# WTBA

UNIVERSITY OF WISCONSIN
PLATTEVILLE

Highway Technician
Certification Program

January 2024

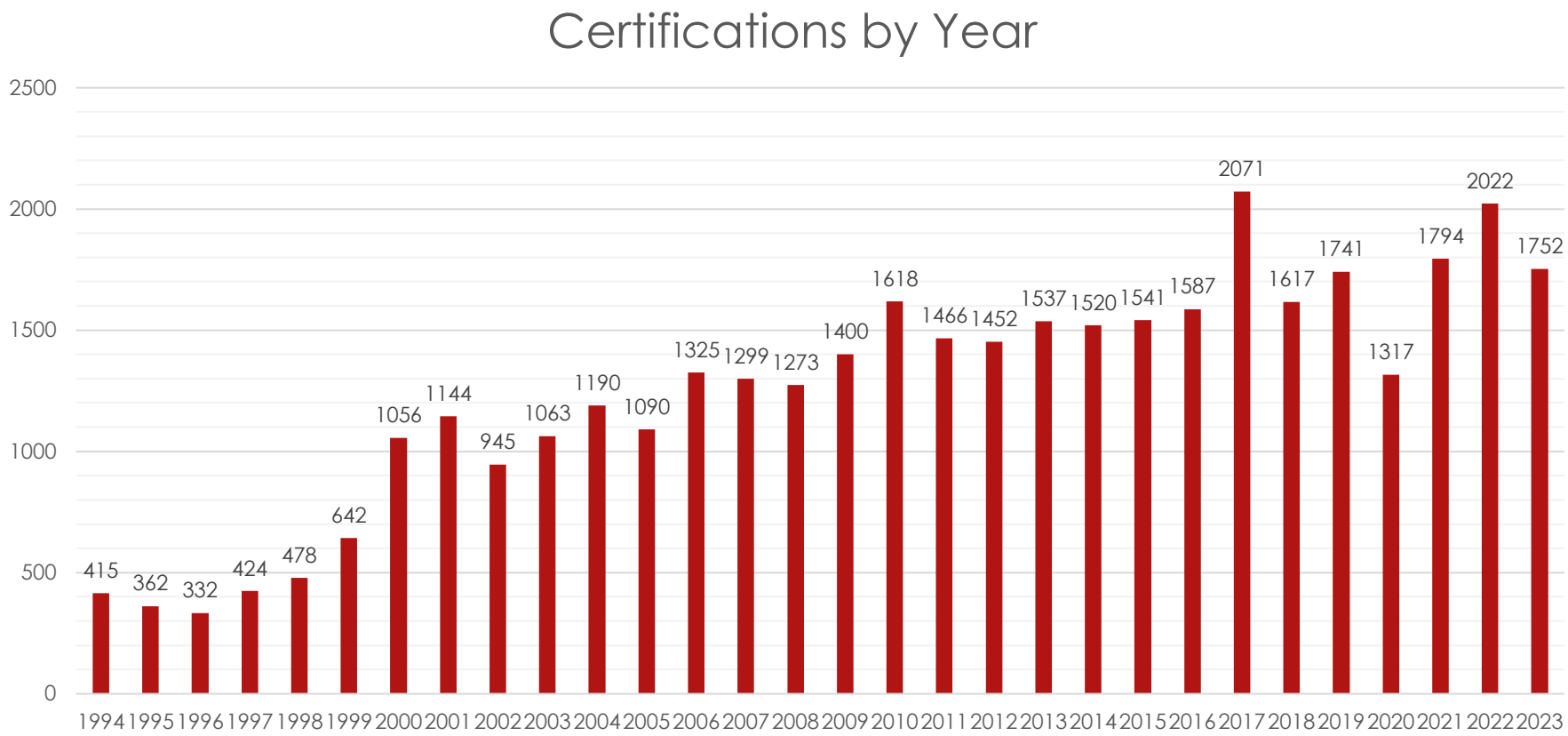
# Agenda

- 2023 HTCP Review
  - Certification Overview
  - QMP Award Winners
- 2024 HTCP Review
  - Expiring 2024 Cert Communication
  - Schedule
  - Certification Overview
  - What’s New - MOTP

# 2023 Program Updates

# 2023
# Certification Overview

# Certification Comparison




2017: +30% up to 2016 (1587) with new MCT certification
2018: - 22% down to 2017 (2071) with MCT fall off, PCCTEC-II
2019: +8% up to 2018 with PCCTEC-II revamp
2020: -24% down to 2019 due to the COVID-19 Closure
2021: +36% up to 2020 due to pent up demand
2022: +13% up to 2021 addt'l pent up demand from Level 2 extensions, Retention
2023: -13% down to 2022 due to getting back to normal/F2F/Post-Covid
Approx. 7,528 Active Certifications

# 2023 Certification Mix

- Category Mix of 2023 Certifications:
  - No change in % of mix from 2022

| Category | 2023 % of Mix |
|---|---|
| Consultant | 47% |
| Industry | 37% |
| WisDOT | 13% |
| Municipal/County | 2% |
| Other | 1% |

# 2023 Certification Breakout

| Certification | 2023 | % of TTL |
|---|---|---|
| PCCTEC-I | 398 | 22.7% |
| MCT | 293 | 16.7% |
| NUCDENSITY | 249 | 14.2% |
| TMS | 216 | 12.3% |
| AGGTEC-I | 197 | 11.2% |
| HMA-IPT | 89 | 5.1% |
| CST | 83 | 4.7% |
| GRADING | 55 | 3.1% |
| HMA-TPC | 44 | 2.5% |
| ATTS | 40 | 2.3% |
| PCCTEC-II | 36 | 2.1% |
| HMA-MD | 31 | 1.8% |
| Profiler | 21 | 1.2% |

# 2023
# IA Communication

# HTCP Certification Communications

- IA/HTCP Communication to Level 1 Certs:
  - New technician communication
    - To help improve IA communication to technician
    - IAP to evaluate 90% of all active certified sampling and testing personnel
    - Ensure RIAS are fully aware of operations on projects to fulfill their duties as Regions IAP reps
    - Technician to contact RIAS when testing/sampling
    - Map attached
    - Email sent to technicians with AGGTEC-I, TMS, CST, PCCTEC-I, Nucdenisty or HMA-IPT certifications
      - Sent: ***Spring 3/31/23*** & ***End of Season 8/15/23***

# HTCP/IA Communication

UNIVERSITY OF WISCONSIN PLATTEVILLE

August 8, 2022

Highway Technician Certification Technician:

You are receiving this notification as you have a valid HTCP Certification in either AGGTEC-I, TMS, CST, PCCTEC-I, Nucdensity, or HMA-IPT certification. As many of you are aware the Wisconsin Department of Transportation (WisDOT) is required by Code of Federal Regulations to provide an Independent Assurance Program (IAP) to evaluate all active HTCP certified sampling and testing personnel and the testing equipment. WisDOT uses what is called a system-based approach to the IAP, this means WisDOT must evaluate at least 90% of all active certified sampling and testing personnel performing work on WisDOT and Local Program projects. This is a federal requirement and critical to the success and life of our highways and roadways.

Over the course of the past three years there have been some areas that have been flagged for improvement. One of these area's is communication between the Region Independent Assurance Specialists (RIAS) and the HTCP certified personnel conducting sampling and testing on our projects. This communication is critical to ensure our RIASs are fully aware of operations occurring on our projects and can fulfill their duties as the Region's IAP representatives. To improve communication this letter is being sent to all certified personnel with level one certifications asking that you contact the RIAS associated with the projects where sampling and testing of the following will be performed:

- Base aggregate sampling and testing,
- Concrete mix testing,
- Concrete aggregate sampling and testing,
- Concrete compressive strength testing,
- Hot mix asphalt (HMA) mix testing,
- Nuclear density testing for HMA, MSE wall backfill, base compaction, pulverize and relay, CIR, and QMP subgrade.

Attached is a map of the Region Independent Assurance Specialists along with their area of focus (if applicable) and contact information. Contact your Region Independent Assurance Specialist when sampling and/or testing is forthcoming. Please allow enough lead time for scheduling purposes and feel free to collaborate with other HTCP certified testers to complete multiple IA evaluations simultaneously.

Your cooperation in this matter is greatly appreciated and will go a long way to improve our transportation system.

Please let us know if you have any questions.

Thank You,

Adam Johnson
WisDOT-IA Coordinator
608-598-9441

Jodi Pluemer
HTCP Director
608-342-1580



Highway Technician Certification Program

# 2023 QMP Award Winners

# 2023 QMP Award

- HTCP's Quality Management Program Award recognizes:
  - Outstanding certified highway materials technicians
  - Who have displayed exceptional leadership roles in developing quality materials used in highway constructions projects

# 2023 QMP Award

- Winners are nominated and chosen from:
  - Contractors
  - Consultants
  - The Wisconsin Department of Transportation

# 2023 QMP Award

- We have two individual award winners

- Announced:  WAPA & WCPA Conference
  - November 28th (WAPA)
  - February 15th (WCPA)

# 2023 QMP Award

- 2023 Individual Award Winners Include:
  - Presented at WAPA Conference
  - Emily Gasser
    - CORRE, Inc.

# 2023 QMP Award

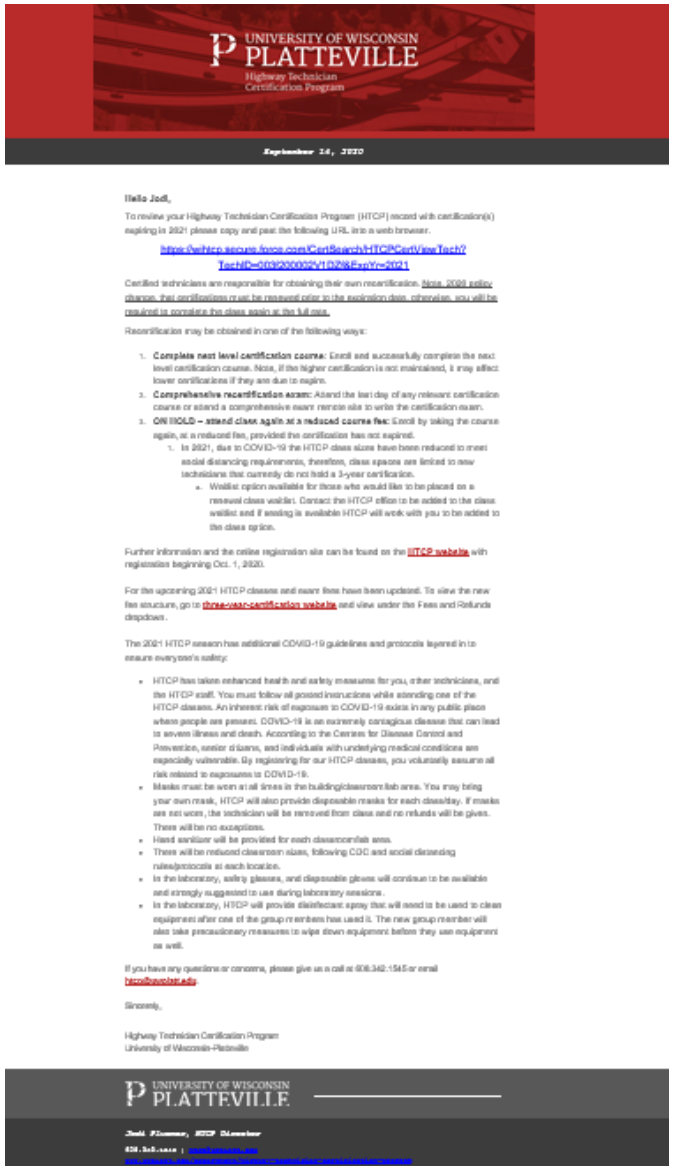
- 2023 Individual Award Winners Include:
  - Presented at WCPA
  - Leslie Hidde
    - WisDOT/WCPA

# 2024 Program Updates

# HTCP Certification Communications

- Expiring 2024 Certification Letters:
  - HTCP sends out communication to company and technician of upcoming expired certifications
    - Moved from hard copy letter to email in 2019
    - Emails sent out to both company and technicians
      - Company email: ***9/9/23***
      - Technician email: ***9/9/23***

# Technician Letter



UNIVERSITY OF WISCONSIN PLATTEVILLE
Highway Technician Certification Program

September 14, 2020

Hello Jodi,

To review your Highway Technician Certification Program (HTCP) record with certification(s) expiring in 2021 please copy and past the following URL into a web browser.

https://wihtcp.secure.force.com/CertSearch?HTCPCertViewTech?TechID=005K000002V1D2KIAV?=2021

Certified technicians are responsible for obtaining their own recertification. Note, 2020 policy change, their certifications must be renewed prior to the expiration date, otherwise, you will be required to complete the class again at the full rate.

Recertification may be obtained in one of the following ways:

1. **Complete next level certification course:** Enroll and successfully complete the next level certification course. Note, if the higher certification is not maintained, it may affect lower certifications if they are due to expire.
3. **Comprehensive recertification exam:** Attend the last day of any relevant certification course or attend a comprehensive exam remote site to write the certification exam.
3. **ON HOLD – attend class again at a reduced course fee:** Enroll by taking the course again, at a reduced fee, provided the certification has not expired.
    1. In 2021, due to COVID-19 the HTCP class sizes have been reduced to meet social distancing requirements, therefore, class spaces are limited to new technicians that currently do not hold a 3-year certification.
        a. Waitlist option available for those who would like to be placed on a renewal class waitlist. Contact the HTCP office to be added to the class waitlist and if seating is available HTCP will work with you to be added to the class ad hoc.

Further information and the online registration site can be found on the HTCP website with registration beginning Oct. 1, 2020.

For the upcoming 2021 HTCP classes and exam fees have been updated. To view the new fee structure, go to three-year certification website and view under the Fees and Refunds dropdown.

The 2021 HTCP season has additional COVID-19 guidelines and protocols layered in to ensure everyone's safety:

- HTCP has taken enhanced health and safety measures for you, other technicians, and the HTCP staff. You must follow all posted instructions while attending one of the HTCP classes. An inherent risk of exposure to COVID-19 exists in any public place where people are present. COVID-19 is an extremely contagious disease that can lead to severe illness and death. According to the Centers for Disease Control and Prevention, senior citizens, and individuals with underlying medical conditions are especially vulnerable. By registering for our HTCP classes, you voluntarily assume all risk related to exposure to COVID-19.
- Masks must be worn at all times in the building/classroom/lab area. You may bring your own mask, HTCP will also provide disposable masks for each class/day. If masks are not worn, the technician will be removed from class and no refunds will be given. There will be no exceptions.
- Hand sanitizer will be provided for each classroom/lab area.
- There will be reduced classroom sizes, following CDC and social distancing rules/protocols at each location.
- In the laboratory, safety glasses, and disposable gloves will continue to be available and strongly suggested to use during laboratory sessions.
- In the laboratory, HTCP will provide disinfectant spray that will need to be used to clean equipment after one of the group members has used it. The new group member will also take precautionary measures to wipe down equipment before they use equipment as well.

If you have any questions or concerns, please give us a call at 608.342.1545 or email htcp@uwplatt.edu.

Sincerely,

Highway Technician Certification Program
University of Wisconsin-Platteville

UNIVERSITY OF WISCONSIN PLATTEVILLE

Jodi Kinney, HTCP Director
608.3[illegible] |

# 2024 Schedule

# 2024 Schedule

- Face to Face/Full capacity
- January  - June
- Schedule Posted:  September 1, 2023
- Registration Go Live:
  - October 2nd, 2023

# 2024 Schedule

- **Noteworthy Callouts:**
  - Contingency plans:
    - Baked into the schedule with secured location and instructors in case spike in demand
  - Locations:
    - Lacrosse:  New Location for PCCTEC-I class
    - Waukesha:  Lecture moved from WisDOT building to Pewaukee hotel location
      - Reduces frustrations/complexities of getting into Barstow
    - Wisconsin Rapids/Green Bay:  Hosting two AGGTEC/TMS classes vs one class in 2023

# 2024 Schedule

- **Noteworthy Callouts:**
  - Certifications:
    - **PROFILER:**
      - Moving from one day class to two-day class
      - More effort/time in the lab & data entry
      - Creating new “simulation videos” of SSI/Ames
    - **HMA-IPT:**
      - Back to “normal” with 4 classes
    - **PCCTEC-I:**
      - SAM content removed from content
    - **PCCTEC-II:**
      - SAM “How To/Troubleshooting”

# 2024 Class Schedule

| Class | 2016 | 2017 | 2018 | 2019 | 2020 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|
| PCCTEC-I | 13 | 13 | 14 | 15 | 14 | 15 | 14* |
| CST | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| PCCTEC-II | 1 | 1 | 1 | 6 | 4 | 2 | 2 |
| AGGTEC-I | 7 | 7 | 7 | 7 | 7 | 9 | 10 |
| TMS | 7 | 7 | 7 | 7 | 7 | 8 | 8* |
| AGGTEC-II | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| ATTS | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| GRADING | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| PROFILER | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| NUCDENSITY | 6 | 7 | 8 | 8 | 8 | 10 | 10 |
| HMA-IPT | 3 | 4 | 4 | 4 | 4 | 5 | 4* |
| HMA-TPC | 1 | 1 | 1 | 1 | 1 | 1 | 1* |
| HMA-MD | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| COMP EX | 7 | 6 | 7 | 7 | 7 | 8 | 8 |
| TOTAL | 55 | 56 | 60 | 66 | 62 | 68 | 67 |

*Contingency class built into schedule/not counted

# 2024
# “What’s New”

# 2024 Content Development

- Manuals: What's New - MOTP
  - Manual summarizes WisDOT modifications to AASHTO and ASTM test methods.
  - These "WisDOT Test Modifications" (WTMs) do not list the test step by step, but rather list the referenced AASHTO or ASTM sections which are modified.
    - Example:  AASHTO R90 to WTM R90
  - If there is no WisDOT modification, it is inferred that the technician will follow the AASHTO or ASTM verbatim.
  - Instances where there is no AASHTO or ASTM, WisDOT created "Wisconsin Test Procedures" (WTP) which describe the test step by step in the manual.

# WTM R90

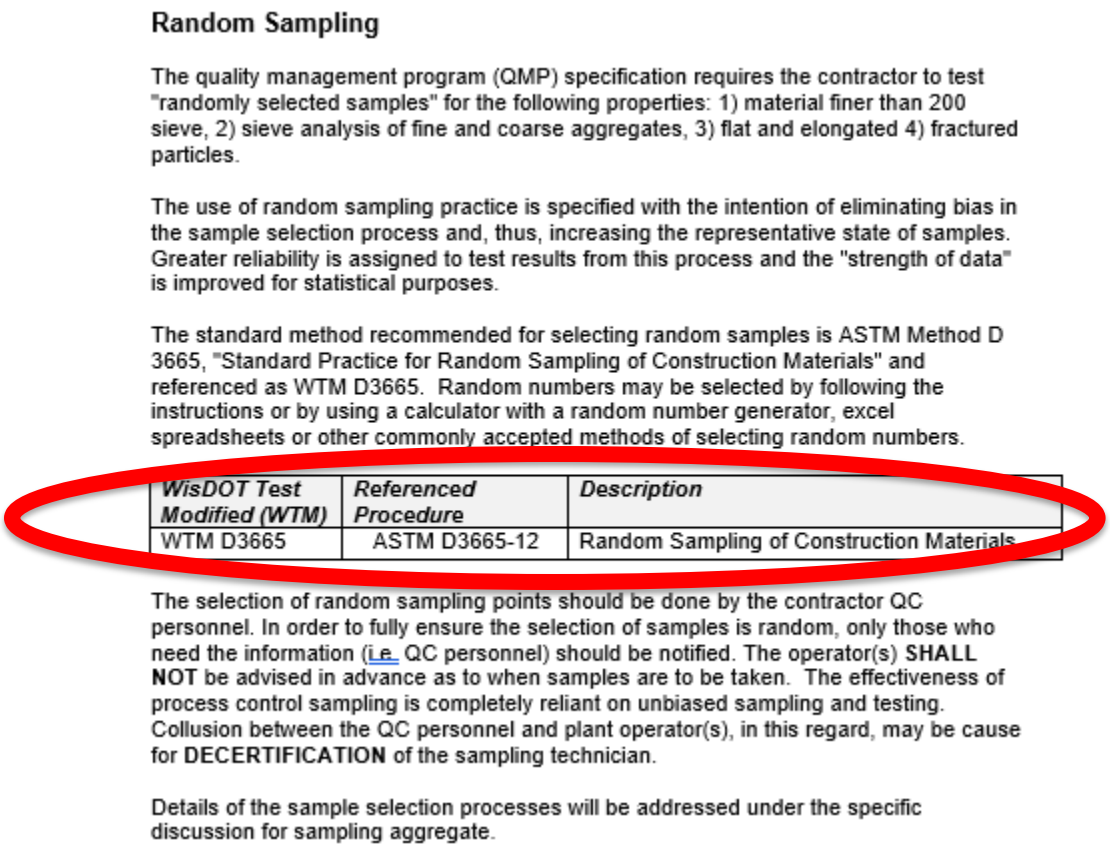
Effective Date: 01/01/24
Revised Date:

Follow AASHTO R90 ***Standard Practice for Sampling Aggregate Products***
with the following modifications:

<table>
<tr><th>AASHTO R90-18 Section</th><th>WisDOT Modification:</th></tr>
<tr><td>2.1</td><td>Replace the AASHTO T 11 and T 27 references with the following WisDOT Modified versions:<br><br>WTM T11 – Finer than No.200<br>WTM T27 – Sieve Analysis</td></tr>
<tr><td>2.2</td><td>Revise Section 2.2 to replace the reference to ASTM D75/D75M with the WTM R90 reference.</td></tr>
<tr><td>3.3</td><td>Revise Section 3.3 to replace the reference to ASTM D75 with the WisDOT Modified R90 reference.</td></tr>
<tr><td>Table 1</td><td>Replace Table 1 with the following:
<table>
<tr><td rowspan="2">Nominal Maximum Aggregate Size</td><td colspan="2">Minimum Weight of Field Samples*</td></tr>
<tr><td>kg</td><td>lb.</td></tr>
<tr><td colspan="3">Fine Aggregate</td></tr>
<tr><td>#10 (2.0mm)</td><td>5</td><td>10</td></tr>
<tr><td>#4 (4.75mm)</td><td>5</td><td>10</td></tr>
<tr><td colspan="3">Coarse Aggregate</td></tr>
<tr><td>⅜ in. (9.5mm)</td><td>5</td><td>10</td></tr>
<tr><td>½ in. (12.5mm)</td><td>10</td><td>25</td></tr>
<tr><td>¾ in. (19.0mm)</td><td>15</td><td>35</td></tr>
<tr><td>1 in. (25.0mm)</td><td>25</td><td>55</td></tr>
<tr><td>1 ¼ in. (31.75mm)</td><td>25</td><td>55</td></tr>
<tr><td>1 ½ in. (37.5mm)</td><td>30</td><td>70</td></tr>
<tr><td>2 in. (50mm)</td><td>40</td><td>90</td></tr>
<tr><td>2 ½ in. (62.5mm)</td><td>45</td><td>100</td></tr>
<tr><td>Larger than 2 ½ in. (62.5mm)</td><td>115</td><td>250</td></tr>
</table>
*When split samples are taken, the field sample size shown above is doubled.</td></tr>
<tr><td>Note 2</td><td>Delete Note 2</td></tr>
</table>

# 2024 Content Development

- Manuals: MOTP Naming Convention



**Random Sampling**

The quality management program (QMP) specification requires the contractor to test "randomly selected samples" for the following properties: 1) material finer than 200 sieve, 2) sieve analysis of fine and coarse aggregates, 3) flat and elongated 4) fractured particles.

The use of random sampling practice is specified with the intention of eliminating bias in the sample selection process and, thus, increasing the representative state of samples. Greater reliability is assigned to test results from this process and the "strength of data" is improved for statistical purposes.

The standard method recommended for selecting random samples is ASTM Method D 3665, "Standard Practice for Random Sampling of Construction Materials" and referenced as WTM D3665. Random numbers may be selected by following the instructions or by using a calculator with a random number generator, excel spreadsheets or other commonly accepted methods of selecting random numbers.

| *WisDOT Test Modified (WTM)* | *Referenced Procedure* | *Description* |
|---|---|---|
| WTM D3665 | ASTM D3665-12 | Random Sampling of Construction Materials |

The selection of random sampling points should be done by the contractor QC personnel. In order to fully ensure the selection of samples is random, only those who need the information (i.e. QC personnel) should be notified. The operator(s) **SHALL NOT** be advised in advance as to when samples are to be taken. The effectiveness of process control sampling is completely reliant on unbiased sampling and testing. Collusion between the QC personnel and plant operator(s), in this regard, may be cause for **DECERTIFICATION** of the sampling technician.

Details of the sample selection processes will be addressed under the specific discussion for sampling aggregate.

# 2024 Content Development

- Manuals: MOTP Appendix



**The Manual of Testing Procedures (MOTP):**

The manual of testing procedures (MOTP) is the WisDOT manual created to summarize WisDOT modifications to AASTHO and ASTM test methods that are used in the QC and QV testing. These "WisDOT Test Modifications" (WTMs) do not list the test step by step, but rather list the referenced AASHTO or ASTM sections which are modified. If there is no WisDOT modification, it is inferred that the technician will follow the AASHTO or ASTM verbatim. Instances where there is no AASHTO or ASTM testing procedure, WisDOT created "Wisconsin Test Procedures" (WTP) which describe the test step by step and found in the MOTP.

Definitions:

- Wisconsin Test Modified (WTM) is a WisDOT modification to the AASHTO or ASTM Test Procedures as specified herein.
- Wisconsin Test Procedure (WTP) is a WisDOT testing procedure that does not have a corresponding AASHTO or ASTM method.

Link to MOTP: https://wisconsindot.gov/pages/doing-bus/eng-consultants/cnslt-rsrces/qmp/default.aspx

**What to do when WisDOT does not modify an AASHTO or ASTM procedure:**

There may be instances where WisDOT requires an ASTM and/or AASHTO test method that is not modified per this manual. In those instances, the technician is required to follow the original AASHTO and/or ASTM procedure, using any relevant applicable referenced WTM or WTP procedures. Always check for a modified procedure. Those take precedence.

For Example:

AASHTO T 164 – Quantitative Extraction of Asphalt Binder from Hot Mix Asphalt (HMA) is required by WisDOT but is not modified by this Manual. This procedure references AASHTO R 97, T 30, T 84, and T 329. The technician shall follow the AASHTO T 164 testing procedure, replacing any AASHTO references with applicable WTMs. In this example, AASHTO R 97 will be replaced with WTM R97, AASHTO T 30 will be replaced with WTM T30, AASHTO T 84 will be replaced with WTM T84 and AASHTO T 329 will be replaced with WTM T329.

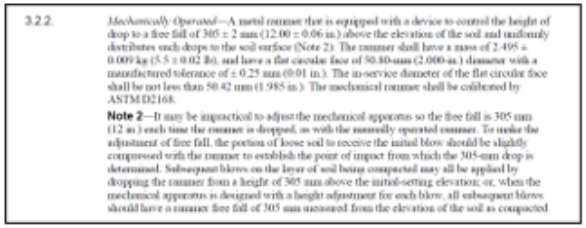


**When the text is "replaced":**

Throughout this manual there are instances where sections of the ASTM or AASHTO are "replaced" with modified text. The limit of the replaced text is defined by the indent. Whatever text, including notes, that falls within the same indent will be replaced with the modified text. If a note or table fall outside the indent, it is not considered modified.

For Example:

"Note 2" falls within the indent. If Section 3.2.2 is replaced by the Manual of Test Procedures, then "Note 2" is also replaced by the modified text. Be aware, the next chronological Note will not be renumbered when a Note is deleted by modified text.



3.2.2 *Mechanically Operated*—A metal rammer that is equipped with a device to control the height of drop to a free fall of 305 ± 2 mm (12.00 ± 0.06 in.) above the elevation of the soil and uniformly distributes such drops to the soil surface (Note 2). The rammer shall have a mass of 2.495 ± 0.009 kg (5.5 ± 0.02 lb), and have a flat circular face of 50.80-mm (2.000-in.) diameter with a manufactured tolerance of ± 0.25 mm (0.01 in.). The in-service diameter of the flat circular face shall be not less than 50.42 mm (1.985 in.). The mechanical rammer shall be calibrated by ASTM D2168.

**Note 2**—It may be impractical to adjust the mechanical apparatus so the free fall is 305 mm (12 in.) each time the rammer is dropped, as with the manually operated rammer. To make the adjustment of free fall, the portion of loose soil to receive the initial blow should be slightly compressed with the rammer to establish the point of impact from which the 305-mm drop is determined. Subsequent blows on the layer of soil being compacted may all be applied by dropping the rammer from a height of 305 mm above the initial-setting elevation; or, when the mechanical apparatus is designed with a height adjustment for each blow, all subsequent blows should have a rammer free fall of 305 mm measured from the elevation of the soil as compacted

**When Modified Procedures are referenced:**

In each modified test method, there is a section where other WTM procedures are referenced to supersede the original AASHTO or ASTM procedure (usually Section 2 in AASHTO). If there are other sections within the AASHTO or ASTM procedure that are not modified by this manual, but also reference the original AASHTO or ASTM procedure, it is inferred that the WTM should be used. In all cases, a WTM procedure supersedes the original AASHTO or ASTM procedure.

# 2024 Content Development

- Manuals: MOTP Appendix



**Which AASHTO or ASTM version to use:**

Every year AASHTO and ASTM procedures may be updated. This manual will clearly list which version of each AASHTO and ASTM procedure is to be used and modified. AASHTO and ASTM versions may be updated annually, however in all instances use the version referenced in the MOTP even if a newer version exists.

For Example:

WTM T84 references AASHTO T84-13 (2021), as highlighted in the first picture below. This means that AASHTO T 84 was "technically revised" in 2013, and it was "reviewed but not updated" in 2021, as seen in the second picture below. Technicians should always ensure they are using the correct version of the referenced AASHTO or ASTM procedure.

**WTM T84**

Effective Date: 03/15/2022

Revised Date:

Follow AASHTO T84 ***Standard Method of Test for Specific Gravity and Absorption of Fine Aggregate*** with the following modifications:

| AASHTO T84-13 (2021) Section | WisDOT Modification: |
|---|---|

Standard Method of Test for

**Specific Gravity and Absorption of Fine Aggregate**

AASHTO

**AASHTO Designation: T 84-13 (2021)[1]**

**Technically Revised: 2013** **Reviewed but Not Updated: 2021**

**Technical Subcommittee: 1c, Aggregates**

**ASTM Designation: C128-12**



**WisDOT preferred Methods:**

There are some AASHTO and ASTM procedures that allow for multiple methods to perform the test. In some cases, WisDOT will only allow one of the optional methods. If the modified procedure removes a method, it is inferred that any subsequent mention of that method is also disallowed without the need for a specific call out in the Manual of Test Procedures.

For Example:

WTM T304 removes Method B and Method C in Section 1, only allowing Method A for WisDOT. In Section 9, the AASHTO procedure describes Method B and Method C in detail. Since the MOTP previously removed Method B and Method C, there is no need to continue to remove all mention of Method B and Method C throughout the WTM – it is inferred.

**MOTP Table of Contents Reference:**

| *WisDOT Test Modified (WTM)* | *Referenced Procedure* | *Description* |
|---|---|---|
| WTM R76 | AASHTO T 76-16 | Reducing Samples of Aggregate to Testing Size |
| WTM R90 | AASHTO R 90-18 | Sampling of Aggregate Products |
| WTM T11 | AASHTO T 11-20 | Materials Finer Than 75-µm (No. 200) Sieve in Mineral Aggregate by Washing |
| WTM T27 | AASHTO T 27-20 | Sieve Analysis of Fine and Coarse Aggregate |
| WTM T84 | AASHTO T 84-13 | Specific Gravity and Absorption of Fine Aggregate |
| WTM T85 | AASHTO T 85-14 | Specific Gravity and Absorption of Coarse Aggregate |
| WTM T96 | AASHTO T 96-02 | Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine |
| WTM T103 | AASHTO T 103-08 | Soundness of Aggregate by Freezing and Thawing |
| WTM T104 | AASHTO T 104-99 | Soundness of Aggregate by Sodium Sulfate |
| WTM T113 | AASHTO T 113-18 | Light Weight Pieces in Aggregate |
| WTM T255 | AASHTO T 255-00 | Total Evaporable Moisture Content of Aggregate by Drying |
| WTM T304 | AASHTO T 304-17 | Uncompacted Void Content of Fine Aggregate |
| WTM D4791 | ASTM D 4791-19 | Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate |
| WTM D5821 | ASTM D 5821-13 | Determining the Percentage of Fracture in Coarse Aggregate |

# 2024 Content Development

- Manuals: MOTP Glossary



**Definitions and Terminology**

| | |
|---|---|
| Aggregate | An inert mineral material such as sand, crushed gravel, crushed stone, or combinations thereof. |
| Absorption | The process of a solid taking up liquid into its interior by capillarity. |
| Base Course | The layer or layers of specified or selected material of designed thickness placed on a subbase or a subgrade to support a surface course. |
| Blue Tops | Wooden hubs or stakes driven into the subgrade to indicate the finished subgrade elevation. |
| Borrow | Suitable material from sources outside the right-of-way limits of the project, used primarily for embankments. |
| Coarse Aggregate | Aggregate predominately retained on the No. 4 sieve. |
| Crushed Gravel | Crushed angular particles of gravel retained on a No. 10 sieve |
| Crushed Stone | Crushed angular particles of quarried rock retained on a No. 10 Sieve |
| Deleterious Material | Deleterious materials are those materials present in an aggregate that are harmful to the desired properties of the aggregate-binder systems. |
| Dense Graded Aggregate | A well-graded aggregate proportioned to contain a relatively small percentage of voids. |
| Density | The weight per unit volume of a material, usually expressed in pounds per cubic foot. |
| Embankment | The mound of soil, soil-aggregate, or broken rock constructed above the embankment foundation and below the subgrade. |
| Fine Aggregate | Those aggregates which entirely pass the 3/8" sieve, almost entirely pass the No. 4 sieve, and are predominately retained on the No. 200 sieve. |
| Fineness Modulus | A numerical value obtained by adding the total percentages of a sample of the aggregate retained on each of a specified series of sieves and then by dividing the sum by 100. |
| Gradation | A general term used to describe the composition by size of the aggregate particles in a mixture. It is usually expressed as the proportion (percent) of the aggregate that will pass a series of designated standardized sieves. |
| Granular Backfill | Backfill of [illegible] sand, gravel, crushed gravel, crushed stone, or other fragmented material. |
| Manual of Test Procedures (MOTP) | Manual summarizes WisDOT modifications to AASHTO and ASTM [illegible] methods. These "WisDOT Test Modifications" (WTMs) do not list the test step by step, but rather list the referenced AASHTO or ASTM sections which are modified. If there is no WisDOT modification, it is inferred that the technician will follow the AASHTO or ASTM verbatim. Instances where there is no AASHTO or ASTM, WisDOT created "Wisconsin Test Procedures" (WTP) which describe the test step by step in the manual. |
| Moisture Content | The proportion of moisture present in a material, expressed as [illegible] |
| Moisture-Density Relationship | The effect of moisture content on the density of a soil compacted according to specified conditions. |

# Questions?

- Questions?

THANK YOU!

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