

## DAFTAR PUSTAKA

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## **LAMPIRAN**

**LAMPIRAN A.** Tabel perhitungan biaya perawatan *preventive*

**Tabel 1.** Perhitungan biaya perawatan *preventive* penggantian alat pompa sentrifugal

No	Peralatan	Harga (TCM)	Frekuensi Pergantian	Frekuensi Pergantian dalam 10 Tahun (n)	Rumus	Total Harga alat Dalam 10 Tahun (TMC)
1	Impeller	\$8,275.00	6 Bulan	20	TMC = TCM x n	\$165,500.00
2	Bearing	\$8,530.00	4 Bulan	30		\$255,900.00
3	Shaft	\$1,667.00	2 Tahun	5		\$8,335.00
4	Casing	\$16,000.00	3 Tahun	3		\$48,000.00
5	Packing	\$1,828.00	1 Tahun	10		\$18,280.00
6	Komponen Kecil	\$146.00	3 Bulan	40		\$5,840.00
Total Pengeluaran						\$501,855.00

**Tabel 2.** Perhitungan biaya perawatan *preventive* penggantian alat pompa torak 2 silinder

No	Peralatan	Harga (TCM)	Frekuensi Pergantian	Frekuensi Pergantian dalam 10 Tahun (n)	Rumus	Total Harga alat Dalam 10 Tahun (TMC)
1	Piston x 2 Silinder	\$34,000.00	4 Tahun	2	TMC = TCM x n	\$68,000.00
2	Batang Piston x 2 Silinder	\$6,000.00	2 Tahun	5		\$30,000.00
3	Packing x 2 Silinder	\$8,420.00	1 Tahun	10		\$84,200.00
4	Silinder x 2 Silinder	\$43,200.00	3 Tahun	3		\$129,600.00
5	Seal/Ring Karet x 2 Silinder	\$1,980.00	3 Bulan	40		\$79,200.00
6	Komponen Kecil	\$95.00	3 Bulan	40		\$3,800.00
Total Pengeluaran						\$394,800.00

**Tabel 2.** Perhitungan biaya perawatan *preventive* penggantian alat pompa torak 3 silinder

No	Peralatan	Harga	Frekuensi Pergantian	Frekuensi Pergantian dalam 10 Tahun	Rumus	Total Harga alat Dalam 10 Tahun
1	Piston x 3 Silinder	\$27,000.00	4 Tahun	2	TMC = TCM x n	\$54,000.00
2	Batang Piston x 3 Silinder	\$4,600.00	2 Tahun	5		\$23,000.00
3	Packing x 3 Silinder	\$6,920.00	1 Tahun	10		\$69,200.00
4	Silinder x 3 Silinder	\$38,200.00	3 Tahun	3		\$114,600.00
5	Seal/Ring Karet x 3 Silinder	\$1,760.00	3 Bulan	40		\$70,400.00
6	Komponen Kecil	\$95.00	3 Bulan	40		\$3,800.00
Total Pengeluaran						\$335,000.00

## LAMPIRAN B. Spesifikasi Pompa

**Tabel 1.** Spesifikasi pompa sentrifugal 8x10:32

<b>Type Pompa : GIW LSA 8x10:32</b>	
Series	LSA Expanded
Vane Diameter	806 mm
Frame Size	3F
Free Passage	86 x 109 mm
Voltage	440 volt
Suction Diameter	254 mm
Discharge Diameter	203.2 mm
Seal Type	K, F, M

**Tabel 2.** Spesifikasi pompa sentrifugal 10x12:32

<b>Type Pompa : GIW LSA 10x12:32</b>	
Series	LSA Expanded
Vane Diameter	806 mm
Frame Size	E18
Free Passage	106 x 165 mm
Voltage	440 volt
Suction Diameter	254 mm
Discharge Diameter	304.8 mm
Seal Type	K, F, M

**Tabel 3.** Spesifikasi pompa sentrifugal 10x12:36

<b>Type Pompa : GIW LSA 10x12:36</b>	
Series	LSA Expanded
Vane Diameter	914 mm
Frame Size	E 11A
Free Passage	88 x 150 mm
Voltage	440 volt
Suction Diameter	254 mm
Discharge Diameter	304.8 mm
Seal Type	K, F, M

**Tabel 4.** Spesifikasi pompa torak 2 silinder

Pompa : Geho PD Pump 2 Cylinder	
Cylinder	2
Cylinder Diameter	1190 mm
Stroke Length	1700 mm
Voltage	440 volt
Capacity	2800 - 3000 gpm
Load Speed	180 rpm
Pump Efficiency	98%

**Tabel 5.** Spesifikasi pompa torak 3 silinder

Pompa : Geho PD Pump 3 Cylinder	
Cylinder	3
Cylinder Diameter	930 mm
Stroke Length	1420 mm
Voltage	440 volt
Capacity	2800 - 3000 gpm
Load Speed	240 rpm
Pump Efficiency	98%

## LAMPIRAN C. Harga Komponen Pompa

### Gambar 1. Pompa Sentrifugal



GIW Industries, Inc.  
5000 Wrightsboro Road  
Grovetown, Georgia 30813-2842, USA  
Telephone +1-706-863-1011  
Fax +1-706-863-5637  
www.giwindustries.com

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**ROCK  
SOLID  
SOLUTIONS™**

#### CENTRIFUGAL PUMP LSA 8x10 32" MATERIAL TAKE OFF

No.	MATERIAL NUMBER	QTY	UOI	DESCRIPTION	UNIT PRICE	TOTAL PRICE	RESERVATION NUMBER
1	40290068	1	EA	PLATE, SUCTION 10ME/RV32, SUIT MODEL 8 X 10 LSA32/25 EFFLUENT RECYCLE PUMP . CATEGORIZED RESTRICTED (NPIK)	3416.49	3416.49	7324781
2	40286348	1	EA	CARTRIDGE, BEARING . CATEGORIZED RESTRICTED (NPIK)	8530.9	8530.9	7324781
3	40339153	1	EA	PEDESTAL ASSEMBLY, SUIT EFFLUENT RECYCLE PUMP	16471.01	16471.01	7324781
4	40271089	1	EA	SLEEVE, SHAFT . CATEGORIZED RESTRICTED (NPIK)	478.65	478.65	7324781
5	40271088	1	EA	GASKET SNAP RING, CATEGORIZED RESTRICTED (NPIK)	195.67	195.67	7324781
6	40271086	1	EA	SHELL, GASITE 28G HIGH CHROME ALLOY, CATEGORIZED RESTRICTED (NPIK)	15098.56	15098.56	7324781
7	40292968	2	EA	IMPELLER, PUMP GASITE 28G HIGH CHROME ALLOY SUIT GIW PUMP MODEL 8X10 LSA32/25 WEIGHT 333 KG/UNIT	8275.27	16550.54	7324781
8	40271084	1	EA	STUFFING BOX 8X10LSA32/25 PUMP . CATEGORIZED RESTRICTED (NPIK)	2302.02	2302.02	7324781
9	40339155	1	EA	CASING, STRAP . CATEGORIZED RESTRICTED (NPIK)	16009.02	16009.02	7324781
10	40271085	1	EA	LINER, PUMP SUCTION, CATEGORIZED RESTRICTED (NPIK)	3382.39	3382.39	7324781
11	40286349	2	EA	SHAFT, PUMP 3-15/16" MODEL 6X8 LSA25 . CATEGORIZED RESTRICTED (NPIK)	1667.07	3334.14	7324781
12	40339155	3	EA	STRAP, RETAINING BEARING HOUSING, 3-15/16" SUIT EFFLUENT RECYCLE PUMP . CATEGORIZED RESTRICTED (NPIK)	62.11	186.33	7324781
13	40286527	1	EA	SCREW AND NUT ASSEMBLY, ADJUSTING S/NO. 5012-6105	489.18	489.18	7324781
14	40286527	1	EA	SCREW AND NUT ASSEMBLYS/NO. 5012-6105	489.18	489.18	7324781
15	40339158	1	EA	FASTENER KIT SUIT EFFLUENT RECYCLE PUMP . CATEGORIZED RESTRICTED (NPIK)	626.53	626.53	7324781
<b>GRAND TOTAL</b>					<b>\$</b>	<b>87,560.61</b>	



Gambar 2. Pompa Torak 2 Silinder





342-223-349 PD PISTON PUMP PART PRICE LIST

NO	DESCRIPTION	QUANTITY	UOI	PRICE/UNIT	TOTAL PRICE
1	SUCTION VALVE;31245268, CATEGORIZED RESTRICTED (NPIK)	1	EA	112.32	112.32
2	DISCHARGE VALVE;31254689, CATEGORIZED RESTRICTED (NPIK)	1	EA	112.32	112.32
3	CYLINDER;31214268, CATEGORIZED RESTRICTED (NPIK)	2	EA	21611.05	43222.1
4	PISTON;31246852, CATEGORIZED RESTRICTED (NPIK)	2	EA	16957.32	33914.64
5	CRANK;31256978, CATEGORIZED RESTRICTED (NPIK)	1	EA	195.67	195.67
6	PISTON ROD;31222546, CATEGORIZED RESTRICTED (NPIK)	2	EA	3041	6082
7	CONNECTING ROD;31264458, CATEGORIZED RESTRICTED (NPIK)	1	EA	2453.89	2453.89
8	STRAINER;31245264, CATEGORIZED RESTRICTED (NPIK)	1	EA	978.08	978.08
9	AIR VESSEL;3125698, CATEGORIZED RESTRICTED (NPIK)	1	EA	1667.87	1667.87
10	CYLINDER LINER;31264258, HIGH CHROME ALLOY, CATEGORIZED RESTRICTED (NPIK)	2	EA	7058.76	14117.52
11	SEAL;31212635, CATEGORIZED RESTRICTED (NPIK)	2	EA	994.64	1989.28
12	SHAFT;31232632, HIGH CHROME ALLOY, CATEGORIZED RESTRICTED (NPIK)	1	EA	3746.03	3746.03
13	PACKING;31312465, CATEGORIZED RESTRICTED (NPIK)	2	EA	4215.25	8430.5
<b>TOTAL</b>				<b>\$</b>	<b>117,022.22</b>

0000.000 / 10.11 / Subject to technical modifications.

Gambar 3. Pompa Torak 3 Silinder

 PD Slurry Pumps		Excellent Minerals Solutions 			
<b>438-846-31 PD PISTON PUMP PART PRICE LIST</b>					
NO	DESCRIPTION	QUANTITY	UOI	PRICE/UNIT	TOTAL PRICE
1	STRAINER;30335468, CATEGORIZED RESTRICTED (NPIK)	1	EA	978.08	978.08
2	AIR VESSEL;30326795, CATEGORIZED RESTRICTED (NPIK)	1	EA	1667.87	1667.87
3	CYLINDER LINER;30312648, HIGH STEEL, CATEGORIZED RESTRICTED (NPIK)	3	EA	5112.21	15336.63
4	SEAL;30316489, CATEGORIZED RESTRICTED (NPIK)	3	EA	586.32	1788.96
5	SHAFT;30323156, HIGH CHROME ALLOY, CATEGORIZED RESTRICTED (NPIK)	3	EA	1232.23	3696.69
6	PACKING;3032645, CATEGORIZED RESTRICTED (NPIK)	2	EA	3460.06	6920.12
7	SUCTION VALVE;30364568, CATEGORIZED RESTRICTED (NPIK)	1	EA	93.23	93.23
8	DISCHARGE VALV;30351268, CATEGORIZED RESTRICTED (NPIK)	1	EA	93.23	93.23
9	CYLINDER;30348695, CATEGORIZED RESTRICTED (NPIK)	3	EA	12733.31	38199.93
10	PISTON;30346258, CATEGORIZED RESTRICTED (NPIK)	3	EA	9238.34	27715.02
11	CRANK;30345876, CATEGORIZED RESTRICTED (NPIK)	1	EA	167.32	167.32
12	PISTON ROD;30316894, CATEGORIZED RESTRICTED (NPIK)	3	EA	1534.09	4602.27
13	CONNECTING ROD;30342658, CATEGORIZED RESTRICTED (NPIK)	3	EA	872.34	2617.02
<b>TOTAL</b>				<b>\$</b>	<b>108,846.87</b>

0000.000 / 10.11 / Subject to technical modifications.

LAMPIRAN D. Koefisien Gesek Pipa



CONCENTRATING DIVISION

CONCENTRATING TECHNICAL SERVICES DEPT. - ENGINEERING



Fitting	Suction	Disch. 1	Disch. 2	Total	Coef. Total
Elbow 90	0	1	9	10	4.2
Elbow 45	0	3	2	5	1.1
Valve	1	0	0	1	0.11
Check Valve	0	0	0	0	0
Reducer	1	1	0	2	1.4
Tee	0	1	0	1	0.9
Inlet	0	0	0	0	0

Jenis pipa	C
Old Seamless Steel	80 - 100 100
New Seamless Steel	120 - 130 130

Koef. Gesek Inlet

I	0.5
II	0.25
III	0.06 r kecil 0.005 r besar
IV	0.56
v	3 Ø tajam

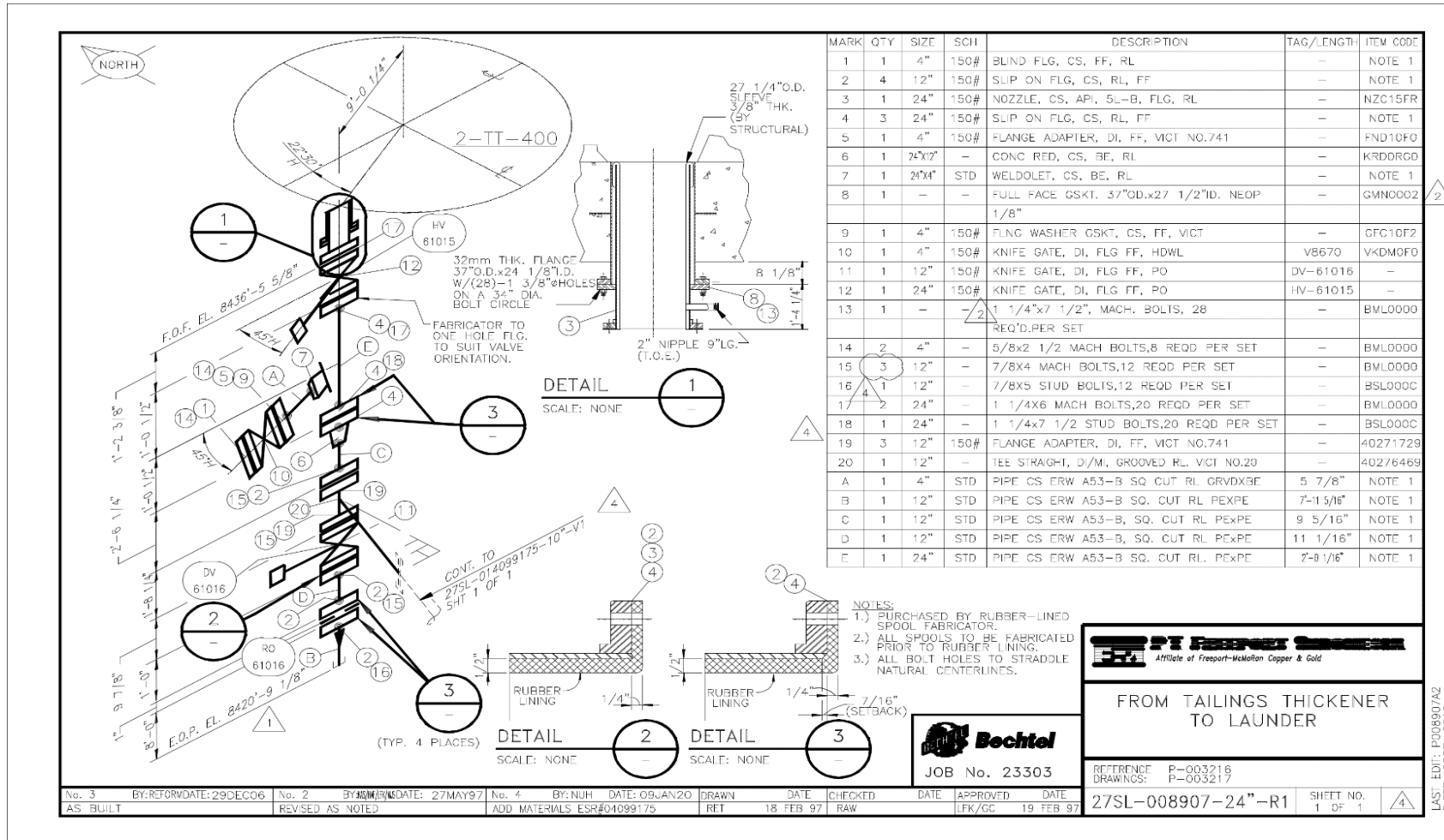
Koef. Gesek Reducer

Ø	D2/D1 = 1.5	D2/D1 = 3
20	0.4	0.4
30	0.7	0.6
40	0.9	0.8
50	1.1	0.95
60	1.2	1.1

Fitting	1/2"	3/4"	1	1-1/4"	1-1/2"	2"	2-1/2" to 3"	4"	4(L)	6"	6(L)	8" to 10"	8(L)	10(L)	12" to 18"	12(L)	14(L)	16(L)	18" to 24"	18(L)	20(L)	24(L)
Gate Valves	0.22	0.2	0.18	0.18	0.15	0.15	0.14	0.12	2.68	0.12	4.04	0.11	5.32	6.68	0.1	7.96	8.75	10	0.1	16.9	12.5	15.1
Globe Valves	9.2	8.5	7.8	7.5	7.1	6.5	6.1	5.8	114	5.1	172	4.8	226	284	4.4	338	372	425	4.1	478	533	641
Angle Valves	4.05	3.75	3.45	3.3	3.15	2.85	2.7	2.55	50.3	2.25	75.3	2.1	99.8	125	1.95	149	164	188	1.8	210	235	283
Ball Valves	0.08	0.08	0.07	0.07	0.06	0.06	0.05	0.05				0.04			0.04							
Elbow - 90	0.81	0.75	0.69	0.66	0.63	0.57	0.54	0.51	10.1	0.45	15.2	0.42	20	25.1	0.39	29.8	32.8	37.5	0.36	42.2	47	56.6
Elbow - 45	0.43	0.4	0.37	0.35	0.34	0.3	0.29	0.27	5.37	0.24	8.09	0.22	10.6	13.4	0.21	15.9	17.5	20	0.19	22.5	25.1	30.2
Elbow - 90 lr	0.43	0.4	0.37	0.35	0.34	0.3	0.29	0.27	5.37	0.24	8.09	0.22	10.6	13.4	0.21	15.9	17.5	20	0.19	22.5	25.1	30.2
Tee / Fic	0.54	0.5	0.46	0.44	0.42	0.38	0.36	0.34	6.71	0.3	10.1	0.28	13.3	16.7	0.26	19.9	21.8	25	0.24	28.1	31.4	37.7
Tee / branch	1.62	1.5	1.38	1.32	1.26	1.14	1.08	1.02	20.1	0.9	30.3	0.84	39.9	50.1	0.78	59.7	65.6	75	0.72	84.4	94.1	113
Bends r/d 1	0.54	0.5	0.46	0.44	0.42	0.38	0.36	0.34		0.3		0.28								0.24		
Bends r/d 2	0.32	0.3	0.28	0.26	0.25	0.23	0.22	0.2		0.18		0.17								0.14		
Bends r/d 3	0.32	0.3	0.28	0.26	0.25	0.23	0.22	0.2		0.18		0.17								0.14		
Bends r/d 4	0.38	0.35	0.32	0.31	0.29	0.27	0.25	0.24		0.21		0.2								0.17		
Bends r/d 6	0.46	0.43	0.39	0.37	0.36	0.32	0.31	0.29		0.26		0.24								0.2		
Bends r/d 8	0.65	0.6	0.55	0.53	0.5	0.46	0.43	0.41		0.36		0.34								0.29		
Bends r/d 10	0.81	0.75	0.69	0.66	0.63	0.57	0.54	0.51		0.45		0.42								0.36		
Bends r/d 12	0.92	0.85	0.78	0.75	0.71	0.65	0.61	0.58		0.51		0.48								0.41		
Bends r/d 14	1.03	0.95	0.87	0.84	0.8	0.72	0.68	0.65		0.57		0.53								0.46		
Bends r/d 16	1.13	1.05	0.97	0.92	0.88	0.8	0.76	0.71		0.63		0.59								0.5		
Bends r/d 18	1.24	1.15	1.06	1.01	0.97	0.87	0.83	0.78		0.69		0.64								0.55		
Bends r/d 20	1.35	1.25	1.15	1.1	1.05	0.95	0.9	0.85		0.75		0.7								0.6		
Check Valve																						
Swing	2.7	2.5	2.3	2.2	2.1	1.9	1.8	1.7	33.6	1.5	50.5	1.4	33.3	41.8	1.3	49.7	54.7	62.5	1.2	70.3	78.4	94.3
Tilt						2.3	2.2	2		1.8		1.7			1.2					0.72		
Foot Valve																						
Hinged	2	1.9	1.7	1.7	1.7	1.4	1.4	1.3		1.1		1.1			1					0.9		
Poppet	11.3	10.5	9.7	9.3	8.8	8	7.6	7.1		6.3		5.9			5.5					5		

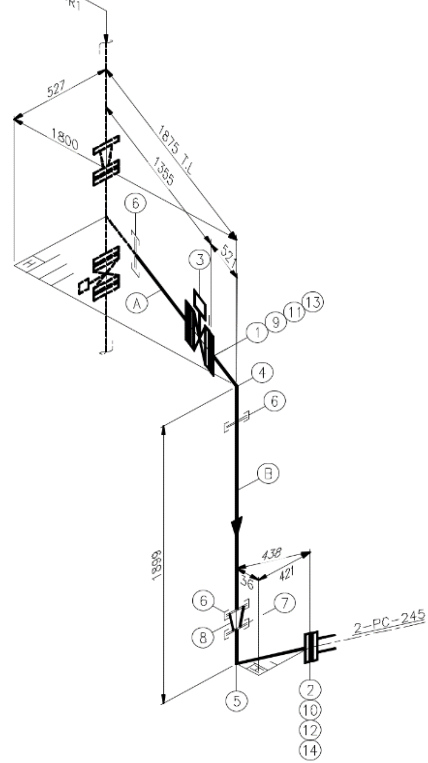
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# LAMPIRAN E. Desain Instalasi Peripaan





CONT. FROM  
27SL-008907-24-R1  
SHT 1 OF 1



**NOTES :**

1. BOLT HOLES TO STRADDLE NATURAL CENTERLINES
2. ALL DIMENSIONS ARE IN MILLIMETERS U.N.O.

**REF. DRAWINGS :**

1. P003202-B MILLSITE - TAILINGS SYSTEM 400# TAILINGS THICKENER AREA 2-TT-400 PIPING PLAN
2. P003216-B MILLSITE - TAILINGS SYSTEM 2-TT-400 FINAL TAILS PIPING PLAN

MARK	QTY	SIZE	SCH	DESCRIPTION	TAG/LENGTH	SAP/ITEM CODE
1	1	12"	150#	FLANGE ADAPTER, DI, FF, VICT NO.741		40271729
2	1	10"	150#	FLANGE ADAPTER, DI, FF, VICT NO.741		40187022
3	1	12"	-	KNIFE GATE, DI, FLG FF, PO		40325343
4	1	12"	-	ELBOW 90 DEG, 1-1/2", VICT NO.110		40300369
5	1	10"	-	ELBOW 90 DEG, 1-1/2", VICT NO.110		40391690
6	3	12"	-	CPLG, DI, LRG DIA GRVD PIPE VICT #77		40272130
7	1	10"	-	CPLG, DI, LRG DIA GRVD PIPE VICT #77		40364265
8	1	12"x10"	-	REDUCER CON, VICT NO.51		40286504
9	12	12"	-	7/8x6" HEX HEAD BOLTS,UNC, GR8, PHOSPHATE		40187022
10	12	10"	-	7/8x5" HEX HEAD BOLTS,UNC, GR8, PHOSPHATE		40187022
11	12	12"	-	NUT HEX, 7/8 NC, GR8		40001762
12	12	10"	-	NUT HEX, 7/8 NC, GR8		40001762
13	24	12"	-	WASHER, FLAT		40001758
14	24	10"	-	WASHER, FLAT		40001758
A	1	12"	STD	PIPE CS ERW A53-B SQ. CUT RL GRVDXPE	843	40327689
B	1	12"	STD	PIPE CS ERW A53-B SQ. CUT RL GRVDXPE	762	40325910

**ISSUED FOR APPROVAL**

**MILLSITE  
TAILINGS SYSTEM  
400# TAILINGS THICKENER AREA  
2-TT-400 ISOMETRIC  
SHT 1 OF 1**

DATE SUB : 06/10/18	DRAWN BY : NLS	DATE : 06/10/18
FILE NAME : P014099175001A	DESIGNED BY : NLS	DATE : 06/10/18
EST BY : NLS	SOLE NTS	No. 27SL-014099175-10-R1



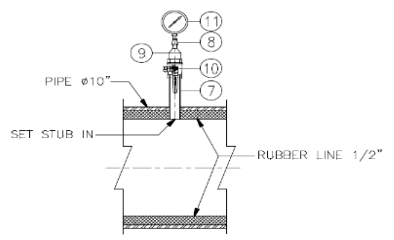
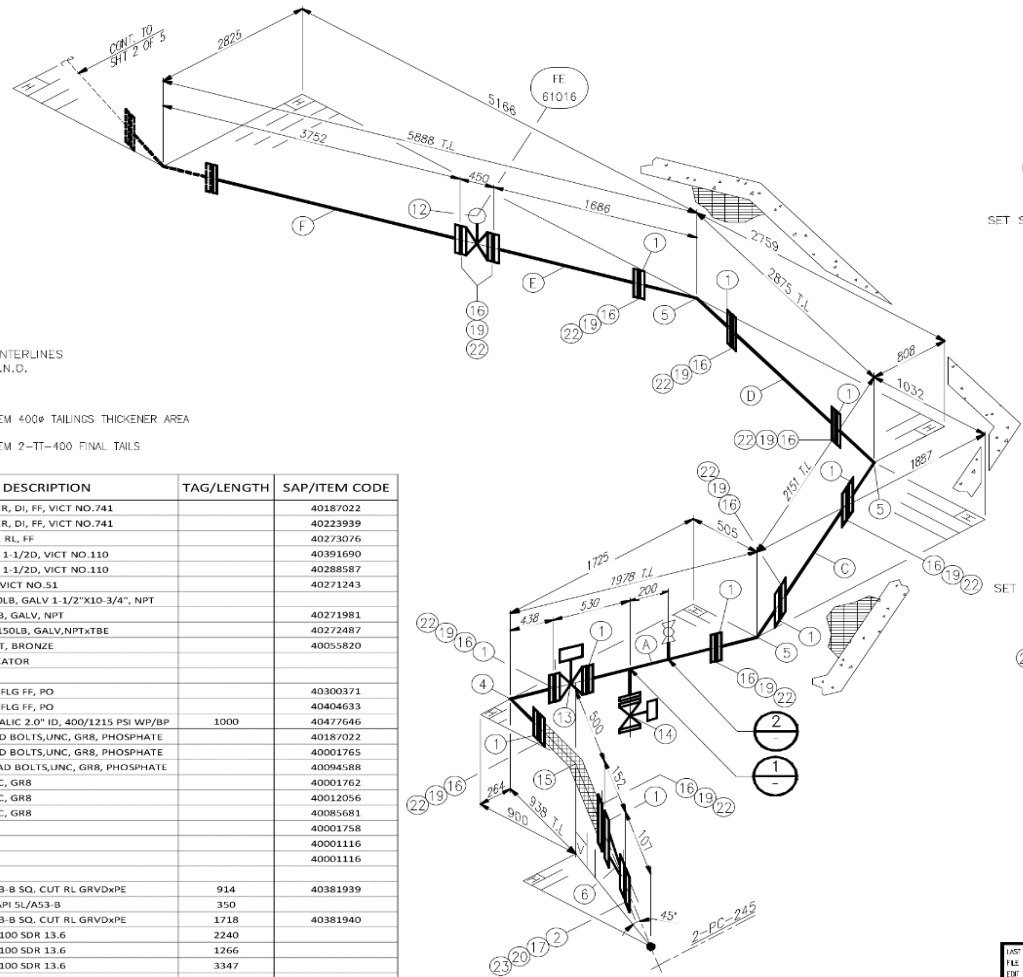
**NOTES :**

1. BOLT HOLES TO STRADDLE NATURAL CENTERLINES
2. ALL DIMENSIONS ARE IN MILLIMETERS U.N.O.

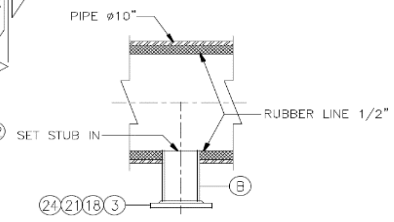
**REF. DRAWINGS :**

1. P003202-B MILLSITE - TAILINGS SYSTEM 400# TAILINGS THICKENER AREA 2-TT-400 PIPING PLAN
2. P003216-B MILLSITE - TAILINGS SYSTEM 2-TT-400 FINAL TAILS PIPING PLAN

MARK	QTY	SIZE	SCH	DESCRIPTION	TAG/LENGTH	SAP/ITEM CODE
1	10	10"	150#	FLANGE ADAPTER, DI, FF, VICT NO.741		40187022
2	1	8"	150#	FLANGE ADAPTER, DI, FF, VICT NO.741		40223939
3	1	4"	150#	SLIP ON FLG, CS, RL, FF		40273076
4	1	10"	-	ELBOW 90 DEG, 1-1/2D, VICT NO.110		40391690
5	3	10"	-	ELBOW 45 DEG, 1-1/2D, VICT NO.110		40288587
6	1	10"x8"	-	REDUCER CON, VICT NO.51		40271243
7	1	2"	-	PIPE NIPPLE, 150LB, GALV 1-1/2"x10-3/4", NPT		
8	1	1/2"x1/4"	-	REDUCER, 150LB, GALV, NPT		40271981
9	1	2"x1/2"	-	SWAGE NIPPLE,150LB, GALV,NPTxTBE		40272487
10	1	2"	150#	VALVE BALL, NPT, BRONZE		40055820
11	1	1/4"	-	PRESSURE INDICATOR		
12	1	10"	-	FLOWMETER		
13	1	10"	150#	KNIFE GATE, DI, FLG FF, PO		40300371
14	1	4"	150#	KNIFE GATE, DI, FLG FF, PO		40404633
15	1	10"	-	HOSE, NONMETALIC 2.0" ID, 400/1215 PSI WP/BP	1000	40477646
16	144	10"	-	7/8x5" HEX HEAD BOLTS,UNC, GR8, PHOSPHATE		40187022
17	8	8"	-	3/4x4" HEX HEAD BOLTS,UNC, GR8, PHOSPHATE		40001765
18	8	4"	-	5/8x4" HEX HEAD BOLTS,UNC, GR8, PHOSPHATE		40094588
19	144	10"	-	NUT HEX, 7/8 NC, GR8		40001762
20	8	8"	-	NUT HEX, 3/4 NC, GR8		40012056
21	8	4"	-	NUT HEX, 5/8 NC, GR8		40085681
22	288	10"	-	WASHER, FLAT		40001758
23	16	8"	-	WASHER, FLAT		40001116
24	16	4"	-	WASHER, FLAT		40001116
A	1	10"	STD	PIPE CS ERW A53-B SQ. CUT RL GRVxPE	914	40381939
B	1	4"	STD	PIPE, ERW, CS, API 5L/A53-B	350	
C	1	4"	STD	PIPE CS ERW A53-B SQ. CUT RL GRVxPE	1718	40381940
D	1	10"	STD	PIPE, HDPE, PE 100 SDR 13.6	2240	
E	1	10"	STD	PIPE, HDPE, PE 100 SDR 13.6	1266	
F	1	10"	STD	PIPE, HDPE, PE 100 SDR 13.6	3347	



**DETAIL 2**  
SCALE: NONE



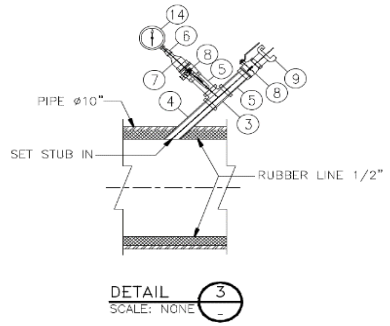
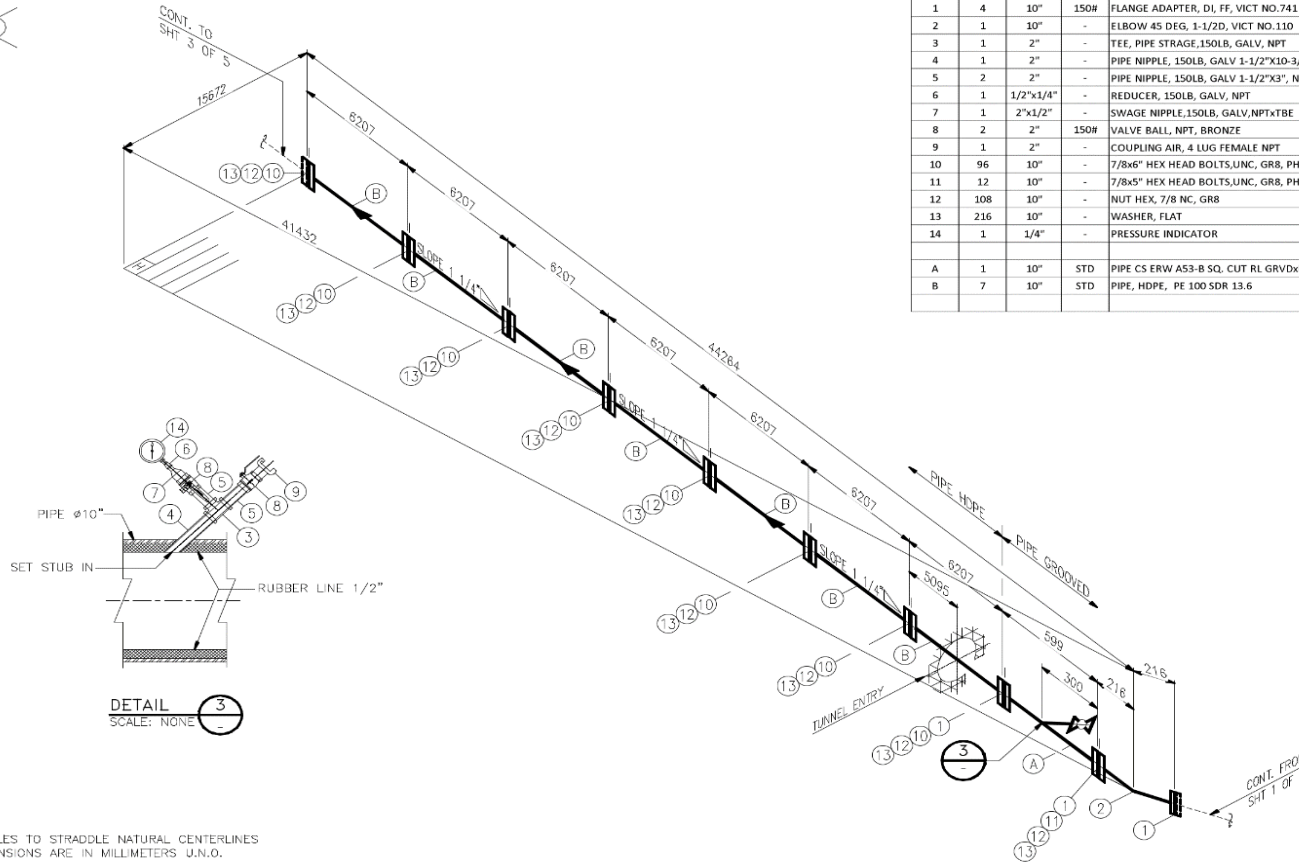
**DETAIL 1**  
SCALE: NONE

**ISSUED FOR APPROVAL**

MILLSITE  
TAILING SYSTEM  
400# TAILINGS THICKENER AREA  
2-TT-400 ISOMETRIC  
SHT 1 OF 5

LAST DATE : 08/10/19	CHECKED BY: HES	DATE: 08/10/19	DRAWN: HES	DATE: 08/10/19
FILE NAME : P021099175001A	APPROVED BY: [Signature]	DATE: 08/10/19	DESIGNED: HES	DATE: 08/10/19
DATE OF : N/A	SCALE: N/S	NO: 27SL-024059175-10-H1	[Warning Triangle]	

CONCENTRATING ENGINEERING



**NOTES :**

1. BOLT HOLES TO STRADDLE NATURAL CENTERLINES
2. ALL DIMENSIONS ARE IN MILLIMETERS U.N.O.

**REF. DRAWINGS :**

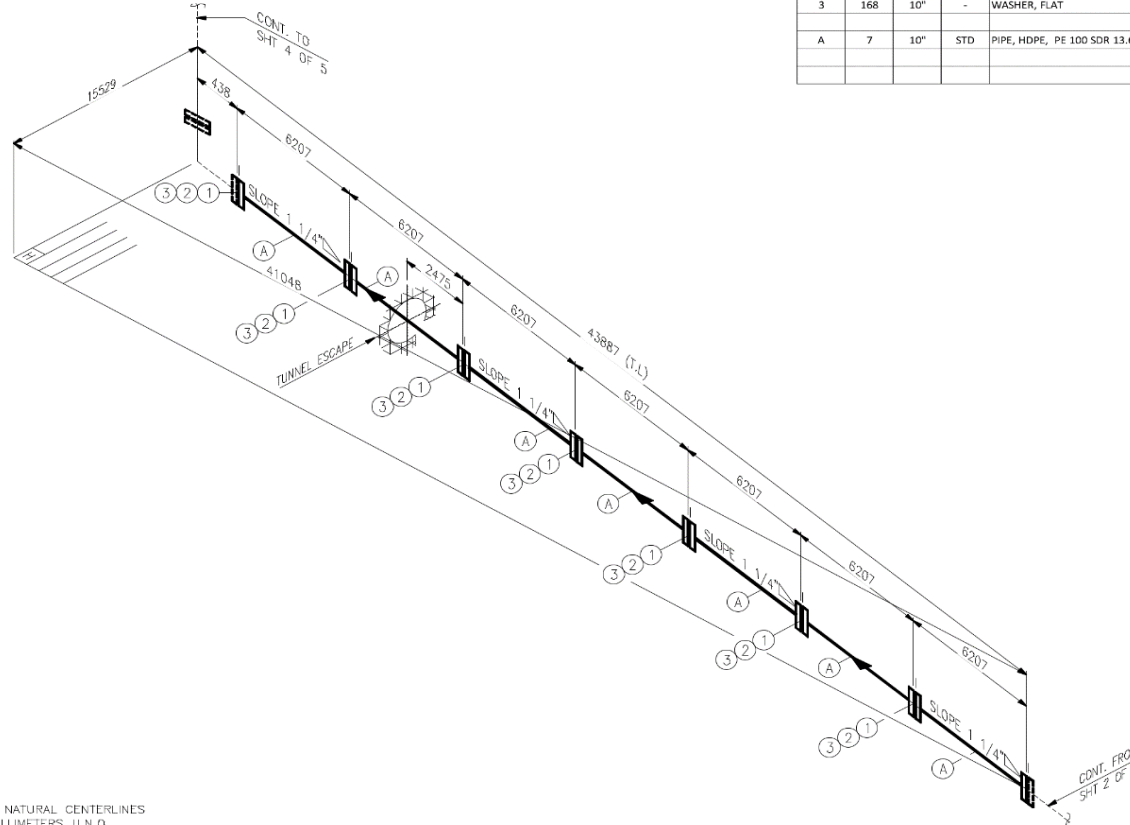
1. P003202-B MILLSITE - TAILINGS SYSTEM 400# TAILINGS THICKENER AREA 2-TT-400 PIPING PLAN
2. P003216-B MILLSITE - TAILINGS SYSTEM 2-TT-400 FINAL TAILS PIPING PLAN

MARK	QTY	SIZE	SCH	DESCRIPTION	TAG/LENGTH	SAP/ITEM CODE
1	4	10"	150#	FLANGE ADAPTER, DI, FF, VICT NO.741		40187022
2	1	10"	-	ELBOW 45 DEG, 1-1/2D, VICT NO.110		40288587
3	1	2"	-	TEE, PIPE STRAGE,150LB, GALV, NPT		40288587
4	1	2"	-	PIPE NIPPLE, 150LB, GALV 1-1/2"x10-3/4", NPT		
5	2	2"	-	PIPE NIPPLE, 150LB, GALV 1-1/2"x3", NPT		40271981
6	1	1/2"x1/4"	-	REDUCER, 150LB, GALV, NPT		40271981
7	1	2"x1/2"	-	SWAGE NIPPLE,150LB, GALV,NPTxBE		40272487
8	2	2"	150#	VALVE BALL, NPT, BRONZE		40055820
9	1	2"	-	COUPLING AIR, 4 LUG FEMALE NPT		40023649
10	96	10"	-	7/8x6" HEX HEAD BOLTS,UNC, GR8, PHOSPHATE		40187022
11	12	10"	-	7/8x5" HEX HEAD BOLTS,UNC, GR8, PHOSPHATE		40187022
12	108	10"	-	NUT HEX, 7/8 NC, GR8		40001762
13	216	10"	-	WASHER, FLAT		40001758
14	1	1/4"	-	PRESSURE INDICATOR		
A	1	10"	STD	PIPE CS ERW A53-B SQ. CUT RL GRVDxPE	599	40271308
B	7	10"	STD	PIPE, HDPE, PE 100 SDR 13.6	6000	

**ISSUED FOR APPROVAL**

**MILLSITE  
TAILING SYSTEM  
400# TAILINGS THICKENER AREA  
2-TT-400 ISOMETRIC  
SHT 2 OF 5**

LAST EDIT : 08/10/19	DESIGNED : 08/20/19	DRAWN : M.H.	CHECKED : M.H.
FILE NAME : P003216-02.dwg	APPROVED BY : 08/20/19	DESIGNED : M.H.	CHECKED : M.H.
EST BY : M.H.	SCALE :	No. :	
Consulting Engineering	NTS	775L-074089175-10-H1	



MARK	QTY	SIZE	SCH	DESCRIPTION	TAG/LENGTH	SAP/ITEM CODE
1	84	10"	-	7/8x6" HEX HEAD BOLTS,UNC, GR8, PHOSPHATE		40187022
2	84	10"	-	NUT HEX, 7/8 NC, GR8		40001762
3	168	10"	-	WASHER, FLAT		40001758
A	7	10"	STD	PIPE, HDPE, PE 100 SDR 13.6	6000	

**NOTES :**

1. BOLT HOLES TO STRADDLE NATURAL CENTERLINES
2. ALL DIMENSIONS ARE IN MILLIMETERS U.N.O.

**REF. DRAWINGS :**

1. P003202-B MILLSITE - TAILINGS SYSTEM 400# TAILINGS THICKENER AREA 2-TT-400 PIPING PLAN
2. P003216-B MILLSITE - TAILINGS SYSTEM 2-TT-400 FINAL TAILS PIPING PLAN

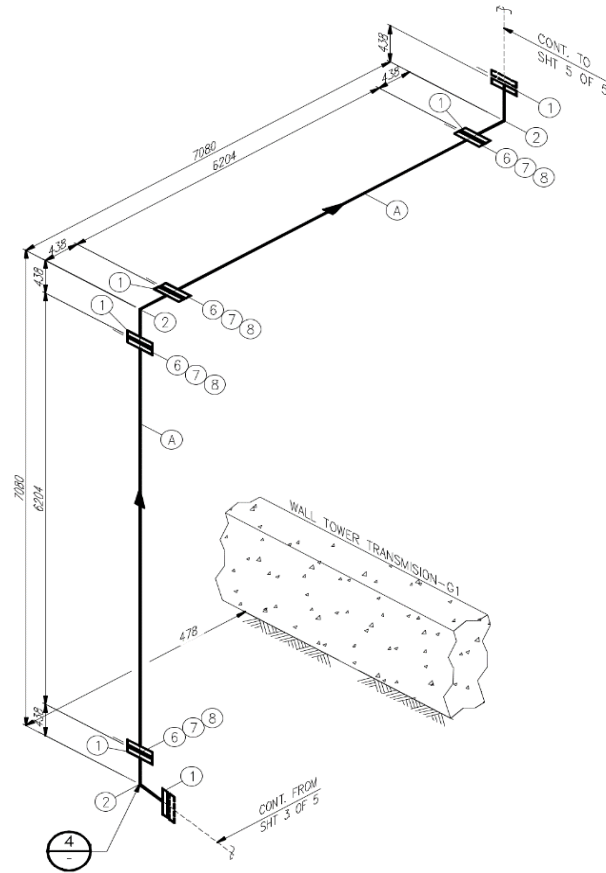
ISSUED FOR APPROVAL

**PROFESSIONAL ENGINEER**  
 Office of Professional Control & Regulation  
 MILLSITE  
 TAILING SYSTEM  
 400# TAILINGS THICKENER AREA  
 2-TT-400 ISOMETRIC  
 SHIT 3 OF 5

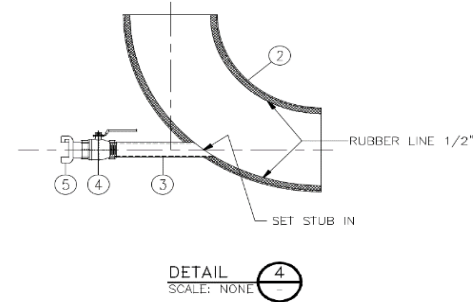
LAST TIME : 09/10/19  
 FILE NAME : P00400175000A  
 LIST BY : NTH  
 Engineering

CHECKED BY: NTH  
 APPROVED BY: NTH  
 SEAL: NTH  
 No. 27SL-024089175-10-HI





MARK	QTY	SIZE	SCH	DESCRIPTION	TAG/LENGTH	SAP/ITEM CODE
1	6	10"	150#	FLANGE ADAPTER, DI, FF, VICT NO.741		40223940
2	3	10"	-	ELBOW 90 DEG, 1-1/2D, VICT NO.110		40391690
3	2	1-1/2"	-	PIPE NIPPLE, 150LB, GALV 1-1/2"X10-3/4", NPT		
4	1	2"	150#	VALVE BALL, NPT, BRONZE		40055820
5	1	2"	-	COUPLING AIR, 4 LUG FEMALE NPT		40023649
6	48	10"	-	7/8x6" HEX HEAD BOLTS,UNC, GR8, PHOSPHATE		40187022
7	48	10"	-	NUT HEX, 7/8 NC, GR8		40001762
8	96	10"	-	WASHER, FLAT		40001758
A	2	10"	STD	PIPE, HDPE, PE 100 SDR 13.6	6000	



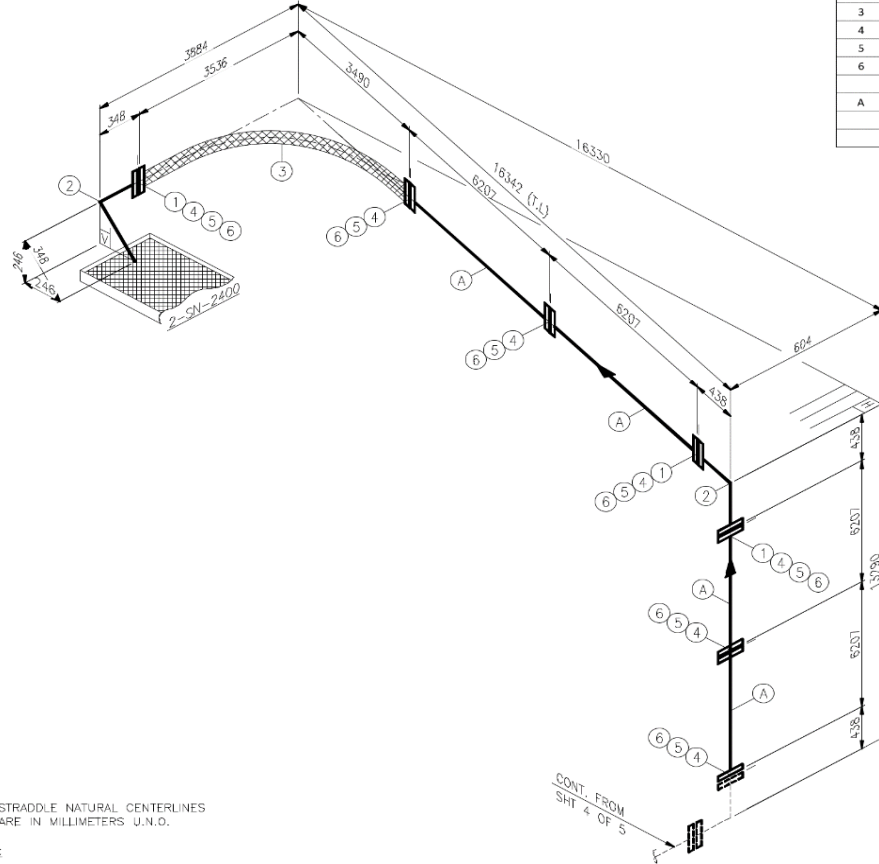
**NOTES :**  
 1. BOLT HOLES TO STRADDLE NATURAL CENTERLINES  
 2. ALL DIMENSIONS ARE IN MILLIMETERS U.N.O.

**REF. DRAWINGS :**  
 1. P003202-B MILLSITE - TAILINGS SYSTEM 400# TAILINGS THICKENER AREA 2-TT-400 PIPING PLAN  
 2. P003216-B MILLSITE - TAILINGS SYSTEM 2-TT-400 FINAL TALS PIPING PLAN

ISSUED FOR APPROVAL  
**CONCENTRICITY ENGINEERING**  
 Office of Process-Intensive Support & Care  
 MILLSITE  
 TAILING SYSTEM  
 400# TAILINGS THICKENER AREA  
 2-TT-400 ISOMETRIC  
 SHT 4 OF 5

LAST EDIT : 09/10/19  
 FILE NAME : H2210091.DWG  
 DWF BY : NHA  
 Concentricity Engineering

DRAWN BY : JLS/MSD  
 CHECKED BY : JLS/MSD  
 APPROVED BY : JLS/MSD  
 DATE : 09/08/19  
 SCALE : NTS  
 No. : 775L-024099175-10-M1



MARK	QTY	SIZE	SCH	DESCRIPTION	TAG/LENGTH	SAP/ITEM CODE
1	3	10"	150#	FLANGE ADAPTER, DI, FF, VICT NO.741		40223940
2	2	10"	-	ELBOW 90 DEG, 1-1/2D, VICT NO.110		40391690
3	1	10"	-	HOSE, NONMETALIC 2.0" ID, 400/1215 PSI WP/BP	6000	40273977
4	84	10"	-	7/8x6" HEX HEAD BOLTS,UNC, GR8, PHOSPHATE		40187022
5	84	10"	-	NUT HEX, 7/8 NC, GR8		40001762
6	168	10"	-	WASHER, FLAT		40001758
A	4	10"	STD	PIPE, HDPE, PE 100 SDR 13.6	6000	

NOTES :  
 1. BOLT HOLES TO STRADDLE NATURAL CENTERLINES  
 2. ALL DIMENSIONS ARE IN MILLIMETERS U.N.D.

- REF. DRAWINGS :
- P003202-B MILLSITE - TAILINGS SYSTEM 400# TAILINGS THICKENER AREA 2-TT-400 PIPING PLAN
  - P003216-B MILLSITE - TAILINGS SYSTEM 2-TT-400 FINAL TAILS PIPING PLAN

ISSUED FOR APPROVAL  
**Process Control**  
 Office of Process-Industry Control & Opt.  
 MILLSITE  
 TAILINGS SYSTEM  
 400# TAILINGS THICKENER AREA  
 2-TT-400 ISOMETRIC  
 SHT 5 OF 5

DATE: 06/10/16	DESIGNED: [Signature]	REVIEW: [Signature]
FILE NAME: P02499915A05A	APPROVED BY: [Signature]	DESIGNED BY: [Signature]
EST BY: NLI	SCALE: NTS	No. 273L-024089175-10"-H1

No. 7	BY: [Signature]	DATE: [Date]	No. 6	BY: [Signature]	DATE: [Date]	No. 5	BY: [Signature]	DATE: [Date]	No. 4	BY: [Signature]	DATE: [Date]	No. 3	BY: [Signature]	DATE: [Date]	No. 2	BY: [Signature]	DATE: [Date]	No. 1	BY: [Signature]	DATE: [Date]
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## Dokumentasi Instalasi

