NEVADA DIVISION OF WATER RESOURCES
ENGINEERING REVIEW OF DAMS:
DESIGN, PLANS, AND SPECIFICATIONS

Instructions: Note page on which noted information lies. Leave no blanks.
Use check mark if page number is inappropriate.
Note deficiencies and inconsistencies on last page.

1. **APPLICATION FORM**
   1.1. _____ Heading properly completed
   1.2. _____ Location properly completed
   1.3. _____ Dam information complete
   1.4. _____ Engineer listing complete
   1.5. _____ Original signature of person listed in heading

2. **PLANS**
   2.1. _____ Owner names on plans and dam name
   2.2. _____ Vicinity/location
   2.3. _____ Survey tie to found section corner
   2.4. _____ Plan view of watershed boundary. Tributary area __________
   2.5. _____ Downstream hazard
   2.6. _____ Reservoir storage capacity curve
      2.6.1. _____ Capacity to spillway invert __________ at elevation __________
   2.6.2. _____ Capacity to crest of dam __________ at elevation __________
   2.7. _____ Reservoir area curve
      2.7.1. _____ Area at spillway invert __________ at elevation __________
      2.7.2. _____ Area at crest of dam __________ at elevation __________
   2.8. _____ Discharge curves for outlet(s) and spillway(s)
   2.9. _____ Plan view of dam and reservoir area
   2.10. _____ Post-construction topography with elevation contours
   2.11. _____ Reference point on dam. Latitude __________ Longitude __________
   2.12. _____ Limits of stripping
   2.13. _____ Borrow areas
   2.14. _____ Test pits/boreholes
   2.15. _____ Cross section alignments
   2.16. _____ Cross sections
      2.16.1. _____ Along axis
      2.16.2. _____ At outlet
      2.16.3. _____ At Spillway
2.16.4. _____ Other
2.16.5. _____ Dam crest elevation _________
2.16.6. _____ Spillway crest elevation _________
2.16.7. _____ Water level elevations
  2.16.7.1. _____ At maximum conservation __________
  2.16.7.2. _____ At IDF __________
  2.16.7.3. _____ At minimum pool (if applicable) __________
  2.16.7.4. _____ Maximum flow line in spillway and elevation _________
2.16.8. _____ Foundation elevation (after stripping and after any improvement)
2.16.9. _____ Location and dimensions of core
2.16.10. _____ Location and dimensions of filter and drain zones
2.16.11. _____ Location and dimensions of shell or random fill zones
2.16.12. _____ Location and dimensions of erosion protection
2.16.13. _____ Dam face slopes
2.16.14. _____ Dam crest camber
2.17. _____ Spillway plan view and cross sections
  2.17.1. _____ Energy dissipation
  2.17.2. _____ Erosion protection
  2.17.3. _____ Grade control
  2.17.4. _____ Concrete details
  2.17.5. _____ Reservoir control works details
2.18. _____ Outlet pipe plan view and cross sections
  2.18.1. _____ Detail of inlet. Invert elevation __________
    2.18.1.1. _____ Trash rack
    2.18.1.2. _____ Gate(s)
    2.18.1.3. _____ Gate operator(s)
    2.18.1.4. _____ Vent
    2.18.1.5. _____ Protection from ice, vandalism, wave action
    2.18.1.6. _____ Structural details
  2.18.2. _____ Detail of outfall. Invert elevation __________
    2.18.2.1. _____ Structural details
    2.18.2.2. _____ Tailwater control
    2.18.2.3. _____ Energy dissipater. Type __________
  2.18.3. _____ Detail of pipe
    2.18.3.1. _____ Support
    2.18.3.2. _____ Joints
2.18.3.3. ____ Cut off collars (NOT ADVISED AS SOLE MEANS OF SEEP CONTROL)
2.18.3.4. ____ Seep control, collection and disposal

2.19. ____ Drains
  2.19.1. ____ Type and location ________________________________
  2.19.2. ____ Filters
  2.19.3. ____ Details of construction
  2.19.4. ____ Access/cleanouts

2.20. ____ Monitoring works
  2.20.1. ____ Type, location and details

2.21. ____ Foundation improvement
  2.21.1. ____ Dental concrete
  2.21.2. ____ Grouting program
  2.21.3. ____ Piles
  2.21.4. ____ Over excavation
  2.21.5. ____ Consolidation
  2.21.6. ____ Relief wells
  2.21.7. ____ Drains

2.22. ____ Other considerations or details

3. **BASIS OF DESIGN**

3.1. **HAZARD CLASSIFICATION** _________________________________

3.2. **HYDROLOGY**
  3.2.1. ____ Tributary area described
    3.2.1.1. ____ Nature of tributary area
    3.2.1.2. ____ Base flow
  3.2.2. ____ Storm recurrence interval _________________________
    3.2.2.1. ____ Appropriate for hazard/size?
    3.2.2.2. ____ Incremental damage analysis?
  3.2.3. ____ Runoff calculation method utilized ____________________
    3.2.3.1. ____ Appropriate curve numbers or infiltration rates
  3.2.4. ____ Flood routing method utilized _________________________
  3.2.5. ____ Freeboard to crest of dam ____________________ ft.
  3.2.6. ____ Freeboard in spillway __________________________ ft.
  3.2.7. ____ Dam break analysis
    3.2.7.1. ____ Method utilized _________________________
    3.2.7.2. ____ Appropriate constants applied?
3.2.7.3. ____ Inundation maps
3.2.8. ____ Potential for seiche due to landslide into reservoir
3.2.9. ____ Reservoir fetch and wave run up calculations

3.3. FOUNDATION
3.3.1. ____ Geotechnical report
  3.3.1.1. ____ Surface conditions
  3.3.1.2. ____ Possible geological hazards 
  3.3.1.3. ____ Stripping requirements
  3.3.1.4. ____ Borrow area(s)
  3.3.1.5. ____ Shear strength for each zone
  3.3.1.6. ____ Permeability
  3.3.1.7. ____ Grain size distribution and classification
3.3.2. ____ Boring/test pit logs
  3.3.2.1. ____ Located on plans
  3.3.2.2. ____ Located in report
  3.3.2.3. ____ Total depth
  3.3.2.4. ____ Stratigraphy with location of various formations and depth to groundwater
3.3.3. ____ Seep analysis
3.3.4. ____ Foundation cut-off
3.3.5. ____ Strength of foundation materials
3.3.6. ____ Foundation/abutment improvement necessary
3.3.7. ____ Expected settlement
3.3.8. ____ Overall depth to groundwater
3.3.9. ____ Deficiencies or special conditions

3.4. EMBANKMENT
3.4.1. ____ Availability of suitable materials
3.4.2. ____ Soil properties
  3.4.2.1. ____ Shear strength tests. Max. allowable shear stress
    3.4.2.1.1. Core _____ psi
    3.4.2.1.2. Shell or random fill _____ psi
    3.4.2.1.3. Other structural zone _____ psi __________________
  3.4.2.2. ____ Particle size distribution and classification
    3.4.2.2.1. ____ Core
    3.4.2.2.2. ____ Drain(s)
3.4.2.2.3. _____ Filters
3.4.2.2.4. _____ Shell or random fill
3.4.2.2.5. _____ Erosion protection
3.4.2.2.6. _____ Erosion protection bedding
3.4.2.3. _____ Density curves. Method ________________________
3.4.2.4. _____ Filter compatibility between zones

3.4.3. _____ Slope stability
3.4.3.1. _____ Factors of safety
3.4.3.1.1. Post-construction static ______
3.4.3.1.2. Steady state seep ______
3.4.3.1.3. Rapid fill ______
3.4.3.1.4. Rapid draw down ______
3.4.3.1.5. Seismic ______
   3.4.3.1.5.1. Method of determining seismic stability ____________
   3.4.3.1.5.2. Constants used ________________________
   3.4.3.1.5.3. Pseudo-static seismic coefficient ______
   3.4.3.1.5.4. _____ Assumptions stated?

3.4.4. _____ Seep analysis
3.4.5. _____ Armoring
   3.4.5.1. _____ Riprap calculations including bedding
   3.4.5.2. _____ Soil-cement design
   3.4.5.3. _____ RCC design
   3.4.5.4. _____ Other revetment design

4. **SPECIFICATIONS**
4.1. _____ Standard specification cited ________________________________
4.2. _____ Inspection and testing schedules for all facets of work and materials
4.3. _____ Test or inspection failure procedure
4.4. _____ Clearing and grubbing construction area
   4.4.1. _____ Stripping unsuitable material
   4.4.2. _____ Identification of waste dumps
   4.4.3. _____ Identification of areas of over stripping
4.5. _____ Borrow sources
   4.5.1. _____ Material stockpiles
   4.5.2. _____ Material handling
   4.5.3. _____ Rejection of loads
4.5.4. ____ Moisture conditioning

4.6. ____ Foundation preparation and compaction
   4.6.1. ____ Relative compaction ___________ Mod. Proctor/Proctor
   4.6.2. ____ Special requirements

4.7. ____ Placement of embankment materials
   4.7.1. ____ Lift thickness
   4.7.2. ____ Relative compaction ___________ Mod. Proctor/Proctor
   4.7.3. ____ Equipment requirements
   4.7.4. ____ Filter and drain placement

4.8. ____ Concrete
   4.8.1. ____ Strengths

4.9. ____ Erosion protection
   4.9.1. ____ Riprap
   4.9.2. ____ Soil-cement
   4.9.3. ____ RCC
   4.9.4. ____ Other

NOTES ON NEXT PAGE