Concrete Evaluation and Repair Field Work at Two Important Historic Sites:
Pointe du Hoc, Normandy, France, and Alcatraz Island, San Francisco

Dr. Tanya Wattenburg Komas, Associate Professor and Director of the Concrete Industry Management (CIM) program at California State University, Chico, and Founding Director of the Concrete Preservation Institute (CPI), will present two distinctive programs at Alcatraz Island and the WWII D-Day landing site at Pointe du Hoc, Normandy, France. Projects at these sites highlight recent technological advances and best practice approaches for concrete repair and evaluation while demonstrating the challenges and CPI’s unique success in applying these in the context of education and historic preservation.

While the presentation provides immediately applicable information for concrete practice, the interwoven stories of the expressive power, haunting beauty, and crushing weight of time and history associated in different ways at each of these sites makes this presentation at the same time highly personal, moving, and inspirational.

Individual Project Descriptions:

Historic Concrete Investigations at Pointe du Hoc, Normandy, France

Pointe du Hoc is one of the most culturally important historic sites of the 1944 World War II Normandy invasion. Early in the morning of June 6, 1944, elements of the 2nd Ranger Battalion embarked on one of the most famous and heroic actions of D-Day. Their mission was to destroy 155mm cannons capable of firing on troops and ships landing on Utah and Omaha beaches. They succeeded but not without heavy losses.

The site consisted of a variety of defensive concrete structures that were constructed as part of Hitler’s Atlantic Wall campaign. The site remains today as a monument to those who sacrificed on that fateful day. The current physical condition of the site includes a cliff that extends some 100’ below the site, which was recently stabilized utilizing concrete micro-piles, soil-nailing, shotcrete, and decorative concrete finishes following work by Texas A&M University, and continued deterioration of the reinforced concrete bunkers that are undergoing progressive deterioration after the D-Day attack and subsequent exposure in the chloride-rich sea-side environment.

Faculty and students from Chico State have led the project to evaluate the condition of the concrete bunkers utilizing advanced non-destructive testing technology together with selected destructive and laboratory methods. The presentation will at the same time take an emotional journey through history to understand the full significance of the site and the effect on those working to preserve it to culminate with a discussion of the site’s precarious future that stands in the face of its position as one of the world wide most visited sites of WWII.
Concrete Repair and Preservation at Alcatraz Island, San Francisco, CA

The Concrete Preservation Institute partners with the National Parks Service for education, preservation, and research of concrete structures focused on Alcatraz Island while aimed more broadly at advancing the concrete and preservation industries and developing future leaders in these fields.

Alcatraz is a National Historic Landmark within the Golden Gate National Recreation Area (GGNRA), the largest of the National Park Service’s (NPS) urban parks in the United States. Undergraduate and graduate college students and military veterans from across the US as well as local vocational youth participate with CPI as full-time interns or fellows and National Park volunteers during 10-14 week sessions on the Island.

Participant instruction for project design, planning, and implementation as well as CPI research are led by CPI staff, CIM faculty, NPS experts, and leading professionals from many areas of the concrete industry who offer their expertise with materials, equipment, testing, project design and management, asset management, and even “repair aesthetics” aimed at appropriate and sensitive aesthetic treatments for repair work; these individuals often recruit CPI participants as employees for their companies or even engage as learners themselves for purposes of gaining new professional knowledge in repair and historic preservation.

CPI blends concrete industry best practices with the Secretary of the Interior’s Standards for the Treatment of Historic Properties as mandated by US federal law for historically significant structures – an area becoming increasingly more prevalent as our nation’s concrete buildings and infrastructure ages. CPI’s story is compelling far beyond the goal of “Saving the Rock”. Together with the National Park Service, CPI has defined a new standard for field-based research and education based on a strong public/private partnership model that produces new knowledge and approaches, offers the repair and preservation industries professional training and engagement opportunities, and develops knowledgeable, dedicated, conscientious, and inspired future preservation and repair leaders.

About the Concrete Preservation Institute

The mission of the Concrete Preservation Institute (CPI) is to provide training and education of undergraduate and graduate college students, military veterans, and local youth that accomplishes the preservation, stewardship, repair, and research of cultural resources and infrastructure, advances the concrete repair industry, serves local and regional communities, and helps participants develop into future industry leaders and park stewards. CPI’s vision is to be the world’s foremost field education and research institute, based at Alcatraz Island while growing to other important historical sites, dedicated to concrete cultural heritage preservation and talent development based on partnerships with agencies, industry, and institutions around the world.
Project Images and Descriptions from the Presentations:

**Pointe du Hoc Project:**

Chad Golden (left) and Andrew Billingsley (right) use Olson Engineering’s Concrete Thickness Gauge to determine the thickness of the slab at the exterior of the Observation Post. The Monument to the Rangers sits on top of the Structure. (Cover photo and feature story for *Concrete International*, magazine for ACI, January, 2008).

Ultrasonic Pulse Velocity Evaluation - Chad Golden (on top of casement) holds a transducer that is sending ultrasonic pulses through the approximately 80 inches of concrete to where Robert Hostettler (inside) is holding the receiver. Andrew Billingsley (seen through the barbed wire) is running the test data via a field ruggedized computer on the velocity of the sound waves to determine soundness of the concrete.

Close-up of Ultra Sonic Pulse Velocity test on Observation Post interior wall with two-sided access.

Alexx McAvoy and Robert Hostettler conduct an impact echo test on the Observation Post. Impact Echo Tests can be conducted with one or two-sided access.
Alcatraz Project:

Structural Engineer Jim Markovich, Ferrari Moe & active ICRI member, volunteers this time to discusses structural concrete repair considerations with Chico State CIM students Andrew Billingsley (left) and Jonathan Hall (right).

ICRI Past-President Randy Beard, serving as an industry expert instructor, teaches students about proper procedure for drilling concrete cores for testing.

Students designed and built form in preparation for high pressure concrete pumping.

“Find the repair” – Approximately a third of the concrete on this stair railing has been replaced and finished to blend with the nearly 100 year old historic concrete.
2010 Alcatraz team. Left to right: Chico State CIM Students - Stig Strombeck, Chad Golden, Trevor Prater, Andrew Billingsley, Bryan James, Jonathan Hall. Far right: Jason Hagen (NPS Architectural Historian) and Tanya Komas (CPI Founding Director/CIM Professor).

CPI staff Scott Burghardt (far left) and Andrew Billingsley (far right) consult with CPI engineer Patrick Sparks (middle left) and National Park Service Historical Architect Jason Hagin (middle right) about the current project.