

## Overview

Proper grit system pump selection requires calculating the TDH of the overall grit system and is based on the specific system layout. TDH is the total equivalent height that a fluid is to be pumped, taking into account friction and minor losses in the system piping. TDH includes total static head, which is the change in water elevation between the water level in the grit collection device and grit washing device, combined with headloss through the grit washing device and friction and minor losses in system piping. TDH is determined at a specific pump flow rate using this equation:  $TDH = \text{Total Static Head} + \text{Friction Loss} + \text{Head at Washing Unit}$

<b>A</b>	Static Suction Head ( $H_1-H_2$ )		ft		m
<b>B</b>	Static Discharge Head ( $H_4-H_3$ )		ft		m
<b>C</b>	Pump Flow Rate		gpm		l/s
<b>D</b>	Grit Washing Unit Headloss ( $H_5^*$ )		ft		m
<b>E</b>	Total Static Head (B-A)		ft		m
<b>F</b>	Friction Loss		ft		m
<b>G</b>	Total Dynamic Head (D+E+F)		ft		m

## Definitions

**Static Suction Head (A)** - Change in elevation between the water surface in the grit collection tank ( $H_1$ ) and the pump ( $H_2$ )

**Static Discharge Head (B)** - Change in elevation between the water surface in the washing unit ( $H_4$ ) and the pump ( $H_3$ )

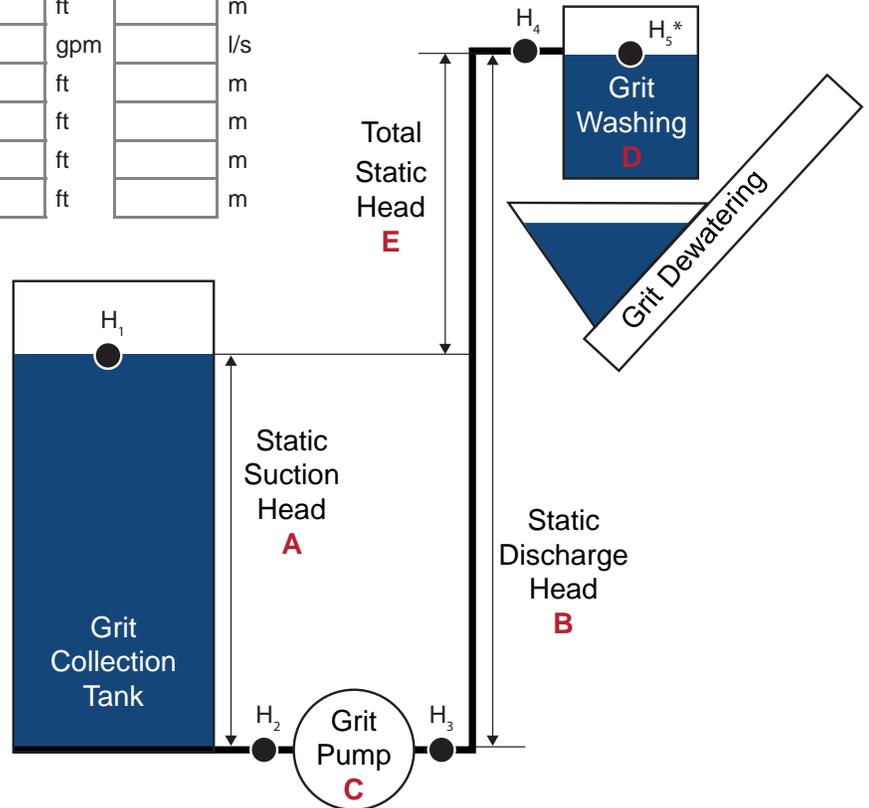
**Pump Flow Rate (C)** - Specific pump rate at which concentrated grit slurry will be pumped from the collection device to the washing device

**Grit Washing Unit Headloss (D)** - Grit washing or concentrating equipment will impart additional headloss ( $H_5^*$ ). Headloss curves for particular products should be available from the equipment manufacturer\*

**Total Static Head (E)** - Total static head is the distance that the water is to be lifted or the difference in elevation of water surfaces between the grit collection tank and the washing unit. **Total Static Head, ft = (Static Discharge Head, ft (B)) - (Static Suction Head, ft (A))**

**Friction Loss (F)** - Headloss associated with the piping and fittings between the bulk grit collection tank and the grit washing units as well as tank entrance and exit losses at the flow rate. Length and diameter of all piping plus quantity and types of all valves, couplings, elbows, and fittings must be included to determine total friction loss.

**Total Dynamic Head (TDH) (G)** - Total equivalent height that a fluid needs to be pumped at a flow rate, taking friction losses in the pipe into consideration. For water, TDH is the pressure head difference between the pump's inlet and outlet when measured at the same elevation and with an equal diameter inlet and outlet. TDH is also the work done by the pump per unit weight, per unit volume of fluid.



The results of this calculation are to be used for estimation purposes only. There are numerous factors which need to be considered in selecting a pump for a specific project. Proper pump selection is the responsibility of the system Design Engineer. Hydro International assumes no responsibility for pump selection based on results from this estimate.