

## SECTION 1000 – QUALITY REQUIREMENTS

### QUALITY REQUIREMENTS

#### PART 1 – GENERAL

##### 1.01 Section Summary

- A. This section includes information on testing and inspection services and procedures for quality control and quality assurance for City of Minot projects and projects in City right-of-way.

##### 1.02 Related Sections

- A. Section 1800 – Excavation and Embankment
- B. Section 1900 – Subgrade Preparation
- C. Section 2000 – Trench Excavation and Backfill
- D. Section 2100 – Water Main
- E. Section 2200 – Water Main Services
- F. Section 2300 – Sanitary Sewer
- G. Section 2400 – Sanitary Sewer Services
- H. Section 2700 – Storm Sewer
- I. Section 2900 – Aggregate Base Course
- J. Section 3000 – Hot Mix Asphalt Pavement
- K. Section 3100 – Portland Cement Concrete Pavement
- L. Section 3200 – Concrete Curb and Gutter
- M. Section 3300 – Concrete Walk, Medians, and Driveways
- N. Section 3700 – Lawns and Grasses

1.03 References

- A. North Dakota Department of Transportation (NDDOT) "Standard Specifications for Road and Bridge Construction" 2014 Edition, As Revised.
- B. NDDOT Field Sampling and Testing Manual.
- C. American Association of State Highway Transportation Officials (AASHTO) testing procedures.
- D. ASTM International (ASTM) testing procedures.

1.04 Submittals

- A. Before construction may start, submit testing agency information for approval by the Engineer.
- B. All testing reports and manufacturer's certificates of quality control and/or testing shall be submitted or copied to the City Engineer's Office.
- C. On City of Minot projects, all submittals and submittal procedures shall conform to the requirements outlined in the Contract Documents.
- D. If requested by the Engineer, provide manufacturer's certificates along with any shop drawings certifying that products meet or exceed specified requirements executed by a responsible officer.

1.05 Tests and Inspections

- A. City of Minot Projects
  - 1. Engineer Responsibilities
    - a. Enlist the services of an independent testing agency to perform testing, except for those tests specified to be performed by the Contractor.
    - b. With proper notice given by the Contractor, arrange for tests to occur, except for those tests specified to be performed by the Contractor.
    - c. Pay the independent testing agency for tests performed and properly reported, except for those tests specified to be paid for by the Contractor.

2. Contractor Responsibilities

- a. Notify Engineer 48 hours in advance of tests and inspections, weekends excluded.
  - b. Provide incidental labor and facilities to obtain, handle, and store samples at the project site or at the sample source.
  - c. Provide adequate quantities of representative samples of materials, transportation of samples to the testing agency, facilitate tests and inspections for storing and curing of test samples.
  - d. Perform or arrange for and pay for all tests specified to be performed or paid for by the Contractor.
- B. All other projects: The Contractor shall perform or arrange for and pay for all tests.

1.06 Testing Agency Responsibilities

- A. Conduct and interpret tests and inspections and state in each report whether tested inspected work complies with or deviates from the requirements.
- B. Notify Engineer and Contractor immediately of irregularities or deficiencies observed in the work during performance of its services.
- C. Provide qualified personnel.
- D. Provide interpretation of test results when requested by the Engineer.
- E. Submit a certified written report of each service performed.

1.07 Laboratory Reports

- A. After each test and inspection, submit 1 copy of Laboratory Reports to the Engineer.
- B. Include in the report the following information:
  - 1. Date Issued.
  - 2. Project Name and City Project Number.
  - 3. Name of the individuals performing tests and inspections.
  - 4. Date, time, and location of sample, test, and inspection.

5. Type of tests/re-tests and inspection/re-inspection, methods used for each.
6. Results of tests and conformance to Contract Documents.
7. Recommendations on re-testing or re-inspecting.

1.08 Limits on Testing Agency Authority

- A. Laboratory has no authority to release, revoke, alter, or increase the Contract Document requirements.
- B. Laboratory may not accept or approve any portion of the work.
- C. Laboratory has no authority to stop the work.
- D. Laboratory may not perform any duties of the Contractor.

1.09 Manufacturer's Field Services

- A. Engage a qualified representative to observe field conditions, conditions of surfaces and installations, quality of workmanship, start-up of equipment, and to test, adjust, and balance equipment.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

3.01 General

- A. The Contractor shall be responsible for ensuring the quality of work meets the requirements of the Contract Documents.
- B. Contractor shall assist Engineer or designated representative in obtaining materials needed for conducting tests of material properties. Contractor will supply labor and equipment necessary for taking samples.
- C. Engineer shall determine all test locations.
- D. When the work does not meet test requirements, the Engineer shall have sole authority to reject the work and require the Contractor to take corrective action.
- E. The testing frequency in this Section may be adjusted with approval of the City Engineer.
- F. All acceptance testing must be witnessed by the Engineer or designated representative.

3.02 Excavation, Embankment, and Aggregate Base – Summary below. See Sections 1800.3 and 2900.3 for details.

<b>Type of Construction:</b>		<b>Excavation, Embankment, and Aggregate Base</b>
<b>Test Required</b>	<b>Frequency</b>	<b>Specification</b>
<b>1. Gradation</b>		
(a) Granular Borrow	1/500 Tons	Section 1800 2.01B
(b) Aggregate Base	1/1000 Tons	Section 2900 2.02
<b>2. Moisture-Density (Standard Proctor)</b>		
(a) Embankment Soil	1 per major soil	AASHTO T-99
(b) Aggregate Base	1 per source	AASHTO T-99
<b>3. Compaction</b>		
(a) Embankment Soil (subgrade)	1/600 SY or 1/STA for Each Lift, Whichever is More Frequent	100% Maximum Density (AASHTO T-99) within 1 foot of subgrade, otherwise 95% Maximum Density with $\pm 3\%$ optimum moisture.
(b) Aggregate Base	1/600 SY or 1/STA Whichever is More Frequent	100% Maximum Density (AASHTO T-99)
(c) Cement Stabilized Base/Subgrade	1/600 SY or 1/STA Whichever is More Frequent	98% Maximum Density (AASHTO T-99) with moisture per Section 2920 3.06.C
(d) Utility Trench Backfill	1/100 LF at Various Depths	100% Maximum Density (AASHTO T-99) within 1 foot of street subgrade, otherwise 95% Maximum Density with $\pm 3\%$ optimum moisture.
(e) Utility Service Trench Backfill	50% of Total Services at Various Depths	100% Maximum Density (AASHTO T-99) within 1 foot of subgrade, otherwise 95% Maximum Density with $\pm 3\%$ optimum moisture.

- A. Compaction testing shall be performed in accordance with NDDOT procedures, except using a nuclear density gauge (AASHTO T 310) is permitted.

3.03 Water Main and Services – Summary below. See Section 2100.3 for details.

<b>Type of Construction:</b>		<b>Water Main and Services</b>
<b>Test Required</b>	<b>Frequency</b>	<b>Specification</b>
<b>1. Hydrostatic Pressure</b>	From Valve to Valve Maximum of 1200 LF	150 PSI for 2 hours, Zero Drop in Pressure
<b>2. Total Coliform (Bacteria)</b>	2/Test Section, maximum of 1200 LF	2 passing tests per test section taken 24 hours apart.
<b>3. Tracer Wire</b>	Within one week after passing pressure tests, in all cases before paving.	Verify tracer wire installation by using low frequency (512 Hz or similar) line locating equipment. Must be able to locate all water mains and hydrant leads.

3.04 Sanitary Sewer and Services – Summary below. See Section 2300.3 for details.

<b>Type of Construction:</b>		<b>Sanitary Sewer and Services</b>
<b>Test Required</b>	<b>Frequency</b>	<b>Specification</b>
<b>1. Deflection (Mandrel)</b>	Manhole to Manhole	30-day minimum wait after installation before test, 5% maximum deflection
<b>2. Closed Circuit TV Inspection (Televis)</b>	Manhole to Manhole	Accurate to 1 ft, label each run, audio description of condition, STA location for service, DVD and paper report submittal
<b>3. Leakage Testing</b>	Manhole to Manhole	Low pressure air test for pipe 30" diameter and smaller.  Hydrostatic pressure test for pipes larger than 30" diameter.
<b>4. Tracer Wire</b>	Within one week after passing pressure tests, in all cases before paving.	Verify tracer wire installation by using low frequency (512 Hz or similar) line locating equipment. Must be able to locate all water mains and hydrant leads.

3.05 Storm Sewer – Summary below. See Section 2700.3 for details.

<b>Type of Construction:</b>		<b>Storm Sewer</b>
<b>Test Required</b>	<b>Frequency</b>	<b>Specification</b>
<b>1. Closed Circuit TV Inspection (Televising)</b>	Manhole to Manhole	Accurate to 1 ft, label each run, audio description of condition, DVD and paper report submittal

3.06 Concrete

<b>Type of Construction:</b>		<b>Concrete</b>
<b>Test Required</b>	<b>Frequency</b>	<b>Specification</b>
<b>1. Air Entrainment</b>	1 Test on First 50 CY, then 1/100 CY thereafter or 1/Day, Whichever is More Frequent	ASTM C231 (%)
<b>2. Slump</b>	1/150 CY or 1/Day, Whichever is More Frequent	ASTM C143
<b>3. Compressive Strength</b>	1/150 CY or 1/Day, Whichever is More Frequent	ASTM C39 & ASTM C31
<b>4. Temperature</b>	1/150 CY or 1/Day, Whichever is More Frequent	ASTM C1064 (F)

DRAFT



3.07 Hot Mix Asphalt (HMA) – Summary below. See Section 3000.3 for details.

<b>Type of Construction:</b>		<b>HMA Paving</b>	
<b>Test Required</b>	<b>Frequency</b>	<b>Specification</b>	
<b>1. Gradation</b>			
(a) Chip Seal Cover Aggregate	1/250 Tons	ND T-27 & ND T-11	
(b) Plant Mix Aggregate	1/1000 Tons	ND T-27 & ND T-11	
<b>2. Superpave Mix Properties</b>			
	1 per Job	NDDOT 430.03.C	
<b>3. Asphalt Binder Content (%)</b>			
	Daily	Provide bitumen cutoff report daily. AASHTO T-164 may be required at Engineer's discretion.	
<b>4. Density</b>			
(a) Air Voids	1/1000 tons of mix produced/day (minimum of once per day)	ND T-209 & ND T-166; Single Test 2 – 6% Moving Avg. 2.5 – 5%	
(b) Density by Nuclear Method	1/1500 SY/Day	ASTM D2950; minimum in-place density of 91% of daily average maximum theoretical density	
(c) Density by Coring	1/15,000 SY/lift (or 10% of lots), minimum of 1/lift/project.  Core density can be substituted for nuclear density testing	4" or 6" diameter cores ND T-166; minimum in-place density of 91% of daily average maximum theoretical density	

3.08 Lawns and Grasses

<b>Type of Construction:</b>		<b>Lawns and Grasses</b>	
<b>Test Required</b>	<b>Frequency</b>	<b>Specification</b>	
1. Seed Mixture	1 per Seed Mixture	Submit seed bag tags to Engineer	

PART 4 – MEASUREMENT AND PAYMENT

- A. On City of Minot projects, the Owner will pay for all passing material and compaction tests required by these specifications.
- B. All failing tests shall be paid for by the Contractor.
- C. The Contractor shall pay all costs for testing that is required by these specifications to be performed by the Contractor, and those that are specified as included in Bid Unit Items.

END OF SECTION

DRAFT