CALIFORNIA MEMORIAL STADIUM

UNIVERSITY OF CALIFORNIA, BERKELEY

4.0 STRUCTURAL NARRATIVE

PART 1 - GENERAL

1.1 INTENT

A. The intent of this Narrative is to generally describe the structural systems proposed for the California Memorial Stadium. The structural systems are designed to provide proper support of the proposed facilities and meet all requirements of the 2007 California Building Code. This Narrative supports the Schematic Design Documents and includes information that may not be reflected in those documents.

1.2 STRUCTURAL SYSTEMS SCOPE

A. California Memorial Stadium will consist of a West Seating Bowl structure (with Press Box) and Fault Rupture Zone structures (or blocks) at the known location of the Hayward Fault.

PART 2 - DESCRIPTIONS OF STRUCTURAL SYSTEMS

2.1 GENERAL SEISMICITY AND GEOTECHNICAL CONDITIONS

A. California Memorial Stadium lies directly over the Hayward Fault. The Geotechnical Engineer has supplied estimated fault movements and zones of potential ground displacement for design of the stadium superstructure. The portions of the stadium not directly over the fault will be designed for lateral forces derived from the UC Berkeley site-specific campus spectrum, developed by Dr. Paul Somerville of URS Corporation.

B. The site soils generally are dense, with good bearing capacity and little potential for liquefaction or landsliding, according to the geotechnical information developed by Geomatrix. The north portion of the site is underlain by fill material, which will be modified to support the superstructure through the use of stone columns or another comparable soil modification technique.

C. Due to the proximity of the structure to the fault, the Fault Rupture Zone structures and adjacent portions of the West Seating Bowl will be located on a mat foundation. This will create a built-in slip plane that will allow the structure to move in response to near-fault ground distortions.

2.2 PHASE I: CALIFORNIA MEMORIAL STADIUM

A. Foundations
   1. The foundation for the stadium will consist of a mat foundation or spread footings with interconnecting grade beams in various portions of the project. The areas of the project closest to the fault will be on a mat to allow the structures to slide in response to ground distortion from faulting. The other portions of the structure will be on spread footings with interconnecting grade beams, which allows for economical use of concrete.

B. Gravity Framing System
   1. The gravity framing of the below-seating support and concourse spaces will consist of cast-in-place reinforced concrete slabs supported by concrete beams and columns.
   2. The seating bowl will be framed with a sloped concrete slab supported by concrete raker beams at each gridline.

3. The Press Box will be framed with repeating story-deep steel trusses supported by concrete cores and steel columns. The upper roof will be a light steel frame with a metal deck roof. At the top level of the Press Box will be a west-facing balcony framed with exposed pipe trusses and structural glass decking.

C. Lateral Load Resisting System
1. The West Seating Bowl lateral system, in the circumferential direction of the stadium, will consist of a sloped concrete slab transferring lateral loads to new shotcrete walls (backing the historic west wall) and field-side retaining walls at the on-grade seating. In the radial direction, lateral diaphragm loads will be transferred to radial concrete walls and to core walls at the stairs and elevators.
2. The Press Box lateral system will consist of light concentric braced frames at the roof transferring loads to concrete slab diaphragms at the Club level. The Club and Press level slabs will transfer lateral loads to the concrete core walls at each end of the press box. The core walls will carry the lateral load down to the seating bowl where lateral loads are distributed through the West Seating Bowl lateral system.
3. The Fault Rupture Zone blocks will be independent structures with concrete walls on all sides and interior concrete stiffening walls to create a stiff structure that can sustain fault rupture offsets underneath its foundation. The blocks will be gapped from each other and the surrounding structures by a twelve inch open seismic joint. This joint will allow the block to slide, rotate, and tilt in response to fault rupture ground displacements without being tied to adjacent structures.
4. The existing historic West Wall will be reinforced for out-of-plane seismic forces with shotcrete backing walls. These new walls will span vertically between the ground, concourse, and seating bowl levels and anchor and brace the existing brittle concrete.

PART 3 - PROBABLE CONSTRUCTION SEQUENCE IMPLICATIONS

3.1 PHASE I: CALIFORNIA MEMORIAL STADIUM

A. The existing West Wall of the stadium will need to be temporarily laterally braced while the existing seating bowl structure is demolished and replaced. This bracing will most likely be placed outside the existing wall, on the adjacent SAHPC, to allow maximum flexibility of construction inside the footprint of the stadium.

B. Access to the site will most likely need to be from the field, which will require moving equipment in through the North tunnel and accessing the construction footprint from the on-grade seating berm.

C. The existing West Wall will need to be patched and structurally repaired after the back-up shotcrete has been installed.

END OF STRUCTURAL NARRATIVE