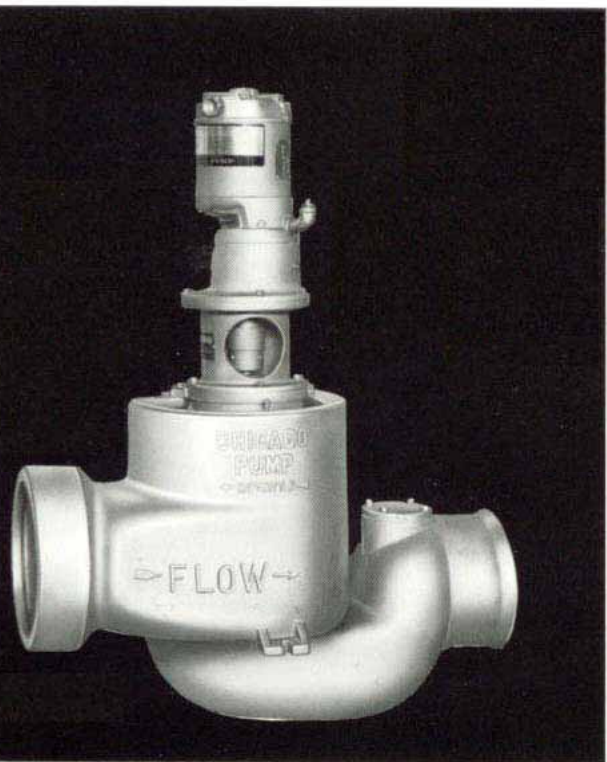


# The Original Chicago Pump® Comminutor



In-the-flow comminution  
for domestic and industrial  
waste treatment plants

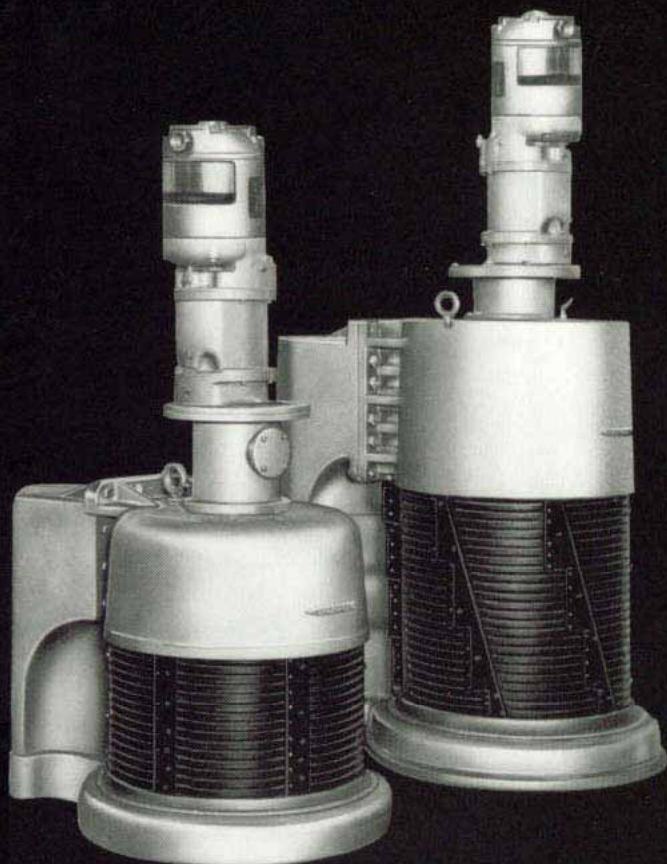
Designed for flows to  
**72 mgd**

Sizes from  
**7" to 54"**

In-line 7" and 10"  
comminutors

Easy-Lift 7"  
comminutor

Hydraulic drives  
available for all  
sizes





# Number 1 in comminution

The Chicago Pump® comminutor was originated and developed for in-the-flow comminution • Chicago Pump Company manufactures the most complete line of comminution equipment available.

The Chicago Pump® comminutor, a rugged machine for the automatic and continuous screening and cutting of coarse entrained sewage solids without their removal from the sewage channel was originated over 50 years ago. The introduction of this unit provided plant operators with an automated means of handling in-the-flow solids, eliminating the costly manual raking of the odoriferous materials.

The Chicago Pump comminutor continuously screens and comminutes large solids into small settleable particles. These small particles pass through a maximum drum slot of  $\frac{3}{8}$ "

and settle readily in a settling tank, whereas, larger uncut materials tend to remain in suspension. Reduced comminuted particles are more easily transferred without clogging pumping equipment, and are also more suitable for the digestion process.

Through the years, the comminutors have been improved, simplified, and perfected. Today, the Chicago Pump comminutor provides the ultimate in design and mechanical qualifications. Over 7,000 installations of all types, varying from a 7" unit to the largest, a 54" comminutor, attest to the acceptance of the Chicago Pump comminutor.



## Outstanding advantages of the Chicago Pump® comminutor

### **Automatic In-The-Flow Screening and Cutting of Sewage Solids**

Eliminates the objectionable and costly need for manual raking and its associated messiness, odors, and insect nuisance.

### **Extremely Low Liquid Differentials (Head Loss)**

By using the total drum area as a screen, low liquid level differentials are attained.

### **Screening and Comminution of the Entire Flow**

No portion of the flow is allowed to pass uncut as a result of overflows etc. Uncut solids in the liquid introduce the possibility of serious problems with the mechanical equipment downstream of the comminutor.

### **Systematic Staggering of the Cutting and Shearing Components**

Provides continuous and gradual cutting, equal torque distribution, and most important, eliminates plugging during high rag loads.

### **Maximum Cutting Efficiency**

The result of the drum assembly rotating in *one* direction at a constant *optimized* speed.

### **Drive Alternatives**

Gearmotor drives in close-coupled or extended shaft configurations.

Hydraulic drives for remote operation in explosion bound atmosphere or installations subject to flooding.

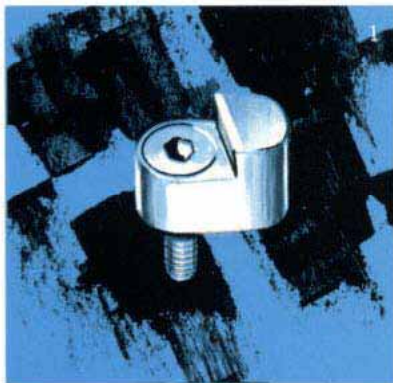
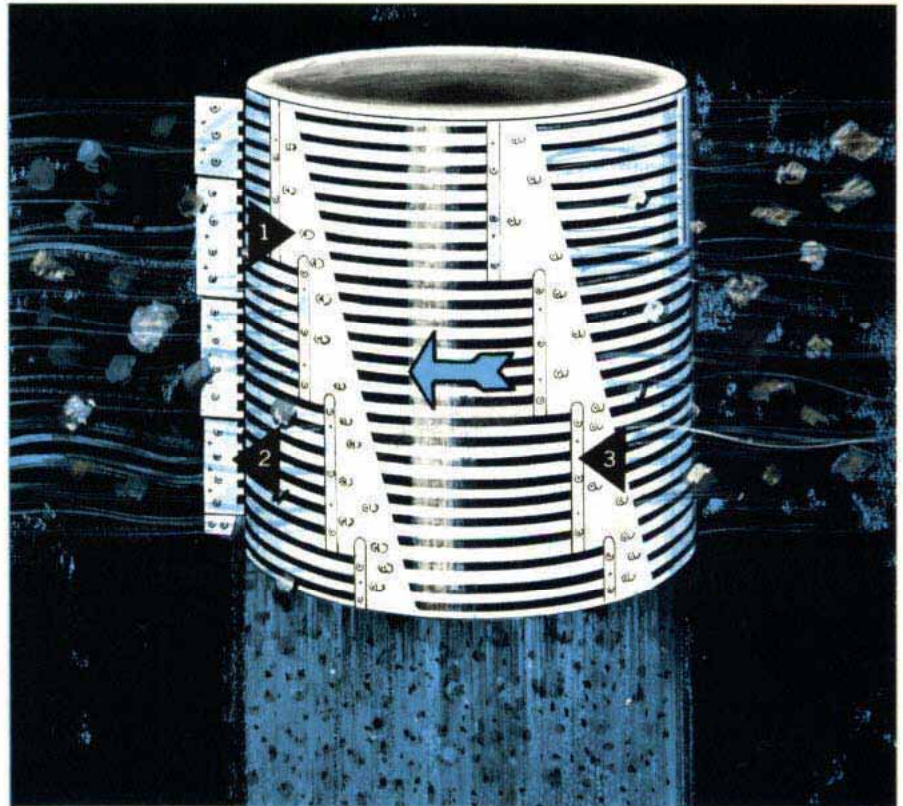


# Simplicity of operation

The cutting action of the comminutor is provided by a systematic arrangement of rotating drum cutting components consisting of cutting teeth, shear bars, and stationary cutting comb bars.

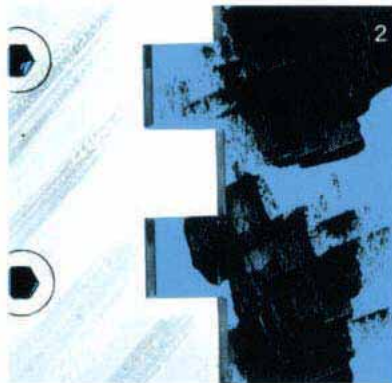
## Drum

The heavy duty, slowly rotating slotted drum is a combination screen and support casting for the cutting teeth and shear bars. Heavily constructed, the drum provides life-long maintenance-free dependability.



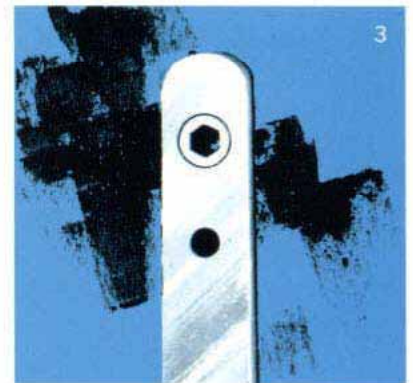
## Cutting teeth

The cutting teeth are effectively positioned on the entire outer perimeter of the rotating drum screen in a staggered, or diagonal alignment. As the drum rotates the cutting teeth pass through the stationary comb sections and cut against them. This concept provides smooth continuous cutting and prevents "shock" transmission to the bearings, motor and shaft. The cutting teeth are made of a special cast stellite alloy, which may be resharpened, if necessary.



## Comb bars

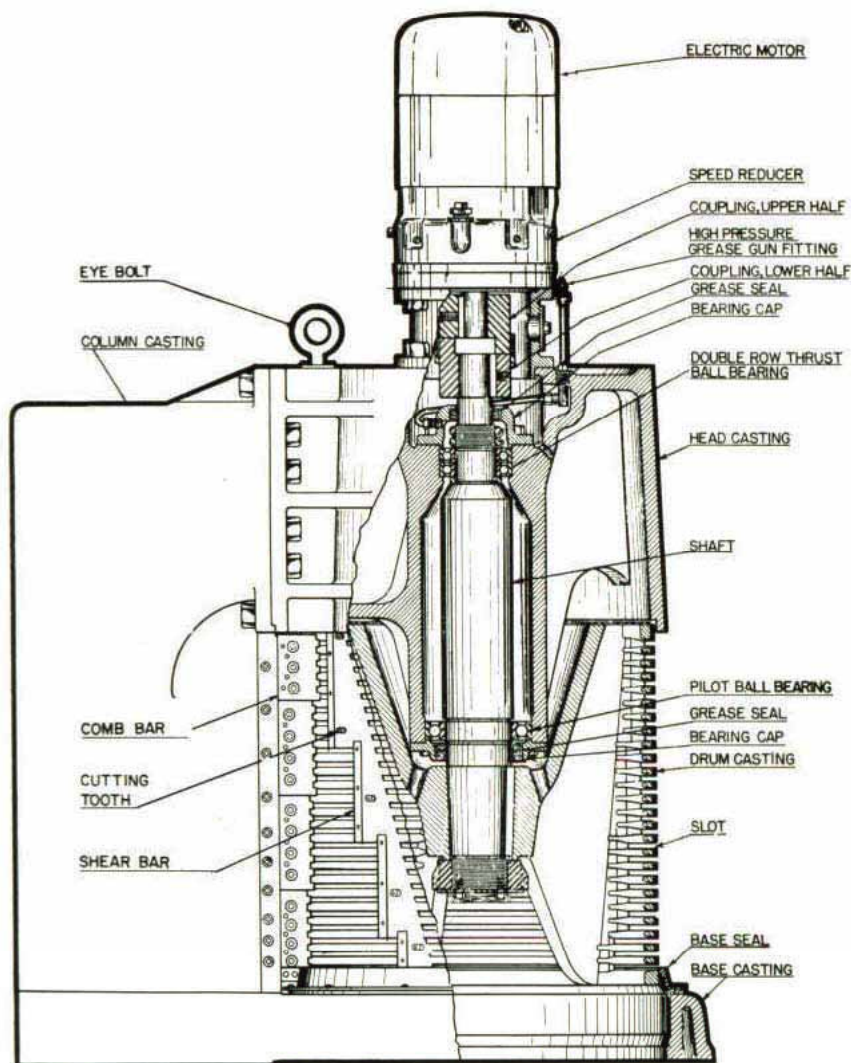
The comb bars are mounted against the main casing of the comminutor. The effective positioning of the comb bars, in a diagonal alignment (opposed to the cutting teeth alignment) further provides for a smooth, continuous cutting and shearing action. All combs are made of hardened tool steel for durability and are individually replaceable.



## Shear bars

The rectangular shear bars provide additional cutting against the outer surface of the stationary comb bar section. These abrasive resistant hardened tool steel bar sections are also mounted in a staggered manner as an integral part of the rotating drum assembly.





## Ruggedness and simplicity of construction

The simplicity of the comminutor enables easy maintenance. Moving parts have been held to a minimum to reduce wear. No dismantling is necessary to obtain access to the cutting components. All are mounted on the outside of the machine.

Aside from lubrication and periodic inspection of cutting components, the comminutor does not require any maintenance. The machine simply cuts, shears, screens and disposes of large solid matter in the incoming waste.

## Gearmotor drive configurations

### MOTOR ON SUPPORT PIPE ASSEMBLY:

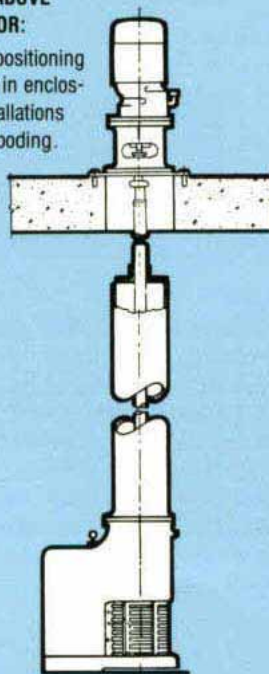
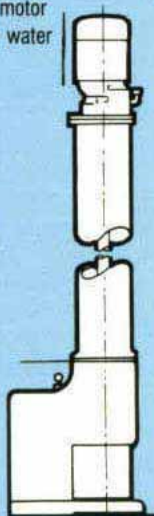
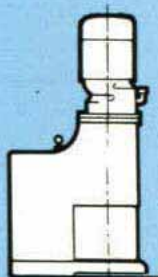
For elevation of motor above maximum water level.

### MOTOR INSTALLED ON FLOOR ABOVE COMMUNUTOR:

For remote positioning of the motor in enclosed type installations subject to flooding.

### STANDARD HEIGHT:

For installation in channels not subject to motor flooding.



## Hydraulic drive

If your plant design:

- Requires an explosion proof unit
- Includes deep channels where flooding might occur
- Can't utilize an extended shaft configuration

A hydraulically driven unit should be selected.

Configurations are available from the factory and are prepared individually to meet your exacting needs.



## Technical data

		7C	10C	15C	25M	25A	36A
MOTOR & GEAR UNIT	Horsepower	1/8	1/4	3/4	1 1/2	1 1/2	2
	Motor RPM	1750	1750	1150	1750	1750	1750
	Reduction Ratio	31 to 1	31 to 1	31 to 1	70 to 1	70 to 1	106 to 1
	Standard Voltage	1 Phase 115/230		NON-STANDARD 230/460			
CUTTING TEETH	Quantity	7	14	22	30	32	46
COMBS	Quantity	1	2	3	1	4	4
SHEAR BARS	Quantity	3	8	12	12	24	56
SLOTS	Nominal Width Each	1/4"	1/4"	1/4"	3/8"	3/8"	3/8"
	Total Area	27.0	63	123	325	595	1182
CYLINDER (DRUM)	RPM	56	56	37	25	25	16.5
	Outlet Area (Sq. In.)	24.9	52.7	119	312	368	804
	Screen Area (Sq. In.)	90.4	256	540	953	1660	3547
HOUSING MATERIAL		CAST IRON					
RETURN BEND MATERIAL		C.I.	GALVANIZED FABRICATED SHEET STEEL				
SUPPORT PIPE ASSEMBLY	Available Support Pipe Lengths	5'	6' Max.	6' Max.	6' Max.	6' Max.	6' Max.
	Pipe Diameter	5"	6"	6"	8"	8"	12"
PROTECTION PIPE ASSEMBLY	Standard Length	6'	6'	6'	6'	6'	6'
	Diameter	5"	6"	6"	8"	8"	12"
FINISH PAINT		ONE COAT MACHINERY ENAMEL					
SIZE OF FLOOR OPENING WHICH WILL PASS UNIT	Square	32"	22"	28"	41"	42"	64"
	Rectangular	19" x 34"	16" x 26"	19" x 34"	32" x 49"	34" x 51"	48" x 69"

## Comminutor specifications

Furnish and install \_\_\_\_\_ (Motor Driven) (Hydraulically Driven)\* comminutor(s) that will continuously screen and comminute solids in the raw sewage flow. They (it) shall be Chicago Pump size \_\_\_\_\_. The comminutor(s) shall reduce the solids to a size that will pass through \_\_\_\_\_ inch slots in the single direction, continuously rotating drum.

The comminutor(s) shall be designed to screen and comminute the entire design flow of \_\_\_\_\_ MGD and not allow overflow of uncut solids. The headloss through the comminutor at design flow shall not exceed \_\_\_\_\_ inches.

The cutting elements shall be provided over the entire height of the drum screen and stationary casting. The total screen area shall not be less than \_\_\_\_\_ square inches.

The comminutor(s) shall be complete with 3 types of cutting elements to achieve the required comminution. The stationary comb-bar sections shall be of hardened tool steel. Shear-bar sections shall be hardened tool steel and shall be integrally mounted on the rotating drum. Cutting teeth shall be abrasion resistant stellite alloy and pass through the stationary comb sections. The cutting teeth shall be effectively spaced and staggered on the entire rotating drum assembly. All cutting elements shall be individually replaceable.

Each comminutor shall receive one shop coat of rust inhibitive primer and one final coat of machinery enamel.

\*A. For motor driven comminutor:

Furnish one gearmotor with each comminutor \_\_\_\_\_ HP, \_\_\_\_\_ Volts, \_\_\_\_\_ Phase, \_\_\_\_\_ Hertz of totally enclosed (explosion proof) (weatherproof)\* design.

The gearmotor drive arrangement shall be: (specify one)

1. Standard height with the gearmotor mounted directly on the comminutor.
2. Complete with support pipe assembly, elevating the gearmotor above the comminutor with an intermediate motor support and flexible shafting extension.
3. Complete with shafting protection pipe, small or large floor plate, and the gearmotor mounted on the floor above. The intermediate shafting shall be enclosed by a galvanized pipe to a point above the machine for protection from the rotating shaft.

\*B. For hydraulically driven comminutor:  
Furnish for each unit:

1. One hydraulic power pack consisting of one \_\_\_\_\_ gallons reservoir, one suction strainer, one pressure relief valve, one gauge with cock, one \_\_\_\_\_ HP, \_\_\_\_\_ RPM, \_\_\_\_\_ Volts, \_\_\_\_\_ phase, \_\_\_\_\_ Hertz, TEFC electric motor, one hydraulic pump, coupling and guard.
2. One directional control valve with mounting subplate.
3. One hydraulic motor.
4. One complete set of hydraulic hoses and fittings.

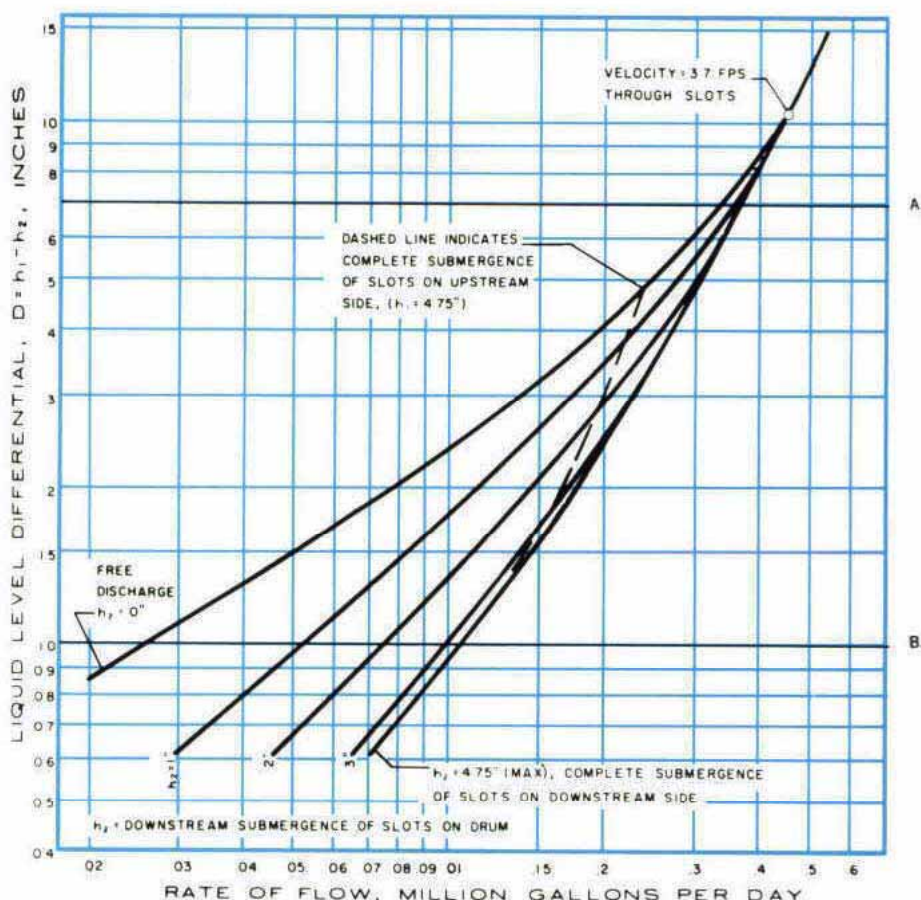
Each comminutor shall be complete with a spare set of teeth, comb(s), special tools and maintenance instructions.

\* Specify either one only.



# Hydraulic characteristics and design information

## 7C comminutor

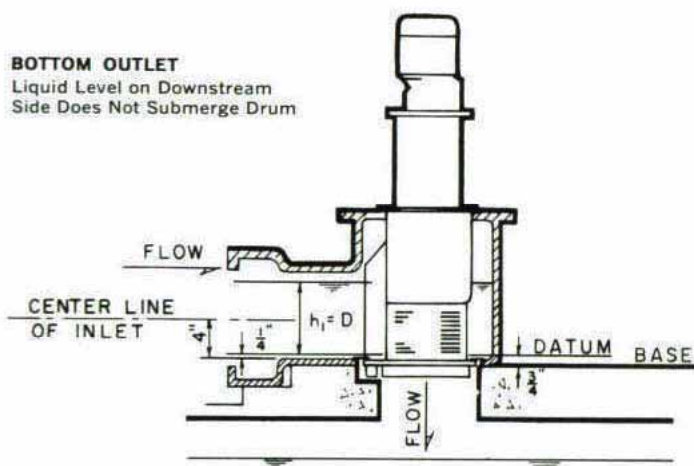


A. Maximum Limit: 7C Machine

B. Application not recommended below this line for average flows. Velocities are inadequate.

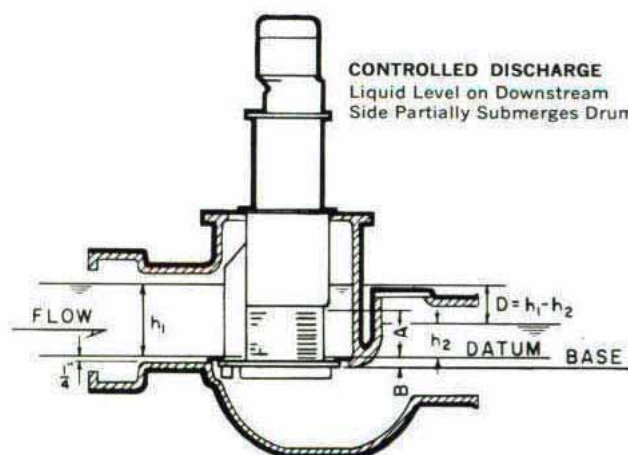
### BOTTOM OUTLET

Liquid Level on Downstream Side Does Not Submerge Drum



### CONTROLLED DISCHARGE

Liquid Level on Downstream Side Partially Submerges Drum



### GENERAL DATA

Drum Diameter	7 Inches
Average Slot Width	$\frac{1}{4}$ Inch
Drum Inlet Area	27 Sq. In.
Drum Outlet Area	24.9 Sq. In.
Drum Speed	56 R.P.M.
Size Motor Required	$\frac{1}{3}$ H.P.
Number of Slots	21
"A" Dimension	$4\frac{3}{4}$ Inches
"B" Dimension	$\frac{3}{4}$ Inch

1.0 U.S. Gallon = 0.833 Imperial Gallon

1.0 U.S. M.G.D. = 43.75 Liters Per Second

1.0 Inch (U.S.) = 25.4 Millimeters

The Chicago Pump size 7C and 10C comminutors easily adapt to the individual installation.

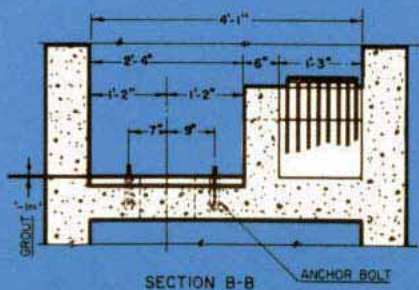
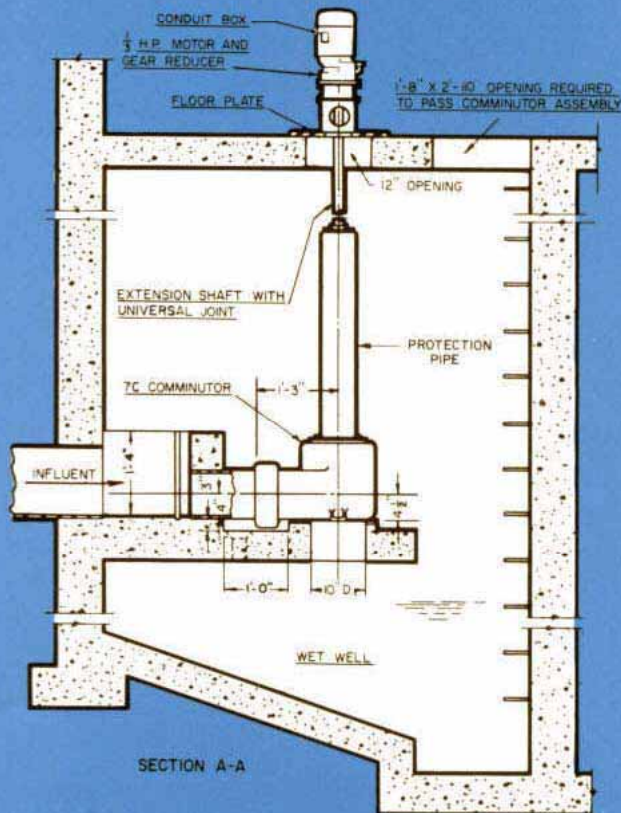
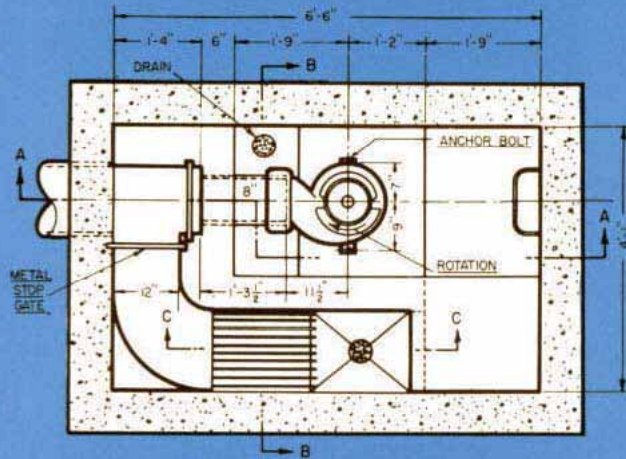
For wet wells the "Bottom Outlet" machine with hydraulic drive or extension shaft and protection pipe raising the motor to the service floor, makes an excellent installation.

For small treatment plants the "Return Bend" unit provides a simple installation with or without a by-pass channel.

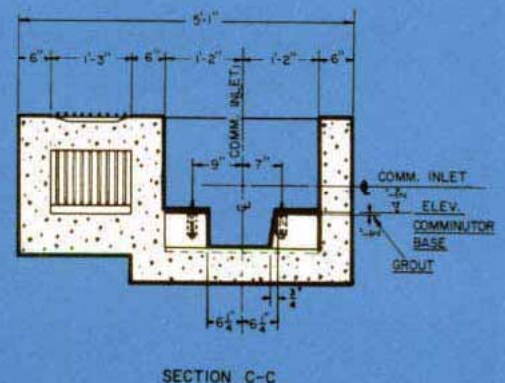
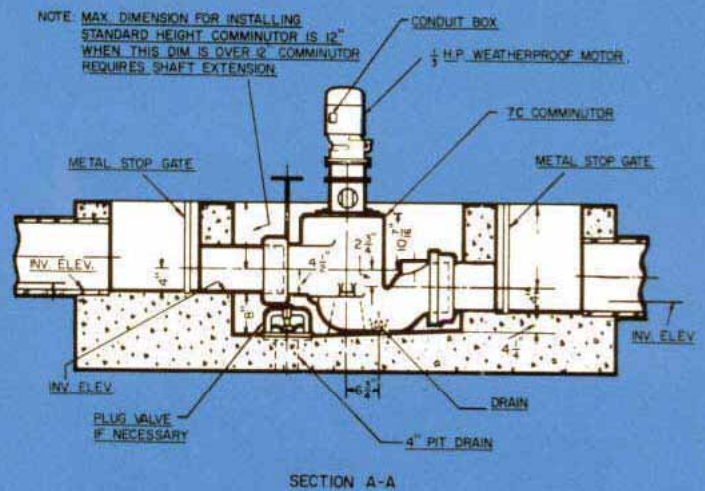
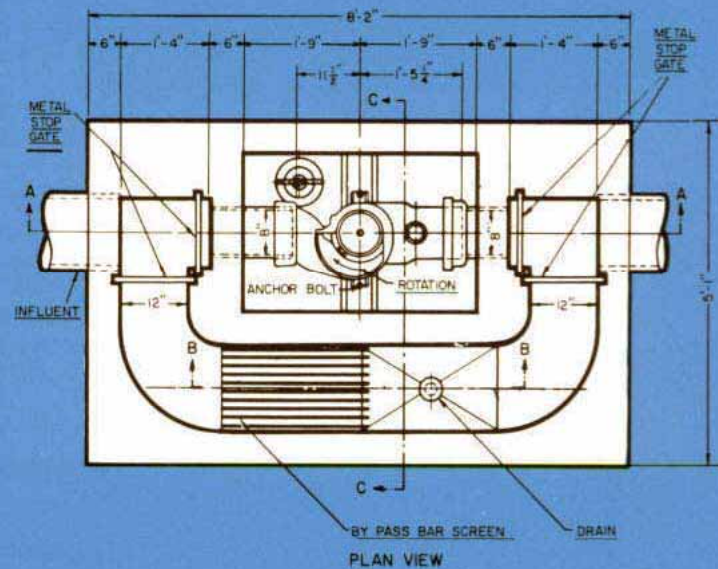


## 7C comminutor with bottom outlet

10C comminutors are also available in these configurations



## 7C comminutor with return bend

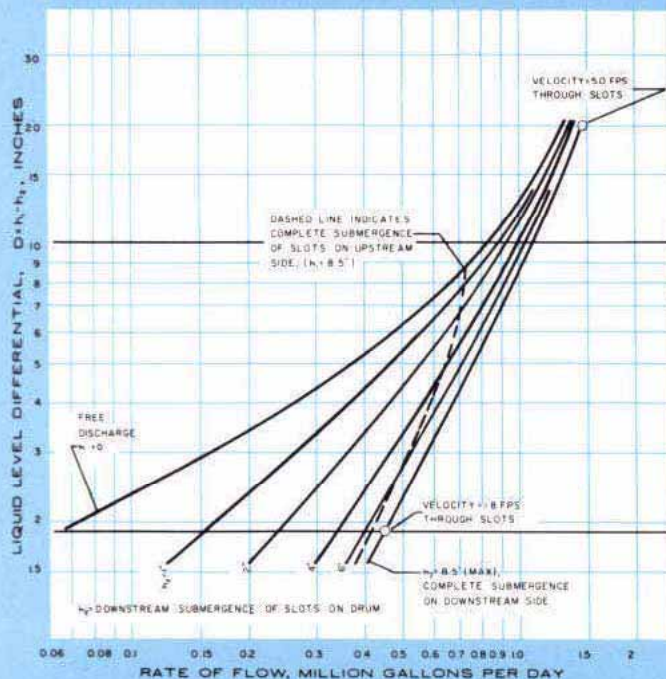




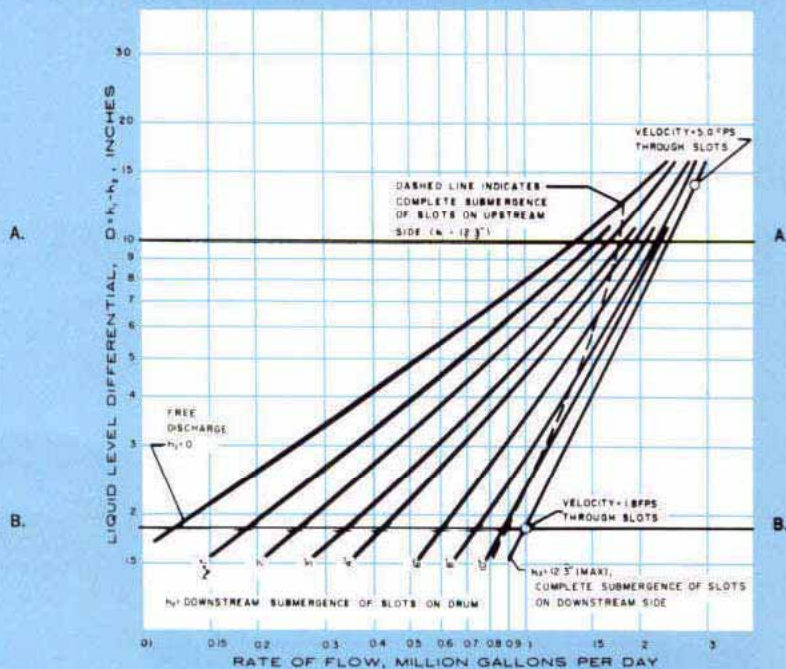
# Hydraulic characteristics of 10C-15C-25M-25A units

See drawings illustrating "Free discharge" and "Controlled discharge" on page 10

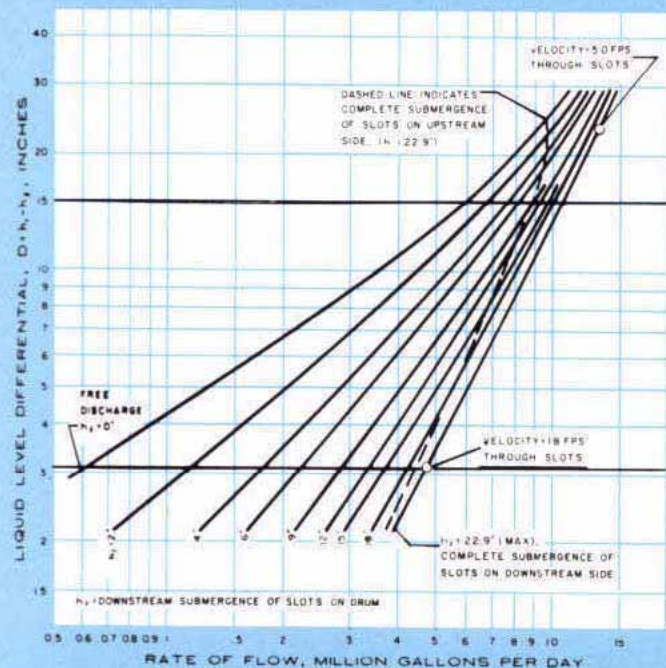
## 10C



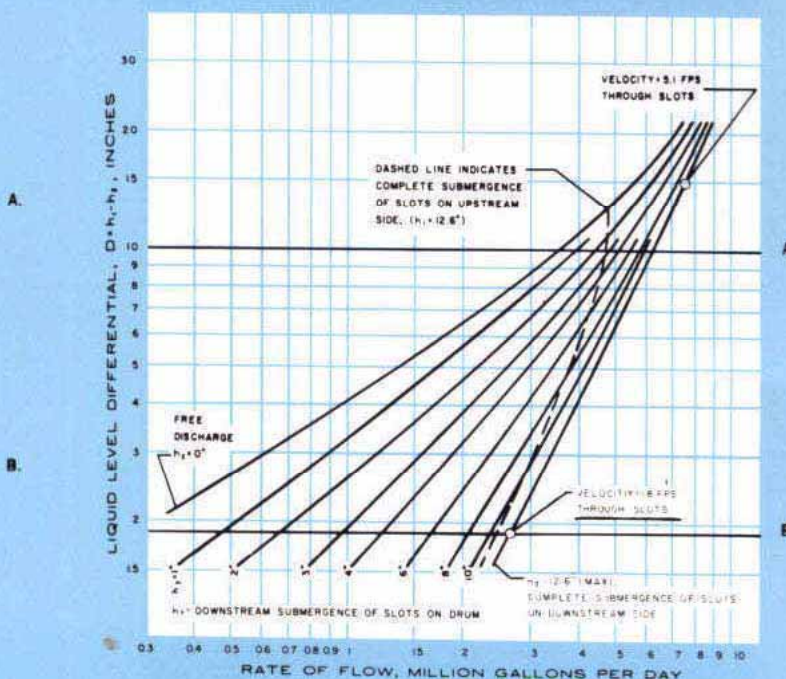
## 15C



## 25A



## 25M

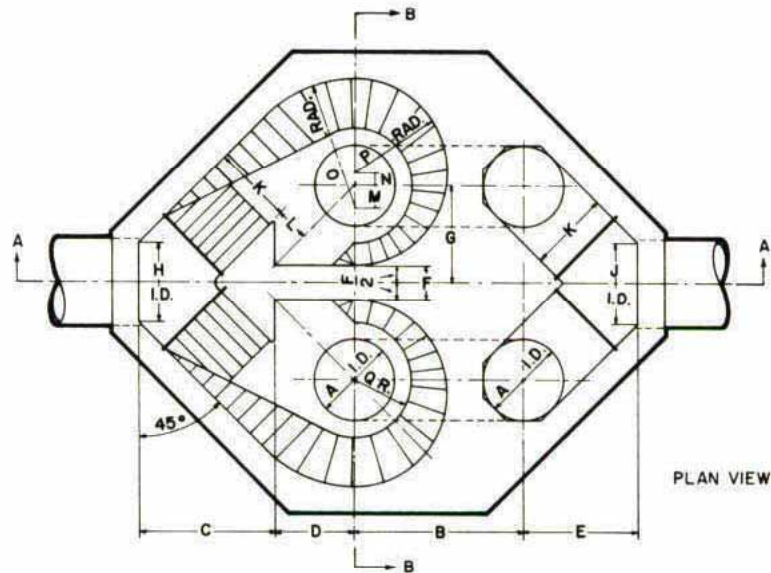


A. Limit for standard height comminutor and basin. For application above this limit elevate motor.

B. Application not recommended below this line for average flows. Velocities are inadequate.



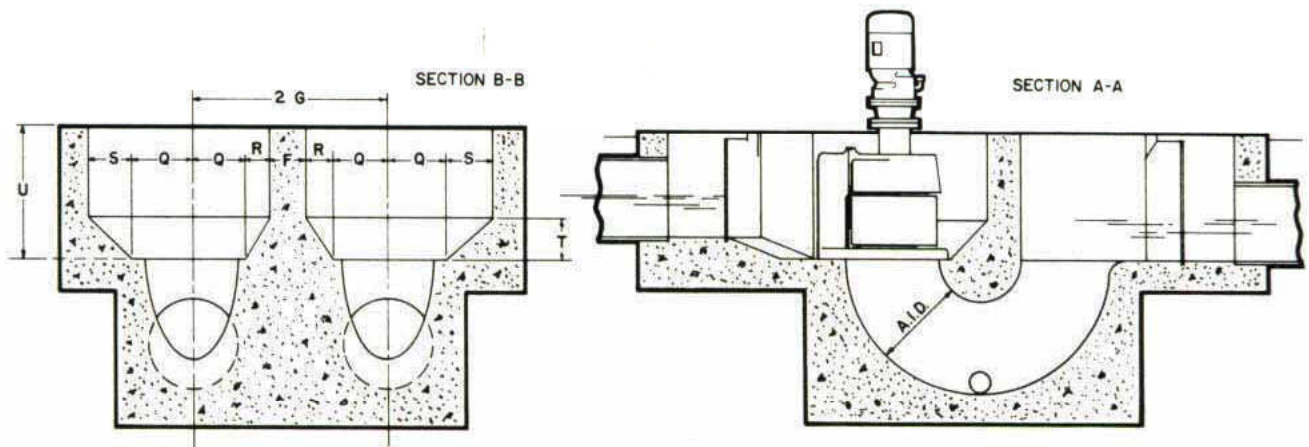
# Typical channel design for 10C, 15C, 25M and 25A units



## GENERAL DATA

Comminutor Size	10C	15C	25M	25A
Average Slot Width-Inches	1/4	1/4	3/8	3/8
Drum Inlet Area-Sq. in.	63	123	325	595
Drum Outlet Area-Sq. in.	52.7	119	312	368
Drum Speed	56 R.P.M.	37 R.P.M.	25 R.P.M.	25 R.P.M.
Size Motor Required	1/2 H.P.	3/4 H.P.	1 1/2 H.P.	1 1/2 H.P.
Number of Slots	48	102	90	150
A Dimension-Inches*	8 1/2	12 1/4	12 5/8	22 7/8
B Dimension-Inches*	3 1/4	3 1/2	5 1/4	6 1/4

\*See drawings on page 10



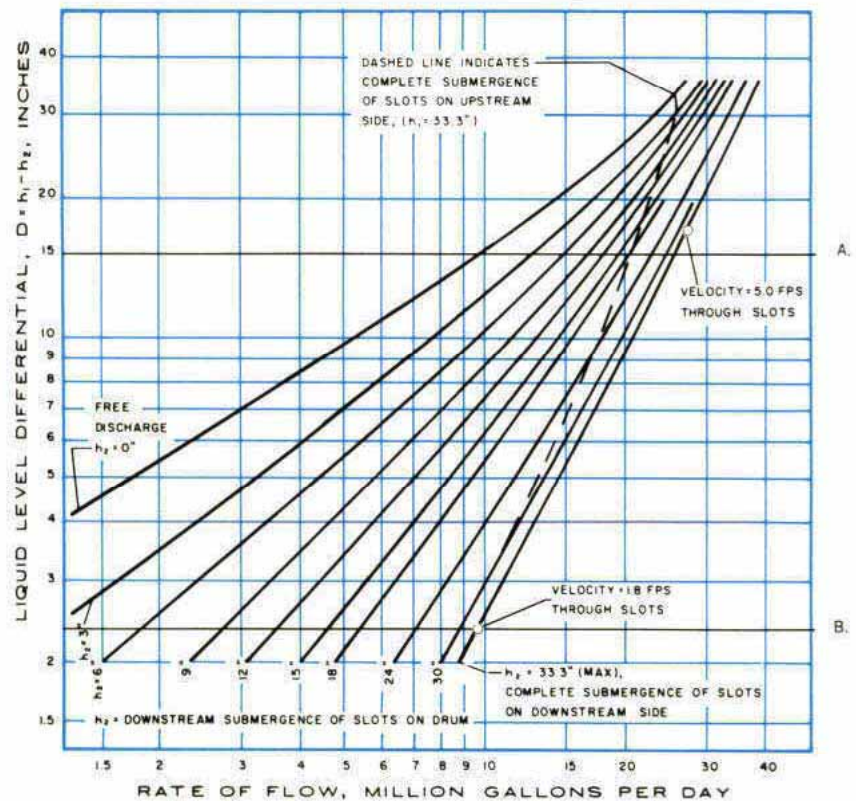
COMMINUTOR SIZE	A I.D.	B	C	D	E	F	G	Inlet Sewer H I.D.	Outlet-Sewer J I.D.	K	L	M	N	Radius O	Radius P	Radius Q	R	S	T	U**
10C	1'-0"	2'-5 1/2"	2'-0 1/2"	1'-1 1/2"	1'-8 1/2"	9"	1'-6"	12"	12"	1'-0"	6 1/4"	2 1/2"	2"	1'-8"	1'-3 1/2"	8"	5 1/2"	9 1/2"	6"	2'-2"
15C	1'-3"	3'-0"	2'-5 1/2"	1'-5 1/2"	2'-1"	9"	1'-10"	15"	15"	1'-3"	8"	5"	2"	2'-2 1/2"	1'-7 1/2"	11"	6 1/2"	10 1/2"	9"	2'-9"
25M	2'-0"	4'-3"	3'-5"	2'-0"	2'-10"	10"	2'-5"	24"	24"	2'-0"	10"	7"	4"	3'-3"	2'-4"	1'-5"	7"	1'-3"	11"	3'-2"
25A	2'-3"	4'-5"	4'-0"	2'-0 1/2"	3'-0 1/2"	12"	2'-6 1/2"	30"	30"	2'-6"	10 1/2"	1'-5"	5 1/2"	4'-4 1/2"	2'-6"	1'-5"	7 1/2"	1'-6 1/2"	11"	4'-2"

\*\*Maximum dimension for standard machine



# Hydraulic characteristics

## 36A comminutor

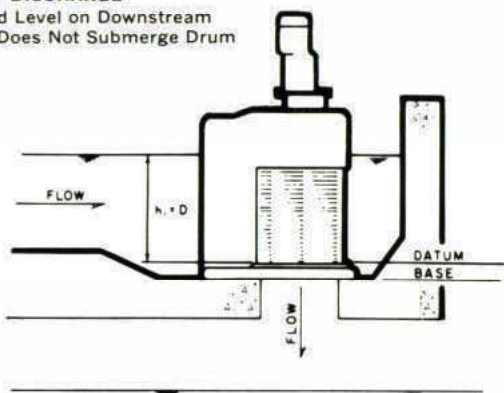


A. Limit for standard height comminutor and basin. For application above this limit elevate motor.

B. Application not recommended below this line for average flows. Velocities are inadequate.

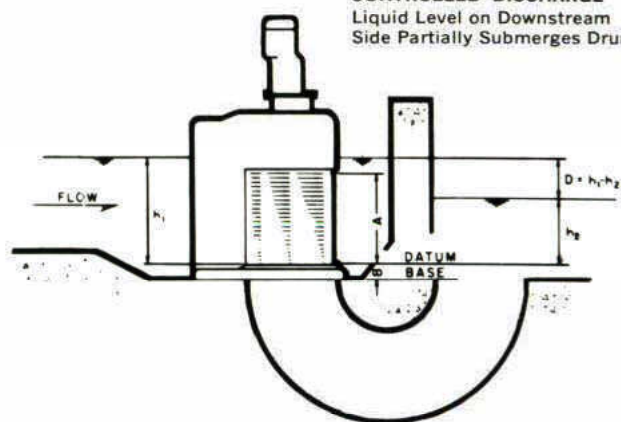
### FREE DISCHARGE

Liquid Level on Downstream Side Does Not Submerge Drum



### CONTROLLED DISCHARGE

Liquid Level on Downstream Side Partially Submerges Drum



### GENERAL DATA

Drum Diameter	36 Inches
Average Slot Width	$\frac{3}{8}$ Inch
Drum Inlet Area	1182 Sq. In.
Drum Outlet Area	804 Sq. In.
Drum Speed	16.5 R.P.M.
Size Motor Required	2 H.P.
Number of Slots	288
"A" Dimension	$33\frac{1}{2}$ Inches
"B" Dimension	$10\frac{3}{8}$ Inches

1.0 U.S. Gallon = 0.833 Imperial Gallon

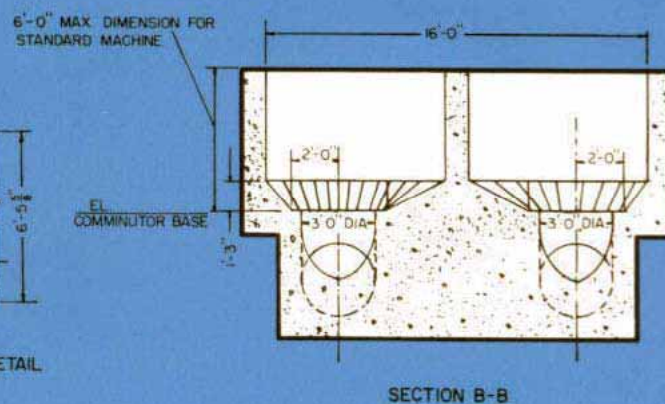
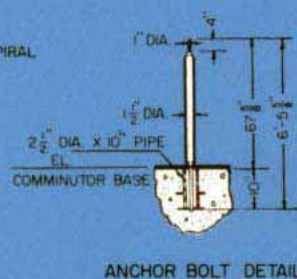
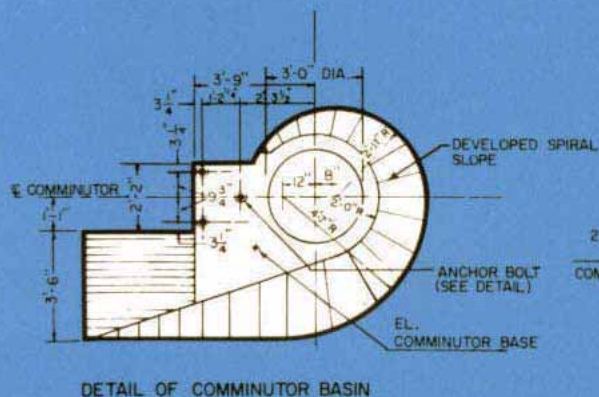
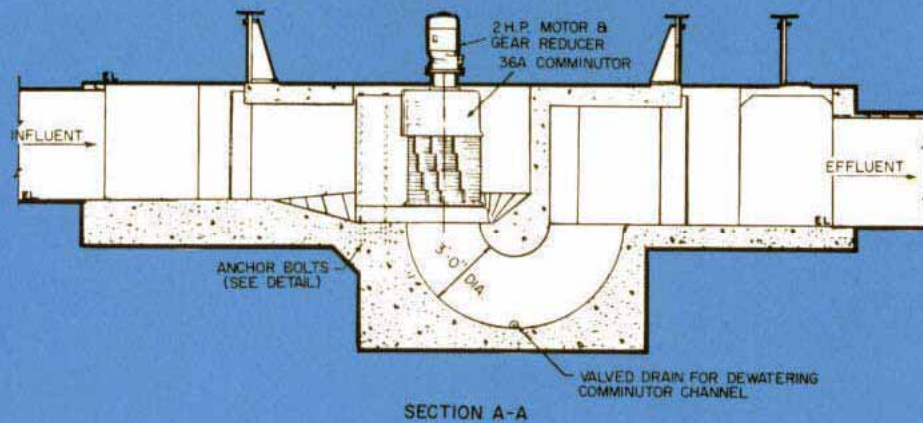
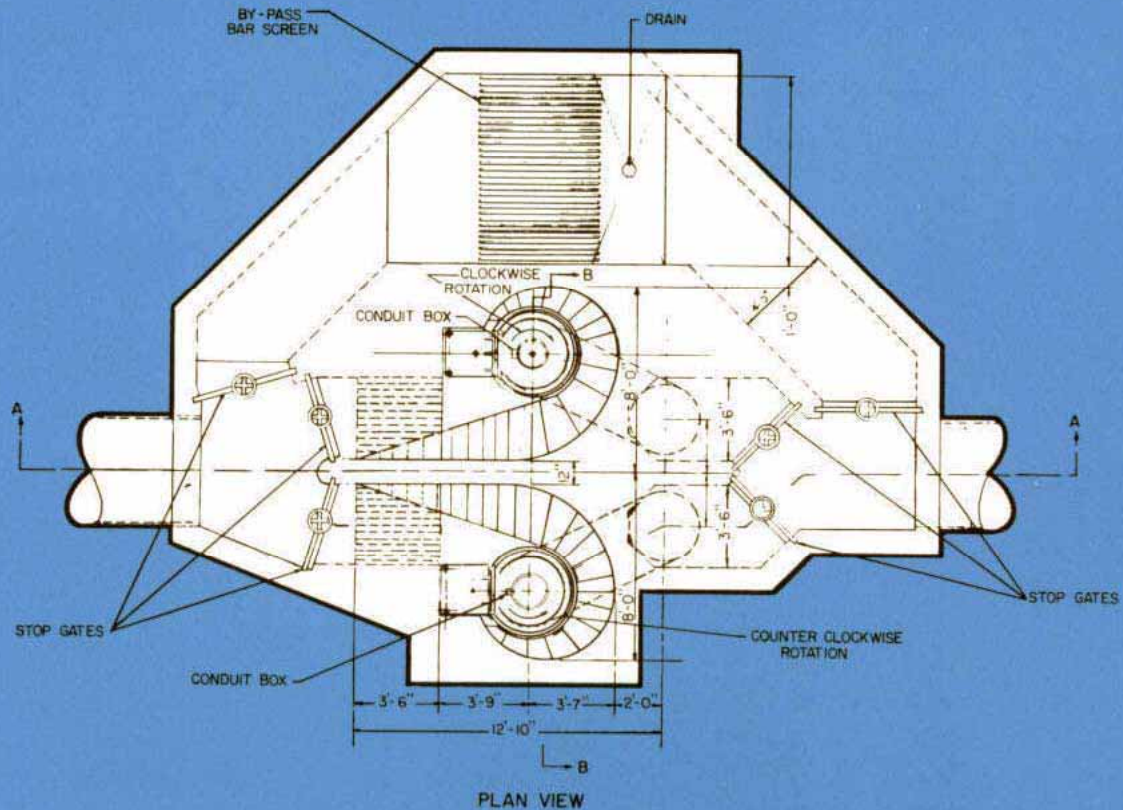
1.0 U.S. M.G.D. = 43.75 Liters Per Second

1.0 Inch (U.S.) = 25.4 Millimeters

Outstanding performance and reliability are obtained from the 36A comminutor. Single, duplex, or triplex installations are common in current Sewage Treatment Plants or Lift Stations. For additional information and design criteria, please contact your local Chicago Pump sales representative.



# Typical channel design for 36A comminutor

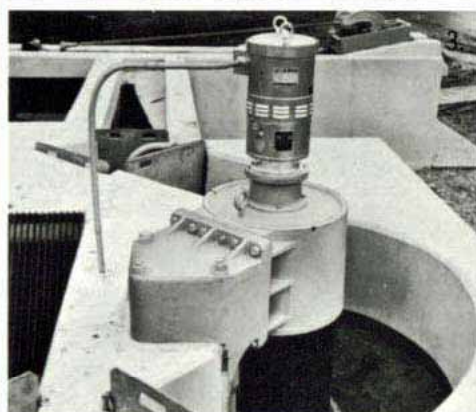
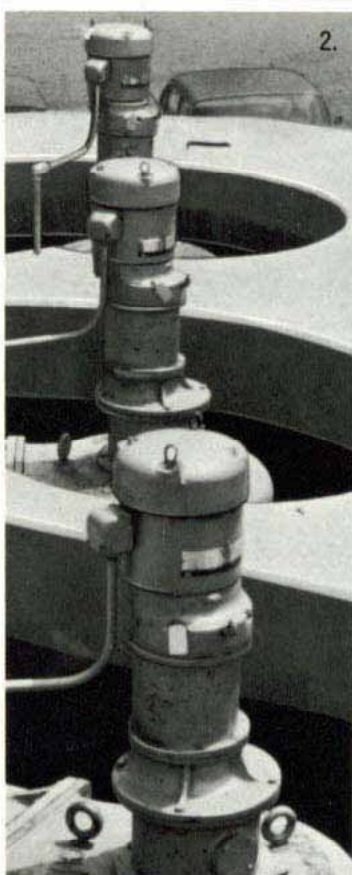
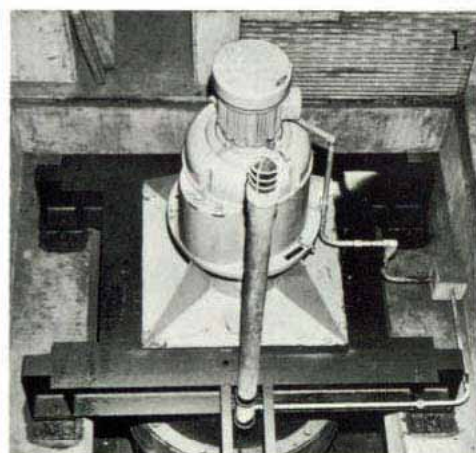






Chicago Pump Company  
3905 Enterprise Court  
Aurora, IL 60504  
(630) 236-5700  
FAX (630) 236-5779

## Typical installations



1. One of the largest comminutors built. This 54" unit is installed at Mill Creek Sewage Treatment Plant at Cincinnati, Ohio.

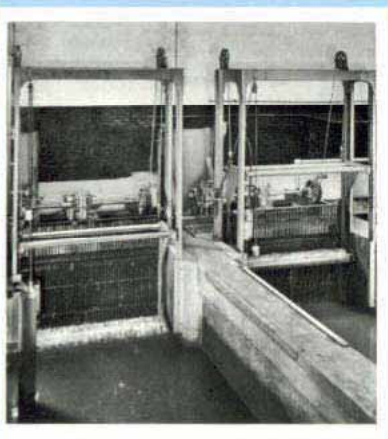
2. Triplex installation of Chicago Pump 36" comminutors installed at the Anderson, Indiana Sewage Treatment Plant.

3. 25" comminutor at Parris Island, South Carolina.

## The most complete line of screening and comminuting equipment

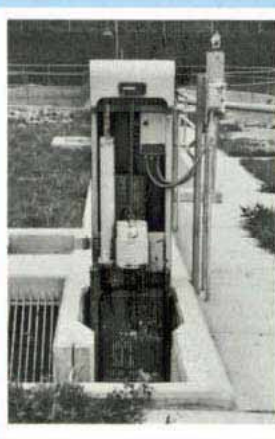
Chicago Pump Company is the only manufacturer with a complete line of comminution equipment. There are in excess of 7000 installations of all types, including the 54" units. Comminutors are installed in lift stations, sewage treatment plants and

industrial applications. For convenient, economical installation of comminution equipment in existing installations, consider the exclusive Barminutor, screening and comminuting machine described below.



**MODEL A BARMINUTOR®**  
Machine  
Capacities to 150 MGD

For installation in new or existing channels in widths of 4' to 8' in increments of 1' for any desired channel depth. The high capacity, low head loss, two-way cutting unit is independently powered by a special motor. The unit screens continuously, however cutting is accomplished on a demand basis, only when solids are present in the liquid flow, when Stop-N-Go control is activated.



**MODEL C-2 BARMINUTOR®**  
Machine  
Capacities to 15 MGD

A smaller Barminutor machine in 12, 18, 24 and 36 inch widths for new or existing channels. It is available in weatherproof construction. The comminuting assembly can be swung out of the channel for ease of inspection or maintenance. The Model C utilizes the Stop-N-Go control permitting full time screening while cutting is accomplished as solids accumulate.