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CIVIL & TRAFFIC ENGINEERS / LAND SURVEYORS / PLANNERS / LANDSCAPE ARCHITECTS

Serving Connecticut, Massachusetts, & Rhode Island

Stormwater Management Statement

Pete's Tire Barn
260 Chapel Road
South Winsor CT
September 21, 2020

Introduction

Pete's Tire Barns, Inc., is proposing a building expansion to their existing facility located at 260 Chapel Road South Windsor, Connecticut. The property is referenced on the Town of South Windsor Tax Assessors map as GIS # 18000260. The proposed development will include the construction of 12,000± sf building addition and associated site improvements to include, but not limited to, regrading of pavement areas, landscaping, lighting, and updates to existing stormwater management BMP's.

The total property area is 4.59 acres, 0.62± acres of which is proposed to be disturbed during construction. A large majority (0.54± acres) of the proposed disturbance is within the limits of existing pavement. For more information, please refer to the plans entitled "Pete's Tire Barns ~ Site Plan Modification ~ 260 Chapel Road ~ South Windsor, CT" prepared by Design Professionals, Inc., and dated September 21, 2020, as amended.

Discussion

All Stormwater runoff from the existing site gets conveyed to an infiltration basin located at the north west corner of the site. The property owner has indicated no problems of flooding or prolonged wet pools in this basin.

The proposed building addition is expected to increase the total impervious area onsite by approximately 60 SF (0.001 Acres). Due to this minimal increase in impervious area, DPI is only proposing slight modifications to the bottom of the pond to allow for the installation of a new 24" HDPE Flared End. Such a small increase in impervious cover will have a negligible effect on the peak flows to the basin. With this, it is DPI's professional opinion that the infiltration basin will continue to operate just as it does today.

Storm Water Upgrades

The last two legs of the existing underground storm piping system will be removed and replaced with new pipes to re-route stormflow around the addition. The new pipe run will be accompanied by an ADS Barracuda S6 unit to address water quality of all sheet flow from pavement areas entering the infiltration basin. This unit was sized based on recommendations made in the 2004 Connecticut Stormwater Quality Manual for determining the water quality flow rate for the site. Water quality flow calculations, and ADS Barracuda manufacturer's sizing info is included as an attachment to this statement.

Conclusion

The proposed stormwater management system upgrades as discussed herein and shown on the referenced plans is appropriate for the proposed development on the subject site and should not pose any detrimental impacts to the environment.

Please contact us with any questions.

Sincerely,
DESIGN PROFESSIONALS, INC.

Daniel H. Jameson, P.E.
Project Manager

Attachment A
WQF & ADS Barracuda Specs

260 Chapel Road
DPI Project No.:4516
September 21, 2020

Pete's Tire Barn Water Quality Unit Sizing

To find Unit Peak Discharge q_u with Exhibit 4-III, the following is needed:

Time of Concentration (T_c):

$$\underline{6 \text{ mins}} = \underline{0.10 \text{ hours}}$$

Initial Abstraction (I_a) in inches / Design Precipitation (P) in inches:

Initial abstraction (I_a) from Table 4-I in Chapter 4 of TR-55 needs Curve Number (CN)

$$CN = \underline{92}$$

$$I_a = \underline{0.174 \text{ inches}}$$

Design Precipitation (P) = 1" for water quality storms per Appendix B

$$I_a/P = \underline{0.174}$$

$$\text{Unit Peak Discharge } q_u = \underline{650 \text{ cfs/mi}^2/\text{inch}}$$

$$\text{Drainage Area } A = \underline{2.514 \text{ acres}} = \underline{0.004 \text{ mi}^2}$$

$$\text{Runoff Depth } Q = \text{WQV (acre-feet)} \times 12 / \text{drainage area (acres)}$$

Water Quality Volume (WQV) = (1")(R)(A)/12, where:

R = volumetric runoff coefficient

$$= 0.05 + 0.009(I), \text{ where } I = \text{percent impervious cover} = \underline{72.5\%}$$

$$R = 0.05 + 0.009(I)$$

$$R = 0.05 + 0.009(\underline{72.5})$$

$$R = \underline{0.703}$$

$$A = \text{drainage area in acres} = \underline{2.514 \text{ acres}}$$

$$\text{WQV} = (1")(R)(A)/12$$

$$\text{WQV} = (1")(\underline{0.703})(\underline{2.514 \text{ acres}}) / 12 \text{ in/ft}$$

$$\text{WQV} = \underline{0.147 \text{ acre-feet}}$$

$$Q = (\text{WQV} \times 12 \text{ in/ft}) / \text{Drainage Area}$$

$$Q = (\underline{0.147 \text{ acre-feet}} \times 12 \text{ in/ft}) / \underline{2.514 \text{ acres}}$$

$$Q = \underline{0.702 \text{ in}}$$

$$\text{WQF} = q_u \times A \times Q$$

$$\text{WQF} = \underline{650 \text{ cfs/mi}^2/\text{inch}} \times \underline{0.004 \text{ mi}^2} \times \underline{0.702 \text{ in}}$$

$$\text{WQF} = \underline{1.83 \text{ cfs required}}$$

Proposed

As shown on the enclosed water quality unit sizing report, the proposed BaySaver Barracuda S6 is rated for 80% TSS removal for the required 1.83 cfs water quality flow. See Barracuda sizing chart included in the Appendix.



BaySaver Technologies, LLC
1030 Deer Hollow Drive
Mount Airy, MD 21771
(301) 679-0640; dfigola@ads-pipe.com

November 1, 2017

ATTENTION: Daniel Figola, General Manager

REFERENCE: Third Party Review of Testing Procedures for Barracuda™ Separator at the Mid Atlantic Storm Water Research Center, 1207 Park Ridge Drive, Mount Airy, MD 21771

SUMMARY

Boggs Environmental Consultants, Inc. (BEC) was hired by Advanced Drainage Systems (ADS) in August of 2017, to serve as independent third-party oversight of the BaySaver Barracuda S4 Separator test unit for removal of sediment with equivalent particle size distribution to the industry standard OK-110. The BaySaver Barracuda S4 is a storm water treatment device with a Maximum Treatment Flow Rate (MTFR) of approximately 1.08 cubic feet per second (cfs) that removes suspended solids from storm water runoff, with an average removal efficiency of 80% at the MTFR and a feed concentration of 300 mg/L. The device is an insert that can be installed in either Polypropylene plastic pipe or concrete vault, and consists of a cone (vortex separator) and baffles (“teeth”).

SCALED RESULTS

Testing flow rates ranged from 0.31 to 1.61 cfs, with a feed OK-110 concentration of 300 mg/L. Based upon New Jersey scaling methodology, the table below represents treatment and device information for the S4, S6, and S8 units.

Table 1: MTFR's and Sizing for BaySaver Barracuda Models

Model ¹	Man-hole Diameter ¹ (ft)	OK110 80% TSS Maximum Treatment Flow Rate (cfs)	Treatment Area (ft ²)	Hydraulic Loading rate (gpm/ft ²)	Chamber Depth (ft)	Wet Volume (ft ³)	50% Maximum Sediment Storage ² (ft ³)
Barracuda S4	4	1.08	12.57	38.6	6.83	75.4	10.47
Barracuda S6	6	2.43	28.27	38.6	6.83	169.7	23.56
Barracuda S8	8	4.32	50.27	38.6	11.03	512.7	41.89

Notes:

1. In some areas, Barracuda units are available in additional diameters. Units not listed here are sized not to exceed 38.6 gpm/ft² of effective treatment during the peak water quality flow.
2. 50% Sediment Storage Capacity is equal to manhole diameter x 10 inches of sediment depth. Each Barracuda unit has a 20 inches deep sediment sump.

Should you have any questions, contact our office at your earliest convenience.

Sincerely,

BOGGS ENVIRONMENTAL CONSULTANTS, INC.

William R. Warfel
Principal Environmental Scientist

Robin J. Maliszewskyj
Chemical Engineer