



August 06, 2020

Town of Chaplin  
Planning and Zoning Commission  
495 Phoenixville Road  
Chaplin, CT 06235

655 Winding Brook Drive  
Glastonbury, CT 06033

Tel: 860-652-8227

[www.bscgroup.com](http://www.bscgroup.com)

RE: General Review of Site Plan application for Bestway Food & Fuel  
64-66 Willimantic Road, Chaplin, CT

Dear Commissioners:

BSC Group, Inc. (BSC) has been engaged to provide a general engineering review of the Site plans for Bestway Food & Fuel located at 64-66 Willimantic Road in the Town of Chaplin, CT

The current plan set reviewed is entitled “MEHAK REALITY, LLC Convenience Store & Gasoline Station AT 64-66 Willimantic Road, RTE-#6 Chaplin, CT Dated October 18, 2019 and Revised to 7-25-20

Additional materials include a hydrologic report revised to July 25, 2020

**General Comments:**

The Applicant has made numerous revisions to the drainage and hydrology, such that the entire site now discharges towards the wetlands located at the rear (west end) of the property. This is of particular concern whereas the receiving wetlands flows beneath the abutters driveway via a 10” CMP culvert as depicted on the applicant’s plan. The existing culvert does not have the capacity to handle any additional flows resulting from the increased runoff from the applicant’s site. We have witnessed field evidence of driveway overtopping after a rain event. Although the applicant’s Engineer will likely state that there are no additional flows leaving the proposed site, we suspect that the detention basins are undersized for various reasons contained within this review. We have not reviewed the stormwater modelling calculations as there are numerous conflicts with the design. This July 25 revised design should also be reviewed by the Inland Wetland commission as this may involve a significant impact.

**Existing Conditions Plan:**

We have noted that the surveyor of record is a consultant to the applicant’s engineer. However, there appears to be a lack of coordination between the applicant’s engineer and the surveyor as it relates to the required zoning regulations for site plan/ special permit submission. Engineering drawings contain existing condition information that

- Engineers
- Environmental Scientists
- GIS Consultants
- Landscape Architects
- Planners
- Surveyors



is not depicted on the survey plans which raises some question as to the accuracy of the data being shown. Current survey plans contain some inconsistencies as follows:

- 1) Elevations are on an assumed datum more than 200' off from the required US+CGS Datum. Applicant should provide datum on the North American Vertical Datum of 1988 (NAVD88) in accordance with the Chaplin Zoning regulations 8.7.H.11). this has been noted at previous public hearings and has not been addressed by the applicant.
- 2) Project indicates that North is based on the Connecticut Grid System, recommend providing northing, easting coordinates on two property corners with reference to the source of the datum.
- 3) Project Benchmark will be destroyed during construction. This is of concern given the fact this is on an assumed elevation datum.
- 4) Topographic contours do not cover the westerly portion of the property which is important to understand flooding conditions resulting from an undersized culvert channeling waterflow underneath the Fiasconaro driveway.
- 5) Plans do not depict the intermittent watercourse within the wetlands
- 6) Building setbacks are not depicted yet appear within the legend
- 7) Numerous Drainage features within Route 6 are not depicted yet partially appear on the Applicant's Engineering plans.
- 8) Plan does not indicate Property owner and source of title (deed references) as normally provided with A-2 Property Surveys. This plan is dated September 23, 2019 and signed 10-23-19. It is our understanding that the property ownership has changed subsequent to the initial application.
- 9) Plan does not contain signature of the soil scientist.
- 10) Plan depicts an iron pipe found at the southerly angle of the property. While the deed for the property calls for the iron pipe as the corner, the surveyor shows that the iron pipe is 3.26' off. We are not trying to question the Surveyors professional opinion however, called for monumentation normally controls over bearing and distance. The abutters maintain the property lines in the vicinity of the iron pipe and perhaps has color of title and or unwritten rights. Consideration should be made to the site plan's impact on the written/unwritten claim that the abutter may have including property setbacks and required buffers. Ultimately this discrepancy should be corrected.
- 11) Survey Plan does not depict the property zone and the zone of the abutting properties
- 12) Survey plan does not depict soil test hole locations and spot elevations which raises the question of the horizontal accuracy and the relative elevations of those soil tests depicted on the design plans.
- 13) As portion of the A-2 Survey requirements the plan does not depict the names and addresses of the owners of record of abutting parcels and those within (300) feet of the property lines. (Chaplin Zoning section 8.7.H.3). The site proximity map sheet 9 of 9 is not consistent with the survey in the representation of the property lines as this does not appear to be prepared by the project surveyor. What is the source of the location of the abutting buildings. The commission would need to determine if this plan is acceptable since this is not part of the A-2 Survey and is not certified as such.



## **Demolition plan**

- 1) Silt fence is depicted within a foot or two of the southerly property lines. (See comment 10 above).
- 2) Plans do not show protection of the two catch basin inlets at Route 6
- 3) We assume the existing well is a ground water dug well. What is the static level of the ground water? Further recommend water quality samples testing for the presence of VOC's. (See additional comments).

## **Site Layout and Drainage plans**

- 1) Although the plans have been revised to remove proposed features from the required vegetative buffer. Certain items still remain within the required buffer including: Continuous pour concrete barrier; oil/water separator; numerous wood posts; 8' stone access drive; Manhole #5; Infiltration structures; Bio-Retention basins; and associated earthen berms; stone berms; modified rip-rap; overflow pipes; septic systems; buried utility wires; and PVC Vinyl fence; All of these features require a certain amount of maintenance activity and will degrade from the overall intent and quality of the required Buffer strip.
- 2) Article II Definitions section 2.2 of the Chaplin Zoning regulations defines Buffer Strip as "Vegetative screening consisting of but not limited to plantings or naturally occurring shrubs, bushes, trees, evergreens, tall grasses, etc., the purpose of which is to isolate visually and acoustically adjacent property areas". It would appear as if the site plan is in violation of this regulation, we are not aware of a zoning board of appeals application for a variance of this regulation. Although Article VII special regulations section 8.5 dictates that the 1/3 of the outer area shall be planted, the inner two thirds would need to be naturally occurring shrubs, bushes, trees, evergreens tall grasses, etc. By Strict definition of a buffer strip the applicant would be precluded from mowing the lawn to maintain the septic system and or detention basins.
- 3) By opening this site to a convenience store with drive thru and large paved areas will significantly open the site to increased sound decibels levels from Route 6 traffic, audible speaker orders from the drive thru and the higher lumen levels from the gas station store front and site lighting will significantly impact the residential neighbors. It should be noted that much of the planted buffer is lower in elevation than the proposed site.
- 4) The proposed store drive thru and service station will cater specifically to right turn traffic from the southwest bound Route 6 traffic. We have noted that the right turn radius for ingress to the site is only 11.5'. (25' would be more appropriate). The current design is inadequate for this type of business that serves vehicles of all sizes. Larger vehicles will inevitably park along the shoulder of Route 6 obstructing sight line of vehicles exiting the site.



- 5) There are only five standard parking spaces in the front of the building. Chaplin Zoning regulations do not specifically consider parking at the gas pumps. Although employees will likely park in the rear of the building, in absence of a rear business entrance to the store, the rear parking will not be utilized by the public as intended. Many customers will inevitably park at the pumps causing conflicts and queuing at the pumps on an already congested site.
- 6) We recommend eliminating the skewed parking space with the concrete wheel stop located at the north end of the site. There is a safety concern that drivers entering the one-way loop will not be expecting a vehicle backing into the lane in that manner. The wheel stop will likely be heavily damaged during snow removal operations. Replace with large striped island for ease of plowing.
- 7) The Applicant has demonstrated that the turning movement for a fuel truck involves entering the site, followed by reversing into position. There is a safety concern with the truck blocking the site entrance, potentially causing queuing on Route 6. Additionally, cars are likely to parallel park “illegally” along the site entrance island curb. The Applicant should demonstrate a re-fueling turning movement that would not conflict with any cars parked along that curb or overhanging the fueling islands
- 8) The Applicant should show the turning movement for a vehicle entering and exiting the drive thru lane. We find that the turning movements leaving the drive thru lane will often conflict with larger vehicles at the pumps. Larger vehicles will not be able to safely utilize drive thru encouraging random parking throughout the site
- 9) The proposed well location shows bollards located right off the back of curb near the well. Recommend providing a clear 4-foot radius between the well and the bollards, with an additional clearance of 4 feet behind the back of curb to give vehicle clearance. The resulting island would be approximately 17’ wide. This is important for the protection of the well as this would be classified as a public drinking water supply system.
- 10) There is a callout on the plans that indicates perimeter grooves in the concrete pads around the pump islands. The Applicant should show/add grooves to the concrete pad for the gasoline pumps on the plan. Note that the 24’x120’ concrete pad is sloped at about 2% longitudinally and 1.25% transversely. Consider creating a more level pad for the perimeter grooves to be more effective in containing a spill. At the current pitch, they would have significantly less storage volume. The Applicant should not rely on the adjacent catch basin (CB-1) to collect any “overflow” contaminants.
- 11) A concern is the design of the shape of detention basin # 2 with the bottom elevation set to 489.6 at three feet wide with side slopes of 3:1. The infiltration pipe is two feet wide with one foot of freeboard for less than one half foot in width. This configuration may form a sediment dam overtime losing the intended freeboard adding maintenance and allowing for additional sediment and suspended solids to enter the inlet grate. The bottom basin width would need to be increased to insure this does not happen.



- 12) We estimate that Detention basin # 2 has a capacity of 560 cubic feet below the infiltration grate east of the sediment forebay. The shape of the sediment basin should be revised to accommodate the entire water quality volume below the infiltration grate elevation. Per the applicant's Engineering calculations, the required water quality volume is 1754 cubic feet of treatment. The volume of the detention basin below the inlet grate of the infiltration pit would need to be increased 3.14 times the current configuration.
- 13) Applicant's drainage calculations indirectly takes credit for additional amount of infiltration during the storm event by using a Runoff curve number (RCN) of 10. This dramatically increases the overall initial abstraction during the storm event taking additional credit for infiltration of approximately 5" during the rainfall event. The calculations should be revised utilizing reasonable RCN numbers within the detention basin. In general, the detention basins have less capacity than as stated.
- 14) Detention Basin 2 now has an emergency overflow from within the Sediment forebay. The culvert connecting between basin one and basin 2 is a 12" PVC. This is of concern due to the flat slope (0.4%) and potential clogging due to sediment buildup. We recommend that the drainage system be revised to relocate the drainage inlet at the east end of basin no. two which would include a sediment forebay on the east side. The emergency outlet should be a two-stage outlet structure with a side weir including a protective trash rack on top and sides with a type CL catch basin top.
- 15) The cross-section C-C shows a 1 to 1 riprap slope infilled with topsoil. This section is supposed to be portion of the planted buffer. If this is allowed within the buffer area, the design engineer should consult with a landscaped architect for the appropriate type of plantings.
- 16) Bottom of footing elevations are not shown on section C-C. Are the footings at a frost depth approx. = 488.5, this makes the overall height of the wall at 7' during construction
- 17) Flow line elevations are incorrect at pipe crossing detail # 4
- 18) Flow elevations are incorrect at pipe crossing detail #5. The top of 8" PVC pipe is in conflict with the bottom of 12" HDPE/PVC pipe. There is a conflict with the type of pipe labeled on the plan.
- 19) Applicant should specify the ASTM number for the tight Pipe as well as the bedding material. Pipe should be moved further away from the D-Box. It is recommended that an anti-seep silt collar be placed along the pipe 25' from the reserve area to prevent water from the retention basin from running through bedding material of the pipe.
- 20) The applicant is proposing site lighting conduit within 25' from the Septic System. The Applicant should verify if Electrical conduit meets the Technical standards for Tight pipe.
- 21) Applicant should show a detail for the Air pump with underground conduit as this is in close proximity to the buffer strip and septic areas.
- 22) There is a 6 ft high vinyl fence that is proposed to be constructed within three feet of the parking areas. This is in conflict with a light pole and will be



- easily damaged by overhanging cars and snow plowing activities. We recommend that the fence is place approximately 5' from the parking areas.
- 23) Site grading drops off quickly 1.5' in elevation from the top of curbing at Drainage basin #1. Curbing will not withstand multiple years of impacts resulting from snow plowing activities. There should be a designed shoulder adjacent to the curbing.
  - 24) The majority of the site drainage is designed with either 12" PVC or 12" HDPE ADS N12. Several of the pipe slopes on site are 1% or less making them susceptible to siltation and clogging with long term maintenance problems. We recommend that 15" culverts are utilized on lengths greater than 25'.
  - 25) We have noted that there is a lack of cover over the inlet culverts to Detention basin # 2 and Detention basin #1 (less than two feet). We recommend reinforced concrete flared ends to counter the lifting force of the expected water levels within the basins.
  - 26) Cross section BB indicates a depth of modified riprap of 10" therefor the base elevation will be constructed at 494.02. the adjacent wetland elevation is at 494.6. How will this prevent water from the wetlands from entering the detention basin. Given the fact that the storm water overtops the neighboring driveway it is possible for the water elevation at the wetland boundary to exceed the elevation of 494.6. more detail information is required for ground and groundwater elevations. We recommend this area be monitored and analyzed for during the wet seasons. Applicant should develop ground water contours in this area.
  - 27) The infiltration pipe within Detention basin #1 is set too low. Based on the test pit locations depicted on the plan we have estimated seasonal high ground water at 491.6' more or less. The bottom of the infiltration pipe is set at 490.5' (1.1' below seasonal high ground water.
  - 28) The overall bottom of Detention basin #1 is set only 1.9' above seasonal high ground water. 3 ft. is recommended by the 2004 CT DEEP Stormwater Design Manual.
  - 29) The Stone berm and riprap at forebay location is estimated to be approximately 6 feet wide based on the detail depicted on sheet 8 of 9. The location shown is in conflict with the infiltration pipe at detention basin #1. The plan shows one foot of freeboard above the bottom of the basin. If constructed at the plan location there will be no freeboard and or the rip-rap will partially cover the inlet grate. Any sediment that overtops the berm can easily enter the grate and clog the infiltration pit.
  - 30) The invert elevation at MH#5 is 493.42' in elevation. This is lower than the flared end at detention basin#1. There are also numerous mistakes in the roof leader invert elevations as it relates to the flow direction towards MH#5
  - 31) We have noted that deep sumps are being proposed for the catch basins. We further recommend that hoods be placed at the catch basin outlets specifically catch basin one and two to help contain any spills that may occur due to their proximity to fueling islands.
  - 32) Catch basins 1 and 2 are extremely close to fueling islands. Catch basin 1 is located approximately 8 feet from the canopy island for gasoline dispensers.



Catch basin 2 is located approximately 2 feet from the diesel island canopy. The location of these drainage structures is unusually close to fueling operations and represent a significant risk if spill from fueling dispensers are not contained within seconds. Dispenser shut off valves fail from time to time, although it is illegal for patrons to leave their vehicles during fueling operations this happens at convenience stores quite often. Typical gasoline dispenser's pump out 6-7 gallons per minute and highspeed diesel dispensers are typically set to 13-14 gallons per minute and can be set to dispense at higher flow rates. Positive limiting barriers grooves cannot capture the amount of fuel that could potentially overflow within a 30 second spill.

- 33) Per Zoning Regulations 8.7.H.12). *“The landscape plan showing all existing Land features, trees, forest cover and water courses and all proposed changes to these features including size and type of plant material. The site plan shall include all aquifers, ponds, lakes, brooks, streams., wetlands, flood plains and drainage retention areas. A Certified Soil Scientist shall delineate all wetlands on the proposed site”*. In review of this requirement we note that the intermittent watercourse that runs through the wetlands is not shown. The site plans are not signed by a certified soil scientist. There is no report or proof of that the wetlands were delineated by a certified soil scientist. A landscape plan of this size and critical nature should involve a Licensed Landscape Architect. Will the proposed planting provide adequate screening to eliminate noise, dust and objectionable lighting? Will the proposed plants within the detention basin impact the long term storage capacities? White Pine should not be planted on or near the berms of detention basin 1. The root growth and stability of the white pines near of the continuous concrete berm are questionable. Planting of white pine in the vicinity of the neighbor's property line may create inadvertent long-term maintenance problems with large branches that will reach the neighbor's driveway and may raise the PH of the soil for the existing mowing areas. Planting of trees in the septic areas are not recommended. It appears as if the site lighting will stand high above the proposed planting buffer.

### **Additional comments**

- 1) Chapter 7 Table 7-5 of the CT 2004 Stormwater manual identifies Vehicle Fueling facilities (Gas Stations and other facilities with onsite Fueling) as a Land use or Activities with potential for higher pollutant loads. As such a Storm Water Pollution prevention plans including maintenance is recommended for this facility.
- 2) The Applicant's Engineer has designed the drainage system attenuation with a hybrid of bioretention and Infiltration. Bioretention basins do not normally receive flows from a 10-100-year storm event. Bioretention basins and rain gardens are normally designed to treat stormwater quality and not quantity. Infiltration is normally an off-line system. suspended sediment particles in larger storm events can be introduced to the receiving soils of the infiltration



pits resulting in premature clogging and diminished infiltration rates limiting the life of the system.

- 3) The following notes (a-e) pertain to Siting considerations for the detention basins
  - a) Three field tests and test pits or soil borings are normally performed at each basin. The applicant has now addressed this after the initial submission. The Test pits should be excavated to identify the depth of groundwater. This has been done in within basin one however groundwater was not identified in basin two.
  - b) Depth of test pits should be excavated 4 feet below bottom of detention basin to identify the presence of ledge and or groundwater. This has not been demonstrated. We estimate that the bottom of the test pits for D and E to be at an elevation of 487.0 which is only 2.6' feet below the bottom of the basin. Soil testing should be conducted to a depth of 3 feet below the infiltration pit. Bottom of infiltration pit for Detention Basin 2 = 486.1 this is lower than the lowest test pit excavation. Applicant's test should be excavated to an elevation depth of 483.1 feet
  - c) Ground water depth has not been identified in detention basin # 2. The design elevation of Detention basin #1 has conflicts with the ground water elevations.
  - d) The bottom elevation of the Septic system is set at an elevation of 490.5 whereas the overflow of detention basin #2 is set at 494.0, Due to the proximity of the septic system to the detention basin, flooding of the leaching trenches can theoretically occur.
  - e) The bottom of Detention basin # 1 is set at 493.5 whereas the elevation of the nearby wetlands is at 494.3. Due to freezing thawing cycles and southeasterly aspect of the cut slope within proximity of the wetlands it is reasonable to assume that groundwater may intermittently seep into detention basin #1 thus potentially reducing storage capacities, eliminate water quality treatment, impacting wetlands and creating a mosquito breeding ground.
- 4) The proposed well site, design, construction and operations will require approvals from the State of CT Drinking Water Division and will likely be classified as a transient non community public water supply (TNC). This will require periodic testing by the systems operator. By definition a TNC water system is any publicly or privately owned establishment that has its own drinking water source(s), provides water for human consumption, and serves an average of 25 or more people per day for a minimum of 60 days per year. The persons served need not be the same people.
- 5) The applicant plans depict the well to be constructed in the middle of a parking area centered in a small island protected with steel bollards. This well needs to be installed at a minimum of 75' from the neighboring property line such that the applicant controls the entire 75' protective radius. If the well yield and or withdrawal rate exceeds 10 gallons per minute, the





protective radius will need to be increased to 150'. Please note that the proposed well appears to be within 100' from the highwater elevation of the detention basin at the west end of the property.

- 6) The applicant would need to be aware and promote best practices for deicing the parking area in the vicinity of the well. The current island is 9' wide. This should be increased for this installation of the bollards to be constructed at least four feet from the curb to prevent vehicles from inadvertently hitting the bollards due to turning movements. Additionally, the bollards should be placed at least 4 ft. from the well casing such that the well is outside of the fall radius of the bollards. Any direct hit can cause damage to the well casing. It is therefore recommended that the plans depict a detail layout indicating the bollard locations. In absence of a detail, the island should be increased to at least 17' wide.
- 7) As we understand the requirements of the Transient non community Public Water Supply testing will require an initial screening for Volatile Organic Chemicals (VOC's) If the initial testing demonstrates undetectable limits for VOCs the operator will no longer be required for this testing. Due to the gasoline and onsite fueling activities with potential for higher pollutant loads we recommend the VOC screening test to be continued and conducted on a quarterly basis to ensure that the stormwater practices used on this property to not pollute the public drinking water supply. It is recommended that a representative of the certified testing lab be required to obtain any samples.
- 8) Please note that trace amounts of MTBE have been detected in the northerly neighbors TNC water supply well which may have been attributed to former gasoline pumps from the 1930's, prior poor management practices of the property owners and or possibly the fuel service station located approximately 500-northeasterly of a gasoline service station owned by Mickey Pankaj LLC. It would be helpful in the review of this project if a hydrogeological report was made to contain information on the sites geological conditions, soil conditions, groundwater flow conditions, ground water quality including chemical and bacteriological analysis as well as ground water recharge figures as suggested the Chaplin Zoning regulations section 8.7.H.17.
- 9) Septic System- The Eastern Highlands Health District Department of Health has reviewed the proposed plans. It should be noted that however, the applicant's engineer has chosen a proprietor type leaching trench, Geomatrix. This type of septic system is typically used in very tight situations where space is limited. This convenience store will likely be frequented for public restrooms by travelers and patrons of nearby establishments. The primary concern is the storage capacity of the proposed system. Larger gallery type systems have larger storage capacity to handle peak flows generated from this business during busy summer weekends. The public health code addresses average daily flow and not peak flow. Given the fact the proposed building contains two kitchens and we are uncertain of the potential use, we question the sizing criteria of the septic system including the grease and septic tanks.



Since the grease and septic tanks are under pavement, at a minimum we believe they should be increased in size. The septic leaching trenches are very limited to expansion or repair due to the close proximity of the property line and the detention basins.

### Hours of Operation

- 1) It should be noted that the applicant's stated hours of operation are from 6:00 am to 11:00 pm seven days a week. Connecticut Regulation of State Agencies 22a-69-1.1 as it relates to sound regulation indicates daytime hours are from 7:00 am to 10:00 pm. Nighttime hours are from 10:00pm to 7:00am. This relates to allowable noise levels and noise zone standards which have a general reduction of 10 decibel levels at night (see RSA 22a-69-3.5). The gasoline service station is considered a "Class B" emitter of sound abutting a "Class A" receptor zone which has a 45-dba limit at night and 55 dba limit during the day. Decibel levels emitted in excess of 45 dba are considered excessive noise. In consideration of the neighborhood residential zone, the commission could consider reducing the hours of operation from 7:00 am to 10 pm.

The above comments express our review of the latest set of drawings as they relate to common engineering practices and regulatory documents. While we have not specifically reviewed the most recent routing calculations of the drainage system, we are concerned with overall drainage system and coordination given the previous design, assumptions and modifications demonstrated by the applicant's engineer on previous plans and public testimony, we can reasonably expect to have concerns over the assumptions used.

Sincerely,  
**BSC Group, Inc.**

Michael C. Healey, PLS  
Manager of Survey

Robert Newton, P.E.,  
Manager of Civil Engineering