



Proactive by Design

GEOTECHNICAL
ENVIRONMENTAL
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MANAGEMENT

190 Old Derby Street
Suite 210
Hingham, MA 02043
T: 781.278.4820
F: 781.749.2751
www.gza.com



April 7, 2017

Via Email

Braintree Planning Board
1 JFK Memorial Drive
Braintree, MA 02184

RE Peer Review Response Letter
Braintree Athletic Center
128 Town Street, Braintree, MA

Dear Board Members:

AS requested by the design engineer, this letter presents GZA GeoEnvironmental, Inc. (GZA) comments on Level Design Group's responses of April 4, 2017 to GZA's comment letter of January 22, 2017. GZA's January 22, 2017 comments are shown in normal font with the Level Design Group responses shown in italics followed by GZA's updated comments.

SITE PLANS

1. Fire truck access is not provided to the rear of the building. Fire Department should confirm adequacy of fire access.

The proposed fire truck access is consistent with the access sought by the Town of Braintree Fire Department regarding the proposed project. On two separate occasions, the Fire Department in meetings with Staff and the applicant have asked that we provide access to the front, the parking lot side and the side closest to the football field. The design as presented goes one step further and provides additional access to a portion of the rear of the proposed building. In accordance with our meeting on March 8, 2017 Christine Stickney will request in writing adequacy of access from the fire department.

GZA Response: Concur

2. Locations of proposed hydrant, post indicator valve and Siamese connection should be coordinated with the Fire Department and shown on the plans before approval by the Planning Board.

The fire department specifically did not require an additional fire hydrant. Additionally, the PIV and the Siamese connections will be shown on the final building plans. These construction plans will not be complete until after the project receives approval from the municipal permitting boards, specifically, the Planning Board and Conservation Commission, but will be provided to the Planning Staff for their review prior to an application for a Building Permit. To the extent that the Fire Department, in the future, requires an additional hydrant, the Applicants agree to coordinate the location of the hydrant, post indicator valve and Siamese connection with the Fire Department. Moreover, a copy of said plans showing any additional hydrant can be provided to the Planning Staff or review prior to building permit sign-off. In accordance with our meeting on March 8, 2017, Christine Stickney will request in writing from the fire department and water Department.



GZA Response: Concur

3. The limit of work should be shown on the plans.

A full limit of work can be shown, but will be dependent on the contractor and who is bidding the building construction. We will show the full limit of work on the final construction plans and will provide a copy of said plans to the Planning Staff for their review thirty (30) days before a building permit application is submitted.

GZA Response: Concur

4. Landscape plans were not included in the current plan set.

A set of landscape plans were provided shortly after the submission of the revised site plans, which were submitted on January 13, 2017.

GZA Response: Landscape plan to be reviewed with next submission.

5. Per Section 135-812 A. (5) of the Zoning Bylaws interior planting areas should be bounded by concrete curbs. It appears that asphalt curbing is proposed.

In compliance with the Zoning Bylaw, all interior islands are shown as bounded by precast concrete on the Layout and Materials Sheet. Additionally, the surrounding external parking lot is bounded by bituminous concrete curbing which is not governed by this section of the Zoning By-law.

GZA Response: Concur

6. Bollards should be provided to protect the proposed transformer.

The bollards spacing and location will be dependent on the Braintree Light and Power provided transformer based upon final loads, which has not yet been determined. The transformer location is a place holder until that time and the bollards/protection will comply with the requirements of Braintree Light and Power

GZA Response: Preliminary location of bollards should be shown on the plans as a space saver.

7. Proposed grading and curbing at the building entrance plaza should be shown on the plans.

As shown on Plans, there is spot grading detailed for this area showing positive drainage and handicap access

GZA Response: Additional spot grades should be shown.

8. Decorative safety bollards should be considered for the entrance plaza area to prevent vehicle intrusions.

The co-applicants are still finalizing the design of the entrance plaza and these types of amenities will be considered as well as planters and the like; however, we respectfully do not think that the permitting process should be delayed unnecessarily while those discussions are ongoing.

GZA Response: Preliminary location of bollards should be shown on the plans as a space saver.

9. An Erosion Control Plan should be added to the plan set which could also be used to delineate the demolition work.

Erosion control measures are shown on the plan sheet titled "Grading & Utilities" at the locations where erosion control is proposed. As discussed and agreed to at our meeting on March 8, 2017, a separate erosion control plan sheet with all associated notes will be included in the final revised plan set submitted to the Planning Board.



GZA Response: Concur

10. The existing 12" drain line located along the south side of the new building should be removed. The plans should indicate the removal of the drain pipe.

The removal of the existing 12" drain line located along the south side of the new building as well as the remainder of the site demolition, will be shown on the construction drawings, assuming the proposed project is approved.

GZA Response: The removal should be called out on the Grading & Utilities Plan.

11. A 10-foot separation should be provided between proposed drain and sewer pipes.

Although it is typical to maintain 10' separation between sewer and water lines, there is no requirement for 10' separation between sewer and drain pipes. The proposed separation between the proposed sewer and drainpipes meets engineering standards.

GZA Response: If the drain and sewer pipes are to be installed as proposed then, the drain pipes should have water tight gaskets and water stops should be installed in the trench prior to backfilling to prevent the migration of sewage through the backfill material to the drain headwall and wetlands in the event of a sewer pipe leak or failure.

12. Sidewalk ramps should be provided along the new sidewalk connection to Town Street.

As shown on the Plans, sidewalks are all shown with new handicap ramps where we are proposed and placing walks and crosswalks. Where there is existing sidewalk to Town Street, the project is not modifying the pre-existing ramp structure. In accordance with our meeting on March 8, 2017, the proposed entrance radii into the main parking area will be modified to be vertical granite curbing.

GZA Response: The current plans do not appear to include sidewalk ramps along the new connection through the parking area.

13. At the eastern end of the proposed sewer line there appears to be a conflict with the existing 15" diameter drain pipe.

This will be modified; there is a conflict as noted. This will be corrected on the final revised plan set that will be submitted to the Planning Board which will capture all relevant changes related to both stormwater, traffic, and other Board or staff concerns.

GZA Response: Concur

14. Typical sections for the proposed infiltration basins in the parking lot islands should be submitted.

As shown on the Plans, typical cross sections are provided, but specific cross sections are not. in accordance with our meeting March 8, 2017 a typical section through the outlet catch basin within each "pond" will be shown on the detail sheet of the final plan set.

GZA Response: Concur

15. Purpose for proposed subdrains around the proposed infiltration basins should be submitted. The subdrains will likely divert some of the water infiltrated by the basins and possible increase post development stormwater runoff rates.



As noted in previous responses, subdrains are a recommended method by the Stormwater regulations to allow a detention area to drain within 72 hours and for a mitigation of flows. When a subdrain is utilized and modeled it allows for a constant flow during smaller storm events as well as the infiltration. Since the infiltration rate of 2.41 is low, it is anticipated that there will be some infiltration and some stormwater flow from the underdrain; however, it is not short circuiting the system. On the contrary, it is an approved method of mitigating flow without large and complicated outlet structures. The post development stormwater calculations show that this design does not increase post development flow to the outlet control points.

GZA Response: As reported in my March 13, 2017 email to the Planning Board, Mr. Thomas Maguire of the Mass. DEP indicated that the use of a curtain drain does not comply with the Stormwater Standards and that artificially lowering the groundwater elevation is not an acceptable method to achieve the 2-foot groundwater separation. He also indicated that it would defeat the purpose of providing stormwater recharge.

DRAINAGE DESIGN & CALCULATIONS

16. Basis for the infiltration rates used in the parking lot infiltration basins should be provided.

The infiltration rate used was per acceptable Rawls rates found within the Stormwater regulations. This rate was determined through field investigation and conversations with Planning staff. A rate of 2.41 is conservative based upon the available Rawls rates and soils observed

GZA Response: GZA is not disputing the soil infiltration rate. Based on the 2.41"/hour rate and the bottom area of the basin the maximum discharge rate for the basin should be approximately 0.7 cubic feet per second. The model is calculating a discharge rate in excess of 5 cubic feet per second. Modelling of all ponds including catch basins should be checked for discrepancies.

17. The required pre-treatment of the runoff is not provided for the parking lot infiltration basins.

The parking lot depressions can be considered "vegetated filter strips" which per the Stormwater regulations are described as follows: Description: Vegetated filter strips, also known as filter strips, grass buffer strips and grass filters, are uniformly graded vegetated surfaces (i.e., grass or close-growing native vegetation) that receive runoff from adjacent impervious areas. Vegetated filter strips typically treat sheet flow or small concentrated flows that can be distributed along the width of the strip using a level spreader. Vegetated filter strips are designed to slow runoff velocities, trap sediment, and promote infiltration, thereby reducing runoff volumes. Within the detail of the BMP it specifically details infiltration as a benefit. The regulations go on to detail that the strip must be constructed 2' above groundwater to prevent groundwater contamination. To accommodate, the parking lot will be raised, if necessary, to meet the 2' separation. The cost of raising and re-grading the parking lot, if ultimately necessary, will be resolved between the co-applicants.

GZA Response: The proposed parking lot infiltration basins do not appear to function as vegetated filter strips. They appear to resemble "Bioretention Areas" or "rain Gardens".

18. The Pond 2P parking lot infiltration basin is overtopped for the 25-year and 100-year rain events.

These areas, modeled as ponds, are made to overtop into the catch basins within the strips. This will not cause issues within the parking lot.

GZA Response: GZA concurs as long as catch basins are provided in each of the parking lot basins.



19. During the winter months, the parking lot infiltration basins may become clogged with snow and ice. This may result in back up of water onto the parking areas creating ice conditions.

This is not an unusual condition of any infiltrative practice in New England. The snow cannot be stockpiled in these areas, but the water will flow to the basin and the outlet as it would in non-winter conditions. This type of infiltrative and natural LID practice is not only encouraged by the state regulations but was encouraged by the Planning Board prior to redesign. As a maintenance matter, the co-applicants will ensure that snow is not stockpiled in these areas once the project is constructed and operational. A label noting that snow is not to be stored in these areas, and a note regarding snow storage areas has been made on the plan set.

GZA Response: Installation of catch basins in each of the parking lot basins should prevent back up of water onto the parking areas.

20. The minimum 2-foot separation between the bottom of the basin and the seasonal high groundwater elevation is not provided for infiltration basin 6P.

The regulations specifically read that the 2' separation is required if this basin is considered an infiltration basin required for the recharge calculations. The infiltration basins required and utilized for the calculations include: those noted in the stormwater report under Standard 3, Pond 8P, 13P & 4P. Since basin 6P was not utilized as an infiltrative basin/practice as part of the required recharge under Standard 3, per the regulations, it does not need to meet the 2' separation requirement even if it will in some way contribute to overall site infiltration.

Although not mandated as explained above, the parking lot will be raised and regraded to accommodate the increased offset to groundwater as requested for basin 6P. The cost of raising and re-grading the parking lot to accommodate the increased offset for basin 6P will be resolved between the co-applicants.

GZA Response: GZA disagrees with the contention that the 2' separation is only required if the basin is used for the recharge calculations. The 2' separation is provided to allow for variations in the seasonal high groundwater elevation, to maintain the hydraulic gradient required for infiltration, and to reduce the risk of microbial contamination. The American Society of Civil Engineers "Design and Construction of Urban Stormwater Management Systems" recommends a minimum 4' separation.

21. As required by the Massachusetts Department of Environmental (DEP) Protection Stormwater Standards (Stormwater Standards.) a Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan (CPPP & ECP) should be submitted.

Erosion notes have been added to the Grading and Utilities sheets where erosion control is shown. Once the responsible party is determined these sheets and notes will be finalized with construction sequence based upon the actual contract. As certain aspects of the proposed development plan are still being finalized, including which entity will be responsible, the co-applicants suggest that the Planning Board condition any approval on the submission to Planning Staff of a Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan at least thirty (30) days prior to the submission of a Building Permit application.

GZA Response: Submission of a CPPP & ECP will be required for the Notice of Intent to be filed with the Conservation Commission. At a minimum, a copy should be provided to the Planning Board at that time.

22. A DEP "Checklist for Stormwater Report" should be submitted.

As this is not a DEP supported project, a checklist is not required.

GZA Response: Please provide basis for relaxation of requirement for submittal of checklist.



23. The owner listed in the Long Term Pollution Prevention Plan (LTPPP) should be updated.

As certain aspects of the proposed plan are still being finalized, including which entity will be responsible, the co-applicants suggest that the Planning Board condition any approval on the submission to Planning Staff of a Long Term Pollution Prevention Plan at least thirty (30) days prior to the submission of a Building Permit application.

GZA Response: Submission of a LTPPP will be required for the Notice of Intent to be filed with the Conservation Commission. At a minimum, a copy should be provided to the Planning Board at that time.

24. The HydroCAD calculations appear to significantly over estimated the infiltration rate for Infiltration Basin 6P.

The infiltration rate was based on the Rawls rates found within the Stormwater regulations. This rate was determined through field investigation and conversations with Planning staff. A rate of 2.41 is conservative rate based upon the available rawls rates and soils observed. In speaking with Mr. Williams from GZA, the model for this basin has been modified accordingly to reflect this infiltration rate throughout.

GZA Response: GZA is not disputing the soil infiltration rate. Based on the 2.41"/hour rate and the bottom area of the basin the maximum discharge rate for the basin should be approximately 0.7 cubic feet per second. The model is calculating a discharge rate in excess of 5 cubic feet per second

25. The existing conditions drainage calculations use the minimum Tc value of six minutes, which does not appear to be a reasonable assumption and may over estimates existing runoff rates. Tc calculations should be submitted.

As noted in previous responses, the Tc's within the existing and proposed overestimate the flow, which requires that the drain system in the proposed system be oversized slightly to accommodate the plug flow coming at a faster rate. This is a conservative and reasonable approach which also allows the design to mitigate larger storm events though not modeled. In accordance with the meeting on March 8, 2017 the Tc paths and values will be shown in the revised Stormwater calculations. These Tc's will detail the actual path and flow and will have a separate direct entry to bring the Tc to the min 6 minutes. This will allow each to be calculated /or review but will utilize the information within the Hydro CAD to detail the need for the additional flow path information. These revised calculations will be submitted shortly to Planning staff and GZA for review

GZA Response: The standard of practice is to provide the Tc flow paths on the existing and proposed grading plans and to provide Tc calculations. Use of the minimum Tc value of six minutes for the existing conditions calculations will likely overestimate the existing conditions flow and volumes which will reduce the size of the basins required to mitigate the post construction increase in runoff, which is not a conservative approach.

26. The watershed drainage plans should be full sized and show flow paths used in the Tc calculations.

In accordance with the meeting on March 8, 2017 the Tc paths and values will be shown in the revised Stormwater calculations. These Tc's will detail the actual path and flow and will have a separate direct entry to bring the Tc to the min 6 minutes. This will allow each to be calculated for review but will utilize the information within the HydroCAD to detail the need for the additional flow path information. The flow maps will be reproduced in full size for the set to be submitted to GZA for review. The updated flow maps will be submitted with the final revised plan set

GZA Response: Additional explanations should be provided on how the "Tc's will detail the actual path and flow and will have a separate direct entry to bring the Tc to the min 6 minutes".

27. Drain pipe sizing calculations should be provided.



The drain pipe sizing calculations are provided in the hydrologic report, and each pipe is modeled in HydroCAD.

GZA Response: Drain pipe sizing calculations should be provided using the rational method.

28. Only three soils test were performed to determine soil conditions and seasonal high groundwater elevations. The number of test pits should comply with the Stormwater Standards.

As the proposed project is located on Town parcel(s) which are actively used in association with the Town of Braintree High School, the applicants had received initial authorization to perform limited testing. Subsequent to our March 8, 2017 meeting, the applicants received authorization for additional testing. On March 30, 2017, testing was done in/our additional locations to verify soil conditions and elevations of groundwater. As such, the number of test pits now complies with the Stormwater Standards. The results of the additional testing will be incorporated in the final plan set as required.

GZA Response: Concur.

29. Catch basin inlet calculations should be provided for proposed catch basin and lawn catch basins.

Catch basin inlet calculations are not provided individually; nor are they required by regulation. The area draining to each basin is minor with the exception of the existing parking lot. As stated in previous discussions with Planning Staff and detailed in prior responses, the existing infrastructure for the existing high school parking lot, which is not located on the lot for the proposed building, is undersized, but BSC Partners, LLC is neither responsible for nor proposing to replace the existing infrastructure for the existing school parking lot, which although undersized still functions adequately. Each catch basin is modeled within the HydroCAD calculations and details problems with inlet capacity in accordance with standard engineering practice.

GZA Response: The HydroCAD modelling of the catch basins indicates that there may be a problem with inlet capacity. Catch basin inlet capacity calculations should be provided for new catch basin structures.

30. Based on site observations and NRCS guidance, the cover condition used to determine the Curve Number (CN) for wooded areas should be "good".

Respectfully, the project engineer does not agree with this comment, as based on multiple site visits and observations, there is a significant amount of trash and debris covering the development site area. Within the wooded test pit done at the "Front" of the property, the top 30" contained trash. Based upon the testing and observations, the soils do not meet the "good" designation and modelling the soil surface conditions as "fair" is reasonable and appropriate. In light of the additional testing done on March 30, 2017, the areas within the existing soccer field have been modified to "good" to reflect areas outside of the wooded area as not containing the deleterious materials noted above. The change will be noted on the final plan set and final stormwater management report, as appropriate

GZA Response: Subsurface soils testing is not a factor in the delineation of the cover condition. If areas of the woods are covered in trash then the areas should be delineated on the plans and the cover condition can be adjusted for those areas.



ADDITIONAL COMMENT

31. The total Existing Conditions and Proposed Conditions watershed areas used in the drainage should be equal.

Should any of the Board Members have any questions on the information presented in this letter, please feel free to contact me at (781) 278-4821 or peter.williams@gza.com.

Sincerely,

GZA GeoEnvironmental, Inc.

A handwritten signature in black ink, appearing to read "Peter J. Williams", written in a cursive style.

Peter J. Williams, P.E.
Senior Project Manager

cc: Daniel Campbell, P.E., Level Design Group