

SUBCOMMITTEE ON MATERIALS

Mid-Year Web Meeting
Wednesday, February 11, 2015
1:00 pm - 2:30 pm EST

TECHNICAL SECTION 5b ENVIRONMENTAL QUALITY MEASURES

I. Call to Order and Opening Remarks

II. Roll Call

- A. New Vice Chair – If anyone else has an interest in being Vice Chair, contact the Chair (Jack Cowsert)
- B. Requests for Membership

| Voting Members | | | | | |
|--------------------|----------------------|---|-------------------|---------------|---|
| Cowsert, Jack E. | North Carolina–Chair | X | Mullis, Cole F. | Oregon | |
| Stolarski, Phil J | California | | Farley, Paul M | West Virginia | |
| Burnett, Robert A. | New York | X | | | |
| Non-Voting Members | | | | | |
| San Angelo, Mike | Alaska | X | Pan, Charlie | Nevada | X |
| Rish, Ian | Georgia | X | Felag, Mark | Rhode Island | X |
| Geary, Georgene | Georgia | X | Kaulfers, David | Virginia | X |
| Rabun, JT | Georgia | X | Dasgupta, Shovini | Ontario, CA | X |
| Mueller, Matt | Illinois | X | Amir, Hanna | NAS | X |
| Joubert, Harris | Louisiana | X | Barnhart, Tracy | AMRL | X |
| Kahl, Steven | Michigan | X | Lacinak, Henry | AASHTO | X |
| Syslo, Mick | Nebraska | X | | | |

III. Approval of Technical Section Minutes

- Bob Burnett – moved to approve the meetings
- Jack Cowsert – second

IV. Old Business

- A. SOM Ballot Item
 - i. R16 list of chemicals used in various standards, became very outdated and we balloted for removal
 - 1. Negative from Michigan (Attachment 1) Steven Kale from Michigan spoke; MIOSHA regulations reference this type of information; Bob Burnett suggested finding out if other organizations reference the standard before removing it; would need reconfirmation since it has an '09 date; need someone to look at the current standard and also determine if it's being used – is there any value in keeping it? Steven volunteered to help out and Jack Cowsert will also

participate – are there any chemists in the states that might be interested?
Suggestion made to form a Task Group – “Bob” volunteered to help, Ontario
Ministry of Transportation rep will investigate with their organization and will
get back to; motion made to find negative persuasive, which passed

2. Standards referencing R16:

T: 21, 42, 44, 65, 71, 88, 103, 104, 111, 113, 164, 194, 201, 202, 210, 211, 213,
217, 218, 219, 232, 233, 240, 303.

M: 252,278,294,304,330.

R: 59

- B. TS letter ballots
 - i. Reconfirmation of R8, R21 and R22.
- C. Task Force Reports

V. New Business

- A. Research Proposals Georgene gave a brief overview and wanted to make sure TS 5b was aware of what has been going on; Jack requested support for the NCHRP Problem Statement from the states; Jack asked if anyone has an interest in recyclable materials as used in SOM to contact him – the recycling task force is still on the books; Jack is the research liaison for TS 5b – if you have any research ideas, contact him
 - i. Recommendations from Membership
 - ii. NCHRP Problem Statement 2016-D-11 (Attachment 2)
- B. AMRL/CCRL Issues not sure that we have any
- C. NCHRP Issues previously discussed we have one problem statement that revolves around recycling - a Task Group has been formed; Amir spoke in general terms about research projects
- D. Correspondence, calls, meetings not aware of any that relate to 5b
- E. Proposed New Standards not aware of any
- F. Proposed New Task Forces previously discussed
- G. Standards Requiring Reconfirmation Task Group will handle issues with R 16
- H. SOM Ballot Items not aware of any

VI. Open Discussion

Cricket chirping...no comments

- VII. Adjourn Mark Felag reminded everyone to register early for SOM meeting and to make hotel reservations; meeting adjourned at 1:41 p.m. but some people stayed on the line for Q&A session

AASHTO Electronic Balloting System
Ballot Summary Report for TS 5b

Ballot Detail

Ballot Number: SOM-14-02

Technical Section 5b

Attachment(s): [TS 5b Final.pdf](#)

| | |
|---------------------|---|
| Item Number: | 106 |
| Description: | SOM ballot item to discontinue R16: Regulatory Information for Chemicals. See page of the 4 of the minutes. |
| Decisions: | Affirmative: 45 of 53 Negative: 1 of 53 No Vote: 7 of 53 |

| Agency (Individual Name) | Decision |
|--------------------------|----------|
|--------------------------|----------|

| | | |
|---|--|-----------------|
| Michigan Department of Transportation (John F Staton) (statonj@michigan.gov) | R16: 29CFR 1910.1200 is an integral part of the Michigan OSHA (MIOSHA) requirements. Regardless of whether or not the information is available on the web, the MIOSHA states that Hazard Communication must be (at least) in conformance with federal regulations. If these requirements are removed, there will be an empty reference in the MIOSHA regulations. Through recent dialogue, it is deemed certain that the MIOSHA will not take it upon itself to modify their regulation simply to accommodate this proposed change. By discontinuing this part of the federal regulations 29CFR, it leaves the Michigan DOT in noncompliance with the MIOSHA. Michigan DOT feels strongly against discontinuation of this CFR requirement. | Negative |
|---|--|-----------------|

I. PROBLEM NUMBER**2016-D-11****II. PROBLEM TITLE (HSOM Rank 3)**

Utilizing Technology to Productively Use Marginal Materials

III. STATEMENT OF THE RESEARCH PROBLEM

Over 200M tons of construction debris are landfilled every year worldwide. An additional 50+M tons of coal combustion by-products are disposed in the US, often because they do not meet existing standards (i.e., they are “marginal”). Both examples represent unrealized opportunities for productive reutilization, with potential savings in costs and more efficient allocation of resources.

Advances in nanoscience and nanotechnology can be used to expand upon the productive utilization of marginal and recycled materials in new construction. That is, nanomanufacturing, and nanotechnology-derived processing or processing methods which rely upon nanoscale characterization can be used to transform otherwise waste or marginal materials into components beneficial in transportation infrastructure applications. While such materials may not meet existing prescriptive-based requirements prior to the application of nano-science or nano-technology derived technology, when transformed and/or utilized appropriately, desired performance may be achieved. Such utilization strategies, however, must meet short and long-term performance requirements, be economically viable and contribute to sustainable development.

With hundreds of millions of tons of construction debris and marginal material disposed every year, development of new opportunities for productive reuse in the transportation sector will provide benefits such as:

- Reduction in amounts of material landfilled and stored
- Reduction in mining of virgin materials, leading to a lower resource demand
- Contributions to sustainability by the substitution of virgin materials with lower embodied energy and lower embodied pollution recycled or marginal materials
- Development of new types of materials, which utilize recycled or marginal materials and which find high utilization rates in transportation infrastructure
- Development of new technologies, derived from the growing nanoscience and nanotechnology knowledge base
- Reductions in cost, without sacrificing performance or even enhancing performance.

Given the tremendous amounts of concrete (~25Bt), asphalt (~0.8Bt) and steel (~1Bt) consumed annually, the potential for impact –through even small improvements in cost and environmental footprint – is enormous.

IV. LITERATURE SEARCH SUMMARY

NCHRP Synthesis 435 – Recycled Materials and Byproducts in Highway Applications recently documented in high detail the status of recycling in State DOT applications and even looked at possible modifications to transform marginal materials into suitable materials; but looked mainly at typical methods, such as special stockpiling or cement stabilization. Rather than to incrementally contribute to any of the existing practices, the goal of this research is to spur the identification of new opportunities for use of recycled and marginal materials and to identify new processes for incorporation of recycled and marginal

materials which overcome existing barriers to their utilization in transportation infrastructure. Proposed research should be highly innovative, not incremental. In particular, research approaches must take advantage of recent advances in nanotechnology, nanomaterials, and nanomanufacturing to be viewed as innovative.

TRR 2142 identified several potential areas of improvement including nanoporous thin film technology to coat marginal materials and nanomodifiers to improve concrete mixture properties. A review of the Research in Progress (RIP) database identified one project by the Southwest region UTC looking at self-heating and self-healing pavements with nanotechnology, but no projects looking at marginal or recycled materials.

V. RESEARCH OBJECTIVE

The overall objective is to identify and develop new commercially-viable pathways, which apply nanoscience and/or nanotechnology, for increased utilization of marginal and recycled materials. Applications must support needs in transportation infrastructure, in an economical manner and contribute or potentially contribute to sustainable development.

Of interest are recycling of infrastructure materials, including asphalt concrete, portland cement concrete, and structural steel by novel processes or to create new materials. Also of interest, is the productive utilization of marginal materials; these may include industrial by-products which do not meet current prescriptive specifications for reuse, and, materials whose properties or anticipated performance are uncertain and/or variable. The developed materials could be used as a substitute or as an additive to currently used materials used in transportation infrastructure construction. The result will be a documentation of the method and materials identified, including an AASHTO Standard specification for the process.

VI. ESTIMATE OF PROBLEM FUNDING AND RESEARCH PERIOD

\$500,000 and 24 months

VII. PERSONS DEVELOPING THE PROBLEM

TRB AFN15T Task Force on Nanotechnology in Concrete (TF Chair- Georgene Geary, Georgia DOT)

VIII. PROBLEM MONITOR

To be recommended by NCHRP or AASHTO SOM

IX. DATE AND SUBMITTED BY

AASHTO Subcommittee on Materials Technical Section 3c & 5b

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