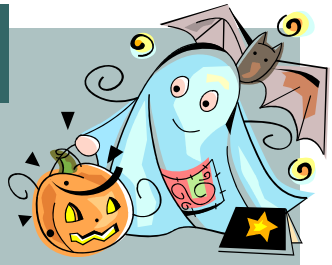
Georgia Chapter ACI

NEWSLETTER

October 2010–Issue 8



INSDIE THIS ISSUE:

2010 GEORGIA CHAPTER OFFICERS:

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PRESIDENT'S MESSAGE

If you ever watched the recent blockbuster *Titanic*, or even better, the 1958 British classic on the same theme, *A Night to Remember*, you were probably struck by both the magnitude of the accomplishment that the magnificent ship represented as well as the utter helplessness of the passengers and crew while they watched the "unsinkable ship" drop to the bottom of the North Atlantic. The sinking of the *Titanic* was a wake-up call for naval architects, shipbuilders, executives in the shipping industry, and regulating agencies.

One detail of the tragedy is that the British Board of Trade at the time only mandated lifeboats for 1200 of the total capacity of 2200 passengers, assuming that nearby ships would be able to lend a hand in an emergency. The captain and crew, along with the ship's architect who was on board, took almost an hour to recognize and evaluate the damage and wake up the first class passengers to get them to the lifeboats. To make matters worse, the passengers of the most luxurious liner in the world were reluctant to board the lifeboats, not realizing the imminent danger. Finally, a nearby ship, the *Californian*, did not understand the signals from the Titanic and was not keeping a 24 hour radio watch, so they did not realize what was happening and did not come to the aid just a few miles across the water.

We often think that we too have "mastered nature" with our modern concrete structures. But stop to think: are some of the minimum standards we follow enough to provide the quality that is appropriate? Are we taking enough time to think through our decisions, or are we too busy with the "business" side of the business? Are we so comfortable in our experience that we believe our buildings are "unsinkable?" A healthy dose of humility and caution are in order each day we come to work. The public who occupies our buildings and drives on our roads and bridges counts on it.

Brent Bandy, P.E., LEED® AP
Georgia Chapter ACI, President

UPCOMING EVENTS

Saturday, October 16, 2010
ACI Field Tech Exam
Heidelberg Technology Center
Doraville, GA
7:30 am – 1:00 pm

Friday, October 22, 2010
GA Chapter ACI Lunch Meeting
"Nondestructive Testing for Concrete Pavements and Structures"
Speaker: Brent Rollins, UT Chattanooga
Marriott Buckhead Hotel & Conf. Ctr.
Atlanta, GA
11:30 am Registration
12:00 pm - 1:30 pm Lunch Meeting
Information & Registration at:
www.georgiachapteraci.org

Saturday, October 23, 2010
ACI Aggregate / Strength / Lab Exam
TEC Services, Inc.
Lawrenceville, GA
7:45 am – 4:00 pm

Sunday thru Thursday,
October 24–28, 2010
ACI International Fall Convention
The Westin Convention Center Hotel
Pittsburgh, PA
Information & Registration at:
www.aciconvention.org

Thursday, November 4, 2010
ACI Field Tech Training
GC&PA Headquarters
Lake Level Conf. Room
Tucker, GA
12:30 am – 4:30 pm

Saturday, November 13, 2010
ACI Field Tech Exam
Thomas Concrete Lab
Doraville, GA
7:30 am – 1:00 pm

Because of the Thanksgiving Holiday our Regular Meeting will be on the THIRD Friday of the month instead of the normal Forth Friday so.....:

MARK YOUR CALENDERS FOR:
Friday, November 19, 2010
GA Chapter ACI Lunch Meeting

Important Note: ACI Training & Exams are for Pre-registered Persons Only.
No walk up seating available
For Information go to:
www.cabofgeorgia.org

*** Member News ***

Southern Polytechnic State University Student Chapter of Georgia Chapter ACI Elects New Student Chapter Officers

ACI Board Member, Angela San Martin, PE reported that our ACI Student Chapter at Southern Polytechnic in Marietta, GA recently held their first meeting on September 28, 2010. They had 27 students in attendance and elected their slate of 2010/2011 Student Chapter Officers as follows:

President:
Clint Behm; *cbehm@spsu.edu*

Vice-President:
Bryan Sartin; *bsartin@spsu.edu*

Secretary/Treasurer:
Enrique Chacons; *echacons@spsu.edu*

Co-Advisors:
Dr. Wasim Barham; 1100 S. Marietta Pkwy, Marietta, GA 30060
Dr. Merdad Mesbahi; *mmesbahi@spsu.edu*

Ms. Martin also asked that if any of our members are interest in helping out by speaking at their next meeting, scheduled for Tuesday 11/16 from noon till 1:00 pm, please contact her at: asanmartin @metromont.com and she will be glad to help coordinate. Thanks Angela!!!!!!!!!!! for working with the students and reviving this long dormant student chapter.

New Member

John Lyons

Structural Evolution, LLC
Peachtree City, GA

****

We need 15 new members, or old members who failed to renew in 2010, to join our Chapter before the end of the year to keep from loosing National *"Excellent Chapter"* Points.

Visit our web site: www.georgiachapteraci.org for more information and an easy to submit application.

September Lunch Meeting

submitted by: Wayne Wilson

Vice-President Maloof opened our September Meeting with an introduction of David Earnest, Chief Consultant with Substrate Management Services, who gave us an AIA Presentation on *Polished Concrete Floors.* David gave us a general overview of polished concrete, went into some detail on the polishing process and closed with some of the many benefits and features of a quality polished floor.

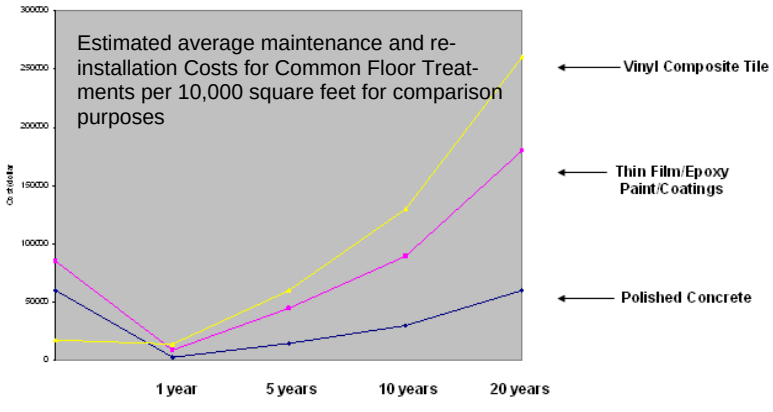
Polished concrete was first used in Tunisia by a granite and marble contractor using a wet grinding process. While working on a Palace Project for the Royal Tunisian' Family the contractor's laborers made a mistake a polished some floors without using water. The contractor was very surprised to see that this "dry process" produced very favorable results and equipment was further developed to support and enhance this dry polishing process. The process was brought to the US in the early 90's and is becoming increasingly popular in virtually all types of concrete flooring applications.

For a successfully polish; the floor must be clean and dry, 28 days of age, a minimum of 3500 psi and the equipment and applicator/contractor must be proven (preferably certified). The polishing process then begins by working through a series of up to 9 steps depending on the degree of polish desired. Typical finishes are a 800 Grit or Satin Finish that will reflect images with side lighting; a 1500 Grit or Semi-Gloss Finish that will reflect overhead and side images from 35 to 45 feet away with increased reflectance; and a 3000 Grit or a High-Gloss Finish that will look wet and show mirror like reflections of side and overhead images. The basic polishing steps are:

1. 80 Grit Metal Bond Grinding Segment
2. 150 Grit Metal Bond Grinding Segment
3. Concrete Densifier Application
4. 100 Grit Diamond Resin Polishing
5. 200 Grit Diamond Resin Polishing
6. 400 Grit Diamond Resin Polishing
7. 800 Grit Diamond Resin Polishing (Satin Finish)
8. 1500 Grit Diamond Resin Polishing (Semi-Gloss Finish)
9. 3000 Grit Diamond Resin Polishing (High-Gloss Finish)

800 Grit Satin Finish	1500 Grit Semi-Gloss Finish	3000 Grit High Gloss Finish
		

David furthered his presentation with some specific examples and a review of the many benefits of having a polished concrete floor like: the elimination of dusting; stain resistance (reduces surface porosity of concrete); older floor restoration or repair; enhanced lighting (better reflectivity); better slip resistance (*this one was a surprise to me!* i.e. the higher the polish, the more surface contact area available and subsequently a higher coefficient of friction); less maintenance; reduced tire wear (in warehouse applications); installation timing (applied at 28 days, non-toxic so can be done while a building is occupied); can be very cost effective; and finally is long lasting.



David closed with some comments on sustainability and contrasted polished concrete with some other common floor covering applications. VP Maloof closed the meeting with the speaker presentation of the coveted GA Chapter ACI Mug and thanked everyone for the attendance.

American Concrete Institute®
Advancing concrete knowledge

This month in *Concrete International*.....

Reprinted from the October 2010 issue of *Concrete International* with permission from American Concrete Institute (www.concrete.org)

Concrete Mixture Design Submittal

What the designer needs to know

by Frank A. Kozeliski

For any project, the concrete mixture design submittal is required before concrete is placed. While the submittal becomes part of the contract between the concrete supplier and concrete contractor, it also communicates to the specifier what the supplier intends to supply and exceptions, if any, taken to the contract documents. Typically, a single submittal includes information on all of the concrete mixtures proposed for a specific project, and it should state whether the mixture proportions are prescriptive- or performance-based.

Specific Information

The information contained in the submittal includes:

- Basic identification of the project: client name, project name and location, and date of bid.
- Current National Ready Mixed Concrete Association (NRMCA) concrete plant certification(s) and delivery fleet inspection reports.
- Mixture proportions and ingredients for all concrete proposed for the project. Each mixture design should be designated with the mixture number for easy ordering and entering into the batch plant computer; typically, it will also have a brief descriptor such as "4000 psi with [or without] entrained air." The number and the descriptor should appear on all concrete delivery tickets to allow verification that the correct mixture was delivered. The ingredients to be used should be clearly indicated—for example, not just "cement," but "GCC, Type I-II, LA, Tijeras." The name and batch weight of each aggregate, the volume of water, and the names and dosages of admixtures should also be included.

The submittal should also contain performance data on these concretes—historical compressive strength (to verify the mixture provides the required average strength per ACI 318-08, Section 5.3.2[1]) and other test data where called for, such as electrical conductance (indication of ability to resist chloride ion penetration) (ASTM C1202) or potential alkali reactivity of aggregates (ASTM C1260 or C1293).

- Certifications for all cementitious materials. For cement, this would be a mill certification demonstrating compliance with ASTM C150, C1157, or C595; for fly ash, a certification of compliance with ASTM C618; for slag cement, a certification of compliance with ASTM C989; and for silica fume, a certification of compliance with ASTM C1240. All certifications should be current (that is, no more than 6 months old).
- Data on the proposed aggregates to be used. These include specific gravity, absorption, and grading for coarse, intermediate, and fine fractions and may include test results on potential for alkali reactivity. The grading information should also include data for use with a scheme for optimization, such as the Shilstone method.[2] In that case, the specifier should verify that the grading is suitable for the application. If you are the specifier and are unfamiliar with a particular aggregate—especially if the project is located some distance from your normal territory—it's worth doing some independent checking before you accept it. A state department of transportation (DOT) is often the best source of information on aggregates. Some DOTs assign a number to every pit or quarry in their respective states. It should be possible to find relevant data on the DOT's Web site. An aggregate's suitability for use in highway and bridge construction will be the major concern of a DOT, so you'll be able to find information regarding reactivity, how much of what type of fly ash is sufficient to control reactivity, and whether the aggregate is susceptible to D-cracking or popouts. You should verify that the information is current, as quarries don't always produce uniform aggregates. There may be additional information you should know before using the aggregate for your particular project, but the DOT check will provide a good start. Also, as long as you're visiting the DOT Web site, you should check out the DOT's specification for aggregates to see whether there are more stringent or more specific requirements than ASTM C33, which doesn't always thoroughly address local concerns.
- Source of supply for mixing water (and ice, if proposed for use).

Submittal **continued on Page 5...**

...Submittal continued from Page 4

- A letter from the manufacturer of each admixture proposed for the concrete, certifying its compliance with ASTM C260 (air-entraining admixtures), ASTM C494 (water-reducing and set-controlling admixtures), or ASTM C1017 (admixtures for flowable or selfconsolidating concrete). Verify that each admixture contains no added chlorides. I recommend that all of the admixtures for any one concrete mixture are from the same manufacturer, as they will have been tested for compatibility.
- Material Safety Data Sheets (MSDSs), product data sheets, guidelines for use, product notes, storage and handling information, shelf life, and recommended dosage ranges for all admixtures.

The submittal may request that all testing be conducted by technicians certified by ACI or other agencies or by a laboratory accredited by the American Association for Laboratory Accreditation or other agencies. Precise testing is in everyone's best interest. Although it may cost more up front to hire an accredited laboratory that maintains current certifications for its technicians, reliable test results will cost far less than following up on low strengths that resulted from improper test procedures. Nearly every deviation from the standard strength testing procedures of ASTM C31 and ASTM C39 causes artificially low test results, so anything that minimizes the likelihood of error will pay off.

As a contract requirement for the contractor, the submittal may also call for appropriate facilities for initial curing of cylinders in the field. Such facilities are required by ASTM C31 Section 10.1.2, but they are not always provided. (If the specifications incorporate ACI 301[3] by reference, the contractor is obligated to provide them.) Normally, the contractor is responsible for providing a facility for curing the newly cast cylinders on site for the first 24 to 48 hours. However, I believe that the testing laboratory should work with the owner and contractor to ensure compliance with the initial curing requirements in Section 10.1.2 of ASTM C31.

Proper curing temperature is most difficult to maintain in the extremes of hot summers or cold winters. Ideally, interior conditioned space in the site trailer would provide both temperature control and security against vandalism or accidental disturbance of the specimens. Lesser measures, however, can be perfectly adequate on many jobs. Commercial curing boxes of various types, insulated coolers filled with water at the appropriate temperature, and even 5 gal. (20 L) plastic pails (white to reflect the sun's rays in the summer) have all been successfully used for this purpose. This matter should be provided for in the contract, but the particulars should be discussed at the concrete preconstruction meeting.

What Do I Do with the Submittal?

If you are the Engineer of Record, you should receive the complete concrete mixture design submittal at least 4 weeks before a project's first placement. You should, in turn, review the submittal and return it within 2 weeks to allow time for a concrete preconstruction meeting. Review the submittal for completeness in accordance with the itemized list and verify that it meets all the requirements of the specification. You should note any items you wish to discuss at the concrete preconstruction meeting.

The Concrete PreConstruction Meeting

It is always advisable to meet with the General Contractor, the Concrete Contractor, the Concrete Supplier, the Testing Agency, the Special Inspections Coordinator, and the Engineer of Record before any concrete is placed. In some cases, the Owner and the Architect will also attend this meeting. Any other trades that must coordinate with concrete placement, finishing, and curing operations should also be represented. NRMCA and the American Society of Concrete Contractors have prepared a checklist[4] of items to discuss in the preconstruction meeting.

If the concrete will incorporate special admixtures such as integral color, or if the concrete is to receive a topping (such as a dry-shake topping) or flooring (such as vinyl composition tile), the topping or flooring manufacturer's representative should also be present at the meeting. Many of these products affect the type and duration of curing that can be used and may also affect the required drying method and duration.

If the mixture design itself or any of the ingredients are new to either the concrete producer or the concrete contractor, a mockup may be needed before any concrete is placed. If no provision for a mockup has been included in the specification, a change order may be required. This will result in additional cost, but it could more than pay for itself. In some cases, the mockup can be incorporated into the project if its performance and appearance are satisfactory. Mockups are particularly advisable when:

- The concrete is colored;
- The appearance of the concrete is critical;
- This is the first time the contractor has placed silica fume concrete;
- The concrete will be pumped a long distance or to a high elevation; or
- A dry-shake topping is to be applied to a slab.

Verify that the Testing Agency has sufficient technicians with the appropriate certifications for the testing required and that the General Contractor is providing an appropriate facility for curing the cylinders in the field. Ideally, one field technician will be assigned to the project. Clarify which tests are to be conducted on site and in the laboratory. The unit weight of the fresh concrete, which should be listed in the contract documents, is easily obtained along with the air content by weighing the sample container before putting the cover on the air meter. This measurement provides a check on the air content measurement. Something else to clarify at the concrete preconstruction meeting is what can or cannot be added to the concrete at the site. Normally, a high-range water-reducing admixture (HRWRA),…

Submittal continued on Page 6...

...Submittal continued from Page 5

… if used, is added at the site to obtain the most benefit from the increase in slump. Many ready mixed concrete producers withhold some of the batch water at the plant so that adjustments can be made as desired at the site. This practice can be problematic, however, when air-entraining admixtures are used.

Retempering the concrete by on-site addition of water (or, to a lesser extent, HRWRA) can adversely affect the air-void system. The technician may find the total volume of air to be satisfactory, but retempering may cause the air voids to coalesce into relatively few, larger voids that do little to protect the concrete from damage due to freezing and thawing. The compressive strength will also be adversely affected. Another problem that can result from retempering is the clustering of air voids around the aggregate particles, dramatically reducing the compressive strength. It's therefore best to require that the ready mixed concrete supplier adds all of the batch water at once at the plant. That is, prohibit the addition of water at the site. For concretes without entrained air, the addition of water or HRWRA at the site is acceptable as long as the allowable water-cementitious material ratio is not exceeded.

The preconstruction meeting should facilitate future communication among the attendees. Make sure that it's understood that reports from the Testing Agency should go to the concrete supplier in a timely manner to allow for adjustments to be made. ACI 301-05,[3] which is often incorporated by reference into concrete specifications, requires that final reports of compressive strength test results be provided within 7 days of completion of the test. Also, ensure that the Contractor understands that adequate notice—usually considered to be at least 24 hours—must be provided to the testing lab or inspection agency before any concrete placement.

References

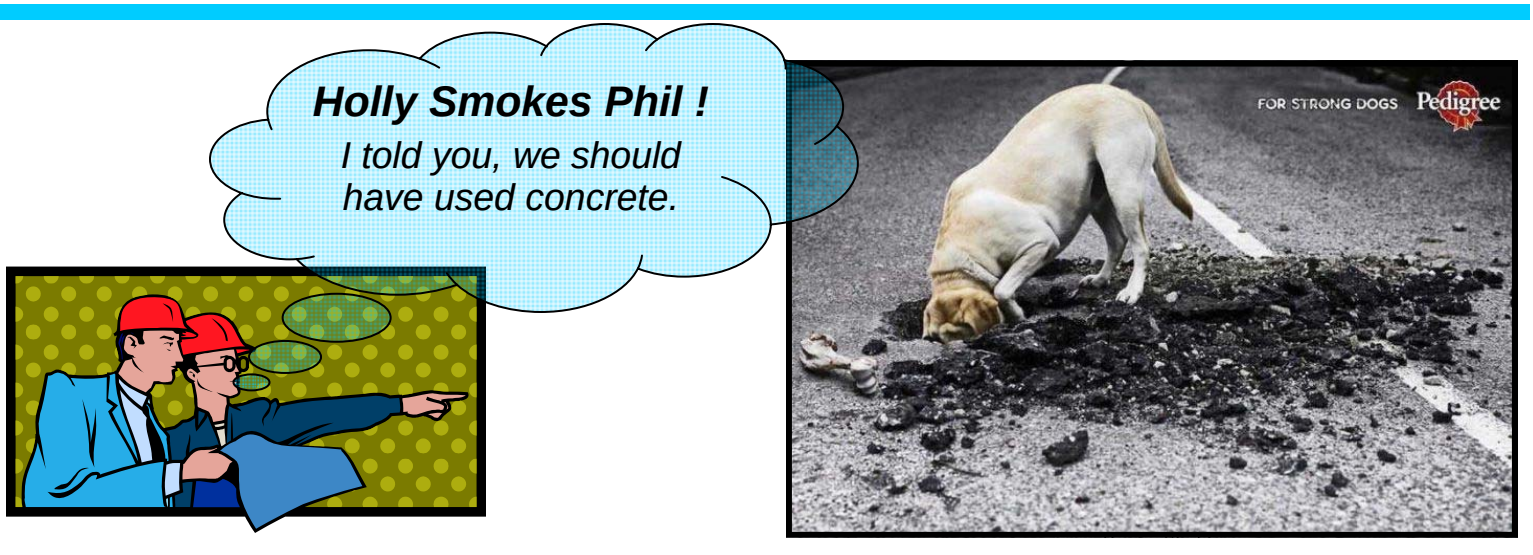
1. ACI Committee 318, "Building Code Requirements for Structural Concrete (ACI 318-08) and Commentary," American Concrete Institute, Farmington Hills, MI, 2008, 473 pp.
2. Shilstone Sr., J.M., "Concrete Mixture Optimization," *Concrete International*, V. 12, No. 6, June 1990, pp. 33-39.
3. ACI Committee 301, "Specifications for Structural Concrete (ACI 301-05)," American Concrete Institute, Farmington Hills, MI, 2005, 49 pp.
4. National Ready Mixed Concrete Association and American Society of Concrete Contractors, "Sample Checklist for the Concrete Pre-Construction Conference," 2000, 18 pp.

Note: Additional information on the ASTM standards discussed in this article can be found at **www.astm.org**.

This article is a continuation of the "What's This Report For?" series, based on a technical session sponsored by ACI Committee E702, Designing Concrete Structures. In keeping with ACI's mission to provide knowledge and information for the best use of concrete, the articles will be posted on the ACI Web site (**www.concrete.org/education/edu_online_CEU.htm**) and, along with sample reports and multiple-choice questions, be used for educational materials.

About the author:

Frank A. Kozeliski, FACI, is a licensed professional engineer in New Mexico, Alabama, and Texas. Until 2007, he was Owner and Operator of Gallup Sand & Gravel Co. He served as Chair of ACI Committee 211, Proportioning Concrete Mixtures, and is a member of ACI Committees 229, Controlled Low-Strength Materials; 305, Hot Weather Concreting; 308, Curing Concrete; and 330, Concrete Parking Lots and Site Paving. Kozeliski received his BS and MS degrees in civil engineering from New Mexico State University.



Georgia Chapter ACI Newsletter

Published Monthly
January - May
Summer Issue
September - December

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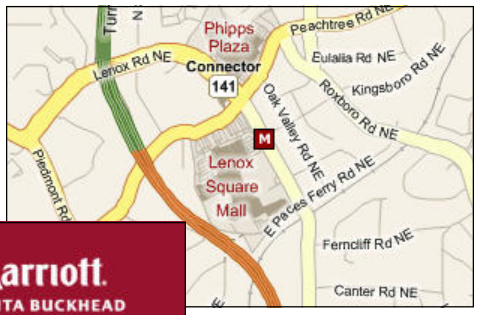
www.georgiachapteraci.org

GA CHAPTER ACI
SEPTEMBER MEETING NOTICE

Date: *Friday, October 22, 2010*

Time: *Registration — 11:30 am*
Luncheon—12:00 p.m.

Location: *Marriott Atlanta Buckhead Hotel & Conference Center*
3405 Lenox Road, NE
Atlanta, Georgia 30326
Tel: 404-261-9250



Marriott ATLANTA BUCKHEAD HOTEL & CONFERENCE CENTER

Program: "Nondestructive Testing for Concrete Pavements and Structures"

The presentation will be a general overview of nondestructive testing for pavements and structures with brief discussion of specific types of NDT. Our speaker will also be discussing case studies including:

- Use of Ground Penetrating Radar and Falling Weight Deflectometer in the City of Chattanooga's pavement management system
- Use of multi-method NDT for compressive strength evaluation of concrete with particular attention paid to confidence levels attainable by NDT versus traditional coring (several specific projects)
- Use of impact echo to locate a soda can in a cofferdam structure
- Use of impact echo in a yield investigation on a second story semi-lightweight slab
- Investigation of corrosion potential in a very popular tourist site in Chattanooga (The Passage) which led to the discovery of poorly grounded lighting in a fountain. This fountain was a popular place for children to play in the summer months.

Speaker: Alex Brent Rollins

Director, Civil Engineering Materials Research Laboratory
University of Tennessee at Chattanooga

Price: ***$25.00 Pre-registered***
$30.00 Walk-ins & No-shows
$10.00 Students

Cash or Check at the door

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RSVP: **On-line at: georgiachapteraci.org**

or call: **"Sam" Morris @ 770-455-7274 or Diane Dial @ 770-621-9324**

or e-mail: **"Sam" Morris @ SammieLFM@aol.com or Diane Dial @ ddial@mail.gcpa.org**

Please RSVP by: WEDNESDAY October 20, 2010