It was said by Henry Ford that, “Coming Together is a Beginning, Keeping Together is Progress, Working Together is Success.” As we discussed last month, the importance of working together, developing synergy, and team building cannot be understated; however, before this can happen we must outreach to grow and form the team. “Coming Together is the Beginning” and not surprisingly, growth is not only a primary objective for the ASCE Sacramento Section this year, it is also an objective that is happening every day. It happens every time we interact with those around us. We each are representatives not only for the industry, but representatives for the profession. The engine that will ultimately drive ASCE’s success is its ability to grow and outreach more of the profession.

The success of the four basic objectives for ASCE this year all share one thing in common: they rely upon active and effective growth. Growth that not only increases the number of members, but increases the engagement of members, the diversity of members, and responds to the challenges our profession faces today and tomorrow. It is valuing our profession, beginning with our people, those who have helped to shape it, those who practice it today, and those that will further it tomorrow. While there are many opportunities and manifestations of growth, two such instances and goals for growth in the ASCE Sacramento Section this year include: the local meeting and event outreach efforts, and the ASCE Outstanding Project Awards.

Goals and Opportunities to Outreach More of the Profession:

Some of the best outreach opportunities happen every day in the meetings and events at our local branches, institutes, and committees. Each of us represents a face in our profession, and through daily interactions, constant opportunities arise to invite a guest to the next meeting. Invite a guest to the next event. For ASCE to grow it is important to actively reach out to new members and look for opportunities to more completely represent the profession. Yet reaching out is only part of effective growth; it also means looking for opportunities to get people involved. Listen to members and guests and they usually provide clues of their passions and interests. These interests will often provide the road map to membership involvement. The goal for the ASCE Sacramento Section this year is then to look for opportunities to invite guests or new members to meetings and local events. If each member in the local branches, institutes, and committees were to invite a friend to the next local meeting or event and look for opportunities to get people involved, the community would not only experience great growth, it would also grow engaged members.

This growth is not only limited to the working profession, it also applies to the students and younger professionals of our industry. These people not only hold great value to the future of our profession, they also provide insight to the technological evolution of our profession and opportunities to pay it forward. For many students and younger professionals bridging the gap between school and industry is a challenge. Reaching out to these people not only exposes students to the profession and provides content to the education, but it is also one of the first steps at networking young professionals. It should then also be a goal to look for opportunities to invite students and young professionals to meetings and events and identify instances for them to get involved.

Finally, perhaps one of the most evident and best outreach opportunities is happening right now with the ASCE Outstanding Project Awards. Over the last few months applications have been included in the EOG and while they are currently being accepted for review, they are due no later than January 6, 2012. Following review, an Awards Dinner for the winners is planned to occur on February 22, 2012. While the Outstanding Project Awards have been discussed as a great opportunity for networking the industry and recognizing outstanding achievement, they are also
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University of California, Davis: Alex Wong and Joe Novielli, Co-Presidents, ucd.asce.president@gmail.com

For more ASCE activities if you wish to be active in a committee, career opportunities, complete text for the legislative activities, go to the Sacramento Section web site at www.asce-sacto.org, or contact a current officer. To MAKE CHANGES OR RENEW YOUR MEMBERSHIP, go to website: www.asce.org. For MEMBERSHIP APPLICATIONS, please e-mail to memapp@asce.org.
### Shasta Branch

For more information about the Shasta Branch meetings, please contact Dale Roper, P.E., at droper@shn-engr.com.

### Feather River Branch

For more information about the Feather River Branch meetings, please contact Amie McAllister at amie.steel@gmail.com.

### Central Valley Branch Meeting

For more information about the Central Valley Branch meetings, please contact Jason Tokheim at jtokheim@ksnine.com.

### Capital Branch

There will be no Capital Branch Luncheon in December. For more information about the Capital Branch, you may email or call Alfred R. Mangus at mangusalf@yahoo.com or 916-205-1962.

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### President’s Message - Continued from Page 1

...an opportunity to reach out to more of the profession. It is an opportunity to reach out to non-members, to invite guests, and to reach out to students and younger professionals. For many this outreach has already begun and continues through the project application process looking for more opportunities to recognize excellence in the projects and performances of our profession. This outreach also continues through the Awards Dinner in February. The goal for the ASCE Sacramento Section this year is to reach out and make the Outstanding Project Awards a great success this year. Each branch, institute, and committee should reach out to at least three projects or performances of excellence during the application process, and when February arrives, identify opportunities to invite guests.

If “Coming Together is a Beginning” and “Working Together is Success” then the impact of collective outreach efforts cannot be understated; and when it comes to reaching out sometimes the best opportunities exist in our personal connections within the profession. While mass emails and website postings can be an effective way to transmit information, sometimes a phone call, a conversation, or personal outreach can yield the greatest results. Each of us has an opportunity to make a difference, invite a guest, and pay it forward. While a phone call or a few conversations may seem trivial, each of us taking a single step together can cover a lot of ground. Today is another opportunity to take that step, invite a friend, and further network and grow the profession.

Thank you, and please let us know what you think at: asce@sacto.org

Sincerely,
Jon Balzer


2011 ASCE Outstanding Engineering Project Award
Entry Form

**General Information:**

Please complete the following information and submit 5 copies with a letter explaining the project and stating why you feel this project should receive this award.

**Entries Due:** January 6, 2012

**Please send this information to:**

Kimberly Brown, Senior Director
ASCE Sacramento Section
c/o HDR Inc., 2365 Iron Point Rd., Suite 300
Folsom, CA 95630-8709
E-mail: Kimberly.Brown@hdrinc.com

Entries should meet the entry criteria stated for this award, will not be returned, and will become the property of ASCE, Sacramento Section.

**Project Information:**

Project name (exactly as it should appear on a plaque):
Project location (city, state):
Completion date:
Enter up to three (3) categories to be considered for in addition to Project of the Year:

- Small Project
- Structural
- Water/Wastewater
- Environmental
- Geotechnical
- Architectural
- Transportation
- Sustainability
- Bridge

**Entrant Information:**

ASCE Member: Yes No
Sacramento Section Member: Yes No
Submitted by: _______________________________________
Title: ________________________________________________
Employer: ___________________________________________
Address: _____________________________________________
City: ___________________ State ________ Zip _____________
Phone __________________ Fax __________________________
Signature__________________________________________ Date _______________________________________

**Project Owner Information:**

Project owner (attach addendum for more names) __________________________________________

Contact Person: __________________________________________
Address: _______________________________________________
City: ___________________ State ________ Zip _____________
Phone __________________ Fax __________________________
The Sacramento Section Outstanding Civil Engineering Project Award is presented by the Sacramento Section of ASCE to a project that demonstrates the greatest engineering skills and represents the greatest contribution to civil engineering progress and to society. In addition to the Outstanding Project of the Year award, additional subcategory awards will be given to projects of significance for their particular category of civil engineering. The sub-categories are listed on the Entry Form and below. Given to the project rather than to an individual, the Award(s) honor the outstanding work of the many engineers who have contributed to the project.

Rules:
1. The project must be predominantly civil engineering work.
2. The project must be located in the Sacramento Section area.
3. The project must meet one of the following eligibility criteria:
   - Bridges, tunnels, waterways, structures, roads: eligible when carrying traffic.
   - Water supply, flood control facilities: eligible when ready to take the full design head of water.
   - Power dams: eligible when the major civil-engineered construction is completed.
   - Fuel power plants, heating or cooling facilities: eligible when power goes on-line.
   - Buildings and structures: eligible when ready for use.
   - Airports and other similar large developments: eligible when initial phase is 75% operational.
   - Water supply, waste disposal: the entire project is eligible when its initial phase is 50% operational.
   - Military projects (such as bases, launching units and harbor facilities): eligible for their engineering aspects.
   - Urban development or recreation facilities: When open for public use.
   - Natural resources restorations: When restoration is complete

The judging committee will determine the eligibility of projects not categorized above.

Judging Criteria:
1. Contribution to the well-being of people and communities.
2. Resourcefulness in planning and solving design challenges.
3. Pioneering in use of materials and methods.
4. Innovations in construction.
5. Impact on physical environment.
6. Beneficial as well as adverse effects of the project, including aesthetic value.

Entry Format:
The award entry should inform the reader about the project and emphasize the appropriate items listed in the judging criteria above as well as any significant features of the project. Photos and/or drawings of significance should be included.

Nominations:
1. Nominations may be submitted by any ASCE - Sacramento Section member.
2. Nomination materials must be received by January 7, 2011, for projects meeting eligibility in 2010.
3. Five (5) copies of the nomination must be submitted and accompanied by the Entry Form.
4. A non-winning project from an earlier year may be renominated if it meets the eligibility rules.
5. Send applications to: Kimberly Brown, Senior Director, ASCE Sacramento Section, c/o HDR Inc., 2365 Iron Point Rd., Suite 300, Folsom, CA 95630-8709, or by e-mail to: Kimberly.Brown@hdrinc.com

Nominations will be judged by a panel comprised of Awards Committee (made up of past presidents or other section officers) of the Sacramento Section. A plaque for permanent display will be given to the project owner and a certificate to the designer by the Section in an award presentation ceremony as part of Engineers Week in February. For further information, contact the ASCE office at 916-961-2723 or asce@sacto.org.

Additional Categories:
- Small Project (under $5.0 million)
- Structural
- Water/Wastewater
- Environmental
- Geotechnical
- Architectural
- Transportation and Development
- Sustainability
- Bridge
Norm Root and Mentoring

Introduction: For those of you who do not know me, my name is Alfred R Mangus PE, and this is my second time as President of the ASCE Capital Branch (last 2003-2004).

Who’s on First: Thor Larsen is Past President, Mario Carreon was elected President Elect, Dick Weitzenberg is Treasurer, Bob Luscombe is our Secretary, and our Vice President of Education is Ajay Sehgal.

Hats off to: Regional Transit who is expanding with Green-line to the north, and south to Consumes River College with Blue-Line. I have been a rider for 19+ years of Lightrail.

We Want you: to provide us with a speech on a diversified ASCE topic. We need speakers from each and every ASCE Institute. Please email us at aksehgal@comcast.net about any topic(s) or commitment. We are open to out-of-town visitors who can provide high quality talks.

What’s up: Please provide us with news about your project in our area. We are also seeking tours including “hardhat” tours of local projects. A portion of your section dues go to funding this newsletter, let’s all utilize this communication resource. Please email our President-Elect, Mario.carreon@att.net, about any topic(s) or commitment.

Our international Bridge Event: The Third International Orthotropic Bridge Conference www.orthotropic-bridge.org will be chaired by Bob Luscombe (R.Luscombe@comcast.net). Additional volunteers are needed for his committee. It’s planned for 2013 in the San Francisco Bay Area. Precise dates and hotel/meeting room have not been selected. Suggestions are welcome. More details in our next newsletter.

Presidential Pulpit: Norm Root had just turned 76-YEARS and died a few weeks later in October 2011. Norm was hired on June 30, 1959 by the State of California Division of Highways, which later was incorporated into Caltrans. President Eisenhower created the interstate funding in 1955. Norm served as bridge engineer in various roles, bridge construction, bridge design and management. Norm retired from Caltrans in March 2003. He was a life member of ASCE and was active in history groups at Caltrans, ASCE, Route 66 and the Lincoln Highway Association.

Although we were both stamp collectors and Boy Scouts, we only talked about ASCE and bridge history. Our three big trips were the Anniversary of the 90th Lincoln Highway, the opening of the Sundial Pedestrian Bridge in Redding, described in our 2004 EOG, the 50th Anniversary of the Interstate in 2005.

The Good Roads Movement occurred during the period of 1892 to the 1920s by bicyclists who needed roads. The League quickly went national, and in 1892 began publishing Good Roads Magazine. Norm was a key committee chair for the Caltrans Good Roads 100 years celebration (1893 to 1993). The classic cowboy movie Butch Cassidy and the Sundance Kid features Paul Newman riding the new fangled bicycle that will replace horses.

The first officially recorded length of the entire Lincoln Highway in 1913 was 3,389 miles (5,454 km) made of concrete from New York City to Golden Gate Park in San Francisco. Thus it passes through Sacramento. (See photo above of Norm escorting the late Jackson Durkee, PE, Honorary Member of ASCE at the Ulatis Creek Bridge in Old Town Vacaville.) You can see the 100th anniversary of the Lincoln Highway in 2013 with more details at http://www.lincolnhighwayassoc.org/.

One of the original U.S. highways, Route 66, was established on November 11, 1926—with road signs erected the following year and officially removed from the United States Highway System on June 27, 1985. Route 66 passes through Norm’s home state of New Mexico. Arroyo Seco Parkway is notable not only for being the first California freeway, mostly opened in 1940, but for representing the transitional phase between early parkways and freeways. It was placed on top of Route 66. California Historic Route 66 Association California Historic Route 66 Association’s contact details may be viewed at www.route66ca.org/.

Norm’s unfulfilled dream was a California highway transportation Museum located in Sacramento. I was involved with searching for museum sites and partners for about 15 years to assist Norm. I realized during my trip to Alaska that my late father, Marvin Mangus, could have been a Civil Engineer, but he was a geologist. His father, Alfred Ross Mangus, owned the Mangus Express trucking company based in Altoona, PA. My father drove Mangus’ trucks as a college student, and described the winding roads of the Allegheny Mountains plus the Modern Marvel, the Pennsylvania Turnpike. He saw a lot of exposed rock formations due to cuts made for the roads. The US War Department asked him to switch majors to geology as part of the shortage of needed geologists. My grandfather was successful and owned rental homes, where my dad learned how to repair houses. My dad taught me how to repair and expand his house in Alaska, thus creating my interest in Architectural Engineering. My father’s other passion was plen-

Continued on Page 7
Liability Without Fault Does Not Apply to Engineers

Strict liability is the legal responsibility for damages, or injury, even if the person found strictly liable was not at fault. In a case involving a water system that failed to supply sufficient water to extinguish a house fire, the property owner attempted to argue that the design engineer should be strictly liable for the damages. The court disagreed.

A fire completely destroyed a home and some trees on the property of the plaintiff. The damage was so extensive because of an inadequate supply of water from the water distribution system. The home owner sued the developer who installed the water system and the engineer. The engineer was sued for negligence in the design, engineering and construction of the water system. The engineer was also sued, along with the developer, on the theories of strict liability (liability without fault) and negligence.

In defending the suit, the engineers attempted to claim that they enjoyed the same immunity from suit that the water company had as a water supplier. The court disagreed with this argument, however, holding that the engineer who prepared the design for the water system did not become a water supplier and hence, did not benefit from any immunity that would accrue to the water company.

The Court did find that the developer could be strictly liable for damages caused by the fire noting that the water system was constructed for the purpose of protecting the properties from fire. The engineer, however, could not be held liable on the theory of strict liability.

The Court stated that the engineer rendered a professional service and was in no sense analogous to manufacturers who place products on the market and who are, therefore, in the best position to spread the cost of injuries resulting from defective products as are developers. Citing a prior case, the Court noted that “...the well settled rule in California is that where the primary objective of a transaction is to obtain services, the doctrines of implied warranty and strict liability do not apply.” From another case, it was noted that the engineer “...was not a seller of property who obligated himself as part of his bargain to convey property in the condition represented. The amount of his fee and the fact that he was paid by the hour also indicate that he was selling service and not insurance. Thus the general rule is applicable that those who sell their services for the guidance of others in their economic, financial, and personal affairs are not liable in the absence of negligence or intentional misconduct.” “The services of experts are sought because of their special skill. They have a duty to exercise the ordinary skill and competence of members of their profession, and a failure to discharge that duty will subject them to liability for negligence. Those who hire such persons are not justified in expecting infallibility, but can expect only reasonable care and competence. They purchase service, not insurance.”

Not all states are as kind to engineers as California.

The author’s discussion of legal ramifications of the particular case(s) are provided only for educational purposes and should not be relied on as legal advice. If you have a specific legal problem, please consult with your attorney.
NOVEMBER MIXER

The November Mixer was held at a YMF favorite, Luigi’s Slice. Theron Roschen of Jacob’s Engineering presented On Green Roads. The two types of “green” asphalt Theron reviewed were: 1) recycled asphalt concrete (RAC); and 2) reclaimed asphalt pavement (RAP).

Several of the benefits of RAC mentioned were:

- Increased lifetime
- Reduced thickness
- Higher resistance to rutting, cracking, and fatigue
- Noise abatement.

Benefits of RAP included:

- Fewer emissions in manufacturing
- Extended paving season
- Longer haul distances

Theron’s presentation also included topics such as tire aggregate use as lightweight fill behind retaining walls, and the manifesting processes of both RAC and RAP.

Thank you Theron for taking time to present!

UPCOMING EVENTS

Upcoming events for the 2012 year are in the planning process. Please visit www.sacymf.org and go to the “events tab” to get the latest information on upcoming events and conferences that YMF is involved in.

UPCOMING EVENTS

* Please go to the YMF website to see the calendar of activities.

For more information, visit www.sacymf.org
Outstanding Projects and Leaders

by Magnus Pacific Corp., Roseville, CA

This month’s outstanding project: Natomas Levee Improvement Program, Sacramento, CA

HISTORY

The Natomas Basin is a part of the Sacramento River Flood Control Project (SRFCP) which is an integrated system of levees, overflow by bass channels, and dams that was designed and constructed by Federal, State and Local interests over several decades of the 20th century to protect farmlands, towns and cities in the Sacramento Valley from large floods. The levees were constructed using materials dredged from the river channel that contained a significant amounts of sand and silt dislodged from the foothills and mountains along the east side of the Sacramento Valley during the hydraulic mining era. These materials proved to be extremely porous when subjected to the prolonged high flows produced by the storms of 1986, particularly in the Natomas area where levee failure due to seepage through the levee was avoided only through a massive effort to shore up the levee during the height of the flood. With the combined efforts of the US Army Corps of Engineers and SAFCA, improvements to the existing levee system were completed under the Sacramento Urban Levee Reconstruction Project and North Area Local Project. However, these improvements were tested during the storms of 1997 which produced flows comparable to the storms of 1986. The levees around the Natomas Basin passed these flows without significant signs of stress, but the flood did cause failures of some SRFCP levees along the Feather River and Sutter Bypass upstream of Natomas. The Corps determined from their post flood assessment that the failures may have been caused due to underseepage. Underseepage can act as a levee failure mechanism where the soils in the ground beneath a levee contain materials that are sufficiently permeable to transmit water under high pressure from the riverside to the landside of the levee. The Corps recommended an assessment to be completed to identify the need to potentially install deep seepage cutoff walls along the east levee of the Sacramento River and Natomas Cross Canal south bank. The recommendations were adopted by Congress in 1999. SAFCA initiated the Natomas Levee Evaluation Study in June of 2005, the study was completed in late 2005, and the findings confirmed post 1997 flood concerns regarding underseepage.

BACKGROUND

During the February 1986 major storms in Northern California, water levels rose above the design safety margin for levees protecting the Sacramento area. Some emergency repair work was required at several locations. Fortunately, the noted storms were not of long enough duration to cause levee failure, which would have been catastrophic to the Sacramento area.

The effects of the 1986 storms raised concerns over the adequacy of the existing flood control systems, which led to a series of investigations. These investigations led to the need for measures that are required to provide additional flood protection to the Sacramento area. A view of boil conditions and levee failures from different locations are shown in Figures 1 and 2 (below). These measures include expansion of existing reservoirs, increasing reservoir releases and system flood storage and modification and strengthening of existing levees.
SAFCA started construction of the Natomas Levee Improvement Program in 2007 to correct the underseepage problems, and ultimately to bring the entire 42-mile Natomas Basin perimeter levee system into compliance with applicable Federal and state standards for levees protecting urban areas.

The scope of work includes construction of set-back levee, slurry walls, and levee embankment (berm) and pump stations. The work was constructed under four (4) separate contracts starting in September, 2007. Magnus Pacific team members completed the earthwork and cutoff wall under Natomas Cross Canal (NCC) Phase 1 and 1B contracts. Magnus Pacific team members completed the slurry wall portion of NCC Phase 2 / Sacramento River East Levee (SREL) Phase 1 and SREL Phase 1B. The slurry wall under NCC Phase 1 consisted of soil-cement-bentonite mixture using deep soil mixing to a maximum depth of 90 feet. The slurry wall for the subsequent phases consisted of soil-bentonite constructed using long reach excavators to a maximum depth of 85 feet, and with deep soil mixing equipment to a maximum depth of 120 feet.

**SLURRY WALL DESCRIPTION**

**(EXCAVATION METHOD)**

Slurry walls, whether Soil-Bentonite (SB), Soil-Cement-Bentonite (SCB), or Cement-Bentonite (CB), are commonly used as subsurface barriers to lateral flow of groundwater and to water-borne pollutants. The major characteristics of slurry wall construction are the use of bentonite and water slurry during excavation to support the excavation without the use of the other lateral supports such as shoring. Slurry walls are built by excavating a narrow trench, three feet wide for this project, while pumping slurry into the trench and maintaining its level at or near the top of the trench during the excavation. Usually, the trench is extended deeper or keyed into an underlying acquiclude, to form a bottom seal. The acquiclude forms the impervious base, and the backfill, which for this project is soil-cement-bentonite mixture, and forms the vertical groundwater barrier.

Bentonite clay is montmorillonite clay and the most common amendment is soil-bentonite, soil-cement-bentonite and cement-bentonite slurry walls. Bentonite has the ability to swell as much as 20 times its volume upon contact with water. Sodium-cation bentonite is the highest quality bentonite and is available dried and bagged for commercial use.

The slurry trench construction method is a proven method to construct a slurry cutoff wall. The soil-bentonite system can be economical because of the minimum amounts of materials required. After the trench has been excavated under bentonite slurry, more slurry is mixed with the soil adjacent to the trench or at a remote location. A bulldozer and/or hydraulic excavator is/are used to work the materials to a smooth consistency, and it is then pushed into the trench so the backfill slop displaces the bentonite slurry forward. Excavating and backfilling in phases make the operation continuous with relatively small quantities of new slurry required to key the trench fill and to mix backfill. Figure 3 (below) shows the excavation and backfill procedures.

**SLURRY WALL DESCRIPTION**

**(DEEP SOIL MIXING METHOD)**

Deep Soil Mixing (DSM) is a method whereby the soil is blended with cementitious mixture of bentonite slurry and portland cement. The cementitious mixture is injected through the hollow rotating kelly bars, with a cutting tool at the bottom. The Kelly bar above the tool has additional discontinuous mixing paddles. Figure 4 (on the next page) shows a typical DSM panel.
The Engineerogram

December 2011

Outstanding Projects and Leaders - Continued from Page 10

PROJECT DESCRIPTION

NATOMAS CROSS CANAL SOUTH LEVEE PHASE 1, SACRAMENTO, CA

Magnus Pacific team members constructed a soil-cement-bentonite cutoff wall along 6,000 linear feet of NCC South Levee and 500 linear feet of Sacramento River East Levee along the Garden Highway. Approximately 370,000 square feet of cutoff wall was constructed to a depth of 85 feet below the levee crown using the deep soil mixing (DSM) technique. An additional 45,000 square feet of cutoff wall was constructed to a depth of 70 feet below the levee crown using conventional soil-cement-bentonite (SCB) slurry trench construction methods. The constructed cutoff wall met the required specifications for maximum hydraulic conductivity of 5x10^-7 cm/sec and 40 to 300 psi unconfined compressive strength in 28 days. The work also included:

- Salvaging aggregate base from the top of the levee for reuse;
- Clearing grubbing, and stripping surface soils and vegetation for offsite disposal;
- Deactivating and relocating a PG&E power line that crossed Garden Highway and constructing a temporary 18” irrigation pipeline bypass for a local farmer;
- Constructing a temporary traffic bypass for a 500 foot section of Garden Highway;
- Degrading the levee by removing, hauling and stockpiling approximately 65,000 cubic yards of soil;
- Excavating and placing approximately 75,000 cubic yards of soil to rebuild the levee to design grades;
- Restoring the work area including hydroseeding, placing aggregate base, and replacing asphalt pavement on Garden Highway.

The project, performed on an accelerated schedule, started in early August 2007 and was substantially complete by September 30, 2007. During levee degrade and restoration as many as 300 loads of soil were hauled into and out of the limited access project site each day.

NATOMAS CROSS CANAL SOUTH LEVEE PHASE 1B, SACRAMENTO, CA

The project involved construction of a soil-bentonite cutoff wall along the western side of the NCC South Levee. The 288,527 square foot cutoff wall was approximately 4,600 linear feet long and was constructed to a depth of 73 feet below the levee crown. The constructed cutoff wall met the specified maximum permeability of 1x10^-6 cm/sec.

The scope of work also included salvage of aggregate base from the top of the levee as well as clearing, grubbing, and stripping surface soils and vegetation for off-site disposal. The levee was degraded by removing approximately 90,000 cubic yards of soil from specific locations and hauling a portion of it to a designated borrow stockpile site. Following completion of the cutoff wall, the project continued on the next page.

Deep Soil Mixing Drill Rig - Summer 2007

Soil Bentonite Backfill Mixing Operation - Summer 2008

Continued on Page 12
approximately 87,000 cubic yards of borrow soil was excavated, processed, hauled, and placed to reconstruct the levee to design grades. Work areas were hydrosed for erosion control, aggregate base was placed on the reconstructed levee, and asphalt pavement was replaced on Riego Road.

The project was completed on an accelerated schedule that started in late July of 2008 and completed on October 24, 2008. To meet the demands of the schedule, the team constructed the cutoff wall utilizing 12-hour double shifts, 6 to 7 days per week. During the levee degrade and restoration portions of the project, as many as 400 loads of soil were hauled in and out of the limited access project site each day.

**NATOMAS CROSS CANAL SOUTH LEVEE PHASE 2 / SACRAMENTO RIVER EAST LEVEE PHASE 1, SACRAMENTO, CA**

Magnus Pacific supported efforts to prevent underseepage and protect the foundation of the Natomas Cross Canal South Levee during flood events by constructing a 547,500 square foot soil-bentonite cutoff wall to a depth of 75 feet below the crown of the levee. The cutoff wall was constructed along 7,300 linear feet of the levee with a maximum specified permeability of 1x10-7 cm/sec. Excavated soils and imported sand were utilized to meet the required maximum fines content of 60%. Magnus Pacific constructed the cutoff wall using a company-owned Komatsu PC 1250 excavator equipped with a custom built boom and stick capable of excavating to a depth of 85 feet.

The cutoff wall was constructed on an accelerated schedule that started in June of 2009 and ended in early August of 2009 to allow the General Contractor, Teichert Construction, to complete the greater levee reconstruction and restoration before the prime contract completion date of October 31, 2009. Magnus Pacific constructed the cutoff wall working 12-hour double shifts, six days per week to meet the demands of the schedule. The project was completed within budget and without a lost time incident.

**SACRAMENTO RIVER EAST LEVEE PHASE 1B, SACRAMENTO, CA**

The Sacramento River East Levee Phase 1B project was the fourth phase of a multi-year, multi-million dollar levee improvement project directed by the Sacramento Area Flood Control Agency (SAFCA) in the Natomas Basin. Magnus Pacific constructed the soil-bentonite cutoff wall along 18,300 linear feet, between stations 31+00 and 214+00 of the Sacramento River East Levee along the Garden Highway. The cutoff wall was constructed in four separate headings due to the sequence of construction for portions of the setback levee. The cutoff wall work pad, which was made up by the base of the set back levee, had to be constructed to approximate elevation 39.0 ft-msl prior to constructing the cutoff wall. The cutoff wall was then excavated through approximately 10 – 15 feet of levee fill before continuing into the native soil to the full design depth. The design depth varied from 27 feet to 63 feet below the work pad elevation. All new trench headings were constructed with a lead in trench on a 2:1 slope for initial placement of the soil-bentonite backfill. All tie-ins to completed trench
sections were constructed with a lead out trench on a 4:1 slope to maintain stability of the existing soil-bentonite backfill.

All excavated soils were placed along work pad adjacent to the trench for mixing of the soil-bentonite backfill. Typically, the excavated soils contained fines content greater than the maximum allowable specification of 60% passing the No. 200 sieve. Trench logging was performed to document variations in the excavated soils over the length and depth of each cut (or approximately 20 linear feet). Based on the information gathered during the mix design study and verification through the trench logging, the required percentage of sand material was imported and blended with the excavated trench soils to meet the gradation specification. During the mix design study, consideration was also given to the impact the sand would have on the permeability of the soil-bentonite backfill and whether or not additional dry bentonite would be required to meet the project specification for permeability. However, it was concluded that all mixes with the specified gradation range of 20 to 60% passing the No. 200 sieve met the maximum permeability requirement of 5x10^-7 cm/sec without the addition of dry bentonite. Over the duration of the project, over 330 samples were collected and tested for gradation and permeability. All samples met the requirements of the project specifications.

Construction of the slurry cutoff wall phase of the project began in July 2010 and was completed by September 2010, working single shift and 6 days per week.

CONTRACTOR WINNING WAYS

• Immediately after notice to proceed, Magnus Pacific provided all the essential elements to getting the project moving toward a successful start. These items included the schedule, submittal work plans and mix design.

• The accuracy in developing the schedule and implementing accurate project management tools made for ease addressing correspondence, RFI’s and pay estimates.

• Staying focused on submittals and starting the laboratory mix design after bid opening (prior to notice to proceed) allowed the work to proceed without delays or the worry of costly rework and schedule impacts.

• Weekly coordination meetings kept all parties aware of current activities, upcoming events and quick issue resolution. This meeting was well attended each week by SAFCA, DWR, design engineers, local reclamation district, quality control/quality assurance representatives and local and state sponsors.

• The project’s proactive safety program allowed for over 50,000 man hours without lost time accidents.

• Magnus Pacific exhibited a great deal of technical expertise while constructing the cutoff wall. Request for information were kept to a minimum, and when required, they were submitted way ahead of time and for a good reason.

• Over 3,500 quality control samples were tested and exceeded the specification requirements. The cutoff wall was constructed in a timely manner without any rework or quality control deficiencies.

Multiple specialized excavators have been needed to complete the cutoff walls in the Natomas Basin

• Magnus Pacific provided sufficient equipment and spare parts to complete the work in a timely manner without impacting the schedule. The equipment included long reach excavators capable of excavating slurry walls to a depth of 85 feet, and deep soil mixing equipment (supplied by Raito, Inc.) capable of constructing cutoff walls in place to a depth of 125 feet.

The Quality Control Program was essential to the success of the project - Soil Bentonite Backfill slump testing

• Over twenty civil engineers and geologists have worked on the project. Their duties included trench logging and soil classifications, slurry and cutoff wall material testing, and quality control reporting.

Continued on Page 14
CONGRESSWOMAN MASUI’S VISIT

Congresswomen Doris Matsui (CA-05) participated in a press conference and tour of the Natomas Cross Canal on June 30, 2009 to provide an update on the ongoing Natomas Levee Improvement Program (NLIP) construction activity. Congresswomen Matsui was joined by state and local representatives and elected officials, Sacramento Area Flood Control Agency (SAFCA) employees, the California Department of Water Resources, and members of the community. Rep. Matsui’s remarks as prepared for delivery are below.

“As many of you know, providing Sacramento with an improved level of flood protection is my number one priority. Flood protection is needed to keep our homes and families safe, and to allow our region’s economy to thrive.

“I am pleased to be joined today by many of my colleagues that share that same commitment to flood protection: Councilman Ray Tretheway, Lester Snow from DWR, Mayor Kevin Johnson, Supervisor Roger Dickenson, many of SAFCA’s board members, and although he can’t join us today - Senator Darrell Steinberg.

“It is great to be standing here on this levee, marking the ongoing levee construction. We are standing next to the Natomas Cross Canal. This canal protects Natomas from flooding by carrying the rain that falls in Roseville, Rocklin, and Lincoln to the Sacramento River. We know that this canal’s levees, like the rest of the levees in Natomas are key to keeping us safe, but needs improvements.

“Behind us, those improvements are underway. Crews are working 24 hours a day, tearing down existing levee, installing a 70 foot deep concrete slurry wall, and rebuilding the levee up stronger that before. The hum of the diesel equipment and sight of dirt being hauled and concrete being mixed is welcome news to my constituents. By November 1st these crews will have improved the whole stretch of this levee. While the others crews will have moved on to work along the Sacramento River.

“This work could not be going on without the support of the State of California. Even in the midst of our state’s budget crisis - the state’s leadership understands the need to keep projects like this alive. Just this month the state allocated $30 million dollars to this project.

“Standing here you can see why this is so important. To our south is Natomas and downtown. The only thing that keeps the water from flowing towards it is this levee. It also stimulates our economy by keeping over 1,000 men and women at work. Standing here I must thank those men and women for keeping this project going. This includes the dedicated people at Teichert Construction, Parsons Brinckerhoff, Magnus Pacific and of course the men and women of Operating Engineers Local 3 and Laborers Local 185.

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“The work being done behind us is just the beginning. We are in the midst of a $600 million, 40 mile project that must get done. With the efforts of SAFCA, the federal government, DWR and your elected officials it will get done. I look forward to being back out here in the near future to see the progress.”

The Natomas Levee Improvement Project received the 2010 Project of the Year Award from the Sacramento Section of ASCE. ~ Ed.
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