Ferguson Structural Engineering Lab Newsletter

THE UNIVERSITY OF TEXAS AT AUSTIN - STRUCTURAL ENGINEERING

Volume 2, Issue 3

September 08, 2010

Breen's Corner: Hot Monkeys on the Loose (By Jason Stith)

AUSTIN, TX It is often said those that who do not learn history are doomed to repeat it. Well sometimes history should be repeated, because it makes great stories. This is one of those occasions. In general, you should learn the history of Ferguson Lab to learn from past mistakes! However, if this ever happens again, do not hesitate to call me; I want to know about it ASAP. So thus our story begins... John Breen has recently moved from Missouri with his family to work on a PhD at the University of Texas in 1959...

Prior to the launching of the first American into space, numerous rocket tests were performed by the Air Force—predecessor to the National Aeronautical and Space Administration (NASA). The effect of cosmic radiation on human space flight was a major concern, which is why the space program based out of... Continued on page 11

New Faces at FSEL

Jose Manuel Gallardo

I was born in Panama. I obtained undergraduate and master degrees from "Universidad Tecnologica de Panama," where I also worked for 5 years. I enjoy biking, restaurants, music, bridges, and watching movies. I moved here in January with my wife (Ailenne) and I will try to absorb all of the Texas culture that I can while studying here in Austin.

Matt Reichenbach

I grew up in a small town outside of Baltimore, Maryland. I then moved on to Easton, Pennsylvania, for undergrad where I graduated last spring from Lafayette College (yes, good chance you've never heard of it). I also played on the varsity soccer team while there. And now I'm excited to leave behind the cold winters of Pennsylvania for the warmth of Texas. I enjoy watching all sports, especially soccer and of course my beloved Baltimore Ravens.

Aaron "Please say the P!" Woods

[Romans 8:37] I started my undergraduate studies at Jacksonville University as a dual-degree student athlete, playing football. I think that's where I first learned how to knock out opposition. Challenges on the field weren't much different from those in the classroom. But after much prayer, I turned in my cleats for steel-toed boots, to focus on engineering. I transferred to the University of Florida, where my passion for designing stadiums quickly outgrew my desire to play in them. In the process of completing my BS in Physics and Civil Engineering, I met my beautiful wife, graduated, got married, and moved to Texas! Happy to be a Longhorn, but I will always bleed Orange & Blue.

Inside this issue:

Cracked Panels - Aaron Woods, Umid Azimov, & Kiyeon Kwon

The paint may be fading with time, but that doesn't keep the orange boxes from still making headlines.

The infamous orange boxes are back! Continuing Foster and Forman's research, we are investigating prestress loss in precast concrete panels (PCPs) in order to optimize reinforcement details and control cracking. Previously the researchers determined that the actual prestress loss was less than that calculated using AASHTO equations. It was concluded that the initial prestress force in PCPs could be reduced from 16.1 to 14.4 kips per strand to be consistent with the overestimate in prestress loss.

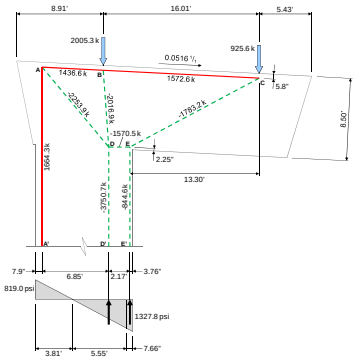
Our team has been monitoring the old precast panels to determine long-term prestress losses. Moreover, we cast six new panels this summer with a reduced initial prestress force to verify the results of the previous experiment. These new panels were instrumented on site using embedment and vibrating wire gauges. We plan to cast another set of panels this fall.

We've also prepared an instrumentation plan for an upcoming bridge monitoring project. By installing several gages in CIP panels, we will observe the behavior of CIP panels in a real composite bridge.

Positive Pressure Ventilation Research - Kevin Carollo, Thanhson Patrick Nguyen, Kristopher Overholt, & Craig Weinschenk

Firefighters use positive pressure ventilation (PPV) to remove hot combustion products from a fire room using strategic ventilation and a large fan. Higher heat release rates have revealed smoldering combustion in small channels that transition to flaming combustion when PPV is applied. The remaining experiments will complete the venting permutations at various heat release rates. Future work for the project includes conducting smaller scale channel experiments to study flame spread in small, non-dimensionalized channels. Other work also includes detailed analysis of the experimental uncertainty for temperature and velocity measurements from prior experiments. For questions, please contact ut.firegroup@gmail.com.

Strut-and-Tie Model Design Examples for Bridges - Chris Williams



Cantilever Bent Cap

The purpose of this project is to assist TxDOT engineers with the implementation of the strut-and-tie model (STM) provisions developed as a result of TxDOT project 0-5253, "Strength and Serviceability Design of Reinforced Concrete Deep Beams," by creating a set of design examples of reinforced concrete bridge components.

The design examples that have been completed include a cantilever bent cap and a five-column bent cap of a skewed bridge. Both of these designs address specific challenges. For example, the cantilever bent cap example demonstrates a method to design a "curved-bar node" at the outside of a frame corner under closing loads.

The next example will be the design of a pile cap. This will require the development of a 3-D strut-and-tie model illustrating the flow of forces from the column to the individual piles.

Seismic Behavior of Steel Beam-Column Connection - Sungyeob Shin

Past experimental studies on panel zone behavior in steel moment resistant frames (SMRFs) under seismic loading showed that joints with weak panel zones exhibit ductile and stable hysteretic responses without degrading strength and also achieve large interstory drift angles. However, simultaneous shear distortions of weak panel zones can lead to fracture in the beam flange welds. Therefore, despite the excellent performance of weak panel zones, recent US building codes have increased the shear strength of the panel zone (strong panel zone design) to avoid joint fracturing.

The overall goal of this project is to evaluate how much shear yielding of panel zones can be permitted in the inelastic seismic response of SMRFs through large-scale experimental studies and parametric computational studies on fracture-related behavior of panel zones.

Final detailed design of the test setup is currently completed. A series of large-scale interior beam-column joints will be tested at the NEES MAST Laboratory at the University of Minnesota.

NEES MAST Laboratory (University of Minnesota)

Passive Wireless Corrosion Sensors - Ali Abu Yousef

In order to investigate the performance of the new sensor when embedded in concrete, an experimental program was initiated. The program includes two independent experiments. The first examines the effect of medium on response and will target the durability and output consistency concerns. To this end, sensors were embedded in unreinforced concrete cubes and positioned at different read distances.

The second experiment evaluates the changes in sensor response as corrosion develops in concrete. The sensors were placed in reinforced concrete beams. Two groups of beams are being tested, one is exposed to 3.5% NaCl salt-water solution and the other is tested under tap water. Different sacrificial elements are used in this experiment. Dripping of the corroding solution is used instead of ponding to simulate the splash zone condition; hence, accelerate corrosion exists as oxygen will always be available.

These beams are fed weekly with hand-made 3.5% salt water, cleaned with soap every couple of weeks, and stored alone; no wonder they are the envy of all the other beams in FSEL.

U-Beam Shear Project - Catherine Hovell & Andy Moore

The U-Beam Team veered from its course of testing U-Beams this summer, instead conquering three different tasks. Andy continued finishing up his thesis and began studying for the PhD qualifying exam. As well, his research efforts have become more focused on the spliced girder project he will be officially starting soon. Young David, the former-undergrad-turned-MS student, spent the majority of his time under Alejandro's tutelage, learning the ins-and-outs of building Texas box beams.

The lone U-Beam-er left, Catherine, chose to better understand two-webbed beam behavior by studying single-webbed Tx girders, and working with Alejandro to orchestrate three shear tests on bulb-T beams like the one pictured. She also spent time setting up the first of the box beam shear tests.

The team is still waiting to have two U-Beams fabricated out-of-house to finish the U-Beam testing program. We all hope that will happen this fall.

Large-scale testing (def.): Specimen is taller than the grad student.

NDT Evaluation of ASR/DEF Damaged Bent Caps - Eric Giannini, Kerry Kreitman, & Zach Webb

Fundamental theorem of structural engineering:
cement + water + rocks + sand (+ NaOH) =
breakfast tacos, cookies, and concrete

Editor's Note: For steel students, a more appropriate title for the above equation might be "Fundamental parts of a concrete pour"

The three large-scale bent cap specimens that were cast last semester are currently being conditioned at the north end of the laboratory to accelerate concrete expansions caused by alkali-silica reaction (ASR) and delayed ettringite formation (DEF). As part of the conditioning regime, a service dead load was induced and the beams are undergoing continuous wet/dry cycles. Several non-destructive testing (NDT) methods are being performed in the test regions of the beams on a weekly basis, in addition to mechanical strain measurements in the concrete core and reinforcing steel.

In addition to the large-scale specimens, four smaller "slices" were cast this summer to investigate the use of NDT methods for evaluating in-service structures subject to ASR/DEF expansions. Three different concrete mix designs were used to examine the use of fly ash in mitigating ASR/DEF expansions. Two of the slices were cast using the reactive concrete mix design of the large scale beams, one was cast using a 25% cement replacement with fly ash, and the other cast using a 25% fly ash addition. Expansive strains caused by ASR/DEF in the concrete core and steel reinforcing will be monitored and eventually a stirrup will be intentionally severed in one of the slices and the use of NDT techniques to locate the fracture will be evaluated.

Elevated Temperature Material Properties - Jinwoo Lee

Jinwoo enjoys the heat!

There is increasing interest in the US to develop engineered approaches to structural fire safety of buildings as an alternative to conventional code-based prescriptive approaches. In steel buildings, one of the key elements of an engineered approach is the ability to predict the material properties during and after a fire.

The major purpose of this project is to figure out the material properties of ASTM A992 material at different temperatures. Specifically, the goals of the project include:

- Provide the fundamental mechanical properties for analyzing the building behavior during and after fire including earthquake event
- Evaluate the structural integrity of buildings due to fires of varying severity and different causes
- Provide basic data for the building design code for fire-resistant design

The experimental tests were performed by simulating real fire conditions. The following tests are being performed to characterize the ASTM A992 material.

- Tensile and compression test at elevated temperature
- Tensile test at room temperature after heating and cooling
- Tensile test at elevated or room temperature after yielding and heating or cooling
- Charpy V-Notch impact test and creep test at elevated temperature

The results of this research will include the elastic modulus, yield strength, and stress-strain curve at multiple elevated temperatures. The material properties will prove useful in the evaluation of the combined effect of earthquake and fire events.

Coupon after tensile test at elevated temperature.

Flexure-Shear Critical Columns - Matt LeBorgne

This project is investigating the behavior of non-seismically detailed columns in older buildings constructed before the 1970's. It is the goal of this research to determine the boundary conditions that initiate shear failure and quantify the degrading response. An analytical model has been developed and the damage parameters calibrated to a database of columns that have yielded in flexure prior to failing in shear. The results of the calibration show the cyclic shear failure response can be predicted by the material and geometric properties of the column. However, the regression that predicts the slope of the backbone curve has a significant amount of variability and shear failure is sometimes not detected with sufficient accuracy.

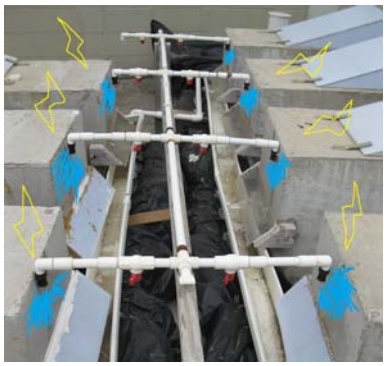
Over the summer we constructed a massive amount of formwork and cast our first specimen. The column specimen was cast in three stages to mimic typical construction practice. The casts were a success in no small part because of the FSEL student volunteers and staff…so thanks! The next task is to construct our steel test frame, mount the actuators, and wire the controller. Then MTS will complete the installation of our new controller and actuators. We are very excited about this new system since it will control axial load, beam attitude, and the applied lateral load. The second specimen will be cast after testing is complete on our first column.

In case of emergencies, a tornado shelter was built in the middle of the lab.

Corrosion Resistance of New PT Systems - Greg McCool & Kevin Moyer

This project examines the corrosion performance of various types of prestressing strand, ducts, and post-tensioning anchorages under extreme conditions. Several years ago, small-scale beam specimens containing various material combinations were constructed according to TxDOT standard practice and were exposed to saltwater spray in an alternating wet-dry cycle. Recently, autopsies were completed on eleven of these specimens. While corrosion did occur on all components to varying degrees, it appears that careful concrete placement, consistent grouting practices, and plastic post-tensioning ducts greatly reduced the extent and severity of corrosion damage.

While the project report is being compiled, non-destructive monitoring and specimen maintenance are continuing. In addition, the dead-end saltwater spray system was upgraded with new pipes, a new collection system, and a new pump obtained from our friends at the hydroponic shop. Expect a report full of colorful graphs and pictures in the near future.

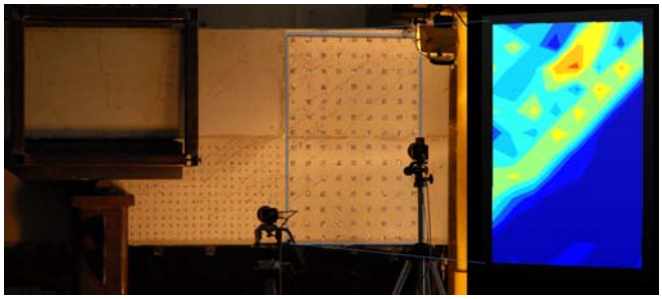


The new anchorage saltwater exposure system in action (lightning bolts added for emphasis).

Capturing Behavior with Photogrammetry - Matthew Homer

Close-range photogrammetry and finite element formulation converge to create a high-resolution visual strain measurement system. The project intends to create a visual strain measurement system with greater flexibility and capability than traditional surface mounted strain gages. The visual strain measurement system is able to capture entire strain fields at high-resolution both before and after cracking; yet, unlike traditional strain gages the visual system has no deformation capacity and continues to capture strain data well after traditional strain gages would fail. The system will be used extensively this fall in the study of flexure-shear critical columns.

Matthew's techniques have also been known to capture ghostly images.



Shear Cracking of Inverted Tee Bent Caps - Eulalio Fernandez, Nancy Larson& Dave Garber

Three 2M pound capacity rams were used to emulate the conditions of multiple bridge girders resting on a bent-cap's ledge.

There are several cases of Inverted Tee bent caps in Texas experiencing unexpected web cracking at early ages. The affected IT bent caps are located in the cities of Austin, Houston, El Paso and Waco. Some of these cracks are up to 0.04" wide, which is significant according to the findings of TxDOT project 0-5253 (predecessor of the current project 0-6416) and preliminary test results.

To accomplish the objectives of the current project, the proposed work includes: field inspections of the affected bent caps, assembly of an evaluation database from previously published studies, and experimental evaluation of at least nine beams with two tests per specimen.

Over the summer, five specimens were constructed and three were tested. These specimens explored the effects of two different shear span to depth ratios, two different shear reinforcement ratios, as well as ledge lengths and depths. The data collected from this first test can be directly compared to TxDOT project 0-5253. The preliminary results from these tests may suggest that the tension field created above the load point in the inverted tee may alter the behavior of the direct compressive strut, compared to that of a top chord loaded member.

Wireless Fatigue Monitoring - Jeremiah Fasl, Vasilis Samaras, & Matt Reichenbach

Dr. Helwig decided to show Vasilis how to drive the manlift…fortunately, Vasilis has a strong stomach and does not easily get motion sickness!

The end of summer signals the end of the wireless and antenna testing of the current generation of NI equipment. The last two bridges (truss bridge near the Austin airport and an I-girder bridge in San Antonio) revealed some interesting conclusions: stock antennas work just as well as specialized antennas for many bridge types and sometimes the wireless link quality increases with distance!

This summer, noise and drift tests (mentioned in the last newsletter) were conducted in a controlled environment and on the FSEL lab floor. Based on the results, some changes are being made to the prototype WSN strain node before testing the data acquisition equipment outside. The strain gage durability tests are ongoing on the southeast corner of FSEL as well as in the environmental chamber at ECJ. Looking toward the future, a fracture-critical bridge in San Antonio will be instrumented (strain gages, solar panel, modem, and cRIO) and monitored over the next year.

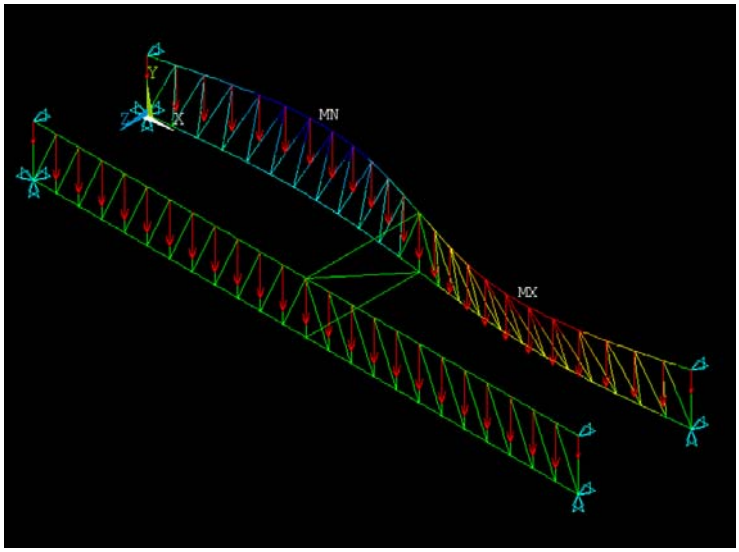
Shear Behavior of Box Beams - Alejandro Avendaño, Eisuke Nakamura, David Wald, & Brian Hanson

Ever since Lady Gaga started singing his name, Alejandro has been under constant paparazzi pressure. As such, Alejandro must keep a watchful eye out for the paparazzi.

With the goal of optimizing the end region of Texas box beams, two specimens have been fabricated using standard TxDOT details. As high curing temperatures are cause for durability concerns, maximum curing temperatures were recorded to evaluate the benefits of reducing the size of the skewed end blocks through an alternative internal void geometry. Additionally, shear tests will be performed to evaluate if the smaller end block hinders shear performance in any way. The first two specimens revealed the need for additional transverse (horizontal) reinforcement across the end block. During the fall, we expect to culminate the fabrication of standard detail specimens, test these specimens in shear, and move on to fabricating and testing a specimen with improved reinforcement details.

Bracing Truss Systems - Rangsan Wongjeeraphat

The purpose of this research is to develop bracing requirements for truss systems. Trusses are complicated structures, in which buckling behavior is not well studied. Type and location of brace can affect the buckling behavior. The current work focuses on using a parametric study to investigate the behavior of truss with torsional bracing. Analyses were all based on the results of Eigenvalue buckling analysis by using ANSYS. The analyses were conducted on trusses with spans ranging from 48 to 96 feet and depths of 3 and 6 feet.



Tubular Cross Frames - Anthony Battistini & Wei Wang

The principle of the research is to improve the behavior of cross frames by utilizing tubular members. Due to the increased buckling strength of tubular members, a single diagonal cross frame can provide effective bracing (as demonstrated on the large-scale buckling tests Wei is currently running).

Since connecting tubular members to flat plates can lead to complex connections, we have proposed the use of a steel casting. Over the summer we visited Quality Electric Steel Castings in Houston, TX, to discuss the feasibility of using castings and to take a tour of the foundry. The company specializes in sand casting, a method in which a pattern is used to create a negative image of the desired part inside a sand mold, which is subsequently injected with molten steel. This fall we hope to create a wooden pattern of our prototype connection and to cast connections for laboratory testing.

Bent Plates - Wei Wang & Andrew Wahr

The purpose of this research is to design a connection for skewed steel bridge end cross frames that improves their elastic buckling efficiency. The project officially finishes at the end of August 2010.

In conclusion, we proved that the proposed split pipe stiffener has significant advantages over traditional ones on increasing the buckling strength of girders and reducing girder end twist. We also introduced a hand calculation method and a computer method for the design of the split pipe.

Although the project is closing and we say goodbye to two of our major researchers, Craig Quadrato, PhD and Andrew Wahr, MS, our laboratory test will still go on and merge into the Improved Cross Frame Project (TxDOT Project 0- 6564). In the fall semester, we plan to test a 24 degree skew angle frame to expand our understanding of cross frame behavior under skewed bridge conditions.

High Mast Illumination Poles: Field Instrumentation - Luca Magenes & Jeremiah Fasl

Vasilis safely guiding the team back from El Paso.

Still in the bucket truck…

After Austin and El Paso the Team instrumented a pole in Corpus (and managed not to run over a turtle in the road). This time we made it a one day job, thanks to the efficiency of the Team. On the roster: Jeremiah, James, Luca, and Matt (which did a great job for being a rookie). Vasilis had to stay on the bench to take care of his corrosion problems.. At present we have been recording wind velocity and strains at the poles bases in El Paso for three months and in Corpus for one. Next we'll take down one of the setups in El Paso and move it to Lubbock. This 1300-mile trip in the Texas heat will not stop the team from its battle against Fatigue. The path will even cross the borders of New Mexico and who knows what misadventures are there waiting for the boys. Maybe this time we could use a better map.

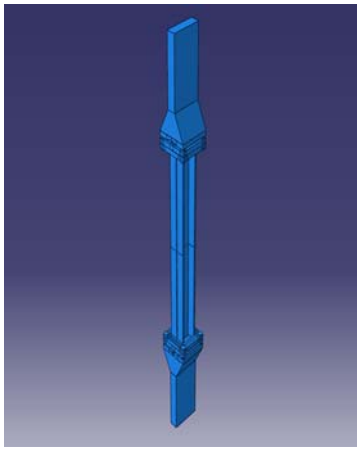
A Rubik's Cube?

Beam End Connections in Fire - Guanyu Hu

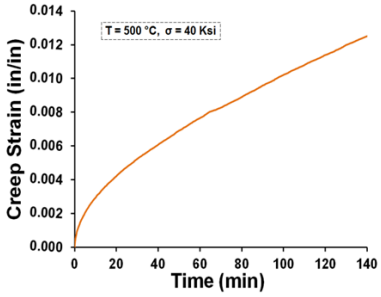
After testing the connection under combined shear, tension and rotation at elevated temperatures this summer, we found that with an increase in temperature, there is a progressive loss in connection rotation strength and a shift in failure mode from bearing failure to bolt shear failure.

In addition, due to the large rotation of the connection, sequential failure behavior can be observed during the tests. The initial failure always locates near the top bolt, and after first fracture, the failure location moves to the area near the second bolt, and so on. The connections show a quite large rotation ductility, which implies that during a fire the beam end shear connections have fairly good rotational capacity. We also concluded that large axial force and rotation demand in a fire can be significantly relieved when initial failure occurs. This project is approaching its end and will be officially finished by fall 2010.

Creep Buckling Due to Fire - Mohammed Ali Morovat

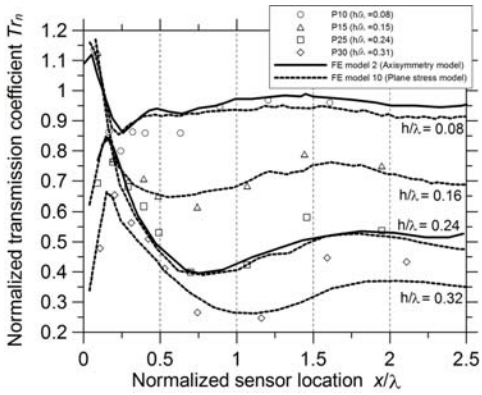


As mentioned previously, the overall goal of this research project is to obtain a better understanding of creep buckling of structural steel columns, and to develop data and models of creep and creep buckling to enable better analysis and design of steel structures for severe fire exposure. To fulfill this objective, an extensive experimental program on elevated temperature creep testing of structural steel has started; a representative result at 500 °C is shown here. Moreover, a test setup has been designed in order to perform creep buckling tests on structural steel columns at high temperatures. The plan is to complete material creep tests at elevated temperatures and fabricate the column test setup in the fall.



Surface Wave Transmission - Seong-Hoon Kee

Previous studies show that the surface wave transmission (SWT) method is effective to determine the depth of a surface-breaking crack in solid materials. However, near-field wave scattering caused by the crack affects the reliability and consistency of surface wave transmission measurements. Prior studies on near-field scattering have focused on the case where crack depth h is greater than wavelength λ of surface waves (i.e., $h/\lambda > 1$). Near-field scattering of surface waves remains not completely understood in the range of h/λ for the SWT method (i.e., $0 \le h/\lambda \le 1/3$), where the transmission coefficient is sensitive to crack depth change and monotonically decreases with increasing h/λ. In this study, the near-scattering of surface waves caused by a surface-breaking crack are investigated using experimental tests and numerical simulations for $0 \le h/\lambda \le 1/3$. First, the effect of sensor locations on surface wave transmission coefficients across a surface-breaking crack are studied experimentally. Data are collected from Plexiglas and concrete specimens using air-coupled sensors. As a result, the variation of transmission coefficients is expressed in terms of the normalized crack depth (h/λ) as well as the normalized sensor location (x/λ). The validity of finite element models is also verified by comparing experimental results with numerical simulations. Second, a series of parametric studies is performed using the verified finite element model to obtain more complete understanding of near field scattering of surface waves propagating in various solid materials with different mechanical properties and geometric conditions. Finally, a guideline for selecting appropriate sensor arrangements to obtain the reliable crack depth using the SWT method is suggested.

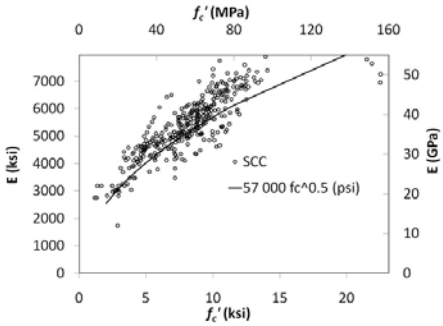


Beams Fabricated from Self Consolidating Concrete - Jose Gallardo

Self consolidating concrete (SCC) mixture is designed so that it can be placed without the use of vibration. In order to achieve that goal, SCC mixture includes additives, as well as fine and less coarse aggregate. Those differences in concrete mixture design causes differences in the mechanical properties of concrete.

In this project we will try to compile a series of databases to study the mechanical properties of SCC. In addition, the adequacy of code provisions for structural components made with SCC will be verified and modifications to those provisions will be proposed as necessary.

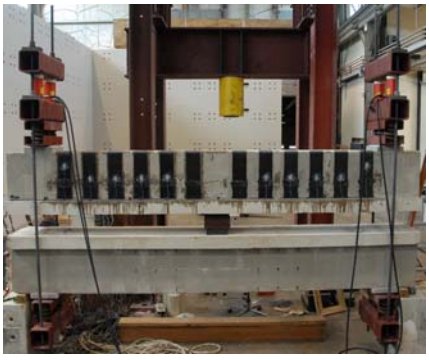
As a first step we have been doing some reading. Past research studies show that, for some properties, difference between SCC and conventional concrete (CC) is clear and consistent (e.g. SCC has smaller modulus of elasticity than CC). That's it for now, hope the readers enjoy the E vs f_c' graph (no big test pictures for this project yet, sorry.)



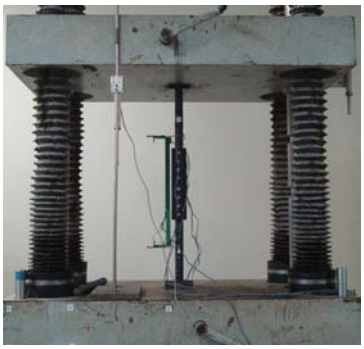
CFRP Anchorage in Shear Strengthening Applications - Yungon Kim & Neil Satrom

Our project completed the testing of four 27' long and 48" deep members at the beginning of June. The tests gave us valuable information about the productivity of CFRP anchors in large scale members. We found that CFRP anchors were very effective in helping to develop the full strength of CFRP sheets under shear loading.

The bulk of the summer was spent constructing four smaller beams that are 24" deep and 14' long. Two of these specimens will be used to test the effectiveness of CFRP Anchors under sustained loads, while the other two beams will be used for fatigue testing of the CFRP anchors. The sustained load tests will begin in mid-September and the fatigue tests will take place at the beginning of October. Following these tests, we will be examining the effectiveness of CFRP and CFRP anchors on large scale, prestressed I-girders provided by TxDOT.



Mechanical Splices - Guillermo Huaco



Mechanical Splice and #8 bars in the universal machine

There are several methods to retrofit damaged structural members. The use of mechanical splices is a non-typical procedure for the rehabilitation of damaged structures. After an event that causes damage to a structure, the rebar of the concrete element can be bent or buckled in some portion of its length, as often seen in columns and walls. Instead of removing the damaged RC member, rehabilitation can be accomplished using epoxy and CFRP sheets. Another method would be to repair the damaged portion by installing a new rebar that is mechanically spliced (coupled) to the existing rebar. There are different types of couplers, varying by the process of the installation.

A new type of coupler is being testing. The two bars are tied into the mechanical splice by bolts and then the system is tested axially by a universal testing machine. The failure of the system is through rupture of the rebar.

High Masts: Thermal Study - James Kleineck

James tries new, innovative debugging techniques

Since the last publication, researchers have collected heating data from two high mast stub sections during galvanizing, examined three high mast stub sections from cracking following galvanizing, and conducted a battery of tensile tests from older high mast illumination towers, galvanized in January of 2010. All instrumentation and experimentation has been consistent, thus far, with past testing and observations.

Recently, an emphasis has been placed on developing a finite element model to simulate the galvanizing process. Two problems have thus far plagued the process of running these analyses: the computer which can run the simulation has a slow graphics card and a rather unwieldy GUI, and the new, faster computers with updated programs and state-of-the-art specs will not run the researchers' user-defined subroutine because of some linking error. (For recommendations on how to resolve these problems, send comments to jrkleineck@mail.utexas.edu) A working FEM is currently at the top of the list of priorities, and with luck, parametric studies should begin by October.

Also, depending on possible funding options for next year, more high mast stub sections might be able to be instrumented to test how different dipping orientations may potentially affect the resulting cracks after galvanizing.

Congratulations to Perla and Lalo on the birth of their daughter, Samantha Fernandez Loya! Samantha was born on August 12, 2010, weighing 6 lbs. 5 oz. and measuring 19 inches long.

Congratulations to the 2010 FSEL Spring and Summer Graduates!!

Spring 2010

- Seongwoo Jo (PhD)
- Craig Quadrato (PhD)
- James Foreman (MS)
- Stephen Foster (MS)
- Brian Petruzzi (MS)
- Stephen Pool (MS)
- Chris McKinstry (MS)

Summer 2010

- Jason Stith (PhD)
- Tz-Wei Wang (PhD)
- Chih-Chieh Chou (MS)
- Adam Kirk (MS)
- Nancy Larson (MS)
- Andrew Wahr (MS)

BUILDING24 COMMITTEE

*Committee Vision: Increase **productivity** at Ferguson Laboratory through improved **communication** and **collaboration** of students, staff, and faculty*

Breen's Corner: Hot Monkeys on the Loose (Cont'd)

Brooks Air Force Base in San Antonio set up a research lab near Austin, Texas, at the Balcones Research Center in 1951. The Radiobiological Laboratory was built for the study of biological effects of ionizing radiation on living organisms with a special emphasis on subhuman primates and small mammals. During the time of the space race, the lab housed approximately 700 monkeys and 1,500 rats as well as a number of guinea pigs and rabbits. The most famous residents of 10100 Burnet Road were Sam and Miss Sam, two of the first animals to ever successfully fly into suborbital space and return alive. Much of the research was classified and forgotten by the public, but a few individuals are still alive who can tell stories from a time long past.

Sam the Monkey (Wikipedia 2010)

Radiobiological Laboratory

On a few occasions, the researchers at the radiobiological labs would forget to close a gate or some other mishap and a monkey would get loose. A "hot monkey on the loose" call would go out to all buildings on the Balcones campus, including the Structural Mechanics Research Laboratory, now Ferguson Structural Engineering Laboratory. The open bay building with long span metal trusses was a perfect jungle gym for the primates. All research in the lab would be stopped and the crane would be killed to prevent electrocuting the monkey. Air Force personnel would run around the lab with nets attached to long poles for hours trying to corner and catch the radioactive monkeys. It was only after the pesky primate was captured that the research could continue and the structural engineering graduate students could resume their important work. And you thought lonely rattle snakes under the raised strong floor was the only hazard of working at Ferguson lab in the old days

Visitors from ACI got more than they bargained for when visiting the structures lab (a young John Breen is shown)

Special points of interest:

- First home game tailgate is Saturday September 11th. Starts EARLY, location TBD
- *Welcome BBQ will be Friday September 17th; Social hour starts at 5pm and food served at 6pm
- Steel Day, October 22, Pickle Research Center
- First-years vs. Old-timers Flag Football Challenge: October 29

Information about the Newsletter

The goal of this publication is to keep those working at FSEL aware of the status of ongoing projects around them. In addition to projects, we may also highlight special events, people, or news of interest. The newsletters will come out once a semester, three times a year.

In the 2010 fall issue, twenty-five research projects at FSEL are summarized. Hopefully you will learn something new about each project so as to initiate more discussions with your fellow researchers.

Feedback
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