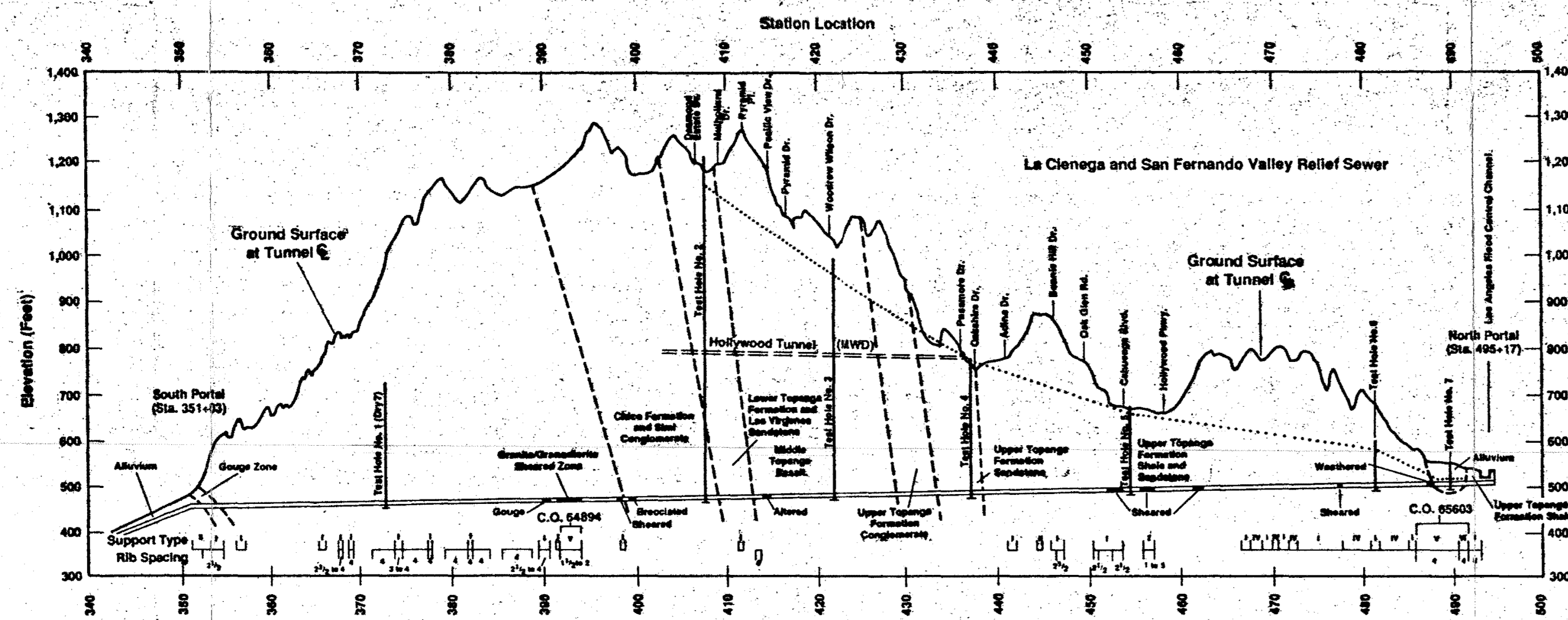


Lower Hemisphere Stereonet Projection of Rock Discontinuities

Relative Density of Rock Discontinuities as a Spherical Gaussian Function

**GEOLOGIC PROFILE AND TUNNEL SUPPORT TYPES USED**



**EXPLANATION**

- Type of Tunnel Support (I-VI) Spacing of Ribs in Feet
- Piezometric Surface Estimated from Exploratory Test Hole Data

Note: Spacing of Ribs is 5ft. Center to Center or as Indicated.

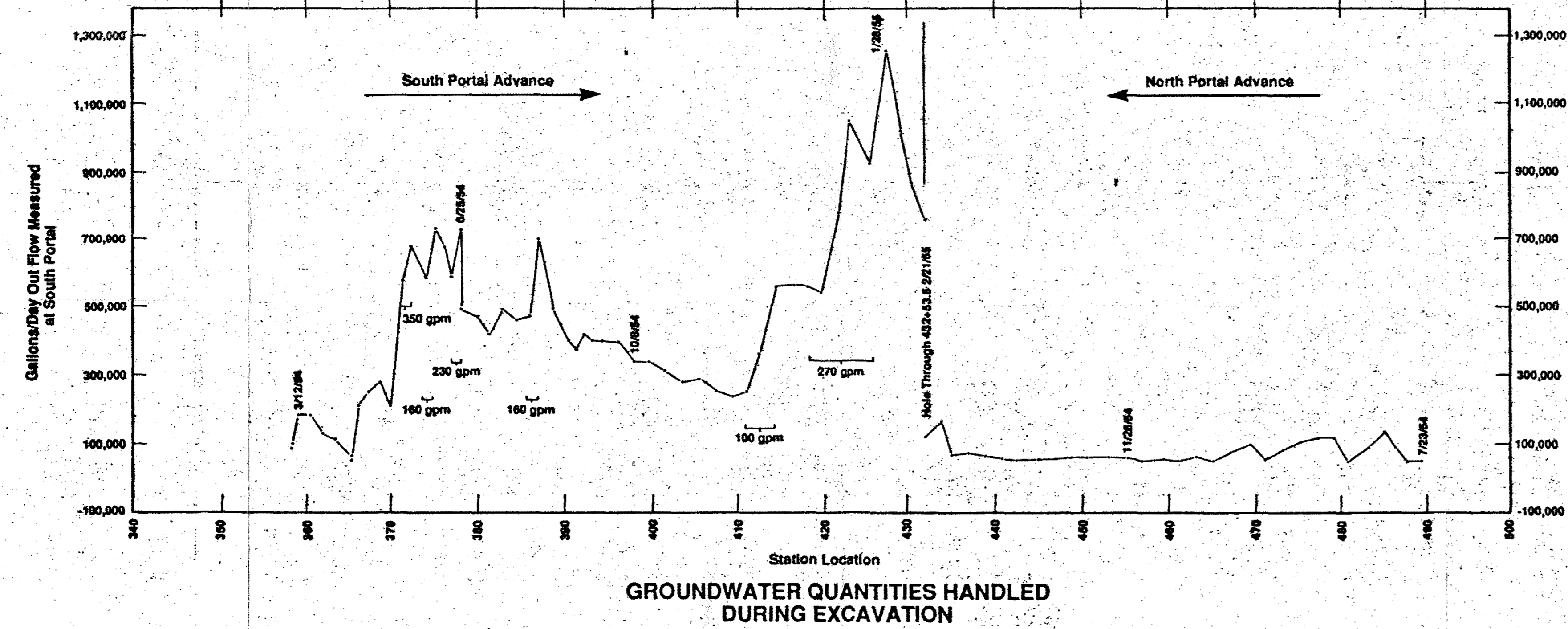
**"Heavy" Ground Types and Tunnel Support Types**

- Type I Used in Ground Which is Moderately "Heavy"
- Type II Used in Ground Which is Moderately "Heavy" and in Which Standard Tile Subdrain is Used
- Type III Used in Lieu of A-4 (Liner Plate) in Alluvial Ground
- Type IV Used Where Subgrade has Softened but Remainder of Ground Around Periphery is Firm
- Type V Used in Very "Heavy" or "Squeezing" Ground
- Type VI Used in Very "Heavy" Alluvial Ground

**Change Orders for "Heavy" Ground**

South Portal Tunnel  
C.O. 64894 "Revised Tunnel Section Installed in Heavy Ground"; "Angular Fragments and Fault Clay." Type V Supports, 4", 13 lb Steel Ribs Instead of 7.7 lb Ribs.

North Portal Tunnel  
C.O. 65603 "Constructed Heavier Tunnel Section in Poor Ground." Alluvium Caved to the Surface at Sta. 491+17 to 491+25. Types V and VI Supports.



**EXPLANATION**

- Data Point of Gallons Per Day (gpd) Plotted Versus Where Tunnel Heading was at Time of Flow Measurement
- Location Where Increase in Water Flow was Indicated at Tunnel Heading; Gallons Per Minute (gpm)

Note: Dewatering of Alluvium by Seven Wells on Universal Lot Produced 95,000 gpd at North Portal in July of 1954.