

Los Angeles Section

Monthly: Est. 1913

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PRESIDENT'S MESSAGE

Michael Thornton, P.E.
Los Angeles Section President

VOL. XLXV NO. 5

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The Society Report Card, Part 1

On March 19, 2013, ASCE released its updated Report Card regarding infrastructure grades. Every four years, ASCE issues the Report Card which evaluates conditions and investment needs for major sectors of infrastructure. ASCE continues these efforts to increase awareness of the need for investment. The latest assault on investment came by way of the "Sequester." We must continue our efforts to get elected officials to understand the importance of this investment and continued delays in investment that will eventually cost much more. The Report Card is a terrific tool. The grades continue to show that the lack of investment will ultimately lead to much greater costs and a much greater burden for children.

This year's Report Card covers 16 infrastructure categories. I will cover a few this month and a few more next month as follows, in alphabetical order:

1. Aviation (D)-air travel is a major transportation component. During this economic downturn, air travel at my local airport, Ontario International Airport, seems to have seen the effects of it; many fewer flights are coming and going. I am planning to attend ASCE's legislative day in Sacramento May 14, 2013 and began planning my trip in early April only to learn that the 6 a.m. flight is already full. How could this be? I began planning almost 2 months before and look, no availability. Clearly, the challenges at my local airport are temporary.

Our society report card says "The Federal Aviation Administration estimates that the national cost of airport congestion and delays was almost \$22 billion in 2012. If current federal funding levels are maintained, ... it will rise to \$34 billion by 2020 and to \$63 billion by 2040." We can all attest to frustrations due to airport delays. ASCE is predicting they will get much worse. In Regions 9's 2012 update, the aviation Grade was a "B" but ASCE warned us that without an annual investment of \$300 million over the next 10 years, the grade will move toward the national grade.

2. Bridges (C+)-during your next trip to work, count how many bridges you use. I take my kids to school in the mornings prior to work and I either cross over/under 8 bridges. They are either freeway or rail bridges and many are currently being improved; long overdue. ASCE indicates that 1 in 9 bridges are structurally deficient and that the average age of our 607,380 bridges is 42 years. Our state report indicates that some 4,178 of the 24,812 bridges in California are functionally obsolete and that 2,978 are structurally deficient. Doesn't sound good does it? Caltrans indicates that 40% of our bridges are in need of some level of maintenance. California's grade is a C-. To improve our grade, greater investment is needed.

continued on page 3



A Century of Water Resources Development within the Los Angeles Section

By John T. Morris, P.E., BCEE, Hon. D.WRE, WEF Fellow, F.ASCE, F.IAE

More effort and more ingenuity have gone into developing water resources to serve the people that live within the Los Angeles Section of ASCE than anywhere else in the country. It has taken some of the greatest ASCE landmarks to achieve a reliable water supply including the Owens Valley Aqueduct (which is also celebrating its centennial in 2013), Hoover Dam and the Colorado River Aqueduct among others.

The Birth of Los Angeles Water

The initial water system development was for Pueblo of Los Angeles and consisted of diversion from the Los Angeles River near today's Griffith Park which brought water into the pueblo near today's Olvera Street using the Zanja Madre or mother ditch. The Los Angeles City Water Company (LAWCC) was formed in 1854 to develop and operate a water system



for the growing city. William Mulholland arrived in Los Angeles in 1877 at the age of 22. Shortly thereafter, he obtained a job from Frederick Eaton as Deputy Zanjero with the LAWCC. The Los Angeles Water Department was formed in 1902 with Mulholland, a self-taught engineer, as its first superintendent.

The Dawn of Importation

With the population of Los Angeles growing rapidly following the real estate boom of the 1880s which resulted from the railroad's arrival in Los Angeles, William Mulholland recognized that the local ground and surface waters would soon be insufficient to meet the needs of the burgeoning population. In 1906 the citizens of Los Angeles approved a bond issue in 1906 by a ten to one margin to finance the aqueduct. Construction of the all gravity aqueduct commenced in 1908 and was completed in 1913. The first deliveries were in November, 1913. The City of Los Angeles adopted a new City Charter which forbade surplus water to be used outside of the City limits which resulted in a number of formerly independent cities to annex to Los Angeles.

Regionalization

With water came the rapid growth of the City of Los Angeles and Mulholland quickly realized that new supplies would be needed. He visualized a Los Angeles that would encompass the entire coastal plain of southern California so much water would be needed. In 1923, he sent surveyors out to the desert to identify potential routes for an aqueduct to bring Colorado River water to Los Angeles. The City of Los Angeles filed an application with the Department of Water Resources for 1500 cfs of water from the Colorado River.

The City of Pasadena, along with other cities that fiercely defended

their independence from Los Angeles, realized that Los Angeles could not afford to build such an aqueduct from the Colorado River by themselves, called the cities together as the Colorado River Aqueduct Association which included Los Angeles. After passage of the Metropolitan Water District Act in 1928, the eleven founding cities voted to create and join the Metropolitan Water District of Southern California (MWDSC) and the first Board meeting was held in Pasadena in December, 1928.

By 1931, two of the original eleven member cities chose to drop out of MWDSC and four others opted to join making the total membership thirteen cities. These cities voted to approve a \$220 million bond issue to construct the Colorado River Aqueduct by a four to one ratio. This represented about eight percent of the total assessed valuation of the District which is amazing given that the depression had already started.

The Colorado River Aqueduct carries water 242 miles, from Lake Havasu, on the Colorado River, to Lake Matthews in western Riverside County, at the edge of the Los Angeles basin. The system is composed of two reservoirs, five pumping stations, 63 mi of canals, 92 mi of tunnels, and 84 mi of buried conduit and siphons and conveys an annual average flow of a billion gallons per day. The first delivery of treated water from the Colorado River Aqueduct was made to the City of Pasadena in November, 1941. In 1955, the aqueduct was recognized by the ASCE as one of the "Seven Engineering Wonders of American Engineering"



Los Angeles Aqueduct Dedication, Owensmouth, November, 1913

The First State Water Project

While the Colorado River Aqueduct was under construction, the State of California was developing its own plans for a State Water Project to provide flood control and water supply for California's

Think back to the Minnesota bridge collapse; it was a national tragedy. We don't need any more of those kinds of events.

3. Dams (D)-I will always recall my first tour of the Hoover Dam fondly. It was one of the reasons I selected Civil Engineering as the profession for me. Dams are simply incredible engineering accomplishments; they provide public safety from flooding and drinking water not to mention energy. Without dams, what would California be? ASCE indicates that the average age of the Country's 84,000 dams is 52 years. There are more than 4,000 deficient dams nationwide and the Association of State Dam Safety Officials estimate that an investment of \$21 million is needed. The state report card indicates that we have 807 high hazard dams. California employs 60 to oversee these facilities.

4. Drinking Water (D)-water systems are the life blood of society. There is no life without water. Society continues to reclaim lands without water because engineers develop water solutions to these complex challenges. ASCE reports that 240,000 breaks occur annually. The cost to replace these systems is estimated in the trillions of dollars over the next decades. The state report card indicated a slightly higher grade of C+ and advised that an annual investment of \$4.6 billion is needed over the next 10 years. I, a person working every day in the water world, understand that the need for greater investment is needed to conserve our limited supplies. Read more about water in my December and January newsletter messages.

5. Energy (D+)-energy is yet another key component to economic recovery. I heard it said that California's use of energy to move water is the greatest energy user; and the water engineers in response say that energy is the greatest users of water. Clearly, they are interconnected and we need both. ASCE indicates that America relies on an aging electrical grid, some of which originated as long ago as the 1880's. Growing demands will continue to require additional investment in power and the capacity to move power to urban areas. California has been a leader in green energy technology; it is the second largest producer of green energy producing 59,000 gWH of power annually. I am working in a small community that, believe it or not, has residential development occurring in which the homes are being built with solar panels. Reports from the developer indicate that power costs for the models is essentially zero, budgeted over \$1,000. Apparently, it is giving them a market share advantage. California will continue to lead the way provided the necessary investment is dedicated to these projects.

6. Hazardous Waste (D)-protecting our environment has long been one of our nation's priorities. Cleanup of hazardous waste sites must continue to be a priority. Many have leaked to our groundwater supplies. US EPA has indicated that is costs between 1/10 and 1/100 the cost to prevent pollution rather than the cost to cleanup these sites. We must have a better effort to protect

natural resources. California has 98 hazardous waste sites on the National Priority List.

7. Inland Waterways (D)-ASCE indicates that inland waterways and rivers are the hidden backbone of our freight network. These systems have not been updated since the 1950's. Delays in goods movement are creating significant costs to economic efficiencies. In California, at least Southern California, we can agree they really aren't part of our transportation system. Rail through my community moves goods and it creates significant delays.

8. Levees (D)-boy do we know about levees! ASCE indicates that there are 100,000 miles of levees that were built to protect farmlands now protect urban areas. It is estimated that to rehabilitate these levees will require \$100 billion. The latest national disasters have shown that the cost to repair out distances the cost to prevent by considerable length. Let's make the investment. In California, we have 13,571 miles of levees. Strategic failure of these levees would result in complete economic disaster to California. Life without the delta is unimaginable! The state report card indicates that we need an annual investment of \$2.8 billion over the next 10 years.

Next month, I will discuss ports, public parks and recreation, rail, roads, schools, solid waste, transit, and wastewater. Furthermore, I will discuss how our membership should use the report card to increase awareness of the need for infrastructure investment.



Central Valley. The plan called for a number of dams, reservoirs, canals and pumping stations however, due to the deepening of the depression, the state was unable to issue the bonds so the Bureau of Reclamation stepped in and built the project which we know now as the Central Valley Project (CVP) which provides benefits to Central Valley agriculture including much of the northern reaches of the ASCE Los Angeles Section.

Rapid Population Growth

Following the end of World War II, an unexpected population boom was experienced in California. While the Colorado River Aqueduct had been anticipated to meet the needs within MWD until the 1980s, it needed to be expanded to its ultimate capacity of 1,280,000 AFY during the 1950s. With this rapid influx plus the burgeoning baby boom, it became quickly apparent to the water planners that more facilities would be needed.

The Second State Water Project

The fall of 1960 found the people of California approving the Burns Porter Act at the urging of Governor Pat Brown. This \$1.75 bond issue, the largest in the state to that time, authorized the construction of the first phases of the State Water Project (SWP) including Oroville Dam, the 444 mile state aqueduct and fourteen pumping stations. Additional facilities were planned to be developed as the growth in demand warranted. The initial deliveries to southern California were in 1972.

The population of California continued to grow and the state started planning for some of the next phases of the State Water Project. The diversion of water from north coast rivers had been considered during the initial planning however, Governor Jerry Brown signed the Wild and Scenic Rivers legislation which took these potential sources off the table. Planning was then done for the Peripheral Canal to help



Oroville Dam

improve water quality as well as separate the conflicts between water supply and threatened species in the Delta. Governor Brown decided to put this issue before the voters of California in 1982. The issue lost by a nine to one ratio in northern California and was supported by a six to four ratio in southern California. The defeat caused the term "Peripheral Canal" to be controversial for many years.

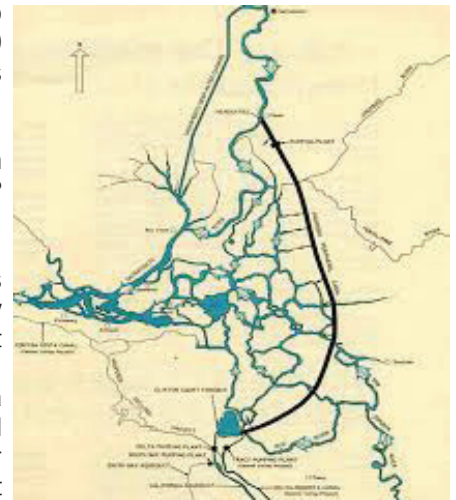
The Six Year Drought

One of the worst drought periods to hit California and the west in recorded history was from 1986 to 1992. The impacts were widespread as all of the watersheds were impacted; the northern Sierra, the southern Sierra, the Rockies, as well as local streams and groundwater basins. The MWDSC deliveries dropped from 2.6 MAF in 1990 to 1.8 MAF in 1991 not only causing hardship on the Districts'

customers but also resulting in a \$400 million draw on reserves over two years.

Santa Barbara and San Luis Obispo – SWP Coastal Branch

The impacts of this drought were not only felt by MWDSC but throughout the region. The City of Santa Barbara contracted for 8.9mgd seawater desalination facility that was built and started up but then, the "March



The Peripheral Canal

miracle" happened which provided ample water to Santa Barbara's normal sources. But, Santa Barbara had learned its lesson well. In the fall they opted to purchase the desalination facility from the supplier and keep it in reserve. In addition, the Counties of Santa Barbara and San Luis Obispo both voted to authorize the construction of the Coastal Branch of the SWP. Both counties had joined the SWP in the 1960s and had been paying for their share of capital facilities ever since but never authorized the Coastal Branch which was necessary for them to get deliveries within their counties.

New Ways of Looking at Water Resource Management

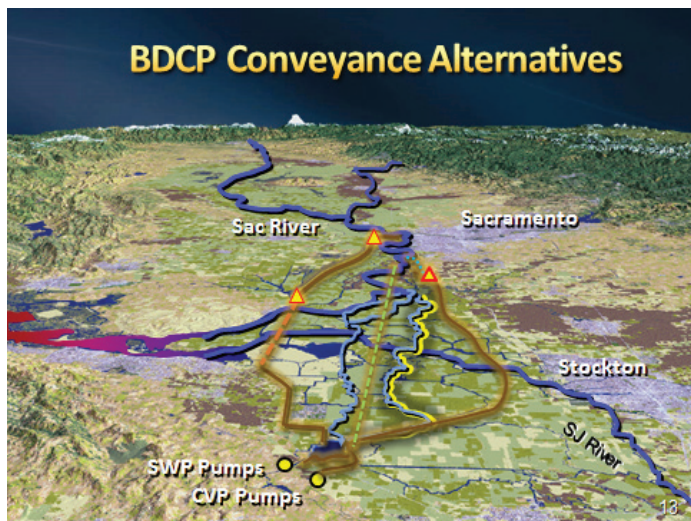
What may be a silver lining in this massive cloud that was the drought is that it motivated MWDSC to adopt a new Strategic Plan as well as its first Integrated Water Resources Plan (IRP). The MWDSC business model changed from total reliance on increasing imports to one that relies on increasing local sources, including conservation, water recycling, groundwater recovery and seawater desalination. Better water management was also a keystone of the IRP with many groundwater storage accounts being developed and the implementation of the 810,000 AF Diamond Valley Lake. These changes enabled MWDSC, under normal hydrologic cycles, to put water into storage seven out of ten years and to meet demands by withdrawals from storage three years out of ten. But then again, an unexpected occurrence; Judge Oliver Wanger, a Federal Court Judge in Fresno issued his first judgment on the threatened Delta Smelt which ordered reduced pumping from the Delta at many times of the year. Over the next several years, additional Endangered Species Act restrictions were caused by Long finned Smelt, Spring and Winter Run Salmon, Green Sturgeon and even Orca as the Central Coast pod fed off of the threatened salmon. These collective restrictions impacted both the SWP and the CVP pumping operations in the Delta impacting millions of people and millions of acres of Central Valley agriculture. For MWDSC, the result was that now they could only store water three years out of ten and had to withdraw water from storage the other seven years, an unsustainable circumstance.

The Grand Fix for the CVP/SWP – BDCP

November 2009 brought a number of bills out of the California

State Legislature which were aimed at dealing with California's worsening water crises. Notably, there was one to create the Delta Stewardship Council and a second one to place a Bond issue before the electorate for \$11.2 billion for water and environmental issues affecting the Delta. Both of these are complimentary to the Bay Delta Conservation Planning (BDCP) process which commenced earlier in 2009. This is a joint State and Federal effort to develop a plan for resolving the current conflicts in the delta which has a basic premise of environmental restoration and water supply reliability being co-equal goals. The last few years have seen hundreds of millions of dollars spent on this planning process with significant progress being made. In 2013 the BDCP Plan was released for review. The EIR/EIS is anticipated to come shortly thereafter.

The preferred project includes a new Delta conveyance system consisting of three new intakes in the Sacramento River near Courtland; a forebay to collect from the intakes; two forty feet in diameter tunnels, 150 below ground, 35 miles long; and an afterbay adjacent to the existing Clifton Court in the south Delta. The conveyance system and any related environmental impacts will be funded by SWP and CVP Contractors. Also included are habitat improvements on as much as 100,000 acres in and adjacent to the delta.



20 by 2020 – Water Conservation

In addition to these efforts, the State has adopted a goal for all municipal water systems in the state to reduce their average per capita demands by twenty percent by the year 2020. This is commonly referred to as “20 by 2020”. This goal can be met through increased conservation efforts as well as through water recycling and like efforts that result in a net reduction of per capita use of potable water.

Ocean Desalination

While inland groundwater desalination has continued to expand as reverse osmosis technologies have advanced and become more economical, ocean desalination never kicked off in the late 20th century as a major supply source primarily due to less expensive

alternative water supply options. However, in 2013 permitting was approved for the Carlsbad Desalination Project, a 50 mgd seawater desalination plant and a 10-mile, large-diameter pipeline being developed by Poseidon Resources, a private, investor-owned company that develops water and wastewater infrastructure. Though this facility is expected to be operating in 2016 and is actually serving the San Diego County Water Authority coastal area and is located south of the Los Angeles Section area, it is considered a harbinger of future “large scale” ocean desalination facilities expected over the coming decades on the U.S. west coast, some of which are anticipated to be located in the Los Angeles Section such as the Huntington Beach facility.

Recycled Water

In 2006, the world's largest water purification system for potable reuse was constructed as a joint venture of Orange County Sanitation District and Orange County Water District and called the Orange County Groundwater Replenishment System (GWRS). This facility, winner of the 2009 ASCE Society Opal Award, takes highly treated wastewater that would have previously been discharged into the Pacific Ocean and purifies it using a three-step advanced treatment process consisting of microfiltration, reverse osmosis and ultraviolet light with hydrogen peroxide. The process produces high-quality water that exceeds all state and federal drinking water standards necessary for delivery to groundwater recharge basins and sea water intrusion barriers. Operational since January 2008, this water purification project produces up to 70 million gallons of high-quality water every day, enough water to serve nearly 600,000 residents in north and central Orange County, California. Similar types of advanced water recycling projects known as indirect potable reuse projects are being planned in the Inland Empire area and are expected to continue to serve as a significant source of water supply for future water needs in coming generations.

The future – IRWMPs

As the reader can see, there have been many significant efforts on the water front in California, particularly over the last century. But we have also learned that we cannot be complacent and must always be preparing for changed circumstances such as climate change or other unanticipated such as natural disasters. Good planning had helped us get to where we are but we need to continue and improve those efforts. Many water agencies are presently working on Integrated Water Resource Management Plans which will help us, as an industry, develop and implement adaptive management techniques and practices. Collectively, these will help us be better at reliably meeting the water resource needs of the future while reducing the impact on the environment. An excellent example of some of the work being done currently on these efforts is that being done by the Santa Ana Watershed Project Authority covering the northern portion of Orange County and the western portion of San Bernardino and Riverside Counties. We can all learn from them how to prepare for our next century.



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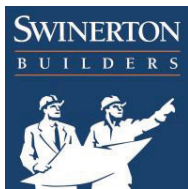


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To donate, please visit www.ascelasection.org

Obituary: Janice Horcasitas (1957-2013), Former ASCE Los Angeles Section Officer



On April 11, 2013 our Lord called upon Janice to come home to Him in Heaven. She went peacefully from her home, surrounded by family and friends. After a 3 year battle, her body succumbed to metastatic cancer, but her spirit refused to yield. Even when undergoing chemotherapy Janice remained active. During that time, she participated in the Bakersfield Police Memorial Marathon, the Disneyland

Half Marathon, and continued to ski with her fellow members of the Avalanche Ski Club. Janice was a Bakersfield native and worked for the phone company for many years. But at age 36, she needed a more challenging career, so she enrolled in the Engineering program at Cal Poly, San Luis Obispo and graduated with a BS degree in Civil Engineering in 1997.

Her first job after graduation was with the Kern County Water Agency, but accepted a job with the City of Bakersfield in 1999. She started out in Public Works as an Engineer I (Traffic), then transferred to Engineering/Design (Subdivisions) where she was promoted to Engineer II in 2001. In 2003, she earned her Civil Engineering License, received a promotion to Engineer III, and transferred to the Building Division where she remained until the end. She enjoyed being a public servant and the people she served enjoyed working with her.

As an active member of the American Society of Civil Engineers (ASCE), Janice served as Treasurer, Secretary, Vice President, President, and Past President for the Southern San Joaquin Chapter. She also served on the American Public Works Association board for several years, was a member of BCMEMBA where they "always enjoyed her bright smile and easy laughter" (thanks to Martin Ortiz for those beautiful words), and she helped teach engineering and surveying classes at Bakersfield College. She also took part in the development of the new St. Elizabeth Ann Seton Catholic Church. Janice loved a challenge. She ran in many marathons, dared black diamond ski runs at Mammoth, learned to ride her own Harley, and even finished the grueling Volksoff obstacle course put on by the US Marines!

When she wasn't pursuing a challenge, Janice enjoyed many leisure activities. She loved to ballroom dance. She knew many dance steps but her favorite was the West Coast Swing. She also took delight in playing tennis, golfing, traveling to Hawaii and Europe, attending the spring BBQs at St. Francis Church, OLP Church, and CSUB, and hangin' with her Cactus Valley friends at Table 13.

Janice was a beautiful and vibrant woman, full of life, fun to be around, and had a personality that people naturally gravitated to. Where ever she worked and whatever activities she got involved with, she made friends...lots of friends. Many became dear and close to

her and became her extended family. She will be dearly missed here on Earth, but Heaven just gained another Angel! Her family would like to express their deepest appreciation and gratitude to all her friends for their love and support, and to all the wonderful folks at CBCC, and to the Optimal Hospice team for their genuine concern and care. Janice is preceded in death by her "Grandma" Juanita. She is survived by her husband James Santos, her mother and step-father Estelle and Philip Fuentez, her father Rudy Horcasitas, her sister, brother-in-law, and niece Rena, Steve, and Dana Grant.

www.bakersfield.com/obits

Published in Bakersfield Californian from April 19 to April 21, 2013

ARTICLE

ASCE's Career Fair-in-a Box: All you need for an exhibit!



ASCE's Career Fair-in-a Box is perfect for times when you have been asked to present to a group of students at an exhibit-style event, and need supplies in a hurry! Show your enthusiasm for civil engineering with a brightly colored display that includes interesting table-top posters, handouts and give away items that are sure to please every audience. Combine the kit with one of ASCE's fun educational outreach activities or use it as a stand-alone exhibit. Bring lots of engineers into the mix to ensure a successful event! To order visit <http://www.asce.org/precollege-resources/>,

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ASCE Centennial: City of LA Proclamation



The LA City Council recently presented a Proclamation honoring the ASCE Los Angeles Section Centennial on April 12, 2013 at the Los Angeles City Hall. Some of the ASCE members who attended include Don Sepulveda, Julia Moye, Jay Higgins, Mike Thornton and Joe Buley. Councilmembers Dennis Zine and Tom LaBonge were on hand for the handoff. In this picture, Councilman Zine is presenting the proclamation to Jay Higgins among ASCE Los Angeles Section members.

Nominations Announced for L.A. Section Officers; Terms to Begin in October

The Los Angeles Section Nominating Committee has made the following recommendations to the Board of Directors for the slate of officers for the term beginning October 2013:

President-Elect (for a three-year term; President-Elect, President, and Past President):

- Kenneth H. Rosenfield, P.E., Director of Public Services, City Engineer, City of Laguna Hills

Treasurer (for a two-year term):

- Diego Cadena, P.E., Geosyntec Consultants

Vice President Student Activities (for a two-year term):

- Prof. Nazaret Dermendjian, Ph.D., P.E., Chair, Department of Civil Engineering & Applied Mechanics, California State University, Northridge

In accordance with Article 4, Section 4.3.6, of the current Los Angeles Section Bylaws,

Additional nominations for each office to be filled may be made by a petition signed by no less than fifty (50) Voting Members of the Section provided that such a petition is accompanied by a written acceptance of the nomination by the nominee and is filed with the Incumbent Section Secretary within 30 days after the announcement of the nominees.

The Voting Member grades, as defined in the Los Angeles Section Constitution, Article 2, Section 2.2.1, are Associate Member, Member, Fellow Member, and Distinguished Member, whose dues are current or who are granted a Section dues exemption.

Petitions are due within 30 days of the distribution date of this announcement and should be submitted to:

Secretary, Los Angeles Section ASCE
c/o Gayle Stewart Enterprises, Inc.
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