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SEPTEMBER 17, 2018 ■ enr.com

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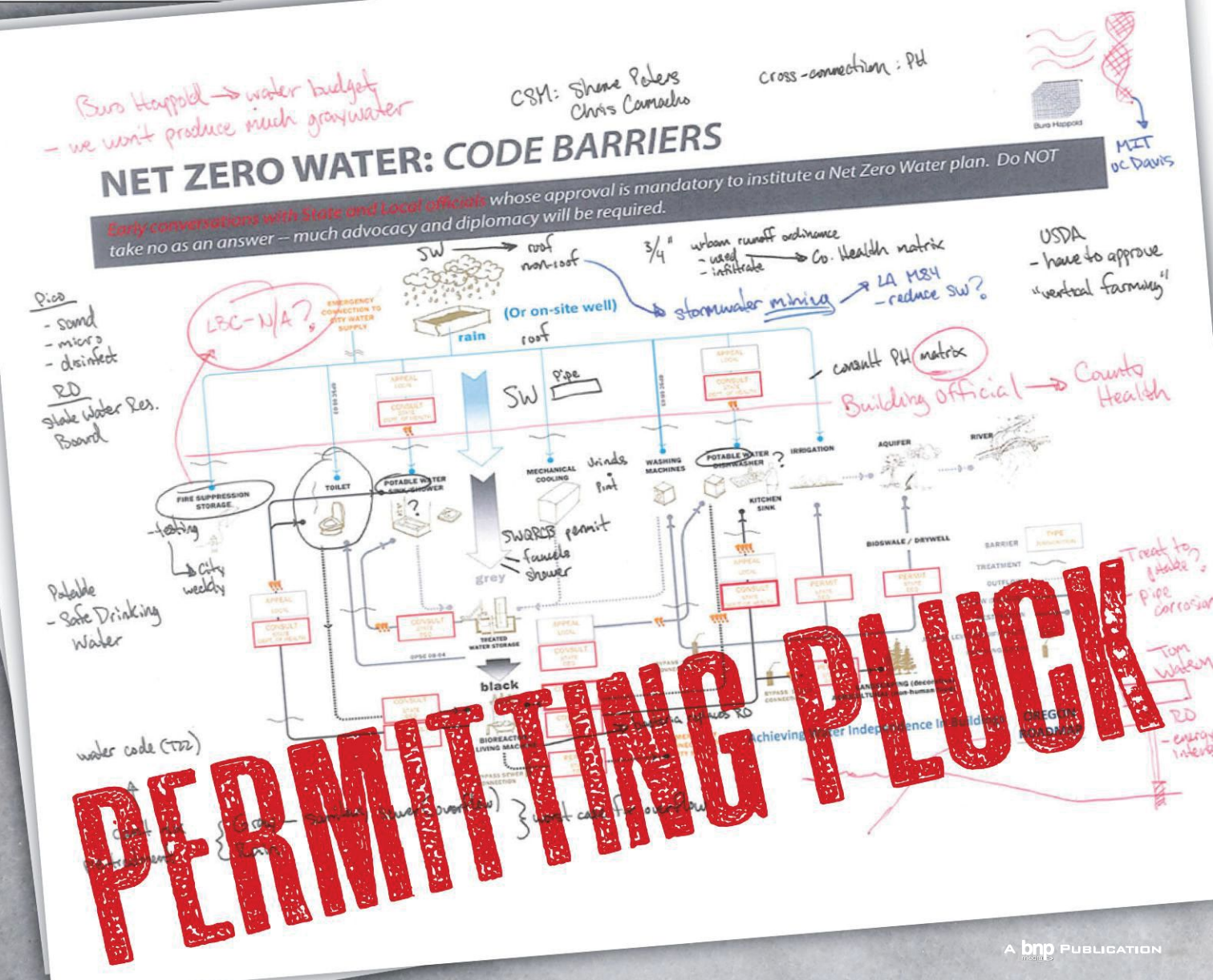


PERMITTING PLUCK

A bnp PUBLICATION

NO EASY TASK TO GET APPROVALS FOR SUSTAINABLE CITY BUILDING IN SANTA MONICA (P.16)

DARING TO JUMP

Santa Monica takes a high dive into deep sustainability waters in thirsty

BEHIND HISTORIC CITY HALL
Glass-clad City Services Building, scheduled to open in April 2020, is on course to be the first building in Southern California to have a composting toilet system and to make drinking water from rainwater. It is also the first municipal building project in the nation to tackle certification under the rigorous Living Building Challenge sustainability program.

IN FIRST

Southern California By Nadine M. Post

IMAGES: COURTESY OF CITY OF SANTA MONICA

Last fall, after Chris Lee took over as Santa Monica's building official, he couldn't resist making a day trip to Seattle. It wasn't for the views of Mount Rainier, the Olympics or the Cascades. Lee wanted to see the composting toilets at Seattle's super-sustainable Bullitt Center.

"We left for the airport at 4 a.m., flew to Seattle, spent three hours at Bullitt Center and returned that night," says Lee, who traveled with his predecessor, Jack Leonard.

It was Leonard's second trip to the 52,000-sq-ft office building. The Leonard-Lee interest in the exotic sanitary waste disposal system, which uses very little water, was not academic.

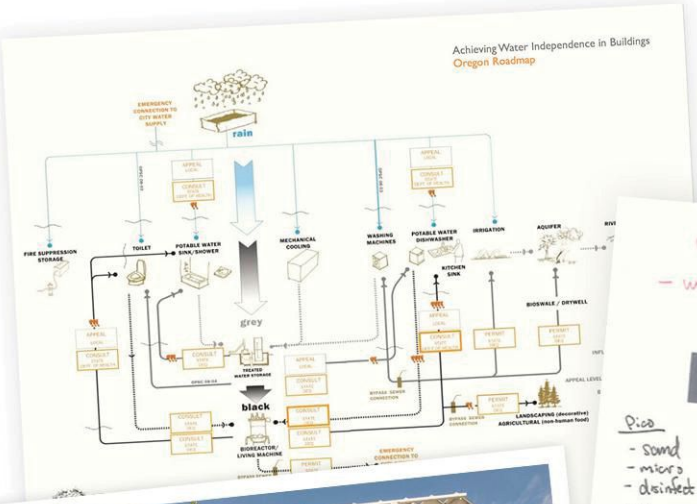
At the time, Santa Monica was seeking approval from its Building and Safety Division and county and state regulators for a composting toilet system and a rainwater-to-potable-water treatment system for its 50,200-sq-ft City Services Building (CSB), under construction since spring.

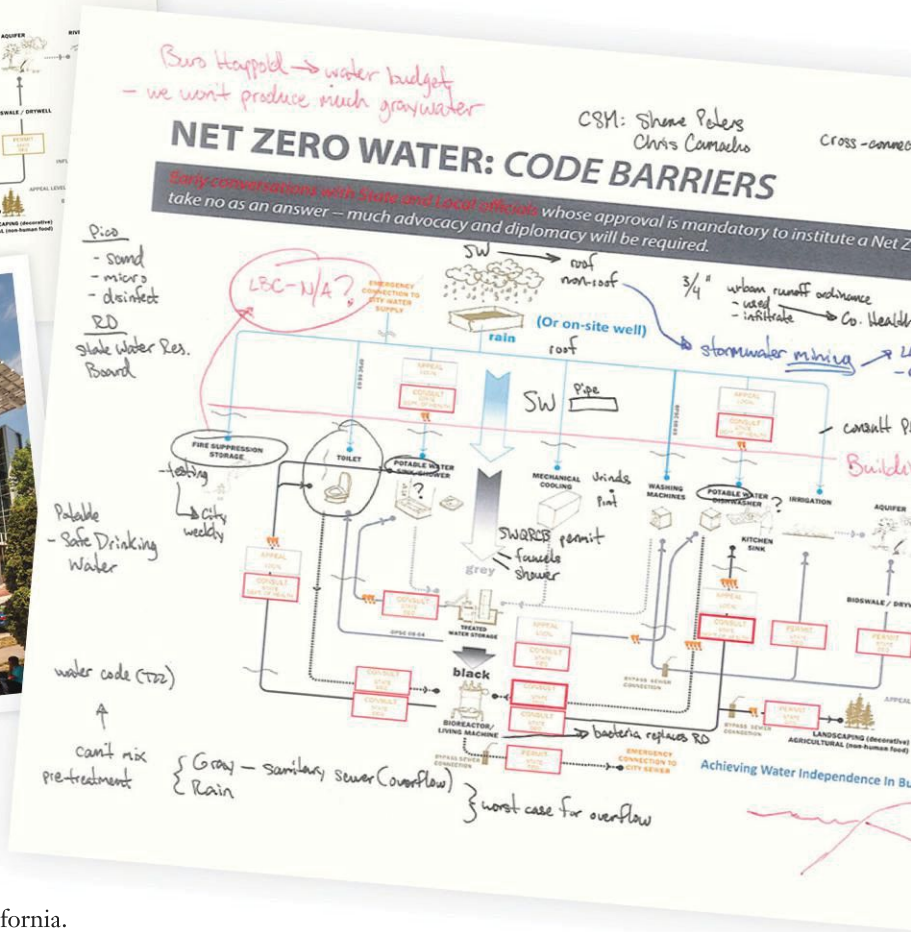
Lee was impressed with Bullitt Center and its composting toilets. "There's negative pressure on the toilet system," says Lee. "You don't smell anything."

Wary building regulators in California, charged with guarding public health and safety, had never approved either the rainwater or the composting system before.

"One of the biggest challenges was that code officials were not familiar with the systems," because they are not specified in the California plumbing code, says Lee.

After it opens in April 2020, the $76.8-million CSB, sited behind and linked to historic City Hall, will be the place for plan review, approval and permitting of all building projects in Santa Monica by





PATHWAYS To track and to understand the regulatory maze for the Santa Monica building, Joel Cesare marked up a road map to net-zero water, created by the International Living Future Institute for an Oregon project.

SEATTLE INSPIRATION The Santa Monica City Services Building is cut from the cloth of Bullitt Center, a five-year-old Living Building that is considered the greenest office building in the world.

Lee's Building and Safety Division. It will also be a showcase for sustainability in water-thirsty Southern California.

"To achieve our goals for the CSB, we've had to break down regulatory barriers to support" the latest water-conservation technologies, says Susan Kline, director of public works for the 8.4-sq-mile Pacific Coast city, which has a population of more than 92,000.

The CSB is cut from the cloth of Bullitt Center, which is considered the world's greenest commercial building. In 2015, the now five-year-old speculative office building achieved Living Building status under the rigorous Living Building Challenge (LBC) green-building certification program of the International Living Future Institute. ILFI is headquartered in Bullitt Center, which the environment-focused Bullitt Foundation developed as a model for sustainability.

Among other criteria, Living Buildings must demonstrate performance, during a year after occupancy, of net-zero annual water and energy use. Contractors must meet standards for waste control during construction. And building teams must specify materials, components and systems that are not harmful to people and the environment.

Bullitt Center is an inspiration and model for the CSB, which is seeking Living Building certification. Bullitt Foundation President Denis Hayes, Bullitt Center's mastermind, even became an advocate for the CSB. He presented Bullitt Center, by video, to Santa Monica's city council in early 2015.

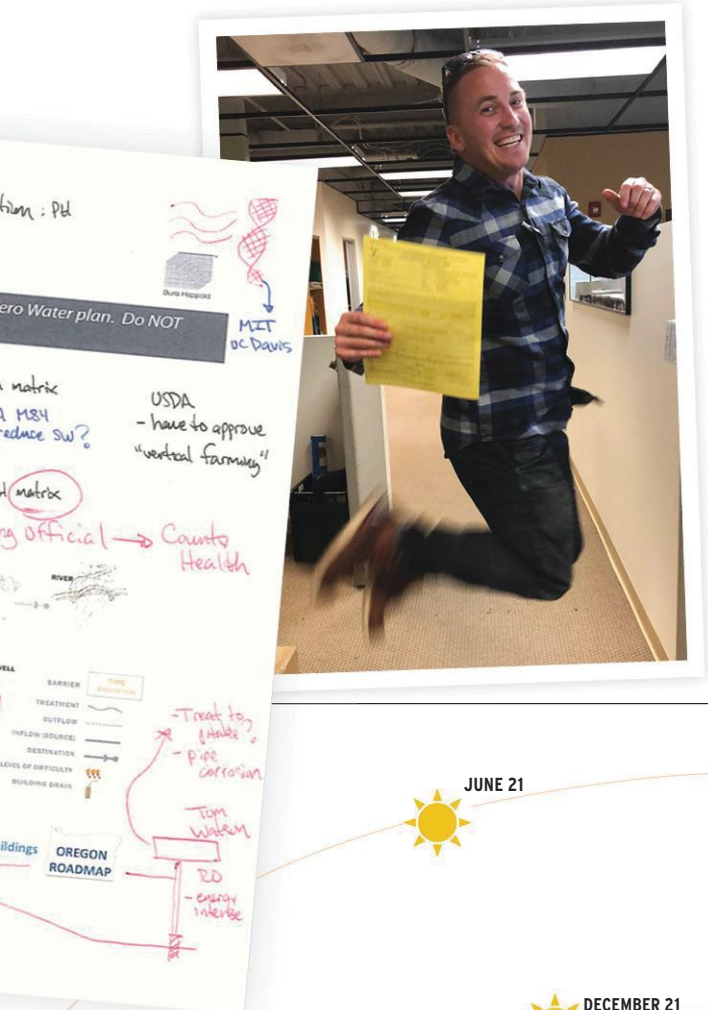
"We're leveraging the investment of the Bullitt Foundation," says Kline.

Beyond pioneering composting toilets and a rainwater-to-potable water treatment system in Southern California, the CSB is on course to be the first municipal Living Building. The building's green systems also include a 240-kv solar energy system, designed to produce enough power to eliminate electricity bills.

The project is a way for the city to demonstrate that "third-party-verified standards in sustainability can be achieved in Southern California," says Shannon Parry, the city's deputy sustainability officer. It also is "an opportunity to develop policy and pilot tools and technology [for private-sector projects] to help achieve the city's sustainability goals."

Those goals are ambitious. The city is pursuing water self-sufficiency by 2020, zero waste production by 2030 and carbon neutrality by 2050. Ordinances for new buildings restrict water use and require rooftop

PHOTO LEFT BY NIC LEHOUX; OREGON ROAD MAP COURTESY ILFI; CSB ROAD MAP COURTESY JOEL CESARE; PHOTO TOP RIGHT BY ERIN HAMANT



solar systems. And the city has several sustainable infrastructure initiatives (see p. 21).

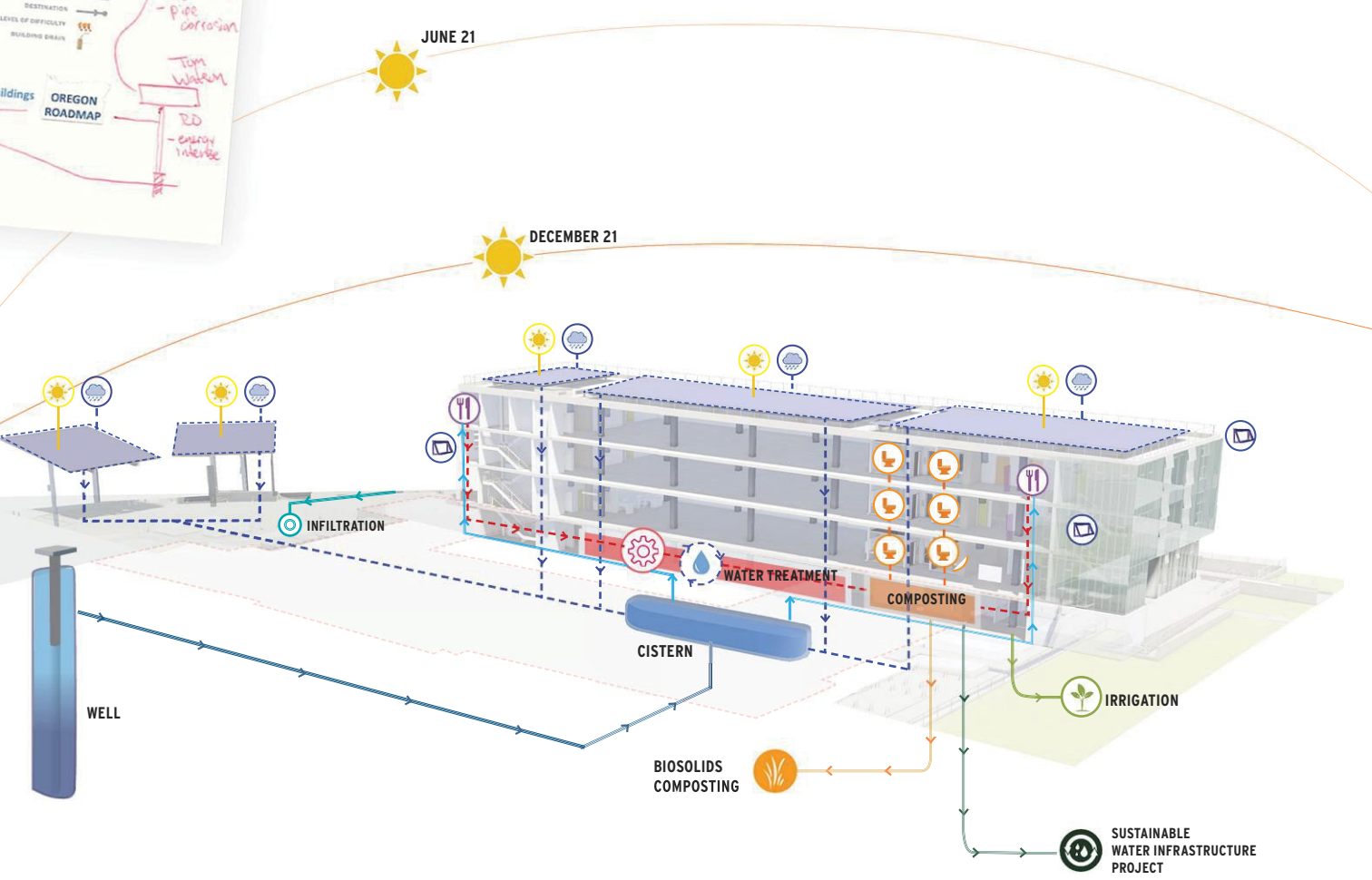
The CSB is considered a piece of the city's sustainable infrastructure, with its own ecosystem, of sorts. The roof is the equivalent of a watershed. The cistern is a reservoir. The water treatment skid is a scaled-down treatment plant.

"It's really a cool building," says Tim Purcell, the city's staff construction manager for the CSB. "I love it and want to be part of making history."

City Bonds

The city council approved the CSB project on Aug. 8, 2017. The development is financed from $76,760,000 of city-issued bonds. The city expects the savings on annual leases for rented office space will exceed the annual cost of construction financing after 16 years, and that the building will pay for itself well within its useful life.

JUMPING FOR JOY Cesare leapt with excitement last year when the CSB team received its final permit from the city's buildings department. Approvals for the exotic building systems (below) took two to three times longer than they would for a conventional building.



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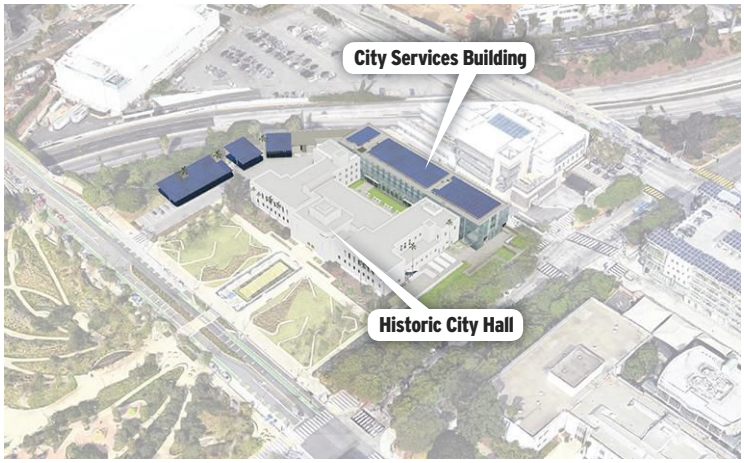

FITTING IN
Santa Monica's City Services Building (rendering, top, and site plan, right) is sited directly behind the landmark City Hall (photo, above, and site plan, right). The $76.8-million CSB is designed to be energy and water self-sufficient.

The city opted to minimize its cost risk through a "progressive" design-build construction contract, with a guaranteed maximum price of nearly $60.8 million. Progressive design-build has three phases: design-bid-build, design-build and a GMP phase.

The delivery method is a plus for the CSB, for it "brings in design and construction expertise from the beginning," says Rebecca M. Abano, the city architect.

In 2014, the city received proposals from seven design-build teams. Hathaway Dinwiddie Construction Co. won the job in January 2015, with a team that includes architect Frederick Fisher and Partners and consulting engineer Buro Happold (BH). HD's first association with the job, however, was in 2014, when it was contracted to do a feasibility study.

For Joel Cesare, the city's project manager for the CSB, the project is the opportunity of a lifetime. In 2014, during his interview to work in the city's sustainability office, Cesare was told he might work on a Living Building. "That had been my primary goal," he says.

Getting initial approvals for the CSB took one year, which is two to three times longer than is typical. "Permitting fatigue set in for us and the agencies," says Cesare, who literally jumped for joy when the final building permit came through.

Approvals were much "harder than they should have been because we were on the bleeding edge," says Julian Parsley, a BH principal. "It was a rigorous review to make sure we thought through all eventualities."

Cesare is credited with steering the team through the approvals maze. He hung in by using diplomacy but he never took "no" for an answer from regulators.

The nail-biting is not over. The permits, granted between August 2017 and May, are conditional upon final inspection after the CSB is occupied. "If something doesn't work, [regulators] could say, 'take it out,'" says Parsley.

In Cesare's view, composting was the most difficult feature to get approved. Rainwater was next. But even the graywater system was a challenge: There were fears of system cross-contamination.

To help track the path to net-zero annual water use, Cesare marked up ILFI's Oregon net-zero water-permitting road map, developed for a Portland project. His copious scribbles almost resemble graffiti.

The CSB team filed for approval with the city's buildings department under the alternate means and methods section of the code, which allows innovation.

IMAGES: COURTESY OF CITY OF SANTA MONICA

Approvals were also needed from the State Water Resources Control Board (SWRCB), the California Coastal Commission and Los Angeles County's departments of public works and health.

To woo support, the CSB team approached regulators early in design, beginning in 2014, and created a dialogue to answer questions, address issues and remove barriers.

"We first met starting about two years ago and had four more meetings," says Jeff O'Keefe, chief of the Southern California section of SWRCB's drinking water division. "Our concerns were clear from the beginning."

Some LBC project teams go into permitting with an "us-versus-them" attitude, says Kathleen Smith, ILFI's LBC vice president. "The Santa Monica team was thoughtful, smart and strategic from the get-go."

Because some systems required several agencies' approval, regulators also were in touch with each other. And in Seattle, they met with local, county and state counterparts to hear about lessons learned from Bullitt Center.

"The reality is that a lot of the rules are open to interpretation and it's up to individuals in the agencies to interpret them," says Smith.

For the rainwater system, for example, California regulations don't clearly identify rainwater as a source of drinking water.

For conditional approval, Santa Monica "was in a unique position" because it has its own public water utility, with a permit and a track record. "This gave confidence they will succeed," says O'Keefe.

The CSB team did just about everything possible to get approvals. Due diligence included organizing regulators' trips to Seattle to tour Bullitt Center and meet with their regulatory counterparts and others associated with the building.

SANTA MONICA PUSHES AHEAD TO MEET AGGRESSIVE SUSTAINABILITY GOALS

Santa Monica currently requires all new residential and commercial construction to include rooftop solar systems. The Southern California coastal city of more than 92,000 people was the first city to require all new residential construction to be "zero-net" energy. Santa Monica has a water neutrality ordinance that caps water use for developments to the historical five-year average for the site. And the city is the first municipality to construct a super-sustainable Living Building.

The laws and programs, all since 2016, are part of the city's ambitious three-part goal to achieve water self-sufficiency by 2020, zero waste production by 2030 and carbon neutrality by 2050.

The goals are outlined in the most recent update of the Santa Monica Sustainable City Plan, first adopted in 1994. "Santa Monica is always at the forefront," says Rick Valte, the city engineer. "We hope what we do here is adopted by others."

There is more. The city just finished its $13.5-million Clean Beaches Initiative (CBI), designed to improve beach water quality and drought resiliency. The project included construction of a subgrade stormwater storage tank to harvest runoff from the Santa Monica pier's drainage basin, which covers 106 acres. The harvested runoff will then be diverted for treatment at the Santa Monica Urban Runoff Recycling Facility (SMURRF) and distributed for nonpotable uses. Overflows from the tank will be discharged into the sanitary sewer system.

The CBI system will treat 150 million gallons of water each year.

"We are looking at economic vitality, social equity and environmental protection."
—Shannon Parry, Deputy Sustainability Officer

Valte is even more excited about the city's Sustainable Water Infrastructure Project. SWIP consists of three elements. The first includes a modular reverse osmosis unit at SMURRF, a new shallow brackish and saline groundwater extraction well at the beach and new solar panels for energy offset. The second element includes a below-grade stormwater and sewer treatment facility at the civic center parking lot with a 1-million-gallon-per-day capacity. The third element consists of two new stormwater harvesting tanks at the city's Memorial Park and the civic center lot, with a 4.5-million-gallon capacity.

The design phase for the nearly $70-million project is just beginning. Construction is expected to start next June. Completion is set for the fall of 2020.

On the renewable power supply side, Santa Monica has joined Los Angeles Community Choice Energy. LACCE, which has more than 30 city and other members in Los Angeles County, is a way to achieve community-wide reductions in greenhouse gas emissions from electricity generation by providing competitively priced electricity from renewable sources to homes and businesses.

"This gives options to consumers to use 100% renewable energy," says Kevin McKeown, a member of the city council and former mayor who has been charged with coordinating the program, which he calls "a launch pad" for renewable energy production.

In February, service is scheduled to start for residential customers. Service for nonresidential customers is scheduled to start next summer. And to meet growing demand, LACCE has plans to build a solar power plant.

The city's sustainable plan is "not just a green city initiative," says Shannon Parry, the city's deputy sustainability officer. "We are looking at economic vitality, social equity and environmental protection." ■

UNDER WAY Construction, which started in the spring, is on schedule (left). Crews recently installed the 40,000-gallon underground cistern for potable water storage (above), when the adjacent City Hall was temporarily vacant.

Cesare briefed all stakeholders, including regulators, about composting by engaging a nutrient recovery specialist and a certified industrial hygienist.

He visited New York City's Bronx Zoo. He even raked compost at the Chesapeake Bay's Brock Environmental Center—a Living Building—and churned compost at Bullitt Center. "I had to become an expert on composting toilets," says Cesare.

County regulators were especially wary about the composting toilets. They had recently turned down a request for them for a campsite on nearby Catalina Island because of public health concerns, mostly related to proper operations and maintenance, says Scott Abbott, manager of the county health department's environmental protection branch.

For a green light for CSB, regulators have mandated several conditions. There must be public works staff operating the system. There must be ultraviolet radiation in the ventilation stack for disinfection. Composting room fans must have added capacity and backup power. There must be a vestibule room for cleaning staff and equipment outside the main composting room. The system must have a carbon dioxide sensor and alarm system. There must be an industrial water system with an air gap to mitigate any cross-connection to other water systems. And there must be a 4-in.-dia backup connection to the public sewer.

The permit also requires urine drainage to the public sewer at all times. That requirement prompted the team to get an exemption from the LBC, which usually doesn't allow wastewater to go into the sewer.

Prior to requesting a final building inspection, the team must get approvals from a third-party certified industrial hygienist, who will evaluate the city's employee training and maintenance manuals. BH and Clivus Multrum Inc., the maker of the composting

PHOTOS COURTESY OF THE CITY OF SANTA MONICA

toilets, must file inspection reports.

Quarterly inspection from an industrial hygienist is mandated for two years after the certificate of occupancy is issued. Inspections thereafter are required at the discretion of the hygienist.

For the rainwater-to-potable water system, designed by PACE and BH, the city must demonstrate the system will produce water that "meets federal and state drinking water standards prior to supplying water to the building consumers."

Drinking-water regulators are typically extremely cautious. For example, Bullitt Center still does not have a permit for its occupants to drink treated rainwater.

The state's O'Keefe isn't too concerned about the CSB: Santa Monica is a "water utility with a track record," he says.

Materials

Though the site is hemmed in, construction of the three-story building is straightforward. For the construction team, the job's big challenges involve meeting LBC requirements, especially for materials and components.

LBC teams are expected to avoid "worst in class" chemicals by following LBC bans on harmful ingredients in building materials and contents, listed in the LBC Red List. When that is impossible, for example due to the need to comply with official regulations, teams are given exemptions.

To collect rainwater for drinking, roofing material—and essentially any surface the rain touches—needs to be National Standards Foundation 151/61-certified, which verifies that materials won't leach toxins into potable water, says Jessie Buckmaster, HD's sustainability manager.

Early in design, there was no certified roofing material that was also toxin free and robust enough to last. Carlisle Construction Materials, an established roofing and waterproofing material maker, agreed to get its material NSF-certified. "It took time and a significant investment, but theirs is the first LBC-compliant roof membrane that is certified," says Buckmaster. "Other LBC projects [with rainwater collection systems] can use the material in the future."

Santa Monica gets, on average, 14 in. of rain each year, mostly from December through March. A 40,000-gallon cistern, installed when City Hall was vacant, will provide potable water during dry times. Accommodations were made to avoid stagnation, which was a concern of regulators.

LBC certification is based on a year of post-occupancy performance data. But to ensure public safety, regulatory agencies are requiring that operators test the rainwater system for a full year before occupants are allowed to drink the water, says Buckmaster.

The LBC allows the team to fill the cistern once, at the opening of the project, which is scheduled for after the rainy season. "We are planning to have the collection area and treatment system ready prior to or during the 2019-20 rainy season so we can begin the testing period," says Cesare.

The construction schedule enables this. But if the schedule changes or if the rainy season doesn't cooperate, occupants may be drinking city water for a year or more and treated rainwater will be used for nonpotable purposes. A well provides backup potable water.

There are other Red List headaches. Authorities are requiring the use of chlorine for disinfection of the water in the conveyances to the spouts. The team is pursuing a waiver with the LBC, which considers chlorine a Red List toxin.

The LBC program requires high levels of construction waste diversion. "We must meet 95% diversion for metals and paper/cardboard, 100% for soils, 90% for rigid foam/carpet/insulation and 80% combined for everything else," says Buckmaster.

Subcontractors are briefed. "We don't want someone going to a truck and grabbing a roll of noncompliant tape or a tube of caulking," says the CSB's Purcell.

"We are trying to encourage sustainable behavioral change," adds Joshua Nelson, HD's project manager. This includes such tips as recommending crews bring in reusable food containers.

Work is progressing on schedule, says Nelson. System commissioning should start in January 2020, followed by substantial completion that March.

Regulators, having been through CSB approvals, are now able to offer advice to other developers: "Contact places that have done it and build on their lessons learned," Abbott says. But he cautions that the county health department would be reluctant to approve composting toilets for a developer that might sell the building. "That could create a discontinuity of knowledge" and possibly "a public health nightmare," he says.

Smith says ILFI is "very excited" about the CSB. "There aren't a lot of public agencies registered for the LBC," she says. "This project is at the leading edge and already a model for others." ■

"There aren't a lot of public agencies registered for the Living Building Challenge. This project is already a model for others."
—Kathleen Smith, Vice President, International Living Future Institute