

APPENDIX C

EXAMPLE VISUAL AIDS

Visual Aid #1 Causes of piping

Four conditions that must exist for piping

- Concentrated Flow Path
- Unfiltered exit
- Erodible material
- Ability to support roof

Von Thun, April 1996

Greatest piping resistance

- Plastic clay
- $PI > 15$
- well compacted or poorly compacted

Sherard, Jan 1953

Intermediate piping resistance

- well graded clay binder
 - Well compacted or poorly compacted
 - $6 < PI < 15$
- well graded cohesionless
 - $PI < 6$
 - well compacted

Least piping resistance

- Well graded cohesionless $PI < 6$; poorly compacted
- Very uniform fine cohesionless sand; $PI < 6$, well compacted or poorly compacted

Piping more likely

- Core: alluvial materials, dispersive clays, low plasticity silts, poorly & well graded sands no formal compaction
- Conduit through embankment
- No filter
- Untreated foundation irregularities
- Sheet pile wall/poorly constructed diaphragm
- Soil foundation

Foster et al, 1998

Piping less likely

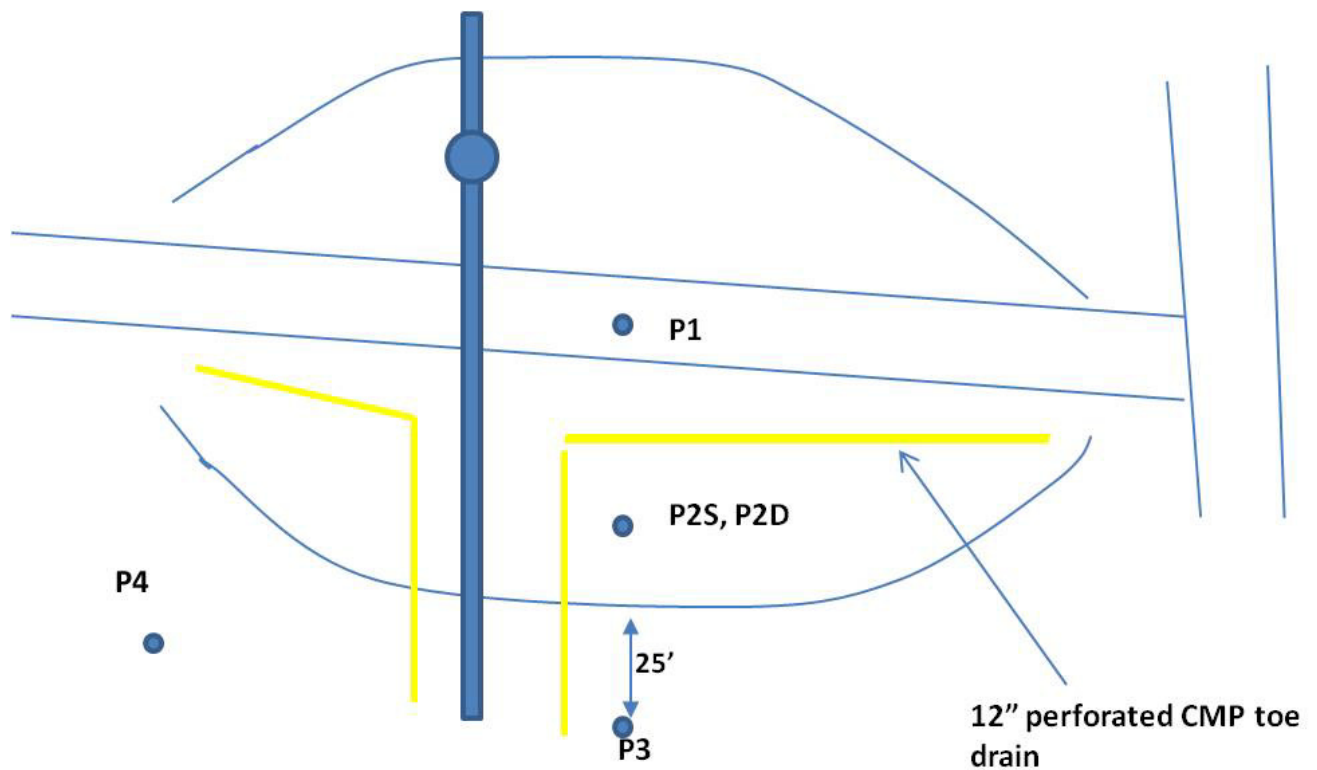
- Core: clayey & silty gravels, high plasticity clay, glacial origin, rolled with good compaction control
- Filters transition zones
- Well constructed cutoff trench/slurry wall

Visual Aid #2 Plan view of the dam

Include and clearly label:

- Instrumentation,
- Outlet
- Spillway
- Toe drains
- Manholes
- Distances between features where appropriate

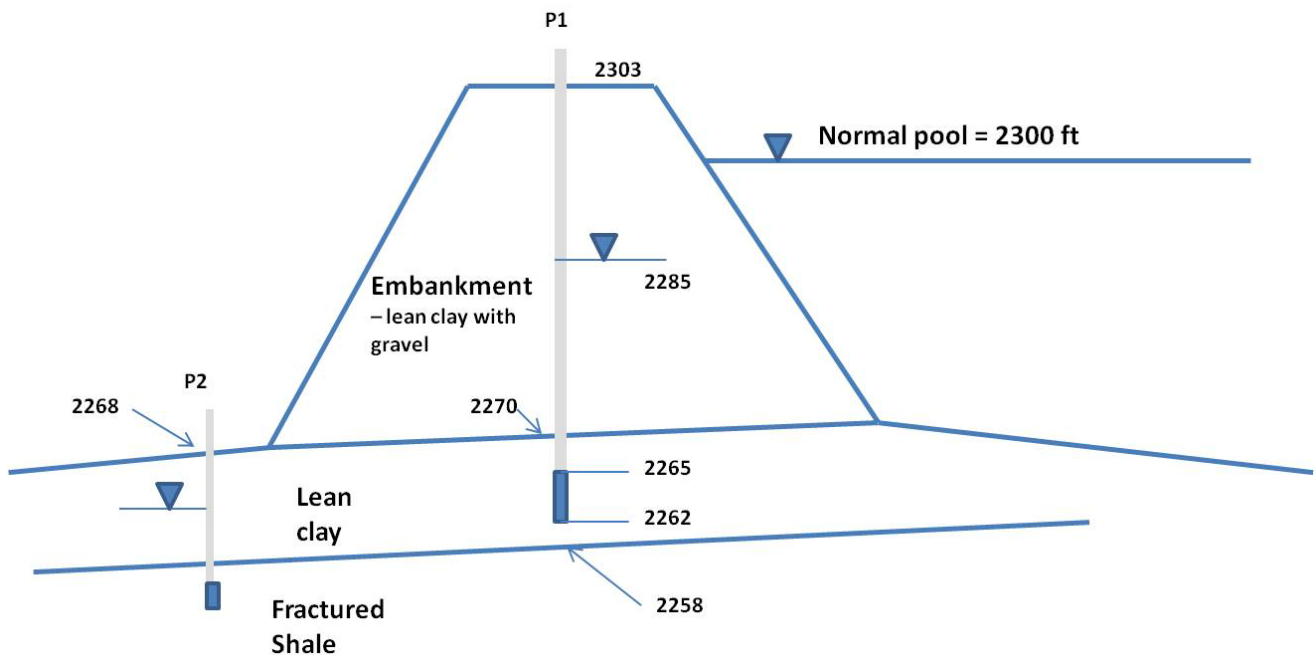
Redraft if necessary - make it simple – construction plans are often hard to see and understand



Visual Aid #3 Geotechnical Dam Cross Section

Include:

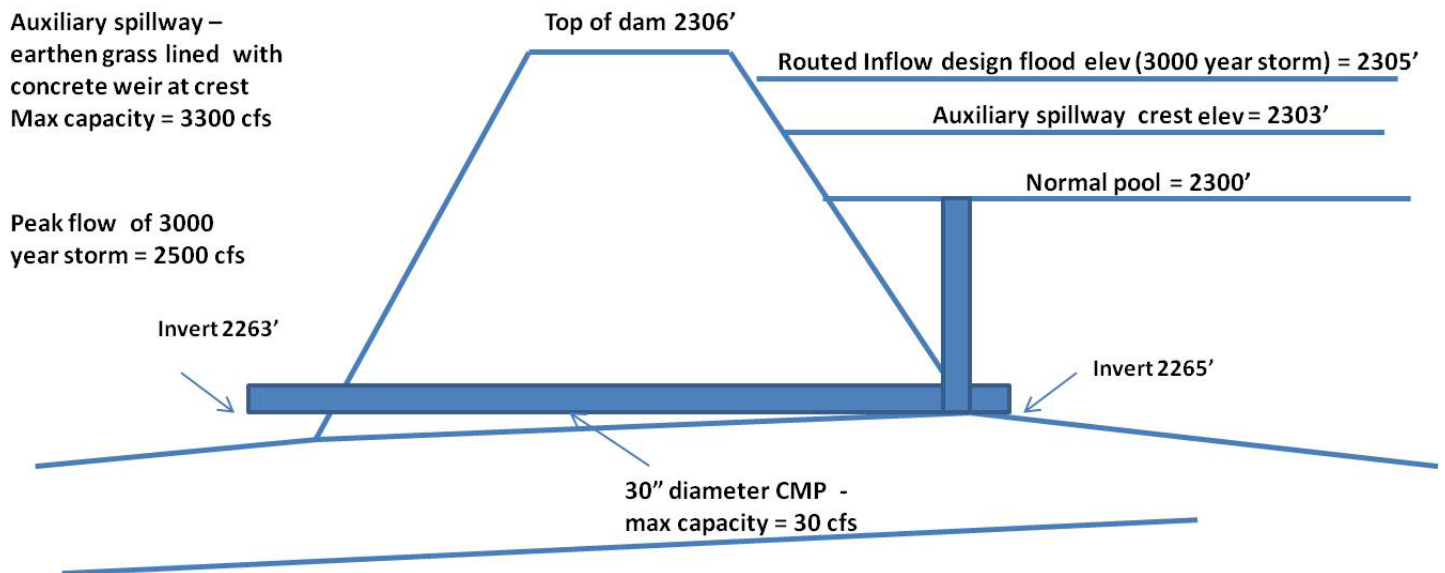
- Dam geology
- Elevations of embankment zones and foundation
- Location, depth and perforation intervals of piezometers.
- Normal pool reservoir elevation
- Static water levels in piezometers that correspond to normal pool



Visual Aid #4 Hydrologic/Hydraulic Dam Cross Section

Include:

- Elevation of spillways and outlet works
 - outlet invert
 - principal spillway (normal pool) crest elevation
 - auxiliary spillway crest elevation
- Dam crest elevation
- Maximum capacity as appropriate
- Elevation of routed inflow design flood if available



Visual Aid #5 Pertinent Dam Data

Include:

- Height
- Length
- Reservoir capacity
- Drainage area
- Age of dam
- Year of repair/modifications
- Stream or diversion
- Pertinent conclusions from past studies – be sure and note source
 - Inflow design storm flow/return period,
 - Embankment stability safety factors, etc.

Other Tips

- Print out on a 24 inches by 36 sheet and mount on poster board.
- Use large font and bold colors
- It may be necessary to have a projector available to zoom in on other engineering plans or drawings during the course of an FMA.