



COMMITTEE ON MATERIALS & PAVEMENTS

2018 Annual Meeting – Cincinnati, OH

Monday August 6, 2018

10:15 – 12:15 PM EST

TECHNICAL SUBCOMMITTEE 1a

Soils and Unbound Recycled Materials

I. Call to Order and Opening Remarks

Chairperson Andy Babish of Virginia DOT – Call Meeting to Order
The Technical Subcommittee did not have a COMP ballot in 2017, thus a midyear meeting was not held. There were 11 standards under the stewardship of the subcommittee that were reconfirmed that will be discussed under old business.

II. Roll Call

The Subcommittee Vice Chairperson role is vacant for anyone interested. Kaye Chancellor Davis (AL DOT) is the Research liason for the technical subcommittee. The current listing of voting members is shown below:

| FirstName | LastName | Company | ExternalEmailAddress | MemberType |
|-----------|--------------|---|--------------------------------|------------|
| Becca | Lane | Ontario Ministry Of Transportation | Becca.Lane@ontario.ca | Voting |
| Charles | Babish | Virginia Department of Transportation | andy.babish@vdot.virginia.gov | Voting |
| Clement | Fung | Massachusetts Department of Transportation | clement.fung@state.ma.us | Voting |
| Craig | Wieden | Colorado Department of Transportation | craig.wieden@state.co.us | Voting |
| Daniel | Tobias | Illinois Department of Transportation | daniel.tobias@illinois.gov | Voting |
| Darin | Tedford | Nevada Department of Transportation | dtedford@dot.nv.gov | Voting |
| David | Horhota | Florida Department of Transportation | david.horhota@dot.state.fl.us | Voting |
| Donald | Streeter | New York State Department of Transportation | donald.streeter@dot.ny.gov | Voting |
| James | Williams,III | Mississippi Department of Transportation | jwilliams@mdot.state.ms.us | Voting |
| Jennifer | Pinkerton | Delaware Department of Transportation | Jennifer.Pinkerton@state.de.us | Voting |
| Joe | Feller | South Dakota Department of Transportation | joe.feller@state.sd.us | Voting |
| Jose | Lima | Rhode Island Department of Transportation | jose.lima@dot.ri.gov | Voting |
| Kaye | Davis | Alabama Department of Transportation | chancellor@dot.state.al.us | Voting |
| Mladen | Gagulic | Vermont Agency of Transportation | mladen.gagulic@vermont.gov | Voting |
| Paul | Hanczaryk | New Jersey Department of Transportation | Paul.Hanczaryk@dot.nj.gov | Voting |
| Richard | Douds | Georgia Department of Transportation | rdouds@dot.ga.gov | Voting |
| Robert | Lauzon | Connecticut Department of Transportation | robert.lauzon@ct.gov | Voting |
| Sejal | Barot | Maryland Department of Transportation | sbarot@sha.state.md.us | Voting |



| | | | | |
|---------|---------|---|-----------------------|--------|
| Timothy | Ramirez | Pennsylvania Department of Transportation | tramirez@pa.gov | Voting |
| Travis | Smith | Tennessee Department of Transportation | travis.w.smith@tn.gov | Voting |

III. Approval of Technical Subcommittee Minutes

The Technical Subcommittee did not hold a midyear meeting as there were no 2017 ballot items. Therefore the Subcommittee needs to review and approve the minutes from the 2017 annual meeting held in Phoenix, AZ on August 10, 2017. **See Attachment A for the 2017 annual meeting minutes.**

Action: Approve Technical Subcommittee 2017 Annual Meeting minutes
Motion: ?

IV. Old Business

A. COMP Ballot Items

There were 11 standards reconfirmed in 2017 with some having minor edits based on ballot comments. **The ballot detail report with the comments is shown in Attachment B.** A summary table of the reconfirmed standards with publication comments from the Chair is shown below.

| | |
|------|--|
| T190 | Publish as is, no new edits. |
| T194 | Section 1.4 and 2.3 edited to reflect replacement of R16 (R16 was deleted) with OSHA reference matching other standards. |
| T217 | Section 1.4 and 2.3 edited to reflect replacement of R16 (R16 was deleted) with OSHA reference matching other standards. |
| T220 | Publish as is, no new edits. |
| T226 | Publish as is, no new edits. |
| T236 | Section 6.2 corrected to reference Section 6.1 instead of 5.1 |
| T258 | Publish as is, no new edits. |
| T267 | Section 5.2 edited to reflect same Farenheit reference in Section 3.3 |
| T273 | Publish as is, no new edits. |
| T289 | Section 2.1; reference T2 was removed, Section 3.2 was deleted as it was redundant to Section 9.8 and 11.1 |
| T291 | Section 2.1; reference T2 was removed. |

- 1. Outstanding items from Mid-Year Meeting? – None.
- B. TS Ballots – None.
- C. Task Force Reports –

TF 17-01 - From 2017 Annual Meeting minutes:
AASHTO Re:source/CCRL - Observations from Assessments? Greg Uherek/AASHTO re:source spoke about an issue that came up with T 90 during a

recent assessment; the wording in T 90, Section 6.4, states to roll until the thread begins to crumble and can no longer be rolled; the technician interpreted failure as when the thread began to crack; Uherek asked the tech section to consider clarifying the wording and perhaps add some pictures to the standard. Mark Felag/RI asked whether the pictures in ASTM were helpful, which AASHTO Re:source believes they are.

The Task Force TF 2017-01 was formed to improve the wording of Section 6.4 in T90 and to possibly move non-mandatory language in Note 6 to mandatory language – Task Force will include AASHTO re:source; Greg Uherek, Maria Knacke (Maria Knacke will take the lead), PA, FL, VA, WAQTC (AK will represent WAQTC).

TF 17-01 Update: ?

V. New Business

- A. Research Proposals - ?
 - 1. Quick turnaround RPS
 - 2. Full NCHRP RPS
- B. AASHTO Technical Service Programs Items - ?
- C. NCHRP Issues - ?
- D. Correspondence, calls, meetings

AASHTO Resource inquiry regarding T88:

1) Section 3.1.7 and Note 4, "... *Is this second list of sieves meant to be a complete sieve set that can be used in place of the first sieve set, or is the second list of sieves included only as complementary sieves to the first sieve set?*"

Chair Response: The second list of sieves is not meant to be a complete sieve set that can be used in place of the first sieve set, it is listed as complimentary sieves to obtain more data points and better define the graph if needed. The sieves identified as "normally required" are the sieves needed to distinguish between coarse and fine sands, silts and clays, etc.

2) Section 12.1 and Note 6, "..the number of turns during this minute shall be 60 +/- 5". *Why is the 60+/- 5 turns concept included in a note rather than the procedure? Is it meant to be a suggestion or a requirement?*

Chair Response: The note reads as a requirement ("shall") however notes are not mandatory in Standards. In practice, I understand technicians, at least here, follow it as if it is a requirement. This is an item I will bring up at the committee meeting in August, for discussion and consideration. If the committee agrees, a vote and a ballot item would need to be passed to move this requirement out of the note and into section 12.1 as it is a technical change to the standard.

Action: Does the technical subcommittee agree that the language in Note 6 under Section 12.1 regarding the number of turns be moved from the note to Section 12.1 as part of the procedure? If so, this is a technical change and needs to be balloted.

Motion: ?

- E. Presentation by Industry/Academia - ?
- F. Proposed New Standards - ?
- G. Proposed New Task Forces - ?
- H. Standards Requiring Reconfirmation -

The standards shown in the table below are due for reconfirmation this ballot cycle.

| Std. | Category | Latest ASTM | Steward | Remarks |
|----------------|----------|-------------|-----------------|---|
| M 318-02(2015) | A | | AL, MS | |
| M 319-02(2015) | A | | AL, MD | |
| R 27-01(2015) | A | | NY, RI | |
| R 52-10(2015) | A | | DE, MD | |
| R 58-11(2015) | A | | NV, FHWA, PA | Formerly T-87; revised and changed to a Practice (R). |
| T 100-15 | B | D 854-14 | MA, NC | |
| T 208-15 | B | D 2166-16 | MS, TN | No Precision & Bias statement. |
| T 233-02(2015) | A | | OK, TN | No Precision & Bias statement. |
| T 265-15 | A | | MA, FHWA, OR | Added Precision & Bias statement. |
| T 311-00(2015) | A | | NJ, NY | No Precision & Bias statement. |

I. COMP Ballot Items (including any ASTM changes/equivalencies/harmonization)

VI. Open Discussion

VII. Adjourn



SUBCOMMITTEE ON MATERIALS

2017 Annual Meeting – Phoenix, AZ

Thursday August 10, 2017

8:00 – 10:00 AM MST

MINUTES

TECHNICAL SECTION 1a

Soils and Unbound Recycled Materials

- I. **Call to Order and Opening Remarks** – Chairman; Andy Babish welcomed all to the annual meeting and facilitated introductions and roll call for the membership.

- II. **Roll Call** - Chair called roll of tech section members. There were 14 members present representing their respective DOT's. Those tech section members present at the annual meeting are noted in the membership roster table below.

| present | FirstName | LastName | State | Email | Designation | MemberType |
|---------|-----------|---------------|-------|-----------------------------------|------------------|------------|
| Y | Charles | Babish | VA | andy.babish@vdot.virginia.gov | Chair | Voting |
| Y | Bill | Schiebel | CO | bill.schiebel@state.co.us | Vice Chair | Voting |
| N | Daniel | Tobias | IL | daniel.tobias@illinois.gov | Member | Voting |
| N | Darren | Hazlett | TX | darren.hazlett@txdot.gov | Member | Voting |
| Y | Donald | Streeter | NY | donald.streeter@dot.ny.gov | Member | Voting |
| Y | Kaye | Davis | AL | chancellork@dot.state.al.us | Member | Voting |
| N | Paul | Hanczaryk | NJ | Paul.Hanczaryk@dot.nj.gov | Member | Voting |
| Y | Robert | Lauzon | CT | robert.lauzon@ct.gov | Member | Voting |
| Y | Sejal | Barot | MD | sbarot@sha.state.md.us | Member | Voting |
| Y | Mladen | Gagulich | VT | mladen.gagulich@vermont.gov | Member | Voting |
| Y | Darin | Tedford | NV | dtedford@dot.state.nv.us | Member | Voting |
| Y | David | Horhota | FL | david.horhota@dot.state.fl.us | Member | Voting |
| N | Joe | Feller | SD | joe.feller@state.sd.us | Member | Voting |
| Y | Mark | Felag | RI | mark.felag@dot.ri.gov | Member | Voting |
| Y | Richard | Douds | GA | rdouds@dot.ga.gov | Member | Voting |
| Y | Greg | Stellmach | OR | greg.f.stellmach@odot.state.or.us | Member | Voting |
| N | Jennifer | Pinkerton | DE | Jennifer.Pinkerton@state.de.us | Member | Voting |
| N | Ron | Horner | ND | rhorner@nd.gov | Member | Voting |
| Y | Timothy | Ramirez | PA | tramirez@pa.gov | Member | Voting |
| N | James | Williams, III | MS | jwilliams@mdot.state.ms.us | Member | Voting |
| Y | Becca | Lane | ON | Becca.Lane@ontario.ca | Associate Member | Voting |

New member; Travis Smith – TN Dot. Email: Travis.w.smith@tn.gov. Chair will update roster and notify Evan Rothblatt (AASHTO) and Jack Springer (SOM Secretary).

Vice Chair Bill Schiebel is retiring from Colorado Dot by end of calendar year 2017. The Tech Section is in need of a new vice chair. Andy thanked Bill for all of his help with the tech section and AASHTO, and wished him well. Chair solicited tech section for volunteers to serve in the vice chair role and if anyone is interested in being the Vice-Chair, let Andy know.

Ron Horner of North Dakota retired. North Dakota to name a new representative if desire to continue membership on TS 1a. Chair will update roster and notify Evan Rothblatt (AASHTO) and Jack Springer (SOM Secretary).

Mark Felag no longer member of TS 1a, took another position in RI Dot. Mark Felag indicated Joe Lima will replace him on TS 1a. Email is Jose.lima@dot.ri.gov. Andy thanked Mark for all of his help over the years.

Chair will update roster and notify Evan Rothblatt (AASHTO) and Jack Springer (SOM Secretary).

Action: Chair to update roster with changes noted above and communicate to AASHTO SOM Executive Council.

III. Approval of Technical Section Minutes

The Technical Section's midyear meeting was held January 27, 2017, beginning at 1pm and was adjourned at 1:40pm. Meeting was held in a webinar format. [See pp. 4-7](#) for minutes of Jan 27 Tech Section Meeting.

Action taken: Tech Section midyear meeting minutes were approved as written, Motion – NY, 2nd – FL.

IV. Old Business

A. SOM Ballot Items

All 2016 SOM Ballot Items were addressed at the January 27, 2017 midyear Technical Section Meeting.

B. TS Ballots -

No TS Ballots were conducted.

C. Task Force Reports

No Task Forces are active, no reports at this time.

V. New Business

A. Research Proposals

1. 20-7 RPS - None

2. Full NCHRP RPS - Two Research Need Statements are proposed for TS1a endorsement; [See pp 8-14](#). Kay Davis/AL is the research liaison for TS 1a. She was not present at the meeting but forwarded the proposals. Both of these research proposals were also discussed and endorsed at the TS 1b annual meeting earlier this week. Georgene Geary gave a little more information on one of the proposals (Defining Geotechnical Test and Performance Data), which will need some revisions to the wording in the objective (i.e. the word "consensus"). Mohammed Mulla of NC DOT and Chair of TRB committee AFP30, is the Problem Monitor for both proposals.

Action taken: TS 1a endorsed both research proposals, with understanding that wording of the objective will change. Tech Section gave emphasis to the research problem statement titled "Defining Geotechnical Test and Performance Data for Asset Management and Accelerated Design Benefits". Motion - RI, 2nd - NY.

Andy will follow up with Chair of TS 1b to ensure consistency and communicate 1a actions considering 1b is the lead tech section for these proposals.

- B. AASHTO Re:source/CCRL - Observations from Assessments? Greg Uherek/AASHTO re:source spoke about an issue that came up with T 90 during a recent assessment; the wording in T 90, Section 6.4, states to roll until the thread begins to crumble and can no longer be rolled; the technician interpreted failure as when the thread began to crack; Uherek asked the tech section to consider clarifying the wording and perhaps add some pictures to the standard. Mark Felag/RI asked whether the pictures in ASTM were helpful, which AASHTO re:source believes they are.

Action: Task Force TF 2017-01 was formed to improve the wording of Section 6.4 in T90 and to possibly move non-mandatory language in Note 6 to mandatory language – Task Force will include AASHTO re:source; Greg Uherek, Maria Knacke (Maria Knacke will take the lead), PA, FL, VA, WAQTC (AK will represent WAQTC).

- C. NCHRP Issues **None**
- D. Correspondence, calls, meetings **None**
- E. Presentation by Industry/Academia **None**
- F. Proposed New Standards **None**
- G. Proposed New Task Forces **2017-01 review of T 90 and Note 6 (see above)**
- H. Standards Requiring Reconfirmation

The table below lists the standards that are due for reconfirmation in 2017; Category B stewards are reminded to make sure that any revisions to the ASTM versions are acceptable to the Tech Section

| Std. | Category | Reconfirm Date | Latest ASTM | Steward | Remarks |
|-----------------|----------|----------------|-------------|--------------|--------------------------------|
| T 190-14 | B | 2017 | D 2844-07 | AL, RI | No Precision & Bias statement. |
| T 194-97(2013) | A | 2017 | | NJ, ND | No Precision & Bias statement. |
| T 208-15 | B | 2018 | D 2166-00 | MS, TN | No Precision & Bias statement. |
| T 215-14 | A | 2017 | | RI, VT, OR | No Precision & Bias statement. |
| T 217-14 | A | 2017 | | MA, FHWA, PA | No Precision & Bias statement. |
| T220-66(2013) | A | 2017 | | AL, MS | No Precision & Bias statement. |
| T 226-90(2013) | B | 2017 | D 2664-04 | AL, CO | |
| T 236-08(2013) | B | 2017 | D 3080-04 | MS, TN | No Precision & Bias statement. |
| T 258-81(2013) | A | 2017 | | OK, SD | No Precision & Bias statement. |
| T 267-86 (2013) | A | 2017 | | GA, VT, NJ | No Precision & Bias statement. |
| T 273-86(2013) | A | 2017 | | OK, SD | No Precision & Bias statement. |
| T 289-91(2013) | A | 2017 | | FL, NY | No Precision & Bias statement. |
| T 291-94(2013) | A | 2017 | | FL, NY | No Precision & Bias statement. |

- I. SOM Ballot Items (including any ASTM changes/equivalencies) **None**.

VI. Open Discussion **None**.

VII. Adjourn 8:47 a.m.



SUBCOMMITTEE ON MATERIALS

2017 Midyear Meeting - Webinar

Friday January 27, 2017

1:00 – 3:00 PM EST

MINUTES

TECHNICAL SECTION 1a

Soils and Unbound Recycled Materials

- I. **Call to Order and Opening Remarks**
Andy Babish/VA gave opening remarks.
- II. **Roll Call**
Chair conducted roll call for members. All present required to send Tracy Barnhardt email stating their attendance with contact information. See list of attendees on page 4 of minutes.
- III. **Approval of Technical Section Minutes**
See [attachment 1](#) for Tech Section Minutes from annual meeting held in Greenville, SC, Aug. 4, 2016.
Action: Approve Tech Section Minutes from Annual Meeting held Aug. 4, 2016
Motion: CO, 2nd : AL, motion passed. Minutes approved as written.
- IV. **Old Business**
 - A. SOM Ballot Items
Item 1 - T 176; Section 4.9 revised to include defined process for mixing the working solution..
Affirmative = 43, Negative = 0, No vote = 8

2 states with comments for editorial consideration;

Pennsylvania Department of Transportation (Timothy L Ramirez) (tramirez@pa.gov)

In Section 4.9, 1st sentence, consider revising from "Prepare the working calcium chloride by diluting one measuring tin full (85 +/- 5 mL) of the stock calcium chloride solution to 3.8 L (1 gal) with water." to "Prepare the working calcium chloride by diluting one full measuring tin (85 +/- 5 mL) of the stock calcium chloride solution with 3.8 L (1 gal) of water."

Tech Section members discussed wording proposed by PennDOT and intent of revision balloted (WAQTC champion of revision). After discussion, proposed final wording for publication consideration was;

"Prepare the working calcium chloride solution by diluting one measuring tin full (85 +/- 5 mL) of the stock calcium chloride solution with water until it reaches a total volume of 3.8 L (1 gal)."

WAQTC members present agreed along with TS members, this wording does not change technical intent of standard and provides clarity. The intent of the revised language in Sect. 4.9 is to end up with total volume of solution equal to 1 gal.

Action: Chair to provide proposed final wording to AASHTO publications staff. PennDOT comment was not associated with a negative vote, and this wording change from what was balloted is editorial therefore no further balloting actions necessary.

Kentucky Transportation Cabinet (Allen H Myers) (allen.myers@ky.gov)

In Section 2.1, change the reference from "AASHTO T 248" to "AASHTO R 76".

In the first sentence of Section 6.2, change "T 248." to "R 76".

We agree with New York's comment from the technical section ballot. Should a requirement exist to mix the solution prior to testing? If the solution sits untouched for an extended period, it is possible that the solution has separated and needs remixing.

Action: Chair finds proposed edit to reference R76 instead of T248 appropriate and will edit standard accordingly. TS membership agreed. Chair to provide editorial change to AASHTO publications staff for publishing.

Item 2 – T297; Concurrent ballot item to delete T 297; this is a category C standard.

Affirmative = 43, Negative = 0, No vote = 8

No comments received on the ballot item. Standard will be deleted.

- B. TS Ballots – None to discuss/report on.
- C. Task Force Reports – None to discuss/report on.

V. New Business

- A. Research Proposals -Kaye Chancellor/AL gave an update on research needs. There are no research needs ready to be voted on in August.
 - 1. 20-7 RPS
 - 2. Full NCHRP RPS
- B. AMRL/CCRL - Observations from Assessments? – Marie Knacke with AASHTO Re:source review how labs are handling oversize particle correction with T99 and T180. Tracy Barnhart read the following statement, per Maria Knacke: Now that T 99 and T 180 have the oversize correction implemented into these standards, (AASHTO re:source) assessors are checking the lab on oversize corrections whenever the AASHTO proctor standards (T 99 and T 180) are being performed for an assessment. First, we are making sure that the laboratory has a guideline for when they are performing an oversize correction, and then we have them show us how they calculate and report it. This can be shown through an Excel program they use, and showing a previous report with that being done, or by having them do an oversize correction if it is appropriate for the proctor sample used to demonstrate the test during the AASHTO re:source assessment. To summarize, a laboratory must show AASHTO re:source evidence that they know how to perform the correction. They can perform it for us while we are there, or show us records of completing the correction and applying this to past test results.
- C. NCHRP Issues - Any?
- D. Correspondence, calls, meetings – See **attachment 2** from Craig Wilson, Arizona DOT regarding T190. Apparently there are incorrect dimensions shown on the Tamping Foot Drawing in Section 3.3. The standard stewards are AL and RI.

Action: Review inquiry from AZ dot and make appropriate corrections for 2017 balloting, or are corrections such that can be considered editorial and as such, corrected and published in next publication?

TS members agreed this was an obvious error in the standard and considered correction to be editorial. It appears that the English units were converted incorrectly (typo) however, the SI units are correct. Andy will work with AASHTO Publications to make this correction editorially. No objections from the group. Andy said an advanced figure may be required for the standard. Chair to provide corrections to AASHTO publications staff for publishing.

E. Presentation by Industry/Academia - None

F. Proposed New Standards – Any?

G. Proposed New Task Forces – None?

VI. Open Discussion - None

VII. Adjourn - Andy summarized the action items. Meeting adjourned at 1:40pm.

List of Attendees for Jan. 27 Webinar meeting:

| Name | Email Address | Agency |
|-----------------------|---|------------------------------------|
| Andy Babish | Andy.Babish@VDOT.Virginia.gov > | VA DOT |
| Bill Schiebel | bill.schiebel@state.co.us > | CO DOT |
| Brian Egan | | TN DOT |
| Carole Anne MacDonald | Caroleanne.Macdonald@ontario.ca > | Ministry of Transportation Ontario |
| Charlie Pan | | NV DOT |
| Chris Clarke | | OK DOT |
| Christopher Leibrock | Christopher.Leibrock@ks.gov > | KS DOT |
| Daniel Tobias | Daniel.Tobias@illinois.gov > | IL DOT |
| Darin Tedford | | NV DOT |
| David Horhota | David.Horhota@dot.state.fl.us > | FL DOT |
| Geogene Geary | ggeary@ggfga.com > | GGfGA Engineering, LLC |
| Jimmy Si | | TX DOT |
| Joe Fiello | Joe.Fiello@txdot.gov > | TX DOT |
| John Giannini | John.Giannini@ct.gov > | CT DOT |
| Kaye Chancellor | chancellor@dot.state.al.us > | AL DOT |
| Kenny Seward | KSEWARD@ODOT.ORG > | OK DOT |
| Lyndi Blackburn | blackburnl@dot.state.al.us > | AL DOT |
| Michael Doran | Michael.Doran@tn.gov > | TN DOT |
| Mike Sant | mike.santi@itd.idaho.gov > | ID DOT |
| Mladen Gagulic | Mladen.Gagulic@vermont.gov > | VT DOT |
| Oak Metcalfe | | MT DOT |
| Paul Hanczaryk | Paul.Hanczaryk@dot.nj.gov > | NJ DOT |
| Price Hayes | | OK DOT |
| Richard Izzo | Richard.Izzo@txdot.gov > | TX DOT |
| Ron Horner | rhorne@nd.gov > | ND DOT |
| Roy Capper | Roy.J.Capper@wv.gov > | WV DOT |
| Scott Seiter | | OK DOT |
| Steve Heiser | Steve.Heiser@dot.ny.gov > | NY |
| Tracy Barnhart | tbarnhart@aaashtoresource.org > | AASHTO re:source |
| Uriah Nichols | | OK DOT |
| Warren Lee | Warren.Lee@ontario.ca > | Ministry of Transportation Ontario |

Defining Geotechnical Test and Performance Data for Asset Management and Accelerated Design Benefits

RESEARCH PROBLEM STATEMENT

Geotechnical design, construction and performance monitoring are intimately tied to the collection, interpretation and delivery of geotechnical data. Unfortunately, data is often provided in an informational format that limits operational efficiencies and its future usefulness. Examples of “informational” include reports in PDF or Excel, etc. formats that cannot be readily transferred or applied for new interpretation without manual manipulation (cut and paste). In addition, little to no metadata is conveyed to identify the type, source and reliability of the data.

Access to historic data saves money and time for agencies by reducing the amount of new data required. Time and money is also saved when operational efficiencies are optimized through automation using standardized data structure. Further, the collation of consistently formatted and comparable data across regions will improve design efforts and establish performance expectations, practical measures and aid overall asset management.

Clear definition of data structures for transfer and storage is necessary for consistent, complete data independent of interpretation.

LITERATURE SEARCH SUMMARY

In 2006, a consortium of organizations, including Ohio DOT and FHWA, initiated the Data Interchange for Geotechnical and Geoenvironmental Specialists (DIGGS) standardized schema, which was later revised as DIGGS V2.0 through Ohio DOT funding and in coordination with the Geo-Institute of ASCE. With these efforts complete, the Geo-Institute of ASCE now begins to administer an open-source data structure ready for practice. Currently, geotechnical and geologic test elements have been defined. As a result of limited resources, elements such as geoenvironmental, foundation installation and load testing have been provisionally removed from this system to expedite proof of function. Completion of the existing system and defining elements for subsequent development of the system to meet the needs of transportation agencies will require this funded effort.

RESEARCH OBJECTIVE

The research will develop industry consensus to expand the data dictionary for soil mechanics, structure installation, ground improvement, instrumentation, and potentially performance data sets based on industry needs. Further, this effort will ensure data structures are consistent with existing standards including ASTM, AASHTO testing procedures. Engaging industry interest groups will further ensure a complete and robust object structure for the benefit of transportation assets. The extent of the dictionary test features will be dependent on resources available but may include such items from:

Soil Properties: Density, moisture content and gradation to shear strength, unsaturated behavior, cyclic performance, compressibility, etc. There are approximately 45 tests included in the DIGGS Schema that require final vetting.

Structure Installation: Pile, drilled shaft installation, shallow foundation construction, grouting and ground improvement beneath structures and embankments, wall construction. Recent work on large diameter pipe piles, DTFH61-14-C-00036, reviewed and update the schema for pile load tests and demonstrates the value of data compilation and would serve as a baseline for this effort related to deep foundation load testing.

Performance: Long term management of assets will be dictated by their performance indicators. There is ongoing research to define key metrics of performance. As these indicators are defined (by others), they will be incorporated into the same data structure so that inter related evaluation of an asset can consider the full lifecycle of the structure and its components.

The deliverable for this work would be the online data dictionary. Although the goal will be to have a robust dictionary defined, the open source system would allow future expansion if required.

ESTIMATE OF PROBLEM FUNDING AND RESEARCH PERIOD

Recommended Funding: \$200k

Research Period: 24 months.

URGENCY, PAYOFF POTENTIAL, AND IMPLEMENTATION

Availability of usable data is critical to our ability to make future interpretations, manage existing features or assets, and accelerate future project delivery. Efficient collection, transfer, storage and retrieval of data for design, construction and asset management will save substantial time and money.

Implementation simply requires the data standardized structure to be used as standard practice, and can be achieved through requirements within guidance manuals and standards developed by FHWA and AASHTO, respectively. Maintenance and updating these data structures as required would be managed by the Geo-Institute of ASCE and vetted as needed by AASHTO subcommittees for adoption.

PERSON(S) DEVELOPING THE PROBLEM

Christopher Merklin, P.E., Ohio Department of Transportation, Email: chris.merklin@dot.ohio.gov

Mr. Bradley Keelor, Director, ASCE Geo-Institute, bkeelor@asce.org

Mr. Allen Cadden, Schnabel Engineering, acadden@schnabel-eng.com

PROBLEM MONITOR

Mohammed Mulla, AFP30 Chair, Email: mmulla@ncdot.gov

Cosponsoring Committees and Endorsements:

AFP30, Soil and Rock Properties,

AFS30, Foundations of Bridges and Other Structures

AFP10 (2), Geotechnical Asset Management

AFP20 Geotechnical Site Characterization

Ohio DOT

Missouri DOT

Louisiana DOTD

Louisiana Transportation Research Center

North Carolina DOT

New Hampshire DOT

Colorado DOT

Development of High-Quality Databases of Deep Foundations Load Tests

I. Research Problem Statement

Data at foundation load test sites can be used to verify and optimize the Geotechnical design of foundations in the projects they are used in. In addition, if complete and high-quality data at load test sites are obtained and compiled in databases, they can be used in the future by: a) designers to improve the geotechnical design for production foundations and, more important, b) by researchers in the reliability calibration to develop more accurate and economical foundation geotechnical design methods. Reliability calibration is the best option to develop resistance factors for the geotechnical design methods of foundation and thus for implementation of LRFD. High-quality national, regional, and local deep foundation load tests are still needed in the USA to perform reliability calibration of foundation geotechnical design methods. The contents of these databases are results of load tests, subsurface investigation, construction and quality control (QC) methods, and the conditions employed to obtain these results (e.g., types of: foundations, foundation soils, and construction methods).

As geotechnical practice moved towards LRFD, vast majority of the current LRFD foundation geotechnical design methods were developed based on past experience and judgement. There are only a very small number of reliability-based resistance factors for foundations adopted by AASHTO or State DOTs due to the lack of quality and complete foundation load test databases. The current highway engineering practices emphasize the use of load test results for individual projects, not for future reliability calibration. This could lead to two main problems with the load test data obtained in these projects: a) data is not complete or of good quality (accuracy) for use in the reliability calibration; and b) not reported or compiled for future use. There are variations in the type of data collected at load test sites and the procedures followed for obtaining these data by various State DOTs. There are still issues with the quality of the reported data at load test sites (e.g., clarity, accuracy and completeness), even in some developed load test databases.

Literature Search Summary

Toward developing quality foundation load test databases, the FHWA published in a 2015 TRB paper recommendations to develop and share quality foundation load test databases (Abu-Hejleh et al., 2015), and recently (January 2017) released version 2 of its Deep Foundation Load Test Database, DFLTD, (Petek et al., 2017). The DFLTD v2 includes an updated framework and 150 new load test data for the large size diameter open end driven piles. The database is relational where the records can be queried in numerous ways to include foundation type and size, subsurface soil information, and location. The DFLTD v.2 can be used by Federal and State

agencies, universities, consultants and contractors, design engineers and planners, and research and development professionals.

In addition, several State DOTs and researchers have developed and are now developing their own foundation load test databases (e.g., Florida, Iowa, Louisiana, and Illinois)

Even so, significant work is still needed to develop high-quality national and local databases of deep foundation load tests that include a complete and adequate number of high-quality and complete records of data at load test sites that cover all common foundation design and construction conditions encountered in the United States. The local databases would also allow for reliability calibration of local design methods not covered in AASHTO LRFD.

II. Research Objectives

The proposed research study will benefit from existing work described above toward the achieving the following objectives:

- Develop/finalize a national protocol to obtain and report quality/complete/consistent data at new load test sites, and to identify and compile existing quality load test data that were not reported in the load test databases.
- Develop/finalize the framework for a quality foundation load test database to store the data collected at load test sites and provide the information needed by designers and researchers for the two applications discussed above. This database should be available online, in line with the developed national protocol, flexible so that it can be easily updated, changed, and expanded, and have appealing and user-friendly interface.
- Develop a national quality database for deep foundation load tests using available data. It should include the reported quality and complete load test data, for example in the existing load test databases, like DFLTD, v2 (review these databases), and the available quality load test data that are not documented.
- Develop recommendations to help State DOTs develop their foundation load test databases using the 3 products described above.
- Develop guidance and examples for applications and limitations of foundation load test databases.
- Develop recommendations for sharing, updating, and maintaining of the national and local foundation load test databases.

ESTIMATE OF PROBLEM FUNDING AND RESEARCH PERIOD

\$300,000 over a period of 3 years.

URGENCY, PAYOFF POTENTIAL, AND IMPLEMENTATION

This research study will help move the geotechnical design of deep foundations to true reliability-based design, which is the best option for LRFD implementation since it will lead to development of more accurate and economical foundation geotechnical methods. These advantages will increase the confidence in design methods for foundations and reduce significantly the cost for construction of foundations. Reliability calibration requires development of quality foundation load test databases. Although, there have been some noble efforts in the development of such databases, there is still urgent need to develop a better and complete national foundation load test database and a national protocol to obtain and report data at load test sites. It is a crucial need at this time since the vast majority of the current LRFD foundation geotechnical design methods are developed based on past experience and judgement, not reliability calibration.

Implementation of the results of this research study can be immediate. State DOTs, consultants, and researchers would have access to use the data in the national database. The study recommendations should be discussed and implemented through collaboration between national and state transportation agencies (AASHTO, FHWA, State DOTs, ASCE, DFI, ADSC, and PDCA). This collaboration can happen in conferences, like TRB, and led by AASHTO and/or FHWA. One of the outcomes of this collaboration is to how to maintain and update the national database for foundation load test databases. The State DOTs may need to sponsor research studies to benefit from the work performed in this study and implement it to develop their foundation load test databases.

PERSON(S) DEVELOPING THE PROBLEM

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PROBLEM MONITOR

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Cosponsoring Committees and Endorsements:

AFP30, Soil and Rock Properties,

AFS30, Foundations of Bridges and Other Structures

AFP10 (2), Geotechnical Asset Management

AFP20 Geotechnical Site Characterization

Ohio DOT

Alabama DOT

New Mexico

Missouri DOT

Louisiana DOTD

Louisiana Transportation Research Center

North Carolina DOT

New Hampshire DOT

Colorado DOT

AASHTO Electronic Balloting System Ballot Detail Report

Ballot Detail

Ballot Name: TS1a Reconfirmation Ballot 2017

Ballot Manager: Evan Rothblatt

Ballot Start Date: 11/13/2017

Ballot Due Date: 1/5/2018

TS1a Reconfirmation Ballot 2017

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| Item Number: | 1 |
| Description: | Reconfirm T190 -Resistance R-Value and Expansion Pressure of Compacted Soils |
| Decisions: | <p>Affirmative: 21 of 21 Negative: 0 of 21 No Vote: 0 of 21 No Comments</p> |

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| Item Number: | 2 |
| Description: | Reconfirm T194 -Determination of Organic Matter in Soils by Wet Combustion |
| Decisions: | <p>Affirmative: 21 of 21 Negative: 0 of 21</p> |

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| No Vote: 0 of 21 |
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| Agency (Individual Name) | Comments | Decision | Response Attachment |
|--|---|-------------|--|
| New York State Department of Transportation (Donald Streeter) (donald.streeter@dot.ny.gov) | <p>Is a hazard statement needed, or is reference to R-16 ok. other standards say:</p> <p>1.1. This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.</p> | Affirmative | Section 1.4 changed to match other standards |

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| Item Number: | 4 |
| Description: | Reconfirm T217 - Determination of Moisture in Soils by Means of a Calcium Carbide Gas Pressure Moisture Tester |
| Decisions: | <p>Affirmative: 21 of 21</p> <p>Negative: 0 of 21</p> <p>No Vote: 0 of 21</p> |

| Agency (Individual Name) | Comments | Decision | Response Attachment |
|--|---|-------------|--|
| New York State Department of Transportation (Donald Streeter) (donald.streeter@dot.ny.gov) | <p>Is a hazard statement needed, or is reference to R-16 ok. other standards say:</p> <p>1.1. This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety concerns associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.</p> | Affirmative | Section 1.4 changed to match other standards |

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| Item Number: | 5 |
| Description: | Reconfirm T220 - Determination of the Strength of Soil–Lime Mixtures |
| Decisions: | <p>Affirmative: 21 of 21 Negative: 0 of 21 No Vote: 0 of 21 No Comments</p> |

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| Item Number: | 6 |
| Description: | Reconfirm T226 - Triaxial Compressive Strength of Undrained Rock Core Specimens without Pore Pressure Measurements |
| Decisions: | <p>Affirmative: 21 of 21 Negative: 0 of 21 No Vote: 0 of 21 No Comments</p> |

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| Item Number: | 7 |
| Description: | Reconfirm T236 - Direct Shear Test of Soils under Consolidated Drained Condition |
| Decisions: | <p>Affirmative: 21 of 21 Negative: 0 of 21 No Vote: 0 of 21</p> |

| Agency (Individual Name) | Comments | Decision | Response Attachment |
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| New York State Department of Transportation (Donald Streeter) (donald.streeter@dot.ny.gov) | Section 6.2 states in the last sentence " trimmed as in Section 5.1." It | Affirmative | Corrected editorially. |

should read "trimmed as
in Section 6.1."

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| Item Number: | 8 |
| Description: | Reconfirm T258 - Determining Expansive Soils |
| Decisions: | <p>Affirmative: 21 of 21 Negative: 0 of 21 No Vote: 0 of 21 No Comments</p> |

| Agency (Individual Name) | Comments | Decision | Response Attachment |
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| Item Number: | 9 |
| Description: | Reconfirm T267 - Determination of Organic Content in Soils by Loss on Ignition |
| Decisions: | <p>Affirmative: 21 of 21 Negative: 0 of 21 No Vote: 0 of 21</p> |

| Agency (Individual Name) | Comments | Decision | Response Attachment |
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| Oregon Department of Transportation (Greg Frank Stellmach) (greg.f.stellmach@odot.state.or.us) | Editorial - Should there be a Fahrenheit equivalent in Section 5.2? Assume that it would be the same as it is in Section 3.3. | Affirmative | F equivalent of 833 +/- 18 added. |
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| Item Number: | 10 |
| Description: | Reconfirm T273 - Soil Suction |
| Decisions: | |

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| | Affirmative: 21 of 21 Negative: 0 of 21 No Vote: 0 of 21 No Comments |
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| Item Number: | 11 |
| Description: | Reconfirm T289 - Determining pH of Soil for Use in Corrosion Testing |
| Decisions: | Affirmative: 21 of 21 Negative: 0 of 21 No Vote: 0 of 21 |

| Agency (Individual Name) | Comments | Decision | Response Attachment |
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| Oregon Department of Transportation (Greg Frank Stellmach) (greg.f.stellmach@odot.state.or.us) | Does the reference to T2 in this test procedure make sense? I am not familiar with this test procedure, but I was surprised to see T2 called out. If it is appropriate for this test procedure, then the reference should be updated to the new standard that is being voted on this year. | Affirmative | The scope includes soil-aggregates, most likely the reason for the T2 reference. But T2 is not mentioned in the standard so it was removed. |
| New York State Department of Transportation (Donald Streeter) (donald.streeter@dot.ny.gov) | not sure what 3.2 is saying. | Affirmative | Agree. 3.2 mentions conformance to a specification but this is a Test procedure, not a specification. Section 11.1 addresses rounding, therefore Section 3.2 was removed, as it was redundant |

ATTACHMENT B

and potentially
confusing.

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| Item Number: | 12 |
| Description: | Reconfirm T291 - Determining Water-Soluble Chloride Ion Content in Soil |
| Decisions: | Affirmative: 21 of 21 Negative: 0 of 21 No Vote: 0 of 21 |

| Agency (Individual Name) | Comments | Decision | Response Attachment |
|---|--|-------------|---|
| Oregon Department of Transportation (Greg Frank Stellmach) (greg.f.stellmach@odot.state.or.us) | Does the reference to T2 in this test procedure make sense? I am not familiar with this test procedure, but I was surprised to see T2 called out. If it is appropriate for this test procedure, then the reference should be updated to the new standard that is being voted on this year. | Affirmative | The scope includes soil-aggregates, most likely the reason for the T2 reference. But T2 is not mentioned in the standard so it was removed. |

Date: 1/11/2018