

LA Desalination Project 2018, Super Conduit, Hoop Stress Analysis

| | | | | | | |
|---------------------------------|--------|--------|--|--------------------------------|------|---------|
| Velocity | 2 | ft/sec | | Super Conduit distance | 137 | miles |
| Flow | 240000 | gpm | | Haiwee Reservoir elevation | 3774 | ft |
| High elevation minimum pressure | 300 | psi | | Super Conduit lowest elevation | 200 | ft |
| Low elevation maximum pressure | 1547 | psi | | density of steel | 490 | lb/cuft |
| Max allowable tensile stress | 30000 | psi | | | | |

Assume constant slope the whole distance from Haiwee Reservoir to Desalination Plant in Sylmar, CA

| # of Conduits in System all 137 miles | Conduit Inside Diameter all 137 miles (ft) | Minimum wall thickness at mile 0 (in) | Maximum wall thickness at mile 137 (in) | Average wall thickness all 137 miles (in) | Single Conduit average linear density all 137 miles (lb/ft) | Conduit System average linear density all 137 miles (lb/ft) | Total Conduit System weight all 137 miles (lb) |
|---|---|--|--|--|---|---|---|
| 1 | 18.45 | 1.107 | 5.709 | 3.408 | 8191 | 8191 | 5,924,758,720 |
| 2 | 13.05 | 0.783 | 4.037 | 2.410 | 4095 | 8191 | 5,924,758,720 |
| 3 | 10.65 | 0.639 | 3.296 | 1.968 | 2730 | 8191 | 5,924,758,720 |
| 4 | 9.23 | 0.554 | 2.855 | 1.704 | 2048 | 8191 | 5,924,758,720 |
| 5 | 8.25 | 0.495 | 2.553 | 1.524 | 1638 | 8191 | 5,924,758,720 |
| 6 | 7.53 | 0.452 | 2.331 | 1.391 | 1365 | 8191 | 5,924,758,720 |



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