

# Concrete

# Landscape

DECEMBER 2005

DESIGNS



# The Cure for the Common Yard. Highland Stone.®



For a dependable retaining wall with rich, earthen colors and an attractive, rough-hewn face, look to Highland Stone® from Anchor Wall Systems.

Highland Stone is a landscaper's favorite. It's available in three- and six-inch-high sizes, giving you the option of mixing and matching sizes to create a random appearance. Or you can build your project using just one size to best accentuate your design. Whichever size you prefer, both feature our patented rear-lip system for fast, easy and accurate installation every time.

To add the perfect complement, we suggest Highland Stone Free Standing Wall. Made with a complementary palette of earthen colors and a rough-hewn face, the Highland Stone Free Standing Wall System is one of the easiest to install and is perfect for a patio border, creating a sitting wall or building a column.



Call 1.877.295.5415 or visit [anchorwall.com](http://anchorwall.com).

# Concrete Landscape DESIGNS

DECEMBER 2005



## ON THE COVER:

Creating naturally beautiful waterways with concrete masonry.

## FEATURES

4

### Sky Ridge Medical Center

The design offers a permanent water feature that combines sustainable and responsible design with a stunning, dramatic, and practical use of CMU for water retention.



10

### Deep Creek Lake, Maryland

A segmental retaining wall built to control erosion makes a splash in scenic western Maryland.



## DEPARTMENTS

9

Technical Resources

14

AIA Continuing Education Reporting Form

15

Detail of the Month

## PROJECT CREDITS

We would like to thank the following members for their assistance to *CM Designs* with providing information:

VERSA-LOK Retaining Wall Systems,  
Keystone Retaining Wall Systems,  
Best Block, and R.I.Lampus.

**Concrete Landscape Designs** showcases the qualities of design and construction using concrete masonry.

**Concrete Landscape Designs** is devoted to design techniques using standard and architectural concrete masonry units; concrete brick; unit concrete pavers and segmental retaining walls; and other concrete masonry products around the world. We welcome your editorial comments, ideas and submissions.

It is the policy of **Concrete Landscape Designs** magazine to provide the names of authors of articles appearing in the magazine upon request.

**Concrete Landscape Designs** is published quarterly by the National Concrete Masonry Association and distributed to advance and support the concrete masonry industry and the public interest through research and educational programs designed to meet the future needs of the industry.

Send address corrections to NCMA's Publications Department:

13750 Sunrise Valley Drive  
Herndon, VA 20171-4662  
703.713.1900 Fax 703.713.1910  
www.ncma.org



**Publisher:** Jerry R. Harke, APR

**Editor:** Rick Ardalan  
rardalan@ncma.org

**Associate Editors:** Dennis W. Graber, P.E.;  
Robert D. Thomas; Michael F. Werner, P.E.;  
Harry Junk

**Advertising:** Heidi Weiss  
hweiss@ncma.org

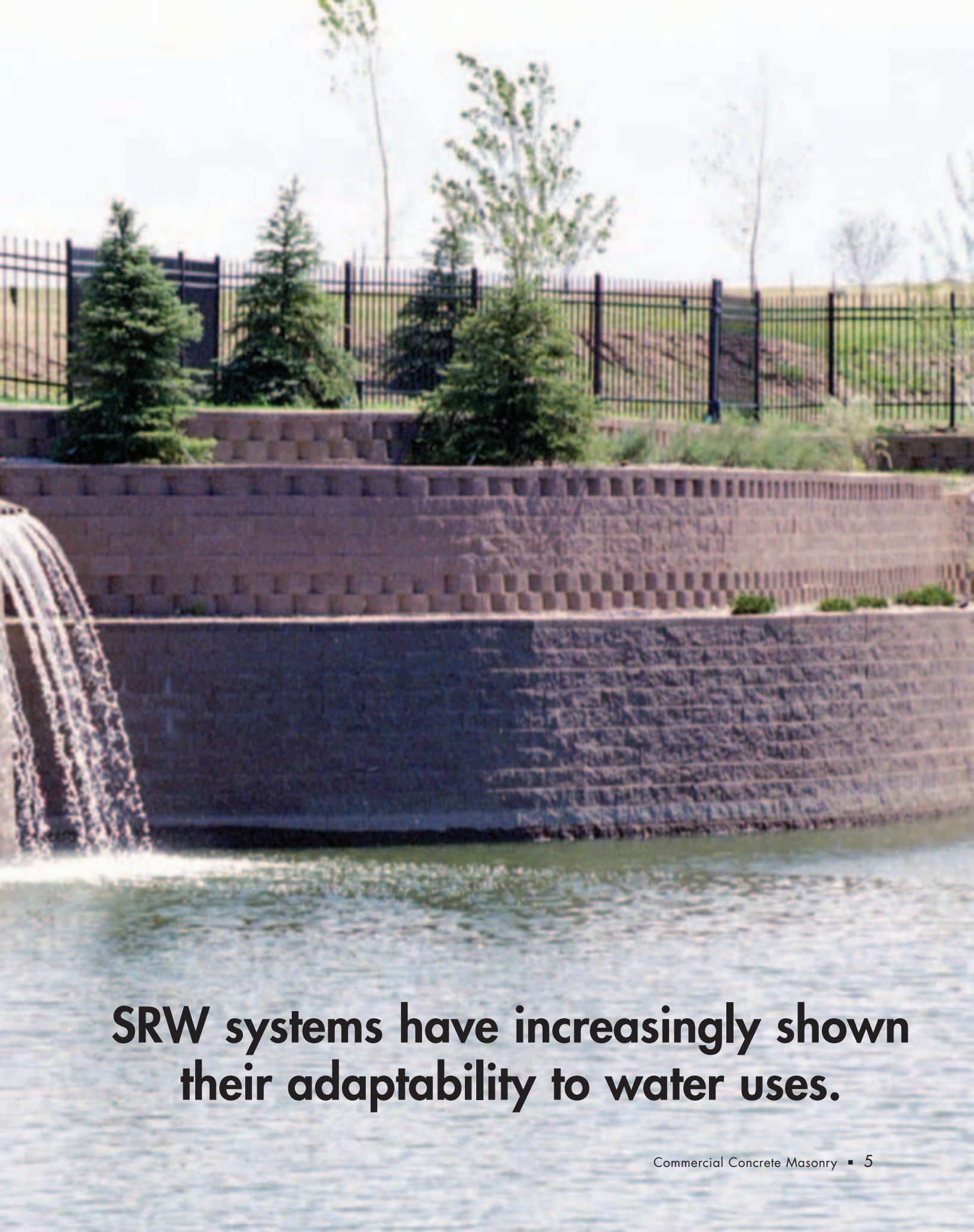
**Design & Layout:** Rick Ardalan, NCMA

*Copyright 2005 by National Concrete Masonry Association (NCMA). All rights reserved. Contents may not be reprinted or reproduced without written permission from NCMA.*



### AIA Learning Objectives

After reading this article you should be able to answer the AIA CES questions on page 14.



**SRW systems have increasingly shown their adaptability to water uses.**

**Project**

Sky Ridge Medical Center

**Location**

Lone Tree, Colorado

**Architect:**

Gresham Smith and Partners, Nashville, TN

**Hospital Land Planner**

Civitas, Denver CO

**Construction Management**

Bovis Lend Lease, Nashville, TN

**Landscape Engineering**

Keystone Engineering

**Mason Contractor:**

Ames Construction Inc., Aurora, CO

The new, 138-bed Sky Ridge Medical Center in Lone Tree, Colorado, is not only a much-needed acute care hospital and state-of-the-art medical facility, but also a lavish feast for the eyes with its rich use of materials and creative design. Complimenting its resort-like atmosphere at the base of bluffs 1,000 ft. (300 m) above mile-high Denver and with views of the Rocky Mountains is landscape design that mixes creativity with functionality. Among its amenities, the design offers a permanent water feature that combines sustainable and responsible design with a stunning, dramatic, and practical use of segmental retaining wall units for water retention.

The Sky Ridge Medical Center occupies a 42-acre (17 hectares) site that will become part of the 3,500-acre (1400 hectares) development of

RidgeGate, a planned community based on the principles of smart growth. RidgeGate will eventually employ reuse and mixed-use criteria to create a diverse community of retail, offices, schools and parks as well as residential space over the next 40 years. A 54,000 sq. ft. (5016 m<sup>2</sup>) recreation center opened early this year, and a light rail is planned to create easy access to various parts of the community. As an anchor to the new development, the Sky Ridge Medical Center has set the tone for outdoor design that will eventually incorporate many of its facets into future concepts.

With site levels of the campus varying as much as 40 ft. (12.2 m), retaining walls were needed to develop access to several levels of the Medical Center and to provide parking to various entrances of the hospital. Engineers and designers combined this site feature with a design to collect water runoff from the site and facility. A sustainable and ecologically sound plan was created out of adherence to site contours and

## *The sweeping curves of the rising tiers offer a visually striking structure that addresses pure functionality with a creative solution.*

simple necessity. To this end a terraced design was implemented for the majority of the segmental retaining walls (SRWs).

Graceful and commanding, five tiers of SRWs rise above the storm water retention pond created to collect runoff water from the property and facility. Inlet structures feed the pond from these sources and a pump driven waterfall creates a cascade of water. A turret shaped structure houses the minimalist waterfall and flowing curves break the line and meander majestically around the pond. Plantings of conifers and shrubs rise above each tier, creating a sense of strong planes and vertical accents. The pond's

unique impervious rubber lining was installed to the top of the first tier and the entire earth reinforced zone—at the lowest tier stretching 30 ft. (9.2 m) behind—was filled with crushed rhyolite. This allows water to rapidly fill and rapidly draw down avoiding any buildup of water pressure behind the wall.

The sweeping curves of the rising tiers offer a visually striking structure that addresses pure functionality with a creative solution. A walkway has been created that leads to this popular destination, and a future medical building will focus more directly on the pond with a light rail station proposed directly across from it. In addition, the



pond provides for irrigation to the landscape generally, and during dry spells, water can be pumped from a deep-water well and held in the pond.

Another area of the project that utilizes SRWs for both structural and aesthetic purposes is a staircase leading down to the outdoor seating area of the Medical Center's café, an inviting place for workers and guests to gather and one that has been used for outdoor parties and other institutional events. Sky Ridge Medical Center CEO Maureen Tarrant observes the "thoughtful functionality" needed utilizing segmental retaining walls to create a retention pond with areas of flowerbeds and a cascading waterfall that "tried to get more out of it than its function."

SRW systems have increasingly shown their adaptability to water uses, including scour protection, erosion control and floodplain applications. Special provisions must be made in such water applications that include a sound foundation design, allowance for relieving hydrostatic pressure behind the walls, and freeze-thaw cycles, among other concerns. The ability of SRWs to accommodate themselves to all manner of curvature makes them particularly well suited to building around water. With choice building sites at a premium, developers have to face increasingly limited building conditions. SRWs offer practical, durable, and long lasting alternatives to other methods of soil retention. ★



**Retaining Walls—  
A Building Guide and  
Design Gallery**

The essential guide to constructing segmental retaining walls with detailed, easy to follow full color diagrams/charts for do-it-yourself homeowners and landscape contractors. Professional price: \$24.95



and textures, enhance every outdoor environment—from the smallest backyard patio to the grand urban plazas. Some of the best projects

from across North America illustrate this book. Written for landscape architects, contractors and homeowners alike, this is the design handbook for concrete pavers. Professional price: \$29.95

**Segmental Retaining  
Wall Installation Guide**

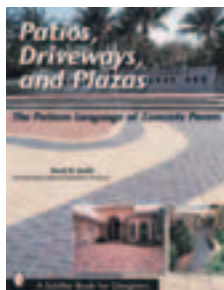
Educate contractors and owners in the proper techniques for installing segmental retaining wall systems. This useful guide addresses the specific installation steps for engineered and

non-engineered systems and includes technical information regarding excavation, geosynthetic grids and much more. Professional price: \$4.00



**Patios, Driveways, and  
Plazas—The Pattern Language  
of Concrete Pavers**

Concrete pavers are one of the hottest pavements around homes, residential buildings and urban spaces. Designers know that the selection of pavement patterns and colors have a big influence on the character of these places. In this book, you'll learn the design vocabulary of basic paving patterns and progress to more intricate variations. Each of the 300+ color photos demonstrates how specific patterns, colors,



**Residential Technology,  
Volume 3 (ResTEK3)  
on CD-ROM**

Fully updated, this terrific interactive residential masonry tool contains the following:

- 38 NCMA TEK pertaining to residential design and construction in easy to read, searchable PDF format.
- The following two HUD documents
  - Concrete Masonry Homes: Recommended Practices and
  - Building Concrete Masonry Homes: Design and Construction, both with details prepared by the National Association of Homebuilders Research Center
- 32 concrete masonry house plans from Home Design Services, Inc.
- plus video footage on correct procedures of common masonry construction tasks.

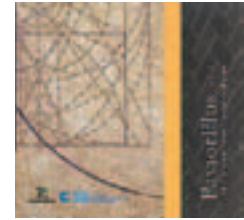


This is a must for every home builder and designer. Order yours today!

**PaviorPlus™ Concrete  
Paver Software**

Create customized paver layouts in a fraction of the time!

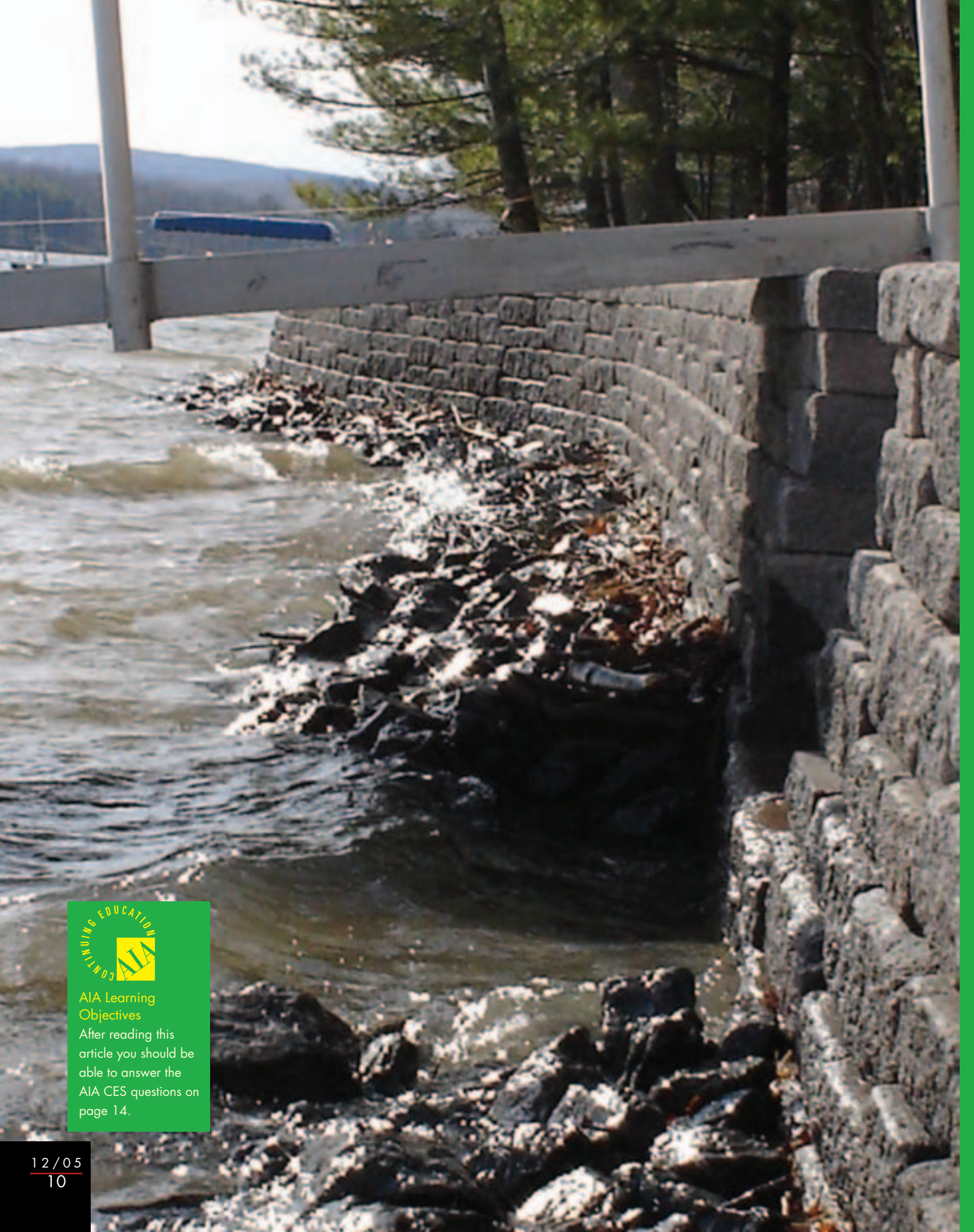
This powerful software is both a drawing tool and a structural design tool. It contains a library of 56 popular patterns and 43 generic and proprietary shapes to fill a drawn or imported paved area, determines the quantities of pavers needed, and the type and thickness of base for the project. Professional price: \$50.00



**e-TEK and e-Details**

NCMA's TEK series and details are available online FREE to architects, engineers and specifiers. The TEKs include more than 130 technical bulletins on various topics related to concrete masonry with a new TEK published monthly. In addition, many others are revised and updated to reflect code or building design changes as necessary.

The Web site-accessible e-TEK and e-Details service can be reached through NCMA's member Web sites that sponsor the program. A listing of sponsors with hot-links to their sites can be found at [www.ncma.org](http://www.ncma.org). Click on the "Select Your State" pulldown menu and then select your local concrete masonry producer. Click on "Technical Details" for e-Tek or "Technical Manual" for e-Details. e-Details has all drawings downloadable in various electronic formats including DWG for AutoCAD and DXF. This service allows viewers to be supplied with the latest up-to-date information on concrete masonry. For those who still prefer the hard copies, they are available from NCMA at [www.ncma.org](http://www.ncma.org) or by calling the publications department at 703.713.1900. ■



**AIA Learning  
Objectives**

After reading this article you should be able to answer the AIA CES questions on page 14.



## Deep Creek, Preserved Shoreline.

*Shoreline erosion is insidious. Landscaping or other vegetation that seems far from the shore can, in a matter of years, find itself nearly water bound.. Homeowner Dave Buscher was determined to stop the process in his backyard before it was too late.*

*"We had one big tree, three feet (.9 m) in diameter, that was being undercut by erosion," says Buscher, whose five-bedroom second home is on the shore of Deep Creek Lake in western Maryland. "We wanted to save that tree, and the way to stop the erosion was by building a retaining wall."*

*Created on Deep Creek River in the 1920s by the construction of a hydroelectric dam, Deep Creek Lake is now the center of a real estate and recreational boom at the far end of Maryland's panhandle. The area is home to Backbone Mountain, the state's highest point, and the Eastern Continental Divide. Water from Deep Creek Lake flows west toward the Ohio River, while other streams feed the eastern flowing Potomac River.*



In this landscape of mountains, river valleys and lakes, retaining walls are a common feature.

But concrete masonry segmental retaining walls are strangers to these parts. That is, until Buscher and contractor Cliff Welch, owner of Land Design Landscaping and Excavating, applied for a permit from Deep Creek Lake's owner, the state's department of natural resources, to build a segmental retaining wall.

The department's guidelines state that "hand stacked stone and native wetland plantings are considered" for erosion control. Additionally, "permit holders are responsible for all costs of improvement."

Those guidelines for shoreline erosion prevention techniques are being reassessed, says Sean McKeen, regional manager for wetlands and waterways for the state's department of the environment. The department, together with the department of natural resources, is responsible for issuing permits, who previously resisted issuing permits for stacked stone or segmental retaining walls because of a misconception that they performed the same.

Buscher and Welch received their permit-but it took time. Construction on the retaining wall itself took about two weeks, Buscher says. "But it took almost two years from the time we applied for the permit to the time the wall was finished."

By building the wall, "we're basically paying to keep erosion down on [the state's] lake," he adds.

In mandating stacked stone, authorities are trying to maintain "a rustic look," Welch says. But the contractor had sound practical and economic reasons for preferring a segmental retaining wall to laying native stone.

"All the landscaping work is very labor intensive," he says. "We have a lack of skilled labor to lay stone. The stone itself is hard to come by, and it's expensive."

Then there's the small window of opportunity for building on the shoreline. The lake is at its lowest point from late September through March, Welch explains. He spent about two weeks in construction in November 2004 before the weather got too cold, then returned for two days in the spring of 2005 to complete the job.

The wall answers all the shortcomings of stacked stone. The crew doesn't need to be highly skilled - "Basically, it's like stacking Lego blocks," Welch says. The supplier was nearby, and the price was right - \$38-\$40 a square foot, "depending on accessibility."

The finished wall 3 feet (.9 m) high and 100 feet (30.5 m) long, in what Welch calls "a walnut color that mimics fieldstone." He used four types of block to achieve a random look - a standard unit 6 inches



(152 mm) high by 16 inches (406 mm) across by 12 inches (304 mm) deep; a cobbled unit 6 inches (152 mm) high by 8 inches (203 mm) across by 12 inches (304 mm) deep; and two accent units, both 4 inches (101 mm) high by 12 inches (304 mm) across and 12 inches (304 mm) deep.

Welch began by digging a 3-foot-wide (.9 m) footer, then put down a layer of filter fabric at the bottom of the trench. Then he laid down 6 inches (152 mm) of compacted road base, placed filter fabric on top of that and, finally, another 6 inches (152 mm) of road base.

Built above the frost line, "it's designed to withstand the freeze and thaw cycle. That's why you don't pour in a concrete footer," he says.

The first course of block is the most critical, Welch says, so he dry-stacked the units. "We spent 40-50 percent of our time on that row of block. That's how critical it is. Then you can lay the rest pretty fast."

The segmental product Welch used features a slot and hole system. A pin goes through the top unit and into the unit below it, he explains.

He built the wall in panels, with each panel including one standard segmental retaining wall unit, one cobbled unit and two accent units in changing configurations. "That's how you get that random look," he says.

In addition to the retaining wall, Welch used paver slabs to construct a patio, a walkway around the deck, and laid pavers on the driveway for his client.

Buscher, who bought the home in 2000, says his retaining wall has "a much cleaner look" than the stone and rip-rap walls he sees on the lake shore. "If you go around the lake in a boat and look at the others, they don't seem to have any permanence to them."

He worries about kids scrambling over the sharp rocks to get into the water. "With this wall we put in some steps so you could get right down to the water."

At the same time that Buscher's permit was approved, Welch received the go-ahead to build a segmental retaining wall at another home on the lake. Whether this is the beginning of a trend, or just exceptions to the rule remains to be seen. Buscher, though, believes the extra wait to get the retaining wall he wanted was worth it.

"It turned out fantastic," he says. "I don't think we could have saved that tree otherwise." ★

#### Project Credits

**Project:** Residential erosion control retaining wall  
**Owner:** Dave Buscher  
**Location:** Deep Creek Lake, Md.  
**Masonry contractor:** Land Design Landscaping and Excavating LLC, Oakland, Md.  
**Masonry supplier:** Alcon Inc., Morgantown, W.Va.



Concrete Landscape Designs AIA /ASLA Continuing Education Learning Program

**Learning Units Reporting Form**

To receive one learning unit, read "Sky Ridge Medical Center" (page 4) and "Deep Creek Lake" (page 10) and complete the following questions on both articles. Return this form to the National Concrete Masonry Association. Only original forms will be accepted for learning unit credit.

Forms received after January 2007 will not be accepted for learning unit credit.

I am a non-AIA architect or design professional. Please send me a certificate stating the learning units earned that I can use for documentation to fulfill other continuing education requirements.

Send completed Report Form to: AIA CES, National Concrete Masonry Association, 13750 Sunrise Valley Drive, Herndon, VA 20171-4662. If you have questions, please contact NCMA at 703.713.1900.

December 2005

**AIA/ASLA Questions:**

(Check the correct answer)

1. SRW systems have shown their adaptability to water uses by:
  - Scour protection
  - Erosion control
  - Floodplain applications
  - Ability to accommodate curvature
  - All of the above
  
2. Special provisions that must be made for SRW water applications include:
  - Sound foundation design
  - Allowance for hydrostatic pressure behind the walls
  - Unit color
  - Freeze-thaw cycles
  - a,b, and d
  
3. One of the advantages of using a crushed stone footing for SRWs above the frost-line is:
  - It looks better
  - It withstands freeze-thaw cycles better than a concrete footing
  - It doesn't require any special attention for installation
  - It reduces the potential for settlement
  
4. In regard to other methods of soil retention, SRWs offer:
  - No advantage
  - No attention to installation needed.
  - More practical, durable, and long lasting alternatives

**AIA/ASLA Member Information:**

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE/PROVINCE \_\_\_\_\_ POSTAL CODE \_\_\_\_\_

PHONE \_\_\_\_\_ FAX \_\_\_\_\_

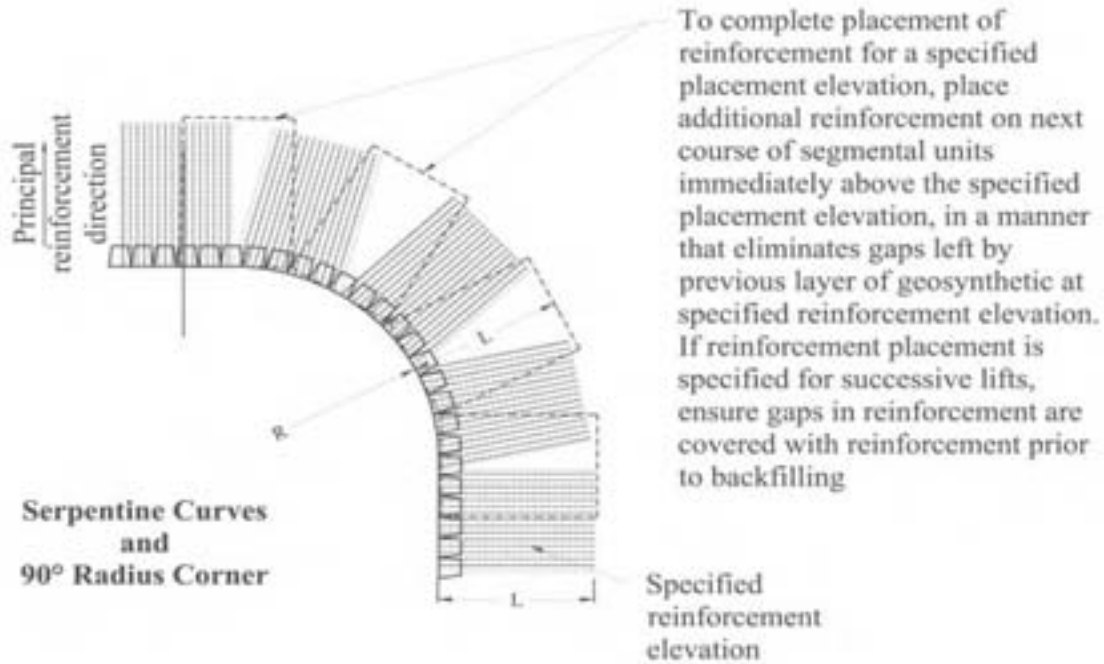
E-MAIL \_\_\_\_\_ ID NUMBER \_\_\_\_\_

*I certify that the above information is true and accurate to the best of my knowledge. I have complied with the AIA/ASLA Continuing Education Guidelines.*

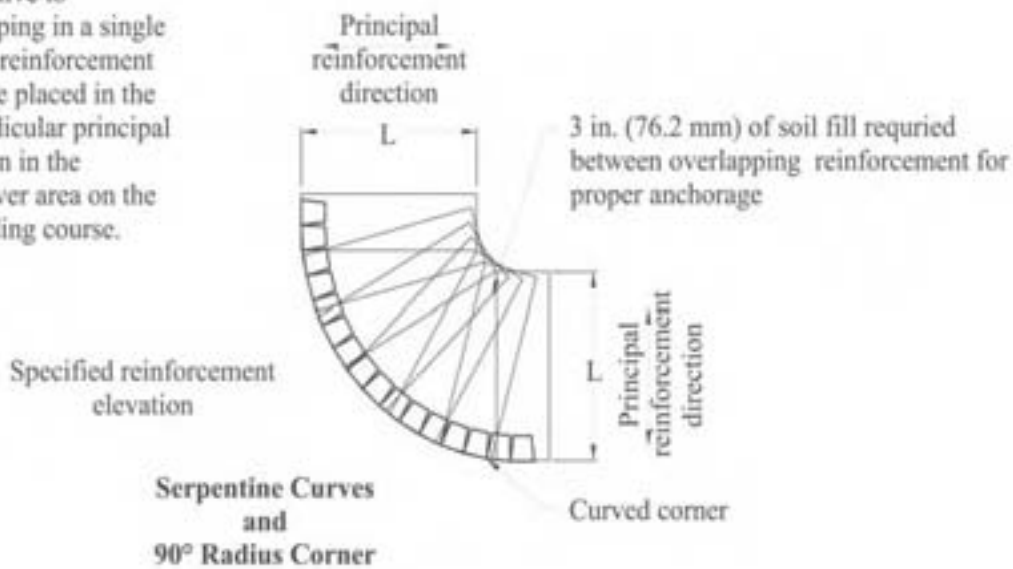
SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

Check here to request a catalog of concrete masonry technical literature.

# Reinforcement Placement for Curved Walls



Alternative to overlapping in a single course, reinforcement could be placed in the perpendicular principal direction in the cross-over area on the succeeding course.



# RANDOM-PATTERN TALL WALLS

WHEN WE SAY THE SKY'S THE LIMIT, WE MEAN IT.

VERSA-LOK CAN TAKE YOU TO DIZZYING HEIGHTS. With Mosaic, you not only can build stunning random-pattern tall walls with an artistic flair, but unsurpassed structural integrity and easy installation as well. VERSA-LOK's Weathered™ option delivers a more historic texture without compromising strength.



Municipal  
Parking Lot,  
Town of Wilton, Maine,  
in VERSA-LOK Weathered Mosaic



TWO PRODUCTS, ENDLESS POSSIBILITIES. And don't forget about VERSA-LOK Standard, its unique, solid-unit, top-pinning features give you unequalled design freedom, versatility, and installation simplicity. You can do more, and do it easily. WITH VERSA-LOK, IT DOESN'T TAKE A MIRACLE TO CREATE A MARVEL. For more information on Mosaic and other VERSA-LOK products, call 800-770-4525 or visit [www.versa-lok.com](http://www.versa-lok.com).



© 2005 Kiltie Corporation - Oakdale, Minnesota - [www.versa-lok.com](http://www.versa-lok.com)

Concrete  
Landscape  
DESIGNS

13750 Sunrise Valley Drive  
Herndon, VA 20171-4662

PRSRST STD  
U.S. POSTAGE  
PAID  
Herndon, VA  
Permit No.39