WETEC-TAS™ Aeration System with AERGRID™ High Efficiency Full Floor Coverage Coarse Bubble Spargers

The AERGRID™ Full Floor Coverage High Efficiency Coarse Bubble Aeration System is a custom design coarse bubble sparger aeration system consisting of HDPE air distribution piping, AERGRID™ air laterals with sparger orifices, and an anchorage system consisting of HDPE yoke pipe supports, installation and leveling tether assemblies, and concrete anchor blocks.

A. Air Distribution Piping and AERGRID™ Air Laterals

1. The submerged air distribution pipe shall be 3- and 4-in. diameter, ultra violet stabilized, high density polyethylene (HDPE) pipe with a minimum thickness rating conforming to SDR-11 (ASTM 2239-67).

2. The resin shall be high density polyethylene with the following properties:

density	0.955	g/cm^3
melt index	0.14	g/10 min.
tensile strength	3,550	psi
elongation	> 800	percent
modulus of elasticity	110,000	psi
flexural modulus	133,000	psi

3. A simple and positive connection shall be made at the main air header. A flange-to-flange connection shall be acceptable. Flexible couplings, dresser type fitting, and gear hose clamps are not acceptable.

4. The air distribution pipe shall be installed through the HDPE yoke and tether assembly. Air distribution pipe orifices shall be located such that the air exiting the orifices is in a downward vertical position during operation.

5. Rotational orifice alignment shall be maintained by two retention collars fused to the air distribution pipe, one on each side of the last HDPE yoke on each air lateral.

6. Connections to the main air header piping shall be flanged, with flange drilling conforming to ANSI B16.1, Class 125.

7. Connecting bolts and flanges shall be of Type 304 stainless steel, furnished by the manufacturer.

B. AERGRID™ Supports

1. The AERGRID™ support shall consist of a 300-lb. concrete anchor, HDPE yoke pipe support, and installation and leveling tether assembly. The AERGRID™ support assemblies shall be secured to the basin floor by a concrete anchor using a 1/2-inch diameter combination polypropylene core/polyester jacket tether.

Concrete anchors shall be reinforced concrete with a minimum compression strength of 3,500 psi. A leveling tube with elevation adjustment, tether stop, and flotation assembly shall be furnished as part of the support and anchorage assembly. The leveling tube shall be of high density polyethylene with minimum wall thickness of 0.34 inches. All surfaces in contact with the tether shall be of high density polyethylene. The tether shall be fastened to the pipe and tether stop with an approved knot and Monel retainer clip.

The AERGRID™ support and anchorage assembly shall be lowered into position by pushing the assembly down the tether rope toward the concrete anchor block until the installation elevation is reached. Final elevation adjustment shall be made in 1/2-inch increments without retieing or refastening the tether rope at the top of the assembly.

2. The resin for manufacturing the yoke pipe support shall be high density polyethylene with the following properties:

density	0.95	g/cm^3
melt index	10	HLMI (Condition F)
tensile strength	3,800	psi
elongation	> 600	percent
flexural modulus	175,000	psi

3. Gear clamps, metal pipe clamps, plastic ties, or other types of rigid clamps shall not be allowed as AERGRID* supports.

4. AERGRID™ pipe supports shall permit thermal expansion and contraction of the air distribution pipe during operation.

5. Smooth surfaces shall exist wherever polyethylene piping comes in contact with the anchor assembly in order to insure a non-abrasive contact.

6. All yoke pipe support assemblies shall be checked or tested for:

   a. Dimensional conformation to Drawings.

   b. Proof tested to withstand a minimum 2,000 pound tensile force to verify integrity of the assembly.

   c. Destructive testing shall be performed on one assembly in fifty (50) to verify its ultimate strength.

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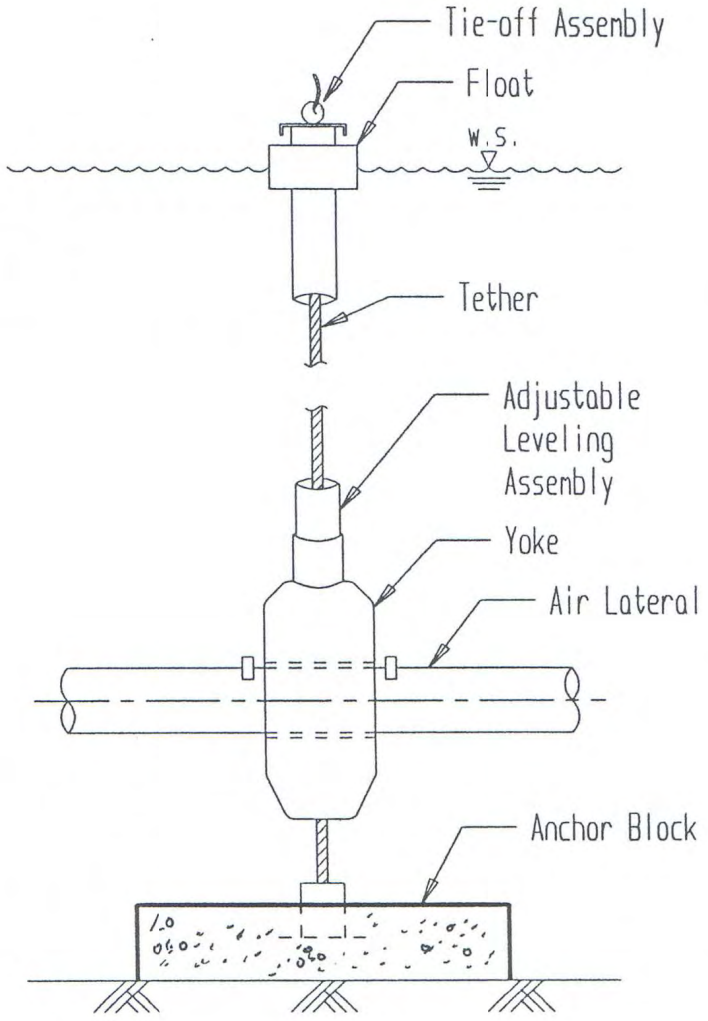
SUPPORT ASSEMBLY DETAIL, NTS



Aertec®

WETEC-TAS™ Aeration System with AERMAX™ Diffuser Design Configuration

The WETEC-TAS™ Aeration System is a custom design fine bubble aeration system consisting of HDPE air distribution piping, AERMAX™ fine bubble diffusers, and an anchorage system consisting of HDPE yoke pipe supports, installation and leveling tether assemblies, and concrete anchor block forms.

AIR DISTRIBUTION PIPING

1. The submerged air distribution pipe shall be 3- and 4-in. diameter, ultra violet stabilized, high density polyethylene (HDPE) pipe with a minimum thickness rating conforming to SDR-11 (ASTM 2239-67).

2. The resin shall be high density polyethylene with the following properties:

density	0.955	g/cm^3
melt index	0.14	g/10 min.
tensile strength	3,550	psi
elongation	> 800	percent
modulus of elasticity	110,000	psi
flexural modulus	133,000	psi

3. A simple and positive connection shall be made at the main air header. A flange-to-flange connection shall be acceptable. Flexible couplings, dresser type fitting, and gear hose clamps are not acceptable.

4. The air distribution pipe shall be installed through the HDPE yoke and tether assembly.

5. Connections to the main air header piping shall be flanged, with flange drilling conforming to ANSI B16.1, Class 125.

6. Connecting flanges shall be of galvanized carbon steel, furnished by the manufacturer.

7. Connection bolts shall be of Type 304 stainless steel, furnished by others.

SUPPORT ASSEMBLIES

1. The support assemblies shall consist of a concrete anchor, HDPE yoke pipe support, and installation and leveling tether assembly. The support assemblies shall be secured to the basin floor by a concrete anchor using a 1/2-inch diameter combination polypropylene core/polyester jacket tether rope.

   Concrete anchors shall be reinforced concrete with a minimum compression strength of 3,500 psi. A leveling tube with elevation adjustment, top bushing and flotation assembly shall be furnished as part of the support and anchorage assembly. The leveling tube shall be of high density polyethylene with minimum wall thickness of 0.34 inches. All surfaces in contact with the tether shall be of high density polyethylene.

The tether shall be fastened to the tether support with a figure 8 knot and Monel retainer clip and to the top bushing with an eye knot.

The support and anchorage assembly shall be lowered into position by pushing the assembly down the tether rope toward the concrete anchor block until the installation elevation is reached.

2. The resin for manufacturing the yoke pipe support shall be high density polyethylene with the following properties:

density	0.95	g/cm^3
melt index	10	HLMI (Condition F)
tensile strength	3,800	psi
elongation	> 600	percent
flexural modulus	175,000	psi

3. Gear clamps, metal pipe clamps, plastic ties, or other types of rigid clamps shall not be allowed as AERGRID™ supports.

4. Smooth surfaces shall exist wherever polyethylene piping comes in contact with the anchor assembly in order to insure a non-abrasive contact.

5. All yoke pipe support assemblies shall be checked or tested for:

   a. Dimensional conformation to Drawings.
   b. Proof tested to withstand a minimum 2,000 pound tensile force to verify integrity of the assembly.
   c. Destructive testing shall be performed on one assembly in fifty (50) to verify its ultimate strength.

AERMAX™ DIFFUSERS

1. Diffusers shall be AERMAX™ slotted membrane type as manufactured by Aeration Technologies, Inc. The diffuser shall consist of high density HDPE pipe frame with threaded end cap, and slotted EPDM membrane secured by SS fasteners. Orifice release holes are designed to insure completely uniform distribution of air over the entire operating range of air flows. The diffuser assembly shall be furnished totally assembled by the manufacturer, ready for installation.

   The standard diffuser length shall be 3.5-ft. as measured from outside end of the end cap to the centerline of the HDPE air lateral connector. The nominal diameter of the diffuser shall be a minimum of 2.0 inches.

2. The diffuser membrane shall consist of EPDM membrane with die punch slits that open under pressure. The surface of the membrane shall be reasonably smooth to prevent biological growth build-up and no increase in headloss and to provide for easy cleaning. Plasticized PVC membranes will not be allowed. Membrane wall thickness shall be 0.062 inch, and perforations shall be 0.032 inch.

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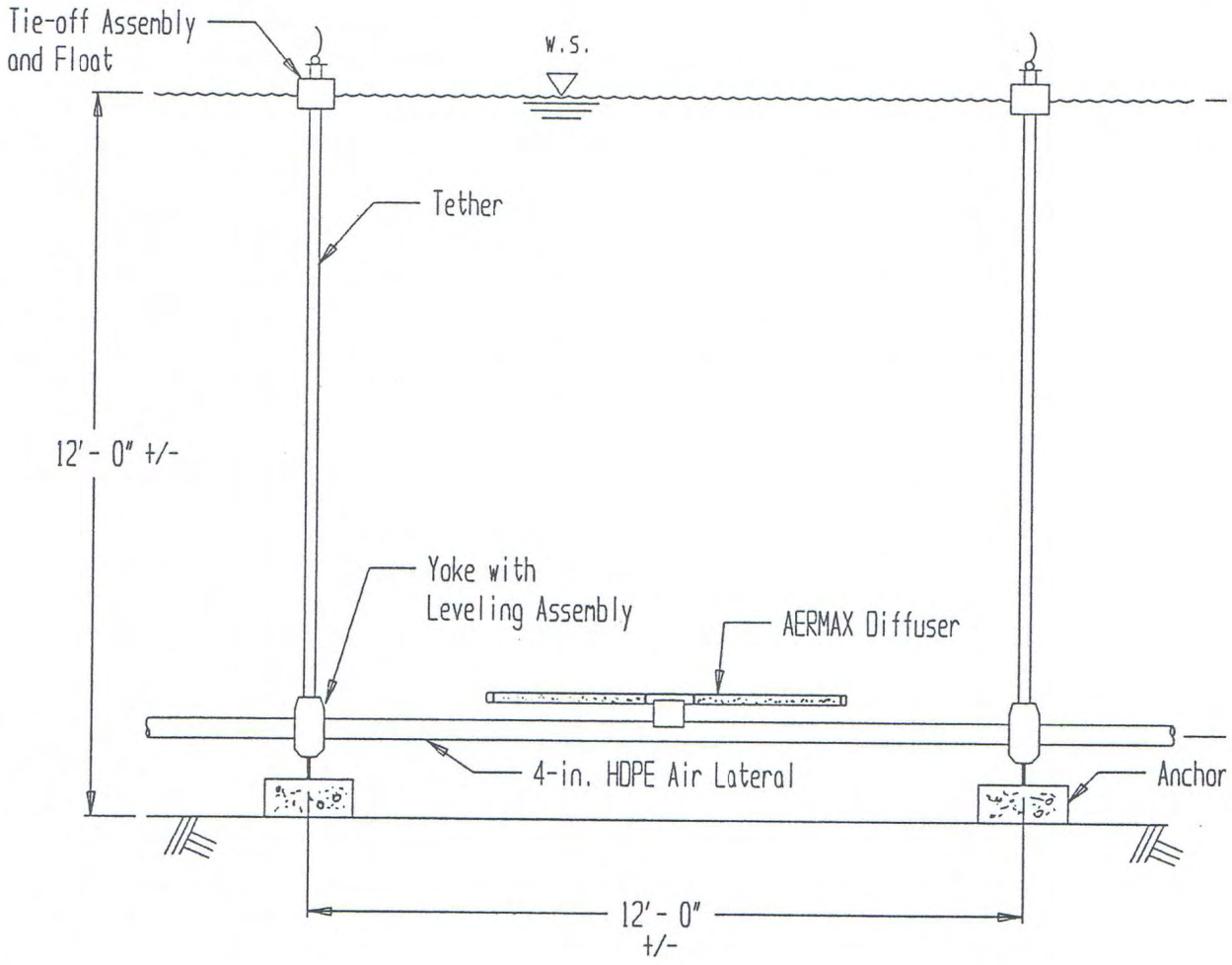
WETEC-TAS™ / AERMAX™ MEMBRANE DIFFUSER, NTS

Typical Elevation



WETEC-TAS™ Aeration System with AERMAX™-AERAC™ Diffuser Design Configuration

The WETEC-TAS™ Aeration System is a custom design fine bubble aeration system consisting of HDPE air distribution piping, AERMAX™-AERAC™ fine bubble diffusers, and an anchorage system consisting of HDPE yoke pipe supports, installation and leveling tether assemblies, and concrete anchor blocks.

AIR DISTRIBUTION PIPING

1. The submerged air distribution pipe shall be 3- and 4-in. diameter, ultra violet stabilized, high density polyethylene (HDPE) pipe with a minimum thickness rating conforming to SDR-11 (ASTM 2239-67).

2. The resin shall be high density polyethylene with the following properties:

density	0.955	g/cm^3
melt index	0.14	g/10 min.
tensile strength	3,550	psi
elongation	> 800	percent
modulus of elasticity	110,000	psi
flexural modulus	133,000	psi

3. A simple and positive connection shall be made at the main air header. A flange-to-flange connection shall be acceptable. Flexible couplings, dresser type fitting, and gear hose clamps are not acceptable.

4. The air distribution pipe shall be installed through the HDPE yoke and tether assembly.

5. Rotational orifice alignment shall be maintained by two retention collars fused to the air distribution pipe, one on each side of the last HDPE yoke on each air lateral.

6. Connections to the main air header piping shall be flanged, with flange drilling conforming to ANSI B16.1, Class 125.

7. Connecting bolts and flanges shall be of Type 304 stainless steel, furnished by the manufacturer.

SUPPORT ASSEMBLIES

1. The support assemblies shall consist of a 300-lb. concrete anchor, HDPE yoke pipe support, and installation and leveling tether assembly. The support assemblies shall be secured to the basin floor by a concrete anchor using a 1/2-inch diameter combination polypropylene core/polyester jacket tether.

   Concrete anchors shall be reinforced concrete with a minimum compression strength of 3,500 psi. A leveling tube with elevation adjustment, tether stop, and flotation assembly shall be furnished as part of the support and anchorage assembly. The leveling tube shall be of high density polyethylene with minimum wall thickness of 0.34 inches. All surfaces in contact with the tether shall be of

high density polyethylene. The tether shall be fastened to the pipe and tether stop with an approved knot and Monel retainer clip.

The support and anchorage assembly shall be lowered into position by pushing the assembly down the tether rope toward the concrete anchor block until the installation elevation is reached. Final elevation adjustment shall be made in 1/2-inch increments without retieing or refastening the tether rope at the top of the assembly.

2. The resin for manufacturing the yoke pipe support shall be high density polyethylene with the following properties:

density	0.95	g/cm^3
melt index	10	HLMI (Condition F)
tensile strength	3,800	psi
elongation	> 600	percent
flexural modulus	175,000	psi

3. Gear clamps, metal pipe clamps, plastic ties, or other types of rigid clamps shall not be allowed as AERGRID* supports.

4. Pipe supports shall permit thermal expansion and contraction of the air distribution pipe during operation.

5. Smooth surfaces shall exist wherever polyethylene piping comes in contact with the anchor assembly in order to insure a non-abrasive contact.

6. All yoke pipe support assemblies shall be checked or tested for:

   a. Dimensional conformation to Drawings.
   b. Proof tested to withstand a minimum 2,000 pound tensile force to verify integrity of the assembly.
   c. Destructive testing shall be performed on one assembly in fifty (50) to verify its ultimate strength.

AERMAX™-AERAC™ DIFFUSERS

1. Diffusers shall be AERMAX™ slotted membrane type as manufactured by Aeration Technologies, Inc. The diffuser shall consist of high density HDPE pipe with removable end cap, slotted membrane secured by SS fasteners. Orifice release holes are designed to insure completely uniform distribution of air over the entire operating range of air flows. The diffuser assembly shall be furnished totally assembled by the manufacturer, ready for installation.

   The standard diffuser length shall be 27 inches as measured from outside end of the removable end cap to the centerline of the air manifold. The diameter of the diffuser shall be a minimum of 2.5 inches.

2. The diffuser membrane shall consist of EPDM membrane with die punch slits that open under pressure. The surface of the membrane shall be reasonably smooth to prevent biological growth build-up and no increase in headloss and to provide for easy cleaning. Plasticized PVC membranes will not be allowed.

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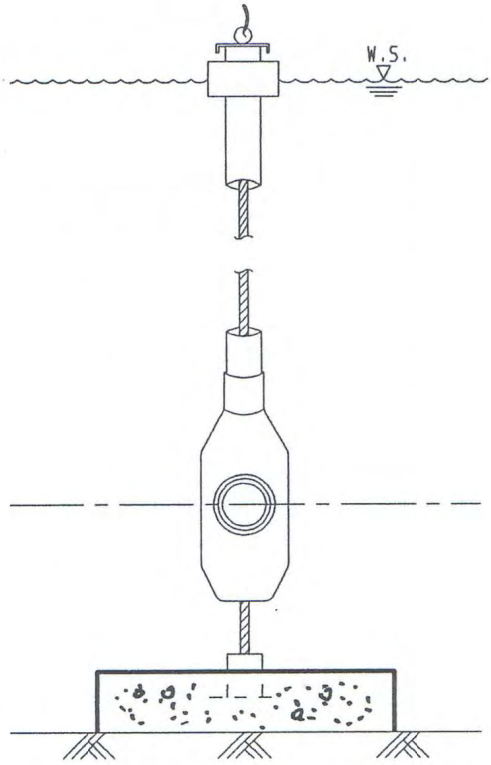
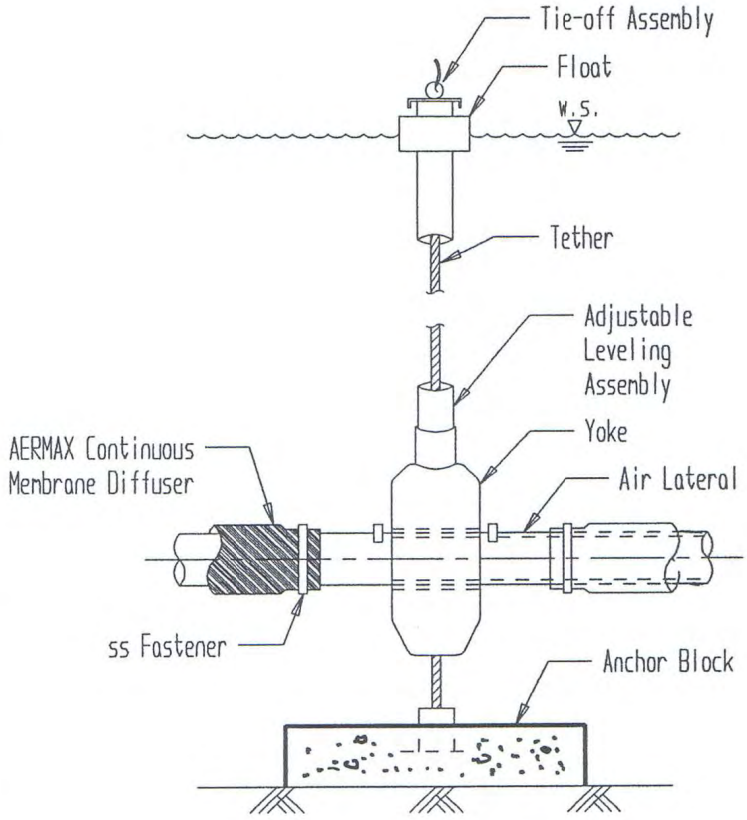
WETEC-TAS™ Surface Installable and Retractable Aeration System with AERMAX™ Continuous Perforated Membrane Tube Diffusers



END VIEW



SIDE VIEW

DETAIL SKETCH, NTS