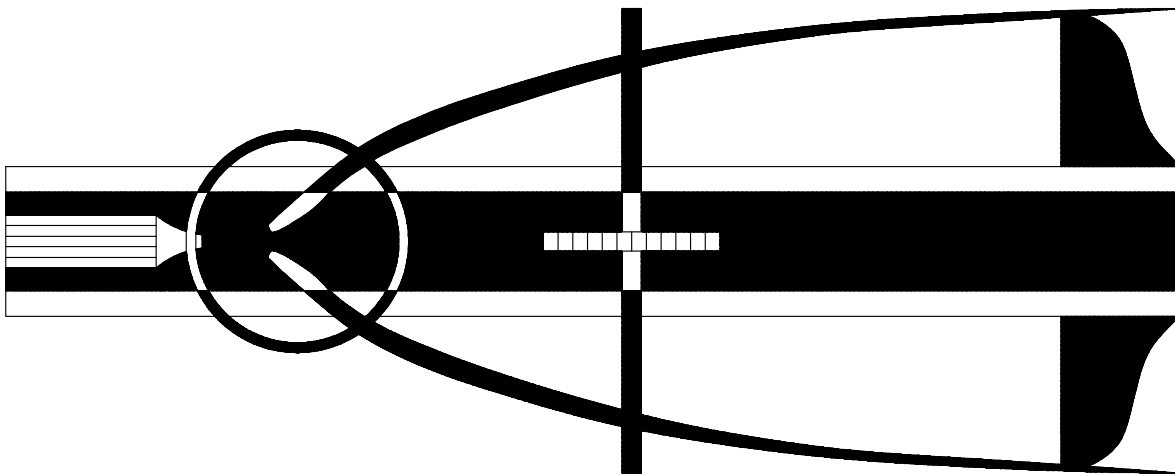


BIO-KINETIC®

WASTEWATER MANAGEMENT SYSTEM MODEL BK 2000

GENERAL SPECIFICATIONS

The contractor shall furnish and install one complete Bio-Kinetic wastewater management system with Bio-Kinetic tertiary device, including all applicable equipment, as described in the following specifications. All domestic wastewater shall pass through the Bio-Kinetic wastewater management system for advanced treatment prior to being returned to the environment. Settling and storage of suspended solids, flow equalization, filtration and chemical addition shall be accomplished for the wastewater treatment facility by the Bio-Kinetic wastewater management system. The advanced treatment system shall be a Bio-Kinetic Model BK 2000 wastewater management system, as manufactured by Norweco, Inc., Norwalk, Ohio, USA. The wastewater management system shall be serviceable from grade and shall include a solids settling and retention basin, Bio-Kinetic tertiary device, anti-shear inlet and outlet couplings, safety/service guard, lockable access cover, compression clamp, system mounting casting and extension risers as required.



OPERATING CONDITIONS

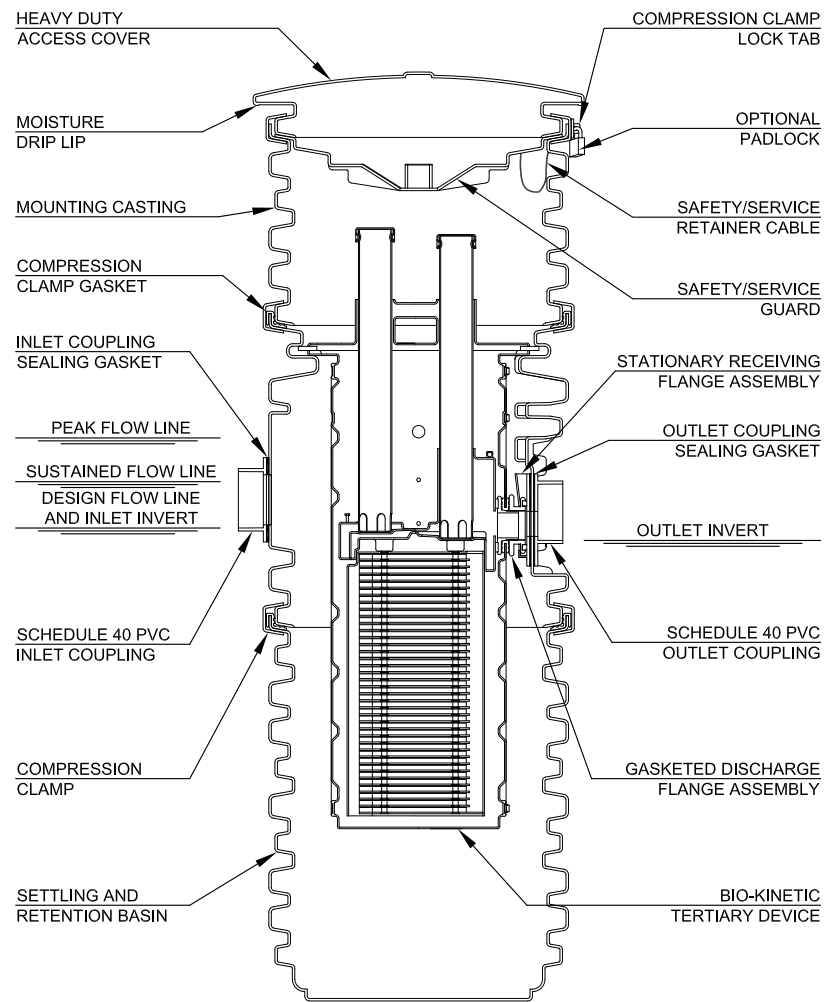
The Bio-Kinetic wastewater management system shall be an integral part of the overall wastewater treatment and disposal facility. The system shall be rated to accommodate domestic wastewater flows up to 2,000 gallons per day when used downstream of a properly sized treatment facility. Total holding capacity of the wastewater treatment facility shall provide a minimum of 24 hour retention of the average design daily flow. Design of the wastewater treatment facility, including primary/secondary treatment and wastewater management system, shall insure reliable, long term performance without upset even when the significant runoff period is six hours. Hydraulic design considerations of the treatment facility and wastewater management system shall be such that intermittent peak flow factors as high as four shall not upset hydraulic reliability within the facility. Use of the Bio-Kinetic wastewater management system, when installed by an authorized agent, shall be approved by the local governing regulatory agency.

SPECIFICATIONS

BIO-KINETIC®

SETTLING AND RETENTION BASIN

The settling and retention basin shall be designed to remove biosolids from domestic wastewater. Total holding capacity of the retention basin below the outlet invert shall be 52 gallons. For special applications, additional ring sections are available to increase the liquid and solids retention capacity. The retention basin shall be manufactured to be watertight at burial depths of up to 12 feet. The inlet and outlet couplings of the basin shall contain 4" diameter Schedule 40 PVC pipe couplings to permit a solvent weld connection of inlet and discharge piping. Fall through the retention basin and internal components from inlet invert to outlet invert shall be a total of one inch. A system mounting casting to allow access to the retention basin, Bio-Kinetic tertiary device and all internal components shall be provided. The mounting casting shall be equipped with a molded, one-piece, heavy duty, ribbed, removable access cover with moisture drip lip. The access cover shall be securely installed such that the moisture drip lip is 3" above finished grade. The cover shall be secured to the retention basin by an injection molded compression clamp with lock tab to prevent unauthorized access. The retention basin shall be equipped with a safety/service guard. The safety/service guard shall be installed below the retention basin cover and securely connected to the mounting casting by a retainer cable. The internal safety/service guard shall be designed to prevent accidental entry and be supported by the uppermost internal rib of the mounting casting. To prevent loss or theft, the safety/service guard shall be permanently connected to the retention basin by stainless steel cable. The retention basin, optional ring sections, safety/service guard, access cover and system mounting casting shall be constructed of corrosion resistant, UV stabilized polyethylene. All joints within the retention basin shall be sealed with a polyisoprene gasket and injection molded compression clamp secured with bolted lock tab. The retention basin shall be an integrally molded, heavy duty, one-piece unit, with only one clamp required to attach the access cover. For deeper installations, additional clamps shall be used to connect ring sections and extension risers to the retention basin. Where special shipping considerations apply, the retention basin may be shipped in individual sections for field assembly with compression clamp.



BK 2000 SYSTEM

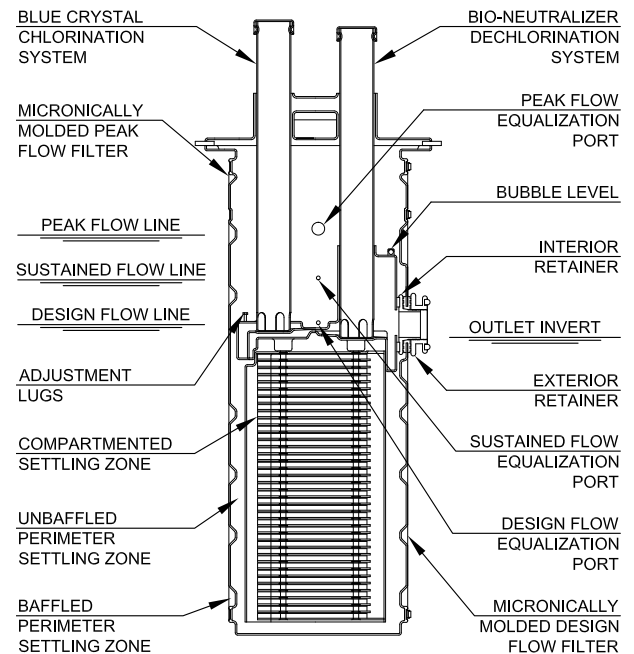
EXTENSION RISERS

For installations where the inlet invert of the retention basin is more than 28" below finished grade, optional extension risers shall be installed. Extension risers shall be constructed of the same material as the retention basin, optional ring sections and mounting casting. To permit maximum installation flexibility and to accommodate various treatment system elevations, individual extension risers shall be available in 6" increments from 6" up to 72" in height. When an extension riser is used, the internal safety/service guard shall be mounted in the uppermost rib of the riser, directly below the access cover. Extension risers shall be connected to the mounting casting and sealed with a polyisoprene gasket and injection molded compression clamp.

MODEL BK 2000

BIO-KINETIC® TERTIARY DEVICE

A Bio-Kinetic tertiary device shall be connected to the outlet coupling within each retention basin. Suspended and settleable solids and BOD shall be removed from the wastewater flow and retained within the basin and/or the three separate filtration zones and eight independent settling zones of the Bio-Kinetic tertiary device. Each Bio-Kinetic tertiary device shall provide non-mechanical flow equalization through all gravity flow treatment processes of the upstream and downstream wastewater facility, including (as applicable) pretreatment, anaerobic treatment, aerobic treatment, clarification, filtration, chlorination, dechlorination and surface or subsurface effluent disposal systems. The Bio-Kinetic device shall be supplied with locking lugs and removable moisture/vapor shield and shall consist of a design flow and peak flow micronically molded filter, baffled perimeter settling zone, non-mechanical flow equalization, flow distribution deck, lifting handles, level indicator, adjustment lugs, chlorination feed tube, unbaffled perimeter settling zone, solids contact zone, vertical inlet zone, compartmented settling zone consisting of thirty-seven baffled chamber plates, effluent stilling well, final discharge zone, adjustable outlet weir, dechlorination feed tube, outlet zone and gasketed discharge flange. All components shall be manufactured from inert synthetic materials or rubber, assembled in circular fashion and connected to a PVC outlet coupling. The outlet coupling shall permit a solvent weld connection to the discharge piping. Each Bio-Kinetic device shall be installed such that the inverts of the design flow equalization ports are located at the normal liquid level of the gravity flow treatment facility. If intermittent flow rates exceed the capacity of the design flow ports, flow shall be held upstream until the intermittent flow dissipates or continues to increase. If the intermittent flow continues to increase, it will reach the pair of sustained flow equalization ports. With four ports in use, flow through the system increases while the Bio-Kinetic device continues to provide non-mechanical flow equalization to all upstream and downstream processes. Two peak flow equalization ports shall be supplied to equalize intermittent periods of peak hydraulic loading. Blue Crystal tablet chlorination system and Bio-Neutralizer dechlorination system feed tubes shall be positioned such that the flow-activated chemical cannot make contact with the liquid upstream of the feed tubes. Treatment systems utilizing only slotted or screen filtration do not provide non-mechanical flow equalization throughout all gravity flow processes or chemical addition and shall not be considered for this application.



BIO-KINETIC TERTIARY DEVICE

NON-MECHANICAL FLOW EQUALIZATION

The Bio-Kinetic device shall provide non-mechanical, demand use, flow equalization to the entire gravity flow wastewater treatment facility. Flow equalization shall control normal residential flow rates and reduce typical residential flow surges (e.g. shower @ 10 minutes duration, bathtub discharge @ 5 minutes duration, clothes washer discharge @ 2 minutes duration, and dishwasher discharge @ 2 minutes duration). The flow equalization rate shall be dependent upon the hydraulic loading pattern, the duration of flow surges and the size of the treatment facility tankage. In order to fully utilize the upstream flow equalization capacity, the transfer pipe connecting the upstream facility to the Bio-Kinetic wastewater management system shall be not longer than 10 feet and shall fall no more than 1/4" over the entire length. The transfer pipe may be installed at greater length and/or with more fall, but shall result in decreased flow equalization rates that are dependent upon overall pipe length and total fall. At a 2,000 gallon per day residential loading pattern, minimum performance of the device shall equalize daily flow more than 60% when used with a treatment facility having at least 80 square feet of upstream liquid surface area. Flow equalization shall increase detention time of the wastewater in all treatment processes and shall prevent hydraulic upset and solids washout. Flow equalization shall result in additional solids being retained in the upstream portion of the treatment facility, insuring fewer and more stabilized solids in the effluent. Remaining solids shall be further reduced by the Bio-Kinetic wastewater management system. Reduced hydraulic and organic loading shall result in increased treatment and disposal system life.

BLUE CRYSTAL® CHLORINATION SYSTEM

The BK 2000 shall be equipped with a supply of Blue Crystal residential disinfecting tablets installed in the chlorine feed tube of the wastewater management system. Blue Crystal tablets shall be specifically formulated for consistent chlorine dosage to the sustained, variable and intermittent flows that are typical of domestic wastewater treatment systems. The tablets shall be manufactured from pure calcium hypochlorite and shall contain a minimum of 70% available chlorine. The tablets shall incorporate beveled edges to enhance the chemical dissolution pattern. Each tablet within the feed tube shall be 2⁵/₈" diameter, compressed to a 1" thickness, weigh approximately 5 ounces and be white in color with blue crystals for easy identification. The tablets shall dissolve in direct proportion to the flow rate, releasing controlled amounts of chlorine.

BIO-NEUTRALIZER® DECHLORINATION SYSTEM

The BK 2000 shall be equipped with a supply of Bio-Neutralizer dechlorination tablets installed in the dechlorination feed tube of the wastewater management system. The active ingredients of the dechlorination tablets shall be specifically formulated to chemically neutralize both free and combined chlorine. The tablets shall incorporate beveled edges to enhance the chemical dissolution pattern. Each tablet within the feed tube shall be 2⁵/₈" diameter, compressed to a 1³/₁₆" thickness, weigh approximately 5 ounces and be green in color for easy identification. The tablets shall dissolve in direct proportion to the flow rate, releasing controlled amounts of chemical for the instantaneous removal of residual chlorine.

TEN YEAR LIMITED WARRANTY

The manufacturer shall provide a limited warranty against defects in material and workmanship under normal use and service for a period of ten years. The limited warranty shall cover all components of the Bio-Kinetic wastewater management system purchased from the manufacturer, including retention basin, ring sections, safety/service guard, access cover, system mounting casting, extension risers and Bio-Kinetic tertiary device. A detailed copy of the warranty shall be provided to the regulatory agency, contractor and customer as required.

EQUIPMENT MANUFACTURER

The equipment specified herein shall be the product of a manufacturer having a minimum of seven years experience in the construction of prefabricated wastewater treatment equipment and systems. Bids shall be prepared on the basis of the equipment and material specified herein for purposes of determining the low bid. This is not done, however, to eliminate other products of equal quality and efficiency. If equipment is to be substituted, approval of such substitution must be made prior to the execution of any order. It is assumed that substitution will result in a reduction of cost to the contractor and that if accepted, these savings will be passed along by a reduction in the base bid.

PROGRESS THROUGH SERVICE SINCE 1906

norweco®

*Engineering the future of water
and wastewater treatment*

220 REPUBLIC STREET
NORWALK, OHIO, USA 44857-1196
TELEPHONE (419) 668-4471
FAX (419) 663-5440
www.norweco.com

DISTRIBUTED LOCALLY BY:

Singulair®, Modulair®, Travalair®, Lift-Rail®, Microsonic®, Norweco®, Bio-Dynamic®, Bio-Sanitizer®, Bio-Neutralizer®, Bio-Kinetic®, Bio-Static®, Bio-Gem®, Blue Crystal®, Grease Buster® and "BUSTER" logo® are registered trademarks of Norwalk Wastewater Equipment Company, Inc.

©MMII NORWECO, INC.