



ISWP Standards Working Group

January 18, 2017 Standards Working Group (SWG) Meeting Recap

The ISWP Standards Working Group met by conference call on Wednesday, January 18, 2017 from 12:00 p.m. to 1:30 p.m. U.S. Eastern Time. This document provides objectives and a recap.

Objectives

1. Discuss progress updates from the subgroups and related future work.

Discussion

1. Design Guidelines:
 - a. The group met in California with Jamie, Noon, Mark Richards, Ralf Hotchkiss, Elsje Scheffler and Keoke King to review and discuss the ISWP Design Guidelines.
 - b. Based on discussion, several edits are being made to the guidelines.
 - c. Basic wheelchair user and intermediate user are two user categories for whom the guidelines are compiled, pediatrics are covered later in document.
 - d. Mark did edits in the document, Kim has done some formatting.
 - e. Mark anticipates having another version of the document ready by January 27, 2017.
 - f. The guidelines document requires some illustrations and pictures. Mark has put bookmarks where pictures need to go.
 - g. JP to send out images and photos from WMAT training package to Mark.
 - h. Chris to send out the drawings from Motivation to Mark.
 - i. Matt & JP would be working on the sections of wheelchair testing and purchasing.
2. Caster Testing
 - a. Update slides: <https://drive.google.com/open?id=0B3o-KpFV8x-8STBtZW9hMVNCS1k>
 - b. Chris & Dan queried about conducting corrosion testing with mechanical testing on caster test.
 - i. JP mentioned it can be implemented later based on further analysis and validation. Currently, the corrosion exposure is to be conducted in salt fog and then durability testing will proceed on ISWP Chakra.



- c. Plots should be completed by February 8 Standards WG call.
 - d. Norm will send an accelerometer to confirm that his is comparable to the one ISWP is using.
3. Corrosion testing
- a. Update slides: <https://drive.google.com/open?id=0B3o-KpFV8x-8STBtZW9hMVNCS1k>
 - b. Two caster models were put in salt fog chamber for 200 hours then tested. No significant difference in number of test cycles before failure, but testing is still under way. A study with corrosion testing will be conducted again after validating the caster test.
 - c. JP recommendations for caster or other system tests:
 - i. How is rolling resistance impacted by corrosion. Expose for 100 hours then test using rolling resistance or chakra.
 - ii. Or use as reference for exposure to finishes. Could set/recommend a corrosion limit – how far a chip in paint or scratch should change after 100 hours of exposure.
 - iii. Recommendation to types of finishes that should be used.
4. Whole Chair Testing (WCT):
- a. South Dakota School of Mines and Technology to manufacture and deliver the test equipment to FWM by April end.
 - b. Bonnie from FWM working on instrumentation of wheelchairs for collecting accelerometer data, temperature and strain gage forces.
 - c. Experiencing some issues with strain gauges which will be consulted with JP and Anand.
 - i. FEA model developed by FWM shows the max strains near bend and caster mounting frame.
5. Rolling resistance testing:
- a. Norm tested 5 wheels and got reliable results when carriage and wheel were intact.
 - b. Zero on load cell changes when dropping the wheel and design recommendations were made for a suitable load cell mounting for stable results.



- c. To find a range of rolling resistances, testing of various wheel designs was suggested for example, comparing a worse case (knobby tire with low pressure) to trued tires or with to-in and toe-outs.
 - d. Design changes will be done to carriage and load cell mounting for reliable RR data.
6. Working Group funding proposal for 2017:
- a. ISWP is finalizing a strategic plan for the Advisory Board and preparing another funding request for ISWP support. Part of that request would be funding proposals from each working group (up to \$50,000 per group, including subcommittees) to support activities in 2017. It is not a guarantee of funding, but it would help to have ideas and estimates from each Working Group. Standards WG ideas:
 - b. Hire outside consultants to contribute to Intermediate portion of design
 - c. Support ISWP representatives to attend ISO meeting to present technical specs for rolling resistance, casters, corrosion and whole chair (to extent ready) at ISO and have Standards WG meeting there
 - d. Purchase materials for Chakra and rolling resistance testing equipment
 - e. Sponsor wheelchair tests for different organizations that may not have resources to pay otherwise (especially important for local organizations which manufacture in country)
 - f. Support CLASP (logistics hub run by UCP) as an independent review group to vet products to be included (could be based on ISWP standards tests and product reviews).
7. Drawings Library: Joe Ott is creating a library of drawings for ISWP-built equipment. Norman to share rolling resistance Solid Works drawings.



Subgroups (for reference)

- Design Guidelines: Mark Sullivan (lead), Daniel Martin, Jon Pearlman, Norman Reese, Chris Rushman, Eric Wunderlich
- Casters: Anand Mhatre (lead), Matt McCambridge, Jon Pearlman, Norman Reese, Don Schoendorfer, Joseph Ott, Stephanie Lachell
- Corrosion: Matt McCambridge, Don Schoendorfer, Anand Mhatre, Jon Pearlman
- Rolling Resistance: Norman Reese (lead), Matt McCambridge, Jon Pearlman
- Whole Chair Testing: Don Schoendorfer, Matt McCambridge, Josiah Auer, Mark Sullivan, Daniel Martin, Jon Pearlman, Norman Reese, Anand Mhatre, Dave Mahilo, Joseph Ott

Participants

- ✓ Daniel Martin, Shonaquip
- ✓ Matt McCambridge: DEKA (formerly with Whirlwind)
- ✓ Norman Reese, LeTourneau University
- ✓ Rachel, LeTourneau University
- ✓ Don Schoendorfer, Free Wheelchair Mission
- ✓ Karl-Erik Westman, Handicap International
- ✓ Eric Wunderlich, LDS Church
- ✓ Chris Rushman, Motivation
- ✓ Dave Mahilo, Invacare
- ✓ Dr. Rory Cooper, University of Pittsburgh
- ✓ Anand Mhatre, University of Pittsburgh
- ✓ Dr. Jonathan Pearlman, University of Pittsburgh
- ✓ Nancy Augustine, University of Pittsburgh
- ✓ Ben Gebrosky, University of Pittsburgh
- ✓ Josiah Auer, Free Wheelchair Mission
- ✓ Joseph Ott, University of Pittsburgh
- ✓ Stephanie Lachell, University of Pittsburgh
- ✓ Krithika Kandavel, ISWP

Prepared by: Anand Mhatre, University of Pittsburgh