

TECHNICAL MEMORANDUM

2707 Colby Avenue, Suite 900, Everett, WA 98201 | P 425.252.7700

To: Sherrie Ringstad, Associate Planner, City of Mill Creek

From: Brian Caferro, PE, Perteet

Date: July 13, 2018

Re: Review Comments for Cubes Self Storage

This memorandum provides review comments for the Cubes Self Storage development project in the City of Mill Creek. Submittal materials were reviewed based on the project's compliance with the City of Mill Creek Municipal Code and the minimum requirements of the 2012 Stormwater Management Manual for Western Washington (SWMMWW), as amended in December 2014. Review comments are specific to drainage, grading, and TESC elements only.

Plans

Sheet D-1.1 (Preliminary ESC Plan)

- Include City Standard details for silt fence, construction sequence, sediment pond, etc. on a detail sheet with the next submittal.
- Call out what type of access road material is being used and at what thickness.
- Move the upper silt fence to the top of the slope.
- Provide sediment pond calculations with the next drainage report submittal.
- Provide inlet protection for the four existing catch basins across SR 527.

Sheet C-2.0 (Preliminary Grading and Drainage Plan)

- The control structure rim is 1.5 feet above the pond access road. Move out of roadway or revise design so rim is not sticking up out of the road.
- Top and bottom surface areas of the live storage zone cannot be the same if there are side slopes present, which appears to be the case.
- Double check the bioretention cell surface area. It appears to be about 1,400 SF and not 1,620 SF.
- What is the 2-year storm event water surface elevation in the detention pond? Need to make sure it is not backing up into the bioretention cell. Maximum drawdown time of 48 hours within the bioretention cells needs to be maintained.

Drainage Report

- Page 3 – City requires the 100 year event for conveyance design. Both the rational and SBUH methods are allowed.
- Minimum Requirements (MR)
 - MR #1: This requirement has been met.
 - MR #2: A SWPPP, based on the most recent Ecology template, needs to be prepared and submitted for review prior to the start of construction.
 - MR #3: If source control is required then state what BMPs will be used. If it is not required then state why.

MEMORANDUM

- MR #4: This requirement has been met.
- MR #5: This requirement has been met. Infiltration is not feasible based on geotechnical investigation.
- MR #6: This requirement appears to have been met. Bioretention facility size needs to be confirmed.
- MR #7: The detention pond sizing calculations has an infiltration rate. However, the pond is supposed to have a liner to prevent infiltration. Re-size pond without infiltration.
- MR #8: This requirement has been met.
- MR #9: An operation and maintenance manual still needs to be provided.
- Page 14 – Replace the terms “rate” and “conditions” with “durations” in the first paragraph as shown in the attached report redlines.
- Page 15 – Is the detention pond area included in the proposed basin? The detention pond area needs to be included in the pond sizing calcs if they aren’t already.
- Page 15 – With a pond liner and a high groundwater elevation, will there be any upheaving from buoyance effects? If so, then an underdrain may need to be added around the pond perimeter.
- Page 15 – Provide a basin map which delineates the areas tributary to the bioretention cell and detention pond.
- Page 15 – Does the bioretention cell also need a liner?
- Page 17 – The storm event for conveyance calculations needs to be the 100-year event.
- Page 17 – A backwater analysis also needs to be performed.
- WWHM Calcs Page 5 – Area of bioretention cell needs to be included in the calcs, if it isn’t already.
- WWHM Calcs Page 7 – Detention pond sizing should not have infiltration occurring.
- WWHM Calcs Page 7 – Calcs show vertical sides, which is not the case. One side is entirely sloped (access road side) and the others are partially sloped before becoming vertical. Revise calcs accordingly.

Geotechnical Report

- Page 20 – Last paragraph, change “Snohomish County” to “Ecology.”

Critical Areas Report

- Page 5 – Last sentence of 6.2, change to the 2012 Stormwater Management Manual for Western Washington, as amended in 2014.

August 10, 2018

Brian Caferro, P.E. **(Reviewer responses are shown below in RED) 8/17/2018**

Perteet

PACLAND responses are shown below in green 8/20/2018

2707 Colby Avenue, Suite 900
Everett, WA 98201

Cc: Sherrie Ringstad, Associate Planner, City of Mill Creek

Subject: Cubes Self Storage Review Comments

Dear Mr. Caferro,

The following letter is in response to your July 13, 2018 Technical Memorandum outlining comments specific to drainage, grading, and TESC.

PLANS

Sheet D-1.1 (Preliminary ESC Plan)

- Include City Standard details for silt fence, construction sequence, sediment pond, etc. on a detail sheet with the next submittal.
Response: A separate detail sheet (D-1.0) has been included with applicable standard plans.
Reviewer Response: Comment addressed.
- Call out what type of access road material is being used and at what thickness.
Response: Access road material and thickness has been specified on the plan sheet.
Reviewer Response: Comment addressed.
- Move the upper silt fence to the top of the slope.
Response: Silt fence has been relocated as requested.
Reviewer Response: Comment addressed.
- Provide sediment pond calculations with the next drainage report submittal.
Response: Sediment pond calculations have been included in the revised drainage report.
Reviewer Response: It is unclear where the 2yr flow was obtained from. Please provide where you got this flow rate from. Also the dewatering orifice size was not calculated right. Make sure your order of operation is right when re-calculating. Comment applicable to Final Drainage Report.
- Provide inlet protection for the four existing catch basins across SR 527. **Response: CB inlet protection has been added to plans as requested.**
Reviewer Response: Comment Addressed.

Sheet C-2.0 (Preliminary Grading and Drainage Plan)

- The control structure rim is 1.5 feet above the pond access road. Move out of roadway or revise design so rim is not sticking up out of the road.
Response: The design has been revised. The structure is no longer located in the access drive.
Reviewer Response: Comment Addressed.
- The top and bottom surface areas of the live storage zone cannot be the same if there are side slopes present, which appears to be the case.

Response: The areas have been updated to accurately reflect the pond geometry including sloped area at the north for the access road. The bottom of the pond is graded to accommodate sediment storage only and is not part of the live storage.

Reviewer Response: Comment Addressed.

- Double check the bioretention cell surface area. It appears to be about 1,400 sf and not 1,620 sf.

Response: The bioretention cell is no longer part of the proposed design. An enhanced water quality treatment facility (proprietary structure-media filter) will be installed to treat all stormwater generated onsite excluding the building roof drainage.

Reviewer Response: Comment Addressed.

- What is the 2-year storm event water surface elevation in the detention pond? Need to make sure it is not backing up into the bioretention cell. Maximum drawdown time of 48 hours within the bioretention cell needs to be maintained.

Response: Comment is no longer applicable. See above response.

Reviewer Response: Comment Addressed.

It is acknowledged that the plans are in a preliminary design phase and that more detail such as pond and trench cross sections, pipe profiles, etc. will be provided with the final engineering plan submittal so that a more detailed review can be conducted.

Drainage Report

- Page 3 – City requires the 100-year event for conveyance design. Both the rational and SBUH methods are allowed.

Response: A backwater analysis and conveyance calculations have been provided in the revised drainage report.

Reviewer Response: Comment Addressed.

- Minimum Requirements
 - MR #1: This requirement has been met.
 - MR #2: A SWPPP, based on the most recent Ecology Template, needs to be prepared and submitted for review prior to construction.

Response: A SWPPP will be prepared and submitted for review as part of the Building Permit submittal.

Reviewer Response: Noted.

- MR #3: If source control is required then state what BMPs will be used. If not required then state why.

Response: A statement has been added to the drainage report stating why source control will not be required for this project.

Reviewer Response: Comment Addressed.

- MR #4: This requirement has been met.
- MR #5: This requirement has been met. Infiltration is not feasible based on geotechnical investigation.

Response: Groundwater levels and soil characteristics will provide for limited infiltration. Building roof drainage (clean) will be infiltrated to the maximum extent feasible. Further geotechnical investigations (per 2014 SMMWW) will be performed prior to final infiltration facility design.

Reviewer Response: Noted. Given the length of the proposed infiltration trench, at least two infiltration test locations shall be included. Also the geotechnical engineer will need to review the infiltration trench and infiltration pond design. I have concerns regarding short circuiting of the infiltrated water. Will infiltrated water enter the wall

drains which are in close proximity to this system, thus not allowing all the water to fully infiltrate? Comment applicable to Final Drainage Report.

- MR #6: This requirement appears to have been met. Bioretention facility size needs to be confirmed.

Response: Enhanced water quality treatment is to be provided by a proprietary media filter system. The size and type of structure is yet to be determined, likely an Old Castle Biopod Biofilter or Filterra Modular Wetland system.

Reviewer Response: Noted. Sizing calculations to be provided with next submittal.

- MR #7: The detention pond sizing calculations has an infiltration rate. However, the pond is supposed to have a liner to prevent infiltration. Re-size pond without infiltration.

Response: The detention pond for the developed areas (excluding the building) has been sized without infiltration. The infiltration trench and pond (for building roof drainage) have been sized using the recommended infiltration rate provided by the geotechnical engineer.

Reviewer Response: Noted. Infiltration testing will still need to be conducted. See response under MR #5 above. Also, there needs to be an emergency overflow for the detention pond, in addition to the primary overflow (riser pipe in flow control structure).

- MR #8: This requirement has been met. Comment applicable to Final Drainage Report.
- MR #9: An Operation and Maintenance Manual still needs to be provided.

Response: An Operations and Maintenance Manual has been prepared and is included in the revised drainage report.

Reviewer Response: Comment Addressed.

- Page 14 – Replace the terms “rate” and “conditions” with “durations” in the first paragraph as shown in the attached report redlines.

Response: The terms have been revised as requested.

Reviewer Response: Comment Addressed.

- Page 15 – Is the detention pond area included in the proposed basin? The detention pond area needs to be included in the pond sizing calculations if they aren’t already.

Response: The detention and infiltration ponds are not included in the basin calculations. Instead, WWHM provides the option to apply precipitation and evaporation to the facility, which provides a more representative model of the site and basin/facility hydrology.

Reviewer Response: Yes, WWHM provides this option but you still need to include the pond area in your existing condition and model it as forested because this will be part of your developed area. You would apply the precipitation and evaporation to the facility area in the developed condition. Revise Preliminary Drainage Plan as noted. **REVISED AS REQUESTED.**

- Page 15 – With a pond liner and high groundwater elevation, will there be any upheaving from buoyancy effects? If so, then an underdrain may need to be added around the perimeter.

Response: Final wall design to be prepared by others. Design calculations to be provided at time of building permit submittal. If deemed necessary, appropriate measures will be designed/constructed to eliminate buoyancy effects.

Reviewer Response: Noted.

- Page 15 – Provide a basin map which delineates the areas tributary to the bioretention cell and detention pond.

Response: A basin map has been provided in the revised drainage report as requested.

Reviewer Response: The basin map shows the paved area between the two buildings as part of the area tributary to the infiltration trench. Is this area covered with roofing that drains into the downspout system? If not, revise basin map accordingly. Yes, the area is covered with roof.

- Page 15 – Does the bioretention cell need a liner?

Response: This comment is no longer applicable.

Reviewer Response: Comment Addressed.

- Page 17 – The storm event for conveyance calculations needs to be the 100-year event.

Response: Conveyance calculations for the 100-year event have been provided.

Reviewer Response: Comment Addressed.

- Page 17 – A backwater analysis also needs to be performed.

Response: A backwater analysis has been provided.

Reviewer Response: Comment Addressed.

- WWHM Calcs Page 5 – Area of bioretention cell needs to be included in calcs., if it isn't already.

Response: The detention and infiltration ponds are not included in the basin calculations. Instead, WWHM provides the option to apply precipitation and evaporation to the facility, which provides a more representative model of the site and basin/facility hydrology.

Reviewer Response: Yes, WWHM provides this option but you still need to include the pond area in your existing condition and model it as forested because this will be part of your developed area. You would apply the precipitation and evaporation to the facility area in the developed condition. Revise Preliminary Drainage Report as noted. **REVISED AS REQUESTED.**

- WWHM Calcs Page 7 – Detention pond sizing should not have infiltration occurring.

Response: WWHM analysis has been updated and no longer includes infiltration for stormwater runoff from the proposed site improvements (excluding building roof runoff).

Reviewer Response: Comment Addressed.

- WWHM Calcs Page 7 – Calcs. show vertical sides, which is not the case. One side is entirely sloped (access road side) and the others are partially sloped before becoming vertical. Revise calcs. accordingly.

Response: WWHM analysis has been updated to include the sloped access road. The basin bottom is graded down from the base of the wall for sediment storage and is not included as part of the live storage for which the facility model is designed.

Reviewer Response: Comment Addressed.

Geotechnical Report

- Page 20 – Last paragraph, change “Snohomish County” to “Ecology”. **Response: The report has been revised as requested.**

Reviewer Response: Revised geotech report was not included in the revised drainage report. I will review with the next submittal. Disregard comment.

Critical Areas Report

- Page 5 – Last sentence of 6.2, change to the 2012 Stormwater Management Manual for Western Washington, as amended in 2014.

Response: The report has been revised as requested.

Reviewer Response: Revised Critical Areas report was not provided for review. I will review with the next submittal. Disregard comment.

Please contact me with any further questions or comments. Thank you.

Sincerely,

Sean Mallon, PE