APPENDIX 8

DESIGN OF WASTEWATER PUMP STATIONS

Proposed Wastewater Pump Station At _____

Designed By _____ **DATE** _____

INFLOWS

Refer to clause 4.6 of the Standards

1. Average dry weather flow ..... l/s
2. Peak daily dry weather flow ..... l/s
3. Peak wet weather flow ..... l/s

HEAD LOSSES

Static Head

Level at rising main discharge (or highest point) = m

Level at pump bowl = m

Static Head = m

Friction Head

Friction head ADWF l/s

Required Discharge (@ P.W.W.F.) = l/s

Select Diameter = mm

Rising Main Material =

Length = m

Head Loss (from flow resistance chart) = m

Fitting Loss = m

TOTAL HEAD (@ P.W.W.F) = _____ m

TOTAL HEAD (@ A.D.W.F) = _____ m

PUMP SELECTION

Proposed Pump Type _____ Impeller _____

PLOT SYSTEM CURVE AND CHECK SELECTION

Discharge (l/s)	( )	( )	( )	( )	( )	( )	( )
Head Loss							
Static Head							
Fitting Losses							
Total							

Operating Discharge (from system curve) = l/s

Operating Head (from system curve) = m

Wastewater Flow Velocity (1.0 m/s <VEL> 3.0 m/s) = m/s
(From System Head Curve and Rising Main dia.)

Check Efficiency of Various Impellers (see notes)

Revised Pump (if applicable) Type _____ Impeller _____
(Attach system curve to final calculation sheet)

Revised Initial Impeller (see note)

PUMP CHAMBER SIZE

Wet Well Diameter = mm

Wet Well Invert = m

Wet Well Storage Volume = l

Storage Volume in Pipes, Manholes and Storage Chamber = l

Total Storage
(Refer to clause 4.15.2 of the Standards)

Wet Well Volume required for Desirable Storage at 4 hrs A.D.W.F = l

Final Storage Time at 4 hrs A.D.W.F (see note) = hrs

Wastewater Inlet Invert = m

Distance between Start and Stop Points = mm

Volume Between Stop and Start Points (see note) $V_{min} = \frac{T_{min} \times Q}{4}$ = l

NOTES

Check capacity of rising main receiving sewer.

Check pipe class of rising main is compatible with operating pressure head.

Check that stop and start levels are adjusted so as to prevent surcharge in inlet pipe.

Check alignment of inflow pipe into station as to prevent airlock of pump. (May require baffle).

A smaller impeller may be desirable if only part of the overall catchment is initially contributing.

Sump volume $V_{min} = \frac{T_{min} \times Q}{4}$

Where Vmin is in litres
Tmin (cycle time) is in seconds
Q (pump capacity) is in l/s

Therefore $T_{min} = \frac{60min}{15} = 4min = 240$ secs.

Power Consumption in kWhr/Day = $\frac{\text{A.D.W.F.}}{\text{Pump Capacity}} \times$ Pump Power Input x 24

Note: min/max starts align with pump supplier's specifications