Concrete Masonry Association of California and Nevada

April 2012

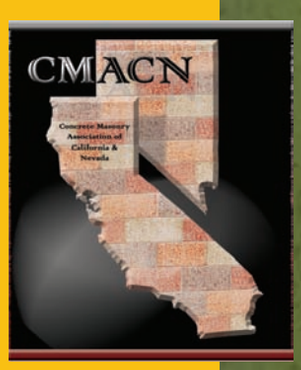
CMU

Profiles in Architecture

Why Masonry?
www.whymasonry.org

Concrete masonry buildings are durable. They withstand continual use and abuse by students, community groups, fire fighters, police and armed forces personnel alike.

Featured in this issue: 1



High Tech High North County
Photo: ©Jim Brady, Brady Architectural Photography

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Center for the Arts

Redlands, California

Architect:
Lentz Morrissey Architecture, Inc.
204 N. Broadway, Suite F
Santa Ana, CA 92701

Paul Russell Lentz, AIA
Principal

Tom Morrissey AIA, LEED® AP
Principal

Structural Engineer:
KPFF Consulting Engineers
General Contractor:
Tilden-Coil Constructors, Inc.
Masonry Contractor:
Masonry Technology, Incorporated
Block Producer:
Angelus Block Company, Inc.
Owner:
University of Redlands

Architect's Commentary: Isolated from the main campus, the existing theatre building was built in 1966 as a stand-alone structure at the south edge of the campus. The existing building is sited at the campus/community edge across from a public park, and between the Zanja Creek and an adjacent residential area. Meeting a critical need for expanded facilities in both the fine arts and theatre curriculum, the new Center for the Arts includes an expansion of the existing theatre building classroom and administrative space, "black box" theatre, and support spaces, and a new, separate structure to house the fine arts classroom/studio space and administrative offices.

Why Masonry? Concrete masonry is used throughout the new facility as both finish and structure. Concealed interior shear walls are constructed of precision units, while burnished and split face units of contrasting colors are used at lobbies, entries and as skin and structure of the Frederick Loewe Theatre. The rich texture of the burnished and split face units adds a simple elegance to the project while meeting the requirements of sustainability (recycled content), durability and economy.

Designed as a simple but contemporary envelope of concrete and masonry, the new facility is a collection of simple forms that are a purposeful contrast to the classical architecture of the historic campus center, while at the same time a complement to the existing theatre building. In keeping with the sustainability goals of the university, the project achieved a LEED Gold rating.

The complex is organized by an east/west pedestrian promenade that connects the new facilities to the existing structure. This promenade connects a series of public spaces arranged to reinforce and further develop a sense of community within the arts curriculum and with the City of Redlands. Courtyards, pathways, lobbies and other spaces overlap and intersect with the promenade and within the complex, creating space for outdoor studios/classes, exhibits and displays, and public receptions. These spaces foster casual encounters between faculty, students and the community, leading to greater communication, the exchange of information & ideas, and increased creativity.

The new Center for the Arts raises the image of the University of Redlands, both in the context of the City of Redlands and in the educational community. These new facilities increase visibility and awareness, attracting students to the arts curriculum and enabling the university to attract and retain top faculty in the arts field. At the same time, this contemporary complex is a symbol of the university's progress as an institution and is a new public face at the campus edge.

Riverside Aquatics Complex

Riverside, California

Architect:
AVRP Studios
703 16th Street, Suite 200
San Diego, CA 92101

Randy Robbins, AIA, LEED ®AP, NCARB
Principal

Aquatic Consulting Firm:
Aquatic Design Group
Structural Engineer:
Envision Engineering
Construction Manager:
Tilden-Coil Constructors
Masonry Contractor:
Kretschmar & Smith Masonry Contractors
Block Producer:
ORCO Block Co., Inc.
Owner:
Riverside Community College District

Architect's Commentary: Riverside Aquatics Complex is home to Riverside City College's aquatics sports teams, college water fitness and training classes, community swim programs, diving and synchronized swimming clubs, and host venue for local, regional, state and national swim, dive, and water polo competitions.

The complex with its dive tower is a landmark facility that complements the adjacent historic Cutter Pool facilities. The surrounding arroyo, terraced environment and existing facilities within the landlocked campus provided a challenging scenario for the designers.

The complex houses indoor and outdoor learning environments for aquatic sports and is designed to be environmentally friendly through the use of sustainable materials, natural daylight and cross ventilation. The 4,000 square-foot aquatics building features locker facilities, coach's office and team rooms and incorporates abundant natural light and ventilation. The separate 2,500 square-foot mechanical building contains the equipment required for pool operation. Photovoltaic panels will be incorporated into a shade structure to offset the facility energy usage.

Why Masonry? Concrete masonry, a regionally manufactured material, was selected for both aesthetic and practical reasons. Split face, precision and projected blocks in multiple colors respond to the movement of the water as well as the colors utilized on campus. The concrete masonry accentuates the inside/outside aesthetic as it completes the volumes and becomes exposed in interior areas.

The complex is funded by the Riverside Community College District and City and County of Riverside with a mandate to be environmentally sensitive. The energy efficient design includes:

- Extensive use of daylighting
- Cross ventilation in the shower/locker rooms. Operable windows and high ceilings promote natural ventilation
- Recycled and reusable materials
- High solar reflectance value flat roof surfaces
- Shade structure will shield spectators at southern exposures
- Material palette with inherently high thermal mass properties
- Selection of native indigenous plant stock reduces irrigation demands
- Strategic employment of insulated glass storefront with 'low-e' glazing
- Advanced lighting controls, extensive use of LEDs and compact fluorescents
- Energy management system for HVAC
- Variable volume pumps for the pool

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©Photography: Y.K. Cheung, Y.K. Cheung Photographer

Oxnard College Student Services Center

Oxnard, California

Architect:
Nadel, Inc.
1990 S. Bundy Drive, 4th Floor
Los Angeles, CA 90025

Greg Serrao, AIA
Principal

Structural Engineer:
BP Consulting, Inc.
General Contractor:
Douglas E. Barnhart, Inc.
Masonry Contractor:
Frazier Masonry Corporation
Block Producer:
Angelus Block Company, Inc.
Owner:
Ventura County Community College District

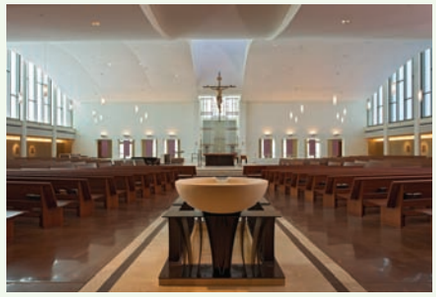
Architect's Commentary: The Student Services Center is located on the Oxnard College campus in Oxnard, California. The 32,600 square-foot Student Services Building consolidates the student administrative functions and the college administrative offices into one convenient location. The 7,900 square-foot food services facility houses indoor dining, servery and kitchen, and is surrounded by a canopied Outdoor Dining area.

Why Masonry? The architectural design gives a "forward-looking" and positive image for the heart of the campus quadrangle. Designed as a "Foreground Building", the Student Services Center utilizes materials and elements that are compatible and in harmony with the surrounding structures in both coloration and texture, fully utilizing the dominant building materials, including concrete masonry. The contrast of the colored concrete masonry units with the glass and corrugated metal panels also provides interest to the material composition.

The running bond block pattern is delineated by 4″ high, precision-cool gray accent bands, with a field of burnished warm grey block along the first story, with precision auburn and cinder white at the surfaces above the first floor window level.

Full block concrete masonry veneer cavity wall construction with 4″x8″x16″ units is used throughout the project. The system consists of a 1″ air gap between wall membrane covered gypsum sheathing and the masonry units, allowing any water penetrating through the masonry to travel through the air gap and escape through weep holes at motar joints. The masonry units are supported by releaving angles connected to tube steel supports, and are tied back with Fleming anchors to 16-gauge metal stud framing for lateral stability. A slip joint along the window head level allows for lateral seismic movement.

The end result is a successful concrete masonry building that expresses a timeless quality, evocative of strength, permanence, stability and warmth.



Good Shepherd Catholic Church

Elk Grove, California

Architect:
HGA
1410 Rocky Ridge Drive, Suite 250
Roseville, CA 95661

John Justus, AIA
Principal

Structural Engineer:
Buehler & Buehler Structural Engineers
General Contractor:
Jackson Construction
Masonry Contractor:
Diablo Valley Masonry, Inc.
Block Producer:
Basalite Concrete Products, Inc.
Owner:
Roman Catholic Diocese of Sacramento

Architect's Commentary: The design concept for the new 1000-seat church comes from the parish name "The Good Shepherd." The parishioners see in John's Gospel, Chapter 10, that Jesus is the Good Shepherd. He cares for his sheep. In fact he lays down His life for us.

Why Masonry? Concrete masonry was significant to the success of the design. With all of the existing structures on the site employing various extents of concrete masonry, utilizing this material for the new church helps to relate to the campus. More importantly, concrete masonry articulates the design concept by forming a sheepfold where the assembly gathers and is protected. Within this resting place, the solid perimeter walls provide a sense of permanence and screen out the secular world from within.

The nave of the church rises up from within the concrete masonry haven and meets the sky with a flowing ceiling form and gentle uplifted roof. Together they express the living and nurturing care of the Shepherd by providing a gentle hand over the flock and a place where heaven and earth interact. The translucent window walls and 3 roof lanterns express the awareness and connection to the sky by filling the space with transcendent light. Within this luminous sanctuary, the red stone altar, representing the blood that Christ Jesus shed for our sins, is the focal point of the sanctuary and allows the celebrants to gather around it during Mass.

The church building was designed to make visible the dwelling of God among us. The external and internal structure of the church express the dignified beauty of God's holy people who gather there and of the sacred rites they celebrate. The building invites believers to raise their minds and hearts to the One who is the source of all beauty and truth.

Burton Mesa Public Safety Center

Lompoc, California

Architect:
RRM Design Group
3765 South Higuera Street
San Luis Obispo, CA 93401

Jim Duffy, AIA, LEED ®AP
Project Manager

Margaret Ambrosavage, LEED ®AP
Project Architect

Structural Engineer:
TMAD Taylor & Gaines
General Contractor:
Maino Construction Company, Inc.
Masonry Contractor:
Curt J. Bailey Masonry, Inc.
Block Producer:
Air Vol Block, Inc.
Owner:
County of Santa Barbara

Architect's Commentary: The County of Santa Barbara hired RRM Design Group to provide design and construction administration services for a new joint use fire/sheriff station for the Santa Barbara County Fire and Sheriff Departments. The new 12,500 square-foot facility replaced an aging and inadequate Fire Station 51 and Sheriff substation buildings located near the project site. RRM went through an extensive programming phase with the County to ensure the new facility would meet the space needs for each department, while staying within the County's budget. The result is a building design that efficiently integrates the different space, technology and operational needs of each department, while providing opportunities for shared spaces such as the workout room and conference room. Situated adjacent to the Burton Mesa Nature Preserve, the project was designed to respect the surrounding terrain in its massing, materials and landscape. A Burton Mesa Preserve Interpretive Center is located in the lobby. This is the first combined fire/sheriff station in Santa Barbara County and is the prototype for future projects.

Why Masonry? Concrete masonry was chosen to provide a durable material that has an attractive finish which reflects the strong presence of the Fire and Sheriff Departments. An exposed, split-faced block was used in the apparatus bay for its durability, resistance and low maintenance. Split-faced block was also used at the site wall and sign pilasters, as well as at wall base and awning bases to provide the building a solid anchor to the site. A light sandy tone was selected for the masonry to reflect the colors of the local natural stone and to blend in with the surrounding area.

Energy efficiency and sustainable design measures were incorporated into the project through elements such as strategically located overhangs and trellises that provide solar protection. The thermal mass of the masonry assisted in reducing the heating and cooling requirements. Water-efficient plumbing fixtures, energy-efficient lighting, and materials with low VOC and high recycled content were also used.

©Photography: Nick Hoover

High Tech High North County

San Marcos, California

Architect:
Studio E Architects
2258 First Avenue
San Diego, CA 92101

John Sheehan, AIA
Principal

Maxine Ward, LEED® AP
Project Architect

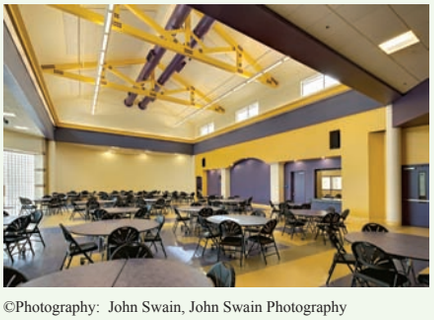
Structural Engineer:
Davido Consulting Group
General Contractor:
Bycor General Contractors
Masonry Contractor:
Modern Masonry
Block Producer:
RCP Block & Brick, Inc.
Owner:
High Tech High Learning

Architect's Commentary: Opened in 2009, High Tech High's San Marcos campus serves 550 North San Diego County students. The High School's five-acre master plan includes a future middle school and a recreational open space embraced by these two schools as the campus' front door.

The architect's plan organizes school activities around an active "Main Street" gallery—the school's primary social space and display area for student work—that links a series of educational neighborhoods of classrooms, labs, and studios. Designed to emphasize sustainability and community, the building carefully attends to its setting by capturing prevailing breezes and daylight while limiting direct solar gain.

Why Masonry? Masonry was the ideal material choice for several reasons. For an organization concerned about sustainability – masonry offered the school a locally produced, high quality, "pre-finished", low-maintenance material capable of holding-up to the wear and tear of students. Masonry was intentionally left exposed in many areas of the building to make visual links between indoor and outdoor. Further, the earthy color and texture of the units added a welcome warmth and contrast to the interiors.

The approximately 45,000 square-foot building was built for just under $12 million.



Bret Harte Union High School District
Bret Harte Multi-Purpose/Community Center

Angels Camp, California

Architect:
Two Rivers Architects
13405 Folsom Blvd., Building 300
Folsom, CA 95630

Lawrence R. Washington, AIA
Principal

Structural Engineer:
DKG Engineering, Inc.
General Contractor:
F & H Construction
Masonry Contractor:
Brent Martin Masonry
Block Producer:
Calstone Company, Inc.
Owner:
Bret Harte Unified High School District

Architect's Commentary: Bret Harte Multipurpose and Community Center is uniquely beautiful, durable. It is economical to run and it was economical to build.

Why Masonry? The design concept depended on choosing a building material that would be both structural and finish material. The material had to be flexible enough to take on curved forms, span long distances, have a variety of finishes, and durable enough to stand up to high school students year after year. Structural concrete masonry was chosen, because it is a material that has strength, durability, and flexibility. This is a lot to ask for a material in a seismically active area, but concrete masonry did it with ease. The outcome is a design that is open and honest, and a statement of simplicity and beauty.

The building is constructed with 8″x8″x16″ single scored, ground face, integrally colored white concrete masonry units (CMUs) The color was selected to provide contrast with the existing building to which it was being attached. The integral color eliminates the need for paint.

Occupying 90% of the tiny site, it was important that the one exposed corner was rounded to soften the building so that it would not be a barrier between the two sides of the campus. Concrete masonry allowed us to accomplish this strategy.

The Multipurpose/Community Center is in a location that is susceptible to power outages and the owner required that the building have the ability to be used even when the power is out during the day. To achieve this sustainable requirement, we placed a large clerestory with operable windows on the top of the building and turned it 45 degrees to the building walls to bring in true north/south light and to be able to exhaust the hot convection air out. An added sustainable bonus with concrete masonry is it has thermal mass to absorb the unwanted heat during the day and release it at night, which works well in this mountain community where it can be hot during the day and very cool at night.

State of California, Department of General Services Central Utility Plant

Sacramento California

Architect:
Nacht & Lewis Architects
600 Q Street, Suite 100
Sacramento, CA 95811

Michael Parrott, AIA LEED AP
Senior Project Manager

Structural Engineer:
CYS Structural Engineers, Inc.
General Contractor:
Skanska USA Building
Masonry Contractor:
SW Mertz Masonry Specialists
Block Producer:
Basalite Concrete Products, LLC
Owner:
State of California, Department of General Services

Architect's Commentary: The State of California central utility plant is sited in the downtown Sacramento area. The prime directives were to provide safe, reliable and efficient heating and cooling systems, a progressive design aesthetic, minimize the schedule and maximize value. Adjacent functions include low, mid and high-rise residential, office, commercial and government buildings. The appearance was mandated to be civic in nature. Other goals were for functional anonymity while respecting the neighborhood. Performance was to be silent, non-obtrusive and the TES tank was to be screened.

Why Masonry? A monolithic block was chosen as the cladding material as it effectively met all the above requirements. At 16″x24″ it gives the plant an appearance that is civic in stature and highly textured, which relates to adjacent residential. At 4″ thick it contributed significantly to the required STC56 rating. The block was produced 20 miles away and finished in the shop of the masonry contractor 25 miles away. The client is pleased with the low maintenance-high durability of the product.

The new facility is built on the existing site. The existing plant was not to be interrupted. The strategy was to build all the new facilities and then switch over the operation, demolish the existing plant, and finally construct the four million gallon Thermal Energy Storage (TES) tank.

An operational initiative taken by the team was to provide an array of smaller chillers with variable frequency drives (VFD's) and sophisticated controls to bring each small chiller on-line as the load demanded for maximizing efficiency. Producing .45kW per ton of chilling, this plant is one of the most efficient in the country. The TES gives the flexibility to chill water at night and to store the chilled water for use during the day.

An occupancy and demand ventilation control HVAC system was installed, which uses 70 percent less energy than the current ASHRAE standard. External shading avoids overheating in summer and high performance low-E glazing helps to insulate the buildings. The use of natural day lighting reduces the need for artificial lighting. When needed, efficient lighting with occupancy sensors are used. Reduced energy consumption of the plant annually saves over 4,300 tons of CO_2.

The plant uses 90 percent less water than the old plant, which makes daily savings of over 14,000 m^3. Water from the cooling tower is reclaimed for toilet flushing and landscape irrigation. No potable water is used for site landscape irrigation. The facility is equipped with solar water heaters providing 90 percent of the domestic hot water for the office. The plant is also equipped with an 11 kW photovoltaic array that generates power for the facility's office and support areas.

The project has been certified LEED Platinum.

1st Marine Logistics Group Operations Center

Camp Pendleton, California

Architect:
Joseph Wong Design Associates, Inc. (JWDA)
2359 Fourth Avenue, Suite 300
San Diego, CA 92101

Joseph O. Wong, FAIA
Paul Chelminiak
Project Team

Structural Engineer:
Flores Lund Consultants
General Contractor:
Soltek Pacific
Masonry Contractor:
Frazier Masonry Corporation
Block Producer:
ORCO Block Co., Inc.
Owner:
NAVFAC Southwest

Architect's Commentary: Concrete masonry was selected as the material for load-bearing walls at the new 1st Marine Logistics Group Operations Center at Camp Pendleton, California for a variety of reasons.

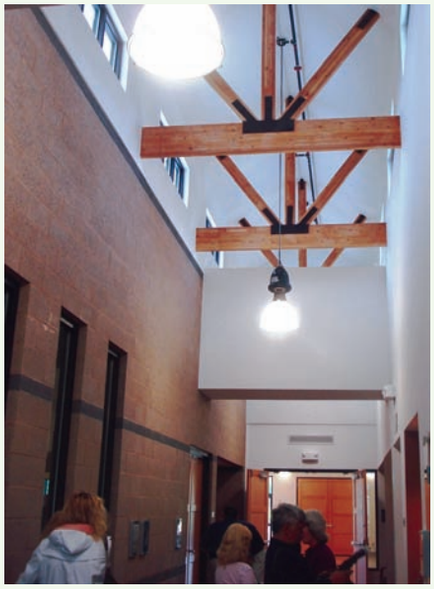
Why Masonry? After considerable research and study, the Marine facilities development team defined detailed materials standards for the base. These standards are identified in the Base Exterior Appearance Plan (BEAP). Concrete masonry units (CMUs) are included as a unifying exterior element throughout the base because of their durability and the low level of maintenance required. They provide sound attenuation, thermal mass, and meet the security requirements of Anti-Terrorism Force Protection (ATFP) guidelines that apply to construction on the base. The flexibility and variety of the modular units allow for inventive architectural expression and provide a sense of solidity and timelessness that is appropriate to the command function of the Operations Center.

In total, 63,365 gray, tan and wheat concrete masonry units were installed, along with 7,411 square feet of concrete pavers. Architectural design coined the windows making them look offset for a more pleasing appearance. The use of 10″x8″x16″ offset CMU helped differentiate the building by separating split face units from precision units on the top section of the building.

The 1st MLG Operations Center is one of only a few buildings in Camp Pendleton that incorporates pavers at all entrances to buildings, helping to contribute to LEED® efficiency and savings.

From a sustainability standpoint, the concrete masonry units were manufactured nearby in plants located in Riverside and Romoland/Perris, California, resulting in greatly reduced shipping distances, costs and use of natural resources. The designers were able to negotiate a single production run at the plant to guarantee color match throughout the project. A combination of precision cut and split-face units are utilized to craft a horizontal layering on the building exterior, anchoring the building to its site.

The 1st Marine Logistics Group Operations Center has achieved LEED® Silver status.



©Photography: Ben Kawachi, Kishimoto Architects, Inc.

University Community Park Center

Irvine, California

Architect:
Kishimoto Architects, Inc.
3002 Dow Avenue, Suite 106
Tustin, CA 92780

Kaz Kishimoto, AIA, LEED® AP, NCARB
Principal-in-Charge

Joe Arias, LEED® AP
Project Architect, Project Manager

Ben Kawachi, LEED® AP
Manager, LEED® Specialist

Structural Engineer:
Integrated Design Services
General Contractor:
RC Construction Services, Inc.
Masonry Contractor:
The Masonry Group (Ginger Masonry)
Block Producer:
RCP Block & Brick, Inc.
Owners:
City of Irvine

Architect's Commentary: University Community Park Center (UCP), which opened on July 31, 2010, is the City of Irvine's first LEED® project. The new 10,000 square foot complex was awarded LEED® Gold Certification from the U.S. Green Building Council.

The Community Center consists of a new 6,062 square foot building featuring a multi-purpose room, commercial kitchen, exercise room and restrooms. The project also includes modernization of the original 3,823 square foot community center to match the materials and features of the new building.

Why Masonry? The team of designers created a project fulfilling the City's requirements of a high performing, energy efficient facility that is aesthetically warm and inviting. The Community Center was built primarily with burnished concrete masonry units (CMUs) and a galvalum standing seam roof, which adds to the natural appearance of the facility. By using the CMUs, the exterior will not require refinishing for more than 50 years; a significant savings to the City.

The project team selected the building materials for their environmental attributes, such as being manufactured/harvested within 500 miles, leading to significant fuel, time, and cost savings. Virtually all of the materials used in the buildings have recycled content, including the CMUs. These healthier construction materials equate to better indoor air quality for all who use the UCP facilities.

As utility costs rise, UCP facilities are able to reduce energy needs by up to 50% for the entire life of the buildings through the use of large windows and skylights, which allow daylight harvesting; and solar panels, which are used to generate renewable energy. Additionally, the CMU exterior walls and furred insulation absorb heat during the day and allow the absorbed daytime heat to be released in the evening.

Additional sustainable features:

- Reuse of existing materials (concrete block walls, planter walls, playground rubber mat surface)–95% of waste was diverted
- 20% recycled content for new materials and 30% regional materials like CMU
- Energy efficient restrooms with automatic flushing and high efficiency plumbing fixtures – 52% water reduction, kitchen with energy efficient appliances
- Rapidly renewable bamboo wood flooring
- Photovoltaic panels & monitoring system for public viewing
- Energy efficient HVAC equipment & lighting with natural lighting – 38% energy reduction
- Rainwater catchment with dry well system for rain water infiltration from rain garden

Concrete Masonry Association of California and Nevada

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Mark your calendar for the 2013 CMACN/AIACC Concrete Masonry Design Awards competition "Call for Entries."

The 2011 award winning projects can be viewed at www.cmacn.org.

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Concrete Masonry Association of California and Nevada (CMACN) *a nonprofit professional trade association established in 1977, is committed to strengthening the masonry industry in California and Nevada by providing:*

- Technical information on concrete masonry for design professionals.
- Protect and advance the interests of the concrete masonry industry.
- Develop new and existing markets for concrete masonry products.
- Coordinate members' efforts in solving common challenges within the masonry industry.

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