NTPEP Committee Work Plan for

Geotextile Product Evaluation and Facility Audits

NTPEP Designation: GTX-18-01
INTRODUCTION

The National Transportation Product Evaluation Program (NTPEP) was established to minimize the amount of duplicative testing of transportation materials performed by AASHTO member states by providing a process where manufacturer/suppliers submit their products to NTPEP for laboratory and/or field testing. The results of the testing are then shared with member Departments for their use in product quality assurance.

This practice provides the NTPEP member departments information on the geotextiles testing and facility audit program. In keeping with the NTPEP philosophy of purely testing materials and auditing facilities for compliance to the work plan, no conclusions are provided with the test results. The evaluation and acceptance or rejection of the product test and facility audit results are left up to each member department.
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1. **SCOPE**

1.1 This work plan covers the requirements and testing criteria for the National Transportation Product Evaluation Program (NTPEP) evaluation of geotextiles. NTPEP serves the member departments of the American Association of State Highway and Transportation Officials (AASHTO).

1.2 The purpose of AASHTO’s NTPEP work plan for geotextiles is to provide for the establishment of a list of manufacturing facilities, converter facilities, and private label facilities, and their associated geotextile products that conform to the quality assurance requirements of this work plan. It should be noted that there is a companion document to this work plan that governs the auditing of the facilities described in this work plan. That companion document is NTPEP SP-01, Standard Practice for Qualification of Highway Product Manufacturers Through the Use of NTPEP Audits.

1.3 AASHTO member departments can then use this information in their quality assurance program for geotextiles. This may include utilizing this information to establish a qualified supplier list and/or a qualified products list.

1.4 By participating in this program, the participant agrees to supply geotextiles that meet or exceed the requirements in AASHTO M288 and follow the minimum quality assurance provisions of the program. NTPEP validates this agreement through testing the geotextile product(s) to verify compliance with the applicable standard and auditing the participant’s quality system.

1.5 The manufacturer, converter, or private label company agrees that NTPEP may use the test results and audit reports along with other relevant information for review and verification of compliance with this NTPEP work plan and the applicable AASHTO Specification. If compliance is demonstrated, the NTPEP will list the product(s) and facilities conforming to this work plan in DataMine, NTPEP’s online database.

1.6 This work plan may involve hazardous materials, operations, and equipment. It does not purport to address all safety problems associated with its use. When conducting evaluations for the test methods included in this work plan, please use the required personal protective equipment (PPE). It is the responsibility of the user of this work plan to establish the appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. **REFERENCED DOCUMENTS**

2.1 AASHTO Standards:

2.2 ASTM Standards:
- ASTM D 276, Standard Test Methods for Identification of Fibers in Textiles (melting point)
- ASTM D 4354, Standard Practice for Sampling of Geosynthetics for Testing
- ASTM D 4355, Standard Test Method for Deterioration of Geotextiles by Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
- ASTM D 4439, Standard Terminology for Geosynthetics
- ASTM D 4491, Standard Test Methods for Water Permeability of Geotextiles by Permittivity
- ASTM D 4533, Standard Test Method for Trapezoid Tearing Strength of Geotextiles
- ASTM D 4873, Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples
- ASTM D 5261, Standard Test Method for Measuring Mass per Unit Area of Geotextiles
- ASTM D 6140, Standard Test Method to Determine Asphalt Retention of Paving Fabrics Used in Asphalt Paving for Full-Width Applications
- ASTM D 6241, Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe

Note 1 - All ASTM test methods referenced herein are copyrighted by ASTM International, 100 Barr Harbor Drive, PO Box C700, West Conshohocken, Pennsylvania, USA 19428-2959. All AASHTO specifications referenced herein are copyrighted by American Association of State Highway and Transportation Officials, 444 North Capitol Street N.W., Suite 249, Washington, D.C. 20001.

3. TERMINOLOGY

3.1 Annual NTPEP Audits – Audits of a manufacturer’s plant and associated internal test facilities by a NTPEP auditor and any AASHTO member department co-auditor that wishes to participate.

3.2 Auditor, NTPEP – An individual retained by NTPEP to review submittals, coordinate auditing and testing, and report audit findings and resin and geotextile split sample test results.

3.3 Audit Supervisor - The individual responsible for administering and managing the audit program.

3.4 Converter – A company that obtains geotextile manufactured by others, or that uses geotextile the company manufactures in a separate operation, and uses it as part or all of a finished product that has been modified relative to the geotextile product as received from the source manufacturer. Possible modifications range from simply cutting the roll into smaller sections to modification of the geotextile in a way that affects its properties. A converter may re-label geotextile product with their own information.

3.5 Deficiency, Major - A procedure missing from the quality system: nonconformance that results in the probable shipment of nonconforming product.

3.6 Deficiency, Minor – A quality issue that does not result in the breakdown of the quality system, failure in part of the documented system.

3.7 Independent Laboratory Acceptable to NTPEP – a laboratory that is qualified to perform the specific tests as outlined in the work plan and has on site qualified technicians and equipment necessary to perform the tests per ASTM and AASHTO standards.

3.8 Initial Audit - The first NTPEP audit conducted at a manufacturing plant.

3.9 Lot Summary – A lot-specific table showing all sequential sample roll test results and the associated lot statistics for each measured property. Statistics presented include average, standard deviation, minimum average roll value (MARV), minimum, and maximum.

3.10 Manufacturer - All producing plants and testing laboratories a manufacturer owns and operates.
3.11 **MARV** – The minimum average roll value (MARV) for the geotextile, defined as the average value minus two (2) standard deviations from documented quality control test results for a defined lot of production sampled in accordance with ASTM D4354, Table 1.

3.12 **Maximum Test Value** – The maximum test value for the geotextile, defined as the highest value from documented quality control test results for a defined lot of production sampled in accordance with ASTM D4354, Table 1.

3.13 **Minimum Test Value** – The minimum test value for the geotextile, defined as the lowest value from documented quality control test results for a defined lot of production sampled in accordance with ASTM D4354, Table 1.

3.14 **MD** – Machine Direction of the geotextile

3.15 **XD** – Cross-Machine direction of the geotextile

3.16 **NTPEP Manager** - The individual responsible for overseeing that all areas of the program are conducted in accordance with this Work Plan.

3.17 **NTPEP Geosynthetics Technical Committee Chairman** – The individual responsible for all technical aspects of this Work Plan. Together with the NTPEP manager, resolves any conflicts that may arise.

3.18 **NTPEP Split Sample** – a specimen selected from the manufacturing line or stockyard to be tested by both the manufacturer and NTPEP designated third party test laboratory.

3.19 **Periodic Testing** - Additional testing completed on specimens collected aside from what is tested during the annual on-site audit.

3.20 **Private Labeler** – Private label facilities provide products listed in NTPEP by a source manufacturer, then offer them for sale under the Private Label company's brand. When multiple manufacturer sources are used for a given private label product, the products obtained from all the source manufacturers must all have the same fabric structure (e.g., weaving and bonding technique, and fiber type) and use the same polymer(s). Private label firms may not reprint, relabel, repackage, or in any other way modify geotextile product from a prime manufacturer. They must arrange for the product to arrive from the manufacturer as they desire to sell it.

3.21 **Plant** - An individual geotextile manufacturing facility.

3.22 **Product Line** - A series of products manufactured using the same polymer which comes from the same source. The manufacturing process and the stabilization package are the same for all products in the product line, and the only difference is in the product weight/unit area or number of fibers contained in each yarn.

3.23 **Product Style** – The proprietary name/number used as a designation for a specific product.

3.24 **Production Unit** – With regard to a geotextile lot, a production unit shall be defined as a product roll.

3.25 **Quality Management System (QMS)** – The system by which a manufacturer controls and documents the quality of the products it produces. The producing plant shall maintain documentation of their quality system by use of a Quality Manual (QM) and corresponding documentation.
3.26 **QMS Desk Top Audit** – a complete review of a participant’s Quality Management System (QMS) and the corresponding documentation by NTPEP or its designee.

3.27 **Raw Materials** – Materials acquired by a geotextile manufacturer and used in a production line to create a finished geotextile product, such as raw polymer/resin, fibers (including slit film fibers), or yarns and polymeric additives (e.g., antioxidants, carbon black, fillers, other polymers to create polymer blends, dyes, and reworked material). However, unfinished or partially finished fabrics, felts, etc., shall not be considered raw materials.

3.28 **Raw Material Lot** – A lot of raw material for a geotextile manufacturing facility is a railcar or truckload, hopper truckload, or truckload of boxes, but no larger than the lot of raw material as defined by the raw material supplier.

3.29 **Recycled Plastic** – Post Consumer. Recycled polymer used to produce geotextile for non-DOT jobs. For example, detergent bottles.

3.30 **Reworked (or Regrind) Material** – A plastic from a processor’s own production that has been reground, pelletized, or solvated after having been previously processed by molding, extrusion, etc. (ASTM D883)

3.31 **Single-Stream Resin** – A feed of one virgin resin. A single stream resin may include carbon black pellets and reworked material in accordance with AASHTO M288.

3.32 **Source Manufacturer** – The manufacturer that functions as the source for a finished product and who is responsible for the quality of the finished product, including the quality assurance testing conducted to assure the quality of the product.

3.33 **Surveillance Audit** - An audit conducted by NTPEP at a plant when major deficiencies are noted during a previous on-site audit. If a local DOT performs a plant audit, which is not the annual inspection by NTPEP, and finds major non-compliance issues, then a follow up NTPEP audit will be performed at the manufacturer’s expense. Surveillance audits may not necessarily be announced and will proceed regardless of the availability of key QC staff.

4. **SIGNIFICANCE AND USE OF THE NTPEP GEOTEXTILE PROGRAM**

4.1 The NTPEP Geotextile Program assesses the conformance of both the manufacturing, converting, and private labeling, processes by auditing these facilities and the geotextile products themselves by testing to the requirements stated in this work plan. The program includes the following:

4.1.1 NTPEP Desk Top Audit of the participant’s Quality Management System (at least once every three years)

4.1.2 Initial and Annual on-site NTPEP Audits

4.1.3 Split Sample Testing of Geotextile (manufacturers only) between NTPEP contract lab and facility chosen lab

4.1.4 Facility identification of each roll of geotextile product produced by marking (printed code on fabric) and labeling of rolls of product

4.1.5 A NTPEP database website (called DataMine and available at www.ntpep.org) with the following information:

4.1.5.1 A listing of geotextile products, by manufacturer, converter, or private label company and style, tested and found to conform to the requirements of the AASHTO M288 Material Specifications.
4.1.5.2 A listing of participating manufacturing plants, converters, and private label companies with a Quality Management System (QMS) found to conform to this work plan.

4.1.5.3 A document library containing this work plan and a secure area where AASHTO member departments can view manufacturers’ QMS documents and split sample test results for M 288 geotextile materials.

5. **APPLICATION FOR PROGRAM INCLUSION**

5.1 Participants of the NTPEP Audit Program for Geotextiles (defined as geotextile manufacturers, converters, and private label companies) must submit an application through the NTPEP DataMine website ([http://data.ntpep.org](http://data.ntpep.org)) during each submittal cycle. The submittal cycle may vary year to year but is typically from late September to the end of November; NTPEP staff send an email to all participants every year notifying them of the submission cycle dates. (Note: The submittal cycle is set up this way so that the audit tour can be prepared for the year, beginning in January.) Every 3rd year, participants must submit a completed pre-audit application so that a desktop review can be performed by NTPEP for that particular facility. The desktop review must be completed before the on-site audit can be scheduled. Products to be evaluated by the NTPEP contract lab are however on a rolling submission cycle and may be submitted anytime during the year for product evaluation and subsequent listing of the results in DataMine.

5.2 Any manufacturer of geotextiles as defined in AASHTO M288, geotextile converters, and private label companies who sell geotextiles manufactured by others under their own brand may participate in the program. For information regarding costs, and their associated due dates, please refer to the Terms and Conditions located under DataMine’s ([http://data.ntpep.org](http://data.ntpep.org)) Legal Information section.

5.3 For companies that distribute geotextile products as converters or private labelers and that wish to have those products included in the NTPEP program, the manufacturers that produce those products must participate in and conform to this NTPEP work plan.

5.4 For geotextile converters that wish to have the geotextile portion of their products included in the NTPEP program, they shall be considered as a private label company. However, if the geotextile converter takes full responsibility for the quality of the geotextile product used in their converted product, then the geotextile converter shall be considered as a manufacturer in this audit and testing program. To take full responsibility for the quality of the geotextile product, the converter must meet the QMS requirements for manufacturers in this work plan and must conduct QA testing, treating the geotextile as a raw material in their finished product, and thereby verify the accuracy of the source manufacturer’s QC test results. If the geotextile converter changes the properties of the source geotextile due to the conversion process, the converter shall be subject to the requirements of a manufacturer in this work plan. In either case, the manufacturers that produce those products must participate in and conform to this NTPEP work plan.

5.5 The participation process is summarized as follows:

5.5.1 The participant must make a formal request through the NTPEP website to participate in the program. The request must list the participant’s facilities and products to be evaluated and describe the participant’s Quality Management System (QMS).

5.5.2 Once the QMS is found to conform, the participant facility, including all associated internal testing facilities that the participant desires to qualify, will be audited. This shall constitute the initial audit. Geotextile samples will be taken for testing in accordance with the appropriate AASHTO specification and this NTPEP work plan. For the initial audit, the required minimum number of products tested during the initial audit will depend on the current status of the product testing cycle for the participant. However, the participant may request up to 100% of their products be tested as part of the initial audit.

5.5.3 An on-site audit will be scheduled approximately 4 weeks in advance. The plant will receive an Announcement Letter from AASHTO.

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5.5.4 Each unique geotextile product requested for inclusion into the program will be separately tested once every 3 years. For private labeled products, since the products that are private labeled must be from a source manufacturer who has been audited by NTPEP and found compliant, only a limited check testing program on representative products within the private label company’s product line will be conducted.

5.5.5 Audit reports are released to the NTPEP website and are able to be viewed by all AASHTO Member Departments and the personnel from the participant company at which the audit was conducted. A hard copy of the draft summary is also left with the plant personnel at the completion of the on-site audit.

5.5.6 Each participating company is also listed on the NTPEP website, showing if they are compliant with the program.

Note 2 - If major deficiencies are noted during an on-site audit, a surveillance audit will be required to be completed. Surveillance audits may not necessarily be announced and will proceed regardless of the availability of key QC staff.

6. **ANNUAL MANUFACTURING PLANT AUDITS**

6.1 Once initial plant QMS and product conformance is established as described in Section 5 above, annual NTPEP auditing and testing will be required for a manufacturer’s plant to remain on the NTPEP list of compliant plants. The annual audits will be announced to the manufacturer in advance to make sure the manufacturer’s key quality and manufacturing personnel are available during the audit. Audits will not occur on weekends or national holidays.

6.2 Annual plant audits will include the following:

6.2.1 **Documentation Review** - The auditor(s) will check the availability of the most current AASHTO and ASTM standards, review training and competency records, and evaluate the most current Quality Manual documentation and equipment records to verify implementation of the plant’s QMS.

6.2.2 **Production Line Inspection** - During the production line inspection, the auditor(s) will walk through the manufacturing process to observe the conditions of the lines. During this process, the auditor will inspect product marking and identify samples of geotextile to be collected for split-sample testing purposes. For those geotextile properties that are tested on a product line basis (i.e., only products representative of the line are actually tested), the consistency of the manufacturing process and materials used for all products considered to be in the product line will be verified by the auditor. This will include verification that the same base polymer and yarn is used in all products included in the product line, verification of polymer source(s) used and consistency of the polymer property standards for the sources used, and verification in the consistency of the manufacturing process.

6.2.3 **Sampling and Testing** – Audits will include the sampling of geotextile from current production or from inventory. The products sampled for independent testing will be those being newly submitted to the program and those re-submitted on the 3-year approval cycle. If no product submittals have been received for the year of the audit, no samples will be taken. Samples will be submitted to the NTPEP designated independent third party laboratory for evaluation. Additional samples will be tested by the manufacturer.

Note 3 - All geotextile samples selected over a three year period at each plant during the annual audit shall collectively represent all unique geotextile products requested for inclusion into the NTPEP program. Thus each unique geotextile product included in the NTPEP program will have been tested at least once during the three year period.

6.2.4 **Inventory Inspection** - The auditor(s) will inspect the condition of AASHTO M 288 geotextile in the plant’s inventory storage facility. Additionally, the auditor(s) will select various product styles of AASHTO M 288 geotextile and verify that roll test results, raw material lot test results/certifications, and a lot summary associated with each lot representing the product style selected are available for the samples of geotextile selected.

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6.2.5 **Quality Control Testing Evaluation** - Each manufacturer will be asked to demonstrate the quality control tests they perform on a regular basis. While performing each test, the most current AASHTO or ASTM test methods may be referenced if needed. The equipment used for each test will be examined and applicable records will be reviewed.

6.2.6 **The NTPEP Audit Team** - The NTPEP auditor (AASHTO employee or designated subcontracted auditor) and an AASHTO member department co-auditor(s) from any state that wishes to participate. The Auditor will produce a single audit report, which will include findings from both the Auditor and AASHTO Member Department co-auditor(s), if present.

6.2.7 **Inspection Visits and Testing** - AASHTO member departments using the NTPEP listing have the right to conduct inspection visits and audit any manufacturer’s plant and associated laboratory included in the program to determine compliance with the program requirements. Unscheduled inspection visits will be announced to the manufacturing plant by pre-announcing a window of a minimum two weeks of time for the audit to take place. They may also randomly select samples of product in production for confirmation testing to meet their quality assurance requirements.

**Note 4** - Inspection visits may result in the need for an additional NTPEP surveillance audit.

6.2.8 **Proprietary Information** - The manufacturer may reserve the right to require NTPEP Audit Team and/or AASHTO members to sign confidentiality agreements prior to visiting plants or facilities to protect information the manufacturer considers to be proprietary. The confidentiality agreement shall not restrict the ability of NTPEP to distribute information in the final audit report necessary to understand the audit findings to the NTPEP membership. However, NTPEP members shall not distribute such information to anyone outside of their organizations.

6.3 For manufacturers that have multiple plants, an audit will need to be conducted in each plant with regard to the geotextile products produced in each of the respective plants submitted for NTPEP evaluation. For materials defined as raw materials, the producer of the raw materials does not need to be audited; however, traceability and quality assurance procedures and documentation used/obtained by the geotextile manufacturer will be evaluated as part of the geotextile manufacturer audit.

### 7. ANNUAL PRIVATE LABEL AND CONVERTER COMPANY AUDITS

7.1 An annual audit is required of companies that private label or convert products produced by others. (In the case of converters classified as manufacturers in Section 5.4, they shall be audited as manufacturing companies.) The focus of the audit is to establish traceability of these products to an audited geotextile manufacturing plant that is in compliance with this work plan. The company audit will include documentation review as applicable to records traceability and retention, and QA procedures used by the company and all its satellite warehouse/distribution facilities to assure the quality of the products they purchase, private label and sell, inventory/warehouse inspection to evaluate the condition of the private-labeled rolls and product marking, and sampling and testing of randomly selected rolls of product. Converter company QA data will also be subject to review in a similar manner with that used for manufacturing companies. The annual audits will be announced to the company in advance to make sure the company’s key quality personnel are available during the audit. Audits will not occur on weekends or national holidays.

7.2 AASHTO member departments using the NTPEP listing have the right to conduct inspection visits and audit any private label company included in the program to determine compliance with the program requirements. Unscheduled inspection visits will be announced to the private label company by pre-announcing a window of a minimum two weeks of time for the audit to take place. They may also randomly select samples of product for testing to meet their quality assurance requirements.
8. QUALITY MANAGEMENT SYSTEM (QMS) REQUIREMENTS FOR MANUFACTURERS

8.1 NTPEP Audits will be based on a manufacturer following a quality control program at the plant that provides the following information: assurance that the products produced meet the requirements of the AASHTO M288 and that these products conform to this NTPEP work plan. The Manufacturer will implement a documented Quality Management System (QMS). Each manufacturer shall include elements that it considers necessary to assure that products meet AASHTO M288 requirements, but as a minimum, for geotextile manufacturers, the QMS shall include or address the following:

8.1.1 Organization and Organizational Policies
8.1.2 Product Marking and Labeling
8.1.3 Manufacturing Process and Documentation Control
8.1.4 Quality Assurance of Raw Materials
8.1.5 Quality Control Inspection, Measurement, and Testing for Geotextile Products
8.1.6 Quality Control Personnel - Training and Competency Evaluation
8.1.7 Statistical Analysis of Test Results
8.1.8 Resolution of Non-Conforming Product or Test Results
8.1.9 Retention of Test Results and Product Traceability
8.1.10 Quality Control Testing Facilities
8.1.11 Marking, Storage, Shipping, and Handling of Finished Geotextile
8.1.12 Internal Quality Audits of Each Plant Producing Product
8.1.13 A List of Plants and Quality Control Testing Facilities

8.2 The following sections provide more information about each of the 13 elements identified above.

8.2.1 (Detailed information for 8.1.1) Organization and Organizational Policies - The QMS shall indicate the line of authority from the QC testing technicians to the QA manager, ensure that QC testing technicians have the authority to require corrective action, and ensure that the QA manager is independent of production management and of equal status to production managers.

8.2.2 (Detailed information for 8.1.2) Product Marking and Labeling – Each unique geotextile manufactured for AASHTO M288 qualification and NTPEP program participation shall be marked with a clearly legible print showing, as a minimum, the manufacturing plant (or manufacturing plant ID code numbers).

8.2.2.1 This marking shall be located on the roll edge of the product in the selvedge at a frequency of at least once per 16.4 ft. (5 meters). The marking shall be unique for each manufacturer and manufacturing plant facility. The mark will be established by NTPEP during the application process for the initial audit. Once the unique manufacturer mark has been established, it shall not be changed.
8.2.2.2 In addition, labels shall be affixed by the product manufacturer to both ends of the outside of the geotextile roll outer wrapping and both ends of the inside of the geotextile roll core where they are easily visible for inspection, and shall be attached in a manner that would make the label difficult to remove or replace. As a minimum, the label shall contain the following additional information about the product and its production: the roll number, its production date, AASHTO M288 class(es) the product meets (or “NTPEP listed” if no class applies), and the product name (if the manufacturer is supplying the product to a private label company, the product name is the one that will be used by the private label company). If the permanent mark described above contains the product name and AASHTO class, along with the manufacturing code, the labels on one end of the roll may be eliminated.

8.2.2.3 If the finished product has been through a converting process, the converter must attach NTPEP-compliant labels to the converted product. Compliant labels include:

- The original (prime) manufacturer’s manufacturing code and date of production.
- The converter’s manufacturing code, style number, roll number* and date of conversion. (* Converter roll number will be the manufacturer’s assigned roll number with a suffix designating the sequentially derived roll/package from the original roll, a.k.a. parent-child identification. If the converted rolls are palletized, the suffix may be the range of rolls on the pallet.) Additionally, every label shall indicate the AASHTO Class or include the wording “NTPEP listed”.

Four labels are required on each converted roll/package – one inside the core at each end of the roll, and one on the outside wrapping at each end of the roll. An exception to this requirement is made for silt fence rolls converted from originally manufactured narrow (<60-inch width) source geotextile. For these rolls – which are not typically wrapped – only two labels are required: either one in or on the core or one on the leading edge (inside end) of the fabric, and one on the trailing edge (outer end) of the fabric, or for silt fence with wooden stakes attached one near top of stake at leading edge and one near top of stake at trailing edge. Labels must be weatherproof.

In all cases, the information on the labels must not conflict with any information printed as part of the marking on the geotextile fabric itself. Typically only the manufacturing facility code is printed on the fabric. If however more information such as style number is printed on the fabric, it must be printed to match any subsequent converter labeling planned for that material.

8.2.3  **(Detailed information for 8.1.3) Manufacturing Process and Documentation Control** – Each manufacturer shall establish, document, and maintain a quality management system (QMS) available for review by the NTPEP Audit Team, similar to the QMS documentation required for a certificate of registration from the International Organization for Standardization (ISO) 9001:2015 quality management system. If a manufacturer owns multiple geotextile manufacturing plants, each plant shall have its own QMS.

8.2.4  **(Detailed information for 8.1.4) Quality Assurance of Raw Materials** – The QMS shall include requirements for evaluating the quality of incoming resins, yarns, fibers, and other raw materials. The manufacturer shall do, as a minimum, the following:

- Establish specifications to be used for procuring raw materials used in the manufacture of geotextile products, and confirm that Certificates of Analysis (COA) demonstrate compliance with those specifications.
- COAs are provided with each raw material shipment (if shipment contains more than one lot as defined by the raw materials supplier lot definition, COAs shall be provided for each raw material lot).
- If more than one raw material supplier lot is used in a single lot of geotextile product, the geotextile manufacturer shall have specified maximum variances of COA properties allowed in a single geotextile product lot.
- If geotextile manufacturer conducts raw materials QA testing to verify the COA provided by a
supplier, those QA test results are traceable to the COA’s and raw materials lot numbers.

- Geotextile manufacturer maintains records of raw materials such that COAs, showing raw material suppliers’ lot numbers, are traceable to final geotextile product on a roll/geotextile lot specific basis.

8.2.4.1 This work plan addresses three scenarios for geotextile converters: 1) those who do not unroll the source manufacturer geotextile roll, do not do anything to the geotextile to change its AASHTO M288 properties relative to the properties of the material as received from the source manufacturer, but who cut the roll into shorter widths, 2) those who unroll the source manufacturer geotextile roll, change the dimensions of the source roll to reduce its width and/or length, and who may attach other materials (e.g., fence posts) to the geotextile or sew pieces of the geotextile together to make the finished product, but still do not do anything to the geotextile to change its AASHTO M288 properties relative to the properties of the material as received from the source manufacturer, and 3) those who change one or more of the source geotextile’s AASHTO M288 properties during the conversion process.

8.2.4.2 For scenario (1) in Section 8.2.4.1, no additional testing by the converter is necessary, provided that the source manufacturer’s or original labels remain and are legible, the style as received by the converter is not changed on the added converter labels, and traceability to the source manufacturer is maintained.

8.2.4.3 For scenario (2) in Section 8.2.4.1, “QA” testing in accordance with Table 1 by a laboratory meeting the requirements of Section 8.2.10, plus relabeling, is required, treating the source manufacturer’s product as a raw material and using the source manufacturer’s test data and AASHTO M288 properties as verification of the properties of the source geotextile. If the converter is also the manufacturer of the geotextile, and the conversion process does not change the properties of the geotextile, QA testing of the geotextile used in the converted product is not required because the QC data for the geotextile is obtained by the same entity. If sewn seams are added to the geotextile, it should be recognized that this work plan does not address seam strength.

Table 1: Geotextile Converter QA Test Requirements for those Converters who Unroll, Convert, and Reroll Product without Affecting AASHTO M288 Properties

<table>
<thead>
<tr>
<th>Test Designation &amp; Units</th>
<th>ASTM Standard</th>
<th>Notes</th>
<th>Reported Value</th>
<th>Test Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass per Unit Area</td>
<td>ASTM D5261</td>
<td>All M288 products</td>
<td>Typical ounces/square yard</td>
<td>ASTM D 4354, Table 2</td>
</tr>
<tr>
<td>Grab Tensile Strength2</td>
<td>ASTM D4632</td>
<td>All M288 products, both MD and XD</td>
<td>MARV lbs/%</td>
<td>ASTM D 4354, Table 2</td>
</tr>
<tr>
<td>Static Puncture Strength1</td>
<td>ASTM D62411</td>
<td>All M288 products</td>
<td>MARV lbs3</td>
<td>ASTM D 4354, Table 2</td>
</tr>
<tr>
<td>Apparent Opening Size</td>
<td>ASTM D4751</td>
<td>All M288 products</td>
<td>Maximum test value mm</td>
<td>ASTM D 4354, Table 2</td>
</tr>
<tr>
<td>Tensile Strength &amp; Ult. Elongation2,4</td>
<td>ASTM D5035, Type 2C-E</td>
<td>M288 Type I paving fabrics, both MD and XD</td>
<td>MARV lbs/%</td>
<td>ASTM D4534 Table 1</td>
</tr>
</tbody>
</table>

1 Note that a 1-hour conditioning time is considered sufficient prior to testing of polyolefins and polyesters.
2 Note that ASTM D4632 requires if jaw faces are other than plain smooth steel it must be noted in the test report. Report must describe facing material used if this is the case. This will also be required for ASTM D5035 results.
3 A modification to this requirement is made for Originally manufactured narrow (<60-inch width) source geotextiles intended to be converted to silt fence. For these materials, Permittivity via ASTM D4491 is to be substituted for the purposes of QA testing. Acceptance should be based on demonstrated “minimum test values” in units of sec1.
4 ASTM D5035 was added in 2018 so products submitted previous to these years will not have this test data available.
For scenario (3) in Section 8.2.4.1, the converter is considered to be a manufacturer and must meet all the QMS and QC testing requirements of manufacturers as specified in this work plan. In this last scenario, the raw materials requirements specified in Section 8.2.4 shall apply to the converter, except that the source geotextile shall be considered as the raw material, as well as any other materials added to the geotextile by the converter. The QC testing conducted by, or on behalf of, the converter shall be conducted after the conversion process. In general, manufacturing processes that could change the properties of the source geotextile may include, but are not limited to, heat or pressure treatment, adding additional fibers to the geotextile, tensioning the geotextile, and possibly even painting significant portions of the geotextile to add converter advertisements to the product.

### 8.2.5 Quality Control Inspection, Measurement and Testing for Geotextile Products

(Detailed information for 8.1.5) Quality Control Inspection, Measurement and Testing

#### 8.2.5.1
The QMS shall describe the geotextile manufacturer’s geotextile visual inspection and production monitoring procedures. As a minimum the procedure shall require the manufacturer to conduct visual inspections continuously during production of the final product for the following:

- Holes,
- Damage,
- Thin spots,
- Other workmanship items as described in AASHTO M288,
- Proper product marking and labeling

#### 8.2.5.2
The QMS shall also describe production equipment operational indicators to assure consistency in the operation of the production line. Examples include temperature sensors, pressure sensors, industrial sized magnet and metal detectors to locate any broken needles in needle-punched geotextiles, and any other indicators that can be used to quickly assess malfunctions. These operational indicators shall alert the production staff of the problem in a timely manner so that production can be immediately stopped to address the issue.

#### 8.2.5.3
The QMS shall define the quality control tests, the method for random sampling, the size of the sample, and the lot size not to exceed 12 consecutive months for production facility quality control sampling and testing. The QMS shall also include an example of a quality control test report form. The QMS shall reference applicable AASHTO and ASTM procedures. The QMS shall also describe any company procedures used.

#### 8.2.5.4
The QMS shall require that the manufacturer perform and record the results of QC tests at the frequencies summarized in Table 2.

<table>
<thead>
<tr>
<th>Test Designation</th>
<th>ASTM Standard</th>
<th>Notes</th>
<th>Reported Value</th>
<th>Units</th>
<th>Test Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mass per Unit Area</td>
<td>ASTM D5261</td>
<td>All M288 products</td>
<td>Typical</td>
<td>ounces/square yard</td>
<td>ASTM D4354 Table1</td>
</tr>
<tr>
<td>Grab Tensile Strength and Ult. Elongation2</td>
<td>ASTM D4632</td>
<td>All M288 products (except Type I paving fabrics), both MD and XD</td>
<td>MARV</td>
<td>lbs/%</td>
<td>ASTM D4354 Table1</td>
</tr>
<tr>
<td>Trapezoid Tearing Strength</td>
<td>ASTM D4533</td>
<td>All M288 products, both MD and XD</td>
<td>MARV</td>
<td>lbs</td>
<td>ASTM D4354 Table1</td>
</tr>
<tr>
<td>Static Puncture Strength</td>
<td>ASTM D6241</td>
<td>All M288 products</td>
<td>MARV</td>
<td>lbs</td>
<td>ASTM D4354 Table1</td>
</tr>
<tr>
<td>Permittivity</td>
<td>ASTM D4491</td>
<td>All M288 products</td>
<td>Minimum test value</td>
<td>sec⁻¹</td>
<td>ASTM D4354 Table1</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Property</th>
<th>Standard</th>
<th>Description</th>
<th>Test Value</th>
<th>Unit</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparent Opening Size</td>
<td>ASTM D4751</td>
<td>All M288 products</td>
<td>Maximum test value</td>
<td>mm</td>
<td>ASTM D4354 Table 1</td>
</tr>
<tr>
<td>UV Degradation</td>
<td>ASTM D4355, 500 hr</td>
<td>At least on lightest weight M288 products having unique formulation within the product line</td>
<td>Typical value</td>
<td>% retained</td>
<td>Annually</td>
</tr>
<tr>
<td>Tensile Strength &amp; Ult. Elongation², ⁴</td>
<td>ASTM D5035, Type 2C-E</td>
<td>M288 Type I paving fabrics, both MD and XD</td>
<td>MARV</td>
<td>lbs/%</td>
<td>ASTM D4534 Table 1</td>
</tr>
<tr>
<td>Asphalt Retention</td>
<td>ASTM D6140</td>
<td>Applicable M288 products targeted for paving applications</td>
<td>Typical value</td>
<td>MD gallons/yd²</td>
<td>Annually</td>
</tr>
<tr>
<td>Melting Point³</td>
<td>ASTM D276</td>
<td>Applicable M288 products targeted for paving applications</td>
<td>Typical value</td>
<td>Degrees F</td>
<td>Annually</td>
</tr>
</tbody>
</table>

¹ Note that a 1-hour conditioning time is considered sufficient prior to testing of polyolefins and polyesters.
² Note that ASTM D4632 requires if jaw faces are other than plain smooth steel it must be noted in the test report. Report must describe facing material used if this is the case. This will also be required for ASTM D5035 results.
³ Typical Value is the test result of independent testing performed within the previous 12 months; MD = Machine Direction; XD = Cross-machine Direction
⁴ ASTM D5035 was added in 2018 and ASTM D276 was added in 2017 so products submitted previous to these years will not have this test data available.

8.2.5.5 The QMS shall ensure that:

- Each sample selected for quality control inspection and testing is designated with a product ID and sample control number for record keeping and traceability
- The test report for each sample identifies the product, plant, date, shift of manufacture, production line, and lot designation for the raw materials, and
- That quality control test reports (not samples) are maintained and available for review for 3 years, and may be in electronic form (i.e., paper copies not required).

8.2.6 (Detailed information for 8.1.6) Quality Control Personnel - Training and Competency Evaluation

8.2.6.1 The QMS shall ensure that:

- The manufacturer’s QA manager meets the requirements established by the manufacturer;
- The QA manager qualifies technicians performing QC testing;
- QC personnel are familiar with the tests they perform, and that
- QC personnel have sufficient authority to assure that corrective actions are carried out when necessary.

8.2.6.2 The QMS shall describe the manufacturer’s QC technician qualification program. As a minimum the program shall include:

- Training in the AASHTO, ASTM, or Company test procedures, operation of equipment, the procedures to be used, calculations required, and reporting;
- Demonstration of competency for each required test;
- Demonstration of ability to properly document test results;
- Annual auditing of each technician’s ability to satisfactorily perform the required tests;
- Retraining when a test method is revised.

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8.2.6.3 Training and competency reviews shall be documented in such a way that compliance with the requirements for the initial and updated training and the initial and annual competency reviews can be demonstrated for each technician and for each test the technician performs. The documentation shall include the date of the training or competency review and contain the handwritten signature or initials of the trainer/reviewer and the technician. This documentation shall be retained, for a minimum period of 5 years, at each facility where quality control testing occurs, and shall be made available to NTPEP for review upon request.

8.2.7 **(Detailed information for 8.1.7) Statistical Analysis of Test Results** - The QMS shall include a description of the manufacturer’s approach using quality control data to monitor production and initiate changes or improvements in production as needed to maintain consistent quality and to establish certifiable property values. The manufacturer shall maintain lot-specific summary tables for each product style (lot summaries). Table 3 is an example of a lot summary table.

### Table 3
**TEST RESULTS**

<table>
<thead>
<tr>
<th>STYLE:</th>
<th>LOT #:</th>
<th>DATES:</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Date / Time</th>
<th>Roll No.</th>
<th>Area Wt. g/m²</th>
<th>Thickness mm</th>
<th>MD Tens N</th>
<th>MD Elong. %</th>
<th>CD Tens N</th>
<th>CD Elong. %</th>
<th>MD Trap Tear</th>
<th>CD Trap Tear</th>
<th>Punc N</th>
<th>Perm</th>
<th>AOS s-1 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

AVERAGE ROLL VALUES FOR EACH PROPERTY FOR EACH ROLL TESTED

<table>
<thead>
<tr>
<th>Average</th>
<th>Std. Deviation¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum</td>
<td>Maximum</td>
</tr>
<tr>
<td>MARV Certifiable Value</td>
<td></td>
</tr>
</tbody>
</table>

¹ Note that along with Std. Deviation, the statistic Coefficient of Variation (COV) is often useful, but is for specimen to specimen variation comparisons, and so COV is not used in calculating MARVs.

8.2.8 **(Detailed information for 8.1.8) Resolution of Non-Conforming Product or Test Results** - The QMS shall include a procedure for resolving non-conforming product or test results. The procedure shall specify that:

8.2.8.1 Test reports clearly identify the deficiencies relative to targeted minimum property values;

8.2.8.2 All product produced subsequent to the previous testing be identified and quarantined pending investigation of the failure;

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8.2.8.3 Investigations include obtaining and testing check samples, unless the manufacturer decides to only investigate manufacturing contributing factors based on observations and production monitoring records and dispose of the quarantined material without further testing;

8.2.8.4 If the first check sample meets requirements, the manufacturer shall document the reasons for the original failure and may release the quarantined material, with the exception of the roll of material from which the failing sample was obtained, and resume normal production and testing;

8.2.8.5 If the first check sample fails, the manufacturer shall take corrective action to bring the product into conformance, shall note the corrective action on the test report, and shall continue QC testing to verify the deficiency has been corrected;

8.2.8.6 If additional QC testing also fails, the manufacturer shall repeat the process until the deficiency is corrected, and that,

8.2.8.7 All non-conforming material shall be segregated in the inventory. This segregated inventory shall be handled using one of the following options:

- Re-worked to manufacture new product;
- Scrapped, or
- Downgraded. If downgraded to a lower specification class because segregated inventory did not meet the minimum requirements for the intended class and are intended to be sold as NTPEP evaluated and marked geosynthetic, the cause of not meeting the intended specifications shall be evaluated and documented by the manufacturer, and that documentation maintained with the QC test results as part of their records retention program.

8.2.8.8 If no assignable cause is determined for the failing production then the test values associated with the failing rolls will be maintained in the database or files and kept in the MARV calculation within the lot summary

8.2.8.9 If an assignable cause is identified for the failing production it shall be documented along with a corrective action, then the failing test values may be removed from the lot summary but must be maintained in the database or files. The failing test values must be replaced by new values reflecting material sampled and tested to validate the corrective action

8.2.9 (Detailed information for 8.1.9) Retention of Records and Test Results, and Product Traceability - The QMS shall describe in detail the process for storing and the location of stored quality control test reports, and how traceability of retained information from raw materials to final products is maintained. The maintained records may be stored in electronic form (i.e., long-term storage of paper copies is not required). The QMS shall ensure that:

8.2.9.1 Test reports are retained for at least 3 years and are available to the NTPEP upon request;

8.2.9.2 Product and product test reports are identified in such a way that the test results for any geotextile and raw material used to manufacture the geotextile can be located;

8.2.9.3 Documentation that indicates the action taken to resolve raw material or product failures, and that:

8.2.9.4 The manufacturer retains a copy of the NTPEP audit documentation for a facility and actions taken to resolve any noted deficiencies on file at the facility for a period of 5 years;

8.2.9.5 Raw material test reports and the raw material manufacturer’s certificate of analysis (COA), and any raw material testing conducted by the geotextile manufacturer are traceable to the final product and can be retrieved upon request:
8.2.9.6 The manufacturer maintains a record of QC technician training and competency review documentation:

8.2.9.7 The manufacturer maintains a record of equipment maintenance activities:

8.2.9.8 The manufacturer maintains a record of all calibration activities, including the person doing the work and the date the calibration activities were performed.

8.2.10 (Detailed information for 8.1.10) Quality Control Testing Facilities

Note 5 – QC testing may be performed at a location separate from the geotextile manufacturing facility and/or by outside labs. For outside labs, they shall either be GAI-LAP accredited or shall be subjected to review and evaluation in accordance with this work plan.

8.2.10.1 The QC testing facility shall:

- Maintain current versions of all AASHTO, ASTM, and Company test procedures for all tests performed and a current version of the Company’s QMS documentation;
- Adequately house and allow proper operation of all required testing equipment; and
- Maintain records of all NTPEP reviews and actions taken to resolve any noted deficiencies.

8.2.10.2 The QMS shall describe in detail the requirements for the QC test facility(ies) and include, as a minimum, a description of how the following requirements are met:

- The plant shall cover QC responsibilities at all times, including when the QA Manager is away from the plant for any reason.
- The manufacturer’s QA manager shall be responsible for QC testing at all facilities and assure that all sampling and testing is done by technicians meeting the requirements of the manufacturer’s technician qualification program.
- QC testing equipment shall be calibrated/verified in accordance with the equipment manufacturer’s recommendations at least once every 12 months by personnel qualified for such work.
- QC testing equipment shall be properly maintained.

8.2.11 (Detailed information for 8.1.11) Marking, Storage, Shipping, and Handling of Finished Geotextile Product

- The QMS shall:

- Describe the manufacturer’s method for permanently marking the geotextile in accordance with the minimum requirements of this Program;
- Detail and explain any coding used to mark the geotextile; and
- Describe the procedures used to ensure that product handling, storage, and shipping processes will not adversely affect the material composition, characteristics, or product quality.

8.2.12 (Detailed information for 8.1.12) Internal Quality Audits of Each Plant

8.2.12.1 The QMS shall include a description of the procedures used to conduct internal audits. The manufacturer, or an independent auditor hired by the manufacturer, shall perform these audits at least annually unless problems in the quality control program or with the quality of the product indicate more frequent audits are necessary. The internal audits shall include the following as a minimum:

- Evaluation of plant inspection,
- Inspection of testing equipment and calibrations,
• Observation of raw material sampling and lot control procedures,
• Observation of final product sampling and testing procedures,
• Review of product certification procedures,
• Review of inspection and testing report documentation, and
• Review of nonconforming product documentation and actions taken.

8.2.12.2 The QMS shall ensure that:

• Audit findings are discussed with plant management and testing technicians and documented in a report;
• Corrective actions are taken as necessary and documented in the report, and that
• The most recent report is included in QMS documentation submissions.

8.2.13 (Detailed information for 8.1.13) Lists of Plants, Quality Control Testing Facilities, and
Technicians - The QMS shall include the address and telephone numbers of all plants and QC testing
facilities for which the manufacturer desires NTPEP qualification. The QMS shall also identify the QA
contact for each facility with contact information and lines of responsibility.

9. QUALITY MANAGEMENT SYSTEM (QMS) REQUIREMENTS FOR PRIVATE LABEL AND CONVERTER COMPANIES

9.1 Companies that distribute products manufactured by others under a private label or that
convert product, shall establish a QMS documenting the procedures used to maintain traceability of the
products to the source manufacturer, how they maintain quality control of their private label products,
requirements for warehousing and storage of the geotextile products, how they maintain records or
quick access to records of the product they purchase and re-sell (including current manufacturer QC
data for those products), and that the records retention requirements in this work plan are met. These
companies will be required to participate in and conform to an annual audit of their QMS. (In the case
of converters classified as manufacturers in Section 5.4, their requirements shall be the same as those for
manufacturing companies.) Private label and converted products will be subject to sampling/testing at
the warehousing location during the annual QMS audit or at DOT customer project sites to verify
compliance with these quality requirements. Conformance testing shall be completed per the
requirements of the “Product Conformance Testing - Sampling and Testing for Products
Distributed/Sold under a Private Label” section of this document (Section 10.3).

9.2 The company QMS shall include or address the following:

9.2.1 Organization and organizational policies, including locations of all warehousing facilities

9.2.2 The company’s source manufacturer qualification and quality review requirements

9.2.3 Requirements for visual inspection of each product, verifying the as-manufactured product
marking/labeling, manufacturer supplied certifications, and lot specific source manufacturer QA data

9.2.4 How the company verifies incoming and outgoing shipments of geosynthetic materials at all
warehouses/distribution facilities are compliant with the requirements established in the company’s quality
policies document, including private label product specifications.

9.2.5 How the company maintains traceability of specific geotextile rolls to specific orders.

9.2.6 Resolution of Non-Conforming Product or Test Results, including how geosynthetic
products that are determined to not meet specification requirements are identified, traced, and quarantined
9.2.7 How source manufacturer certifications and QC Test Results are retained or quickly accessed, and private label product traceability to the source manufacturer product data are maintained

9.2.8 Marking, Storage, Shipping, and Handling of Finished Geotextile

9.2.9 Converter company QA data will also be subject to review in a similar manner as that used for manufacturing companies.

10. PRODUCT CONFORMANCE TESTING (NTPEP SPLIT SAMPLE TESTING)

10.1 The NTPEP Geotextile Program requires that geotextile be sampled and tested to determine conformance with the AASHTOM288s.

10.2 Sampling and Testing for Manufacturing Plants

10.2.1 Once initial product evaluation has been established, an AASHTO or DOT Auditor will sample geotextile during each plant audit. At a minimum, all unique geotextile styles must be sampled and tested within a 3-year period.

10.2.2 The AASHTO or DOT Auditor will randomly select the product roll from which the samples will be taken, and oversee the specific product samples taken. Each sample will be split, with the manufacturer retaining one set of samples for in-house testing and the auditor retaining the other set of samples split from the overall sample taken for AASHTO NTPEP testing. If the geotextile manufacturer does not have capability to perform a particular test as specified in M288, the split samples may be tested at a laboratory accredited by the Geosynthetics Accreditation Institute (i.e., GAI-LAP) to perform this testing. Each set of samples shall consist of a minimum of three laboratory samples measuring 3 feet in length by the width of the roll and shall be obtained from the single roll selected by the auditor. The samples shall not include the outer wrap of the roll. For rolls less than 12 feet wide, the length of the sample shall yield a minimum area of 36 square feet for each sample. The AASHTO or DOT auditor will label all samples to be tested. Two samples are to be sent to the NTPEP designated lab – one for primary testing and one for re-testing, if needed. The third sample is to be retained by the manufacturer for split-sample testing.

10.2.3 The AASHTO/DOT auditor shall complete an identification label, and attach it to each sample (an example of the label is shown below). The completed label shall identify the NTPEP designation number, manufacturer, style, roll number, lot number, the AASHTO or DOT auditor’s name, date sampled, and date shipped. Alternatively, this information may be written directly on the geotextile sample. The sample shall be clearly marked to indicate the machine direction (MD) along the outer edge of the sample.

![AASHTO-NTPEP TEST SAMPLE](image)

**Figure 1. Example geotextile product sample identification label.**
10.2.4 The sample shall be rolled for shipment to the AASHTO NTPEP designated testing facility. It shall be placed inside, or around, a rigid core during shipment. The package shall be wrapped with a protective cover. If sample rolling is not possible, at the discretion of the manufacturer, the samples may be loosely boxed for shipment to preserve sample integrity. It is imperative that the product obtained for cyclic qualification / re-qualification testing represents actual current production of the product. Thus, to this end, the inventory made available to the auditor from which to pick a sample roll must be from a production, or production(s), of at least 10 rolls manufactured within the 12 months immediately prior to the date of the audit. Further, at least 6 rolls from this production, or productions, representing various times during the production(s), shall be retained and made available for sampling. The auditor will select one roll at random. A full roll list and a lot summary for the production lot from which the auditor selects a sample shall be furnished to the auditor.

10.2.5 In addition, an “In-Plant Sampling Report” must be completed by the sampler. One copy of this report must accompany the samples. An example of this report is included at the end of this work plan.

10.2.6 All tests identified in “Quality Control Inspection, Measurement and Testing” in this work plan shall be conducted. Within 15 days after the sample is taken, the manufacturer shall submit their split sample test results to the NTPEP Audit Program Supervisor. Once the NTPEP laboratory results are available and submitted to the NTPEP Audit Program Supervisor, the NTPEP Audit Program Supervisor will compare the test results and determine if both sets of test results are in compliance with the NTPEP work plan. If any of the test results are not in compliance, the NTPEP Audit Program Supervisor will request from the manufacturer an explanation of any noncompliant test results, including any corrective actions found necessary in the manufacturing process or testing procedures. The NTPEP Audit Program Supervisor will post the comparison of the split sample results and the corrective action taken in the secure area of the NTPEP website, available only to AASHTO member departments and the manufacturer for whom the testing was conducted, and annually evaluate the split sample results and report on testing proficiency.

10.2.7 The test results for a product will be considered to be in compliance with this NTPEP work plan if:

10.2.7.1 The test results meet or exceed all of the AASHTO M288 specification requirements for the intended M288 class for the product (if applicable), and

10.2.7.2 The test results meet or exceed the manufacturer’s MARV’s, minimums, or maximums for the product established based on the values submitted in the participant’s annual application.

10.3 Sampling and Testing for Products Distributed/Sold under a Private Label

10.3.1 A reduced sampling and testing program will be conducted for NTPEP quality assurance (QA) purposes for companies that market and distribute products manufactured by others to confirm consistency between the product testing conducted by the source manufacturer and NTPEP on the manufacturer’s products as described in the previous section, and the products distributed and sold under a private label.

10.3.2 “Consistency” is defined as meeting or exceeding the same AASHTO M288 class specification as the source manufacturer’s audit results demonstrated and that they also meet or exceed the source manufacturer’s MARV, minimum, or maximum for the source product which is based on the source manufacturer’s QC test results conducted in conformance with the source manufacturer audit.

10.3.3 Sampling shall be conducted in a manner that is consistent with the sampling protocol and documentation process as defined in the previous section for testing to evaluate conformance of the manufacturer to this audit work plan.

10.3.4 As a minimum, tests conducted on the private labeled products shall include:

- Apparent Opening Size (AOS) – ASTM D4751
- Grab Strength – ASTM D4632

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10.3.5 Testing will be conducted on a product line basis. For the first three tests, generally, only the lightest weight product, plus two others within the product line, at the discretion of the auditor, will be tested. For the UV resistance, only one of the products tested as part of the manufacturer’s audit program NTPEP testing will be tested. Testing will be conducted on a three year cycle.

11. RESOLUTION OF AUDIT OR TESTING FAILURES AND DISPUTES:

11.1 When a nonconformance is found during an audit, the burden will be on the Participant to identify the cause; develop, implement and document the resolution; and revise his QA plan to assure future conformance. When the Participant is found to not conform with one or more aspects of the governing QMS, the following steps shall be taken:

11.1.1 The NTPEP Auditor notifies the Participant of the issue(s).

11.1.2 The Participant furnishes a Corrective Action Report (CAR) to AASHTO within 15 business days of the final NTPEP Audit report to the NTPEP Auditor. The CAR is to contain: the issue being addressed, the course(s) of action to be taken and a timeline showing when these actions will be taken. There should be sufficient detail to adequately explain the processes to be followed.

11.1.3 If the CAR is not received within 15 business days, NTPEP notifies the Participant that their facility is classified as “non-compliant” with AASHTO’s NTPEP Audit Program. The audit is considered completed and all fees paid will not be refunded.

11.1.4 If the Participant still requests to participate in the program, they will need to reapply (Ref.: Section 5).

11.2 When the Participant has a dispute with NTPEP regarding procedural issues, it shall be handled as follows:

11.2.1 The Participant notifies NTPEP in writing of the dispute, providing appropriate documentation for the committee to fully understand the controversy, and requests a resolution.

11.2.2 Copies of the dispute and documentation are forwarded by NTPEP to the Technical Committee Chairman and Vice-Chairman and to the NTPEP Technical Committee Liaison. The Technical Committee, less industry representatives, will convene to discuss the dispute and render a decision on the appropriate resolution. Quorum for the purposes of this decision will be either the Chairman or Vice-Chairman, the NTPEP liaison or his/her designee, and one other Technical Committee member. The Chairman or Vice-Chairman will communicate the resolution to the Participant in writing through NTPEP.

11.2.3 The Participant may appeal within 30 days of the date of the resolution. If the dispute is not resolved to the Participant’s satisfaction, the dispute can be raised to the NTPEP Executive Committee Chairman for resolution by the NTPEP Appeals Board. The decision by the Appeals Board is final.

11.3 Inevitably, there are times when the sampled geotextile fails to meet one or more of the M288 specification requirements, or the manufacturer’s MARV, minimum, or maximum for the product established based on the QMS evaluated as part of this audit program, when tested by NTPEP, or when the manufacturer is found, during an audit, to have neglected one or more aspects of the governing QMS during manufacturing. While the manufacturer may request a retest, if sufficient sample is available, the burden will be on the manufacturer to identify the cause, document the resolution, and revise his QA plan to assure future conformance. All results will be reported. Any retesting or re-auditing will be at the
discretion of NTPEP and the associated costs will be borne by the manufacturer.

11.4 **Disagreements with NTPEP** - Disagreements with NTPEP regarding test results will be handled as follows:

11.4.1 The manufacturer should verify that his/her manufacturing process is operating correctly, that test equipment is calibrated, and that test procedures are correct. If these conditions are met, a set of three samples shall be obtained by an AASHTO representative per the “Annual Product Conformance Testing” above, as appropriate, from the same lot as the failing test. The samples shall be taken from one of the originally sampled geotextile rolls or from another geotextile roll of the same lot made during the same shift.

11.4.2 The manufacturer will test one of the samples, and if the results pass the AASHTO M288 specifications and the MARV, minimum, or maximum for the product as determined based on the manufacturer’s QC test results, the AASHTO representative will send one sample of the same product to a third party independent laboratory acceptable to NTPEP and a second sample to NTPEP and request that the product be tested. NTPEP will consider the dispute resolved if the manufacturer’s test results are in conformance with this work plan and conform with at least one of the other testing facility results (i.e., the manufacturer’s test results and either the third party or NTPEP laboratory test results are determined to be in compliance with this work plan as specified in Section 10 “**Product Conformance Testing (NTPEP Split Sample Testing)**”. If this is not the case, the manufacturer should repeat the process of checking the manufacturing process, the equipment calibration and the test procedures until satisfactory agreement with inter-laboratory testing is accomplished.

11.5 **Withdrawal from Program** - A written request to withdraw the audit request must be received by the NTPEP Manager at least five business days before the auditing/sampling is to begin. For information regarding costs, and their associated due dates, please refer to the Terms and Conditions located under DataMine’s (http://data.ntpep.org) Legal Information section.

12. **DELIVERABLES – EVALUATION RESULTS AND DATA**

12.1 Test result data will be compiled in populated test tables and made available to all participating states and testing companies through the AASHTO/NTPEP DataMine website. No judgment as to a product’s acceptability to any state will be made in DataMine. End state user participants will establish individual criteria for product acceptability. Product preparation/installation and post-evaluation images and video will also be uploaded to DataMine.

12.2 1.2 The populated test tables shall contain the test data generated by the contracted NTPEP laboratory(ies). The images/video uploaded will also be captured by the laboratory(ies) representative.

12.3 1.3 Test results will be transmitted electronically in the web-based data base, DataMine, as follows. Once populated test tables and images are reported to the technical committee’s chair and liaison, they will release data and associated images to the manufacturer for review. When the manufacturer reviews and accepts the data, s/he can release the data to the public through DataMine.

12.4 1.4 DataMine – This database can be accessed through the AASHTO//NTPEP web site link at http://data.ntpep.org/.

13. **PUBLIC NOTICE**:

13.1 One of the primary reasons for a quality assurance program is to instill confidence in the end-user and the general public that the materials being used for infrastructure construction are of sufficient quality and to facilitate use of products that have proven to be of sufficient quality.
13.2 To this end the program will provide for public notice of companies, plants, and AASHTO M288 geotextile products found to conform with the provisions of this work plan via website postings, with official electronic reports issued to AASHTO member departments.

14. MODIFICATION OF QUALIFIED PRODUCTS (RETEST REQUIREMENTS):

14.1 Product design may change over time as manufacturers improve their products and optimize their manufacturing processes. When a design change is made in a NTPEP listed product, the Manufacturer shall notify the NTPEP of the change and submit samples for re-consideration of conformance with this work plan.

14.2 Any changes in a manufacturing method or product weight shall be considered design changes.
# IN-PLANT SAMPLING REPORT

**NTPEP Program:** GTX  
**NTPEP Number:** (20__)-0__

| Manufacturer Name: | |  |
|--------------------|------------------|

**Type of Facility where Sampling Conducted:**  
- **Manufacturing (production line):** Describe  
- **Warehouse (storage of finished product):** Describe

**Location of Facility where Sampling Conducted:**  

**Location within Production Line/Process where Sampling Conducted:**  

**Date Material(s) Sampled:**  

**Manufacturer Representative(s) Present:**  

**Pre-arrangements Made with Manufacturer to Sample:**  
- **Specific sampling appt. date given**  
- **Advance warning given (____ days) but not specific sampling appt. date**

**Material(s) Sampled and Description:**  
*(Please specify product designation and structure (IE: NP-NW, HB-NW, MF-W, etc. for each style submitted below :)*

<table>
<thead>
<tr>
<th>Sample</th>
<th>Roll No.</th>
<th>Lot/Batch No.</th>
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**Sampling Event Notes:**  
*(Plant condition, roll storage/inventory, traceability of raw materials to products, sampling issues, etc.)*

**Sample Shipment Preparation Observations:**  
*(Sample identification approach, sample placement in the shipping container, who did shipment preparation, how shipped, etc.)*

**Sampler Name and Affiliation: (please print):**

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15. **KEYWORDS**

NTPEP; DataMine; geotextiles