

Sanitaire



ITT Industries



Diffused Aeration Equipment

for
NEWPCC
SBR-1

Represented By:
eda Environmental Ltd
180 Wyatt Road
Winnipeg, MB R2X 2X6
204 632-9154

Sanitaire #16639-04
May 9, 2006

fp K:\A16639-04\SBR Aeration Equipment\5.9.06 Setup.aer

Sanitaire Aeration Design Inputs for: NEWPCC, Sanitaire #16639-04

Tank Geometry

1 Train Consisting of:

Parameter	Units	Pass 1
Parallel Reactors		1
Pass Process		Aerobic
SWD	m	6.30
Submergence	m	5.92
Volume	m ³	5,367.6
Reactor Geometry:		Rect
Length	m	48.00
Width	m	17.75

<-@6.3M SWD

Oxygen/Air Distribution

	Zone	1
	Pass	1
Default		100.0%

Oxygenation

Parameter	Units	Max. Air	Max. Condition 2	Ave. Condition 2	Min. Air
No. Trains Operating		1	1	1	1
Air Rate	m ³ /hr	15,120.0			3,780.0
Oxygen Requirement	KG/HR		1,572.0-S	1,361.0-S	

Standard Oxygen Correction Factor Parameters

Parameter	Units	Max. Air	Max. Condition 2	Ave. Condition 2	Min. Air
Site Elevation	MASL	225.0	225.0	225.0	225.0
Ambient Pressure	KPAA	98.92	98.92	98.92	98.92
Water Temperature	°C	25	25	25	25

Sanitaire Project Name: NEWPCC
 Sanitaire Project #16639-04
 Design Summary

	Units	Operating Point & O2 Distribution			
			Max. Condition	Ave. Condition	Min. Air
		Max. Air Default	2 Default	2 Default	Min. Air Default
No. Trains in Operation		1	1	1	1
No. Grids in Operation		3	3	3	3
No. Operating Diffusers		4,610	4,610	4,610	4,610
SOR	KG/HR	1,569	1,572	1,361	446.5
SOTE	%	37.2	37.2	37.8	42.4
Total Air Rate	m3/hr	15,120	15,155	12,927	3,780
Min. Diffuser Air Rate	m3/hr/diff.	3.28	3.29	2.8	0.82
Max. Diffuser Air Rate	m3/hr/diff.	3.28	3.29	2.8	0.82
Static Pressure	kpag	57.95	57.95	57.95	57.95
Diffuser DWP @ Min Air	kpag	3.82	3.83	3.66	2.99
Diffuser DWP @ Max Air	kpag	3.82	3.83	3.66	2.99
Pressure @ Top of Dropleg	kpag	63.32	63.33	62.73	61.03

Sanitaire Project Name: NEWPCC**Sanitaire Project #16639-04**

Consulting Engineer:

Operating Condition: Max. Air

Oxygen Distribution: Default

Aeration System Design

Parameter	Units	Zone 1	Totals/Overall
Pass		1	
SWD	m	6.30	
Subm	m	5.92	
Volume	m ³	5,367.6	5,367.6
No. Parallel Tanks		1	
No. Trains in Operation		1	
Grid Count		3	3
Dropleg Diameter	mm	300	
At/Ad		4.85	
Diffuser Density	% Floor	20.61%	
Diffusers/Grid		Varies	4,610

Oxygen Transfer

Diffuser Type		SSII-9	
Alpha			
Beta			
Theta			
D.O.	mg/l		
Water Temp	°C	20	
AOR/SOR			
Oxygen Distribution	%/Zone	100.0%	100.0%
AOR	KG/DAY		
SOR	KG/DAY		
Air Rate (8)	m3/hr	15,120.0	15,120.0

Performance

Mixing Criteria	m ³ /hr/m ²	2.1900001	
Safety Factor	%		
Mixing Air (1)	m3/hr	1,865.9	
Process Air (for SOR)	m3/hr	15,120.0	
Design Air (2,8)	m3/hr	15,120.0	15,120.0
Diffuser Air Rate	m3/hr/Diff.	3.28	3.28
Delivered SOR	KG/DAY	37,649.9	37,649.9
Delivered SOTE	%	37.2%	37.2%
Pressure @ Top of Dropleg	kpag	63.32	63.32
kW		434.7	434.7

Notes:(1) Fine Mixing air based on 2.19 m³/hr/m²

(2) Design air is the maximum of process air or mixing air

Sanitaire Project Name: NEWPCC

Sanitaire Project #16639-04

Consulting Engineer:

Operating Condition: Max. Condition 2

Oxygen Distribution: Default

Aeration System Design

Parameter	Units	Zone 1	Totals/Overall
Pass		1	
SWD	m	6.30	
Subm	m	5.92	
Volume	m ³	5,367.6	5,367.6
No. Parallel Tanks		1	
No. Trains in Operation		1	
Grid Count		3	3
Dropleg Diameter	mm	300	
At/Ad		4.85	
Diffuser Density	% Floor	20.61%	
Diffusers/Grid		Varies	4,610

Oxygen Transfer

Diffuser Type		SSII-9	
Alpha			
Beta			
Theta			
D.O.	mg/l		
Water Temp	°C	20	
AOR/SOR			
Oxygen Distribution	%/Zone	100.0%	100.0%
AOR	KG/DAY		
SOR	KG/DAY	37,728.4	37,728.4
Air Rate (8)	m3/hr		

Performance

Mixing Criteria	m ³ /hr/m ²	2.1900001	
Safety Factor	%		
Mixing Air (1)	m3/hr	1,865.9	
Process Air (for SOR)	m3/hr	15,154.8	
Design Air (2,8)	m3/hr	15,154.8	15,154.8
Diffuser Air Rate	m3/hr/Diff.	3.29	3.29
Delivered SOR	KG/DAY	37,728.4	37,728.4
Delivered SOTE	%	37.2%	37.2%
Pressure @ Top of Dropleg	kpag	63.33	63.33
kW		435.7	435.7

Notes:

(1) Fine Mixing air based on 2.19 m³/hr/m²

(2) Design air is the maximum of process air or mixing air

Sanitaire Project Name: NEWPCC

Sanitaire Project #16639-04

Consulting Engineer:

Operating Condition: Ave. Condition 2

Oxygen Distribution: Default

Aeration System Design

Parameter	Units	Zone 1	Totals/Overall
Pass		1	
SWD	m	6.30	
Subm	m	5.92	
Volume	m ³	5,367.6	5,367.6
No. Parallel Tanks		1	
No. Trains in Operation		1	
Grid Count		3	3
Dropleg Diameter	mm	300	
At/Ad		4.85	
Diffuser Density	% Floor	20.61%	
Diffusers/Grid		Varies	4,610

Oxygen Transfer

Diffuser Type		SSII-9	
Alpha			
Beta			
Theta			
D.O.	mg/l		
Water Temp	°C	20	
AOR/SOR			
Oxygen Distribution	%/Zone	100.0%	100.0%
AOR	KG/DAY		
SOR	KG/DAY	32,664.4	32,664.4
Air Rate (8)	m3/hr		

Performance

Mixing Criteria	m ³ /hr/m ²	2.1900001	
Safety Factor	%		
Mixing Air (1)	m3/hr	1,865.9	
Process Air (for SOR)	m3/hr	12,927.0	
Design Air (2,8)	m3/hr	12,927.0	12,927.0
Diffuser Air Rate	m3/hr/Diff.	2.80	2.80
Delivered SOR	KG/DAY	32,664.4	32,664.4
Delivered SOTE	%	37.8%	37.8%
Pressure @ Top of Dropleg	kpag	62.73	62.73
kW		368.8	368.8

Notes:

(1) Fine Mixing air based on 2.19 m³/hr/m²

(2) Design air is the maximum of process air or mixing air

Sanitaire Project Name: NEWPCC

Sanitaire Project #16639-04

Consulting Engineer:

Operating Condition: Min. Air

Oxygen Distribution: Default

Aeration System Design

Parameter	Units	Zone 1	Totals/Overall
Pass		1	
SWD	m	6.30	
Subm	m	5.92	
Volume	m ³	5,367.6	5,367.6
No. Parallel Tanks		1	
No. Trains in Operation		1	
Grid Count		3	3
Dropleg Diameter	mm	300	
At/Ad		4.85	
Diffuser Density	% Floor	20.61%	
Diffusers/Grid		Varies	4,610

Oxygen Transfer

Diffuser Type		SSII-9	
Alpha			
Beta			
Theta			
D.O.	mg/l		
Water Temp	°C	20	
AOR/SOR			
Oxygen Distribution	%/Zone	100.0%	100.0%
AOR	KG/DAY		
SOR	KG/DAY		
Air Rate (8)	m3/hr	3,780.0	3,780.0

Performance

Mixing Criteria	m ³ /hr/m ²	2.1900001	
Safety Factor	%		
Mixing Air (1)	m3/hr	1,865.9	
Process Air (for SOR)	m3/hr	3,780.0	
Design Air (2,8)	m3/hr	3,780.0	3,780.0
Diffuser Air Rate	m3/hr/Diff.	0.82	0.82
Delivered SOR	KG/DAY	10,715.8	10,715.8
Delivered SOTE	%	42.4%	42.4%
Pressure @ Top of Dropleg	kpag	61.03	61.03
kW		105.4	105.4

Notes:

(1) Fine Mixing air based on 2.19 m³/hr/m²

(2) Design air is the maximum of process air or mixing air

Sanitaire



ITT Industries



Diffused Aeration Equipment

for
NEWPCC
SBR-2

Represented By:
eda Environmental Ltd
180 Wyatt Road
Winnipeg, MB R2X 2X6
204 632-9154

Sanitaire #16639-04
May 9, 2006

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Sanitaire Aeration Design Inputs for: NEWPCC, Sanitaire #16639-04

Tank Geometry

1 Train Consisting of:

Parameter	Units	Pass 1
Parallel Reactors		1
Pass Process		Aerobic
SWD	m	6.30
Submergence	m	5.92
Volume	m ³	5,216.4
Reactor Geometry:		Rect
Length	m	48.00
Width	m	17.25

<-@ 6.3M SWD

Oxygen/Air Distribution

	Zone	1
	Pass	1
Default		100.0%

Oxygenation

Parameter	Units	Max. Air	Max. Condition 2	Ave. Condition 2	Min. Air
No. Trains Operating		1	1	1	1
Air Rate	m ³ /hr	15,120.0			3,780.0
Oxygen Requirement	KG/HR		1,572.0-S	1,361.0-S	

Standard Oxygen Correction Factor Parameters

Parameter	Units	Max. Air	Max. Condition 2	Ave. Condition 2	Min. Air
Site Elevation	MASL	225.0	225.0	225.0	225.0
Ambient Pressure	KPAA	98.92	98.92	98.92	98.92
Water Temperature	°C	25	25	25	25

Sanitaire Project Name: NEWPCC
 Sanitaire Project #16639-04
 Design Summary

		Operating Point & O2 Distribution			
		Max. Air	Max. Condition	Ave. Condition	Min. Air
Units		Default	2 Default	2 Default	Default
No. Trains in Operation		1	1	1	1
No. Grids in Operation		3	3	3	3
No. Operating Diffusers		4,610	4,610	4,610	4,610
SOR	KG/HR	1,570	1,572	1,361	446.7
SOTE	%	37.2	37.2	37.8	42.4
Total Air Rate	m3/hr	15,120	15,147	12,920	3,780
Min. Diffuser Air Rate	m3/hr/diff.	3.28	3.28	2.8	0.82
Max. Diffuser Air Rate	m3/hr/diff.	3.28	3.28	2.8	0.82
Static Pressure	kpag	57.95	57.95	57.95	57.95
Diffuser DWP @ Min Air	kpag	3.82	3.83	3.66	2.99
Diffuser DWP @ Max Air	kpag	3.82	3.83	3.66	2.99
Pressure @ Top of Dropleg	kpag	63.32	63.32	62.73	61.03

Sanitaire Project Name: NEWPCC**Sanitaire Project #16639-04**

Consulting Engineer:

Operating Condition: Max. Air

Oxygen Distribution: Default

Aeration System Design

Parameter	Units	Zone 1	Totals/Overall
Pass		1	
SWD	m	6.30	
Subm	m	5.92	
Volume	m ³	5,216.4	5,216.4
No. Parallel Tanks		1	
No. Trains in Operation		1	
Grid Count		3	3
Dropleg Diameter	mm	300	
At/Ad		4.71	
Diffuser Density	% Floor	21.21%	
Diffusers/Grid		Varies	4,610

Oxygen Transfer

Diffuser Type		SSII-9	
Alpha			
Beta			
Theta			
D.O.	mg/l		
Water Temp	°C	20	
AOR/SOR			
Oxygen Distribution	%/Zone	100.0%	100.0%
AOR	KG/DAY		
SOR	KG/DAY		
Air Rate (8)	m3/hr	15,120.0	15,120.0

Performance

Mixing Criteria	m ³ /hr/m ²	2.1900001	
Safety Factor	%		
Mixing Air (1)	m3/hr	1,813.3	
Process Air (for SOR)	m3/hr	15,120.0	
Design Air (2,8)	m3/hr	15,120.0	15,120.0
Diffuser Air Rate	m3/hr/Diff.	3.28	3.28
Delivered SOR	KG/DAY	37,668.3	37,668.3
Delivered SOTE	%	37.2%	37.2%
Pressure @ Top of Dropleg	kpag	63.32	63.32
kW		434.7	434.7

Notes:(1) Fine Mixing air based on 2.19 m³/hr/m²

(2) Design air is the maximum of process air or mixing air

Sanitaire Project Name: NEWPCC

Sanitaire Project #16639-04

Consulting Engineer:

Operating Condition: Max. Condition 2

Oxygen Distribution: Default

Aeration System Design

Parameter	Units	Zone 1	Totals/Overall
Pass		1	
SWD	m	6.30	
Subm	m	5.92	
Volume	m ³	5,216.4	5,216.4
No. Parallel Tanks		1	
No. Trains in Operation		1	
Grid Count		3	3
Dropleg Diameter	mm	300	
At/Ad		4.71	
Diffuser Density	% Floor	21.21%	
Diffusers/Grid		Varies	4,610

Oxygen Transfer

Diffuser Type		SSII-9	
Alpha			
Beta			
Theta			
D.O.	mg/l		
Water Temp	°C	20	
AOR/SOR			
Oxygen Distribution	%/Zone	100.0%	100.0%
AOR	KG/DAY		
SOR	KG/DAY	37,728.4	37,728.4
Air Rate (8)	m3/hr		

Performance

Mixing Criteria	m ³ /hr/m ²	2.1900001	
Safety Factor	%		
Mixing Air (1)	m3/hr	1,813.3	
Process Air (for SOR)	m3/hr	15,146.6	
Design Air (2,8)	m3/hr	15,146.6	15,146.6
Diffuser Air Rate	m3/hr/Diff.	3.28	3.28
Delivered SOR	KG/DAY	37,728.4	37,728.4
Delivered SOTE	%	37.2%	37.2%
Pressure @ Top of Dropleg	kpag	63.32	63.32
kW		435.5	435.5

Notes:

(1) Fine Mixing air based on 2.19 m³/hr/m²

(2) Design air is the maximum of process air or mixing air

Sanitaire Project Name: NEWPCC

Sanitaire Project #16639-04

Consulting Engineer:

Operating Condition: Ave. Condition 2

Oxygen Distribution: Default

Aeration System Design

Parameter	Units	Zone 1	Totals/Overall
Pass		1	
SWD	m	6.30	
Subm	m	5.92	
Volume	m ³	5,216.4	5,216.4
No. Parallel Tanks		1	
No. Trains in Operation		1	
Grid Count		3	3
Dropleg Diameter	mm	300	
At/Ad		4.71	
Diffuser Density	% Floor	21.21%	
Diffusers/Grid		Varies	4,610

Oxygen Transfer

Diffuser Type		SSII-9	
Alpha			
Beta			
Theta			
D.O.	mg/l		
Water Temp	°C	20	
AOR/SOR			
Oxygen Distribution	%/Zone	100.0%	100.0%
AOR	KG/DAY		
SOR	KG/DAY	32,664.4	32,664.4
Air Rate (8)	m3/hr		

Performance

Mixing Criteria	m ³ /hr/m ²	2.1900001	
Safety Factor	%		
Mixing Air (1)	m3/hr	1,813.3	
Process Air (for SOR)	m3/hr	12,919.9	
Design Air (2,8)	m3/hr	12,919.9	12,919.9
Diffuser Air Rate	m3/hr/Diff.	2.80	2.80
Delivered SOR	KG/DAY	32,664.4	32,664.4
Delivered SOTE	%	37.8%	37.8%
Pressure @ Top of Dropleg	kpag	62.73	62.73
kW		368.6	368.6

Notes:

(1) Fine Mixing air based on 2.19 m³/hr/m²

(2) Design air is the maximum of process air or mixing air

Sanitaire Project Name: NEWPCC

Sanitaire Project #16639-04

Consulting Engineer:

Operating Condition: Min. Air

Oxygen Distribution: Default

Aeration System Design

Parameter	Units	Zone 1	Totals/Overall
Pass		1	
SWD	m	6.30	
Subm	m	5.92	
Volume	m ³	5,216.4	5,216.4
No. Parallel Tanks		1	
No. Trains in Operation		1	
Grid Count		3	3
Dropleg Diameter	mm	300	
At/Ad		4.71	
Diffuser Density	% Floor	21.21%	
Diffusers/Grid		Varies	4,610

Oxygen Transfer

Diffuser Type		SSII-9	
Alpha			
Beta			
Theta			
D.O.	mg/l		
Water Temp	°C	20	
AOR/SOR			
Oxygen Distribution	%/Zone	100.0%	100.0%
AOR	KG/DAY		
SOR	KG/DAY		
Air Rate (8)	m3/hr	3,780.0	3,780.0

Performance

Mixing Criteria	m ³ /hr/m ²	2.1900001	
Safety Factor	%		
Mixing Air (1)	m3/hr	1,813.3	
Process Air (for SOR)	m3/hr	3,780.0	
Design Air (2,8)	m3/hr	3,780.0	3,780.0
Diffuser Air Rate	m3/hr/Diff.	0.82	0.82
Delivered SOR	KG/DAY	10,721.8	10,721.8
Delivered SOTE	%	42.4%	42.4%
Pressure @ Top of Dropleg	kpag	61.03	61.03
kW		105.4	105.4

Notes:

(1) Fine Mixing air based on 2.19 m³/hr/m²

(2) Design air is the maximum of process air or mixing air

Sanitaire



ITT Industries



Diffused Aeration Equipment

for

NEWPCC

SBR-2 (Guaranteed Performance - Ave. SOR)

Represented By:
eda Environmental Ltd
180 Wyatt Road
Winnipeg, MB R2X 2X6
204 632-9154

Sanitaire #16639-04
May 15, 2006

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Sanitaire Aeration Design Inputs for: NEWPCC, Sanitaire #16639-04

Tank Geometry

1 Train Consisting of:

Parameter	Units	Pass 1
Parallel Reactors		1
Pass Process		Aerobic
SWD	m	6.30
Submergence	m	5.92
Volume	m ³	5,216.4
Reactor Geometry:		Rect
Length	m	48.0
Width	m	17.25

<- @ 6.3M SWD

Oxygen/Air Distribution

	Zone	1
	Pass	1
Default		100.0%

Oxygenation

Parameter	Units	Ave. - GP
No. Trains Operating		1
Oxygen Requirement	KG/HR	627.0-S

Standard Oxygen Correction Factor Parameters

Parameter	Units	Ave. - GP
Site Elevation	MASL	225.0
Ambient Pressure	KPAA	98.92
Water Temperature	°C	25

Sanitaire Project Name: NEWPCC
 Sanitaire Project #16639-04
 Design Summary

	Units	Ave. - GP Default
No. Trains in Operation		1
No. Grids in Operation		3
No. Operating Diffusers		4,610
SOR	KG/HR	627.0
SOTE	%	41.0
Total Air Rate	m3/hr	5,492
Min. Diffuser Air Rate	m3/hr/diff.	1.19
Max. Diffuser Air Rate	m3/hr/diff.	1.19
Static Pressure	kpag	57.95
Diffuser DWP @ Min Air	kpag	3.12
Diffuser DWP @ Max Air	kpag	3.12
Pressure @ Top of Dropleg	kpag	61.3

Sanitaire Project Name: NEWPCC**Sanitaire Project #16639-04**

Consulting Engineer:

Operating Condition: Ave. - GP

Oxygen Distribution: Default

Aeration System Design

Parameter	Units	Zone 1	Totals/Overall
Pass		1	
SWD	m	6.30	
Subm	m	5.92	
Volume	m ³	5,216.4	5,216.4
No. Parallel Tanks		1	
No. Trains in Operation		1	
Grid Count		3	3
Dropleg Diameter	mm	300	
At/Ad		4.71	
Diffuser Density	% Floor	21.21%	
Diffusers/Grid		Varies	4,610

Oxygen Transfer

Diffuser Type		SSII-9	
Alpha			
Beta			
Theta			
D.O.	mg/l		
Water Temp	°C	20	
AOR/SOR			
Oxygen Distribution	%/Zone	100.0%	100.0%
AOR	KG/DAY		
SOR	KG/DAY	15,048.2	15,048.2
Air Rate (8)	m3/hr		

Performance

Mixing Criteria	m ³ /hr/m ²	2.1900001	
Safety Factor	%		
Mixing Air (1)	m3/hr	1,813.3	
Process Air (for SOR)	m3/hr	5,492.0	
Design Air (2,8)	m3/hr	5,492.0	5,492.0
Diffuser Air Rate	m3/hr/Diff.	1.19	1.19
Delivered SOR	KG/DAY	15,048.3	15,048.3
Delivered SOTE	%	41.0%	41.0%
Pressure @ Top of Dropleg	kpag	61.30	61.30
kW		153.8	153.8

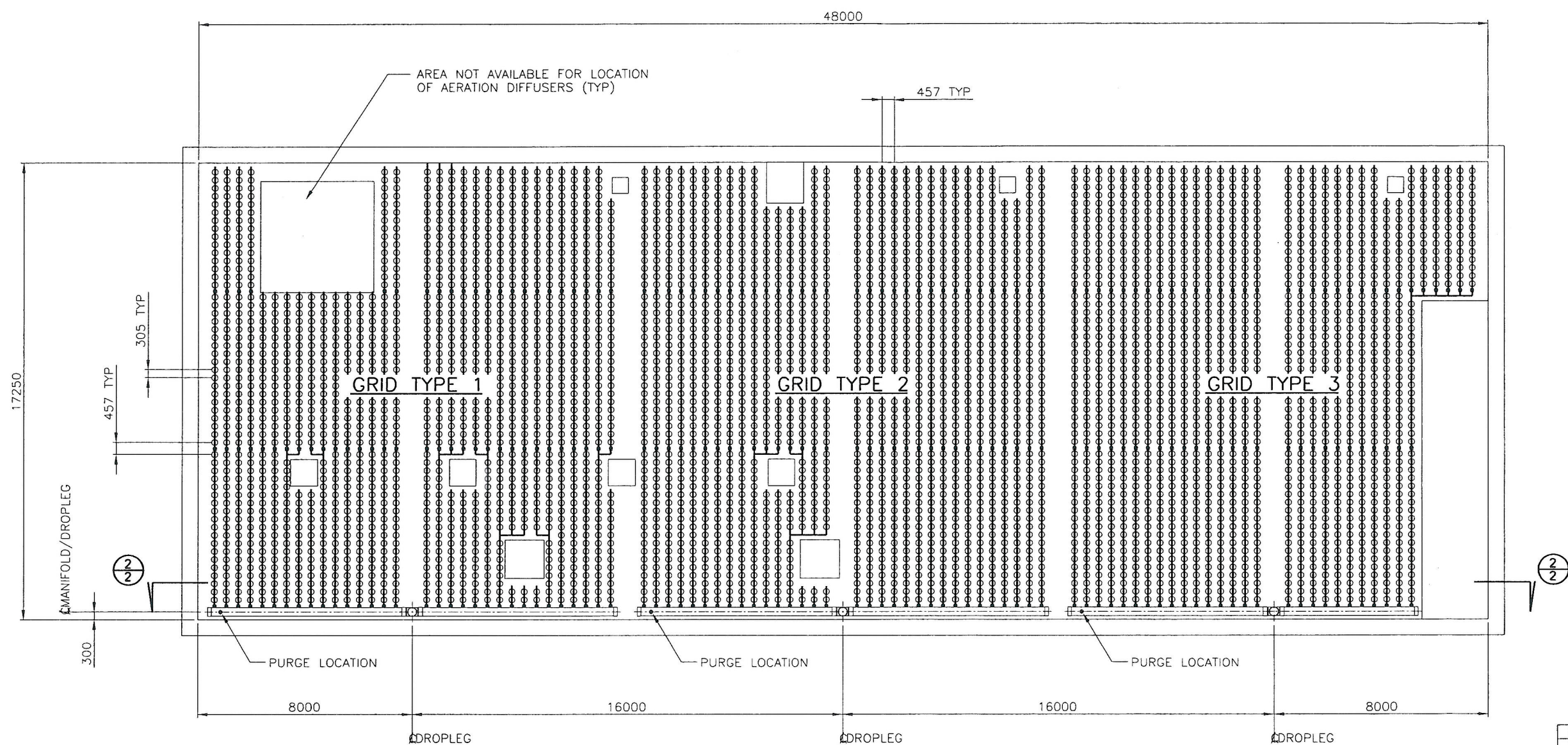
Notes:

(1) Fine Mixing air based on 2.19 m³/hr/m²

(2) Design air is the maximum of process air or mixing air

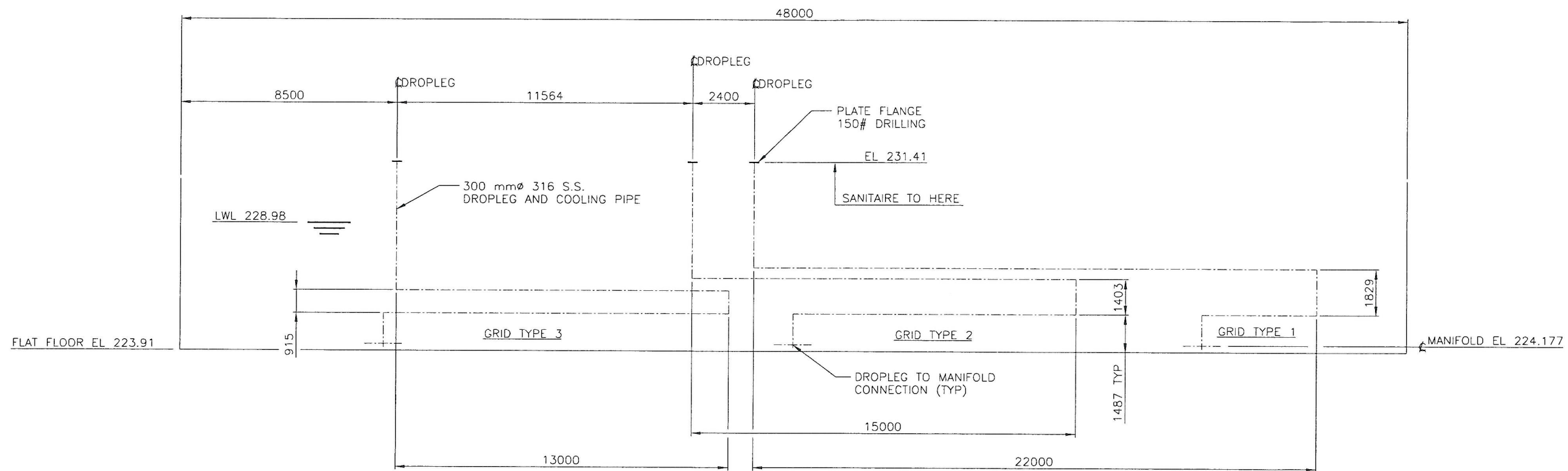
HEAT TRANSFER ESTIMATES

<u>Heat Loss Calculations</u>			
FINAL RESULTS SUMMARY		@ TURBULENT FLOW	
Bulk Air Temp Entering Ea. SS Drop/Feed Pipe	257.000	Deg F	
Bulk Air Temp. Exiting SS Drop/Feed Pipe	174.543	Deg F	
PVC Drop Pipe Air Side Wall Temp.	159.695	Deg F	< 160_ok
PVC Lower Dr. Pipe Water Side Wall Temp.	97.468	Deg F	
PVC Lower Drop Pipe Mean Wall Temp.	128.582	Deg F	< 130_ok
Header Pipe Air Side Wall Temp.	134.049	Deg F	
Header Pipe Water Side Wall Temp.	97.617	Deg F	
Header Pipe Mean Wall Temp.	115.833	Deg F	
INPUT			
Upper Drop Pipe Material (SS/CS/PVC/FRP)?	<u>SS</u>	(Dimensionless)	
Lower Drop Pipe Material (SS/CS/PVC/FRP)?	<u>PVC</u>	(Dimensionless)	
Is the Air Main Considered (Y/N)?	<u>n</u>	(Dimensionless)	
Multiple Airmain Sections to Considered (Y/N)?	<u>N</u>	(Dimensionless)	
Header Pipe Thickness (SDR 33.5,30,24.5)?	<u>24.500</u>	(Dimensionless)	
Air Main Air flow	<u>8.895</u>	SCFM total	
Dropleg Air Flow	<u>2,965</u>	SCFM per grid	
Wastewater Temperature	<u>96.000</u>	Deg F	
St. St. Drop Pipe Thickness	<u>0.109</u>	Inches	
Drop Pipe Outer Diameter	<u>12.750</u>	Inches	
Drop Pipe Length in Wastewater	<u>96.000</u>	Feet	(Submerged SS)
Atmospheric Pressure	<u>14.700</u>	PSI	
Wastewater Velocity	<u>0.500</u>	Ft/Sec	
Diffuser Submergence	<u>21.720</u>	Feet	(@ 7M SWD)
Beginning SS Drop/Feed Pipe Temperature	<u>257.000</u>	Deg F	
Number of Headers per Grid	<u>29</u>	(Dimensionless)	
Number grids	<u>1</u>	(Dimensionless)	



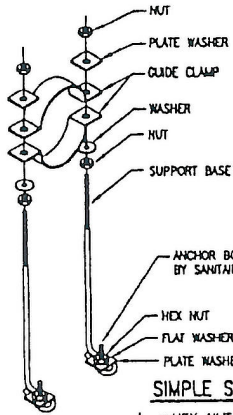
**SBR 2
PLAN VIEW**

4				
3				
2				
1				
NO.	DATE	REVISION	BY	
THE CITY OF WINNIPEG NEWPCC CENTRATE NUTRIENT TREATMENT NITROGEN REMOVAL FACILITY				
THIS DRAWING IS THE PROPERTY OF SANITARE AND IS SUBMITTED IN CONFIDENCE. IT IS NOT TO BE DISCLOSED, USED OR DUPLICATED WITHOUT PERMISSION OF SANITARE.				
PROCESS TANKS PLAN VIEW				
ITT ADVANCED WATER TREATMENT				
DRWN BY	BB	DATE	5-12-08	EQUIP.
CHKD BY		DATE		STD.
APPVD BY		DATE		SIZE D REV.
				JOB: 16639-04
				SHT 1 OF 2
				DWG 1

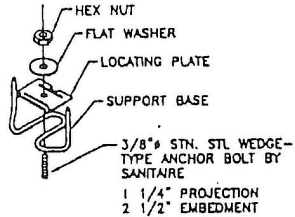


SBR 2
DROPLEGS & COOLING LOOPS
SECTION 2

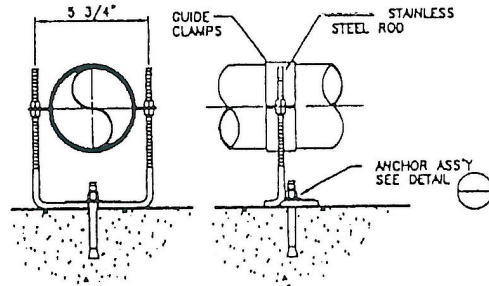
4					
3					
2					
1					
NO.	DATE	REVISION		BY	
THE CITY OF WINNIPEG NEWPCC CENTRATE NUTRIENT TREATMENT NITROGEN REMOVAL FACILITY <small>THIS DRAWING IS THE PROPERTY OF SANITAIRE AND IS SUBMITTED IN CONFIDENCE. IT IS NOT TO BE DISCLOSED, USED OR DUPLICATED WITHOUT PERMISSION OF SANITAIRE.</small> PROCESS TANKS DROPLEG/COOLING LOOP SECTION ADVANCED WATER TREATMENT					
DRWN BY	BB	DATE	5-12-06	EQUIP.	
CHGD BY		DATE		STD.	
APPRD BY		DATE		SIZE	D
				REV.	DMG 2
				JOB	16639-04
				SH.	2
				OF	2



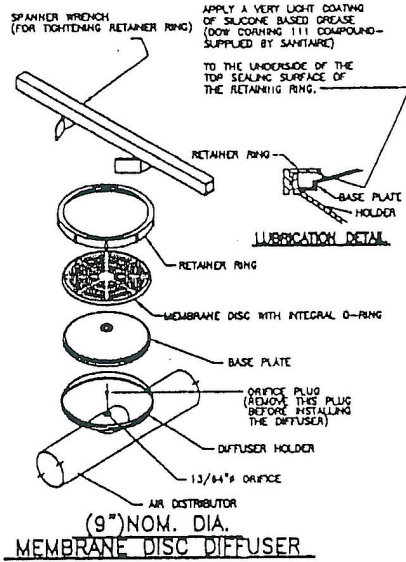
SIMPLE SUPPORT



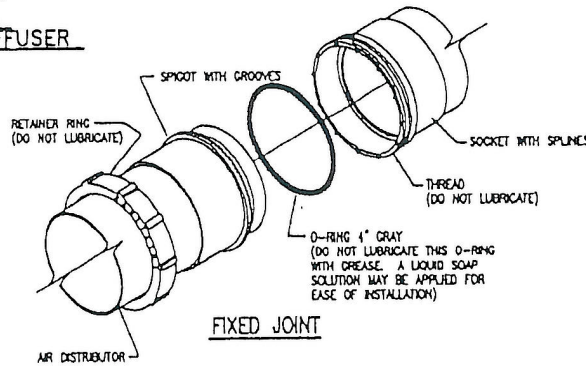
ANCHOR ASSEMBLY



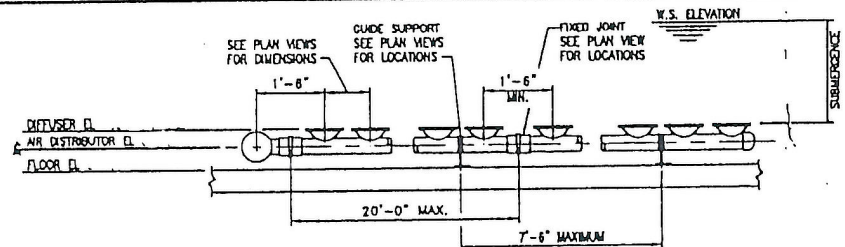
GUIDE SUPPORT



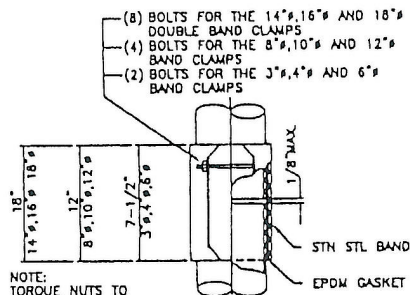
(9") NOM. DIA. MEMBRANE DISC DIFFUSER



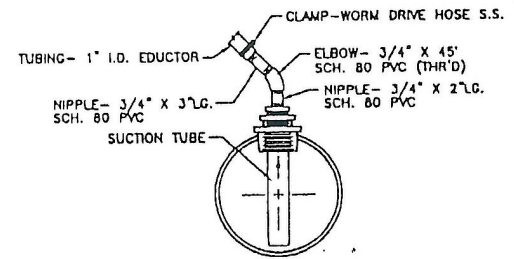
FIXED JOINT



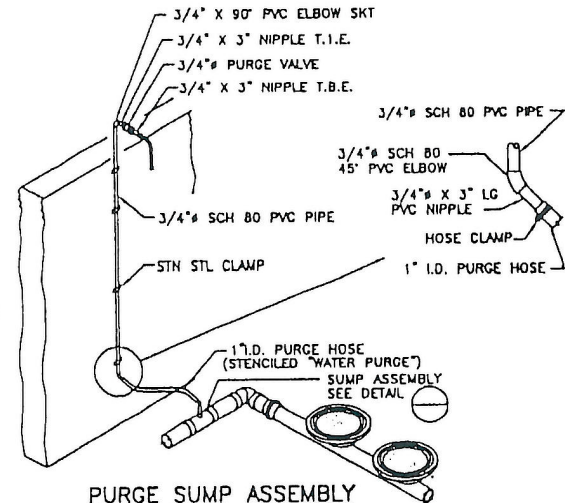
AIR DISTRIBUTOR DETAIL FB-20A



CLAMP COUPLING

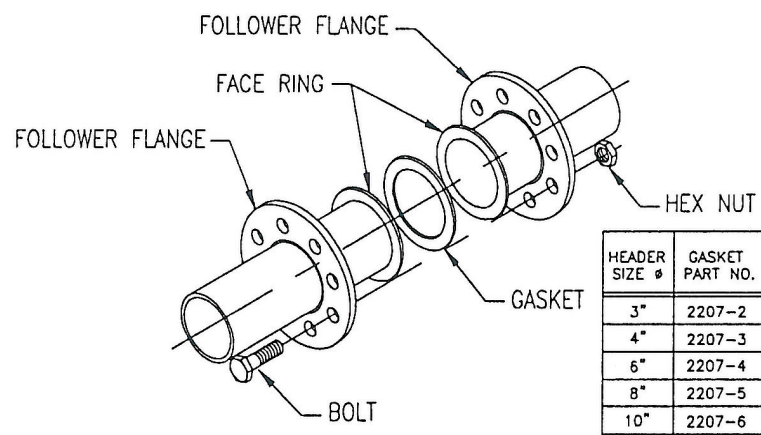


PURGE SUMP DETAIL FB-14A



PURGE SUMP ASSEMBLY

DRIFLEG / COOLING RUN JOINT



SANITAIRE FLANGE
DETAIL CB-10

HEADER SIZE Ø	GASKET PART NO.	BOLT SIZE	QUAN REQ'D PER FLANGE
3"	2207-2	5/8"Ø X 2 1/4"	4
4"	2207-3	1/2"Ø X 1 1/2"	8
6"	2207-4	1/2"Ø X 1 1/2"	8
8"	2207-5	1/2"Ø X 1 1/2"	8
10"	2207-6	1/2"Ø X 2"	12
12"	2207-7	1/2"Ø X 2"	12
14"	2207-8	1/2"Ø X 2 1/4"	12
16"	2207-9	1/2"Ø X 2 1/4"	16
18"	2207-10	1/2"Ø X 2 1/4"	16
20"	2207-11	1/2"Ø X 2 1/4"	20

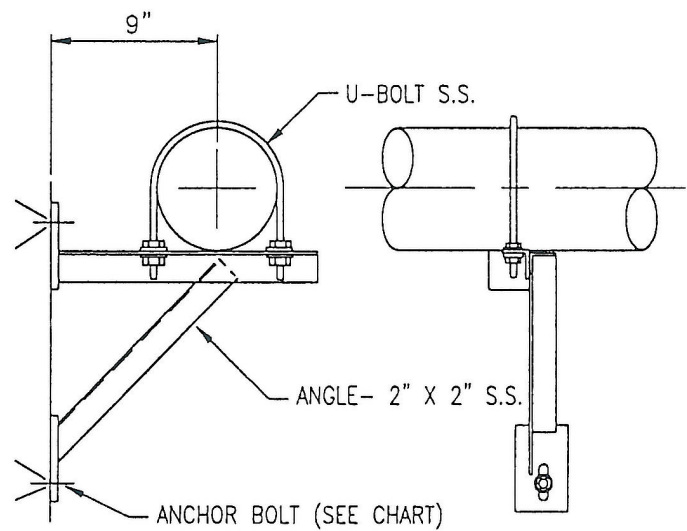
HEADER SIZE O.D.	GASKET PART NO.	BOLT SIZE	QUAN REQ'D PER FLANGE
3 1/2"	2234-1	5/8"Ø X 2 1/4"	4
4 1/2"	2234-2	1/2"Ø X 1 1/2"	8
6 5/8"	2234-3	1/2"Ø X 1 1/2"	8
8 5/8"	2234-4	1/2"Ø X 1 1/2"	8
10 3/4"	2234-5	1/2"Ø X 2"	12
12 3/4"	2234-6	1/2"Ø X 2"	12

SANITAIRE FLANGE
COARSE BUBBLE
DETAIL



CB-10

1/30/98



ANGLE SUPPORT
DETAIL SUP-38

Ø	TUBE SIZE U-BOLTS		NUTS=4 WASHERS=4
	304	316	
4"	1395-2	1395-16	3/8"
6"	1395-4	1395-18	1/2"
8"	1395-5	1395-19	1/2"
10"	1395-6	1395-20	1/2"
12"	1395-7	1395-21	1/2"
14"	1395-8	1395-22	1/2"

USE THESE LAYERS TO
SELECT U-BOLT TYPE
PIPE_SIZE
TUBE_SIZE

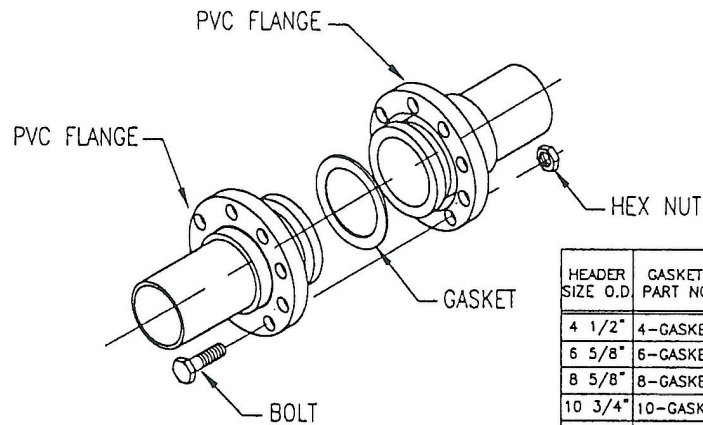
ANGLE SUPPORT
U-BOLT W/KICKER
DETAIL

SUP-38

 **SANITAIRE**[®]
WATER POLLUTION CONTROL CORP
MILWAUKEE, WISCONSIN

MANIFOLD JOINT

1/30/98



HEADER SIZE O.D.	GASKET PART NO.	BOLT SIZE	QUAN. REQ'D PER FLANGE
4 1/2"	4-GASKET	5/8"φ X 3 1/2"	8
6 5/8"	6-GASKET	3/4"φ X 4"	8
8 5/8"	8-GASKET	3/4"φ X 4 1/2"	8
10 3/4"	10-GASKET	7/8"φ X 5"	12
12 3/4"	12-GASKET	7/8"φ X 5"	12

PVC FLANGE
DETAIL FB-23

SANITAIRE FLANGE
PVC
DETAIL



SANITAIRE®

WATER POLLUTION CONTROL CORP
MILWAUKEE, WISCONSIN

FB-23

AERATION SYSTEM TECHNICAL DESCRIPTION

Sanitaire's scope of supply is per the contract documents. Our equipment starting point is a flange connection at the top of the dropleg, per the contract drawings. All in-tank piping and supports downstream of the dropleg flange connection are included in our scope. Based on our heat calc's, cooling of the process air is required prior to the PVC piping. For cooling, we have included a minimum of 29M of stainless steel cooling run (below bottom water level) prior to each dropleg. A diagram of the cooling runs is shown in the attached drawings. A table showing the parameters used for our heat calc's is included in this Section of our proposal.

Equipment material shall be as follows:

Droplegs/Cooling Runs:	12 ga. SS – 316 (300 mm)
Manifolds:	Schedule 40 PVC (300 mm)
Air Distribution Headers:	SDR 26 PVC Pipe (100 mm)
Supports:	316 SS (Min. Rod Diameter: 12.5 mm)
Diffuser Holders, Base-Plate & Retainer Rings:	PVC
9" Membrane Disc Diffusers:	EPDM

Any misc. items not listed above shall be per the specifications.

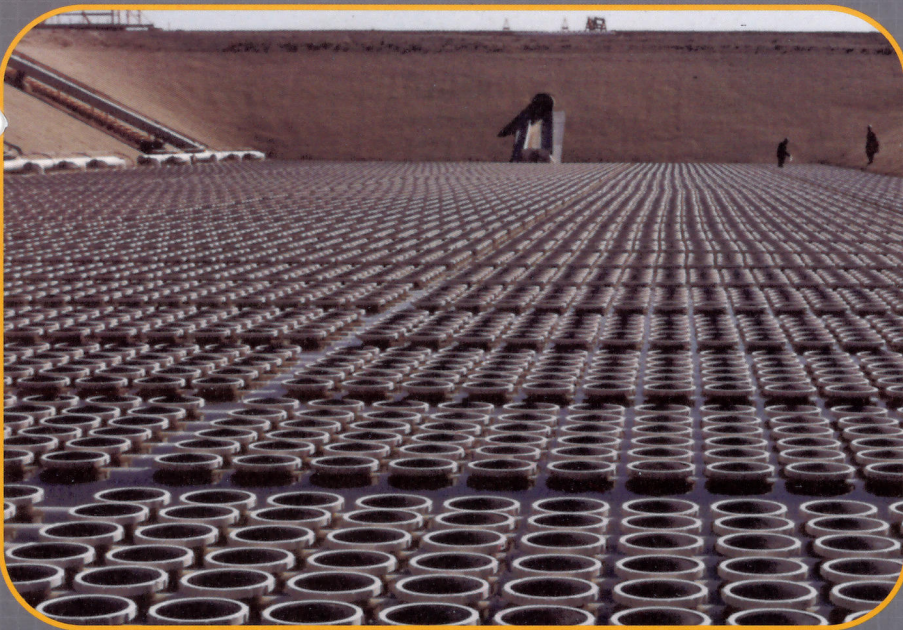
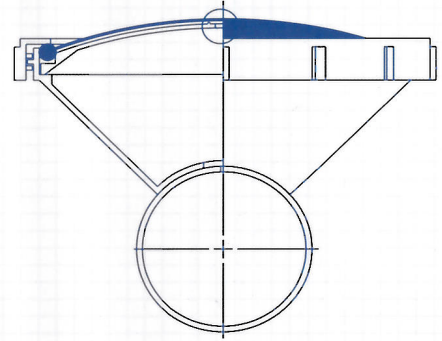
Dropleg, cooling run and manifold joints shall include flange type joints and wall supports. Typical drawings are included with the layout, sectional and detail drawings. Joints shall allow for maximum of 12M SS pipe sections with supports at maximum of 5M spacing.

Manifolds shall include flange type joints and floor supports. Typical joint and support drawings are included with the layout, sectional and detail drawings. Joints shall allow for maximum of 7.5M PVC pipe sections with supports at maximum of 2.4M spacing.

Air Distribution Headers shall include fixed union type joints and floor supports. Typical joint and support drawings are included with the layout, sectional and detail drawings. Joints shall allow for maximum of 6.0M PVC pipe sections with supports at maximum of 2.3M spacing. (See typical header section drawing with the detail drawings.)

Membrane Disc

Fine Bubble Aeration Systems



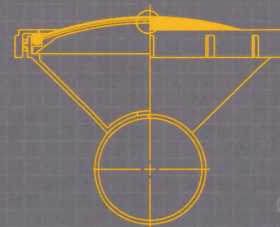
Sanitaire



ITT Industries
Engineered for life

Membrane Disc

Fine Bubble Aeration Systems



Technology You Can Count On

SANITAIRE® is the trade name recognized throughout the wastewater treatment industry for quality products and advanced technology. SANITAIRE Silver Series membrane fine bubble disc diffusers are recognized worldwide for their high oxygen transfer efficiency and durability in wastewater treatment plant aeration processes.

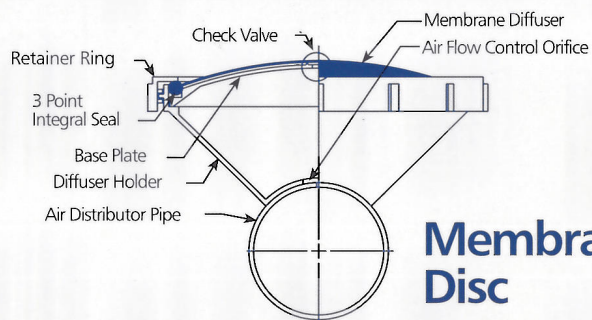
Owners and engineers prefer SANITAIRE fine bubble diffusers because:

- Power costs can be reduced by 50% or more.
- High oxygen transfer efficiency and low system headloss lead to low energy costs.
- Minimal maintenance is required.
- Gentle positive mixing action using full floor coverage aeration grids promotes excellent floc formation.

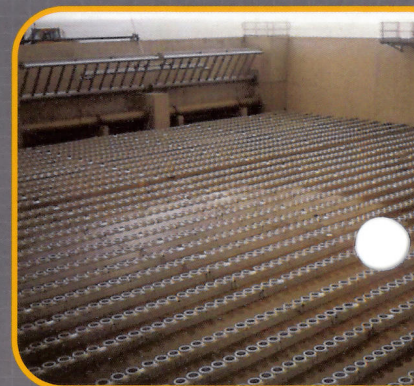
Sanitaire's leadership and experience in aeration technology has resulted in high quality SANITAIRE fine bubble disc aeration systems being specified more than any other. The SANITAIRE Membrane Disc fine bubble aeration system offers advantages in performance, ease of maintenance, construction integrity and quality. Ongoing research and development shows Sanitaire's commitment to the most technologically advanced diffused aeration system.

Diffuser and Holder Features

- Diffuser holders are factory solvent welded to the air distribution piping providing superior mechanical strength and eliminating the necessity for field installation and leveling of individual assemblies.
- Membrane diffusers include an integral check valve. The non-perforated center portion of the membrane collapses onto the air release port of the base plate when the air is turned off. The diffuser slits also act as check valves and close onto the base plate when the air is turned off.
- Integral seal and threaded retainer ring design prevents air leakage and resulting contamination from mixed liquor solids leakage into the aeration system.



Top centerline diffuser mounting prevents cantilever or torque forces from being transmitted to piping system.

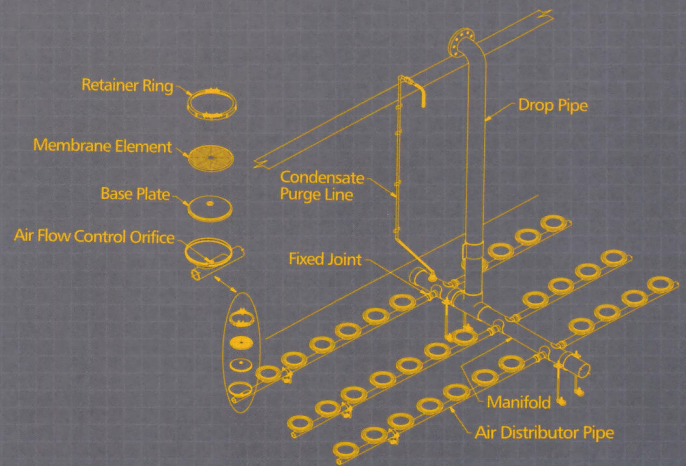


- Diffuser and holder are designed to provide full surface uniform air distribution and bubble release.
- The membrane is completely supported by the base plate, preventing reverse flexing.
- Available in 9-inch (229-mm) and 7-inch (178-mm) diameters.

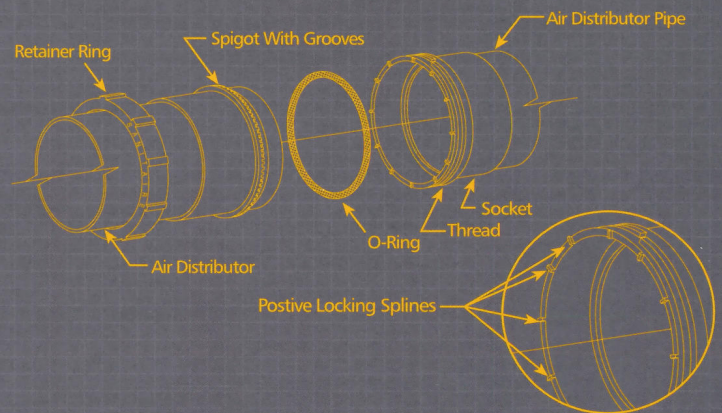
Proven System Components

- The SANITAIRE air distribution system incorporates patented locking pipe joints combined with guide type supports that do not positively grip the pipe to accommodate thermal expansion and contraction. The unique system design allows the individual distributor pipes to move freely through the pipe supports.
- The patented SANITAIRE fixed joint features an airtight O-ring seal, anti-rotational splines and a positive locking threaded retainer ring to prevent air leakage, pipe blow apart and distributor rollover.
- PVC air distribution piping system provides long-term mechanical integrity.
- Submerged components of corrosion resistant materials.
- Unique all stainless steel anchorage system with threaded supports for infinite adjustments on sloped or irregular floors.
- Joint components are factory solvent welded to the pipe ends, allowing for quick and easy field assembly of air distributor sections.
- Condensate removal with sumps and purge system.
- Over 10 million fine bubble diffusers installed worldwide.

Typical Membrane Disc Grid Layout



Sanitaire Positive Locking Fixed Joint



Membrane Disc Diffuser Advantages

- Provides full surface, uniform air distribution and bubble release.
- Operating air pressure creates peripheral seal to eliminate air leakage.
- Precision die-formed slits are punched perpendicular to membrane grain direction for greater resistance to elongation and tearing.
- Proprietary technologically advanced membrane material blended from special synthetic rubber compound has been specifically engineered for domestic and industrial waste applications providing:
 - Extended service life.
 - Resistance to material property changes.
 - High modulus of elasticity.
 - Proper material thickness - lower unit stress.
 - Resistance to oils and ultraviolet light.
 - High oxygen transfer efficiency.
- Alternative materials and configurations available for specific applications.
- The unique design eliminates the use of hold-down bolts, lift limiters and metallic mechanical fasteners.
- Existing aeration tanks can be easily upgraded with membrane disc aeration, upgrading existing plant's organic treatment capacity without adding tankage.
- Convenient shipping - diffusers and piping are delivered in a compact palletized arrangement.
- Ease of installation - up to 12 units installed per man-hour. Step-by-step O&M manuals, educational videos and field service startup training provided with every system.
- Factory installed diffuser holders and pipe end fittings to reduce installation time.
- Pressure monitoring system available.

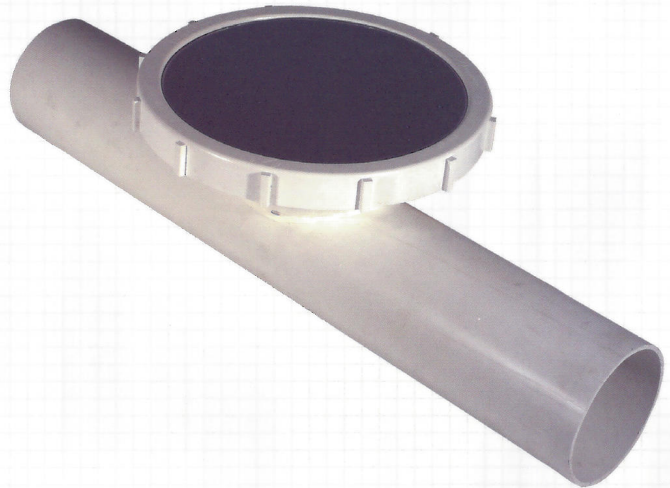
Applications

- Aeration Tanks
- Sludge Holding Tanks
- Aerobic Digesters
- Sequencing Batch Reactors
- Channel Aeration
- Air On/Air Off Processes
- Membrane Bioreactors

Those Who Choose Membrane Disc Aeration...

get the best of all worlds when they choose proven SANITAIRE systems for their wastewater treatment needs.

Sanitaire provides time-tested aeration technology and products for municipal and industrial markets worldwide.



Call Sanitaire - the aeration leader for more information

9333 N. 49th Street
Brown Deer, WI 53223 USA
Tel 414 365 2200
Fax 414 365 2210
www.sanitaire.com

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