Welcome

Mark Monin

Chair, WACO

Director, El Toro Water District

WACO
Water Advisory Committee of Orange County

WACO Meeting – September 8, 2023


I pledge allegiance to the flag
of the United States of
America, and to the republic
for which it stands, one nation
under God, indivisible, with
liberty and justice for all.

Reminders

- Participants will be muted during the presentation
- Q&A will be conducted after the presentation
- To ask a question, please use the chat box or raise hand feature

WACO
Water Advisory Committee of Orange County

WACO
Water Advisory Committee of Orange County

CERTIFICATE

OF APPRECIATION

for

The Honorable Jose Vergara

We thank you for your dedicated years of service and leadership to the Water Advisory Committee of Orange County (WACO). Your experience and passion for water issues will be missed.

Mark Monin

Mark Monin, Chair

Greg Mills, Vice Chair

WEROC Report

Vicki Osborn
Director of Emergency Management
WEROC/MWDOC

MET Report

Linda Ackerman
MWDOC MET Director

ACWA Report

Cathy Green
President, OCWD
Vice President, ACWA

Program

Are Local Water/Wastewater Infrastructure Ready For the Big One?

Annde Ewertsen
Executive Director
Alfred E. Alquist Seismic Safety Commission

Karl Kuebitz, P.E.
Engineering Manager
Brady Engineering

WACO
Water Advisory Committee of Orange County

California Seismic Safety Commission (SSC) Overview and Projects

Alfred E. Alquist Seismic Safety Commission

Annde Ewertsen, Executive Director
Annde.Ewertsen@caloes.ca.gov

Cal OES

GOVERNOR'S OFFICE
OF EMERGENCY SERVICES

My Background

- Executive Director, Seismic Safety Commission
- 5 years with California Earthquake Authority's (CEA) as Mitigation Director and the Managing Director, California Residential Mitigation Program's (CRMP) Earthquake Brace + Bolt (EBB) Program.
- 8+ years with CEA as the Communications and External Affairs Manager.
- Relevant experience with Cal OES as Recovery Infrastructure Branch Chief—5 disasters (2017 Winter Storms and 2 fires)
- 14+ years with DOF and GAO

California Seismic Safety Commission

- Established in 1975 by Law, reorganized by AB100 in 2020
- 15 Commissioners
- 10 Appointed by the Governor
  - Local Government
  - Social Services
  - Public Utility
  - Planning (vacant)
  - Insurance (vacant)
  - Structural Engineer
  - Fire Protection
  - Emergency Services
- State Legislature
  - Senate
  - Assembly
- State Agencies
  - Building Standards Commission (Building Codes)
  - State Architect (Schools)
  - California Governor's Office of Emergency Services

SSC MISSION AND VISION

Mission Statement

Support the People of California to Reduce Life and Economic Losses from earthquake related disasters

Vision Statement

Achieve resiliency by providing state, local government and the public with state-of-art disaster tools that will reduce losses and expedite recovery

SSC Goals and Actions

- Help communities build a more resilient environment by strengthening emergency risk management policies and best practices in the areas of prevention, preparedness, mitigation, response, and recovery
- Support policies and best practices that identify hazards, vulnerabilities, and capacity to assess and reduce risk
- Promote risk awareness and (loss) reduction

Roles and Collaborations

- Collaboration with:
  - Earthquake Engineering Research Institute (EERI)- Public Policy Committee
  - CA Earthquake Clearinghouse
  - FEMA working groups (including BCA Critical Infrastructure)
  - SCEC and ECA
  - ShakeAlert Technical Users Coordinating Committee
  - Structural Engineering Association of CA – Resilience and Seismology Committees
  - Electric Power Research Institute: Inner Utility Working Group (IUWG)
  - California Building Officials Structural Code Committee (CALBO)
- Multiple Advisory Roles
  - Building Code Development
  - CPUC Independent Peer Review Panel
  - California Strong Motion Instrumentation Program (CSMIP)
  - State Historical Building Safety Board
  - Global Earthquake Model (GEM)
  - SFPUC Water System Improvement Program – Seismic Review

Cal OES GOVERNOR'S OFFICE OF EMERGENCY SERVICES

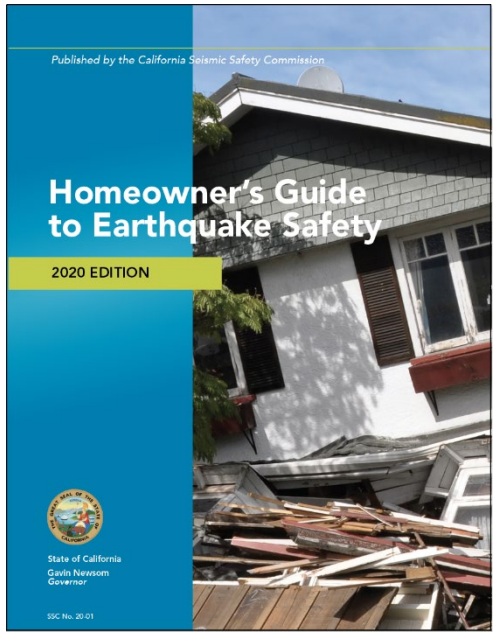
STATE OF CALIFORNIA Seismic Safety Commission SSC

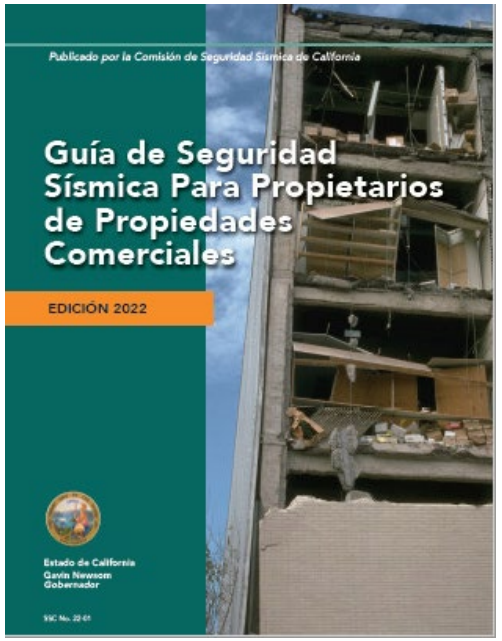
Current Projects

- Updating Strategic Plan
- Ferndale/Türkiye Report
  - Rio Dell Lessons Learned
  - Doublet-Triggered Scenarios
  - Resilience Model
- Fire Station Inventory
- Quake Heroes Screenings
- Shake Table test & UAV Project

Recent Publications and Resources https://ssc.ca.gov/forms_pubs/

Homeowner's and Commercial Property Owner's Guide

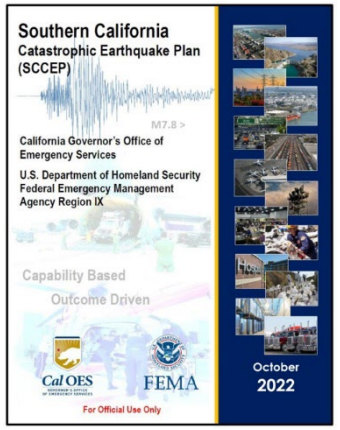




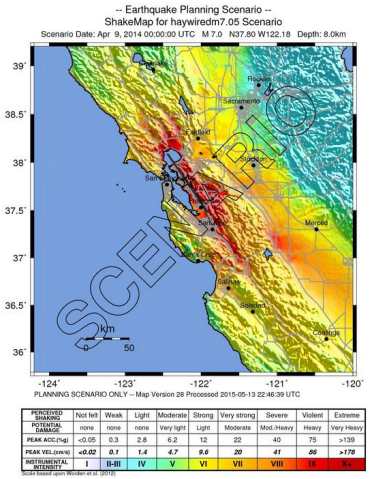
Outsmart Disaster | Outsmart Disaster is a statewide preparedness initiative aims to equip all Californians with the tools they need to be resilient in the face of natural disasters.

Impacts of EQs

- Not a lot of data
- Cal OES Scenarios
  - SoCal Catastrophic Earthquake Plan



- HayWired



SoCal Catastrophic Earthquake Plan (SCCEP)

- Scenario Fact Sheet (07/2023): SCCEP is based on a risk assessment of 21 major fault rupture zones in Southern California.

- Models M7.8—not the largest earthquake that the SSAF can produce
- San Andreas Fault is not only fault to threaten SoCal—it is the largest potential catastrophic earthquake due to its overdue recurrence interval.
- That risk includes:
  - 99.7% chance of a M6.7 or larger earthquake in CA in the next 30 years.
  - 17% chance of a M7.7 or larger on the SSAF in the next 30 years.

Source: Microsoft Word - CalOES_FactSheet_SCCEP_v2023_06_22 final

HayWired

- HayWired scenario—hypothetical earthquake (mainshock) with a moment magnitude of 7.0 occurring on April 18, 2018, at 4:18 p.m. on the Hayward Fault in the east bay part of California's San Francisco Bay area.
- Most economic, cultural, and personal elements of society have grown entwined with the Internet since the last time California experienced a large urban earthquake. What will happen to an Internet-dependent society when a large earthquake occurs?
- How do tangible lifelines—roads, power, water, communication, etc.—interact in damage and restoration, and how do they interact with the online world of commerce, social media, and news?
- How will aftershocks affect recovery?

Source: HayWired | U.S. Geological Survey (usgs.gov)

Let's Talk Mitigation Funding

Federal Grants & Financing To Research

- Hazard Mitigation Assistance (HMA)
  - Disaster (HMGP and Post-Fire)
  - Non-Disaster (BRIC and FMA)
- High Hazard Potential Dam (HHPD)
- Other Federal Grants & Financing
  - Natural Resources Grants | FederalGrants.com)
  - Climate Smart and Disaster Ready | Federal Grant (FederalGrants.com)
  - Community Wildfire Defense Grant 2022 West | Federal Grant (FederalGrants.com)
  - DE-FOA-0003088: SECTION 247: MAINTAINING AND ENHANCING HYDROELECTRICITY INCENTIVES
  - Drinking Water and Clean Water State Revolving Fund

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SSC
Seismic Safety Commission

Table 2. HMA Program Comparison

HMA Program Comparison	 HMGP	 HMGP Post Fire	 BRIC	 FMA
Program Type	Post-disaster	Post-disaster	Pre-disaster	Pre-disaster
Funding Availability	Presidentially declared disaster	FMAG-declared disaster	6% set aside from federal post-disaster grant funding	Annual appropriations
Competitive?	No	No	Yes	Yes
Eligible Applicants	States, federally recognized tribes, territories and the District of Columbia (DC)	States, federally recognized tribes, territories and DC	States, federally recognized tribes, territories and DC	States, federally recognized tribes, territories and DC
Eligible Subapplicants	State agencies, local governments, tribes and private nonprofit (PNP) organizations	State agencies, local governments, tribes and PNP organizations	State agencies, local governments and tribes	State agencies, local governments and tribes
Hazard Mitigation Plan Requirement	Yes	Yes	Yes	Yes
NFIP Participation	Communities with projects in Special Flood Hazard Areas (SFHAs)	Communities with projects in SFHAs	Communities with projects in SFHAs	Subapplicants and properties

HMA Programs: A Deeper Dive

A few HMA Eligible Activities:

- New Plan Creation and Updates
- Planning-Related Activities (incl. Code Development and Standards)
- Project Scoping/ Advance Assistance
- Partnerships (BRIC and FMA only)
- Mitigation Reconstruction
- Localized and Non-Localized Flood Risk reduction
- Tsunami Vertical Evacuation
- Retrofit
- EEW
- Aquifer Recharge, Storage and Recovery
- Innovative Capability & Capacity Building or Mitigation Projects

(See page 82 of HMA Program Policy Guide or link to tri-fold brochure on this slide for specific HMA Program eligibility)

IA Eligible Activities

TION PROJECTS	HMGP	HMGP POST FIRE	BRIC	FMA
erty Acquisition	Yes	Yes	Yes	Yes
cture Elevation	Yes	Yes	Yes	Yes
ation nstruction	Yes	Yes	Yes	Yes
l Risk Reduction sures	Yes	Yes	Yes	Yes
loodproofing Non-dential Buildings	Yes	Yes	Yes	Yes
ami Vertical uation	Yes	Yes	Yes	–
Rooms truction	Yes	Yes	Yes	–
ire Mitigation	Yes	Yes	Yes	–
fitting	Yes	Yes	Yes	Yes
rators	Yes	Yes	Yes	–
quake Early ing System	Yes	Yes	Yes	–
LITY AND CAPACITY BUILDING				
Plan Creation Updates	Yes	Yes	Yes	Yes
ning-Related ities	Yes	Yes	Yes	Yes
ct Scoping/ nce Assistance	Yes	Yes	Yes	Yes
cial Technical stance	–	–	–	Yes

he table above is not an exhaustive list of eligible activities. lease see program guidance or Notice of Funding Opportunity NOFO) for more information on eligible activities.

Additional Resources

For general questions about the HMA programs please contact your State Hazard Mitigation Officer or FEMA Region.

FEMA GO Helpline:
femago@fema.dhs.gov
1-877-585-3242

Hazard Mitigation Helpline:
1-866-222-3580

Benefit Cost Analysis (BCA) Helpline:
BCHelpline@FEMA.dhs.gov
1-855-540-6744

Feasibility and Effectiveness Helpline:
FEMA-BuildingScienceHelp@fema.dhs.gov

Office of Environmental Planning and Historic Preservation:
EHPHelpline@fema.dhs.gov
1-866-222-3580

Please scan this QR code for easy access to FEMA's HMA webpage to learn more about the programs, or visit http://www.fema.gov/hazard-mitigation-assistance.

Scan me

Hazard Mitigation Assistance

Note: Eligibility varies by HMA Program. Scoping and Technical Assistance are available through CalOES Hazard Mitigation Branch.

Environmental Planning and Historical Preservation Checklist and EHP Section

Floodplains	Wetlands – Section 10 of the Rivers & Harbors Act or a Clean Water Act Section 404 Permit	Viewshed	Existing Habitat
Endangered / threatened species and / or critical habitat	Migratory flyway or migration barrier	Invasive Species	Minority or low-income populations (EO 12898)
	Prime farmland	Historic & Cultural Characteristics	

EHP Documentation

- FEMA Environmental Checklist
- FEMA FIRM Map
- CEQA documents (e.g., Initial Study/Mitigated Negative Declaration, Environmental Impact Report)
- Hazardous & Toxic substances (Phase I or II Environmental Site Assessments)
- Re-vegetation plan without spread
- Previous biological surveys and reports
- Archeological surveys
- Permit applications/documentation
- Previous consultation conducted with state and federal agencies

A Few words on BCA and EHP

BCA Concerns for Seismic CI Projects

- BCA Seismic module rated as a top barrier to accessing FEMA funding despite high expected losses
- Especially true for critical infrastructure projects
- Jurisdictions can spend a high level of resources, with little to no guarantee of funding
- Challenging to meet the 1.0 BCR requirement

A Few words on BCA and EHP

Recent Key Recommendations

- BCA Critical Infrastructure Working Group (formed by Commissioner Kim-Lopez) working with Anne Rosinski (FEMA Region 9,EQ Program Manager) and other technical experts and FEMA BCA Experts developed several recommendations.

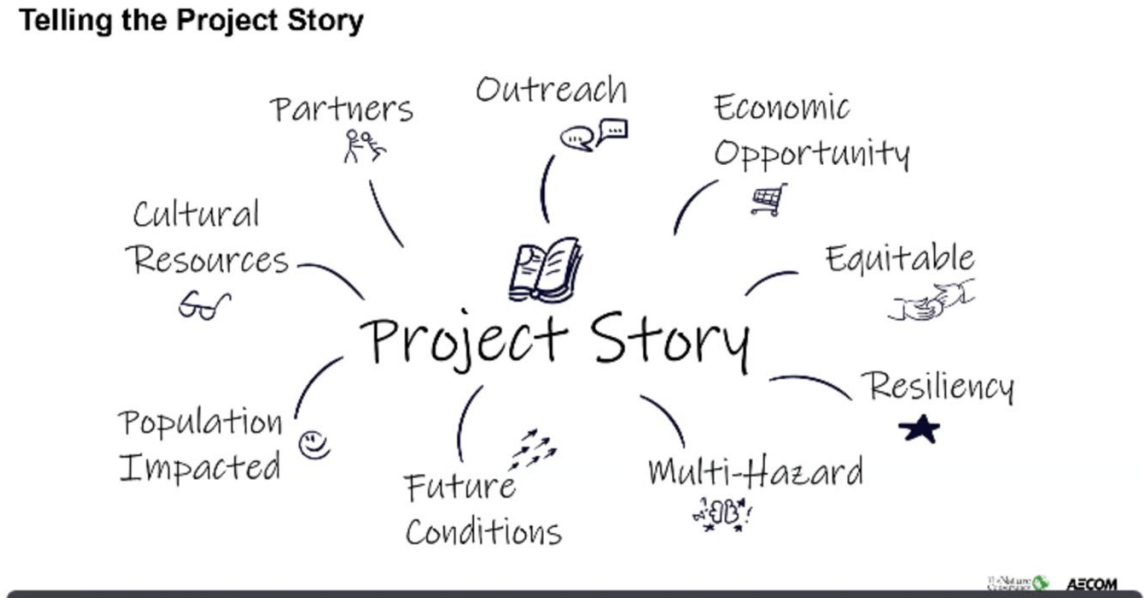
- Cal OES submitted a support letter and noted :
  - Recommendations from the working group will:
    - Allow the sub applicants to do a better-informed initial assessment
    - Allow the State to evaluate and identify critical seismic mitigation projects in a comprehensive manner
    - Provide more flexibility and transparency in the process

Federal Grants

- Be creative
  - Flood
  - Wildfire
  - Climate Change
  - Socially-vulnerable populations/equity

Federal Grants

- Tell the story—connect the dots
  - EBB BRIC application
    - $20M in 2021 and 2022
    - Highlighted social vulnerability, climate adaptation/change, partners



Federal Grants

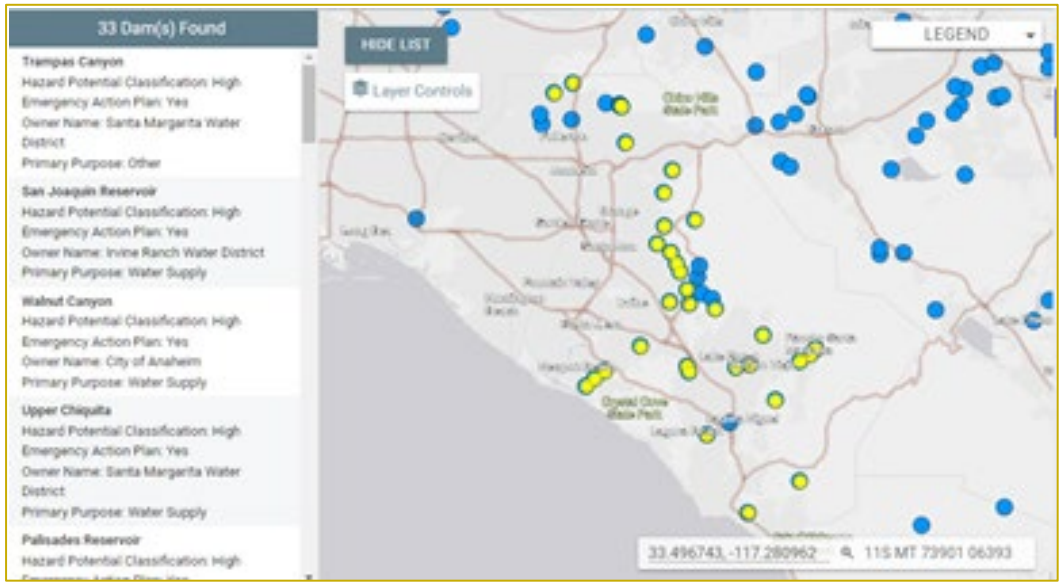
- Reach out to OES
  - Training
  - Discuss the concept
- Be patient
  - Overall Process is long
  - EHP Process…

High Hazard Potential Dam (HHPD) Rehabilitation Grants:

Quick NID search of basic criteria:

County: Orange
State Regulated: Yes
Hazard Potential Classification: High

Note: This is a Non-HMA Federal Grant



High Hazard Potential is a classification standard for any dam whose failure or mis-operation will cause loss of human life and significant property.

Grant **provides technical, planning, design, and construction assistance** for eligible rehabilitation activities that reduce dam risk and increase community preparedness

Possible Organizational Opportunity

- Geologic Hazard and Abatement Districts (GHADs)
  - 1979 Beverly Act (PRC 26500-26654) provided for establishment of these independent public agencies
  - Main function is to oversee geologic hazards in defined geographic areas
  - Currently 35 GHADs in CA
  - Key Benefits utilizing a plan of control:
    - Act to prevent damage resulting from earth movement by identifying and monitoring potential geologic hazards and undertaking improvements as appropriate.
    - Quick response to a geologic hazard due to its funding capability and technical expertise
    - GHAD assessments can be easily collected as part of general property tax (vs. a homeowners' association)
    - GHADs are provided a degree of immunity from liability for actions they undertake (GC § 865).

It All Starts Locally - Planning and Preparedness

Remember ALL disasters are local. Whether the cause originates locally or from an external source, the response for a disaster is best handled as close to the local level as possible.

- Encourage employees and constituents to be prepared
  - Preparedness Resources
- Develop and Exercise your Plan & Coordinate with Others
  - Resiliency Resources Toolkit including Business Continuity Planning Template
- Encourage local government and your organization's participation in Individual preparedness programs such as National Preparedness Month, The Great Shakeout, Preparedness Ambassadors, and seasonal and disaster specific events and campaigns
- Subscribe to State of CA Wireless Emergency Alerts (WEAs) and Earthquake Early Warning/My Shake App

A Quick Wrap-Up

- **Key Points**
  - Risk is Real, but not a lot of data
  - Funding Opportunities exist, but need to think outside the box and THINK BIG
  - Grants are long-term opportunities
  - Don't be afraid to apply
  - Preparedness and Mitigation Resources available to homeowners and organizations
  - Coordinate with others for planning and grants
  - Exercise your emergency preparedness plans—batteries?

Questions?

Thank you for the opportunity to speak with you today.

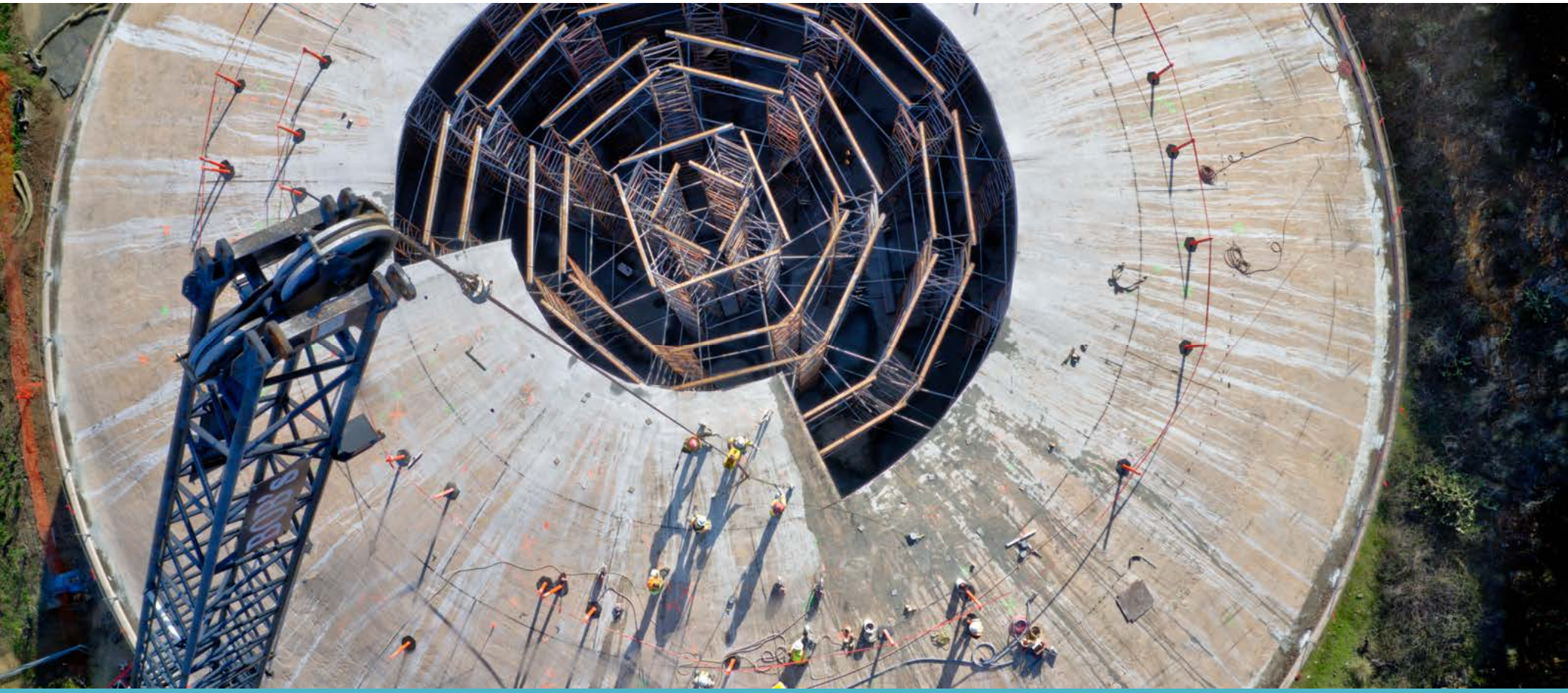
Annde Ewertsen@caloes.ca.gov

Cal OES
GOVERNOR'S OFFICE
OF EMERGENCY SERVICES

WACO
Water Advisory Committee of Orange County

Are Local Water/Wastewater Infrastructure Ready For the Big One?

Karl Kuebitz, PE



Overview of Today's Presentation

Presented by: Karl Kuebitz, PE -- Engineering Manager, BRADY

California Water Code

THE PEOPLE OF THE STATE OF CALIFORNIA DO ENACT AS FOLLOWS:

SECTION 1. Section 10632.5 is added to the Water Code, to read:

10632.5. (a) In addition to the requirements of paragraph (3) of subdivision (a) of Section 10632, beginning January 1, 2020, the plan shall include a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of a water system and mitigate those vulnerabilities.

(b) An urban water supplier shall update the seismic risk assessment and mitigation plan when updating its urban water management plan as required by Section 10621.

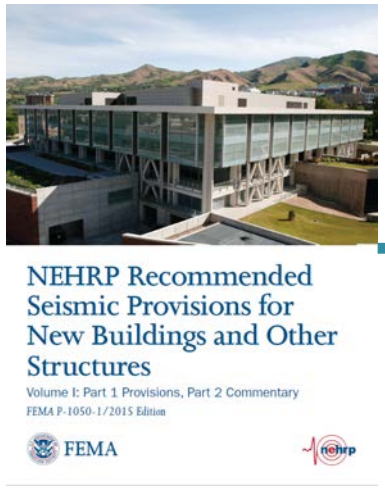
(c) An urban water supplier may comply with this section by submitting, pursuant to Section 10644, a copy of the most recent adopted local hazard mitigation plan or multihazard mitigation plan under the federal Disaster Mitigation Act of 2000 (Public Law 106-390) if the local hazard mitigation plan or multihazard mitigation plan addresses seismic risk.

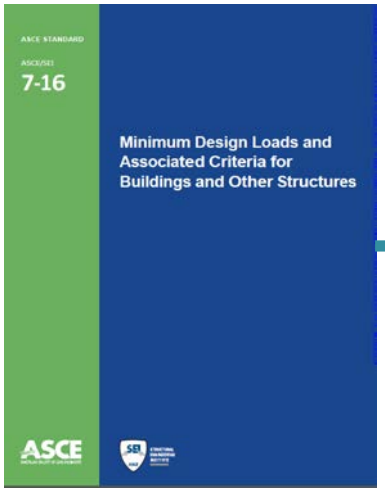
§ 10632.5

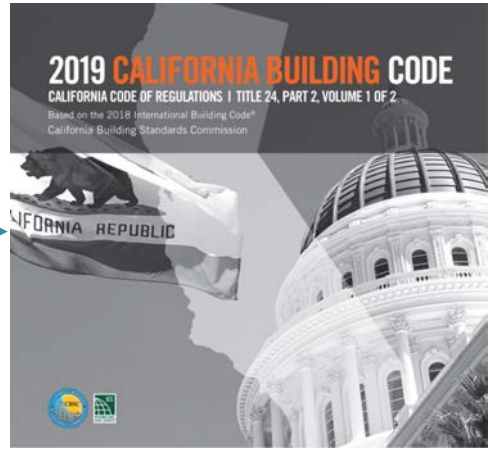
- ❑" … include a seismic risk assessment …"
- ❑" … assess the vulnerability of each of the various facilities of a water system …"
- ❑" … and mitigate those vulnerabilities."

Updates to Codes

Design Ground Motions adopted by CBC are recommended by NEHRP and ASCE 7





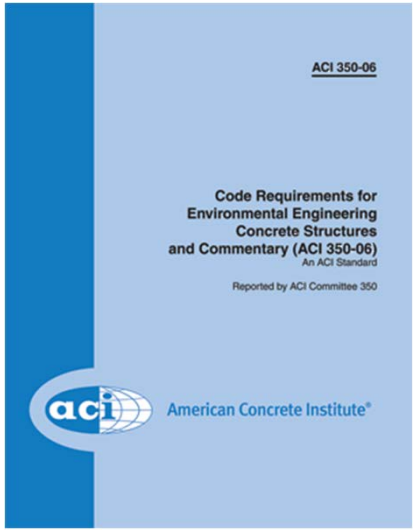


NEHRP Seismic Provisions (2015) → ASCE 7 (2016, Supplement 3 2021) → IBC (2018) → CBC (2019, 2022)

NEHRP 2020 Released → ***ASCE 7-22 Released*** → ***IBC (2024)?*** → ***CBC (2025)?***

Updates to ACI 350

First update in 16 Years



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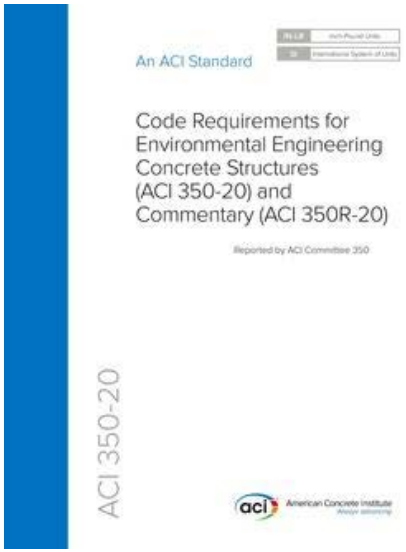

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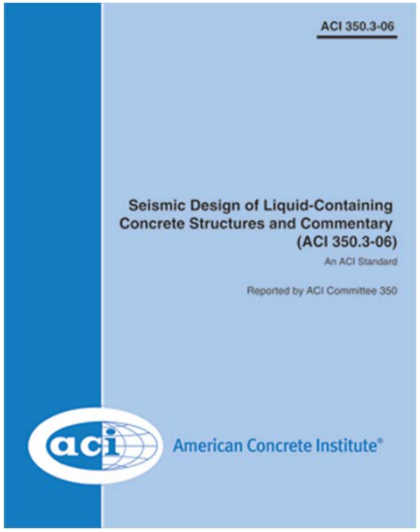
published in 2022



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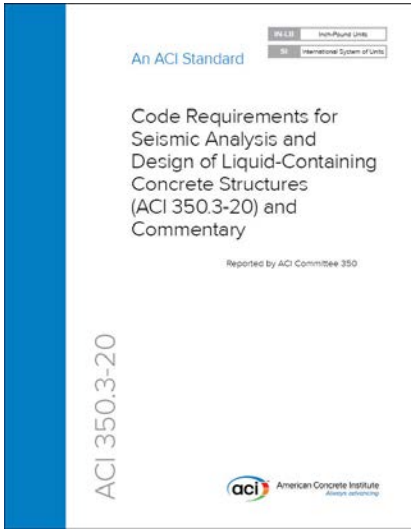
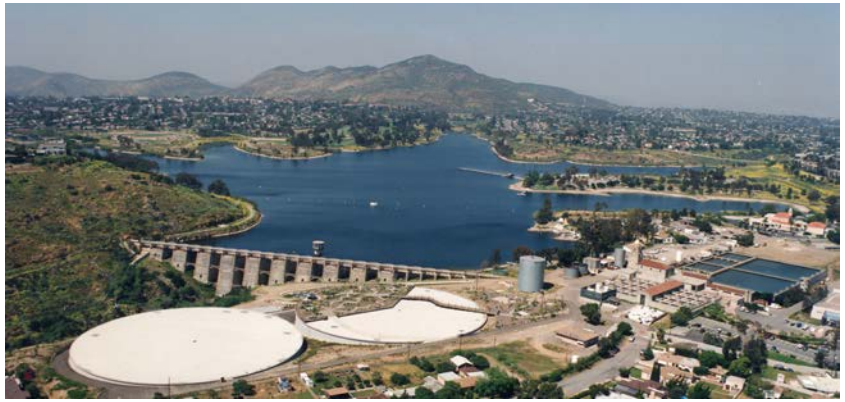


2020 Version,
published in 2021,
Not adopted by ASCE 7-22

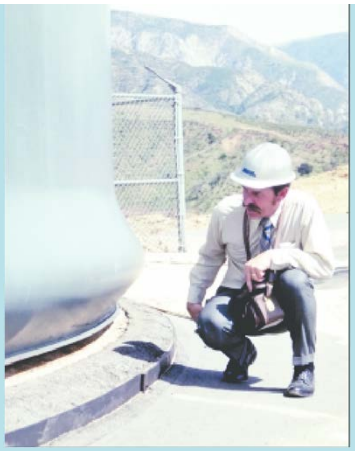
Treatment Plants, Turnouts, Elevated Feeder Pipes



Pump Stations

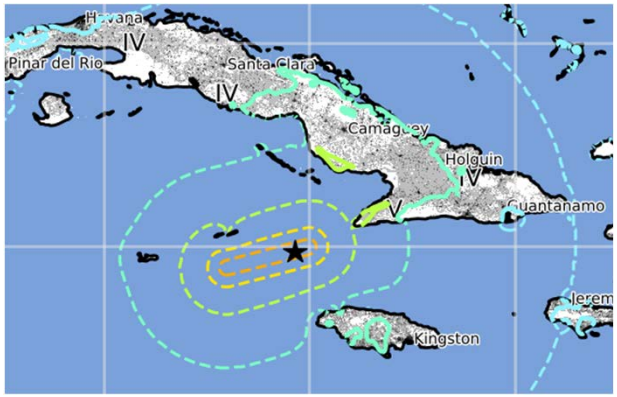
Structure is not as critical as the braces and supports

Must be able to deliver water during and immediately after an earthquake



Modes of Tank Failures

Sliding Sloshing Buckling Connections Overturning



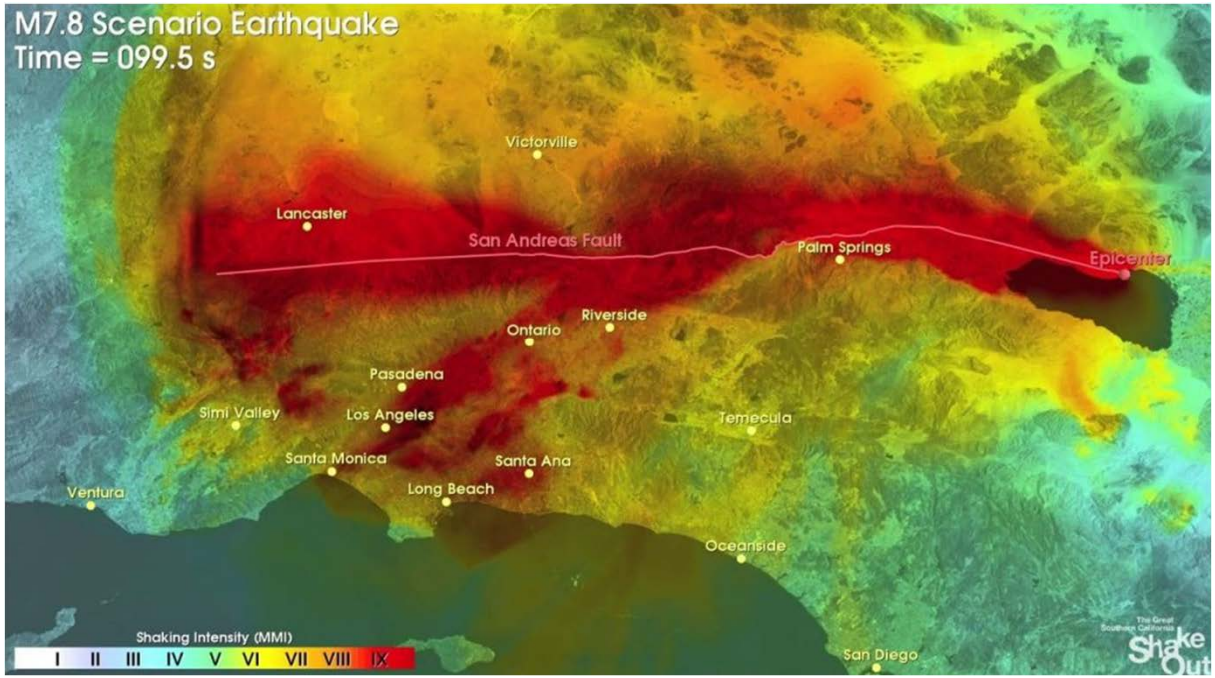
MMI	Shaking	Population
I	Not Felt	0 k*
II-III	Weak	12,699 k*
IV	Light	9,637 k
V	Moderate	3,714 k
VI	Strong	150 k
VII	Very Strong	0 k
VIII	Severe	0 k
IX	Violent	0 k
X	Extreme	0 k

2020 Caribbean Earthquake

Long Convective Period

Sloshing during a “Moderate” Earthquake as described by the USGS and the MMI, Modified Mercalli Intensity Scale

MMI Scale of a Probable EQ on San Andreas



Every tank in the yellow areas could have a similar response as Cuba

Typical condition of steel tanks installed in the 1970s

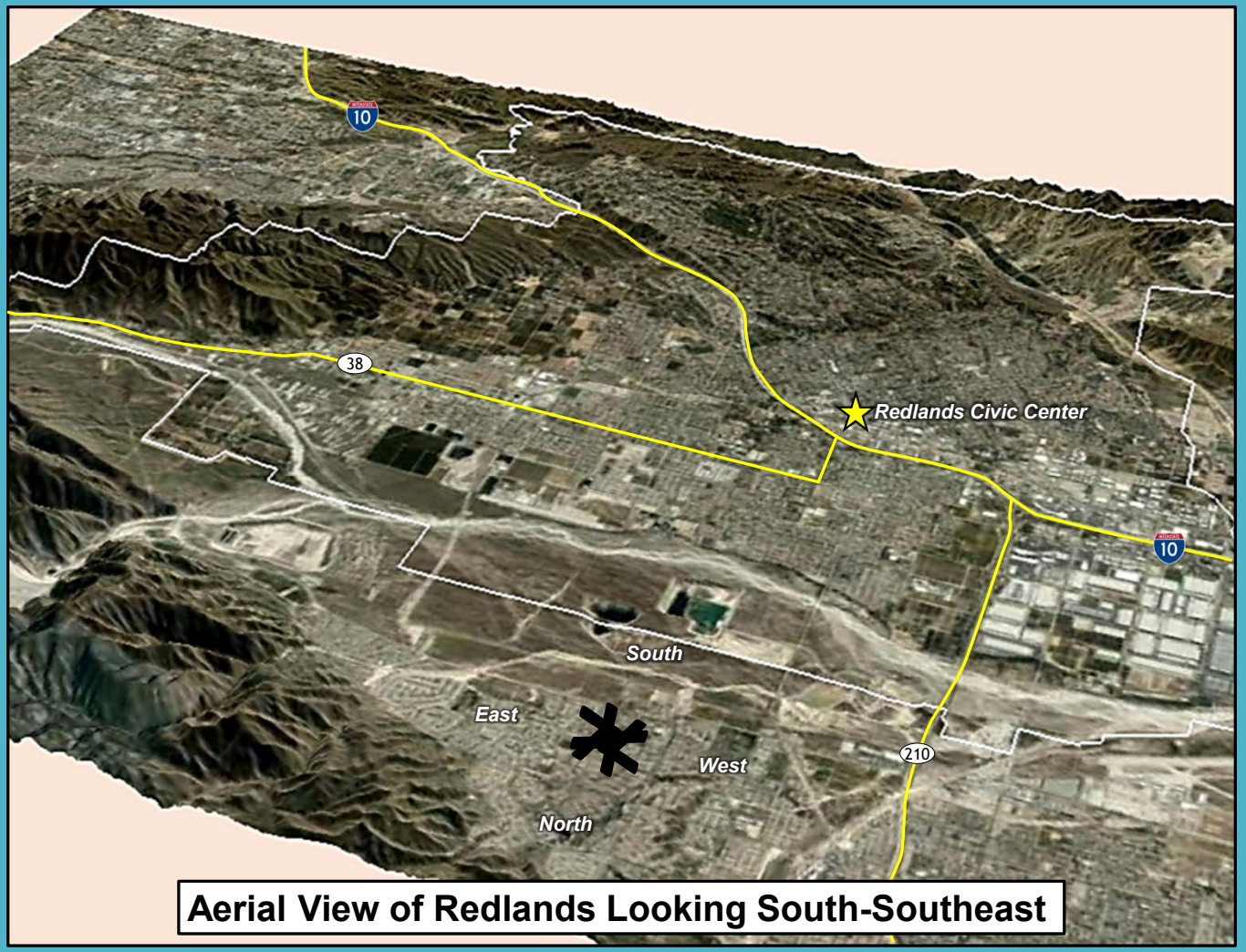
ASCE 7-16, Findings

Value	ASCE 7-10	ASCE 7-16
Seismic Parameter C_i	1.00	0.956
Seismic Parameter C_c	0.0194	0.0879
Freeboard	**1.45 ft**	**6.59 ft**
Base Shear V	706.1 k	886.5 k

- ❑ New maps
- ❑ New triggers for site-specific analyses
- ❑ New conservative penalties when all variables are note well defined.
- ❑ ACI adopting the T_L maps and equations.
- ❑ New research on sloshing

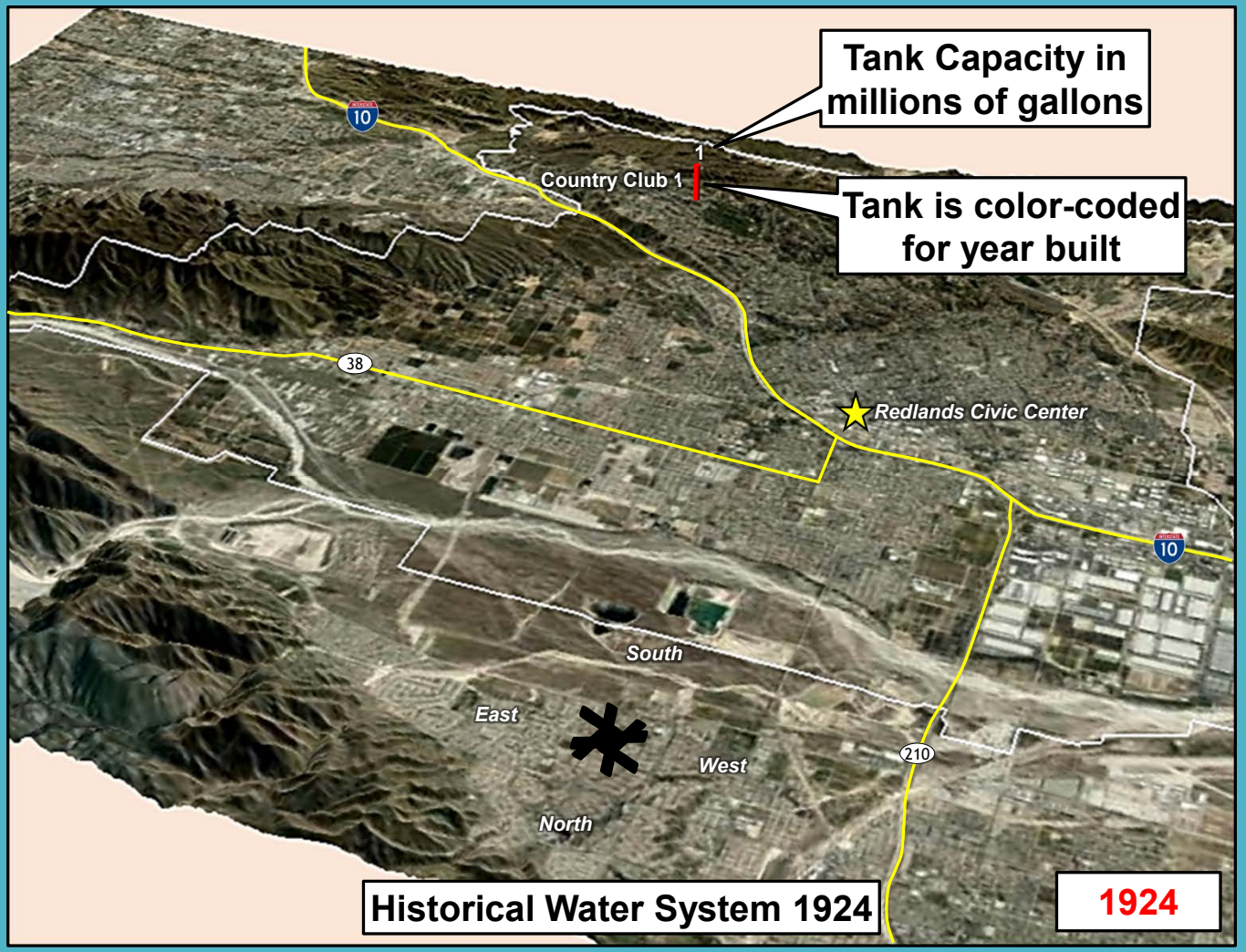
City of Redlands, CA

18 Reservoirs, 9 pump stations, 2 raw water pipelines

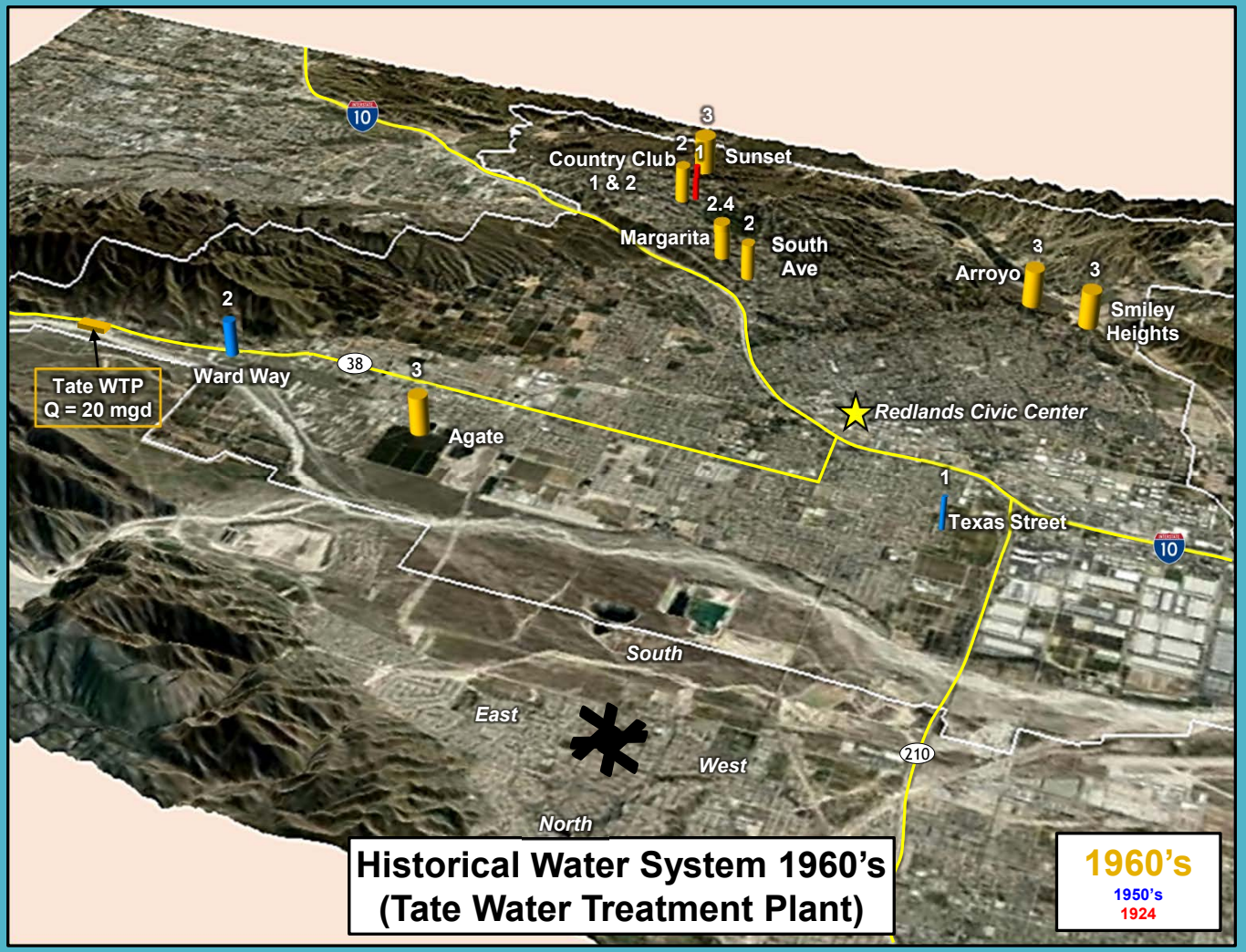


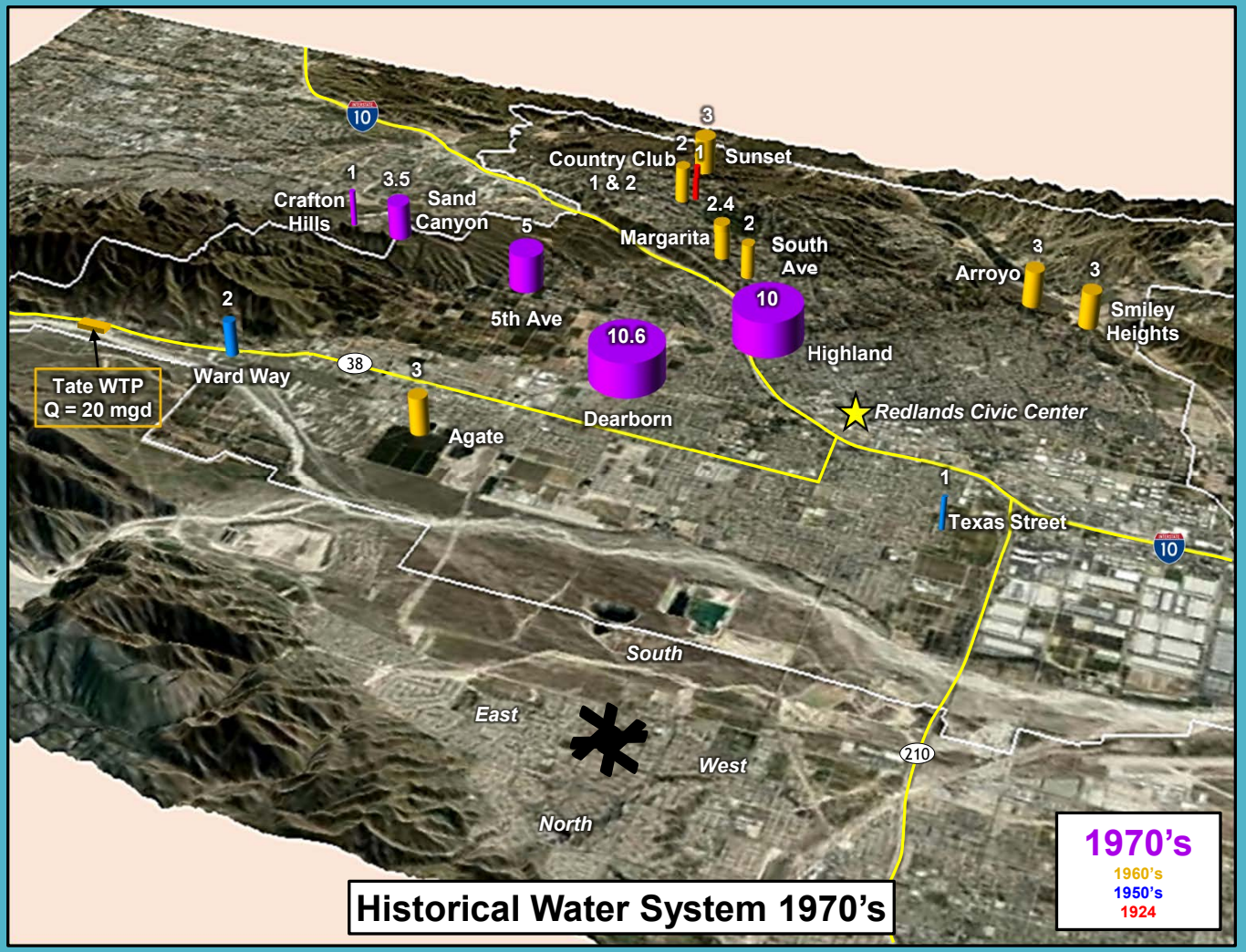
Aerial View of Redlands Looking South-Southeast


10
Country Club 1
1
38
Redlands Civic Center
10
South
East
West
210
North
Historical Water System 1924
1924


Tank Capacity in millions of gallons
1
Country Club 1
Tank is color-coded for year built
10
38
Redlands Civic Center
10
South
East
West
210
North
Historical Water System 1924
1924


10
1
Country Club 1
2
Ward Way
38
Redlands Civic Center
1
Texas Street
10
South
East
West
North
210
Historical Water System 1950's
1950's
1924


10
3
2
1
Sunset
Country Club
1 & 2
2.4
2
Margarita
South
Ave
3
Arroyo
3
Smiley
Heights
2
Tate WTP
Q = 20 mgd
Ward Way
38
3
Agate
Redlands Civic Center
1
Texas Street
10
South
East
West
North
210
Historical Water System 1960's
(Tate Water Treatment Plant)
1960's
1950's
1924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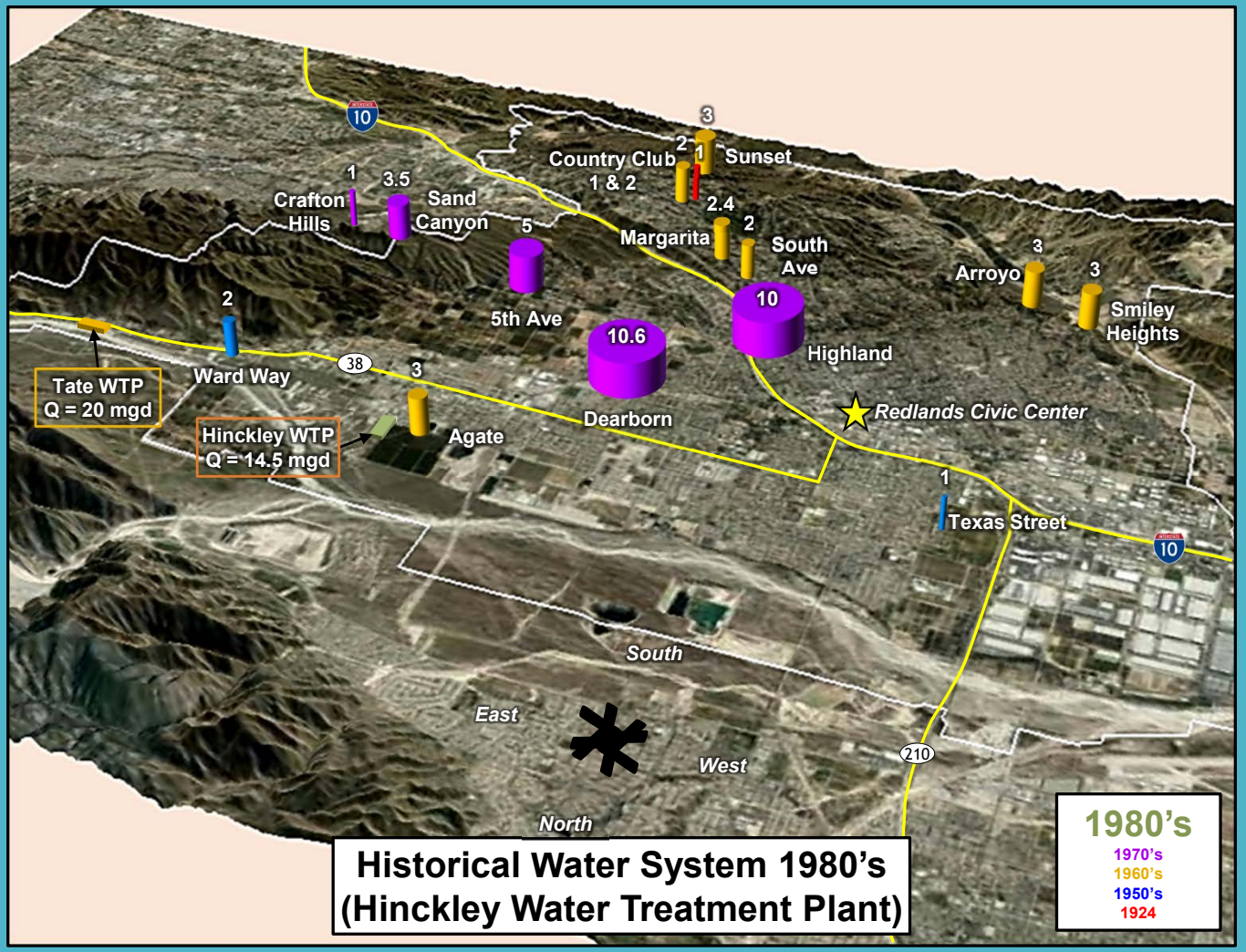
Crafton Hills
1
3.5
Sand Canyon
5
5th Ave
Country Club 1 & 2
3
2
1
Sunset
2.4
Margarita
2
South Ave
10
Highland
10.6
Dearborn
3
Arroyo
3
Smiley Heights
2
Ward Way
Tate WTP
Q = 20 mgd
38
3
Agate
Redlands Civic Center
1
Texas Street
10
South
East
West
North
210
Historical Water System 1970's
1970's
1960's
1950's
1924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Crafton Hills
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3.5
Sand Canyon
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5th Ave
Country Club 1 & 2
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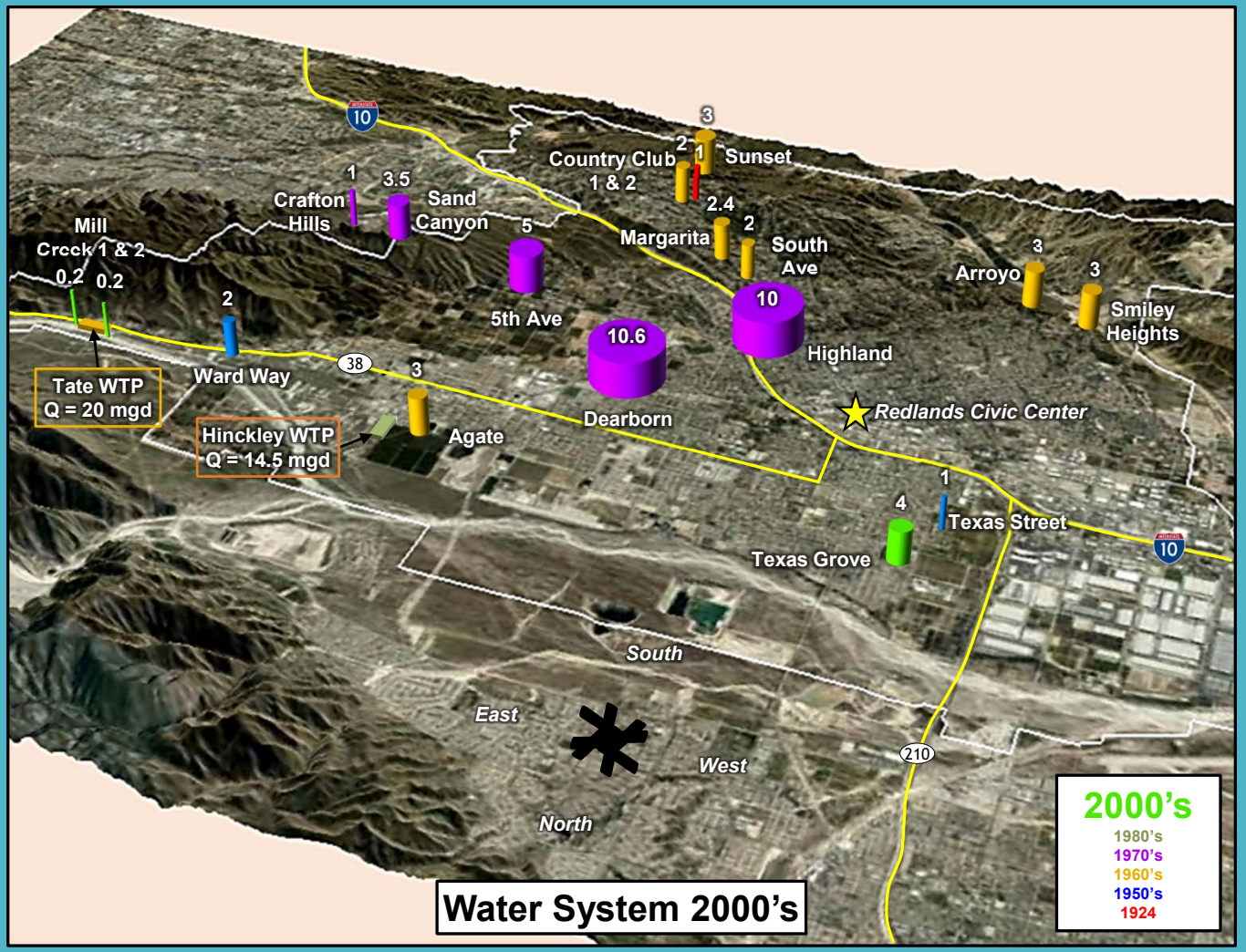
1
Sunset
2.4
Margarita
2
South Ave
10
Highland
10.6
Dearborn
3
Arroyo
3
Smiley Heights
2
Ward Way
38
Tate WTP
Q = 20 mgd
Hinckley WTP
Q = 14.5 mgd
3
Agate
Redlands Civic Center
1
Texas Street
10
South
East
West
North
210
Historical Water System 1980's
(Hinckley Water Treatment Plant)
1980's
1970's
1960's
1950's
1924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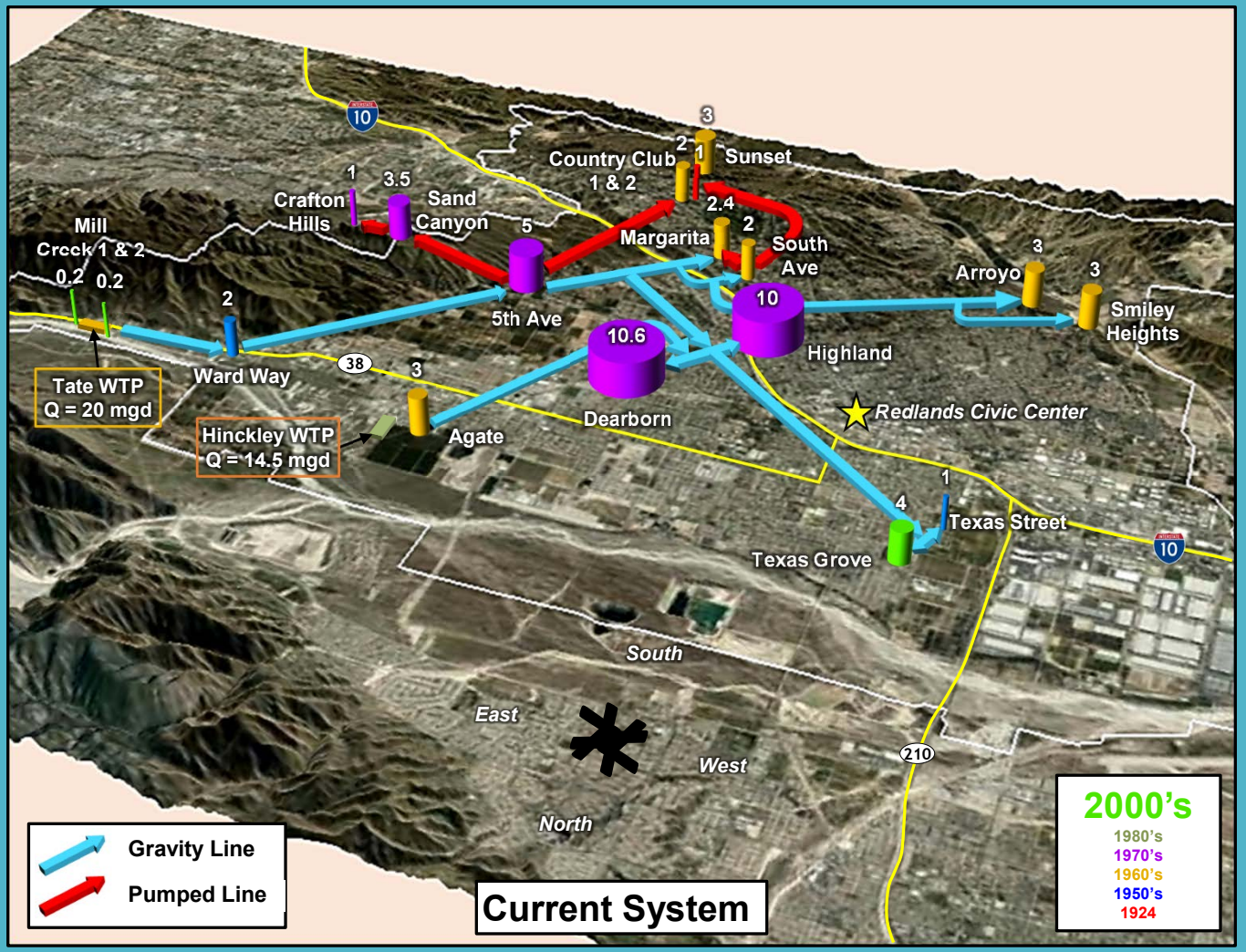
Country Club
1 & 2
3
2
1
Sunset
Crafton
Hills
1
3.5
Sand
Canyon
5
Margarita
2.4
2
South
Ave
Arroyo
3
3
Smiley
Heights
Mill
Creek 1 & 2
0.2
0.2
2
5th Ave
10.6
10
Highland
Tate WTP
Q = 20 mgd
Ward Way
38
3
Agate
Dearborn
Redlands Civic Center
Hinckley WTP
Q = 14.5 mgd
1
4
Texas Street
Texas Grove
10
South
East
West
North
210
2000's
1980's
1970's
1960's
1950's
1924
Water System 2000's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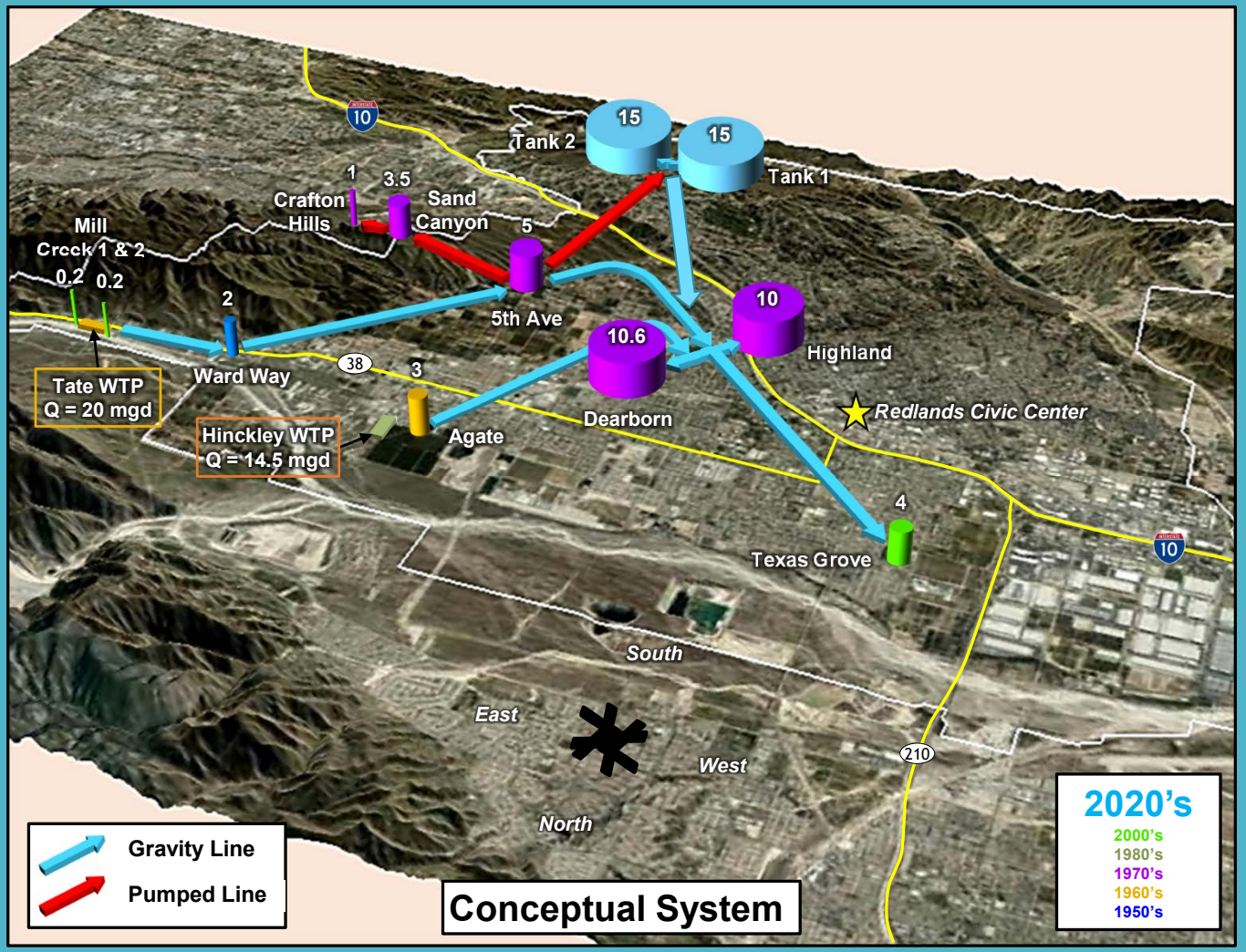
3
2
1
Sunset
Country Club
1 & 2
1
3.5
Crafton
Hills
Sand
Canyon
5
2.4
2
Margarita
South
Ave
Mill
Creek 1 & 2
0.2
0.2
2
5th Ave
10
Highland
3
Arroyo
3
Smiley
Heights
10.6
Tate WTP
Q = 20 mgd
Ward Way
38
3
Agate
Dearborn
Redlands Civic Center
Hinckley WTP
Q = 14.5 mgd
1
4
Texas Street
Texas Grove
10
South
East
West
North
210
Gravity Line
Pumped Line
Current System
2000's
1980's
1970's
1960's
1950's
1924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Tank 2
15
15
Tank 1
1
3.5
Crafton Hills
Sand Canyon
5
Mill Creek 1 & 2
0.2
0.2
2
5th Ave
10
10.6
Highland
38
3
Tate WTP
Q = 20 mgd
Ward Way
Hinckley WTP
Q = 14.5 mgd
Agate
Dearborn
Redlands Civic Center
4
Texas Grove
10
South
East
West
North
210
Gravity Line
Pumped Line
Conceptual System
2020's
2000's
1980's
1970's
1960's
1950's

Action

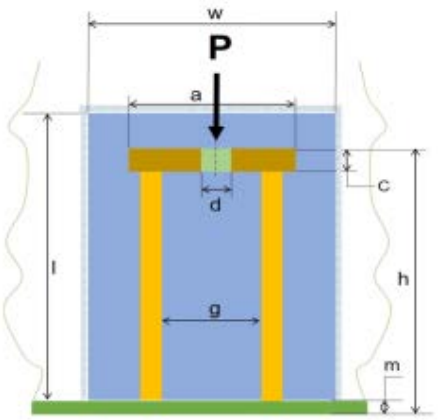
Analysis

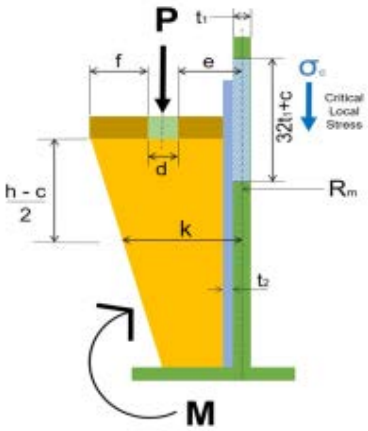
Reduce Water Level

Anchor and Brace

Anchor Structures

Modern, Resilient Design





Funding

Changes for the Fiscal Year 2022 Grant Cycle

FEMA made the following changes to the Fiscal Year 2022 funding opportunity to improve equity and reduce complexity:

- **Increased total available funding**, more than doubling BRIC levels from $1 billion in FY 2021 to $2.295 billion in FY 2022. This increase was boosted by the Infrastructure Investment and Jobs Act (IIJA). The IIJA appropriates billions of dollars to FEMA to promote resilient infrastructure, respond to the impacts of climate change, and equip our nation with the resources to combat its most pressing threats. Within that total, the FY 2022 funding opportunity also:

FEMA

Cal OES
GOVERNOR'S OFFICE
OF EMERGENCY SERVICES

Conclusion

- ❑ California Water Code and Seismic Risk
- ❑ Updates to the Code require in-depth analysis.
- ❑ Sloshing equation is revising significantly and conservatively.
- ❑ System-wide studies prioritize tasks for seismic resiliency
- ❑ Funding opportunities exist

Questions

To ask a question, please use the chat box or use the raise hand feature.

WACO
Water Advisory Committee of Orange County

Thank you

Next WACO meeting:

Friday, October 6, 2023 at 7:30am via Zoom

Next WACO planning meeting:

Tuesday, September 19, 2023 at 7:30am via Zoom

WACO
Water Advisory Committee of Orange County