Materials Laboratory
Strategic Directions 07-09

6/30/2009

Construction Materials

Joe DeVol		2007				2008						2009					
		1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			5th Quarter			6th Quarter			7th Quarter			8th Quarter		
Task	Description	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
1	Examination of HMA N-design																								65%
2	Identify and Implement New Moisture Susceptibility Procedure																								25%
3	Performance Prediction Testing Study - Part 1 (Texas Overlay Tester)																			100%					
4	Performance Prediction Testing Study - Part 2 (Hamburg Wheel Tester)																								20%
5	Aggregate Specific Gravity Study - Part 1 (Mechanical vs. Human)																								90%
6	Aggregate Specific Gravity Study - Part 2 (Variation in Production)																								60%
7	PG Plus Specifications																								85%

Materials Laboratory
Strategic Directions 07-09

6/30/2009

Construction Materials

Bob Briggs		2007						2008									2009					
		1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			5th Quarter			6th Quarter			7th Quarter			8th Quarter		
Task	Description	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
8	Integrated Computer Applications																								75%
9	Replace RegTec with Mats																								95%
10	MTP																								95%
11	Acceptance and Approval of Temporary Items																			100%					
12	Standardized Grout Specifications																								100%
13	System Approval of guardrail																								Terminated

Mike Polodna		2007						2008									2009					
		1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			5th Quarter			6th Quarter			7th Quarter			8th Quarter		
Task	Description	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
14	Low Degradation Aggregates in Concrete																								25%
15	Update Construction Manual																								75%
16	Combined Gradation Update Nominal Maximum Size																								90%
17	Concrete Cure Acceptance																			100%					

Materials Laboratory
Strategic Directions 07-09

Construction Materials

Chemical		2007						2008									2009				
		1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			5th Quarter			6th Quarter			7th Quarter			8th Quarter		
Task	Description	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
18	Paint Specifications																								96%
19	Sealing Compound Tester																			100%					
20	IR Scans for Epoxies																								20%
21	Standard specification for silicone joint sealants																								1%

Dwight Carlson		2007						2008									2009				
		1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			5th Quarter			6th Quarter			7th Quarter			8th Quarter		
Task	Description	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
22	Grounding End Bushing Evaluation																						100%		
23	Electric Service Cabinet Quality Improvement																								99%
24	Signal Turn On Checklist																						100%		
25	Update Standard Specification Section 9-29																								12%
26	Solar Energy Project																								1%
27	Specification for LED Roadway Luminaries																								1%

Materials Laboratory
Strategic Directions 07-09

Construction Materials

Linda Hughes		2007						2008									2009					
		1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			5th Quarter			6th Quarter			7th Quarter			8th Quarter		
Task	Description	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
28	Develop Videos																								97%
29	Develop Online Quality Systems Manual																								97%
30	Electronic Balances & Lab Equipment Calibration																			100%					

Al Gabo		2007						2008									2009					
		1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			5th Quarter			6th Quarter			7th Quarter			8th Quarter		
Task	Description	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
31	Annual Plant Approval Process																								95%
32	Cross-training TE2 in all Aspects of Inspection																								90%

Materials Laboratory
Strategic Directions 07-09

Construction Materials

Task	Description
1	Examination of N-design: Nationwide research underway to validate the Superpave HMA design levels (compaction tables) for volumetric mix designs. The question is: are current standards giving us the best possible pavement performance? This study to include: • Review of WSDOT Equivalent Single Axel Loads (ESAL) and HMA design levels. • Collect production data for comparison to mix design data. • Identify candidate projects to evaluate pavement performance. • Provide recommendations for future Superpave HMA design levels. **Status:** Since implementation of the Superpave volumetric mix design process in 2004 the Bituminous Materials Section has been collecting test data using both the Hveem stability and Superpave HMA mix design processes on every project paved in the state. This review started in January 2005 and will continue until national standards are changed and/or WSDOT alternative identified. Test data compiled and given to Pavement Management Section for candidate project selection.
2	Identify and Implement New Moisture Susceptibility Procedure. The implementation of Superpave volumetric mix design process and the phasing out of the Hveem mix design process facilitates the need for a new moisture susceptibility test procedure. This new procedure must include: • A process to evaluate variable quantities of liquid antistrip additives. • Use test specimens that replicate volumetric properties of HMA mix design. **Status:** Surveyed other states to identify alternative moisture susceptibility test procedures. Research indicates that the Hamburg Wheel Tester could provide alternative moisture susceptibility test in addition to predicting the rut potential of HMA. Research proposal completed and submitted for funding. Implemented use of gyratory compacted specimens for moisture susceptibility testing until alternative can be determined. No change since last reporting, proposal for purchase of Hamburg Wheel Tester submitted.

Materials Laboratory
Strategic Directions 07-09

Construction Materials

Task	Description
3	Performance Prediction Testing (PPT) Study - Part 1 (Texas Overlay Tester). Produce gyratory compacted specimens from candidate hot mix asphalt (HMA) paving projects to send to Texas Department of Transportation for performance prediction testing. Testing includes: • Asphalt overlay fatigue testing. Study to provide analysis of typical HMA mixes used in Washington State in performance prediction test protocol. **Status:** Samples collected from five candidate projects and shipped to TxDOT for testing. Study completed, report finalized and distributed as Technote. Results indicate significant variability in test results, no additional research with overlay tester planned.
4	Performance Prediction Testing (PPT) Study - Part 2 (Hamburg Wheel Tester). Research project to identify potential of Hamburg Wheel Tester to measure rutting susceptibility of HMA mixtures in Washington State. Project to include: • Review for existing research. • Training with TxDOT. • Fabricate samples for testing WSDOT mixes by TxDOT. • Develop recommendations for WSDOT to implement the Hamburg Wheel Tester. On completion of project a report will be written and distributed with recommendation to purchase device and potential specification for design and production testing. **Status:** Research and literature search completed. Working with TxDOT to identify mix design and production specification applications and coordinate on-site training. Research proposal completed and submitted for funding. No change since last reporting, proposal for purchase of Hamburg Wheel Tester submitted.
5	Aggregate Specific Gravity Study - Part 1 (Mechanical vs. Human) Part one of this study is an evaluation of mechanical methods for the determination of coarse and fine aggregate specific gravity compared to conventional test methods. This study includes: • Corelok automatic vacuum sealing device and the Thermolyne SSDetect testing system. • AASHTO T84 & T85 aggregate specific gravity test methods. **Status:** Testing completed report under review for final draft and distribution. No change since last reporting.

Materials Laboratory
Strategic Directions 07-09

Construction Materials

Task	Description
6	Aggregate Specific Gravity Study - Part 2 (Variation in Production). Part two of this study is an effort to measure the variability of aggregate specific gravity in quarry and gravel sources throughout production on select paving projects. This study includes: • Identification and selection of candidate projects for evaluation. • Scheduling and acquisition of samples. • B79Testing analysis and reporting. **Status:** Study was originally scheduled for 2007 construction season on four select projects but samples where not acquired as requested. Additional projects have been identified for 2008, project completion extended until 2009. All aggregate samples received and tested, data analysis and draft report being prepared.
7	Performance Graded (PG) asphalt binder (Plus Specifications). Where is the nation going and where is WSDOT going? • What test(s) should be used to verify performance of asphalt modification. • Work with Pavement Management to establish work plan and identify need for plus specifications. Trial projects in Eastern Washington in 2006 season. **Status:** Trial project using elastic recovery test completed in the Eastern Region in 2007. Additional projects used elastic recovery test for acceptance in 2008, MSCR test data was also collected. Complete data analysis for all projects underway, draft report pending. New test and specification for 2009 delayed, waiting for new AASHTO M 320 specification due out soon. Bituminous Materials Section participating in the round robin study to evaluate the new asphalt binder low temperature bond test that uses an Asphalt Binder Cracking Device (ABCD). ABCD device received June 12th training underway & testing scheduled to begin June 22nd.
8	Develop a plan for integrated computer applications for Construction /Materials. Requirements for MATS is currently underway and expect to have an overall plan for future work to be complete by January 2007. Due to delays, this project has been extended to June 2008. **Status:** Currently the SPMG group is working on ways to integrate the systems. Eastern Region has developed a system that will be used for field documentation. Mats mix design now is directly inputted into SAM. As the field testing in MATS is developed, more integration will occur with all of the materials programs. Over the next year, we will be developing the field testing portion of MATS. We will also be developing the automatic filing of test reports into MTP and the uploading of test data into SAM.

Materials Laboratory
Strategic Directions 07-09

Construction Materials

Task	Description
9	Replace RegTec with Mats within 1 year and continue to develop the remainder of Mats. Development is underway and expect to have the first phase of deployment in January 2007 with the complete deployment of MATS by January 2008. **Status:** MATS deployed phase 1 in April 07. Completed HMA Mix Design, and density standards. The rest of RegTec will be replaced by when there is a miscellaneous test report by April 2009. We are working on the core testing and miscellaneous testing. When these are complete, we are looking at July to replace RegTec completely. This is currently on schedule for sometime in July to replace RegTec.
10	Work on MTP to satisfy people's need to achieve 100% usage. The plan is to identify the problems in late 2005 and fix the problems in 2006 with 100% usage of the MTP system by January 2007. Due to delays in programming, this project has been extended to April 2008. **Status:** The Eastern Region is working on a field documentation system that will require MTP to be used and kept up. With the deployment of MATS, all bid items will come from MTP and test reports will be automatically sent to MTP. A review of the users showed that only 8 PE offices out of 40 were not using MTP. We will be putting on a training class for MTP, as well as all of our computer programs in 2009. The usage is increasing due to the training that we are providing. We completed the 2009 training, and with the Eastern Region electronic field note record, we are at about 80% usage. We are making some changes this year and will be making MTP mandatory for the 2010 construction season.
11	Acceptance and Approval of Temporary Items. Identify the temporary items that need to have approval and acceptance criteria. These will be identified in the Construction Manual. Expected to be complete in fall of 2008. **Status:** We have finished working on section 9-35, temporary traffic items. This is complete.
12	Standardized Grout Specifications. This work involves reviewing the different group specifications and come to a standard specification that all will use. **Status:** There has been a draft specification developed and is under review. This will be finished in June for the 2010 specification book printing. We are continuing to review the draft specifications. This is now 100% complete.
13	System Approval of guardrail. A committee will be formed to address the DOT requirements by March 2006. Meeting's with industry to develop a guardrail suppliers QC plan will occur to implement a plan by January 2007. Due to workload and staffing issues, this task has been extended to fall of 2008. **Status:** Fabrication section drafted a QC plan. This is on hold due to poor quality of wooden guardrail posts. This will be re-reviewed when the guardrail post issue is resolved. The issue has been put on hold. This issue is not terminated due to the poor quality of posts and rail. Sometime in the future we may revisit this issue. Terminated

Materials Laboratory
Strategic Directions 07-09

Construction Materials

Task	Description
14	WSU study on the use of low degradation aggregates in concrete. **Status:** The first round of testing has begun at WSU. Specimens were cast in late 2008. Results from the first round are due in late 2009. Status meeting with professors scheduled for July 1, 2009
15	The WSDOT Construction Manual needs to be updated on how to check concrete mix designs. The construction manual needs to be updated with specific information on what needs to be checked on concrete mix designs so WSDOT Project Offices can independently check concrete mix designs. **Status:** The mix design review form has been edited and is ready for inclusion in the Construction Manual.
16	Combined Gradation Update Nominal Maximum Size. The aggregate combined section in the Standard Specifications needs to be updated to reflect larger aggregate sizes. WSDOT allows 2 inch aggregate or larger in PCCP, but currently the combined gradation only covers up to 1-/2 nominal maximum size. The specifications need to cover 2 inch, 2-1/2 inch, and 3 inch gradations to the Standard Specifications Section 9-03.01(5) Grading. **Status:** Proposed gradations have been developed and need to be reviewed at WACA before inclusion in the Standard Specifications.
17	Review the requirements for accepting and testing concrete cure. Determine if current testing standards need to be changed or remain the same. Determine if there are storage requirements for cure, both temperature and time related. **Status:** Completed.
18	Review and modify the paint specifications, Section 9-08 Paint. Review and subsequent revision of the specifications started in January 2008. This task is 95% complete. **Status:** The updated specifications are being reviewed by Jesse Beaver and DeWayne Wilson. Further reviews by the ETG and final approval are pending.
19	The reviews, equipment set-up, verification and material testing for sealing compound tester from Applied Testing Systems Inc. was started in March 2008 and was completed in October 2008. **Status:** Specification Section 9-04.2 (1) was updated, respective amendment to the Standard Specifications was published. 100% completed.

Materials Laboratory
Strategic Directions 07-09

Construction Materials

Task	Description
20	The technique of Infrared Spectroscopy (IR) is being employed to analyze the uniformity of a specific company's epoxy coating system formula over time. Our objective is to test and evaluate the uniformity of these epoxy systems and determine whether we can correlate spectrum differences (chemical formula variations) samples with failing physical testing and whether there was a change to the formulation of the same product. **Status:** We received 20 epoxies between 1/1/2009 and 4/14/2009. Of the 20 epoxies 13 were not tested by FTIR: 7 were in cartridges and could not be tested, 1 was not tested due to improper sample submittal, 3 were in kits and thus not tested, and 2 were not tested due to the contractor taking the samples back before the FTIR could be completed. The remaining 7 epoxies were analyzed by FTIR and cataloged for future comparison studies. Only two new epoxies could be compared against each other at this time. Parts A and B from two Unitex Propoxy 204 samples were compared. The resulting spectral scans showed no spectral difference between the two of them. These samples both passed compression and shear strength specifications. This task is on-going and approximately 20 % complete.
21	Development of standard specification for silicone joint sealants used to span joint openings in road and bridge construction. **Status:** Starting date is April 2009, the proposed work should be completed by January 2010. Review of respective specifications began, 1% completed
22	Grounding end bushing evaluation: Review the WSDOT specification for grounding end bushing to ensure the proper material is specified. **Status:** Update submitted for implementation into Standard Specifications.
23	Electric service cabinet quality improvement project. Develop an inspection scheme to improve the quality of electrical service cabinet. Electric service cabinet manufacturers are now performing their own quality control inspection on electrical cabinets. WSDOT electrical inspectors are checking cabinets for QC checklist. **Status:** Continue monitoring manufacturer QA program.
24	Signal turn on checklist: Develop a list of tasks to be completed by the Project Engineer prior to signal turn on. Checklist for signal turn on completed and submitted to HQ Construction Office for inclusion into Construction Manual. **Status:** Update submitted for implementation into Construction Manual.

Materials Laboratory
Strategic Directions 07-09

Construction Materials

Task	Description
25	Update Standard Specifications Section 9-29 Illumination, Signal, Electrical. This section in the Standard Specifications has not been updated in a number of years and needs to be updated to remove outdated requirements and updated to include the latest standards. Need to identify and assemble Expert Task Group to review specifications (ETG Members identified). **Status:** Initial Expert Task Group meeting set for September 2, 2008. Changes to 2-29.1, 9-29.2, 9-29.3 and 9-29.4 have been submitted and approved by FHWA for inclusion the 2009 spec. book.
26	The purpose of this strategy is to investigate how WSDOT can contribute to the use of renewable energy in the daily operation of the highway system. The investigation will include research into how the use of solar energy can reduce the amount of and/or the cost of commercial electrical energy WSDOT consumes, through the use of existing resources or developing resources, in partnership with industry, which would have a predictable pay back. **Status:** No measurable change in this task, continuing to research the specific applications of solar panels for example individually solar powered roadway lights.
27	Research and develop a specification and photometric acceptance for LED based roadway luminaires. **Status:** Continue to research the development of LED's for use in roadway lighting.
28	Develop videos for all materials testing procedures. November 2005 to September 2007 **Status:** Overall Project 97% complete; HMA - 100% complete; Aggregate Module; 95% complete; Concrete Module 98% complete; Construction Trainers are creating an on-line version of Density that will be housed on another site so I am removing this from our site. Online training Concrete Module requires TM2 and SOP 716 for completion. Aggregates require a review and T2.
29	Develop and implement online version of Quality Systems Manual. • Produce online version of Quality Systems Manual that is accessible through WSDOT online manuals website and Materials Lab website. • Format needs to be set-up so updates will be done at certain specified times of the year similar to Materials Manual • Develop online lab equipment inventory that is capable of being easily updated by Region and HQ Materials Lab **Status:** Quality Systems Manual is 97% complete. Appendicies are being added and are almost complete. Manual should be ready for an in house check at the end of June. Upload to web is estimated for end of July.

Materials Laboratory
Strategic Directions 07-09

Construction Materials

Task	Description
30	Electronic Balances & Laboratory Equipment Calibration Costs • Identify what laboratory equipment WSDOT can costs effectively calibrate in house, versus paying to have equipment calibrated. • Electronics Scale Calibration Contract: If found to be cost effective; plan and implement WSDOT calibration of electronic scales • Laboratory Equipment Calibration Contract: If costs effective plan identify Laboratory Equipment that WSDOT can calibrate costs effectively and what equipment requires contracting out. **Status:** Task is complete. Equipment to be calibrated in house was identified with minor savings in the cost of calibration. Electronic calibration was found to be more cost effective when having an outside contractor perform the calibration because of the expense of purchasing and calibrating the standard weight sets.
31	Improve and streamline Annual Plant Approval document submittal and review process through email and scanning results in the finished approved documentation prior to meeting with fabricators for the annual plant approval meeting. July 2007 to June 2009. **Status:** Streamlining of Annual Plant Approval process to result in approved documentation prior to annual meetings is 95% complete.
32	Cross-training of our E-2's in prestress, precast, crosshole sonic logging testing and miscellaneous materials inspection and documentation for uniformity. July 2007 to January 2009. **Status:** Cross training E-2's in prestress, precast, crosshole sonic logging testing and miscellaneous materials inspection and documentation for uniformity is 90% complete.