2. Wastewater treatment through Coarse Solids Reduction:

mechanically cleaned screens to shred screenings that are cut up into a smaller, more uniform size for return to the flow stream for subsequent removal by downstream treatment operations and processes, communitors, macerators and grinders can theoretically eliminate the messy and task of screening handling and disposal.

Comminutors – small WWT (0.2 m³/s or 5 MGD) 6 - 20 mm (0.25 N 0.77in)

a. Comminutors:

Comminutors are used commonly in small wastewater treatment plants having discharge less than $(0.2m^3/s \text{ or 5MGD})$. They are installed in a wastewater flow channel to screen and shred material to sizes from 6 to 20 mm (0.25 to 0.77 in) without removing the shredded solids from the flow stream. It cuts them to a relatively uniform size and prevents the solids from freezing/clogging in the flow.

Comminutors are always placed before the grit chamber

PRETREATMENT PROCESS -COMMINUTORS & MACERATORS-



Macerators







b. Macerators:

Macerators are slow speed grinders that typically consist of two sets of counter rotating assemblies with blades. The assemblies are mounted vertically in the flow channel. The blades or teeth on the rotation assembles have a close tolerance that effectively chop material as it passes through the unit



c. Grinders:

High speed grinders, receive screened materials from base screen. The materials are pulverized by a high speed rotation assembly that wets the materials passing through the unit.



(B) Shredder.

3. Grit Removal system from Wastewater:

Grit Chamber



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It is a Unit operation (physical). Removal of grit form waste water may be accomplished in grit chambers or by centrifugal separation of solids. Grit chambers are designed to remove grit, consisting of sand, gravel, , or other heavy solid materials that have specific gravities or setting velocities substantially greater than those of organic particles in wastewater. Grit chambers are most commonly located after the bar screens and before the primary sedimentation. These are just like sedimentation tanks, design mainly to remove heavier particles or coarse inert and relatively dry suspended solids from the wastewater. There are two main types of grit chambers like rectangular horizontal flow types and aerated grit chambers. In the aerated grit chamber the organic solids are kept in suspension by rising aerted system provided at the bottom of the tank.

Purpose of Grit Chamber

Grit chambers are provided to:

Protect moving mechanical equipment from abrasion and accompanying abnormal wear.

Reduce formation of heavy deposits in pipelines, channels and conduits.

Reduce the frequency of digester.