

1603 - WELDED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT

SECTION 1603

WELDED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT

1603.1 DESCRIPTION

This specification governs the welded steel wire fabric for concrete reinforcement that is produced from deformed or non-deformed steel wire or a combination thereof.

1603.2 REQUIREMENTS

a. General.

(1) Any plant producing welded steel wire fabric for concrete reinforcement through this specification must be currently prequalified. A plant is any facility that welds the steel wire fabric from wire produced internally or obtained from an external source.

(2) The fabric provided through this specification can be produced from deformed or non-deformed wire or a combination of both unless specified otherwise in the Contract Documents.

(3) The fabric is to be produced to the dimensions and sizes as specified the Contract Documents. Deviations from this requirement must have the documented approval of the Engineer’s representative.

b. Material Specifications.

- Non-deformed steel wire AASHTO M 32
- Deformed steel wire AASHTO M 225
- Fabric produced from non-deformed steel wire AASHTO M 55
- Fabric produced from deformed wire or a combination of deformed and non-deformed wire AASHTO M 221

1603.3 TEST METHODS

Conduct all tests as specified in **subsection 1603.2b**.

1603.4 PREQUALIFICATION

Follow the instructions on the AASHTO National Transportation Product Evaluation Program’s (NTPEP) website to participate in the welded wire producing mill audit program.

Forward an official copy of the initial (and latest) NTPEP audit report, including split sample results, to the Bureau Chief of Construction & Materials for evaluation. Producing mills that have successfully met the requirements of the audit (including test results that comply with **subsection 1603.2b**.) and are listed on the NTPEP website as compliant will be prequalified.

In order to maintain prequalified status, send a copy of the annual NTPEP certificate of compliance as soon as it is received. Producing mills that have been removed from the NTPEP website listing will be removed from prequalified status.

For producing mills that attain “provisional” status on the NTPEP website, immediately forward a description of the failing material (sizes, grade, and heat) to the Bureau Chief of Construction & Materials.

Producing mills that fail to provide the annual certificate of compliance or descriptions of failing material associated with a “provisional” NTPEP status, or are no longer in compliance with the audit requirements may be removed from prequalified status.

1603.5 PREQUALIFICATION (Alternate Method)

a. General. Contact the Bureau Chief of Construction and Materials to arrange for the required sampling, observation of testing procedures and review of the plant quality control program.

The plant is to absorb all the Engineer’s representative’s expenses associated with the inspection. This includes travel, subsistence and lodging, and the expenses of shipping the selected wire and fabric specimens to the KDOT Materials and Research Center for comparison testing.

1603 - WELDED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT

It is the option of the Bureau Chief of Construction and Materials to grant prequalified status to a plant based upon the qualification test and inspection results of the transportation agencies of other states.

A plant will be notified by written documentation in the event of any change in their prequalified status. The Bureau of Construction and Materials will maintain a list of all plants that are prequalified to provide fabric to KDOT projects.

b. Plant Quality Control Requirements. The plant must have a quality control section identified within its organization that is adequately staffed to perform the required lot by lot testing. The plant laboratory must have proper equipment, calibrated according to AASHTO T 67 (ASTM E 4) annually as a minimum, with which to adequately perform all testing required through **subsection 1603.3**. Provide a copy of the plant quality control plan the Engineer's representative during the plant inspection.

c. Sampling and Testing Procedure. The Engineer's representative will select the test samples, at random, at the plant. Provide access to all facilities necessary for the Engineer's representative to randomly select samples from all lots defined below. Provide plant personnel to cut and label the necessary specimens from the randomly selected wire and fabric.

(1) Lot size. The reinforcing fabric and wire that is subject to sampling includes all sizes and production lots of fabric, and heats or lots of wire in stock. Remove the fabric samples from 10 different production lots. Remove 3 wire samples from each of 10 different lots, heats when available, of wire being utilized to produce fabric at the plant. Vary the size of the fabric and wire that is sampled to the greatest extent that availability permits. This is for the purpose of obtaining a representative cross-section of the plant production. These sampling requirements apply unless exceptions are authorized by the Bureau Chief, Construction and Materials, or their designated representative.

(2) Fabric samples are to be contiguous sections, i.e., all wires and welds intact, that are 6 longitudinal or 'running' wires in width by 10 transverse wires in length. Wire tensile samples are to be 2 m in length.

(3) Sample preparation. Assign each fabric and wire sample a unique identification number. Durably affix this number to each end of the wire tensile and fabric samples. For definition purposes, the length direction of a fabric sample is parallel to the longitudinal wires. Cut each fabric and wire sample into 2 equal length specimen preparation sections. This cut is perpendicular to the longitudinal wires for the fabric samples. Each wire section provides a tensile and bend test specimen and each fabric section provides 4 weld shear test specimens. The specimens from one section are for testing by the plant and the specimens from the companion section are for the comparison testing by the KDOT. Leave the KDOT's specimen preparation sections in one piece. Conduct all sample preparation operations in the presence of the Engineer's representative.

(4) Specimen testing. Test the specimens according to the procedures and requirements of the applicable AASHTO specification as referenced in **subsection 1603.2b**. For the purpose of comparing the plant and KDOT testing laboratories, one tensile and bend test set from each sample and one weld shear test specimen set from each sample is to be tested by each laboratory. Provide all the necessary facilities and test records required by the Engineer's representative to witness the tests.

The Engineer's representative will witness all relevant testing performed by the producer. Record the plant test results onto a KDOT form and sign the form. Provide these results to the Engineer's representative for submittal to the KDOT central laboratory.

Submit the remaining companion sections from each sample to the KDOT central laboratory. It is mandatory that these sections retain their unique identification number during shipment and when delivered to the central laboratory.

(5) Comparison testing. The companion sections will each provide a tensile and bend test specimen set and a set of 4 weld shear test specimens that will be tested by the KDOT central laboratory according to the procedures and **subsection 1603.2b**.

The KDOT results will be compared to the parallel plant data from each heat or lot for variations and differences. These variations and differences may not exceed the following, based on the KDOT values as the reference where applicable:

1603 - WELDED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT

TABLE 1603-1: WELDED STEEL WIRE FABRIC COMPARISON TESTING		
Property	Individual Specimen Test Results	Average Test Results for the Heat or Lot
Tensile Strength	10%	5%

All variations and differences are absolute value based.

A heat or lot that fails the comparison requirements may be resampled one time only, and on a 2 to 1 basis. It is preferable that the resample be removed from the same heat or lot that failed. The initial test results will be replaced by those of the resample specimens. A lot that fails the weld shear test requirements may be resampled in accordance with the procedures of **subsection 1603.2b**.

d. Plant Status.

(1) Attainment of prequalified status. In order for a plant to be prequalified to provide welded wire fabric to KDOT projects, the following requirements must be complied with:

- (a) With the exceptions as noted in (b) and (c) to follow, no single heat of those tested is permitted to fail to comply with the applicable requirements referenced in **subsection 1603.2b**.
- (b) No heat or lot tested by the KDOT may have any of the individual test results for yield strength, tensile strength, reduction of area (when applicable), or the average weld shear strength below the AASHTO specified minimum values without the deficiency also being identified by the plant quality control section.
- (c) It is permissible for one bend test specimen from 1 heat or lot only to fail the bend test.
- (d) The variations from the comparison testing are not to exceed the values stated in **subsection 1603.5c(5)** for any heat or lot of wire.

(2) Renewal of prequalified status. Plants that have attained their initial prequalification status will remain prequalified unless the results of verification samples indicate quality control deviations, or there are significant changes in production methods or material characteristics. Any variations in production methods or material characteristics must be immediately brought to the attention of the Bureau Chief, Construction and Materials, to determine if a subsequent prequalification evaluation is required.

A prequalified plant that becomes disqualified must comply with all the requirements that apply to a plant that is attempting the initial prequalification, with the following exception. The disqualified plant may petition for an immediate reevaluation provided it can be demonstrated to the Bureau Chief, Construction and Materials, that the disqualifying deficiencies have been corrected.

(3) Disqualification. All prequalified plants that are currently providing welded steel wire fabric for KDOT projects will have their product quality monitored through the use of verification samples.

- (a) Verification samples. During the course of each calendar year, every KDOT District will randomly select a minimum of one verification sample from the fabric being provided by each prequalified plant for use on KDOT projects in the District. These samples will be drawn from various shipments and heats and may be obtained at the project, fabrication, or warehouse locations or any other location approved by the Engineer’s representative. These samples will be submitted to the KDOT central laboratory for testing according to the procedures and requirements of **subsection 1603.2b**.
- (b) Verification sample testing. The verification samples are to comply with the minimum requirements of the applicable AASHTO specification of **subsection 1603.2b** with the exceptions as noted in the following.
 - It will not be permissible for the test results from any annual verification sample from a prequalified plant to be less than the following:

1603 - WELDED STEEL WIRE FABRIC FOR CONCRETE REINFORCEMENT

Property	Requirement
Unit Weight, Deformed Wire only:	98% of the specified minimum
Weld Shear Strength, Average	95% of the specified minimum
Tensile Strength	95% of the specified minimum
Reduction of Area,%, Non-deformed Wire only:	Specified minimum minus 2

- No annual verification sample from a prequalified plant will be permitted to fail the bend test.
- In the event that the verification sample fails to comply with the preceding, the Engineer’s representative may resample the failing lot one time only on a two to one basis or reject the failing lot. The contractor is to replace the rejected lot at no additional cost to the KDOT. The initial test results will be replaced by those of the resample specimens.

Failure of the verification sample fabric from a plant to comply with the sample requirements of **subsection 1603.5d(3)(b)** will result in disqualification of the plant and removal from the prequalified source list. In the event of disqualification, the plant is subject to **subsection 1603.5**. A plant that fails to comply with **subsection 1603.5d(3)(b)** 2 times, consecutive or otherwise, will be permanently disqualified.

1603.6 BASIS OF ACCEPTANCE

The plant must be currently prequalified.

Receipt and approval of a Type C certification as specified in **DIVISION 2600**.

Single sections, bound sections or rolls, or otherwise grouped fabric must be tagged or otherwise marked in a durable manner. At a minimum, this identification must list the fabric manufacturers corporate identification and plant location, the heat, lot, job, or mill order number, and display a copy of the of the identification markings attached to the delivered materials.

The final disposition of the fabric will be completed at the final destination as the result of inspection for the quality of workmanship and the delivery condition.