



Planning & Development
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Memo

Date: March 30, 2023 Updated 4-12-23 Updated 4-13-23

To: Planning Board
Platz Associates, CivilX

From: Michael G. Livingston, Town Engineer/Planner

Re: Bulrush Retail Plaza –Drainage Review Memo – Tax Map 108, Lot 33-15

Drainage Analysis/ Model Review/Plan Review

Information Provided

- Stormwater Management Report dated March 2023 by Travis A. Letellier PE #13920 of CivilX
[revised 4-8-23](#) [Revised 4-13-23](#)
- Sheet C-1 Grading and Drainage Plan [revised 4-8-23](#) [Revised 4-13-23](#)
- Sheet C-2 Erosion Control Notes and Details
- [Drainage Comment Responses, 4-8-23](#)

Methodology:

HydroCad utilized – good
Storm event to be 25 year vs 10 year [Revised to 25 yr., but used 6.05 inch rate vs typical 6.2; but OK, small basin area.](#)
Type III storm used to be verified [NRCC 24 hr. D used, not typical but OK, small basin area](#)
Pre vs Post Areas – good
Need full size pdf of Sheet S-1 [Provided](#)

Pre- Development

Basins: Limits, good
 Areas and surface types, good
 Flow paths, good

Analysis Point: Good

Post- Development Total area equal to Pre of 0.79 acre, good

Basins: Basin limits appear well modelled
 Surface areas appear accurate for the proposed development
 Flow paths appear appropriate for each basin.

Ponds: Drywell and Dripline Filter as ponds, good

- Exfiltration rate of 15 in./hr. used is high. Soils information indicates 1.42 to 14.17 in./hr. for Adams and 1.42 to 6.0 in./hr. for Naumburg. Revised rate of 9.9 inches has been used. This rate remains higher than typically assumed with no on-site soils information such as test pits and perk rates. The rate was weighted based on high rates of 12 and 5 (max. rates of 14 and 6 per SCS data). The rate is OK to be weighted, but should be based on average rates of 7.8 and 3.7 which results in a weighted rate of 6.6. This may also compensate for soil variations at depth which are proposed to be approximately 9 feet. Revised 4-13-23 using a rate of 6.6 for the dripline pond and 7.8 for the drywells, OK. Revised HCad data has peak pond elevations higher but consistent with design elevations at the 25 year event.
- Portion of surface flow will bypass the drywell and flow directly into CB-1 Invert elevations will prevent as described in response, addressed.
- Drywell outlet in model is 6" at 38.0, Plan has as 12" at 37.0 Addressed
- Drywell storage needs clarity: top 20" is pavement and gravel base materials; Stone area 40% voids; stone VF vs stone & drywell VF will have different storage. Lowest elev. 31.0, 31.0 to 32.5 32.5 to 38.7+/- Addressed in detail on C-1 and in revised HCad data
- Dripline is half in Naumburg and half in Adams soils per soils map OK, dripline is shallow in this area, soil type drainage properties may change with soil depth.
- Perforated drain pipe in Dripline detail. Not in model. Where would it outlet? Is it needed for a foundation drain? Detail revised on C-1, addressed in response

Comments:

- Analysis to be done at 25 year event and re-evaluated Addressed
- Exfiltration rate to be revised Rate to be supported with field data or a more conservative value used Revised 4-13-23 using a rate of 6.6 for the dripline pond and 7.8 for the drywells, OK
- An additional drywell or two may be needed A second drywell was added
- Dripline may need to be widened Addressed
- Barrier between dripline and foundation drain may be needed Detail revised on C-1, addressed in response
- Revised model data needed at lower infiltration rate, impacts to be evaluated Revised HCad data has peak pond elevations higher but consistent with design elevations at the 25 year event.
- See C-1 with markups:
 - Entrance culvert does not have minimum cover required. To be lowered? Culvert elevation lowered and diameter changed from 12" to 15", addressed.
 - Grading at entrance culvert outlet needs to be addressed. Rip rap depicted onto abutting lot. Revised grading may also be needed onto abutting lot to create a swale downslope if a swale cannot be contained within the street ROW Grading and culvert outlet locations adjusted, addressed.
 - Is an easement from the abutter needed? None needed based on revisions made.
 - Drywells on plan view to have detail added: correct diameter of 8 feet and depict stone limits Notations added to plan, C-1, addressed.
- Revised HCad data still results in a slight decrease in stormwater flowrate from the site at the analysis point: PRE 0.7 cfs vs POST 0.6 cfs.

Conclusions:

The proposed stormwater analysis and design meets Town requirements.
The proposed erosion control plan meets BMP's and Town requirements.