

**TMUA PROJECT No. WPC 21-3,
FY '21 NORTHSLOPE CAPITAL EQUIPMENT REPLACEMENTS**

ATTENDANCE AT PRE-BID CONFERENCE IS MANDATORY

PREPARED BY:
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ALIECHTI@CITYOFTULSA.ORG



Account Number: 7503392 544003

Andrew T. Liechti, P.E. OK#20887

04-FEB-2021

Date

CLAYTON EDWARDS, P.E., DIRECTOR
WATER AND SEWER DEPARTMENT

Clayton Edwards, P.E., Director, Water & Sewer Dept.

2-8-21

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

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214.3D	Aeration Basin #1 Diffusers (Grid Type 3)
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214.3G	Aeration Basin #1 Diffusers (Grid Type 6)
214.3H	Aeration Basin #1 Diffusers (Grid Type 7)
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214.5A	Flat Rock FEB Diversion Pumps (Equipment Site Location)
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214.6A	Flat Rock Creek Hoist Site Location
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Index of Equipment

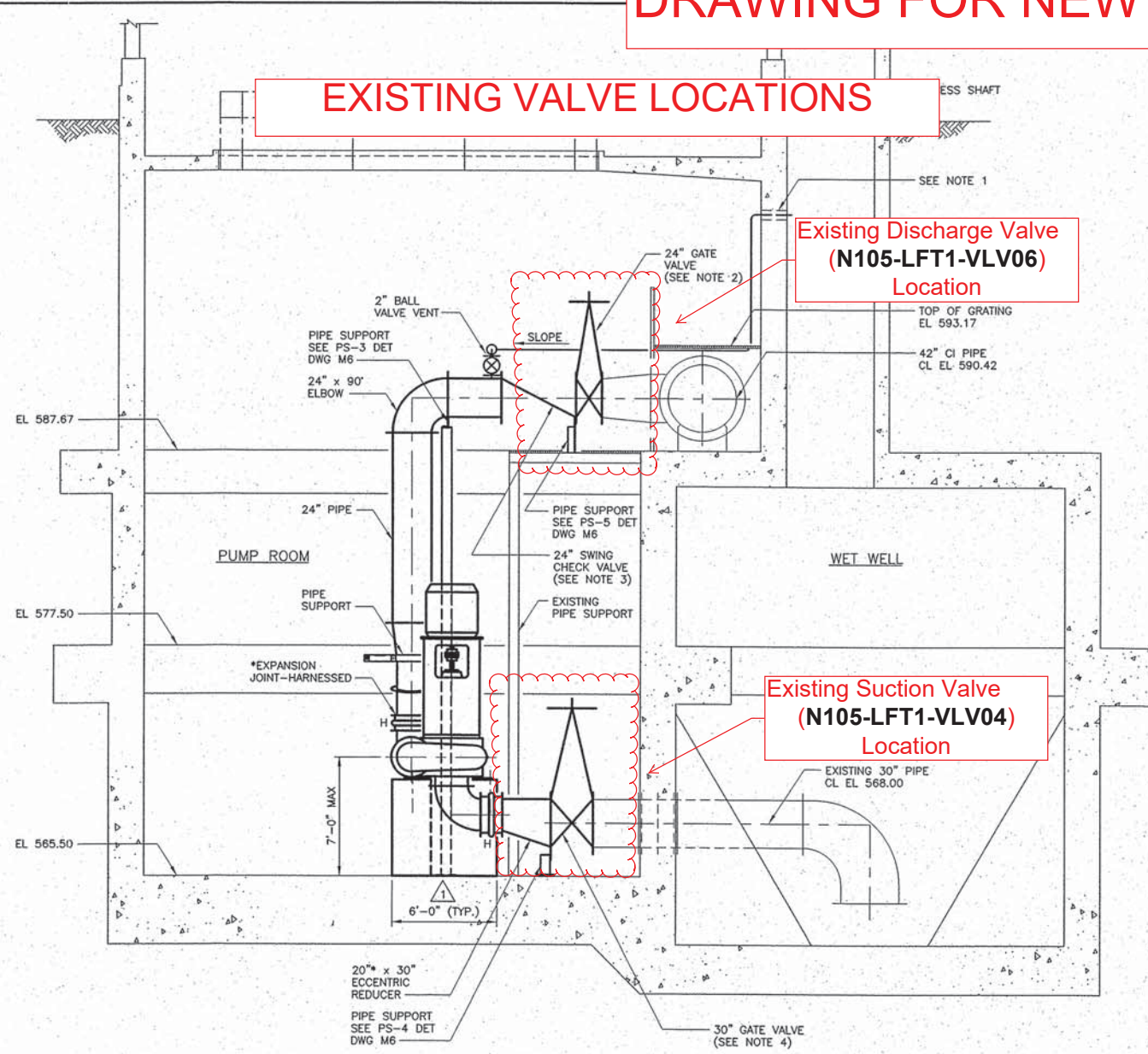
Spec Sect	Equipment ID	Equipment Description	Equipment Status
214.1	N105-LFT1-VLV06	Apache LS Discharge Valve	Replaced
214.1	N105-LFT1-VLV04	Apache LS Suction Valve	Replaced
214.2	N030-PCL1-SCP01	Primary Clarifier 1 Scum Pump	Replaced
214.2	N030-PCL3-SCP01	Primary Clarifier 3 Scum Pump	Replaced
214.2	N030-PCL4-SCP01	Primary Clarifier 4 Scum Pump	Replaced
214.2	N/A	Primary Scum Pump #1 and #2 Discharge Plug and Check Valve	Replaced
214.2	N/A	Primary Scum Pump #2 Suction Plug Valve	Replaced
214.3	N/A	Aeration Basin #1 Diffusers	Replaced
214.4	N133-FEB1-SBM06	Mingo FEB Wet Well Diversion Pump	Replaced
214.4	N133-FEB1-SBM07	Mingo FEB Wet Well Diversion Pump	Replaced
214.4	N/A	Mingo FEB Diversion Pump 6&7 Rails	Replaced
214.4	N/A	Mingo FEB Diversion Pump 6&7 Base Elbows	Replaced
214.5	N131-FEB1-WWP01	Flat Rock FEB Wet Well Diversion Pump	Replaced
214.5	N131-FEB1-WWP02	Flat Rock FEB Wet Well Diversion Pump	Replaced
214.5	N131-FEB1-WWP03	Flat Rock FEB Wet Well Diversion Pump	Replaced
214.5	N131-FEB1-WWP04	Flat Rock FEB Wet Well Diversion Pump	Replaced
214.5	N/A	Flat Rock FEB Diversion Pump 1,2,3 &4 Rails	Replaced
214.5	N/A	Flat Rock FEB Diversion Pump 1,2,3 &4 Base Elbows	Replaced
214.6	N/A	Flat Rock Creek FEB Hoist	Repair
214.7	N/A	Coal Creek FEB Hoist	Repair

NOTE: For the purposes of Warranty, a piece of equipment will not be considered installed or in-service until all of the following have been completed and provided for the piece of equipment (Reference Specification Section on Submittal Requirements).

1. Preliminary O&M approved by Owner
2. Manufacturer Representative's Start-up completed and report provided (approved by Owner)
3. Manufacturer Representative's Training completed for Plant personnel (approved by Owner)
4. Updated Warranty Log Provided (approved by Owner)

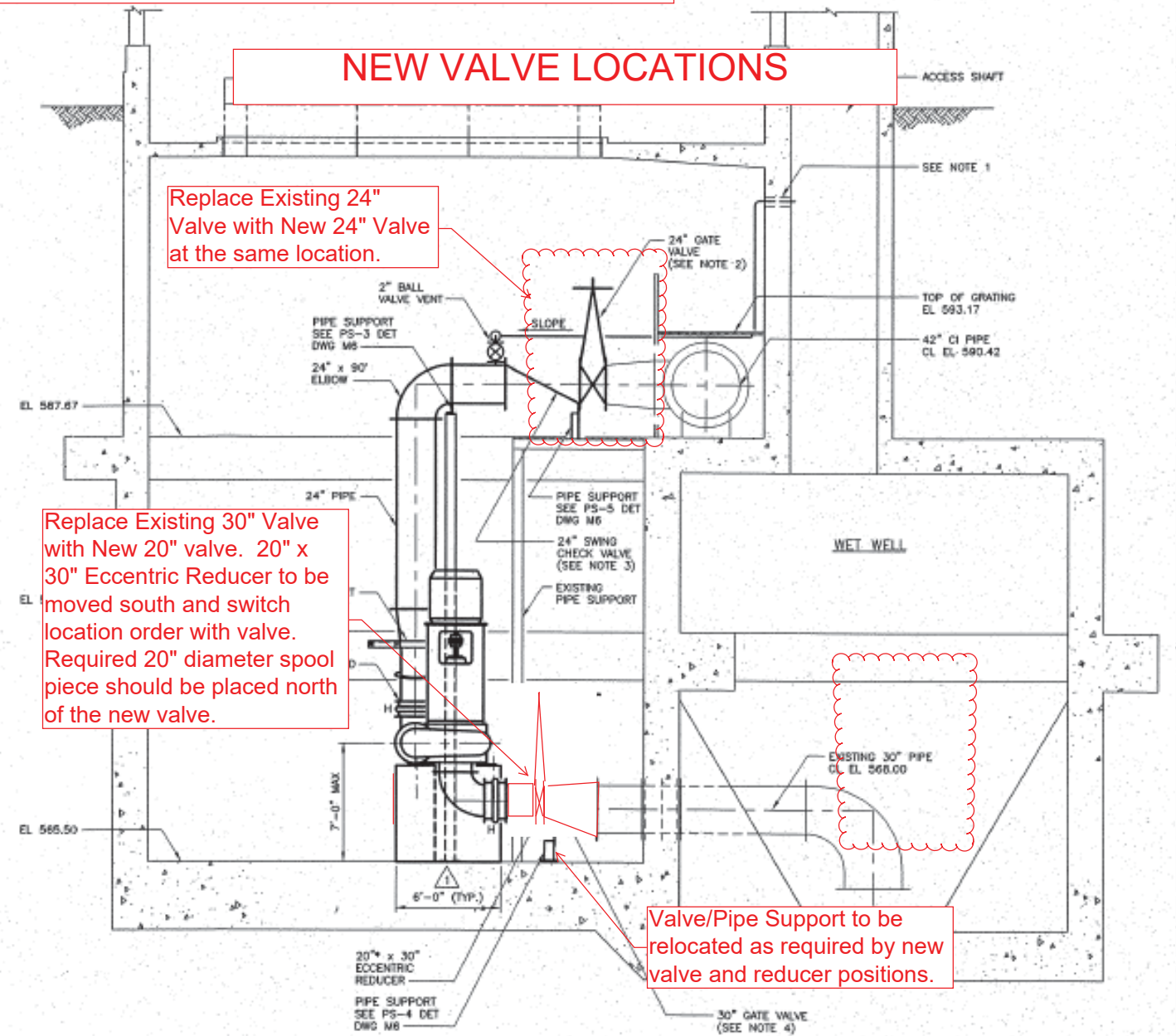
DRAWING FOR NEW VALVE LAY-IN LENGTH OF $\leq 4"$

EXISTING VALVE LOCATIONS



SECTION 4/M3
SCALE: 1/4"=1'-0"

NEW VALVE LOCATIONS



CONCRETE PIER DETAIL
NOT TO SCALE

NOTES:

1. CORE DRILL THRU 2' THICK WALL AND INSTALL MODEL S-316 LINK SEAL. 2" VENT PIPE TO PROTRUDE 3" INTO ACCESS SHAFT.
2. PROVIDE NEW 24" GATE VALVES UNDER ADD ALT. 2 WORK.
3. PROVIDE NEW 24" CHECK VALVES UNDER ADD ALT. 3 WORK.
4. PROVIDE NEW 30" KNIFE GATE VALVE UNDER ADD ALT. 1 WORK.

LEGEND:

- DENOTES EXISTING FACILITIES
- DENOTES NEW FACILITIES
- * DENOTES DIMENSIONS TO BE DETERMINED AFTER FINAL SELECTION OF EQUIPMENT
- H DENOTES EXPANSION JOINT HARNESS

Apache LS Pump #2 Suction and Discharge Valve Replacement

IMPROVEMENTS
TMUA PROJECT NO. ES 2002-02

CITY OF TULSA, OKLAHOMA
PUBLIC WORKS DEPARTMENT
ENGINEERING SERVICES DIVISION

PLANS AND ESTIMATES PREPARED BY:
GREELEY AND HANSEN LLC
100 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

REVISION	DATE	PLAN SCALE	DRAWN	QNG	APPROVED
RECORD DRAWING REV.	7-05	AS SHOWN	DESIGNED	JDA	
			SURVEY		
		PROFILE SCALE	FIELD MGR	ASR	9-03
		HORIZONTAL:	SECT. MGR	SWB	9/03
		VERTICAL:	PROJ. MGR	MW	9-19-03
			REGISTERED	WALSH	9/26/03
			DEPUTY DIRECTOR		
			PUBLIC WORKS DIRECTOR		

FILE: ALSM050 DRAWING: M5 DATE: SEPTEMBER 2003
ATLAS PAGE NO.: SHEET 6 OF 14 SHEETS

WPC 21-3
214.1A

Primary 1&2 SCUM PUMP LOCATIONS

Scum Pump (N030-PCL2-SCP01) not to be replaced

Existing Scum Pump to be replaced (N030-PCL1-SCP01) Location

Remove and replace the discharge plug valve for pump #1 and the discharge and suction for pump #2

Remove and replace the discharge check valve for pumps #1 and #2

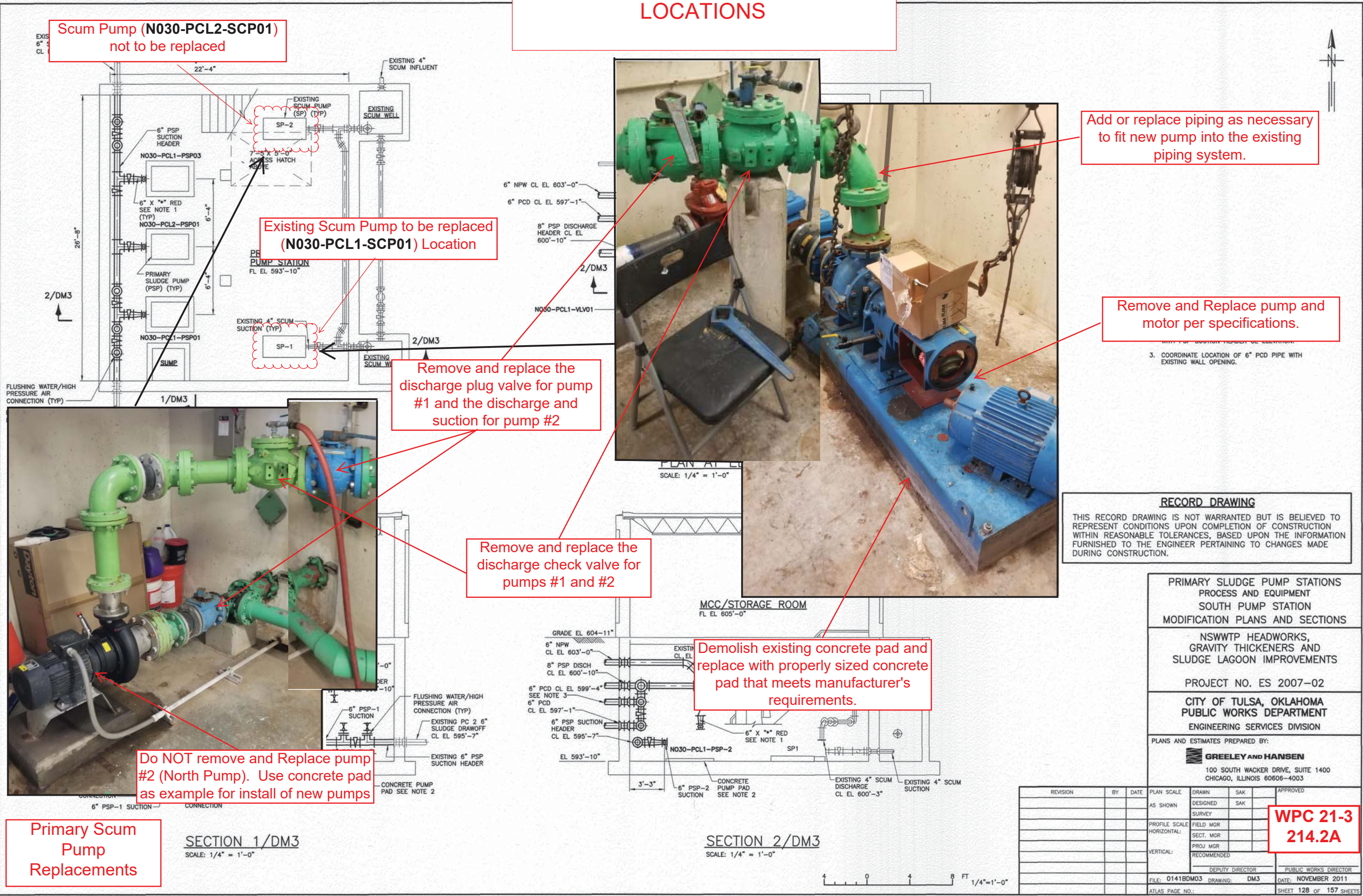
Demolish existing concrete pad and replace with properly sized concrete pad that meets manufacturer's requirements.

Add or replace piping as necessary to fit new pump into the existing piping system.

Remove and Replace pump and motor per specifications.

Do NOT remove and Replace pump #2 (North Pump). Use concrete pad as example for install of new pumps

Primary Scum Pump Replacements



RECORD DRAWING
 THIS RECORD DRAWING 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.

PRIMARY SLUDGE PUMP STATIONS
 PROCESS AND EQUIPMENT
 SOUTH PUMP STATION
 MODIFICATION PLANS AND SECTIONS

NSWTP HEADWORKS,
 GRAVITY THICKENERS AND
 SLUDGE LAGOON IMPROVEMENTS

PROJECT NO. ES 2007-02

CITY OF TULSA, OKLAHOMA
 PUBLIC WORKS DEPARTMENT
 ENGINEERING SERVICES DIVISION

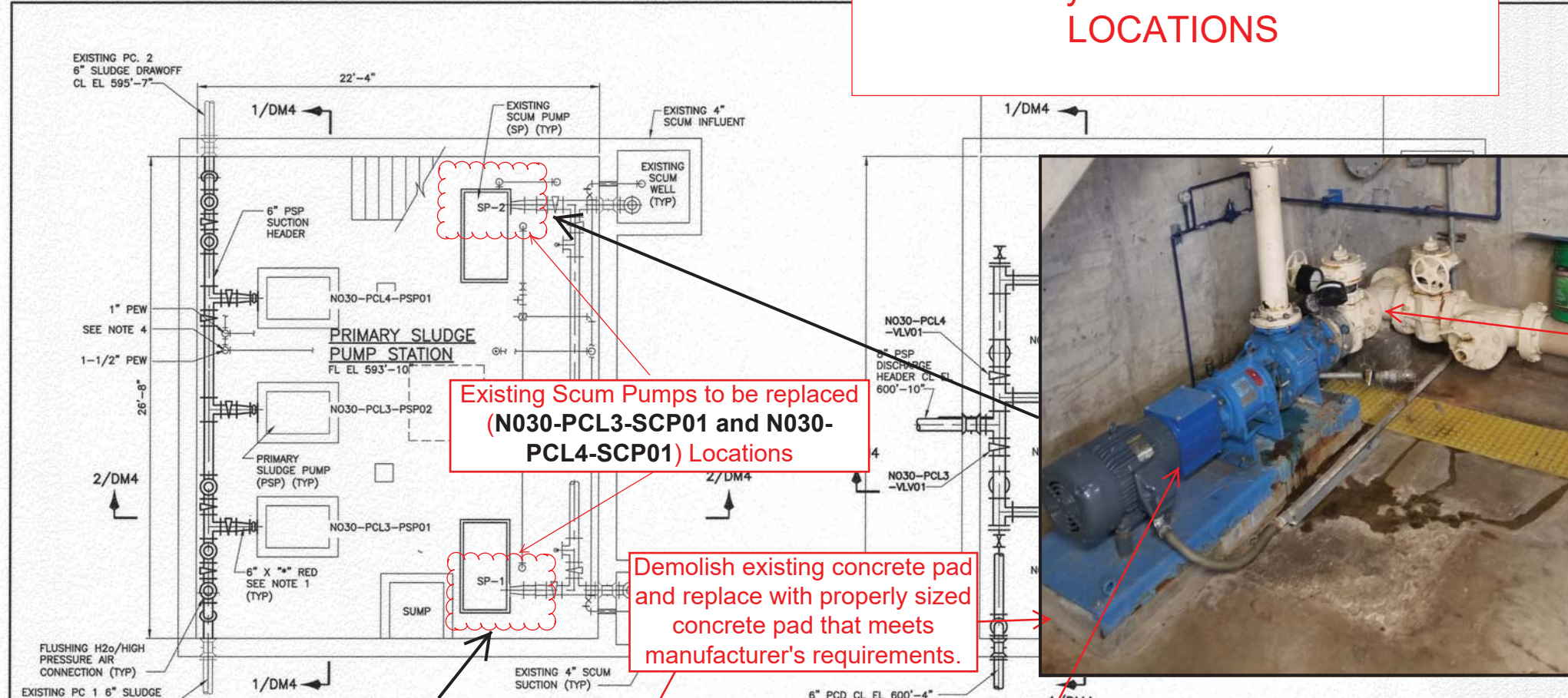
PLANS AND ESTIMATES PREPARED BY:
GREELEY AND HANSEN
 100 SOUTH WACKER DRIVE, SUITE 1400
 CHICAGO, ILLINOIS 60606-4003

REVISION	BY	DATE	PLAN SCALE	DRAWN	SAK	APPROVED
AS SHOWN				DESIGNED	SAK	
				SURVEY		
				FIELD MGR		
				SECT. MGR		
				PROJ MGR		
				RECOMMENDED		
				DEPUTY DIRECTOR		PUBLIC WORKS DIRECTOR
				FILE: 0141BDM03	DRAWING: DM3	DATE: NOVEMBER 2011
				ATLAS PAGE NO.:		SHEET 128 OF 157 SHEETS

**WPC 21-3
214.2A**

K:\0141B - TMAA - NORTHSIDE HEADWORKS\21.120 WORKING\0141BDM03 2015/04/23 3:00 PM YAHR, RONALD

Primary 3&4 SCUM PUMP LOCATIONS



Existing Scum Pumps to be replaced (N030-PCL3-SCP01 and N030-PCL4-SCP01) Locations

Demolish existing concrete pad and replace with properly sized concrete pad that meets manufacturer's requirements.

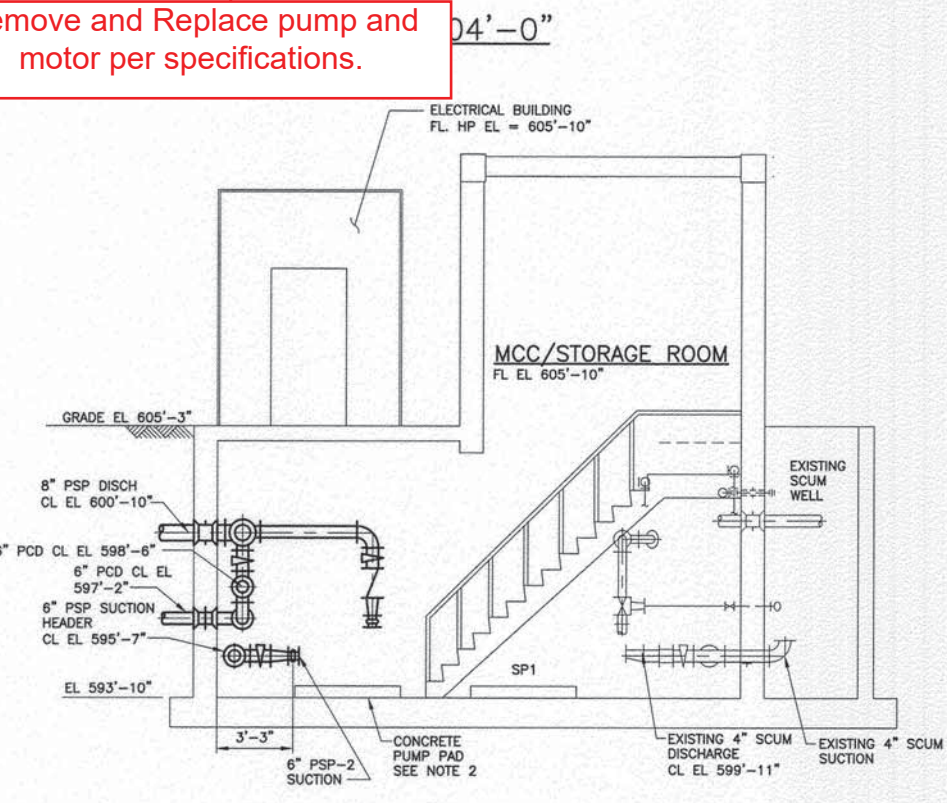
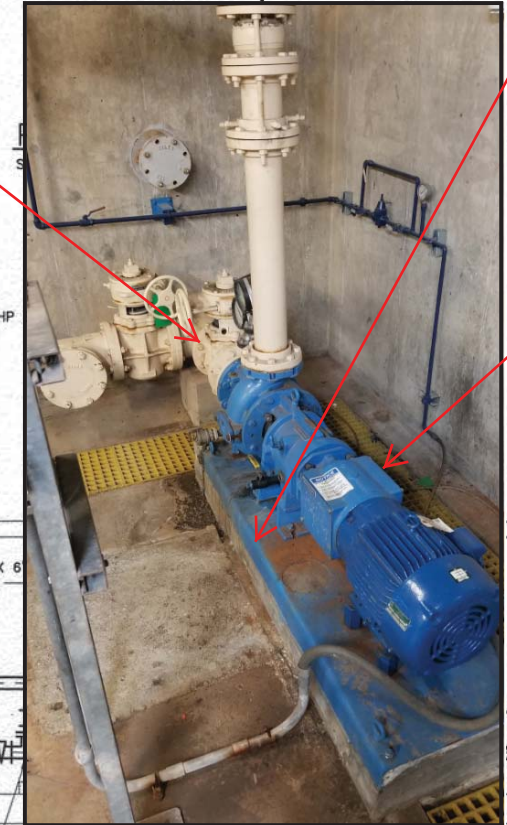


Add or replace piping as necessary to fit new pump into the existing piping system.

- NOTES:**
1. "x" SIZE TO BE DETERMINED BASED ON FINAL EQUIPMENT SELECTION
 2. COORDINATE HEIGHT OF CONCRETE PAD BE COORDINATED WITH PSP SUCTION HEADER CL ELEVATION.
 3. COORDINATE LOCATION OF 6" PCD PIPE WITH EXISTING WALL OPENING.
 4. REROUTE EXISTING NPW AND PEW PIPING AS REQUIRED.

Add or replace piping as necessary to fit new pump into the existing piping system.

Remove and Replace pump and motor per specifications.



RECORD DRAWING

THIS RECORD DRAWING 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.

PRIMARY SLUDGE PUMP STATIONS
PROCESS AND EQUIPMENT
NORTH PUMP STATION
MODIFICATION PLANS AND SECTIONS

NSWWTP HEADWORKS,
GRAVITY THICKENERS AND
SLUDGE LAGOON IMPROVEMENTS

PROJECT NO. ES 2007-02

CITY OF TULSA, OKLAHOMA
PUBLIC WORKS DEPARTMENT
ENGINEERING SERVICES DIVISION

PLANS AND ESTIMATES PREPARED BY:

GREELEY AND HANSEN
100 SOUTH WACKER DRIVE, SUITE 1400
CHICAGO, ILLINOIS 60606-4003

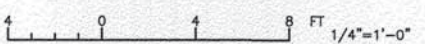
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			HORIZONTAL:	SECT. MGR		
			VERTICAL:	PROJ MGR		
				RECOMMENDED		
				DEPUTY DIRECTOR		PUBLIC WORKS DIRECTOR
			FILE: 0141BDM04	DRAWING: DM4		DATE: NOVEMBER 2011
			ATLAS PAGE NO.:			SHEET 129 OF 157

**WPC 21-3
214.2B**

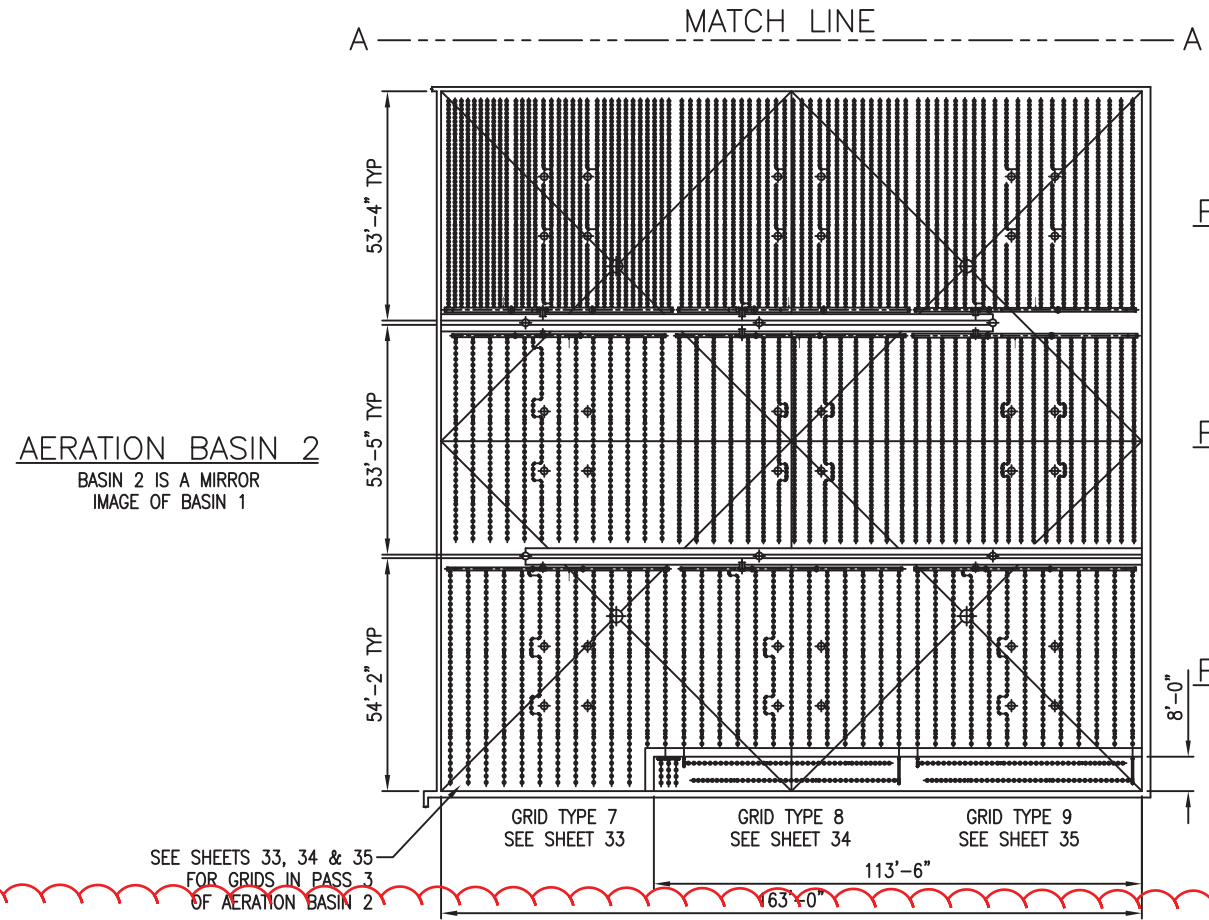
Primary Scum Pump Replacements

SECTION 1/DM4
SCALE: 1/4" = 1'-0"

SECTION 2/DM4
SCALE: 1/4" = 1'-0"



K:\0141B - TMDA - NORTHSIDE HEADWORKS\21 CAD FILES\21.120 WORKING\0141BDM04 2015/04/23 3:50

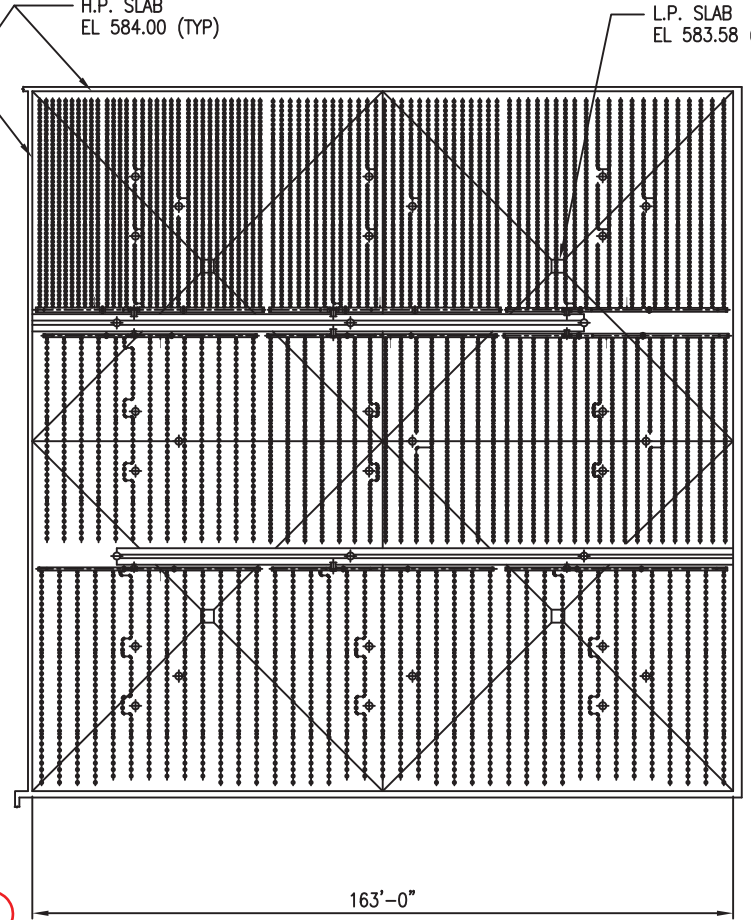


AERATION BASIN 2
BASIN 2 IS A MIRROR
IMAGE OF BASIN 1

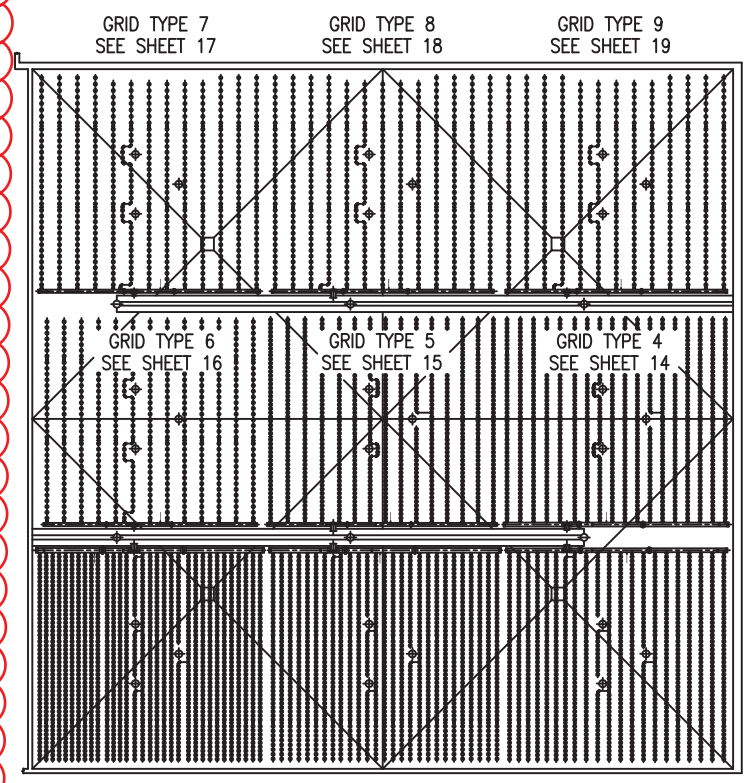
SEE SHEETS 33, 34 & 35
FOR GRIDS IN PASS 3
OF AERATION BASIN 2

AERATION BASIN 1

**Aeration Basin #1
Diffuser
Replacements**



AERATION BASIN 4
BASIN 4 IS A MIRROR
IMAGE OF BASIN 3



AERATION BASIN 3

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: TUBULAR PRODUCTS ASTM A774 ASTM A584 DIMENSIONS: ASTM A774 ASTM A584	150# DRILLING FOR TERMINATION FLANGE CONNECTION. SCH 10 PIPE WALL THICKNESS ON DROPLEG. *SEE BELOW
SUPPORTS	3/8" SWELLS ST STEEL & PAGES PER ASTM A286 THREADED RODS PER ASTM A276		1" 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 15% 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 D1788 FITTINGS: ASTM D2486	
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 124524		MINIMUM 2% TITANIUM DIOXIDE
DIFFUSER ELEMENT	EPDM		
PVC SOLVENT WELDING	ASTM D2584	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 A330-99. THE ACID FOR USE DEFINED BY TABLE A2.1 OF
ANNEX A2 OF ASTM A330. FINAL RINSE AND DRY IN ACCORDANCE TO SECTION 8.3 OF ASTM A330. ALL WELDED
SURFACES TO CONFORM TO AISI NO. 20 FINISH.



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

4			
3			
2			
1			
NO.	DATE	REVISION	BY
TULSA, OK NORTHSIDE WWTP			
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.			
AERATION BASINS 1, 2, 3 & 4			
WPC 21-3 214.3A			
SANITAIRE BROWN OCEAN, WISCONSIN 53220 ADJ			
DRWN BY	DATE 9-17-07	EQUIP. MEM	JOB 07-6567S
CHWD BY	DATE 9-20-07	STD.	1 OF 32
APPVD BY	DATE	SIZE D REV.	WPC-E-1

KEY PLAN **1**

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 $\pm 3/4"$.

NOTE:
 This sheet shows the existing 1546 diffuser holders in Aeration Basin #1, 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
- VARIABLES - DIFFUSER HOLDERS PER AIR DISTRIBUTOR
- 1546 - TOTAL DIFFUSER HOLDERS PER GRID
- VARIABLES - 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

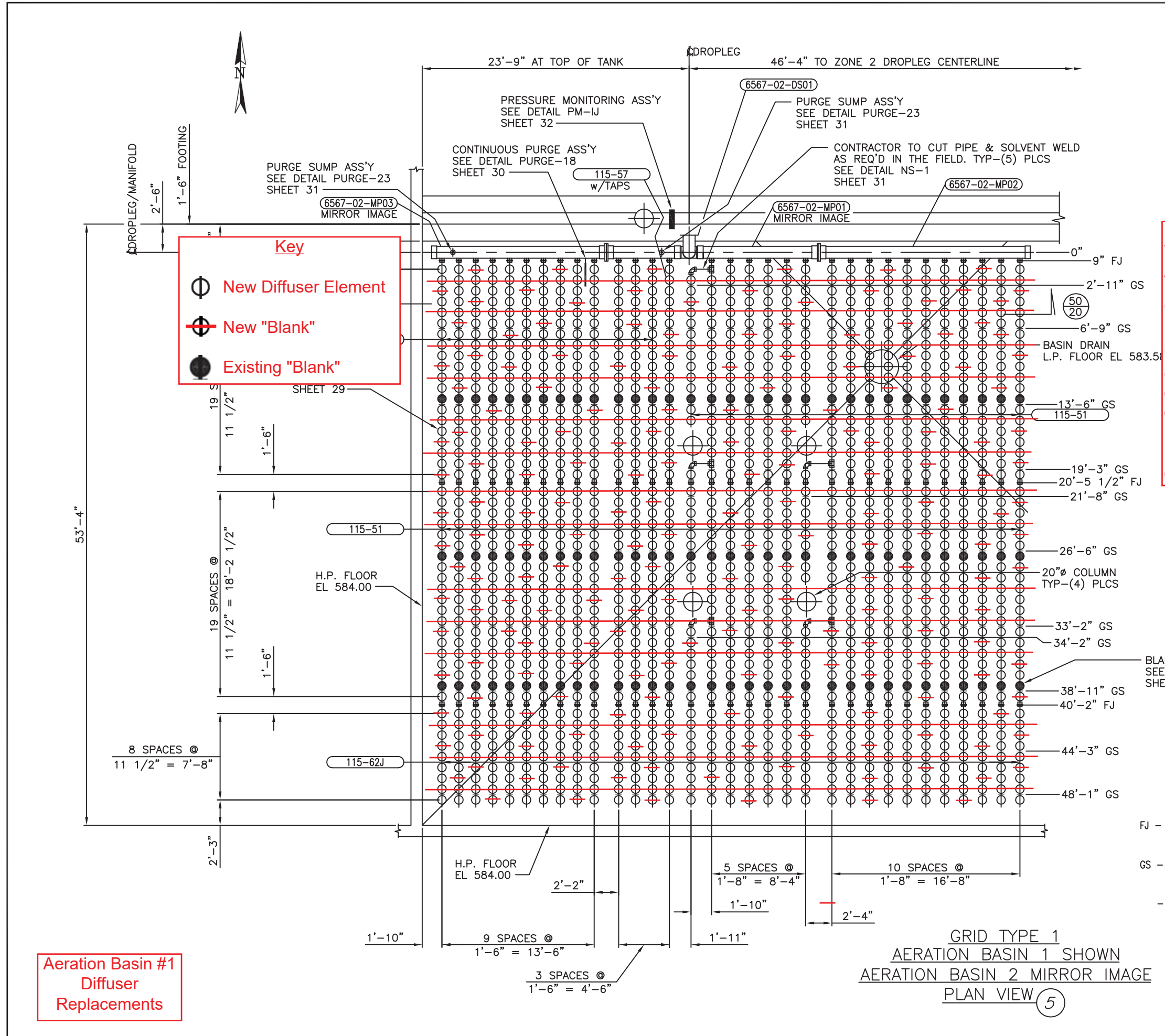
BLANK DIFFUSER ASS'Y
 SEE DETAIL FB-5B
 SHEET 30

- 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

4				
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1				
NO.	DATE	REVISION	BY	
TULSA, OK NORTHSIDE WWTP				
AERATION BASINS 1 & 2 GRID TYPE 1				
WPC 21-3 214.3B				
SANITAIRE BROWN DEER, WISCONSIN 53220 ADJ*				
DRWN BY	DATE	EQUIP.	MEM	JOB
CHWD BY	DATE	STD.		
APPRD BY	DATE	SIZE	D	REV.

GRID TYPE 1
AERATION BASIN 1 SHOWN
AERATION BASIN 2 MIRROR IMAGE
PLAN VIEW (5)

Aeration Basin #1
Diffuser
Replacements



Key

- New Diffuser Element
- / New "Blank"
- Existing "Blank"

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.

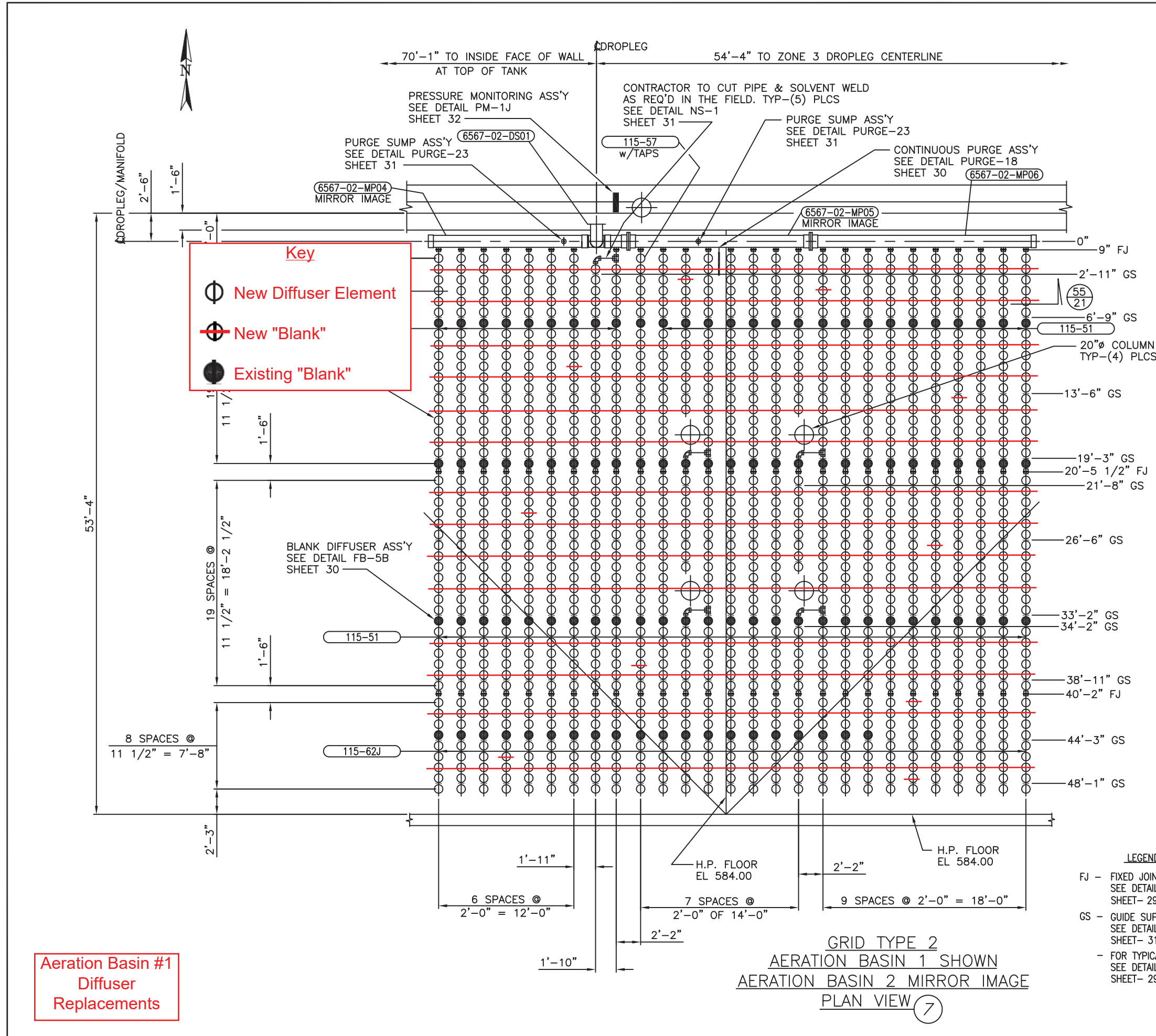
The actual support anchor locations must be indexed from the centerline of the manifold. The actual accumulative dimensional error from the manifold to the anchor bolt must not exceed $\pm 3/4"$.

NOTE:
 This sheet shows the existing 1301 diffuser holders in Aeration Basin #2, Grid 1 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.

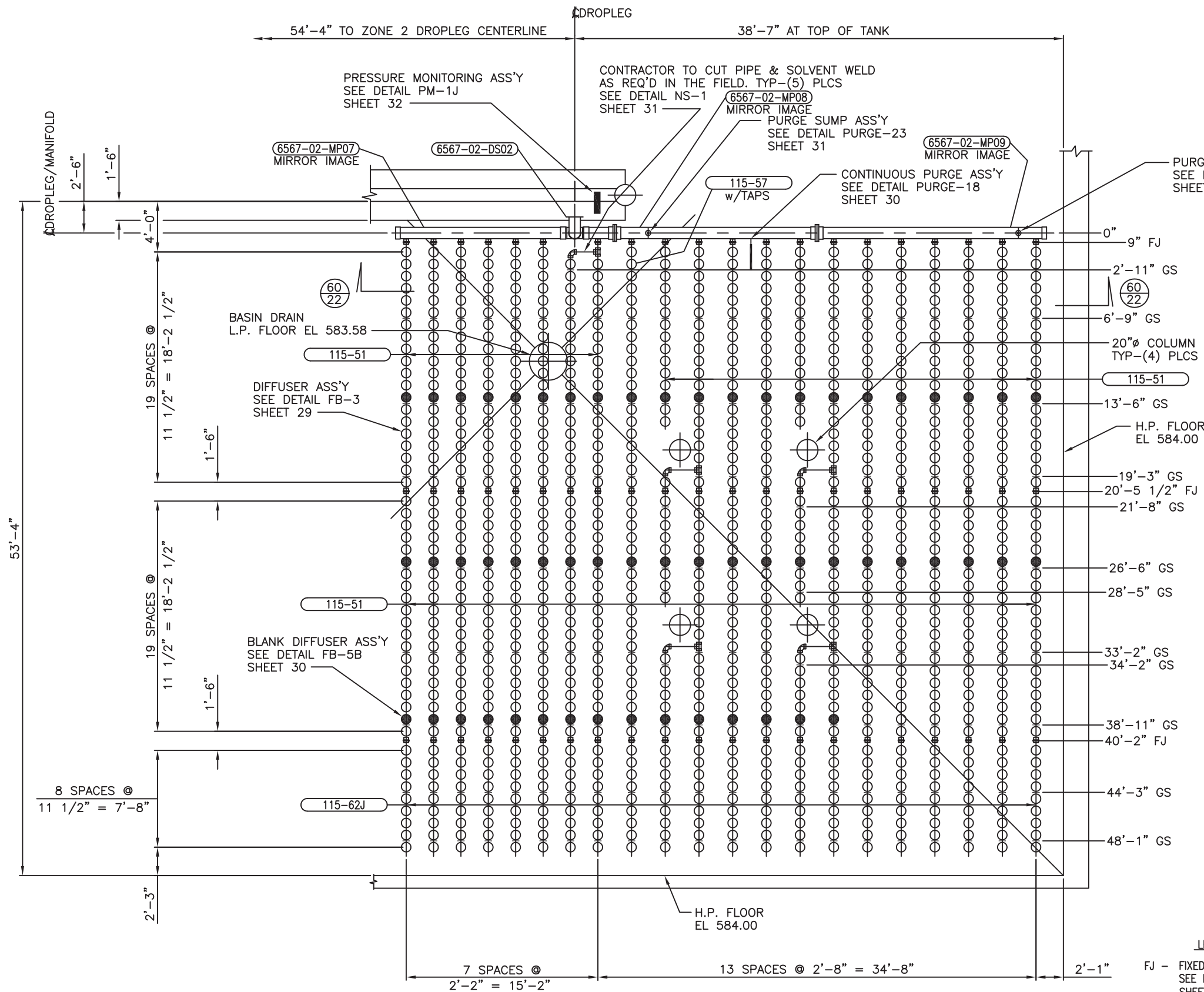
GRID TYPE '2'

2	-TANK(S)
1	-GRID(S) PER TANK
27	-AIR DISTRIBUTORS PER GRID
VARIABLES	-DIFFUSER HOLDERS PER AIR DISTRIBUTOR
1301	-TOTAL DIFFUSER HOLDERS PER GRID
VARIABLES	-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

4			
3			
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AERATION BASINS 1 & 2 GRID TYPE 2			
WPC 21-3 214.3C			
SANITAIRE			
DRWN BY	DATE 9-17-07	EQUIP. MEM	JOB 07-6567S
CHWD BY JK	DATE 9-20-07	STD.	3 OF 35
APPVD BY	DATE	SIZE D	REV. DWG E-3



**Aeration Basin #1
 Diffuser
 Replacements**



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 $\pm 3/4"$.

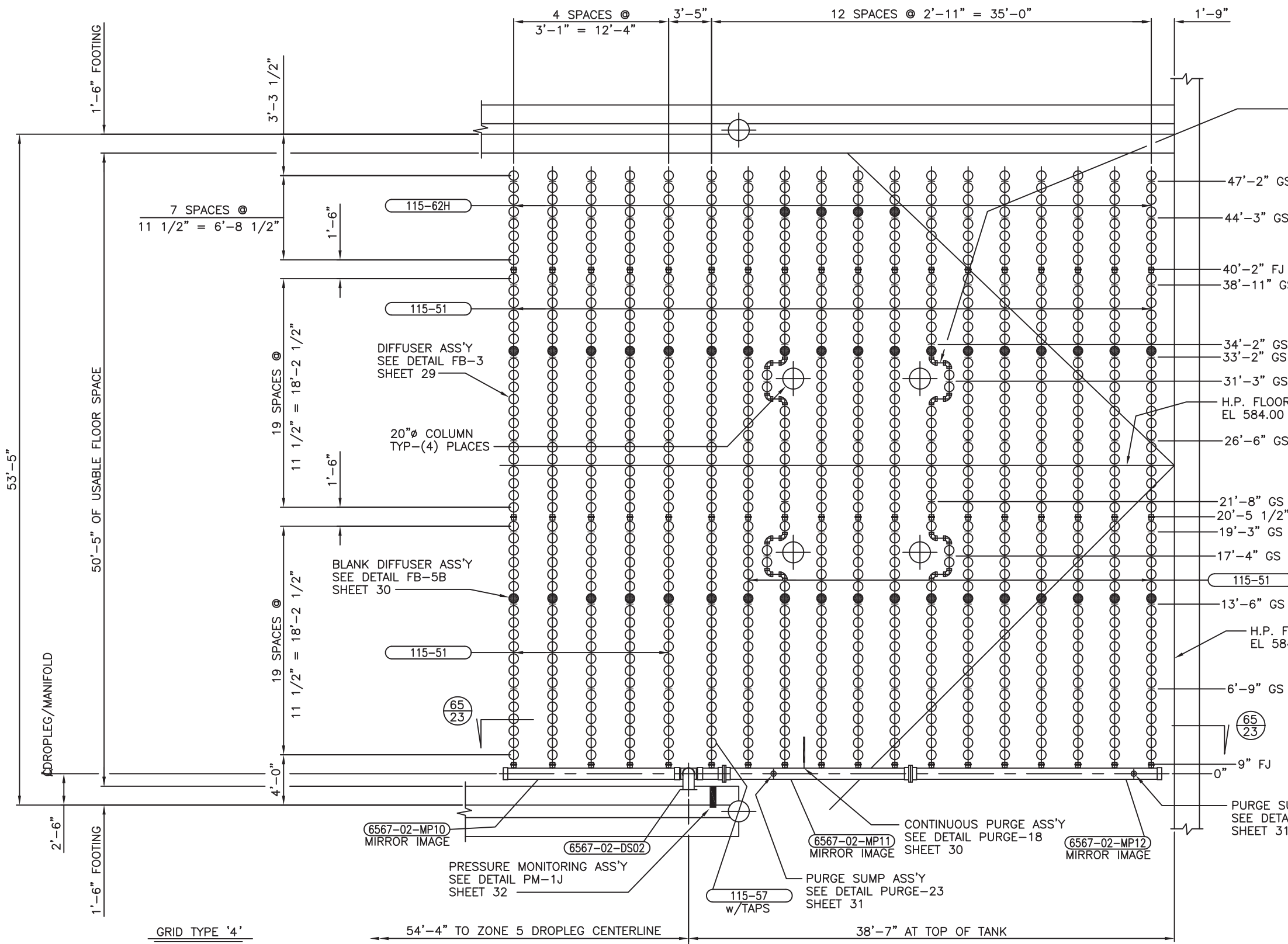
- GRID TYPE '3'**
- 2 - TANK(S)
 - 1 - GRID(S) PER TANK
 - 21 - AIR DISTRIBUTORS PER GRID
 - VARIABLES - DIFFUSER HOLDERS PER AIR DISTRIBUTOR
 - 1007 - TOTAL DIFFUSER HOLDERS PER GRID
 - VARIABLES - DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
 - 950 - DIFFUSER ELEMENTS INSTALLED PER GRID
 - 1900 - TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
 - 57 - TOTAL BLANK DIFFUSERS PER GRID

- 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

Aeration Basin #1
Diffuser
Replacements

GRID TYPE 3
AERATION BASIN 1 SHOWN
AERATION BASIN 2 MIRROR IMAGE
PLAN VIEW (9)

4					
3					
2					
1					
NO.	DATE	REVISION			BY
TULSA, OK NORTHSIDE WWTP					
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.					
AERATION BASINS 1 & 2 GRID TYPE 3					
WPC 21-3 214.3D					
SANITAIRE A DIVISION OF CROWN PAPER, WISCONSIN, U.S.A. ADJ*					
DRAWN BY RH	DATE 9-17-07	EQUIP. MEM	JOB 07-6567S	SH 4	OF 35
CHWD BY JK	DATE 9-20-07	STD.	DWG E-4		
APPROV BY	DATE	SIZE D	REV.		



CONTRACTOR TO CUT PIPE & SOLVENT WELD AS REQ'D IN THE FIELD. TYP-(4) PLCS SEE DETAIL NS-1 SHEET 31



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 $\pm 3/4"$.

- 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

4			
3			
2			
1			
NO.	DATE	REVISION	BY

TULSA, OK
 NORTHSIDE WWTP

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AERATION BASINS 1 & 2
 GRID TYPE 4

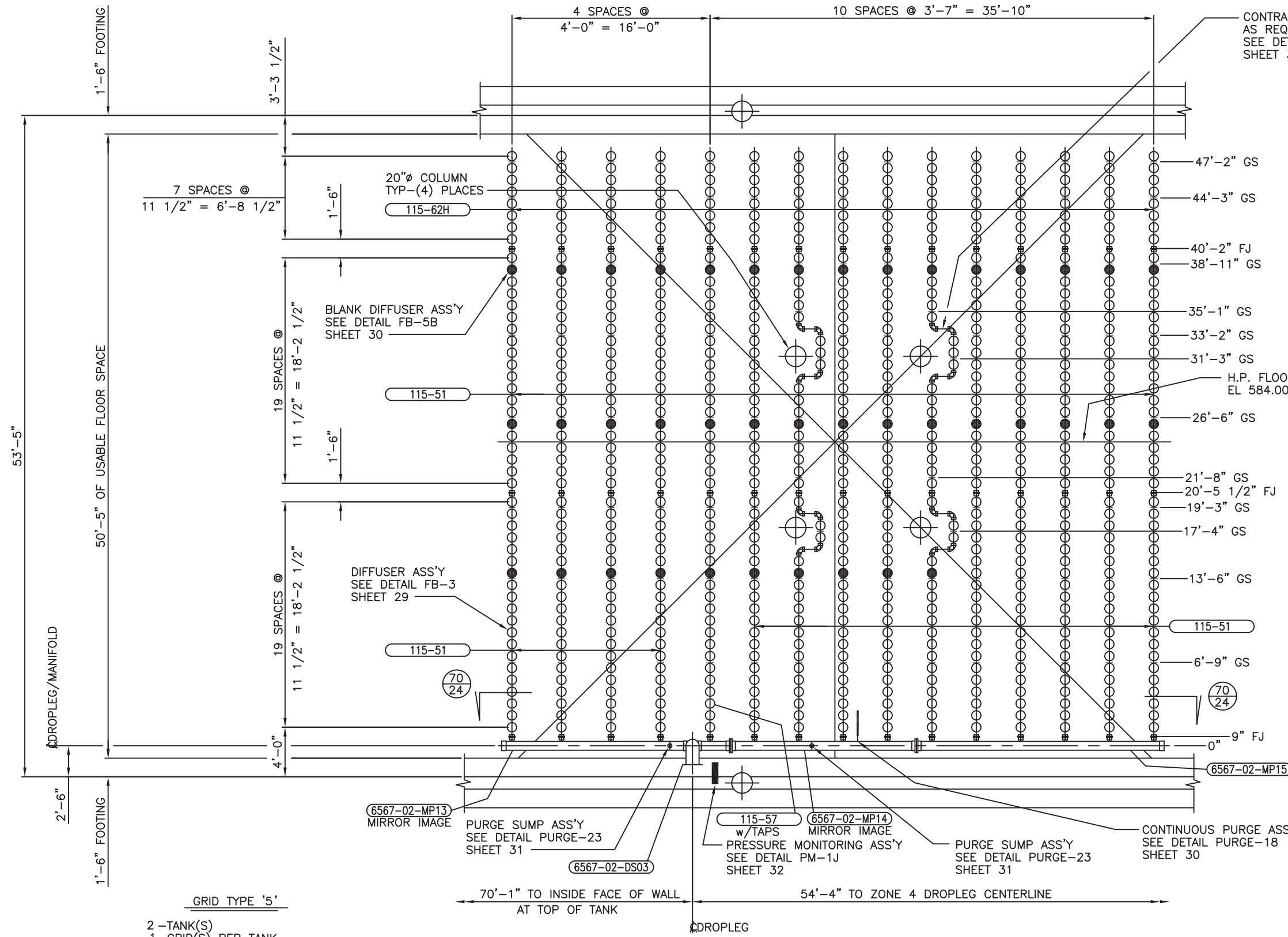
WPC 21-3
214.3E

DRWN BY RH	DATE 9-17-07	EQUIP. MEM	JOB 07-6567S	SHF 5
CHWD BY JK	DATE 9-20-07	STD.		OF 35
APPVD BY	DATE	SIZE D	REV. DWG-E-5	

- GRID TYPE '4'**
- 2 - TANK(S)
 - 1 - GRID(S) PER TANK
 - 18 - AIR DISTRIBUTORS PER GRID
 - VARIABLES - DIFFUSER HOLDERS PER AIR DISTRIBUTOR
 - 856 - TOTAL DIFFUSER HOLDERS PER GRID
 - VARIABLES - DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
 - 816 - DIFFUSER ELEMENTS INSTALLED PER GRID
 - 1632 - TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
 - 40 - TOTAL BLANK DIFFUSERS PER GRID

GRID TYPE 4
AERATION BASIN 1 SHOWN
AERATION BASIN 2 MIRROR IMAGE
PLAN VIEW (11)

Aeration Basin #1
Diffuser
Replacements



CONTRACTOR TO CUT PIPE & SOLVENT WELD AS REQ'D IN THE FIELD. TYP-(4) PLCS SEE DETAIL NS-1 SHEET 31



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 $\pm 3/4"$.

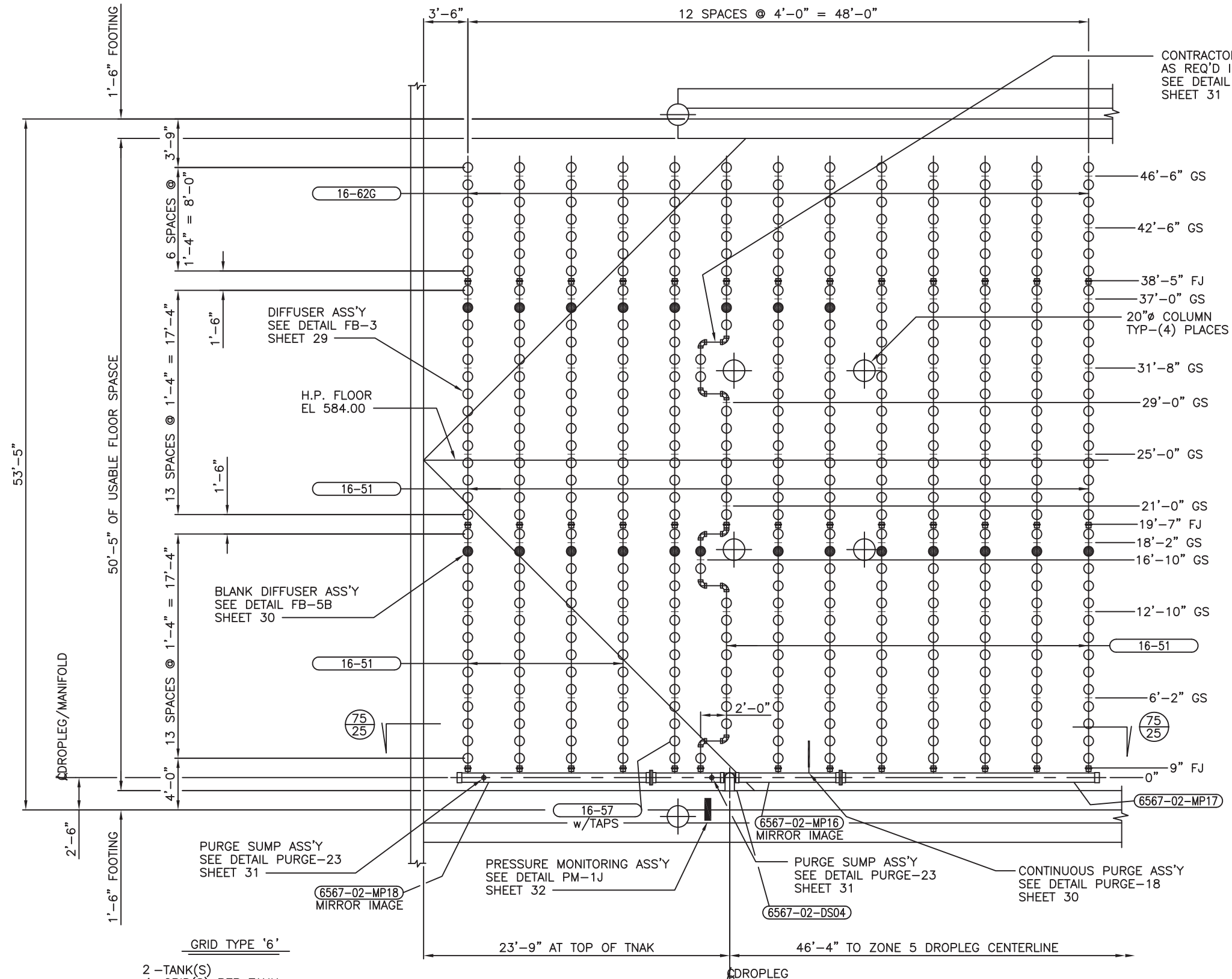
- LEGEND**
- FJ - FIXED JOINT SEE DETAIL FB-10A SHEET- 29
 - GS - GUIDE SUPPORT SEE DETAIL SUP-2 SHEET- 31
 - FOR TYPICAL AIR DISTRIBUTOR SECTION SEE DETAIL FB-22C SHEET- 29

- GRID TYPE '5'**
- 2 - TANK(S)
 - 1 - GRID(S) PER TANK
 - 15 - AIR DISTRIBUTORS PER GRID
 - VARIABLES - DIFFUSER HOLDERS PER AIR DISTRIBUTOR
 - 712 - TOTAL DIFFUSER HOLDERS PER GRID
 - VARIABLES - DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
 - 672 - DIFFUSER ELEMENTS INSTALLED PER GRID
 - 1344 - TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
 - 40 - TOTAL BLANK DIFFUSERS PER GRID

**GRID TYPE 5
AERATION BASIN 1 SHOWN
AERATION BASIN 2 MIRROR IMAGE
PLAN VIEW**

**Aeration Basin #1
Diffuser
Replacements**

4			
3			
2			
1			
NO.	DATE	REVISION	BY
TULSA, OK NORTHSIDE WWTP			
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.			
AERATION BASINS 1 & 2 GRID TYPE 5			
WPC 21-3 214.3F			
SANITAIRE BROWN DEER, WISCONSIN 53220 ADJ*			
DRWN BY RH	DATE 9-17-07	EQUIP. MEM	JOB 07-6567S
CHWD BY JK	DATE 9-20-07	STD.	SH. 6 OF 35
APPVD BY	DATE	SIZE D	REV. DWG E-6



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 $\pm 3/4"$.

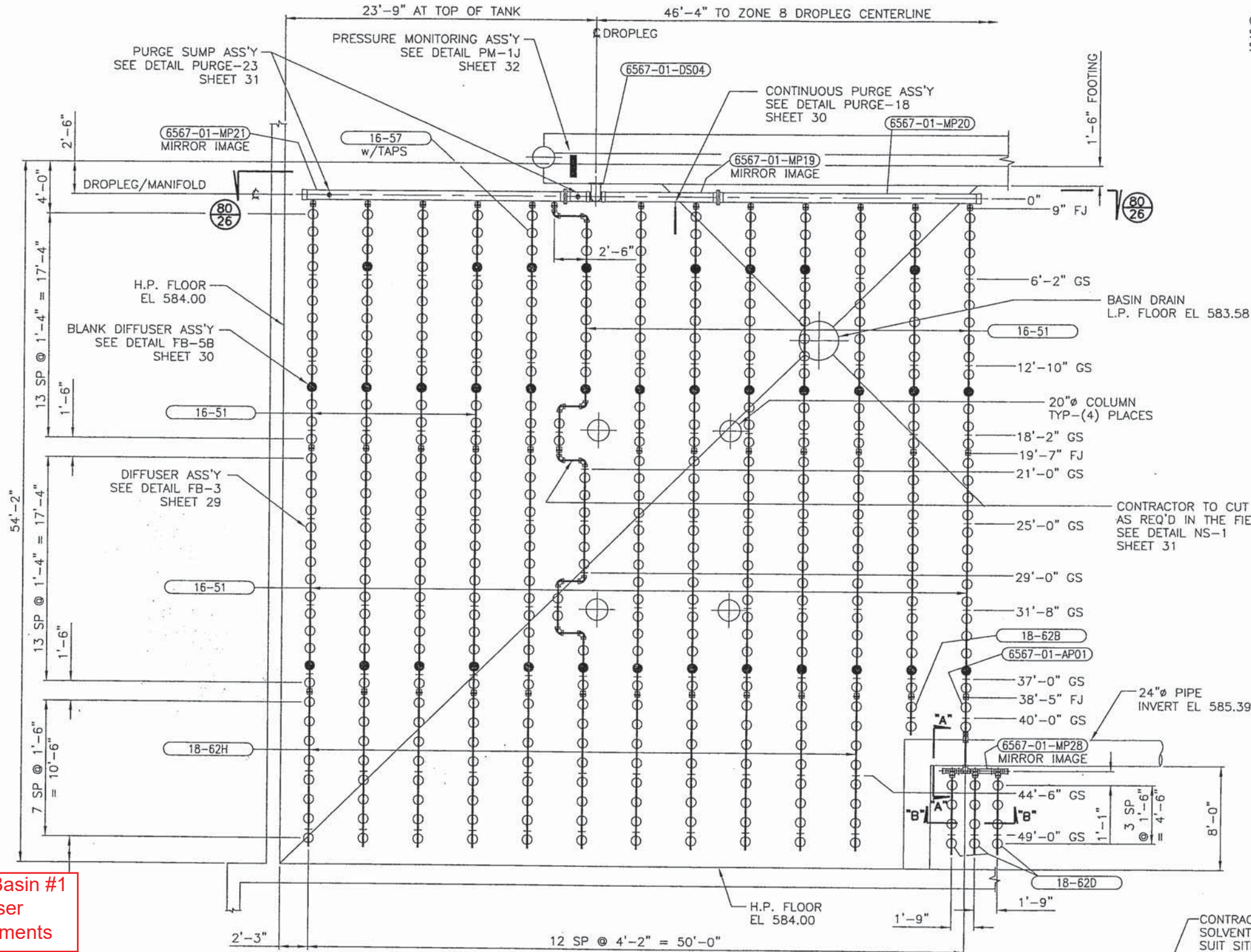
- LEGEND**
- FJ - FIXED JOINT
SEE DETAIL FB-10A
SHEET- 29
 - GS - GUIDE SUPPORT
SEE DETAIL SUP-2
SHEET- 31
 - FOR TYPICAL AIR DISTRIBUTOR SECTION
SEE DETAIL FB-22C
SHEET- 29

- GRID TYPE '6'**
- 2 -TANK(S)
 - 1-GRID(S) PER TANK
 - 13 -AIR DISTRIBUTORS PER GRID
 - VARIABLES -DIFFUSER HOLDERS PER AIR DISTRIBUTOR
 - 450 -TOTAL DIFFUSER HOLDERS PER GRID
 - VARIABLES -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

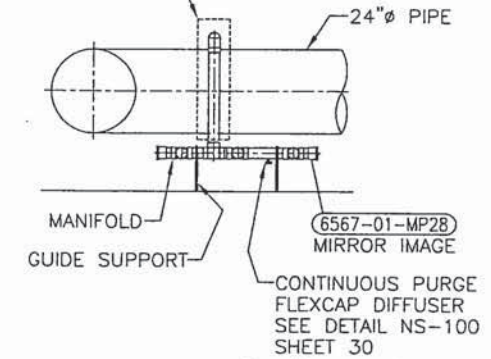
GRID TYPE 6
AERATION BASIN 1 SHOWN
AERATION BASIN 2 MIRROR IMAGE
PLAN VIEW (15)

Aeration Basin #1
Diffuser
Replacements

4					
3					
2					
1					
NO.	DATE	REVISION			BY
TULSA, OK NORTHSIDE WWTP					
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.					
AERATION BASINS 1 & 2 GRID TYPE 6					
WPC 21-3 214.3G					
SANITAIRE BROWN DEER, WISCONSIN 53223 ADJ					
DRAWN BY RH	DATE 9-17-07	EQUIP. MEM	JOB 07-6567S	SHEET 7	OF 35
CHWD BY JK	DATE 9-20-07	STD.	DWG E-7		
APPROV BY	DATE	SIZE D	REV.		



CONTRACTOR TO CUT TO SUIT AND SOLVENT WELD IN THE FIELD TO SUIT SITE CONDITIONS.



SECTION "B-B"

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.

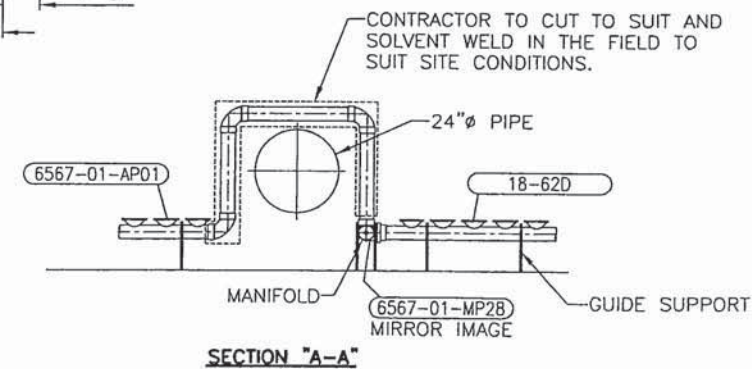
The actual support anchor locations must be indexed from the centerline of the manifold. The actual accumulative dimensional error from the manifold to the anchor bolt must not exceed $\pm 3/4"$.

**Aeration Basin #1
Diffuser
Replacements**

GRID TYPE '7'

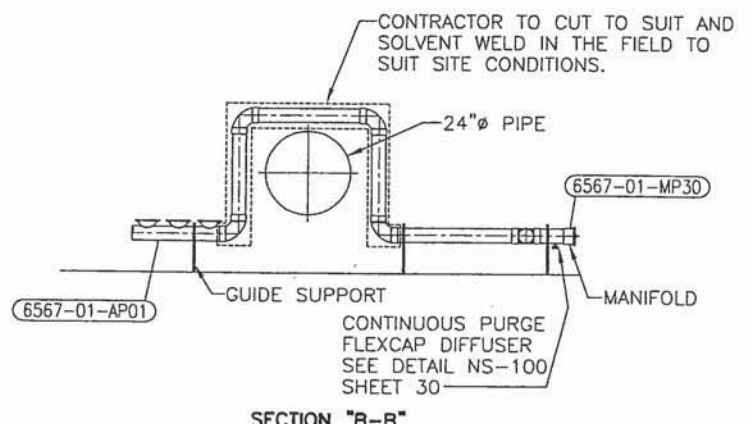
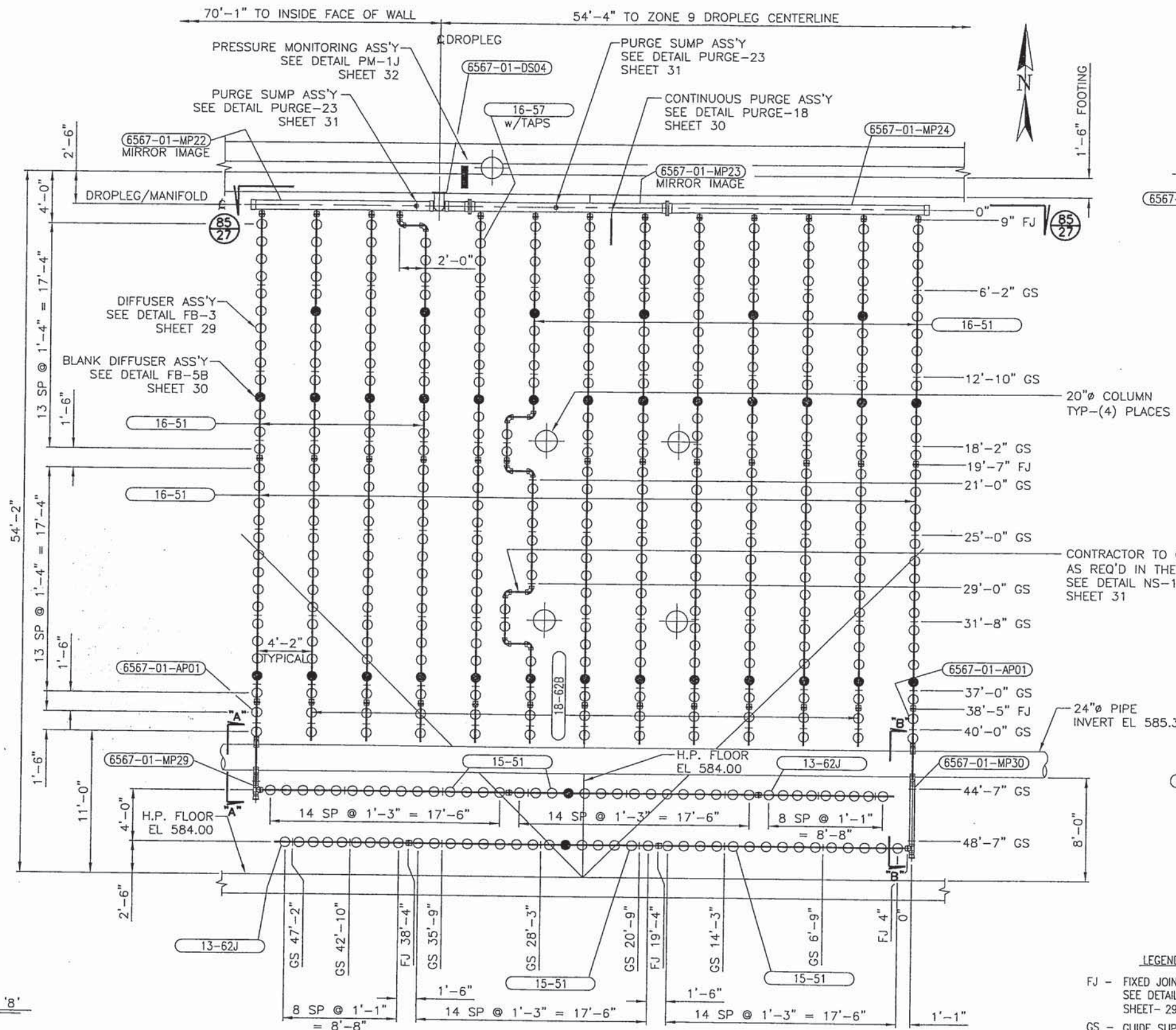
- 1-TANK(S)
- 1-GRID PER TANK
- 13-AIR DISTRIBUTORS PER GRID
- VARIES-DIFFUSER HOLDERS PER AIR DISTRIBUTOR
- 463-TOTAL DIFFUSER HOLDERS PER GRID
- VARIES-DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
- 429-DIFFUSER ELEMENTS INSTALLED PER GRID
- 429-TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
- 34-TOTAL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

GRID TYPE 7
AERATION BASIN 2 AS SHOWN
AERATION BASIN 1 MIRROR IMAGE
PLAN VIEW 92



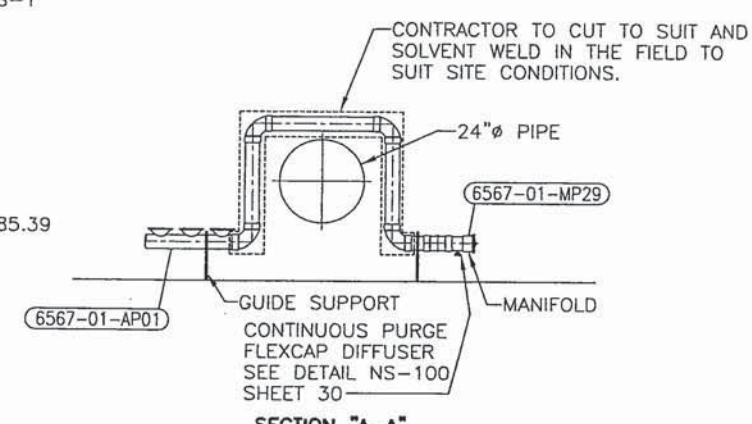
SECTION "A-A"

4			
3			
2			
1			
NO.	DATE	REVISION	BY
TULSA, OK NORTHSIDE WWTP			
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AERATION BASINS 1 & 2 GRID TYPE 7 PLAN VIEW			
WPC 21-3 214.3H			
SANITAIRE			
DRWN BY JKH	DATE 6-17-08	LOUPL: MWM	JUN 07-6567S
CHKD BY JK	DATE 6-18-08	STD.	
APPRD BY	DATE	SIZE D	REV. A DWG E-33



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 $\pm 3/4"$.



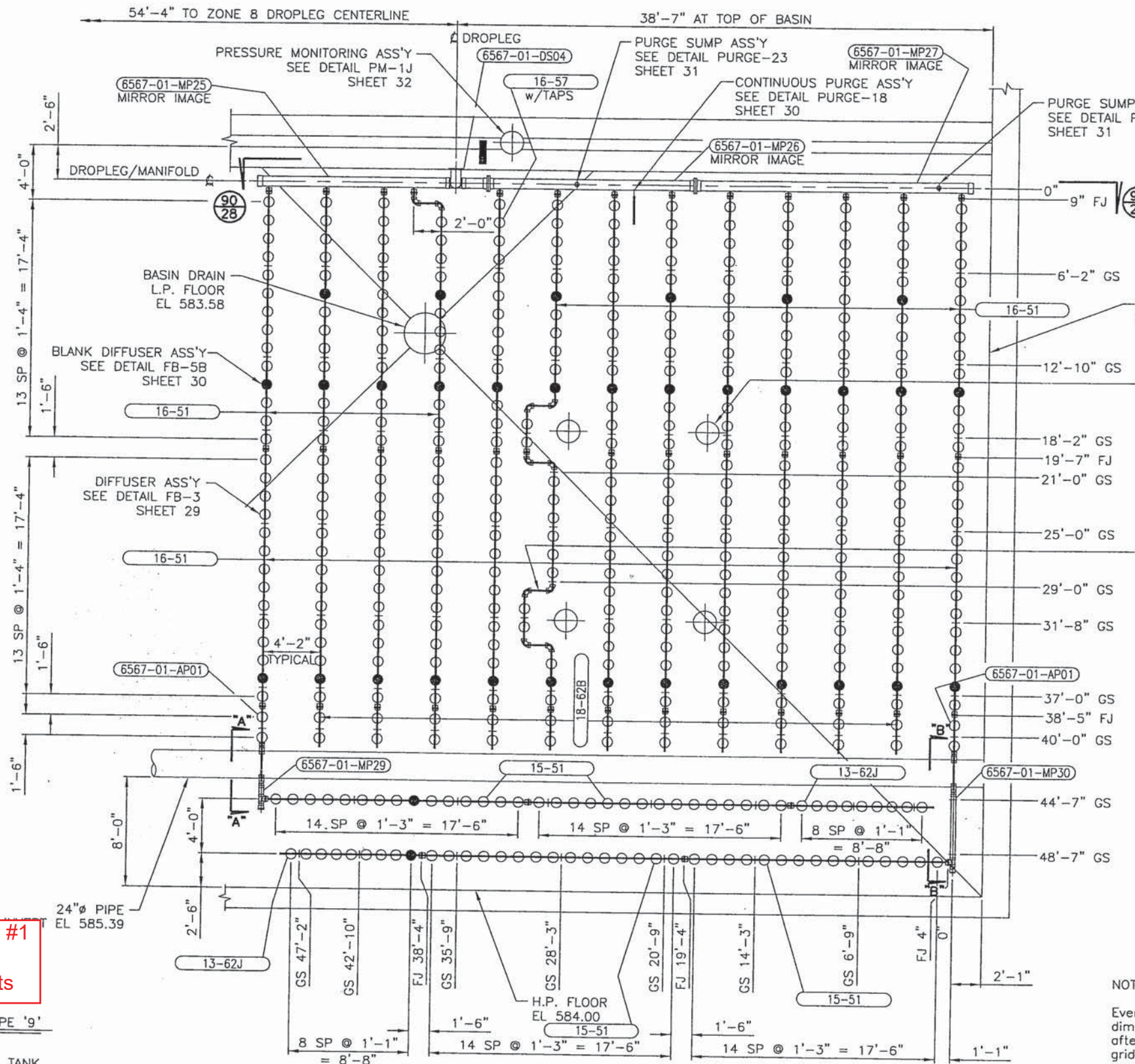
**Aeration Basin #1
 Diffuser
 Replacements**

- GRID TYPE '8'**
- 1 - TANK
 - 1 - GRID PER TANK
 - 13 - AIR DISTRIBUTORS PER GRID
 - VARIABLES - DIFFUSER HOLDERS PER AIR DISTRIBUTOR
 - 463 - TOTAL DIFFUSER HOLDERS PER GRID
 - VARIABLES - DIFFUSER ELEMENTS PER AIR DISTRIBUTOR
 - 429 - DIFFUSER ELEMENTS INSTALLED PER GRID
 - 429 - TOTAL DIFFUSER ELEMENTS INSTALLED FOR THIS GRID TYPE
 - 34 - TOTAL BLANK DIFFUSERS PER GRID

**GRID TYPE 8
 AERATION BASIN 2 AS SHOWN
 AERATION BASIN 1 MIRROR IMAGE
 PLAN VIEW**

- 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

4				
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NO.	DATE	REVISION	BY	
TULSA, OK NORTHSIDE WWTP				
AERATION BASINS 1 & 2 GRID TYPE 8				
WPC 21-3 214.31				
SANITAIRE ABJ				
DRAWN BY	DATE 6-17-08	EQUIP. MEM	JOB 07-6567S	SHEET 22 OF 23
CHGD BY	DATE 6-18-08	STD.		
APPROV BY	DATE	SIZE D	REV. A	DWG E-34

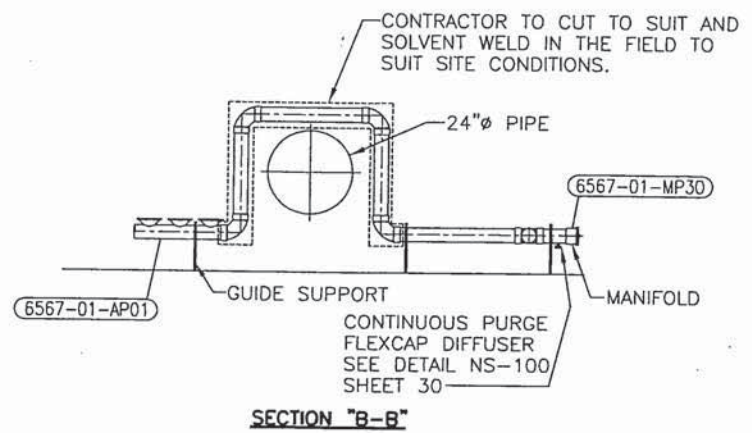
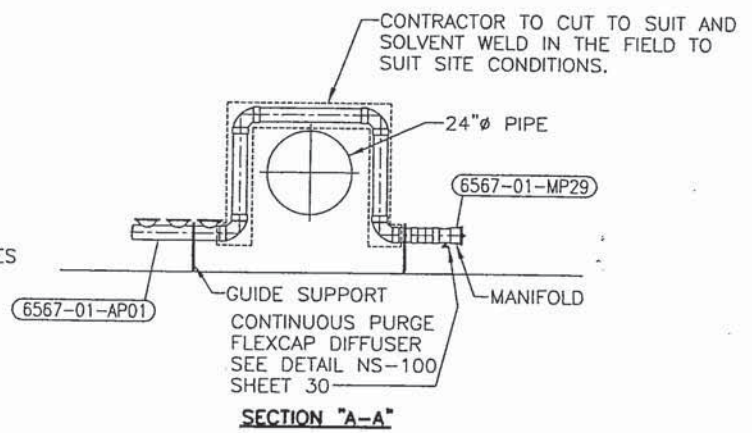


LEGEND

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



**Aeration Basin #1
Diffuser
Replacements**

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

**GRID TYPE 9
AERATION BASIN 2 AS SHOWN
AERATION BASIN 1 MIRROR IMAGE
PLAN VIEW 94**

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 $\pm 3/4"$.

4			
3			
2			
1			
NO.	DATE	REVISION	BY
TULSA, OK NORTHSIDE WWTP			
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AERATION BASIN			
WPC 21-3 214.3J			
SANITAIRE® BROWN DEER, WISCONSIN 53223 ABJ			
DRWN BY	RH	DATE 6-17-08	EQUIP. MEM
CHKD BY	JK	DATE 6-18-08	STL
APPRD BY		DATE	SIZE D REV. A
			JOB 07-6567S
			SHEET 23 OF 23
			DWG E-35

Equipment Site Location



Mingo FEB Access

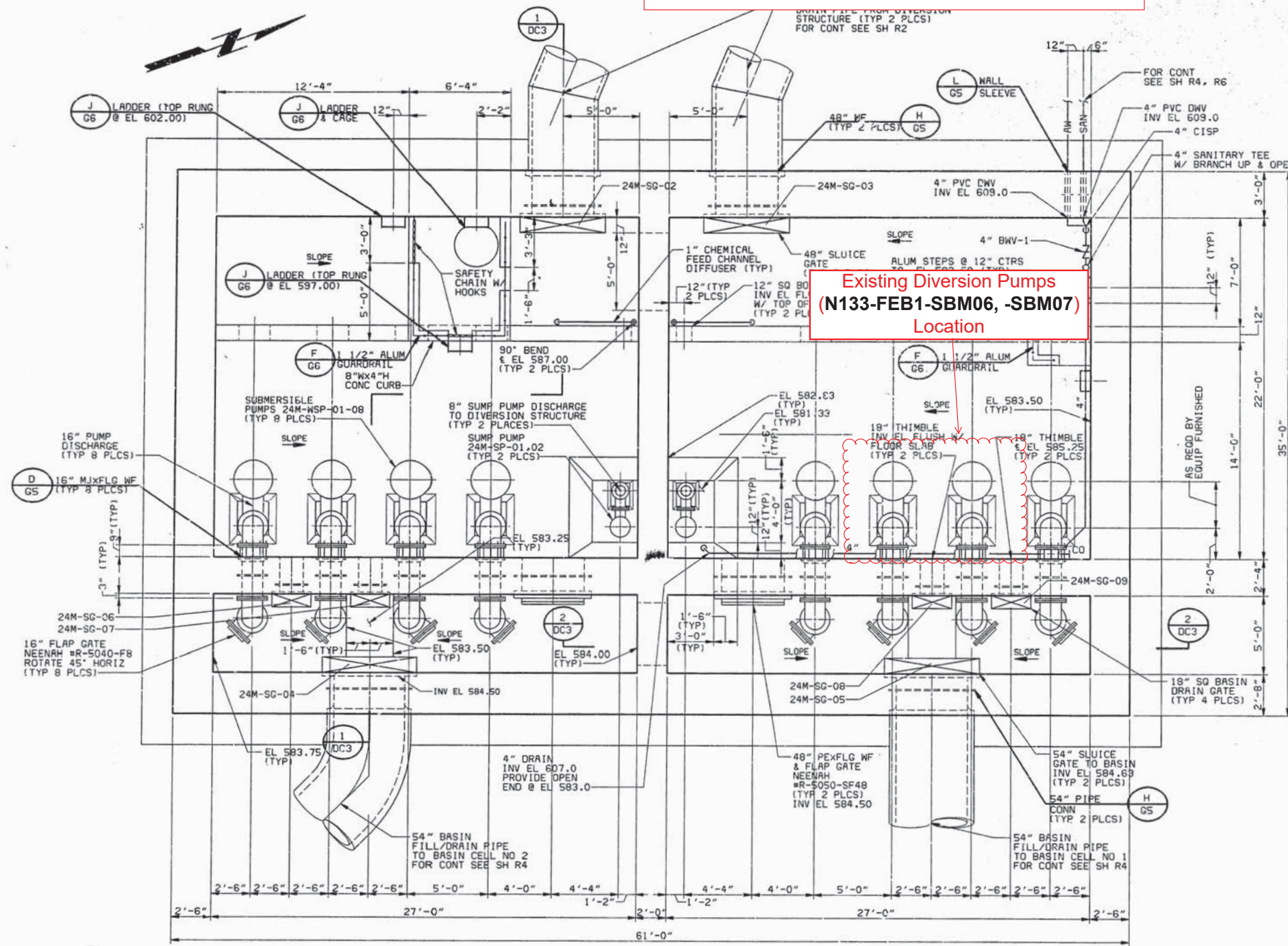
Mingo FEB Wet Well Location

Mingo FEB

Mingo FEB
Diversion Pump
Replacement

WPC 21-3
214.4A

DIVERSION PUMP SYSTEM (Plan View)



Existing Diversion Pumps
(N133-FEB1-SBM06, -SBM07)
Location



Note:
New pumps to be connected to existing power using switch rated plugs (Typ. 2) as already completed on Diversion Pumps 1, 2, 3, 4, 5 & 8 on previous projects. Reference Specification Section 214.4.7 for information on switch rated plugs to be provided.

SECTIONAL PLAN
1/4" = 1'-0"

Mingo FEB
Diversion Pump
Replacement

THIS DRAWING WAS
ORIGINALLY SEALED
BY RICK L. ZILKA,
A LICENSED
PROFESSIONAL
ENGINEER IN THE
STATE OF OKLAHOMA,
NO. 15946.

REVISION	BY	DATE	PLAN SCALE:	DRAWN	JJD	SJS	APPROVED:
CONFORMED TO	RLZ	5-96	1"	DESIGNED	RJA	JGW	WPC 21-3 214.4B
CONSTRUCTION RECORDS				SURVEY			
				FIELD MNGR.			
			HORIZONTAL:	SECT. MNGR.			
			VERTICAL:	PROJ. MNGR.			
				RECOMMENDED:			
				DEPUTY DIRECTOR			
FILE:	DRAWING: DC1						PUBLIC WORKS DIRECTOR
ATLAS PAGE NO:							DATE: 2-18-94
							SHEET 27 OF 148 SHEETS

DIVERSION LIFT STATION (RFB)
CIVIL
WETWELL SECTIONAL PLAN
NORTHSIDE FLOW
EQUALIZATION BASIN

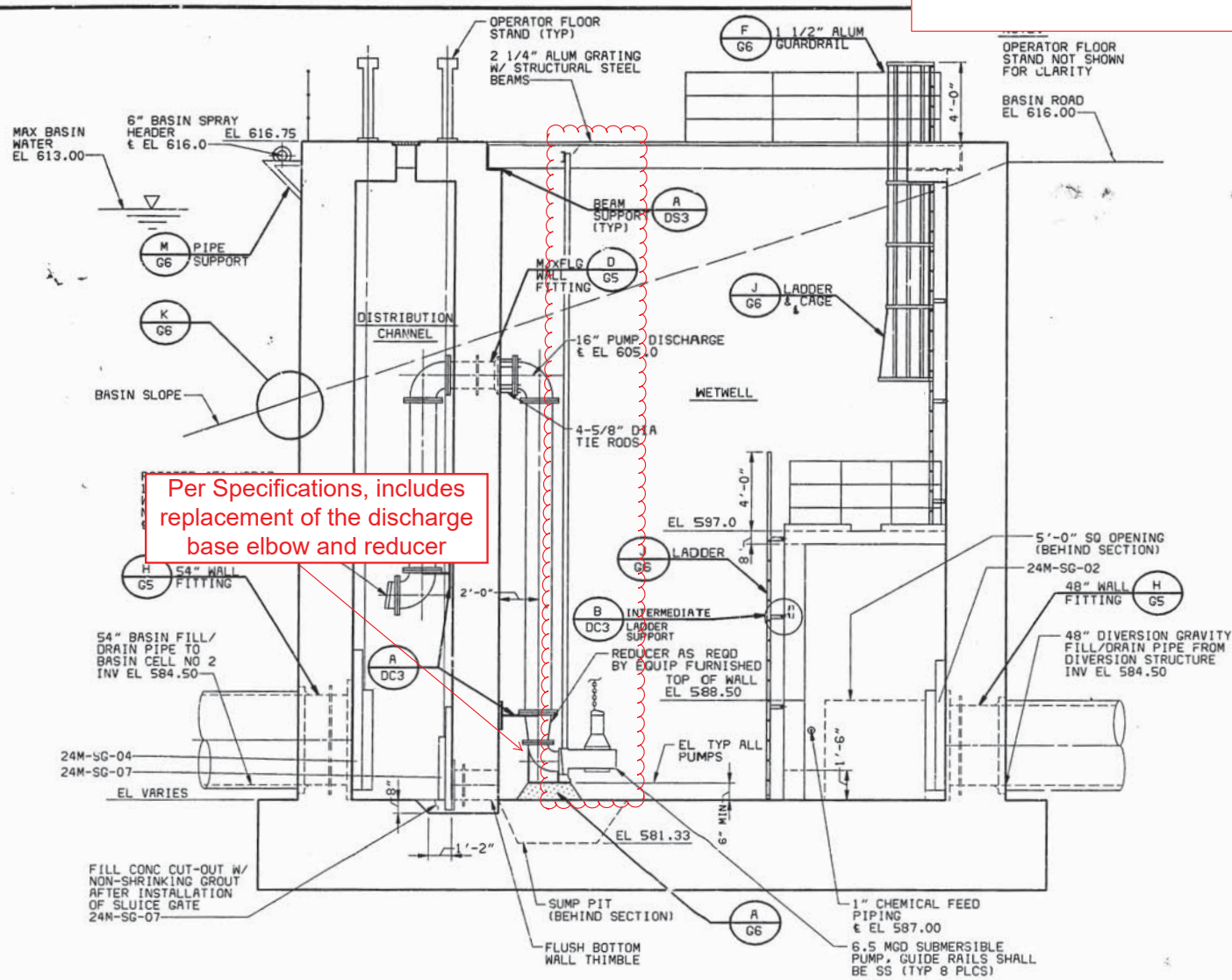
TULSA METROPOLITAN UTILITY AUTHORITY
5-YEAR SALES TAX CAPITAL FUNDS
PROJECT NO. SY-91-145

CITY OF TULSA, OKLAHOMA
PUBLIC WORKS DEPARTMENT
ENGINEERING SERVICES DIVISION

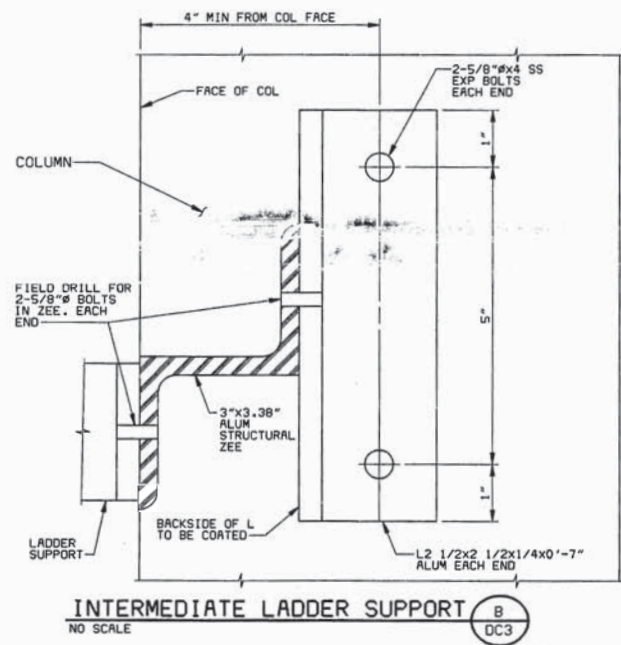
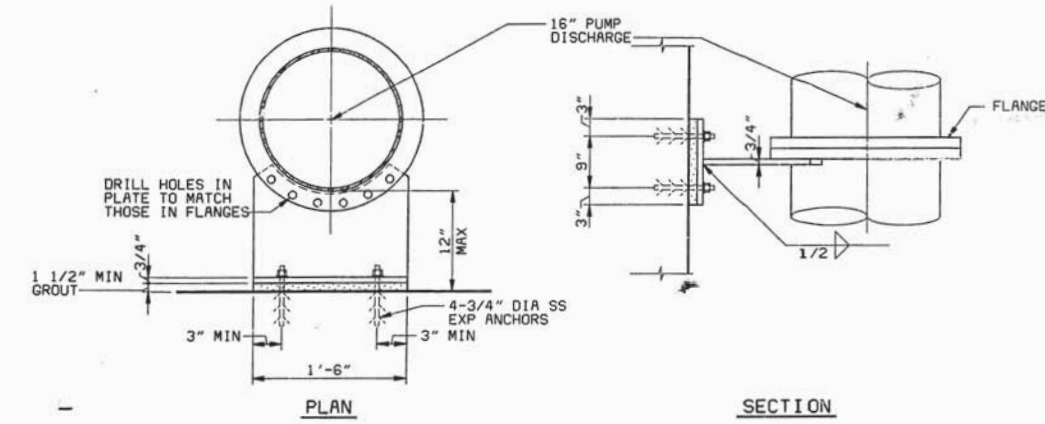
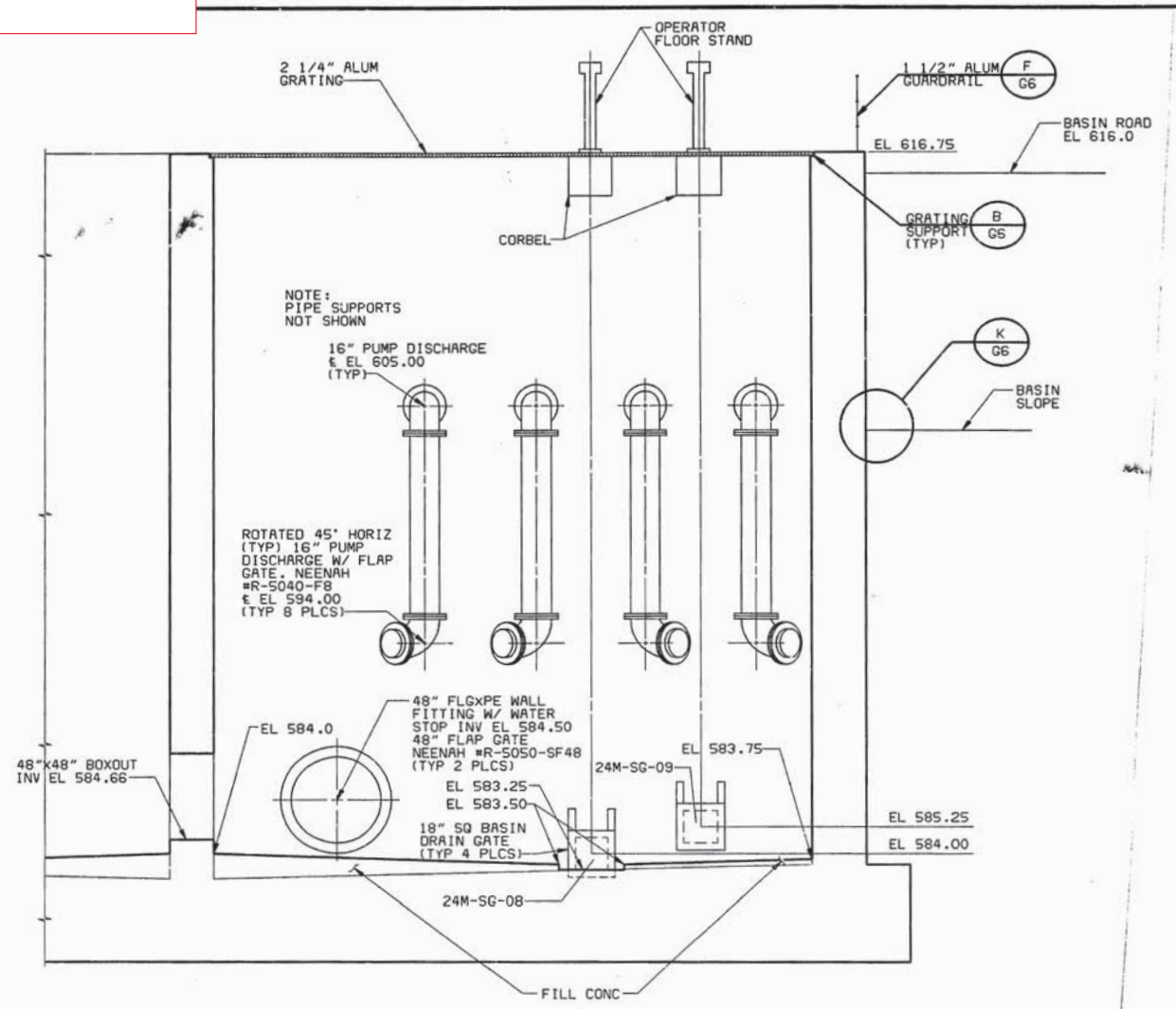
PLANS PREPARED BY:
BRUTON, KNOWLES & LOVE, INC. BLACK & VEATCH -
ENGINEERS - ARCHITECTS - PLANNERS TULSA, OKLAHOMA KANSAS CITY, MISSOURI

DIVERSION PUMP SYSTEM (Section View)

07/24/95 14:13:15 VPL
07/24/95 11:02:27 ATSSK



Per Specifications, includes replacement of the discharge base elbow and reducer



Mingo FEB
Diversion Pump
Replacement

DIVERSION LIFT STATION (RFEB)
CIVIL
WETWELL PIPING SECTIONS
**NORTHSIDE FLOW
EQUALIZATION BASIN**
TULSA METROPOLITAN UTILITY AUTHORITY
5-YEAR SALES TAX CAPITAL FUNDS
PROJECT NO. 5Y-91-14S
**CITY OF TULSA, OKLAHOMA
PUBLIC WORKS DEPARTMENT
ENGINEERING SERVICES DIVISION**
PLANS PREPARED BY:
BRUTON, KNOWLES & LOVE, INC. BLACK & VEATCH -
ENGINEERS - ARCHITECTS - PLANNERS KANSAS CITY, MISSOURI
TULSA, OKLAHOMA

THIS DRAWING WAS
ORIGINALLY SEALED
BY RICK L. ZILKA,
A LICENSED
PROFESSIONAL
ENGINEER IN THE
STATE OF OKLAHOMA,
NO. 15946.

REVISION	BY	DATE	PLAN SCALE	DRAWN	JJG	SJS	APPROVED:
CONFORMED TO	RLZ	5-96	1"	DESIGNED	JJG	JGW	THIS DRAWING WAS <b style="color: red; font-weight: bold;">WPC 21-3 214.4C
CONSTRUCTION RECORDS				SURVEY			
				FIELD MNGR.			
				SECT. MNGR.			
				PROJ. MNGR.			
				RECOMMENDED:			
				DEPUTY DIRECTOR			
				FILE:	DRAWING: DC3		DATE: 2-18-94
				ATLAS PAGE NO:			SHEET 29 OF 148 SHEETS

Equipment Site Location



Flat Rock Creek FEB Access

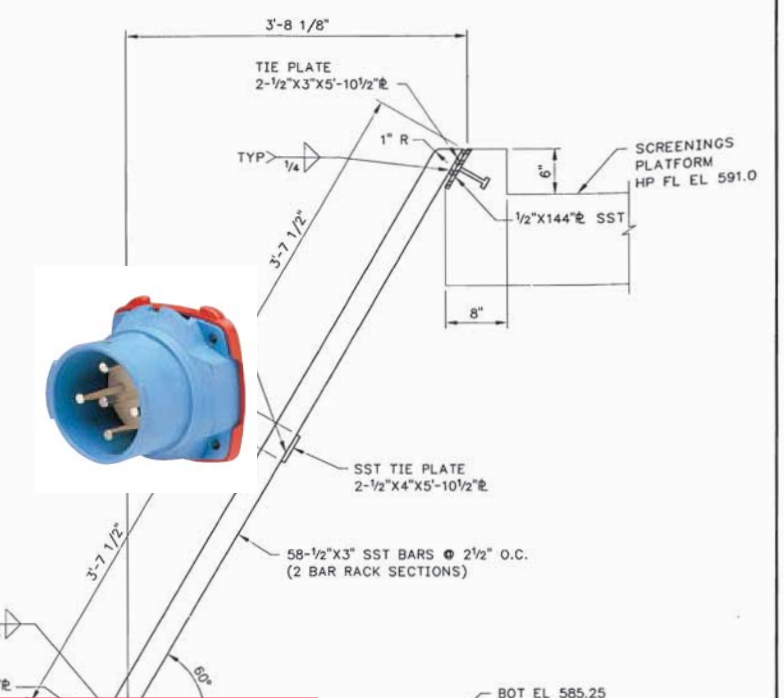
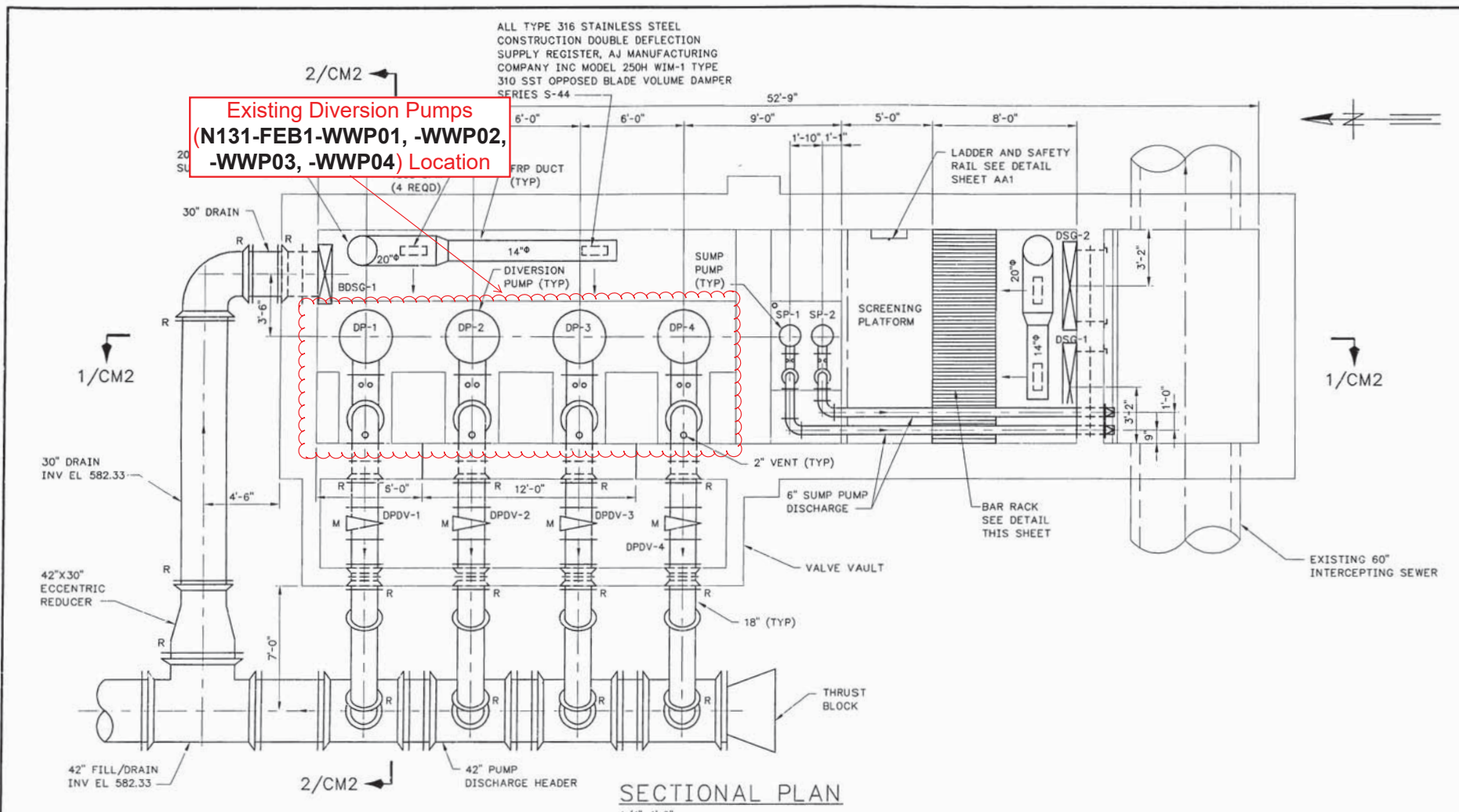
Flat Rock Creek FEB

Flat Rock Creek FEB Wet Well Location

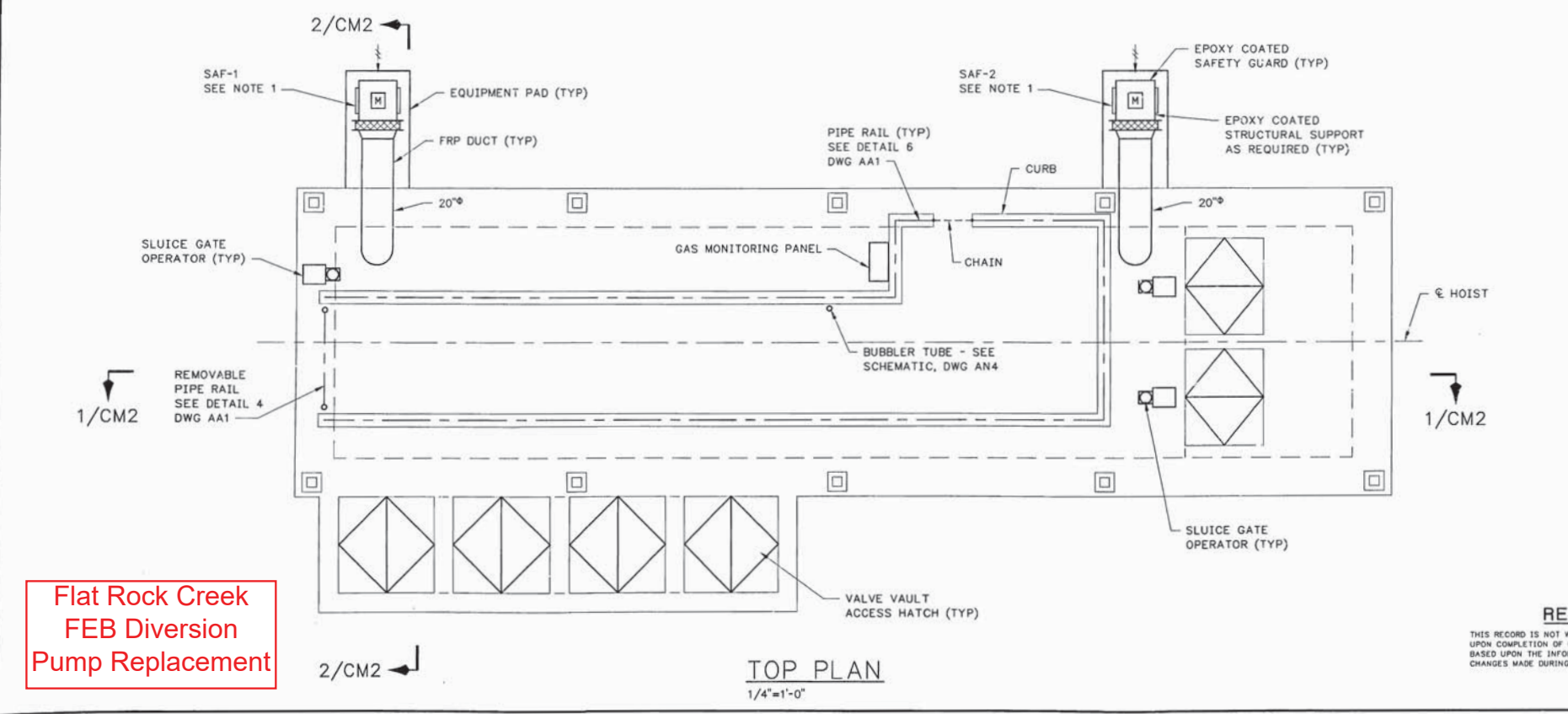
Flat Rock Creek FEB Diversion Pump Replacement

WPC 21-3
214.5A

DIVERSION PUMP SYSTEM (Plan View)



Note:
New pumps to be connected to existing power using switch rated plugs (Typ. 2) as already completed on Diversion Pumps 1, 2, 3, 4, 5 & 8 on previous projects. Reference Specification Section 214.5.7 for information on switch rated plugs to be provided.



NOTE:
1. EQUIPMENT CONTROLS SAF-1 AND SAF-2 ARE CONTROLLED FROM THE H-O-A KEY-OPERATOR SELECTOR SWITCHES LOCATED NEAR THE FANS. IN THE AUTO MODE THE FANS ARE CONTROLLED BY THE AIR MONITORING SYSTEM.

**Flat Rock Creek
FEB Diversion
Pump Replacement**



DIVERSION LIFT STATION PIPING AND EQUIPMENT	
FRC PLANS AND DETAIL	
NORTHSIDE INTERCEPTOR FLOW EQUALIZATION BASINS	
PROJECT NO. 5Y STCF 96-3	
CITY OF TULSA, OKLAHOMA PUBLIC WORKS DEPARTMENT ENGINEERING SERVICES DIVISION	
PLANS AND ESTIMATES PREPARED BY: GREELEY AND HANSEN ENGINEERS 100 SOUTH WACKER DRIVE CHICAGO, ILLINOIS 60606	

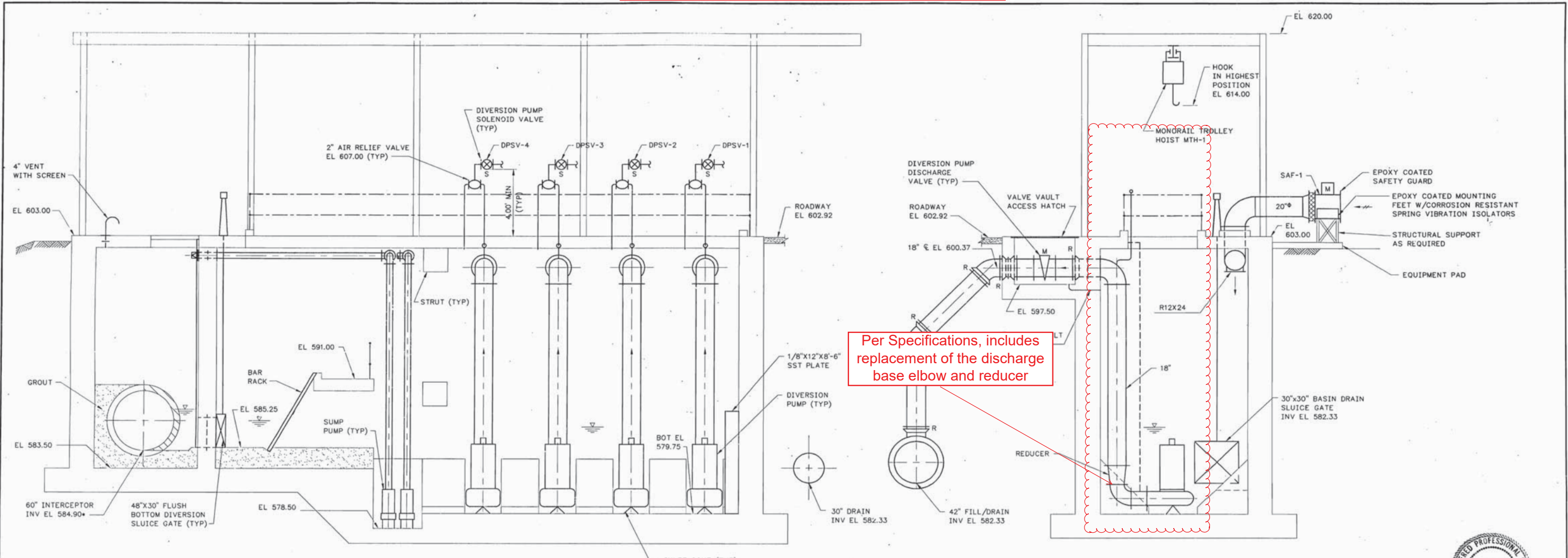
REVISION	BY	DATE	PLAN SCALE	DRAWN	JFC	APPROVED
			1/4"=1'-0"	DESIGNED	EVT	
				SURVEY		
			PROFILE SCALE	FIELD MGR		
			HORIZONTAL:	SECT. MGR		
			VERTICAL:	PROJ. MGR		
				RECOMMENDED		
				DEPUTY DIRECTOR		PUBLIC WORKS DIRECTOR
			FILE:	DRAWING: CM1		DATE: MAY 1998
			ATLAS PAGE NO.:			SHEET 59 OF 78 SHEET 11

**WPC 21-3
214.5B**

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.

FILE: FRCAM01 1:1 08/17/00 09:18 GH-A FILE: FRCAM01 1:1 06/15/98 16:25 GH-A

DIVERSION PUMP SYSTEM (Section View)



SECTION 1/CM1

SECTION 2/CM1



DIVERSION LIFT STATION
PIPING AND EQUIPMENT

FRC SECTIONS

NORTHSIDE INTERCEPTOR
FLOW EQUALIZATION BASINS
PROJECT NO. 5Y STCF 96-3

CITY OF TULSA, OKLAHOMA
PUBLIC WORKS DEPARTMENT
ENGINEERING SERVICES DIVISION

PLANS AND ESTIMATES PREPARED BY:
GREELEY AND HANSEN
ENGINEERS
100 SOUTH WACKER DRIVE
CHICAGO, ILLINOIS 60606

Flat Rock Creek
FEB Diversion
Pump Replacement

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.

REVISION	BY	DATE	PLAN SCALE	DRAWN	JFC	APPROVED
RECORD DRAWING		7-21	1/4"=1'-0"	DESIGNED	EVT	<b style="color: red; font-weight: bold;">WPC 21-3 214.5C
REVISIONS	TQB	2000		SURVEY		
				FIELD MGR		
			PROFILE SCALE	SECT. MGR		
			HORIZONTAL:	PROJ MGR		
			VERTICAL:	RECOMMENDED		
				DEPUTY DIRECTOR		PUBLIC WORKS DIRECTOR
			FILE:	DRAWING: CM2		DATE: MAY 1998
			ATLAS PAGE NO.:			SHEET 60 OF 78 SHEETS

FILE: FRCM02 1:1 08/09/00 13:55 GH-A
FILE: FRCM01 1:1 06/15/98 16:25 GH-A

Equipment Site Location



Flat Rock Creek
FEB Access

Skatenorth

E 56th St N

Soccer park portal

N Gary Ave

Cherokee Expy

75

Flat Rock
Creek FEB

Flat Rock Creek
FEB Hoist
Location

Flat Rock Cre

Flat Rock Creek FEB
Hoist Refurbishment

WPC 21-3
214.6A

Equipment Site Location



Coal Creek FEB

Coal Creek FEB Hoist Location

Coal Creek FEB Access

Coal Creek FEB Hoist Refurbishment

WPC 21-3
214.7A