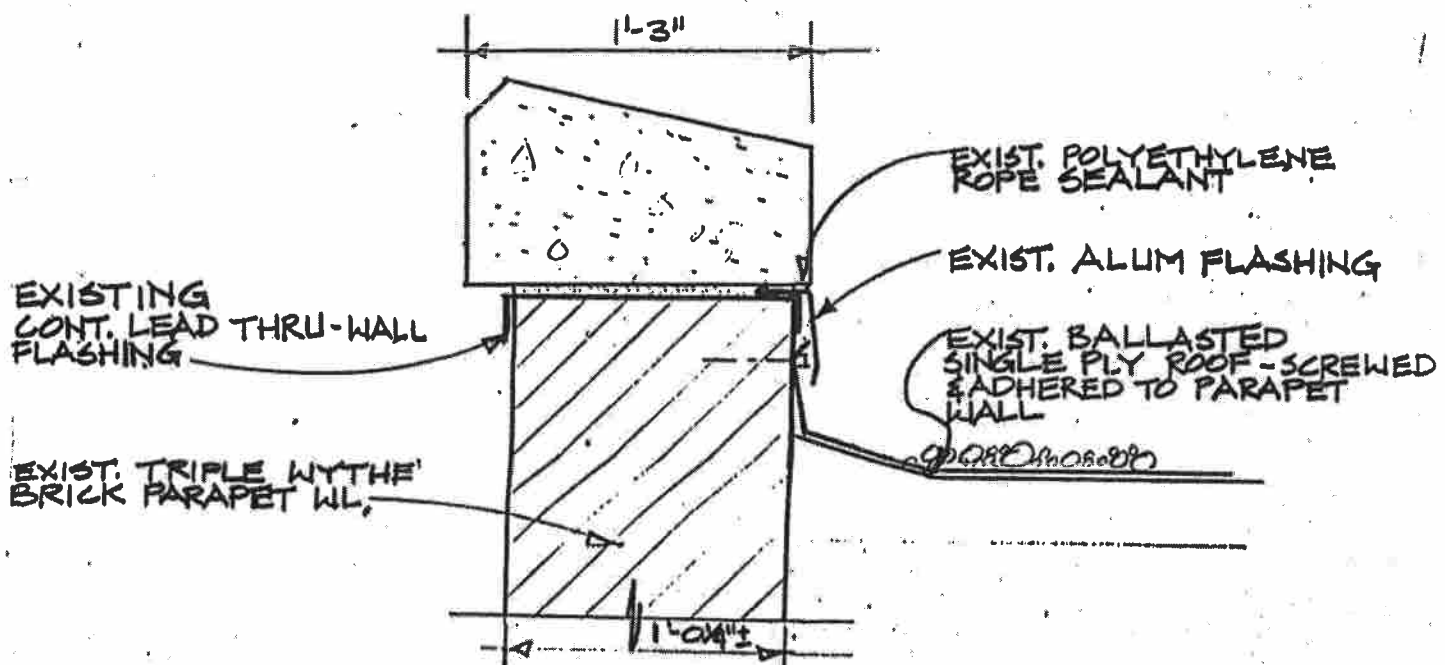
EXIST. TRIPLE WYTHE
BRICK PARAPET WL.

EXIST. ALUM FLASHING
SET INTO REGLET

EXIST. BALLASTED
SINGLE PLY ROOF
SCREWED & ADHERED
TO PARAPET WALL

Ⓐ TYPICAL PARAPET WALL
SCALE: 1/2" = 1'-0"

SKETCH NO. 1



EXISTING
CONT. LEAD THRU-WALL
FLASHING

EXIST. POLYETHYLENE
ROPE SEALANT

EXIST. ALUM FLASHING

EXIST. TRIPLE WYTHE
BRICK PARAPET WL.

EXIST. BALLASTED
SINGLE PLY ROOF - SCREWED
& ADHERED TO PARAPET
WALL

Ⓑ TYPICAL LOW PARAPET WL. - SOUTH SIDE
SCALE: 1/2" = 1'-0"

SEPT. 19, 1991

JOSEPH S. ZAJCHOWSKI

A R C H I T E C T

1240 airport parkway

south burlington, vermont 05403

(802) 863-6863

September 24, 1991

Mr. Steven Goodkind, City Engineer
City of Burlington
P.O. Box 849
Burlington, VT 05402-0849

RE: Memorial Auditorium Weathering Analysis

Dear Mr. Goodkind:

As requested, please find enclosed a suggested priority list for the rehabilitation of Memorial Auditorium exterior.

If you have any questions, please contact my office.

Yours truly,



Joseph S. Zajchowski
Architect

JSZ/tlc

SUGGESTED PRIORITY LIST FOR REHABILITATION OF
MEMORIAL AUDITORIUM EXTERIOR

1. Repair existing single ply roofing and roof flashing at parapet walls where it has pulled away from wall attachment.
2. Remove, repair and reset all cast stone coping at top of parapet wall.
3. Repair and repoint any brick work in vicinity of cast stone coping and cast stone bands, including rebuilding of brick chimney at northwest corner of roof.
4. Repair all deteriorated portions of cast stone bands at top of building, and point and caulk all joints in such bands.
5. Clean entire upper portion of masonry walls (from top of wall down to approximately second cast stone band), and seal all such cleaned areas with a water repellent coating.
6. Replace steel lintels where necessary, clean and remove rust from all others and repaint all lintels.
7. Point and caulk all joints in cast stone band above lower level windows
8. Replace or repair steel windows as necessary, caulk all perimeter joints and repaint all windows.
9. After all masonry and cast stone has been pointed, clean portion of masonry walls that were not cleaned in item 5 and seal all such walls with a water repellent coating.

Respectfully submitted,



Joseph S. Zajchowski
Architect

JSZ/tlc

p.c. Durbrown Associates - Al Lesage
Farrington Construction - Dave Farrington Sr.
City of Burlington - Lee Alberry