



Red Barn Group, Inc.

www.redbarn-engineering.com

Field Report and Drainage Calculations

DATE: March 2, 2023

TO: KEVIN NGUYEN, DRAINAGE REVIEWER, CITY OF MERCER ISLAND

FROM: Rebekah Weston, PE Principal Civil Engineer

SUBJECT: Jaffe Residence – Drainage Analysis

Red Barn Group, Inc. (Gopi Masarapu and Rebekah Weston) and the City of Mercer Island (Kevin Nguyen) met at the site to discuss the drainage options for the site. The original site plan had runoff for the upper portion of the addition draining back toward the street. The City said that this would have to be hard-piped and no discharge onto the street could occur.

The existing drainage system has a drywell that collects the roof runoff. The new site impervious area is less than 2,000 SF, which does not require a drainage review. However, a city review comment required that the drywell be validated that it was working properly as well as for the additional runoff going to it. This is problematic in that the yard is well vegetated and would require digging within large root zones to find the drywell and test it.

At the site visit, we discussed the options and the following was decided:

- 1) It was discussed to not alter the impervious area going to the existing system. We walked downstream and there was no evidence of a failing system. There was no exposed soils or rutting occurring. Because the project is not altering the existing system, it was agreed that the drywell system did not need to be investigated further.
- 2) There is no existing drainage system other than the noted drywell on the property. Hence, the new impervious areas from the roof need to be routed through a drainage BMP to disperse to the extent possible. A basic dispersion trench is able to fit on the property and meets all the requirements. See Attachment A for a summary of the criteria for a basic dispersion trench.

See the plans for the areas that are routed to the new basic dispersion trench. Note that a portion of the SE roof will compensate for the front roof extension over the patio where that area is only feasible to be routed to the existing drainage system.

Pictures from the site visit are included in Attachment B.

Sincerely,

Rebekah J. Weston, PE

Engineer of Record



Attachment A – Basic Dispersion Criteria (Section C.2.4.4. 2021 King County Surface Water Manual) –
 USE OF GRAVEL FILLED TRENCHES FOR BASIC DISPERSION

	2021 King County Surface Water Manual Criteria	How Met?	Does Design Meet the Criteria?
1	No more than 700 SF of impervious surface can drain to a simple 10-ft dispersion trench. Up to 3,500 SF of impervious can drain to a 50-ft trench with notch board. Smaller lengths of trench with notch board may be used at a ratio of 10 feet of trench per 700 SF of impervious surface. The 10-ft trench length is the maximum allowed without a notch grade board as shown in Figure C.2.1.D.	A 15 foot trench is used that allows for 1,050 SF to go to the trench. New Addition Front of House = 193 SF New Addition Garage = 455 SF Compensating Roof Area = 334 SF TOTAL AREA TO TRENCH: 789 SF = (455 + 334)	Yes. Figure C.2.1.D from the KCSW Manual is referenced on the plans and meets the criteria in the manual.
2	A “vegetated flowpath segment” of at least 25 feet in length must be available along the flowpath that runoff would follow upon discharge trench. The length must be increased to 50 feet if the discharge is toward a steep slope hazard area or a landslide hazard area steeper than 15%. All or a portion of the vegetated flowpath segment may be within the buffer for the steep slope hazard area or landslide hazard area.	A 25-foot vegetated path is shown on the plans. It was verified in the field that no slope greater than 15% or steep slope exists. Site is not in a hazard area.	Yes.
3	The simple 10-foot trench illustrated in Figure C.2.4.B must be at least 2-feet wide by 18-inches deep. The maximum 50-foot trench with notch board detailed in Figure C.2.1.D must be at least 2-feet wide and 24-inches deep.	A 15-ft trench is required and the detail shown on the plan is compliant with Figure C.2.1.D with the notched board.	Yes.
4	All trenches must be filled with ¾ to 1-1/2-inch washed rock.	The dispersion trench detail calls out the rock.	Yes.
5	All trenches must be placed at least 10 feet from any building and must be parallel as possible to the contour of the ground. A setback of at least 5 feet must be maintained between any edge of a trench and the property line.	The dispersion trench is placed such that it meets the clearances from the building and property line.	Yes.
6	For purposes of maintaining adequate separation flows discharged from adjacent dispersion devices, the outer edge of the vegetated flowpath segment for the dispersion trench must not overlap with other flowpath segments, except these associated with sheet flow from a non-native pervious surface.	Not applicable. There is only (1) dispersion trench, so this criteria does not apply.	Yes.



Attachment B – Field Site Visit Photos



Downstream of site looking north towards backyard of residence.



Downstream of site on pavement below, looking north through vegetated area where flow dispersion will occur.













