California is in the midst of a historic, severe drought fueled in part by unbalanced development. In California, the supply of and demand for water are geographically separated; 75% of the state's water comes from rainfall in the north while 75% of water consumption occurs in urban centers of the south, including this project's site (Santa Barbara)[1]. In response, the Governor of California proposed $2.2 billion for water conservation related activities in his 2015-2016 Drought Package[2] and his 2015 Executive Order requires communities to cut potable urban water use by 25%.[3] To meet this requirement, city officials in Santa Barbara have prioritized the reduction of residential swimming pools. The city only permits thirteen new pools annually and in 2015 considered a moratorium on new pools.[4] These restrictive policies are effective at reducing potable water use but can have the unintended consequence of alienating residents from the wonder, fun, and ecological role of water. The relationship between water and the residents of Southern California must be reinvented to foster a healthy respect for the role of water in nature while educating people about its true costs and appropriate uses.

*Water Revival*, a family-friendly, mixed-income community in the heart of Santa Barbara's Lower Westside, creates the opportunity to demonstrate the responsible use of water for recreation, landscaping, gardening and relaxation. The site is developed around a reinvention of the residential swimming pool, offering a place for recreation that uses 70% less water, is safer for children, and is a symbol for water conservation. We developed an active-play space that takes the form of a shallow, weaving ribbon of water, dotted with low bubbling fountains, that cools the courtyard. Using evaporation modeling software, we carefully situated the water ribbon for minimal water loss. The water ribbon connects across the site through vegetated swales that reduce the heat island effect of the hard-surface environment. The courtyard is alive with native plants while the tidal cells, anaerobic tanks, and ultraviolet filters are hard at work sanitizing rainwater and greywater from the site. This water will then be reused for subterranean irrigation and flushing toilets. Although water is treated to meet local water quality standards, the system is designed to avoid direct contact with people.

The apartment complex we propose to replace Monteria Village is a postmodern interpretation of the surrounding historic architecture. Choosing new construction over a gut rehab will allow the most innovative environmental and social strategies to be integrated in a cost-effective manner. *Water Revival* provides high-quality, affordable housing to residents, positively engages the neighborhood, and advocates respect for the environment. *Water Revival* serves both families working in the area and those attending the nearby Santa Barbara City College (SBCC). Thirty-four of the units are reserved for families making 60% of area median income (AMI) while eight two-bedroom units will be leased through a long-term agreement to SBCC at a discounted rate of $1,725 PUPM to provide housing for families of students.

Broad stucco walls, recessed windows, heavy timber structural members, arcades, and balconies reflect the historic Spanish Colonial and Mission Revival architectural styles. These historic elements were selected because they serve a functional role in responding to the climate and are cost effective. We avoided other historic architectural features, like arches, which are expensive to construct and lack authenticity due to modern construction methods. We introduced new elements to the vernacular: exposed iron cisterns, natural wood siding, and articulated facades reinvent the aesthetic character. The unit plans

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[1] http://www.lao.ca.gov/reports/2013/calfacts/calfacts_010213.aspx#Californias_Economy

[2] http://www.lao.ca.gov/handouts/resources/2015/drought-package-051715.pdf

[3] https://www.gov.ca.gov/docs/4.1.15_Executive_Order.pdf

[4] http://www.latimes.com/local/california/la-me-pool-drought-20150602-story.html

and arrangement are modeled on a successful typology for multifamily housing.[5] Inside, open floor plans allow for flexible uses of space; they support a diverse arrangement of furniture to accommodate a wide variety of family cultures and compositions. Rather than tempering the environment with central heat and air, the units are oriented and designed for passive, natural ventilation that captures ocean breezes. Capitalizing on the coastal climate will reduce the resident's utility costs and create a healthier indoor environment by diminishing indoor pollutants.

*Water Revival* is designed to achieve LEED Gold Certification. Key sustainable features are the 50% reduction in indoor water use, 100% reduction in potable water for landscaping, 100% on-site filtration of stormwater, 45% reduction in energy use, 100% renewably sourced on-site energy, and a 70% reduction in the heat island effect. In addition, we have mapped out priorities for environmentally responsible construction processes, materials selection, and waste management.

Located between the city center and the beach, the existing neighborhood's urban design lacks cohesive identity and has the potential to isolate current residents. Our proposed design builds upon the work of Kevin Lynch who identified five characteristics that are favorably associated with community: paths, nodes, edges, districts, and landmarks.[6] The multi-model east corner of the site provides connecting paths between residents' homes, schools, and places of work through access to five bus lines, a bike route, and sidewalks.

We activated the site at this node of transportation by establishing a public commons – Monteria Plaza. Complete with nearby secure bike parking, this plaza space provides a comfortable place to wait for transit because it accommodates eight food carts, has places of shade and rest, and accommodates all users through universal design principles. *Water Revival* clearly identifies boundaries to distinguish between residence (private), the courtyard and commons (semi-private), and the plaza and sidewalks (public). This distinction ensures that residents feel safe but not isolated from the neighborhood and that the public plaza is welcoming. We chose compatible functions for the plaza such as a study hall, classrooms, and a neighborhood-led co-op to sell produce from the community garden. These uses bring diversity to *Water Revival* without imposing on the residential nature of the neighborhood. Rising above Monteria Plaza, the cistern tower is a landmark anchoring the community. The tower orients and guides people to the public plaza while making a bold statement about water conservation.

The City of Santa Barbara offers a density bonus for providing a multifamily development that serves low-income families; 80% of the units are affordable to low-income households. This 35% density bonus allows the eight additional units, a mix of uses that strengthen the community's residential character, and setbacks of 10 feet rather than 15 feet. The smaller setback prioritizes courtyard space over expanded front yards. Minimizing this front yard space reduces lawn maintenance and contributes to community safety by keeping playing children away from the busy intersection and adding eyes on the street.[7] *Water Revival* also complies with the private exterior living space requirements per Santa Barbara's Title 28 through balconies and landscaped alcoves.

*Water Revival* contains 73 surface parking spaces (four accessible) and 18 tuck-under garage spaces. This parking provision meets the requirements for affordable properties while promoting multi-modal transportation. Each three- and four-bedroom affordable unit is allocated 2.25 spaces while each two-bedroom unit is allocated 1.75 spaces. The eight two-bedroom units leased by SBCC are allocated 1.75

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[5] Jones, Tom, William Watkins Pettus, and Michael Pyatok. *Good Neighbors: Affordable Family Housing*. Ed. Sally Byrne Woodbridge. Melbourne: Images Publishing Group, 1997.

[6] Lynch, Kevin. *The Image of the City*. Cambridge, MA: MIT, 1960.

[7] Jacobs, Allan B. *Great Streets*. Cambridge, MA: MIT, 1993.

spaces. Five spaces are allocated for the outreach service offices and flex-use. Our design follows Smartcode version 9.2 to incorporate best practices within a residential transect (drive width, lighting styles, etc.). Three units meet the 2010 International Building Code Standards for Accessibility and one unit is designed specifically for people with hearing or visual disabilities. All units meet the recommendations for multifamily design and materials as issued by the California Housing Finance Agency (CalHFA). To support the effective use of Monteria Plaza, we propose that HACSB develop a long-term lease with the City of Santa Barbara Parks and Recreation, a partnership similar to that seen recently in Seattle.[8] This will allow the center to accommodate diverse types of programming and will eliminate staffing and maintenance costs for HACSB.

*Water Revival* is financially structured through a 74% equity stake from HASBC and 26% through a construction loan for a total project valued at $13.5M. The diversity of financial sources leverages the development to provide a strong return while maintaining a low degree of risk. The equity components are primarily the 9% LIHTC ($9.5M over 10 yrs.), the Business Energy ITC ($15,000 over 1 yr.) and the New Market Tax Credit ($400,000 over 7 yrs.). Our community meets the top five scoring criteria for the 9% LIHTC and we assume 130% of basis because the project is located in a Difficult to Develop Area.[9] We estimate that the tax credits will sell at a conservative 95 cents on the dollar and that the total capital generated from tax credits will be $9.4M. HASBC will invest $250,000 in equity yielding an 8.3% return (an estimated total equity of $9.6M). Long-term leases mitigate financial risk by guaranteeing cash flow. The long-term lease with SBCC will generate $14,000 each year and the lease for Monteria Plaza is set at a fixed rate of $80,000/10 yrs. Covenants allow for the inclusion of compatible uses, like leasing space to food trucks, that may generate income to offset the city's risk of agreeing to a long-term lease. Savings achieved through electricity efficiency measures are passed onto the residents in a 30% discounted utility allowance.

The debt structure will consist of an initial construction loan of $3.4M. This loan will have several draws throughout the construction period. For capital budgeting, we assume one draw at a rate of 7% ($238,000 payment following a one-year build). This loan and payment will be refinanced with a traditional 20-year FHA mortgage (5.04%). The project will make yearly payments of $293,000.

HACSB can ensure the long-term affordability of *Water Revival* through durable materials and low maintenance costs. Although our site does not have elevators or central air in the units, we conservatively accounted for $75,000 in O&M contingency in years 7-20. A third-party enhanced commissioning review will ensure systems are calibrated to function properly, increasing the lifespan of the building and keeping residents comfortable. We recommend early contractor involvement (ECI) as consulting with a local contractor early in the building delivery process significantly lowers the cost of design changes.[10]

Designed to be a long-term community asset, *Water Revival* is a replicable model for safe, sustainable, and integrated communities. Using water conservation as our inspiration, we designed spaces that foster family cohesion through active play; just add water!

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[8] http://seattlehousing.net/redevelopment/yesler-terrace/people/neighborhood-park/

[9] http://www.treasurer.ca.gov/ctcac/programreg/2015/20151021/regulations.pdf

[10] Lu, W., Fung, A., Peng, Y., Liang, C., and Rowlinson, S. (2015). "Demystifying Construction Project Time–Effort Distribution Curves: BIM and Non-BIM Comparison." *J. Manage. Eng.*, 10.1061/(ASCE)ME.