



**SOUZA, TRUE  
AND PARTNERS, INC.:**  
STRUCTURAL ENGINEERS

265 Winter Street, Third Floor  
Waltham, Massachusetts 02451

Telephone 617-926-6100 email: souzatrue@souzatrue.com

TERRY A. LOUDERBACK, P.E.  
JEROME A. YURKOSKI, P.E.  
LISA A. BOHLIN, P.E.  
TODD P. BLAKE, P.E.

**October 26, 2017**

**Scott / Griffin Architects**  
800 Main Street 5<sup>th</sup> Floor  
Waltham, Massachusetts, 02451

**Attention:** Mr. Tom Scott

**Reference:** Stop & Shop Edgartown  
PV Array Analysis on Existing Roof  
225 Upper Main Street  
Edgartown, Massachusetts

**Dear Mr. Scott:**

You requested Souza True and Partners (STP) to analyze the existing roof framing system of the above named building to determine if it could support the weight of a new photovoltaic (PV) array system (a.k.a. solar panels). On January 11, 2016 we performed an observational site visit to the building to review the existing structure and to determine its roof framing system. In our previous letter, dated April 5, 2016, we described the existing roof framing as 2x12 wood joists spaced at 16" to 24" on center spanning between steel beams.

In our analysis, we focused on these wood joists to determine their capacity for additional load. We estimated the weight of the existing roof structure (along with existing MEP services and ceiling system below) as 20 pounds per square foot (psf), based on our notes from the previous site visit. The Massachusetts State Building Code requires that the roof also support a design snow load of 25 psf over the entire roof area. These loads were combined with the anticipated weight of the new PV array which you provided to us as 5 psf.

The weight of the PV array would increase the total load on the roof joist by more than 10%. When we examined the capacity of the joists, we found that the additional weight of the proposed PV array system would cause the joists to exceed their design capacity. This means that any joists that support the new PV arrays would have to be reinforced / sistered with new wood framing to increase their load carrying capacity.

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RICHARD W. SOUZA AND EDWARD K. TRUE

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The work required to reinforce the existing wood joists would be disruptive to the day to day operations of the store. Metal scaffolding would need to be erected to provide a platform for the workers to stand on to reach the existing framing. The existing drop ceiling would have to be removed and any mechanical services or lighting would have to be moved to temporary locations. To remain open and to facilitate this work, the store would be required to close sections of the sales floor to the public. Products in that section of the store would have to be moved to different locations while work commences and then moved back once the work is complete. This process would then repeat for the next portion of the store that would be worked on.

Once we determined that the typical wood joists would require reinforcement, we did not pursue our analysis any further, due to the amount of work and disruption it would cause to the owner. Further review of the steel beams that support the typical joists would be required to complete our analysis. Since the wood joists will require reinforcement, we can assume that at least a few of the steel beams would also require reinforcement. Reinforcing steel beams requires welding new steel plates to the underside of the existing steel beams. Welding in an existing wood building will necessitate a fire watch which will add to the burden on the owner.

Therefore, the exterior roof framing system is not structurally capable to withstand the proposed weight from the PV array system. Additionally, the work required to reinforce the roof framing system presents an excessive burden to the owner. Please call us if you have any further questions or comments.

Sincerely,  
**SOUZA, TRUE AND PARTNERS, INC.**



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**John M. Schroeder**  
Structural Engineer



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**Jerome Yurkoski, P.E.**  
Senior Principal

