TMUA PROJECT NO. WPC 23-3,

FY '23 NORTHSLOPE CAPITAL EQUIPMENT REPLACEMENTS

ATTENDANCE AT PRE-BID CONFERENCE IS MANDATORY

PREPARED BY:
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Masaru Brook Iwata — Feb 13, 2023
Masaru Brook Iwata, P.E. OK#28906 — Date

Matt Vaughan — 2.13.23
Matt Vaughan, P.E. OK#19788 — Date

CITY OF Tulsa
A New Kind of Energy.

ERIC LEE, DIRECTOR

WATER AND SEWER DEPARTMENT

Account Numbers: 7503392 544003

Eric Lee, Director, Water & Sewer Dept. — 2.14.2023 Date

Note: The Drawings attached hereto as part of these Specifications are for information purposes only. The Authority makes no representation or guarantee with respect to the accuracy of any information contained in the Drawings. It is the Contractors responsibility to verify information on the drawings to ensure the equipment installed or controlled by work performed under this Contract performs as specified herein.

Water and Sewer Department
175 E. 2nd Street
Tulsa, Oklahoma 74103
(918) 596-9845

DRAWINGS

Index of Drawings

Drawing	Title
214.1A	Aeration Basin #4 Diffusers (key Plan)
214.1B	Aeration Basin #4 Diffusers (Grid Type 1)
214.1C	Aeration Basin #4 Diffusers (Grid Type 2)
214.1D	Aeration Basin #4 Diffusers (Grid Type †)
214.1E	Aeration Basin #4 Diffusers (Grid Type 4)
214.1F	Aeration Basin #4 Diffusers (Grid Type 5)
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214.2B	PEW Pump Suction and Discharge Valve Replacement
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214.4A	Aeration Basin 4 Air Valve Actuator Replacement
214.5A	Chemical feed line replacement
214.5B	Chemical feed line replacement

Index of Equipment

Spec Sect	Equipment ID	Equipment Description	Equipment Status
214.1	ÉA	Aeration Basin #2 Diffusers	Replaced
214.2	N060-PEW1-BFV06	PEW INLET BUTTERFLY VALVE	Replaced
214.2	N060-PEW1-BFV07	PEW INLET BUTTERFLY VALVE	Replaced
214.2	N060-PEW1-BFV08	PEW INLET BUTTERFLY VALVE	Replaced
214.2	N060-PEW1-BFV09	PEW INLET BUTTERFLY VALVE	Replaced
214.2	N060-PEW1-BFV10	PEW OUTLET BUTTERFLY VALVE	Replaced
214.2	N060-PEW1-BFV11	PEW OUTLET BUTTERFLY VALVE	Replaced
214.2	N060-PEW1-BFV12	PEW OUTLET BUTTERFLY VALVE	Replaced
214.2	N060-PEW1-BFV13	PEW OUTLET BUTTERFLY VALVE	Replaced
214.2	N060-PEW1-CKV01	PEW OUTLET CHECK VALVE	Replaced
214.2	N060-PEW1-CKV02	PEW OUTLET CHECK VALVE	Replaced
214.2	N060-PEW1-CKV03	PEW OUTLET CHECK VALVE	Replaced
214.2	N060-PEW1-CKV04	PEW OUTLET CHECK VALVE	Replaced
214.3	N060-CHL1-MTP01	BLEACH BUILDING CHEMICAL PUMP	Replaced
214.3	N060-CHL1-MTP02	BLEACH BUILDING CHEMICAL PUMP	Replaced
214.3	N060-CHL1-MTP03	BLEACH BUILDING CHEMICAL PUMP	Replaced
214.4	N040-ARB4-ACT01	AB4 ACTUALTOR	Replaced
214.5		CHEMICAL FEED LINE	Replaced
214.5		DUCK BILL CHECK VALVE	Replaced

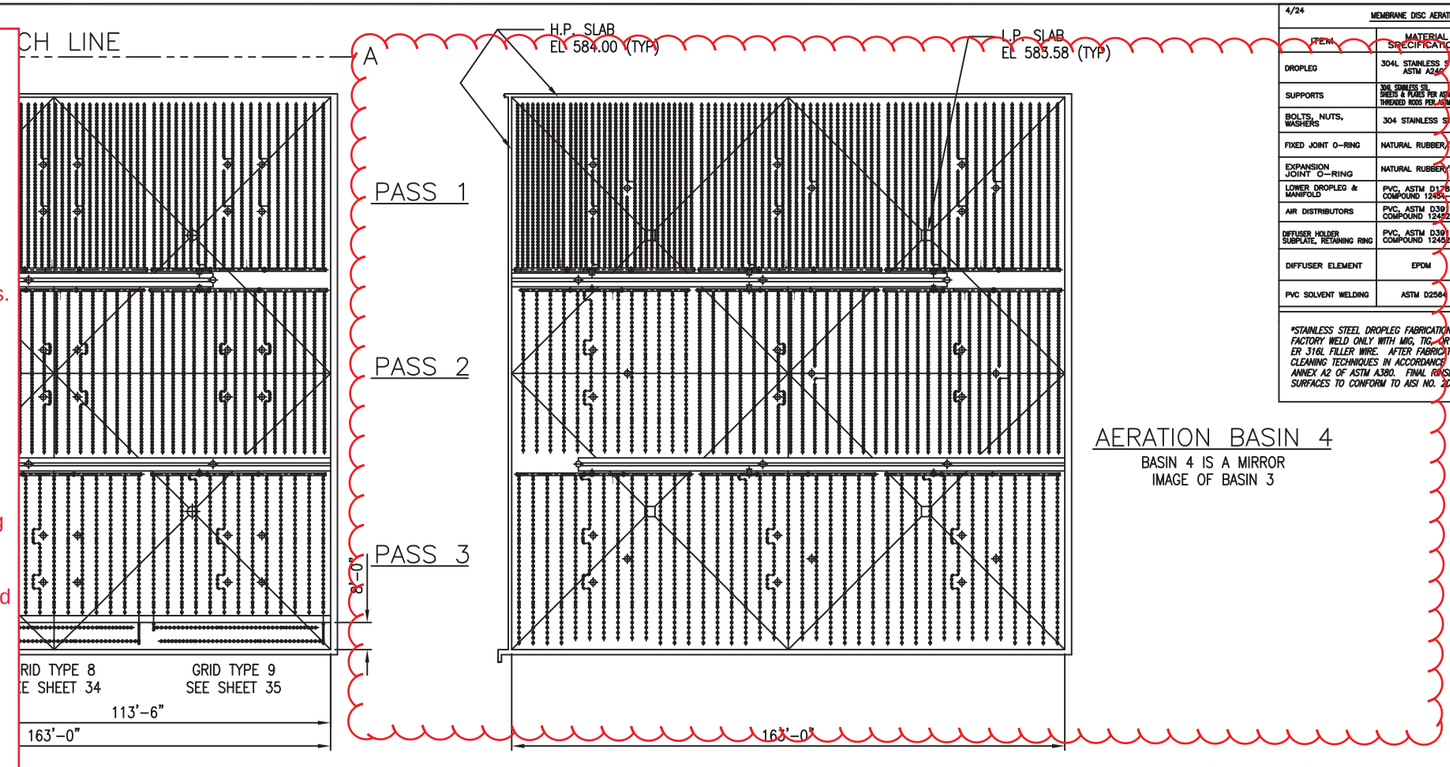
Index Of Drawings
WPC 23-3


AERATION BASIN #4
DIFFUSER REPLACEMENT SPEC # 214.1
AIR VALVE ACTUATOR SPEC # 214.4
BLEACH BUILDING & CONTACT BASINS
PEW VALVE REPLACEMENT & PAINT SPEC # 214.2
CHEMICAL PUMP REPLACEMENT SPEC # 214.3
CHEMICAL FEED LINE & DUCK BILL CHECK VALVE REPLACEMENT SPEC # 214.5
Northside Wastewater Treatment Plant
N 105th E Ave
Locations of Projects
WPC 23-3

Notes:
Remove & Replace
214.1.6 Diffuser Assemblies shall be model Silver Series II 9" Membrane Disc Diffusers manufactured by Sanitaire, EDI or approved equal Contractor to order enough EPDM orifice plugs for the called out blanks. Any unused plugs will be given to the plant.

214.1.7 INSTALLATION: Diffuser Assemblies and Retainer Rings shall be installed per manufacturers instructions including the following noted steps and concerns.
1. Before installation on a given row of diffusers, Contractor is to remove the diffusers to be replaced and flush out existing piping.
2. **It is extremely important not to over-torque the retainer rings during installation.**
3. Contractor is to report any assemblies that are missing plates, so that City personnel can purchase for replacement at a later time.
4. Contractor to report any existing diffuser holders or piping that has existing damage, so that City personnel can purchase for replacement at a later time. Contractor will be responsible for any existing holders or piping that is damaged during install.
5. Contractor Hydraulically clean airlines free of any / all debris.

214.1.8 TESTING: The diffuser assemblies shall be installed in strict conformance with the manufacturer's recommendations, which are to be submitted with the shop drawings. After completion of the installation, the diffuser assemblies shall be tested by the Contractor under actual operating conditions. An Authorized Manufacturer's Representative shall do onsite verification of diffusers at Start-Up and provide a report on transfer efficiency.



4/24

MEMBRANE DISC AERATION SYSTEM MATERIAL AND MANUFACTURING SPECIFICATIONS (304L, PVC)

ITEM	MATERIAL SPECIFICATION	MANUFACTURING SPECIFICATION	NOTES
DROPLEG	304L STAINLESS STEEL ASTM A240	FITTINGS: ASTM A774 TUBULAR PRODUCTS: ASTM A778 DIMENSIONS: ASTM A554	150# DRILLING FOR TERMINATION FLANGE CONNECTION. SCH 10 PIPE WALL THICKNESS ON DROPLEG. *SEE BELOW
SUPPORTS	304L STAINLESS STL SHEETS & PLATES PER ASTM A240 AND THREADED RODS PER ASTM A276	———	"L" GRADE NOT REQUIRED FOR NON-WELDED PARTS
BOLTS, NUTS, WASHERS	304 STAINLESS STEEL	———	———
FIXED JOINT O-RING	NATURAL RUBBER/SBR	———	45 ± 5 DUROMETER SHORE A COMPRESSION SET 5% MAX
EXPANSION JOINT O-RING	NATURAL RUBBER/SBR	———	40 ± 5 DUROMETER SHORE A 0.45 COEFFICIENT OF FRICTION MAX.
LOWER DROPLEG & MANIFOLD	PVC, ASTM D1784 COMPOUND 12454-B	PIPE: ASTM D1785 FITTINGS: ASTM D2466	———
AIR DISTRIBUTORS	PVC, ASTM D3915 COMPOUND 124524	PIPE: ASTM D3034 FITTINGS: ASTM D3034	MINIMUM 2% TITANIUM DIOXIDE
DIFFUSER HOLDER SUBPLATE, RETAINING RING	PVC, ASTM D3915 COMPOUND 124534	———	MINIMUM 2% TITANIUM DIOXIDE
DIFFUSER ELEMENT	EPDM	———	———
PVC SOLVENT WELDING	ASTM D2564	ASTM D2855	———

*STAINLESS STEEL DROPLEG FABRICATION
FACTORY WELD ONLY WITH MIG, TIG, OR PLASMA-ARC WELDING INERT GAS PROCESSES, FULL PENETRATION BUTT WELDS, ER 316L FILLER WIRE. AFTER FABRICATION FINISH CLEAN ALL WELDED STAINLESS STEEL ASSEMBLIES BY FULL IMMERSION CLEANING TECHNIQUES IN ACCORDANCE TO 6.2.11 OF ASTM A380-88. THE ACID FOR USE DEFINED BY TABLE A2.1 OF ANNEX A2 OF ASTM A380. FINAL RINSE AND DRY IN ACCORDANCE TO SECTION 8.3 OF ASTM A380. ALL WELDED SURFACES TO CONFORM TO AISI NO. 2D FINISH.

Aeration Basin #4
Diffuser
Replacements

TYPICAL PLUGGED DIFFUSER

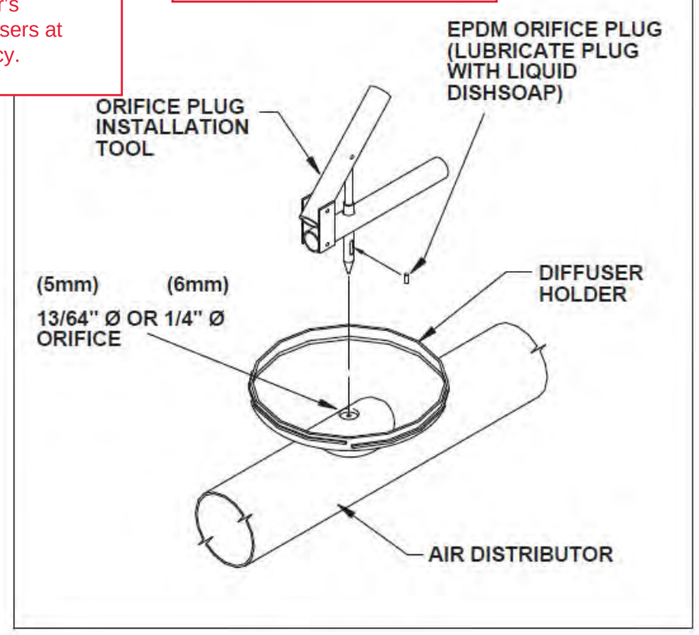


Figure 37

TYPICAL DIFFUSER

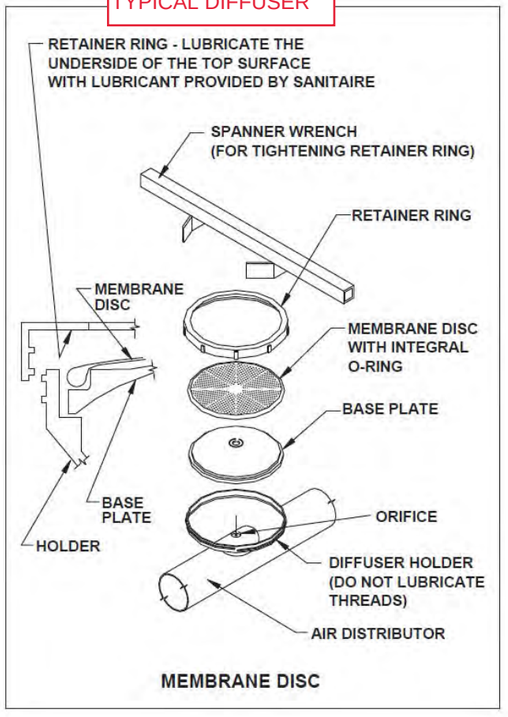


Figure 36

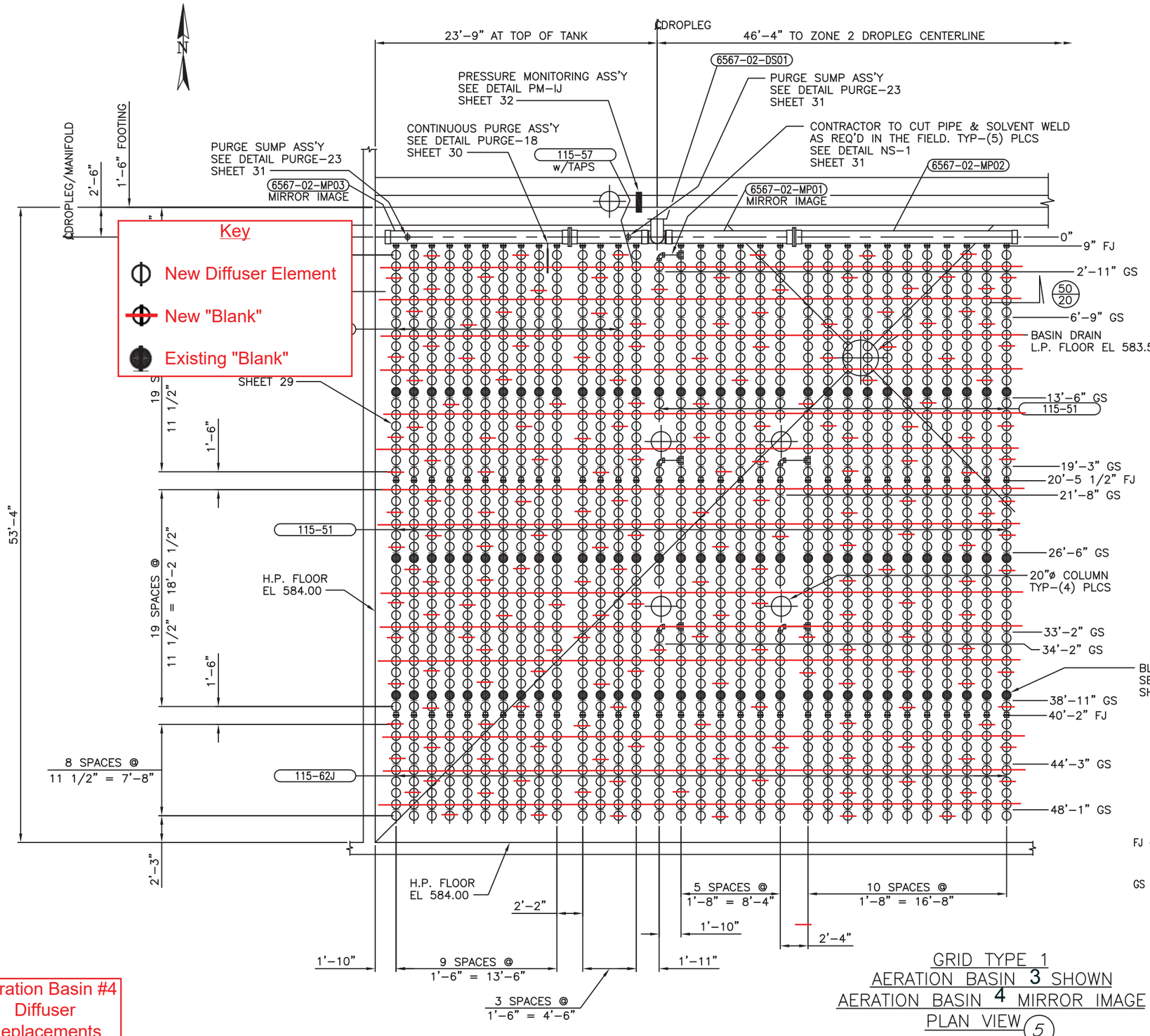
VIEW,SECTION OR DETAIL NUMBER
2/3
SHEET NUMBER ON WHICH VIEW, SECTION OR DETAIL IS FOUND

NO.	DATE	REVISION	BY
4			
3			
2			
1			

TULSA, OK

NORTHSIDE WWTP

WPC 23-3
214.1A



NOTE: SUPPORT SPACING

Every attempt has been made to insure locational dimensions of the supports are correct. However, after one line of air distributor anchors for any grid type have been installed, the locations must be checked for proper clearances by installing the supplied air headers. Spacing between lines must be checked for fit with the cross manifold and drain line. Any discrepancies or interferences must be brought to the attention of SANITAIRE prior to further installation.

The actual support anchor locations must be indexed from the centerline of the manifold. The actual accumulative dimensional error from the manifold to the anchor bolt must not exceed ± 3/4".

NOTE:
This sheet shows the existing 1546 diffuser holders in Aeration Basin #4, Grid 1 of which 1450 existing holders have diffuser elements installed and 96 "blank" diffusers.

Contractor to install NEW diffuser elements in only 816 of the 1450 existing holders with old diffuser elements and make the remaining 634 holders "blank" diffusers (in addition to the existing "blank" diffusers).

Please see the key for locations of new diffuser elements and new "blank" diffusers.

2 –TANK(S)
1 –GRID(S) PER TANK
32 –AIR DISTRIBUTORS PER GRID
VARIES –DIFFUSER HOLDERS PER AIR DISTRIBUTOR
1546 –TOTAL DIFFUSER HOLDERS PER GRID
VARIES –DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
1450 –DIFFUSER ELEMENTS INSTALLED PER GRID
2900 –TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
96 –TOTAL BLANK DIFFUSERS PER GRID

*subject to manufactures final recommendations

LEGEND

FJ – FIXED JOINT
SEE DETAIL FB-10A
SHEET- 29

GS – GUIDE SUPPORT
SEE DETAIL SUP-2
SHEET- 31

– FOR TYPICAL AIR DISTRIBUTOR SECTION
SEE DETAIL FB-22C
SHEET- 29

GRID TYPE 1
AERATION BASIN 3 SHOWN
AERATION BASIN 4 MIRROR IMAGE
PLAN VIEW 5

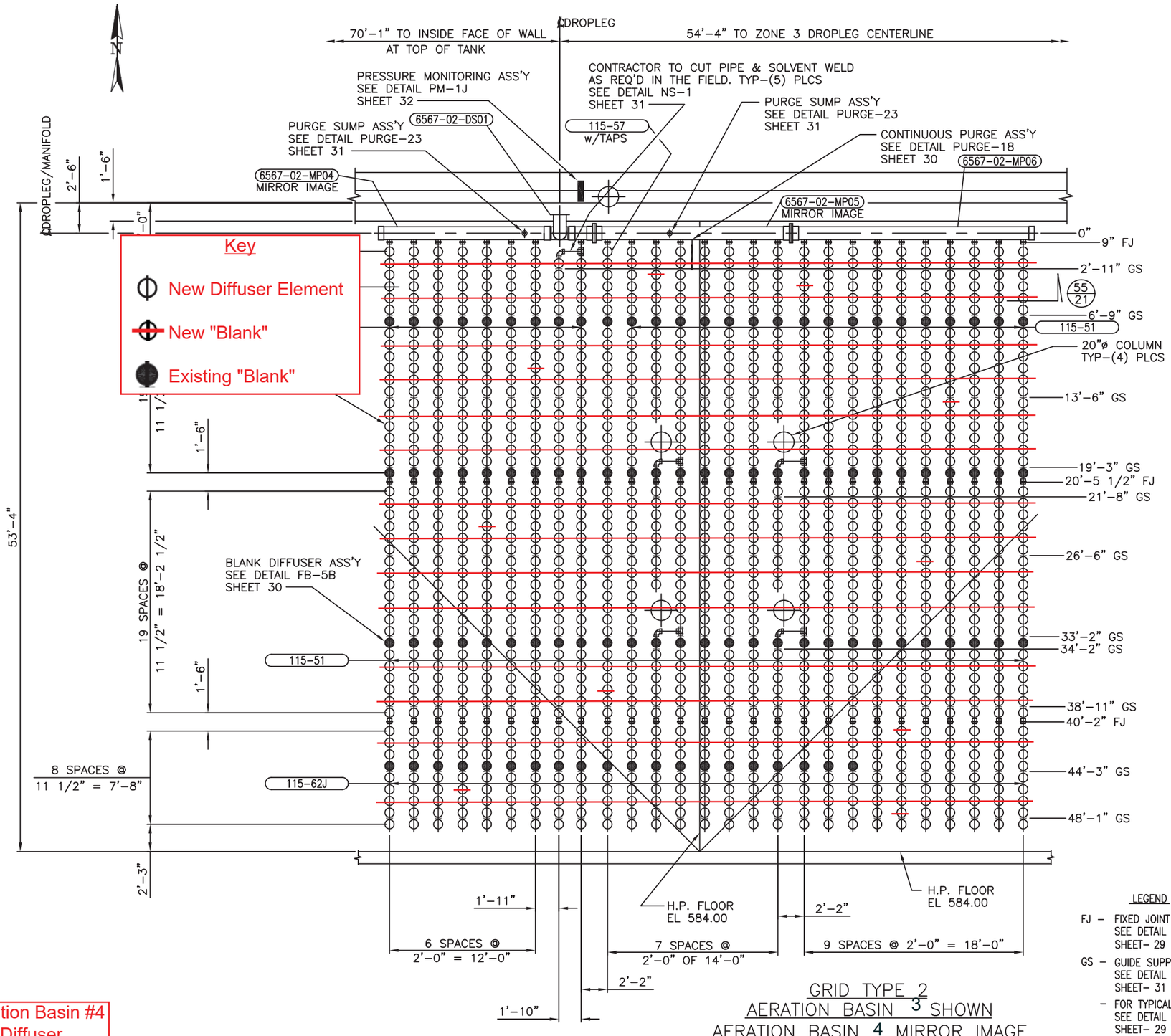
Aeration Basin #4
Diffuser
Replacements

NO.	DATE	REVISION	BY
4			
3			
2			
1			

TULSA, OK

NORTHSIDE WWTP

WPC 23-3
214.1B



GRID TYPE 2
AERATION BASIN 3 SHOWN
AERATION BASIN 4 MIRROR IMAGE
PLAN VIEW (7)

LEGEND

FJ – FIXED JOINT
SEE DETAIL FB-10A
SHEET- 29

GS – GUIDE SUPPORT
SEE DETAIL SUP-2
SHEET- 31

– FOR TYPICAL AIR DISTRIBUTOR SECTION
SEE DETAIL FB-22C
SHEET- 29

NOTE: SUPPORT SPACING

Every attempt has been made to insure locational dimensions of the supports are correct. However, after one line of air distributor anchors for any grid type have been installed, the locations must be checked for proper clearances by installing the supplied air headers. Spacing between lines must be checked for fit with the cross manifold and drain line. Any discrepancies or interferences must be brought to the attention of SANITAIRE prior to further installation.

The actual support anchor locations must be indexed from the centerline of the manifold. The actual accumulative dimensional error from the manifold to the anchor bolt must not exceed ± 3/4".

NOTE:
This sheet shows the existing 1301 diffuser holders in Aeration Basin #4, Grid 2 of which 1200 existing holders have diffuser elements installed and 101 "blank" diffusers.

Contractor to install NEW diffuser elements in only 816 of the 1200 existing holders with old diffuser elements and make the remaining 384 holders "blank" diffusers (in addition to the existing "blank" diffusers).

Please see the key for locations of new diffuser elements and new "blank" diffusers.

*subject to manufactures final recommendations

GRID TYPE '2'

2 –TANK(S)
1 –GRID(S) PER TANK
27 –AIR DISTRIBUTORS PER GRID
VARIES –DIFFUSER HOLDERS PER AIR DISTRIBUTOR
1301 –TOTAL DIFFUSER HOLDERS PER GRID
VARIES –DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
1200 –DIFFUSER ELEMENTS INSTALLED PER GRID
2400 –TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
101 –TOTAL BLANK DIFFUSERS PER GRID

Aeration Basin #4 Diffuser Replacements

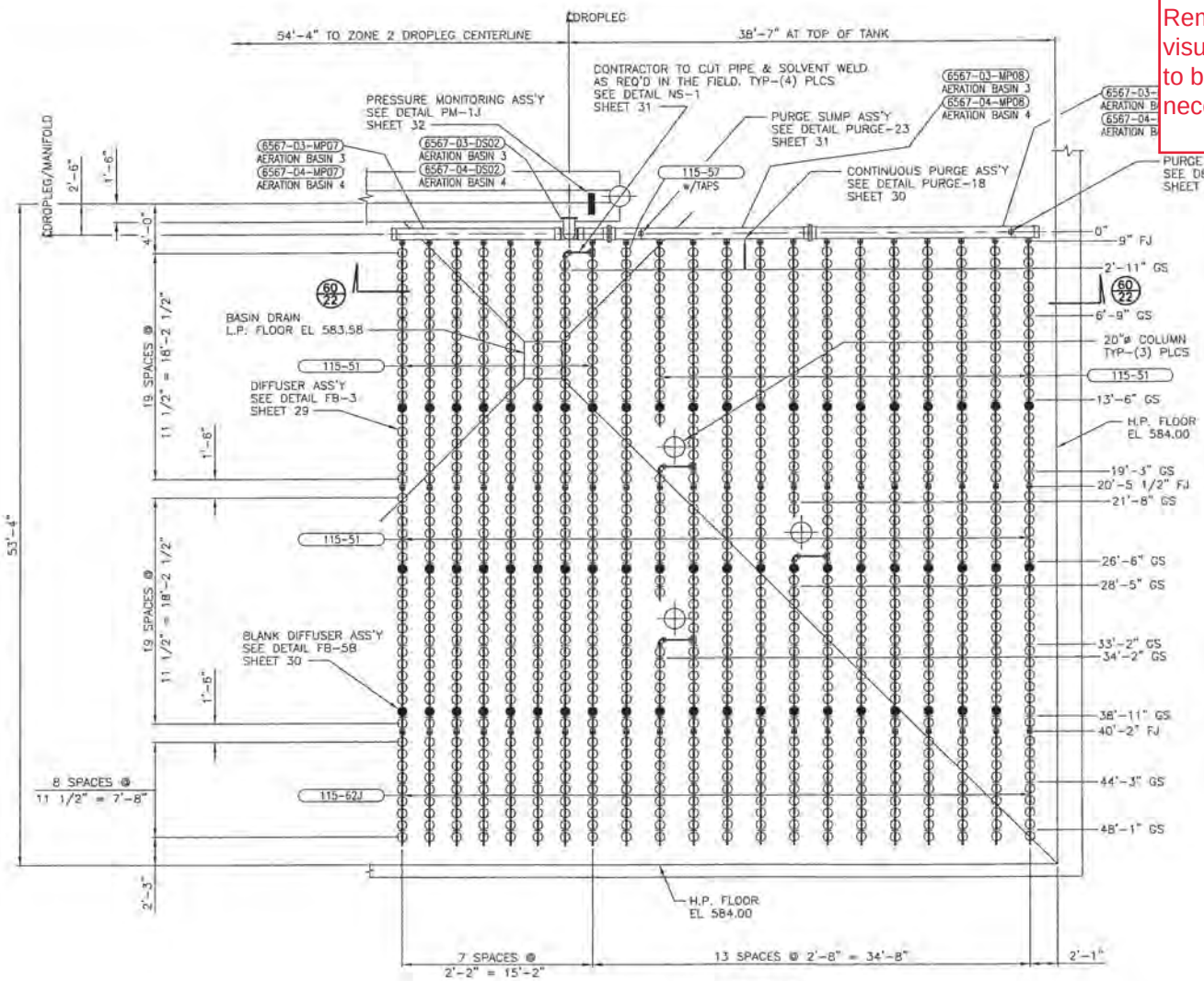
NO.	DATE	REVISION	BY
4			
3			
2			
1			

TULSA, OK

NORTHSIDE WWTP

WPC 23-3
214.1C

Notes:
Remove & Replace ring diffusers and visually inspect all plugged units intended to be plugged. Replace missing plugs as necessary.



GRID TYPE 3
AERATION BASIN 3 SHOWN
AERATION BASIN 4 MIRROR IMAGE
PLAN VIEW (29)

NOTE: SUPPORT SPACING

Every attempt has been made to insure locational dimensions of the supports are correct. However, after one line of air distributor anchors for any grid type have been installed, the locations must be checked for proper clearances by installing the supplied air headers. Spacing between lines must be checked for fit with the cross manifold and drain line. Any discrepancies or interferences must be brought to the attention of SANITAIRE prior to further installation.

The actual support anchor locations must be indexed from the centerline of the manifold. The actual accumulative dimensional error from the manifold to the anchor bolt must not exceed ± 3/4".

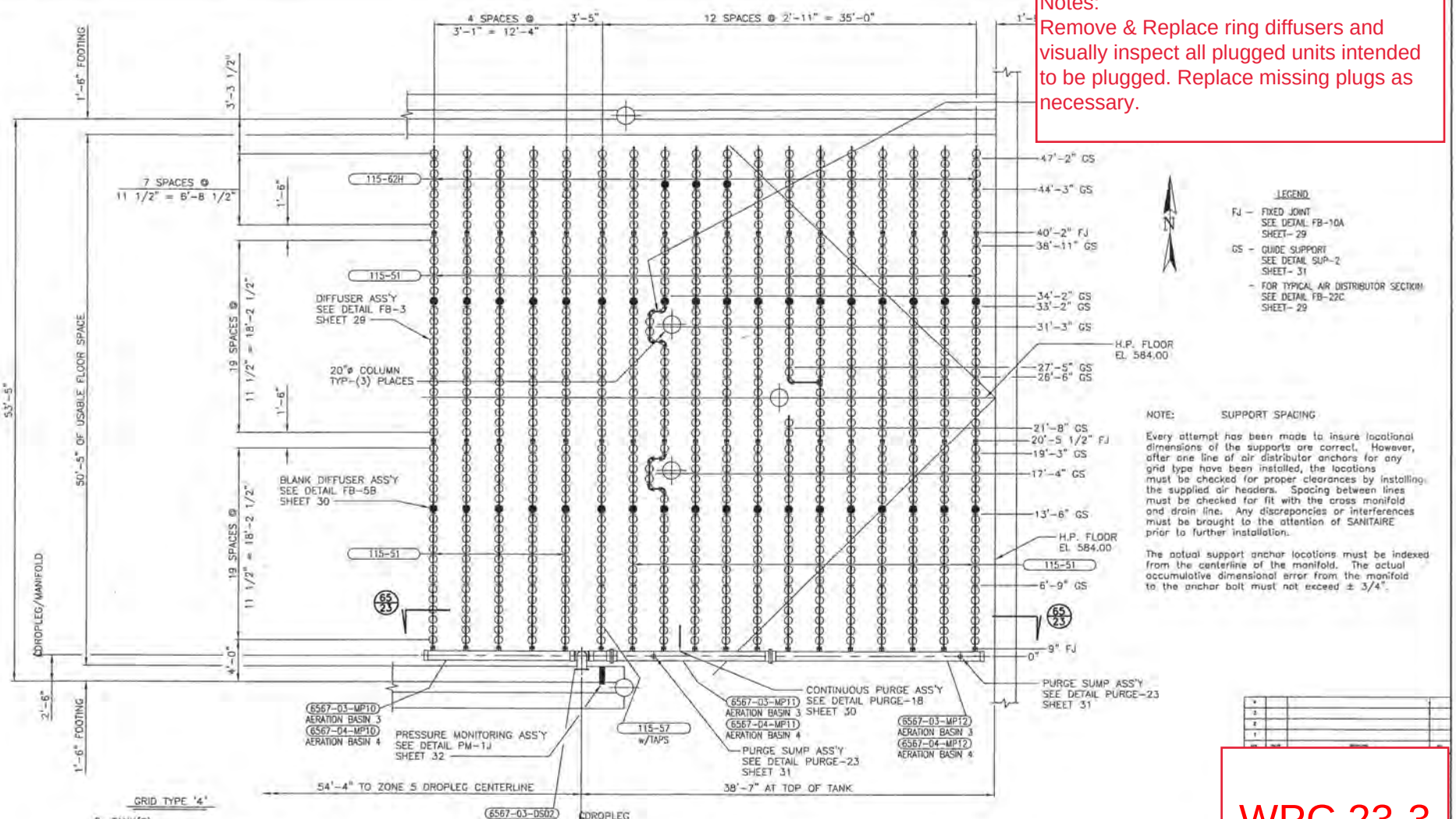
GRID TYPE '3'

2 – TANK(S)
1 – GRID(S) PER TANK
21 – AIR DISTRIBUTORS PER GRID
VARIES – DIFFUSER HOLDERS PER AIR DISTRIBUTOR
1012 – TOTAL DIFFUSER HOLDERS PER GRID
VARIES – DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
950 – DIFFUSER ELEMENTS INSTALLED PER GRID
1900 – TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
62 – TOTAL BLANK DIFFUSERS PER GRID

– FOR TYPICAL AIR DISTRIBUTOR SECTION SEE DETAIL FB-22C SHEET- 29

WPC 23-3
214.1D

Notes:
Remove & Replace ring diffusers and visually inspect all plugged units intended to be plugged. Replace missing plugs as necessary.



NOTE: SUPPORT SPACING

Every attempt has been made to insure locational dimensions of the supports are correct. However, after one line of air distributor anchors for any grid type have been installed, the locations must be checked for proper clearances by installing the supplied air headers. Spacing between lines must be checked for fit with the cross manifold and drain line. Any discrepancies or interferences must be brought to the attention of SANITAIRE prior to further installation.

The actual support anchor locations must be indexed from the centerline of the manifold. The actual accumulative dimensional error from the manifold to the anchor bolt must not exceed ± 3/4".

GRID TYPE '4'

2 -TANK(S)
1 -GRID(S) PER TANK
18 -AIR DISTRIBUTORS PER GRID
VARIES -DIFFUSER HOLDERS PER AIR DISTRIBUTOR
855 -TOTAL DIFFUSER HOLDERS PER GRID
VARIES -DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
816 -DIFFUSER ELEMENTS INSTALLED PER GRID
1632 -TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
39 -TOTAL BLANK DIFFUSERS PER GRID

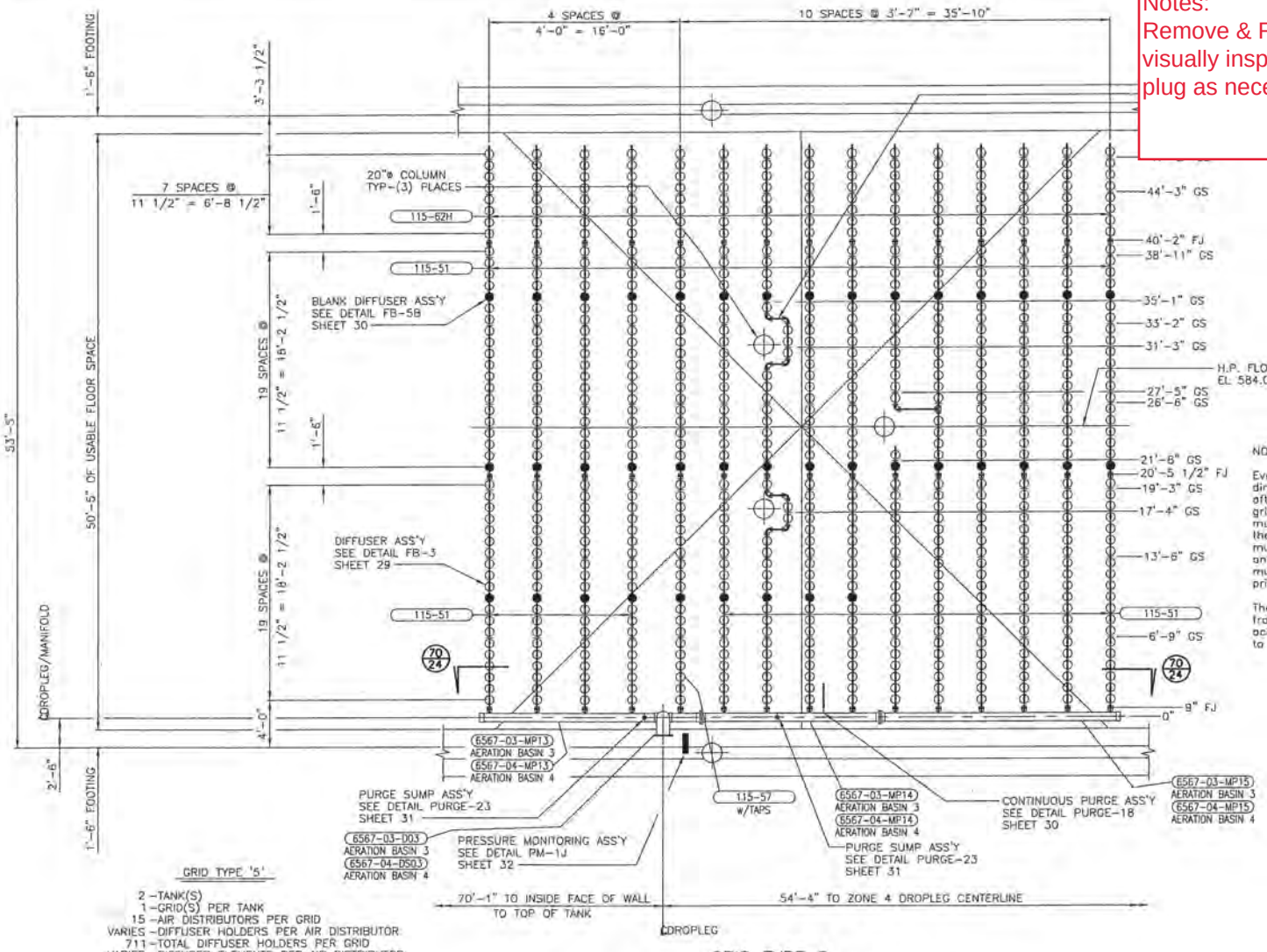
GRID TYPE 4
AERATION BASIN 3 SHOWN
AERATION BASIN 4 MIRROR IMAGE
PLAN VIEW (31)

WPC 23-3
214.1E

6/19/2008

APPROVED FOR CONSTRUCTION

Notes:
Remove & Replace ring diffusers and visually inspect all plugged units. Replace plug as necessary



NOTE: SUPPORT SPACING

Every attempt has been made to insure locational dimensions of the supports are correct. However, after one line of air distributor anchors for any grid type have been installed, the locations must be checked for proper clearances by installing the supplied air headers. Spacing between lines must be checked for fit with the cross manifold and drain line. Any discrepancies or interferences must be brought to the attention of SANITAIRE prior to further installation.

The actual support anchor locations must be indexed from the centerline of the manifold. The actual accumulative dimensional error from the manifold to the anchor bolt must not exceed ± 3/4".

GRID TYPE '5'

2 -TANK(S)
1 -GRID(S) PER TANK
15 -AIR DISTRIBUTORS PER GRID
VARIES -DIFFUSER HOLDERS PER AIR DISTRIBUTOR
711 -TOTAL DIFFUSER HOLDERS PER GRID
VARIES -DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
672 -DIFFUSER ELEMENTS INSTALLED PER GRID
1344 -TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
39 -TOTAL BLANK DIFFUSERS PER GRID

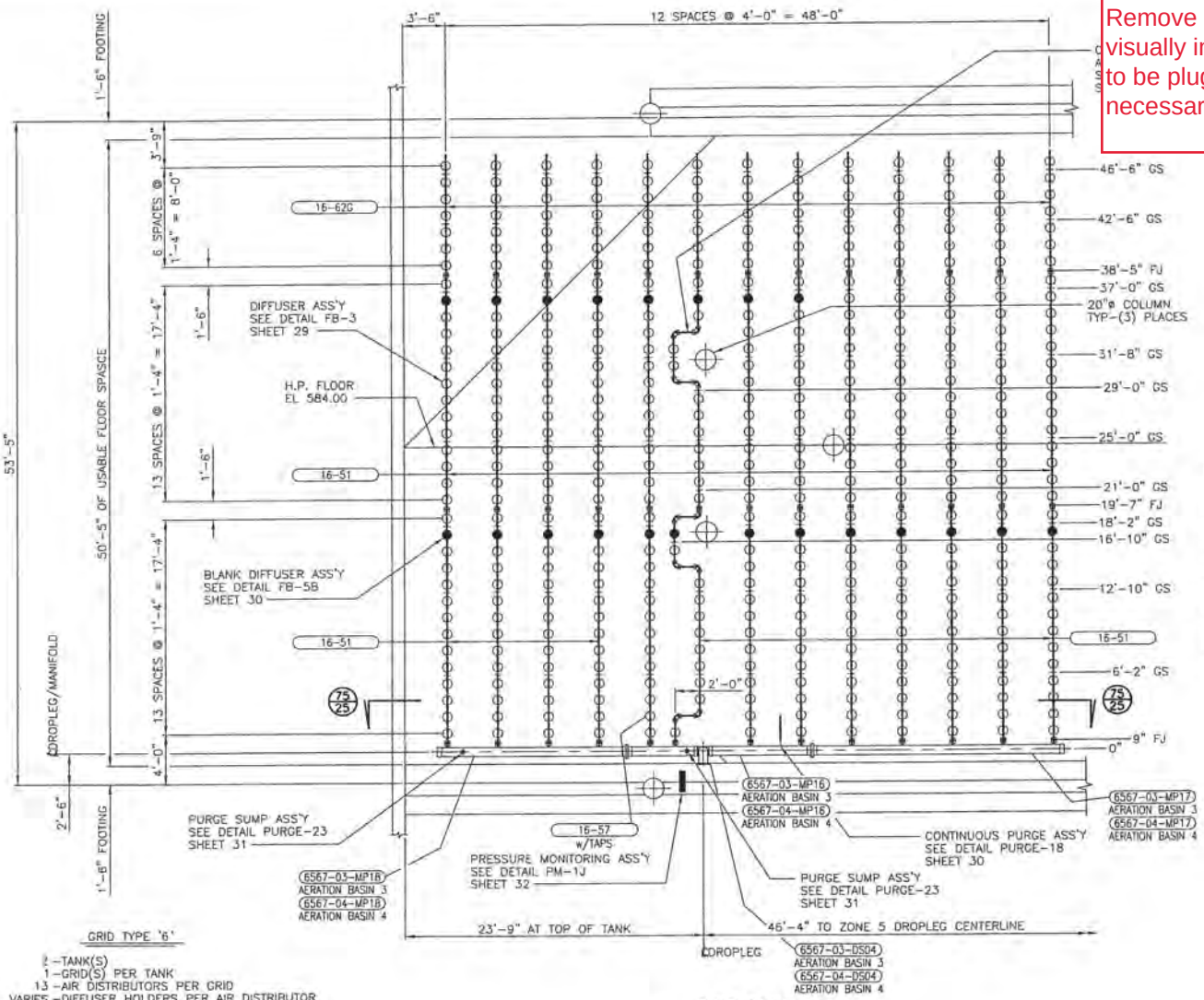
GRID TYPE 5
AERATION BASIN 3 SHOWN
AERATION BASIN 4 MIRROR IMAGE
PLAN VIEW (33)

WPC 23-3
214.1F

6/19/2008

APPROVED FOR CONSTRUCTION

Notes:
Remove & Replace ring diffusers and visually inspect all plugged units intended to be plugged. Replace missing plugs as necessary.



GRID TYPE '6'

2 –TANK(S)
1 –GRID(S) PER TANK
13 –AIR DISTRIBUTORS PER GRID
VARIES –DIFFUSER HOLDERS PER AIR DISTRIBUTOR
450 –TOTAL DIFFUSER HOLDERS PER GRID
VARIES –DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
429 –DIFFUSER ELEMENTS INSTALLED PER GRID
858 –TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
21 –TOTAL BLANK DIFFUSERS PER GRID

GRID TYPE 6
AERATION BASIN 3 SHOWN
AERATION BASIN 4 MIRROR IMAGE
PLAN VIEW (35)

LEGEND

FJ – FIXED JOINT SEE DETAIL FB-10A SHEET– 29

GS – GUIDE SUPPORT SEE DETAIL SUP-2 SHEET– 31
– FOR TYPICAL AIR DISTRIBUTOR SECTION SEE DETAIL FB-22C SHEET– 29

N

NOTE: SUPPORT SPACING

Every attempt has been made to insure locational dimensions of the supports are correct. However, after one line of air distributor anchors for any grid type have been installed, the locations must be checked for proper clearances by installing the supplied air headers. Spacing between lines must be checked for fit with the cross manifold and drain line. Any discrepancies or interferences must be brought to the attention of SANITAIRE prior to further installation.

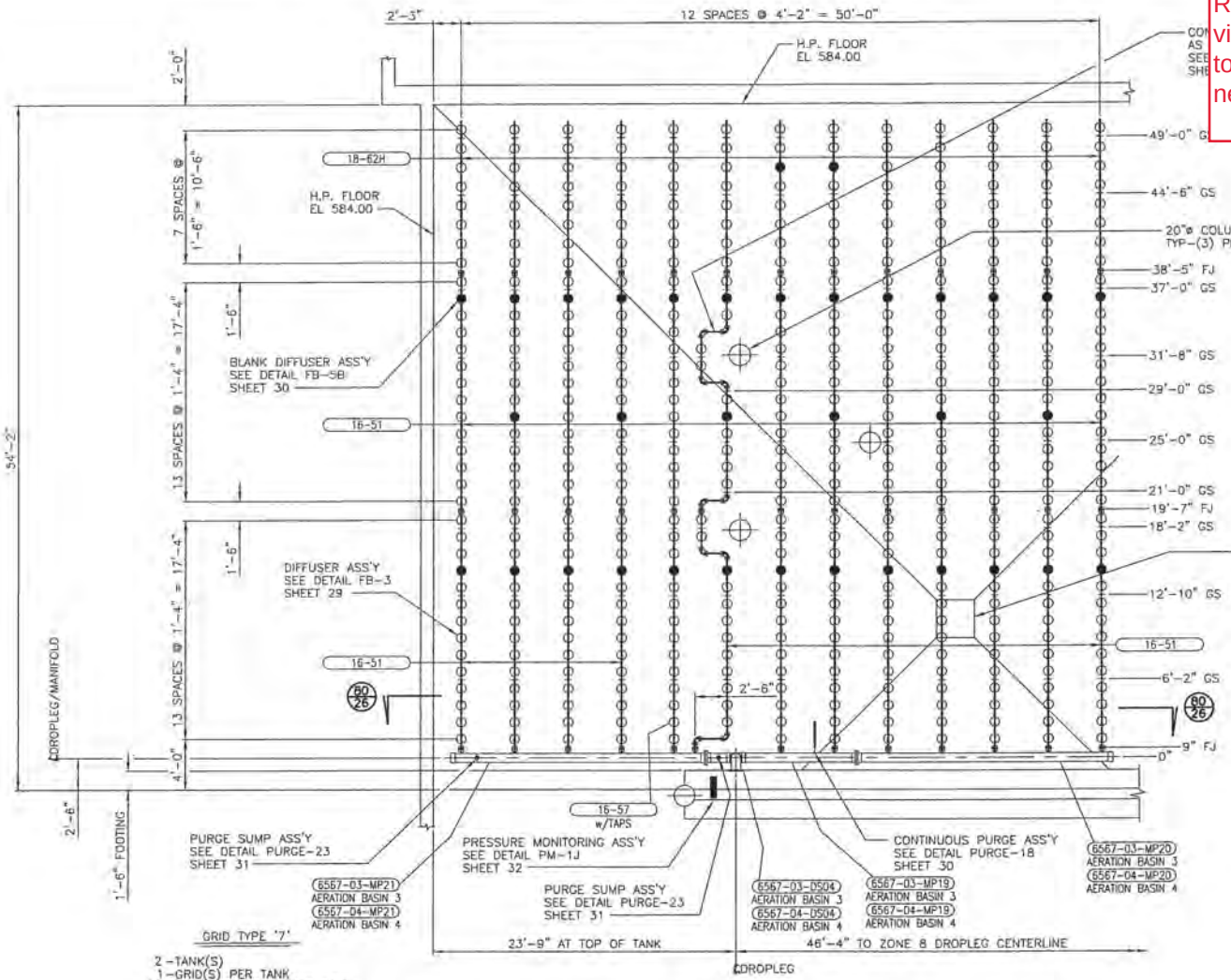
The actual support anchor locations must be indexed from the centerline of the manifold. The actual accumulative dimensional error from the manifold to the anchor bolt must not exceed ± 3/4".

WPC 23-3
214.1G

6/19/2008

APPROVED FOR CONSTRUCTION

Notes:
Remove & Replace ring diffusers and visually inspect all plugged units intended to be plugged. Replace missing plugs as necessary.



NOTE: SUPPORT SPACING

Every attempt has been made to insure locational dimensions of the supports are correct. However, after one line of air distributor anchors for any grid type have been installed, the locations must be checked for proper clearances by installing the supplied air headers. Spacing between lines must be checked for fit with the cross manifold and drain line. Any discrepancies or interferences must be brought to the attention of SANITAIRE prior to further installation.

The actual support anchor locations must be indexed from the centerline of the manifold. The actual accumulative dimensional error from the manifold to the anchor bolt must not exceed ± 3/4".

LEGEND

FJ - FIXED JOINT SEE DETAIL FB-10A SHEET- 29

GS - GUIDE SUPPORT SEE DETAIL SUP-2 SHEET- 31

- FOR TYPICAL AIR DISTRIBUTOR SECTION SEE DETAIL FB-22C SHEET- 29

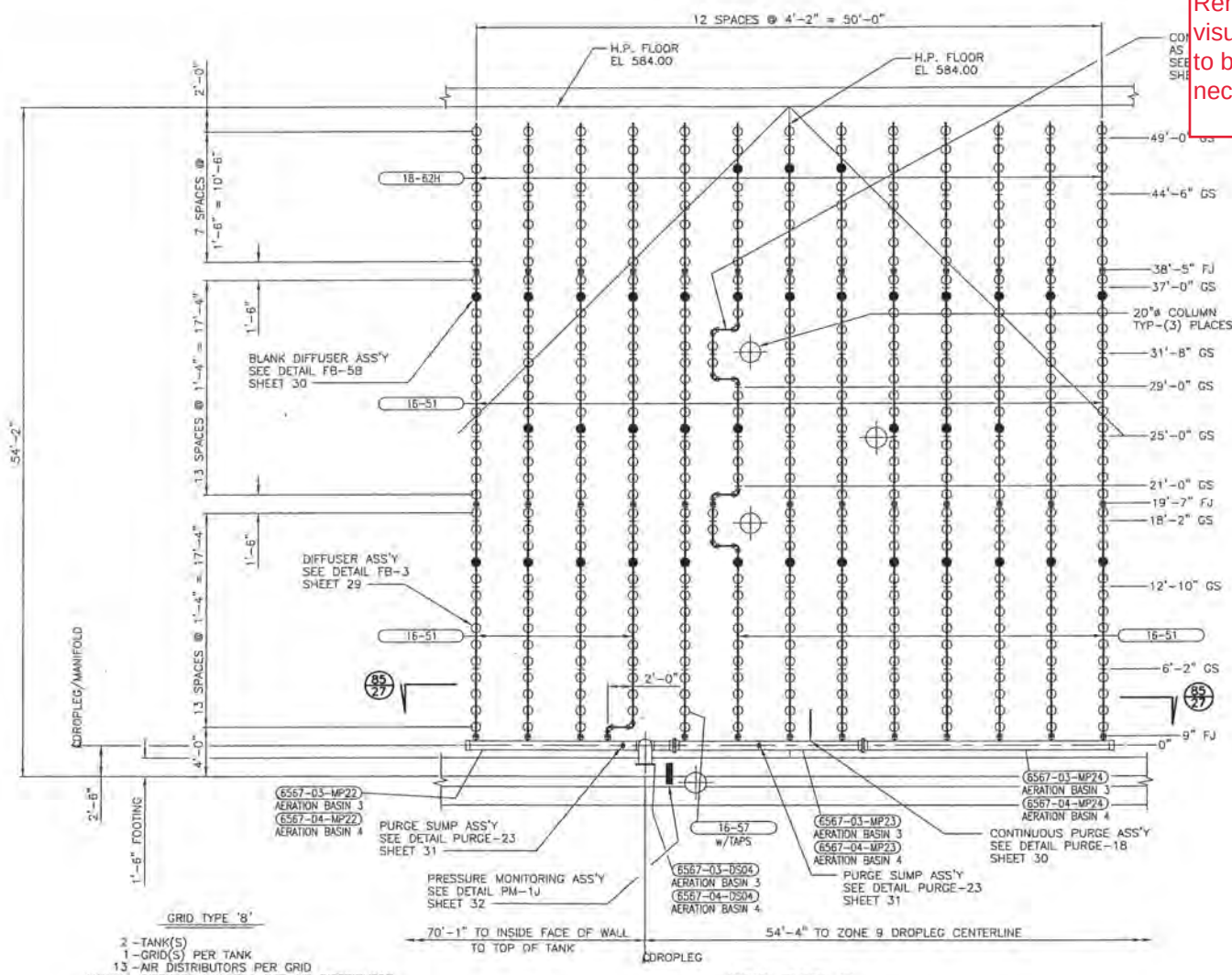
GRID TYPE '7'

2 -TANK(S)
1 -GRID(S) PER TANK
13 -AIR DISTRIBUTORS PER GRID
VARIES -DIFFUSER HOLDERS PER AIR DISTRIBUTOR
463 -TOTAL DIFFUSER HOLDERS PER GRID
VARIES -DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
429 -DIFFUSER ELEMENTS INSTALLED PER GRID
858 -TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
34 -TOTAL BLANK DIFFUSERS PER GRID

GRID TYPE 7
AERATION BASIN 3 SHOWN
AERATION BASIN 4 MIRROR IMAGE
PLAN VIEW (37)

WPC 23-3
214.1H

Notes:
Remove & Replace ring diffusers and visually inspect all plugged units intended to be plugged. Replace missing plugs as necessary.



GRID TYPE '8'

2 - TANK(S)
1 - GRID(S) PER TANK
13 - AIR DISTRIBUTORS PER GRID
VARIES - DIFFUSER HOLDERS PER AIR DISTRIBUTOR
463 - TOTAL DIFFUSER HOLDERS PER GRID
VARIES - DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
429 - DIFFUSER ELEMENTS INSTALLED PER GRID
858 - TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
34 - TOTAL BLANK DIFFUSERS PER GRID

GRID TYPE 8
AERATION BASIN 3 SHOWN
AERATION BASIN 4 MIRROR IMAGE
PLAN VIEW (39)

LEGEND

FJ - FIXED JOINT SEE DETAIL FB-10A SHEET- 29
GS - GUIDE SUPPORT SEE DETAIL SUP-2 SHEET- 31
- FOR TYPICAL AIR DISTRIBUTOR SECTION SEE DETAIL FB-22C SHEET- 29

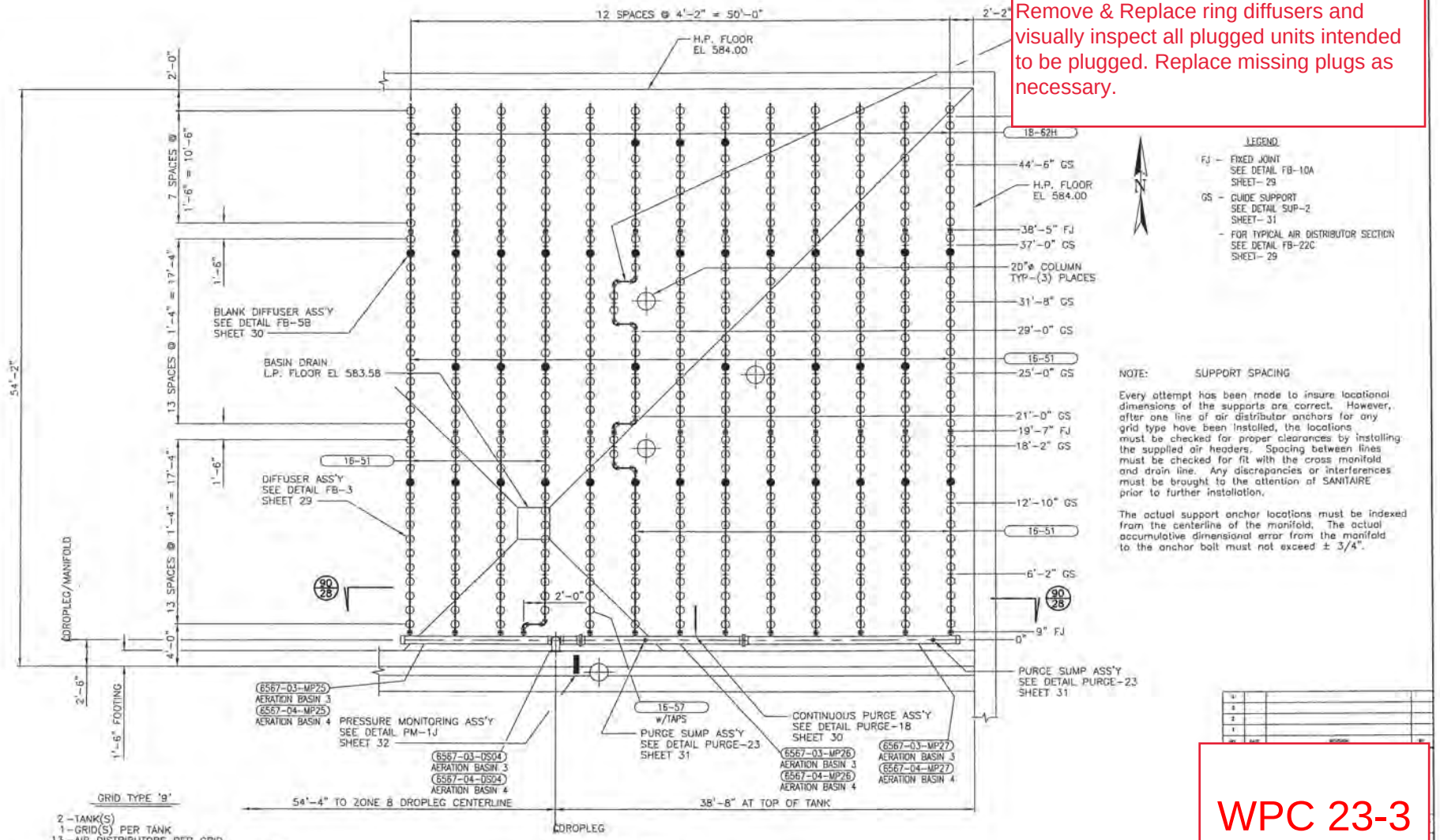
NOTE: SUPPORT SPACING

Every attempt has been made to insure locational dimensions of the supports are correct. However, after one line of air distributor anchors for any grid type have been installed, the locations must be checked for proper clearances by installing the supplied air headers. Spacing between lines must be checked for fit with the cross manifold and drain line. Any discrepancies or interferences must be brought to the attention of SANITAIRE prior to further installation.

The actual support anchor locations must be indexed from the centerline of the manifold. The actual accumulative dimensional error from the manifold to the anchor bolt must not exceed ± 3/4".

WPC 23-3
214.1I

Notes:
Remove & Replace ring diffusers and visually inspect all plugged units intended to be plugged. Replace missing plugs as necessary.



GRID TYPE '9'
2 - TANK(S)
1 - GRID(S) PER TANK
13 - AIR DISTRIBUTORS PER GRID
VARIES - DIFFUSER HOLDERS PER AIR DISTRIBUTOR
463 - TOTAL DIFFUSER HOLDERS PER GRID
VARIES - DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
429 - DIFFUSER ELEMENTS INSTALLED PER GRID
858 - TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
34 - TOTAL BLANK DIFFUSERS PER GRID

GRID TYPE 9
AERATION BASIN 3 SHOWN
AERATION BASIN 4 MIRROR IMAGE
PLAN VIEW (41)

WPC 23-3
214.1J

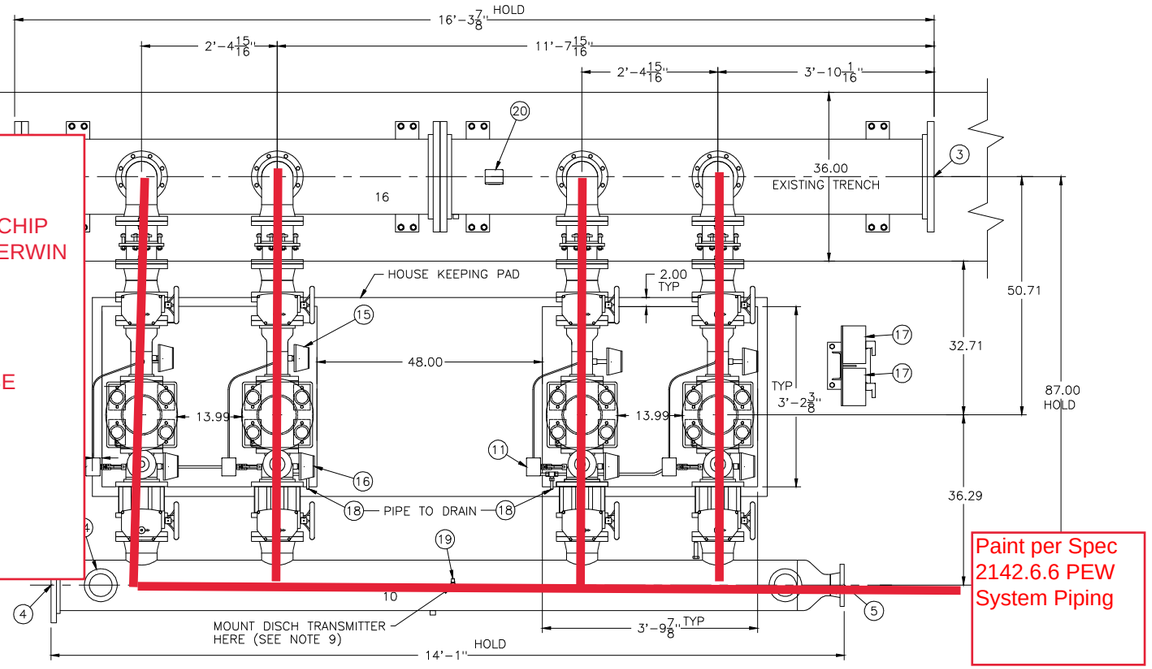
NOTES:
SURFACE PREP & PAINT

SPEC214.2.6.6 COATINGS SHALL BE PREPPED, BLASTED, CHIP RESISTANT PRIMED, & PAINTED TO MATCH PEW LINE, SHERWIN WILLIAMS OR TNEMEC PANTONE 522 MATCH

SPEC 214.2.14TAGGING TO CONFORM TO 215.1.4

*ALL PIPE MARKINGS ARE APPROCIMATE AND MAY NOT BE COMPLETE. CONSULT WITH ENGINEER IF UNCLEAR

STENCIL FLOW ARROWS & CURRENT PIPE MARKING

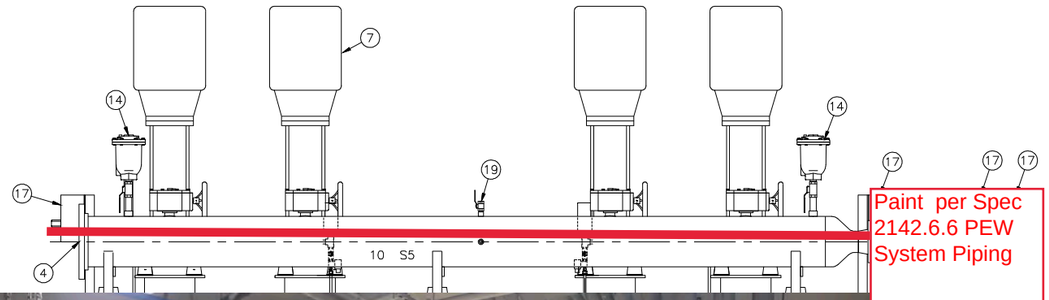


Paint per Spec 2142.6.6 PEW System Piping

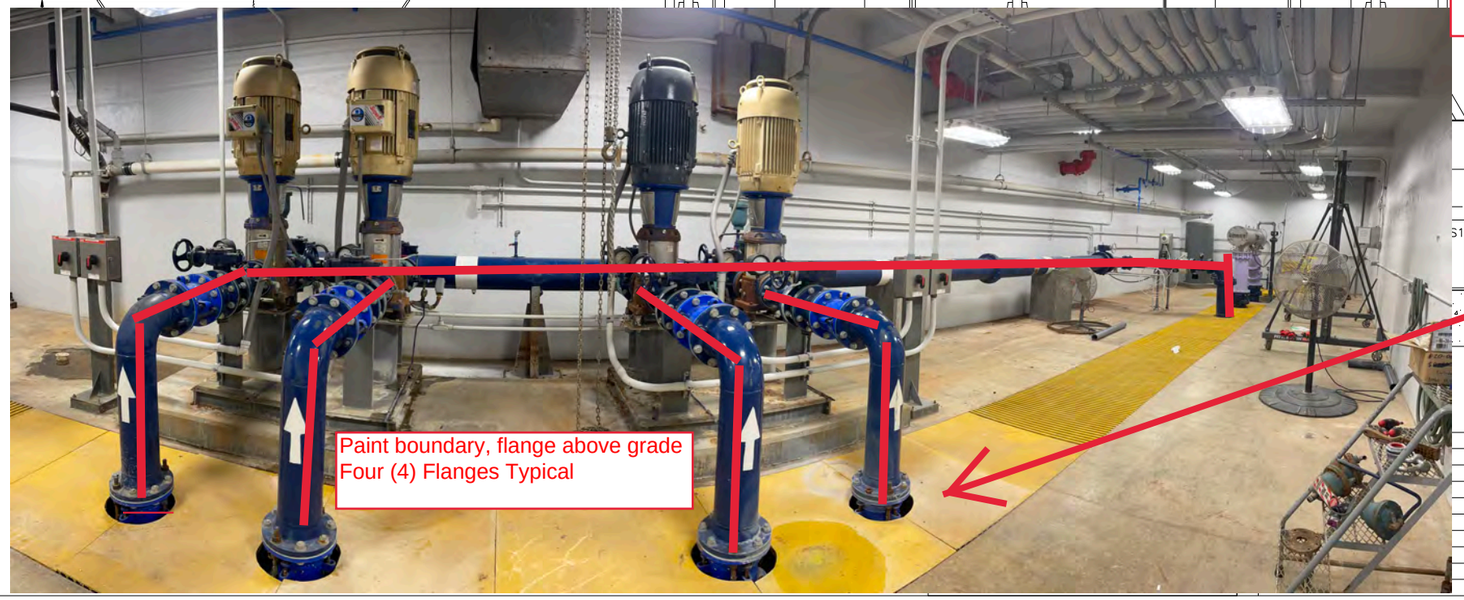
ITEM	QTY	SIZE	DESCRIPTION	LGTH	PART NO./NOTE
21	8	1.5TON	SHACKLE–LIFTING		
20	1		SWITCH–LIP		
19	18	.5"	VALVE–BALL		
18	2	.5"	DRAIN–THERMAL PURGE		
17	4		DISCONNECT		
16	4	4.5"	GAUGE–0–160 PSI PRESSURE		DISCH HEADER
15	4	4.5"	GAUGE–30"–0–100 PSI PRESSURE		SUCT HEADER
14	2	1"	VALVE–COMBO AIR RELEASE		
13	4	.5"	VALVE–COMBO AIR RELEASE		
12	16		ISOLATOR–VIBRATION		
11	4		ASSEMBLY–NEMA 1 THERMAL PURGE		
10	4	6"	VALVE–SILENT WAFER CHECK		
9	8	6"	VALVE–AWWA GEAR OPERATED ISO		
8	8	6"	DISMANTLING JOINT–SMITH/BLAIR 975		
7	4	50 HP	PUMP–GOULDS 92SV31GR4F60 CENTRIFUGAL		
6	1	16"	FLANGE–150# BLIND		
5	1	4"	DISCHARGE–150# FLANGED		
4	1	10"	DISCHARGE–150# FLANGED		
3	1	16"	SUCTION–150# FLANGED		
2	1		SKID		
1	1		SKID		

1. THIS AREA TO REMAIN CLEAR OF ALL OBSTRUCTIONS. CONDUIT ETC... REQUIRED BY NATIONAL ELECTRIC CODE
2. SUCTION AND DISCHARGE PIPING CONNECTIONS MUST BE RESTRAINED AGAINST THRUST BY OTHERS.
3. ALL VACANT TOL'S TO BE PLUGGED WITH LIKE MATERIAL PIPE PLUGS
4. ALL MANIFOLDS TO BE DETACHABLE.
5. PIPING TO BE ASTM A53 B CARBON STEEL FUSION BONDED EPOXY COATED.
6. USE ALL LIFTING EYES WHEN LIFTING
7. PAINT ANCHOR PLATES SAME COLOR AS SKID
8. ALL FLANGES TO BE FLAT FACED
9. TRANSMITTER, FLOWMETER AND FLOWMETER PIPING ARE SUPPLIED BY OTHERS
10. NOTE HOLD DIMENSIONS

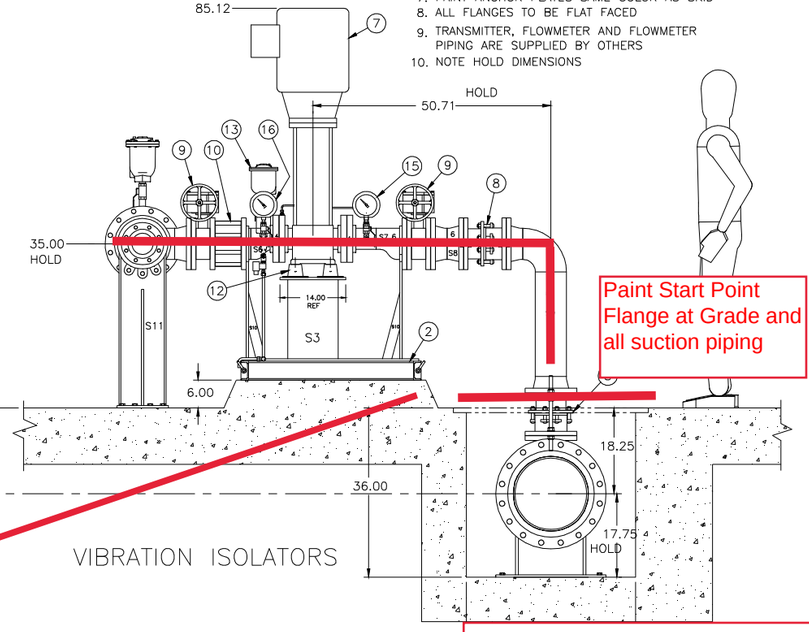
163 ASME TANK SHIP LOOSE



Paint per Spec 2142.6.6 PEW System Piping



Paint boundary, flange above grade
Four (4) Flanges Typical



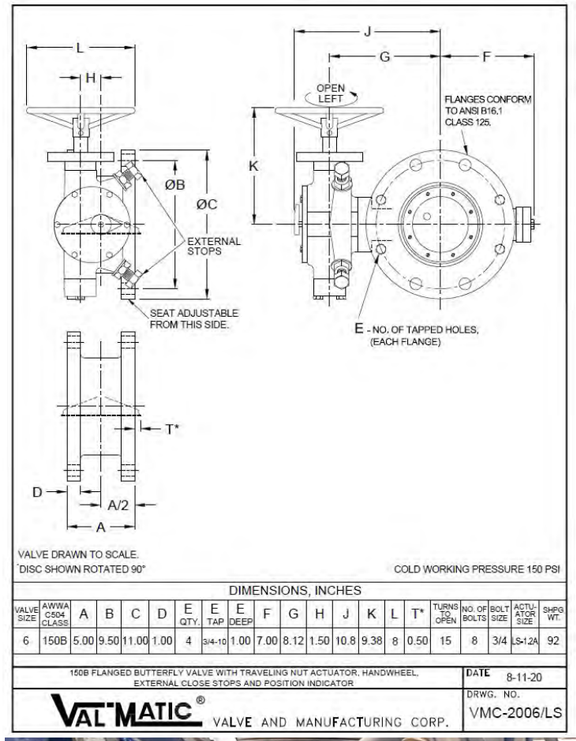
Paint Start Point Flange at Grade and all suction piping

DATE	BY
11/15/11	JHC
12/21/1	JHC
12/21/11	JHC
12/22/11	JHC
12/22/11	JHC
2/3/12	JHC
3/6/12	JHC
5/11/12	JHC
.	.

10661
DALL
8

WPC 23-3
214.2A

B | 0 | 1 OF 1



DIMENSIONS, INCHES

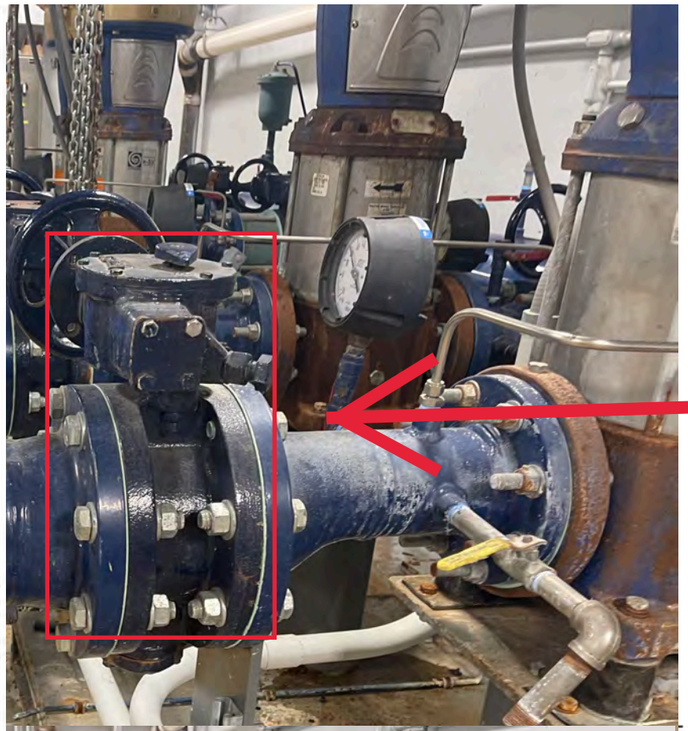
VALVE SIZE	AWWA C504 CLASS	A	B	C	D	E QTY.	E TAP	E DEEP	F	G	H	J	K	L	T*	TURNS TO OPEN	NO. OF BOLTS	BOLT SIZE	ACTUATOR SIZE	SHPG WT.
6	150B	5.00	9.50	11.00	1.00	4	3/4-10	1.00	7.00	8.12	1.50	10.8	9.38	8	0.50	15	8	3/4	LS-12A	92

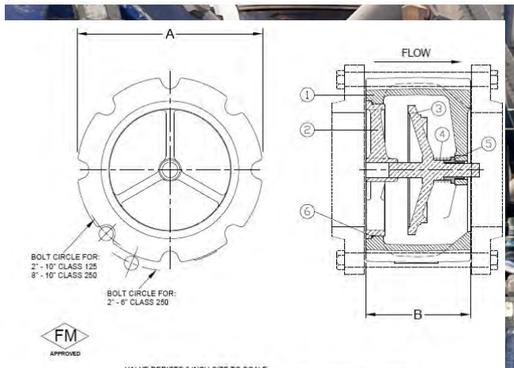
150B FLANGED BUTTERFLY VALVE WITH TRAVELING NUT ACTUATOR, HANDWHEEL, EXTERNAL CLOSE STOPS AND POSITION INDICATOR

DATE 8-11-20

VAL-MATIC® VALVE AND MANUFACTURING CORP.

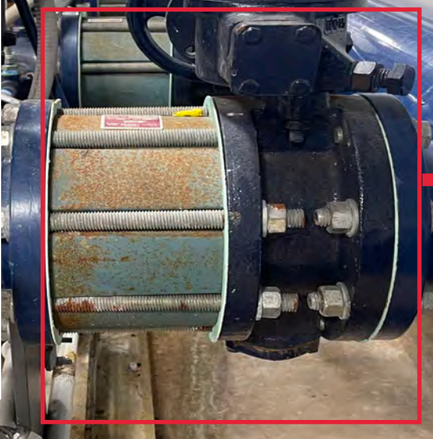
DRWG. NO. VMC-2006/LS

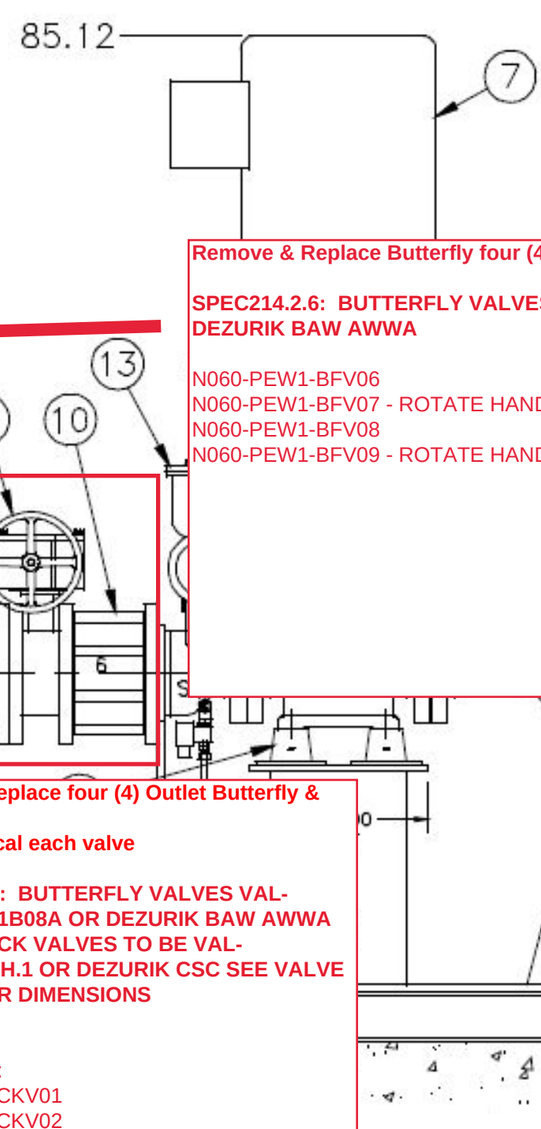




VALVE DEPICTS 6 INCH SIZE TO SCALE.
SEE DRAWING NO. VM-1402A-M FOR STANDARD MATERIALS OF CONSTRUCTION.

VALVE SIZE	MODEL NO. *	ANSI CLASS	CWP PSI	A	B
2	1402A	125 250**	200 400 **	4.25	2.63
2.5	1425A	125/250	400	5.00	2.88
3	1403A	125/250	400	5.75	3.13
4	1404A	125/250	400	7.00	4.00
5	1405A	125/250	400	8.75	4.75
6	1406A	125/250	400	9.75	5.50
8	1408A	125	200	13.38	6.50
8 **	1458A	250	400	13.38	6.50
10	1410A	125	200	16.00	8.25
10 **	1460A	250	400	16.00	8.25





Remove & Replace Butterfly four (4) Inlet Valves:

SPEC214.2.6: BUTTERFLY VALVES VAL-MATIC 2006 1B08A OR DEZURIK BAW AWWA

N060-PEW1-BFV06
N060-PEW1-BFV07 - ROTATE HANDWHEEL
N060-PEW1-BFV08
N060-PEW1-BFV09 - ROTATE HANDWHEEL

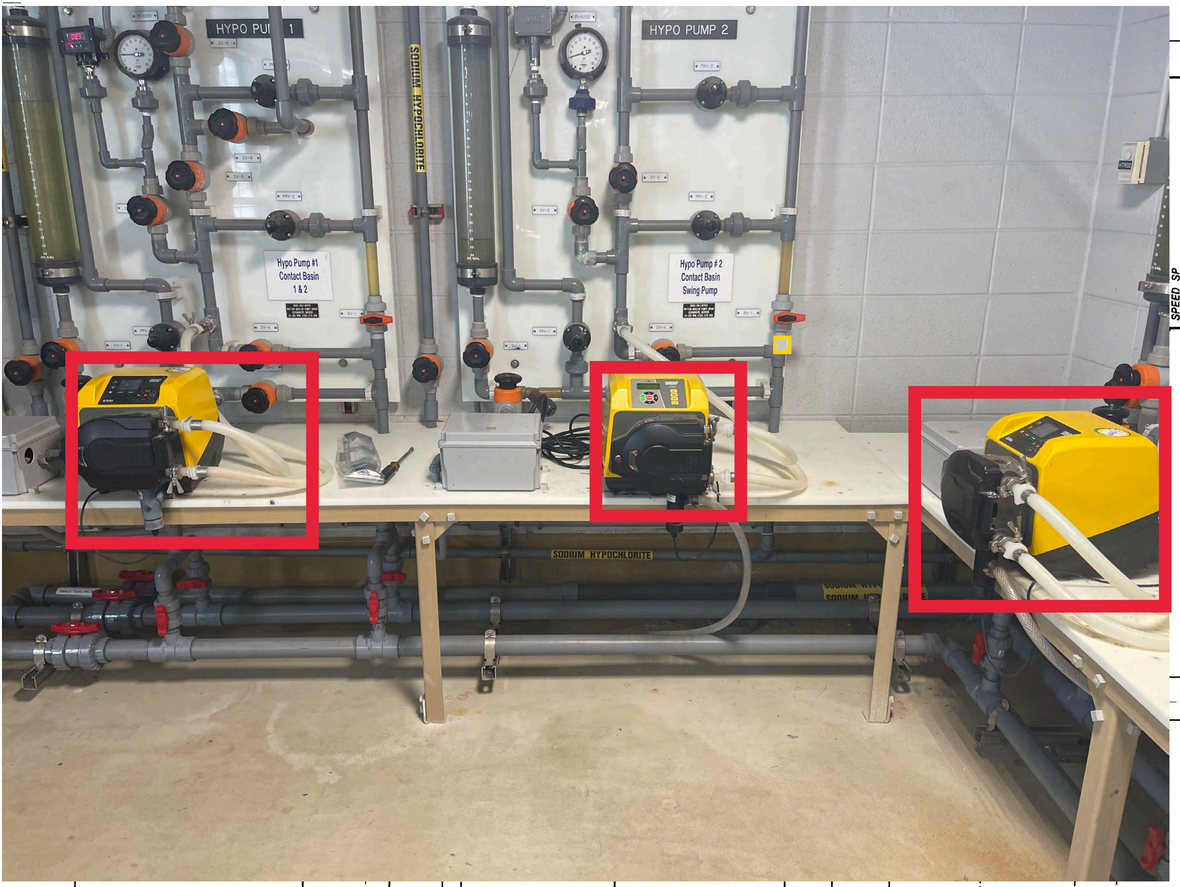
Remove & Replace four (4) Outlet Butterfly & Check valve
Four(4) Typical each valve

SPEC214.2.6: BUTTERFLY VALVES VAL-MATIC 2006 1B08A OR DEZURIK BAW AWWA SILENT CHECK VALVES TO BE VAL-MATIC1406AH.1 OR DEZURIK CSC SEE VALVE DETAILS FOR DIMENSIONS

Check valves:
N060-PEW1-CKV01
N060-PEW1-CKV02
N060-PEW1-CKV03
N060-PEW1-CKV04

Butterfly Discharge Valves
N060-PEW1-BFV10
N060-PEW1-BFV11 - ROTATE HANDWHEEL
N060-PEW1-BFV12
N060-PEW1-BFV13 - ROTATE HANDWHEEL

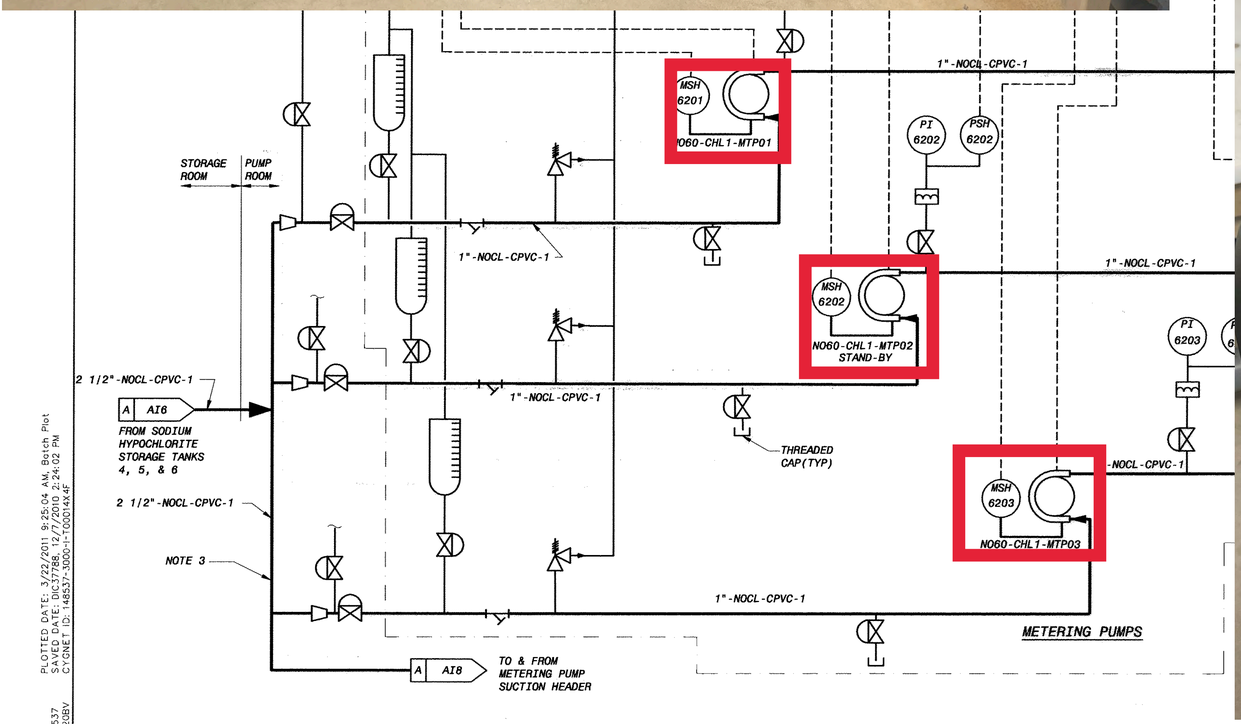
WPC 23-3
214.2B

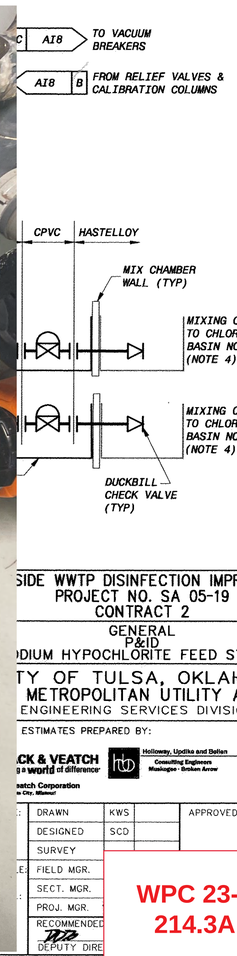


Notes:
Remove & Replace:
chemical pump # N060-CHL1-MTP01
chemical pump # N060-CHL1-MTP02
chemical pump # N060-CHL1-MTP03
See Spec 214.3.6 Pumps shall be a model 630U Watson Matlow or Blue-White M2s24-QNLR

214.3.6.1. **Conditions of Operation:** Each pump shall be capable of providing the following hydraulic conditions:
Design Conditions
620UMAN/RE
M012282
0.1-265 RPM
0.002-4.75 GPM
ANALOG SIGNAL OUTPUT

See Spec 214.3.9 All pumps, material and equipment to be salvaged shall be removed carefully to prevent damage, and then delivered to an area designated by the Plant Superintendent on site. The contractor shall dispose of all parts of the existing pump deemed unnecessary to the plant. The Plant Superintendent shall specify which parts of the existing pump are to be salvaged.





SIDE WWTP DISINFECTION IMPROVEMENTS
PROJECT NO. SA 05-19
CONTRACT 2
GENERAL
P&ID
DIUM HYPOCHLORITE FEED SYSTEM
TY OF TULSA, OKLAHOMA
METROPOLITAN UTILITY AUTHORITY
ENGINEERING SERVICES DIVISION

ESTIMATES PREPARED BY:
CK & VEATCH
Holloway, Updike and Bolen Consulting Engineers Muskogee · Broken Arrow
BWGATES Engineering Services

DRAWN	KWS		APPROVED:
DESIGNED	SCD		
SURVEY			
FIELD MGR.			
SECT. MGR.			
PROJ. MGR.			
RECOMMENDED			
DEPUTY DIRE			CTOR

WPC 23-3
214.3A

FILE: DRAWI
ATLAS PAGE NO:
SHEET 14 OF 84 SHEETS
B&V PROJECT NO. 148537

JSB 3-30-11

PLOTTED DATE: 3/22/2011 9:25:04 AM, Batch Plot
SAVED DATE: 3/22/2011 9:20:02 AM
CYGNET ID: 148537-3000-T-T000144.4F

FD148537
D145123BV

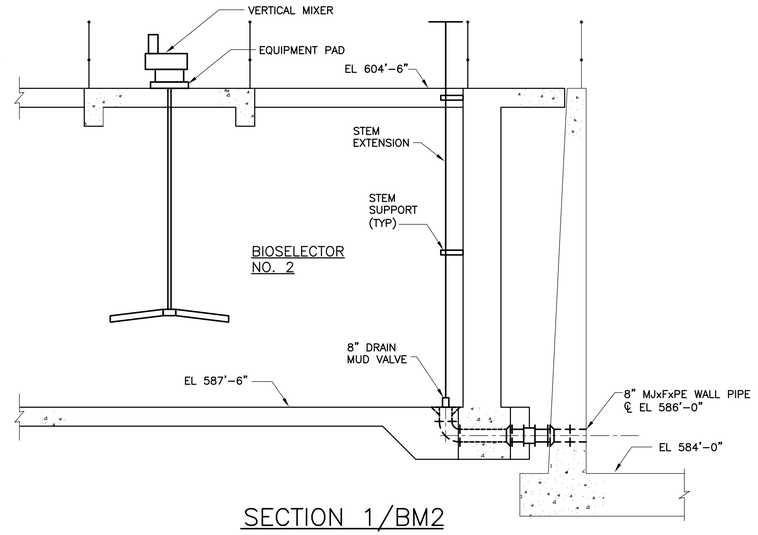
NOTES:

REMOVE & REPLACE:

SPEC 214.4.6.1 THE EXISTING ACTUATOR WAS MANUFACTURED BY AUMA SAR07.6/GS63.3/AM01.1 FLANGE FA12, BORE TO BE VERIFIED AT TIME OF ORDER FOR THE NORTHSLOPE WASTE WATER TREATMENT PLANT. THE NEW EQUIPMENT SHALL BE MANUFACTURED BY AUMA OR LIMITORQUE EQUAL.

TOP PLAN

SCALE: 3/32=1'-0"



SECTION 1/BM2

SCALE: 1/4"=1'-0"

NOTES:

1. FILL HOLE IN PLATFORM WITH CONCRETE. SEE STRUCTURAL DETAIL 29. DISCONNECT EXISTING POWER SUPPLY AND CONTROL WIRING AT AERATOR/MIXER MOTOR. REMOVE EXPOSED CONDUIT AND ALL WIRING IF NOT REUSED. ABANDON AERATOR MIXER LUBRICATING SYSTEM PIPING IN PLACE. CUT AT WALKWAY SURFACE AND GROUTED WITH NON SHRINK.
2. EXISTING WALL THICKNESS VARIES BETWEEN 1'-0" AT TOP AND 2'-0" AT BOTTOM. EXTEND WALL CASTING BEYOND FACE OF EXISTING WALL AS REQUIRED.
3. REMOVE EXISTING 3'-6" HIGH PIPE RAILING AND CHAIN LINK FENCE AS NEEDED AT LOCATIONS WHERE IT INTERFERES WITH NEW AIR PIPING. INSTALL NEW END POSTS, TOP AND BOTTOM RAILS, AND FENCE FABRIC MATCHING EXISTING TO REPAIR.
4. SEE DWG BM1 FOR TYPICAL TANK AND NEW PIPING DIMENSIONS. DIMENSIONS TO BE FIELD VERIFIED.
5. SEE DWGS BM1 AND BM2 FOR LOCATIONS OF TYPICAL SECTION CUTS FOR AIR PIPING, CHAIN LINK FENCE, AND WEIR PLATE. SECTIONS SHOWN ON DWG BM5.
6. SEE DWG BS6 FOR STRUCTURAL PIPE SUPPORT DETAILS. PSF = FIXED SUPPORT PSS = SLIDING SUPPORT
7. SEE DWG BM5 FOR AERATION BASIN FLUSHING WATER SYSTEM DETAILS.
8. PROVIDE FINE PORE AIR DIFFUSER EQUIPMENT ARRANGED TO PROVIDE FULL FLOOR COVERAGE. AERATION ZONE DESIGNATIONS:
9. PROVIDE ADDITIONAL FLANGED JOINTS AS NEEDED TO FACILITATE THE TRANSPORT AND ASSEMBLY OF AIR PIPING.

1	2	3
6	5	4
7	8	9

REUSED. ABANDON AERATOR MIXER LUBRICATING SYSTEM PIPING IN PLACE. CUT AT WALKWAY SURFACE AND GROUTED WITH NON SHRINK.

RECORD DRAWING

THIS RECORD IS NOT WARRANTED BUT IS BELIEVED TO REPRESENT CONDITIONS UPON COMPLETION OF CONSTRUCTION WITHIN REASONABLE TOLERANCES, BASED UPON THE INFORMATION FURNISHED TO THE ENGINEER PERTAINING TO CHANGES MADE DURING CONSTRUCTION.

8 0 8 16 24 FT
3/32"=1'-0"

AERATION BASINS AND BIOSELECTORS
PIPING AND EQUIPMENT

FLOW TRAIN 4 PLAN AND SECTION

NORTHSIDE WWTP
NITRIFICATION IMPROVEMENTS

PROJECT NO. ES 2003-12

CITY OF TULSA, OKLAHOMA
PUBLIC WORKS DEPARTMENT
ENGINEERING SERVICES DIVISION

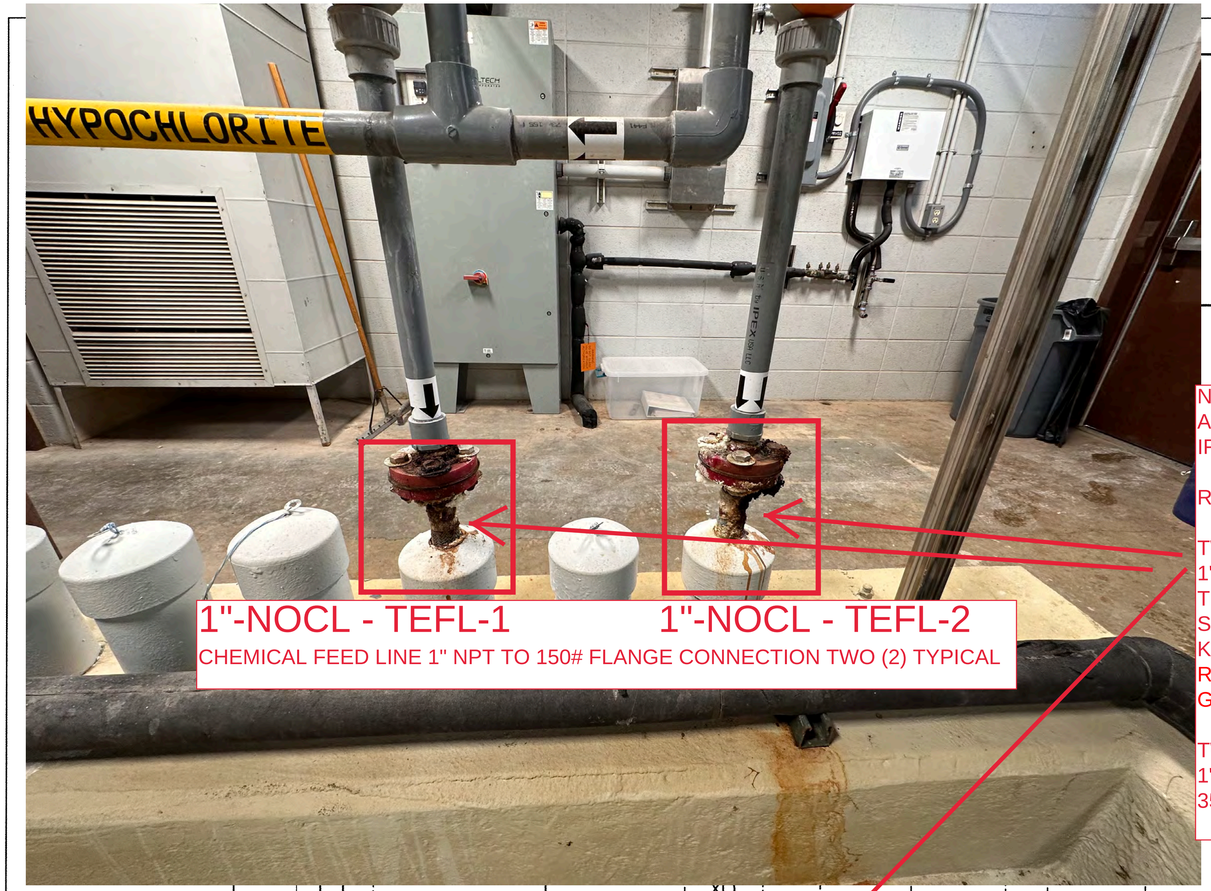
PLANS AND ESTIMATES PREPARED BY:
GREELEY AND HANSEN
100 SOUTH WACKER DRIVE, SUITE 1400

REVISION	BY	DA
1 RECORD DWG REVS	TJN	3/

WPC23-3
214.4A

ECTOR
6

FILE: 01415BM04 1:1 05/04/10 11:11 GH-A

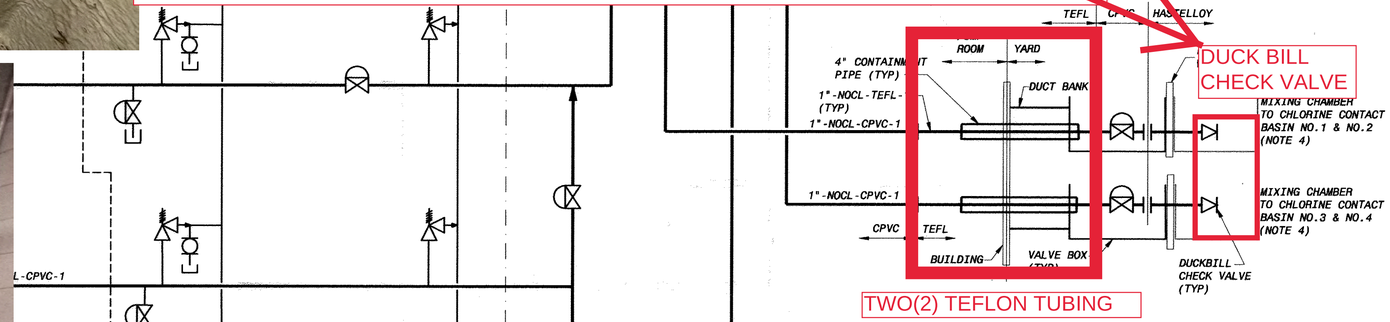


NOTES:
ALL MARKINGS ARE APPROXIMATE AND MAY NOT BE COMPLETE. CONSULT WITH ENGINEER IF UNCLEAR

REMOVE AND REPLACE:

TWO(2) TYPICAL:
1" NPT X 150# RF FLANGE TUBING TO BE POLYPROPYLENE BRAIDED, CONVOLUTED PFA TEFLON TUBING; PUREFLEX INC "PROFLEX" OR EQUAL. FACTORY SPLICE CONNECTIONS SHALL BE ACCOMPLISHED USING PROFLEX STYLE 11 FITTINGS CONSTRUCTED OF SOLID KYNAR
REPLACE FASTENERS WITH HASTELOY NUT, BOLT, & WASHERS
GASKET TO BE VITRON OR APPROVED EQUIVALENT

TWO(2) TYPICAL:
1" SLIP ON CHECK VALVE SHALL BE AS MANUFACTERERED BY TIDEFLEX INDUSTRIES SERIES 35 OR SERIES TF-2 OR EQUAL



NOTE:
SEE LEGEND ON DRAWINGS AI1, AI2, AND AI3
SHALL BE ROUTED TO SLOPE CONTINUOUSLY
TON OF FEED POINTS.
S, LOCATED ON MCCs OR AT EQUIPMENT,
EET HIGHER THAN THE TOP OF
HE ISOLATION VALVE AT EACH PRESSURE
ND THREADED CAP ON THE BRANCH OF THE
L BE LOCKABLE.

AI8 TO VACUUM BREAKERS
AI8 B FROM RELIEF VALVES & CALIBRATION COLUMNS

RECORD DRAWING

REGISTERED PROFESSIONAL ENGINEER
TIMOTHY A HOLMES
20954
3-23-11
OKLAHOMA

REVISION	BY	DATE

NORTHSIDE WWTP DISINFECTION IMPROVEMENTS
PROJECT NO. SA 05-19
CONTRACT 2
GENERAL
P&ID
SODIUM HYPOCHLORITE FEED SYSTEM
CITY OF TULSA, OKLAHOMA
TULSA METROPOLITAN UTILITY AUTHORITY
ENGINEERING SERVICES DIVISION

PLANS AND ESTIMATES PREPARED BY:

WPC 23-3
214.5A

PLAN SCA
PROFILE SC
HORIZONT 1" =
VERTICAL 1" =
DCTOR

FILE: DRAWING: AI7 DATE APRIL 15, 2011
ATLAS PAGE NO: SHEET 14 OF 84 SHEETS

JSB 3-30-11 B&V PROJECT NO. 148537

PLOTTED DATE: 3/22/2011 9:25:04 AM, Botch Plot
PLOTTED BY: Timothy Holmes
CYGNET ID: 148537-3000+-T000104X4F

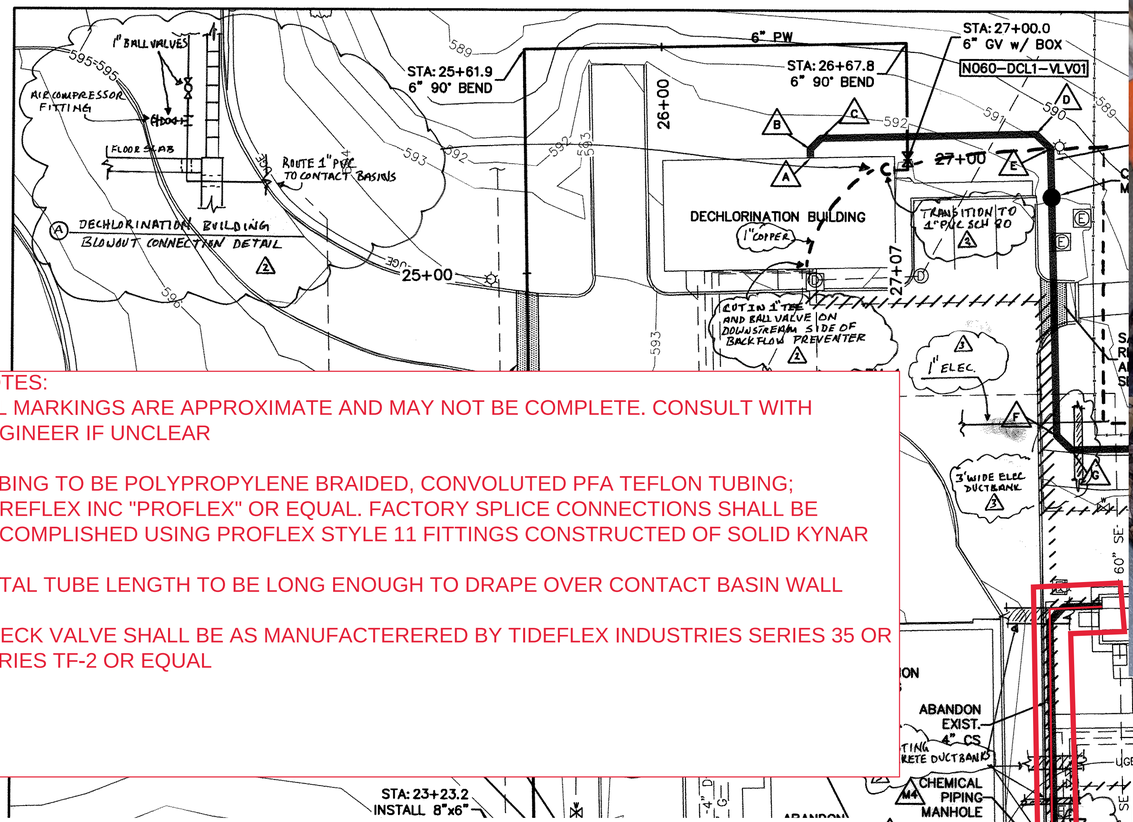
FD148537
D145120BV

NOTES:
ALL MARKINGS ARE APPROXIMATE AND MAY NOT BE COMPLETE. CONSULT WITH ENGINEER IF UNCLEAR

TUBING TO BE POLYPROPYLENE BRAIDED, CONVOLUTED PFA TEFLON TUBING; PUREFLEX INC "PROFLEX" OR EQUAL. FACTORY SPLICE CONNECTIONS SHALL BE ACCOMPLISHED USING PROFLEX STYLE 11 FITTINGS CONSTRUCTED OF SOLID KYNAR

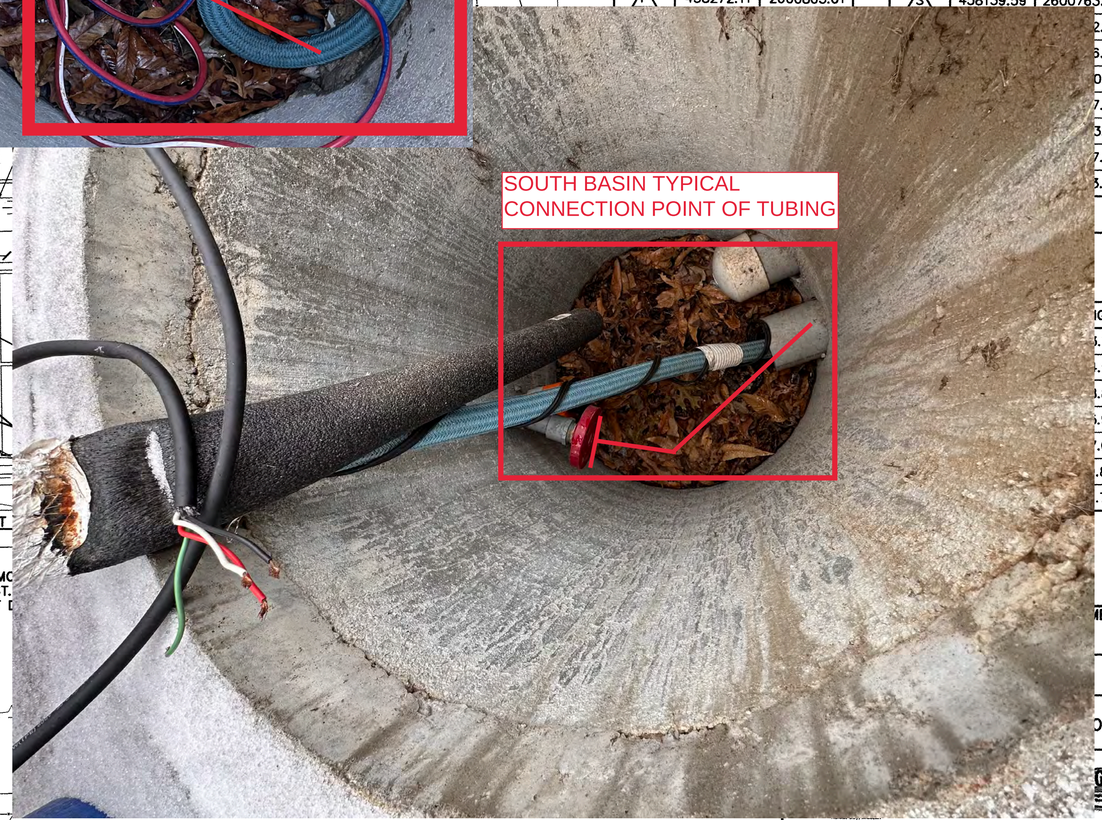
TOTAL TUBE LENGTH TO BE LONG ENOUGH TO DRAPE OVER CONTACT BASIN WALL

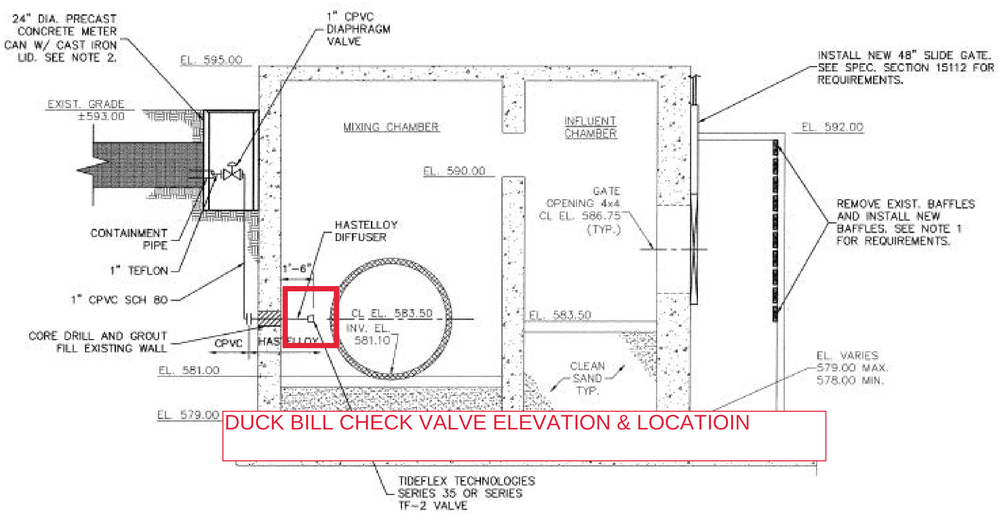
CHECK VALVE SHALL BE AS MANUFACTERERED BY TIDEFLEX INDUSTRIES SERIES 35 OR SERIES TF-2 OR EQUAL



NORTH BASIN TYPICAL
CONNECTION POINT OF TUBING

SOUTH BASIN TYPICAL
CONNECTION POINT OF TUBING





DUCK BILL CHECK VALVE ELEVATION & LOCATIOIN

1 EC1, EC2 SECTION – MIXING CHAMBER, BASINS 3&4 (BASINS 1&2 SIMILAR)
SCALE: 3/8" = 1'-0"

NOTES:
1. PAVEMENT AND CURB REMOVAL AND REPLACEMENT SHALL BE IN STRICT ACCORDANCE WITH CITY OF TULSA PUBLIC WORKS DEPARTMENT CONSTRUCTION SPECIFICATIONS AND STANDARD DRAWINGS LATEST EDITION.
2. ALL PIPING SHOWN AS ABANDONED SHALL BE CUT AND CAPPED WHERE EXPOSED.
3. LOCATION OF EXISTING BURIED PIPING SHOWN IS APPROXIMATE. CONTRACTOR SHALL VERIFY AND NOTIFY ENGINEER OF DISCREPANCIES.
4. EXISTING PIPES AND OTHER SUBSURFACE FEATURES ARE NOT SHOWN IN PROFILE. CONTRACTOR SHALL VERIFY DEPTHS AND ADJUST ELEVATION OF PROPOSED CHEMICAL DUCT BANK AND WATER LINES AS REQUIRED.
5. ALL CHEMICAL DUCT BANK SHOWN IS BURIED.

1" = 20'

CHEMICAL DUCT BANK TYPE B

CHEMICAL DUCT COORDINATE TABLE

ID	NORTHING	EASTING
A	458348.62	2600736.86
B	458350.96	2600736.80
C	458354.03	2600739.73
D	458355.40	2600799.26
E	458351.49	2600803.37
F	458272.11	2600805.61

CHEMICAL DUCT COORDINATE TABLE

ID	NORTHING	EASTING
N	458172.16	2600955.26
O	458171.80	2600939.84
P	458168.41	2600937.91
Q	458153.93	2600756.16
R	458146.43	2600756.27
S	458139.59	2600763.37

SURVEY CONTROL COORDINATE TABLE

ID	NORTHING	EASTING	ELEVATION	SHEET
BM-1	458275.70	2600741.23	592.80	BC2
CP-1	458271.12	2600750.52	593.10	BC2
CP-2	458087.25	2600441.42	603.17	BC5

NSTALLING AND BE INCLUDED IN

REGISTERED PROFESSIONAL ENGINEER LOYD STEPHEN TOLAR 23 OKLAHOMA

REVISION	BY	DATE
1 AS BUILTS	KM	11 APR 12
2 BY FIELD CHANGE	KM	10 APR 12
3 FIELD CONDITIONS	KM	12 APR 12

PLAN SCALE 1"=20'
PROFILE SCALE
HORIZONTAL
VERTICAL
FILE:
ATLAS PAGE NO:

WPC 23-3
214.5 B

SHEET 23 OF 84 SHEETS
B&V PROJECT NO. 148537

3-30-11