TOWN OF MIDDLETON
PUBLIC INFRASTRUCTURE INSPECTION AND TESTING POLICY

Original Adoption Date: 3/19/07
Last Updated and Approved: 2/15/17

The following requirements and policies shall be followed and understood before any improvements commence. The following requirements shall be applicable to any public roadways within the Town of Middleton.

A. Background

1. All roadway construction performed and materials used shall be in accordance with the construction methods listed in the appropriate current sections of the "State of Wisconsin Department of Transportation Standard Specifications of Highway and Structure Construction" and its supplements, or in accordance with Town approved plans, profiles, cross-sections, and specifications, if such specifications are requested by the Town Board or Town Engineer. No construction shall be started until such plans, profiles, cross-sections, and specifications have been approved by the Town Board or Town Engineer.

2. The Contractor shall notify the Town Engineer, or other designee of the Town Board, prior to the start of construction and when each stage of construction is ready for inspection. Any deficiencies found by the Town Engineer or other designee shall be corrected before proceeding to the next phase of construction. Inspections are required at the following stages of the project:

   - after installation of erosion control measures
   - after the completion of grading
   - during roll test of street subgrade
   - during the installation of culverts
   - during the placement of aggregate base course
   - during paving
   - after completion of all work

   The inspections and the reports and findings issued after the inspections are not intended as, nor are they to be construed as, a guarantee. In order to so advise the owners and other interested persons, the following disclaimer shall be applicable to all inspections.

   "The findings of inspections contained herein are intended to report conditions of non-compliance with standards that are readily apparent at the time of inspection."

   a. The Town reserves the right to obtain a sample of the roadway base material prior to placement on the roadway for purpose of determining whether the material meets gradation and soundness requirements.
   b. Samples of material may be required to be taken by the Town at the Contractor's expense during pavement construction operations for purposes of determining that the material meets specifications.

c. The finished roadway must meet the approval of the Town Board based on the recommendation of the Town Engineer, since the Town will include this roadwork in its annual request for highway aid.

3. Compaction is the main method to achieve the required relative density and to reduce air voids in the asphalt mix. Air voids are the primary factor affecting the performance of bituminous pavement. Compaction increases the shear resistance between bituminous layers, minimizes the aging of the asphalt cement within the aggregate and minimizes the penetration of air and water. If the required density is not achieved through compaction, the pavement will not perform as designed, and rutting, cracking, roughness, permeability, and/or the lack of support for traffic loads will occur.

B. Roadway Grading

1. All topsoil and subsoils that have a high shrink-swell potential, low-bearing capacity, or are highly elastic shall be removed and used outside of the right-of-way.
2. Measures shall be installed, if needed, to keep the groundwater level five feet below the pavement surface.
3. Roads shall be graded to their full width in accordance with plans, plus additional width to establish proper ditch slopes.
4. Roadways shall be compacted and graded to subgrade using approved fill material in accordance with Wisconsin Department of Transportation standards.

C. Crushed Aggregate Base Course

1. Prior to placing crushed stone base course, the subgrade shall be proof rolled in the presence of the Town Engineer and Owner's Engineer using a loaded tri-axle dump truck with a minimum load of 18 tons with the tag wheels up. All soft or yielding material shall be replaced with 3" breaker run stone.
2. The lower 6" of the base course shall meet a combination of 1-1/4" or 3" gradations, and the top 6" shall meet a 1-1/4" gradation, according to the Wisconsin Department of Transportation Standard Specifications. The thickness of the layers shall total 12" (or more as determined by the Town Engineer during plan review or construction).
3. At the discretion of the Town Engineer, the crushed stone base course may require proof rolling prior to placing bituminous paving.

D. Asphalt Pavement (Bituminous Concrete – Lower Layer)

1. The Town requires the Contractor to provide a bituminous concrete mix meeting the requirements for an HMA Pavement Type E-1 (19mm), PG 58-28 for low volume roads and an HMA Pavement Type E-1 (19mm), PG 64-28 for high volume roads (collectors and arterials). The lower layer lift shall be 2¼" thick.
2. Pavement density testing will be done in conformance with the Wisconsin Department of Transportation (WDOT) procedures, or as modified in this section.
3. For each paving project, a minimum of five random samples will be tested for density. Projects of 1,500 lineal feet or less shall have five equally spaced density tests. Projects greater than 1,500 lineal feet shall be tested every 300 feet.

   i. The average of all density test results shall meet the required percentage of 89.5%. If the average is below the minimum requirement, a disincentive pay reduction to the lower layer pavement contract price (Town projects) or unit price

per current fee schedule (work done under private development contract) will be calculated according to Table 1 in Appendix A.

ii. If the average of all density test results is above the minimum requirement of 89.5%, an incentive will be paid according to Table 2 in Appendix A for Town projects only.

iii. If any individual density tests are less than 88% of the maximum density, the entire lower layer pavement is subject to a disincentive pay reduction which is applied to the contract price (Town projects) or unit price per current fee schedule (work done under private development contract) according to Table 3 in Appendix A.

4. The absolute minimum temperature of the bituminous concrete shall be 250°F at the time of placement. Optimum density is determined in the lab with the bituminous concrete mix at 275°F. If the temperature is found to be less than the minimum specified, the Town Engineer reserves the right to reject the material. The Contractor shall be responsible for the disposal of rejected material offsite.
5. During construction of the bituminous lower layer, the Town Engineer shall collect load weight tickets and inspect placement of asphalt to verify the placed asphalt thickness.
6. When calculating disincentive pay reduction for projects done under private development contract, the disincentive determined using Table 1 and Table 3 in Appendix A shall apply to the lower layer pavement unit cost found in the current Town of Middleton Fee Schedule.
7. When calculating disincentive pay reduction for Town projects, the disincentive determined using Table 1 and Table 3 in Appendix A shall apply to the lower layer pavement contract unit cost.
8. **If more than 50% of tests for the lower layer fall below minimum specified density, or the average density is more than 3 percent below specified minimum, the entire lower layer asphalt is subject to removal and replacement at the Developer's expense (work done under private contract) or Contractor's expense (Town project) as determined at the sole discretion of the Town.**

E. Asphalt Pavement (Bituminous Concrete – Upper Layer)

1. The Town requires the Contractor to provide a bituminous concrete mix meeting the requirements for an HMA Pavement Type E-1 (12.5mm), PG 58-28 for low volume roads and an HMA Pavement Type E-1 (12.5mm), PG 64-28 for high volume roads (collectors and arterials). The upper layer lift shall be 1¾" thick.
2. In the case of newly developed lands only, the upper layer may be placed no less than one year after the lower layer has been approved by the Town Board or Town Engineer. However, prior to the upper layer placement, the Town Engineer shall inspect the lower layer. Any areas that have failed prior to upper layer placement shall be removed and replaced at the direction of the Town Engineer at the Developer's expense.
3. Prior to placement of the upper layer, the road shall be cleaned and tacked to the satisfaction of the Town Engineer.
4. Pavement density testing will be done in conformance with the Wisconsin Department of Transportation (WDOT) procedures, or as modified in this section.
5. For each paving project, a minimum of five random samples will be tested for density. Projects 1,500 lineal feet or less shall have five equally spaced density tests. Projects greater than 1,500 lineal feet shall be tested every 300 feet.

i. The average of all density test results shall meet the required percentage of 91.5%. If the average is below the minimum requirement, a disincentive pay reduction to the upper layer pavement contract price (Town projects) or unit price per current fee schedule (work done under private development contract) shall be calculated according to Table 1 in Appendix A.
ii. If the average of all density test results is above the minimum requirement of 91.5%, an incentive will be paid according to Table 2 in Appendix A for Town projects only.
iii. If any individual density tests are less than 90% of the maximum density, the entire upper layer pavement is subject to a disincentive pay reduction which is applied to the contract price (Town projects) or unit price per current fee schedule (work done under private development contract) according to Table 3 in Appendix A.

6. The absolute minimum temperature of the bituminous concrete shall be 250°F at time of placement. Optimum density is determined in the lab with the bituminous concrete mix at 275°F. If the temperature is found to be less than the minimum specified, the Town Engineer reserves the right to reject the material. The Contractor shall be responsible for the disposal of rejected material offsite.
7. During construction of the bituminous upper layer, the Town Engineer will collect load weight tickets and inspect placement of asphalt to verify the placed asphalt thickness.
8. When calculating disincentive pay reduction for projects done under private development contract, the disincentive determined using Table 1 and Table 3 in Appendix A shall apply to the upper layer pavement unit cost found in the current Town of Middleton Fee Schedule.
9. When calculating disincentive pay reduction for Town projects, the disincentive determined using Table 1 and Table 3 in Appendix A shall apply to the upper layer pavement contract unit cost.
10. **If more than 50% of the tests for the upper layer fall below minimum specified density, or the average density is more than 3 percent below the specified minimum, the entire asphalt is subject to removal and replacement at the Developer's expense (work done under private contract) or Contractor's expense (Town contract) as determined at the sole discretion of the Town.**

F. Shouldering
1. Shoulders shall be a minimum of 3 feet in width on each side of the roadway and wider when required by the "Town Road Standards" as noted in Sec. 86.26, Wisconsin Statutes.
2. Shoulders shall have a minimum thickness of 4" of compacted in-place crushed state-approved aggregate base course over a minimum 12" of compacted in-place crushed state-approved aggregate base course.

G. Soil Stabilization
1. All disturbed areas within the right-of-way, outside of the pavement or aggregate, shall be restored utilizing 6" of topsoil.
2. Good quality seed, fertilizer, and mulch, in accordance with the seeding requirements prescribed in Wisconsin Department of Transportation standards, shall be applied to areas restored with topsoil.

3. Ditches along roadways shall be stabilized by necessary erosion control devices such as sod, geotextile matting, riprap, stone weeper, etc. as prescribed by the engineering design for the ditches as approved by the Town Engineer.

H. Culverts

1. Culvert placement shall be in accordance with the State of Wisconsin Department of Transportation Standard Specifications of Highway and Structure Construction.
2. The Contractor shall lay culverts either on a shaped, firm, earth subgrade, or on a backfilled granular foundation. The Town Engineer or other designee shall determine which foundation is necessary.

    a. If the culvert foundation is firm earth, the Contractor shall shape the trench bottom to give full continuous support to the pipe.
    b. If the culvert foundation is granular, the Contractor shall excavate the trench 6" below the design elevation for the bottom of the pipe. The trench shall be backfilled with granular or aggregate material as modified in the current Wisconsin Department of Transportation Standard Specifications Section 209.2.1 or as approved by the Town Engineer or other designee. The granular foundation shall be compacted prior to placement of the culvert. After placement of the culvert, the granular material shall be placed and compacted around the pipe in 6" layers to the top of the pipe. Backfill material above the pipe shall be placed in lifts no greater than 12" and compacted prior to additional backfill placement. A minimum of 2' of cover shall be provided above the top of the pipe. The granular material shall be compacted by ramming, tamping, or vibrating to provide full and continuous support of the pipe.

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APPENDIX A

TABLE 1: DISINCENTIVE PAY REDUCTION FOR HMA PAVEMENT DENSITY	
Percent Density below Specified Average (Lower Layer=89.5; Upper Layer=91.5)	Payment Factor (percent of asphalt contract price or price per Town Fee Schedule)
Greater than 0 and less than or equal to 1.0	98
Greater than 1.0 and less than or equal to 1.5	95
Greater than 1.5 and less than or equal to 2.0	91
Greater than 2.0 and less than or equal to 2.5	85
Greater than 2.5 and less than or equal to3.0	70
Greater than 3.0	Remove and replace the pavement with a mixture at the specified density. Once acceptably replaced, the Town will pay for the replaced work at the contract unit price. Alternatively, the Engineer may allow the nonconforming material to remain in place with a 50 percent payment factor.

TABLE 2: INCENTIVE PAY ADJUSTMENT FOR HMA PAVEMENT DENSITY NOTE: Incentive pay only applies towards Town of Middleton Public Projects.	
Percent Density Above Specified Average (Lower Layer=89.5; Upper Layer=91.5)	Payment Adjustment per SY
Greater than 0 and less than or equal to1.4	$ 0.00
Greater than 1.4 and less than or equal to2.0	$ 0.05
Greater than 2.0	$ 0.10

TABLE 3: DISINCENTIVE PAY REDUCTION FOR HMA PAVEMENT DENSITY FOR INDIVIDUAL TESTS BELOW THE MINIMUM SPECIFIED	
Percent of Density Tests Below Specified Minimum (Lower Layer=88.0; Upper Layer=90)	Payment Factor (percent of asphalt contract price or price per Town Fee Schedule)
Greater than 0 and less than or equal to 10	98
Greater than 10 and less than or equal to 20	96
Greater than 20 and less than or equal to 30	94
Greater than 30 and less than or equal to 40	92
Greater than 40 and less than or equal to 50	90
Greater than 50	If more than 40% of the density tests fall below the minimum individual specified density, the Contractor or Developer shall mill and remove the pavement and replace the asphalt mix at the specifications, lines, grades and dimensions shown on the construction plans. Once it is acceptably replaced, the Town or Developer will pay for the replaced work at the contract unit price unless requirement is waived by the Town of Middleton upon recommendation by Town Engineer.

The penalty for pavement that fails the minimum average density and has at least one individual test below the minimum specified shall be the larger of the penalties as determined by Table 1 and Table 3.