

# MELANIE KUEBER WATKINS, P.E., PH.D.

## Summary

Civil engineer with over twenty years of experience in the infrastructure industry:

- designed numerous water resources management structures and geometrics for highways and industrial developments, asset management,
- prepared environmental surveys for wetland mitigation,
- oversaw consultant contracts,
- coordinated with the FHWA, municipalities, agencies, stakeholders and councils for project implementation,
- materials science and chemistry experience includes testing and characterization of industrial materials for beneficial reuse,
- mentoring experience includes on the job and research training for junior engineers and interns
- computer experience includes: Microstation, GeoPak, AutoCAD, ArcGIS, water resources design software including Aquaveo 2D SRH SMS Riverine Pro, HECGeoRAS, HEC-RAS, Linux, OpenFOAM, and
- instructed college students through professional engineers; subjects range:  
water resources management, soils engineering, materials, asset management, and pavement evaluation surface rating, senior design, international senior design in Panama.

## Education

Ph.D. Civil Engineering, Michigan Technological University, May 2013  
M.S. Project Management/Civil Engineering, Northwestern University, 2002  
B.S. Civil Engineering, Michigan Technological University, 1998

## Employment History & Professional Experience

*May 2018- present, Michigan Technological University, Research Assistant Professor*  
*Jan 2018 to May 2018, GEI Consultants, (on call, Marquette, MI)*  
*May 2017 to Jan 2018, Atlas Engineering (<http://www.aegroupltd.com/>) (part time telecommute – Chicago)*  
*2015 to 2017, M3 Engineering Group ([www.m3eg.com](http://www.m3eg.com)) (part time telecommute – St. Louis)*  
*2015 to present, Adjunct Appointment: Graduate Faculty, Civil & Environmental Engineering, Michigan Tech*  
*2015 American Journal Experts, Independent Contract Editor*  
*2013 to 2015 Owner, MK Watkins Engineering, LLC; [mkw-eng.com](http://mkw-eng.com)*  
*2011 to 2015 Michigan Technological University, Center for Technology & Training/Facilities Management*  
*2007 to 2011, Graduate Research and Teaching Assistant, Michigan Technological University*  
*2004 to 2007, Christopher B. Burke Engineering, Ltd. ([www.cbbel.com](http://www.cbbel.com))*  
*1999 to 2004, Illinois Department of Transportation ([www.dot.state.il.us](http://www.dot.state.il.us))*  
*Summer 1998, STS Consultants, Ltd. (<http://www.stsltd.com/>)*  
*Professional Engineer, Illinois 62058394 (since 2005), Michigan 6201055058 (since 2008), Missouri 2019045797*

## Engineering Experience

### **Michigan Technological University**

**Senior Design, Fall 2019, Spring 2020.** Instructor for senior design capstone. Sponsored projects included: MDOT US-41 Reconstruction from East of Macinnes Dr to Isle Royal St, City of Houghton, MTU Facilities Management parking lot North of Lot 21 and South of Lot 21, MDOT reconstruction of US-2 from Powdermill Creek bridge to Old US-2 in Bessemer, MDOT US-41/M-28 R&R from the Front Street Roundabout west to Wright Street, gapping the Grove Street and Hospital Roundabout in the City of Marquette, Support of

## MELANIE KUEBER WATKINS, P.E., PH.D.

Excavation (SOE) & Maintenance of Traffic (MOT) Design and Temporary Site Civil & Maintenance of Flow for Stormwater & Sanitary Sewer Design for Northeast Boundary Tunnel (NEBT) in Washington, DC with Brierly and Associates, reconstruction of the I-69 mainline from I-96 to Airport Rd north of Lansing, MI in Clinton County with HNTB.

HNTB Sponsored MDOT US-31/I-94 BL interchange and 2.9 miles of I-94 from west of East Britain Avenue to east of the I-196 interchange in Benton Township, Berrien County. Advised hydraulics and hydrology team using Michigan State LIDAR data and Aquaveo SMS 2D RiverPro to analyze water shed using ArcPro and size culverts using embedded HY-8. Completed channel stamping of Blue Creek for the project.

Coordinated with industries on a regular basis to provide students with exposure to industry professionals and ensured their review of student projects. Coordinated with industries to secure rigorous projects for future sections of senior design. Reviewed student design, estimates, and construction schedules and design plans including water detention/retention, wetland mitigation, storm sewer, road alignment, MOT, traffic, retaining wall, culvert, and bridge plans.

**Highway Hydraulic Engineering State of Practice: NCHRP Project 20-05 Synthesis Topic 50-02.** The objective of this synthesis is to document significant changes that state DOTs have made to their hydraulic engineering policies and practices over the past decade. The study will highlight the trends and factors driving these changes (PI). Funding Agency: National Academies of Science, \$45k (November 2018 – October 2019, approved for publication, anticipated early 2020).

**CE4620 Instructor, Fall 2016, 2017, 2019.** Instructor for river and flood plain hydraulics. Developed course materials for instruction for this course that includes theory and analysis of open channel systems, including natural channels, designed channels, flow transitions, non-uniform flow, and unsteady flow. Also included HY-8 for culvert sizing and intensive use of HEC-RAS. SMS Aquaveo 2D Riverine Pro software use and design using LIDAR, sonar, and photogrammetry dem; validation of software output data. The lab for this class is a computational lab, this includes: 2 Weeks - ArcGIS design project component using photogrammetry or LIDAR dem data, 2 Weeks - Aquaveo SMS Riverine Pro tutorials/assignments using LIDAR/sonar elevation data, 3 Weeks - Aquaveo SMS Riverine Pro design project including validation of software results. Design projects included MDOT sponsored M35 over the Carp River, Negaunee, MI – modeled 2x7'x10' CMP culverts and bridge using Aquaveo SMS Riverine Pro.

**NHI Continuing Ed: Two-Dimensional Hydraulic Modeling of Rivers at Highway Encroachments.** Learned background data necessary to support a model, hydraulic modeling parameters, mesh development, model simulation parameters, model calibration, hydraulic structures, and reviewing two-dimensional model results. **Model Terrain Development with Various Data Sources WCT, Course FHWA-NHI-135095B.** Learned how to process and effectively use LIDAR and other elevation format types in defining geometry for 2D hydraulic models.

**ASCE Continuing Ed: Stream Restoration: What Works and What Doesn't Work.** Refreshed skills on a synthesis of available data regarding effectiveness of selected stream restoration approaches, identifying key factors that lead to success or failure. These factors may be combined in an overall semi-quantitative assessment of the risk of project failure to produce stream restoration projects that more closely approach stakeholder expectations.

**EGLE WMP.** Continued work and coordination with UPEA and EGLE to update expired WMP. **Huron Creek Watershed Modeling, Houghton, MI.** Advise masters student development of HEC-RAS models with HECGeoRAS using survey and USGS ArcGIS data for the floodplain mapping research project for this this FEMA and state disaster area. Cut cross sections from USGS digital elevation model using HECGeoRAS and ArcMap.

**ASCE EXCEED, Omaha, Nebraska, June 2019.** Professional development practicum that provided engineering educators with an opportunity to improve their teaching abilities. The workshop learning objectives were: explaining what constitutes effective teaching; applying learning style models to the organization and conduct of a class, using classroom assessment techniques to assess student learning,

## MELANIE KUEBER WATKINS, P.E., PH.D.

organizing a class, delivering classroom instruction, assessing a class from a student's perspective, self-assessing your own class.

**Esri, Migrating from ArcMap to ArcGIS Pro, July 2019.** Professional development course, then led students to update course modules from ArcMap to ArcPro.

**ETOM Online Teaching Certification Course October-Nov. 2019.** Designed a general course framework, including an organizational scheme (using Canvas) and course management policies in this online course.

**Senior Design, Fall 2018.** Advised senior design students for the MDOT reconstruction of both sides of I-69 from Ballenger Highway to Fenton Road in Flint, MI, capstone project. This project included reconstruction of existing pavement, alignment and profile shift, storm sewer design, and compensatory storage analysis in a FEMA designated floodway.

**Grant Writing Experience.** Worked on over 50 proposals including multidisciplinary research and contributed to successfully funded research proposals and activities.

**CEE Curriculum Committee.** Facilitated skills survey and worked with CEEPAC to discuss their input and requested they provide a recommendation as to the status of skills that should be provided by the CEE curriculum upon students graduation.

**CE3620 Instructor, Fall 2018.** Instructor for Water Resources Engineering, hydrologic engineering, including rainfall-runoff modeling and hydrologic frequency analysis, as well as the analysis and design of hydraulic systems, such as pipe networks and stormwater management systems.

**CE3101 Instructor, Fall 2018.** Instructor for properties and behavior of typical civil engineering materials, including wood, metals, aggregates, asphalt cement concrete, Portland cement concrete, and composites. Laboratory exercises demonstrate selected engineering mechanics principles, including elastic, inelastic, and time-dependent material behavior. Additional topics include testing techniques, materials standards, report writing, and presentation of experimental data.

**MEEM 2110 Instructor, Spring 2019.** Instructor for principles of static equilibrium by applying Newton's laws of motion to solve engineering problems. Emphasis is placed on drawing free body diagrams and self-checking strategies. Topics include introduction to forces; 2D and 3D equilibrium of particles and rigid bodies; center of gravity and centroids; distributed loading and hydrostatics; friction; analysis of truss structures. Vector algebra used where appropriate.

**Ground Tire Rubber Asphalt for Durable Pavements for Heavy Traffic Road for Michigan's Wet-Freeze Environment.** Senior project personnel. ~200k awarded to Dr. Zhanping You where Michigan Tech will conduct the following on a 5-mile-lane pavement section of Cascade Road in Kent County, MI: a performance evaluation of GTR modified asphalt for wet-freeze environment, evaluation of composite structures and field survey, sampling and testing, analysis and reporting on test sections.

**Scheduled/Anticipated Professional Development:** Michigan Tech Diversity Literacy Full Course & Legal Aspects Full Course, OpenFOAM computational fluid dynamics (CFD), 135095A SRH-2D Model Data Files, Diagnostics & Verifying 2D Model Results WCT course, Bentley OpenRoads 3D accelerated project delivery, ExCEED Mentor or Assistant Mentor.

### **GEI Consultants**

#### **City of Marquette, Noquemanon Trail Network**

Prepare DEQ/USACE Joint permit application for proposed bridge crossing the Carp River for all season trail access. Prepare exhibits using ArcMap and draft proposed structure plan and profile using AutoCAD.

## **MELANIE KUEBER WATKINS, P.E., PH.D.**

### ***SEMCO, S10 and S17 Escanaba River Crossings***

Prepare existing and proposed hydraulic models using HECGeoRAS and HEC-RAS. Cut cross sections from USGS digital elevation model using HECGeoRAS and ArcMap. Import channel information into HEC-RAS for existing and proposed models, add bridge geometry per proposed plans.

### ***Atlas Engineering Group, Ltd.***

***IL Route 31 ADA Feasibility Analysis, McHenry, IL.*** Used Microstation and GeoPAK to analyze new geometry for ADA compliant ramps at intersections. Results from analysis were to be used to modify the existing geometry further to allow for compliant infrastructure along the route prior to construction document completion.

***IDOT District One: PTB 171, Phase II Engineering, I-55 (Stevenson Expressway) and Adjacent Frontage Roads from Lemont Road to IL 83 (Kingery Highway)*** Hydraulics & Hydrology Project Manager. Responsible for the hydraulic analysis of three locations as flagged by a drainage investigation to be deficient and recommended repair or replacement. These locations included proposed replacement of an existing 30" corrugated metal pipe with RCP under I-55 frontage road using HY-8, ditch capacity calculations and rip-rap sizing for the three locations, and a grate opening calculation for grate sizing using the FHWA Hydraulic Engineering Toolbox, Rip-rap Design Systems, and IDOT Standards. The CMP was in a great state deterioration as this discharge pipe was corroded and exposed. Difficulties included tight ROW constraints, addition of an offsite drainage diversion area as identified in the drainage investigation, and existing adverse slope. Additionally, the television report indicated that the 30" RCP to the north of the CMP portion under mainline I-55 appeared to be in fairly good condition but the next section has a cracked joint in the pipe. In order not to disrupt traffic, as a rehabilitation practice, Atlas recommended a CIPP liner instead of replacement.

### ***PTB 170 Item 7 Washington Street over US 41 & UPRR***

Hydraulics & Hydrology Project Manager. Completed Location Drainage Technical Memorandum for Washington Street over US 41 & UPRR. Drainage site analysis, completion of existing and proposed drainage plans, and report for submission to the Illinois Department of Transportation for this bridge deck overlay and replacement project.

### ***M3 Engineering Group***

***Caulks Creek Force Main Rehabilitation, Metropolitan St. Louis Sewer District (MSD)*** MSD desires rehabilitation of 37,300 LF of 20-inch to 30-inch sanitary sewer force main and appurtenances to alleviate several local package treatment plants. Researched methods, performed preliminary design calculations using several material options, and spoke with several rehabilitation manufacturers and installers for information as to determine the appropriate rehabilitation method for the force main. Recommend design thickness and materials based on calculations and design parameters. Performed a pump station evaluation for calibration and completed a report on the EPASWMM model of the approximately 7-mile Caulks Creek Force Main that included 11 pumps and wet wells.

***Cityshed A Planning, St. Louis Metropolitan Sewer District.*** Converted 2011 XPSWMM model to XPSWMM 2016 model, assessed the usability of the model in its current condition via a calibration verification and review of the model as to its inclusion of structures near the Jennings Station Rd/North Baden Basin. Forty meter and gauge data files with peak events from 2004, 2005, and 2006 were reviewed and the model was analyzed with the largest 3-hour and 24-hour storms. The average flowrates were compared with the meter data and statistical analysis performed to find the 10% min-max and 20% min-max scatter to assess the state of the calibration. The model includes six pump stations and five outfalls.

***Old Halls Ferry Road over Halls Ferry Creek, St. Louis County, MO; Ferguson, MO*** St. Louis County Project Number: Ar-1647, Federal Project Number: Brm-5610(609). Completed No-Rise Study for Old Halls Ferry Road Bridge No. 107 including hydraulic report, HEC-RAS analysis, and calibration for structure removal and replacement.

## MELANIE KUEBER WATKINS, P.E., PH.D.

**Gravois Trunk Sanitary Storage Facility (Pardee Lane and Pardee Road), Phase II, St. Louis County, Metropolitan Sewer District.** Completed FEMA Flood Insurance Study Data Request. Conducted hydraulic floodplain impact analysis/no-rise study hydraulic report and calibrated models for the proposed Gravois Trunk Sanitary Storage Facility that will be located at the City of Crestwood's Department of Public Works (DPW) Facility at 8645 Pardee Lane using HEC-RAS.

**Cole Creek Flood Reduction Study, City of St. Charles, MO.** Inventoried and documented all properties located in the designated 1% annual chance area. Completed a protection measures inventory report. In effort to reduce WSELs using the regulatory HEC-RAS model: added the Elm Point Storage Facility with ArcMap/ArcGIS data and weir calculations, widened Elm Point Road and RR structures and added sloping abutments, widened channel choking areas, updated and widened the Runnymede Road structure.

**Sherwood Forest Camp, MO** Reviewed new water distribution design including water supply unit calculations, EPAnet model, pump selection, and water tank location. Reviewed size of water tank, revised elevation of placement, and sized pressure tank. Reviewed construction technical memorandum and permit application.

**Metropolitan Sewer District RDP Tributaries & Upper RDP CSO Controls & Lower Meramec System Improvements RDP Tributaries (Deer Creek) CSO Tunnel – Planning** Reviewed documents for utility and existing bridge pier conflicts, calculate potential underground locations, draft 48" sewer profiles and alignments using AutoCAD.

**The Village of Harwood Heights, IL** The Village of Harwood Heights does not have the option to improve storm water storage capacity downstream of the village so flood volumes resulting from runoff from the village must mitigated. Conducted technical and regulatory investigation exploring the feasibilities of flood mitigation via infiltration versus detention in the Village of Harwood Heights, Illinois.

**Eastman Chemical Company Krummich Plant, Sauget, IL** Researched AREMA railroad load design requirements for track expansion. Calculated earth and live loads via embankment and trench conditions for 24", 30", 8" VCP pipes. Compared calculated loads to D0.01 load tables and made recommendations.

**City of St. Charles, Blanchette** Updated survey information from ArcGIS to XPSWIMM model.

**City of St. Charles Comprehensive Stormwater Management Plan** Phase I / Data Development. Collected side slope data for stream channel restoration/flood mitigation estimates from contours using ArcGIS.

**Deer Creek DC02 Phase 4, St. Louis County, Metropolitan Sewer District.** Drafted structure details for contract plans for 48" pipes including junction chambers for storm sewers using MicroStation. Calculated rip rap thicknesses and specified aggregates for contract plans using Rip Rap Design System and FHWA Hydraulic Toolbox.

**Northside Regeneration Program, St. Louis Development Corp., Metropolitan Sewer District, SLDC.** Draft drainage areas, sewers, and structures for Camp Springs sewer shed using ArcMap/ArcGIS for use in overall PCSWMM model. Draft sewers and structures for additional sewer sheds.

**City of Chicago 2016 Pipeline Inspection.** Review and documented televised inspection results of water main inspection for 36" PCCP and DI water main on Lake Shore Drive and South Indiana Avenue.

**Forest Park Forever.** PASER rate all roads in the park for asset management. Complete PASER road database in ArcGIS ArcMap.

## MELANIE KUEBER WATKINS, P.E., PH.D.

**Creve Coeur Creek Sanitary Trunk Sewer Relief Phase VI.** Calculated rip rap thicknesses and specified aggregates for contract plans using Rip Rap Design System and FHWA Hydraulic Toolbox. Calculated earth loads for PVC and VCP 12" and 24" PVC and VCP pipes.

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**CE4620 Instructor, Fall 2016, 2017.** Instructor for river and flood plain hydraulics. Developed course materials for instruction for this course that includes theory and analysis of open channel systems, including natural channels, designed channels, flow transitions, non-uniform flow, and unsteady flow. Also included HY-8 for culvert sizing and intensive use of HEC-RAS.

**CE/ENVE 4507 Instructor, Spring 2016, 2017, 2018.** Developed course materials to cover the basic civil and environmental engineering principles for water distribution systems, storm and wastewater collection systems, including their appurtenances and pumps with emphasis on design including EPAnet, SewerCAD, and EPASWMM.

**Senior iDesign, Fall 2017.** Advised senior civil and environmental engineering students in the field for water distribution and pump projects. Helped identify water sources, contaminants, and layouts for these projects and relations with indigenous people. The project site was located in the village of Cerro Gallina located in the indigenous Ngäbe-Buglé Comarca rainforest in the Chiriqui province of Panama.

**Senior Design, Fall 2016.** Advise two senior civil engineering student on watershed analysis project for continuation and updates to tailing impoundments site for White Pine Mine. This project included reservoirs and routing using HEC-HMS and HEC-RAS.

**Paint River Watershed, Iron County, MI.** Advise masters student and put together HEC-RAS models using survey and USGS ArcGIS data for the research project: *Informing Great Lakes connectivity decisions: An enhanced online portal for high-resolution barrier data and species-specific benefit analyses*. This project will expand the existing online decision-support tool to enable managers and agencies to assess trade-offs of barrier removals throughout the Great Lakes basin. We will inventory road crossings in the Paint River watershed, and create an index of habitat quality for priority fish species. The website will enable integration of new barrier data, flexible visualization of species-specific habitat loss due to barriers, and customized analysis of optimal barrier removals for a given budget.

### **Michigan Tech CTT/Facilities Management**

- Preparation of contract documents, request for proposals for consultant hire, estimates for campus maintenance, space use studies, pavement evaluation for pavement management plans, estimates, specifications, and designs for renovation and maintenance projects, erosion control and wetland documents, grant proposals and collaboration.
- Coordination with contractors, consultants, regulatory agencies, local government, faculty, and Michigan Tech maintenance staff.
- Monitored accounts, work orders, Michigan Tech Grounds and Trades project work.

### **Projects included:**

**Mont Ripley** Conducted monthly coordination with ski hill manager to monitor earth movement and erosion control. Completed Houghton County Soil Erosion Control Permit revisions for the tube park earthwork. Completed MDEQ application and map documents using ArcGIS for the pre-application for wetland walk-through.

**Portage Lake Golf Course** Coordination with golf course manager and composed the request for proposal and contract for consultant hire for design and construction oversight for this proposed renovation project. Solicited for proposals and awarded consultant contract. Manager of the consultant contract and account. Coordination with DEQ for wetland delineation and potential mitigation.

## MELANIE KUEBER WATKINS, P.E., PH.D.

**Ford Center** Composed the request for proposal and contract for consultant hire for testing of former UST water monitoring wells. Solicited for proposals and awarded consultant contract. Managed the consultant contract and account for completion of testing. Composed the request for proposal and hired consultant for MDEQ closure report. Solicited for proposals and awarded consultant contract. Manager of the consultant contract and account. Coordinated with DEQ.

**Lower Daniel Heights Student Apartments** Performed inspections and prepared an estimate and schedule for indoor maintenance for this \$6 million maintenance project over 25 buildings. Additionally, prepared bid documents including specifications for re-roofing project and estimates and design for sanitary sewer improvements including a force main system with pumps.

**Theta Tau Property** Managed Michigan Tech Grounds & Trades winterization and culvert replacement project.

**DEQ Coastal Zone Management Program** Prepared grant application including the budget for Lakeshore Corridor Enhancements: Walking/Bike Trail. If awarded, the constructed project will improve the Michigan Tech corridor connecting the adjacent east and west portions of the City of Houghton paved waterfront trail with the addition of a ten foot wide concrete sidewalk and handrail constructed per ADA requirements, improvements to traffic safety, vegetation to filter storm water, and heritage signs.

**DEQ Pavement Grant** Facilities Management grant collaboration with Michigan Tech Civil & Environmental Engineering for this Scrap Tire Regulatory Program. If funded, Michigan Tech will construct approximately 900 SY of concrete paving area with a special mix design that will be tested for freeze-thaw performance and chloride durability for future road applications.

**Campus Pavement Management** Evaluated campus pavement using PASER and initial preparation of a campus wide pavement management plan.

**MEEM UST** Prepared estimates for removal.

**Characterization of Unpaved Road Condition Through the Use of Remote Sensing: State of the Practice of Unpaved Road Condition Assessment** Performed literature review and participated in team effort to prepare document on joint project with Michigan Tech Research Institute. November 2011.

**Characterization of Unpaved Road Condition Through the Use of Remote Sensing: Software and Algorithms to Support Unpaved Road Assessment by Remote Sensing** Participated in team effort to prepare document on joint project with Michigan Tech Research Institute. October 2012.

**Activity Travel Behavior, February 2011** Analysis and documentation of a study comparing the benefits of webinars using Michigan LTAP data.

**TAMC PASER QC/QA, 2012, 2013** Update of existing PASER rating quality control plan and assessment report with new 2012 collection data and user survey data.

**RE: MDOT Enterprise Asset Management System: Roadsoft Capabilities, 2013** Marketing document outlining functions of Roadsoft.

**TAMC PASER Training** Instructor for roadway engineers for the Michigan Transportation Asset Management Council sponsored mandatory rater training for Pavement Surface Evaluation Rating of asphalt, concrete, and seal coat roads. Instruction includes conducting webinars and onsite training for rating rules, surface distress identification to assign a PASER rating to roads. Instructed five onsite trainings and three webinars as part of a training team.

**TAMC PASER Certification** Team establishment of new certification exam policy and exam documents. Organized records to establish a list of eligible individuals. Co-administer of exam.

## MELANIE KUEBER WATKINS, P.E., PH.D.

**TAMC AM for EO** Instructor for local governments for the Michigan Transportation Asset Management Council sponsored Transportation Asset Management for Elected Officials. This training includes instruction of basic pavement asset management principles for county, city, and township officials; the role of asset management in Michigan; and brief overview of PASER. Solely conducted over fifteen onsite workshops.

**TAMC Asset Management Pilot Projects** Effort for Michigan Transportation Asset Management Council sponsored pilot project. Provided guidance to a county engineer to establish a pavement asset management plan. This included establishing road improvement strategies using RoadSoft to make best use the budget, milestones, and documentation.

**LTAP Webinars** Main coordinator for technical webinars sponsored by the Local Technical Assistance Program. Researched applicable topics and subject matter experts. Contacted and corresponded with subject matter technical experts. Prepared advertisement materials. Moderated webinars with technical experts. These webinars included:

**Warm Mix Asphalt** June 2011

**Thin Asphalt Overlays** August 2011

**Using Chip Seals and Fog Seals in Pavement Maintenance** February 2012

**Cold In-place Asphalt Recycling** June 2012

**Recycling Asphalt Pavements** June 2012

**The Hole Story: Potholes** April 2013

**The Bridge, A Quarterly newsletter from Michigan's Local Technical Assistance Program**  
**Articles:**

**Unconventional Pavement Maintenance** Chip seals can extend pavement life from both ends of the spectrum. Kueber Watkins M. October 2011.

[http://michiganltap.org/sites/ltap/files/publications/bridge/bridge\\_25\\_2.pdf](http://michiganltap.org/sites/ltap/files/publications/bridge/bridge_25_2.pdf)

**Extreme Makeover: Road Edition** Wright Street, Successful Road Diet in Marquette, Marquette, MI  
Kueber Watkins M. December 2012. Vol. 26, No. 3.

<http://michiganltap.org/sites/ltap/files/publications/bridge/Bridge26-3.pdf>

**Fly Ash – One of Several Options for Stabilizing Soil Before Building a Road**

Ryyannen J, Kueber Watkins M. September 2012. Vol. 26, No. 2.

<http://michiganltap.org/sites/ltap/files/publications/bridge/Bridge26-2%20.pdf>

**County Engineers Workshop, February 2013, 2104** Main coordinator for technical workshop for the County Road Association of Michigan. Contacted and corresponded with subject matter technical experts. Prepared advertisement materials. Prepared budget.

### **Christopher B. Burke Engineering, Ltd.**

- Contract plans and specifications completion independently and as part of a team for: IDOT and municipal heavy highway alignments, profiles, cross sections, water management, utility, floodplain, erosion control, storm water runoff and wetland mitigation.
- Report preparation and modeling for: project feasibility, roadway design, bridge replacement, culvert construction and replacement, storm sewer, and IDNR/OWR permit procurement.
- Contributed to a well-mentored workforce by professionally supervising two junior engineers and two interns to transform theory into buildable infrastructure designs through hands-on experience.
- Facilitated completion of highly challenging design projects as a team.

### **Projects**



## MELANIE KUEBER WATKINS, P.E., PH.D.

### ***Stearns Road Corridor Wetland Mitigation Site (IL Route 25 to the Fox River): Earthwork and Grading Phase Prior to Road Construction***, <http://www.co.kane.il.us/dot/foxbridges/stearnsrd.aspx>

**Project Engineer** for the team collaboration of the plans, specifications, and estimates for IDOT's Federal Letting of November 2006.

This project contract phase included mass grading, detention and compensatory storage for the roadway embankment and earthwork and bike path. The Stearns road project site was located in unincorporated Kane County, west of Illinois Route 25, east of the Fox River, south of the Illinois Central Railroad. The site was approximately 70 acres of area without a road.

This portion of the Stearns Road project was estimated at \$5.7 million. The site statistics included: 11.7 acres of wetland mitigation, 12.8 acres of compensatory floodplain storage, 1500 feet of stream bank restoration, 5 detention basins for storm water management, Stearns Road embankment on new alignment from the Fox River to IL Route 25, special waste removal, tree preservation, several planting and seeding zones, and an extensive storm water pollution plan. The site provided all of the wetland mitigation and compensatory storage for the entire Stearns Road Corridor. Responsibilities included:

- **Calculations, storage design and modeling, report preparation and filing of Illinois Department of Natural Resources/OWR and Kane County permits.** Difficulties included careful engineering and accounting to provide approximately 13 acre-ft of compensatory storage for all the fill in the flood fringe and the floodplain within the project site. The structures compensated for included the roadway embankment and 5 structures; abutments for Stearns Rd. on the east side of the proposed Fox River, the proposed Stearns Road over the North Arm of Brewster Creek, IL 25 over Brewster Cr., IL 25 E Br. Brewster Cr., and Dunham Rd. over east Brewster Cr. This was accomplished by designing the hydraulics for 5 ponds with restrictors using TR-20; 3 were interconnected.
- **The design met the Kane County Ordinance compensatory storage requirements of 1.5:1 from ground to 10-year which is more stringent than the IDNR requirements.**
- Complex earthwork analysis including unsuitable/special waste removal. Difficulties included that there were 6 categories of earthwork that had to be accounted for in the construction plans: topsoil cut, cut, topsoil fill, fill, porous granular fill, and unsuitable.
- Stormwater management including restrictor sizing, approximately 3000' of storm sewer design and modeling, **work on soil erosion control plans for stormwater pollution prevention.** No drainage structures previously existed on the project site.
- Responsibilities included construction plan preparation, specifications and special provision writing and compilation, estimates, and final plan submittals.

### ***DuPage Technology Park, N.F.P., West Chicago***

Water resources engineer for the hydraulic design of 5000' of storm sewer and a 128' 48"x78" elliptical culvert with HydraFlow modeling, plan preparation, and quantities including trench backfill for DuPage Technology Park Loop Road. Drafted culverts and storm sewer systems on contract plans using Microstation and GeoPak. Responsibilities also included report preparation for **DuPage County Stormwater Management Permit**. Difficulties 100-year storm conveyance was required for the storm sewer design and this was a relatively flat location.

The DuPage Technology Park (<http://www.dupageairport.com/dfc/documents/DNTPbrochure.pdf>) project consisted of the development of the subdivision for the industrial park including mass grading and site infrastructure. Site statistics included: 7 storm water detention facilities and 4 regional storm water detention facilities providing approximately 230 AC/FT of storm water storage in accordance with the DuPage County Countywide Storm water and Floodplain Ordinance and the City of West Chicago.

### ***Lawrence Avenue Streetscape, Harwood Heights***

Project engineer for phase I corridor plans including developing neighborhood-friendly uses, pedestrian-oriented architecture, first floor commercial uses, new lighting, widening in the existing right-of-way, and streetscape improvements where the goal was to unite new and existing development while improving safety

## **MELANIE KUEBER WATKINS, P.E., PH.D.**

for roadway users and pedestrians. Responsibilities for this project included conceptual planning then producing engineering documents including: the project development report, roadway plans and cross sections, location drainage report including storm sewer design and detention calculations, and contract drainage plans for IDOT Bureau of Local Roads.

### ***CCHD, 153<sup>rd</sup> Street, from Wolf Road to West Avenue, Orland Park***

Water resources engineer for the reconstruction improvement of 153<sup>rd</sup> Street. Responsibilities included hydrologic and hydraulic analysis including routing for culvert and storm sewer design for contract plans. Hydraulic analysis included: using HY-22 to space inlets, interpreting geometric plans, profiles, and cross sections to size storm sewers with Hydraflow, in-line detention design to meet storage volume requirements by allowable flow analysis, hydraulic grade line analysis, and restrictor sizing. Also analyzed an existing detention basin using topographic maps, existing subdivision plans, and NRCS Soil Maps. Modeled the basin system including weir flow via stage-storage-discharge relationship, used TR-20 with Bulletin 70 to find design flows, and used HY-8 to size a culvert. Completed contract plans using Microstation.

### ***Downtown Redevelopment, Olde Half Day Road, Lincolnshire***

Water resources engineer for the associated hydraulic analysis for downtown redevelopment improvements including roadway, infrastructure and parking lot construction. Responsibilities included storm sewer design.

### ***WCDOH, 135<sup>th</sup> Street, from New Avenue to Archer Avenue, Will County***

Water resources engineer for the Motor Fuel Tax funded widening, reconstruction, and realignment at the east end of the project where 135<sup>th</sup> Street intersected Archer Avenue at a 90-degree angle. Responsibilities included revisions to storm water designs, ESRF submittals, and contract plans including erosion control plans and culvert design.

### ***Butterfield Road - Harding Ave. to IL Rte 137 (Buckley Rd.), Phase II, Libertyville***

Water resources engineer for the widening improvement. Responsibilities included design of **storm sewer, in-line detention following Lake County release rate requirements** and contract preparation. Determined inlet spacing using HY-22, and interpreted geometric plans, profiles, and cross sections to size storm sewers using Hydraflow. **Specified storm water treatment system/low impact development measures for outlet pollution control using separation technology with design flows to maintain discharge water quality.** Drafted storm sewer system including profiles on contract plans using Microstation and Geopak.

### ***I-88 East-West Tollway Mainline Roadway Widening & Construction***

Responsibilities included re-sizing two proposed culverts with HY-8 culvert modeling software.

### ***IL 19 at Meacham Creek***

Water resources engineer for removal and replacement of a 12'x9' box culvert. Responsibilities included: hydraulic report and hydraulic analysis completion using WSP2, profile and cross-section preparation for sizing the new opening.

### ***I-80 over Hickory Creek and Two Tributaries to Hickory Creek, IDOT Various***

Water resources engineer for the replacement of a 6'x5' box culvert, 8'x6' box culvert, and an 8-span structure. Responsibilities included preparation of three hydraulic reports including hydrologic and hydraulic analyses: analyzed hydraulic atlas contours and topographic maps to confirm drainage subdivides for contributory drainage areas, analyzed existing depressions using topographic and NRCS soil maps, modeled weir flow via stage-storage-discharge relationship, and used TR-20 with Bulletin 70 to find flows, and completed models using HEC-2 and HEC-RAS.

### ***Prairie Holding***

Project engineer for preparation of special provisions, contract plans, and sewer design. Drafted storm sewer system, including profiles on contract plans using Microstation and Geopak.

### ***North Industrial Special Assessment, Bensenville***

## **MELANIE KUEBER WATKINS, P.E., PH.D.**

Project engineer for existing storm sewer and proposed storm sewer profiles. Drafted storm sewer system, including profiles, on contract plans using Microstation and Geopak.

### ***131<sup>st</sup> Street over Long Run Tributary BA, Cook County Highway Department***

Water resources engineer for the replacement of the existing box culvert with a 72' precast box culvert with span length of 6' and depth of 8' carrying 131st Street over Long Run Tributary BA. The existing culvert of size 6'x8' was in a great state of deterioration and the roadway embankment side slopes had overgrown.

Responsibilities included completion of hydraulic reports, hydraulic analysis using HEC-2, and HY-8 models for design, sensitive flood receptor survey analysis, **report preparation and IDOT Permit Summary for Floodway Construction**. Difficulties of this project included that there were two regulatory models: a CLOMAR HEC-2 and a FIS WSP2, and decisions how combine the most relevant information for analysis had to be made.

### ***131st Street over Long Run Tributary B, Cook County Highway Department***

Water resources engineer for the replacement of the existing box culvert with a 64' precast box culvert with span length of 8' and depth of 8' carrying 131st Street over Long Run Tributary B. The existing culvert of size 2x6.8'Hx8.7'W and length of 49.2' was in a great state of deterioration.

Responsibilities included completion of hydraulic reports, hydraulic analysis using WSP2, and HY-8 models for design, sensitive flood receptor survey analysis, **report preparation and IDOT Permit Summary for Floodway Construction**. Difficulties of this project included that the regulatory model arrived as a hard copy; an electronic copy had to be produced and executed for analysis, and that the datum correlation between the FEMA models and the CBBEL survey could not be established so separate models for permit and design each had to be used.

### ***Illinois Department of Transportation: Bureaus of Planning & Programming, Local Roads & Streets, Design***

- Project and consultant management independently and as part of an engineering team. Responsibilities included contract negotiation (including man-hours and budgets), contract management, project program database management, and engineering documents review and revisions including reports, plans, cross sections, alignments, highway capacity analysis, storm water management plans, models, and field assessments.
- FHWA, municipality, agency, stakeholder and council coordination: implementation of project and design documents including environmental surveys, and environmental class action determination documents records.
- Development and presentation of conceptual and design plans with emphasis on safety, operational effectiveness, and minimizing impacts to adjacent properties.
- Field inspection and developer coordination for: access permits to ensure safety requirements, concrete workability and placement, soil testing and reinforcement requirement assurance.
- Supervised three entry-level engineers.

### ***Projects***

#### ***Interstate 94/90 (Dan Ryan Expressway), 31<sup>st</sup> Street to Interstate 57***

Engineer in a team effort for consultant management of the reconstruction and reconfiguration of a multi-lane expressway. Responsibilities included contract negotiation and management, and engineering document review including phase I plans and project report. Responsibilities also included public hearing attendance, FHWA, park district, and CTA coordination.

#### ***I-59 (I-55 to the DuPage River)***

Consultant engineer for an extensive highway widening and interchange modification with right-of-way acquisition including extensive drainage improvements and floodplain modifications. Responsibilities included consultant management: contract negotiation, contract management, and engineering document

## **MELANIE KUEBER WATKINS, P.E., PH.D.**

review and revisions, FHWA, municipality, and council coordination. Engineering documents included: phase I plans, project report, location drainage report and storm water models, hydraulic report and bridge waterway models, and drainage plans.

### ***IL Route 53 (Elgin-O'Hare Expressway to Army Trail Road)***

Consultant engineer for a reconstruction and add-lanes project with right-of-way acquisition including drainage improvements to correct extensive flooding problems. Responsibilities included consultant management, contract negotiation, contract management, and engineering document review and revision. Engineering documents included: phase I plans, alignment, capacity analysis, project report, location drainage report and storm water models, environmental documents, and roadway and drainage contract plans. Responsibilities also included public hearing attendance, FHWA, municipality, and council coordination.

### ***I-57 at Stuenkel Road***

Consultant engineer for new construction of an interchange. Responsibilities included consultant management, contract negotiation, contract management, and engineering document review and revision. Engineering documents included phase I plans, alignment, capacity analysis, project report of interchange design options, and environmental documents.

### ***US 20 at McLean Boulevard***

Consultant engineer for new construction of an interchange. Responsibilities included consultant management including contract negotiation, contract management, and engineering document review and revision. Engineering documents included: phase I plans, alignment, capacity analysis, environmental documents, and location drainage report. Also participated in FHWA, municipality, and council coordination.

### ***US Route 6/Illinois Route 7 (I-355 to US Route 45)***

Consultant engineer for reconstruction and add-lanes project with constrained right-of-way acquisition. Responsibilities included consultant management, contract negotiation, contract management, and engineering document review and revision. Engineering documents included: phase I plans, project report, capacity analysis, and roadway and drainage plans. Responsibilities also included public hearing attendance, FHWA, municipality, and council coordination.

### ***5<sup>th</sup> Avenue over Silver Creek***

### ***I-55 (East Frontage Road) over Sunnyland Drain***

### ***Wentworth Avenue over Little Calumet River***

### ***Dixie Highway over Butterfield Creek***

Consultant engineer for various bridge improvement projects that included total replacements, superstructure, and deck replacements. Responsibilities included consultant management, contract negotiation, contract management, and engineering document review and revision. Engineering documents included bridge condition reports, hydraulic reports, plans and cross sections, models, floodplain compensatory storage plans, and permit applications.

### ***IL Route 31 at IL Route 176***

Consultant engineer for the reconstruction of an intersection. Responsibilities included consultant management including contract negotiation, contract management, and engineering document review and revisions. Engineering documents included: project report, location drainage report, contract drainage plans, cross sections, highway capacity analysis, and environmental documents. Responsibilities included public hearing attendance, FHWA, municipality, and council coordination.

### ***Torrence Avenue (US 12/20), 95<sup>th</sup> Street to 124<sup>th</sup> Street***

Consultant engineer for re-pavement improvements in industrial hazardous waste/brown field environment. Responsibilities included project initiation meetings to discuss environmental surveys, and environmental class action determination documents record requirements, preliminary plans, cross sections, and capacity analysis. Responsibilities also included FHWA, municipality, and forest preserve district coordination.

### ***Other Projects***

## **MELANIE KUEBER WATKINS, P.E., PH.D.**

Design engineer for various re-paving and patching projects. Responsibilities included site assessment and drafting of contract plans including profiles, cross sections, alignments using Microstation and Geopak.

### ***STS Consultants, Ltd., Deerfield, IL***

#### ***Construction Quality Insurance Management, Internship***

Daily field inspection including soils, reinforcement, concrete compliance and testing. Report writing.

Bannockburn Center at College Park, 1200 Lakeside Dr., Bannockburn, IL  
Inspected footing rebar, concrete, CA7 backfill compaction. Constructed by Pepper Construction.  
[http://www.peri-usa.com/projects.cfm/fuseaction/showreference/reference\\_ID/316/referencecategory\\_ID/25.cfm](http://www.peri-usa.com/projects.cfm/fuseaction/showreference/reference_ID/316/referencecategory_ID/25.cfm)

Oak Brook Parking Deck No. 5, 100 Oakbrook Center, Oak Brook, IL  
Conducted soil bearing capacity tests, removable of unsuitable soil, lean concrete backfill; inspected cassion, footing, ramp, and column concrete and rebar; CA7 backfill compaction of trenches with Dynamic Cone Penetrometer. Post tensioned cable structure constructed by Corrigan Construction.

Hilton Garden Inn Chicago/Oakbrook Terrace, 1000 Drury Lane, Oakbrook Terrace, IL  
Inspected trench work; footing, elevator shaft, and lintel concrete; rebar; mortar. Constructed by Novak Construction.

Alexian Brothers Hospital, 800 Biesterfield Rd, Elk Grove Village, IL  
Emergency Department Additions/Alterations.  
Inspected lean concrete as back fill for unsuitable soil removal; 3" stone compaction; welded wire mesh placement; foundation wall rebar and concrete; CA7 backfill with Dynamic Cone Penetrometer; slab concrete. Constructed by Pepper Construction.

Inspected rebar and concrete for various new construction and additions at:  
Sherwood Conservatory, 1312 S. Michigan Ave. Chicago, IL. - west side of auditorium walls.  
57 E. Delaware Place Condos - footing concrete, Power Construction.  
Seasons of Glenview Place, 4501 Concord Ln, Northbrook, IL – column concrete, Pepper Construction.  
Dexter Chemical, Waukegan, IL.  
Gray Elementary School, 3730 N. Laramie, Chicago, IL.  
Hyatt Parking Garage  
United Airlines Credit Union  
Rosemont Hyatt Parking Garage  
DePaul University  
BFI Waste Management Dupage  
Ameritech  
Shops at Schaumburg, Osmond Construction  
North Parkway No. 4

### **Computer Proficiency**

#### ***Hydrologic & Hydraulics Programming & Modeling***

HY-22 Inlets, Hydraflow Storm Sewers, TR-20, HY-8, HEC-RAS/HEC-2, WSP2, EPAnet, SewerCAD, EPASWMM, XPSWMM, PCSWMM

#### ***Transportation & Industrial Programming & Modeling***

Microstation, GeoPak, AutoCAD, 3D IDEAS SDRG, HCS, ArcMap ArcGIS for Data Procurement and mapping

# MELANIE KUEBER WATKINS, P.E., PH.D.

## ***Scheduling, Planning, and Estimating Software***

Primavera, Timberline

## ***Misc.***

MS Office, HTML, C Programming, Database Management

## **Michigan Tech Graduate Research & Educational Experience**

***Evaluation of Specifications for Fly Ash Used in Highway Concrete, NCHRP 18-13*** The overall goal of this externally funded research project is to recommend modifications to the existing specifications and test methods for beneficial use of coal fly ash in concrete as a supplementary cementitious material. Interdisciplinary team collaboration has provided a broader understanding of carbon properties and measurement methods. Contributions include improvements to existing laboratory test methods and development of new scientific methods, written drafts of methods and results for reports, journal paper drafts, material management and acquisition, data acquisition and management, conducting user surveys, and also supervision of two undergraduate assistants in avenues for new research opportunities.

***The Coal Fly Ash Industry and Public Policy*** Review of literature and composition using public policy frameworks to model industry problems with incorporation of engineering and science to understand how a multidisciplinary solution would allow for the continued use of fly ash in concrete.

***Natural Pozzolans for Use in Concrete, Tanzania*** 3-week initiative in July 2009 practicing investigative research to assess current, natural pozzolan use in concrete. Evaluated the availability of natural materials and their current use in roads, structures, and concrete floors for houses by studying available literature and explorations. The goal for research is to ultimately suggest innovative solutions to be implemented locally to address transportation, poverty, and sanitation problems with the possibility to retrofit these solutions to address the global concerns in other developing nations.

## **Publications**

***Characterization of Coal Fly Ash by the Absolute Foam Index*** Kueber Watkins M, Ahmed Z, Sutter L, Hand D. ACI Materials Journal, May 2015.

<https://www.concrete.org/publications/internationalconcreteabstractsportal.aspx?m=details&ID=51686972>

***A Review of the State of the Practice of Data Collection Techniques for Unpaved Roads*** Melanie Kueber Watkins, Timothy Colling, Colin Brooks, Chris Roussi, Rick Dobson. Submitted to ASCE Journal of Transportation Engineering April 2014.

***Advances in Gravel Road Management Start with Condition Assessment*** Melanie Kueber Watkins, Chris Roussi, Timothy Colling, Colin Brooks, Richard R. Dobson, Gary Schlaff, Luke Peterson, David Dean. Submitted to ASCE Magazine April 2014.

***Fly Ash Iodine Number for the Measuring the Adsorption Capacity of Coal Fly Ash*** Measurement of iodine adsorption by coal fly ash. Ahmed Z, Hand D, Sutter L, Kueber Watkins M. ACI Materials Journal, July 2014.

<http://www.concrete.org/Publications/ACIMaterialsJournal/ACIJJournalSearch.aspx?m=details&ID=51686582>

***Combined Adsorption Isotherms for the Measurement of AEA's Adsorption by Fly Ash in Concrete*** Ahmed Z, Hand D, Sutter L, Kueber Watkins M. ACS Sustainable Chemistry & Engineering, March 2014.

DOI: 10.1021/sc500043s <http://pubs.acs.org/doi/ipdf/10.1021/sc500043s>

## MELANIE KUEBER WATKINS, P.E., PH.D.

***Air Entraining Admixtures Partitioning and Adsorption by Coal Fly Ash in Concrete*** Ahmed Z, Hand D, Kueber Watkins M, Sutter L. ACS Industrial and Engineering Chemistry Research, March 2014. DOI: 10.1021/ie4018594. <http://pubs.acs.org/doi/pdf/10.1021/ie4018594>

***Characterization of Coal Fly Ash-Cement Slurry by Absolute Foam Index*** Development of the foam index test to characterize coal fly ash, standard procedure, statistical analysis, and correlations to adsorption isotherms, AEA isotherms, and mortar. Dissertation, Kueber Watkins M. May 2013. <http://digitalcommons.mtu.edu/cgi/viewcontent.cgi?article=1492&context=etds>

***Collecting Decision Support System Data via Remote Sensing of Unpaved Roads*** The development of a market-ready unmanned aerial vehicle system to detect unpaved road distress that are compatible with a decision support system. Dobson RJ, Colling T, Brooks C, Roussi C, Kueber Watkins M, Dean D. Transportation Research Record, August 2013. <http://docs.trb.org/prp/14-5076.pdf>

***Integrated Environmental and Economic Comparison of Continuously Reinforced and Jointed Plain Concrete Pavements*** Economic and environmental study of resources and their life cycle projection. Muga H, Mukherjee A, Mihelcic J, Kueber M. Journal of Engineering Design and Technology, October 2008. <http://www.emeraldinsight.com/Insight/viewContentItem.do?contentType=Article&contentId=1779207>

***Extreme Makeover: Road Edition*** Wright Street, Successful Road Diet in Marquette, Marquette, MI Kueber Watkins M. The Bridge, A Quarterly newsletter from Michigan's Local Technical Assistance Program, December 2012. <http://michiganltap.org/sites/ltap/files/publications/bridge/Bridge26-3.pdf>

***Fly Ash – One of Several Options for Stabilizing Soil Before Building a Road*** Ryyannen J, Kueber Watkins M. The Bridge, A Quarterly newsletter from Michigan's Local Technical Assistance Program, September 2012. <http://michiganltap.org/sites/ltap/files/publications/bridge/Bridge26-2%20.pdf>

### Proposal Collaboration

***Developing a Snow and Ice Control Environmental Best Management Practices Manual*** Joint effort for a proposal to develop the best available deicer product, application, and impact information. Russell Alger, Melanie Kueber Watkins, Timothy Colling, Shaughn Kern. Submitted to Clearroads.org August 2013.

***Use of Mature Fine Tails in Concrete and Asphalt*** Joint effort for a proposal investigation and use of recyclable materials. Melanie Kueber Watkins, David W. Hand, Robert Fritz, Jean Leav. Michigan Tech Transportation Institute: \$10k funded September 2013.

***Iodine Number*** Joint proposal effort for refining the iodine number test that is used for directly measuring adsorption capacity of coal fly ash. Ahmed Z., Hand D, Perram D, Kueber Watkins M. 2013.

***Evaluation of Adsorption Inhibitors for Beneficial Uses of High Carbon Fly Ash*** Kueber M, Ahmed Z, Sutter L, Hand D. Proposal for UTC 2009 Summer Scholars Program.

***Fibers in Concrete*** Participated in the preliminary literature review for joint effort for a proposal to develop a state-of-the-art report based on the most recent research regarding the use of fibers in concrete. 2007.

***Recycled Concrete In Transportation Infrastructure*** Participated in the preliminary literature review for a proposal to develop practice based on current information to meet economic challenges while fulfilling environmental and safety requirements. 2007.

# MELANIE KUEBER WATKINS, P.E., PH.D.

## Report Writing

***Characterization of Unpaved Road Condition Through the Use of Remote Sensing: State of the Practice of Unpaved Road Condition Assessment*** Performed literature review and participated in team effort to prepare document on joint project with Michigan Tech Research Institute. November 2011.

***Characterization of Unpaved Road Condition Through the Use of Remote Sensing: Software and Algorithms to Support Unpaved Road Assessment by Remote Sensing*** Participated in team effort to prepare document on joint project with Michigan Tech Research Institute. October 2012.

***Activity Travel Behavior, February 2011*** Analysis and documentation of a study comparing the benefits of webinars using Michigan LTAP data.

***TAMC PASER QC/QA, 2012, 2013*** Update of existing PASER rating quality control plan and assessment report with new 2012 collection data and user survey data.

***RE: MDOT Enterprise Asset Management System: Roadsoft Capabilities, 2013*** Marketing document outlining functions of Roadsoft.

***A Closer Look at the Day to Day Administration of the Illinois Department of Transportation*** Northwestern. December 1999.

## Reviews and Editing

***General Purpose (GP) Cement with Higher Limestone Content in Australia.*** American Concrete Institute. Reviewed September 2015.

***Update Existing Climatic Files and Add New Weather Stations for Pavement ME Design in Michigan using ASOS/AWOS database.*** Michigan Tech for TRB Publication. Reviewed July 2015.

***Report on the Use of Fly Ash in Concrete (ACI 232.2R).*** American Concrete Institute. Reviewed July 2015.

***Guide to Design and Proportioning of Concrete Mixtures for Pavements (ACI 325.XR).*** American Concrete Institute. Reviewed June 2015.

***Runoff Impacts and LID Techniques for Mansionization Based Stormwater Effects in Fairfax County, VA.*** Journal of Sustainable Water in the Built Environment. Reviewed May 2015.

***ACI Committee 304.2 Placing Concrete by Pumping Methods.*** Reviewed September 2013.

***Particle Size and Specimen Preparation Effects on the Iowa Pore Index.*** ACI Materials Journal. Reviewed May 2013.

## Research Dissemination

***Michigan Tech RIM (Recovered Industrial Materials) Education and Research Initiatives*** Kueber, M.; Sutter, L.; Hoy, B. American Coal Ash Association (ACAA) Presenter, Invitee to mid-year conference, Alexandria, VA, July 2008.

***Fly Ash and Surfactant Interactions: The Role of Solution Chemistry and Interfacial Science in Test Design and Application*** PhD Proposal Defense, December 15, 2010.



# MELANIE KUEBER WATKINS, P.E., PH.D.

## Featured Articles

**Precast Solutions** Collaborative Article Effort: **Researchers Increase Concrete's Durability and Recycled Content** *Precast Solutions*, Summer 2009 Issue, 16-20. National Precast Concrete Association. <http://precast.org/2010/07/researchers-increase-concretes-durability-and-recycled-content/>

**Making Concrete Greener** Gagnon, J., Featured article, Michigan Tech Research Magazine 2009, p. 24. <http://www.mtu.edu/research/archives/magazine/pdf/Research%20Magazine%202009.pdf>  
<http://www.mtu.edu/research/archives/magazine/2009/stories/grad/>

## Graduate Student Mentoring

**MS Graduate Committee Member for Jean Leav.** *Mature Fine Tailings (MFTs): A Study of Compressive Strength and Rheological Properties of Athabasca Oil Sands Petroleum Mining Waste Applied in Concrete Mixtures.* MS Report advising/editing, December 2013.

**MS Graduate Committee Member for Brie Rust.** *Beneficial Reuse of Locally-available Waste Materials as Lightweight Aggregate in Lightweight Concrete.* MS Report advising/editing, 2014.

**MS Graduate Committee Member for Toni Larche.** MS Geology. Pending Fall 2015.

**PhD Graduate Committee Member for Mohammad Fard.** PhD Environmental Engineering Pending Spring 2018.

## Other Teaching Experience

**1999, Northwestern University – Engineering First** Taught a recitation section of first year engineering students interdisciplinary engineering fundamentals. Assisted with homework and projects.

**1996 to 1997, Michigan Technological University – Geotechnical Soils Engineering Mechanics Lab** Taught several laboratory sections of third and fourth year engineering students soil and foundation mechanics fundamentals. Assisted with and graded laboratory reports and homework problems.

**September 2010 to 2011, Michigan Technological University – Civil Engineering Materials Lab** Taught several laboratory sections of third and fourth year engineering students. Topics included metal fracture, aggregate properties, and concrete and asphalt fundamentals. Assisted with and graded laboratory reports.

## Honors and Awards

**Graduate Student Representative** Graduate Education Day, April 13, 2010 during Michigan Graduate Education Week. Michigan State Capitol Building, East Lansing, MI. <http://www.mtu.edu/news/stories/2010/april/story25543.html>

**Graduate Student of the Year - Danielle Ladwig Award for Graduate Excellence** Michigan Technological University, Department of Civil and Environmental Engineering, May 2009. CEE 2010, Department News, p. 7. [http://www.cee.mtu.edu/news/Newsletters/CEE\\_newsletter\\_2010.pdf](http://www.cee.mtu.edu/news/Newsletters/CEE_newsletter_2010.pdf)

## MELANIE KUEBER WATKINS, P.E., PH.D.

**Integrated Graduate Education Research Trainee, Southern University & A&M College, Historically Black Colleges and University (HBCU), Baton Rouge, Louisiana: National Exchange Student Spring Semester 2008** (IGERT, [www.sfi.mtu.edu/IGERT](http://www.sfi.mtu.edu/IGERT)) Multidisciplinary program that included engineering and public policy collaboration with the goal of advancing the science of sustainability. August 2007 Recipient. Assessment Committee Member for IGERT Renewal Proposal, Fall 2008.

**University Transportation Center (UTC)-Michigan Sustainable Transportation Institute Student of the Year Award and Fellowship** (MiSTI, [www.misti.mtu.edu](http://www.misti.mtu.edu)) November 2008 Recipient. U.S. Department of Transportation (USDOT), UTC outstanding student award Washington, D.C. MiSTI Transportation News, Vol. 1, p. 3. [http://www.misti.mtu.edu/pdf/misti\\_v3\\_n1\\_web.pdf](http://www.misti.mtu.edu/pdf/misti_v3_n1_web.pdf)

### Community Service & Hobbies

**Portage Township Planning Commission.** Board member, June 2013 to present. Chair, 2015 to present. December Worked with the Planning Commission and the consultant for completion of the Master Plan. Worked with the Planning Commission and the consultant for completion of the Zoning Ordinance. Reviewed site plans. Revised the Zoning Application June 2016. Drafted civil infraction ordinance and rental ordinance for enforcement of the Zoning Ordinance.

**ACEC Illinois.** Member July 2016 to present. Pump station committee chair, November 2016.

**KUUF.** Finance Committee Member, October 2016 to present. Board member, May 2013 to May 2015. Interim Vice President, February 2014 to May 2015. Participated on the committee to hire an Interim Minister. Participated with the former choir director to hire a new choir director.

**City of Houghton Stormwater Ordinance.** Reviewed draft copy and provided comments to Jay Green, City of Houghton Planning Commission. May 2013. Adoption by Houghton 2017.

**Race Volunteer** Roadway crossing and safety volunteer: Canal Run, Kuparisaari Triathlon, Deer Chase, FatTire, ChainDrive. Keweenaw Cyclocross.

**Travel Experience. International:** Argentina, Brazil, British Virgin Islands, Canada, Chile, Czech Republic, Ecuador, Galapagos Islands, Germany, India, Italy, Mexico, Panama, Peru, Tanzania, U.S. Virgin Islands. **Domestic:** Alaska, Alabama, Arkansas, Arizona, California, Colorado, Florida, Georgia, Hawaii, Illinois, Indiana, Iowa, Kentucky, Louisiana, Maine, Maryland, Michigan, Minnesota, Mississippi, Missouri, Nevada, New Hampshire, New Mexico, Ohio, Oregon, Pennsylvania, Rhode Island, Tennessee, Texas, Utah, Virginia, Washington, Washington DC, Wisconsin.

**Outdoor Activities** Cycling, hiking, camping, canoeing, swimming, kayaking, downhill skiing, cross country skiing, back country skiing, snow shoeing.

**Classical Arts** Piano lessons: 10 years. Undergraduate Thematic Studies: Theater History, Musical Theater History, Black Film, Jazz History.