

GATED PIPE DESIGN WORKSHEET

LANDOWNER: _____ DATE: _____

PREPARED BY: _____ FIELD OFFICE: _____

Field # _____ Acres: _____ Soil Type: _____

Field Width: _____ ft. Field Slope: _____ %

Q = _____ M.I. or _____ gpm or _____ CFS

Maximum Nonerosive Streamflow ("C" value from IDIG, Part 692, §692.10)

$$\frac{C}{S} = \frac{\text{Constant for Soil Type}}{\text{Field Slope in Percent}} = \frac{(\quad)}{(\quad \%)} = \quad \text{gpm}$$

$$\text{Gates/set} = \frac{(\quad) \text{gpm (TOTAL)}}{(\quad) \text{gpm/gate}} = \quad \text{use } \quad$$

$$\text{Width/set} = (\quad \text{open gates})(\quad \text{ft./gate}) = \quad \text{ft.}$$

$$\text{Number of sets} = \frac{\text{Field Width}}{\text{Width/set}} = \frac{(\quad) \text{ft.}}{(\quad) \text{ft.}} = \quad \text{use } \quad$$

$$\text{Revised width of set} = \frac{\text{Field width}}{\text{Number of sets}} = \frac{(\quad) \text{ft.}}{(\quad) \text{sets}} = \quad \text{ft./set}$$

$$\text{Number of gates/set} = \frac{(\quad) \text{ft.set}}{(\quad) \text{ft./gate}} = \quad$$

$$\text{Check stream size: } \frac{Q}{\text{gates/set}} = \frac{(\quad) \text{gpm}}{(\quad) \text{gates/set}} = \quad \text{gpm/gate}$$

_____ O.K. _____ Not acceptable
 (If not acceptable, change the number of sets.)

Pipe Size Analysis

Try _____" diameter _____ pipe material _____ single gate _____ double gate

$$V = \frac{Q}{A} = \frac{(\quad) \text{CFS}}{(\quad) \text{ft}^2} = \quad \text{fps}$$

$$\text{Inlet Head} = \frac{v^2}{2g} \times 1.5 = \frac{(\quad)^2}{64.4} \times 1.5 = \quad \text{ft.}$$

$$\text{Friction loss} = \quad \text{ft/ft (from EFM App. 6 or formula)}$$

$$\text{Multiple Outlet Factor (MOF)} = \quad \text{(from EFM 15-52, Ex. 15-4)}$$

$$\text{Friction loss in section being irrigated from} = (\text{MOF})(\text{Friction loss})$$

$$= (\quad) \times (\quad \text{ft/ft}) = \quad \text{ft/ft}$$

NOTE: To complete design, compare friction losses to profile of ground slope, adjust pipe size and/or install head control provisions as required by practice standard 430-HH.