



TECHNOLOGY COUNCIL MEETING
Summer Conference, Long Beach, CA
Wednesday, June 28, 2017

NOTE: These are not the official minutes until approved by Technology Council

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MAJOR MOTIONS PASSED
 Summer Conference, Long Beach, CA
 Wednesday, June 28, 2017

Motion #	Description
1	That Technology Council recommend to the Board that the National Institution of Building Sciences (NIBS) be approved as a co-sponsor to the proposed new standard project, <i>Standard for the Application of Building Information Modeling</i> with ASHRAE as the lead organization.
2-17	That the consent agenda for motions 2-17 with no unresolved commenters and no negative votes from the project committee or Standards Committee be approved for publication.
18-20	That the consent for motions 18-20 with no unresolved commenters and no negative votes be approved for publication.
21-43	That the consent agenda motions 21-43 with no unresolved commenters and no negative votes be approved for publication I.
44	That Tech Council approve a Special Project and allocate funding for the Multi-family Residential Design Guide.
45	That Technology Council request that 6% in lieu of 4% be transferred from the Research Reserve fund for the next two years (17-18, 18-19).
46	That the Residential Building Committee's (RBC) Manual of Procedures (MOP) be approved as submitted.
47	That Technology Council recommend that the Board of Directors (BOD) ExCom initiate a revision of the <i>Filtration and Air Cleaning</i> position document (PD).
48	That Technology Council reaffirm the <i>Indoor Air Quality</i> PD.
49	Research project 1614-TRP, <i>Developing a Test Method to Determine the Effectiveness of UVC Systems on Commercial Cooking Effluent</i> , was awarded to the Syracuse University for a period of 18 months at a total cost to ASHRAE of \$199,292.
50	Research project 1711-TRP, <i>Advanced Sequences of Operation for HVAC Systems – Phase II Central Plants and Hydronic Systems</i> , was awarded to the Taylor Engineering for a period of 24 months at a total cost to ASHRAE of \$160,000.
51	Research project 1720-TRP, <i>Validation of Gas-phase Air-cleaner Performance Test Method (Standard 145.2) by Laboratory Testing of Commercially Available Filtration Devices</i> , was awarded to RTI International for a period of 24 months at a total cost to ASHRAE of \$149,832.
52	Research project 1756-TRP, <i>Evaluation of Particle Sensors for Indoor Air Quality Monitoring and Smart Building Systems</i> , was awarded to Ohio State University for a period of 18 months at a total cost to ASHRAE of \$118,591.

ACTION ITEMS
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 Wednesday, June 28, 2017

AI#	Responsibility	Status	Summary
1	RBC		<i>Capture the historical residential transactions and hard copy documents and request that those be a part of ASHRAE's 125 year anniversary.</i>
2	OPS		<i>Review the Tech Council Budget and prioritize programs.</i>
3	Nominations Ad Hoc		<i>Expand the scope to include recommendations for nominations for Stds, RAC, TAC, EHC and REF.</i>
4	Staff	Done	<i>Doodle Poll Tech Council for webinar date in late July to review MBOs of reporting committees.</i>

MINUTES
TECHNOLOGY COUNCIL MEETING
Summer Conference, Long Beach, CAV
Wednesday, June 28, 2017

Voting Members Present

Pat Graef, Chair
Ginger Scoggins, Vice Chair
Dan Int-Hout
Tom Lawrence
Bill Walter
Jaap Hogeling
Ken Fulk
Charlie Culp
John Harrod
Byron Jones
Mark Modera
Doug Reindl

Non-Voting Members Present

Mike Bilderbeck
Art Giesler
Rita Harrold
Wane Baker
Lan Chi Nguyen Weekes
Cesar Lim
Max Sherman

Absent

Karim Amrane
Kelley Cramm
Steve Emmerich
Kishor Khankari
Chris Mathis
Nicholas Shockley

Guests

Matt Clark, Carrier
Martin Dieryckx, TechC
Craig Drumheller, NAHB
Larry Markel, TechC
Van Baxter, TechC

ASHRAE Staff

Steve Hammerling, AMORTS
DD Latham, Admin. Asst.
Susan LeBlanc, Standards Admin
Lilas Pratt, MOSP
Stephanie Reiniche, DOT
Jim Scarborough, Manager - Grassroots Government Affairs
Alice Yates, Director - Government Affairs

1. CALL TO ORDER

Meeting was called to order at 9:15 AM by Chair, Pat Graef. Members were reminded of the Code of Ethics and a link was included on the agenda. Agenda was presented and the council was asked for any modifications. The following change was made:

- The ASHRAE DC office update was added to the agenda due to the TechC Planning meeting scheduled for the day before being canceled.

Secretary's Note: Quorum was met with 11 voting members plus the Chair in attendance at the start of the meeting.

2. ASHRAE DC OFFICE REPORT

Alice Yates and Jim Scarborough reported on the activities of the Washington office, highlighting some of the more recent notable activities and GGAC's recommendations regarding office mission and direction. A copy of their Power Point presentation is available on Basecamp. (See 07 GGAC Year End Staff Report.)

3. STANDING COMMITTEE REPORTS – All reports can be found on ASHRAE's Basecamp page in the 2017 Long Beach folder (under Meetings).

A. STANDARDS (See 03A-StdC Report)

1. It was moved by Bill Walter and seconded that:

- M1** Technology Council recommend to the Board that the National Institution of Building Sciences (NIBS) be approved as a co-sponsor to the proposed new standard project, *Standard for the Application of Building Information Modeling* with ASHRAE as the lead organization.

BACKGROUND: Standards Committee approved the development of a new project titled, *Standard for the Application of Building Information with Modeling*. This request for co-sponsorship will also require approval by the Board of Directors in addition to the approval of the new project. As part of this project, NIBS is granting ASHRAE copyright to use the *National BIM Guide for Owners* as the basis of the new standard.

TechC 11-0-0, CNV (Yes-No-Abstain)

Consent motions 2-43 have no unresolved commenters and no negative votes from the project committee or Standards Committee for publication approval. Several motions were removed because members of the Council were voting members of the project committee.

It was moved by Bill Walter and seconded that motions 2 to 17 be approved as a consent agenda for publication.

M2-M17

2. BSR/ASHRAE Addendum a (*adds the zeotropic refrigerant blend R-125/134a/143a/227ea/600a*) to ANSI/ASHRAE Standard 34-2016, *Designation and Safety Classification of Refrigerants*.
3. BSR/ASHRAE Addendum b (*adds zeotropic refrigerant blend R-1234yf / 134a / 152a*) to ANSI/ASHRAE Standard 34-2016, *Designation and Safety Classification of Refrigerants*.
4. BSR/ASHRAE Addendum d (*blend R-32 / 125 / 143a / 134a / 600*) to ANSI/ASHRAE Standard 34-2016, *Designation and Safety Classification of Refrigerants*.
5. BSR/ASHRAE Addendum e (*harmonizes verbiage with ISO 817: Refrigerants – Designation and Classification, regarding the use of Molar Mass versus Molecular Mass*) to ANSI/ASHRAE Standard 34-2016, *Designation and Safety Classification of Refrigerants*.
6. BSR/ASHRAE Addendum b (*modifies the language regarding controls for on-demand ventilation systems*) to ANSI/ASHRAE Standard 62.2-2016, *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*.
7. BSR/ASHRAE Addendum d (*allows for a single-point blower door test result to be used when determining variable ventilation options*) to ANSI/ASHRAE Standard 62.2-2016, *Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings*.
8. BSRASHRAE/IES Addendum b (*updates the reference for cool roof determination from CRRC-1 to CRRC-S100*) to ANSI/ASHRAE/IES Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*.
9. BSR/ASHRAE/IES Addendum c (*clarifies that rooftop monitors are included in the definitions of fixed and operable metal framed vertical fenestration*) to ANSI/ASHRAE/IES Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*.

10. BSR/ASHRAE/IES Addendum d (clarifies that future work under phased permitting should comply with the current prescriptive requirements for compliance) to ANSI/ASHRAE/IES Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*.
11. BSR/ASHRAE/IES Addendum e (clarifies that piping losses shall not be modeled in the proposed design or budget building design) to ANSI/ASHRAE/IES Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*.
12. BSR/ASHRAE/IES Addendum f (requirements for the capacity used for selecting the system efficiency in Appendix G) to ANSI/ASHRAE/IES Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*.
13. BSR/ASHRAE/IES Addendum i (addresses a possible loophole to Demand Controlled Ventilation requirements) to ANSI/ASHRAE/IES Standard 90.1-2016, *Energy Standard for Buildings Except Low-Rise Residential Buildings*.
14. BSR/ASHRAE Addendum a (revises Section A3 of Normative Appendix A – Health Care Facilities) to ANSI/ASHRAE Standard 188-2015, *Legionellosis: Risk Management for Building Water Systems*.
15. BSR/ASHRAE Addendum b (adds definition of “construction documents”, removes permissive language) to ANSI/ASHRAE Standard 188-2015, *Legionellosis: Risk Management for Building Water Systems*.
16. BSR/ASHRAE Addendum c (revises Sections A4, A5, A6 of Normative Appendix A – Health Care Facilities) to ANSI/ASHRAE Standard 188-2015, *Legionellosis: Risk Management for Building Water Systems*.
17. BSR/ASHRAE Addendum e (modifies Section 4, “Compliance” for clarification) to ANSI/ASHRAE Standard 188-2015, *Legionellosis: Risk Management for Building Water Systems*.

TechC 11-0-0, CNV (Yes-No-Abstain)

The following motions 18-20 were removed from the consent agenda due to a member being a voting member of the Project Committee. Motions 18 -20 were then moved as a consent agenda for publication approval by Bill Walter and seconded.as follows.

M18-20

18. BSR/ASHRAE Addendum b (removes a restriction on the use of higher flammability refrigerants when used in small in portable unit systems) to ANSI/ASHRAE Standard 15-2016, *Safety Standard for Refrigeration Systems*.
19. BSR/ASHRAE Addendum c (allows the use of OEL values as the refrigerant detector set point for refrigerating machinery rooms) to ANSI/ASHRAE Standard 15-2016, *Safety Standard for Refrigeration Systems*.
20. BSR/ASHRAE Addendum d (expands on the design and operational requirements intended to prevent over servicing of aircraft engines) to ANSI/ASHRAE Standard 161-2013, *Air Quality within Commercial Aircraft*, be approved for publication.

TECHC VOTE: 10-0-1¹, CNV (Yes-No-Abstain)

¹ Byron Jones abstained because he is a member of the SSPC.

The following motions 21-43 were pulled from the consent agenda due to a council member being a voting member of the Project Committee. Motions 21-43 were then moved as a consent agenda for publication approval by Bill Walter and seconded as follows.

M21-43

21. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *ac* (*augments requirements for demand response*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
22. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *ad* (*changes the requirements for permanent projections (such as balconies, overhangs, or shading devices)*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
23. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *ae* (*adds new Section 5.3.8, which addresses plans for the treatment of waste materials*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
24. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *ag* (*creates a new definition for plants that are suitable for inclusion in this standard*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
25. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *am* (*modifies the roof heat island mitigation section that was previously changed via addendum i*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
26. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *au* (*provides additional requirements for irrigation systems to improve water use efficiency*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
27. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *av* (*simplifies the application of lighting power allowances in ASHRAE/USGBC/IES Standard 189.1 and increases their stringency*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
28. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bb* (*adds a new requirement to Section 7 to display energy use in support of existing requirements in Section 10.3.2.1.3.2*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
29. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bh* (*revises the requirements in ASHRAE/USGBC/ IES Standard 189.1 Table B-1*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
30. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bi* (*revises the requirements in ASHRAE/USGBC/ IES Standard 189.1 Table B-5*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.

31. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bj* (*revises the requirements in ASHRAE/USGBC/ IES Standard 189.1 Table B-6*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
32. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bk* (*revises the requirements in ASHRAE/USGBC/ IES Standard 189.1 Table B-12*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
33. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bl* (*revises the requirements in ASHRAE/USGBC/ IES Standard 189.1 Table B-9*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
34. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bo* (*broadens and simplifies the existing definition of “sidelighting effective aperture”*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
35. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bp* (*updates existing requirements for the emissions or VOC content in adhesives and sealants*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
36. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bq* (*updates the existing requirements for the emissions or VOC content for paints and coating materials*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
37. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *br* (*updates the existing requirements for the emissions for floor covering materials*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
38. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bs* (*updates the existing requirements for the emissions for ceiling and wall assemblies*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
39. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bt* (*updates requirements for building envelope airtightness testing*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
40. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bu* (*revises the efficiency requirements in Table B-2*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
41. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bv* (*updates the centrifugal chiller requirement for Kadj, which currently exists as a footnote to Table B-3*) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.

42. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *bz* (updates Normative Appendix B) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.
43. Standards Committee recommends that BSR/ASHRAE/ICC/USGBC/IES Addendum *cd* (revises the daylight requirements in Section 8.4, “Prescriptive Compliance Path,” and Section 8.5, “Performance Option.”) to ANSI/ASHRAE/USGBC/IES 189.1-2014, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*, be approved for publication.

TECHC VOTE: 10-0-1², CNV (Yes-No-Abstain)

B. TECHNICAL ACTIVITIES (See 03B-TAC Rprt)

Chair Mike Bilderbeck updated Tech Council on TAC Activities. There were no pending motions.

C. ENVIRONMENTAL HEALTH (See 03C-EHC Rprt)

Chair Wane Baker updated Tech Council on EHC Activities. There were no pending motions.

D. REFRIGERATION (See 03D-REF Rprt)

REF Staff Liaison, Steve Hammerling, updated Tech Council on REF activities. There were no pending motions.

E. RESIDENTIAL (See 03E-RBC-Rprt)

Chair Max Sherman updated Tech Council on RBC Activities. He reported on the status of RTAR and Work Statement for the Multi-family Residential Design Guide and the need for additional funding to augment the monies allocated from the Research Fund.

It was moved by Jaap Hogeling and seconded by Dan Int-Hout that:

- M44** The Technology Council approve a Special Project and allocate funding for the Multi-family Residential Design Guide.

Background: The project has a total budget of \$195K. An RTAR and Work Statement for a residential guide on multi-family buildings were submitted to RAC and conditionally approved at their spring meeting. The Residential Building Committee (RBC) implemented the changes requested as part of the conditional approval and approved the PES membership at the Long Beach meeting (6-0-1 CNV). The funding is expected from the following sources:

- \$15K from PEAC money allocated for this use.
- \$30K originally allocated for a residential conference
- \$50K from SP budget
- \$53.6K from reallocated money in Standards budget
- ~\$45K from Research Fund (difference between other monies and budget)

² Tom Lawrence abstained because he is a member of the SSPC.

TechC 11-0-0, CNV (Yes-No-Abstain)

AI#1 - RBC to capture the historical residential transactions and hard copy documents and request that those be a part of ASHRAE's 125 year anniversary.

F. RESEARCH ADMINISTRATION (See 03F-RAC)

Dan Int-Hout moved and it was seconded that:

- M45** Technology Council request that 6% in lieu of 4% be transferred from the Research Reserve fund for the next two years (17-18, 18-19).

Background: Current Research Reserve Fund balance is \$5.5 million. This change would add \$110,000.00 to the Research Budget for spending in the next two years. Our budget is tight for the next two years to meet expected expenditures. Current commitments for FY 17-18 total to \$1,601,492 (excluding the three flammable refrigerant projects). If all eight TRPs that were awarded in Long Beach are under contract in the first quarter of FY 17-18, we will incur an estimated \$590,000 in additional commitments for that year for a total of \$2,191,492. The draft FY 17-18 budget for projects, grants and awards is \$2,550,200, which excludes funds transferred from Research fund for expedited A2L research. Full draft research budget amount for FY 17-18 is currently \$3,389,900.

At this point, there are approximately a dozen work statements that were considered in Long Beach for bid this fall. If all of these projects were to bid this fall, that would add \$601,023 in additional funding commitments to FY 17-18 leaving RAC with only \$347,685 that could be allocated to new project payments for work statements approved at the fall meeting, project cost extensions, and possible URPs, grants or Co-RPs, in FY 17-18.

TECHC VOTE: 11-0-0, CNV

4. SUBCOMMITTEE REPORTS

A. OPERATIONS (See 04A OPS Rprt)

John Harrod moved that:

- M46** The Residential Building Committee's (RBC) Manual of Procedures (MOP) be approved as submitted.

Background: The RBC MOP was completed and presented at the OPS Subcommittee Las Vegas meeting in January, however the OPS Subcommittee did not have quorum and the vote to approve was postponed until the Long Beach meeting.

TECHC VOTE: 11-0-0, CNV

AI#2 OPS to review the Tech Council Budget and prioritize programs for the next three years.

B. SPECIAL PROJECTS (See 04B_Spc_Proj_Rprt)

The Chair, Jaap Hogeling, updated Tech Council on Special Projects Activities. There were no pending motions.

C. DRSC (See 04C-DRSC Rprt)

The following motion was moved by Ginger Scoggins that:

- M47** The Technology Council recommend that the Board of Directors (BOD) ExCom initiate a revision of the *Filtration and Air Cleaning* position document (PD).

BACKGROUND: The current PD expires in January 2018. EHC has reviewed and concluded a full revision of the PD is appropriate. The proposed title, purpose and scope (TPS) is unchanged and included as **Attachment DRSC-A**.

TECHC VOTE: 11-0-0, CNV

Ginger Scoggins moved that:

- M48** The Technology Council reaffirm the *Indoor Air Quality* PD.

BACKGROUND: The current PD (**Attachment DRSC-B**) expires July 2, 2017. A PD committee is working on a revision but needs more time.

TECHC VOTE: 11-0-0, CNV

D. DAL AD HOC

Mick Schwedler gave a verbal update on the Ad Hoc activities asking for the council's input on identifying 3 to 5 individuals for nomination to standing committees, especially RAC, TAC and Standards.

AI#4 Nomination Committee to expand their scope to include recommendations for nominations for Stds, RAC, TAC, EHC and REF.

5. EXECUTIVE SESSION

At this point of the meeting, Tech Council members with Conflicts of Interest were asked to leave the room. The following motions were approved during Executive Session:

- M49** Research project 1614-TRP, *Developing a Test Method to Determine the Effectiveness of UVC Systems on Commercial Cooking Effluent*, was awarded to the Syracuse University for a period of 18 months at a total cost to ASHRAE of \$199,292.

MOTION PASSED

- M50** Research project 1711-TRP, *Advanced Sequences of Operation for HVAC Systems – Phase II Central Plants and Hydronic Systems*, was awarded to the Taylor Engineering for a period of 24 months at a total cost to ASHRAE of \$160,000.

MOTION PASSED

- M51** Research project 1720-TRP, *Validation of Gas-phase Air-cleaner Performance Test Method (Standard 145.2) by Laboratory Testing of Commercially Available Filtration Devices*, was awarded to RTI International for a period of 24 months at a total cost to ASHRAE of \$149,832.

MOTION PASSED

- M52** Research project 1756-TRP, *Evaluation of Particle Sensors for Indoor Air Quality Monitoring and Smart Building Systems*, was awarded to Ohio State University for a period of 18 months at a total cost to ASHRAE of \$118,591.

MOTION PASSED

6. TECHNOLOGY DEPARTMENT REPORT (See 06 DOT Report and 06A)

Stephanie Reiniche, Director of Technology, updated Tech Council on the Technology Department Staff activities.

7. ADJOURN

Meeting adjourned at 11:50 AM.

All documents listed in this report can be found on ASHRAE's Basecamp Page in the 2017 Long Beach Folder or requested from Staff.