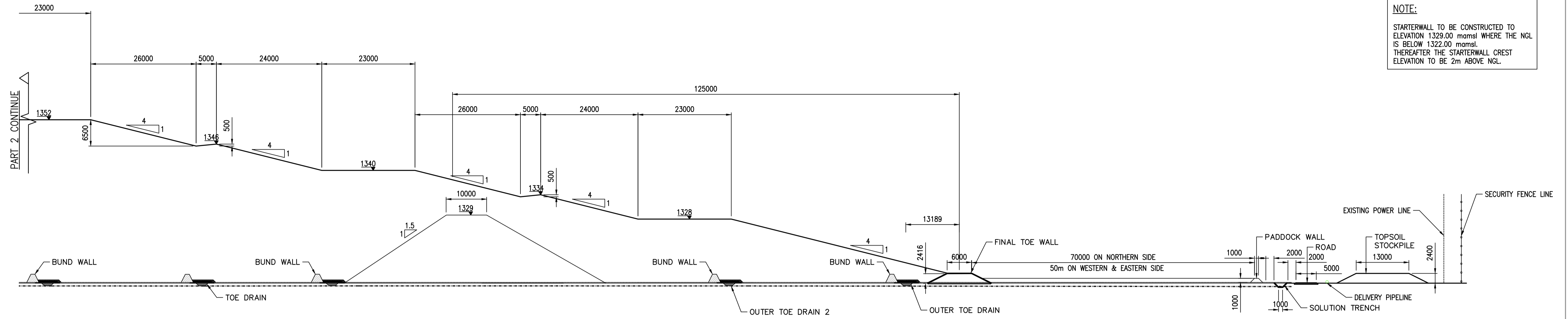
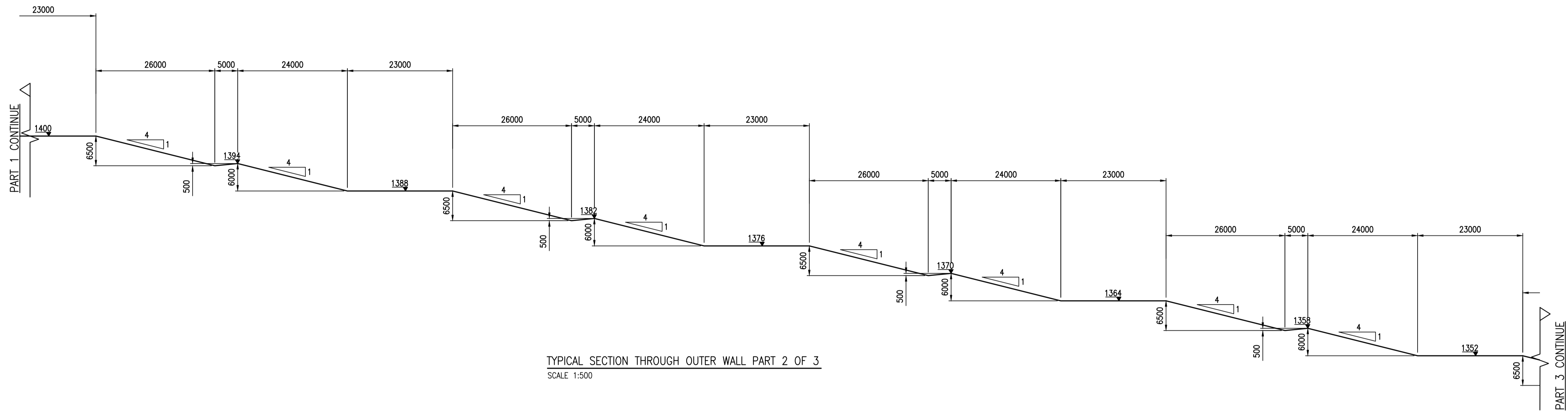


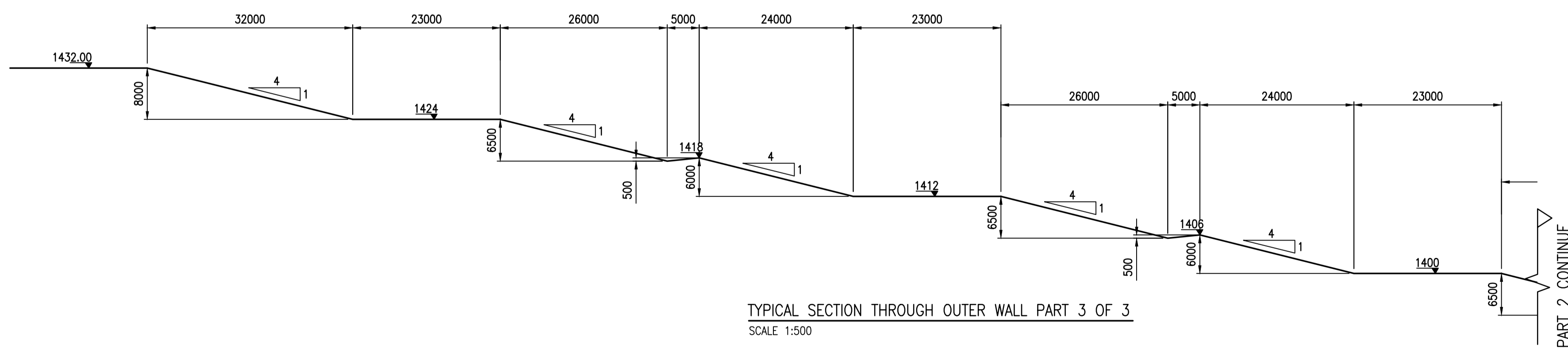
**NOTE:**  
 STARTERWALL TO BE CONSTRUCTED TO ELEVATION 1329.00 mmsl WHERE THE NGL IS BELOW 1322.00 mmsl. THEREAFTER THE STARTERWALL CREST ELEVATION TO BE 2m ABOVE NGL.



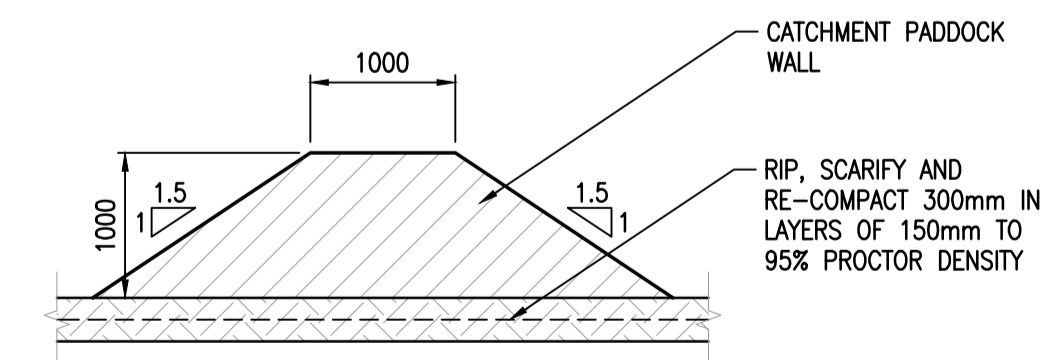
TYPICAL SECTION THROUGH OUTER WALL PART 1 OF 3  
 SCALE 1:500



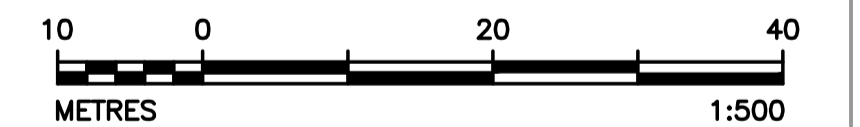
TYPICAL SECTION THROUGH OUTER WALL PART 2 OF 3  
 SCALE 1:500



TYPICAL SECTION THROUGH OUTER WALL PART 3 OF 3  
 SCALE 1:500



TYPICAL SECTION OF CATCHMENT PADDOCK WALL  
 SCALE 1:50



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

SCALE: AS SHOWN

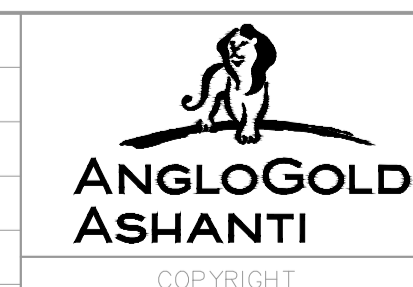
TSF STARTER WALL - LAYOUT	301-00204-13-100	ISSUED FOR APPROVAL	A	20.11.2018			
TSF STARTER WALL - SECTIONS SHEET 1/3	301-00204-13-101	ISSUED FOR TENDER	B	25.01.2019			
TSF STARTER WALL - SECTIONS SHEET 2/3	301-00204-13-103	ISSUED FOR TENDER (DRAINS NAMING UPDATED)	C	25.03.2019			
TSF STARTER WALL - SECTIONS SHEET 3/3	301-00204-13-104						

TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D

REVISIONS	MARK	DATE	INIT	APP'D

DRAWN	FB/ME	20/11/2018
CHECKED	TM	20/11/2018
SENIOR DESIGNER	MET PROJECTS	
PR ENGINEER		
PR TECH		

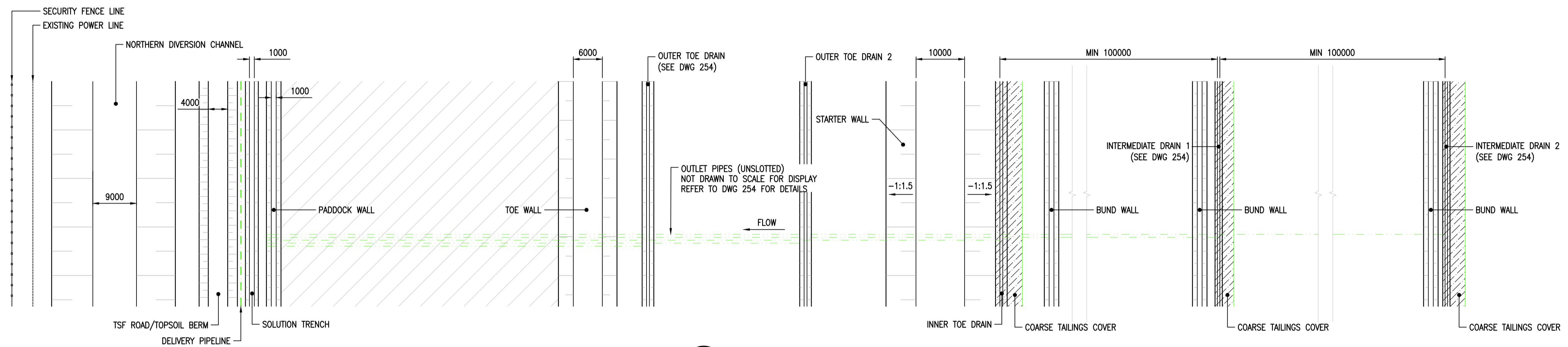
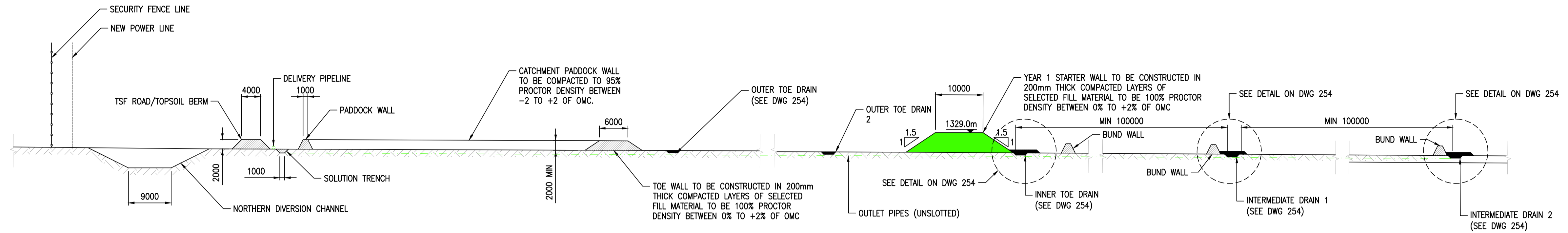
PROJECT / MET ENGINEER	DSG	20/11/2018
MET PROJECTS MANAGER		



301-00204/13-102
REGION SOUTH AFRICA REGION - VR
BUSINESS UNIT MINE WASTE SOLUTIONS
PROJECT KAREERAND TSF EXPANSION PROJECT
DRAWING TITLE TSF - EMBANKMENT SECTIONS

MET PROJECTS CWR1806001

MET-MWS-39-C0011 REV C



**B** SECTION  
100 SCALE: N.T.S.



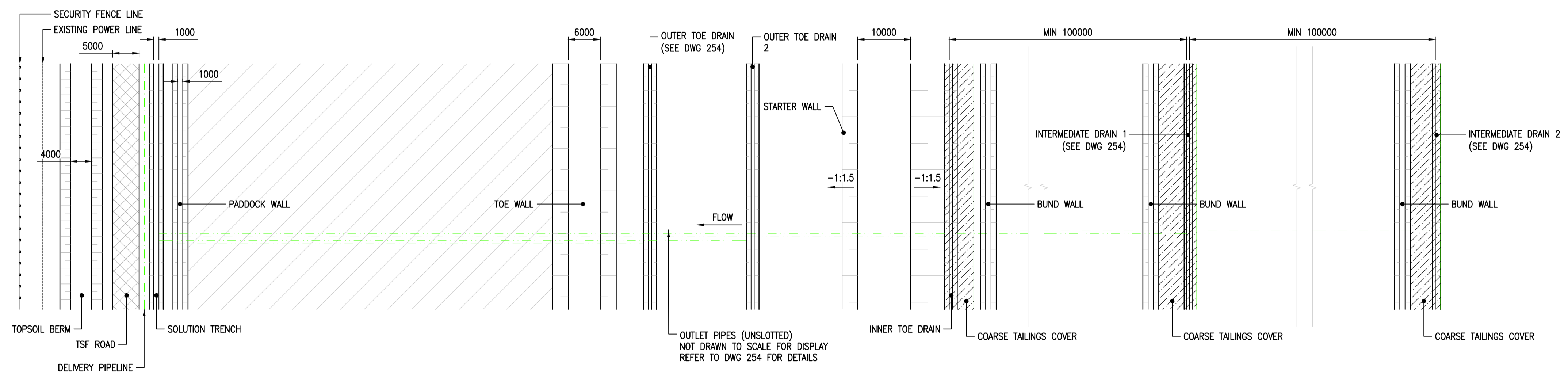
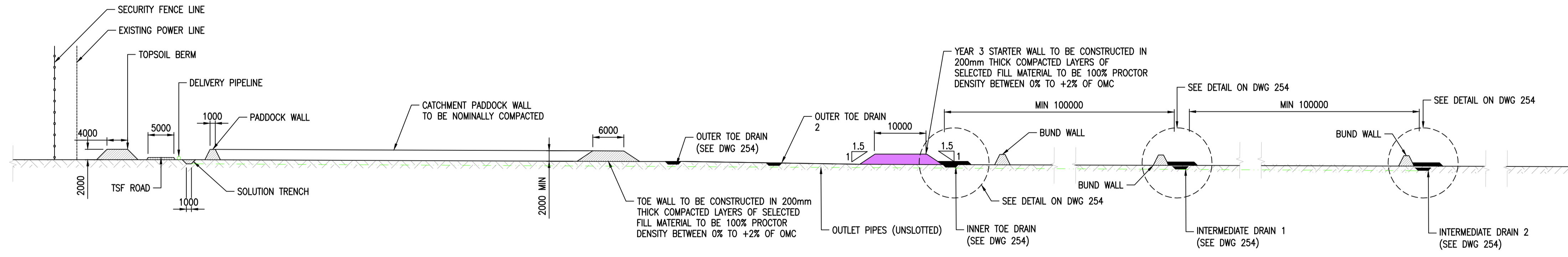
DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

TITLE	DRG. No	DETAIL
TSF-STARTER WALLS-LAYOUT	301-00204/13-100	ISSUED FOR APPROVAL
TSF-STARTER WALLS-SECTION-SHEET 1/3	301-00204/13-101	ISSUED FOR TENDER
TSF-STARTER WALLS-SECTION-SHEET 3/3	301-00204/13-104	ISSUED FOR TENDER (DRAINS NAMING UPDATED)
SEEPAGE INTERCEPTION-FILTER DRAIN OUTLET-SECTIONS AND DETAILS	301-00204/13-254	

MARK	DATE	INIT	APP'D	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
A	21.11.2018			DRAWN	FB			20.11.2018
B	28.01.2019			CHECKED	TM			20.11.2018
C	26.03.2019			SENIOR DESIGNER	MET PROJECTS			
				PR ENGINEER	DGS			
				PR TECH				
				PROJECT / MET ENGINEER	DGS			20.11.2018
				MET PROJECTS MANAGER				20.11.2018

	301-00204/13-103
REGION	SOUTH AFRICA REGION - VR
BUSINESS UNIT	MINE WASTE SOLUTIONS
PROJECT	KAREERAND TSF EXPANSION PROJECT
DRAWING TITLE	TSF STARTER WALL - SECTIONS
MET PROJECTS	CWR1806001

MET PROJECTS	CWR1806001	MET-MWS-39-C0072	REV
PROJECT No.	B/UNIT	AREA	SEQ. No.
SIZE	A1		



C SECTION  
100 SCALE: N.T.S.



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

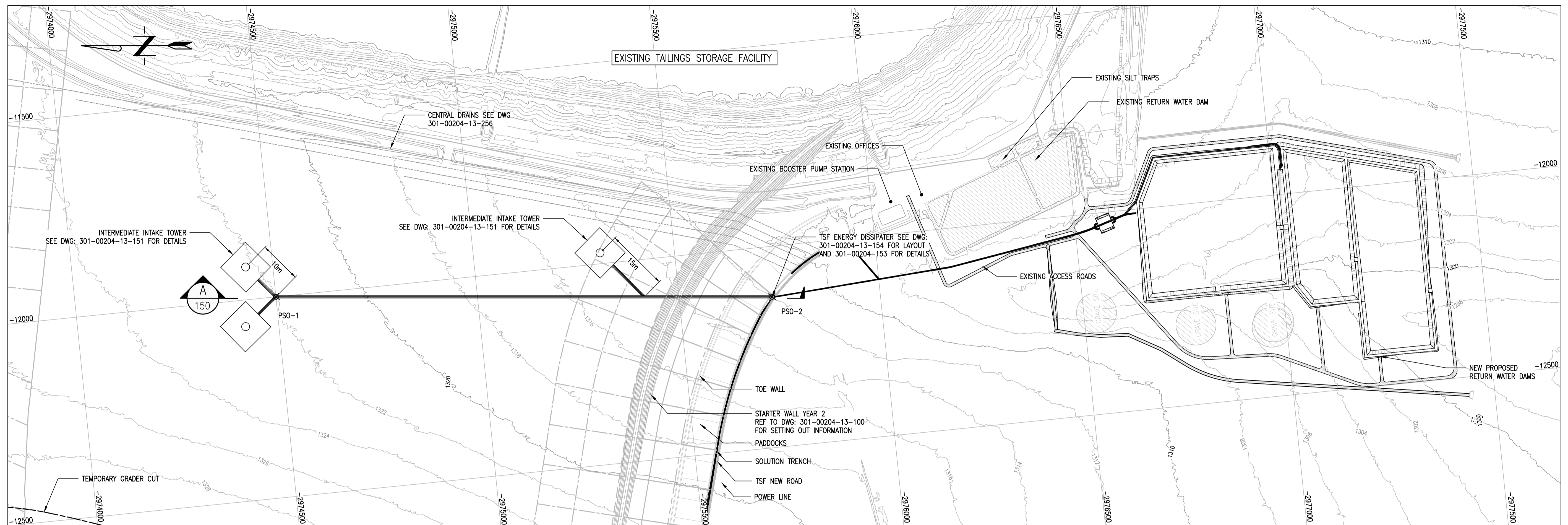
SCALE: AS SHOWN

TITLE	DRG. No	DETAIL
TSF STARTER WALL - LAYOUT	301-00204/13-100	ISSUED FOR APPROVAL
TSF STARTER WALLS-SECTION-SHEET 1/3	301-00204/13-101	ISSUED FOR TENDER
TSF STARTER WALLS-SECTION-SHEET 2/3	301-00204/13-103	ISSUED FOR TENDER (DRAINS NAMING UPDATED)
SEEPAGE INTERCEPTION-UNDERDRAINAGE-WEST LAYOUT	301-00204/13-253	
SEEPAGE INTERCEPTION-FILTER DRAIN OUTLET-SECTIONS AND DETAILS	301-00204/13-254	

MARK	DATE	INIT	APP'D	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
A	21.11.2018			DRAWN	FB			20.11.2018
B	28.01.2019			CHECKED	TM			20.11.2018
C	26.03.2019			SENIOR DESIGNER	MET PROJECTS			
				PR ENGINEER	DGS			
				PR TECH				
				PROJECT / MET ENGINEER	DGS			20.11.2018
				MET PROJECTS MANAGER				20.11.2018

<p>ANGLOGOLD ASHANTI COPYRIGHT</p>	301-00204/13-104	REV c
	REGION SOUTH AFRICA REGION - VR	
	BUSINESS UNIT MINE WASTE SOLUTIONS	
	PROJECT KAREERAND TSF EXPANSION PROJECT	
	DRAWING TITLE TSF STARTER WALL - SECTIONS	
MET PROJECTS	CWR1806001	MET-MWS-39-C0073
	PROJECT No.	B/UNIT AREA SEQ. No. SIZE - A1

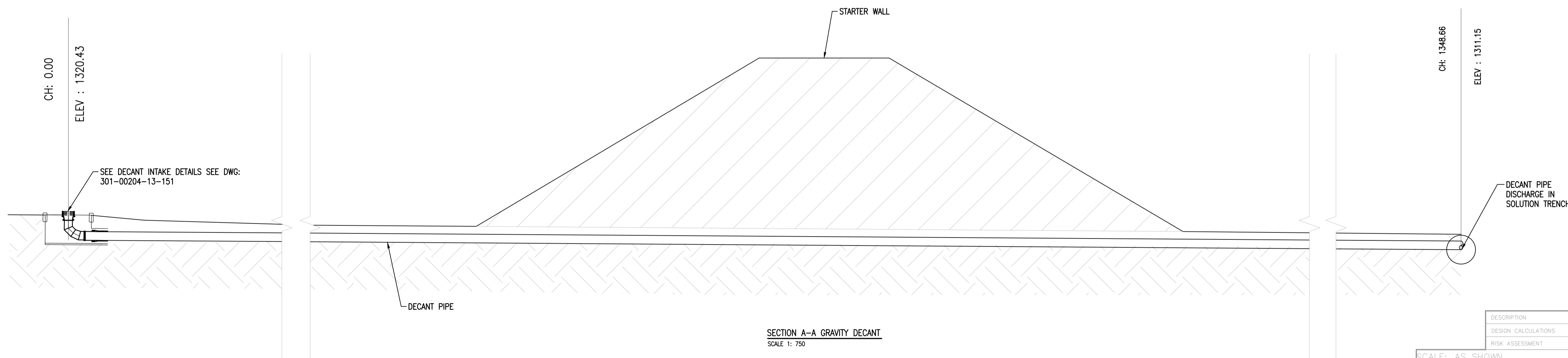




GRAVITY DECANT LAYOUT  
SCALE 1: 5 000

SITE LEGEND	
	TEMPORARY GRADER CUT
	CHIMNEY DRAINS
	INNER SW DRAIN
	OUTER SW DRAIN

TEST PIT SETTING OUT DATA Lo-27-WGS84			
POINT	EASTING	NORTHING	ELEVATION
PSO-1	12000.00	2974500.00	1322.00
PSO-2	12125.47	2975731.07	1311.14



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	PROJECT / MET ENGINEER	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
ISSUED FOR TENDER			A	25.01.2019			DRAWN		FB			31.10.2018
ISSUED FOR TENDER (RWD LAYOUT CHANGED)			B	26.03.2019			CHECKED		TM			31.10.2018
							SENIOR DESIGNER MET PROJECTS					31.10.2018
							PR ENGINEER		DGS			31.10.2018
							PR TECH					
							PROJECT / MET ENGINEER		DGS			31.10.2018
							MET PROJECTS MANAGER		NAME			31.10.2018

COPYRIGHT  
MET PROJECTS

301-00204/13-150

REGION SOUTH AFRICA REGION - VR

BUSINESS UNIT MINE WASTE SOLUTIONS

PROJECT KAREERAND TSF EXPANSION PROJECT

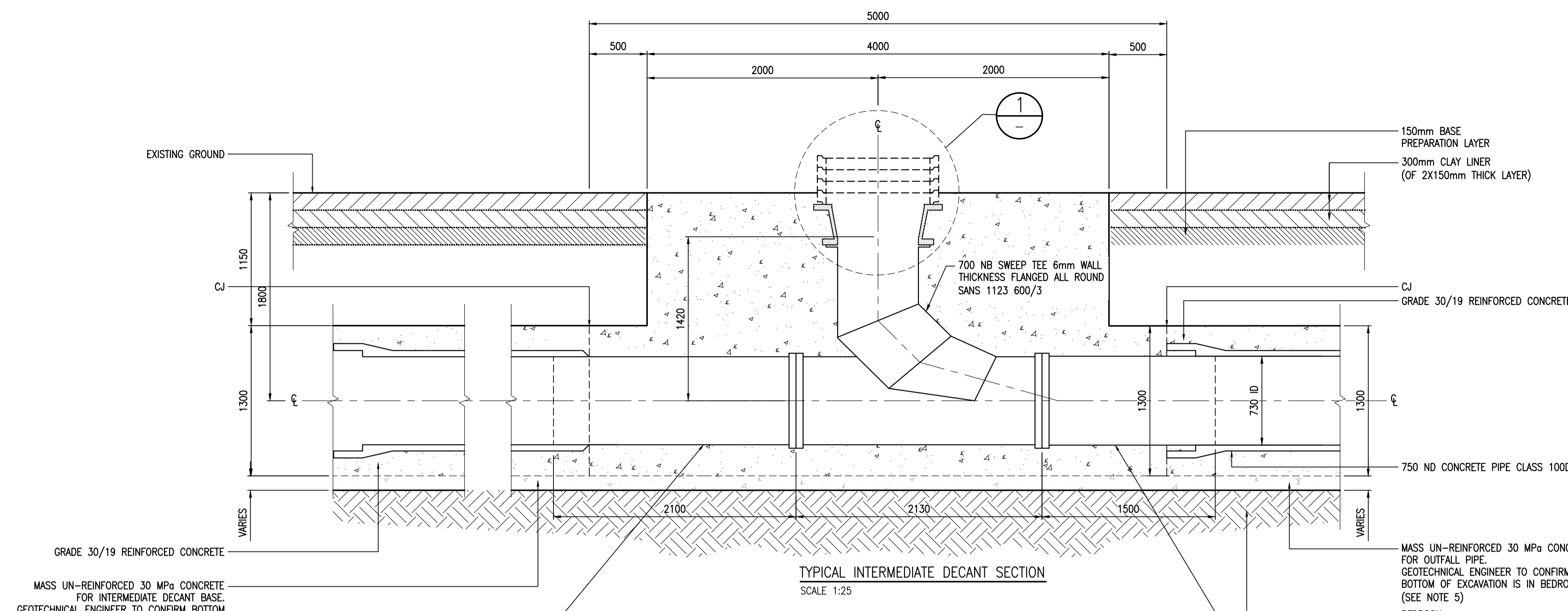
DRAWING TITLE GRAVITY DECANT -LAYOUT AND SECTIONS

SCALE: AS SHOWN

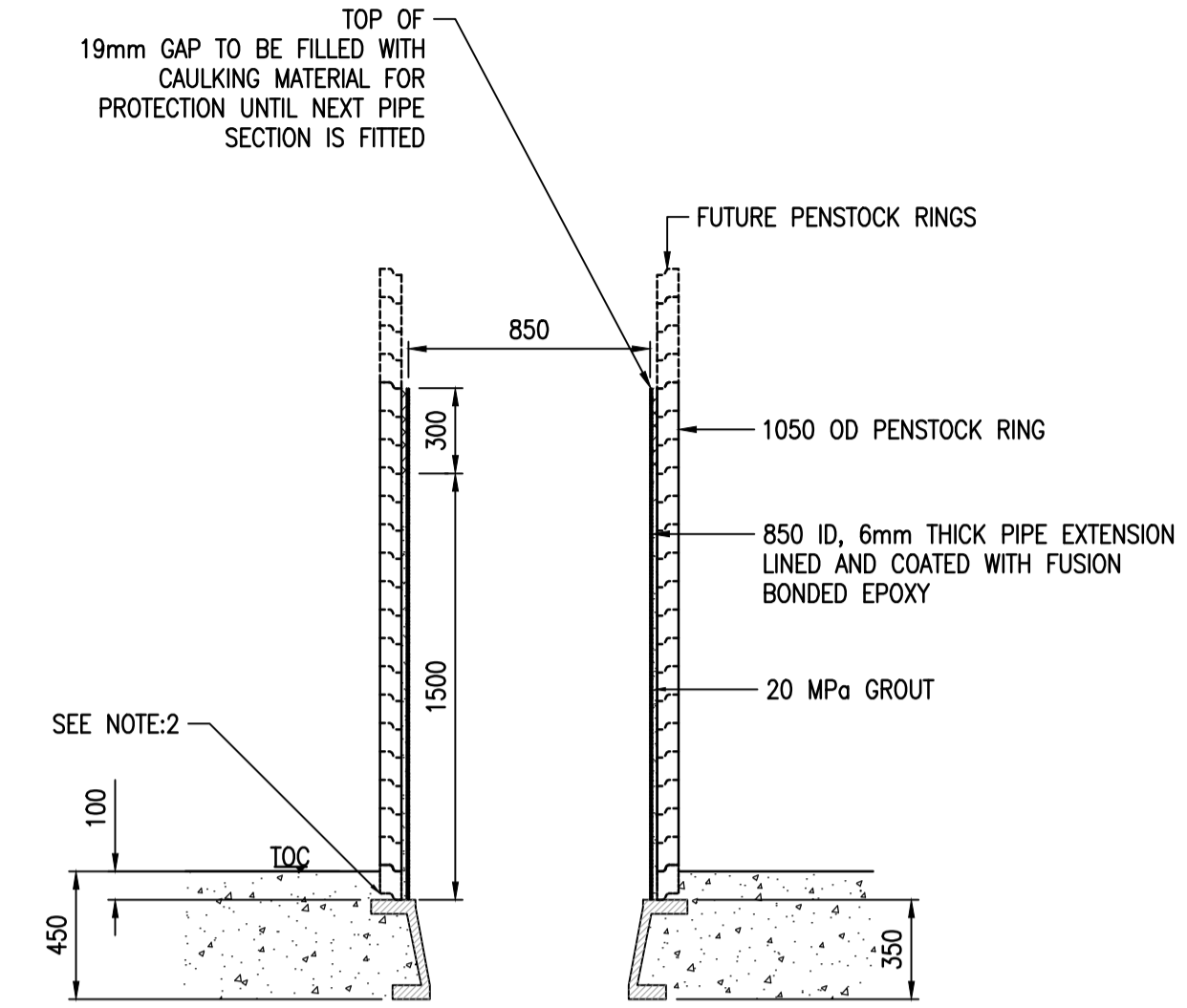
CWR1806001

MET-MWS-39-C0012

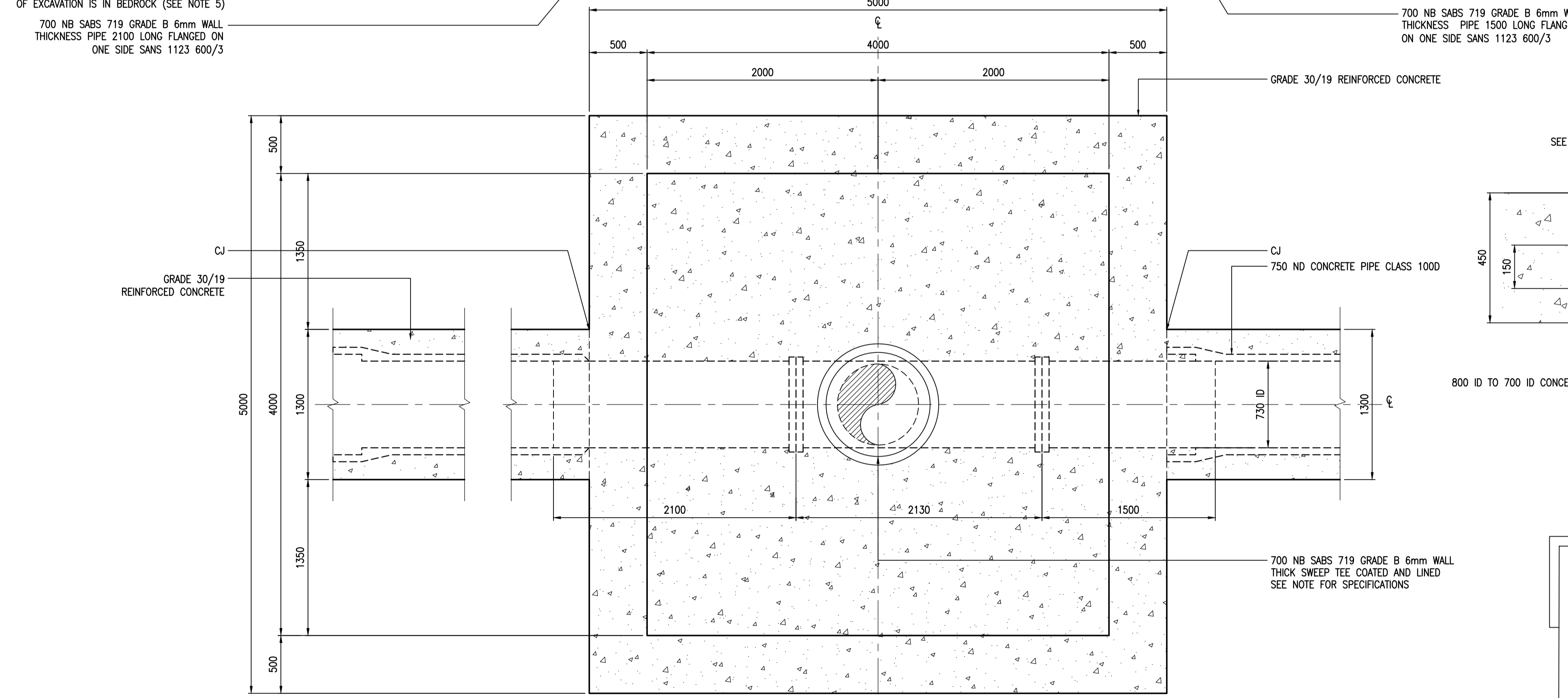




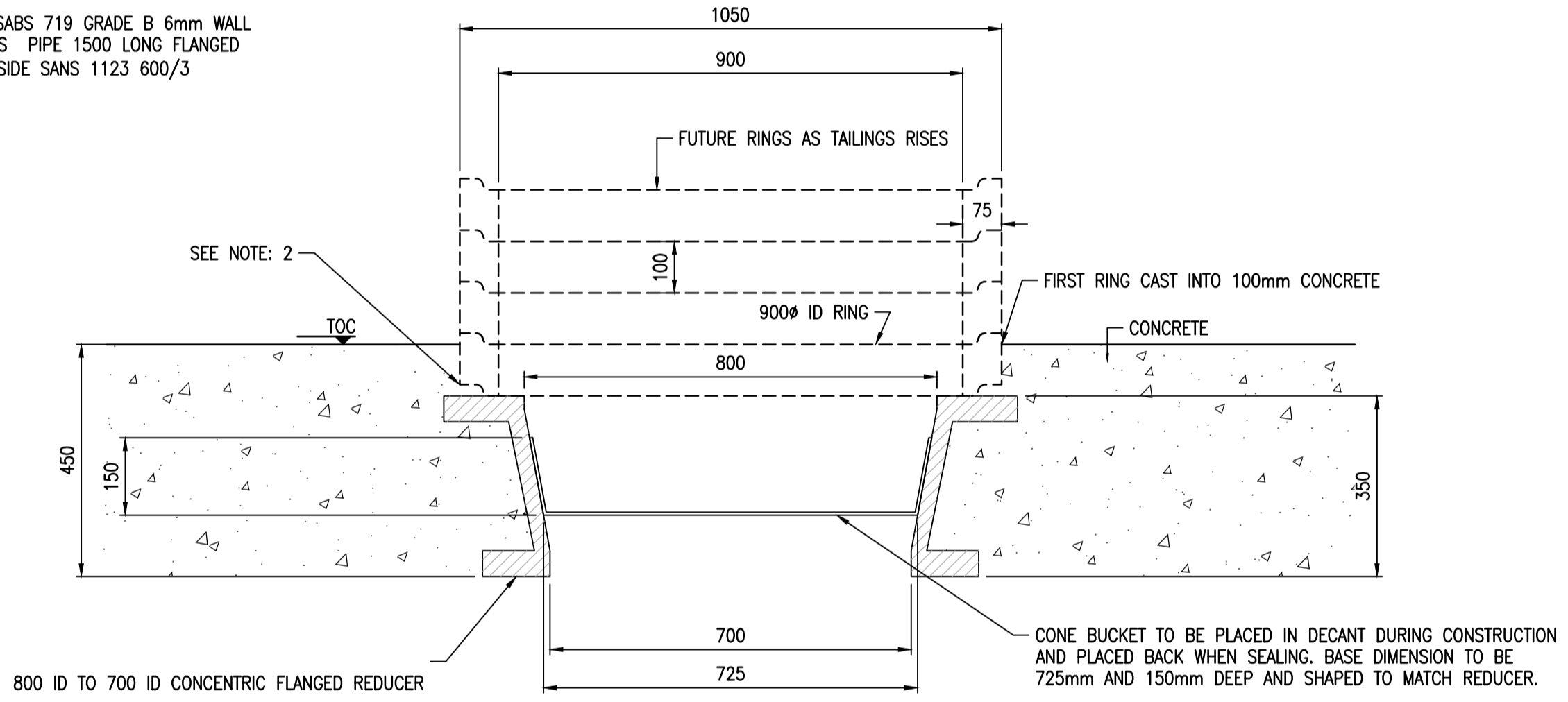
TYPICAL INTERMEDIATE DECANT SECTION  
SCALE 1:25



SECTION THROUGH RINGED TOWER AFTER FIRST PIPE EXTENSION  
SCALE 1:25

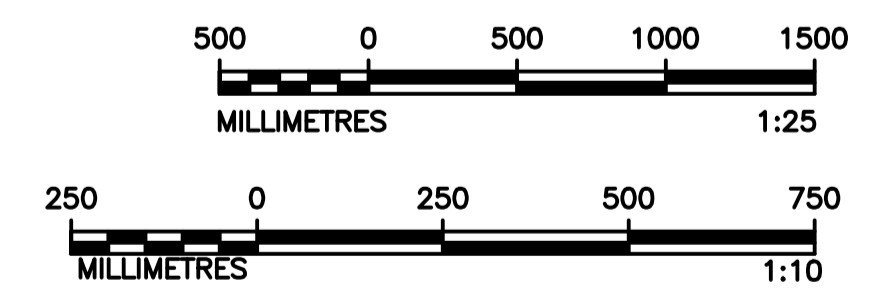


INTERMEDIATE DECANT PLAN VIEW  
SCALE 1:25



TYPICAL DECANT CONCRETE LIFT DETAIL  
SCALE 1:10

- NOTE:**
- ALL CAST-IN PIPE SPECIALS TO BE SABS 719 GRADE B, 6mm WALL COATING SPECIFICATION FOR STEEL PIPE: AGA 164050 327 AND LINING: AGA 164050132
  - ROUGHEN THIS SURFACE BEFORE CASTING IN FIRST PRE-CAST CONCRETE RING CONCRETE TO BE 30/19 REINFORCED CONCRETE
  - ALL CONCRETE SURFACES TO BE FINISHED TO DEGREE 1 ACCURACY WITH A WOOD FLOAT FINISH AS PER SANS 1200A
  - DRAWING APPLIES TO SINGLE INTERMEDIATE DECANT ON DECANT LINE A
  - FOUNDATION DESIGNED FOR A SAFE SOIL BEARING PRESSURE =>1MPa



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

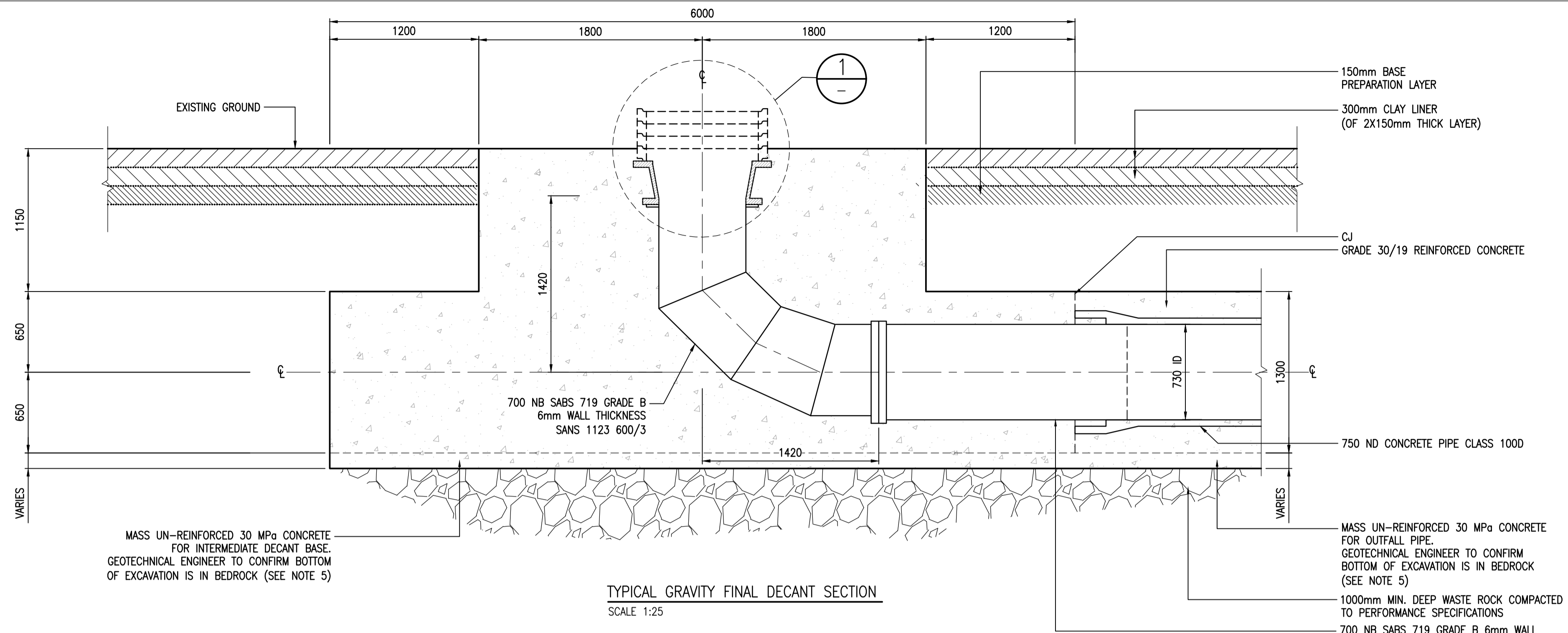
SCALE: AS SHOWN

TITLE	DRG. No	DETAIL	MARK	DATE	INT	APP'D	PROJECT / MET ENGINEER	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
TSF-INTERMEDIATE DECANT-SECTIONS AND DETAILS	301-00204/13-151	ISSUED FOR INFORMATION	A	31.10.2018			DRAWN		FB			16.01.2019
TSF-GRAVITY DECANT-LAYOUT	301-00204/13-150	ISSUED FOR TENDER	B	16.01.2019			CHECKED		DGS			31.10.2018
BOOSTER PUMP STATION-PUMP TRAIN AND DELIVERY PIPEWORK SCHEMATIC	301-00204/13-200	ISSUED FOR TENDER	C	25.01.2019			SENIOR DESIGNER MET PROJECTS		DGS			31.10.2018
TSF-ENERGY DISSIPATER-SECTIONS AND DETAILS	301-00204/13-153	ISSUED FOR TENDER	D	26.03.2019			PR ENGINEER		DGS			31.10.2018
							PR TECH					
							PROJECT / MET ENGINEER		DGS			31.10.2018
							MET PROJECTS MANAGER		NAME			31.10.2018

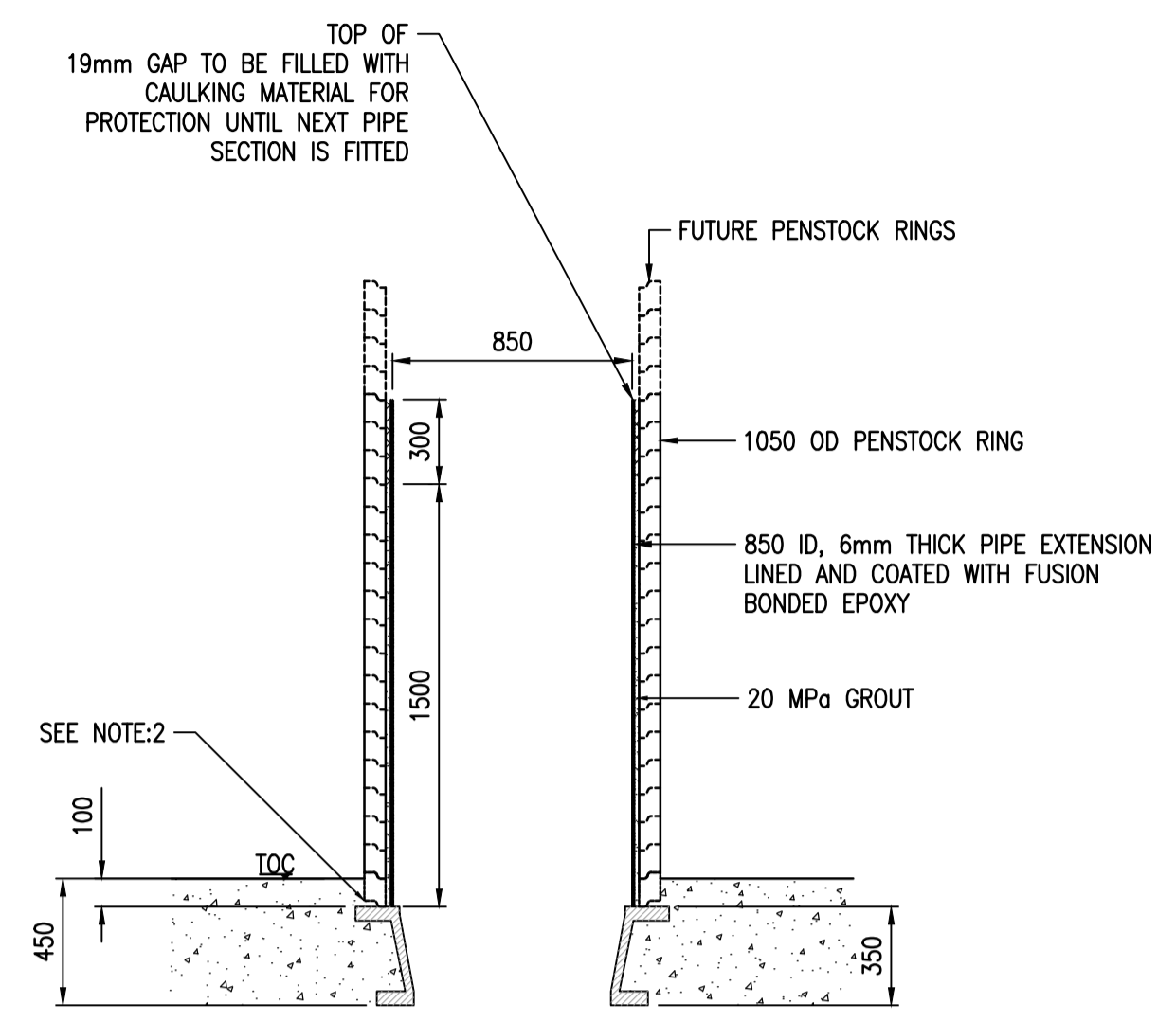


301-00204/13-151	REGION	SOUTH AFRICA REGION - VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	TSF INTERMEDIATE DECANT - SECTIONS & DETAILS
MET PROJECTS	CWR1806001	MET-MWS-39-C0013

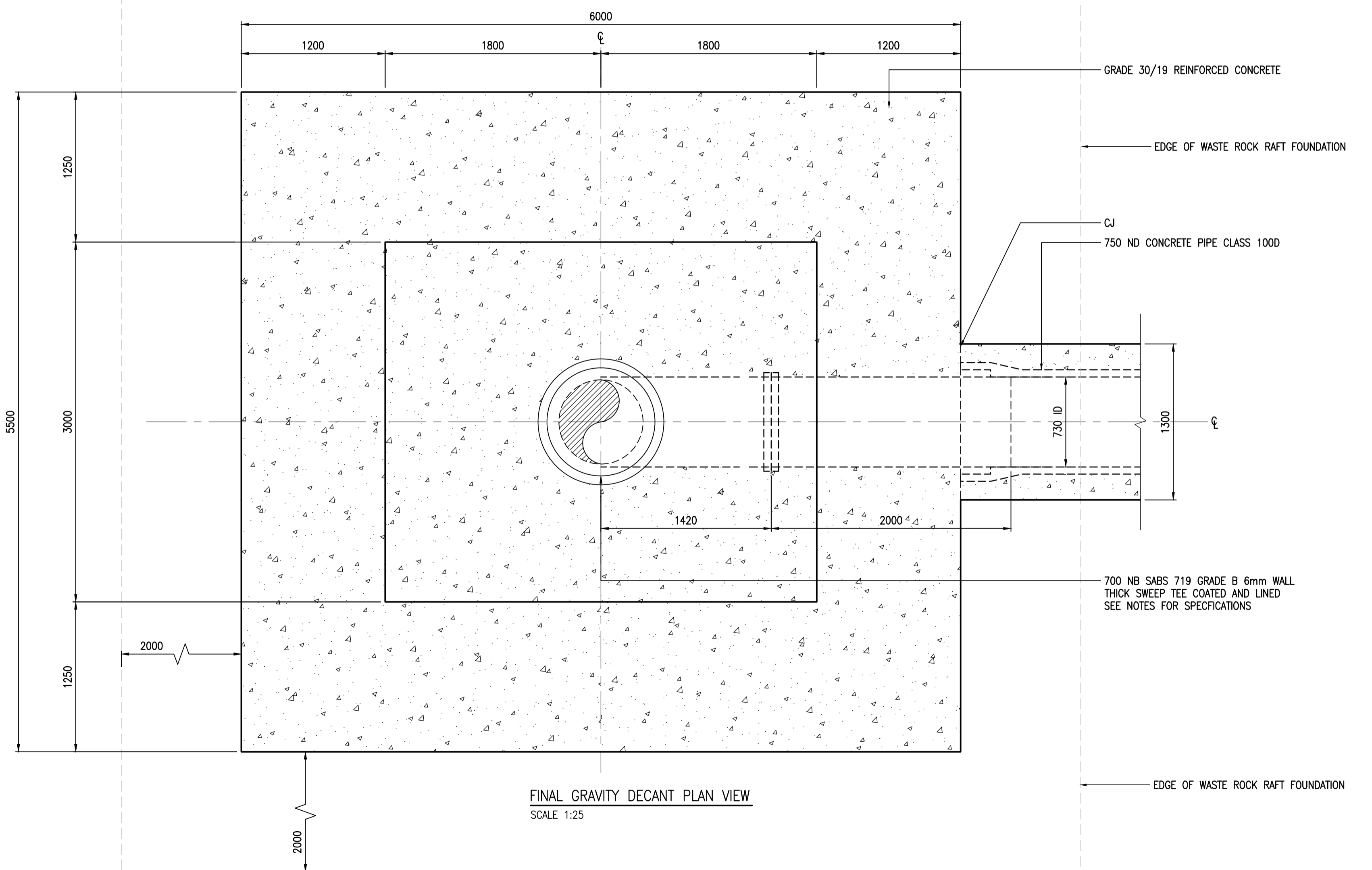




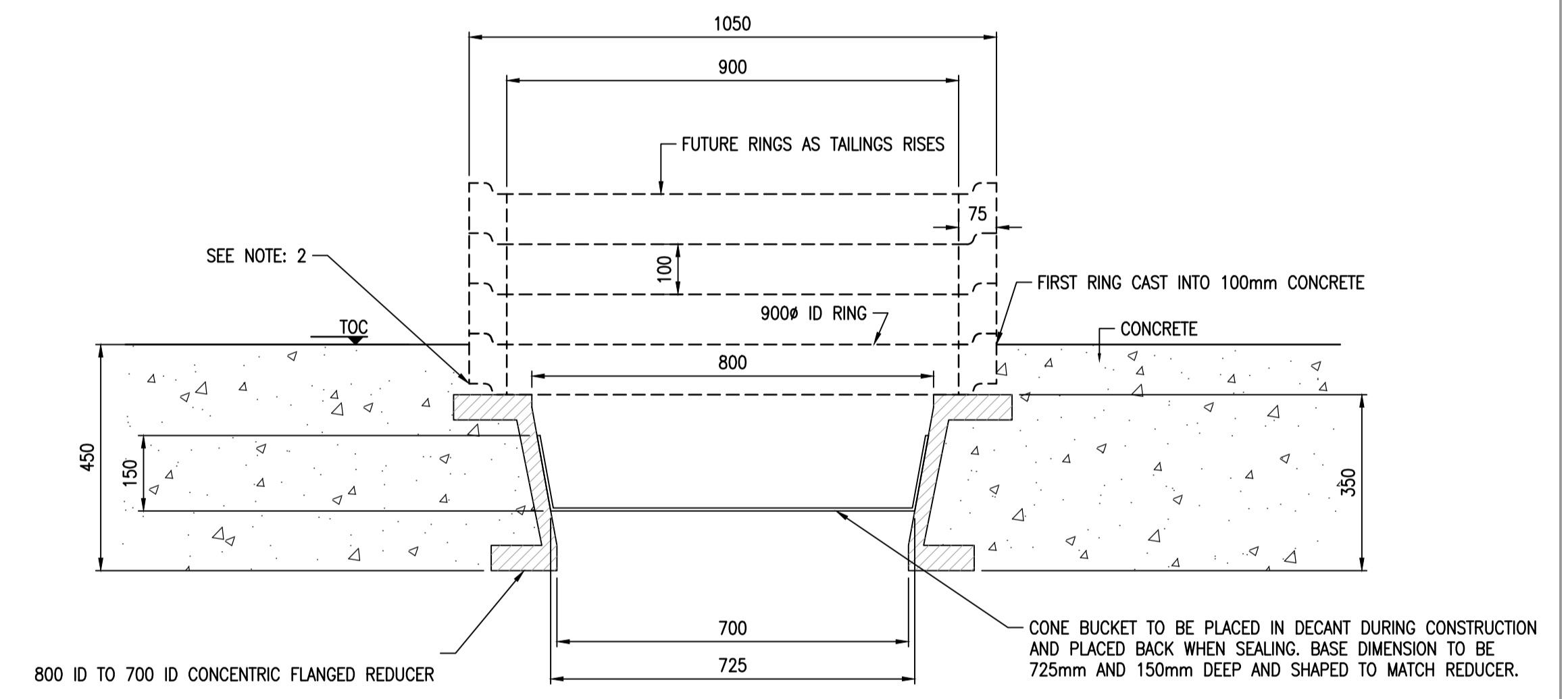
TYPICAL GRAVITY FINAL DECANT SECTION  
SCALE 1:25



SECTION THROUGH RINGED TOWER AFTER FIRST PIPE EXTENSION  
SCALE 1:25

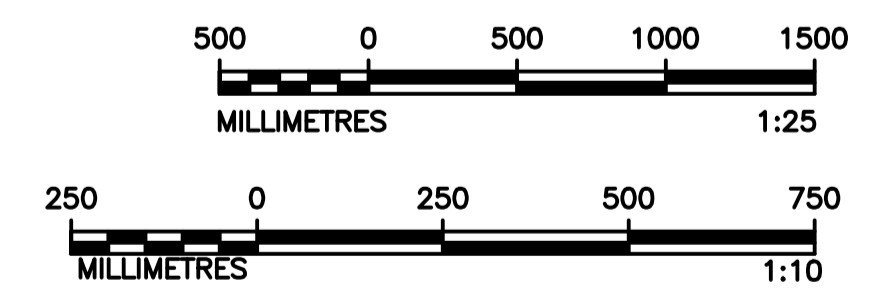


FINAL GRAVITY DECANT PLAN VIEW  
SCALE 1:25



TYPICAL DECANT CONCRETE LIFT DETAIL  
SCALE 1:10

- NOTE:**
1. ALL CAST-IN PIPE SPECIALS TO BE SABS 719 GRADE B, 6mm WALL COATING SPECIFICATION FOR STEEL PIPE: AGA 164050 327 AND LINING: AGA 164050132
  2. ROUGHEN THIS SURFACE BEFORE CASTING IN FIRST PRE-CAST CONCRETE RING CONCRETE TO BE 30/19 REINFORCED CONCRETE
  3. ALL CONCRETE SURFACES TO BE FINISHED TO DEGREE 1 ACCURACY WITH A WOOD FLOAT FINISH AS PER SANS 1200A
  4. DRAWING APPLIES TO SINGLE INTERMEDIATE DECANT ON DECANT LINE A
  5. FOUNDATION DESIGNED FOR A SAFE SOIL BEARING PRESSURE  $\geq 1MPa$



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

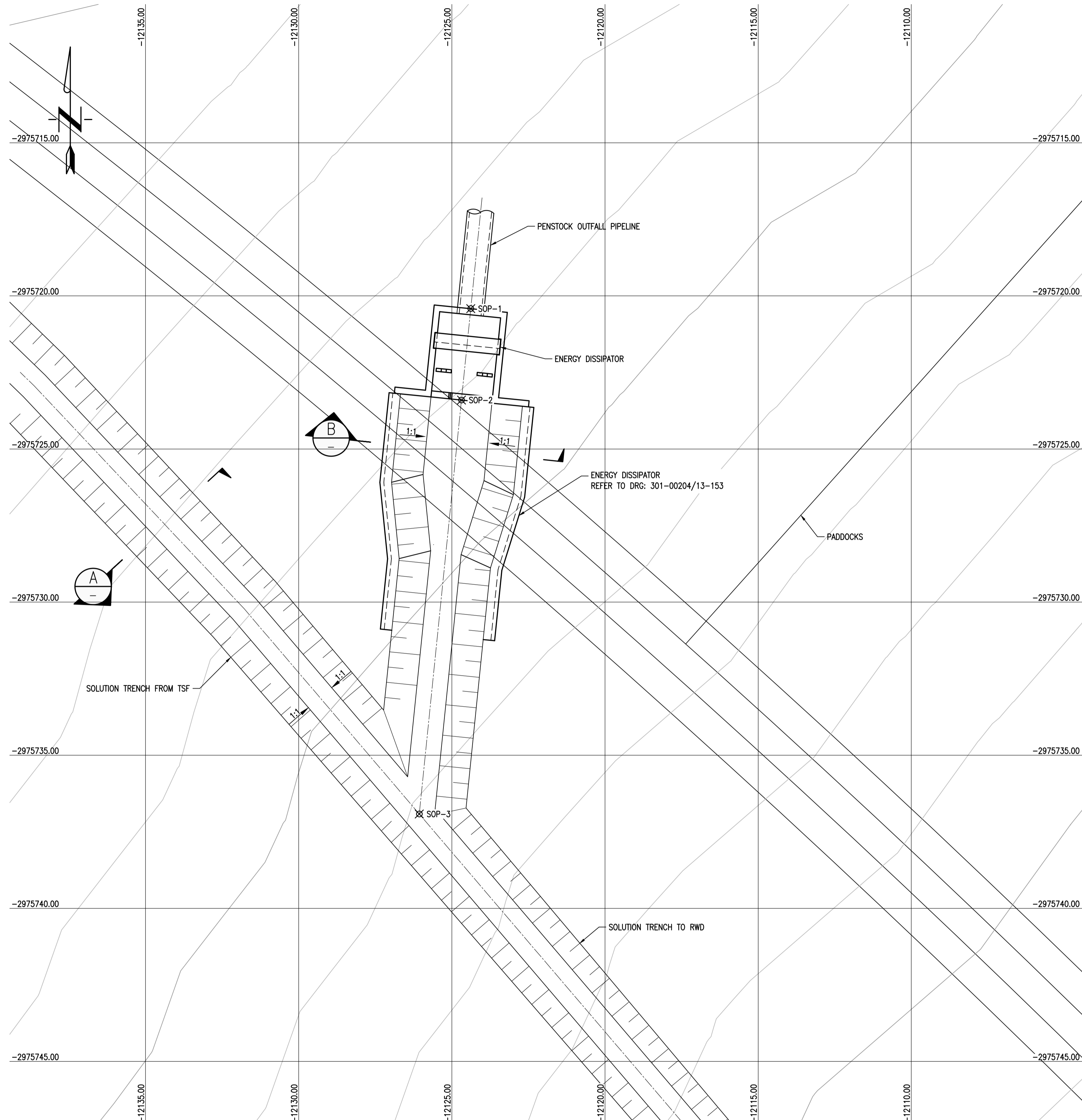
SCALE: AS SHOWN

TITLE	DRG. No	DETAIL	MARK	DATE	INT	APP'D	PROJECT / MET ENGINEER	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
ISSUED FOR INFORMATION			A	31.10.2018			DRAWN		FB			16.01.2019
ISSUED FOR TENDER			B	18.01.2019			CHECKED		TM			31.10.2018
ISSUED FOR TENDER			B	25.01.2019			SENIOR DESIGNER MET PROJECTS		DGS			31.10.2018
							PR ENGINEER		DGS			31.10.2018
							PR TECH					
							PROJECT / MET ENGINEER		DGS			31.10.2018
							MET PROJECTS MANAGER		NAME			31.10.2018

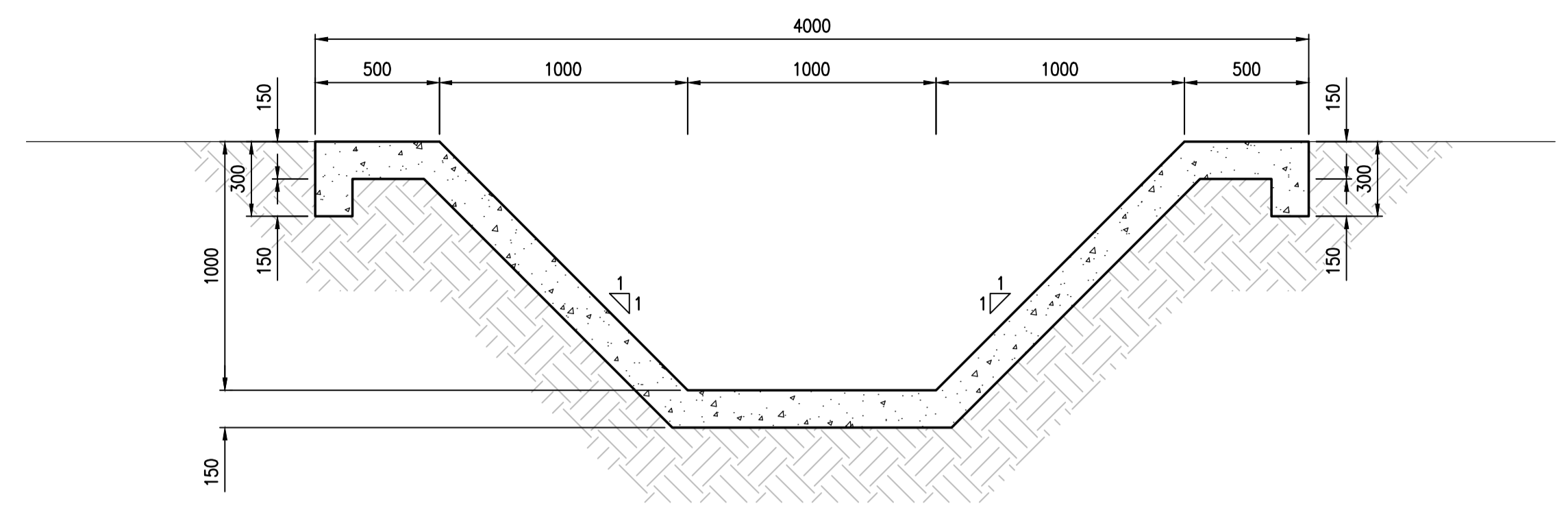


301-00204/13-152	
REGION	SOUTH AFRICA REGION - VR
BUSINESS UNIT	MINE WASTE SOLUTIONS
PROJECT	KAREERAND TSF EXPANSION PROJECT
DRAWING TITLE	TSF FINAL GRAVITY DECANT - SECTIONS & DETAILS
PROJECT No.	CWR1806001
B/UNIT AREA	MET-MWS-39-C0013
SEQ. No.	
SIZE	A1

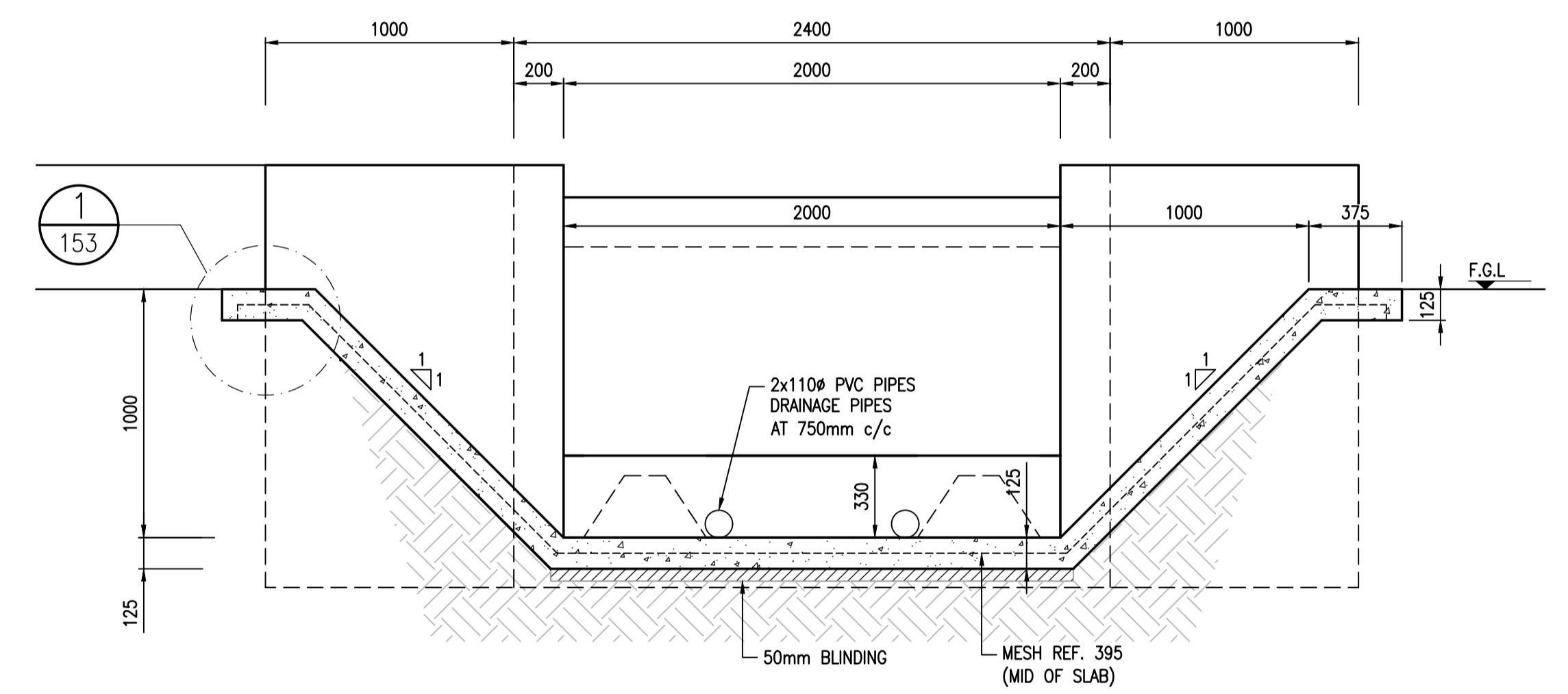




**PENSTOCK OUTLET LAYOUT**  
SCALE 1:75

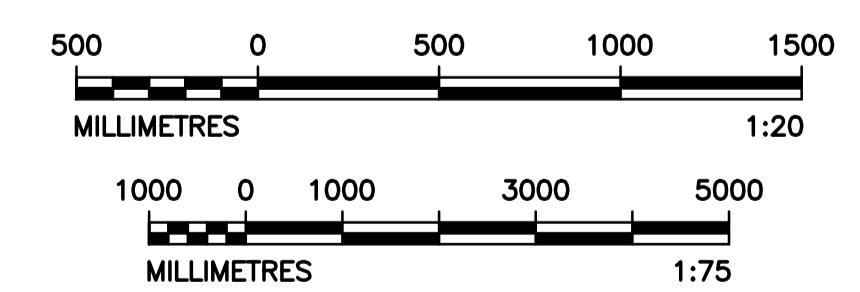


**A TYPICAL SOLUTION TRENCH SECTION**  
SCALE 1:20



**B SECTION TROUGH ENERGY DISSIPATOR**  
SCALE 1:20

WGS27 SETTING OUT DATA		
POINT	EASTING	NORTHING
SOP-1	12126.06	2975736.92
SOP-2	12124.69	2975723.40
SOP-3	12124.38	2975720.42

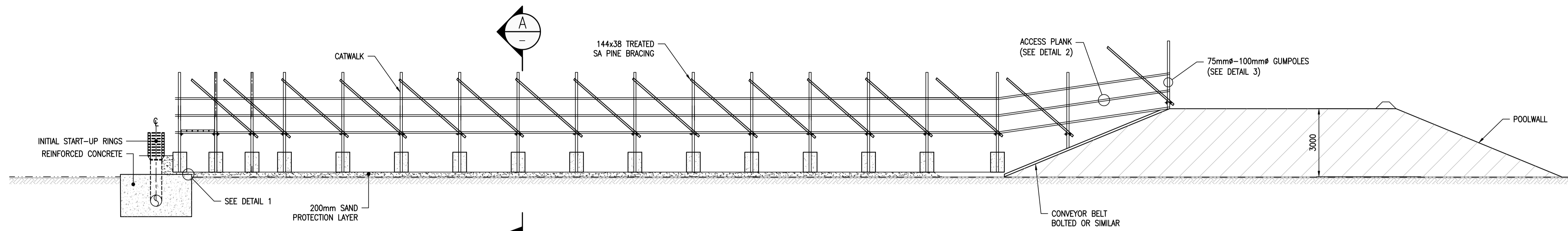


SCALE: AS SHOWN

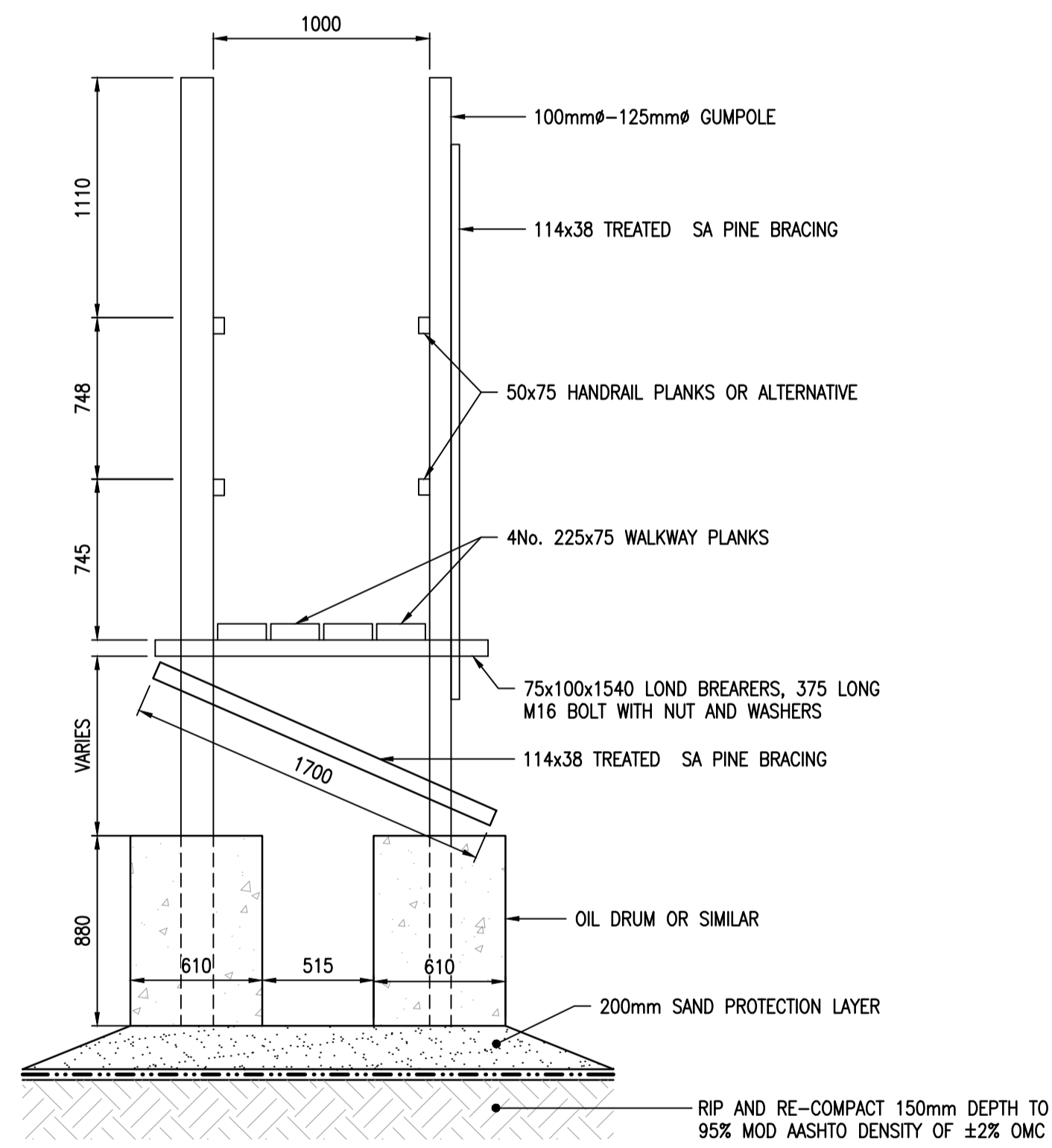


TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
ISSUED FOR APPROVAL			A	20.11.2018			DRAWN	FB/ME			20.11.2018
ISSUED FOR TENDER			B	25.01.2019			CHECKED	TM			20.11.2018
ISSUED FOR TENDER			C	26.03.2019			SENIOR DESIGNER MET PROJECTS				
							PR ENGINEER				
							PR TECH				
							PROJECT / MET ENGINEER	DGS			20.11.2018
							MET PROJECTS MANAGER	NAME			20.11.2018

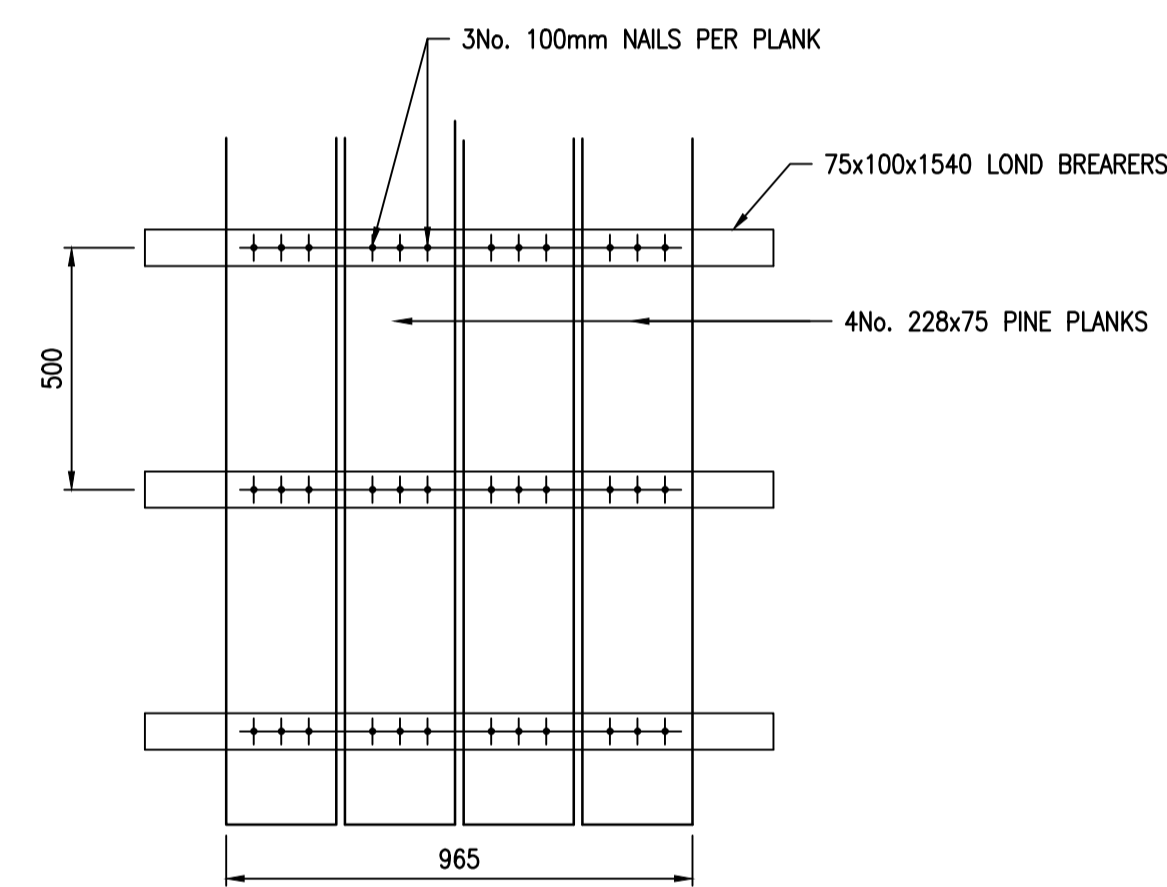
<p>ANGLO GOLD ASHANTI</p> <p>COPYRIGHT</p> <p>MET PROJECTS</p>	301-00204/13-153			
	REGION	SOUTH AFRICA REGION - VR		
	BUSINESS UNIT	MINE WASTE SOLUTIONS		
	PROJECT	KAREERAND TSF EXPANSION PROJECT		
DRAWING TITLE	TSF ENERGY DISSIPATER - LAYOUT ,SECTIONS AND DETAILS			
	CWR1806001	MET-MWS-39-C0023	REV c	



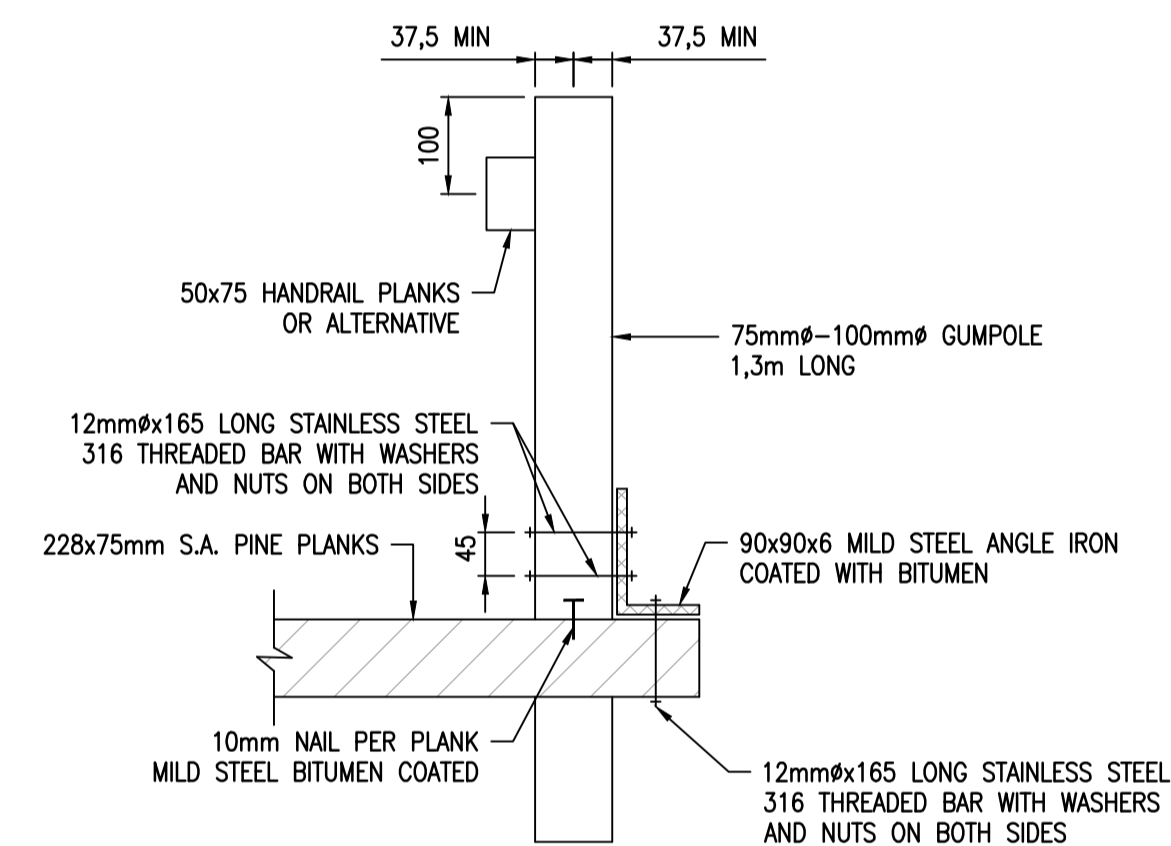
CATWALK LAYOUT PLAN  
SCALE 1:100



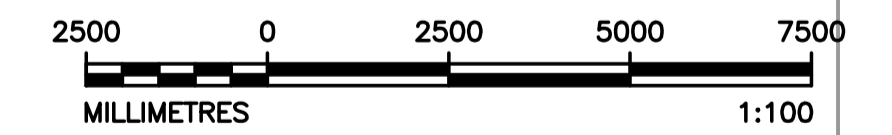
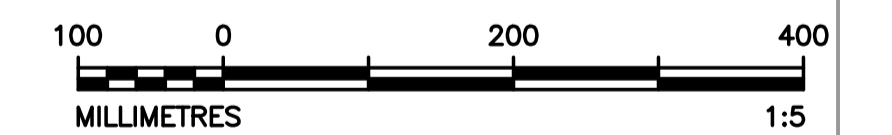
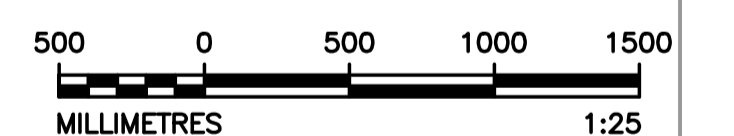
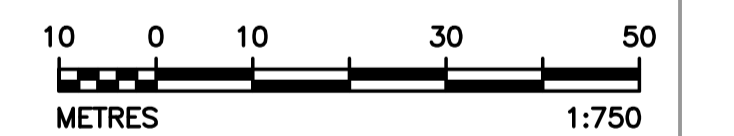
A TYPICAL SECTION  
SCALE 1:25



2 TYPICAL ACCESS PLANK DETAIL  
SCALE 1:15



3 TYPICAL HANDRAIL DETAIL  
SCALE 1:7.5



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

SCALE: AS SHOWN

TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
TSF GRAVITY DECANT LAYOUT	301-00204/13-150	ISSUED FOR TENDER	A	2019/03/13			DRAWN	FB			27.02.2019
		ISSUED FOR TENDER - LINER DETAIL REMOVED	B	2019/03/26			CHECKED	TM			27.02.2019
							SENIOR DESIGNER	MET PROJECTS			27.02.2019
							PR ENGINEER				27.02.2019
							PR TECH				
							PROJECT / MET ENGINEER	DGS			27.02.2019
							MET PROJECTS MANAGER				27.02.2019

301-00204/13-154

REGION SOUTH AFRICA REGION - VR

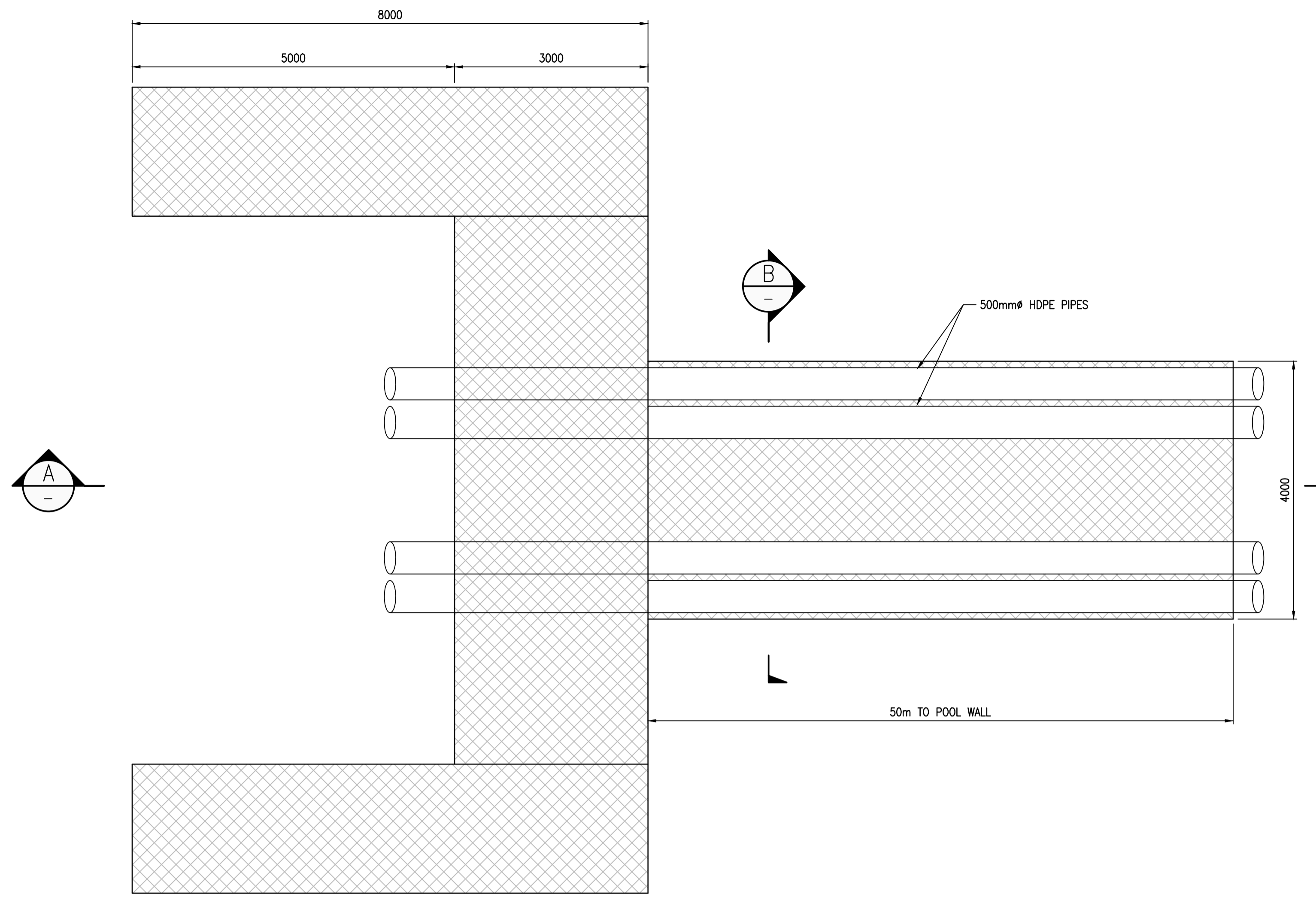
BUSINESS UNIT MINE WASTE SOLUTIONS

PROJECT KAREERAND TSF EXPANSION PROJECT

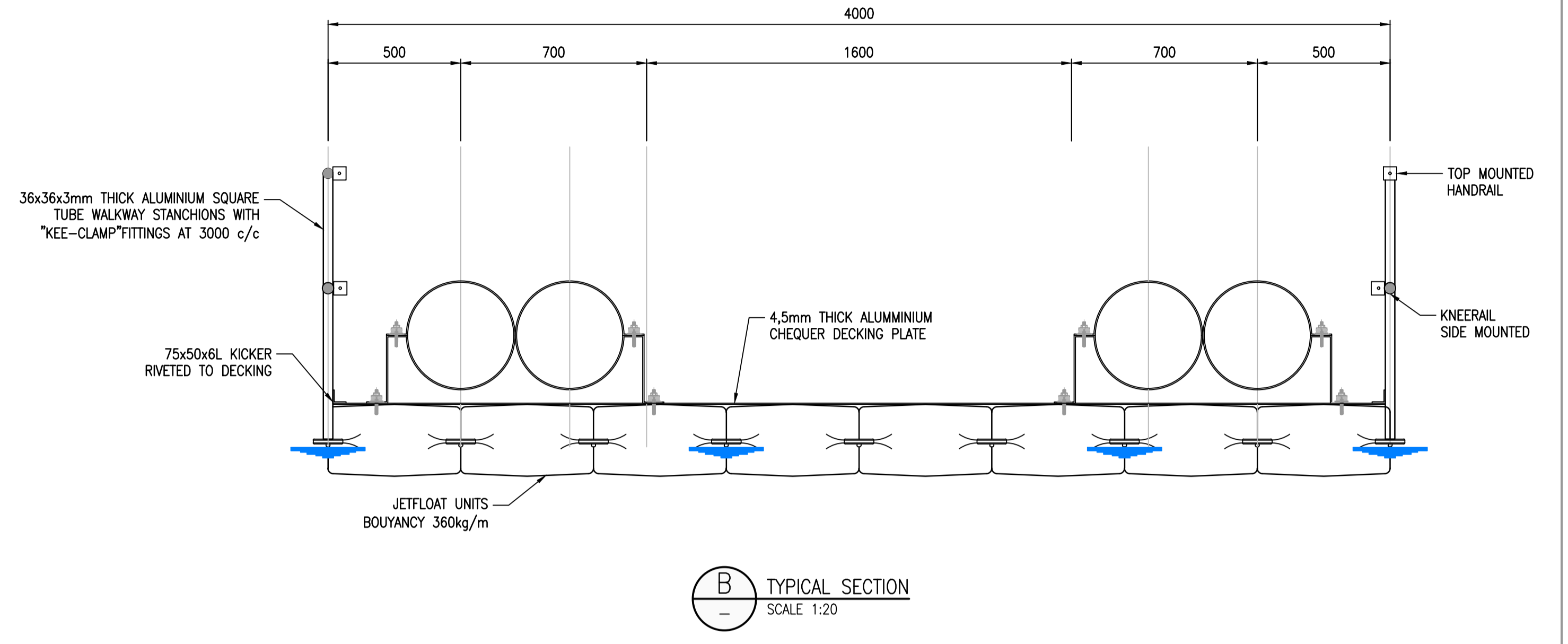
DRAWING TITLE TEMPORARY CATWALK - LAYOUT, TYPICAL SECTIONS & DETAILS

MET PROJECTS
CWR1806001
MET-MWS-39-M0027
REV B

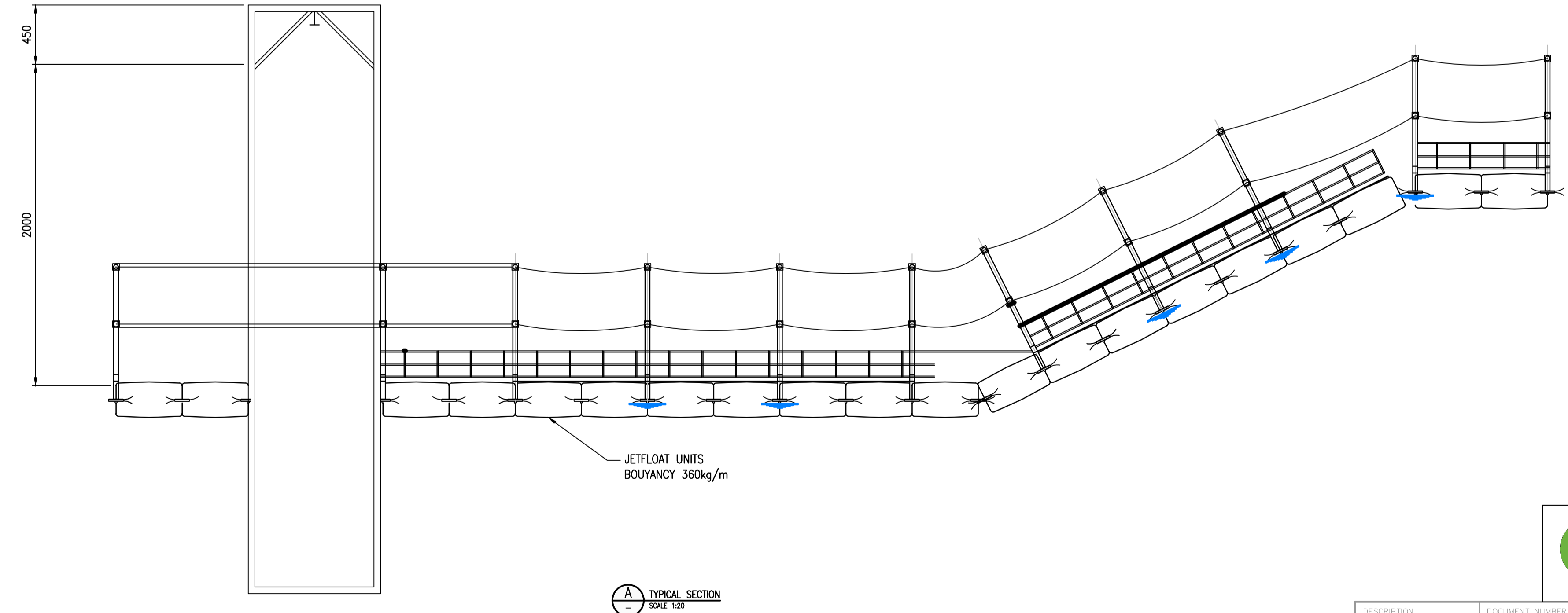




PLAN OF FLOATING PUMP BARGE/SIPHON WALKWAY  
SCALE 1:50



B TYPICAL SECTION  
SCALE 1:20



A TYPICAL SECTION  
SCALE 1:20



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

SCALE: AS SHOWN

ISSUED FOR TENDER	MARK	DATE	INIT	APP'D	DESIGNATION	NAME	REGISTRATION No:	SIGNATURE	DATE
	A	13.03.2019			DRAWN	MKM			27.02.2019
					CHECKED	TM			27.02.2019
					SENIOR DESIGNER	MET PROJECTS			
					PR ENGINEER				
					PR TECH				
					PROJECT / MET ENGINEER	DGS			27.02.2019
					MET PROJECTS MANAGER				27.02.2019

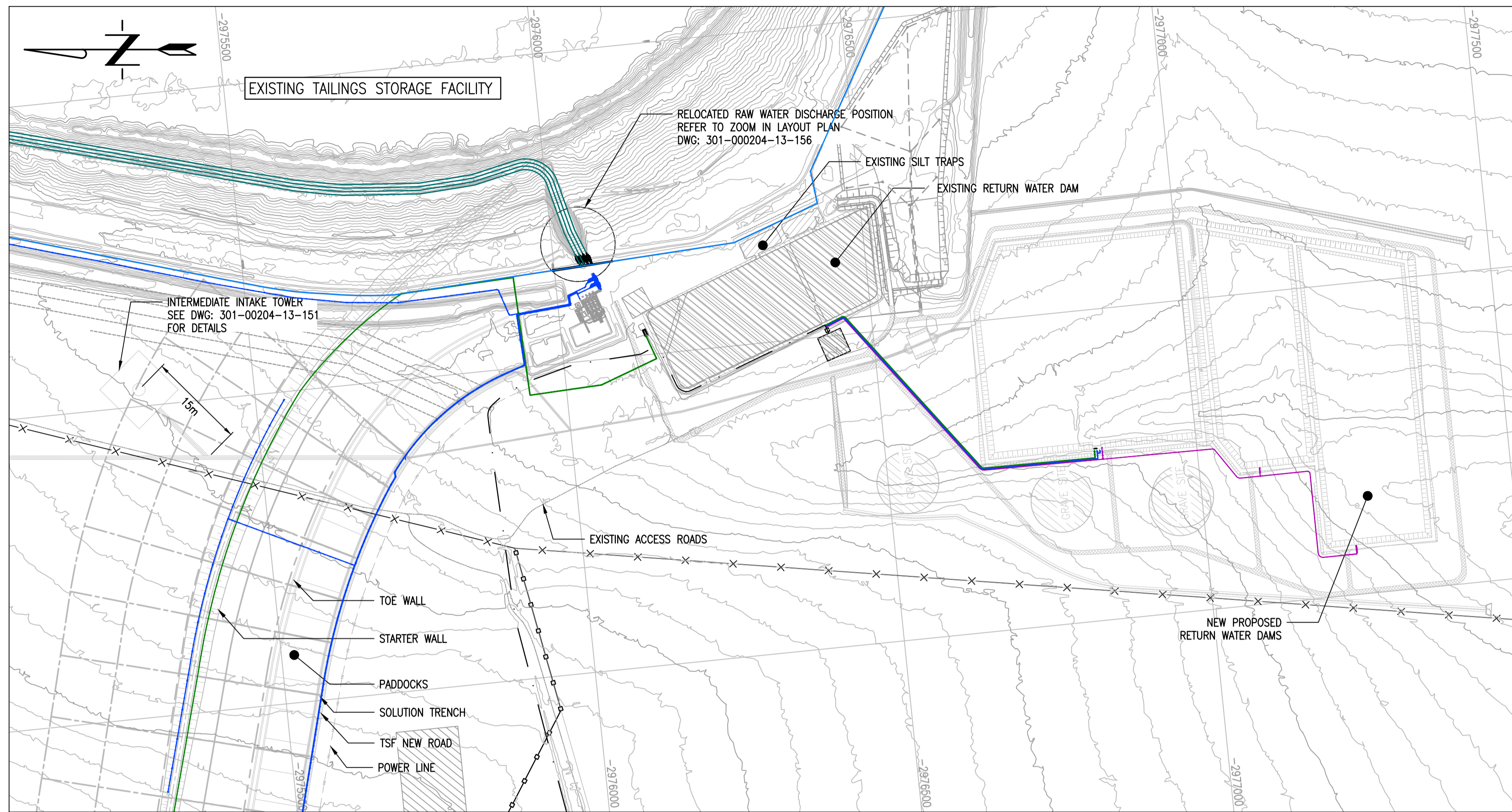


301-00204/13-155  
 REGION SOUTH AFRICA REGION - VR  
 BUSINESS UNIT MINE WASTE SOLUTIONS  
 PROJECT KAREERAND TSF EXPANSION PROJECT  
 DRAWING TITLE FLOATING WALKWAY

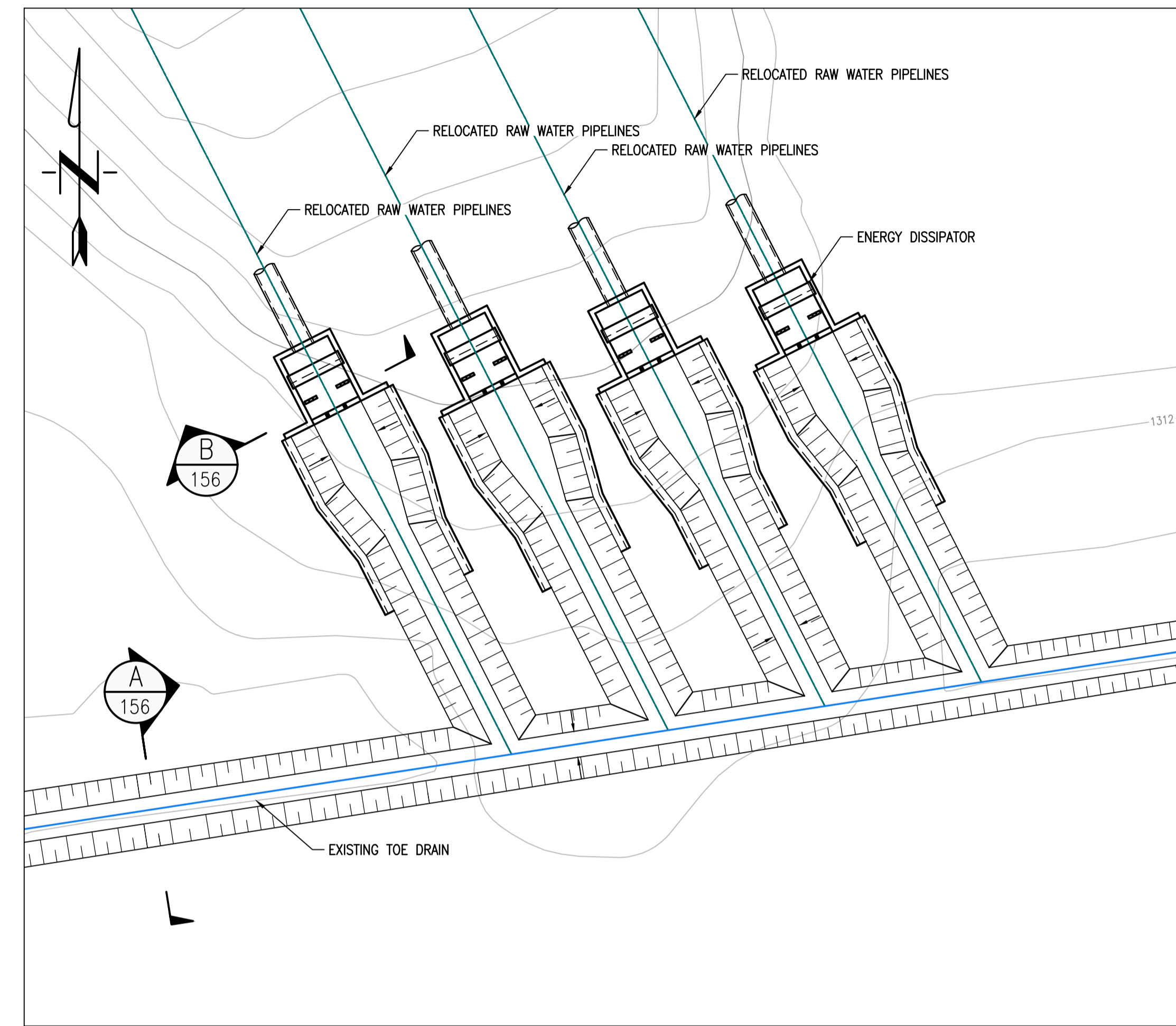
COPYRIGHT MET PROJECTS

CWR1806001

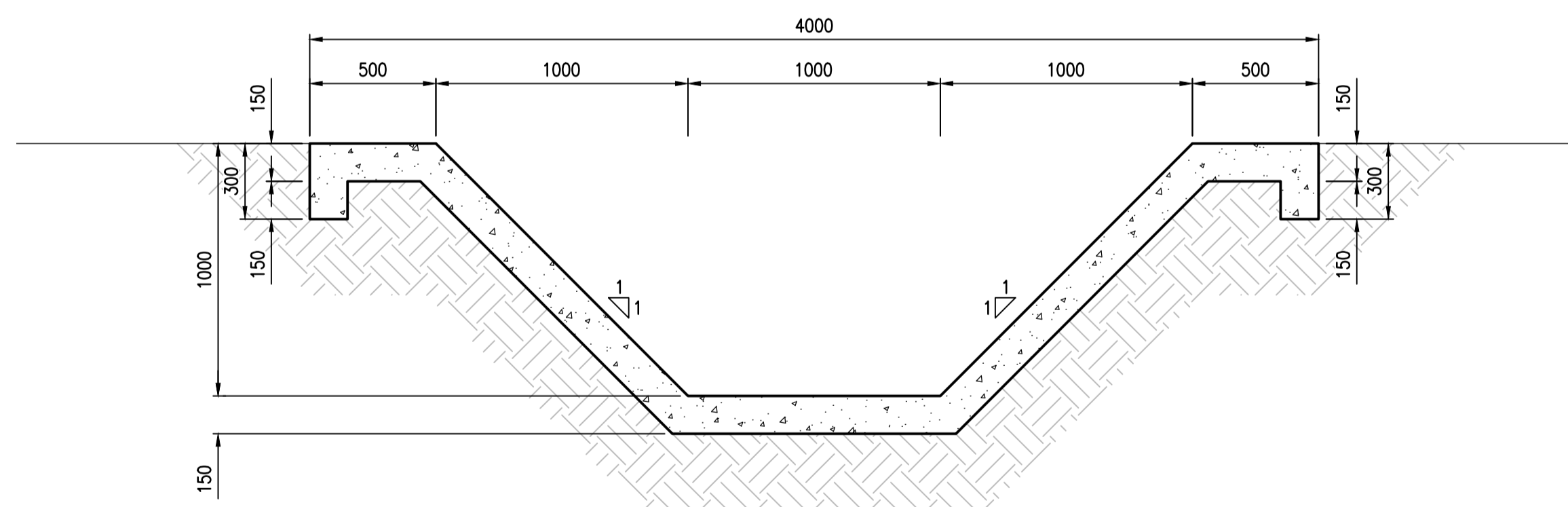




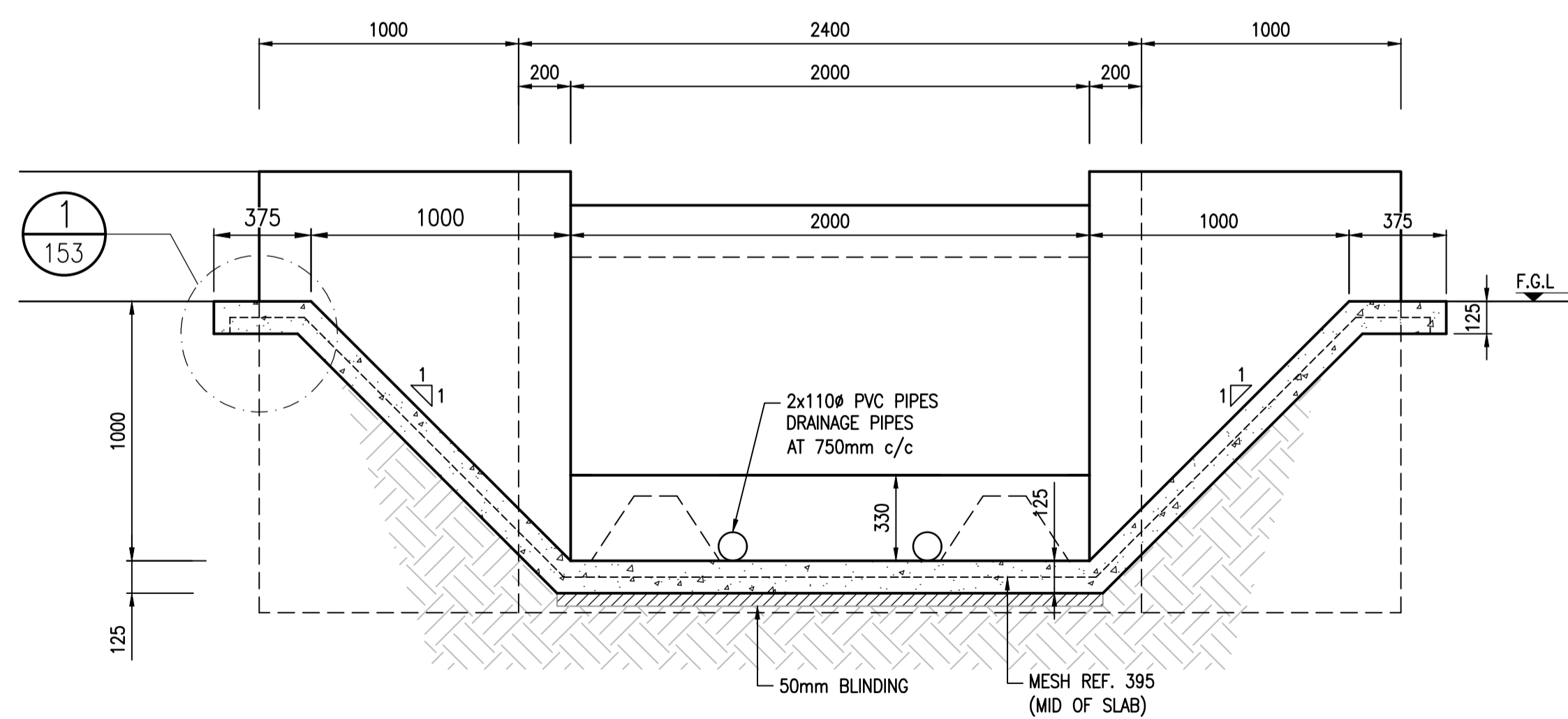
RELOCATED RAW WATER PIPELINES DISCHARGE POSITION  
SCALE 1: 5 000



RELOCATED RAW WATER PIPELINES DISCHARGE POSITION (DETAILED LAYOUT)  
SCALE 1:150

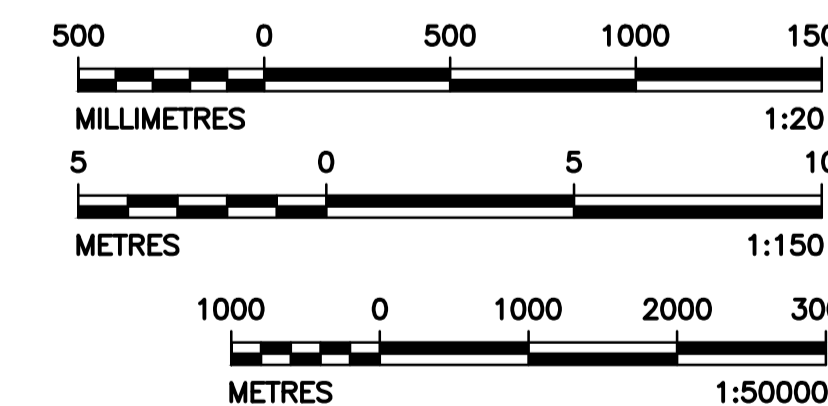


A TYPICAL SOLUTION TRENCH SECTION  
SCALE 1:20



B SECTION THROUGH ENERGY DISSIPATOR  
SCALE 1:20

SITE LEGEND	
	EXISTING TOE DRAIN
	EXISTING SLURRY DELIVERY PIPES



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

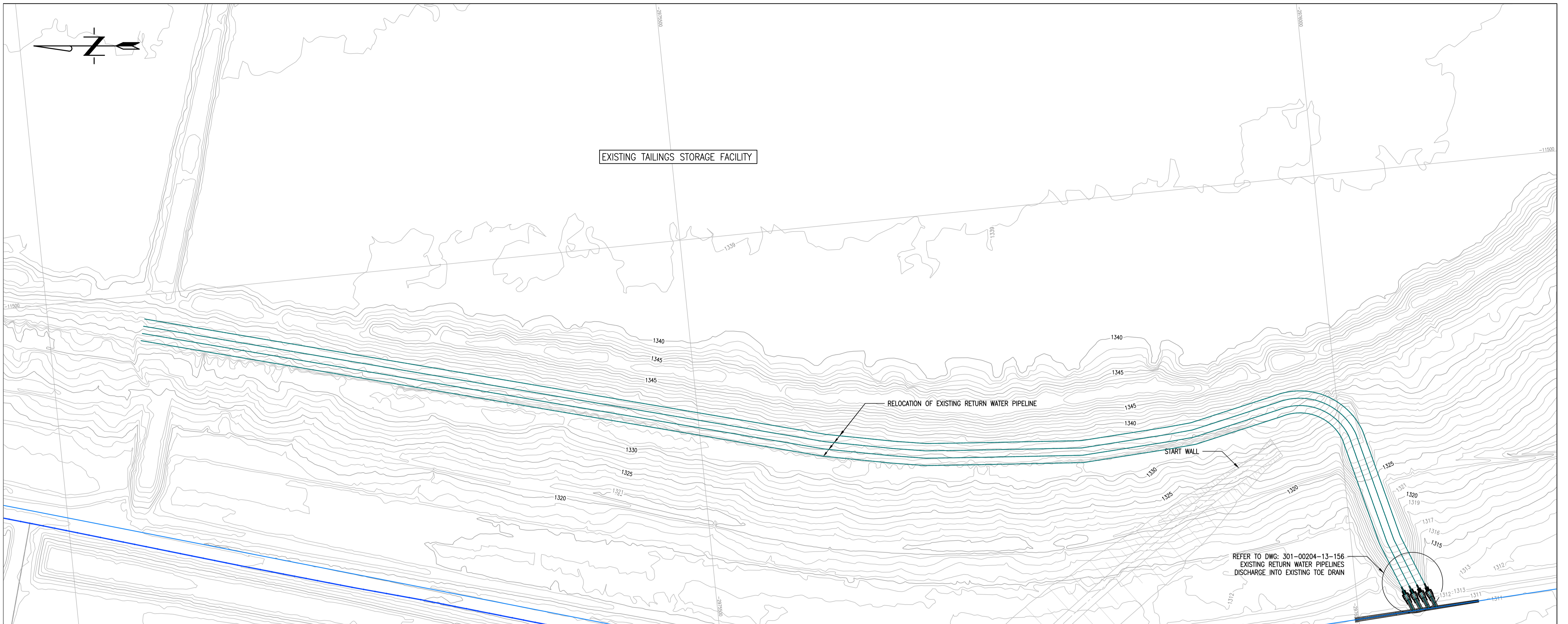
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ISSUED FOR TENDER	ISSUED FOR TENDER	MARK	DATE	INT	APP'D	PROJECT / MET ENGINEER	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
		A	28.02.2019			DRAWN		FB			27.02.2019
		B	29.03.2019			CHECKED		TM			27.02.2019
						SENIOR DESIGNER		DGS			27.02.2019
						PR ENGINEER		DGS			27.02.2019
						PR TECH		DGS			27.02.2019
						PROJECT / MET ENGINEER		DGS			27.02.2019
						MET PROJECTS MANAGER		NAME			



301-00204/13-156	REGION	SOUTH AFRICA REGION - VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	RELOCATED RW PIPELINES AND DISCHARGE INTO EXISTING SOLUTION TRENCH
MET PROJECTS	PROJECT No.	CWR1806001
	B/UNIT	MET-MWS-39-M0029
	AREA	
	SEQ. No.	
	SIZE	A1





EXISTING SLURRY DELIVERY PIPELINES  
SCALE 1: 1 000

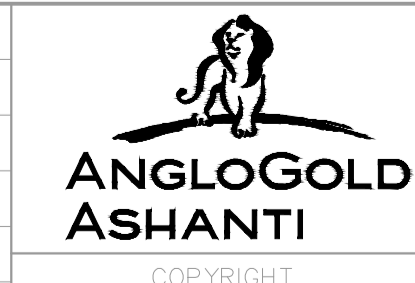
MATERIAL LIST – EXISTING RETURN WATER PIPELINES						
ITEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)
SPOOL	376	NB500	12000mm F/F, PE100 PN 10 STUBBED BOTH ENDS WITH GALVANIZED BACKING FLANGES.	ERW1-1	32.8	1000/3
VALVE	8	NB500	BUTTERFLY VALVE, 127 F/F	ERW1-2	.	.
BEND	4	NB500	90° C/F, PE100 PN 10 FLANGED BOTH END,	ERW1-3	32.8	1000/3
CLOSURE	8	NB500	0-3000mm F/F, PE100 PN 10 FLANGED BOTH END,	ERW1-4	32.8	1000/3
<b>LEGEND</b>						
F/F	FACE TO FACE		L.R.B LONG RADIUS BEND	* TO BE CONFIRMED ON SITE		
C/F	CENTER TO FACE		P/E PLAIN ENDED			



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

SCALE: AS SHOWN

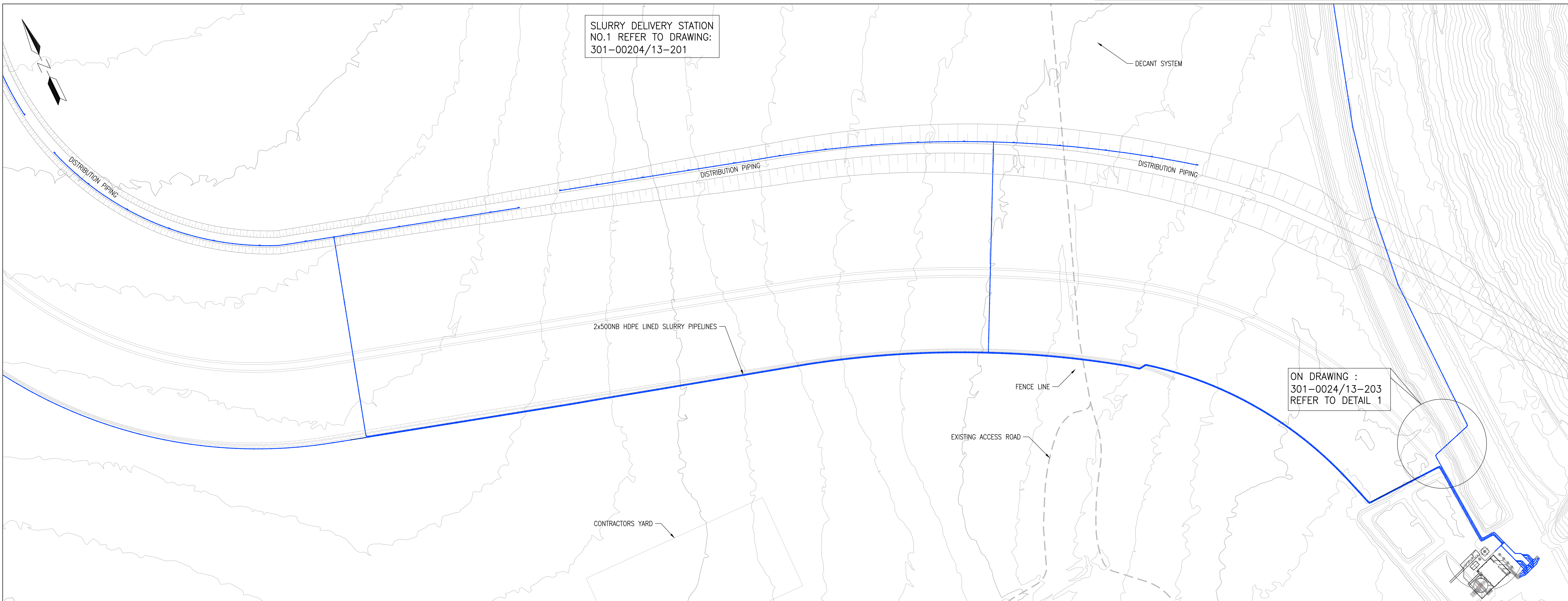
ISSUED FOR TENDER	MARK	DATE	INT	APP'D	PROJECT / MET ENGINEER	DATE
ISSUED FOR TENDER	A	13.03.2019			DRAWN	27.02.2019
ISSUED FOR TENDER MATERIAL LIST UPDATED	B	13.26.2019			CHECKED	27.02.2019
					SENIOR DESIGNER MET PROJECTS	
					PR ENGINEER	27.02.2019
					PR TECH	
					PROJECT / MET ENGINEER	27.02.2019
					MET PROJECTS MANAGER	



301-00204/13-157  
 REGION SOUTH AFRICA REGION – VR  
 BUSINESS UNIT MINE WASTE SOLUTIONS  
 PROJECT KAREERAND TSF EXPANSION PROJECT  
 DRAWING TITLE EXISTING RETURN WATER PIPELINES LAYOUT AND MATERIAL LIST

PROPOSED NEW SIPHON DECANT ( SHEET 1 OF 2 )	DRG. No	DETAIL
EXISTING SLURRY DELIVERY PIPELINES DISCHARGE INTO EXISTING TOE DRAIN	324-M00806	
TITLE	301-00204/13-156	





LAYOUT OF MAIN SLURRY DELIVERY AND DISTRIBUTION PIPING  
SCALE 1:1500

MATERIAL LIST – MAIN SLURRY DELIVERY PIPELINES							
TEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Flg. (PN)	LINER (mm)
SPOOL	84	DN500	13500mm F/F, FLANGED BOTH ENDS, HDPE LINED	.	4.5	2500/3	8
CLOSURE	2	DN500	0–3000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
CLOSURE	3	DN500	3000–6000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
BEND	2	DN500	22.5–45.0 L.R.B, 1289mm C/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
BEND	1	DN500	45.0–90, L.R.B, 2670mm C/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
CLOSURE	4	DN500	6000–9000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8

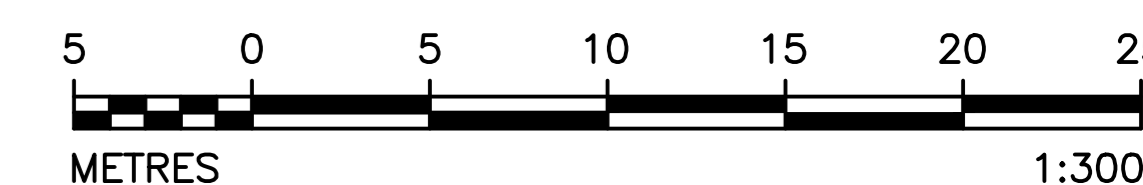
  

LEGEND			
F/F	FACE TO FACE	L.R.B	LONG RADIUS BEND
C/F	CENTER TO FACE	P/E	PLAIN ENDED
* TO BE CONFIRMED ON SITE			

MATERIAL LIST – DISTRIBUTION PIPELINES							
TEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Flg. (PN)	LINER (mm)
SPOOL	81	DN500	13500mm F/F, FLANGED BOTH ENDS, HDPE LINED	.	4.5	2500/3	8
BEND	4	DN500	0–11,25 L.R.B, 745mm C/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
CLOSURE	2	DN500	3000–6000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
VALVE	30	DN500	STRAIGHT THROUGH FULL BORE DIAPHRAGM VALVE, 412mm F/F, FLANGED, SAUNDERS KB SERIES, COMPLETE WITH HANDWHEEL OR SIMILAR APPROVED.	.		2500/3	
FLANGE	4	DN500	BLANK FLANGE, RUBBER LINED, 6mm THICK, SHORE HARDNESS 50	.		2500/3	
SPECIAL	30	DN.	500x150 UNEQUAL 45° LATERAL MANIFOLD, MAIN BARREL 2000mm F/F, FLANGED BOTH ENDS, LATERALS SET OUT 255mm AND 950mm FROM ONE END AND IN THE HORIZONTAL PLANE, DN150 LATERAL 650mm C/F, FLANGED. HDPE LINED, PE 100, SDR 41	.		2500/3	

LEGEND			
F/F	FACE TO FACE	L.R.B	LONG RADIUS BEND
C/F	CENTER TO FACE	P/E	PLAIN ENDED
* TO BE CONFIRMED ON SITE			



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

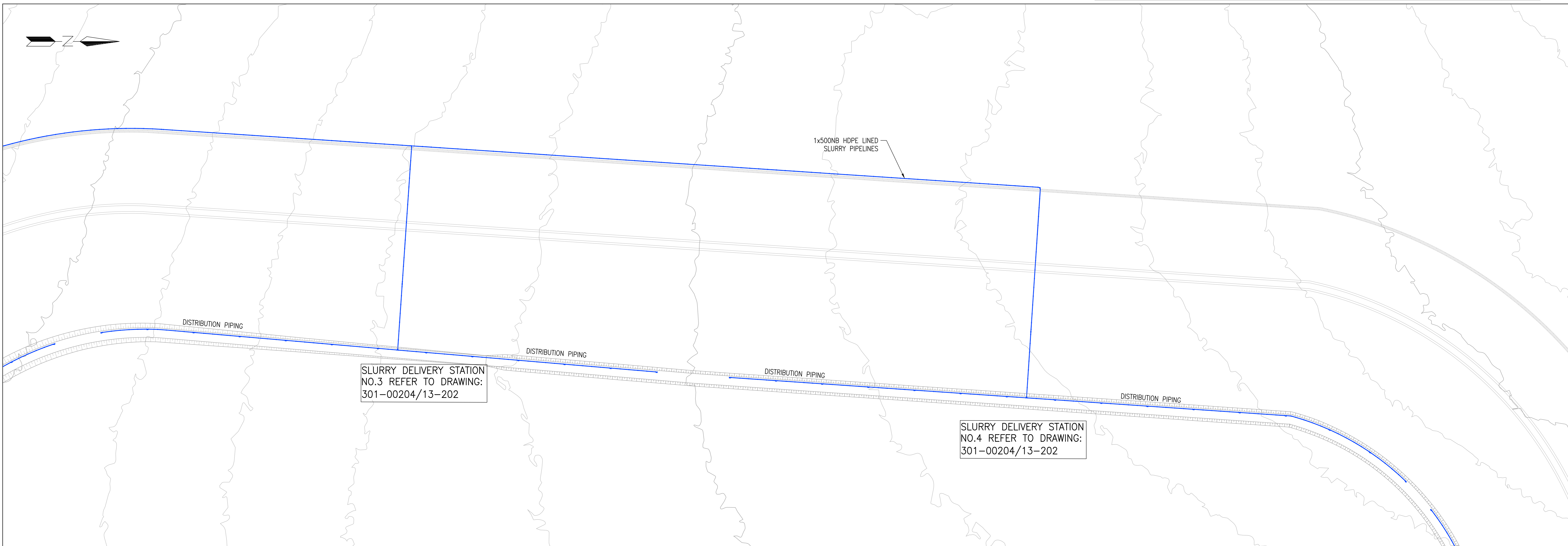
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ISSUED FOR TENDER			A	13.03.2019			DRAWN	TG
ISSUED FOR TENDER MATERIAL LIST ADDED			B	29.03.2019			CHECKED	TM
ISSUED FOR TENDER MATERIAL LIST UPDATED			C	2019.04.24			SENIOR DESIGNER MET PROJECTS	
							PR ENGINEER	DGS
							PR TECH	
							PROJECT / MET ENGINEER	DGS
							MET PROJECTS MANAGER	25/01/2019

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MET PROJECTS

301-00204/13-200	REGION	SOUTH AFRICA REGION – VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	SLURRY DELIVERY PIPING SYSTEM – PIPE SCHEDULE LINE E
CWR1806001	PROJECT No:	
	B/UNIT	AREA
	SEQ. No:	SIZE – A1





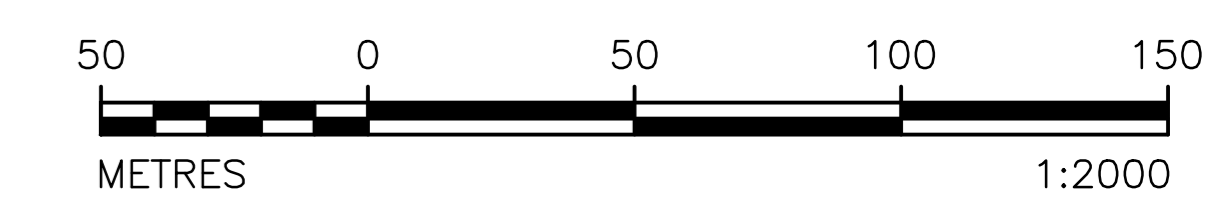
LAYOUT OF MAIN SLURRY DELIVERY AND DISTRIBUTION PIPING  
SCALE 1:2000

MATERIAL LIST – MAIN SLURRY DELIVERY PIPELINES							
TEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
SPOOL	205	DN500	13500mm F/F, FLANGED BOTH ENDS, HDPE LINED	.	4.5	2500/3	8
CLOSURE	6	DN500	0–3000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
CLOSURE	5	DN500	3000–6000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
CLOSURE	3	DN500	6000–9000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
BEND	2	DN500	22.5–45.0 L.R.B, 1289mm C/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
BEND	2	DN500	45.0–90. L.R.B, 2670mm C/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED

MATERIAL LIST – DISTRIBUTION PIPELINES							
TEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
SPOOL	92	DN500	13500mm F/F, FLANGED BOTH ENDS, HDPE LINED	.	4.5	2500/3	8
CLOSURE	4	DN500	0–3000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	
CLOSURE	3	DN500	3000–6000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	
VALVE	27	DN500	STRAIGHT THROUGH FULL BORE DIAPHRAGM VALVE, 412mm F/F, FLANGED, SAUNDERS KB SERIES, COMPLETE WITH HANDWHEEL OR SIMILAR APPROVED.	.	4.5	2500/3	
FLANGE	4	DN500	BLANK FLANGE, RUBBER LINED, 6mm THICK, SHORE HARDNESS 50			2500/3	
SPECIAL	27	DN.	500x150 UNEQUAL 45° LATERAL MANIFOLD, MAIN BARREL 2000mm F/F, FLANGED BOTH ENDS, LATERALS SET OUT 255mm AND 950mm FROM ONE END AND IN THE HORIZONTAL PLANE, DN150 LATERAL 650mm C/F, FLANGED. HDPE LINED, PE 100, SDR 41			2500/3	

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

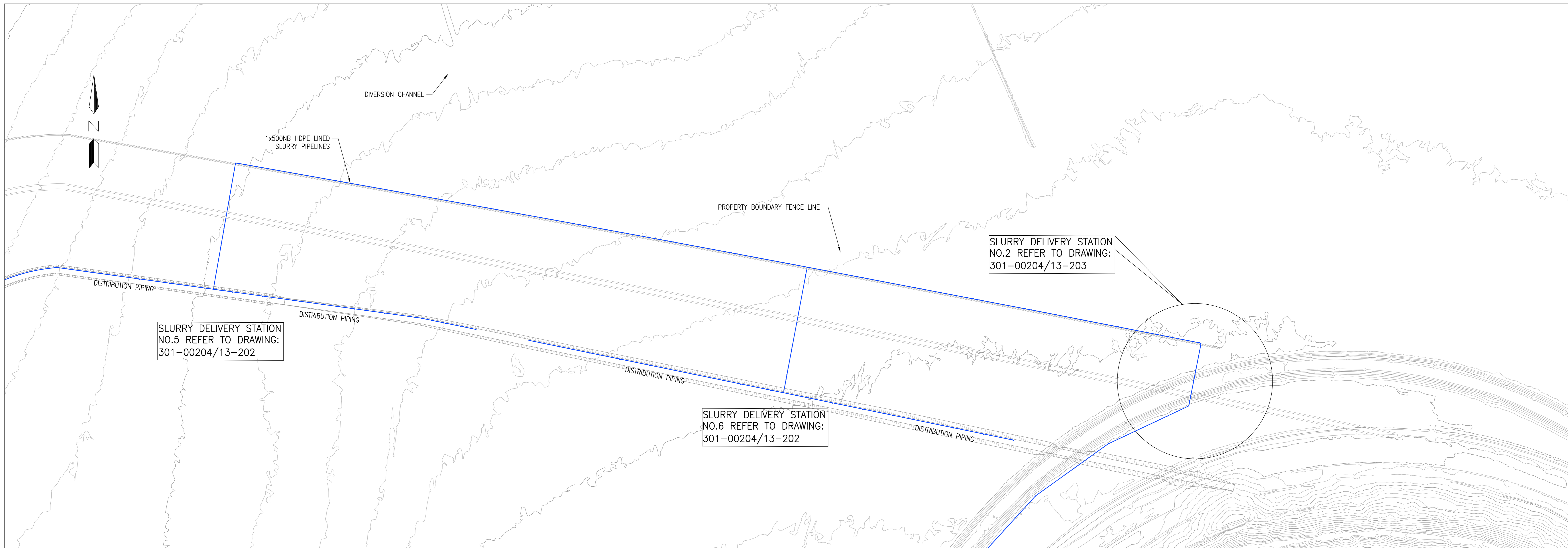
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TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	PROJECT / MET ENGINEER	DATE
ISSUED FOR TENDER			A	13.03.2019			DRAWN	TG
ISSUED FOR TENDER MATERIAL LIST ADDED			B	29.03.2019			CHECKED	TM
ISSUED FOR TENDER MATERIAL LIST UPDATED			C	24.04.2019			SENIOR DESIGNER MET PROJECTS	
							PR ENGINEER	DGS
							PR TECH	
							MET PROJECTS MANAGER	DGS
								25/01/2019
								25/01/2019



301-00204/13-200	
REGION	SOUTH AFRICA REGION – VR
BUSINESS UNIT	MINE WASTE SOLUTIONS
PROJECT	KAREERAND TSF EXPANSION PROJECT
DRAWING TITLE	SLURRY DELIVERY PIPING SYSTEM – PIPE SCHEDULE LINE F
MET PROJECTS	CWR1806001





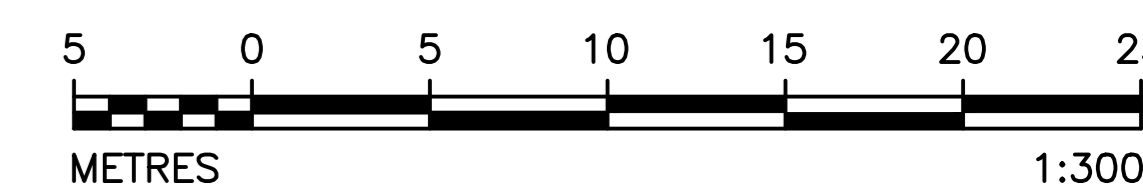
LAYOUT OF MAIN SLURRY DELIVERY AND DISTRIBUTION PIPING  
SCALE 1:2000

MATERIAL LIST – MAIN SLURRY DELIVERY PIPELINES							
TEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
SPOOL	280	DN500	13500mm F/F, FLANGED BOTH ENDS, HDPE LINED	.	4.5	2500/3	8
CLOSURE	1	DN500	0–3000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
CLOSURE	3	DN500	3000–6000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
CLOSURE	3	DN500	6000–9000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
BEND	10	DN500	0–11,25 L.R.B, 745mm C/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
BEND	6	DN500	22,5–45,0 L.R.B, 1289mm C/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
BEND	.	DN500	45,0–90, L.R.B, 2670mm C/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
BEND	3	DN500	11,25–22,5 L.R.B, 745mm C/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED

MATERIAL LIST – DISTRIBUTION PIPELINES							
TEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
SPOOL	106	DN500	13500mm F/F, FLANGED BOTH ENDS, HDPE LINED	.	4.5	2500/3	8
CLOSURE	4	DN500	0–3000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
CLOSURE	3	DN500	3000–6000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8
VALVE	34	DN500	STRAIGHT THROUGH FULL BORE DIAPHRAGM VALVE, 412mm F/F, FLANGED, SAUNDERS KB SERIES, COMPLETE WITH HANDWHEEL OR SIMILAR APPROVED.	.		2500/3	
FLANGE	4	DN500	BLANK FLANGE, RUBBER LINED, 6mm THICK, SHORE HARDNESS 50	.		2500/3	
SPECIAL	34	DN.	500x150 UNEQUAL 45° LATERAL MANIFOLD, MAIN BARREL 2000mm F/F, FLANGED BOTH ENDS, LATERALS SET OUT 255mm AND 950mm FROM ONE END AND IN THE HORIZONTAL PLANE, DN150 LATERAL 650mm C/F, FLANGED. HDPE LINED, PE 100, SDR 41	.		2500/3	
BEND	2	DN500	0–11,25 L.R.B, 745mm C/F, FLANGED BOTH ENDS, HDPE LINED*	.	4.5	2500/3	8

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

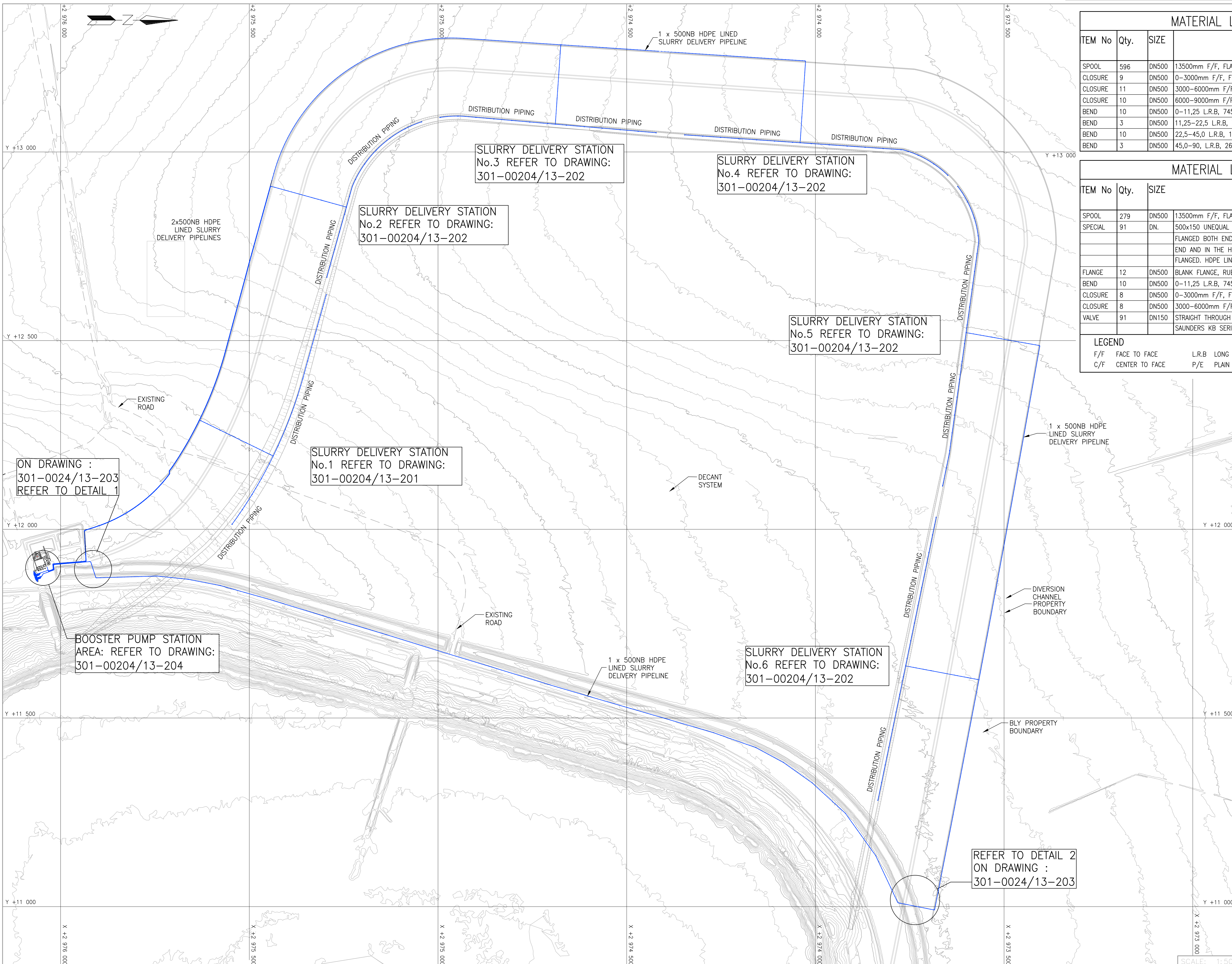
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TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	PROJECT / MET ENGINEER	DATE
ISSUED FOR TENDER	A			13.03.2019			DRAWN	TG
ISSUED FOR TENDER MATERIAL LIST ADDED	B			29.03.2019			CHECKED	TM
ISSUED FOR TENDER MATERIAL LIST UPDATED	C			24.04.2019			SENIOR DESIGNER MET PROJECTS	
							PR ENGINEER	DGS
							PR TECH	
							MET PROJECTS MANAGER	DGS
								25/01/2019
								25/01/2019



301-00204/13-200	REGION	SOUTH AFRICA REGION – VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	SLURRY DELIVERY PIPING SYSTEM – PIPE SCHEDULE LINE G
MET PROJECTS	CWR1806001	





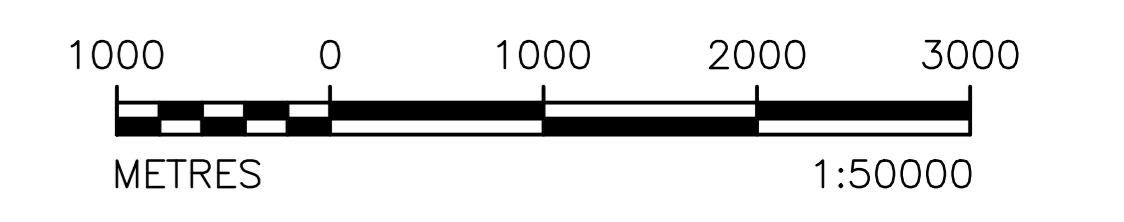
MATERIAL LIST – MAIN DELIVERY PIPELINES							
TEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
SPOOL	596	DN500	13500mm F/F, FLANGED BOTH ENDS, HDPE LINED		4.5	2500/3	8
CLOSURE	9	DN500	0–3000mm F/F, FLANGED BOTH ENDS, HDPE LINED*		4.5	2500/3	8
CLOSURE	11	DN500	3000–6000mm F/F, FLANGED BOTH ENDS, HDPE LINED*		4.5	2500/3	8
CLOSURE	10	DN500	6000–9000mm F/F, FLANGED BOTH ENDS, HDPE LINED*		4.5	2500/3	8
BEND	10	DN500	0–11,25 L.R.B, 745mm C/F, FLANGED BOTH ENDS, HDPE LINED*		4.5	2500/3	8
BEND	3	DN500	11,25–22,5 L.R.B, 745mm C/F, FLANGED BOTH ENDS, HDPE LINED*		4.5	2500/3	8
BEND	10	DN500	22,5–45,0 L.R.B, 1289mm C/F, FLANGED BOTH ENDS, HDPE LINED*		4.5	2500/3	8
BEND	3	DN500	45,0–90, L.R.B, 2670mm C/F, FLANGED BOTH ENDS, HDPE LINED*		4.5	2500/3	8

MATERIAL LIST – DISTRIBUTION PIPING							
TEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
SPOOL	279	DN500	13500mm F/F, FLANGED, HDPE LINED, PE100, SDR 41		4.5	2500/3	8
SPECIAL	91	DN.	500x150 UNEQUAL 45° LATERAL MANIFOLD, MAIN BARREL 2000mm F/F, FLANGED BOTH ENDS, LATERALS SET OUT 255mm AND 950mm FROM ONE END AND IN THE HORIZONTAL PLANE, DN150 LATERAL 650mm C/F, FLANGED, HDPE LINED, PE 100, SDR 41				
FLANGE	12	DN500	BLANK FLANGE, RUBBER LINED, 6mm THICK, SHORE HARDNESS 50			2500/3	8
BEND	10	DN500	0–11,25 L.R.B, 745mm C/F, FLANGED BOTH ENDS, HDPE LINED*		4.5	2500/3	8
CLOSURE	8	DN500	0–3000mm F/F, FLANGED BOTH ENDS, HDPE LINED*			2500/3	8
CLOSURE	8	DN500	3000–6000mm F/F, FLANGED BOTH ENDS, HDPE LINED*			2500/3	8
VALVE	91	DN150	STRAIGHT THROUGH FULL BORE DIAPHRAGM VALVE, 412mm F/F, FLANGED, SAUNDERS KB SERIES, COMPLETE WITH HANDWHEEL OR SIMILAR APPROVED.			2500/3	8

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED

- NOTES:**
- MAKE OF ALL VALVES TO BE APPROVED BY ENGINEER IN WRITING.
  - ALL BOLT HOLES TO STRADDLE CENTRE LINES.
  - ALL WELDING TO BE FULL STRENGTH AND FULL PENETRATION (6mm).
  - WHERE PLAIN ENDS FOR PIPING ARE CALLED FOR, PLAIN ENDS AND FLEXIBLE COUPLINGS MUST MATCH.
  - CORROSION PROTECTION:**  
 AGA SPEC 164050 – 327 (FOR LINING)  
 AGA SPEC 164050 – 132 (FOR COATINGS)
  - ALL LEVELS TO BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK, AND THE ENGINEER TO BE NOTIFIED IN CASE OF ANY DISCREPANCIES.
  - ALL GASKETS, BOLTS, NUTS AND WASHERS TO BE SUPPLIED WITH FITTINGS TO ENSURE A COMPLETE INSTALLATION.

- PIPING SPECIFICATIONS:**
- PIPING SPEC. FOR 200 NB AND ABOVE TO BE SABS 719 GRADE A
  - FLANGES TO SABS 1123 1600 / 3 FOR DISTRIBUTION PIPE WORK  
 4000 / 3 FOR DELIVERY PIPING AND PUMP STATION INTERCONNECTING PIPE WORK
  - ALL GASKETS TO BE FLAT RING TYPE, 3mm THICK.
  - ALL BOLTS TO BE SABS 1700–1 (SABS) Gr. 8.8 GALVANIZED.  
 ALL NUTS TO BE SABS 1700–2 (SABS) Gr. 8 GALVANIZED.  
 ALL WASHERS TO BE FLAT TYPE GALVANIZED.
  - ALL WELDING AND TAPPING TO BE COMPLETED PRIOR TO LINING.



TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
ISSUED FOR TENDER			A	25.01.2019			DRAWN	TG			25/01/2018
ISSUED FOR TENDER			B	2019.01.30			CHECKED	TM			25/01/2019
ISSUED FOR TENDER			C	2019.02.01			SENIOR DESIGNER MET PROJECTS				
ISSUED FOR TENDER (XREF'S UPDATED)			D	2019.03.06			PR ENGINEER	DGS			
ISSUED FOR TENDER (XREF'S UPDATED)			E	2019.03.26			PR TECH				
ISSUED FOR TENDER MATERIAL LIST UPDATED			F	2019.04.24			PROJECT / MET ENGINEER	DGS			25/01/2019
							MET PROJECTS MANAGER				25/01/2019

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301-00204/13-200

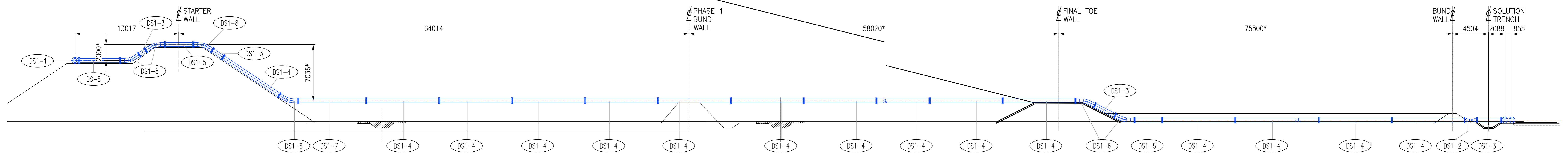
REGION SOUTH AFRICA REGION – VR  
 BUSINESS UNIT MINE WASTE SOLUTIONS  
 PROJECT KAREERAND TSF EXPANSION PROJECT  
 DRAWING TITLE SLURRY DELIVERY PIPING SYSTEM – GENERAL ARRANGEMENT SHEET 1 OF 4

SCALE: 1:5000

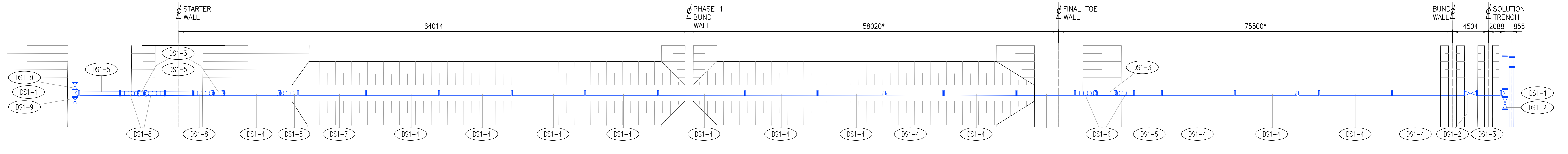
MET PROJECTS      CWR1806001      MET-MWS-39-M0021      REV F

W:\301-00204\13\DRAWINGS\VP\For Tender\301-00204-13-200, 201, 202, 203, 204, 205, 206 Rev.dwg





TYPICAL SECTION THOURG SLURRY DELIVERY STATION No.1  
SCALE 1:250



TYPICAL PLAN VIEW ON SLURRY DELIVERY STATION  
SCALE 1:250

**NOTES:**

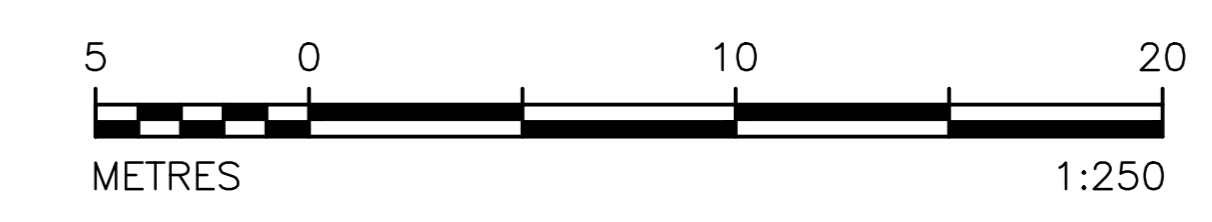
1. MAKE OF ALL VALVES TO BE APPROVED BY ENGINEER IN WRITING.
2. ALL BOLT HOLES TO STRADDLE CENTRE LINES.
3. ALL WELDING TO BE FULL STRENGTH AND FULL PENETRATION (6mm).
4. WHERE PLAIN ENDS FOR PIPING ARE CALLED FOR, PLAIN ENDS AND FLEXIBLE COUPLINGS MUST MATCH.
5. CORROSION PROTECTION:  
AGA SPEC 164050 - 327 (FOR LINING)  
AGA SPEC 164050 - 132 (FOR COATINGS)
6. ALL LEVELS TO BE VERIFIED ON SITE PRIOR TO THE COMMENCEMENT OF ANY WORK, AND THE ENGINEER TO BE NOTIFIED IN CASE OF ANY DISCREPANCIES.
7. ALL GASKETS, BOLTS, NUTS AND WASHERS TO BE SUPPLIED WITH FITTINGS TO ENSURE A COMPLETE INSTALLATION.

**PIPING SPECIFICATIONS:**

1. PIPING SPEC. FOR 200 NB AND ABOVE TO BE SABS 719 GRADE A
2. FLANGES TO SABS 1123 1600 / 3 FOR DISTRIBUTION PIPE WORK  
4000 / 3 FOR DELIVERY PIPING AND PUMP STATION INTERCONNECTING PIPE WORK
3. ALL GASKETS TO BE FLAT RING TYPE, 3mm THICK.
4. ALL BOLTS TO BE SABS 1700-1 (SABS) Gr. 8.8 GALVANIZED.  
ALL NUTS TO BE SABS 1700-2 (SABS) Gr. 8 GALVANIZED.  
ALL WASHERS TO BE FLAT TYPE GALVANIZED.
5. ALL WELDING AND TAPPING TO BE COMPLETED PRIOR TO LINING.

MATERIAL LIST (DELIVERY STATION No. 1)							
TEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Flg. (PN)	LINER (mm)
TEE	2	DN500	SHORT EQUAL TEE PIECE, 510mm C/F, FLANGED BOTH ENDS, HDPE LINED	DS1-1	4.5	2500/3	8
VALVE	2	DN500	SLURRY KNIFE GATE VALVE, FLANGED, COMPLETE WITH HANDWHEEL	DS1-2	.	2500/3	.
CLOSURE	4	DN500	0-3000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	DS1-3	4.5	2500/3	8
SPOOL	10	DN500	13500mm F/F, FLANGED BOTH ENDS, HDPE	DS1-4	4.5	2500/3	8
CLOSURE	3	DN500	3000-6000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	DS1-5	4.5	2500/3	8
BEND	2	DN500	26,56° LONG RADIUS BEND, 1289mm C/F, FLANGED BOTH ENDS, HDPE LINED*	DS1-6	4.5	2500/3	8
CLOSURE	1	DN500	6000-9000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	DS1-7	4.5	2500/3	8
BEND	4	DN500	33,69° LONG RADIUS BEND, 1289mm C/F, FLANGED BOTH ENDS, HDPE LINED*	DS1-8	4.5	2500/3	8
VALVE	2	DN500	SLURRY KNIFE GATE VALVE, FLANGED, COMPLETE WITH HANDWHEEL, ONE SIDE DRILLED TO SABS 1123, 1600/3 OTHER 4000/3	DS1-9	.	.	.

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED

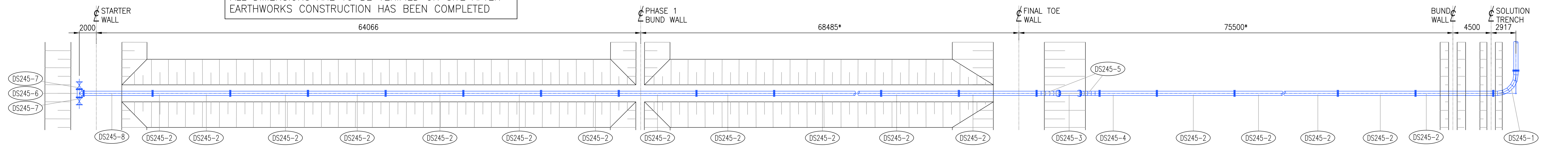
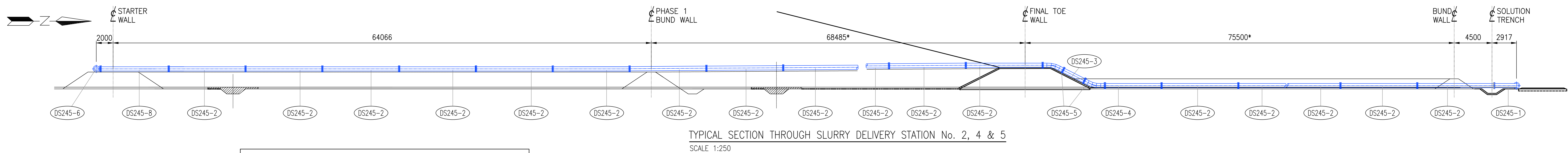


DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	PROJECT / MET ENGINEER	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
ISSUED FOR TENDER				25.01.2019			DRAWN		TG			25/01/2018
ISSUED FOR TENDER				2019.01.30			CHECKED		TM			25/01/2019
ISSUED FOR TENDER				2019.02.01			SENIOR DESIGNER MET PROJECTS					
ISSUED FOR TENDER (XREF'S UPDATED)				2019.03.13			PR ENGINEER		DGS			
ISSUED FOR TENDER (MATERIAL LIST UPDATED)				2019.03.26			PR TECH					
ISSUED FOR TENDER (MATERIAL LIST UPDATED)				2019.04.24			PROJECT / MET ENGINEER		DGS			25/01/2019
							MET PROJECTS MANAGER					25/01/2019

 COPYRIGHT MET PROJECTS	301-00204/13-201 REGION SOUTH AFRICA REGION - VR BUSINESS UNIT MINE WASTE SOLUTIONS PROJECT KAREERAND TSF EXPANSION PROJECT DRAWING TITLE SLURRY DELIVERY PIPING SYSTEM - STATION NO:1 TYPICAL PLAN, SECTION AND MATERIAL LIST	CWR1806001 MET-MWS-39-M0020 REV F
	PROJECT No. B/UNIT AREA SEQ. No. SIZE - A1	





TEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Flg. (PN)	LINER (mm)
BEND	1	DN500	90° LONG RADIUS BEND, 2670mm C/F, FLANGED BOTH ENDS, HDPE LINED*	DS245-1	4.5	2500/3	8
SPOOL	12	DN500	13500mm F/F, FLANGED BOTH ENDS, HDPE LINED	DS245-2	4.5	2500/3	8
CLOSURE	1	DN500	0-3000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	DS245-3	4.5	2500/3	8
CLOSURE	1	DN500	3000-6000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	DS245-4	4.5	2500/3	8
BEND	2	DN500	26.56° LONG RADIUS BEND, 1289mm C/F, FLANGED BOTH ENDS, HDPE LINED*	DS245-5	4.5	2500/3	8
TEE	1	DN500	SHORT EQUAL TEE PIECE, 510mm C/F, FLANGED BOTH ENDS, HDPE LINED	DS245-6	4.5	2500/3	8
VALVE	2	DN500	SLURRY KNIFE GATE VALVE, FLANGED, COMPLETE WITH HANDWHEEL, ONE SIDE DRILLED TO SABS 1123, 1600/3 OTHER 4000/3	DS245-7	.	.	.
CLOSURE	1	DN500	6000-9000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	DS245-8	4.5	2500/3	8

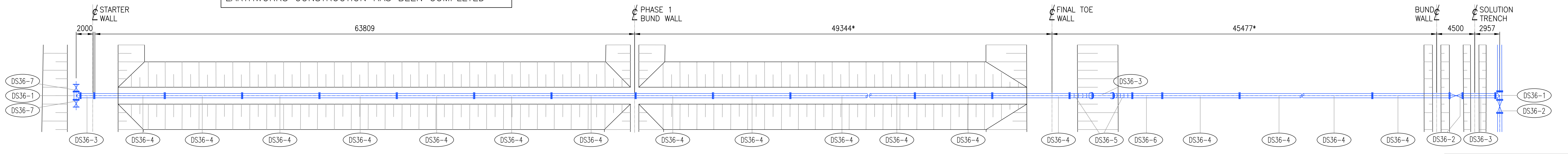
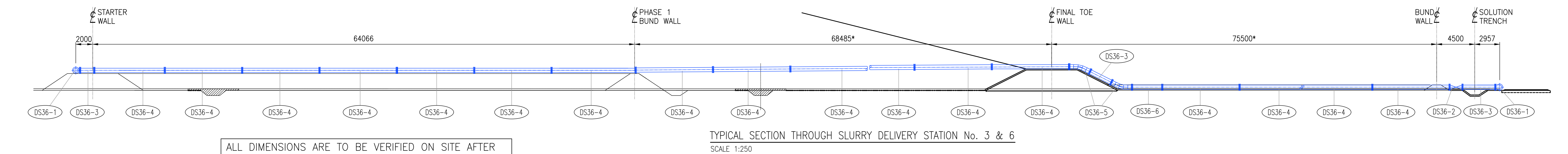
**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED

NOTE: MATERIAL INDICATED IS FOR A SINGLE STATION ONLY

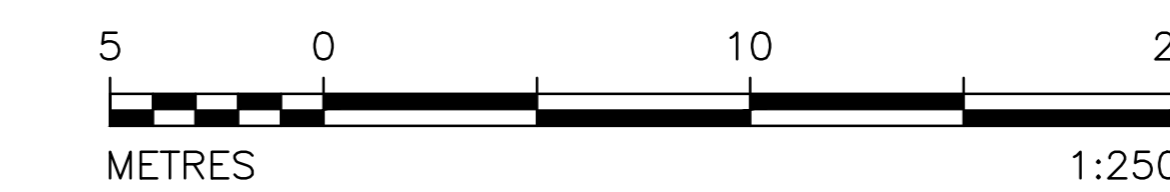
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TEE	2	DN500	SHORT EQUAL TEE PIECE, 510mm C/F, FLANGED BOTH ENDS, HDPE LINED	DS36-1	4.5	2500/3	8
VALVE	2	DN500	SLURRY KNIFE GATE VALVE, FLANGED, COMPLETE WITH HANDWHEEL	DS36-2	.	2500/3	.
CLOSURE	3	DN500	0-3000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	DS36-3	4.5	2500/3	8
SPOOL	12	DN500	13500mm F/F, FLANGED BOTH ENDS, HDPE LINED	DS36-4	4.5	2500/3	8
BEND	2	DN500	26.56° LONG RADIUS BEND, 1289mm C/F, FLANGED BOTH ENDS, HDPE LINED*	DS36-5	4.5	2500/3	8
CLOSURE	1	DN500	3000-6000mm F/F, FLANGED BOTH ENDS, HDPE LINED*	DS36-6	4.5	2500/3	8
VALVE	2	DN500	SLURRY KNIFE GATE VALVE, FLANGED, COMPLETE WITH HANDWHEEL, ONE SIDE DRILLED TO SABS 1123, 1600/3 OTHER 4000/3	DS36-7	.	.	.

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED

NOTE: MATERIAL INDICATED IS FOR A SINGLE STATION ONLY



TYPICAL PLAN VIEW ON SLURRY DELIVERY STATION No. 3 & 6  
SCALE 1:250



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				



ISSUED FOR	DATE	BY	APP'D	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
ISSUED FOR TENDER	25.01.2019	A		DRAWN	TG			25/01/2018
ISSUED FOR TENDER	2019.01.30	B		CHECKED	TM			25/01/2019
ISSUED FOR TENDER	2019.02.01	C		SENIOR DESIGNER MET PROJECTS				
ISSUED FOR TENDER (XREF'S UPDATED)	2019.03.13	D		PR ENGINEER	DGS			
ISSUED FOR TENDER (MATERIAL LIST UPDATED)	2019.03.26	E		PR TECH				
ISSUED FOR TENDER (MATERIAL LIST UPDATED)	2019.04.24	F		PROJECT / MET ENGINEER	DGS			25/01/2019
				MET PROJECTS MANAGER				25/01/2019

COPYRIGHT  
MET PROJECTS

301-00204/13-202

REGION SOUTH AFRICA REGION - VR

BUSINESS UNIT MINE WASTE SOLUTIONS

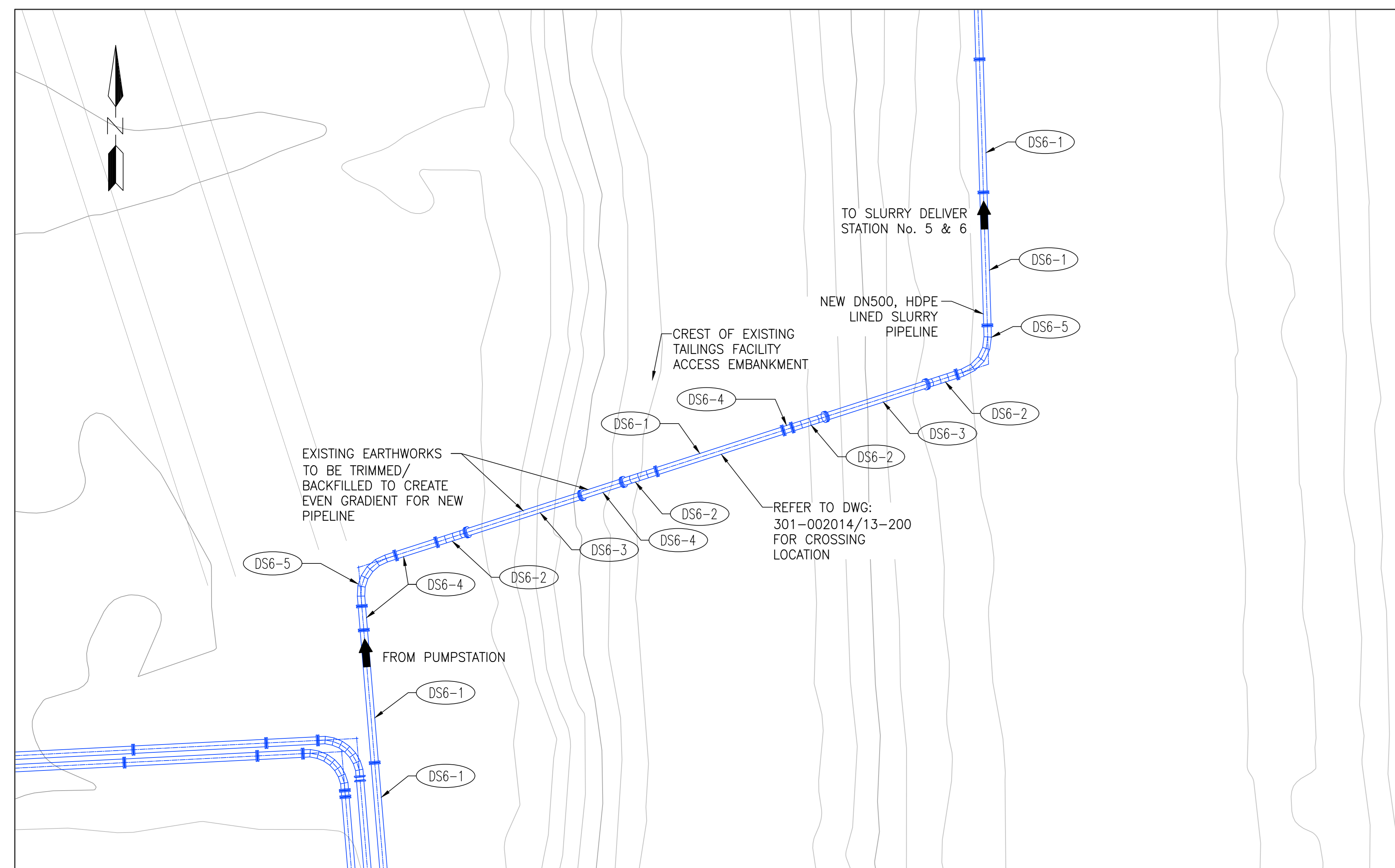
PROJECT KAREERAND TSF EXPANSION PROJECT

DRAWING TITLE SLURRY DELIVERY PIPING SYSTEM - GENERAL ARRANGEMENT

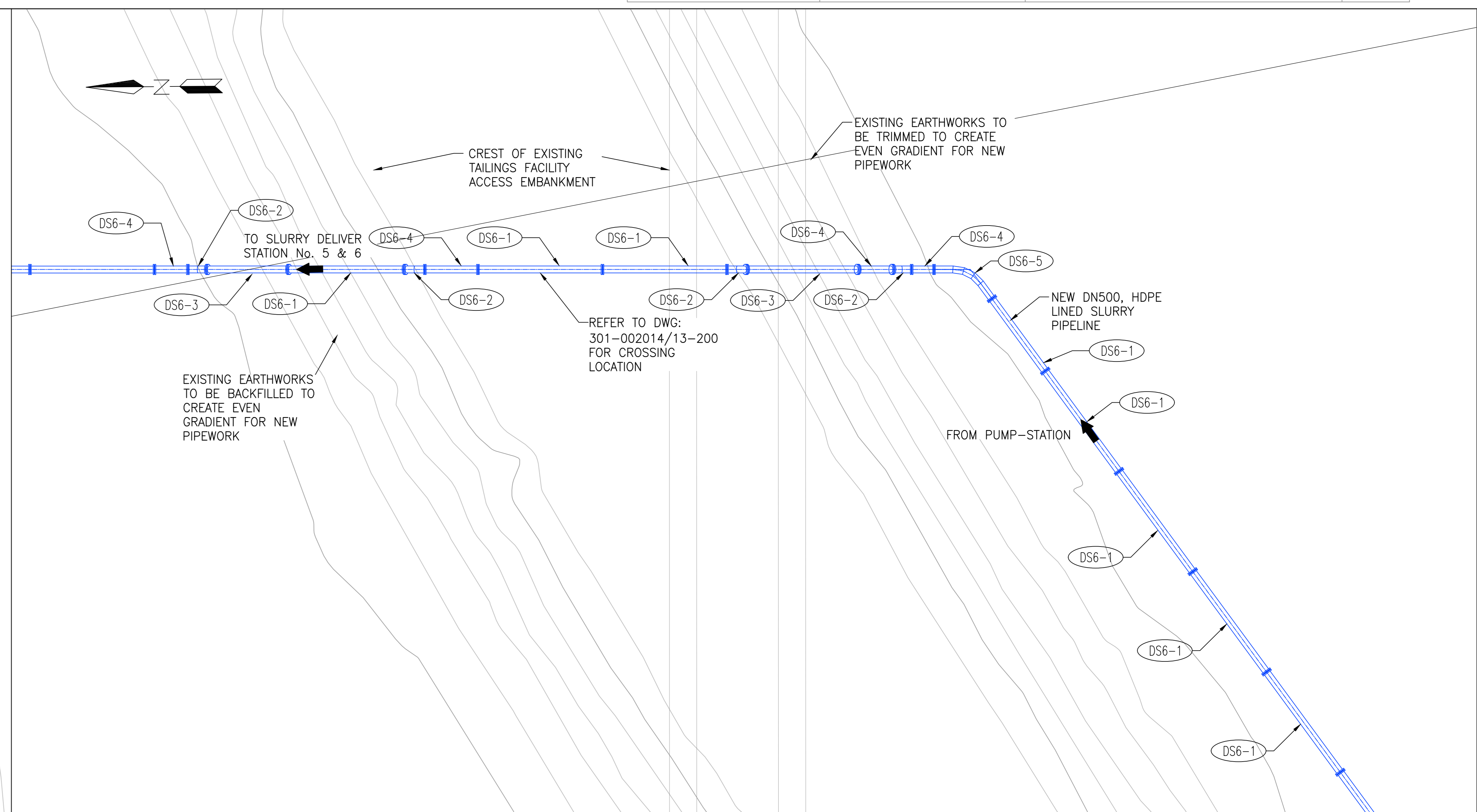
CWR1806001

MET-MWS-39-M0019

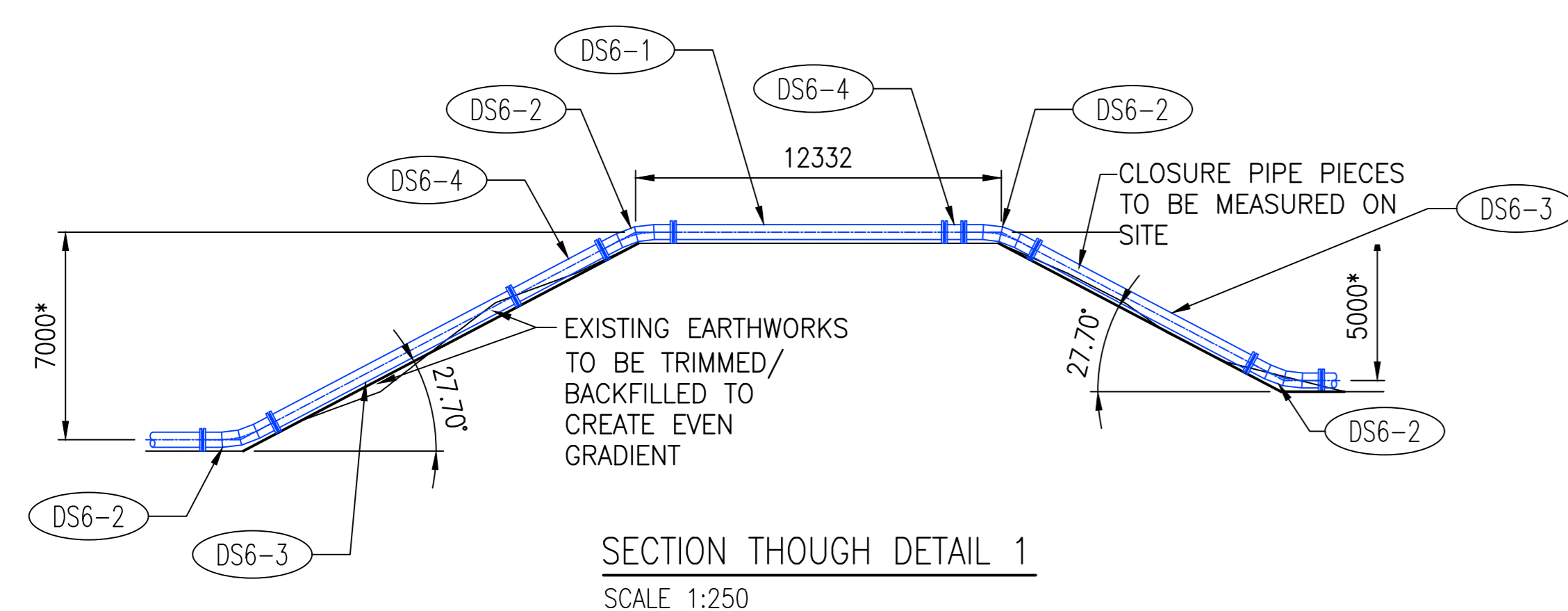




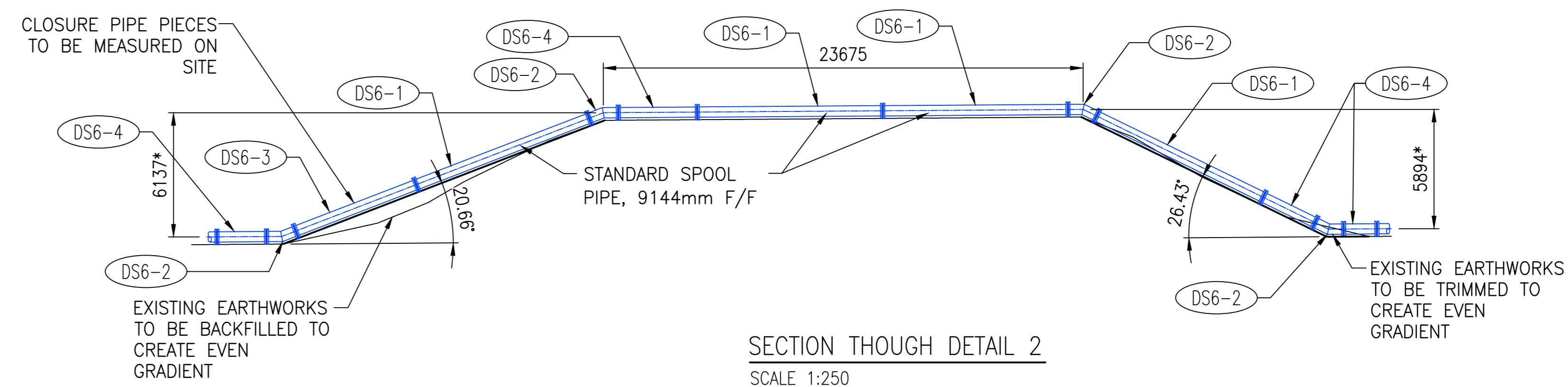
PLAN VIEW DETAIL 1  
SCALE 1:250



PLAN VIEW DETAIL 2  
SCALE 1:250



SECTION THROUGH DETAIL 1  
SCALE 1:250



SECTION THROUGH DETAIL 2  
SCALE 1:250

MATERIAL LIST (DETAIL 1)

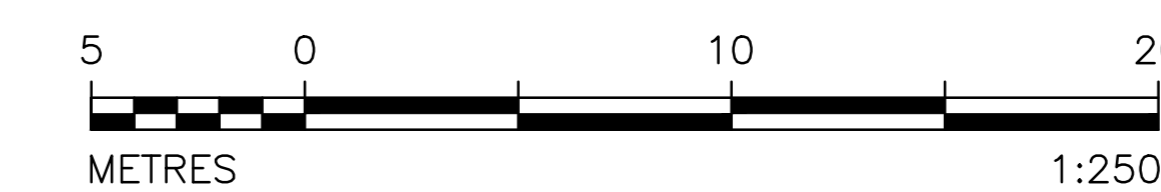
ITEM	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
SPOOL	6	DN500	13500mm F/F, FLANGED BOTH ENDS ,HDPE LINED	DS6-1	4.5	2500/3	8
BEND	4	DN500	22,5-45° L.R.B., 1280mm C/F, FLANGED BOTH ENDS ,HDPE LINED	DS6-2	4.5	2500/3	8
CLOSURE	2	DN500	6000-9000mm F/F, FLANGED BOTH END, SUPPLY WITH LOOSE FLANGE *	DS6-3	4.5	2500/3	8
CLOSURE	3	DN500	0-3000mm F/F, FLANGED BOTH END, SUPPLY WITH LOOSE FLANGE *	DS6-4	4.5	2500/3	8
BEND	2	DN500	45°-90° L.R.B. 1.2680mm C/F, FLANGED BOTH ENDS ,HDPE LINED	DS6-5	4.5	2500/3	8

LEGEND  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED

MATERIAL LIST (DETAIL 2)

ITEM	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
SPOOL	10	DN500	13500mm F/F, FLANGED BOTH ENDS ,HDPE LINED	DS6-1	4.5	2500/3	8
BEND	4	DN500	22,5-45° L.R.B. 700mm C/F, FLANGED BOTH ENDS ,HDPE LINED	DS6-2	4.5	2500/3	8
CLOSURE	2	DN500	6000-9000mm F/F, FLANGED BOTH END, SUPPLY WITH LOOSE FLANGE *	DS6-3	4.5	2500/3	8
CLOSURE	3	DN500	0-3000mm F/F, FLANGED BOTH END, SUPPLY WITH LOOSE FLANGE *	DS6-4	4.5	2500/3	8
BEND	1	DN500	45°-90° L.R.B., 2.670mm C/F, FLANGED BOTH ENDS ,HDPE LINED	DS6-5	4.5	2500/3	8

LEGEND  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED



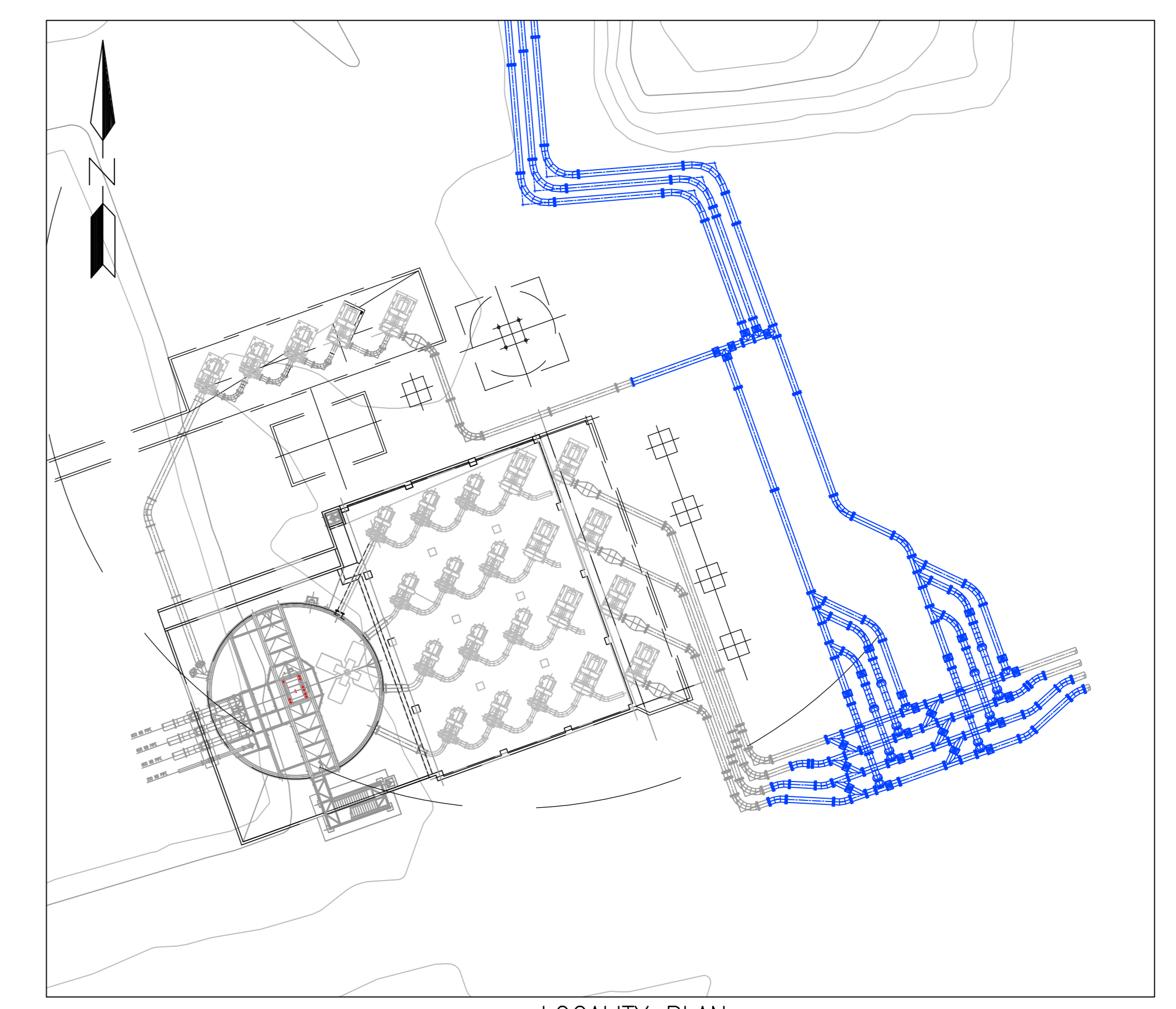
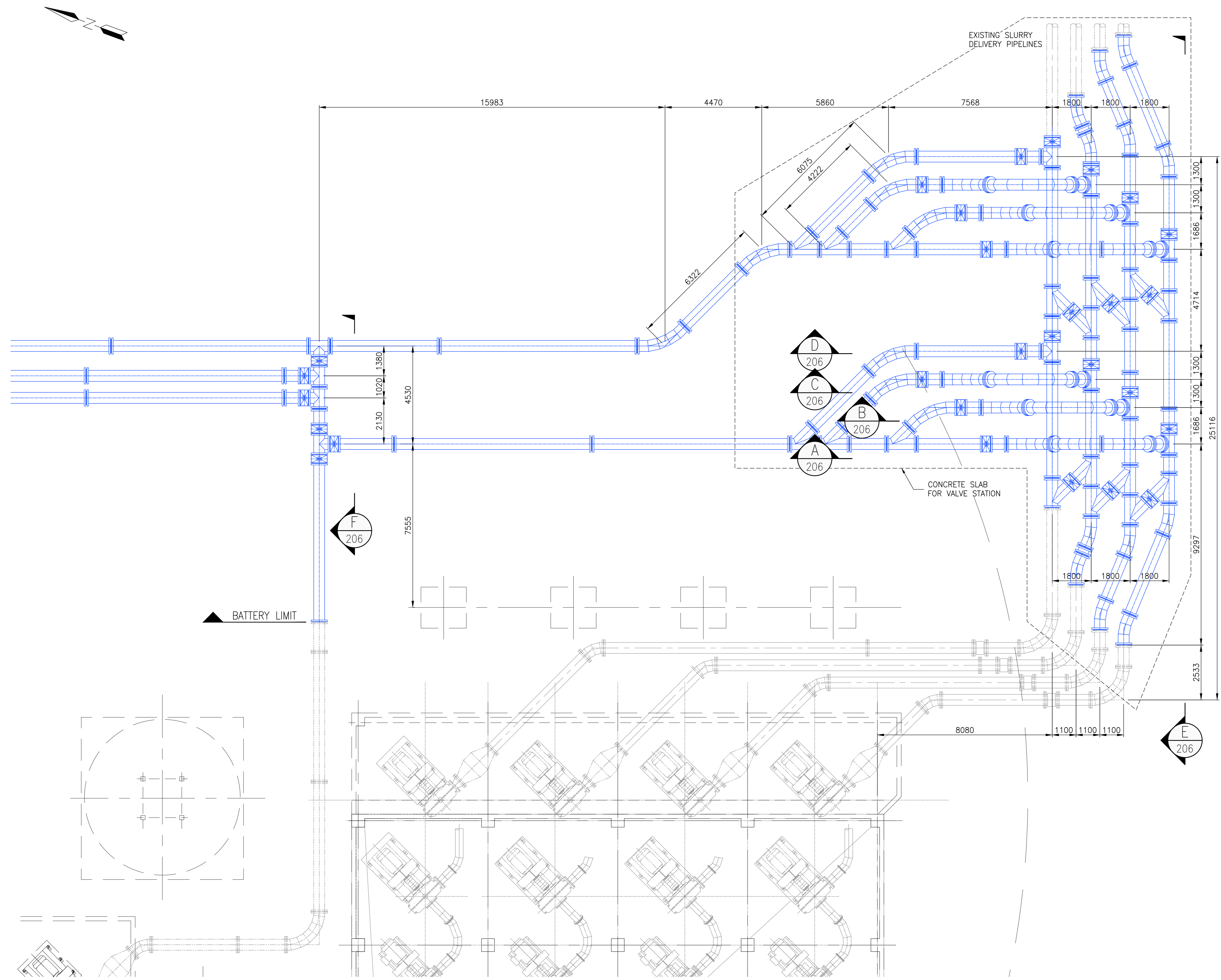
DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APPD	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
ISSUED FOR TENDER			A	25.01.2019			DRAWN	TG			25/01/2018
ISSUED FOR TENDER			B	2019.01.30			CHECKED	TM			25/01/2019
ISSUED FOR TENDER			C	2019.02.01			SENIOR DESIGNER MET PROJECTS				
ISSUED FOR TENDER (MATERIAL LIST ADDED)			D	2019.03.13			PR ENGINEER	DGS			
ISSUED FOR TENDER (MATERIAL LIST ADDED)			E	2019.03.29			PR TECH				
			F	2019.04.24			PROJECT / MET ENGINEER	DGS			25/01/2019
							MET PROJECTS MANAGER				25/01/2019



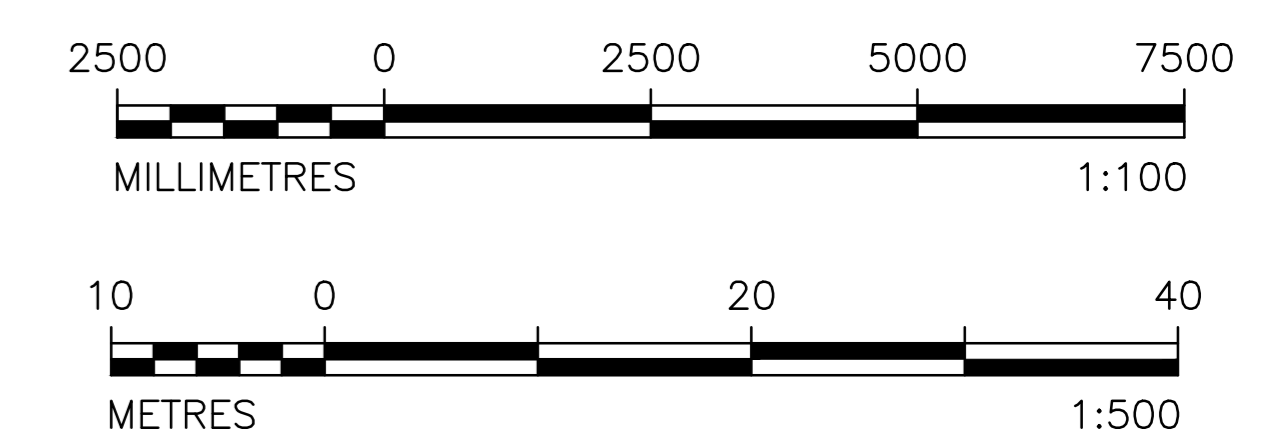
301-00204/13-203	REGION	SOUTH AFRICA REGION - VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	SLURRY DELIVERY PIPING SYSTEM - PIPE WORK ONTO EXISTING TSF (LINE C)
MET PROJECTS	CWR1806001	MET-MWS-39-M0018





LOCALITY PLAN  
SCALE 1:500

PLAN VIEW OF SLURRY INTERCONNECTING PIPEWORK  
SCALE 1:100



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

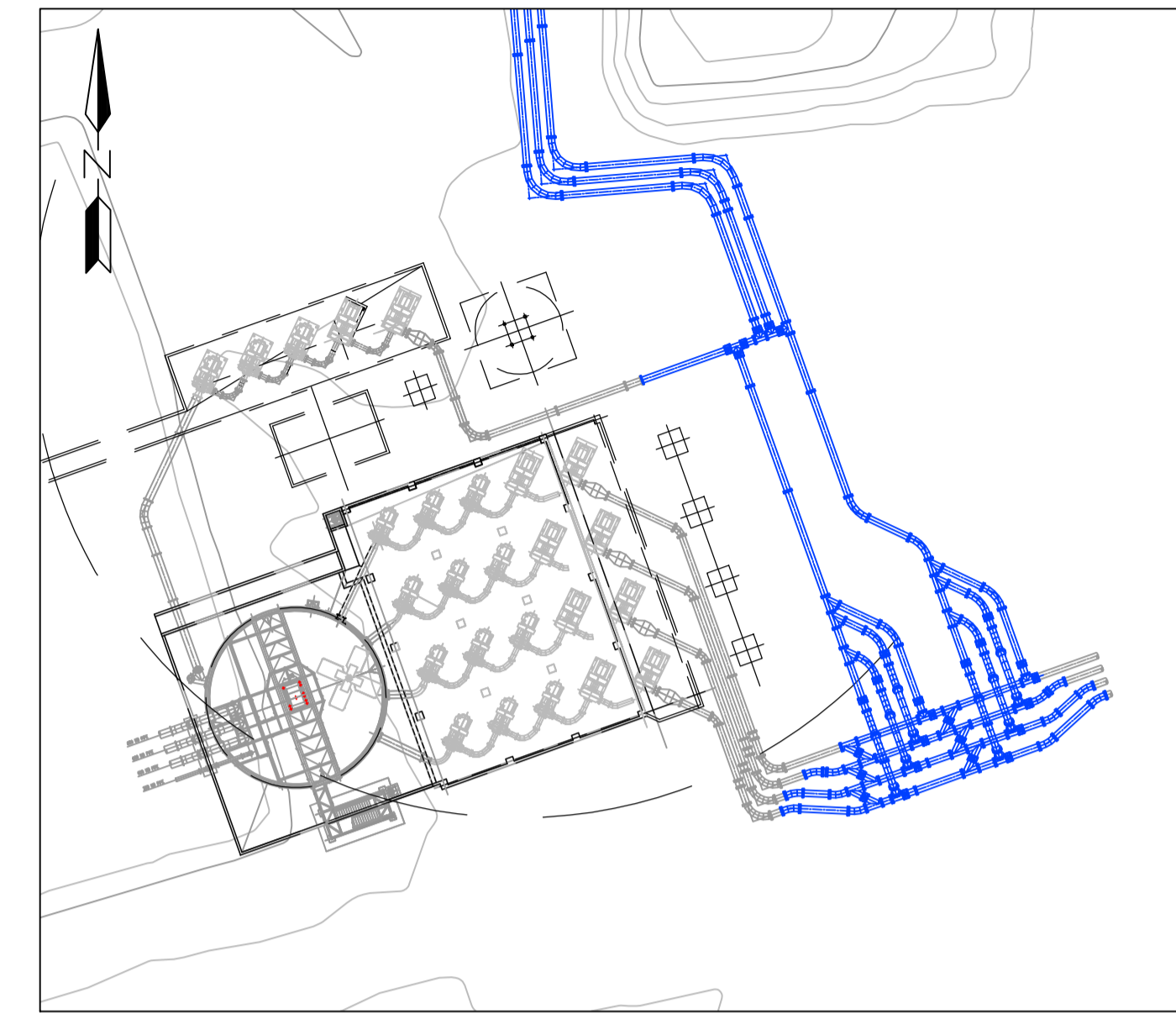
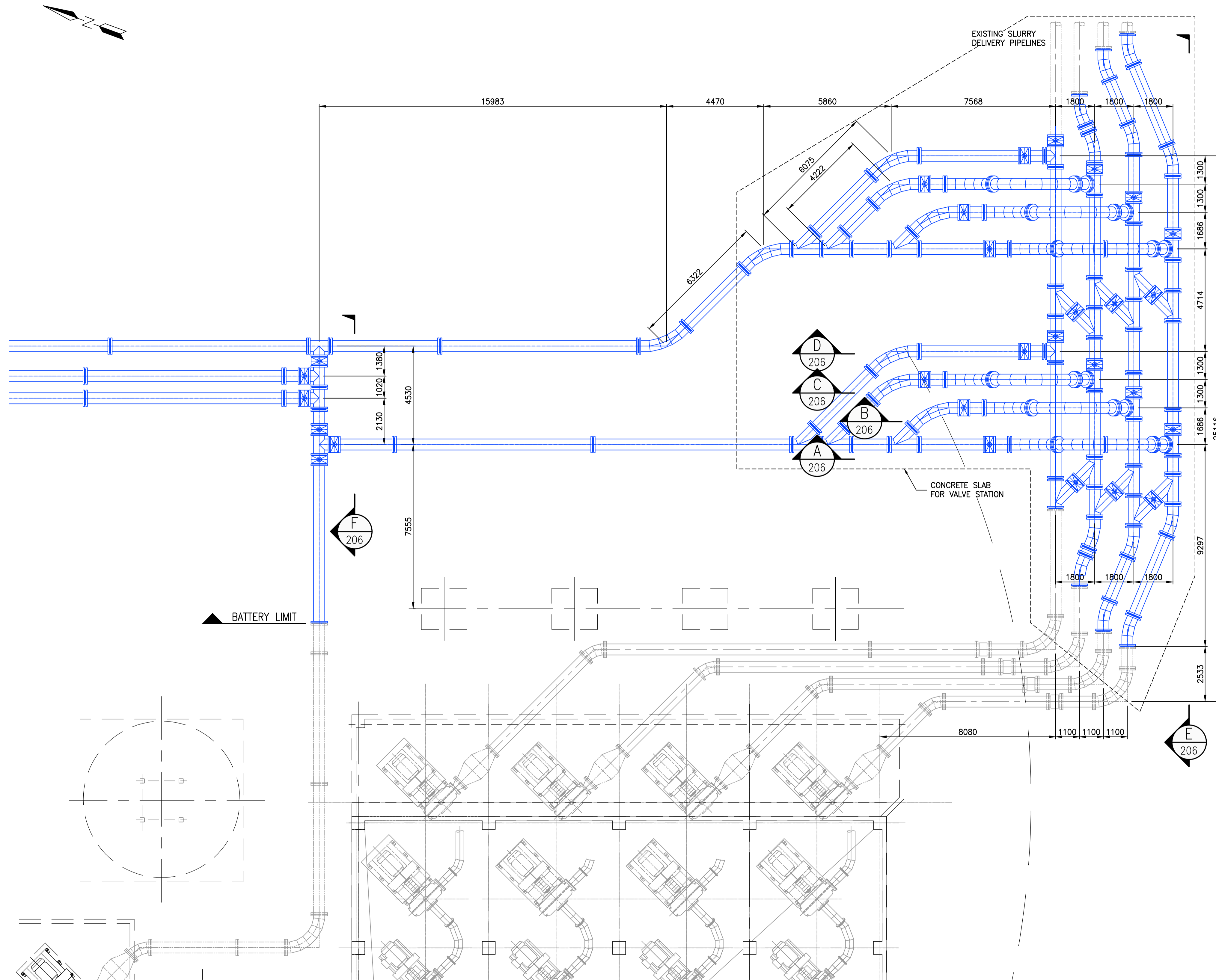
SCALE: AS SHOWN

DESCRIPTION	DOCUMENT NUMBER	DATE	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
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ISSUED FOR TENDER		25/01/2019	CHECKED	TM			25/01/2019
ISSUED FOR TENDER (XREF'S UPDATED)			SENIOR DESIGNER MET PROJECTS	DGS			
ISSUED FOR TENDER			PR ENGINEER	DGS			
			PR TECH				
			PROJECT / MET ENGINEER	DGS			25/01/2019
			MET PROJECTS MANAGER				25/01/2019



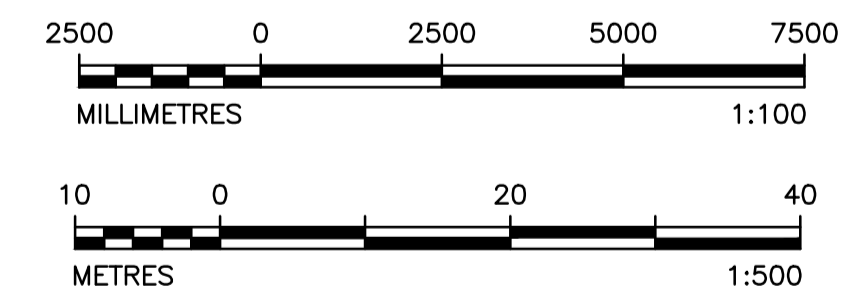
301-00204/13-204	REGION SOUTH AFRICA REGION - VR	BUSINESS UNIT MINE WASTE SOLUTIONS	PROJECT KAREERAND TSF EXPANSION PROJECT	DRAWING TITLE SLURRY DELIVERY PIPING SYSTEM - VALVE STATION GENERAL LAYOUT - SHEET 1/3
CWR1806001	MET-MWS-39-M0017	REV E		





LOCALITY PLAN  
SCALE 1:500

PLAN VIEW OF SLURRY INTERCONNECTING PIPEWORK  
SCALE 1:100



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

SCALE: AS SHOWN

TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	PROJECT / MET ENGINEER	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
ISSUED FOR TENDER			A	25.01.2019			DRAWN	TG				25/01/2018
ISSUED FOR TENDER			B	2019.01.30			CHECKED	TM				25/01/2019
ISSUED FOR TENDER			C	2019.02.01			SENIOR DESIGNER	MET PROJECTS				
ISSUED FOR TENDER (XREF'S UPDATED)			D	2019.03.13			PR ENGINEER	DGS				
							PR TECH					
							PROJECT / MET ENGINEER	DGS				25/01/2019
							MET PROJECTS MANAGER					25/01/2019

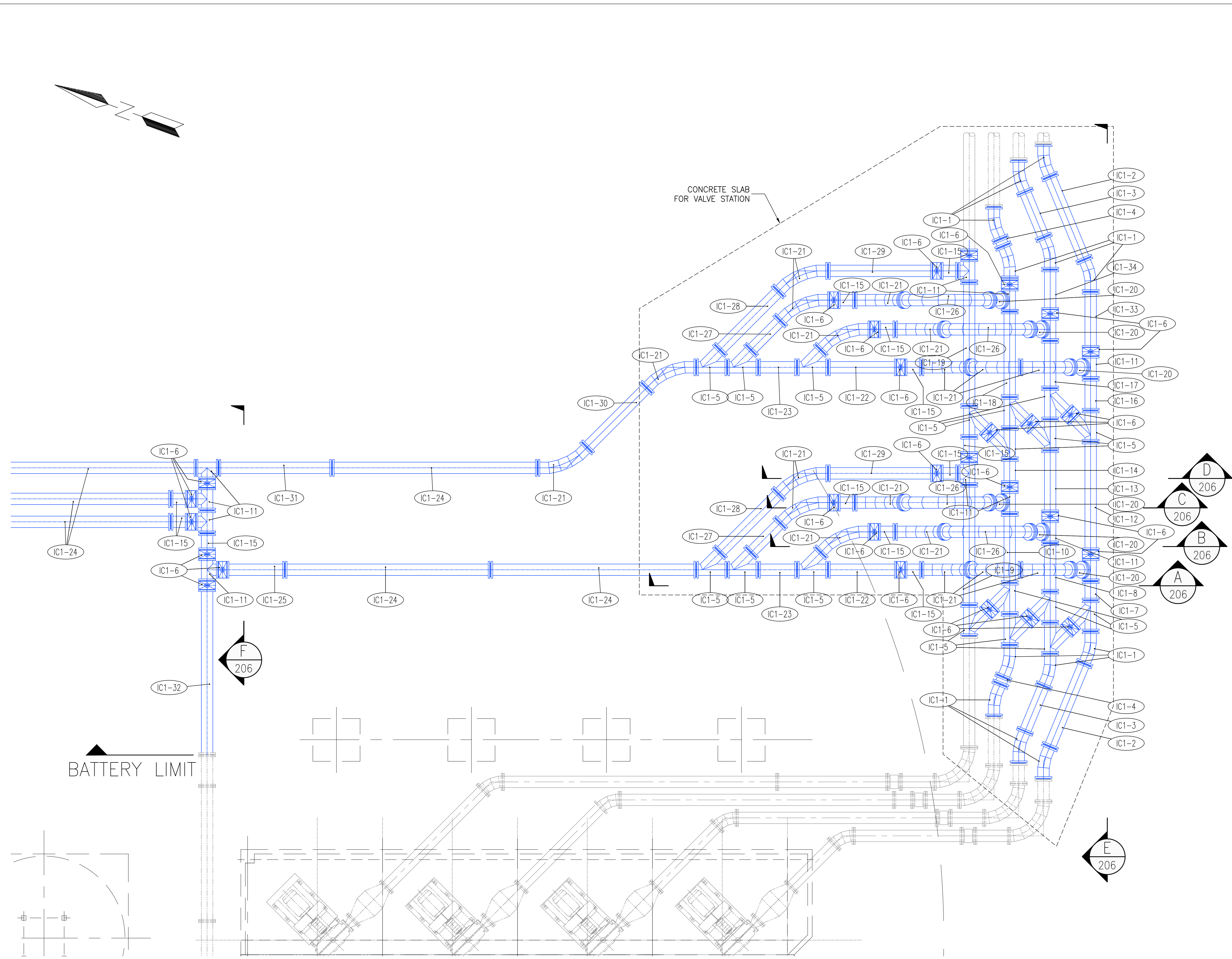
TITLE	DRG. No	DETAIL
SLURRY DELIVERY PIPING SYSTEM - INTERCONNECTING PIPEWORK AT PUMPSTATION (SHT1)	301-00204/13-206	
SLURRY DELIVERY PIPING SYSTEM - INTERCONNECTING PIPEWORK AT PUMPSTATION (SHT2)	301-00204/13-205	
SLURRY DELIVERY PIPING SYSTEM - GENERAL ARRANGEMENT	301-00204/13-200	



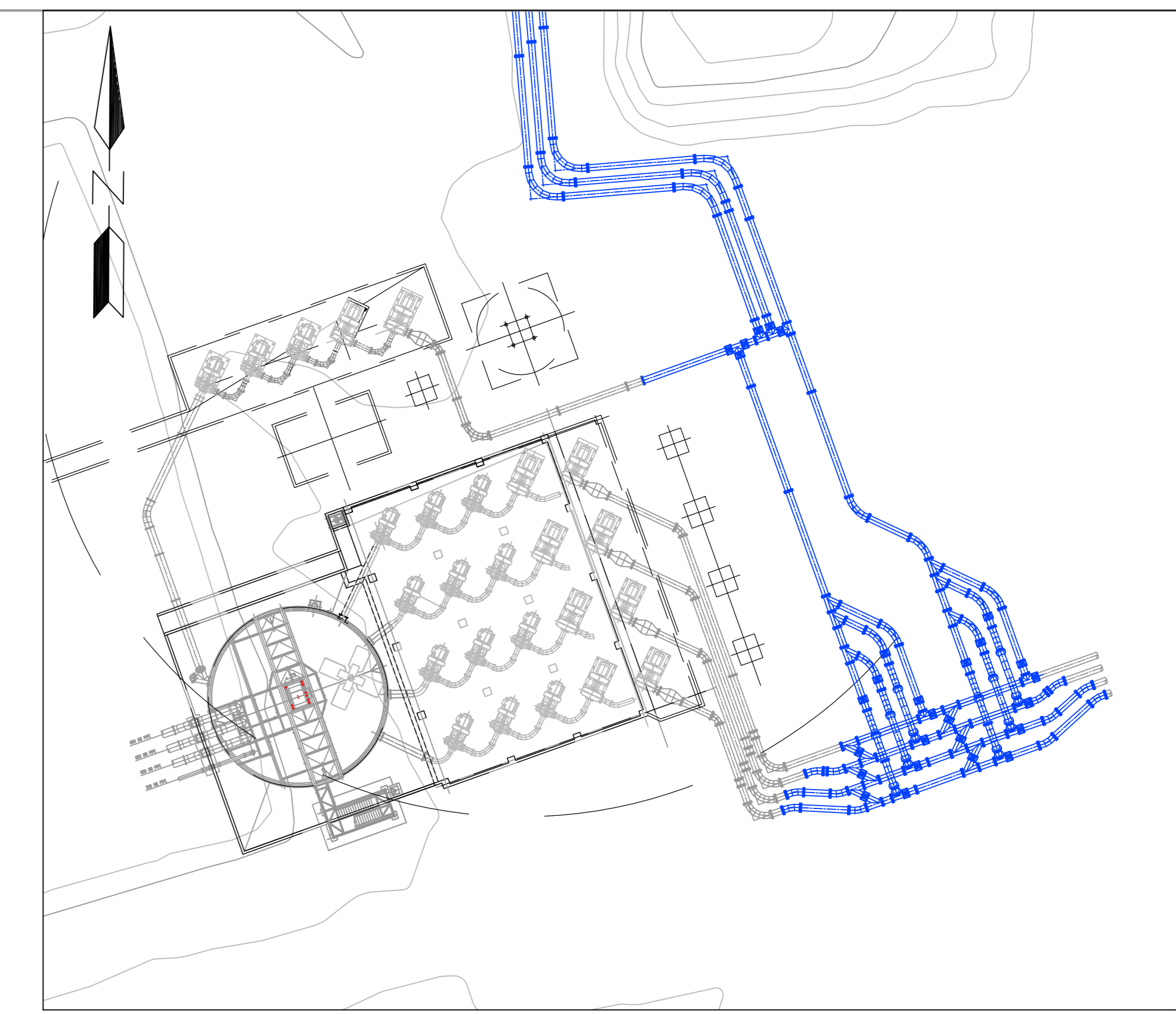
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MET PROJECTS

301-00204/13-204	REGION	SOUTH AFRICA REGION - VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	SLURRY DELIVERY PIPING SYSTEM - VALVE STATION GENERAL LAYOUT - SHEET 1/3
CWR1806001	PROJECT No.	
MET-MWS-39-M0017	B/UNIT	AREA
	SEQ. No.	
	SIZE	A1





PLAN VIEW OF CROSS OVER INTERCONNECTING PIPE-WORK  
SCALE 1:100

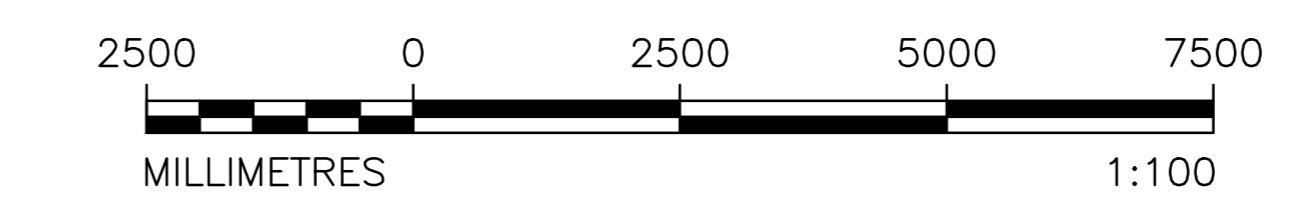


LOCALITY PLAN  
SCALE 1:500

MATERIAL LIST : INTERCONNECTING PIPE WORK AT BOOSTER PUMP STATION

ITEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Flg. (PN)	LINER (mm)
BEND	12	DN500	22.5' LONG RADIUS BEND, 745mm C/F, FLANGED BOTH ENDS, HDPE LINED	IC1-1	4.5	2500/3	8
SPOOL	2	DN500	3995mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-2	4.5	2500/3	8
SPOOL	2	DN500	2165mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-3	4.5	2500/3	8
SPOOL	2	DN500	338mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-4	4.5	2500/3	8
LATERAL	18	DN500	45' LATERAL, FLANGED ALL ROUND, 1095mm C/F, HDPE LINED	IC1-5	4.5	2500/3	8
VALVE	28	DN500	SLURRY KNIFE GATE VALVE, FLANGED, COMPLETE WITH ACTUATOR	IC1-6		2500/3	
SPOOL	1	DN500	850mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-7	4.5	2500/3	8
SPOOL	1	DN500	2145mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-8	4.5	2500/3	8
SPOOL	1	DN500	5345mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-9	4.5	2500/3	8
SPOOL	1	DN500	3060mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-10	4.5	2500/3	8
TEE	12	DN500	SHORT EQUAL TEE PIECE, 510mm C/F, FLANGED BOTH ENDS, HDPE LINED	IC1-11	4.5	2500/3	8
SPOOL	1	DN500	4825mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-12	4.5	2500/3	8
SPOOL	1	DN500	2720mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-13	4.5	2500/3	8
SPOOL	1	DN500	1060mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-14	4.5	2500/3	8
SPOOL	1	DN500	750mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-15	4.5	2500/3	8
SPOOL	1	DN500	1415mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-16	4.5	2500/3	8
SPOOL	1	DN500	2115mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-17	4.5	2500/3	8
SPOOL	1	DN500	3800mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-18	4.5	2500/3	8
SPOOL	1	DN500	5490mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-19	4.5	2500/3	8
CLOSURE	6	DN500	780mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-20	4.5	2500/3	8
BEND	18	DN500	45' LONG RADIUS BEND, 1268mm C/F, FLANGED BOTH ENDS, HDPE LINED	IC1-21	4.5	2500/3	8
CLOSURE	2	DN500	3055mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-22	4.5	2500/3	8
CLOSURE	2	DN500	1720mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-23	4.5	2500/3	8
SPOOL	4	DN500	13500mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-24	4.5	2500/3	8
CLOSURE	2	DN500	2585mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-25	4.5	2500/3	8
BEND	6	DN500	45' LONG RADIUS BEND, 2670mm C/F, FLANGED BOTH ENDS, HDPE LINED	IC1-26	4.5	2500/3	8
CLOSURE	2	DN500	1840mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-27	4.5	2500/3	8
CLOSURE	2	DN500	3675mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-28	4.5	2500/3	8
CLOSURE	2	DN500	4660mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-29	4.5	2500/3	8
CLOSURE	1	DN500	3745mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-30	4.5	2500/3	8
CLOSURE	1	DN500	5040mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-31	4.5	2500/3	8
CLOSURE	1	DN500	7365mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-32	4.5	2500/3	8
CLOSURE	1	DN500	2485mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-32	4.5	2500/3	8
CLOSURE	1	DN500	1790mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-32	4.5	2500/3	8

LEGEND  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	PROJECT / MET ENGINEER	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
ISSUED FOR TENDER			A	25.01.2019			DRAWN		TG			25/01/2018
ISSUED FOR TENDER			B	2019.01.30			CHECKED		TM			25/01/2019
ISSUED FOR TENDER			C	2019.02.01			SENIOR DESIGNER MET PROJECTS					
ISSUED FOR TENDER			D	2019.03.13			PR ENGINEER		DGS			
ISSUED FOR TENDER (PRESSURE RATING REVISED)			E	2019.03.26			PR TECH					
ISSUED FOR TENDER (MATERIAL LIST UPDATED)			F	2019.04.24			PROJECT / MET ENGINEER		DGS			25/01/2019
SLURRY DELIVERY PIPING SYSTEM - INTERCONNECTING PIPEWORK AT PUMPSTATION (SHT1)	301-00204/13-206						MET PROJECTS MANAGER					25/01/2019
SLURRY DELIVERY PIPING SYSTEM - INTERCONNECTING PIPEWORK AT PUMPSTATION (SHT3)	301-00204/13-204											
SLURRY DELIVERY PIPING SYSTEM - GENERAL ARRANGEMENT	301-00204/13-200											

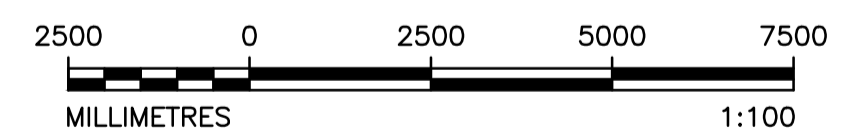
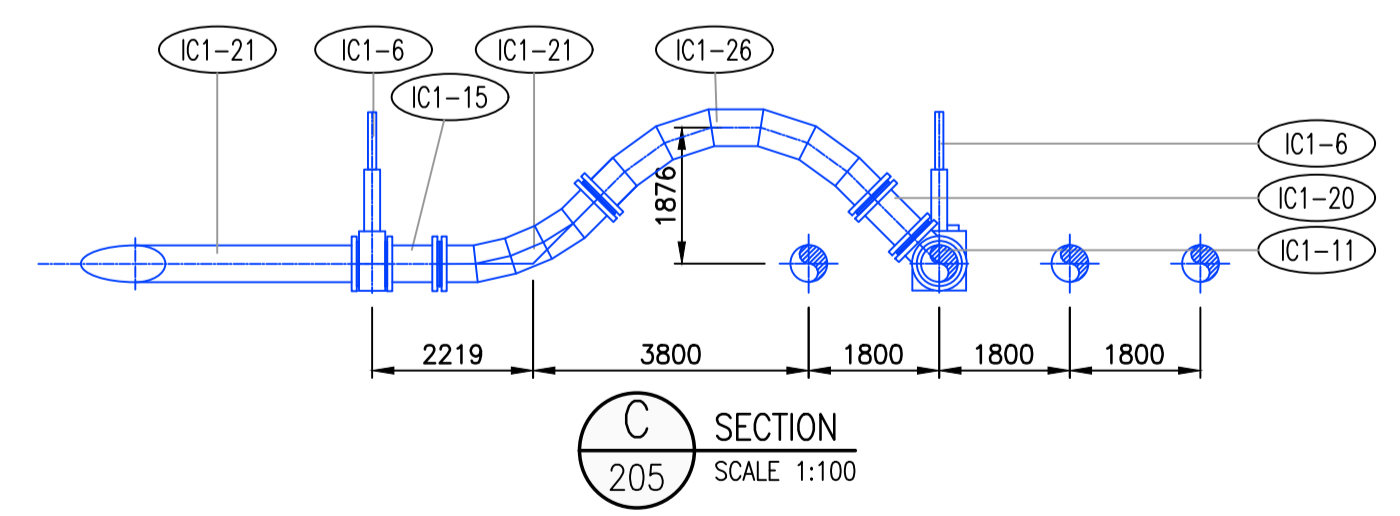
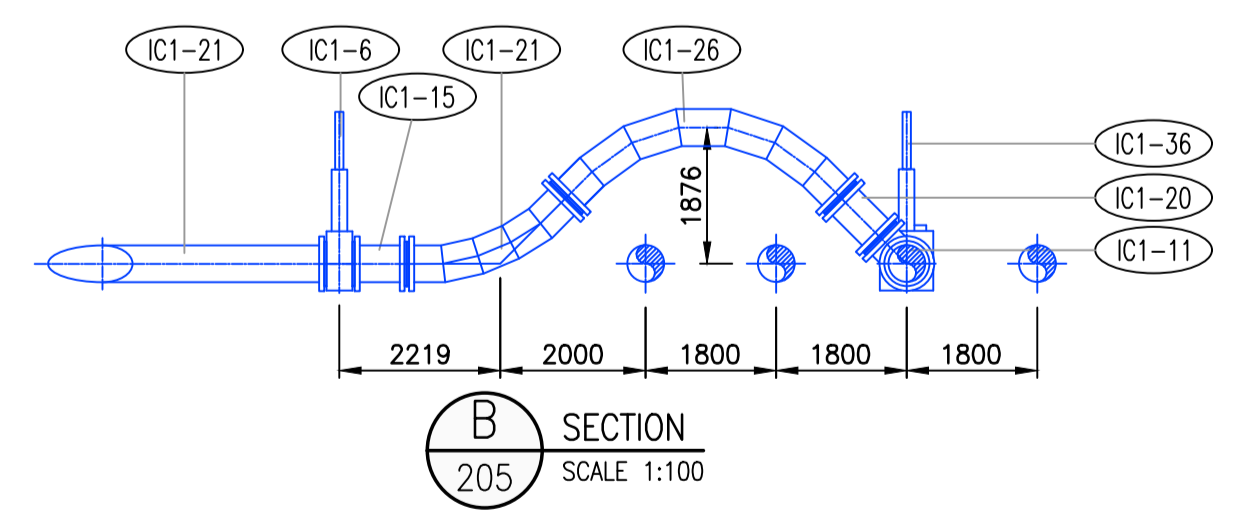
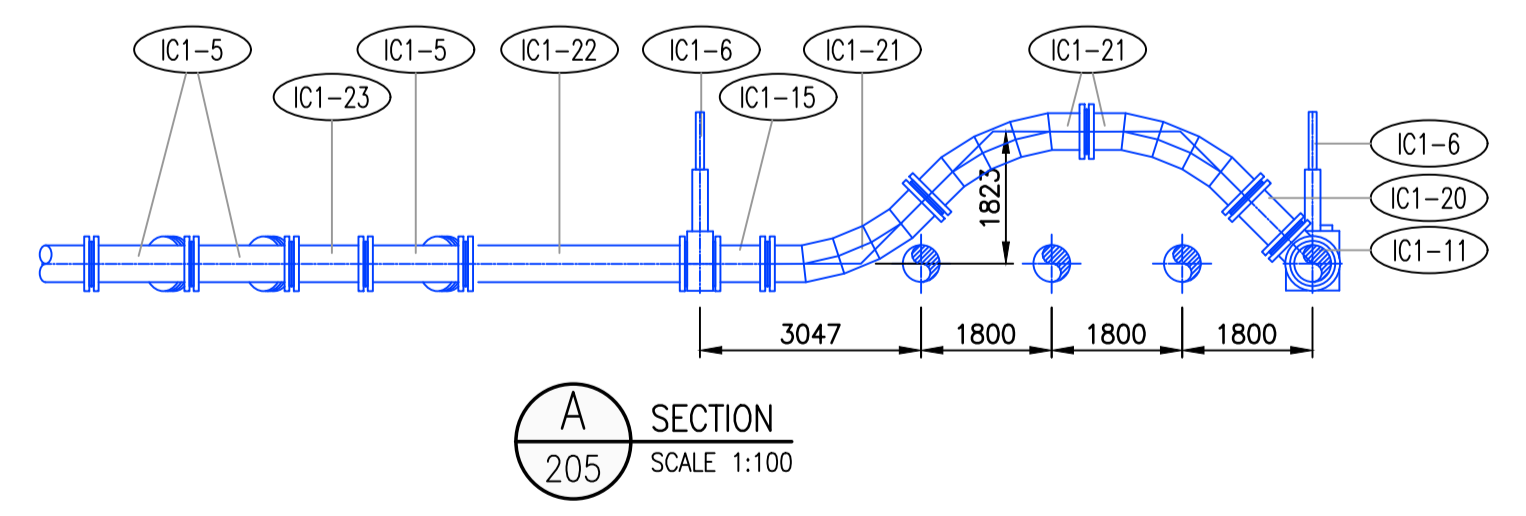
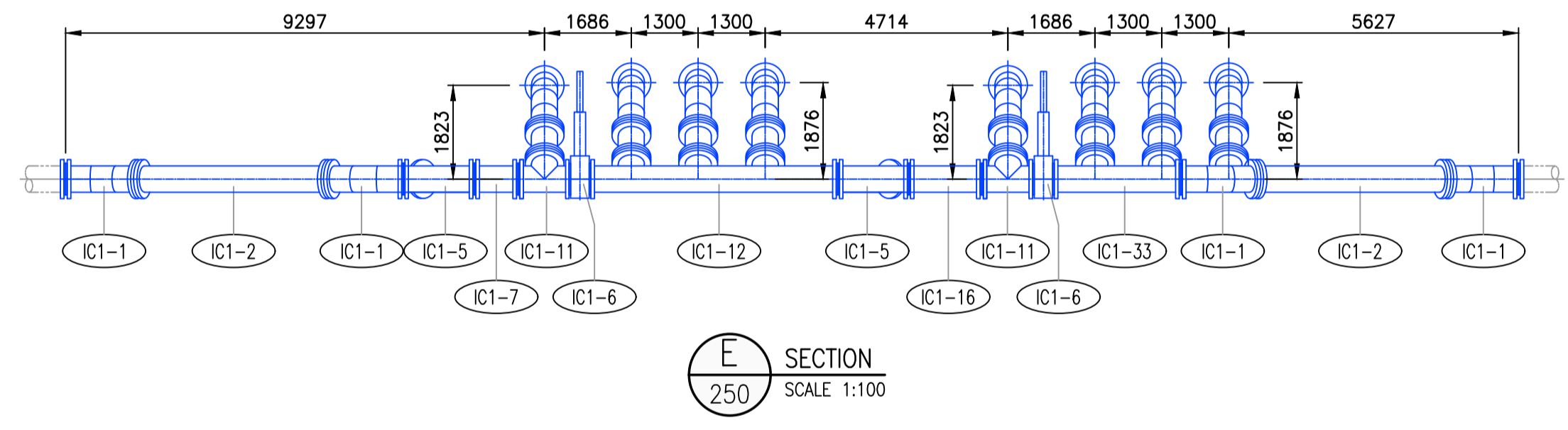
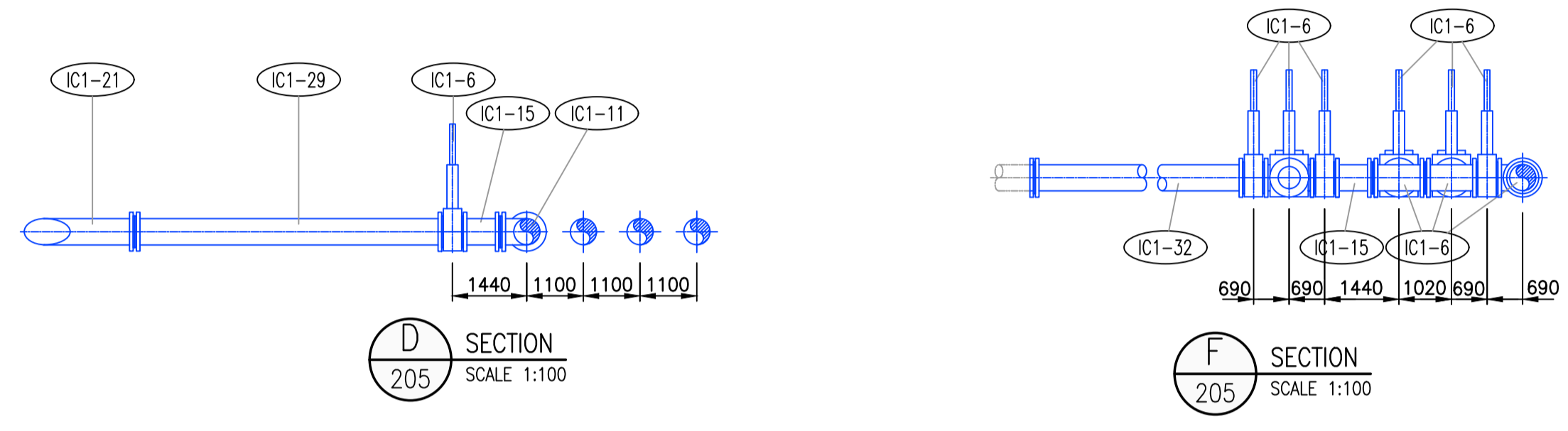
ANGLOGOLD ASHANTI  
 MET PROJECTS  
 301-00204/13-205  
 REGION SOUTH AFRICA REGION - VR  
 BUSINESS UNIT MINE WASTE SOLUTIONS  
 PROJECT KAREERAND TSF EXPANSION PROJECT  
 DRAWING TITLE SLURRY DELIVERY PIPING SYSTEM - VALVE STATION GENERAL LAYOUT - SHEET 2/3  
 CWR1806001 MET-MWS-39-M0016  
 PROJECT No: B/UNIT AREA SEQ. No: SIZE - A1



MATERIAL LIST : INTERCONNECTING PIPE WORK AT BOOSTER PUMP STATION

ITEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
BEND	12	DN500	22,5° LONG RADIUS BEND, 745mm C/F, FLANGED BOTH ENDS, HDPE LINED	IC1-1	8	2500/3	13
SPOOL	2	DN500	3995mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-2	8	2500/3	12
SPOOL	2	DN500	2165mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-3	8	2500/3	12
LATERAL	18	DN500	45° LATERAL, FLANGED ALL ROUND, 1095mm C/F, HDPE LINED	IC1-5	8	2500/3	12
VALVE	28	DN500	SLURRY KNIFE GATE VALVE, FLANGED, COMPLETE WITH ACTUATOR	IC1-6	8	2500/3	
TEE	12	DN500	SHORT EQUAL TEE PIECE, 510mm C/F, FLANGED BOTH ENDS, HDPE LINED	IC1-11	8	2500/3	12
SPOOL	1	DN500	750mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-15	8	2500/3	12
SPOOL	1	DN500	1415mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-16	8	2500/3	12
CLOSURE	6	DN500	780mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-20	8	2500/3	12
BEND	18	DN500	45° LONG RADIUS BEND, 1268mm C/F, FLANGED BOTH ENDS, HDPE LINED	IC1-21	8	2500/3	13
CLOSURE	2	DN500	3055mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-22	8	2500/3	12
CLOSURE	2	DN500	1720mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-23	8	2500/3	12
BEND	6	DN500	45° LONG RADIUS BEND, 2670mm C/F, FLANGED BOTH ENDS, HDPE LINED	IC1-26	8	2500/3	13
CLOSURE	2	DN500	4660mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-29	8	2500/3	12
CLOSURE	1	DN500	7365mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-32	8	2500/3	12
CLOSURE	1	DN500	2485mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-32	8	2500/3	12
CLOSURE	1	DN500	1790mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-32	8	2500/3	12

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

SCALE: 1:100

TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
ISSUED FOR TENDER			A	25.01.2019			DRAWN	TG			25/01/2018
ISSUED FOR TENDER			B	2019.01.30			CHECKED	TM			25/01/2019
ISSUED FOR TENDER			C	2019.02.01			SENIOR DESIGNER	MET PROJECTS			
ISSUED FOR TENDER			D	2019.03.13			PR ENGINEER	DGS			
ISSUED FOR TENDER (PRESSURE RATING REVISED)			E	2019.03.26			PR TECH				
SLURRY DELIVERY PIPING SYSTEM - INTERCONNECTING PIPEWORK AT PUMPSTATION (SHT2)	301-00204/13-205						PROJECT / MET ENGINEER	DGS			25/01/2019
SLURRY DELIVERY PIPING SYSTEM - INTERCONNECTING PIPEWORK AT PUMPSTATION (SHT3)	301-00204/13-204						MET PROJECTS MANAGER				25/01/2019
SLURRY DELIVERY PIPING SYSTEM - GENERAL ARRANGEMENT	301-00204/13-200										

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301-00204/13-206

REGION SOUTH AFRICA REGION - VR

BUSINESS UNIT MINE WASTE SOLUTIONS

PROJECT KAREERAND TSF EXPANSION PROJECT

DRAWING TITLE SLURRY DELIVERY PIPING SYSTEM - VALVE STATION GENERAL LAYOUT - SHEET 3/3

CWR1806001

MET-MWS-39-M0015

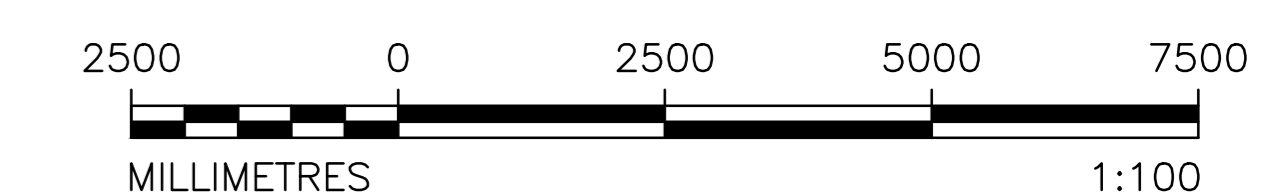
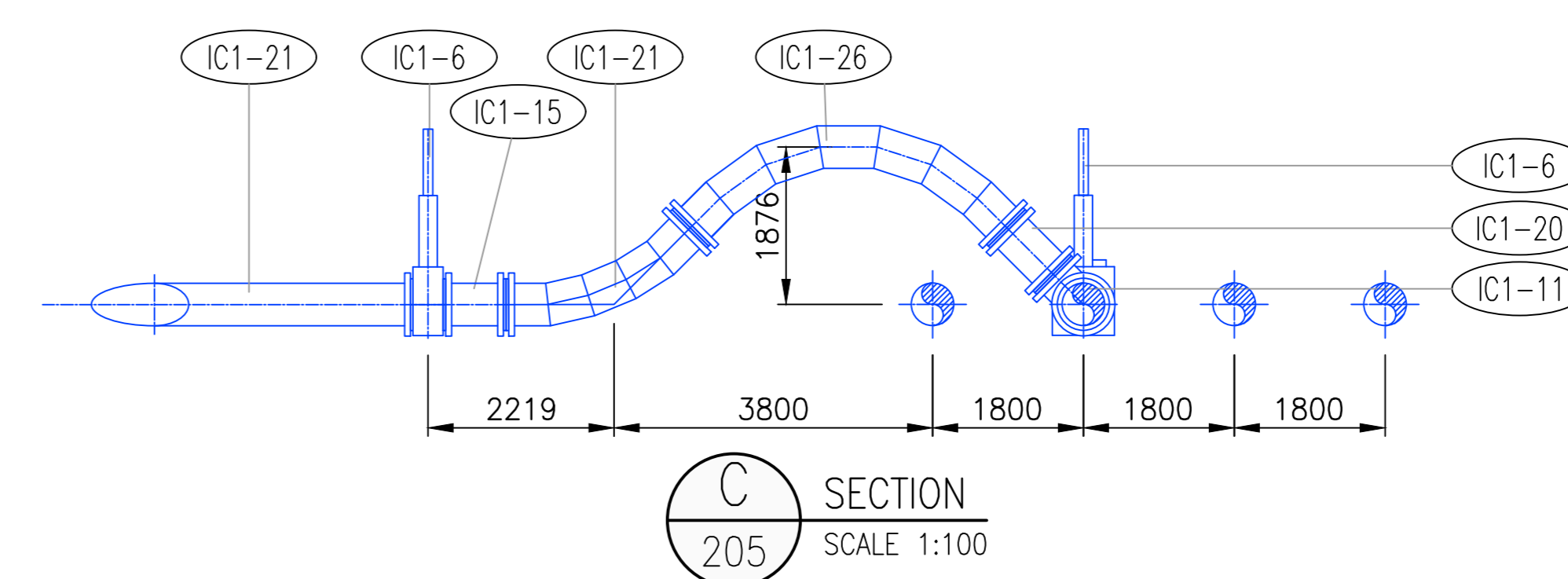
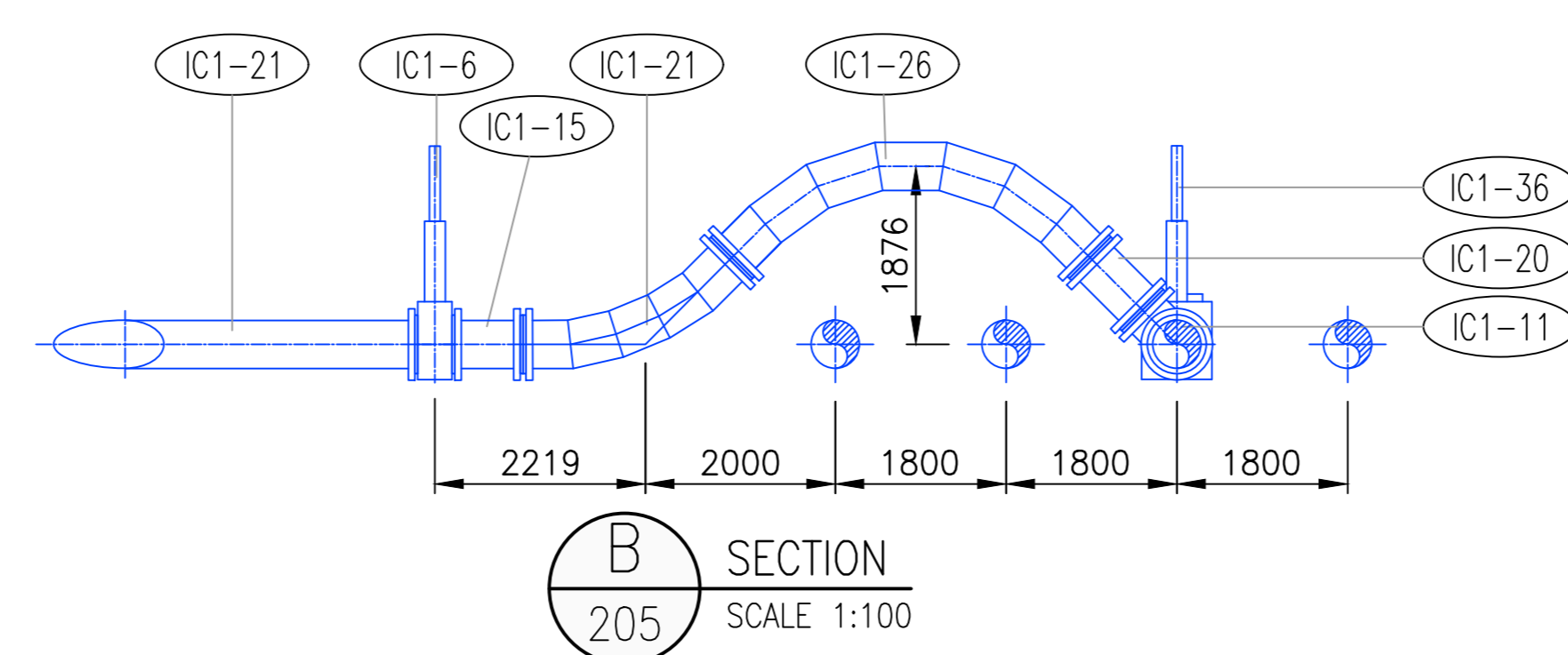
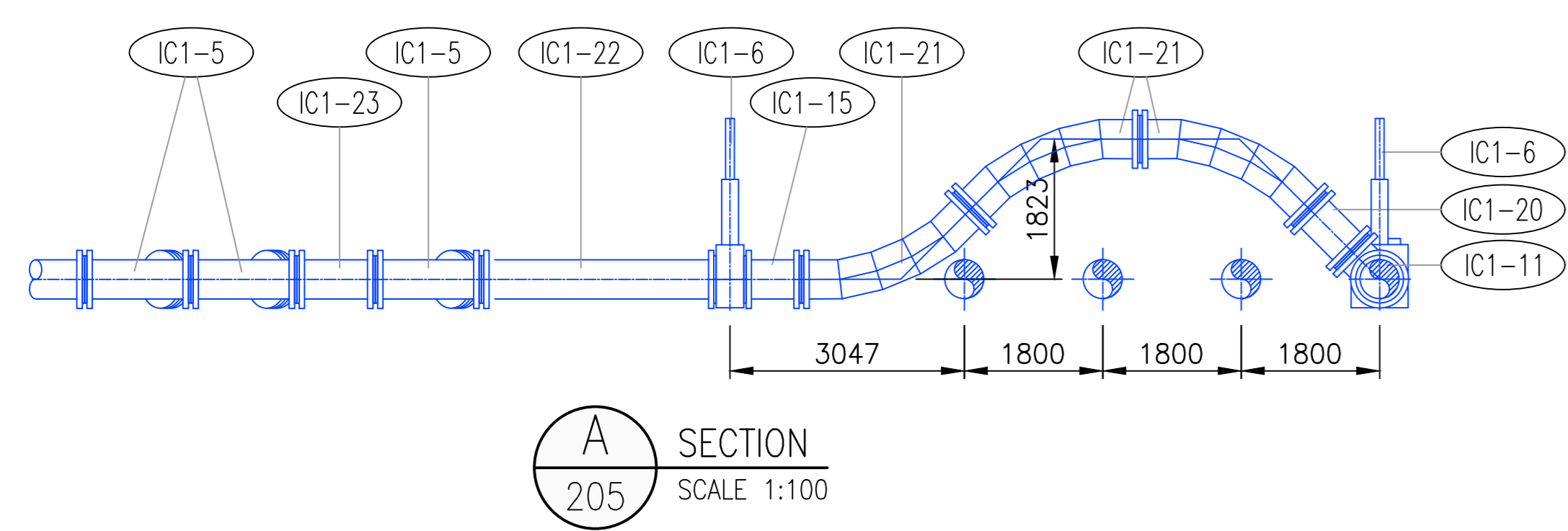
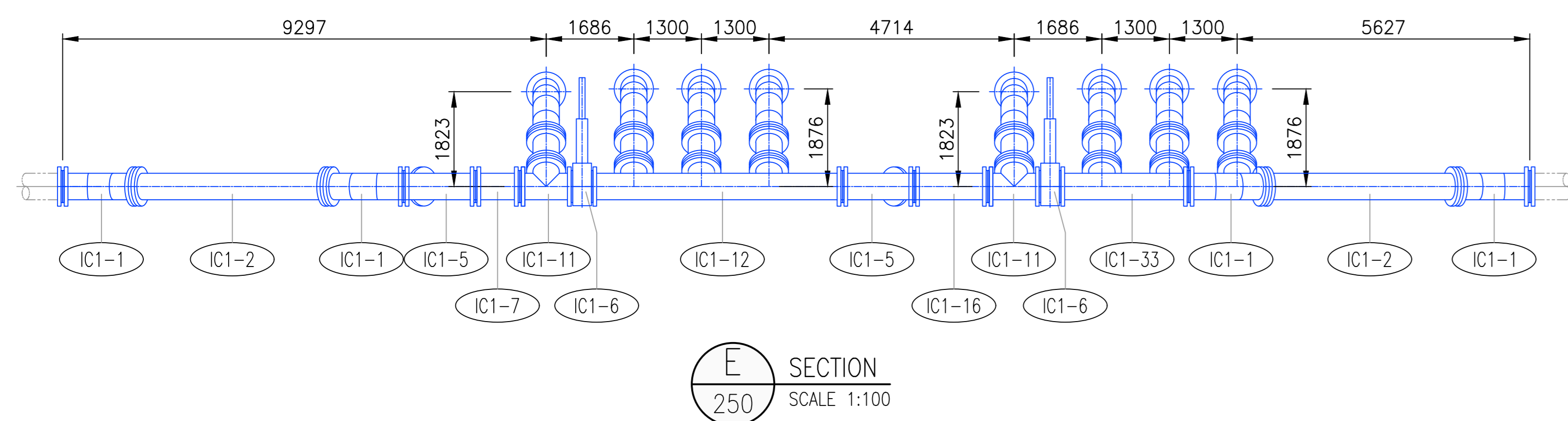
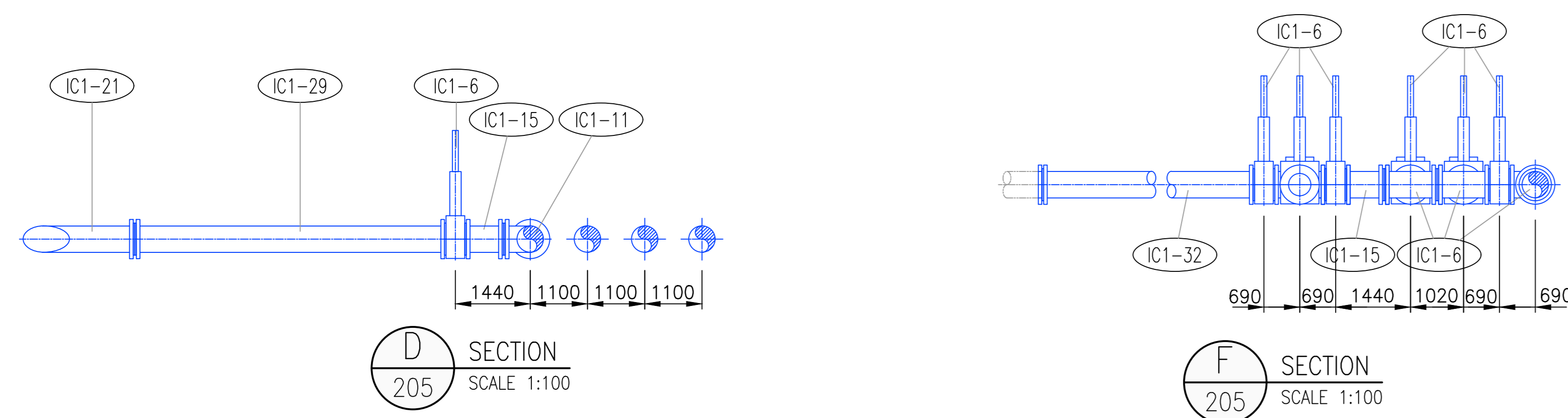


MATERIAL LIST : INTERCONNECTING PIPE WORK AT BOOSTER PUMP STATION

ITEM No	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
BEND	12	DN500	22.5' LONG RADIUS BEND, 745mm C/F, FLANGED BOTH ENDS, HDPE LINED	IC1-1	4.5	2500/3	8
SPOOL	2	DN500	3995mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-2	4.5	2500/3	8
SPOOL	2	DN500	2165mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-3	4.5	2500/3	8
LATERAL	18	DN500	45' LATERAL, FLANGED ALL ROUND, 1095mm C/F, HDPE LINED	IC1-5	4.5	2500/3	8
VALVE	28	DN500	SLURRY KNIFE GATE VALVE, FLANGED, COMPLETE WITH ACTUATOR	IC1-6		2500/3	
TEE	12	DN500	SHORT EQUAL TEE PIECE, 510mm C/F, FLANGED BOTH ENDS, HDPE LINED	IC1-11	4.5	2500/3	8
SPOOL	1	DN500	750mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-15	4.5	2500/3	8
SPOOL	1	DN500	1415mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-16	4.5	2500/3	8
CLOSURE	6	DN500	780mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-20	4.5	2500/3	8
BEND	18	DN500	45' LONG RADIUS BEND, 1268mm C/F, FLANGED BOTH ENDS, HDPE LINED	IC1-21	4.5	2500/3	8
CLOSURE	2	DN500	3055mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-22	4.5	2500/3	8
CLOSURE	2	DN500	1720mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-23	4.5	2500/3	8
BEND	6	DN500	45' LONG RADIUS BEND, 2670mm C/F, FLANGED BOTH ENDS, HDPE LINED	IC1-26	4.5	2500/3	8
CLOSURE	2	DN500	4660mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-29	4.5	2500/3	8
CLOSURE	1	DN500	7365mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-32	4.5	2500/3	8
CLOSURE	1	DN500	2485mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-32	4.5	2500/3	8
CLOSURE	1	DN500	1790mm F/F, FLANGED BOTH ENDS, HDPE LINED*	IC1-32	4.5	2500/3	8

**LEGEND**

F/F	FACE TO FACE	L.R.B	LONG RADIUS BEND	*	TO BE CONFIRMED ON SITE
C/F	CENTER TO FACE	P/E	PLAIN ENDED		



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

SCALE: 1:100

ISSUED FOR TENDER	MARK	DATE	INT	APPD	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
ISSUED FOR TENDER	A	25.01.2019			DRAWN	TG			25/01/2018
ISSUED FOR TENDER	B	2019.01.30			CHECKED	TM			25/01/2019
ISSUED FOR TENDER	C	2019.02.01			SENIOR DESIGNER	MET PROJECTS			
ISSUED FOR TENDER (PRESSURE RATING REVISED)	D	2019.03.13			PR ENGINEER	DGS			
ISSUED FOR TENDER (MATERIAL LIST UPDATED)	E	2019.03.26			PR TECH				
	F	2019.04.24			PROJECT / MET ENGINEER	DGS			25/01/2019
					MET PROJECTS MANAGER				25/01/2019

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301-00204/13-206

REGION SOUTH AFRICA REGION - VR

BUSINESS UNIT MINE WASTE SOLUTIONS

PROJECT KAREERAND TSF EXPANSION PROJECT

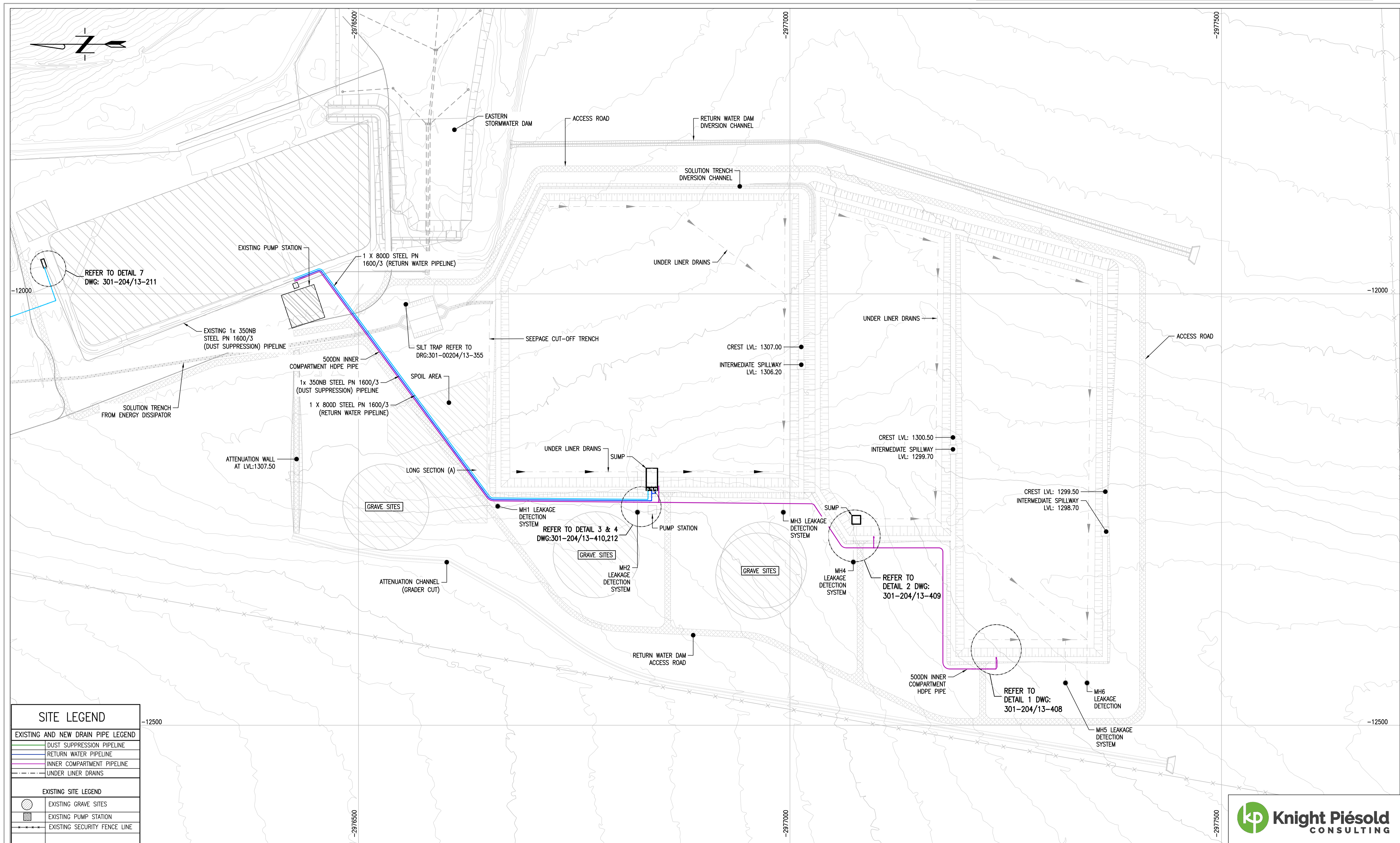
DRAWING TITLE SLURRY DELIVERY PIPING SYSTEM - VALVE STATION GENERAL LAYOUT - SHEET 3/3

CWR1806001

MET-MWS-39-M0015

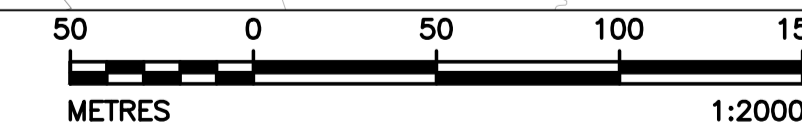
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SITE LEGEND	
<b>EXISTING AND NEW DRAIN PIPE LEGEND</b>	
	DUST SUPPRESSION PIPELINE
	RETURN WATER PIPELINE
	INNER COMPARTMENT PIPELINE
	UNDER LINER DRAINS
<b>EXISTING SITE LEGEND</b>	
	EXISTING GRAVE SITES
	EXISTING PUMP STATION
	EXISTING SECURITY FENCE LINE

DUST SUPPRESSION & RETURN WATER TRANSFER SYSTEMS GENERAL ARRANGEMENT SHEET 1 OF 2  
SCALE 1:2000



DESIGN CALCULATIONS	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D
DUST SUPPRESSION & RETURN WATER TRANSFER SYSTEMS GENERAL ARRANGEMENT 20F2	301-00204/13-207					
DUST SUPPRESSION TRANSFER SYSTEM: PLANS, SECTIONS, MATERIAL LIST	301-00204/13-210					
RETURN WATER TRANSFER SYSTEM: PLANS, SECTIONS, MATERIAL LIST	301-00204/13-208					

ISSUED FOR TENDER	A	2019.02.01		
ISSUED FOR TENDER	B	2019.03.08		
ISSUED FOR TENDER	C	2019.03.27		

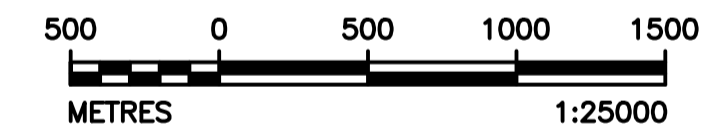
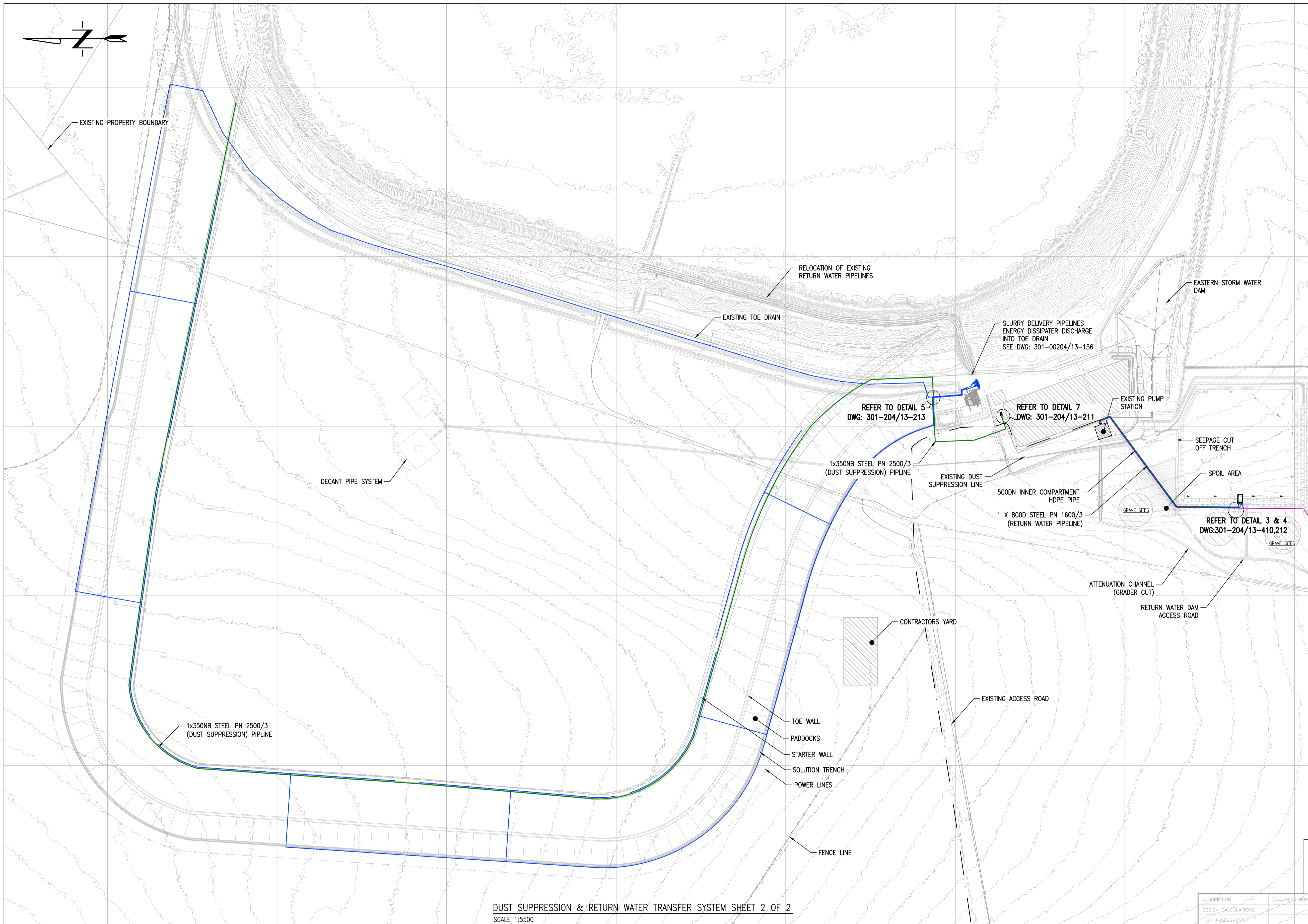
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CHECKED	TM	25/01/2019
SENIOR DESIGNER MET PROJECTS		
PR ENGINEER	DGS	
PR TECH		
PROJECT / MET ENGINEER	DGS	25/01/2019
MET PROJECTS MANAGER		25/01/2019

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301-00204/13-207	REGION	SOUTH AFRICA REGION - VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	DUST SUPPRESSION & RETURN WATER TRANSFER SYSTEMS GENERAL ARRANGEMENT SHEET 1 OF 2
CWR1806001	PROJECT No:	MET-MWS-39-M0022







SITE LEGEND	
<b>EXISTING AND NEW DRAIN PIPE LEGEND</b>	
	DUST SUPPRESSION PIPELINE
	RETURN WATER PIPELINE
	INNER COMPARTMENT PIPELINE
	UNDER LINER DRAINS
<b>EXISTING SITE LEGEND</b>	
	EXISTING GRAVE SITES
	EXISTING PUMP STATION
	EXISTING SECURITY FENCE LINE

DUST SUPPRESSION & RETURN WATER TRANSFER SYSTEM SHEET 2 OF 2  
SCALE 1:5500

SCALE: 1:5500

TITLE	DRG. No	DETAIL
DUST SUPPRESSION & RETURN WATER TRANSFER SYSTEMS GENERAL ARRANGEMENT 1OF2	301-00204/13-207	
DUST SUPPRESSION TRANSFER SYSTEM: PLANS, SECTIONS, MATERIAL LIST	301-00204/13-210	
RETURN WATER TRANSFER SYSTEM: PLANS, SECTIONS, MATERIAL LIST	301-00204/13-208	
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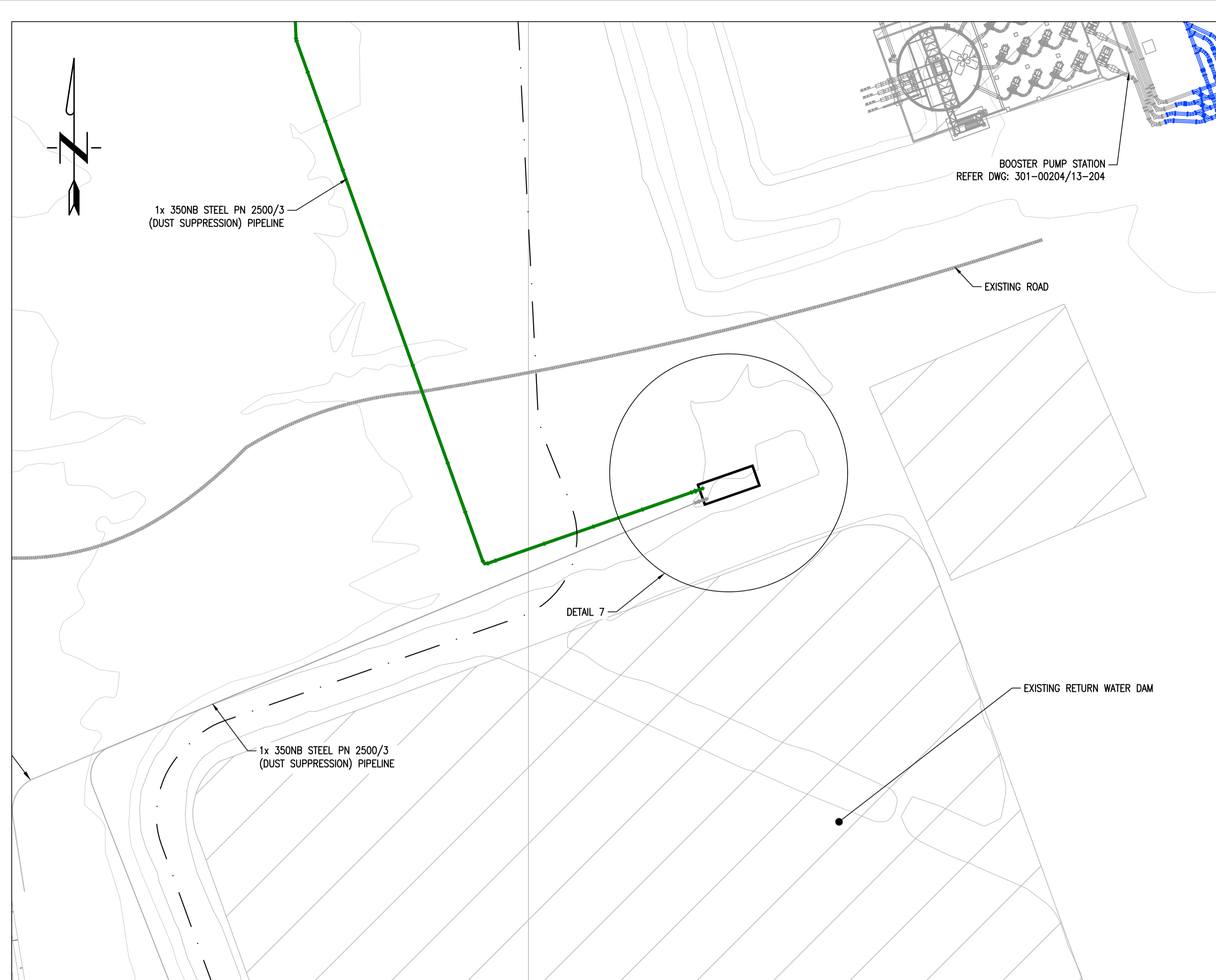
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ISSUED FOR TENDER	A	2019.02.28		
ISSUED FOR TENDER (DETAIL LOCATIONS ADDED)	B	2019.03.06		
PIPE ALIGNMENT CHANGED	C	2019.03.25		

DESIGNATION	NAME	REGISTRATION No:	SIGNATURE	DATE
DRAWN	FB			28/02/2019
CHECKED	TM			28/02/2019
SENIOR DESIGNER	MET PROJECTS			
PR ENGINEER	DGS			28/02/2019
PR TECH				
PROJECT / MET ENGINEER	DGS			28/02/2019
MET PROJECTS MANAGER				



301-00204/13-207	REGION	SOUTH AFRICA REGION - VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	DUST SUPPRESSION & RETURN WATER TRANSFER SYSTEMS GENERAL ARRANGEMENT SHEET 2 OF 2
MET PROJECTS	CWR1806001	MET-MWS-39-M0022





DUST SUPPRESSION DELIVERY AND DISCHARGE SYSTEM AT BUFFER TANK LAYOUT PLAN  
SCALE 1:500

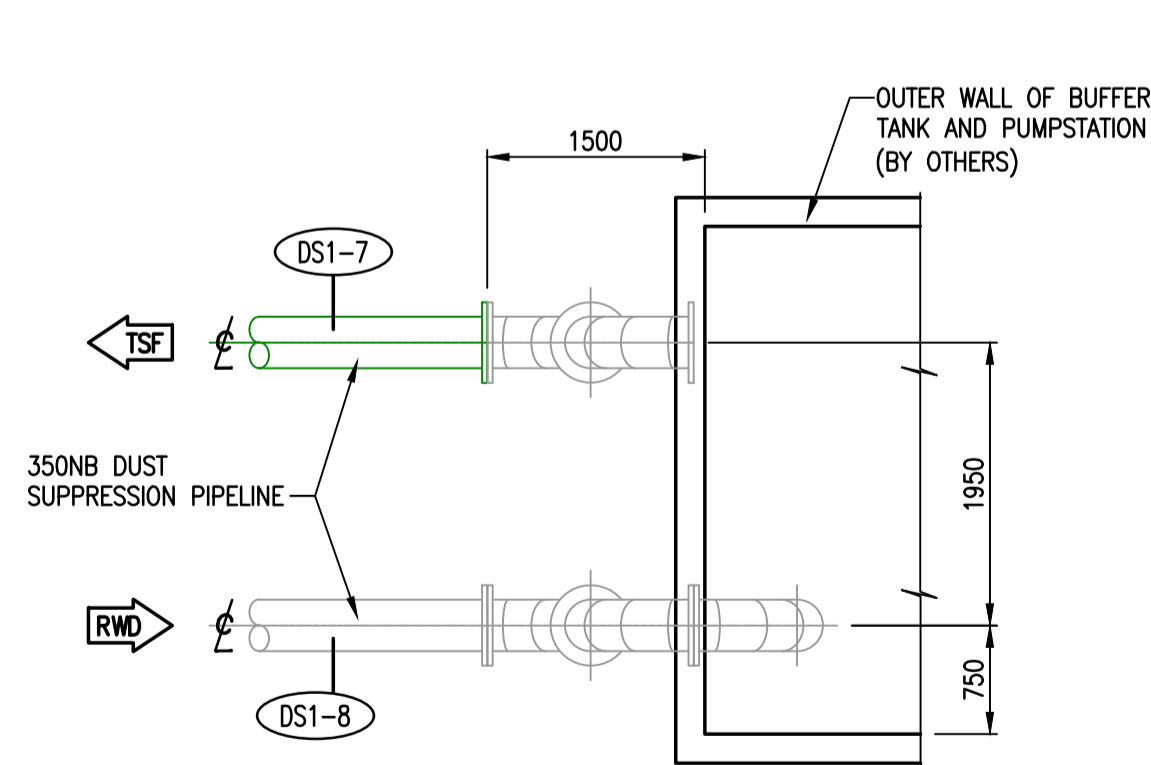
MATERIAL LIST (DUST SUPPRESSION)							
ITEM	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Flg. (PN)	LINER (mm)
SPOOL	2	DN350	9144mm F/F, FLANGED BOTH ENDS ,HDPE LINED	DS1-7	6	2500/3	.
CLOSURE	1	DN350	6000-9000mm F/F, FLANGED ONE END, SUPPLY WITH LOOSE FLANGE *	DS1-8	6	2500/3	.

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED

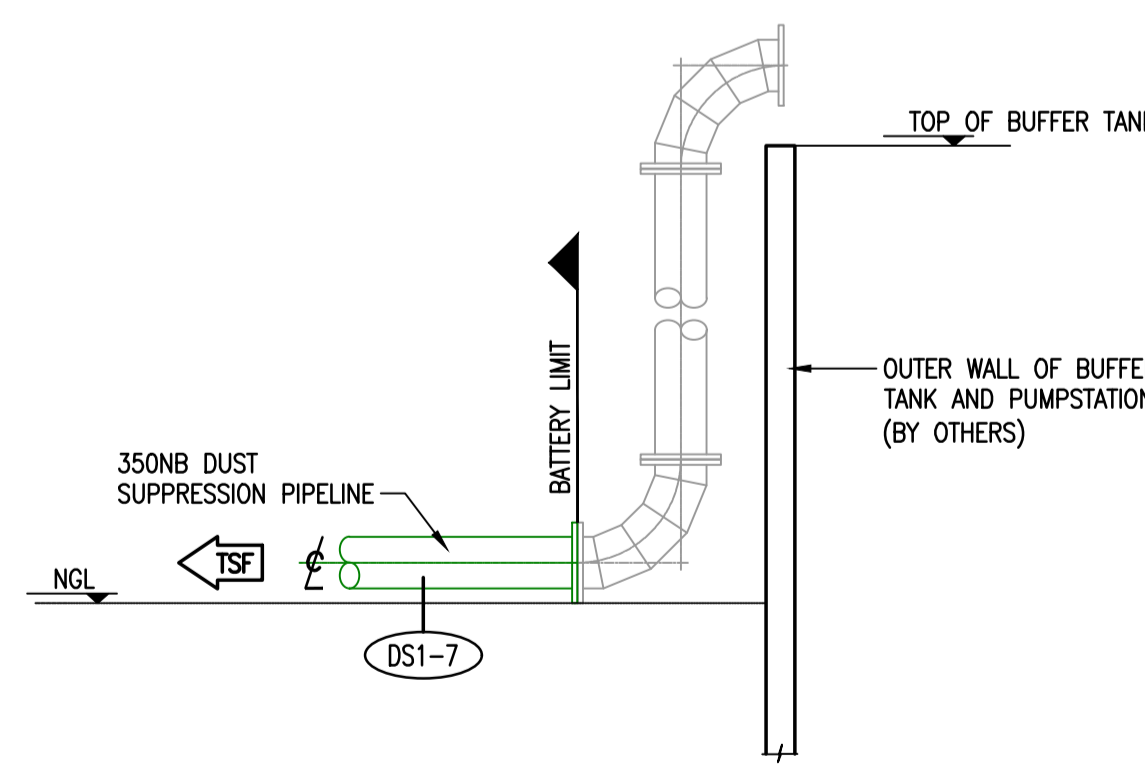
MATERIAL LIST (DUST SUPPRESSION)							
ITEM	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Flg. (PN)	LINER (mm)
BEND	6	DN350	22,5-45° M.R.B., 355mm C/F, FLANGED BOTH ENDS, HDPE LINED	DS1-5	6	2500/3	12
CLOSURE	8	DN350	3000-6000mm F/F, FLANGED ONE END, SUPPLY WITH LOOSE FLANGE *	DS1-6	6	2500/3	12
SPOOL	601	DN350	9144mm F/F, FLANGED BOTH ENDS, HDPE LINED	DS1-7	6	2500/3	12
BEND	3	DN350	90° L.R.B., 1065mm C/F, FLANGED BOTH ENDS, HDPE LINED	DS1-8	6	2500/3	
CLOSURE	4	DN350	0-3000mm F/F, FLANGED ONE END, SUPPLY WITH LOOSE FLANGE *	DS1-9	6	2500/3	12
CLOSURE	1	DN350	6000-9000mm F/F, FLANGED ONE END, SUPPLY WITH LOOSE FLANGE *	DS1-10	6	2500/3	
BEND	2	DN350	0-22,5° M.R.B., 240mm C/F, FLANGED BOTH ENDS, HDPE LINED	DS1-11	6	2500/3	12
REDUCER	1	DN350	DN350/315 ECCENTRIC REDUCER, FLAT BOTTOM, 350mm F/F, DN 350 END FLANGE 1600/3	DS1-12	6	.	12
			OTHER END FLANGE 1600/3 DRILLED TO SUIT 315 HDPE PIPELINE				
SPOOL	1	315 OD	12000mm F/F, HDPE PIPE, PN16, PE100, SDR11, INCLUDING STUB ENDS AND BACKING	DS1-13	6	2500/3	12
SPOOL	2	DN350	500mm F/F, FLANGED BOTH ENDS ,HDPE LINED	DS1-3	8	2500/3	

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE      M.R.B MEDIUM RADIUS BEND  
 C/F CENTER TO FACE      P/E PLAIN ENDED

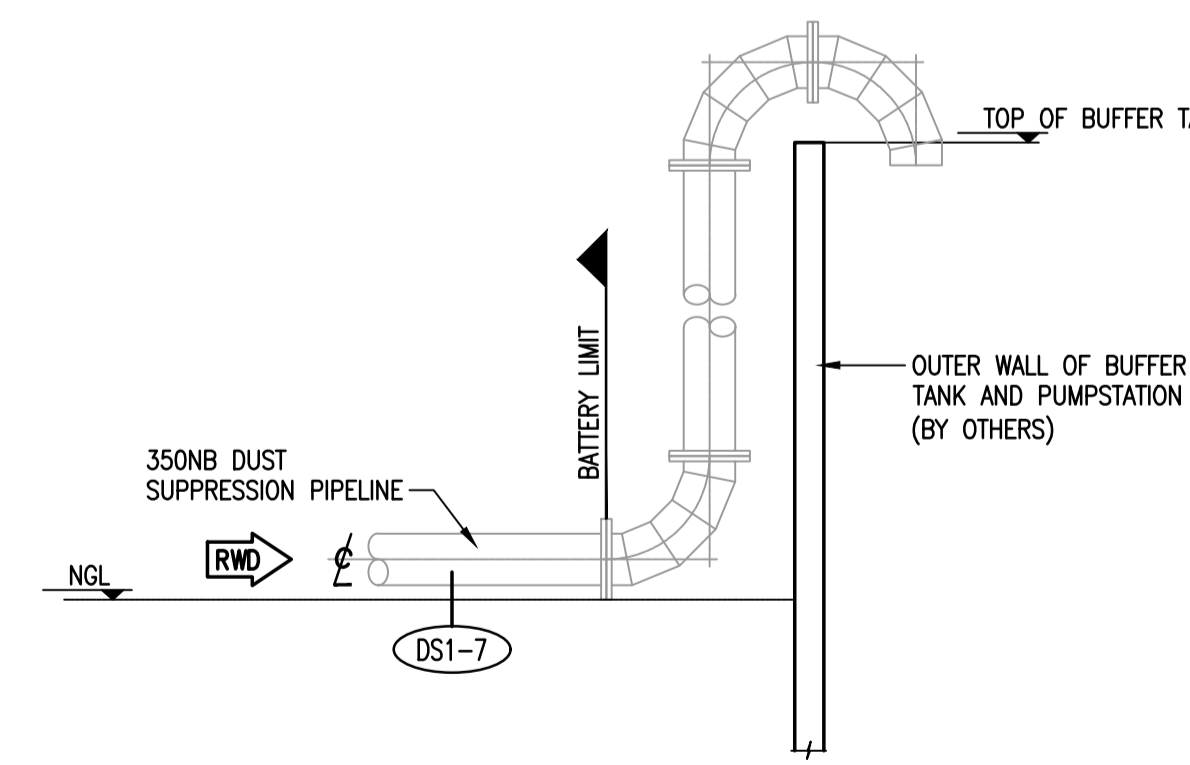
NOTE: MATERIAL INDICATED IS FOR DUST SUPPRESSION TRANSFER SYSTEM



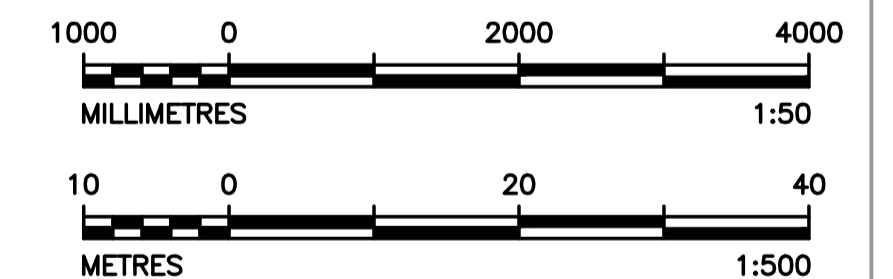
PLAN VIEW OF DETAIL 7  
SCALE 1:50



SECTION THROUGH DETAIL 7 (DELIVERY)  
SCALE 1:50



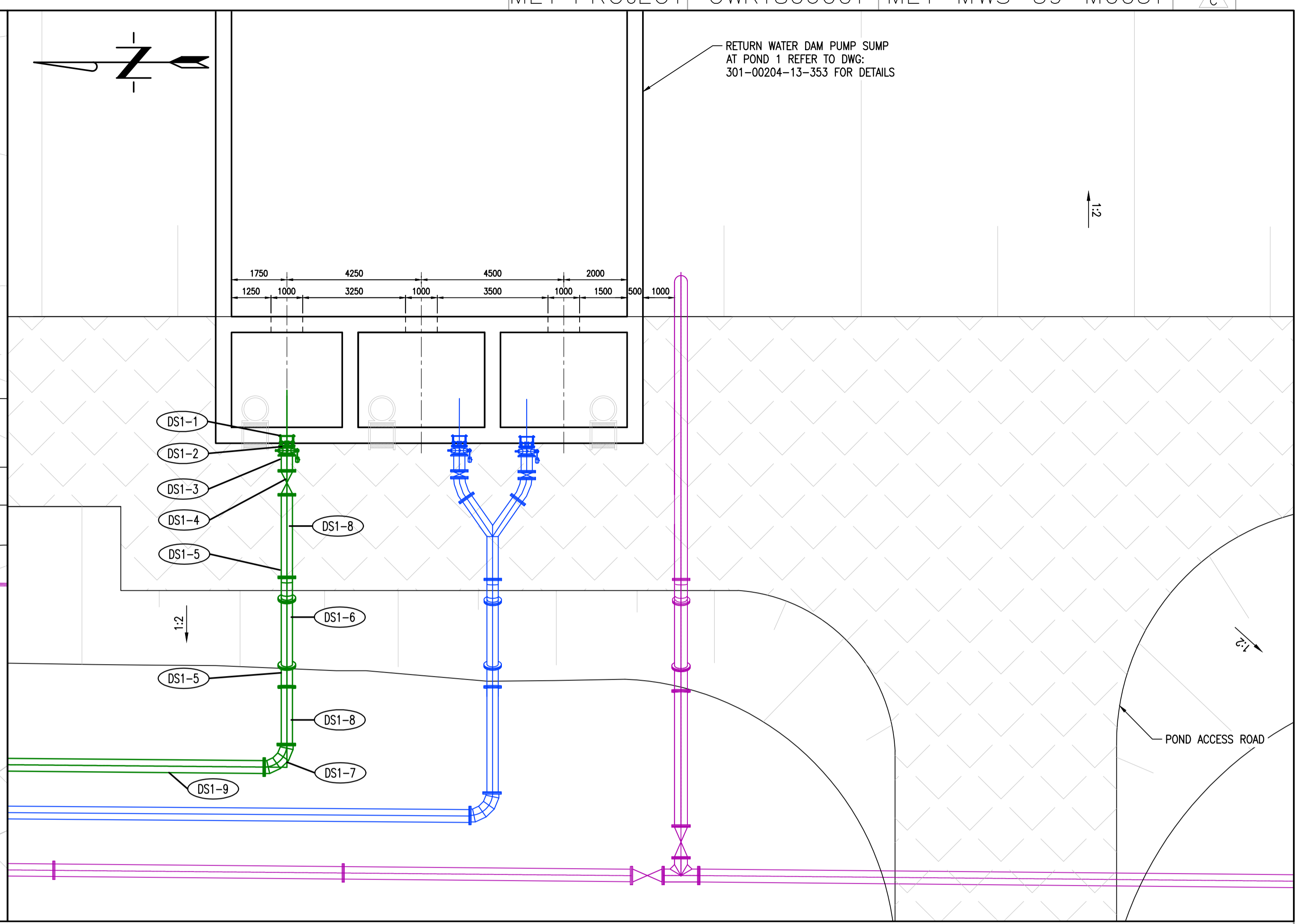
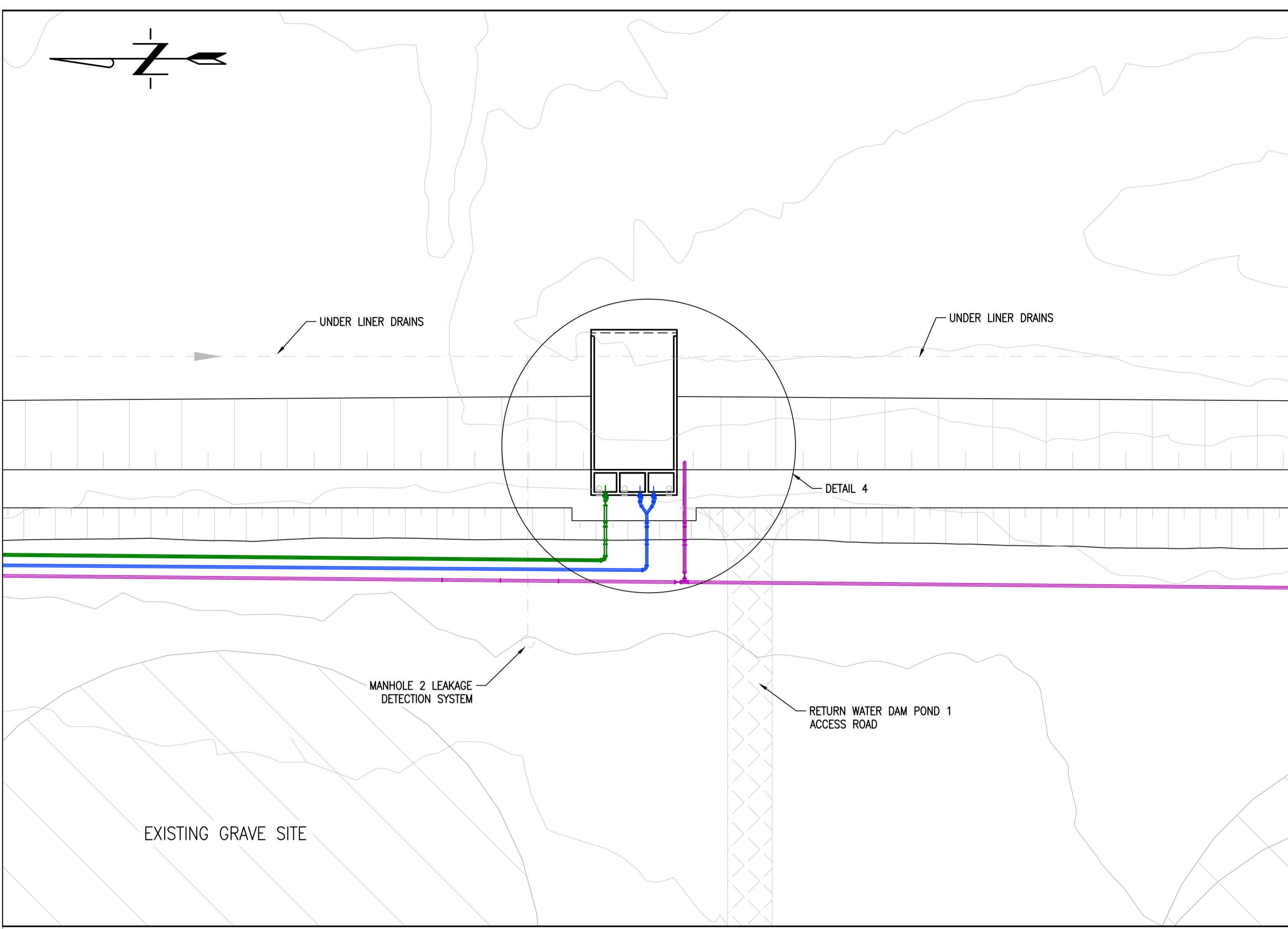
SECTION THROUGH DETAIL 7 (DISCHARGE)  
SCALE 1:50



TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
ISSUED FOR TENDER			A	2019.02.28			DRAWN	TG			25/01/2018
ISSUED FOR TENDER			B	2019.03.13			CHECKED	TM			25/01/2019
ISSUED FOR TENDER			C	2019.03.26			SENIOR DESIGNER MET PROJECTS				
							PR ENGINEER	DGS			
							PR TECH				
							PROJECT / MET ENGINEER	DGS			25/01/2019
							MET PROJECTS MANAGER				25/01/2019

 COPYRIGHT MET PROJECTS	301-00204/13-211	REGION	SOUTH AFRICA REGION - VR
		BUSINESS UNIT	MINE WASTE SOLUTIONS
		PROJECT	KAREERAND TSF EXPANSION PROJECT
		DRAWING TITLE	DUST SUPPRESSION TRANSFER SYSTEMS-PLANS, SECTIONS AND MATERIAL LIST - DETAIL 7
	CWR1806001		MET-MWS-39-M0030





DUST SUPPRESSION TRANSFER SYSTEM LAYOUT PLAN AT POND 1  
SCALE 1:500

DETAIL 4 FOR (DUST SUPPRESSION TRANSFER SYSTEM AT POND 1)  
SCALE 1:100

MATERIAL LIST (DUST SUPPRESSION FROM DETAIL 4-END)

ITEM	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
SPOOL	57	DN350	914mm F/F, FLANGED BOTH ENDS ,HDPE LINED	DS1-9	6	2500/3	12
BEND	1	DN350	45°-90° L.R.B. 405mm C/F, FLANGED BOTH ENDS ,HDPE LINED	DS1-7	6	2500/3	12
CLOSURE	7	DN350	0-3000mm F/F, FLANGED BOTH END, SUPPLY WITH LOOSE FLANGE *	DS1-10	6	2500/3	12
BEND	1	DN350	22,5-45° L.R.B. 405mm C/F, FLANGED BOTH ENDS ,HDPE LINED	DS1-5	6	2500/3	12
VALVE	2	DN350	ISOLATION VALVE, FLANGED, BUTTERFLY	DS1-4	.	2500/3	12

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED

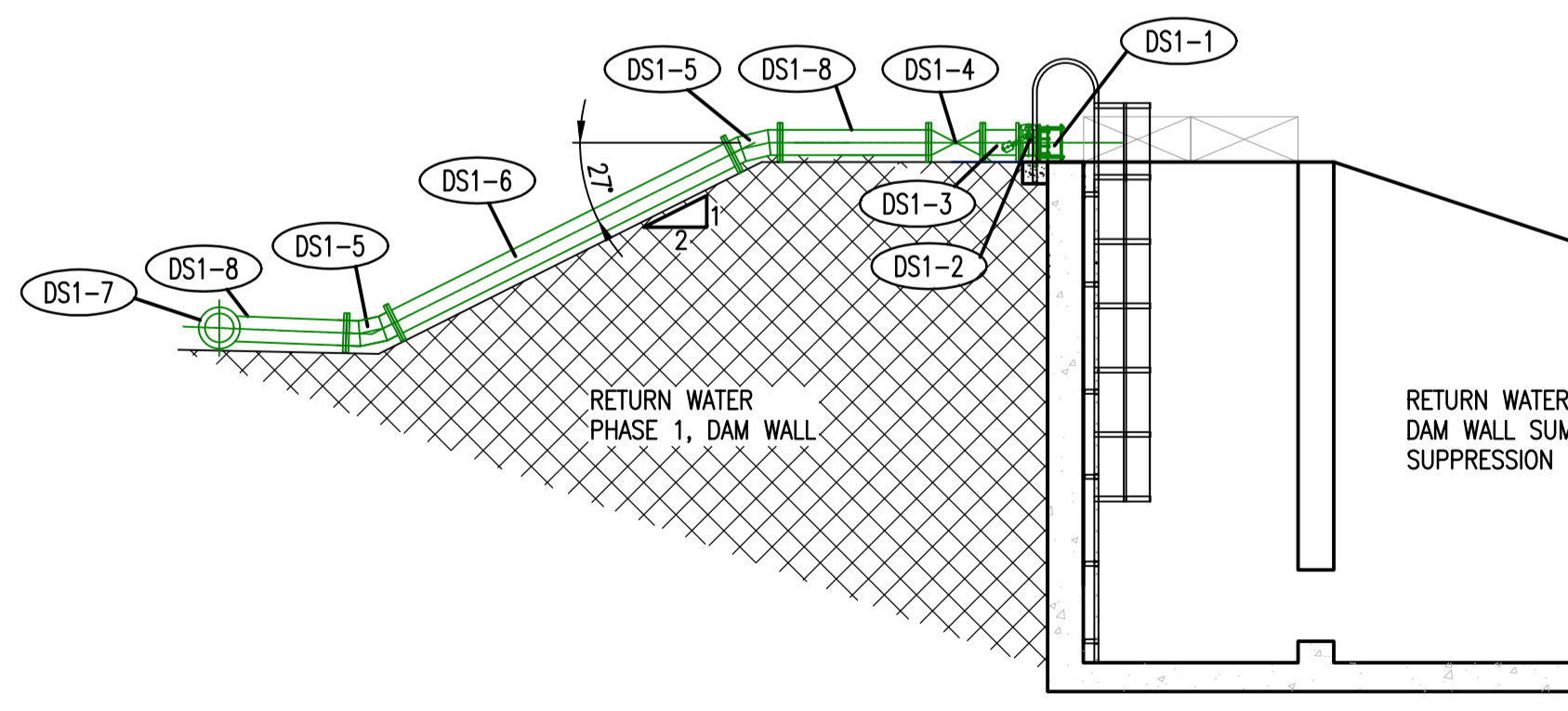
NOTE: MATERIAL INDICATED IS FOR ENTIRE DUST SUPPRESSION TRANSFER SYSTEM

MATERIAL LIST (DUST SUPPRESSION)

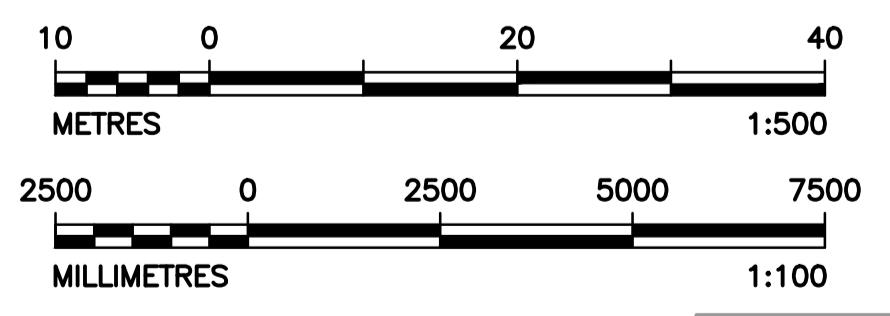
ITEM	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
ADAPTOR	1	DN350	RESTRAINED FLANGE ADAPTOR, DRILLED TO SUIT NON-RETURN VALVE	DS1-1	.	2500/3	12
VALVE	1	DN350	NON-RETURN VALVE, TILTING DISC, FLANGED	DS1-2	.	2500/3	12
SPOOL	1	DN350	500mm F/F, FLANGED BOTH ENDS ,HDPE LINED	DS1-3	6	2500/3	12
VALVE	1	DN350	ISOLATION VALVE, FLANGED, BUTTERFLY	DS1-4	6	2500/3	12
BEND	2	DN350	22,5-45° L.R.B.,355mm C/F, FLANGED BOTH ENDS ,HDPE LINED	DS1-5	6	2500/3	12
CLOSURE	2	DN350	3000-6000mm F/F, FLANGED ONE END, SUPPLY WITH LOOSE FLANGE *	DS1-6	6	2500/3	12
BEND	1	DN350	45-90° L.R.B. 710mm C/F, FLANGED BOTH ENDS *	DS1-7	6	2500/3	12
CLOSURE	1	DN350	0-3000mm F/F, FLANGED BOTH END, SUPPLY WITH LOOSE FLANGE *	DS1-8	6	2500/3	12

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED

NOTE: MATERIAL INDICATED IS FOR DUST SUPPRESSION TRANSFER SYSTEM



SECTION THROUGH DETAIL 4  
SCALE 1:100

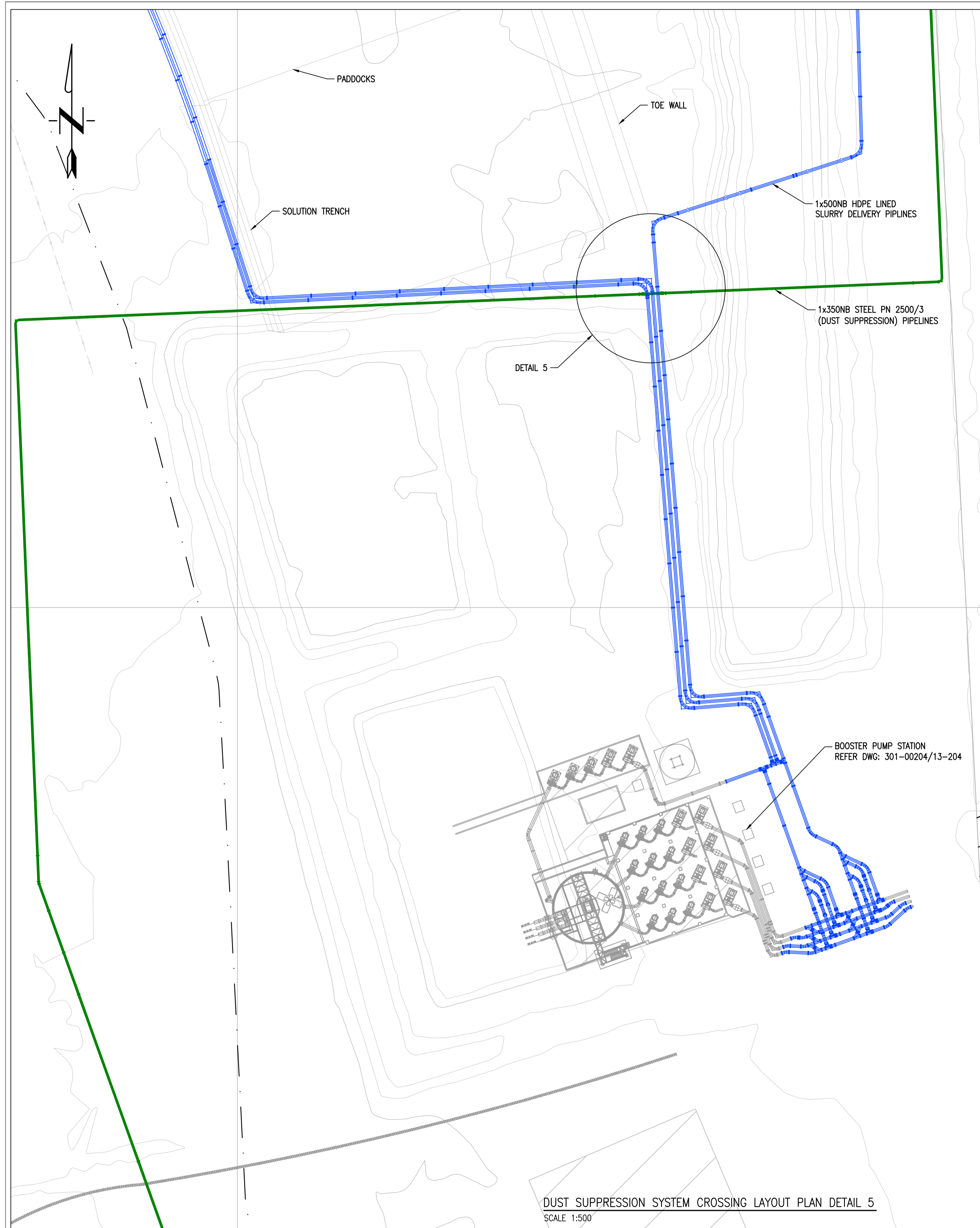


ISSUED FOR TENDER	A	2019.02.01	DRAWN	TG	25/01/2018
ISSUED FOR TENDER	B	2019.03.13	CHECKED	TM	25/01/2019
ISSUED FOR TENDER (MATERIAL LIST ,LAYOUT AND SECTION UPDATED)	C	2019.03.28	SENIOR DESIGNER MET PROJECTS	DGS	
			PR ENGINEER	DGS	
			PR TECH	DGS	
			PROJECT / MET ENGINEER	DGS	25/01/2019
			MET PROJECTS MANAGER		25/01/2019



301-00204/13-212	REGION	SOUTH AFRICA REGION - VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	DUST SUPPRESSION TRANSFER SYSTEMS-PLANS, SECTIONS AND MATERIAL LIST - DETAIL 4
MET PROJECTS	CWR1806001	MET-MWS-39-M0031



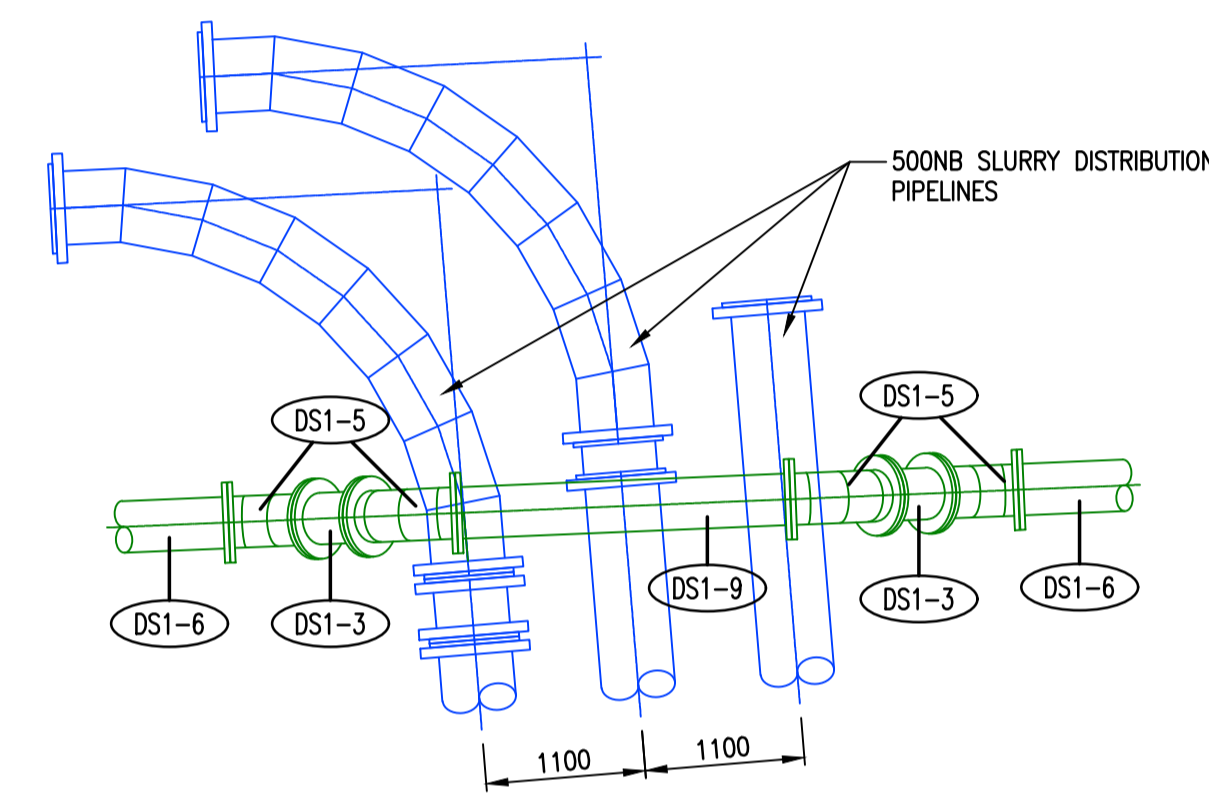


DUST SUPPRESSION SYSTEM CROSSING LAYOUT PLAN DETAIL 5  
SCALE 1:500

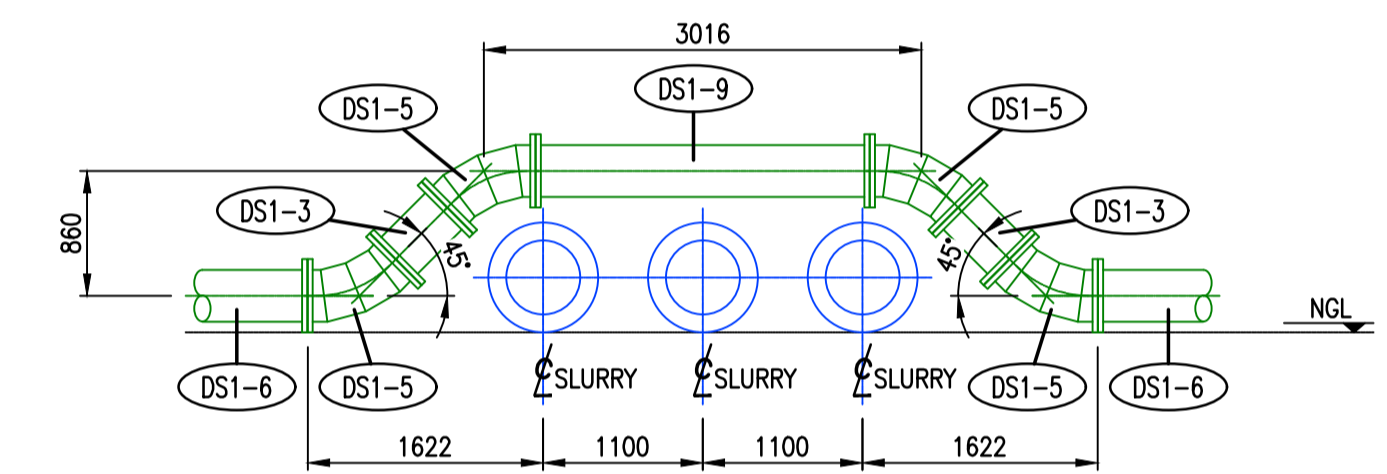
MATERIAL LIST (DUST SUPPRESSION)						
ITEM	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)
SPOOL	2	DN350	500mm F/F, FLANGED BOTH ENDS ,HDPE LINED	DS1-3	8	2500/3
BEND	4	DN350	22,5-45° M.R.B., 355mm C/F, FLANGED BOTH ENDS ,HDPE LINED	DS1-5	6	2500/3
CLOSURE	2	DN350	3000-6000mm F/F, FLANGED ONE END, SUPPLY WITH LOOSE FLANGE *	DS1-6	6	2500/3
CLOSURE	1	DN350	0-3000mm F/F, FLANGED ONE END, SUPPLY WITH LOOSE FLANGE *	DS1-9	6	2500/3

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED

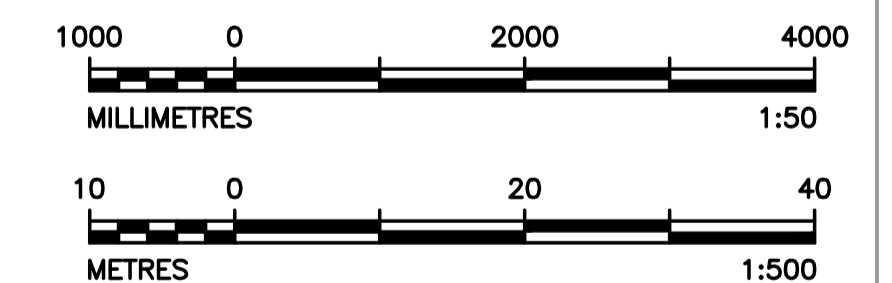
NOTE: MATERIAL INDICATED IS FOR ENTIRE DUST SUPPRESSION TRANSFER SYSTEM



PLAN VIEW SLURRY AND DUST SUPPRESSION CROSSING DETAILS 5  
SCALE 1:50



SECTION THROUGH DETAIL 5  
SCALE 1:50



TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D
DUST SUPPRESSION & RETURN WATER TRANSFER SYSTEM GENERAL ARRANGEMENT 1 OF 2	301-00204/13-207					
DUST SUPPRESSION & RETURN WATER TRANSFER SYSTEM GENERAL ARRANGEMENT 2 OF 2	301-00204/13-207					

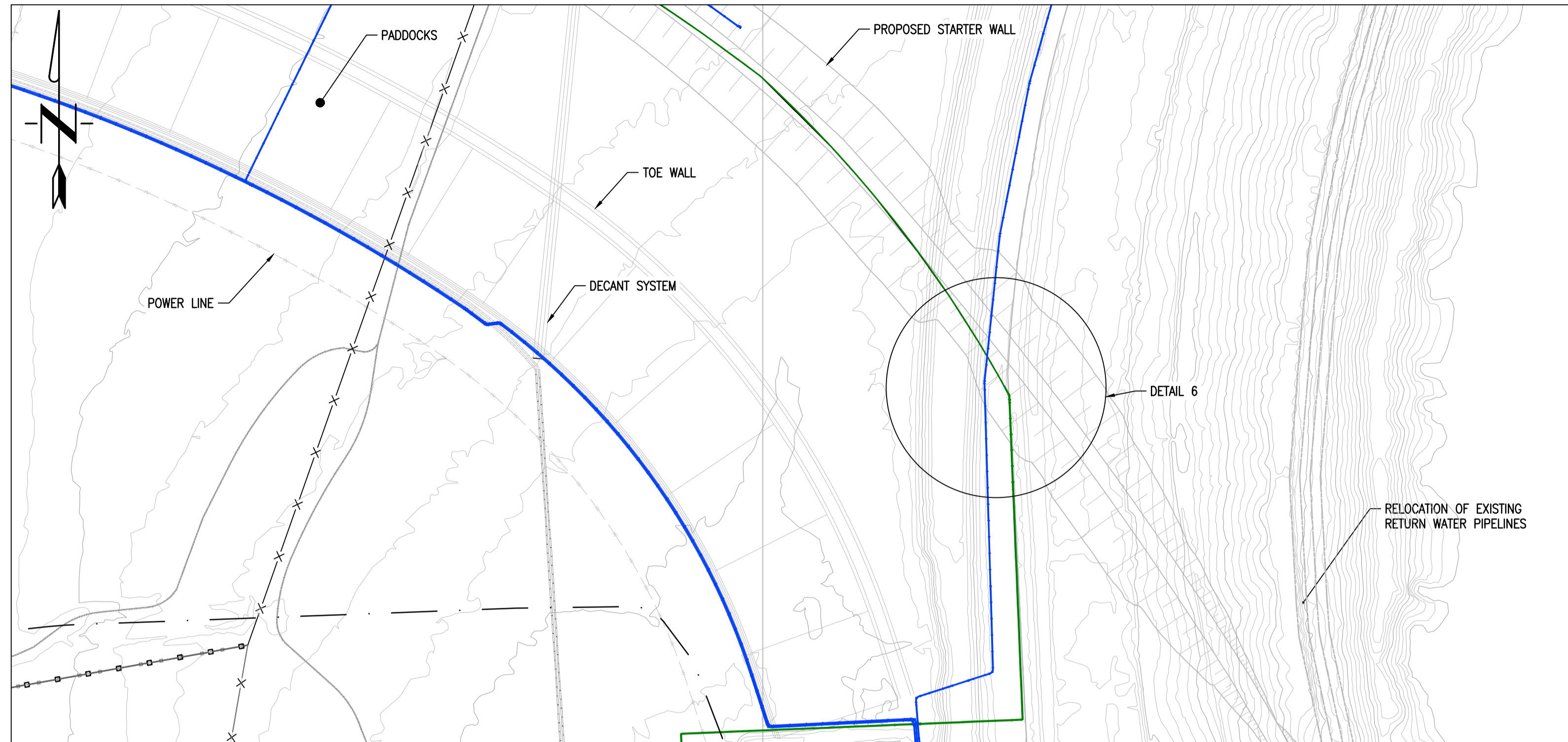
ISSUED FOR TENDER	MARK	DATE	INIT	APP'D
ISSUED FOR TENDER	A	2019.02.28		
ISSUED FOR TENDER	B	2019.03.13		
ISSUED FOR TENDER (LAYOUT UPDATED)	C	2019.03.26		

DRAWN	TG	25/01/2018
CHECKED	TM	25/01/2019
SENIOR DESIGNER MET PROJECTS		
PR ENGINEER	DGS	
PR TECH		
PROJECT / MET ENGINEER	DGS	25/01/2019
MET PROJECTS MANAGER		25/01/2019



301-00204/13-213	REGION	SOUTH AFRICA REGION - VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	DUST SUPPRESSION TRANSFER SYSTEMS-PLANS, SECTIONS AND MATERIAL LIST - DETAIL 5
MET PROJECTS	CWR1806001	MET-MWS-39-M0032



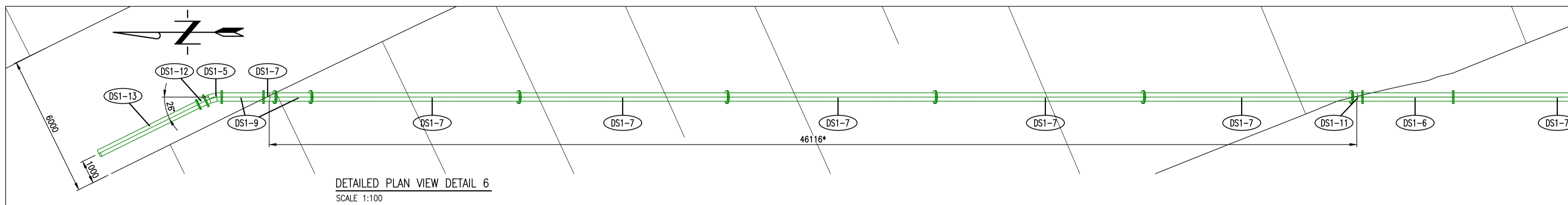


DUST SUPPRESSION SYSTEM LAYOUT PLAN DETAIL 6  
SCALE 1:500

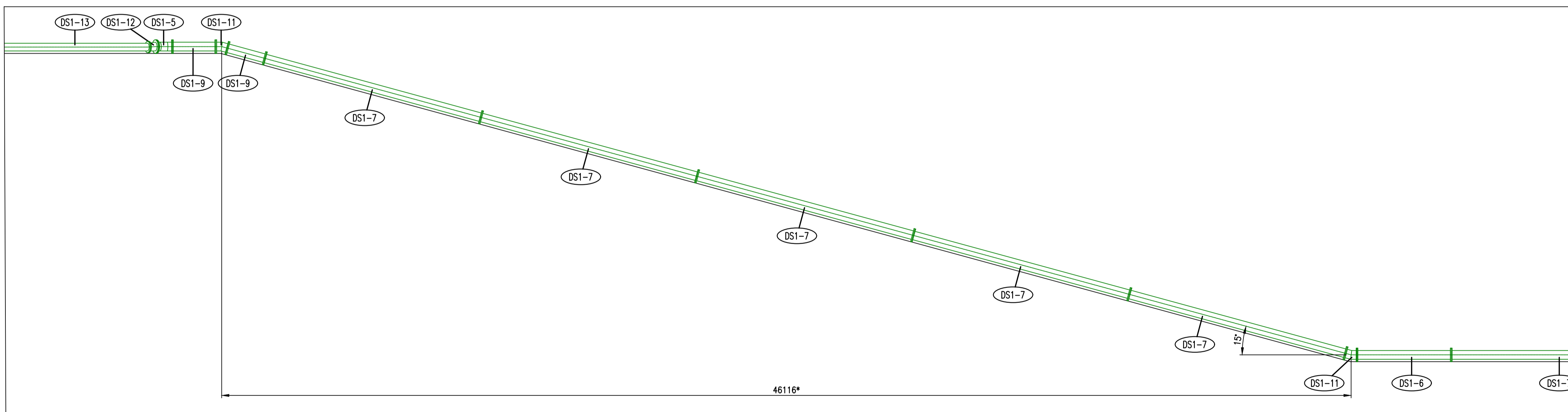
ITEM	Qty.	SIZE	DESCRIPTION	MK	WALL (mm)	Fig. (PN)	LINER (mm)
BEND	1	DN350	22,5-45° M.R.B., 355mm C/F, FLANGED BOTH ENDS, HDPE LINED	DS1-5	6	2500/3	12
CLOSURE	1	DN350	3000-6000mm F/F, FLANGED ONE END, SUPPLY WITH LOOSE FLANGE *	DS1-6	6	2500/3	12
SPOOL	6	DN350	9144mm F/F, FLANGED BOTH ENDS, HDPE LINED	DS1-7	6	2500/3	12
CLOSURE	2	DN350	0-3000mm F/F, FLANGED ONE END, SUPPLY WITH LOOSE FLANGE *	DS1-9	6	2500/3	12
BEND	2	DN350	0-22,5° M.R.B., 240mm C/F, FLANGED BOTH ENDS, HDPE LINED	DS1-11	6	2500/3	12
REDUCER	1	DN350	DN350/315 ECCENTRIC REDUCER, FLAT BOTTOM, 350mm F/F, DN 350 END FLANGE 1600/3	DS1-12	6	.	.
SPOOL	1	315 OD	OTHER END FLANGE 1600/3 DRILLED TO SUIT 315 HDPE PIPELINE				
			12000mm F/F, HDPE PIPE, PN16, PE100, SDR11, INCLUDING STUB ENDS AND BACKING FLANGES	DS1-13	6	2500/3	12

**LEGEND**  
 F/F FACE TO FACE      L.R.B LONG RADIUS BEND      \* TO BE CONFIRMED ON SITE  
 C/F CENTER TO FACE      P/E PLAIN ENDED

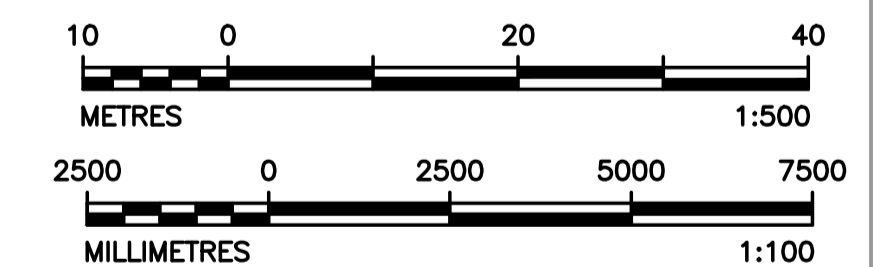
NOTE: MATERIAL INDICATED IS FOR DUST SUPPRESSION TRANSFER SYSTEM



DETAILED PLAN VIEW DETAIL 6  
SCALE 1:100



SECTION THROUGH DETAIL 6  
SCALE 1:100



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

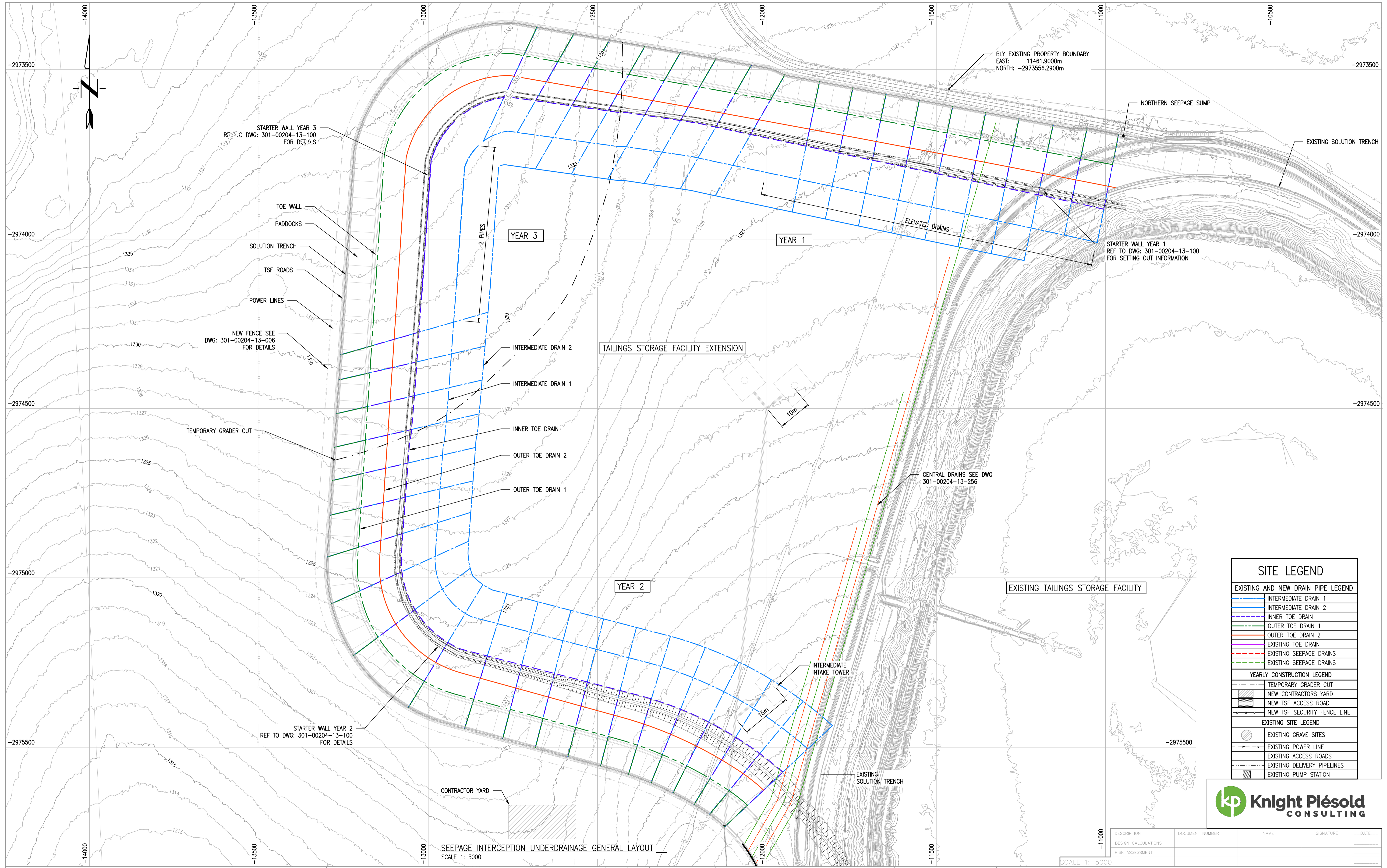
SCALE: AS SHOWN

ISSUED FOR TENDER	A	2019.02.28		DRAWN	TG	25/01/2018
ISSUED FOR TENDER	B	2019.03.13		CHECKED	TM	25/01/2019
ISSUED FOR TENDER	C	2019.03.26		SENIOR DESIGNER	MET PROJECTS	
				PR ENGINEER	DGS	
				PR TECH		
				PROJECT / MET ENGINEER	DGS	25/01/2019
				MET PROJECTS MANAGER		25/01/2019

301-00204/13-214	REGION	SOUTH AFRICA REGION - VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	DUST SUPPRESSION TRANSFER SYSTEMS-PLANS, SECTIONS AND MATERIAL LIST - DETAIL 6

MET PROJECTS	CWR1806001	MET-MWS-39-M0033	REV c
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SITE LEGEND	
EXISTING AND NEW DRAIN PIPE LEGEND	
[Symbol]	INTERMEDIATE DRAIN 1
[Symbol]	INTERMEDIATE DRAIN 2
[Symbol]	INNER TOE DRAIN
[Symbol]	OUTER TOE DRAIN 1
[Symbol]	OUTER TOE DRAIN 2
[Symbol]	EXISTING TOE DRAIN
[Symbol]	EXISTING SEEPAGE DRAINS
[Symbol]	EXISTING SEEPAGE DRAINS
YEARLY CONSTRUCTION LEGEND	
[Symbol]	TEMPORARY GRADER CUT
[Symbol]	NEW CONTRACTORS YARD
[Symbol]	NEW TSF ACCESS ROAD
[Symbol]	NEW TSF SECURITY FENCE LINE
EXISTING SITE LEGEND	
[Symbol]	EXISTING GRAVE SITES
[Symbol]	EXISTING POWER LINE
[Symbol]	EXISTING ACCESS ROADS
[Symbol]	EXISTING DELIVERY PIPELINES
[Symbol]	EXISTING PUMP STATION

SEEPAGE INTERCEPTION UNDERDRAINAGE GENERAL LAYOUT  
SCALE 1: 5000

TITLE	DRG. No	DETAIL
REFERENCE DRAWINGS		

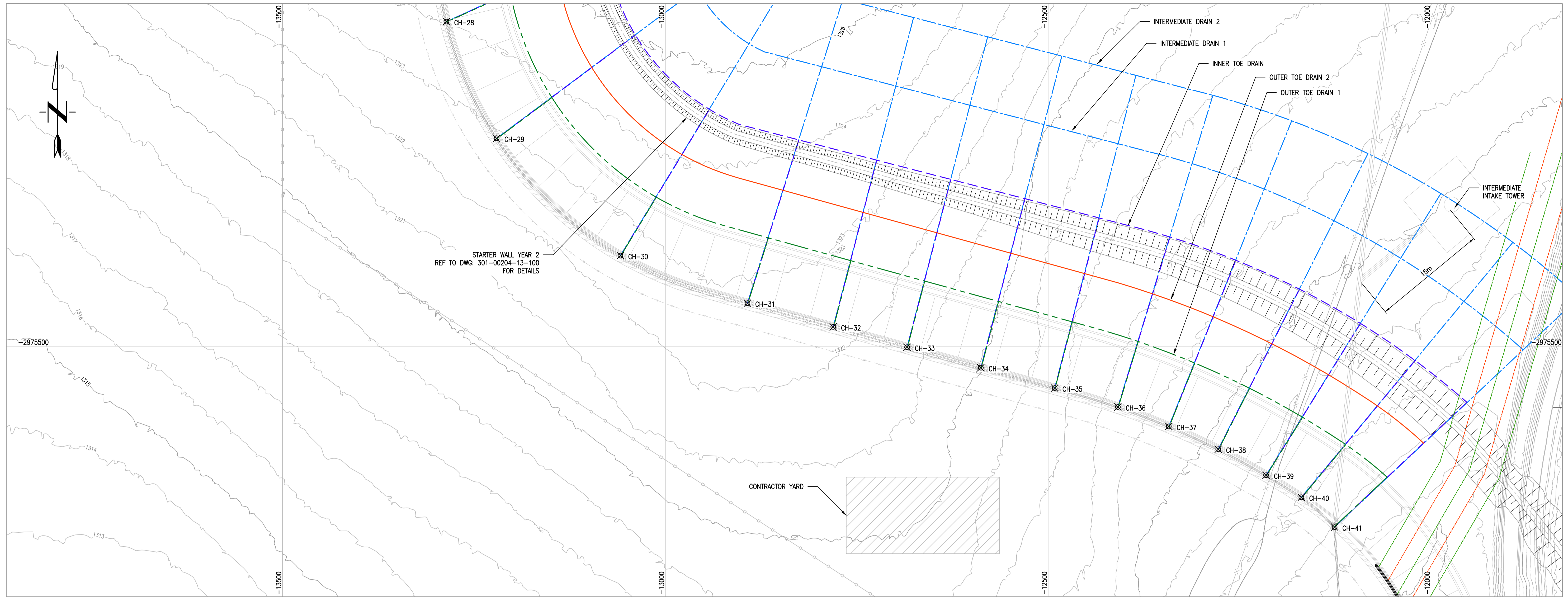
ISSUED FOR INFORMATION		ISSUED FOR APPROVAL		ISSUED FOR TENDER	
A	20.11.2018				
B	20.11.2018				
C	25.01.2019				

DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
DRAWN	FB			20.11.2018
CHECKED	TM			20.11.2018
SENIOR DESIGNER	MET PROJECTS			
PR ENGINEER				
PR TECH				
PROJECT / MET ENGINEER	DGS			20.11.2018
MET PROJECTS MANAGER	NAME			20.11.2018



301-00204/13-250	REGION	SOUTH AFRICA REGION - VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	SEEPAGE INTERCEPTION UNDERDRAINAGE GENERAL LAYOUT
MET PROJECTS	CWR1806001	MET-MWS-39-C0019





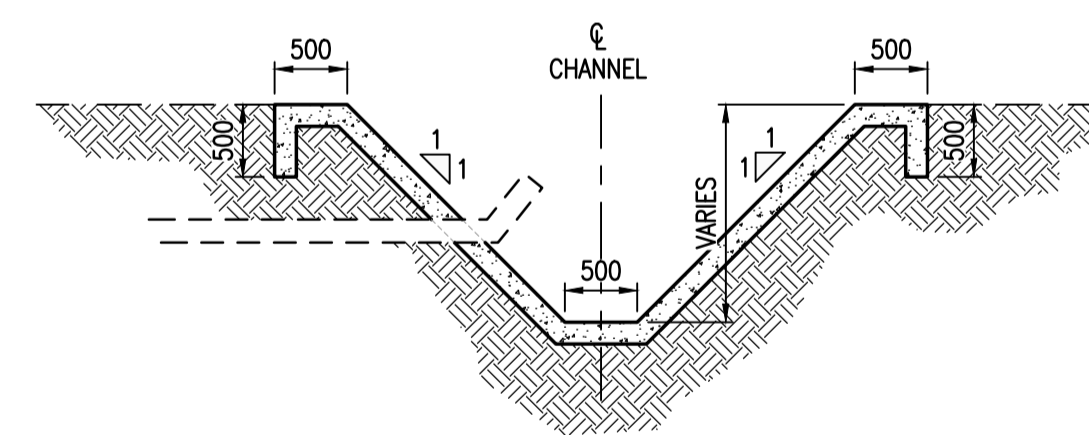
**SEEPAGE INTERCEPTION SETTING OUT DATA Lo-27-WGS84**

POINT	EASTING	NORTHING
-		
-		
BLY-P-42	11461.90	2973556.29
CH-1	10961.80	2973692.55
CH-2	11054.76	2973674.49
CH-3	11154.70	2973663.58
CH-4	11255.44	2973644.89
CH-5	11353.78	2973626.64
CH-6	11451.22	2973608.56
CH-7	11549.57	2973590.32
CH-8	11647.92	2973572.07
CH-9	11745.98	2973553.88
CH-10	11844.33	2973535.63
CH-11	11946.82	2973515.33
CH-12	12045.87	2973496.92
CH-13	12150.56	2973478.33
CH-14	12255.26	2973449.73
CH-15	12359.96	2973431.13
CH-16	12464.66	2973412.53
CH-17	12569.36	2973393.93
CH-18	12678.59	2973374.53

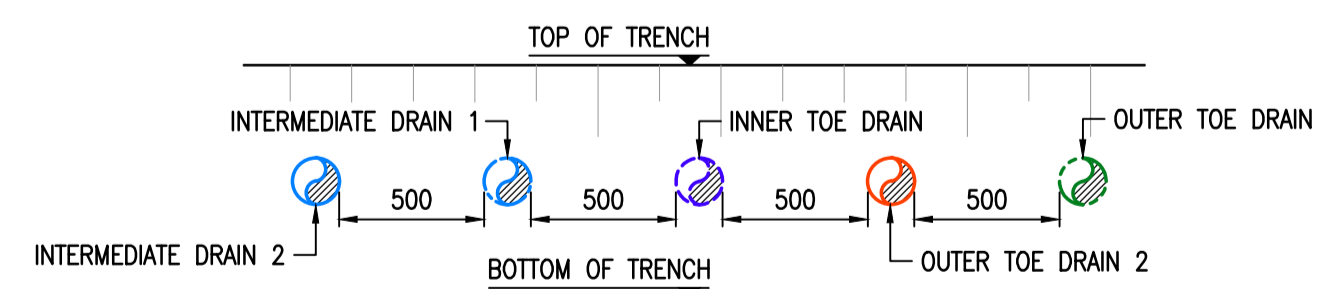
**SEEPAGE INTERCEPTION SETTING OUT DATA Lo-27-WGS84**

POINT	EASTING	NORTHING
CH-21	13258.58	2974341.18
CH-22	13263.48	2974415.24
CH-23	13270.06	2974514.87
CH-24	13276.62	2974614.16
CH-25	13283.10	2974712.36
CH-26	13289.87	2974814.88
CH-27	13298.01	2974938.00
CH-28	13285.85	2975076.17
CH-29	13220.25	2975228.58
CH-30	13058.62	2975381.74
CH-31	12892.66	2975443.89
CH-32	12780.67	2975474.84
CH-33	12684.27	2975501.48
CH-34	12587.87	2975528.11
CH-35	12491.47	2975554.75
CH-36	12408.91	2975579.45
CH-37	12342.40	2975604.86
CH-38	12277.85	2975634.60
CH-39	12215.41	2975668.61
CH-40	12169.30	2975697.35
CH-41	12125.88	2975736.36

**SEEPAGE INTERCEPTION UNDERDRAINAGE SOUTH LAYOUT (YEAR 2)**  
SCALE 1: 2500

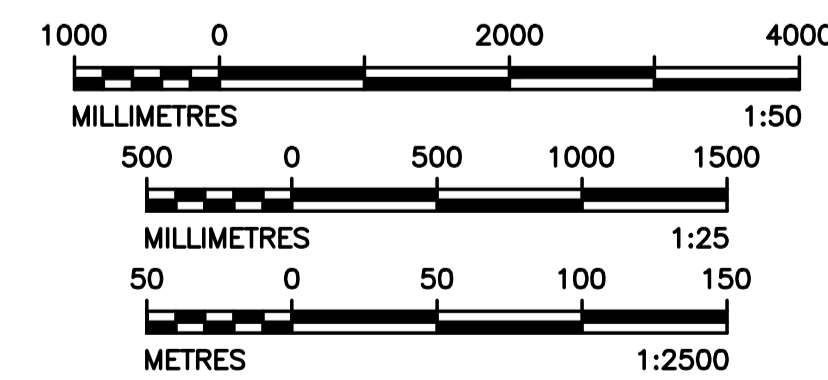


TYPICAL DRAIN OUTLET SECTION  
SCALE 1: 50



TYPICAL DRAIN OUTLET DETAIL  
SCALE 1: 25

SITE LEGEND	
<b>EXISTING AND NEW DRAIN PIPE LEGEND</b>	
[Symbol]	INTERMEDIATE DRAIN 1
[Symbol]	INTERMEDIATE DRAIN 2
[Symbol]	INNER TOE DRAIN
[Symbol]	OUTER TOE DRAIN 1
[Symbol]	OUTER TOE DRAIN 2
[Symbol]	EXISTING TOE DRAIN
[Symbol]	EXISTING SEEPAGE DRAINS
[Symbol]	EXISTING SEEPAGE DRAINS
<b>YEARLY CONSTRUCTION LEGEND</b>	
[Symbol]	TEMPORARY GRADER CUT
[Symbol]	NEW CONTRACTORS YARD
[Symbol]	NEW TSF ACCESS ROAD
[Symbol]	NEW TSF SECURITY FENCE LINE
<b>EXISTING SITE LEGEND</b>	
[Symbol]	EXISTING GRAVE SITES
[Symbol]	EXISTING POWER LINE
[Symbol]	EXISTING ACCESS ROADS
[Symbol]	EXISTING DELIVERY PIPELINES
[Symbol]	EXISTING PUMP STATION

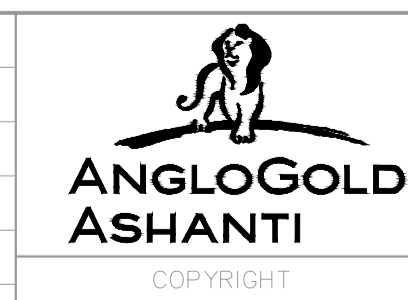


SCALE 1:2500

SEEPAGE INTERCEPTION UNDERDRAINAGE GENERAL LAYOUT	301-00204/13-250	ISSUED FOR INFORMATION
SEEPAGE INTERCEPTION UNDERDRAINAGE NORTH LAYOUT	301-00204/13-252	ISSUED FOR APPROVAL
SEEPAGE INTERCEPTION UNDERDRAINAGE WEST LAYOUT	301-00204/13-253	ISSUED FOR TENDER
SEEPAGE INTERCEPTION FILTER DRAINS OUTLET-SECTIONS AND DETAILS	301-00204/13-254	

			A	20.11.2018						
			B	27.11.2018						
			C	25.01.2019						


DRAWN	FB	20.11.2018
CHECKED	TM	20.11.2018
SENIOR DESIGNER	MET PROJECTS	
PR ENGINEER		
PR TECH		
PROJECT / MET ENGINEER	TM	20.11.2018
MET PROJECTS MANAGER		20.11.2018



301-00204/13-251
REGION SOUTH AFRICA REGION - VR
BUSINESS UNIT MINE WASTE SOLUTIONS
PROJECT KAREERAND TSF EXPANSION PROJECT
DRAWING TITLE SEEPAGE INTERCEPTION UNDERDRAINAGE SOUTH LAYOUT

TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D
REFERENCE DRAWINGS						

REVISIONS	MARK	DATE	INIT	APP'D

DESIGNATION	NAME	REGISTRATION No:	SIGNATURE	DATE
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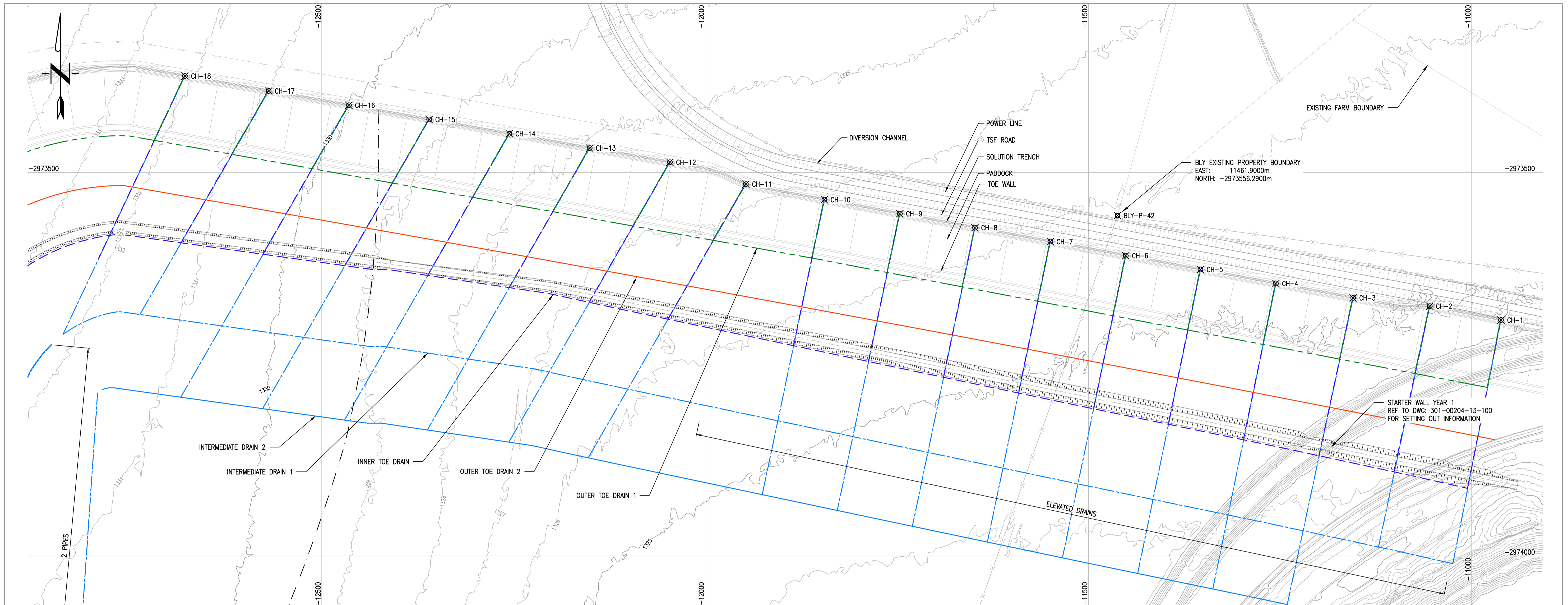
MET PROJECTS

CWR1806001

MET-MWS-C0074

REV C





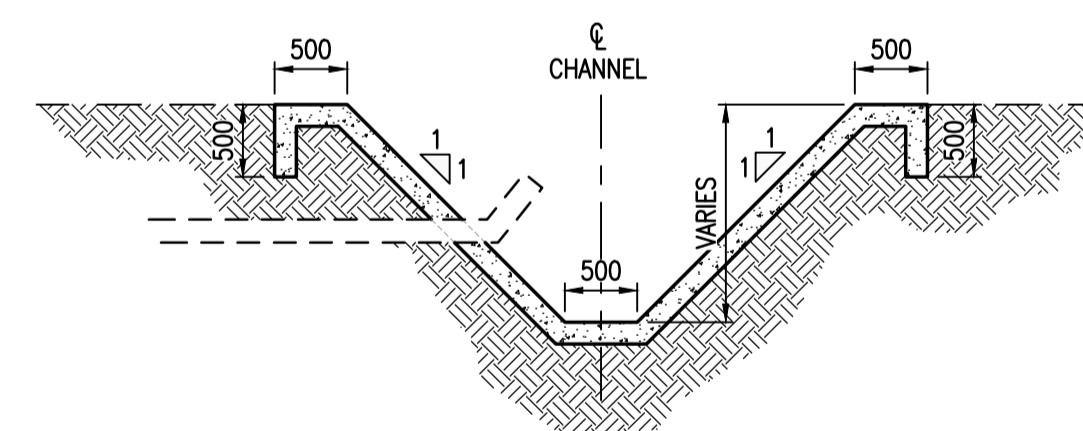
SEEPAGE INTERCEPTION  
SETTING OUT DATA Lo-27-WGS84

POINT	EASTING	NORTHING
-	-	-
BLY-P-42	11461.90	2973556.29
CH-1	10961.80	2973692.55
CH-2	11054.76	2973674.49
CH-3	11154.70	2973663.58
CH-4	11255.44	2973644.89
CH-5	11353.78	2973626.64
CH-6	11451.22	2973608.56
CH-7	11549.57	2973590.32
CH-8	11647.92	2973572.07
CH-9	11745.98	2973553.88
CH-10	11844.33	2973535.63
CH-11	11946.82	2973515.33
CH-12	12045.87	2973486.92
CH-13	12150.56	2973468.33
CH-14	12255.26	2973449.73
CH-15	12359.96	2973431.13
CH-16	12464.66	2973412.53
CH-17	12569.36	2973393.93
CH-18	12678.59	2973374.53

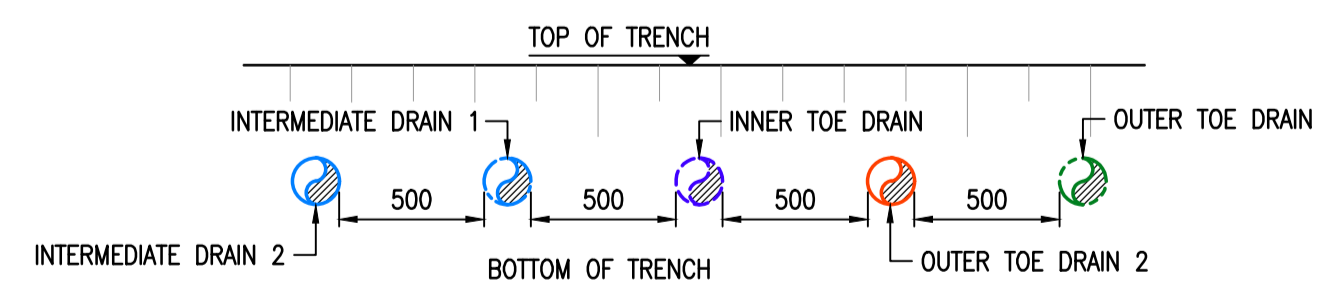
SEEPAGE INTERCEPTION  
SETTING OUT DATA Lo-27-WGS84

POINT	EASTING	NORTHING
CH-21	13258.58	2974341.18
CH-22	13263.48	2974415.24
CH-23	13270.06	2974514.87
CH-24	13276.62	2974614.16
CH-25	13283.10	2974712.36
CH-26	13289.87	2974814.88
CH-27	13298.01	2974938.00
CH-28	13285.85	2975076.17
CH-29	13220.25	2975228.58
CH-30	13058.62	2975381.74
CH-31	12892.66	2975443.89
CH-32	12780.67	2975474.84
CH-33	12684.27	2975501.48
CH-34	12587.87	2975528.11
CH-35	12491.47	2975554.75
CH-36	12408.91	2975579.45
CH-37	12342.40	2975604.86
CH-38	12277.85	2975634.60
CH-39	12215.41	2975668.61
CH-40	12169.30	2975697.35
CH-41	12125.88	2975736.36

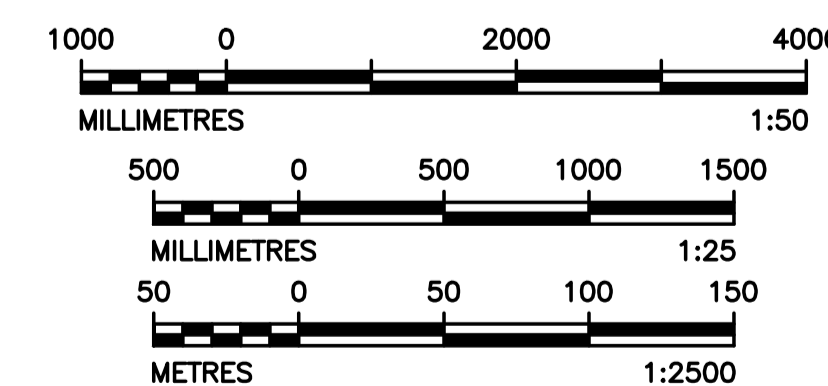
SEEPAGE INTERCEPTION UNDERDRAINAGE NORTH LAYOUT (YEAR 1)  
SCALE 1: 2500



TYPICAL DRAIN OUTLET SECTION  
SCALE 1: 50



TYPICAL DRAIN OUTLET DETAIL  
SCALE 1: 25



SCALE 1: 2500

SITE LEGEND	
<b>EXISTING AND NEW DRAIN PIPE LEGEND</b>	
[Symbol]	INTERMEDIATE DRAIN 1
[Symbol]	INTERMEDIATE DRAIN 2
[Symbol]	INNER TOE DRAIN
[Symbol]	OUTER TOE DRAIN 1
[Symbol]	OUTER TOE DRAIN 2
[Symbol]	EXISTING TOE DRAIN
[Symbol]	EXISTING SEEPAGE DRAINS
[Symbol]	EXISTING SEEPAGE DRAINS
<b>YEARLY CONSTRUCTION LEGEND</b>	
[Symbol]	TEMPORARY GRADER CUT
[Symbol]	NEW CONTRACTORS YARD
[Symbol]	NEW TSF ACCESS ROAD
[Symbol]	NEW TSF SECURITY FENCE LINE
<b>EXISTING SITE LEGEND</b>	
[Symbol]	EXISTING GRAVE SITES
[Symbol]	EXISTING POWER LINE
[Symbol]	EXISTING ACCESS ROADS
[Symbol]	EXISTING DELIVERY PIPELINES
[Symbol]	EXISTING PUMP STATION



TSF STARTER WALL LAYOUT	301-00204/13-100
SEEPAGE INTERCEPTION UNDERDRAINAGE GENERAL LAYOUT	301-00204/13-250
SEEPAGE INTERCEPTION UNDERDRAINAGE SOUTH LAYOUT	301-00204/13-251
SEEPAGE INTERCEPTION UNDERDRAINAGE WEST LAYOUT	301-00204/13-253
SEEPAGE INTERCEPTION FILTER DRAINS OUTLET-SECTIONS AND DETAILS	301-00204/13-254

ISSUED FOR INFORMATION	A	20.11.2018
ISSUED FOR APPROVAL	B	27.11.2018
ISSUED FOR TENDER	C	25.01.2019

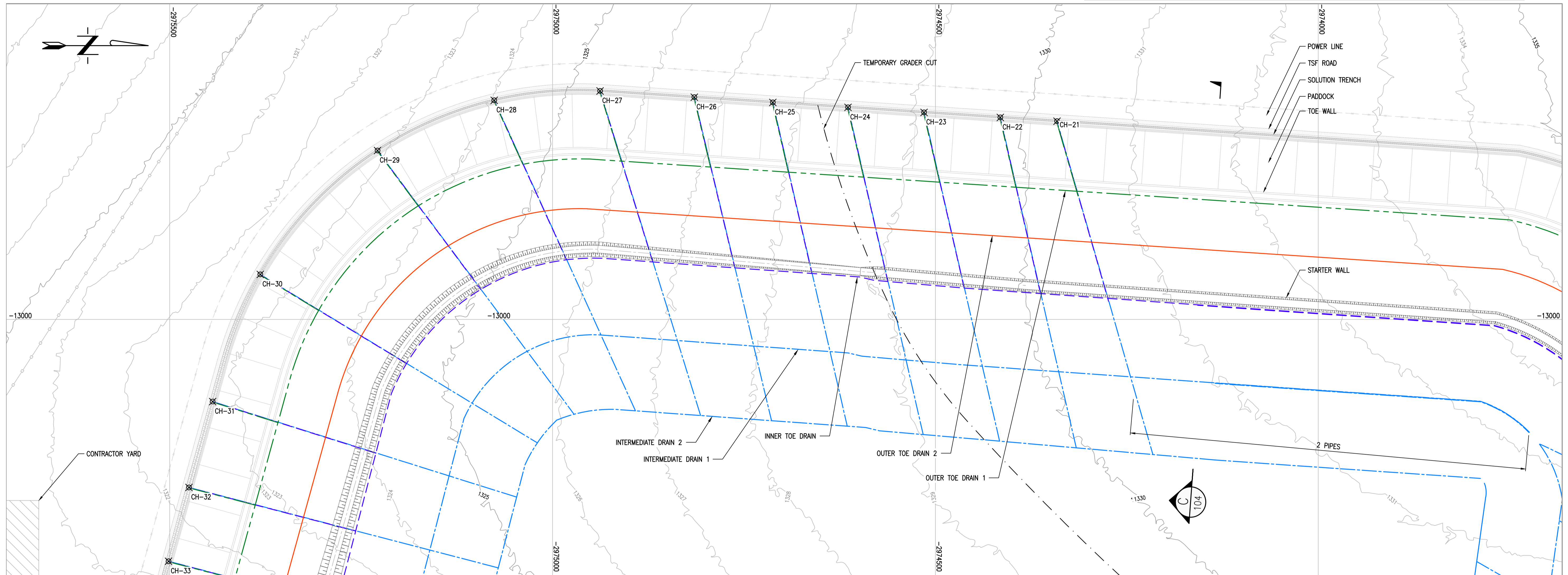
DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
DRAWN	FB			20.11.2018
CHECKED	TM			20.11.2018
SENIOR DESIGNER	MET PROJECTS			
PR ENGINEER				
PR TECH				
PROJECT / MET ENGINEER	TM			20.11.2018
MET PROJECTS MANAGER				20.11.2018

DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
DRAWN	FB			20.11.2018
CHECKED	TM			20.11.2018
SENIOR DESIGNER	MET PROJECTS			
PR ENGINEER				
PR TECH				
PROJECT / MET ENGINEER	TM			20.11.2018
MET PROJECTS MANAGER				20.11.2018



301-00204/13-252	REGION	SOUTH AFRICA REGION - VR
	BUSINESS UNIT	MINE WASTE SOLUTIONS
	PROJECT	KAREERAND TSF EXPANSION PROJECT
	DRAWING TITLE	SEEPAGE INTERCEPTION UNDERDRAINAGE NORTH LAYOUT
MET PROJECTS	CWR1806001	MET-MWS-39-C0075





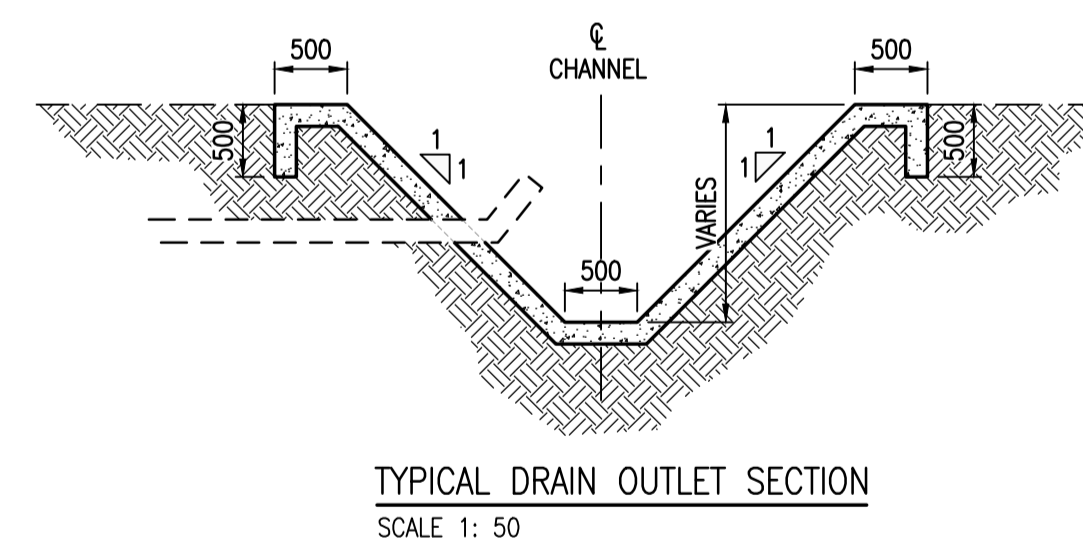
SEEPAGE INTERCEPTION SETTING OUT DATA Lo-27-WGS84

POINT	EASTING	NORTHING
-		
BLY-P-42	11461.90	2973556.29
CH-1	10961.80	2973692.55
CH-2	11054.76	2973674.49
CH-3	11154.70	2973663.58
CH-4	11255.44	2973644.89
CH-5	11353.78	2973626.64
CH-6	11451.22	2973608.56
CH-7	11549.57	2973590.32
CH-8	11647.92	2973572.07
CH-9	11745.98	2973553.88
CH-10	11844.33	2973535.63
CH-11	11946.82	2973515.33
CH-12	12045.87	2973486.92
CH-13	12150.56	2973468.33
CH-14	12255.26	2973449.73
CH-15	12359.96	2973431.13
CH-16	12464.66	2973412.53
CH-17	12569.36	2973393.93
CH-18	12678.59	2973374.53

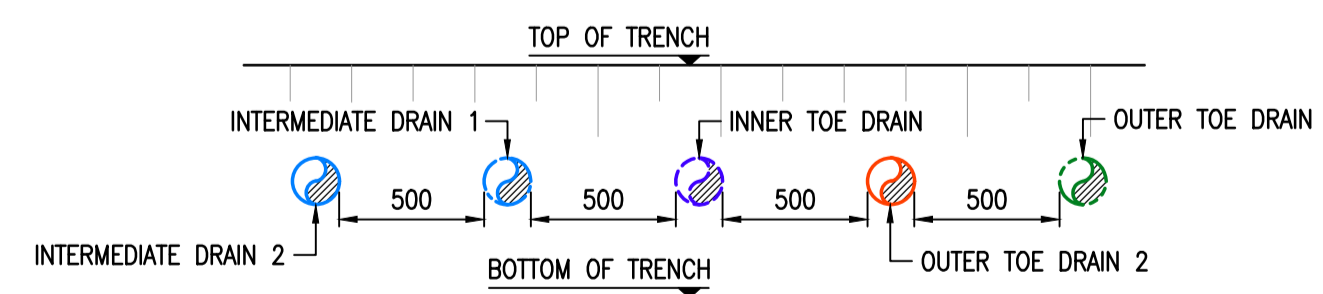
SEEPAGE INTERCEPTION SETTING OUT DATA Lo-27-WGS84

POINT	EASTING	NORTHING
CH-21	13258.58	2974341.18
CH-22	13263.48	2974415.24
CH-23	13270.06	2974514.87
CH-24	13276.62	2974614.16
CH-25	13283.10	2974712.36
CH-26	13289.87	2974814.88
CH-27	13298.01	2974938.00
CH-28	13285.85	2975076.17
CH-29	13220.25	2975228.58
CH-30	13058.62	2975381.74
CH-31	12892.66	2975443.89
CH-32	12780.67	2975474.84
CH-33	12684.27	2975501.48
CH-34	12587.87	2975528.11
CH-35	12491.47	2975554.75
CH-36	12408.91	2975579.45
CH-37	12342.40	2975604.86
CH-38	12277.85	2975634.60
CH-39	12215.41	2975668.61
CH-40	12169.30	2975697.35
CH-41	12125.88	2975736.36

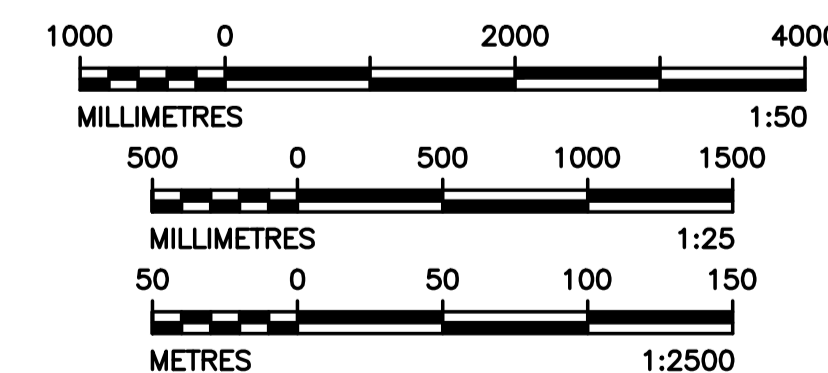
SEEPAGE INTERCEPTION UNDERDRAINAGE WEST LAYOUT (YEAR 3)  
SCALE 1: 2500



TYPICAL DRAIN OUTLET SECTION  
SCALE 1: 50



TYPICAL DRAIN OUTLET DETAIL  
SCALE 1: 25



SCALE 1: 2500

SITE LEGEND	
<b>EXISTING AND NEW DRAIN PIPE LEGEND</b>	
[Blue dashed line]	INTERMEDIATE DRAIN 1
[Blue solid line]	INTERMEDIATE DRAIN 2
[Blue dashed line]	INNER TOE DRAIN
[Green dashed line]	OUTER TOE DRAIN 1
[Green solid line]	OUTER TOE DRAIN 2
[Red dashed line]	EXISTING TOE DRAIN
[Red solid line]	EXISTING SEEPAGE DRAINS
[Green dashed line]	EXISTING SEEPAGE DRAINS
<b>YEARLY CONSTRUCTION LEGEND</b>	
[Dashed line]	TEMPORARY GRADER CUT
[Hatched area]	NEW CONTRACTORS YARD
[Hatched area]	NEW TSF ACCESS ROAD
[Hatched area]	NEW TSF SECURITY FENCE LINE
<b>EXISTING SITE LEGEND</b>	
[Circle with cross]	EXISTING GRAVE SITES
[Dashed line]	EXISTING POWER LINE
[Dashed line]	EXISTING ACCESS ROADS
[Dashed line]	EXISTING DELIVERY PIPELINES
[Circle]	EXISTING PUMP STATION



STARTER WALL - SECTIONS SHEET 3/3	301-00204/13-104	ISSUED FOR INFORMATION
SEEPAGE INTERCEPTION UNDERDRAINAGE GENERAL LAYOUT	301-00204/13-250	ISSUED FOR APPROVAL
SEEPAGE INTERCEPTION UNDERDRAINAGE SOUTH LAYOUT	301-00204/13-251	ISSUED FOR TENDER
SEEPAGE INTERCEPTION UNDERDRAINAGE NORTH LAYOUT	301-00204/13-252	
SEEPAGE INTERCEPTION FILTER DRAINS OUTLET-SECTIONS AND DETAILS	301-00204/13-254	

MARK	DATE	INIT	APP'D
A	20.11.2018		
B	27.11.2018		
C	25.01.2019		

DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
DRAWN	FB			20.11.2018
CHECKED	TM			20.11.2018
SENIOR DESIGNER	MET PROJECTS			
PR ENGINEER				
PR TECH				
PROJECT / MET ENGINEER	TM			20.11.2018
MET PROJECTS MANAGER				20.11.2018

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	CWR1806001	MET-MWS-C0076			

TITLE	DRG. No	DETAIL
REFERENCE DRAWINGS		

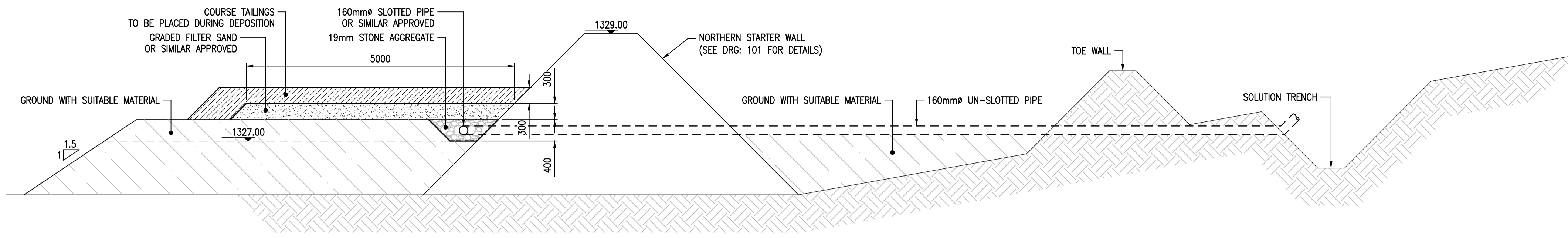
MARK	DATE	INIT	APP'D

DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE

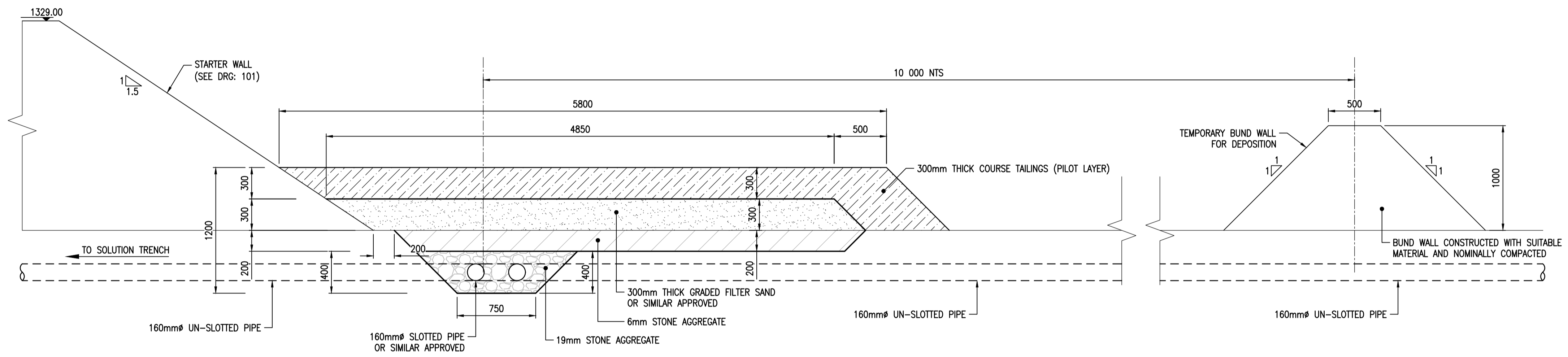
PROJECT No.	B/UNIT	AREA	SEQ. No.	SIZE - A1



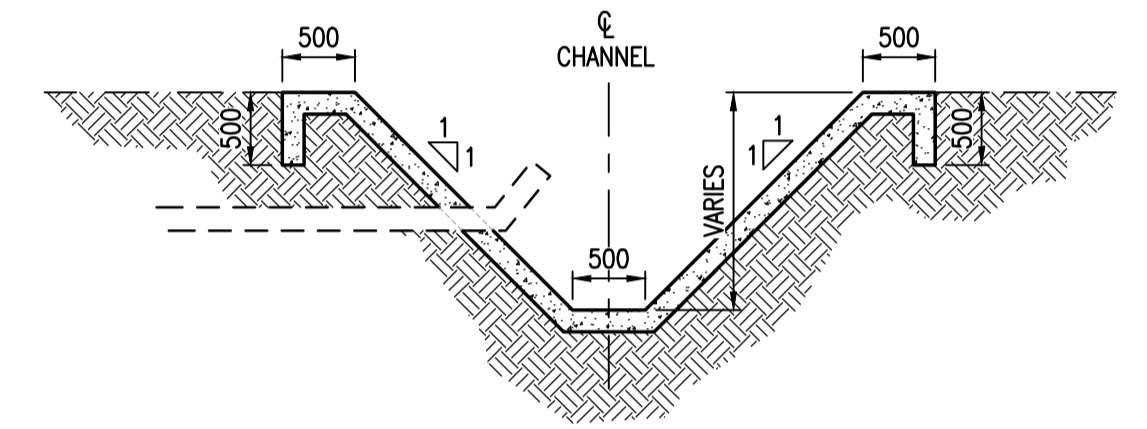
- NOTE:**
1. ALL CAST-IN PIPE SPECIALS TO BE SABS 719 GRADE B, 6mm WALL WITH AN APPROVED LINING
  2. ROUGHEN THIS SURFACE BEFORE CASTING IN FIRST PRE-CAST CONCRETE RING . CONCRETE TO BE 25/19 REINFORCED CONCRETE
  3. ALL CONCRETE SURFACES TO BE FINISHED TO DEGREE 1 ACCURACY WITH A STEEL FLOAT FINISH AS PER SANS 1200A
  4. DRAWING APPLIES TO SINGLE INTERMEDIATE DECANT ON DECANT LINE A
  5. FOUNDATION DESIGNED FOR A SAFE SOIL BEARING PRESSURE =>1MPa



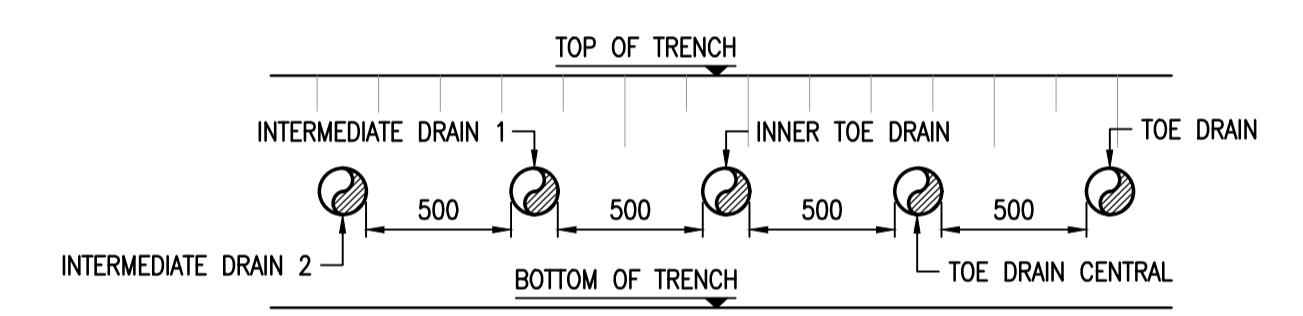
ELEVATED DRAINS - NORTHERN SECTIONS  
SCALE 1:50



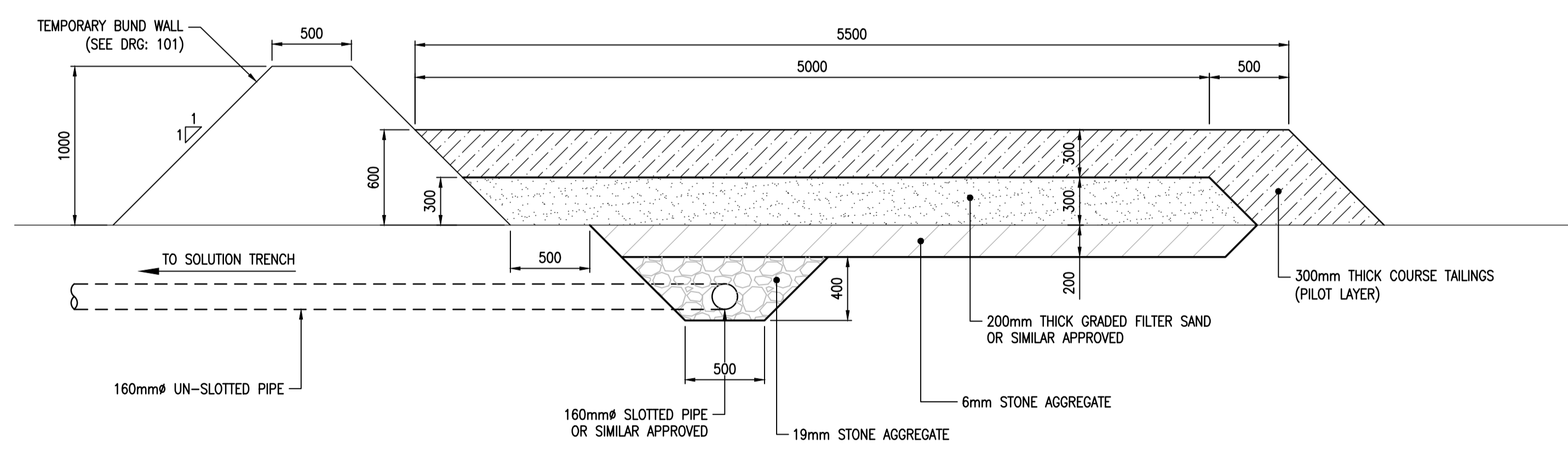
INNER TOE DRAIN DETAIL (DOUBLE PIPES)  
SCALE 1:25



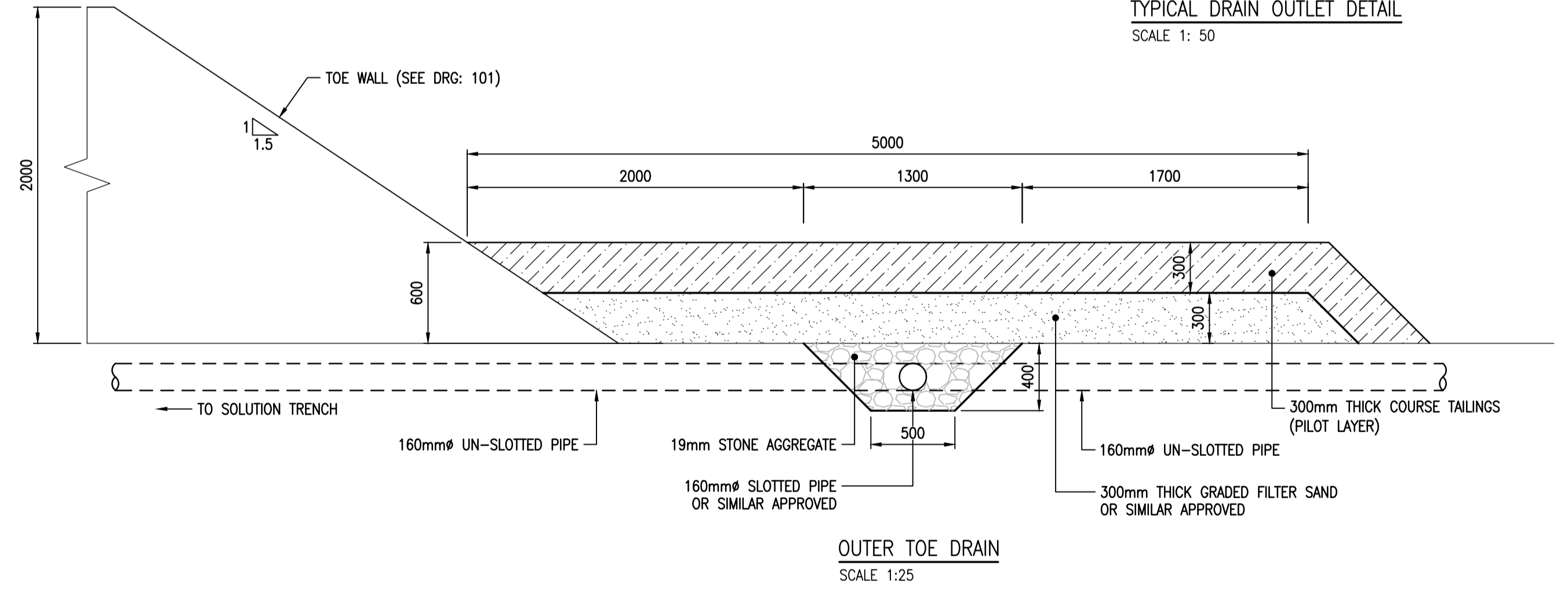
TYPICAL DRAIN OUTLET SECTION  
SCALE 1: 50



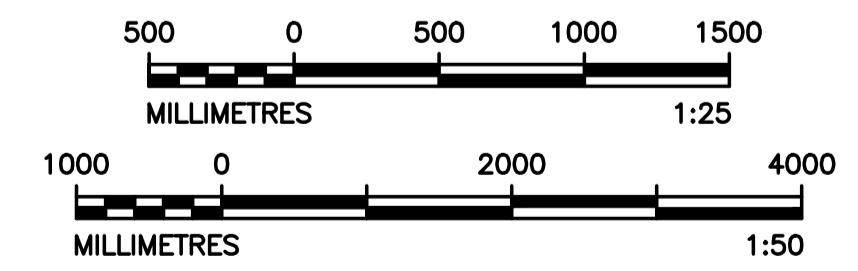
TYPICAL DRAIN OUTLET DETAIL  
SCALE 1: 50



INTERMEDIATE DRAIN 1, 2 & SINGLE INNER TOE DRAIN  
SCALE 1:25



OUTER TOE DRAIN  
SCALE 1:25



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
TSF - STARTER WALLS - SECTION - SHEET 1/3	301-00204/13-101	ISSUED FOR TENDER	B	25.01.2019			DRAWN	ME			20.11.2018
SEEPAGE INTERCEPTION - UNDERDRAINAGE - GENERAL LAYOUT	301-00204/13-250	ISSUED FOR APPROVAL	A	20.11.2018			CHECKED	TM			20.11.2018
SEEPAGE INTERCEPTION - UNDERDRAINAGE - LAYOUT (MAIN DRAIN)	301-00204/13-251						SENIOR DESIGNER	MET PROJECTS			
SEEPAGE INTERCEPTION - UNDERDRAINAGE - NORTH LAYOUT	301-00204/13-252						PR ENGINEER	DGS			20.11.2018
SEEPAGE INTERCEPTION - UNDERDRAINAGE - WEST LAYOUT	301-00204/13-253						PR TECH				
							PROJECT / MET ENGINEER	TM			20.11.2018
							MET PROJECTS MANAGER				20.11.2018

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PROJECT KAREERAND EXPANSION PROJECT

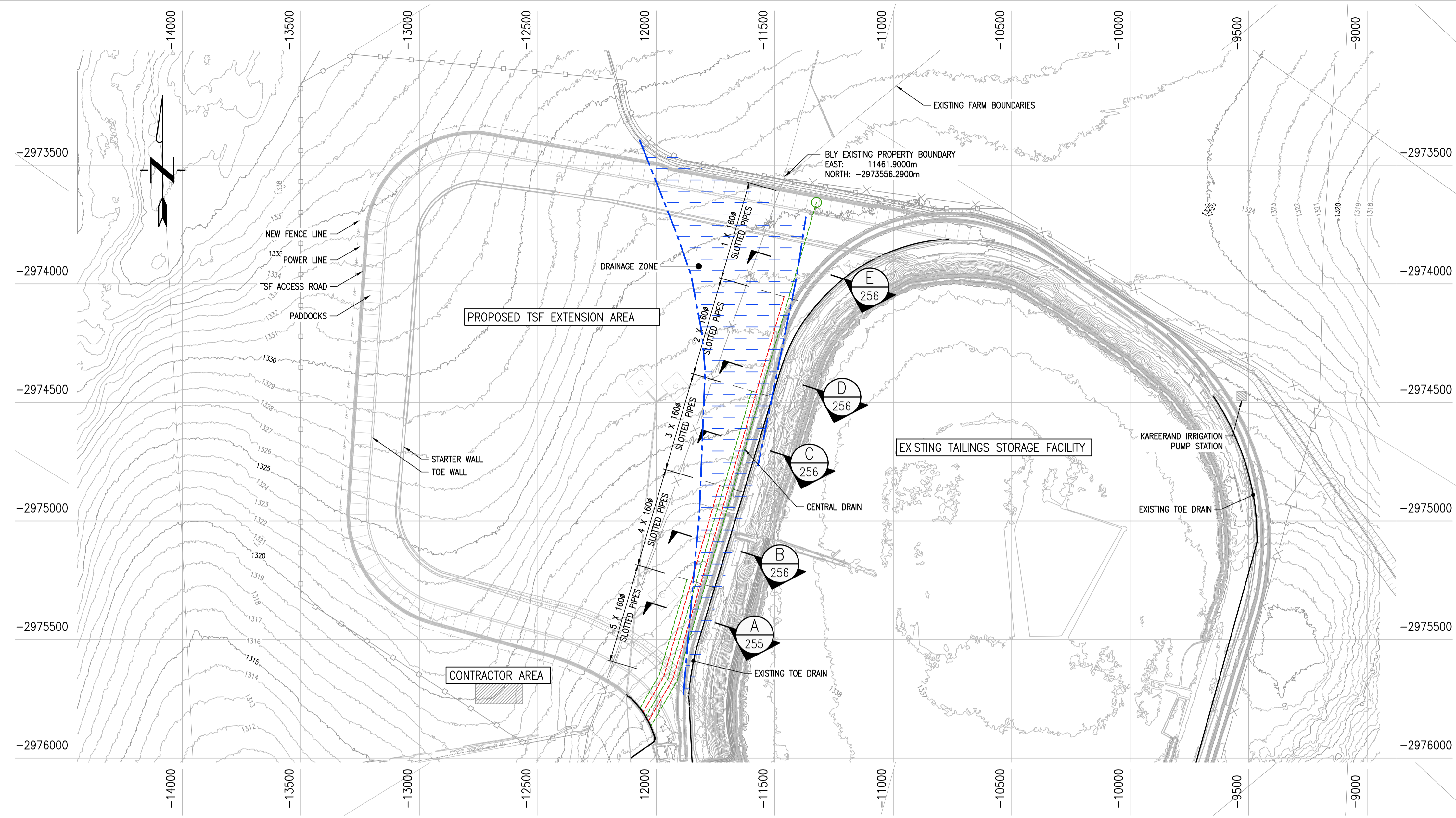
DRAWING TITLE SEEPAGE INTERCEPTION FILTER DRAIN OUTLET-SECTIONS AND DETAILS

CWR1806001

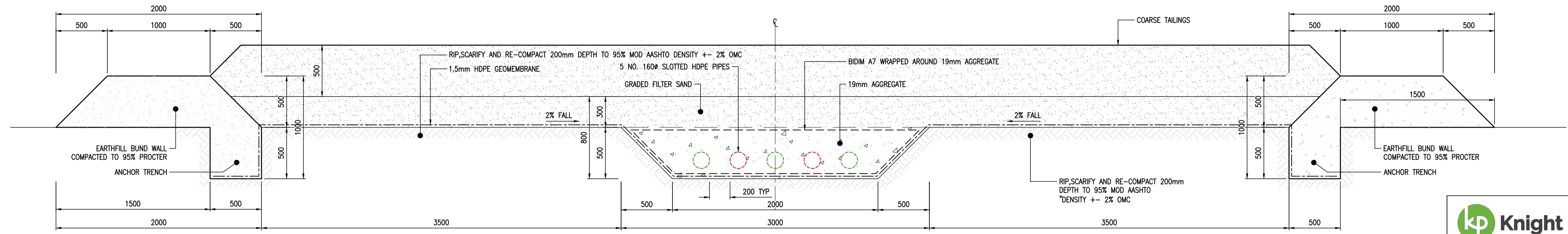
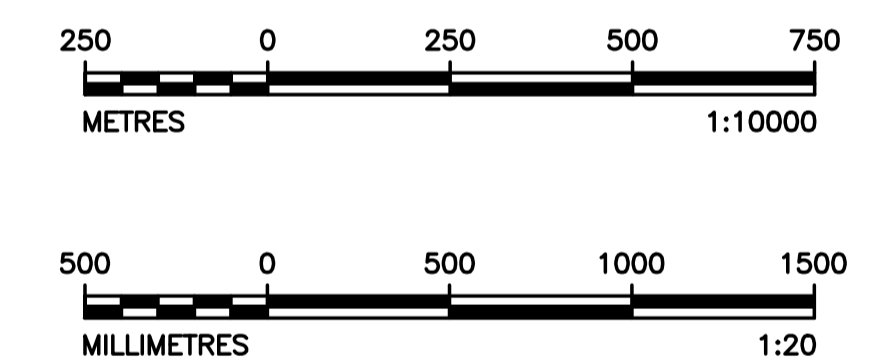
MET-MWS-39-C0022

REV B





CENTRAL DRAIN LAYOUT PLAN  
SCALE: 1:10000



A  
255  
CENTRAL DRAIN SECTION A-A  
SCALE 1:20



DESCRIPTION	DOCUMENT NUMBER	NAME	SIGNATURE	DATE
DESIGN CALCULATIONS				
RISK ASSESSMENT				

TITLE	DRG. No	DETAIL	MARK	DATE	INIT	APP'D	DESIGNATION	NAME	REGISTRATION No.	SIGNATURE	DATE
CENTRAL DRAINS TYPICAL SECTIONS	301-00204/13-256	ISSUED FOR INFORMATION	A	31.10.2018			DRAWN	FB			16.01.2019
		ISSUED FOR APPROVAL	B	14.12.2018			CHECKED	TM			20.11.2018
		ISSUED FOR TENDER	C	16.01.2019			SENIOR DESIGNER MET PROJECTS	DGS			20.11.2018
							PR ENGINEER				
							PR TECH				
							PROJECT / MET ENGINEER	DGS			20.11.2018
							MET PROJECTS MANAGER	NAME			20.11.2018

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301-00204/13-256  
REGION SOUTH AFRICA REGION - VR  
BUSINESS UNIT MINE WASTE SOLUTIONS  
PROJECT KAREERAND TSF EXPANSION PROJECT  
DRAWING TITLE CENTRAL DRAINS LAYOUT AND SECTIONS  
CWR1806001 MET-MWS-C0077  
SCALE: AS SHOWN