# CONSTRUCTION REQUIREMENTS
# HAM LAKE, MINNESOTA

Revised July 2021

1. Specifications which shall apply shall be the "Minnesota Department of Transportation Standard Specifications for Construction", 2020 Edition.

2. All excavation and embankment shall be performed in accordance with MnDOT Specification 2105. Embankments in roadways shall be mechanically tamped in accordance with the "Quality Compaction (Visual Inspection) Method".

3. Aggregate base shall be constructed in accordance with MnDOT Specification 2211. Class 5 material shall conform to MnDOT Specification 3138. Recycled Class 5 is not allowed for aggregate shouldering.

4. <u>STORM DRAIN SYSTEM</u>

    a. Culverts and pipe aprons shall be installed in accordance with MnDOT Specification 2501 and 2503. Excavation, bedding and backfilling shall be in accordance to MnDOT Specification 2451. Materials shall conform to MnDOT Specification 3236 for Reinforced Concrete Pipe class IV or better and/or MnDOT Specification 3247 for Corrugated Polyethylene Pipe. Corrugated Polyethylene Pipe shall be dual wall with watertight joints. Pipe under the street, bike path, curb and driveway shall be Reinforced Concrete Pipe. Culverts installed within Anoka County Right-of-Way are to be Corrugated Steel Pipe per MnDOT Specification 2501 with metal safety aprons per MnDOT Specification 2501.

    b. Rain Guardians shall be installed in accordance with the Anoka Conservation District Specifications.

    c. All storm drain and culvert construction will be inspected by the City prior to backfilling.

    d. Storm Catch Basins and/or Manholes shall be installed in accordance with MnDOT Specification 2506. The materials shall conform to MnDOT Specifications 3621 for Concrete Masonry Units, MnDOT Specification 3622 for Sectional Concrete Manhole/Catch Basin Units. The structures shall be precast concrete, conforming to MnDOT Specification 2462. Excavation, bedding and backfilling shall conform to MnDOT Specification 2451. Inspection and acceptance shall confirm to MnDOT Specification 3236. All catch basins/manhole structures shall have fabric installed per HL-463.

    e. All arch pipe shall be installed with an approved gasket or fabric wrap around all pipe joints to prevent sediment from entering the storm sewer.

    f. Trash Guards shall be installed on all pipe aprons per MnDOT Specification 2501.

    g. Riprap shall be placed at each culvert outlet apron in accordance with MnDOT Standard Plate 3133 or 3134, MnDOT Specification 3601. Riprap shall be placed at the end of each drainage swale. All riprap shall be Class III with type IV fabric.

h. All unsurfaced areas within the right-of-way for streets and drainage ditches shall be covered with a minimum of four inches of topsoil and hydroseeded, unless otherwise specified. Seed type shall be per MnDOT Specification 3876 within City right-of-way, and per Anoka County or Watershed District/ permit requirements. Fertilizer shall be applied at a sufficient rate to establish turf; the type of material used shall conform to MnDOT Specification 3881. Hydromulch type 5 or 6 shall be mixed at a rate 50 pounds per 500 gallons of water in the hydroseeder tank, the material conforming to MnDOT Specification 3884. Topsoil, salvage or borrow, shall be per MnDOT Specification 3877. This work shall be constructed in accordance with MnDOT Specification 2575.

5. BITUMINOUS STREETS

a. Bituminous wearing course shall be constructed in accordance with MnDOT Specification 2360, Type SPWEA240C. After compaction, the thickness of the bituminous pavement shall average the planned thickness and shall not be less than 1/4 inch from the planned thickness.

b. Bituminous non-wear course shall be constructed in accordance with MnDOT Specification 2360, Type SPNWB230C. After compaction, the thickness of the bituminous pavement shall average the planned thickness and shall not be less than 1/4 inch from the planned thickness.

c. Bituminous tack coat shall be placed in accordance to MnDOT Specification 2357.

d. The surface of the street shall show no variations greater than 3/16 inch from the edge of a ten foot (10') straight edge laid thereon parallel to or at right angles to the centerline. The centerline seam shall be smooth, straight and parallel to the roadway.

e. Adjustments for maximum density for pavement, per Table 2360.6-B4 MnDOT

| Field Density<br>% of Maximum Density | % Payment of<br>Performance Bond *** |
|---|---|
| 92.0 and Higher | 100% |
| 91.0 to 91.9 | 98% |
| 90.5 to 90.9 | 95% |
| 90.0 to 90.4 | 91% |
| 89.5 to 89.9 | 85% |
| 89.0 to 89.4 | 70% |
| Less than 89.0 | Remove and Replace |

*** Contract price to be based on a per ton unit price, using 110 pounds per inch - square yard (110 lb/ in-yd$^2$) based upon the recommended Performance Bond amounts. A minimum unit price of $80.00/ton will be used for calculating the pay factor. A check payable to the City of Ham Lake will be made, for the percentage difference in pay factor to bring the streets to 100% pay factor, unless when the remedy is to remove and replace the material.

6. **Construction Staking** for Finished Street Cross-Sections: Grade stakes (blue-tops) shall be placed on the sub-grade along each side of the street at an offset of three feet outside the finished pavement. **The blue-tops shall be left exposed at all times until pavement construction has been checked by the City Engineer**. Grade stakes (blue-tops) shall be spaced as follows:

a. On rural cross-section streets at a maximum spacing of fifty feet along each side of the street.

b. On urban cross-section streets as follows:

   i. When centerline grade is 0.75 percent or less, the maximum spacing is twenty-five feet.

   ii. When centerline grade is greater than 0.75 percent, the maximum spacing is fifty feet.

c. Drainage swales and warped sections across or along the street shall be blue topped at required spacing to arrive at the designed section for the street.

7. **Inspections** by the City Engineer: The Contractor shall notify the City Engineer at least twenty-four hours in advance on all required inspections. Prior to calling for inspection, the Contractor shall check all work to be inspected for compliance with the approved plans and construction requirements. The City Engineer or his representative can be contacted by writing, phoning, faxing or emailing as follows:

Tom Collins, P.E.
RFC Engineering, Inc.
13635 Johnson St. NE
Ham Lake, Minnesota 55304
(763) 862-8000
(763) 862-8042 (fax)
tcollins@rfcengineering.com

a. Required inspections by the City Engineer:

   i. During subbase correction work

   ii. Before backfilling catch basins and catch basin manholes.

   iii. Completion of subbase grading and compaction prior to placement of curb or base material.

   iv. Completion of aggregate base material placement and compaction and finished shaping prior to any pavement construction.

   v. During pavement construction and upon finished pavement construction prior to final shoulder or berm construction.

   vi. Upon completion of all construction including seeding or hydroseeding, fertilizing and mulching, and when seed growth has occurred and signs have been installed.

8. Testing – See MnDOT Schedule of Material Control

   a. One proctor test will be required for each 500 cubic yards, or fraction thereof, of the class 5 aggregate base and two tests will be required for each 400 tons, or fraction thereof, of the bituminous base course and bituminous wear course. Each test shall be performed by an accredited testing laboratory and certified by a registered engineer. Deficiencies shall be corrected at the Developer's expense prior to acceptance by the City. The standard one-year warranty maintenance period after the project is accepted, will be extended to a two-year

period for any failing class 5 aggregate base, base course or wear course specified densities. Two copies of all test results shall be directed to the City Engineer at the above address, directly by the testing laboratory. Each test shall consist of the following:

| AGGREGATE BASE (MnDOT Spec. 2211) | | | |
|---|---|---|---|
| ITEM | TEST PROCEDURES | MINIMUM TESTS | MINIMUM COMPOSITE AVERAGE OF ALL |
| Thickness | ASTM D609-70, Method A | -1/2" Plan Thickness | Plan Thickness |
| Density | ASTM D609-70 Method A | 100% | |
| Gradation | Sieve Analysis | Class 5, MnDOT Spec. 3138 | |

**THE ABOVE TESTS ARE TO BE PERFORMED PRIOR TO PLACING BITUMINOUS SURFACE**

| BITUMINOUS SURFACES (MnDOT Spec. 2360) | | | |
|---|---|---|---|
| ITEM | TEST PROCEDURES | MINIMUM TESTS | MINIMUM COMPOSITE AVERAGE OF ALL |
| Thickness | | -1/4" Plan Thickness Per Lift | Plan Thickness |
| Density | % of Maximum Density* | | |
| Bituminous Material | Extraction % by Weight ** | Type SP Wear Course | MnDOT Spec 2360 |
| Gradation | | MnDOT Spec. 3139 | |

THE ABOVE TESTS ARE TO BE PERFORMED BY CORE DRILLING THE FINISHED MAT AND OBTAINING FROM BITUMINOUS PLANT

* Two tests per 301 tons of bituminous mixture, or fraction thereof, minimum of three.
** Two tests per 500 tons, or fraction thereof.

9. CONCRETE

a. General: All curb and gutter shall be constructed in accordance with Section 2531 of the Minnesota Department of Transportation Standard Specifications for Highway Construction except as modified or altered below.

b. Concrete Mix: The mix design shall be Mix No.3F32 for slip form placement and 3F32 or 3F52 for manual placement according to the MnDOT Specifications Section 2461. The compressive strength is to be not less than 4,500 psi with a three-inch slump.

c. Performed Bituminous Type Mastic Expansion Joint Filler according to the MnDOT Specifications Section 3702: The expansion joint filler shall consist of a bituminous mastic composition, formed and encased between two layers of bituminous impregnated felt. The mastic shall comprise mineral fillers and reinforcing fibers.

d. The filler shall be of such character that it will not be deformed by ordinary handling during the hot summer months or become hard and brittle in cold weather. Thin strips of stiffener will be allowed. This mastic type filler must be used on all curved or irregular sections.

e. Performed Bituminous Type Nonextruding and Resilient Expansion Joint Filler: This type of filler shall be used on straight sections only. All transverse curb and gutter joints must be filled with this material.

f. CONSTRUCTION:

   i. Form Removal: After the concrete has been poured, the form and the metal dividing plates shall not be disturbed until concrete has attained sufficient strength to withstand, without injury, the operation of removing them. Neither shall the face forms nor the plates be left in place until the concrete has attained a permanent set. The back forms shall remain in place for a period of not less than twelve hours.

   ii. Finishing: Immediately after the removal of the face forms and the dividing plate, any cavities shall be filled with mortar and all joints shall be edged with an approved edging tool. Where necessary the exposed faces of the curb then shall be troweled to a smooth and uniform surface, after which the top and face shall be brushed lightly.

   iii. Alternate Machine Placement: Instead of using fixed side forms, concrete may be placed and formed to the required shape by using an approved type of extrusion machine that will produce a finished product meeting the standards for dimension, quality, workmanship and appearance as would be achieved with fixed-form construction provided for herein.

   iv. For machine placement the use of concrete Mix No. 3F32 will be optional, and hand finishing will be required only to the extent necessary to obtain the specified surface finish and texture.

   v. Expansion Joints: Transverse expansion joints, filled with one-half inch performed joint filler material, shall be placed at intervals not to exceed 180 feet and at the ends of all curved sections; and at the ends of the curved portions of entrance and street returns. Expansion joints with filler material shall also be placed at locations where the concrete surrounds or adjoins any existing fixed objects such as fire hydrants, building foundations and other rigid structures.

g. PROTECTION

   i. <u>Curing:</u> The concrete shall be cured after the final finishing by one of the following methods:

      1. Blanket Curing Method: As soon as it can be done without injury to the surface, the work shall be covered with water proof paper or plastic blankets. The water proofing material shall remain in place for at least seventy-two hours.

2. Paper blankets may be reused as long as they provide a moisture proof seal.

3. Plastic blankets to be used in the same manner as the paper and to have equal moisture proof qualities

4. Membrane Curing Method: Immediately after final finishing, the work shall be sprayed with membrane curing compound, at a uniform rate of application of not less than one-half gallon per seventy-five square feet of surface.
5. The work shall be kept barricaded for at least twenty-four hours after curing compound is applied. The Membrane Curing Compound shall contain a fugitive dye.

h. BACKFILLING
   i. Backfill: The trench on both the front and backsides of the curb shall be backfilled, and the fill material shall be thoroughly compacted by hand or mechanical tamping as soon as forms are removed. The back side of the curb shall be filled to within four inches of the top of curb after 72 hours of placement.
   ii. Concrete in Cold Weather: During cold weather, concrete may be placed when the natural air temperature in the shade is 33ºF and rising; concrete shall not be placed when the natural air temperature in the shade and away from artificial heat is 36º F and falling, and in no case shall concrete be deposited upon a frozen subgrade or sub-base. Materials containing frost, lumps or crusts of hardened materials shall not be used.
   iii. If concrete has been placed in accordance with the above provisions and the temperature drops to 32ºF, the concrete shall be covered with sufficient depth of straw or insulation material to prevent freezing.
   iv. The area of concrete to be covered shall be determined by the Engineer.

10. SILT FENCE AND EROSION CONTROL

Silt fence and other erosion control measures shall be placed and maintained by the Contractor where shown on the approved plans and as directed by the City Engineer and/or the Watershed District permit. Temporary erosion control measures to avoid alteration of wetlands and protected areas shall be provided at all times. The Grading Contractor shall provide all erosion control measures called for on the plans, which may include filter fence, sedimentation basins or temporary sediment traps, which shall be constructed and made serviceable prior to commencing any grading operations. All erosion facilities shall be maintained by the Contractor during grading operations and until after turf establishment, at which time they shall be removed. The Contractor will be responsible for the cleaning of storm sewers, ditches, ponds, etc. for the duration of this contract and until all work is accepted by the City of Ham Lake and the Watershed District. The Contractor shall not fill any wetland areas without permits from the Watershed District
, Department of Natural Resources and the Corps of Engineers and shall indemnify the City from same.

11. NOISE, DUST AND VIBRATION CONTROL

a. Hours of operation for excavation activities shall be limited as follows:

| | |
|---|---|
| Monday through Friday | 7:00 A.M. to 7:00 P.M. |
| Saturday | 8:00 A.M. to 5:00 P.M. |

Allowed hours of operation may be altered by the Development Agreement. The Contractor shall be responsible for clean-up at public roadway access areas resulting from vehicle tracking. Wherever construction vehicle access routes intersect paved public roads, provisions must be made to minimize the transport of sediment (mud) by runoff or vehicle tracking onto the paved road surface. Where sediment is transported onto a public road surface, the road shall be cleaned thoroughly at the end of each day. Sediment shall be removed from roads by the Contractor.

b. The Contractor shall wet soils as necessary to control excessive dust from grading equipment. The Contractor shall correct all erosion until grading is complete, topsoil is placed, vegetation is established and work is accepted by the City of Ham Lake and the Watershed District.

12. NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM PERMIT (NPDES)

a. The Contractor shall apply and comply with all requirements of the NPDES permit offered through the Minnesota Pollution Control Agency (MPCA) for the duration of the project as applicable.

13. When any new drainage control facility is installed on private property or when any new connection is made between private property and a public drainage control system, sanitary sewer or combined sewer, the property owner shall grant to the City and the Watershed District the right to enter the property at reasonable times and in a reasonable manner for the purpose of inspection of the stormwater features(s) on the property. This includes the right to enter a property when it has a reasonable basis to believe that a violation of this rule is occurring or has occurred, and to enter when necessary for abatement of a public nuisance or correction of a violation of this rule.

14. Submit to the City and the Watershed District where required the actual “as built” plans for any stormwater management practices or ditch repairs or an improvement located on site after final construction is completed. This includes, but is not limited to any changes to the course, current or cross section of public ditch, wetland mitigation sites and structural stormwater treatment practices. The plan must show the final design for all stormwater management facilities, wetland mitigation, and modification of public ditches. A final inspection of the project by the Watershed District is required before release of any performance escrows can occur.