TOWN OF CLAYTON

2010 MINIMUM ROAD DESIGN STANDARDS POLICY

Revised 2002, 2005, 2011, 2018

SECTION 1 - GENERAL

1.1 Town Road Policy Statement:

All roads constructed in the Town of Clayton shall comply with the minimum standards set forth below in order to be incorporated into the Town Road system.

The Town Board for the Town of Clayton finds that it is in the public interest for the Town of Clayton to establish minimum design standards for roads constructed in its jurisdiction. The Town's minimum road construction standards are intended to accommodate long-range traffic forecasts; to afford satisfactory access to law enforcement, to the fire department, to the Public Works Department snow removal equipment, to sanitation equipment, and to road maintenance equipment; and to minimize the Town's routine road maintenance obligations.

1.2 Definitions:

For clarity and consistency of application of this Policy, the following definitions shall be applied for the interpretation of the Policy:

1. Town road: A thoroughfare owned by the Town over which the public has a legal right to pass, usually measured to include the complete Right-of-Way (ROW).
2. Drainage: The engineered removal of water from the roadway system by means of culverts, ditches, curb and gutter, trenches, channels, and/or a storm sewer drainage system.
3. Roadway: The traveled portion of the highway.
4. Grade: The rate of ascent or descent of the slope of a road.
5. Road Bed: The entire engineered roadway, sub-structure and surface of a public thoroughfare laid in place and ready for travel.
6. Base Course: The lowest engineered portion of a road bed supporting a roadway, typically consisting of crushed aggregate including the shoulders of the road.
7. Surface: The top of the roadway, or the traveled surface.
8. Sub-grade: The earthen portion of a roadway under the engineered base course.
9. Standard Specifications: State of Wisconsin Department of Transportation Standard Specifications for Highway and Structure Construction, Latest Edition.
10. Embankment: The portion of a roadway which requires the placing and compacting of suitable fill material to bring the finished sub-grade up to the required grade.

1.3 Applicability:
This Policy shall be applicable to all roads approved by the Town Board following adoption and publication of the Policy including, but not limited to roads dedicated and constructed as part of a plat approval process pursuant to Chapter 236 of Wisconsin Statutes, any private roads being dedicated to the Town, and any other roads accepted by the Town as public roads in the Town of Clayton.

Town Capital Reconstruction projects and all new roadways shall be constructed to the standards of this Policy.

1.4 Construction Schedule for New Roadways:
Prior to the start of any construction, a subdivision Developer shall have executed a Developer's Agreement and irrevocable financial commitments with the Town equal to the estimated full burden costs of all road construction, including but not limited to construction of the roadway to gravel grade, paving, curb and gutter at intersections, shouldering, roadside ditches, culverts, storm sewer, signage, surface restoration, erosion control, and any required Town Engineering and/or Town legal fees.

Road design and construction plans must be approved by the Town Board prior to any construction. Roadway excavation and construction to gravel grade shall not be performed between November 15th and May 1st without Town approval. Asphalt paving will only be allowed between May 1st and November 15th.

All roads shall be constructed to finished base course grade within one year of the date of approval of the final plat or by a date agreed to by the Town Board.

Gravel Grade: New roads shall be constructed to finished gravel grade and allowed to remain unpaved for a period of six months to one year, or through one winter.

Paving: Where the roadway constructed to gravel grade has satisfied the winter-over, proof roll and grade check requirements, asphalt paving shall be in accordance with the following schedule:

a) Regardless of the lot occupancy level of the subdivision, the binder course of asphalt shall be applied by August 31 following the first winter-over period (second year).
b) Regardless of the lot occupancy level of the subdivision, the final surface layer of asphalt shall be applied by August 31 of the following year (third year).

SECTION 2 – DESIGN STANDARDS

2.1 Standard Specifications

All work shall be done in accordance with the Latest Edition of the State of Wisconsin Department of Transportation Standard Specifications for Highway and Structure Construction (Standard Specifications). If there is a conflict between these Road Standards and the referenced Standard Specifications, these Road Standards shall prevail.

2.2 Minimum Road Design Standards:

The following minimum design standards shall apply under the Town's Policy. All Town roads shall be classified as local roads unless designated by the Town Board as a collector road or arterial road. The classification of all roads under this Policy shall be at the complete discretion of the Town Board. The Town Board shall consider such factors as the traffic count, the character of the anticipated traffic, and the relation of the highway to traffic patterns within the Town, and the State and County highway network within the Town. It is intended that the local road classification have the lowest traffic counts to provide access to private property as its principal function.

Collector Roads are intended to act as conduits from Local Roads to higher priority thoroughfares or developed areas. Arterial Roads are intended to serve as corridors through the Town and to serve intra-regional and inter-area traffic movement.

Maximum Allowable Grade of Roadway (Percent)		
	Residential Development	**Commercial or Industrial Development**
Local	10	8
Collector	8	6
Arterial	6	6
Minimum Centerline Radius of Horizontal Curve (In Feet)		
When a continuous street centerline deflects at any one point by more than 10 degrees, a horizontal curve shall be introduced having a radius of curvature on such centerline of not less than 100 feet on minor streets. For streets serving commercial or industrial uses or for collector streets, when a continuous street centerline deflects at any one point by more than 5 degrees, a circular curve shall be introduced having a radius of curvature on such centerline of not less than 500 feet. There shall be 200 feet of tangent introduced between curves. There shall be a minimum of 100 feet of centerline tangent between the end of a curve and a street intersection.		
Corner Radii at Intersections (In Feet)		
	Residential Development	**Commercial or Industrial Development**
Local	30	30
Collector	30	40
Arterial	40	60
Intersections with County or State Highways may require larger radii.		

Minimum Length of Vertical Curve		
Local	20' for each 1% algebraic difference in grade; none required for under 1% algebraic difference in grade	
Collector	50' for each 1% algebraic difference in grade	
Arterial	50' for each 1% algebraic difference in grade	
Design Speed (MPH) for Local, Collector & Arterial Roads		
	Preferred	Minimum
Local	25	25 (See Notes)
Collector	45	30 (See Notes)
Arterial	55	45 (See Notes)

Notes:

1. The Town Board may make exceptions to these requirements based on specific site topography and/or site limitations.
2. The developer shall supply the Town of Clayton with the design speed per the Wisconsin Department of Transportation Facilities Development Manual.

2.3 Collector and/or Arterial Road Standards:

Collector and/or Arterial Roads shall comply with all of the minimum standards set forth below before the Town Board will consider an application for acceptance as part of the Town road system. This requirement shall include the application for approval of Plats and/or Certified Survey Maps (CSM) where road construction is involved. These standards are as follows:

1) Collector and/or Arterial Roads shall have an eighty foot ROW.
2) Collector and/or Arterial Roads shall be designed to be through roads. Any temporary termination due to project phasing shall include a temporary turn-around consisting of a 50' graveled radius and a 47' paved radius.
3) All top soil shall be stripped from the ROW and stockpiled prior to roadway construction. Excess topsoil shall remain for the Owner or be removed by the Contractor upon request.
4) Suitable sub-soil material excavated from the ditches shall be used for the leveling of the sub-grade.
5) All ditches shall be generally designed to be cut 2-1/4 feet below edge of pavement elevation with a foreslope of no more than 4 to 1, a backslope of no more than 3 to 1, and graded to permit proper drainage with gradual slopes at a grade not less than 1.0% per approval street plans. Variation from these standards required to accommodate existing topography shall be provided in a summary to the Town Board for their approval.
6) Perforated draintile, 6-inches in diameter and covered with geotextile filter fabric sock, shall be installed below the bottom of ditches. The draintile within the geotextile sock shall be surrounded by four inches of ¾-inch clear crushed stone, and topped with six inches of topsoil. Connections of draintile below paved areas shall be made with Schedule 40 PVC pipe.
7) Cross culverts shall be placed to facilitate drainage of the roadway where necessary, per the approved drainage plan. Culverts shall be galvanized corrugated steel metal pipe with associated steel metal end-walls. Bedding and initial backfill for cross culverts shall include 6" of ¾" clean crushed stone.

8) Collector and/or Arterial roads constructed in the Town of Clayton shall have:
   a) Base Course:
      - Upper Layer: 6" of ¾" dense graded base course material.
      - Lower Layer: 18" of 2-1/2" breaker run, or 3" dense graded base course material.
      - All gravel used for street construction shall contain no more than 9.5% P200.
   b) Geotextile Fabric installed below the proposed pavement and shoulders.
   c) Geogrid may be installed below the proposed pavement and shoulders, to be used in lieu of geotextile fabric. Geogrid can be substituted for 3" of lower base course material.
9) The travel portion of the road must be 24' wide and have 4" of compacted asphalt surface (1.75" surface and 2.25" binder).
10) The asphalt surface must have a 3' shoulder on each side consisting of ¾" dense graded base course material.
11) 30-inch (6" sloped) Wisconsin Department of Transportation standard mountable Concrete Curb and Gutter shall be placed on the radii of all road intersections. The Town reserves the right to require curb and gutter on any other portion of a Town Road for both ease of maintenance and public health and safety.

2.4 Local Road Standards:

Local Road Standards shall comply with all of the minimum standards set forth below before the Town Board of the Town of Clayton will consider an application for acceptance as part of the Town road system. This shall apply to application for approval of Plats and/or Certified Survey Maps (CSM) with road construction involved.

1) Town Roads shall have a sixty-six foot ROW.
2) Any permanent dead-end road shall have a 66' radius ROW (47' radius pavement, 50' radius graveled) cul-de-sac at its terminus. Any temporary termination due to project phasing shall have a 47' radius pavement and 50' radius graveled, temporary turnaround installed.
3) All top soil shall be stripped from the ROW and stockpiled prior to roadway construction. Excess topsoil shall remain for the Owner or be removed by the Contractor upon request.
4) Suitable sub-soil material excavated from the ditches may be used for the leveling of the sub-grade.
5) All ditches shall be generally designed to be cut 2-1/4 feet below edge of pavement elevation with a fore-slope of no more than 4 to 1, a back-slope of no more than 3 to 1, and graded to permit proper drainage with gradual slopes at a grade not less than 1.0% per approval street plans. Variation from these standards required to accommodate existing topography shall be provided in a summary to the Town Board for their approval.
6) Perforated draintile, 6-inches in diameter and covered with geotextile filter fabric sock, shall be installed below the bottom of ditches. The draintile within the geotextile sock shall be surrounded by four inches of ¾-inch clear crushed stone, and topped with six inches of topsoil. Connections of draintile below paved areas shall be made with Schedule 40 PVC pipe.
7) Cross culverts shall be placed to facilitate drainage of the roadway where necessary, per approved street plans. Culverts shall be galvanized corrugated steel metal pipe with associated steel metal end-walls. Bedding and initial backfill for cross culverts shall include 6" of ¾" clean crushed stone.

8) Local roads constructed in the Town of Clayton shall have:
   a) Base Course:
      - Upper Layer: 6" of ¾" dense graded base course material.
      - Lower Layer: 15" of 2-1/2" breaker run, or 3" dense graded base course material.
      - All gravel used for street construction shall contain no more than 9.5% P200.
   b) Geotextile Fabric installed below the proposed pavement and shoulders.
   c) Geogrid may be installed below the proposed pavement and shoulders, to be used in lieu of geotextile fabric. Geogrid can be substituted for 3" of lower base course material.
9) The travel portion of the road must be 22' wide and have 3.5" of compacted asphalt surface. (1.75" surface and 1.75" binder).
10) The asphalt surface must have a 3' shoulder on each side consisting of ¾" dense graded base course material.
11) 30-inch (6" sloped) Type Wisconsin Department of Transportation standard mountable Concrete Curb and Gutter shall be placed on the radii of all road intersections. The Town reserves the right to require curb and gutter on any other portion of a Town Road for both ease of maintenance and public health and safety.

2.5 Obstructions within Town Right-of-Way:

General: Fences (including invisible electronic fencing), gates, landscape features, lighting, or other objects shall not be allowed within the Town's ROW.

Driveway Aprons: Concrete driveway aprons shall not be allowed within the Town's ROW.

SECTION 3 –CONSTRUCTION STANDARDS

3.1 Traffic Control

The Contractor shall inform the local police and fire departments prior to construction.

The Contractor shall provide all signs and traffic control devices conforming to the Manual on Uniform Traffic Control Devices. All traffic control signs, barricades, etc. shall be inspected and maintained on a daily basis.

3.2 Erosion Control

Contractor shall be responsible for furnishing, installing, maintaining and removing erosion control devices in accordance with the approved plans.

3.3 Construction Staking:

All staking work shall be done by the Town Engineer. The Town Engineer will provide right-of-way and stationing staking, and summary sheets that provide sub-grade, stone grade, ditch grade, and ROW elevations for all the streets.

The Contractor shall utilize the ROW station stakes for alignment. It is the Contractor's responsibility to stake the edge-of-stone and centerline alignments for the proposed streets. It is the Contractor's responsibility to check the vertical accuracy of the sub-grade and stone grades prior to the Town Engineer's sub-grade and gravel grade checks.

The cost of re-staking, due to the Contractor's negligence shall be borne by the Contractor.

3.4 Clearing and Grubbing:

Clearing and grubbing shall consist of cutting and disposing of trees, brush, stumps, roots, shrubs, fallen trees, fence posts, fence wire, vines and other vegetation and debris occurring within the project limits and disposing of same as required for the specified construction.

The clearing limits shall be the limits of the ROW or easement unless otherwise stated or indicated by the Town Engineer, or as shown on the approved plans.

The Contractor shall use whatever methods for clearing and grubbing best suited to the site and which will not cause damage to adjacent properties.

The Contractor shall remove obstructions such as street signs, culverts and end walls, advertising signs and guard posts located in construction easements or right-of-way, provided the owner is notified prior to removal and they are promptly replaced to their original condition, unless otherwise specified by the Town Engineer.

Any existing culverts that the Town's Engineer indicates shall be salvaged, shall be carefully removed and replaced, or shall become the property of the Developer or Town of Clayton.

Unless otherwise required, all materials resulting from the clearing or from cleanup shall become the property of the Contractor. The Contractor shall take full responsibility for the complete and proper disposal of the materials.

The Contractor and/or Developer shall be responsible for the protection, and replacement if necessary, of survey monuments which may exist throughout the project area. Any disturbed survey monuments shall be replaced by the Town's Engineer at the Contractor's expense.

3.5 Topsoil Stripping

The Contractor shall strip the existing topsoil within the right-of-way as necessary for construction. The topsoil shall be temporarily stockpiled per plan and spread on disturbed areas prior to seeding.

Sod and grass shall be removed before stripping topsoil. Strip topsoil in a manner to prevent intermingling with underlying subsoil or other waste materials. Stockpile topsoil away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

Provide erosion control for topsoil piles as indicated on the approved Erosion Control Plan.

3.6 Excavation:

The Contractor shall sawcut any existing pavement adjacent to proposed pavement prior to excavation.

The entire street ROW shall be excavated to the typical sections shown in the approved plans. There will be areas where existing ground elevations and proposed street grades will dictate that slope intercepts extend beyond the ROW lines. Easements beyond the right-of-way shall be obtained to facilitate 3 to 1 or greater backslopes wherever possible.

The sub-grade shall be comprised of sound non-organic material free from topsoil and/or any other deleterious material. Acceptable excavated sub-grade material shall be moved to locations on the project where fill is required.

Sub-grade in ditch areas shall be excavated and graded to allow for the addition of a minimum of 4" inches of topsoil.

Any excess material not needed for road construction shall be hauled off site or placed and leveled in locations determined by the Town Engineer.

3.7 Roadway Embankments:

Embankments consist of miscellaneous backfill material placed in accordance with the specifications below and conformity with the lines, grades, thicknesses and typical cross sections shown on the approved plans.

Embankments shall consist of approved materials and shall contain no stones larger than 6", concrete, logs, stumps, brush or other organic or frozen material.

Before placing any material in an embankment, the Contractor shall clear, grub and strip the topsoil as noted above. The material shall be placed and compacted in 12" thick layers and compacted to not less than 95 percent of maximum dry density according to ASTM D 1557-91.

3.8 Private Entrance Culverts

Private entrance culverts shall be installed in accordance with the following requirements:

1) The Owner's contractor shall supply and install a corrugated steel culvert with endwalls for each private entrance. Installation shall include excavation, 6" of ¾" clear crushed stone bedding material, installation of the new driveway culvert with all necessary hardware and endwalls, backfilling with a minimum of 6" of ¾" clear crushed stone initial backfill material and native material to subgrade level, restoration of the ditch, side slopes, and any other areas disturbed by construction.
2) The Owner shall designate, with flagged stakes at each end, where the culvert is to be placed.
3) A Town officer will view the site and designate the size and length of the culvert. Culverts must have end walls and the minimum culvert diameter shall be 18" or equivalent with a minimum length of 30'. A 20' culvert may be used when it is being placed in a single lane driveway.

4) Any culvert installed over 30' in length may require an oversized culvert and/or a clean-out located in the middle of the culvert, level within the driveway surface. No culvert shall exceed 36' in length without written approval of the Town Board.
5) Topsoil shall be filled in behind the end walls to provide a blended appearance.
6) Culverts shall be protected from sediment until vegetation is established and the installation is accepted by the Town. Any sediment deposits found in the culverts shall be removed prior to Town's acceptance.
7) If the culvert is set incorrectly or if there are sediment deposits left within the Town's ROW, The Town will clean the ditch and set the culvert (if applicable) to facilitate proper drainage at a fee set by the Town Board.
8) The Town will finalize the culvert permit upon completion of items 1 through 7 above.

3.9 Installation of Draintile in Ditches:

Perforated draintile covered in geotextile filter fabric sock and surrounded by four inches of ¾-inch clear crushed stone and covered with six inches of topsoil shall be installed within roadside ditches.

Draintile shall be soil tight, high density polyethylene plastic pipe with perforated slots meeting ASTM F-405 and SCS/NRCS Code 606.

Geotextile filter fabric sock shall be high performance meeting ASTM D4491 minimum permittivity of 5.5 sec (-1), ASTM D6241 minimum puncture resistance of 1000N, and ASTM D4751 maximum AOX of 0.600 mm/30 U.S. Sieve.

3.10 Preparation and Verification of Sub-grade:

The Contractor shall notify the Town Engineer after the completion of the sub-grade construction, prior to placement of fabric and base course material. The Town's Engineer will check and document the sub-grade compaction and elevations. The Town Engineer will require a proof roll of the sub grade prior to the placement of any fabric and base course material. Proof roll subgrade with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons. Excavate unsatisfactory areas and replace with compacted base course material.

The Contractor shall ensure that the sub-grade elevations are within Policy tolerances (1") prior to requesting that the Town's Engineer to verify elevations.

Should the Contractor begin graveling streets without the consent of the Town Engineer, the Contractor shall remove the fabric and stone at their cost.

3.11 Excavation below Sub-Grade:

The Contractor shall excavate the road to the specifications shown in the typical plan cross-section.

Excavation below sub-grade (undercutting) may be necessary over some portions of a project. If such excavation is required, the Contractor shall obtain prior authorization from the Town Engineer.

The Contractor shall backfill excavations below sub-grade with 2-1/2" breaker run or 3" dense graded base course material. This backfill material shall be compacted and brought up to the sub-grade elevation, and the Contractor shall be paid at the unit price as bid.

3.12 Geotextile Fabric:

The Contractor shall install geotextile fabric on approved sub-grade in the area of the proposed pavement and shoulders below the base course.

The geotextile fabric shall consist of either woven polyester, polypropylene, stabilized nylon, polyethylene or polyvinylidene chloride. All fabric shall have the minimum strength values required in the weakest principal direction. The geotextile fabric rolls shall be clearly marked showing the type of fabric. The fabric shall comply with the following minimum physical requirements:

Geotextile Fabric Minimum Physical Requirements		
Parameter	**Method**	**Value**
Trapezoid Tear (lbs.)	ASTM D-4533	100 lbs.
Permittivity (sec-1)	ASTM D4491	.02
Apparent Opening Size (sieve size)	ASTM D-4751	30/70
Ultraviolet Degradation (% strength retained)	ASTM D-4355	70
Grab Tensile Strength (lbs.)	ASTM D-4632-86	280 min.
Puncture Strength (lbs.)	ASTM D-4833	115 min.
Mullen Burst (psi)	ASTM D-3786	600 min.
Elongation at Required Strength (%)	ASTM D-4632-86	25% max

All numerical values represent minimum/maximum average roll values (i.e., the average of test results on any roll in a lot should meet or exceed the minimum values in the table). The rolls of fabric are to be kept dry until installed and shall be clearly marked showing the type of fabric.

The fabric shall be placed on the sub-grade, rolled out parallel to the roadway, and pulled taut manually to remove wrinkles. After the fabric has been placed on the sub-grade area, no traffic or construction equipment will be permitted to travel directly on the fabric. Adjacent rolls of fabric shall be overlapped a minimum of 24". All factory seams shall have the same strength as the specified strength of the fabric.

Weights or pins may be required to prevent lifting of the fabric by wind. After placement, the fabric shall be exposed no longer than 48 hours prior to covering. Base course material shall be placed by back-dumping with trucks and leveled with a crawler dozer to a minimum depth of 4" over the fabric.

Before covering, the condition of the fabric shall be inspected by the Town's Engineer to determine that no holes, rips, or tears occurred in the fabric. If any defects are observed, the damaged area shall be covered with a patch of fabric using a 36" overlap in all directions.

3.13 Geogrid

Contractor may install geogrid in lieu of geotextile fabric on approved sub-grade in the area of the proposed pavement and shoulders below the base course, as approved by the Engineer.

Geogrid material shall be made of polypropylene base resin, formed into a stable, regular grid network of uniform shape and size square apertures. Material shall have ultra-violet light stabilization with carbon black content less than 2.0 percent by weight.

General Properties (Nominal values):

- Open area: > 84%
- Aperture Opening Size: MD: 1.6in (40mm); XMD: 1.6in (40mm)
- Rib Depth: MD: 0.06in (1.6mm); XMD: 0.05in (1.4mm)
- Rib Width: MD: 0.08in (2.0mm); XMD: 0.09in (2.4mm)

Mechanical Properties (MARV per ASTM D4759)

- Ultimate Tensile Strength: MD: 1,370 lb/ft (20 kN/m); XMD: 1,370 lb/ft (20 kN/m) when tested in accordance with ASTM D 6637, Proc. B.
- Tensile Load at 2% Strain: MD: 520 lb/ft (5.8 kN/m); XMD: 520 lb/ft (5.8 kN/m) when tested in accordance with ASTM D 6637, Proc. B.
- Tensile Load at 5% Strain: MD: 1,045 lb/ft (15.3 kN/m); XMD: 1,045 lb/ft (15.3 kN/m) when tested in accordance with ASTM D 6637, Proc. B.
- Junction Efficiency: 95% when tested in accordance with ASTM D7737 and as a comparison of ASTM D7737 to ultimate strength of the same sample with the ASTM D7737 test run at the non-standard speed of 10%.min.
- Flexural Rigidity: 800,000 mg-cm when tested in accordance with ASTM D 7748 modified by using samples of geogrid with 2 longitudinal ribs and side ribs cut flush to the junctions with the longitudinal ribs.
- Aperture Stability Modulus: 0.34 m-N/deg when tested in accordance with ASTM D7864 at an in-plane rotational moment equal to 20 kg-cm.

Durability Properties (Nominal Values)

- UV Light Degradation Resistance: 100% when exposed for 500 hours and tested in accordance with ASTM D 4355/6637, Proc. B.
- Chemical Degradation Resistance: 100% when exposed for 120 hours and tested in accordance with EPA 9090A.
- Installation Damage Resistance: >90% when tested in accordance with ASTM D 5818 and installed under similar conditions, using similar materials to the those contemplated for the project.

The Contractor shall place the geogrid directly on prepared and approved subgrade. Install geogrid in accordance with manufacturer's instructions. Geogrid shall be overlapped at all edges and seams such that panels do not separate during placement of fill over them. Minimum overlap shall be per the manufacturer's recommendations. Electrical zip ties may be used to mechanically join adjacent panels if required to maintain continuity.

Geogrid shall be temporarily secured in place during fill placement if necessary. Fill placement shall proceed in such a manner that it minimizes development of wrinkles in and/or movement of the geogrid.

A minimum loose lift thickness of six inches is required before operating tracked vehicles over the geogrid placement area. Under all circumstances, turning of tracked equipment shall be avoided while over the geogrid placement area.

3.14 Placing Stone Base

Prior to placing the base course, the contractor shall supply the Town Engineer with a gradation report for the aggregate stockpile to be used. The Town reserves the right to take samples from the stockpile for testing during construction.

3.15 Compaction:

Place fill materials and base course materials in layers not more than 12" in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand operated tampers. Compaction by travel of grading equipment will not be considered adequate for uniform compaction.

Compact soil to not less than 95 percent of maximum dry density according to ASTM D 1557-91.

The material to be compacted shall be at the optimum moisture content to insure proper compaction. If the moisture content is such that excessive distortion or displacement occurs under the compaction equipment, the material shall be allowed to dry. Drying may be accelerated by aeration or manipulation by means of blade graders, discs, or other appropriate equipment. If the material is too dry to compact properly, water shall be added in quantities deemed necessary by the Town Engineer to aid and accelerate effective compaction.

In areas where proper compaction is not obtainable due to segregation of materials, excess fines, or other deficiencies, base course material shall be reworked or removed and replaced with material that will yield the desired results. The contractor shall shape and maintain the material to the proper dimensions prior to and during compaction operations.

3.16 Compaction Testing and Verification of Gravel Grade:

The Town will contract with an independent testing laboratory to provide required compaction testing services for sub-grade and stone base as they see fit.

The Contractor shall notify the Town Engineer after the construction of the roadway to gravel grade, prior to paving. The Town's Engineer will check and document the gravel compaction and elevations. The Town Engineer will require a proof roll of the gravel roadway prior to the paving. Proof roll with a loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons. Excavate unsatisfactory areas and replace with compacted base course material.

3.17 Bituminous Concrete Pavement:

Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

Asphalt lower layer: Air temperature above 30 deg. F and rising.
Asphalt upper layer: Air temperature above 40 deg. F.

Warranty: Finished work shall be free from bumps or depressions, evenly graded to levels shown and shall be warranted against defects of materials and workmanship for a period of 3 years from date of Substantial Completion. Written warranty shall include repair and replacement of defective work.

Hot Mix Asphalt Pavement: WI Standard Specifications Sections 450, 455 and 460.

- Lower layer: 4 LT 58-28 S for Local Roads, and 3 LT 58-28 S for Collector or Arterial Roads
- Upper layer: 4 LT 58-28 S
- Placed in two lifts with 1½' of tapered overlap (Michigan Joint).

Materials and construction shall conform to the requirements of the current WDOT ASP 6, 460.2.1, which includes the regression of air voids from 4.0% to 3.0% with asphalt cement.

Omitted from the WDOT requirements will be QMP mixture sampling and testing (section 460.2.8), nuclear density testing (section 460.3.3), PG binder and tack coat sampling and testing (section 455.2.2 and 455.2.3) and cold weather paving (section 450.3.2.1). Measurement and payment provisions and safety program submittals included in the Standard Specifications do not apply.

Tack Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt, or ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt, slow setting, diluted in water.

Field Quality Control:

1. Thickness: Allowable variation from total thickness required: 1/4 inch
2. Surface Smoothness: Use 10' straightedge applied parallel with and at right angles to centerline of paved area. Allowable variation in surface smoothness:
   Lower layer surface: 1/4 inch
   Upper layer surface: 1/8 inch
3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template: 1/4 inch.

3.18 Shouldering:
The Contractor shall install, with the use of acceptable equipment, a 3' shoulder on each side of the road consisting of ¾" dense graded base course material.

The shoulder shall be constructed to the required cross-section and flush with the pavement as soon as practicable. Shoulders shall be compacted in accordance with standard methods. If shouldering is delayed for any reason, the Contractor shall provide and maintain signing and other traffic protection and control devices.

3.19 Dry Hydrants:
A dry hydrant shall be provided with all new stormwater wet ponds in areas not currently served by residential water. Construction of the dry hydrant components shall be in accordance with standard details provided by the Town of Clayton and the following.

1) All piping shall be Schedule 40 PVC with air tight connections. Piping below normal water level shall be 10-inch diameter, and piping above normal water level shall be 6-inch diameter.
2) Strainer shall be bolted to a 45 degree 10-inch PVC Schedule 40 long sweep elbow. Mating flanges and gasket shall be VAN STONE SOC FLG (P80VSSF10), 10 RR 1/8 FF 150# GSKT (FNWR1FFGA10).
3) Strainer shall be a 10-inch Schedule 40 Barrel Strainer by ETT, LLC Dadeville, AL 9194-100. 36-inches of clearance is required around strainer on all sides.
4) Transition from horizontal pipe to vertical pipe shall be made using two (2) 45-degree elbows with a 24" minimum pipe between the two elbows.
5) A 12" long piece of 6" pipe shall be installed at ground level. Connected at both ends by flanges and gaskets. 6 PVC S80 VAN STONE SOC FLG (PFP80VSSFU), 6 RR 1/8 FF 150# GSKT (FNWR1FFGAU).
6) Provide a 45 Degree adapter with cap shall be Made by Kochek part number DHF612. The top of this adapter shall be 20" above adjacent roadways.

3.20 Placing Topsoil:
The Contractor shall place screened and pulverized, salvaged or imported topsoil to a minimum depth of 6" in all ditches and other areas as indicated on the approved plans and specifications. Imported topsoil shall be screened and pulverized. Rocks, stones, twigs, and clods that will not break down and other foreign material shall be removed, and the entire surface shall be dressed to present a uniform appearance.

3.21 Surface Restoration:
The Contractor shall stabilize all disturbed areas on the project that are not paved. Restoration shall consist of placing and grading topsoil, seeding, fertilizing, and mulching or erosion control matting.

Seeding: The Contractor shall seed areas indicated on the approved plans and specifications. All seed shall conform to the Wisconsin Statutes and Wisconsin Administrative Code Chapter ATCP 20 regarding noxious weed seed content and labeling. A seed mix compatible with land use per Section 630 of the "Standard Specifications" shall be applied at the rate specified in that section.

The Contractor is responsible for a 2" catch of grass and shall reseed any bare or sparse areas as determined by the Town's Engineer.

Fertilizer: The Contractor shall provide (and incorporate into the soil) fertilizer to the areas indicated on the approved plans and specifications to be seeded. Type A Fertilizer per Section 629 of the "Standard Specifications" shall be applied at the rate specified in that section.

Mulching: The Contractor shall utilize Method "C" Mulching per Section 627 of the "Standard Specifications" and it shall be applied at the rate specified in that section. Mulch shall be weed free hay or straw. The Contractor shall furnish and place weed free hay or straw as mulch at a depth of 1" to 1 ½" on all areas indicated on the plans and in the specifications to be seeded. Mulch shall be applied in locations not covered by Erosion Mat. Mulch shall be placed within three (3) days after seeding has been completed.

Mulching operations shall not be performed during periods of excessively high winds which would preclude the proper placing of the mulch. The placed mulch shall be loose or open enough to allow some sunlight to penetrate and air to slowly circulate, but thick enough to shade the ground, conserve soil moisture, and prevent or reduce soil erosion.

Erosion Control Matting: Erosion control matting shall be installed at locations shown on the approved plans.

3.22 Project Acceptance:

Prior to acceptance, the Town Engineer shall submit verification to the Town that the sub-grade, stone grade, ditches and Rights-of-Way were constructed in accordance with the approved plans.

Prior to final payment, the Contractor will conduct a project walk through with the Town and Developer, complete all punch list items and provide lien waivers.

Adopted this 16th, day of May, 2018

Russ Geise, Town Chair

Attest:

Richard Johnston, Town Administrator/Clerk