

# Package Style Wastewater Treatment Systems

Project Name: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Design Flow = X0,000 GPD

**Tipton Environmental International, Inc**  
4446 State Route 132  
Batavia, Ohio

Phone 513-735-2777

Fax 513-735-1485

---

# TEII Systems Specifications Sheet

Sales Agent:

Location of Project:

Project Engineer:

Project No. 2000-\_\_\_\_\_

Design Flow X0,000 gpd

Date: \_\_\_\_\_

---

## TIPTON ENVIRONMENTAL INTERNATIONAL, INC. PACKAGED BIOLOGICAL WASTEWATER TREATMENT SYSTEM EQUIPMENT SPECIFICATIONS

### Wastewater Treatment System Prefabricated Steel Construction

#### 1.0 GENERAL

- 1.1 The contractor shall furnish and install one package biological wastewater treatment system, complete and ready for operation in accordance with the plans and specifications stated herein. The treatment system shall be a Model TEII-\_\_\_\_-C package prefabricated steel construction as manufactured by **Tipton Environmental International, Inc.** The wastewater treatment system shall be known as the activated sludge type, specifically known as "Extended Aeration". The unit shall be designed for treating a total flow of \_\_,000 gallons per day with the influent characteristics as described in section 2.1 below. Because of the nutrient strength and the effluent discharge requirements the aeration chamber shall be sized for a 24 hour retention or a minimum volume of \_\_,000 gallons. The system shall be complete with aeration chamber, hopper clarifier system, chlorination system, and all necessary tank vessels, component equipment necessary for efficient and proper plant operation.
- 1.2 The package system shall be factory prefabricated and assembled, so far as possible, taking into consideration shipping and erection limitations. In addition all internal tank piping and wiring shall be supplied and ended at the appropriate joint. All vessel surfaces shall be factory painted as described below.
- 1.3 The basic equipment furnished by the manufacturer shall include, but not be limited to, tanks, painting, aeration piping, blower assemblies, clarifier mechanism, internal piping, walkways, electrical equipment and/or controls.
- 1.4 The wastewater treatment plant shall be the product of an equipment manufacturer actively engaged in the design and fabrication of similar equipment. The manufacturer must have provided similar equipment in service for at least five (5) years. It will be necessary that the following information be submitted to the engineer at least fourteen (14) days prior to the scheduled bid date in order to allow adequate time for review of the product.

#### 1.5 THE GENERAL CONTRACTORS FIELD SERVICES

The General Contractor shall perform the actual installation of the TEII wastewater flow equalization system. The following is a brief description of the general contractor's responsibilities regarding the installation. The following is a brief description of the General Contractor's field crews area of responsibilities:

- A. Provide a crane and other equipment for off loading and setting of the wastewater treatment system which come in three sections onto its foundation pad. Attach the anchoring facilities to be positioned in the foundation pad as defined by the contract drawings.
- B. Once the system has been set into position, it shall be reconnect including field welding and re-assembly of the piping, valving and wiring which may have been disconnected at the factory for shipping purposes.

---

## TEII Systems Specifications Sheet

Sales Agent:

Location of Project:

Project Engineer:

Project No. 2000-\_\_\_\_\_

Design Flow X0,000 gpd

Date: \_\_\_\_\_

---

- C. The package system shall be delivered to the project site with a majority of the component equipment installed in position. Do to shipping restrictions some of the ancillary equipment such as the blower motor units and the electrical control console, handrails and gratings have been removed. The field crew to be responsible for assembling these items into their proper position.
- D. The field crew shall set into its position all the electrical console, Model CP-1 and others.
- E. The service handrails shall be of the aluminum speed rail type. The general contractor's crew shall install these service handrails.
- F. All area requiring touch up painting shall be painted by the Contractors field crew.
- G. An adequate access road to the plant site shall be provided to enable the lowboy truck into the project site and off loaded.
- H. Provide facilities and equipment for off loading and setting of the wastewater treatment system onto its foundation rock base, which has been provided by the field contractor.
- I. Once the plant has been set into position, it shall be reconnect including when required re-assembly of the piping and wiring which may have been disconnected at the factory for shipping purposes.
- J. The package system shall be delivered to the project site with a majority of the component equipment installed in position. Do to shipping restrictions some of the ancillary equipment such as the blower motor units and the electrical control console, handrails and gratings. The field contractor to be responsible for assembling these items into their position.
- K. All site utilities to the system shall be tied-in to the system. The electrical power requirements at the main power block or main circuit breaker shall be 230 volts, 3 phase, 60 Hz. Each subpanel to be also connected to the main power by the field contractor.
- L. The foundation pad for setting the system on to is to be furnished by the field contractor.
- M. To prevent flotation of the system once set into position the system to be filled with water prior to backfilling and after the drain plugs have been installed.
- N. Prior to backfilling the magnesium anode packages to be set into position and the wire lead from the anode package to be connected to the connection points on the tank vessel.
- P. Backfill, finish grade and placement of gravel around the outside perimeter of the system.

### 2.0 SYSTEM DESIGN PARAMETERS

2.1 Influent Characteristics The following are the influent characteristics of the specified system:

- A. Maximum daily flow \_\_\_\_ ,000 gallons per day
- B. Peak hourly flow rate 2.5 times the daily flow rate
- C. 5 day BOD 210 PPM
- D. Suspended Solids 210 PPM
- E. Water Temperature Range 98 to 75 degrees F
- F. Elevation from sea level 200 feet
- G. Air temperature range 100 to 32 degrees F

---

## TEII Systems Specifications Sheet

Sales Agent:

Location of Project:

Project Engineer:

Project No. 2000-\_\_\_\_\_

Design Flow X0,000 gpd

Date: \_\_\_\_\_

---

H. pH Range 7 to 8

- 2.2 The system shall be capable of treating \_\_,000 gallons per day of crude raw domestic wastewater.
- 2.3 The organic strength shall be 210 ppm 5 day BOD and 210 ppm suspended solids. No substances shall be placed in the system in quantities, which are not biodegradable or toxic to the biological organisms. The system shall be designed to handle the average daily flow fluctuation over a range of 50% to 100% of the design flow with the peak flow rate not to exceed 250% of the average design flow.

### 3.0 VESSEL TANK CONSTRUCTION

- 3.1 All tank vessels shall be fabricated of one-fourth inch structural grade steel plated; (ASTM A-36) joined by arc welding with fillets of adequate section for the joint involved. All walls shall be continuous and watertight and shall be supported by structural reinforcing members where required. Fabrication and erection shall conform to the appropriate requirements of "AISC Specifications of Buildings". Connection shall conform to the requirements of the American Welding Society's Code and shall develop the full strength of the member. Aeration tank will have reinforcing members as required. All other areas such as the floor, end walls, and internal bulkheads to be adequately reinforced.
- 3.2 All piping and valving shall be provided constructed of a minimum of schedule 40 steel pipe. The painting of this pipe and valving to be as defined in section below:
- 3.3 The package wastewater treatment system shall be transported to the project site on Lowboy truck in one major section. The contractor shall be responsible for field assembly, including bolting or field welding where required.

### 4.0 PAINTING AND CORROSION CONTROL

- 4.1 All tank vessel surfaces to be painted shall be properly prepared in a workmanlike manner to obtain a smooth, clean, and dry surface. All rust, metal fragments, dust, weld slag, and mill scale as well as extraneous matter, shall be removed by means of cleaning by wire brushing or whatever means necessary.
- 4.2 All interior tank vessel surfaces below the main box beam shall be painted with Kopper's Superservice coal tar paint, or equal to a minimum total dry film thickness of 8-10 mils.
- 4.3 All exterior tank vessel surfaces including the box beam shall be painted with Kopper's Superservice coal tar paint, or equal to a minimum total dry film thickness of 8 -10 mils.
- 4.4 All steel piping & valving shall be painted with Kopper's Superservice coal tar paint, or equal to a minimum total dry film thickness of 8 - 10 mils.
- 4.5 Cathodic corrosion protection shall be provided using one magnesium anodes, weighing 9 pounds each. These shall be buried by the contractor adjacent to the tank sides and provided with good electrical contact with the tank. The anodes shall come packed in its own low resistant bag filled with material for moisture control. The copper lead wire brazed to the core and insulated with coal tar at that point. The anodes shall be attached to the tank vessel at the connection provided near the top of the tank. The connection will also be coated with a

---

## TEII Systems Specifications Sheet

Sales Agent:

Location of Project:

Project Engineer:

Project No. 2000-\_\_\_\_\_

Design Flow X0,000 gpd

Date: \_\_\_\_\_

---

coal tar insulation. The anodes shall be located at least 5 feet from the tank structure and be at least 5 feet deep. Each of the anodes shall be located at the position shown on the drawing. Each anode is to be then doused with 5 gallons of water prior to backfilling.

### 5.0 FOUNDATION

- 5.1 A concrete foundation pad shall be constructed conforming to the project specifications for level and flatness as specified by the manufacturer on the foundation drawing.

## EQUIPMENT SECTION

### 6.0 INLET CONNECTION

- 6.1 An influent connection to the TEII wastewater system shall be provided. It shall consist of one 6" diameter flanged pipe. The inlet shall be located at the end wall of the surge chamber.

### 7.0 INLET BAR SCREEN

- 7.1 Bar screen shall be provided within the aeration chamber as shown on the contract drawings. Its purpose is to remove any unusually large solids from the incoming crude sewage flow rate. The bar screen shall be fabricated from one-half inch diameter bars spaced one-inch apart and arranged as shown on the drawings. The bars shall be sloped to permit easy cleaning of accumulating debris. A drying deck shall be furnished for drying this debris.

### 8.0 AERATION CHAMBER

- 8.1 There shall be supplied, single aeration chamber to work in conjunction with the clarifier chamber.  
The aeration chamber shall conform to the following specifications:
- 8.2 The aeration chamber shall be of sufficient capacity to provide a total volume minimum of 24 hours retention of the average daily flow, with a minimum chamber volume of \_\_,000 gallons. The vessel shall be so shaped on each side to prevent sludge accumulation, to enhance the rotation of the vessel contents, and to scum and froth accumulation. To insure maximum retention and eliminate short circuiting of minuscule sewage particles, the aeration chamber shall be constructed with air diffusers, placed longitudinally along one side of the chamber so as to, in conjunction with flow control baffles, enhance the spiral rotation of the chamber contents. To ensure adequate circulation velocity, the proportion of the chamber width to depth, in the direction of rotation, shall not exceed 1.33 to 1. The velocity of rotation shall be sufficient to scour the bottom and prevent sludge filleting as well as to prevent the escape to the surface of minuscule air diffusion bubbles and by so causing their entrapment to provide maximum oxygenation efficiency.
- 8.3 An air distribution manifold shall be installed longitudinally on one side of the tank with diffuser drop assemblies connected thereto. This manifold shall be designed to create a bank of air to supply the air needs of the system, and other ancillary equipment such as the air diffusers, airlift pumps, and scum skimmer to draw from this bank of air.

---

## TEII Systems Specifications Sheet

Sales Agent:

Location of Project:

Project Engineer:

Project No. 2000-\_\_\_\_\_

Design Flow X0,000 gpd

Date: \_\_\_\_\_

---

- 8.4 Each diffuser drop assembly shall be equipped with an air regulating and/or shutoff valve, a disconnecting union and a diffuser bar with non-clog air diffuser nozzles mounted on the tee bar. The air flow per diffuser shall range from 1 to 5 CFM. This minimum air velocity shall be maintained to insure sufficient velocity for self-cleaning. The diffusers shall be parallel to and near the base of the vessel sidewall and at an elevation which will provide the optimum diffusion and mixing of the vessel contents. The oxygen transfer capacity of each diffuser shall be such that an adequate supply of oxygen will be maintained in the aeration chamber to meet treatment requirements of the design sewage load. The air diffuser shall be on the air check diaphragm type constructed with a diaphragm mounted on top of the diffuser body. The diffuser body consists of twenty, 3/16" diameter air discharge holes evenly distributed around the diffuser disk. The diffuser will be supplied with standard male pipe thread connections.

### 9.0 Clarifier Chamber

- 9.1 There shall be furnished a mechanical clarifier chamber to work in conjunction with the aeration chamber of the system. The clarifier chambers shall conform to the following specifications:
- 9.2 The clarifier chamber shall be of such size as to provide a minimum of four (4) hours retention, based upon the same design flow rate governing the aeration chambers, and shall have proper baffling to prevent short circuiting and to provide maximum uniform solids settling area. The clarifier shall be of the hopper clarifier type. Settled sludge shall be returned from the clarifier floor sludge well to the aeration chamber by the positive sludge return systems, consisting of airlift pump.
- 9.3 The clarifier effluent shall pass over the edge of the baffled adjustable effluent weir into the effluent trough and then, out the chamber. The weir plate will be constructed of 1/8" galvanized steel or PVC sheet, and will be gasketed with 1/4" x 1" neoprene strips.

### 10.0 Airlift Sludge Recirculation System

- 10.1 Installed within the clarifier chamber for returning the settled sludge consisting of a positive sludge re-circulation system. It consists of one (two), \_\_\_ " diameter airlift sludge return assembly, meeting the following specifications: The airlift pump system shall have the re-circulation capacity ranging from 0% to 150% of the design flow. The air line supplying air to the pump shall be equipped with a needle valve varying the capacity of the pump. The airlift pump shall be firmly supported and shall be equipped with a clean-out plug to allow for easy cleaning and maintenance.

### 11.0 Airlift Scum Recirculation System

- 11.1 Installed within each clarifier chamber for controlling and returning to floatables and scum, is a positive scum and skimming re-circulation system. It shall consist of two, 2 diameter airlift skimming device meeting the following specifications: The skimming device shall be of the positive airlift pump type, located in a position to skim and return floating material to the aeration chamber. The air line supplying air to the skimming device shall be equipped with a needle valve to regulate the rate of return. The scum intake shall be equipped with an adjustable assembly which will enable exact positioning of the skimmer at water level without placing a hand under the water. The discharge port shall be sloped to enable the operator to determine the flow rate.

---

## TEII Systems Specifications Sheet

Sales Agent:

Location of Project:

Project Engineer:

Project No. 2000-\_\_\_\_\_

Design Flow X0,000 gpd

Date: \_\_\_\_\_

---

### 12.0 Air Supply System

- 12.1 For supplying the air requirements of the wastewater treatment system, two, model TEII-\_\_\_\_-R\_\_ shall be furnished and installed at the location shown on the drawings. Each blower motor unit shall have the capacity of supplying 100% of the wastewater air requirements. Each unit shall be completely factory built and tested before shipping.
- 12.2 The blower motor units Model URAI-\_\_\_\_ shall be furnished for supplying all the air requirements needed for the wastewater treatment system. The units shall be capable of delivering \_\_\_\_ SCFM at an operating pressure of 5 psi.
- 12.3 The blower shall be of the positive displacement type and shall be manufactured by Roots Division of Dresser Industries, Inc., Connersville, Indiana or equal Sutorbilt Blower Division Company, Compton, California; or approved equal. The model number of the blower will be URAI-\_\_\_\_\_.
- 12.4 The motor shall be \_\_\_\_ HP for operation on 230 Volt, 3 Phase, 60 Cycle Service, 1800 RPM. It shall be of the open drip proof type.
- 12.5 The blower shall be mounted on a fiberglass base. The base shall be designed to support the blower and motor unit. Furthermore, the base shall have a light ivory finish.
- 12.6 The blower shall be connected to the motor by means of a "V" belt drive unit. The "V" belt drive unit shall be designed for easy adjustment. The "V" belt drive will enable speed adjustment of the blower unit in those applications where flow varies. The motor will be furnished with an adjustable motor mounting base.
- 12.7 Each blower shall be fitted with an air inlet filter type noise silencer. For connecting to the air manifold, the blower shall be fitted with a flexible rubber hose coupling with stainless steel clamps.
- 12.8 Each blower shall and motor shall be enclosed with a fiberglass weatherproof enclosure. The weatherproof hood shall be designed for easy access to service the blower, motor, filter, or "V" belt drive unit. It shall be equipped with a lifting handle and locking facilities. All enclosure surfaces shall be properly prepared in a neat manner to obtain a smooth, clean dry surface. The enclosure shall have a light ivory finish.
- 12.9 Each blower motor unit shall be mounted on vibration pad dampers. This will help reduce blower vibration and noise transmission. For purposes of determining the blower performance, and/or diffuser condition, a pressure relief valve and pressure gauge shall be mounted in the air manifold.

### 13.0 MAIN BLOWER ELECTRICAL CONTROL CONSOLE CP-1

- 13.1 An electrical control center, Model CP-1, shall be installed within a NEMA 4 weatherproof enclosure complete with a mounting pedestal or legs and located as shown on the plan drawings.
- 13.2 The electrical control center shall control the operation of all the auxiliary component equipment requiring electrical power. The blower motor unit operation time will be intermittent and as controlled by the blower timer. The plant operator shall control the

---

## TEII Systems Specifications Sheet

Sales Agent:

Location of Project:

Project Engineer:

Project No. 2000-\_\_\_\_\_

Design Flow X0,000 gpd

Date: \_\_\_\_\_

---

- operation time. The necessary selector switches shall be provided to allow either automatic or manual operation of the auxiliary equipment.
- 13.3 The enclosure shall be equal to a NEMA type 4. The electrical controls shall consist of IEC starters, timers, and selector switches necessary. Properly sized circuit breakers or fuses shall protect all electrical equipment and circuitry.
- 13.4 All wire and conduit required between the control panel and the electrical power service shall be furnished by and installed by the field controller. Wiring and conduit between the control panel and plant equipment shall be furnished by the manufacturer of the TEII wastewater treatment system. The electrical control system shall be detached for shipping purposes. The main power supply shall be 230 Volt, 3 Phase, 60 Cycle. Power to the control panel shall be 110 volt, 3 phase. A power block in the control panel shall be supplied for the electrical connection.
- 13.5 The control console shall be a Model CP-1 and shall be completely factory assembled and tested prior to shipment.
- 13.6 Controls shall be mounted to a removable sub-panel within the enclosure and shall be wired and spaced in accordance with the latest National Electric Code.
- 13.7 Optional - **Blower Operation Controls Method # 1**. Each blower for the aeration chamber shall be controlled by the 24-hour, 7-day time clock and shall be capable of being programmed to control the blower run cycle and to adjust both the start set point every 15 minutes on the 24 hour cycle. The clock shall also include a skip-a-day feature which will allow a separate program. The clock shall be by Paragon, Model #1015. A selector switch shall be provided with off ,on time clock operation.
- 13.8 Optional - **Blower Operation Controls Method # 2**. Each blower for the aeration chamber shall be able to be controlled by the amount of oxygen in the liquid of the aeration chamber. This shall be controlled by the automatic dissolved oxygen control system, Model TEII-FL-100-24. Equipped with a "Fluoroprobe" flourometer, which is of the optical technology for the measurement of oxygen. The Fluoroprobe shall be installed within the aeration chamber to both monitor the dissolved oxygen and at different set point turn the blower on and off as the dissolve oxygen rises and falls because of the oxygen depletion caused by the BOD loadings. A selector switch shall be provided so that the blower system can be selected to operate on the automatic dissolved oxygen operation. The 'Flourometer is designed to provide long-term monitoring and to control the air systems based on the saturation levels of the oxygen in gaseous or aqueous solutions.. The unit is specified because it will not require the changing of the membrane or electrolyte fluids or the movement of the liquid being measured, since these components are not used with this technology. Those units requiring the changing of the membrane or electrolyte fluids or the movement of water shall not be approved.
- 13.8 Optional- The electrical control panel shall be furnished with power failure and blower failure and local alarm. A battery pack shall be provided for this alarm.
- 13.8 All wiring conductors within the control console shall be UL type MTW, stranded #14 AWG minimum, rated at 110 volts. Power wiring shall be color coded per National Electric Code. Control wiring shall be numbered on each end with a permanent heat-shrinkable sleeving made of flexible, irradiated, flame-retardant polyolefin.

### 14.0 SERVICE WALKWAY

---

## TEII Systems Specifications Sheet

Sales Agent:

Location of Project:

Project Engineer:

Project No. 2000-\_\_\_\_\_

Design Flow X0,000 gpd

Date: \_\_\_\_\_

---

- 14.1 A service walkway shall be provided for the service area only to service the plant equipment and shall be approximately \_\_\_\_\_ square feet. Grating panels shall consist of one-piece skid resistant steel plate. All grating panels shall be constructed of 18 gauge, galvanized sheet steel with a maximum yield strength of 37,000 psi. Each grating panel has a standard 9-inch surface width, and a 2 1/2-inch rib depth. Furthermore, each panel shall be so supported as to have a safe uniform load carrying capacity of 50 pounds per square foot. Refer to the attached load bearing chart for grating capacity.
- 14.2 A service handrail shall be provided around the perimeter of the service walkway to provide safety when servicing the plant equipment and shall be approximately \_\_\_\_\_ lineal feet. The service handrails shall consist of two-rail aluminum pipe with speed rail fittings. The aluminum piping shall be shipped with the tank vessel in 20 foot lengths. The stantions shall be shipped to the project site pre-assemblies with the speed rail fittings. The stantions shall be bolted to the tank structure to the bolt holes furnished. Once the stantions have been installed the pipe railings shall be installed and cut to size by the field contractor.

### 15.0 (OPTIONAL) SLUDGE HOLDING CHAMBER

- 15.1 There shall be supplied an aerated sludge holding chamber to work in conjunction with the aeration chamber and the clarifier chamber. The aerated sludge holding chamber shall be an integral section of the main system and shall conform to the following specifications:
- 15.2 The sludge holding chamber shall be of sufficient capacity to provide a total volume minimum chamber volume of \_\_\_\_\_ gallons. The vessel shall be so shaped on each side to prevent sludge accumulation, to enhance the rotation of the vessel contents, and to scum and froth accumulation. To insure maximum retention and eliminate short circuiting of minuscule sewage particles, the aeration chamber shall be constructed with air diffusers, placed longitudinally along one side of the chamber so as to, in conjunction with flow control baffles, enhance the spiral rotation of the chamber contents. To ensure adequate circulation velocity, the proportion of the chamber width to depth, in the direction of rotation, shall not exceed 1.33 to 1. The velocity of rotation shall be sufficient to scour the bottom and prevent sludge filleting as well as to prevent the escape to the surface of minuscule air diffusion bubbles and by so causing their entrapment to provide maximum oxygenation efficiency.
- 15.3 An air distribution manifold shall be installed longitudinally on one side of the tank with diffuser drop assemblies connected thereto. This manifold shall be designed to create a bank of air to supply the air needs of the system, and other ancillary equipment such as the air diffusers, airlift pumps, and scum skimmer to draw from this bank of air.
- 15.4 Each diffuser drop assembly shall be equipped with an air regulating and/or shutoff valve, a disconnecting union and a diffuser bar with non-clog air diffuser nozzles mounted on the tee bar. The air flow per diffuser shall range from 1 to 5 CFM. This minimum air velocity shall be maintained to insure sufficient velocity for self-cleaning. The diffusers shall be parallel to and near the base of the vessel side wall and at an elevation which will provide the optimum diffusion and mixing of the vessel contents. The oxygen transfer capacity of each diffuser shall be such that an adequate supply of oxygen will be maintained in the aeration chamber to meet treatment requirements of the design sewage load. The air diffuser shall be on the air check diaphragm type constructed with a diaphragm mounted on top of the diffuser body. The diffuser body consists of twenty, 3/16" diameter air discharge holes evenly distributed around the diffuser disk. The diffuser will be supplied with standard male pipe thread connections.

---

## TEII Systems Specifications Sheet

Sales Agent:

Location of Project:

Project Engineer:

Project No. 2000-\_\_\_\_\_

Design Flow X0,000 gpd

Date: \_\_\_\_\_

---

- 15.5 The flow into the sludge holding tank shall be direct from the sludge return pump. The necessary piping and valving shall be supplied to allow the to occur manually at the plant operators requirements. A supernatant return facilities shall be provided so that the overflow will return to the aeration chamber.

### 16.0 CHLORINE CONTACT CHAMBER

- 16.1 A baffle type chlorine contact chamber shall be provided, constructed as an integral part of the treatment system. The contact chamber shall be installed immediately following the clarifier. The tank shall be sized for a capacity of 416 gallons based on 30-minute retention of the design flow rate. Baffles shall be provided to prevent short circuiting and shall be designed to keep floating material from leaving the chamber.
- 16.2 Sufficient flow baffles will be supplied to assure proper mixing of the chlorine solution with the system effluent. Two metering pumps shall be supplied of the chemical feed type for supplying chlorination to the contact tank. The chemical feeder shall be a Sanuril Model 1000 or approved equal.

### 17.0 Effluent Connection

- 17.1 The effluent connection of the secondary treatment system shall be located as shown on the plans and shall consist of one 6" square port at the end of the clarifier weir. at the location shown.

### 18.0 FIELD ASSEMBLY

- 18.1 The shipment of the "TEII" wastewater treatment system is done by special lowboy trucks directly to the job site. The equipment necessary to unload the plant and set it on the foundation pad must be furnished by the field contractor. The access road into the project site to handle these lowboy trucks will be the responsibility of the field contractor. The approximate weight of the system is 15,000 pounds..
- 18.2 The TEII package steel treatment systems shall be completely assembled units and are shipped as a unit where shipping height limitations permit. Portion of the equipment must be removed to meet the shipping height limitations. This equipment will be packaged separately at the factory for re-assembly at the field. The equipment should be field assembled and installed by the field contractor.

### 19.0 FIELD SERVICE (OPTIONAL)

- 19.1 At the time the wastewater treatment system is filled with water or sewage, all power connections have been completed, and all equipment is approved for service, the contractor shall provide the services of a representative of the manufacturer who shall instruct the owner's representative in the proper operation and maintenance of the wastewater treatment system including instructions in conducting all required operational tests. The manufacturer's representative shall furnish at this time, a service manual on the equipment installed within the wastewater treatment system. The manufacturer's representative shall for a period of one (1)

---

## TEII Systems Specifications Sheet

Sales Agent:

Location of Project:

Project Engineer:

Project No. 2000-\_\_\_\_\_

Design Flow X0,000 gpd

Date: \_\_\_\_\_

---

year after delivery is made, make periodic inspections of the system, advising the owner's representative of any operational difficulties.

### OPTIONAL - FLOW EQUALIZATION EQUIPMENT SECTION

#### **DIVISION 1 - FLOW EQUALIZATION SYSTEM**

To control the peak hourly flow rates entering the wastewater treatment system a surge control system shall be provided. The surge control system shall consist of a prefab steel tank constructed in accordance with the contract drawings complete with dual surge pumps, liquid level control system, electrical controls, air blower, coarse air diffuser with air manifold.

The following equipment shall be provided by **Tipton Environmental International, Inc** for the flow equalization basin:

- (A) One Air Blower Unit
- (B) One Electrical Control Panel Model CP-4
- (C) Four Liquid Level Sensors
- (D) Two Slide rail Systems for surge pumps
- (E) 24 Coarse Air Diffusers with drop assemblies complete with air diffusers
- (F) One Blower Motor Unit Model B-3
- (G) One Fiberglass Housing
- (H) Two Sewage surge Pumps P-3, P-4,
- (I) One \_\_\_,000 gallon surge tank

#### **D1.1 AIR SUPPLY FOR SURGE TANK (EQUALIZATION TANK)**

For supplying the air requirements of the Flow equalization System control system, one (1) Model BF-\_\_\_\_-R\_\_ Blower Motor Unit shall be provided and shall be item BM-3, and shall be furnished and installed at the location shown on the drawings.

The blower motor unit shall be a Model BF-\_\_0-R\_\_ shall be furnished for supplying all the air requirements needed for the flow equalization Basin. The unit shall be capable of delivering 150 SCFM at an operating pressure of 5 psi.

The blower shall be of the positive displacement type and shall manufactured by Roots Division of Dresser Industries, Inc., Connersville, Indiana or approval equal. The Model number of the blower will be URAI-\_\_\_\_ and equipped with a \_\_\_\_\_ " discharge.

The motor shall be \_\_\_\_ Hp for operation on \_\_ volt, \_\_ Phase, 60 Cycle Service, and 1800 RPM. It shall be of the open drip proof type.

---

## TEII Systems Specifications Sheet

Sales Agent:

Location of Project:

Project Engineer:

Project No. 2000-\_\_\_\_\_

Design Flow X0,000 gpd

Date: \_\_\_\_\_

---

The blower shall be mounted on a structural steel fabricated base. The base shall be designed to support the blower and motor unit. Furthermore, the base shall have a blue finish.

The blower shall be connected to the motor by means of a "V" belt drive unit. The "V" belt drive unit shall be designed for easy adjustment. The "V" belt drive will enable speed adjustment of the blower unit in those applications where flow varies. The motor will be furnished with an adjustable motor mounting base.

The blower shall be fitted with an air inlet filter type noise silencer. For connecting to the air manifold, the blower shall be fitted with a flexible rubber hose coupling with stainless steel clamps.

The blower and motor shall be enclosed with a fiberglass weatherproof enclosure. The weatherproof hood shall be designed for easy access to service the blower; motor, filter, or "V" belt drive unit. It shall be equipped with a lifting handle and locking facilities. All enclosure surfaces shall be properly prepared in a neat manner to obtain a smooth, clean dry surface. The enclosure shall have an ivory finish.

Each blower motor unit shall be mounted on four (4) vibration pad dampers tagged VP-1. This will help reduce blower vibration and noise transmission. For purposes of determining the blower performance, and/or diffuser condition, a pressure relief valve and pressure gauge.

These items shall be shipped loose for field installation in mounting in the air manifold of the surge tank.

### D1.2 ELECTRICAL CONTROL CONSOLE CP-2

An electrical control center Model CP-2 shall be installed within a NEMA 4 steel Electrical weatherproof enclosure complete with floor mounting facilities.

The electrical control center shall control the operation of the following equipment:

- A) Blower Motor Unit BM-3
- B) Surge Pump No. 1 P-1
- C) Surge Pump No. 2 P-2
- D) Liquid level sensors -6 level sensors

Surge Blower Motor Unit - The surge blower unit operation shall be controlled by the liquid level condition of the flow equalization basin. The blower shall turn on when the on liquid level sensor side is activated and off when the low level sensor is reached.

Surge Tank Pumps Control - The surge pumps shall operate on a duplex pump alternator operation 1 mode where as pump one will operate alternately with pump no 1 and 2 on cycles. The pump operation shall be controlled by four (4) encapsulated mercury float Switches each individually adjustable for the following:

- A) All Pumps off & Blower Off
- B) Lead Pump on
- C) Blower On
- D) Lag Pump on
- E) High Level Alarm

---

## TEII Systems Specifications Sheet

Sales Agent:

Location of Project:

Project Engineer:

Project No. 2000-\_\_\_\_\_

Design Flow X0,000 gpd

Date: \_\_\_\_\_

---

The surge pumps shall operate on a lead-lag with the two pumps alternating. If the liquid level reaches lag pump on level, both pumps shall operate. If the liquid level reaches the high water level, the alarm will be activated.

All wiring, terminal blocks, supports and accessories required for the operations of the control panel shall be provided in compliance with the National Electric Code.

D1.3 Flow Equalization Pumps Tagged P-1, P-2,

The surge pumps shall be of the Goulds type. Each pump shall be a Model \_\_\_\_\_ as manufactured by The Goulds Pump Company, Seneca Falls, New York. The pump shall have a capacity of \_\_\_\_\_ GPM @ 14 feet of TDH. The pump shall have a 3/4 horsepower motor which will operate on 230 volt, 3 phase, 60 Hz.

Each surge pump shall be supplied with a 3 inch discharge. In addition to the pump each pump shall be furnished with a slide rail assembly.

### 20.0 GUARANTEE

- 20.1 The manufacturer of the wastewater treatment system shall guarantee for one (1) year from the date of shipment that the vessel and all component equipment shall be free from defective materials and workmanship. The manufacturer shall furnish replacement parts for any component considered in the opinion of the manufacturer to be defective, whether of his other manufacturer during this guarantee period.