

Project Name | BCWD Permit 23-10 Curio Dance Studio

Date | 11/03/2023

To / Contact info | BCWD Board of Managers

Cc / Contact info | T.J. Rose, Larson Engineering

Cc / Contact info | Karen Kill, Administrator / BCWD

From / Contact info | Camilla Correll, PE / EOR; John Sarafolean, EOR

Regarding | BCWD Permit 23-10 Amendment

The following review of a request for approval of a modification of permit 23-10 for the Curio Dance Studio project located within the legal jurisdiction of the Brown's Creek Watershed District (BCWD) was conducted to determine compliance with the BCWD rules for purposes of the engineer's recommendation to the Board of Managers for its determination of the permit-modification application.

Applicant: Patricia Schaber, CDS Properties LLC

Permit modification submittal date: 10/19/2023

Completeness determination: 11/09/2023

Board Action Required By: 12/18/2023

Review based on BCWD Rules effective April 1, 2020

Recommendation: Approve with a stipulation

GENERAL COMMENTS

Curio Dance Studio has applied for a modification of the terms of approval of BCWD permit 23-10 to reflect changes made to the project's stormwater-management design in response to the recent Minnesota Plumbing Board interpretation of state plumbing code to conflict with standard stormwater-management design, as discussed at the October 2023 meeting of the managers. The Plumbing Board has determined that the approved design "shows the parking lot catch basins discharging to the infiltration basin via flared end sections with invert elevations located 1) below the high water level of the basin, and 2) below the invert elevation of the flared end section at the outlet of the basin. This design could result in surcharged storm sewers, which are not allowed (see the Plumbing Board Notice of Final Interpretation for Inquiry PB0159)." (See attached letter, 09/29/2023.)

In response, Curio's engineer has revised the stormwater utilities and management plan as follows:

- Catch basins and storm sewer conveying the runoff from the parking lots have been removed.
- Total new/reconstructed impervious has increased by 340 sf with grass area being reduced and pavement area increased for curb cuts.
- Parking lot grading has been adjusted to drain the parking lot runoff from the pavement to the curb and gutter, and to three curb cut inlets to the infiltration basin. One curb cut to the north that is pretreated by a rain guardian structure and two curb cuts to the south that are pretreated by two rain guardian structures and a vegetated swale before entering the infiltration basin.

Following review of the stormwater-design changes, the BCWD engineer finds that:

Rate Control

According to BCWD Rule 2.4.1(b)(i), an applicant must submit a stormwater-management plan providing no increase in the existing peak stormwater flow rates from the site for a 24-hour precipitation event with a return frequency of two, 10 or 100 years for all points where discharges leave the site.

Rule Requirement Met

The revised stormwater management plan developed for the site was evaluated using a HydroCAD model of existing and post-development site conditions. Proposed peak runoff rates to the east discharge rate have decreased by .01 cfs for the 100-year event. The west discharge rate has increased by .01 cfs for the 2-year, .04 for the 10-year, and .12 cfs for the 100-year event. All proposed discharge rates under the revised design are lower than existing discharge rates therefore still meeting BCWD rule requirements. A comparison of the modeled peak flow rates is included in Table 1 thru 3.

Table 1 – Summary of Peak Discharge Rates to the East

<i>Event</i>	<i>Existing Runoff Rate (cfs)</i>	<i>Proposed Runoff Rate (cfs)</i>
2-year (2.80")	0.14	0.00
10-year (4.17")	0.63	0.00
100-year (7.23")	2.30	0.63

Table 2 – Summary of Peak Discharge Rates to the South

<i>Event</i>	<i>Existing Runoff Rate (cfs)</i>	<i>Proposed Runoff Rate (cfs)</i>
2-year (2.80")	0.08	0.00
10-year (4.17")	0.38	0.00
100-year (7.23")	1.37	0.00

Table 3 – Summary of Peak Discharge Rates to the West

<i>Event</i>	<i>Existing Runoff Rate (cfs)</i>	<i>Proposed Runoff Rate (cfs)</i>
2-year (2.80")	0.05	0.04
10-year (4.17")	0.18	0.13
100-year (7.23")	0.57	0.40

Volume Control

According to BCWD Rule 2.4.1(b)(ii), an applicant must submit a stormwater-management plan providing retention onsite of 1.1 inches of stormwater volume from the regulated impervious surface.

Rule Requirement Met

The applicant is still proposing to utilize an infiltration basin along the east side of the property for volume control.

Impervious surface area has increased by 0.01 acres, required volume treatment has increased by 0.001 acre-ft, and provided volume treatment remained constant at 0.23 acre-ft. Volume control under the revised design meets BCWD rule requirements. A summary of the required stormwater volume shown in Table 4 demonstrates that the required retention volume is met.

Table 4 - Discharge Volume

<i>Impervious Surface Area (acres)</i>	<i>Required Volume (acre-ft)</i>	<i>Provided Volume (acre-ft)</i>
0.74	0.068	0.23

Infiltration Pretreatment

According to BCWD Rule 2.5.2 surface flows to infiltration facilities must be pretreated for long-term removal of at least 50 percent of sediment loads.

Rule Requirement Met with Conditions

The project includes an infiltration basin to meet the stormwater requirements (rate, volume and water quality). Therefore, pretreatment is required for runoff directed to this facility.

All runoff being routed to the infiltration basin will first be directed to three Rain Guardian storm inlet structures, one Rain Guardian Bunker and two Rain Guardian Turrets. According to the University of Minnesota St. Anthony Falls Laboratory study, Capture of Gross Solids and Sediment by Pretreatment Practices for Bioretention. The Rain Guardian Bunker and Turret captured 80% and 85% of the gross solids, respectively, during the low intensity test. Results for the high intensity test show the Rain Guardian Bunker and Turret structures capturing 60% and 70% of the gross solids respectively. The sediment removal results have been averaged and the pretreatment requirement is met as demonstrated by the results in Table 5.

Table 5 - Infiltration Basin Pretreatment

<i>Practice</i>	<i>TSS Reduction (%)</i>
Rain Guardian Bunker	70
Rain Guardian Turret	77.5

Recommendation: The BCWD engineer recommends that the board approve the permit modification with the stipulation that prior to permit closure and release of the \$128,970 financial assurance submitted for the permit, the permittee submit a draft modification of the recorded stormwater declaration for approval, and documentation of recordation.

Except as modified as described herein, permit 23-10 remains valid and enforceable as issued October 2, 2023.

Division of Construction Codes and Licensing
REPORT ON PLUMBING PLANS

PROJECT: Curio Dance Studio, 1655 Washington Avenue, Stillwater, Washington County, Minnesota,
Plan No. PB-R2307-0121

OWNERSHIP: Curio Dance Studio, 1655 Washington Avenue, Stillwater, MN 55082

SUBMITTER: Voss Utility & Plumbing Inc, PO Box 240, Hanover, MN 55341

Plans Dated: Refer to DLI stamped plans:

Sheet Nos. P1 and P2 dated July 15, 2023

Sheet Nos. C400 and C501 dated July 5, 2023

Initial Date Received: July 13, 2023

Last Date Received: July 17, 2023

Date Approved: September 29, 2023

This review is limited to the provisions of the Minnesota Plumbing Code, Minnesota Rules, Chapter 4714 and assumes the data on which the design is based are correct. Approval is contingent upon meeting the requirements listed below. **A copy of the approved plans and this report must be retained at the project location.**

INSPECTIONS: This project will be inspected by the local municipality. The contractor/installer must obtain all required inspection permits from the Stillwater Building Official, Cindy Shilts. All plumbing installations must be tested and inspected in accordance with the requirements of the Minnesota Plumbing Code. No plumbing work may be covered prior to inspection.

REQUIREMENTS:

1. All sanitary drainage pipe within the building must be installed with a uniform slope of at least ¼-inch per foot (see Section 708.1). Where site conditions preclude this, a slope of ⅛-inch per foot minimum may be used for piping 4 inches and larger if approved by the authority having jurisdiction.
2. A building's vent pipes must have total cross-sectional area not less than the area of the largest required building sewer (see Section 904.1). The design shown on the plans fails to meet this requirement.
3. The plans show a 6-inch combination fire protection/domestic water service up to the building. The combination fire protection/domestic water service must comply with the backflow protection requirements of Section 603.5.14:
 - a. A listed double check valve assembly at minimum for systems without chemical introduction.
 - b. An RP backflow device for:
 - i. fire sprinkler systems introducing antifreeze or other chemicals directly;
 - ii. pumper connections less than 1,700 feet from a nonpotable secondary water source (lakes, river, or other surface water source) capable of use by the fire department; or
 - iii. pumper connections served by nonpotable sources, fire department vehicles carrying water of questionable quality, or water treated with chemical agents.

Please consult the local administrative authority and fire department regarding fire protection water sources to determine proper backflow prevention and sprinkler system hydraulic design requirements.

4. Based on a maximum developed length of pipe of 200 feet and a 46 psi building water pressure at the meter, and using Sections 610.7 through 610.12, the hot and cold water distribution branches serving a kitchen sink and a clothes washer must be at least ¾ inches in size.

5. The potable water system supplying a lawn irrigation system must be sized to deliver the full demand of both domestic and irrigation systems (see Section 610.13, (7)).
6. The installation of reduced pressure principle assemblies, double check valve assemblies, pressure vacuum breakers, spill-proof vacuum breakers, reduced pressure detector fire protection assemblies, or double check detector fire protection assemblies is permitted only when a testing and inspection program acceptable to the administrative authority is provided (see Section 603.5.23). The administrative authority must be notified prior to installation and the water purveyor within 30 days of installation. Devices must be tested upon initial installation and not less than annually, and records must be kept. Installations must be at least 12 inches and not more than 5 feet above the finished floor or ground level unless a permanent platform for access is provided. A backflow prevention fact sheet may be viewed at:
http://www.dli.mn.gov/sites/default/files/pdf/fs_backflow.pdf
7. Water supply pipe must be installed at least 10 feet horizontally from any manhole, catch basin, or other source of contamination, measured from the outer edge of the pipe to the outer edge of the contamination source (see Section 609.6.1).
8. A minimum horizontal separation of 10 feet must be maintained between the water service and any sewer, whenever possible (see Section 721.1 and Table 721.1). Common trench installation must be approved by the administrative authority and comply with Sections 609.2, 720.1, and Table 701.2. When the sewer material is not approved for use within a building:
 - a. The bottom of the water pipe must be at least 12 inches above the top of the sewer.
 - b. The water pipe must be on a solid shelf at least 12 inches horizontally from the sewer.
9. Storm water infiltration systems may be subject to groundwater contamination and hydraulic failure. Verify that the administrative authority has approved the design. Please contact the storm water program staff at the Minnesota Pollution Control Agency (MPCA) for construction and permit requirements.
10. The site drainage design shows the parking lot catch basins discharging to the infiltration basin via flared end sections with invert elevations located 1) below the high water level of the basin, and 2) below the invert elevation of the flared end section at the outlet of the basin. This design could result in surcharged storm sewers, which are not allowed (see the Plumbing Board Notice of Final Interpretation for Inquiry PB0159).
11. Inlet and outlet connections to sewer manholes must use flexible compression joints located between 12 and 36 inches from the manhole or approved resilient rubber joints must be used to make watertight connections to manholes, catch basins, and other structures (see Section 719.6).
12. Cleanout intervals may not exceed 100 feet for exterior sanitary sewers (see Section 719.1). Where permitted by the administrative authority, manholes at intervals not exceeding 300 feet may be used per Section 719.6.
13. Exterior PVC sanitary or storm sewers must meet ASTM D1785, D2665, D2729, D3034, F794, F891, F1488, or F1760 with approved fittings (see Table 701.2). Only ASTM D1785, D2665, F891, F1488, or F1760 PVC may cross above or less than 12 inches below potable water pipes (see Section 720.1). Solvent welded joints must use ASTM F656 **purple** primer and ASTM D2564 cement. The sewer must be installed by open-trench on a continuous granular bed per Section 314.4.1.

14. Ductile iron pipe is not approved for use as exterior sanitary piping (see Table 701.2).
15. Ductile iron pipe (DIP) water services or distribution pipes must meet AWWA C151 (see Table 604.1).
16. AASHTO M252 HDPE pipes 4-inch to 10-inch or ASTM F2306 HDPE pipes 12-inch to 60-inch may be used for storm sewers only if approved by the administrative authority as alternate materials prior to installation (see Section 301.3):
 - a. Pipes must be listed and labeled. Fittings are not permitted.
 - b. Pipes must be installed with a minimum 10-foot separation from water piping and may not cross above or less than 12 inches below water pipes (see Section 720.1).
 - c. HDPE pipes must not be installed within 10 feet of a building.
 - d. HDPE connection to a different material must use an approved listed application-specific transition coupling meeting ASTM C1173 or ASTM C1461 (see Section 705.10).
 - e. Water-tight resilient joints must be used at all connections, including structures.
 - f. Installation must be open-trench per Section 314.4.1 and manufacturer's installation instructions. Otherwise, the storm sewer pipe material must meet Table 701.2.
17. Reinforced concrete (RCP) storm sewers complying with ASTM C76 may be installed only if approved by the administrative authority as an alternate material prior to installation (see Table 701.2 and Section 301.3). Cement mortar joints are permitted only for repairs or connections to existing lines having such joints.
18. CPVC water distribution systems must meet Section 605.2 and Table 604.1.
19. PVC drain, waste, and vent systems shall meet Table 701.2 and Section 705.6. Pipe must meet ASTM D1785, D2665, F891, F1488, or F1760. ASTM F794 PVC pipe is not approved for use inside of a building.

NOTES:

1. The scope of this project consists of the construction of a new dance studio. The plumbing includes the following:
 - a. Four water closets, two lavatories, an electric water cooler, a kitchen sink, a clothes washer, a mop sink, six floor drains, a potable water connection (with a reduced pressure zone backflow preventer) to the lawn irrigation system
 - b. Two roof drains and associated storm water piping discharging to grade.
 - c. Site drainage.
2. This facility will be served by new municipal sewer and municipal water service connections.
3. The interior plans and specifications were prepared by a licensed plumber. Only the plumber who has prepared the plans may use the plans for construction. If another plumber is contracted to install the plumbing, they must submit their own plans and specifications for the project. The site utility plan was prepared by a professional engineer.
4. The current Minnesota Plumbing Code, Chapter 4714, and related information can be found at:
<http://www.dli.mn.gov/business/plumbing-contractors/2020-minnesota-plumbing-code>

Authorization may be withdrawn if installation does not begin within one year. Additional requirements may result from changed conditions or additional information.

Curio Dance Studio
Plumbing
Plan No. PB-R2307-0121
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09/29/2023

Approved:



Scott Sawyer, P.E.
Public Health Engineer
Plumbing Plan Review and Inspections Unit
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cc: Voss Utility & Plumbing
Larson Engineering
Sherburne Slater Construction
Cindy Shilts, Building Official
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