Downtown Fresno Soccer Stadium

Civil Engineering

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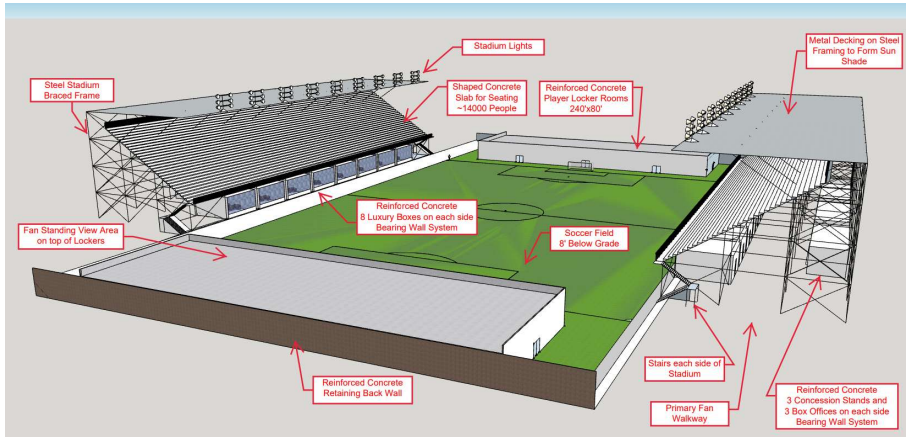
FRESNO STATE

Lyles College of Engineering

Abstract

Central Valley Engineering proposes the construction of a soccer stadium and parking facilities in Downtown Fresno, CA. Beginning in Spring 2018, Fresno's newly acquired professional soccer team will play its home fixtures at Chukchansi Park. Although Chukchansi Park can accommodate a soccer pitch, its baseball-focused design results in a skewed field and removes fans from the action. The project incorporates: the structural design of the 15,000-capacity grandstands with luxury booths; the concessions, players, and staff rooms; a geotechnical report with laboratory testing of on-site soil samples; a water distribution network meeting the demands of domestic, irrigation, and fire suppression; a sanitary sewer and storm drain system connecting the stadium and parking to the Downtown network; roadway improvements with the addition of bike lanes, walkways, and green space; and a software-based traffic simulation to model and optimize movement of vehicles and pedestrians during events.

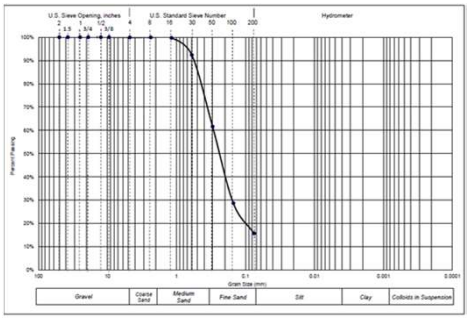
Structural Design



Architectural model of all structural components to be designed for the soccer stadium

Geotechnical Engineering Investigation

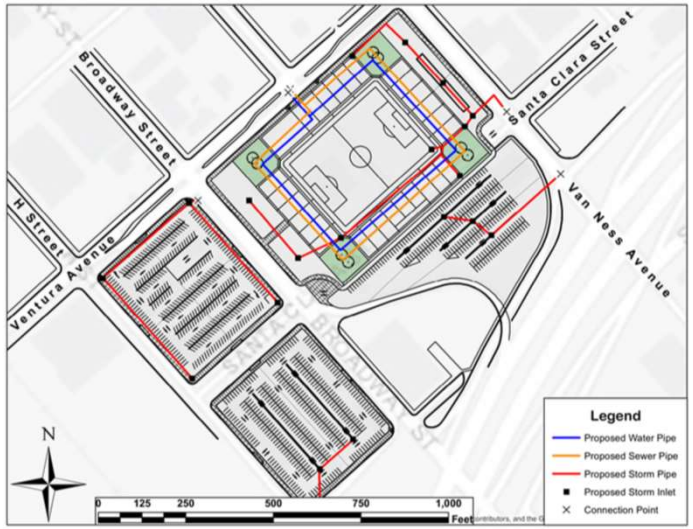
Field exploration for the project site is done to understand the existing conditions. The site is drilled at several representative locations at varying depths. Soil samples are collected to perform laboratory tests to understand the soil characteristics and properties. Taking into consideration subsurface conditions and laboratory results, conclusions and recommendations will be made for the construction of Fresno F.C.'s soccer stadium.



SIEVE ANALYSIS
ASTM C136

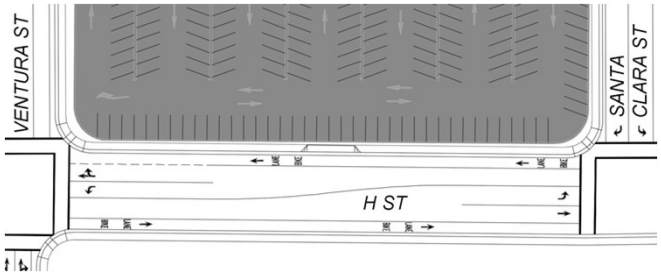
Sieve Size	Particle Size, mm	Percent Passing
1 1/2-in.	37.5	100.0%
1-in.	25	100.0%
3/4-in.	19	100.0%
1/2-in.	12.5	100.0%
3/8-in.	9.5	100.0%
No. 4	4.75	99.9%
No. 8	2.36	99.9%
No. 16	1.18	99.7%
No. 30	0.6	92.4%
No. 50	0.3	61.7%
No. 100	0.15	28.7%
No. 200	0.075	15.7%

Water Resources Design



Site plan indicating all proposed wet utilities and their corresponding connection points to existing utility infrastructure

Transportation Design



Roadway Improvements
- Re-striping
  - Added Bike Lanes
- ADA Curb Ramps
- San Benito St Realignment

Traffic Management
- Signalization
- Special Event Handling

Simulation
- Model Vehicle and Pedestrian movement
- Optimize traffic flow

Sponsors/Conclusion

Thank you to all faculty advisors involved in the project, practitioner mentor Robert Parrish, course instructor Dr. Fariborz Tehrani, Lyles College of Engineering and Salem Engineering Group, Inc.

CENTRAL VALLEY ENGINEERING