Construction materials such as aggregates, cements, supplementary cementitious materials, admixtures and hardened concrete are, quite literally, the building blocks of modern infrastructure.

Most types of construction materials are manufactured. Which means, like most manufactured products, they must meet a stringent set of prescriptive-based specifications—in addition to performance-based specifications relating to the project where they will be used. When these materials fail, an investigation to determine why is at the heart of nearly every litigation.

This is where laboratory testing comes into the spotlight. Lab tests are used to determine if materials are suitable for use, or to analyze why they failed. However, in order for lab tests to produce informative results, the material samples submitted for testing must be appropriately selected and sampled for quality analysis.

The importance of a high-quality sample

These days, performance-based specifications—such as those required for commercial, military, state and federal projects—are becoming increasingly detailed, causing lab assessments to become increasingly complex. Additionally, as new construction materials come on the market, test methods must change or be developed to provide corresponding quality assessments.

To meet these increasing challenges, AET has expanded its lab services over the last decade to include extensive materials evaluation, engineering, petrography, and chemical analyses. For example, our chemical services conduct testing that requires a sophisticated blend of technologies that includes Fourier Transform Infrared Spectrometer (FTIR), X-Ray Fluorescence (XRF) and X-Ray Diffraction (XRD) instrumentation.

The quality of the sample is critical to the laboratory tests.
What does the Hive do for clients?

Instead of receiving each lab report as an individual file, clients can now log in to the Hive and choose to download, print or forward reports at their convenience. The Hive also presents each user with options to personalize their account; for example, users can choose to receive alerts, such as for failed or passed tests, or they can opt for daily or weekly email summaries of pertinent lab reports. Most important, each client’s data is fully protected and accessible only by accounts of their choosing.

Another key feature is the Hive’s powerful search tool, which allows users to quickly locate the exact lab results they need.

Which AET lab reports are available on the Hive?

Many of AET’s lab reports are now available on the Hive. Depending on the needs of clients, other types of AET reports will be added in the near future.

AET’s default lab report delivery method is now the Hive, but clients can still request to receive their results via email, fax or print.

How do I access the Hive?

The first time a client’s report is uploaded to the Hive, the client receives an email that includes a link for account setup. It’s a quick and easy process—it requires the client to assign a password and that’s about it. By default, each client email address will have its own account, but account sharing/ownership can be customized to meet client needs.

Learn how to use the Hive

If you’d like a run-through of how the Hive works and what to expect from it, give us a call. We can tailor the training session (takes only 20-30 minutes) to meet your needs.

Bob Schlick is AET’s IT manager and calls Saint Paul home. Bob can be reached at rschlick@amengtest.com.

In this case, a discussion with the lab professional about the scope of project—before collecting samples—can help you gauge the lab’s ability to provide the correct results on a timely basis, and with your budget.

Tip #3: Know which type of sample is required

The type of sample will depend on the type of test your material-in-question requires. For example, cores of concrete may work for a physical materials test, whereas a powder may be suitable for a test involving XRD or XRF.

Tip #4: Include control samples and background information (if applicable)

For a successful failure analysis (a test performed to determine why a material failed), areas of concern should be compared to areas not exhibiting a problem. In other words, a control sample should be obtained from an area on the project site where a failure is not present. Background information, including product specifications or remnants can also assist the lab professional in understanding the root of the problem.

Tip #5: Practice proper protocol for handling test samples

After obtaining a sample, it is important to follow the preservation protocol and procedures required by the test method. It could be as simple as drying off a core and inserting into a plastic bag. (This procedure is required for compressive strength of core samples.) For other tests, the procedure may be more complicated. Always check with the lab—they will know the most appropriate practices.

Tip #6: Properly label samples

Before sending your samples to a lab, make sure they are properly labeled. Sending unlabeled bags or boxes of materials is never a good practice! Moreover, avoid using simple letter “A” and “B” designations. A sample’s identification should be unique and clear so lab reports can be easily understood. For example, a good label of a core sample may include its location, floor and area of sampling: LOC4132 F3rd NE.
Be sure to securely pack your samples for shipping. Glass containers are never a good idea! We also recommend including a written request, your contact information, and the problem you’re having with the material.

The bottom line? Ask your lab professional how they’d like you to label and ship your samples.

A final note about obtaining samples

Above all else, remember to always check with your lab professional before obtaining—and submitting—samples for testing. Submitting the right sample can not only streamline the laboratory-testing process but also provide you with the information your project—or product—needs to succeed.

Willy Morrison is AET’s Concrete laboratory manager. She can be reached at wmorrison@amengtest.com. Gerard Moulzolf, PG, is AET’s petrographics manager. He may be reached at gmoulzolf@amengtest.com. Bill Rebel is AET’s principal chemist. He may be reached at brebel@amengtest.com.

EDITORIAL: GOOD RIDDANCE TO WINTER
BY JEREMY MORRIS – AET SAINT PAUL

It may seem obvious but we’d like to state for everyone that we’re glad to send winter on its merry way. This photo was taken on February 21 from our first-floor, above-grade, office in Duluth, MN—that puts the drift at at least 6 feet!

Cold temperatures and late season snowstorms lasted into early April. We are anxious to get started on a compressed season of transportation and construction projects throughout the region. Let’s welcome the true onset of spring—construction season—with one big collective sigh of relief.

PROJECT UPDATE: I-90 DRESBACH BRIDGE
BY DAN VRUNO, PG – AET SAINT PAUL

The I-90 Dresbach Bridge over the Mississippi is a heavily used commuter route for travelers in the LaCrosse/LaCrescent area, an important regional connection, and a part of the nation’s longest (coast to coast) interstate highway (I-90). Originally built in 1967, the 3,497-foot steel-girder bridge is now being replaced.

In addition to the design being fracture-critical, the existing Dresbach Bridge has narrow shoulders that have caused lane closures when vehicles are stranded or during routine maintenance operations. The bridge’s current interchange geometry has also created difficult and unsafe traffic movements for commuter traffic.

The new bridge, currently under construction, will be a concrete structure that meets current structural and geometric standards. When completed, it will include a reconstructed interchange designed to improve traffic flow, safety, capacity, and access on and between Highway 61/14 and I-90. The estimated completion date is 2016.

Recent construction activity has included the placement by Ames Construction of piers that support the bridge’s cast-in-place box girders. A typical footing for these piers is 1,600 cubic yards of concrete—a significant amount!

In conjunction AET’s aggregate laboratory has also performed dozens of grain-size and direct shear tests for sands used in the embankments to document that the embankment fill soils are of sufficient shear strength and meet project specifications.

The opportunity to work on such an important project is exciting and rewarding to many here at AET, both for the individuals who work on site and for those in the office performing laboratory tests or engineering analyses. To be part of the construction of the bridge that connects the longest interstate in the nation is pretty amazing, to say the least.

Dan Vruno, PE, is a principal engineer in AET’s Saint Paul office. He can be reached dvruno@amengtest.com.
AET UPDATES

New Employees Jan. - Mar. 2013
Nicole Bonde
Jacob Boyer
Scott Carlson
Alexander Jones
Belick Pfa
Calista Timmerman
Joseph Tongson
Glen Young

WELCOME BACK!
Marilyn Hein
Neil Ramdhan

See Us at These Upcoming Events
AET St. Paul Laboratory Open House
April 24, 4-7 PM – St. Paul, MN
MN Structural Engineers Assoc. Seminar
W. Morrison, speaker, May 13 – Minnetonka
Williston Basin Petroleum Conference
May 20-22 – Bismarck, ND

AET in the Community
Andy Walters, PE, a geotechnical engineer in AET’s Wausau office, was recognized for Outstanding Community Volunteerism related to K-12 outreach at the Region 3, 6 and 7 ASCE Leadership Conference in St. Louis, MO, in January. Andy is the director-at-large of the ASCE Northwest Branch of the Wisconsin Section.

“Attract! Retain! & Grow!” Midway Economic Development Summit
AET is the primary sponsor for this Midway Chamber of Commerce event, which will be held on April 16 at the Como Park Conservatory in St. Paul, MN. For more information or to register, visit www.midwaychamber.com or 651.646.2636.

Promotions and Certifications
Zac Aunson – Field Engineer I
Mike Hultgren – Senior Scientist Supervisor
Jesse Sich – Agg. Laboratory Coordinator
Bob Anderson, Al Harrington, Jeff Johnson, Scott Johnson – MnDOT Bridge Inspector
Nicole Bonde & Calista Timmerman – 40-hr. OSHA HAZWOPER
Matt Fuerst – ICC Reinforced Concrete
Matt Harshbarger – ICC Prestressed Concrete
Allan Kestler & Mike Neal – Asbestos Inspection License

Employee Spotlight – Michael F. Bailey, PE
Mike Bailey joined AET in March 2013 and, since then, has served as manager of AET’s Williston, ND, office. Mike has over 40 years of experience, and is a registered professional engineer in ND, SD, MN and WI. He recently played a key role in the organization of a new chapter of the North Dakota Society of Professional Engineers in Williston.

Correction: Larry Sutter, PhD was incorrectly titled in the Winter 2014 American Edge. His correct title is Director, Transportation Materials Research Center.

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