

# 10\_Testing\_and\_Quality

## 10 — Testing & Quality

### Test Pyramid

- **Unit**: parsers, utils, schema validators.
- **Integration**: ingestion → DB → API.
- **E2E (Playwright)**: map renders, tiles respond, API healthy.

### Data Validation

- Range checks on SST; missing value handling; station existence.
- Ingest vs vendor counts within  $\pm 5\%$  threshold → else alert.

### Performance & Load

- Tiles QPS tests; API soak for 24h.
- Lighthouse CI: performance  $\geq 90$ , accessibility  $\geq 95$ .

### Release Gates

- All tests green; CHANGELOG updated; docs build passes.