4524 Highway 61 White Bear Lake, MN 55110 Phone: (651) 429-3323 Fax: (651) 429-2387

July 26, 2011

Honorable Chris Coleman Mayor – City of Saint Paul, and Members of the Saint Paul City Council 15 W. Kellogg Blvd., Suite 390 St. Paul, MN 55102

Subject:Our client: Richard and Nancy Nicholson – 260 Summit Avenue<br/>Correction Notice issued regarding Walnut Street StairwayCouncil File:11-127250Hearing Date:August 3, 2011

Dear Mayor Coleman, Council President Lantry and Members of the St. Paul City Council:

Our firm represents Richard and Nancy Nicholson, the owners of 260 Summit Avenue, in regard to their appeal of a Correction Notice they received dated April 18, 2011, related to the historic Walnut Street stairway located on the City easement over the Nicholson property located at 260 Summit Avenue.

A significant portion of the stairway wall is structurally insufficient and in need of repair and maintenance in order to protect public safety. The City has taken the position that the Nicholsons are required to complete and pay the cost of the necessary repairs. It is the Nicholsons' position, based upon the original easement grant to the City and historical facts relating to repairs of this public improvement, that, as a matter of law, responsibility for the repair rests with the City of St. Paul, subject to reasonable contribution from our client to the extent of any benefits received from any improvement. The hearing officer has recommended denial of our appeal.

Rather than pursue this matter as a citation resulting in possible civil or criminal prosecution, we believe it would be in the best interest of the City and our clients to reach an agreement, consistent with law, which would provide for the future maintenance and repair of the stairway.

We request consideration of the following in regard to this appeal before the City Council:

#### HISTORY OF WALNUT STREET STAIRWAY

In 1891, James J. Hill built his historic mansion located at 240 Summit Avenue. Thereafter, in 1898, he purchased the adjacent property located at 260 Summit Avenue, for his son, Louis Hill. Prior to construction of a new home on the site, Mr. Hill petitioned the City of St. Paul to vacate Walnut Street which at that time ran between Summit Avenue and Irvine Avenue. In a Resolution adopted by the Board of Aldermen on August 6, 1901, Walnut Street was vacated, subject to certain conditions. The relevant portions of the Resolution read as follows:

"That there shall be and is granted and reserved to the public for all time the right to travel on foot upon and over the portion of said Walnut street, ten feet in width, extending along the northeasterly line thereof, and that the said Mary T. Hill and James J. Hill at their own cost and without any expense to the city, immediately upon the passage of this resolution shall build a suitable stairway, ten feet in width, to be used for the accommodation of foot passengers along the northeasterly line of the present Walnut street, between Summit Avenue and Irvine avenue, as aforesaid, the said stairway to be constructed of stone, iron or such other suitable and durable material as the Commissioner of Public Works of the City of St. Paul shall direct and to be built according to a plan or design therefor to be prepared and approved by said Commissioner."

Although the improvements were built at the sole cost of the Hill family, maintenance was reserved to the City of St. Paul. The Resolution provides:

"Said Mary T. Hill and James J. Hill shall file in the office of the City Clerk their written acceptance hereof, to be approved by the Corporation Attorney, including an agreement upon their part to keep and abide by all the conditions and requirements herein contained, also including therein the **grant to said city for public use of the right to maintain said stairs on the easterly ten feet of said vacated street for foot travel thereon as herein provided**." *(emphasis added)* 

Thereafter, James J. Hill and Mary T. Hill signed a grant of easement on September 17, 1901, granting the public easement required by the vacation resolution and the stairway and appurtenant wall were constructed.<sup>1</sup>

The entire stairway wall which represents the westerly boundary of the stairway is located within the ten-foot easement granted by James J. Hill and Mary T. Hill.<sup>2</sup>

### **REPAIR HISTORY OF WALNUT STREET STAIRWAY**

From the time the improvements were completed in the early part of the twentieth century through 2008, repairs were made by the City of St. Paul. Available records confirm that the City assumed the cost of repairs to the stairway between 1990 and 2008, including repairs to the stairway wall.<sup>3</sup> City records dating back to 1976 outline repairs to be made to the stairway and wall at that time.<sup>4</sup> The City has provided no records showing repairs or maintenance to the stairs or wall by the owners of 260 Summit Avenue from the time the present wall was completed through 2008.

<sup>&</sup>lt;sup>1</sup> The hearing officer, based on Sandborn Fire Insurance Maps (1903-1925), raised the possibility that the original stairway was reconstructed within a short time after the original construction. There is no clear record of what occurred, however, it must be assumed that any reconstruction was also approved by the City. There are no records indicating that the existing structure was not built in accordance with a design approved by the City.

<sup>&</sup>lt;sup>2</sup> See survey prepared by Precision Surveys, Inc., dated April 22, 1997, attached hereto as Exhibit A, which shows the location of the stairway wall within the City easement.

<sup>&</sup>lt;sup>3</sup> See Walnut Street maintenance cost summary prepared by City Bridge Inspector Kevin L. Nelson dated November 26, 2008, attached hereto as Exhibit B, detailing the cost of repairs to the stairway and wall by the City between 1990 and 2008.

<sup>&</sup>lt;sup>4</sup> See Department of Public Works project estimate dated June 24, 1976, attached hereto as Exhibit C, setting forth repairs to the stairway and wall.

The current dispute between the City and my clients originated in 2004 when the northerly portion of the wall collapsed. There were meetings between City staff and my client at that time to discuss responsibility for repair of the wall. No agreement was reached and in 2008 the City issued a citation to Mr. Nicholson. In response to the 2008 citation, and without advice of counsel, Mr. Nicholson signed a contact to make repairs to the stairway and wall under the assumption that there would be a contribution by the City for the cost of repairs. The contractor, Mr. Nicholson's architect, and the staff of the City of St. Paul Public Works worked together on this project. Mr. Nicholson acknowledges that the City contributed labor to the repairs having a value of approximately \$47,000 including work for removal of debris from the collapsed wall and replacement of sidewalk. The total cost of the repair work completed by the contractor (exclusive of City work) was \$182,687 and Mr. Nicholson assumed that the City would pay a greater portion of this work to the extent it was benefit to the existing public improvement. The City made no additional contribution to the 2008 improvement and took the position that it had no obligation under the existing easement to repair the wall and argued, that in any event, the City was precluded from paying for repair work under the theory that such payment, without prior legislative approval, would infringe upon the City legislative process. Thereafter, in a letter dated February 17, 2009, directed to Mayor Chris Coleman the Nicholsons advised the City of St. Paul that they would pay no additional costs related to the repair of the stairway unless there was an agreement between the City and the Nicholsons regarding the appropriate allocation of costs or a court determination as to responsibility for maintaining this public improvement.<sup>5</sup>

## THE WALNUT STREET STAIRWAY WALL PROVIDES A PUBLIC BENEFIT

The stairway wall, which is the subject of this controversy, is appurtenant to and an integral part of the construction of the staircase. My clients acknowledge they receive some benefit from this wall as it provides a privacy barrier and esthetic appeal. At the same time, this wall is an important part of the foundation of the staircase and necessary for public safety. As recently as 2008, Bruce Beese, Director of Public Works, acknowledged in a letter that the wall is necessary as a retaining wall to protect the public stairway. Mr. Beese provided a diagram detailing the structural portions of the wall which serve as a necessary retaining wall.<sup>6</sup>

Furthermore, Kevin L. Nelson, PE, City Bridge Inspector, at a time in 2004 when he was submitting wall work as a capital project, acknowledged that "the lower portion of the wall does retain earth to provide function for the public stairway..."<sup>7</sup>

We are also attaching a report prepared by Meghan Elliott, a structural engineer with Meyer, Borgman, Johnson which concludes that the wall provides structural function to the public stairway as the stairway pavers are directly supported on the masonry wall and the wall serves as a retaining wall where the stairway pavers are below-grade.<sup>8</sup> The wall also functions as a guardrail where the stairway pavers are located above-grade. The structural engineer also sets forth her opinion that the wall, at balanced soil areas, is currently in poor condition and "structurally insufficient to resist code-level windloads in the current condition" and, in areas where the wall is retaining soil, is "structurally insufficient to support code-level lateral forces due to wind and soil pressures." The structural

<sup>&</sup>lt;sup>5</sup> See February 17, 2009, letter to Mayor Coleman, attached hereto as Exhibit D.

<sup>&</sup>lt;sup>6</sup> See September 11, 2008, letter and attachment from City Director of Public Works Bruce Beese, to Carol Carey, Historic St. Paul Corporation, attached hereto as Exhibit E.

<sup>&</sup>lt;sup>7</sup> See September 17, 2004, letter from Kevin L. Nelson, PE, City Bridge Inspector, to Richard Nicholson, attached hereto as Exhibit F.

<sup>&</sup>lt;sup>8</sup> See letter from Meghan Elliott, Structural Engineer dated July 25, 2011, and attached as Exhibit G.

engineer also concluded that "Immediate repairs are recommended to prevent further failure of the wall, such as additional loss of masonry material, continued horizontal movement of the wall, or partial to full collapse of the retaining wall sections." Obviously, any loss of masonry material or full or partial collapse of the wall would impact the public stairway. Clearly the wall is in need of structural repair and such repairs are necessary to protect public safety and to protect both Nicholsons and the City from potential liability.

# **2011 CITATION**

In the spring of 2011 it was evident that additional portions of the stairway wall were deteriorating and the City of St. Paul issued the citation to Mr. Nicholson which is the subject of this appeal. For reference, we are attaching pictures taken on May 13, 2011 which show the deteriorating wall from both the south and north sides.<sup>9</sup> These pictures indicate a wall that is deteriorating as a result of its age and damage from the elements and winter salt. The pictures show significant deterioration in brick and holes in the wall where bricks are falling out. The pictures also indicate a serious bulging of the wall on the north side. As set forth above and detailed in the report of structural engineer Meghan Elliott, the wall is currently unstable and in need of repair. Based on the cost of repair in 2008, it is clear that the current cost of stabilizing the wall will be significant.

# UNDER APPLICABLE LAW THE CITY, AS OWNER OF THE EASEMENT, HAS THE RESPONSIBILITY TO REPAIR THE WALL

Our firm and the Office of the City Attorney are setting forth the same general principals of law pertaining to the allocation of repair and maintenance responsibilities between the City of St. Paul and the Nicholsons. We have both cited the restatement of law – property restatement of law third (servitudes), Section 4.13 (2000) as the law which applies to this easement. The applicable law states as follows:

"...[D]uties to repair and maintain the servient estate and the improvements used in the enjoyment of a servitude are as follows:

(1) The beneficiary of an easement or profit has a duty to the holder of the servient estate to repair and maintain the portions of the servient estate and the improvements used in the enjoyment of the servitude that are under the beneficiary's control, to the extent necessary to (a) prevent unreasonable interference with the enjoyment of the servient estate, or (b) avoid liability of the servient-estate owner to third parties.

(2) ... [T]he holder of the servient estate has no duty to the beneficiary of an easement or profit to repair or maintain the servient estate or the improvements used in the enjoyment of the easement or profit.

(3) Joint use by the servient owner and the servitude beneficiary of improvements used in enjoyment of an easement or profit, or of the servient estate for the purpose authorized by the easement or profit, gives rise to an obligation to contribute jointly to the costs reasonably incurred for repair and maintenance of the portion of the servient estate or improvements used in common." (*emphasis added*)

In an opinion issued by the City Attorney in 2004, the Assistant City Attorney agreed that the City's duty to maintain the stairway require the City to do so in a manner consistent with the above stated

<sup>&</sup>lt;sup>9</sup> See photos attached hereto as Exhibit H.

principle of law. The City Attorney stated at that time: "Therefore, the City's duty to maintain this stairway require the City to do so in a way that (a) does not unreasonably interfere with the Nicholsons' use of their property and (b) avoids liability of the Nicholson's to third parties." Under the current facts of this appeal, the present condition of the wall is structurally insufficient and needs to be repaired in order to prevent potential liability which would result from wall material falling upon the stairway. Under these facts, the City is obligated as a matter of law to undertake this repair in order to avoid liability of the Nicholsons to third parties. At the same time, the Nicholson agree, in conformance with above stated law, that they have a responsibility to contribute to the costs of such repair to the extent their property is benefited by any such improvement.<sup>10</sup>

### **CONCLUSION**

The City of St. Paul vacated Walnut Street in exchange for an agreement by the Hill family to build the necessary improvements and grant an easement to the City for access and repair. Under applicable law it is the responsibility of the City to maintain the improvements located on this easement to avoid liability which may be incurred by the Nicholsons in the absence of such maintenance. The Nicholsons agree that they receive some benefit from the wall and are obligated for costs associated with that benefit.

In our view this is not a matter which should be referred for citation and possible civil or criminal prosecution. We believe it would be in the best interest of the City and the Nicholsons to sit down and reach an agreement, consistent with law, to provide for the future maintenance and repair of the wall.

Thank you for your consideration.

Yours truly,

Muche & them.

Michael C. Fleming

MCF: kb

Encl.

<sup>&</sup>lt;sup>10</sup> See *Bengtson v. Marine on St. Croix*, 310 Minn. 508, 246 N.W.2d 582 (Minn. 1976). If the costs are to be shared, improvement must be made by the City so that appropriate legislative process is followed. A landowner may not make repairs and then seek reimbursement from the City.

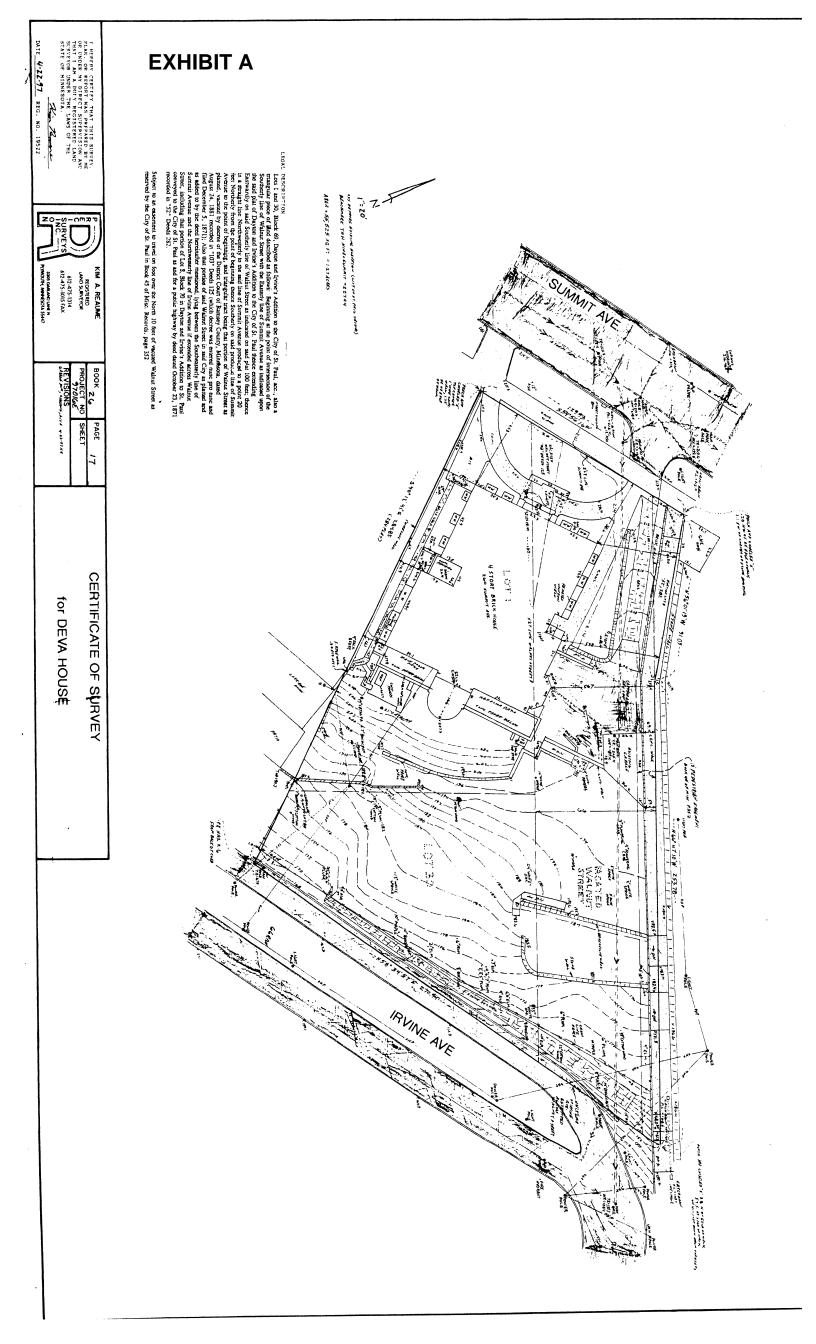


EXHIBIT B

#### Walnut Stairway Maintenance Cost Summary

Year	Mainte Proj	enance ects		aning Snow	Description of Work
1990	\$ 12	20,355	\$	650	Repair of the upper stairway and wall at Summit, Repair of fencing at lower portion at Irvine
1991	\$	7,992	\$	650	Steirway tread repair
1992	\$	346	\$	650	Clean Stalway
1993	\$	6,567	\$	<u>650</u>	Graffiti lower portion at Irvine
1994	\$	1,701	\$	650	Brushing and Cleaning
1995	\$	3,723	·\$	650	Graffiti mostly and cleaning
1996	\$	2,051	\$	650	Graffiti and masonry repair
1997	\$	2,029	\$	650	Graffiti and cleaning
1998	\$	1,152	\$	650	Graffiti and cleaning
1999	\$	1,567	\$	650	Graffiti
2000	\$	806	\$	650	Gratfiti
2001	<u>\$</u> .	2,866	\$	650	Graffiti and concrete stair tread repairs
2002	<b>\$</b> .	13,715	\$	650	Graffiti, cleaning, brushing, erosion control, stair tread repairs
2003	\$	1,533	\$	650	Repairs and cleaning
2004	\$	6,866	\$	650	Stairway tread repair
2005	\$	·	\$	650	No special work
2006	\$	2,447	\$	650	Brushing and Graffil
2007	\$	<u>.</u>	\$	650	No special work
2008	\$	58,184	\$	650	Remove masonry debris, Repair stair treads, replace sidewalk on Summit, reset stone curbing on Summit, overlay driveway apron.

\$ 233,900 \$ 12,350 Subtotal

\$246,250 Total Maintenance Costs 1990 - 2008 (in 2008\$)

\$ 12,961 Average Annual Maint in (2008\$)

Note: All costs in 2008\$. Annual inflation computed at 2.79% based on billing wage rates.

prepared by Kevin L Nelson, PE November 26,2008

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# LAW OFFICE OF MICHAEL C. FLEMING

4524 Highway 61 White Bear Lake, MN 55110 Phone: (651) 429-3323 Fax: (651) 429-2387

February 17, 2009

Honorable Chris Coleman Mayor – City of St. Paul 15 W. Kellogg Blvd – Room 390 St. Paul, MN 55102

RE: 260 Summit Avenue My Clients: Richard and Nancy Nicholson

Dear Mayor Coleman:

On behalf of my clients, I want to thank you and your staff for taking the time to meet with us to discuss responsibility for repairs to the historic Hill Stairway, which were completed in 2008.

We had hoped through these discussions to come to an agreement as to the manner in which repairs to the stairway and wall could be allocated between my clients and the City of St. Paul. It has not been possible to reach an agreement.

When Walnut Street was vacated on August 17, 1901, the City reserved a perpetual easement for the benefit of the public along the northeasterly ten feet of 260 Summit Avenue. The Hill family was required to build a "suitable stairway" for use **by the public** within the easement according to plans approved by the City of St. Paul at that time. Under basic principals of law, the City has the responsibility to repair and maintain a public improvement located upon an easement. It is hard to deny that the stairway is a "public improvement", that the wall is an integral part of the stairway, and that it was approved as such by the City of St. Paul at the time it was constructed. Accordingly, the basic obligation to repair the wall and stairway should rest with the City.

The City is taking the position that their obligation to repair and maintain this improvement is *limited solely to the step portion* of the stairway and not the wall. We do not believe this is a reasonable interpretation given the manner in which the improvement was constructed and historical facts which indicate that the City of St. Paul has maintained both the stairway and wall in the past. As an example of past City maintenance, we are attaching a summary of maintenance, prepared by St. Paul Public Works, which details City maintenance of the wall and stairway during the years 1990 - 2008.

Upon the recent collapse of the wall, Mr. Nicholson, responding to City letters threatening a citation, and in the interest of having the repairs completed to "dress up the City" prior to the arrival of the RNC, retained a contractor to make repairs to the stairway and wall under the assumption that there would be reasonable contribution by the City for the cost of repairs. The contractor, Mr. Nicholson's architect, and staff from St. Paul Public Works worked together on this project. Mr. Nicholson acknowledges that the City contributed labor to the repairs, having a value of approximately \$47,000, including work for removal of debris from the collapsed wall and replacement of sidewalk. The total

cost of the repair work completed by the contractor (exclusive of City work) was \$182,687 and Mr. Nicholson assumed that the City would pay a greater portion of this work to the extent it was a benefit to the existing public improvement. The City continues to maintain that it has no responsibility for the wall and that the City is precluded from paying for the repair work under the theory that such payment, without prior legislative approval of the project, would infringe upon appropriate City legislative process.

Mr. Nicholson has made payment to the contractor for the recent repairs based upon his contractual payment obligation incurred as a result of initiating this project. This payment is not an acknowledgement of any responsibility for these or future repairs, or an assumption of the City's legal obligation to maintain and repair the stairway as a public improvement. Mr. Nicholson hereby places the City of St. Paul on notice that he reserves the right to seek contribution for his expenditure and that he will pay no additional costs related to the repair of the stairway unless there is either a reasonable agreement between the City and the Nicholsons regarding the appropriate allocation of costs, or court determination as to responsibility for maintaining this public improvement.

Yours truly,

Much (7 lom) Michael C. Fleming

MCF:kb

Cc: Client Lisa Veith - St. Paul City Attorney's Office Kevin Nelson - St. Paul Public Works

#### Walnut Stairway Maintenance Cost Summary

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Note: All costs in 2008\$. Annual inflation computed at 2.79% based on billing wage rates.

prepared by Kevin L Nelson, PE November 26,2008

# **EXHIBIT E**

DEPARTMENT OF PUBLIC WORKS Bruce Beese, Director



# CITY OF SAINT PAUL

Christopher B. Coleman, Mayor

1500 City Hall Annex 25 West Fourth Street Saint Paul, Minnesota 55102-1660 Fax: 651-266-6222

September 11, 2008

Carol Carey Historic Saint Paul Corporation 318 Landmark Center 75 West Fifth Street Saint Paul, MN 55102

Re: Walnut Street Steps #ST083

Dear Ms. Carey:

The Walnut steps are a public starway built in 1901 by agreement between the City and James J Hill. The brick wall that abuts the stairway and the residence at 260 Summit partially collapsed last fall. The wall is partly a retaining wall that supports the stair way and partly a privacy wall for the residence. The property owner secured an architect and contractors to reconstruct the wall. They worked closely with the City and the Heritage Preservation Commission to preserve the historic nature of the wall. The City hadrequested funding to share costs of repair with the homeowner through the Capital Improvement Budget process. The funding request was unsuccessful. Since the City could not offer capital money for the cost of the reconstruction, we offered labor from their bridge maintenance forces. The City has agreed to the following: tuck point the remainder of the brick wall that remains in place on the public side of the wall, repair and reset the stone steps and landings, replace the walk along Summit Ave. in the area of the steps and driveway, and reset the stone curbing of the driveway apron.

The City has an interest in preserving the public stairway. In order to do that, there is a clear public interest in the portion of the wall that is structurally designed as a retaining wall for the property at 260 Summit. Any public investment should be limited to that portion of the wall, and any improvements or rehabilitation that may be done on the portion above ground level at 260 Summit are the sole responsibility of the property owner at that address. Please refer to the attached drawing that shows the two distinct portions of the wall - structural and non-structural.

The City of Saint Paul supports the assistance of Historic Saint Paul in efforts to secure funds required to reconstruct the historic retaining wall adjacent to the Walnut Street Steps.

Carol Carey September 11, 2008 Page 2

The stairway is an important piece of public infrastructure that connects Summit Avenue atop the bluff and Irvine Avenue below it and lies within the Summit Avenue Historic District.

Any assistance Historic Saint Paul could provide to this project would be greatly appreciated.

Sincerely,

nose

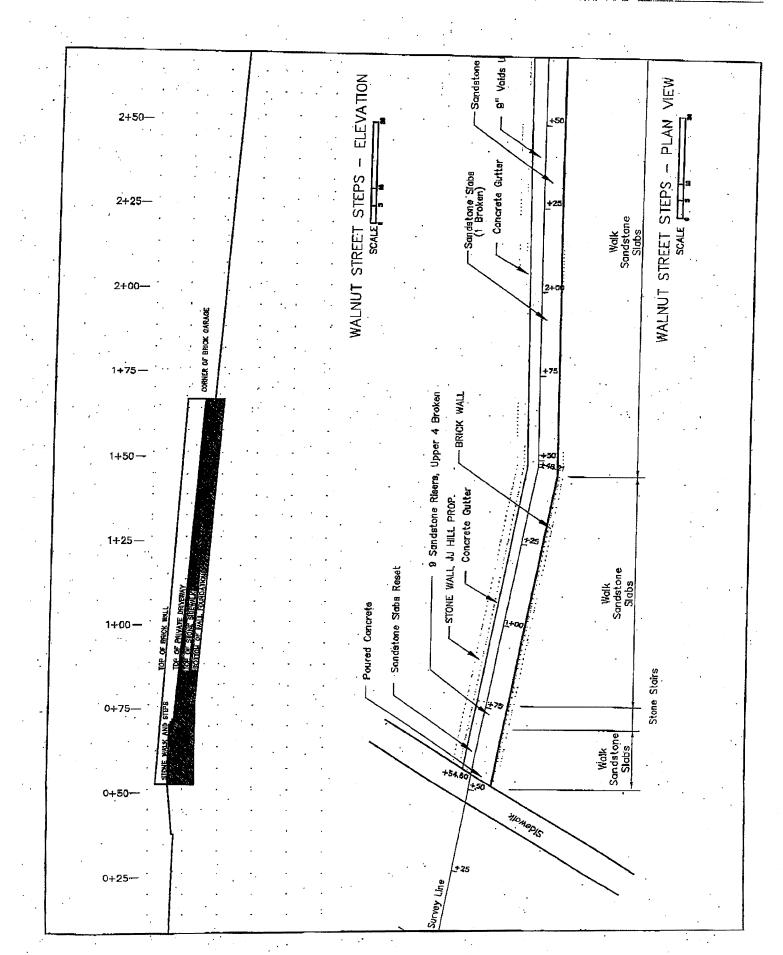
Bruce Beese Director of Public Works

Enc.

cc: Kevin Nelson, Bridge Division

FRJM :HSP

FAX NO. :6517783



# **EXHIBIT F**

DEPARTMENT OF PUBLIC WORKS Robert Sandquist, Director



CITY OF SAINT PAUL Randy C. Kelly, Mayor

1000 City Hall Annex 25 West Fourth Street Saint Paul, Minnesota 55102-1660 Fax: 651-292-7857

September 17, 2004

Richard Nicholson 260 Summit Ave Saint Paul, MN 55102

Re: Brick Wall along driveway at 260 Summit Ave adjacent to Walnut Steps

Dear Mr. Nicholson,

We have reviewed your attorney's request and your contractor's estimate to reconstruct the referenced wall. We find that the City has no obligation to replace the wall.

However, we are willing to submit this work as a Capital Project since the lower portion of the wall does retain earth to provide function for the public stairway and you do plan to reconstruct it. The upper portion of the wall is essentially a privacy fence. Therefore we are submitting for half of the estimated wall project cost \$125,000 or \$62,500. Capitol Project submittals are being solicited from October through January 1, 2005. Funding will be decided by the City Council and Mayor later next fall. If the solicitation is successful, the funding becomes available in 2006 or 2007.

Sincerely,

Kevin L Nelson, P.E.

City Bridge Engineer

Enclosures

cc: Gar Hargens, Close Architecture Richard Kiemen, K M Building Co Lisa Veith, Asst. City Attorney

attachments

Employee Pride

# **EXHIBIT G**

# MEYER BORGMAN JOHNSON

STRUCTURAL DESIGN + ENGINEERING

July 25, 2011

Richard Nicholson c/o Kristine R. Johnston PAN Inc. 6 West Fifth Street, Suite #200 St. Paul, MN 55102 Tel. 651-290-0549 krj@draftco.net

cc: Michael Fleming, Law Office OF Michael C. Fleming

RE: Walnut Street Stairway MBJ Project No.: 11.538.0

Dear Mr. Nicholson,

Thank you very much for contacting us regarding the existing brick masonry wall located along the Walnut Street walkway and historic Hill Stairway in St. Paul, Minnesota. Meyer, Borgman and Johnson (MBJ) has provided structural engineering services for other portions of the wall, and we appreciate the opportunity to continue to work with you.

The purpose of this assessment is to evaluate the wall for structural integrity and to quantify its function with respect to the surrounding landscape and pavers. The pre-project visit took place on July 14, 2011 and included a walk-around of the wall, stairway, and adjacent landscape. Those present included Kris Krol (MBJ), Meghan Elliott (MBJ), Michael Fleming, John Ryan, and Kristine Johnson. The wall survey was performed on July 18, 2011 by Kris Krol and Kasey Gilbertson (MBJ). The wall was measured and visually observed along an approximately 150-foot long wall section from the south-east corner of the garage at 260 Summit Avenue to the lower end of the wall. The survey focused on establishing grade elevations on both sides of the wall, measuring wall out-of-plane displacement (vertical plumbness), and observing the wall for any structural deficiencies. Tools used to gather data included a conventional tape measure, laser measuring device, laser level, and digital camera.

The wall was found to be in very poor condition. The wall lacks sufficient structural capacity to resist current code-level wind, soil, and guardrail loads. Immediate repairs are recommended to prevent further failure of the wall, such as additional loss of masonry material, continued horizontal movement of the wall, or partial to full collapse of the retaining wall sections. Our observations, conclusions, and recommendations are outlined in detail below.

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### **OBSERVATIONS**

- 1) The wall is composed of three wythes of brick with a clay tile cap. The average wall height above the top of the Walnut Street walkway is approximately 7.5 feet. The height of the wall generally follows the slope and steps of the Walnut Street walkway.
- 2) The wall was observed to retain soil at two locations; the wall retains the soil located under the Walnut Street walkway. The lengths of the wall sections retaining soil measured 17 feet and 19 feet. The height of the soil retained varied from 0 feet to approximately 11 feet with an average retained soil height of 5 feet. These wall sections are located along the Walnut Street stair steps (see Conclusion 1 below for additional information). The remainder of the wall has a fairly balanced soil condition with the elevation of the Walnut Street pavers at approximately ±1 foot above the grade on the private residence side. See attached sketch.
- 3) The Walnut Street pavers are supported directly on the masonry brick wall. They appear to bear on one wythe of brick. However, the exterior wythe of brick directly above the pavers was generally observed to be deteriorated with missing mortar and up to 1 inch of continuous vertical separation. Several sections of the wall were observed at which the first two layers of the exterior wythe of brick above the pavers were missing or loose; this was a typical condition at the stair steps.
- 4) Out-of-plane wall "bulging" (lateral movement) towards the private residence side was observed along the length of the wall at the approximate height of the Walnut Street paver bearing. The bulge was measured to be approximately 3 feet high with varied lateral displacement from approximately 1/2 inch up to 2 inches with respect to the location of the face of the wall at grade. The bulging is not present at the two locations where an intersecting perpendicular wall is present.
- 5) Isolated areas of loose bulging brick in the exterior wythes were observed throughout the wall, often accompanied by diagonal cracks.
- 6) Two wall areas measuring approximately 4 square feet each were observed to have lost all three wythes of brick. The wall around these openings appeared to be significantly deteriorated. Additionally, diagonal cracks in the wall were noted to propagate from the opening corners.
- 7) Approximately 60 percent of the wall was observed to have substantial mortar loss. Periodic diagonal, horizontal and vertical cracks were spotted typically at the wall infills or areas where previous wall repairs took place.
- 8) Efflorescence, white powdery mineral deposits that are formed on the walls as water migrates through and evaporates leaving minerals behind, was noted on both sides of the wall but primarily on the private residence side. The intensity and location of efflorescence varies throughout the wall with the most consistent pattern following the bearing elevation of the Walnut Street pavers.

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### CONCLUSIONS

- I. For the purpose of this evaluation, the wall is classified as having two different types:
  - a. The "typical" wall describes the majority of the length of the wall. The soil is relatively balanced on each side of the wall with the difference in grade on each side of the wall between 0 and 12 inches. The wall supports the Walnut Street walkway pavers. The "typical" wall height is approximately 7.5 ft above the top of the pavers.
  - b. The "retaining" wall is located along the stair-stepped areas of the Walnut Street walkway. (See attached sketch.) In addition to supporting the walkway pavers, the wall section below the pavers acts as a "retaining" wall and the wall section above the pavers acts as a guardrail. (See Observation 2 above.) At the "retaining" areas, the grade difference on each side of the wall varies from 0 feet to approximately 11 feet with an average retained soil height of 5 feet. Because of the grade difference between the two sides of the wall, the wall acts as a guardrail. The wall supports the walkway pavers in the same manner as the "typical" wall.
- II. The brick masonry wall is in poor condition. "Poor" condition is defined by the American Society of Civil Engineers Standard 41-06 as: "Masonry found during condition assessment to have degraded mortar, degraded masonry units, or significant cracking".
- III. The masonry brick wall has been severely affected by water migration into and through the wall. Indications of water include loss of mortar, cracking, and efflorescence. Locations for water entry include the top of the wall, especially at cracked or missing tile caps, as well as the level at which the walkway pavers bear on the brick wall. Loose or missing brick at the pavers along with missing mortar allows water from rain or melting snow to enter the wall. Water contributes to deterioration of the wall by accelerating mortar deterioration, and contributing to freeze-thaw damage.
- IV. The support and connection of the Walnut Street pavers could contribute to the "bulging" pattern of the wall. Water entering the wall at the paver level accelerates the loss of mortar in this area. Bulging could be attributed in part to freeze-thaw action at this level. Furthermore, any lateral movement of the pavers is directly translated to the masonry wall. Lateral movement can be caused by the expansion of freezing water trapped on the opposite end of the pavers where they lean against a thicker stone retaining wall. Likewise, the bulging was not present where the brick masonry wall is supported by the perpendicular stone retaining walls; the perpendicular retaining walls provide sufficient resistance to any lateral forces imparted by the pavers.
- V. The majority of diagonal cracks observed in the wall are most likely caused by a combination of out-of-plane displacement of the wall and accelerated by deteriorating wall mortar. Possible settlement of the wall foundations cannot be excluded; however, the majority of any vertical settlement most likely occurred at the time of construction. Vertical cracks are most likely caused by thermal expansion and contraction; no expansion joints were observed along the entire 150 foot long wall. Cracks were observed along the jambs of the infilled wall openings, which is

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the point at which the wall would most likely crack to relieve pressure due to seasonal fluctuations.

- VI. The wall was analyzed for current code-level forces due to soil, and wind. Masonry capacities were based on recommended values defined by the American Society of Civil Engineers Standard 41-06. Soil type and pressure values were assumed to be comparable to a saturated granular sand. Final and more definitive calculations would require a verification of the soil type. Likewise, foundation details were assumed to be similar to the wall to the north of the garage where significant excavation and reconstruction was done in 2008.
  - a. The walls at the balanced soil areas are structurally insufficient to resist code-level wind loads in the current condition. A well-maintained masonry wall in "good" condition would have sufficient capacity to resist current code-level wind loads.
  - b. For the sections of wall that are retaining soil, the wall is significantly structurally insufficient to support code-level lateral forces due to wind and soil pressures. Without geotechnical verification, soils were assumed to be a saturated granular sand with density equal to 130 pounds per cubic foot. The wall has most likely been able to function as a retaining wall in the past due to the following: better condition of masonry with a higher capacity, possibly less original retained soil height as noted by the location of original door thresholds for openings in the wall, and incidental wall lateral support provided by the pavers.
  - c. Additionally, the wall was checked for the code-required guard rail loads at the retaining wall areas and was similarly found to have insufficient structural capacity to act as a guardrail.

The wall is structurally insufficient to resist code-level wind, soil, and guardrail forces. Maintenance and repair should be provided in order to prevent additional failures of the wall both at the "typical" and "retaining" areas. (See Recommendations section below.) Wall failure includes additional loss of masonry material in local areas, continued horizontal movement of the wall (such as bulging), or partial to full collapse of the wall at both the "typical" and "retaining" sections.

### RECOMMENDATIONS

- i. At the "typical" wall conditions, where the soil is balanced on each side, the wall can most likely be repaired to restore structural integrity. Repair would include:
  - a. Limited geotechnical investigation to confirm the soil type and foundation details;
  - b. Evaluation of water-tightness at the wall cap with repair or replacement as required;
  - c. Full re-pointing of both faces of the wall. A qualified preservation architect should be consulted to determine a mortar composition that is compatible with the existing brick units;
  - d. Replacement of missing and cracked bricks;
  - e. Removal and re-building of the wall at areas of significant bulging. Shoring of the wall would be required. The extent (height and length) of the area to be re-built would have to be determined in a more detailed investigation;

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f. Horizontal Separation of the walkway paver support from the wall to eliminate lateral forces. It may be necessary to provide new vertical support for the pavers;

g. Provide control joints to accommodate thermal fluctuations and clay masonry expansion. Alternatively, the wall could be removed in these locations. The wall removal may be subject to approval by the City of St Paul or Heritage Preservation Commission.

- ii. At the "retaining" wall areas, strengthen or replace the wall.
  - a. In-place strengthening would require all of the "repair" items noted in recommendation (i), with the addition of adding wall capacity. Additional wall capacity could be provided by adding steel reinforcement within the wall, or adding additional wall width (such as concrete or brick clad concrete). The wall footing may also need to be strengthened. A geotechnical engineer should be consulted to determine the soil type and best methods for waterproofing of the wall.
  - b. Alternatively, the wall could be replaced with a retaining wall constructed of reinforced concrete or reinforced masonry. The footing would most likely need to be replaced. A geotechnical engineer should be consulted to determine the soil type and best methods for waterproofing of the wall. A guardrail would also need to be integrated into the new wall.

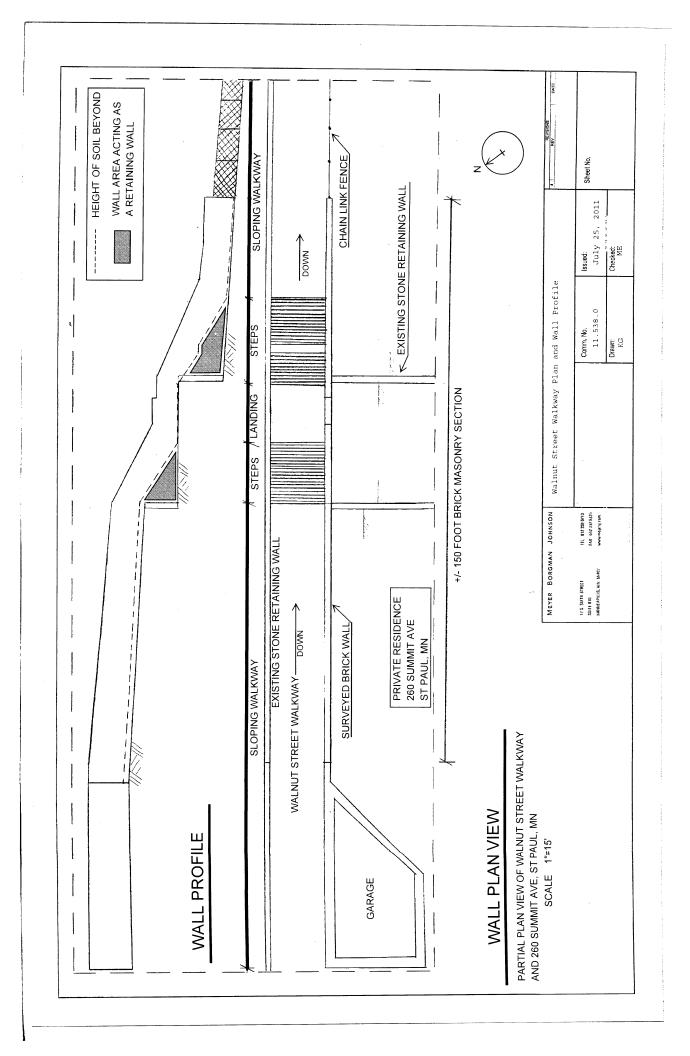
Changes to the wall may be subject to approval by the City of St Paul or Heritage Preservation Commission.

We look to working with you to develop solutions that meet your schedule and budget.

#### Sincerely, MEYER BORGMAN JOHNSON

Meghan Elliott, PE, Assoc. AIA Associate

Daniel E. Murphy, PE Principal





Photos taken on May 13, 2011

