

January 5, 2021



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Assistant Director  
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**SUBJECT: Christmas Day Explosion; Rapid Visual Inspection of Buildings  
2<sup>nd</sup> Avenue North, Buildings, Nashville, TN  
Project No: 20069**

Dear Phillip:

Per your request we visited 2<sup>nd</sup> Avenue North buildings from Church Street to Commerce Street which were damaged during the explosion on December 25, 2020. Our report is based upon a rapid visual assessment of the structures during our visits on 25<sup>th</sup> and subsequent visits the following week. A detailed survey of each of the affected buildings is beyond the scope of this report.

Access to many of the damaged buildings were severely limited due to debris, collapse and unstable nature of the floors and roof. Where possible we have gained access to the structures from either 1<sup>st</sup> or 2<sup>nd</sup> avenue. Typically, the buildings on the east side of 2<sup>nd</sup> avenue are 3 to 4 storied wood framed structures with unreinforced multi-wythe brick at the perimeter and demising walls. The front of the structure (2<sup>nd</sup> avenue) consists of store front glass with masonry or steel columns at the first level and brick masonry above with punched window openings.

#### **GENERAL OBSERVATIONS DUE TO BLAST IMPACT**

Due to the impact of the blast, a significant portion of many of the buildings (see list below) have completely collapsed or on the verge of collapsing. For the rest of the buildings (in the referenced zone) the front façade and structure were severely damaged. The storefront glass was blown out, the masonry / steel columns (1<sup>st</sup> level) have shifted and their attachment to the beams at the 2<sup>nd</sup> level have been compromised. The load bearing masonry walls have several cracks, and the parapet walls have either bowed or experienced severe distress. In the few buildings we accessed, we observed that the demising walls have several cracks with the floor and roof rafters separating from it. Interior 2x floor framing including wood frame beam and columns and its attachments to perimeter walls have been compromised, the floor and diaphragm have been damaged. Lateral stability and gravity elements of the structure have been severely compromised. Parapet walls (all sides) and its attachment to the roof diaphragm will need to be reviewed. Interior structural framing will require a thorough review. The impact on the roof structure is severe, with many cracked and broken rafters and beams. The roof rafters tie the parapet walls in place and due to the blast, this has been compromised and the stability of the parapet walls needs to be evaluated. In summary, the lateral load resisting system (roof and floor diaphragm and its attachment to the masonry shear walls) have been greatly impacted and similarly the gravity load elements (columns, beams, and rafters) have been compromised.

**Given the above observations, it is our professional opinion that the city to require a thorough structural evaluation of each building (by an engineer licensed in the state of Tennessee) that has been impacted by the blast.**

Prior to any repairs or cleaning and boarding of the buildings, the front façade up to the underside of the 2<sup>nd</sup> floor (height of masonry columns) needs to be shored. Furthermore, the front section of the collapsed buildings should be demolished and the demising walls on either side of the collapsed structures will need to be shored. Shoring design should be per a licensed engineer in the state of Tennessee and a licensed contractor should carry out all shoring, demolition, and construction. **Each rehabilitation plan should be accompanied with a plan to shore all existing brick walls including perimeter walls and walls in between the buildings prior to demolition of any structural floor and roof framing.** It is expected that during these operations, 2<sup>nd</sup> Avenue from Church to Commerce, 1<sup>st</sup> Avenue from Church to Broadway and Church street from 1<sup>st</sup> to 2<sup>nd</sup> Avenue will be closed to the public and access for authorized personnel will be monitored as the structures are unstable with falling debris and the instability of the buildings.

## OBSERVATIONS OF THE REFERENCED BUILDINGS DUE TO BLAST IMPACT

The following observations were made on each of the structures during a "Rapid Evaluation". The evaluation is cursory in nature, each building will require individual detailed evaluation once it is deemed safe to do so.

### 184 2<sup>nd</sup> Avenue North, Hooters

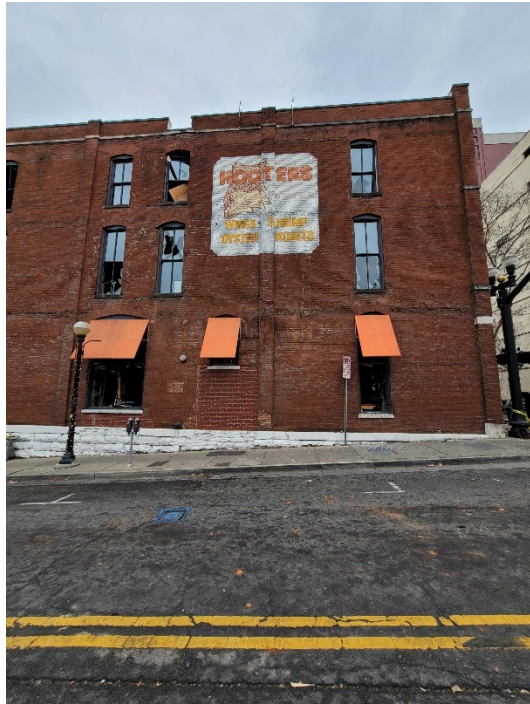
#### **Observations:**

Structure is unreinforced masonry walls with wood floor & roof framing.  
Impact of the blast has caused extensive damage.  
Store front windows and casing collapsed / leaning into building.  
Roof and floor structure including beams, columns and rafters have been severely compromised.  
Many beams and rafters have failed.

#### **Visual Assessment: Structure in danger of Imminent Collapse**

It is our opinion that the structure is unstable. Front and perimeter walls should be shored prior to any clean-up work. Building should remain posted "**UNSAFE.**" Abundant caution should be exercised during any access inside the building. Only professional construction staff should be allowed. It is our opinion that the structural framing of the building will require substantial replacement and the walls will need to be tied to new framing and retrofitted.







## 180 2nd Avenue North, "101 Church St" – Nashville Downtown Hostel

### **Observations:**

Structure is unreinforced masonry walls with wood floor & roof framing.  
Impact of the blast has caused extensive damage.  
Front entry door collapsed.  
High façade appears unsafe.  
Interior ceiling buckling – potential hazard.

### **Visual Assessment: Structure in danger of Imminent Collapse**

It is our opinion that the structure is unstable. Front and perimeter walls should be shored prior to any clean-up work. Building should remain posted "**Restricted Use.**" Abundant caution should be exercised during any access inside the building. Only professional construction staff should be allowed. It is our opinion that the structural framing and walls will require a thorough evaluation and rehabilitation.



## 178 2nd Avenue North, The Quarters

### **Observations:**

Structure is unreinforced masonry walls with wood floor & roof framing.

Impact of the blast has caused extensive damage.

Store front and windows collapsed on each floor.

Parapet appears to have some rotation and bowing – a potential hazard to fall on someone standing below.

Ceiling damage on each floor.

It is likely given the conditions of the ceiling that some damage has occurred to the beams, rafters and columns in the structure. There is a high potential that some have failed.

### **Visual Assessment: Structure in danger of Imminent Collapse**

It is our opinion that the structure is unstable. Front and perimeter walls should be shored prior to any clean-up work. Building should remain posted “**UNSAFE.**” Abundant caution should be exercised during any access inside the building. Only professional construction staff should be allowed. It is our opinion that the structural framing of the building will require substantial replacement and the walls will need to be tied to new framing and retrofitted.





## 176 2<sup>nd</sup> Avenue North, Unnamed Building

### **Observations:**

Structure is unreinforced masonry walls with wood floor & roof framing.  
Impact of the blast has caused extensive damage.  
The store front has collapsed.  
The columns supporting the front façade above are displaced.  
The 3<sup>rd</sup> and 4<sup>th</sup> floors façade is partially or fully collapsed.

### **Visual Assessment: Collapsed (Structure in danger of further Imminent Collapse)**

It is our opinion that this building is uninhabitable and unsafe in the current condition. Demolition of the front façade and a significant portion of the structure is anticipated. Additional shoring of remaining unbraced masonry walls should be conducted. Given the condition of the building to the south there is a high potential for further collapse. Building should be posted "**UNSAFE.**" No personnel should be allowed into the building. It is our opinion that this building will be partially demolished and rebuilt.



## 174 2<sup>nd</sup> Avenue North, Unnamed Building - 4 Stories

### **Observations:**

Structure is unreinforced masonry walls with wood floor & roof framing.

Impact of the blast has caused extensive damage.

Total collapse.

4<sup>th</sup> floor wall on south side of building leaning towards 172 2<sup>nd</sup> Avenue – collapse imminent.

### **Visual Assessment: Collapsed (Structure in danger of further Imminent Collapse)**

It is our opinion that this building is uninhabitable and unsafe in the current condition. Demolition of a significant portion of the building is anticipated. Additional shoring of remaining unbraced masonry walls between adjacent structures should be carried out as soon as it is safe to do so.

Building should be posted “**UNSAFE.**” No personnel should be allowed into the building. It is our opinion that a large portion of this building will be demolished and rebuilt.





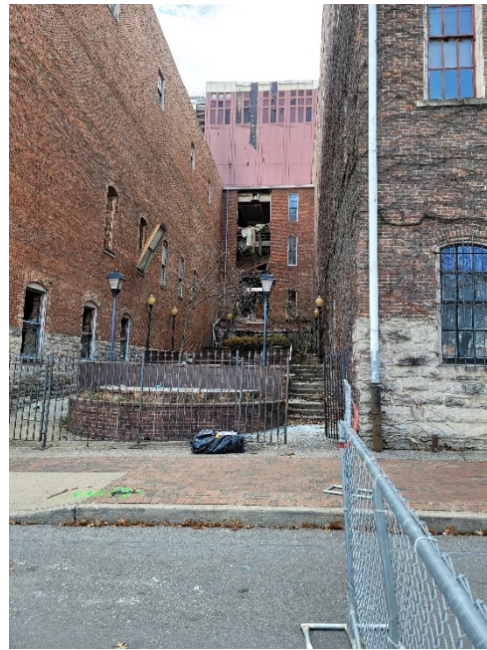
## 172 2<sup>nd</sup> Avenue North, Unnamed Building – 3 stories

### **Observations:**

Structure is unreinforced masonry walls with wood floor & roof framing.  
Impact of the blast has caused extensive damage.  
Total collapse.

### **Visual Assessment: Collapsed (Structure in danger of further Imminent Collapse)**

It is our opinion that this building is uninhabitable and unsafe in the current condition. Demolition of a significant portion of the building is anticipated. Additional shoring of remaining unbraced masonry walls between adjacent structures should be carried out as soon as it is safe to do so. Building should be posted "**UNSAFE.**" No personnel should be allowed into the building. It is our opinion that a large portion of this building will be demolished and rebuilt.





## 170 2<sup>nd</sup> Avenue North, Unnamed Building – 3 stories

### **Observations:**

Structure is unreinforced masonry walls with wood floor & roof framing.  
Impact of the blast has caused extensive damage.  
Partial collapse.

### **Visual Assessment: Collapsed (Structure in danger of further Imminent Collapse)**

It is our opinion that this building is uninhabitable and unsafe in the current condition. Demolition of a significant portion of the building is anticipated. Additional shoring of remaining unbraced masonry walls between adjacent structures should be carried out as soon as it is safe to do so. Building should be posted "**UNSAFE.**" No personnel should be allowed into the building. It is our opinion that a large portion of this building will be demolished and rebuilt.



**168 2<sup>nd</sup> Avenue North, Rhea Building**  
**Laser Quest, Rodizio Grill, Melting Pot**

**Observations:**

Structure is unreinforced masonry walls with wood floor & roof framing.

Impact of the blast has caused extensive damage.

Left side of building – A portion of the parapet has collapsed, brick façade collapse around windows.

Left 3<sup>rd</sup> floor window brick lintel unsupported.

Significant amount of structure displaced on first floor.

First floor façade support displaced.

**Visual Assessment: Collapsed (Structure in danger of further Imminent Collapse)**

It is our opinion that this building is uninhabitable and unsafe in the current condition. Demolition of a significant portion of the building is anticipated. Additional shoring of remaining unbraced masonry walls between adjacent structures should be carried out as soon as it is safe to do so.

Building should be posted “**UNSAFE.**” No personnel should be allowed into the building. It is our opinion that a large portion of this building will be demolished and rebuilt.





## 164 2<sup>nd</sup> Avenue North, Unnamed Building

### **Observations:**

Structure is unreinforced masonry walls with wood floor & roof framing.  
Impact of the blast has caused extensive damage.  
Store front and windows collapsed on each floor.  
The façade is bowing in on the 3<sup>rd</sup> floor.

### **Visual Assessment: Structure in danger of Imminent Collapse**

It is our opinion that the structure is unstable. Front and perimeter walls should be shored prior to any clean-up work. Building should remain posted "**UNSAFE.**" Abundant caution should be exercised during any access inside the building. Only professional construction staff should be allowed. It is our opinion that the structural framing of the building will require substantial replacement and the walls will need to be tied to new framing and retrofitted.



## 160 2<sup>nd</sup> Avenue North, Spaghetti Factory, 160 Lofts

### **Observations:**

North end of parapet overhang appears questionable.  
Façade appears intact.

### **Visual Assessment: Structure in danger of Imminent Collapse**

It is our opinion that the structure is unstable. Front and perimeter walls should be shored prior to any clean-up work. Building should remain posted "**UNSAFE.**" Abundant caution should be exercised during any access inside the building. Only professional construction staff should be allowed. It is our opinion that the structural framing of the building will require substantial replacement and the walls will need to be tied to new framing and retrofitted.





## **154 2<sup>nd</sup> Avenue North, Buffalo Billiards, Dick's, Last Resort, 154 Luxury Hotel**

### **Observations:**

The front façade appears unremarkable.

There appear to be some cracks in the left and right walls of the breezeway on the street level on Second Avenue side.

There appear to be cracks on the left and right masonry walls of buffalo billiards that were reportedly there prior to the blast but appear a little wider.

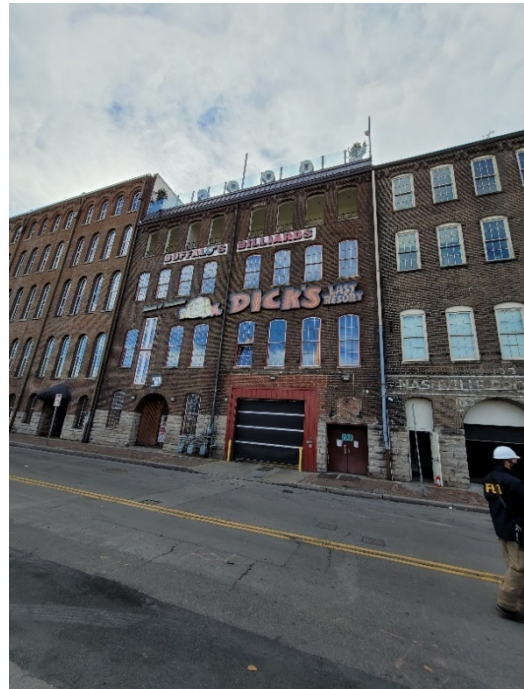
The façade bracing structure appears to have shifted slightly south when viewed from the interior of the breeze way.

On the front portions of the building there are a number of roof joist that appear cracked, damaged, or failed. Most of the damage to the roof structure appears to be limited to the suites with Second Avenue frontage.

There appears to be a few punctures in the roof membrane.

### **Visual Assessment: Structure in danger of Imminent Collapse**

It is our opinion that the structure is unstable. Front and perimeter walls should be shored prior to any clean-up work. Building should remain posted "**UNSAFE.**" Abundant caution should be exercised during any access inside the building. Only professional construction staff should be allowed. It is our opinion that the structural framing of the building will require substantial replacement and the walls will need to be tied to new framing and retrofitted.



## Commerce St Garage

### **Observations:**

Veneer damage at elevator shaft – considerably sized hole.

Concrete column – impact damage loss of section and exposed rebar in two locations on north face.

Low one-story concrete masonry unit (CMU) block wall and pedestrian door damaged.

Third floor CMU block displaced out from concrete structure. Some blocks complete displaced.

Concrete structure of stair tower appears to lean above top parking deck – potentially pour initial construction but also could be from blast.

Pedestrian door on level 6 to north east stair tower has a considerable trip hazard. Full stair tower needs detailed investigation.

### **Conclusion: (TO BE REHABILITATED)**

It is our opinion that the primary garage structure appears to be stable. However, the north east stair tower does not appear to be questionable. The stair tower should be posted “**RESTRICTED USE**” pending further investigation. However, as the damage is extensive, abundant caution should be exercised during any access inside the northeast stair tower. Prior to use of the garage the structural damage reported above should be repaired. It is our opinion that this structure can be rehabilitated in-place.





## Additional Observations

Buildings along 2<sup>nd</sup> Avenue (south of 154 2<sup>nd</sup> Avenue) other than the obvious damage to windows appear unremarkable. However, a force from this type of blast can cause damage to a brittle material such as brick without being evidenced in the cladding on the brick. We recommend that further detailed investigation be conducted on all of the clad brick support columns, wood framing, walls and connections of each building.

Limited observations of AT&T building were conducted during this visit. Evaluation and rehabilitation should be coordinated with engineer contracted by AT&T.

### LIMITATIONS

LPE performed a rapid visual assessment of the existing conditions of the structures in an attempt to gather adequate information to form professional opinions concerning the issues. We have relied upon the information gathered to develop our findings, opinions, and recommendations. A detailed evaluation and analysis of every structural member, even where visible, is beyond the scope of services for this report. The overall stability of the buildings is unknown. Great caution should be exercised during all operations.

If you have any questions on the summary report, please feel free to call me.

Sincerely,

A circular professional engineer seal for Rao Patri, State of Tennessee. The seal contains the text: "MARASIMHA RAO PATRI", "REGISTERED ENGINEER", "NO. 705442", "5-2021", and "STATE OF TENNESSEE". A handwritten signature is written over the seal.

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