Culvert hydraulics

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Culverts are simple structures
Hydraulics are complex
Six principle types of flow:

> Weir or orifice control at inlet

> Four cases of control at or downstream of the outlet
Inlet control

Figure 2.3  Type I flow

Figure 2.7  Type V flow
Inlet flow control curves
Outlet control (1)

Figure 2.4  Type II flow

Figure 2.5  Type III flow
Outlet control (2)

Figure 2.6  Type IV flow

Figure 2.8  Type VI flow  Also partially full case
Culvert performance curve with roadway overtopping

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headwater elevation (ft)
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flow rate (ft³/s)
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- **Roadway Crest**
- **Outlet Control**
- **Inlet Control**
- **Top of Culvert**
- **Overall Performance Curve**
- **Culvert plus roadway overtopping**