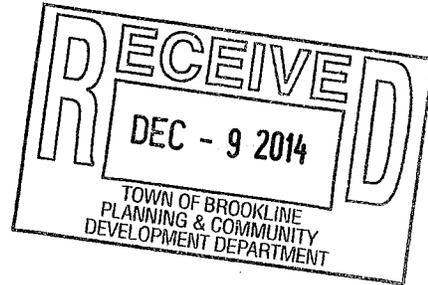


45 Asheville Road  
Chestnut Hill, MA  
(617) 942-2548

December 7, 2014

Ms. Allison Steinfeld  
Planning Director  
Town of Brookline  
333 Washington Street  
Brookline, MA 02445



**Re:**

Dear Ms. Steinfeld:

I am writing to respond to Stantec's October 17, 2014, Memo and Chestnut Hill Realty's (CHR) PowerPoint presentation on October 20, 2014, in which the parties once again attempt to rebut legitimate town concerns raised regarding the proposed development.

**Stantec Memo from Frank Holmes**

**Pages 5-6**

Ms. White's letter clearly only applied to this year and was not conclusive. Stantec should also address the fact that there was standing water on the site of a proposed detention basin. Their drainage report indicated that this area would drain within the 72-hour requirement. Actual conditions do not seem to support this.

**Page 7**

At no point did I suggest the peak rate of runoff from the Stormwater Report would be millions of gallons of water. As recorded in the meeting transcripts, I was simply explaining that the only criteria that was required to be checked was the peak rate of runoff, not the total volume. In my example, I explained that as long as the peak rate (17.29 cfs) were not exceeded you would still have a compliant system. On page 105 of the transcript I state:

*you could build a giant fish tank on your site, collect all the rainwater that falls on it, then start at a 24-hour period. You put a pump line, that 17.28 cubic feet per second. You pump the water onto the neighbor's yard for 24 hours, you turn your pump off. You have not exceeded the 17.29 cubic feet per second. How much water have you put on your neighbor's yard? A quick*

*calculation would show you put 11,167,500 gallons of water on your neighbor's yard.*

Obviously I never was under the impression that Stantec was proposing to build a giant fish tank! This slide was meant to illustrate that the volume of water discharged was not considered in the stormwater regulations. Everything I stated was 100% accurate. Stantec's suggestion that this illustrates my lack of understanding is outrageous.

#### **Page 8**

My values were taken directly out of the stormwater report prepared by Stantec. I provided runoff values for the 10 year and 100 year storm events. After checking my values, I have found that the values listed for the 10 year storm were actually for the 2 year return period, a smaller rain event. The numbers listed for the 100 year storm are accurate. Although Stantec provided some supplemental storm water data on September 9, 2014, this information was only a partial resubmission and did not cover the entire site. The numbers I quoted from the report were for the entire 13.48 acre site. If Stantec wants to dispute these numbers, they should provide the actual amounts of increased runoff and the corresponding pages of the report to support these values.

#### **Page 9**

My rainfall data was taken from the Boston Water and Sewer Commission's website which was clearly shown on the PowerPoint presentation. The data was taken from the well in Roslindale, the closest well to the proposed site. Every value stated in my presentation was correct. Water tables fluctuate daily and taking a reading at the end of a dry period will give misleading values. The recommended method for taking readings from a well is to take daily readings over a minimum 21 days during the historically wettest time of the year. There is no reason why Stantec should be opposed to doing a comprehensive investigation of the groundwater elevation. If they feel confident in their numbers, the detailed investigation would be valuable to support their design.

#### **Page 10**

The quote from the sales representative trying to sell the Stormtank System should have no bearing on whether they will be an effective system. As I noted in my PowerPoint presentation, Stormtank has very specific requirements for using their system:

*A geotechnical investigation is important when implementing an underground storage solution. The bearing capacity, soil composition, limiting zones, etc. of a potential site should be evaluated before deciding on the type of system and configuration.*

Stantec has not done any of the due diligence required to implement this system. Even when all the caveats for use are followed, the manufacturer will only provide a one-year warranty. This should set off major red flags when evaluating this system and its long-term performance.

#### **Page 11**

Stantec claims that if the groundwater was higher than expected the system will not fail. If the water table elevation were to be higher than the bottom of the proposed storage areas, it would reduce the amount of storage capacity the system could handle. If the storage capacity were reduced, the system would not operate as designed. This scenario could easily result in additional runoff being forced to go elsewhere. This would constitute a failure of the system in my opinion.

#### **Page 12**

Contrary to Stantec's allegation, I understand the intent of the design. Stantec intends to use the area below the pavement for storage and assumes that all water being stored will enter one small perforated pipe at the entrance of the parking lot. My concern is that when all the water is in the gravel below the pavement, a significant amount of it will tend to run towards the Russet Road properties before getting to the drain. The check dams will direct water towards the Russet Road properties and block the path to the perforated pipe.

It appears as if Stantec assumes that flooding of the Russet Road properties is only influenced by above ground runoff. However, basement flooding is usually due to a rise in the water table. I feel that a large amount of the water being stored below the porous pavement will not enter the drainage system. Instead, it will be contributing to the rise of water tables below Russet Road. The ledge will prevent infiltration below the bottom of the storage area forcing it to move laterally through the soil.

Also, the designer claims that the porous pavement will conform to the UHN Stormwater Center standards. As I pointed out previously, UNH has issued a fact sheet on porous pavement. Under the design section the first requirement states "Soil Permeability is Recommended Between 0.25-3.0 Inches Per Hour". Stantec is clearly not following this standard. UNH also provides a "Typical Porous Asphalt Cross-Section" on the fact sheet. Stantec is not following this detail either.

#### **Page 13**

The stormwater report should be reissued with the corrections made.

#### **Page 14**

BETA dismisses concerns with the failure rate of the StormTank system by stating that after a brief investigation, they were unable to find "information on the failure rate." BETA does not address, however, whether the system is a proven technology. When presenting alternative systems, such as StormTanks, as part of complex drainage mitigation system it should be incumbent on the designer to prove the system works.

Further, during the meeting, I pointed out that MassDOT does not allow the use of these kinds of systems. Designers for HV stated that MassDOT did not allow these because they don't want to maintain them. I have since spoken directly with Henry Barbaro of MassDOT and he has confirmed that these systems are completely unreliable. MassDOT does not prohibit these systems simply because they are costly and hard to maintain. They prohibit them because it is impossible to verify if maintenance is being done properly. There is no way to inspect these systems and see if they are clogged or not. Mr. Barbaro stated one of the reasons they don't like them is owners hire a service that will come and vacuum out the interior and the owners feels he has met his maintenance obligation. However, over time these systems will continue to clog and eventually fail less than 10 years.

- ***BETA Conclusion: If properly installed and maintained the failure rate for porous pavement is substantially less than 75%.***

Other than citing to the fact that over the last fifteen years there have been many studies completed and advancement with respect to porous pavement, BETA fails to provide any statistics related to the reliability of porous pavement or to quantify "substantially less than 75%."

Of the five reasons as to why porous pavement fails as discussed in the EPA Fact Sheet, this project currently fails to address the majority of them:

1. ***Poor Design:*** There are several inconsistencies that Stantec has failed to address or correct including:
  - a. Failure to adequately identify and show the limits of ledge on the contract drawings.
  - b. Explaining how check dams could be carved into the ledge.
  - c. Properly entering the appropriate storage volumes into the HydroCAD model.
  - d. Failure to identify and mitigate potential utility conflicts.

- ***BETA Conclusion: The project will not solve all existing flooding issues however abutting properties will not be adversely impacted by storm water runoff from this project.***

It is beyond dispute that this project will create significant amounts of additional runoff as previously brought to the ZBA's attention and supported by calculations prepared by Stantec. What is being questioned is whether the proposed methods to store the additional runoff will ensure that the amount of run-off that escapes the boundaries of the project in the post-developed condition is less than in the current pre-developed condition. As described in my prior letter, there are significant errors in the current design that need to be addressed. As noted, the storage capacity of the porous pavement assumed in the calculations has no relation to what was shown on the design plans. In addition, the storage tanks near the proposed tower will lose significant capacity to store runoff during storm events happening in close proximity of each other. The bio-retention basin capacity could be severely reduced if proper groundwater elevations are not determined. Storm Tank failures, due to failures to properly install, maintain or simply due to the poor quality of the materials, could lead to drastic flooding issues for the abutters.

BETA provided a sketch to demonstrate how the porous pavement would help reduce stormwater runoff. The detail provided has no relation to the details provided by Stantec, so it is unclear if BETA is redesigning the porous pavement for Stantec or if they are not familiar with the details Stantec has developed. BETA has assumed that ledge will be removed to 4' below the porous pavement reservoir structure. The current plans only show the excavation to be 2' below the reservoir structure and also show check dams that will reduce storage capacity. Furthermore, BETA assumed that the porous pavement was being designed to meet University of New Hampshire standards, which it is not. If actual ledge removal was provided that met the UNH, Stantec and BETA assumptions, the resulting ledge removal would be 2 to 3 times what CHR has suggested.

The bottom line is there is no consistency between the Applicant, Designer and Peer Reviewer. This lack of coordination should be a major red flag, as it is a strong indication that the necessary time and effort needed to do a thorough and comprehensive peer review have not been allocated to this important issue.

- ***BETA Conclusion: The proposed [StormTank] system will need to be installed according to the manufacturer's specifications.***

For the soils that were noted in the report, the infiltration rates are 1/3 of the requirements of soil below porous pavement as provided by EPA and UNH.

**Page 15**

The plans clearly call for the Contractor to grade the area to drain. However, there are no proposed contours on the plans. The designer should show the proposed finished grade in this area, so the impacts to the trees can be evaluated. Leaving the engineering up to the persons driving a bull dozer is not sound engineering practice.

**Page 16**

The plans should accurately show the elevation of the ledge based on best information available. The survey plans clearly show a ledge outcropping. The MH5 data is on the edge of the parking area. To assume this is a rock is unfathomable. It is clear that rock removal is a huge requirement of this project. The extent of rock removal needs to be properly estimated so the project can be evaluated.

**Page 17**

The designer does not seem to understand his own report.

- Additional Run-off – the parties admit that this project will lead to additional run-off of water.

The Responses to some of BETA's conclusions are below:

- ***BETA Conclusion: The methodology to determine high groundwater elevations is within generally acceptable practice.***

BETA's conclusion is misleading, as the generally acceptable practice standard as outlined by BETA was, in fact, not followed. As BETA stated, "Identifying redox features is MassDEP's primary recommended method for determining seasonal high groundwater elevations. If redox features are not present, measured groundwater elevations must be adjusted using nearby groundwater wells monitored by UCGS."

In this case, Stantec failed to follow the DEP recommendations, as it did not attempt to identify redox features. Instead, it adjusted elevations by using groundwater well data. Moreover, BETA fails to identify the well site, data reviewed, years of data reviewed and the well's proximity to the project.

The use of redox features, as noted in the studies prepared by Michael Frimpter, should be used to determine the seasonal high groundwater elevations.

BETA concludes that the project addresses Independence Drive concerns but dismisses pedestrian safety on VFW Parkway as “beyond the scope of this project.” It does not make sense that pedestrian safety on Independence Drive is addressed, but VFW Parkway concerns are ignored. There will clearly be an increase in pedestrian trips across VFW Parkway generated by this project due to the increased number of residents and reduction in usable green space. Accordingly, safety issues on VFW Parkway should be within the scope of the project.

In a July 19, 2014, Press Release from DCR entitled *Traffic and Pedestrian Safety Improvements along William J. Day Boulevard in South Boston*, DCR Commissioner Jack Murray is quoted as stating “Public Safety is our agency’s highest priority.” It is astounding that neither Stantec, Chestnut Hill Realty, the Town of Brookline or the ZBA have put the safety of residents at the same level. Safety of pedestrians should be a greater concern than the economic viability of this project!

- ***BETA Conclusion: The project has adequately addressed safety and operational concerns on the proposed site circulation roadway system and Beverly Street (sic) will be able to handle the additional site generated trips.***

First, the example previously given of a dangerous roadway condition was not on Beverly Road, but was on Gerry and Sherman Roads within Hancock Village. BETA fails to address that issue. Furthermore, the conditions on Beverly Road were not adequately addressed. BETA states that CHR has analyzed Beverly Road and determined that the “the proposed site related trip generated” is small. However, it is my understanding that traffic was never studied when Beverly Road functions as one-way street, as it does during certain hours of the winter months.

- ***BETA Conclusion: The project has adequately addressed Traffic and Parking Issues.***

BETA dismisses the traffic and parking concerns by stating that the traffic and parking design meets “industry standards.” However, industry standards may not be sufficient to address real-life situations such as speeding, double parking and overflow parking on neighboring streets (which currently occur). Moreover, BETA should clarify which industry standards they are citing and the level of Stantec’s compliance (e.g., is it meeting the minimum standards?).

- ***BETA Conclusion: Due to the small site related vehicle trips that will use the South Street/VFW Parkway Intersection, the scope of the study does not need to include this intersection in assessing additional traffic impacts.***

2. Inadequate Construction Techniques:
  - a. When choosing a contractor to build a system such as this, the general engineering rule of thumb to demonstrate that a contractor has had adequate experience is to have at least three contractors provide examples of five similar projects it has done in the past five years. The use of porous pavements in Massachusetts since the EPA report has been extremely limited. Agencies, such as MassDOT, prohibit its use on their projects. It is doubtful that there is one project in the entire Commonwealth of Massachusetts that has used porous pavement in the manner that Stantec has proposed. It is seriously doubtful that ANY Massachusetts contractor could meet the "5 in 5" standard.
3. Soils with low permeability:
  - a. You cannot have a lower permeability than ledge, which is essentially zero. In other words, one can assume that porous pavement should not be used over ledge.
4. Heavy vehicular traffic.
  - a. Based on current traffic conditions at Hancock Village, it is expected that the traffic for this parking area will be reasonably high.
5. Resurfacing with nonporous pavement materials:
  - a. Due to the limited area that this porous pavement is being used, it is reasonable to assume that in the future it may be "forgotten" that this pavement requires special attention. A portion of the Asheville Road driveway was recently seal coated. If a seal coat were applied to the porous pavement, it would completely nullify the storage capacity of the system.

As noted by BETA, the University of New Hampshire is a leading expert in porous pavement and has issued a Fact Sheet regarding it. The No. 1 *Design Criteria* is:

- Soil Permeability is Recommended Between 0.25-3.0 Inches Per Hour

As noted above, ledge has a permeability rate of 0 inches/hour. Furthermore, the Fact Sheet makes recommendations for a recommended typical cross-section of porous pavement. The porous pavement details in the plans prepared by Stantec do not match these recommendations. This is a clear indication that both the designer and peer reviewer are not familiar with the design and construction of porous pavement.

- ***BETA Conclusion: The project has adequately addressed pedestrians, bicycles and vehicular safety on Independence Drive.***

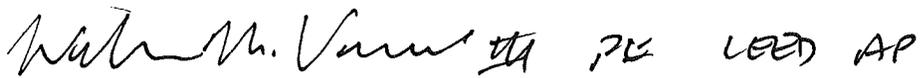
8

BETA concludes that the South Street/VFW Parkway intersection does not need to be included as part of the traffic study. However, BETA's conclusion appears to contradict its own statements made at the September 15, 2014, public hearing. As transcribed in the meeting minutes (page 43), Ms. Netter asks "what can be done, if anything to increase the likelihood of approval for access onto VFW over and above emergency access?" BETA appears to respond that the signals on VFW Parkway are critical no matter how few cars are being added and that this is information that DCR needs to determine if a curb cut for the project would be appropriate.

I have also included a copy of the memo regarding the deadly launch of the space shuttle Challenger that I read. I realize that the engineering that is being done for this project is not "rocket science". However, it should be given the respect it deserves and the ZBA should take the necessary steps to assure it is being done correctly. I can assure you that there are serious flaws with this design and these should be addressed before any decisions are made about going forward with the project.

If you have any questions, please do not hesitate to contact me. Thank you.

Sincerely,



William M. Varrell, III, P.E., LEED AP

cc: Jesse Geller, Esq., Chairman, Brookline Zoning Board of Appeals

**Report of the PRESIDENTIAL COMMISSION on the Space Shuttle Challenger Accident**

**Volume 5 Index**

Hearings of the Presidential Commission on the Space Shuttle Challenger Accident: February 26, 1986 to May 2, 1986.

FEBRUARY 26, 1986 SESSION (part 1 of 2)

[909] [Ref. 2/26-6] MTI Assessment of Temperature Concern on SRM-25 (51L) Launch. Signed: Joe Kilminster.

**MTI ASSESSMENT OF TEMPERATURE CONCERN ON SRM-25 (51L) LAUNCH**

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- 0 CALCULATIONS SHOW THAT SRM-25 O-RINGS WILL BE 20° COLDER THAN SRM-15 O-RINGS
- 0 TEMPERATURE DATA NOT CONCLUSIVE ON PREDICTING PRIMARY O-RING BLOW-BY
- 0 ENGINEERING ASSESSMENT IS THAT:
  - 0 COLDER O-RINGS WILL HAVE INCREASED EFFECTIVE DUROMETER ("HARDER")
  - 0 "HARDER" O-RINGS WILL TAKE LONGER TO "SEAT"
    - 0 MORE GAS MAY PASS PRIMARY O-RING BEFORE THE PRIMARY SEAL SEATS (RELATIVE TO SRM-15)
      - 0 DEMONSTRATED SEALING THRESHOLD IS 3 TIMES GREATER THAN 0.038" EROSION EXPERIENCED ON SRM-15
  - 0 IF THE PRIMARY SEAL DOES NOT SEAT, THE SECONDARY SEAL WILL SEAT
    - 0 PRESSURE WILL GET TO SECONDARY SEAL BEFORE THE METAL PARTS ROTATE
      - 0 O-RING PRESSURE LEAK CHECK PLACES SECONDARY SEAL IN OUTBOARD POSITION WHICH MINIMIZES SEALING TIME
- 0 MTI RECOMMENDS STS-51L LAUNCH PROCEED ON 28 JANUARY 1986
  - 0 SRM-25 WILL NOT BE SIGNIFICANTLY DIFFERENT FROM SRM-15

  
 JOE C. KILMINSTER, VICE PRESIDENT  
 SPACE BOOSTER PROGRAMS

"THOSE WHO CANNOT  
 REMEMBER THE PAST  
 ARE CONDEMNED TO  
 REPEAT IT"

MORTON THIOKOL INC  
 Westech Division

-GEORGE SANTAYANA

[Ref. 2/26-6]