ENDWALLS AND WINGWALLS

Concrete Culvert Overview Flowchart
Structural Defects Flowchart (Concrete)
Bedding Deficiencies Flowchart (Concrete)
Hydraulic Capacity Flowchart (Concrete)

1. SUMMARY

Endwalls and wingwalls can reinforce the culvert barrel, protect it against the erosion, and act as a counterweight to offset buoyant forces (Figure 1). Installing a new headwall may be more efficient than culvert replacement when hydraulic capacity of the existing culvert needs to be increased. Wingwalls help mold and direct channel flow into the culvert and protect the area around the inlet from scour. Endwalls are usually constructed parallel with the embankments at the ends of the culvert (Figure 2) (Ballinger and Drake, 1995).

Deteriorated or collapsed endwalls and windwalls can be replaced. Ballinger and Drake (1995) provided guidelines for replacing headwalls and windwings in Appendix B-16, and for repairing basically sound headwalls and windwings in Appendix B-17. Procedures for repairing severely deteriorated headwalls and windwings are listed in Appendix B-18.

Figure 1. Headwall and wingwalls (CDOT, 2004)

Figure 2. Culvert headwall parallel with the embankment (Kearley and McCallister, 2000)

2. REFERENCES

Ballinger, C.A., and P.G. Drake, 1995. *Culvert Repair Practices Manual*, Vol. 1 & Vol. 2 (Appendices), FHWA-RD-95-089, May 1995, US Department of Transportation, Federal Highway Administration (FHWA), McLean, VA, 330p & 321p

CDOT, 2004. *Drainage Design Manual*, Chapter 11: Energy Dissipators, Colorado Department of Transportation, 30p.

Kearley, G. and L. McCallister, 2000. *Recommended Practices Manual a Guideline for Maintenance and Service of Unpaved Roads*, Feb 2000, 69p

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