

Permit Application Review

Permit No. 2021-117
Received complete: October 11, 2021

Applicant: Deb Williams: City of Bloomington
Consultant: TJ Rose; Larson Engineering, Inc.
Project: Reconstruction of Bloomington Fire Station #4
Location: 4201 West 84th Street: Bloomington
Rule(s): 4 and 5
Reviewer(s): BCO

General Background & Comments

The City of Bloomington is proposing to reconstruct Fire Station #4 located at 4201 West 84th Street.

The project site information is:

- Total Site Area: 39,996 square feet
- Existing Total Site Impervious Area: 20,489 square feet
- Proposed Site Impervious Area: 33,874 square feet
- Increase in Site Impervious Area: 13,385 square feet
- 65.3% increase the impervious area
- Disturbed and reconstructed impervious area: 20,489 square feet
- 100% of the on-site impervious area will be disturbed and replaced
- Total disturbed area: 39,996 square feet

Nine Mile Creek Watershed District's Rule for Redevelopment, Rule 4.2.3, states, if a proposed activity will disturb more than 50% of the existing impervious surface on a parcel or will increase the imperviousness of the parcel by more than 50%, storm water management will apply to the entire project parcel. Otherwise, the storm water requirements apply only to the disturbed areas and additional impervious area on the parcel. Since there is an increase in the site impervious area of 65.3% and 100% of the impervious area will be disturbed and replaced, storm water management is required for the entire site, 39,996 square feet, including 33,874 square feet of new, disturbed and reconstructed impervious area.

The district's requirements for both storm water management and erosion and sediment control apply to the project because more than 50 cubic yards of material will be disturbed and 5000 square feet or more surface area disturbed, Rules 4.2.1a and b and 5.2.1a and b.

The application submittal indicates that the site is located within an Emergency Response Area¹ of a Drinking Water Supply Management Area² as identified in the City's Wellhead Protection Plan.

The submitted geotechnical report identifies the on-site underlying soils generally as sand (SP) with groundwater encountered in the 5 borings taken to a depth of 15+/- feet below ground surface. The borings, and groundwater elevations observed, were taken during the winter months. Seasonal groundwater elevations, observed in the spring and summer, could potentially be several feet higher than observed. The NMCWD engineer has reviewed the well logs of five of the six Bloomington municipal water supply wells for which this Emergency Response Area was delineated, along with the city's Wellhead Protection Plan. These wells withdraw groundwater directly from the Jordan Sandstone. Pumping from the Jordan will likely draw water down from the overlying Prairie du Chien Dolomite, the uppermost bedrock beneath the site. The well logs in the general area of the site indicate that the unconsolidated geologic materials over the Prairie du Chien are variable. In some areas these unconsolidated materials include intervals 10 or more feet thick clay-rich sediments while in other areas the unconsolidated materials are entirely sand and gravel down to the bedrock surface. In addition, the NMCWD engineer referred to the Minnesota Department of Health and Minnesota Pollution Control Agency (MPCA) joint guidance for determining the applicability of infiltration in a DWSMA. Based on this review and analysis, the NMCWD engineer has determined it is likely the unconsolidated aquifer is reasonably likely to be hydraulically connected to the bedrock aquifers that provide water to five of the City's wells, and therefore infiltration at the fire station location presents a risk on migration of contaminants into the underlying drinking-water aquifer.

The city asserts that these conditions inherent to the site preclude retention to the standard in paragraph 4.3.1a of the District Rules. The NMCWD engineer concurs. Stormwater management, water quality management (subsection 4.3.1b) and rate control (subsection 4.3.1c) is to be provided within an underground system, shown to be lined with an impermeable geotextile fabric, for compliance with District Rule 4.3.2 – Restricted sites.

Exhibits

1. Signed Permit Application dated August 10, 2021.

1 Emergency Response Area (ERA): The part of the wellhead protection area that is defined by a one-year time of travel within the aquifer that is used by the public supply well (Minnesota Rules, part 4720.5250). This area is particularly relevant for assessing impacts from potential sources of pathogen contamination because the time of travel is believed to closely correspond with the survival period of many pathogens.

2 Drinking Water Supply Management Area (DWSMA): The surface and subsurface area surrounding a public water supply well, including the wellhead protection area, that must be managed by the entity identified in a wellhead protection plan. The area delineated using identifiable landmarks that reflect the scientifically calculated wellhead protection boundaries as closely as possible.

2. Plans dated August 17, 2021 prepared by Larson Engineering, Inc.
3. Stormwater narrative and Management Plan dated August 16, 2021 prepared by Larson Engineering, Inc.
4. Geotechnical Report dated March 18, 2021 prepared by American Engineering Testing, Inc.
5. Correspondence dated October 11, 2021, from the City of Bloomington requesting the site be considered “restricted” in accordance with District Rule 4.3.2.
6. E-mail correspondence dated August 19, 2021, outlining an additional item required for the permit application to be considered complete.

The necessary submittal was received and the application was complete October 11, 2021.

4.0 Stormwater Management

As previously stated, the City is proposing to provide stormwater management, water quality management and rate control, within an undergrounded, lined, stormwater filtration facility. Because of the risk of contamination of drinking water as discussed above, the NMCWD volume-retention standard through infiltration cannot practicably be met because conditions inherent to the site – the likelihood of migration of contaminants to the underlying drinking-water aquifer.

Based on the criteria of Rule 4.2.3, a volume retention of 3,105 cubic feet is required from the runoff of 1.1-inches from the proposed 33,874 square feet of proposed site impervious area. Because of the risk to the underlying aquifer and the limited green space on the site for reusing runoff, the applicant is unable to practicably provide any retention of stormwater onsite. That is, for purposes of analysis under subsection 4.3.2 of the NMCWD stormwater-management rule, no (0 inches) retention is the maximum extent practicable for the site. However, because the city is able to meet the water-quality standard in 4.3.1c (as analyzed below), the proposal conforms to Rule 4.2.3b. Nonetheless, recognizing that even though the proposed plan complies with the NMCWD rules, the City of Bloomington recognizes that provision of no retention onsite represents a lost opportunity to protect water resources and has proposed to provide the required 3,105 cubic feet of retention volume voluntarily through development and implementation of projects off-site on city-owned property within the Nine Mile Creek watershed in the coming three years.

Rule 4.3.1b requires the 2-, 10-, and 100-year post development peak runoff rates be equal to or less than the existing discharge rates at all locations where stormwater leaves the site. The applicant used a HydroCAD hydrologic model to simulate runoff rates. The existing and proposed 2-, 10- and 100-year frequency discharges from the site are:

Existing Conditions			
Drainage Area	2 year (c.f.s.)	10 year (c.f.s.)	100 year (c.f.s.)
To West 84th Street	1.1	1.8	3.4
To Irwin Avenue	1.0	1.5	2.5
To Off-site: South	<1.0	<1.0	1.7

Proposed Conditions			
Drainage Area	2 year (c.f.s.)	10 year (c.f.s.)	100 year (c.f.s.)
To West 84th Street	< 1.0	<1.0	3.1
To Irwin Avenue	<1.0	<1.0	2.7
To Off-site: South	<1.0	<1.0	<1.0

We concur that the proposed 0.2 c.f.s. increase in the 100-year discharge to Irwin Avenue is within the degree of engineering accuracy. Rule 4.3.1b is met.

The District's water quality criterion requires 60% annual removal efficiency for total phosphorus and 90% annual removal efficiency for total suspended solids. The results from the MIDS model provided show the underground system will provide an annual removal efficiency of 80% for total phosphorus (1.2 lbs.) and 91% for total suspended solids (241 lbs.). We agree with the modeling results. Rule 4.3.1c is met.

Rule 4.3.3 states that all new and reconstructed buildings must be constructed such that the low floor elevation is at least two feet above the 100-year high water elevation or one foot above the emergency overflow of a constructed facility. Additionally, Rule 4.3.3 states that all new and reconstructed buildings must be constructed such that no opening where surface flow can enter the structure is less than two feet above the 100-year high water elevation of an adjacent facility. The HydroCAD modeling provided shows a calculated 100-year high water elevation of underground system is 824.6 M.S.L. The fire station structure is shown to have a finished floor elevation that is also the low opening at elevation of 828.5 M.S.L. With a calculated 100-year high water elevation of underground system of 824.6 M.S.L. and the building opening at 828.5 M.S.L., 3.9 feet of separation is provided. The requirements of Rule 4.3.3 are met.

For pre-treatment of runoff prior to discharging to the underground filtration facility, sumps within catch basins upstream of the underground system and an isolator row within the system are to be provided.

In accordance with Rule 4.3.4, a post-project chloride management plan must be provided that will, 1) designate an individual authorized to implement the chloride-use plan and 2) designate a MPCA certified salt applicator engaged in the implementation of the chloride-use plan for the site.

5.0 Erosion and Sediment Control

The submitted erosion and sediment control plan includes silt fence at the limits of construction, a gravel construction entrance and storm drain inlet protection. The contractor for the project will need to designate a contact who will remain liable to the District for performance under the District's Erosion and Sediment Control Rule 5.0 from the time the

permitted activities commence until vegetative cover is established, in accordance with subsection 5.4.1e.

11.0 Fees

Because the property owner is a public entity, no fees are charged.

Rules 4.0 and 5.0 \$0

12.0 Financial Assurances

Because the property owner is a public entity, the District's financial assurance requirements do not apply.

Sureties for the project are: \$0

Findings

The proposed project includes the information necessary, plan sheets and erosion control plan for review.

1. Rule 5 is met.
2. The site is being reviewed as a Restricted site under section 4.3.2 of the district rules.

Recommendation

Approval, contingent upon:

General Provisions

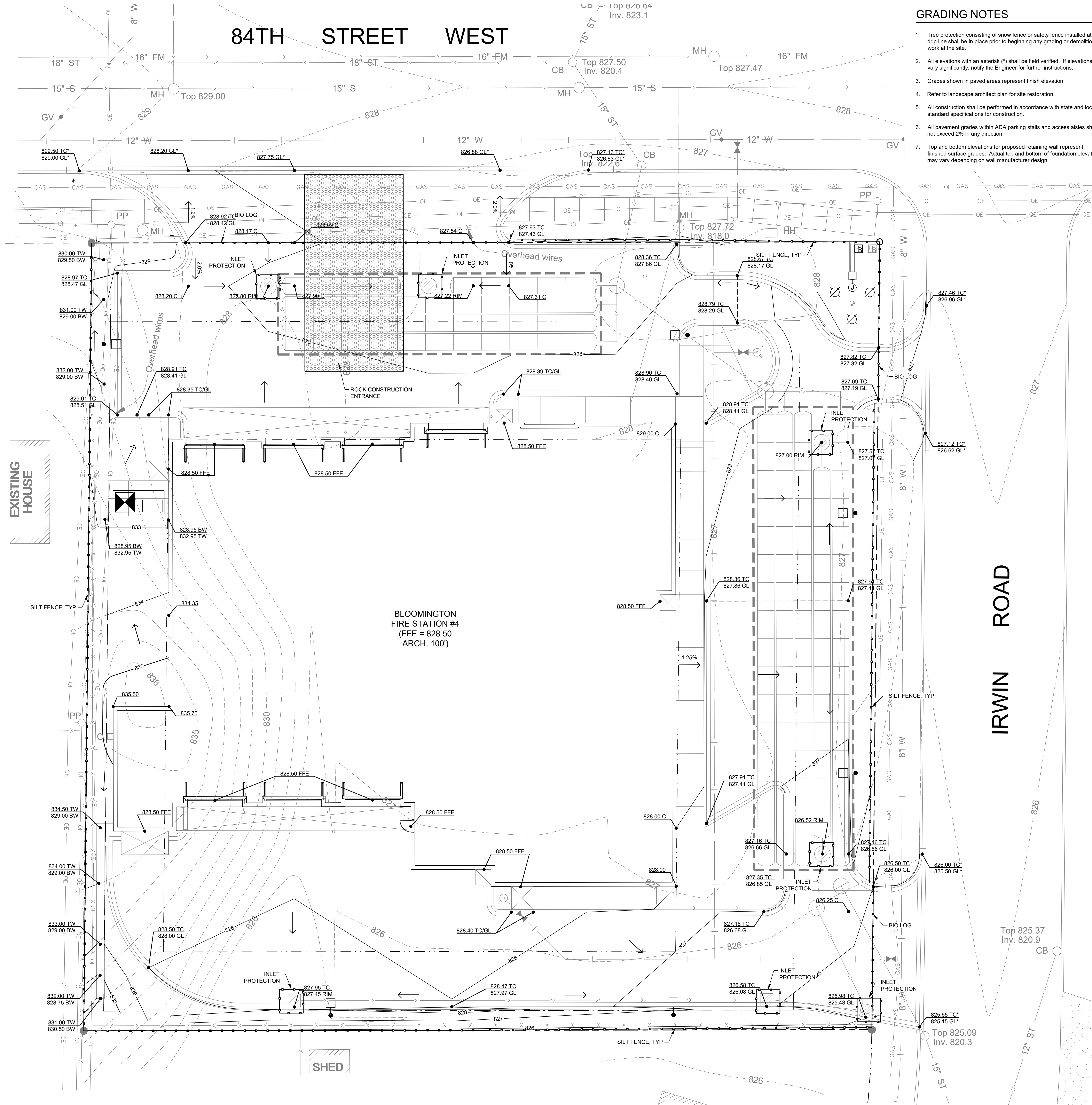
The applicant providing a name and contact information from the contractor responsible for the erosion and sediment control at the site. NMCWD must be notified if the responsible individual changes during the permit term.

Per Rules 4.3.5, the City must submit for NMCWD approval, then execute an agreement providing for the maintenance of the stormwater management facility.

By accepting the permit, when issued, the applicant agrees to the following stipulations:

Per Rule 4.5.8, submit an as-built drawing of the on-site stormwater facility conforming to the design specifications as approved by the district.

Submission of a plan for post-project management of Chloride use on the site. The plan must include 1) the designation of an individual authorized to implement the chloride use plan and 2) the designation of a Minnesota Pollution Control Agency certified salt applicator engaged in the implementation of the chloride-use plan for the site.



- ### GRADING NOTES
- Tree protection consisting of snow fence or safety fence installed at the drip line shall be in place prior to beginning any grading or demolition work at the site.
 - All elevations with an asterisk (*) shall be field verified. If elevations vary significantly, notify the Engineer for further instructions.
 - Grades shown in paved areas represent finish elevation.
 - Refer to landscape architectural plan for site restoration.
 - All construction shall be performed in accordance with state and local standard specifications for construction.
 - All pavement grades within ADA parking stalls and access aisles shall not exceed 2% in any direction.
 - Top and bottom elevations for proposed retaining wall represent finished surface grades. Actual top and bottom of foundation elevations may vary depending on wall manufacturer design.

LEGEND

- 950 --- EXISTING CONTOURS
- 950 --- PROPOSED CONTOURS - MAJOR INTERVAL
- 949 --- PROPOSED CONTOURS - MINOR INTERVAL
- GRADE BREAK LINE
- 2.0% --- GRADE SLOPE
- SILT FENCE
- BIO LOG
- [Pattern] RIP-RAP / ROCK CONST. ENTRANCE (ADDITIONAL ENTRANCES TO BE DETERMINED BY CONTRACTOR, AS NEEDED.)
- [Pattern] EROSION CONTROL BLANKET
- [Symbol] INLET PROTECTION
- [Symbol] CONCRETE WASHOUT STATION

SPOT ABBREVIATIONS:

- TC - TOP OF CURB
- GL - GUTTER LINE
- B - BITUMINOUS
- C - CONCRETE
- EO - EMERGENCY OVERFLOW
- TW - TOP OF WALL
- BW - BOTTOM OF WALL (F/G)
- (*) - EXISTING TO BE VERIFIED

- ### EROSION CONTROL NOTES
- Owner and Contractor shall obtain MPCA-NPDES permit. Contractor shall be responsible for all fees pertaining to this permit. The SWPPP shall be kept onsite at all times.
 - Install temporary erosion control measures (inlet protection, silt fence, and rock construction entrances) prior to beginning any excavation or demolition work at the site.
 - Erosion control measures shown on the erosion control plan are the absolute minimum. The contractor shall install temporary earth dikes, sediment traps or basins, additional siltation fencing, and/or disk the soil parallel to the contours as deemed necessary to further control erosion. All changes shall be recorded in the SWPPP.
 - All construction site entrances shall be surfaced with crushed rock across the entire width of the entrance and from the entrance to a point 50' into the construction zone.
 - The toe of the silt fence shall be trenched in a minimum of 6". The trench backfill shall be compacted with a vibratory plate compactor.
 - All grading operations shall be conducted in a manner to minimize the potential for site erosion. Sediment control practices must be established on all down gradient perimeters before any up gradient land disturbing activities begin.
 - All exposed soil areas must be stabilized as soon as possible to limit soil erosion but in no case later than 7 days after the construction activity in that portion of the site has temporarily or permanently ceased. Temporary stockpiles without significant silt, clay or organic components (e.g., clean aggregate stockpiles, demolition concrete stockpiles, sand stockpiles) and the constructed base components of roads, parking lots and similar surfaces are exempt from this requirement.
 - The normal wetted perimeter of any temporary or permanent drainage ditch or swale that drains water from any portion of the construction site, or diverts water around the site, must be stabilized within 200 linear feet from the property edge, or from the point of discharge into any surface water. Stabilization of the last 200 linear feet must be completed within 24 hours after connecting to a surface water. Stabilization of the remaining portions of any temporary or permanent ditches or swales must be complete within 7 days after connecting to a surface water and construction in that portion of the ditch has temporarily or permanently ceased.
 - Pipe outlets must be provided with energy dissipation within 24 hours of connection to surface water.
 - All riprap shall be installed with a filter material or soil separation fabric and comply with the Minnesota Department of Transportation Standard Specifications.
 - All storm sewers discharging into wetlands or water bodies shall outlet at or below the normal water level of the respective wetland or water body at an elevation where the downstream slope is 1 percent or flatter. The normal water level shall be the invert elevation of the outlet of the wetland or water body.
 - All storm sewer catch basins not needed for site drainage during construction shall be covered to prevent runoff from entering the storm sewer system. Catch basins necessary for site drainage during construction shall be provided with inlet protection.
 - In areas where concentrated flows occur (such as swales and areas in front of storm catch basins and intakes) the erosion control facilities shall be backed by stabilization structure to protect those facilities from the concentrated flows.
 - Inspect the construction site once every seven days during active construction and within 24 hours after a rainfall event greater than 0.5 inches in 24 hours. All inspections shall be recorded in the SWPPP.
 - All silt fences must be repaired, replaced, or supplemented when they become nonfunctional or the sediment reaches 1/3 of the height of the fence. These repairs must be made within 24 hours of discovery, or as soon as field conditions allow access. All repairs shall be recorded in the SWPPP.
 - If sediment escapes the construction site, off-site accumulations of sediment must be removed in a manner and at a frequency sufficient to minimize off-site impacts.
 - All soils tracked onto pavement shall be removed daily.
 - All infiltration areas must be inspected to ensure that no sediment from ongoing construction activity is reaching the infiltration area and these areas are protected from compaction due to construction equipment driving across the infiltration area.
 - Temporary soil stockpiles must have silt fence or other effective sediment controls, and cannot be placed in surface waters, including stormwater conveyances such as curb and gutter systems, or conduits and ditches unless there is a bypass in place for the stormwater.
 - Collected sediment, asphalt and concrete millings, floating debris, paper, plastic, fabric, construction and demolition debris and other wastes must be disposed of properly and must comply with MPCA disposal requirements.
 - Oil, gasoline, paint and any hazardous substances must be properly stored, including secondary containment, to prevent spills, leaks or other discharge. Restricted access to storage areas must be provided to prevent vandalism. Storage and disposal of hazardous waste must be in compliance with MPCA regulations.
 - External washing of trucks and other construction vehicles must be limited to a defined area of the site. Runoff must be contained and waste properly disposed of. No engine degreasing is allowed onsite.
 - All liquid and solid wastes generated by concrete washout operations must be contained in a leak-proof containment facility or impermeable liner. A compacted clay liner that does not allow washouts to enter ground water is considered an impermeable liner. The liquid and solid wastes must not contact the ground, and there must not be runoff from the concrete washout operations or areas. Liquid and solid wastes must be disposed of properly and in compliance with MPCA regulations. A sign must be installed adjacent to each washout facility to inform concrete equipment operators to utilize the proper facilities.
 - Upon completion of the project and stabilization of all graded areas, all temporary erosion control facilities (silt fences, hay bales, etc.) shall be removed from the site.
 - All permanent sedimentation basins must be restored to their design condition immediately following stabilization of the site.
 - Contractor shall submit Notice of Termination for MPCA-NPDES permit within 30 days after Final Stabilization.
 - Temporary vegetative cover shall consist of a suitable, fast-growing, dense grass seed mix spread at a minimum at the MNDOT specified rate per acre. If temporary cover is to remain in place beyond the present growing season, two-thirds of the seed mix shall be composed of perennial grasses.
 - Temporary or permanent mulch shall be uniformly applied by mechanical or hydraulic means and stabilized by disc-anchoring or use of hydraulic soil stabilizers.

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REGISTERED PROFESSIONAL ENGINEER
STATE OF MINNESOTA
EXPIRES 12/31/2024
T. J. Row
L.S. 15500

Bloomington Fire Station #4

CITY OF BLOOMINGTON MINNESOTA

4201 West 64th Street
Bloomington, MN 55437

REVISIONS:

CNH NO.: 19116
DATE: 08/17/21
GRADING AND EROSION CONTROL PLAN

C300

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