



July 20, 2021

Donna Carter
Carter Design Associates
817 W. Eleventh Street
Austin, Texas 78701

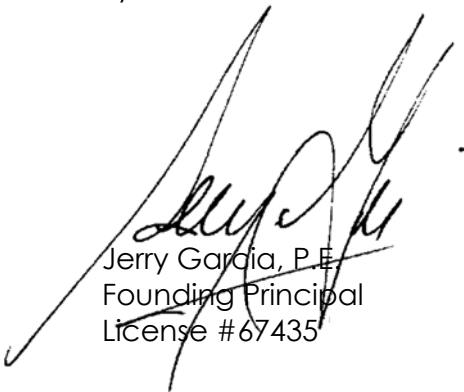
**RE: Structural Assessment of Historic Masonry
907, 909 and 911 Congress Avenue**

Dear Ms. Carter:

At your request, representatives of our office performed a structural assessment of the three existing storefront buildings located at 907, 909, and 911 N. Congress Avenue in Austin, Texas on July 7, 2021. The purpose of this report is to assess the existing masonry elements of all three structures and provide a rendered opinion regarding their structural integrity and options for preserving the historic front façades of the existing buildings.

We appreciate the opportunity to assist you with this structural assessment. Please contact our office at (512) 499-0919 if you have any questions or further needs.

Sincerely,



Jerry Garcia, P.E.
Founding Principal
License #67435



Introduction

All three buildings were constructed at or around 1881 and have experienced a myriad of uses and modifications throughout their history. The superstructure of each building includes a mixture of wood stick framing and structural masonry elements that bear on a concrete slab-on-grade foundation. Existing wood-framed roof and upper floor systems have been observed to have extensive structural damage that has created potential life-safety concerns. The existing slab-on-grade foundation systems appear to be performing adequately with no major concerns noted at the time of observation.

These buildings have been vacant and neglected for an extensive period of time. As such, the buildings have become dilapidated due to the accelerating exposure to the elements and a lack of basic maintenance to both the interiors and exteriors. For the purposes of this report, our office will be limiting our scope and recommendations primarily to the front brick facades and the load-bearing limestone side walls as it is our understanding that all structure behind the front façades will be demolished as part of the forthcoming development of the property.

Masonry Preservation and Restoration Efforts

It is our understanding that the Austin Historic Land Commission requires the preservation of all three existing façades facing Congress Avenue in order to retain the historic fabric of the area. On May 24th, 2021, the Commission made the recommendations that the front façades of 907 and 911 Congress Avenue shall be carefully deconstructed and then reconstructed in its original configuration while the front upper façade of 909 Congress Avenue shall be preserved as it stands today. The purpose of this section is to discuss the structural implications of each of these recommendations and give a professional opinion that best obtains the goal of preserving these historic elements.

Historic Background of Masonry

While portland cement, a major component in modern-day masonry mortars, was introduced to the United States in 1872, it was not commonly used in this area of the country until the turn of the century. Instead, the mortar used throughout these buildings is a lime-based mortar which consists of a mixture of lime, sand, and water. Historically, this has been proven to be a relatively porous material which does not render the wall impervious to moisture. Instead, the mortar would soak in moisture which would evaporate toward the exterior, gradually drying out both the wall cavity and the mortar. This characteristic of permeability would lead to repetitive cycles of wetting and drying, eventually causing the mortar to deteriorate, necessitating the periodic replacement of the mortar as part of building maintenance.

Prior to the 1870s, bricks in this country were largely made by hand, with clay, sand, and water pressed into molds, then dried and fired. Buildings built from this weaker, softer, and more porous handmade brick often required the use of a protective coating for an added layer to combat natural elements. By the time these three buildings were constructed, advances in brickmaking offered stronger, more consistent brick options. These bricks were likely molded with this stronger form of brick which featured harder dress faces that alleviated many of the shortcomings of the earlier bricks and did not require paint or other protective coatings for protection.

The Secretary of the Interior's Standards for Rehabilitation states modern water paints should "almost never" be applied to historically unpainted brick from this era. As moisture intrudes into the masonry from the ground, humidity, rain, or other means, this paint coating can intensify the damage as the trapped moisture cannot escape from the wall. Eventually, this moisture will get out by the path of least resistance, which in this situation is likely toward the exterior due to the high moisture levels in the interiors of the structures. This migration of water can lead to damage to the masonry caused by built-up water pressure on the exterior face of the brick façade. Painted-over masonry found on throughout these properties all have visible blistering of the painted surface, which indicates moisture is indeed trapped behind the impermeable paint coatings. The true state of the masonry can only be discovered once all paint and plaster has been removed and proper observations and testing can be made.

Preservation of Existing Facades

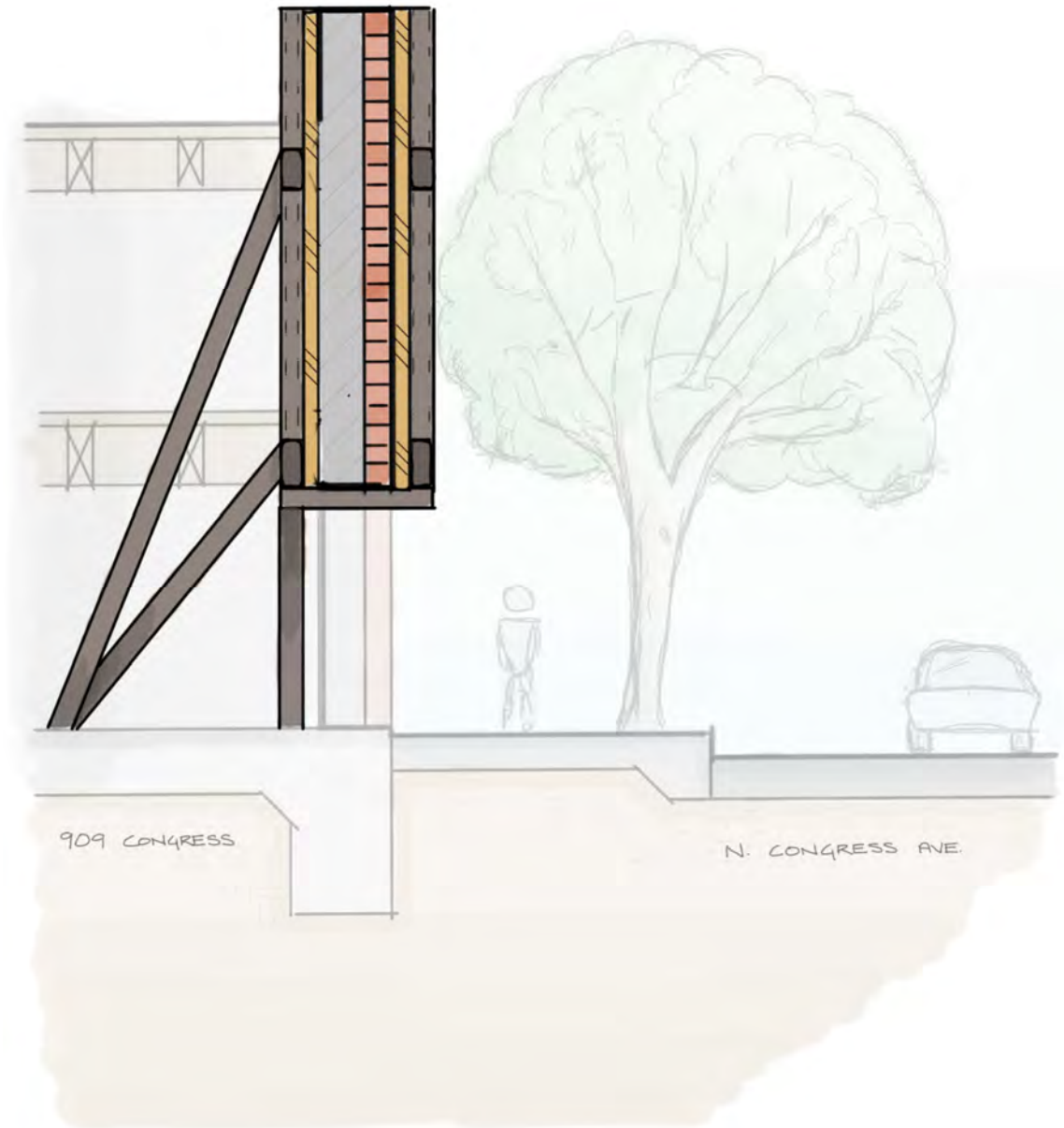
All existing façades visually appear to be clay brick with lime mortar, a common system used by masons in that era of construction. 907 and 911 Congress have exposed brickwork while the 909 Congress façade has been painted over with what appears to be an impermeable paint. All existing façades have experienced varying levels of damages and are all in need of extensive repair to both the brickwork and the mortar joints.

Supporting steel lintel beams have aged poorly and show varying levels of corrosion due to the site's general lack of maintenance and moisture issues. These steel members are extensively rusting, potentially beyond repair, and are exhibiting signs of excessive deflection potentially caused by their compromised structural integrity. Excessive lintel deflection appears to be a contributing factor to the damages and cracks seen on some areas of the front facades.

One of the recommendations made by the Austin Historic Land Commission was to preserve the existing brick façade of 909 Congress Avenue as it stands today, specifically the upper level. To complete this recommendation, the brick façade of the 2nd floor would have to be suspended in place while the storefront below is demolished and remain suspended until the new building structure can be installed to adequately support the brick in its final designed state. Additionally, the facades of 907 and 911 Congress are intended to be carefully deconstructed on either side of 909 Congress Avenue so the upper front section of brick would be the only remaining piece of the existing buildings suspended for the duration of construction. Inherently, there is a significant amount of specialized labor involved with deconstructing and reconstructing the historic facades at 907 and 911 Congress Avenue along with potentially distressing construction occurring in near proximity and underneath the suspended brick at 909 Congress Avenue. Obviously, numerous opportunities for accidental damages may occur that could compromise the historic façade and render the existing masonry unsalvageable or compromised beyond repair. However high the risk may be, our office has identified three potential ways to suspend this portion of façade, each with their own limitations and concerns:

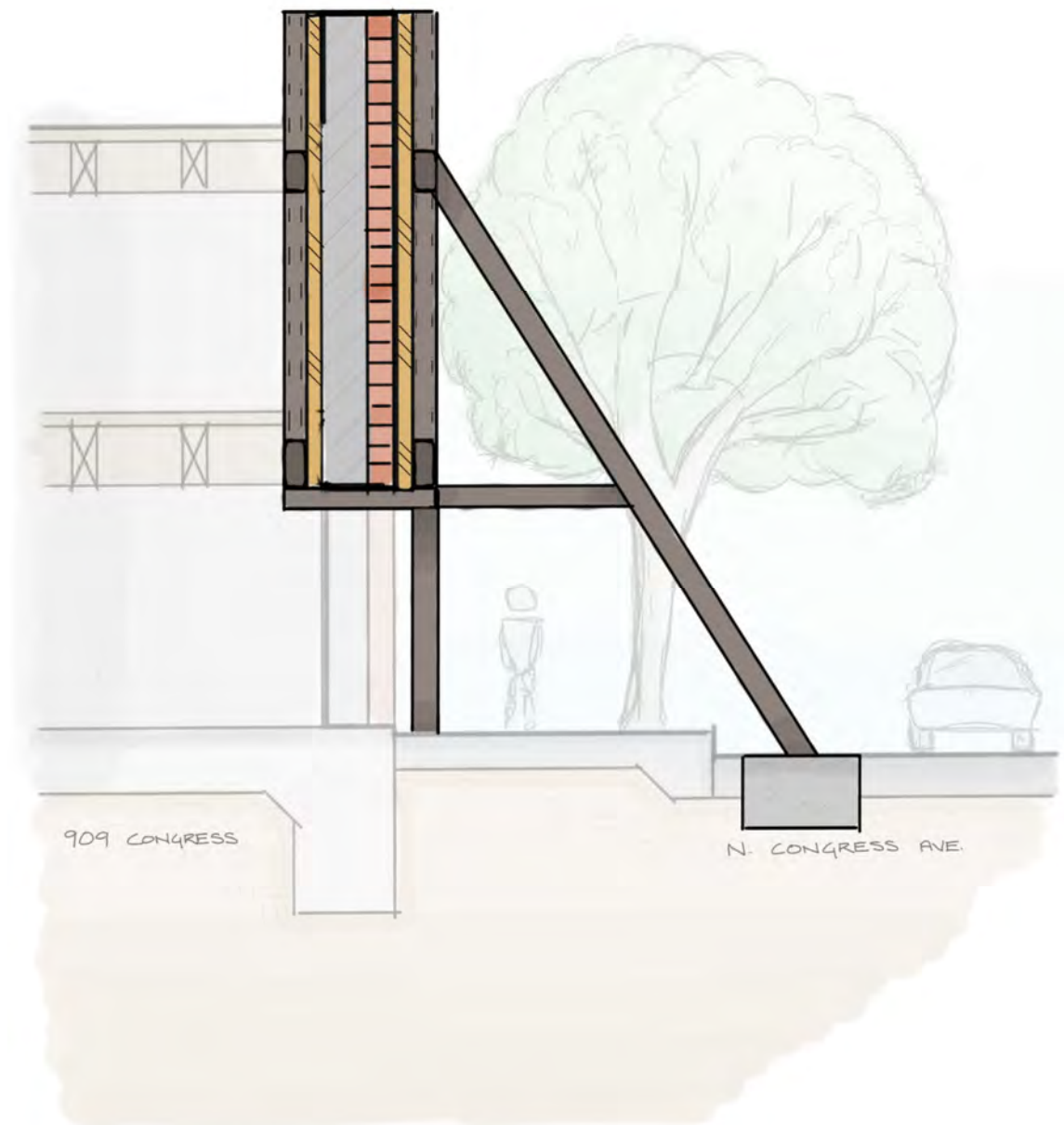
Option 1 - Brace into Lot

A steel frame structure with plywood sheathing could be utilized to sandwich the area of brick façade to be saved. This would allow for a structure that is stiff enough to not cause irreparable damages to the brittle façade. This steel structure would then have to be laterally braced towards the lot and away from Congress Avenue using steel diagonal members that would bear on new foundations within the extents of the existing buildings to provide gravity and lateral support of the brick façade as demolition and construction occurs around it. Due to the extent of demolition required in and around this particular building, this option will likely not be feasible as contractors would likely not be able to complete their scope of work around the proposed bracing elements.



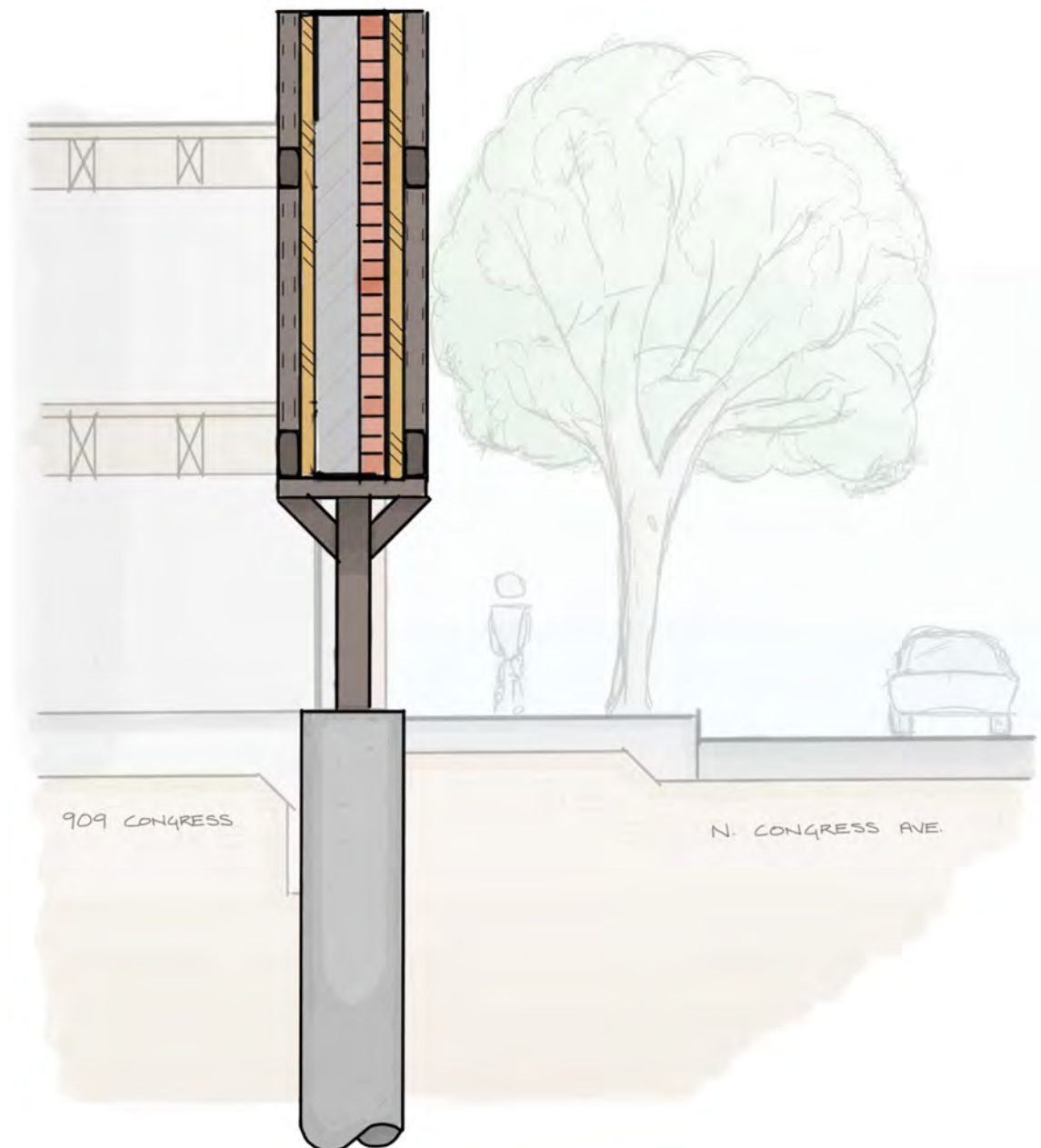
Option 2 - Brace toward Congress Avenue

Similar to Option 1, a steel frame structure with plywood sheathing could be utilized to sandwich the area of brick façade to be saved. This would allow for a structure that is stiff enough to not cause irreparable damages to the brittle façade. This steel structure would then have to be laterally braced towards Congress Avenue using steel diagonal members that would bear on new foundations within the sidewalk or parking areas to provide gravity and lateral support of the brick façade as demolition and construction occurs around it. Bracing elements would have to be attached down through the sidewalk and/or the street parking spots for an extended amount of time until demolition and new construction are completed. This solution would cause significant interruptions to Congress Avenue and may incur excessive fines for impeding the right of way making this option improbable. Additionally, having the bracing elements in the public domain could increase the risks of accidents occurring that would cause distress and potential damage to the masonry.



Option 3 - Brace with Cantilevered Columns

A similar steel frame structure as described in Options 1 and 2, but with far stiffer vertical elements as this option will not require any additional steel diagonal bracing for support. This steel frame will be supported from below with steel columns that are supported by a series of new concrete piers socketed into limestone. All steel elements will have to be designed to resist wind loads and provide adequate stiffness to prevent compromising the suspended masonry. Concerns with vibration during construction of the forthcoming development present a significant concern to the weakened masonry that might not be able to withstand consistent disturbance that is standard for a construction site. It is the opinion of this office that the vibration and general disturbance caused during construction may very likely cause irreparable damages to the masonry while it is being suspended in place. Additionally, drilling the concrete piers directly below this brick façade as part of the bracing installation may also cause vibrations that damage the façade.



Preservation of Existing Limestone Sidewalls

The load-bearing side walls of each structure appear to be stacked limestone wet-laid into a lime mortar similar to that of the brick facades. Most of the limestone walls appear to be in decent structural condition and area continuing to support the second floors and roofs of each building, as the original design intended.

While the wall system as a whole is operating as intended, localized areas have moderate damages that will require future maintenance if they are to remain in place. Our office saw some evidence of excess moisture trapped in both the mortar and limestone likely due to prolonged exposure to humidity and weather with varying levels of temperature and air conditioning on opposite sides of the wall. This moisture does not appear to be causing any notable structural damages when both sides of the wall are saturated, however, if one side is saturated and the other is conditioned/dry then some deterioration was noted. In these conditions, moisture attempts to travel toward the drier side as it is the path of least resistance. This cyclical migration of water can lead to damages to both the limestone and the lime mortar over an extended period of time. Further investigations will be required to generate a solution to these problems once the Client establishes which walls are anticipated to remain as part of the new development.

For walls that will remain as part of the new development scope, shoring/bracing will be required to stabilize the wall as demolition and construction occur. These elements will have to remain in place until the new structure is in place and can fully support the walls on their own. Our office anticipates attaching continuous horizontal HSS tubes to the face of the limestone wall at each level of existing diaphragm. HSS or WF kickers will be welded to these tubes at regular spacing and will be supported on new shallow concrete footing foundation elements within the existing building extents. Specific plans can be provided by our office once it is clear which walls are to remain.

Rendered Opinions and Recommendations

Based on the significance of the proposed development and the extensive effort required to protect already compromised façade elements, it is the opinion of our office to deconstruct, catalogue, and reconstruct all three facades at a more appropriate time in the development's schedule. Our office believes this will prove to be the safest solution in preserving the existing façade elements of all three buildings facing Congress Avenue. Additionally, compromised bricks and deteriorated mortar can be replaced and properly repaired to eliminate concerns regarding integrity thus providing a longer life-span for the three masonry facades. Attempts at suspending the 2nd story façade of 909 Congress Avenue greatly increases the chances of more extensive damage to the brick façade during construction and presents a considerable probability that much of the façade would need to be repaired after construction is complete.

Our office recommends removal of all paint coatings from the front faces of the exterior brick façades by a qualified contractor with experience in paint removal on historic masonry structures using the gentlest means possible. This recommendation is especially pertinent to 909 Congress Avenue which has visible, widespread blistering of the exterior surface that indicates moisture is trapped behind the paint. It is important to visually inspect the physical state of all painted brick and mortar after removal of the paint to confirm the structural integrity of all materials.

At the time of this report, it is the understanding of our office that samples of both the weathering

brick and mortar have been obtained by WJE for lab testing. Further structural recommendations may come after obtaining additional information related to the current properties of each material.