GENERAL

The contractor shall furnish and install one complete Extended Aeration wastewater treatment facility with all necessary parts and equipment as described in the following specifications. The Extended Aeration wastewater treatment facility shall provide primary and secondary treatment of the wastewater flow and shall be as manufactured by Norweco, Inc., Norwalk, Ohio, U.S.A.

Treatment of the daily wastewater flow shall be accomplished by the Extended Aeration process. Other variations of the Activated Sludge process such as Contact Stabilization, Step Aeration, etc., are more susceptible to toxic and hydraulic upsets and shall not be considered for this application.

Primary treatment shall be accomplished in the aeration chamber of the facility. All incoming wastewater shall enter and be retained in the aeration chamber for twenty-four hours. Air shall be introduced along one wall near the bottom to produce a mixing and rolling action in the tank. Two thousand-six hundred cubic feet of air shall be pumped into the aeration chamber for each pound of BOD applied per day. The spiral rolling action created by the introduction of air shall insure thorough mixing of the incoming organic material with the activated sludge present in the chamber. In addition, the spiral flow pattern shall prevent short circuiting of the flow and assure adequate retention of all organic materials.

Secondary treatment of the wastewater shall be accomplished in a clarification chamber. Mixed liquors shall flow from the aeration chamber into the clarification chamber by hydraulic displacement. The effective holding capacity of the clarifier shall be calculated after excluding the lower two-thirds, by height, of the hopper(s) and shall still be of sufficient volume to provide in excess of four hour retention of the daily flow. The chamber shall be designed so that the clarifier will successfully perform its function of solids separation without hydraulic upset even when the significant runoff period is eight hours.

The Extended Aeration wastewater treatment facility shall provide an anticipated eighty-five to ninety-five percent removal of BOD and suspended solids. Net sludge volume increases shall be nominal and should range from zero to one percent depending upon influent characteristics.

Principal items of equipment supplied with the system shall include reinforced precast concrete aeration and clarification tanks, air distribution piping, air diffusion system, Travalair™ mechanical sludge collection system utilizing airlift sludge return pumps and airlift surface skimmers, galvanized handrailing for all tank openings, Travalair™ sludge collection drive unit with independent electrical controls, rotary positive displacement blowers, motors, mechanical equipment housings, automatic electrical controls, effluent weir troughs, sludge collection and return troughs, and all necessary internal piping and valving. To eliminate any possibility of differential settling of the tankage, the contractor shall install a six inch thick leveling pad of sand or stone in the bottom of the excavation prior to tank setting.

OPERATING CONDITIONS

The Travalair™ wastewater treatment facility shall be a Norweco Model _____, as shown on Drawing Number

_____, capable of treating _____ gallons per day of sanitary sewage having a two hundred twenty parts-per-million, five-day BOD strength. This facility shall be designed and built to service a population equivalent of _____ persons with a total loading and treatment capability of _____ pounds of biochemical oxygen demand per day. Hydraulic design considerations of the facility shall be such that intermittent peak flow factors as high as four shall not upset hydraulic reliability within the system.

PRECAST CONCRETE TANKAGE

The wastewater treatment facility shall be constructed of properly reinforced five thousand PSI, twenty-eight day compression strength precast concrete. A leveling pad of sand or crushed stone at least six inches thick shall be installed in the excavation upon which the precast guide rails are set. Each guide rail shall be at least eight feet long by twenty inches wide by eight inches thick to allow accurate leveling in both directions and even distribution of weight over a wide area. There shall be at least one guide rail for every ten feet of tank length to provide adequate support strength for the wall panels.

Reinforced precast concrete wall panels eight inches thick and at least seven feet in length shall be set in place spanning two adjacent guide rails. Wall panels shall have precast joints of shiplap construction at each end to facilitate concrete setting. After one wall panel has been set in place, a four inch by one-half inch neoprene gasket with adhesive backing and release liner on one side shall be applied vertically along the entire wall joint. The second wall panel shall then be set level in place adjoining the first. The two panels shall be secured through holes cast into the shiplap joints by five-eighths inch diameter cadmium plated coarse thread bolts with extra heavy plated steel flat washers and plated heavy hex head nuts. The bolts, when tightened, shall cause the neoprene gasket to be compressed along its entire length to provide a primary seal.

After all wall panels of the Travalair™ wastewater treatment facility have been set in place, leveled, and the primary seal installed, a secondary seal consisting of a trowel-grade polyurethane base non-sag sealant shall be injected into all vertical joints and bolt holes. The sealant material shall cure to medium firm durometer and shall have a tensile strength of at least one hundred fifty PSI, an ultimate elongation in excess of three hundred percent, a peel strength of at least eight PSI, and be totally resistant to sagging in a vertical joint at least three-quarters of an inch wide. The sealant shall also exceed USASI specification 116.1 and federal specification TT-S-230.

After secondary sealing has been completed a concrete floor shall be poured within the wastewater treatment facility to a depth of twelve inches above the leveling pad so that it extends six inches above the bottom of the wall panels to assure a positive seal between the foundation floor and wall panels. The floor shall be poured of five thousand PSI ready-mixed concrete. The excavating contractor shall be responsible for keeping ground water and surface run-off from entering the excavation during installation and curing of the secondary seal and concrete floor. Wastewater treatment plants of similar design in which the concrete floor is poured initially with wall panel setting and installation of sealing materials following thereafter do not provide a positive means to lock the wall panels into position within the finished structure and therefore shall not be considered in this application.

PRECAST CONCRETE WALKWAYS

The entire Travalair™ wastewater treatment facility shall include a network of precast concrete walkways over the aeration and clarification and (optional) integral aerated flow equalization and/or aerated sludge holding chambers to

allow full access to all sides of all chambers for inspection and maintenance purposes. The walkways shall be constructed of properly reinforced five thousand PSI, twenty-eight day compression strength precast concrete and shall be poured with a textured finish applied to the top and to give non-skid properties to the finished structure. The walkways shall be cast with an eight inch wide by six inch deep groove underneath to allow them to mate with the precast concrete sidewall panels and thus impart added strength to the facility and further resistance to severe hydrostatic loadings which might be encountered during backfilling and before settlement of fill has been completed. Walkways shall be provided around the entire perimeter of the wastewater treatment facility and shall also span the width of the aeration chamber at intervals not to exceed six feet edge-to-edge so that all component parts are within safe reaching distance of the plant operator. A walkway shall be provided between each pair of aeration drop pipe and diffuser bar assemblies to permit easy inspection, adjustment or removal.

GALVANIZED STEEL HANDRAILING (OPTIONAL)

The perimeter of every chamber in the Travalair™ wastewater treatment facility shall be protected by a two-rail galvanized steel handrailing. The handrailing shall be secured to the precast concrete walkways with galvanized steel fittings and flanges as required for strength and rigidity. The handrail shall have a minimum outside diameter of one and one-half inches; the top rail shall be installed at a height of forty-two inches above the walkway with an intermediate rail installed at midpoint between the top rail and walkway.

Openings shall be provided in the handrailing system at conveniently located points near the areas where most inspection and maintenance work must be performed. All openings shall be protected by two lengths of three-sixteenths inch, seven hundred-fifty pound cadmium plated safety chain. The chain shall be permanently connected to the rail system at one end and provided with snap-type clips at the other end for removal and access.

AERATION

The aeration chambers shall have a total capacity of _____ gallons to provide twenty-four hour retention of the daily wastewater flow. Duplex aeration chambers in parallel with a common center wall and external flow diversion equipment shall be provided to increase flexibility of system operation. The chambers shall be of sufficient size to provide a minimum of eighty cubic feet of tank capacity per pound of BOD applied per day. Concrete fillets shall be installed in the bottom of the chamber parallel to the treatment flow to insure uniform tank roll and to prevent deposition of solids. Overall design of the chambers shall be such that effective mixing shall be maintained to provide optimum treatment.

AIR DISTRIBUTION PIPING

Galvanized schedule forty piping and galvanized malleable iron pipe fittings shall be used throughout the air distribution system. Individual galvanized pipe unions, dresser couplings and flexible couplings with stainless steel clamps shall be supplied as necessary in the piping system. Individual air control valves shall be installed in the air distribution piping as required to allow individual adjustment of each separate item.

Primary air distribution shall be provided through a galvanized air header. The air header shall have individual drop pipes connected to the header assembly by means of galvanized quick-disconnect couplings for air supply to individual Evenair™ diffuser assemblies. Each drop pipe shall be equipped with an air adjustment valve upstream of the quick disconnect to enable a proper balance of air distribution to be obtained even when a diffuser bar has been removed from service for inspection.

TRAVALAIR™ WASTEWATER TREATMENT PLANT SPECIFICATIONS

Travalair™ wastewater treatment plants of this design which consist of two parallel arrangements of aeration and clarification tanks shall be equipped with separate isolated aeration equipment, drop pipes and Evenair™ diffuser bars for each series of tanks provided.

AIR DIFFUSION SYSTEM

Norweco Evenair™ diffusers shall be provided parallel to the treatment flow in the aeration chamber. Each diffuser assembly shall be installed not more than twelve inches off the floor of the aeration chamber nor more than fifteen inches away from the chamber sidewall. Evenair™ diffusers shall be constructed of schedule eighty polyvinyl chloride (PVC) plastic and shall be designed to apply a minimum of two cubic feet of air per minute per foot of aeration tank length to insure uniform mixing within the aeration chamber. Fine air bubble distribution effected by the diffusers shall be adequate to provide all oxygen necessary for the Extended Aeration process while maintaining an acceptable dissolved oxygen level in the final plant effluent. Arrangement of Norweco Evenair™ diffusers shall be consistent throughout the aeration chamber and shall provide at least one air diffusion orifice for each six inches of aeration chamber length.

CLARIFICATION

An integral final clarification chamber shall be provided for secondary treatment of the daily flow. It shall have a total holding capacity of _____ gallons. Effective holding capacity of the clarifier shall be at least _____ gallons when not using the lower two-thirds (by height) of the hopper area for computing capacity. The effective capacity shall be sufficient to permit holding the design flow into the wastewater treatment facility for a minimum of four hours. The effluent weir shall be of sufficient length to provide an overflow rate of _____ gallons per lineal foot per day, and the surface area of the clarification chambers shall provide a settling rate of _____ gallons per square foot per day. The clarifier shall consist of duplex chambers in parallel with a common center wall. Construction of the precast concrete guide rails, wall slabs and walkways, installation of sealing materials and concrete floor shall be as specified for the aeration chambers above. After installation of the concrete floor, precast concrete hopper wall panels shall be installed along the length and across both ends of each clarification chamber. Hopper sidewalls shall be installed at an angle for forty-five degrees with a twelve inch wide by six inch deep trough for collection and removal of sludge, separating them. Hopper end walls shall be installed at an angle of sixty degrees to permit any sludge accumulating on them to settle by gravity to the collection trough. The clarifier shall consist of essentially four independent zones operating together to provide satisfactory solids separation. An inlet baffle zone shall be provided at the inlet to the clarification chamber.

All transfer turbulence shall be dissipated in the clarifier chamber upstream of the inlet baffle and its performance shall be adequate to eliminate all turbulence downstream of the baffle. The area contained behind the baffle shall allow adequate capacity and detention time for surfacing of all buoyant materials entering the clarifier. The baffle shall extend a minimum of six inches above normal water surface to entrap all floating materials behind it without overflow and it shall extend below the transfer port to the upper level of the sloping hopper sidewall so that all transference of flows from the inlet baffle zone shall be directed immediately to the hopper zone. Upon entry into the hopper zone, sludge shall settle by gravity toward the sloping hopper sidewalls which shall direct the sludge to the central collection trough for removal by the Travalair™ mechanical sludge collection system. After separation of sludge, clarified liquid shall be hydraulically displaced upward into the settling zone above the hopper zone for additional detention time to promote increased gravity settling. From this area they shall be further displaced to the

outlet zone. The outlet zone shall consist of an adjustable sideplate effluent weir trough with outlet baffle. The outlet baffle shall extend into the surface of the liquid to a minimum depth of four inches and shall extend above the surface to a minimum of six inches. This baffle shall extend the entire length of the outlet zone and shall totally separate the surface liquids of the settling and outlet zones. Centered in the outlet zone and parallel to the outlet baffle shall be an effluent weir trough with two adjustable v-notch sideplates. The trough shall be capable of being adjusted from end-to-end to provide adequate fall to the plant outlet and the sideplates shall each be capable of being levelled from side-to-side and end-to-end to the level of the liquid surface in the chamber. The effluent weir shall be located along one end of the clarifier chamber but shall be installed a sufficient distance from the end wall to eliminate the effects of end wall currents.

TRAVALAIR™ MECHANICAL SLUDGE COLLECTION

Settled sludge shall be removed from the collection trough at the bottom of each hopper and each hopper sidewall shall be scraped to aid the settling of sludge on a continuous basis by the Travalair™ mechanical sludge collection system. An adjustable scraper blade with a neoprene squeegee edge shall be installed on each vertical sludge airlift pump at right angles to the wastewater flow. These scraper blades shall gently scrape sludge accumulations from the hopper sidewalls and divert them to the bottom of the hopper within reach of the airlift sludge return pump. The adjustable scraper blade assemblies, with the airlift pumps, shall be powered by a one-quarter horsepower motor through reduction gears to an operating speed of six inches per minute so as not to impart turbulence and disturb the settling action within the clarifier chamber. The Travalair™ sludge collection process shall be driven at this rate along the entire length of the clarifier from a steel track installed on the center walkway above the chamber. The drive motor, gear reducer, power transmission equipment, drive wheels and electrical controls shall all be located above the precast concrete walkway for maximum accessibility to the plant operator. Mechanical sludge collection equipment in which the drive apparatus or other moving parts are submerged within the clarifier require interruption of treatment capability during periods of service and discourage the performance of routine maintenance and therefore shall not be considered in this application.

AIRLIFT SLUDGE RETURNS

A galvanized airlift sludge return pump shall be provided for each clarification chamber. It shall be constructed of schedule forty galvanized steel pipe and galvanized malleable iron pipe fittings. A removable cleanout plug shall be installed at the top of the vertical airlift pipe and a non-rising stem type backwash valve shall be provided in the horizontal discharge line. Galvanized steel sludge return piping shall deposit sludge with positive visible return into an eight inch wide by eight inch deep trough located on each side of the Travalair™ mechanical unit drive track along the entire length of the clarifier chamber. The airlift sludge return pump in each clarifier chamber shall be connected to the mechanical sludge collection drive unit so that settled sludge is continuously being lifted from the entire length of the sludge collection trough in each hopper.

The sludge return and collection trough into which returned sludge is deposited shall be installed high enough above the normal water surface to assure gravity drainage and positive visible return by means of a sludge return line installed to the inlet end of the aeration tank. The sludge return piping outlet shall be positioned at a point in the aeration chamber which prevents short-circuiting and which allows for maximum contact time between returned activated sludge and influent raw wastewater. If an aerated sludge holding facility is to be used, the sludge collection and return troughs or sludge return piping shall be equipped as necessary with diversion plates or non-rising stem type

valves to permit returned sludge to be selectively applied to the aeration chamber or to sludge holding, as determined by the plant operator's needs.

Air for operation of the airlift sludge return pumps shall be provided by a Model _____ Roots-Connersville blower, or equal, mounted directly within the equipment housing of the Travalair™ mechanical sludge collection drive unit. Air supply for operation of clarifier airlift pumps shall be independent of that provided for mixing and biochemical treatment in the aeration chambers to permit settled sludge to be returned to aeration even in periods when the treatment plant blowers have been cycled off. The blower for clarifier airlift operation shall be of the rotary positive displacement type and shall provide _____ cubic feet of free air per minute at a rated operating pressure of _____ PSI. The maximum allowable operating pressure of the blower unit shall be at least _____ PSI. Air available for operation of each sludge airlift pump shall be of sufficient cubic feet per minute so that a pumping rate in excess of the daily design flow rate can be achieved. An air adjustment valve shall be provided for each airlift pump for fine adjustment or shut off. The rotary blower unit shall be provided complete with inlet air filter/silencer, discharge pressure relief valve and discharge flexible coupling connector to the distribution header assembly. Blower connection to the drive motor shall be with conventional v-belt power transmission equipment designed to operate the blower unit at a speed of _____ RPM.

A seventeen hundred fifty RPM, _____ volt, _____ phase, 60 Hertz, _____ horsepower, shielded, drip-proof electric motor shall be used to drive the blower. When operating at the rated horsepower the motor shall reach a maximum speed that shall exceed ninety-seven percent of the referenced synchronous speed. The motor shall be designed and rated for continuous duty applications and shall not overload or exceed motor nameplate ratings when operating as outlined for this facility. The motor shall be mounted in the weatherproof cabinet also used to house the Travalair™ drive motor and gear reducer. An adjustable slide base shall be included for ease of motor alignment and belt tension adjustment.

AIRLIFT SURFACE SKIMMERS

A galvanized airlift surface skimmer shall be provided for each clarification chamber. It shall be constructed of schedule forty galvanized steel pipe and galvanized malleable iron pipe fittings. The surface skimmer airlift pipe shall be constructed of one continuous length of galvanized pipe formed into a twenty inch diameter return bend to pump from the liquid surface to the horizontal discharge line. Surface skimmer airlifts constructed with acute angle bends or submerged fittings are susceptible to plugging and shall not be considered.

A removable cleanout plug shall be installed at the top of the vertical airlift pipe and a non-rising stem type backwash valve shall be provided in the horizontal discharge line. Galvanized steel surface skimmer return piping shall deposit waste materials with positive visible return into the same discharge trough used for returned sludge. The surface skimmer assembly shall be connected to the mechanical sludge collection drive unit so that the entire surface of the clarifier chamber is subjected to continuous skimming as the unit travels from end to end.

The surface skimmer inlet shall be equipped with an adjustable polystyrene plastic inlet cone. The inlet cone shall be provided with a flexible connector for installation and adjustment of the cone to the proper skimming height on the airlift assembly. The diameter of the inlet cone shall be at least three times larger than the diameter of the airlift pipe to insure acceptable skimming velocities. Air for operation of each surface skimmer airlift shall be provided by the same blower/motor assembly supplying air to the airlift sludge return pumps. Air at the rate of four cubic feet per

minute shall be provided for each surface skimmer and an air adjustment valve shall be included with each skimmer airlift for fine adjustment or shut off.

MECHANICAL SLUDGE COLLECTION ELECTRICAL CONTROLS

Electrical controls for operation of the Travalair™ mechanical sludge collection system shall be separate from those controlling the treatment plant aeration equipment and shall be contained within the weatherproof equipment housing with the Travalair™ drive unit and airlift motor/blower assembly. The equipment housing shall have two coats of weather resistant paint and be equipped with a master-keyed locking device. Electrical controls shall include a _____ volt, _____ phase, fusible disconnect switch and circuit breakers, magnetic motor starters and thermal overload protection for both the drive motor and blower motor. The motor starter for the drive motor shall be of the reversing type and shall incorporate time delay relays in the forward and reverse positions to allow for complete momentary stopping of the drive unit before reversing its direction. Time clocks or other devices which cold restrict the hopper side wall scraping or airlift sludge return to intermittent operation shall not be incorporated into this control system. Separate circuit breakers and overload protection shall be provided for each motor so that airlift sludge return capability may be retained unimpaired even during periods of maintenance on the drive motor.

Reversal at either end of the clarifier chamber shall be accomplished by weatherproof reversing limit switches mounted on the Travalair™ drive unit. They shall be tripped at designated points at each end of the clarifier chamber and cause the direction of travel to be reversed. A back-up limit switch shall be provided outboard of the reversing switch at each end of the clarifier which shall automatically override all drive unit electrical controls in case of primary switch failure. The back-up limit switch shall have no effect on the blower motor, which shall continue to lift and return sludge uninterrupted in this situation.

TREATMENT PLANT MECHANICAL EQUIPMENT

Air required for the treatment process and to assure adequate mixing in the aeration chambers shall be provided by _____ Model _____ Roots-Connersville blowers or equal. The blowers shall be of the rotary displacement type and shall provide _____ cubic feet per minute of free air at the rated operating pressure of _____ PSI. Each blower unit shall be provided with an inlet air filter/silencer, discharge pressure relief valve and discharge flexible coupling connector to the air header assembly. If a stand-by blower is provided, check valves shall be included in the discharge piping. Blower connection to the drive motors shall be with conventional v-belt power transmission equipment.

_____ seventeen hundred fifty RPM, _____ volt, _____ phase, 60 Hertz, _____ horsepower, shielded, drip proof electric motors shall be used to drive the blowers. When operating at the rated horsepower the motors shall reach a maximum speed that shall exceed ninety-seven percent of the referenced synchronous speed. The motors for the facility shall be designed and rated for continuous duty applications and shall not overload or exceed motor nameplate ratings when operating as outlined for this facility. The motors shall be mounted on adjustable slide bases for ease of motor alignment and belt tension adjustment.

ELECTRICAL CONTROLS

Electrical controls shall be mounted within a weatherproof enclosure to protect electrical equipment. The enclosure shall have two coats of weather resistant paint and be equipped with a master-keyed locking device. Controls shall

include: _____ volt, _____ phase motor control center, across-the-line magnetic type motor starters, thermal overload protection, circuit breakers and toggle selector switches. The motor control center shall be a Model _____ as manufactured by Norweco, Inc., Norwalk, Ohio, U.S.A. Electrical controls shall be factory-tested under actual jobsite operating conditions prior to shipment.

TIME CLOCK (OPTIONAL)

Electrical controls shall include a fifteen minute multiple, twenty-four hour time clock to permit cyclic automatic operation of the treatment facility throughout the day. Three position "Hand-Off-Auto" selector switches shall be installed for each blower unit supplied to allow the unit to operate either on a continuous run basis or according to the cycle established on the time clock.

EMERGENCY POWER (OPTIONAL)

The manufacturer shall furnish and install an emergency power source receptacle for a portable emergency power generator. This receptacle shall be weatherproof and shall lead directly into the emergency power main fusible switch. The receptacle shall be rated for _____ amps, _____ wire, four pole, 60 Hertz, _____ volts per Russell & Stoll 7334-R reverse service or equal.

FOAM CONTROL SPRAY SYSTEM

A foam control spray system shall be installed in the aeration chambers of the wastewater treatment plant to control periodic occurrences of foaming. The spray system shall be equipped with duplex submersible spray pumps located downstream of the inlet baffle area in the clarification chambers of the facility. Schedule forty galvanized steel piping and galvanized malleable iron pipe fittings shall be used to carry the clarifier liquid from the pumps to a series of Norweco brass non-clog spray nozzles arranged in the aeration chambers opposite to the air drop pipes and diffuser bars. The spray nozzles shall be of one-piece construction and shall have a clear opening which is not less than one-quarter inch in diameter at the smallest point while in operation. Each nozzle shall be capable of delivering 2.5 gallons per minute of non-atomized liquid in a flat, uniformly-distributed pattern within a spray angle of not less than one hundred-five degrees. At least one spray nozzle shall be installed for each three feet of aeration tank length.

The foam control equipment shall include a non-rising stem brass gate valve installed in the line between the pump and spray nozzles for adjustment of the flow or shut off. When the valve is closed, the flow shall be diverted to a three-quarter inch diameter wash water outlet located within twelve inches of the top of the clarifier walkway for easy access by the plant operator. The wash water outlet shall accept a standard threaded hose connection so that the sidewalls, walkways, weirs and piping of the wastewater treatment plant may be routinely hosed clean.

The clear liquid shall be delivered to the spray nozzles by duplex Norweco Model _____ submersible pumps wired for _____ volt, _____ phase, 60 Hertz operation. Each pump shall be _____ horsepower, _____ RPM and shall have a maximum current draw of _____ amps. Each pump shall be fitted with a ____ inch NPT discharge and shall deliver _____ gallons per minute to the spray nozzles against a total dynamic head of _____ feet. The pump shall deliver not less than twenty gallons per minute when flow is diverted to the wash water outlet. The pump shutoff head shall not be less than fifteen feet. The pump shall be capable of operating continuously while either totally submerged or with its motor not submerged.

The pumps shall be of heavy-wall cast iron construction with motor operating in a hermetically-sealed, oil-filled chamber. The pump itself shall be capable of passing ____ inch diameter solids but shall be installed so that the inlet is not less than four inches nor more than twelve inches below the water surface of the clarifier so that neither floating material nor settled sludge is applied to the spray nozzles. The galvanized spray line shall be installed to allow gravity drainage of all liquid through the line and the pump at the end of each pumping cycle to eliminate freezing of spray lines in winter. Non-submersible suction lift pumps containing integral priming reservoirs and check valves which will not permit spray lines to drain and which are themselves susceptible to impeller freezing in colder temperatures shall not be considered in this application.

The foam control spray pump shall be activated by controls housed within the weatherproof enclosure also containing the electrical components governing operation of the treatment plant aeration equipment. A circuit breaker, control relay and "Hand-Off-Auto" selector switch shall be supplied for each pump. The electrical controls shall be wired to permit each pump to run continuously, or on the time cycle established for the aeration equipment or not at all, depending upon the specific plant requirements.

CORROSION PROTECTION

After completion of welding, all steel surfaces of the treatment plant equipment shall be blasted to white metal. All surfaces shall be primed with one coat of strontium chromate primer thinned ten percent with epoxy thinner for a dry thickness of one and one-half mils. After a minimum of eight hours drying time two coats of catalyzed PPG Aquapon shall be applied, one coat in a horizontal spray pattern and one coat in a vertical spray pattern. This shall produce a four to six mil total dry thickness on the interior surfaces and six to nine mil total dry thickness on the exterior surface. The finished interior and exterior color shall be Norweco green. The plant manufacturer shall provide sufficient catalyzed epoxy for field touch-up.

MANUFACTURER

The equipment specified herein shall be the product of a manufacturer having a minimum of five years experience in the construction of prefabricated equipment of this particular type and design. The contractor shall prepare his bid on the basis of the specific equipment and materials specified for purposes of determining the low bid. This is not done, however, to eliminate other products or equipment of equal quality and efficiency. Substitution of equipment may be made if the proposed substitution is superior or equal in construction and performance. If equipment is to be substituted the contractor shall obtain approval prior to execution and shall, at his expense, prepare and submit revised engineering drawings and specifications for the project. It is assumed that the substitution will result in a reduction of cost to the contractor and, if revised drawings submitted by the contractor are approved, the savings will be passed along in a reduction of the contractor's bid price. After execution of the contract, substitution of equipment of makes other than that specified will not be considered.

WARRANTY

The manufacturer shall warrant the equipment being supplied to the owner against defects in workmanship and materials for a period of one year under normal use and service.

The warranty shall not cover any item which has been subjected to external damage, disassembled and/or repaired by

unauthorized persons, flooded or otherwise mistreated. The manufacturer shall not be held liable for any consequential damages or contingent liabilities which are directly or indirectly a result of any failures in materials or equipment, or from delivery or installation delays. Items normally consumed in service such as grease, oil, v-belts, fuses, filters, seals, etc., shall not be warranted.

SERVICE

An initial one-year service policy shall be provided and shall include periodic inspections with performance reports filled out and filed with the appropriate regulatory agency and plant operator. Ten service inspections shall be made during the first twelve months of equipment operation. Initially, they shall be made on a bi-weekly basis and after completion of the twelve week start-up period, on a bi-monthly basis for the remainder of the year. Plant operators shall be instructed regarding routine operation and maintenance of the equipment during each inspection.

Upon expiration of the initial service policy, the manufacturer shall offer a continuing service program to the customer. The program offered shall vary in content from a minimum, emergency type service policy to a maximum full coverage policy. The customer shall have the option to elect to use either policy on an annual basis for a nominal fee.