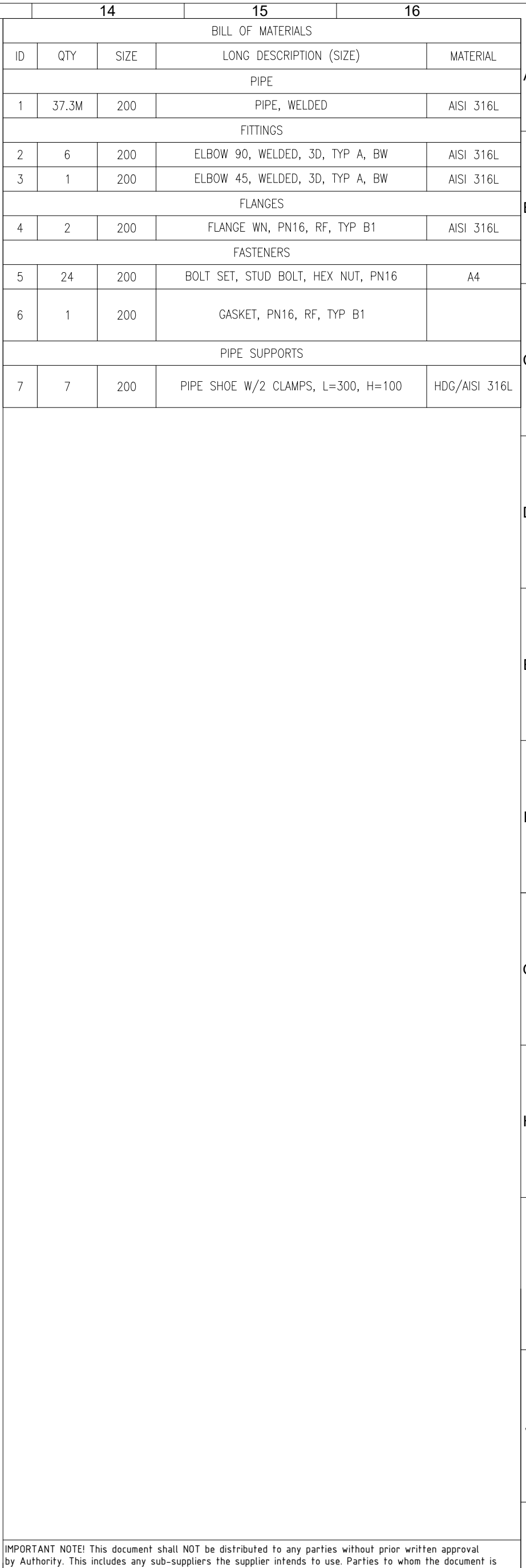
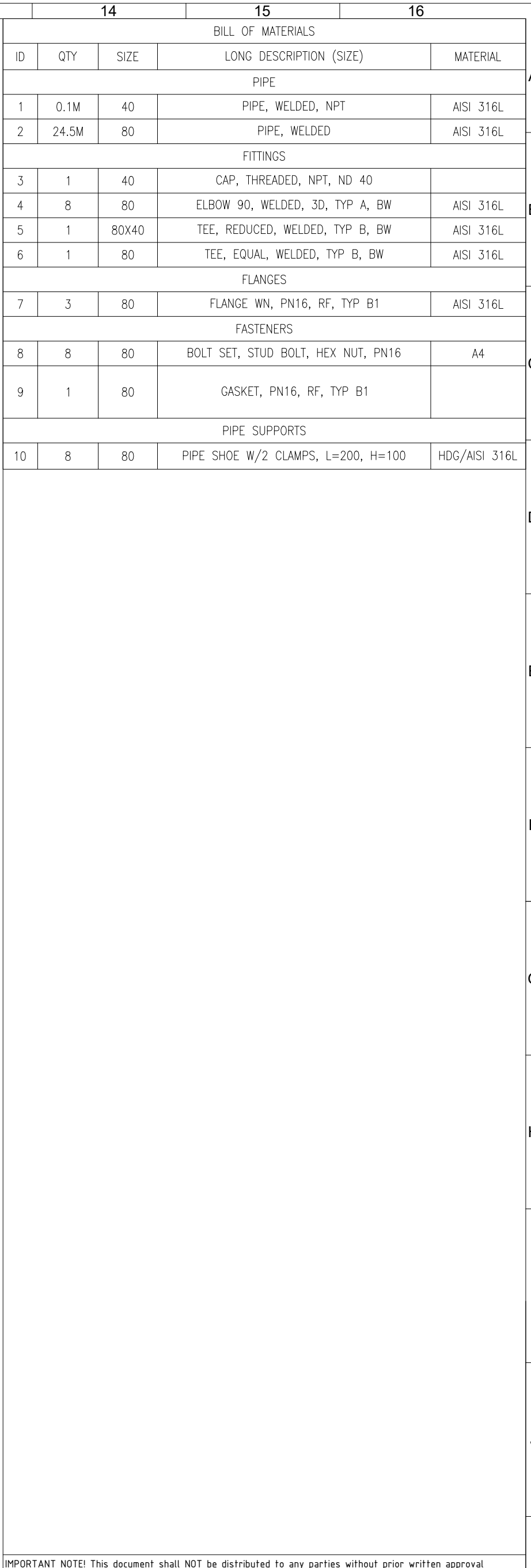
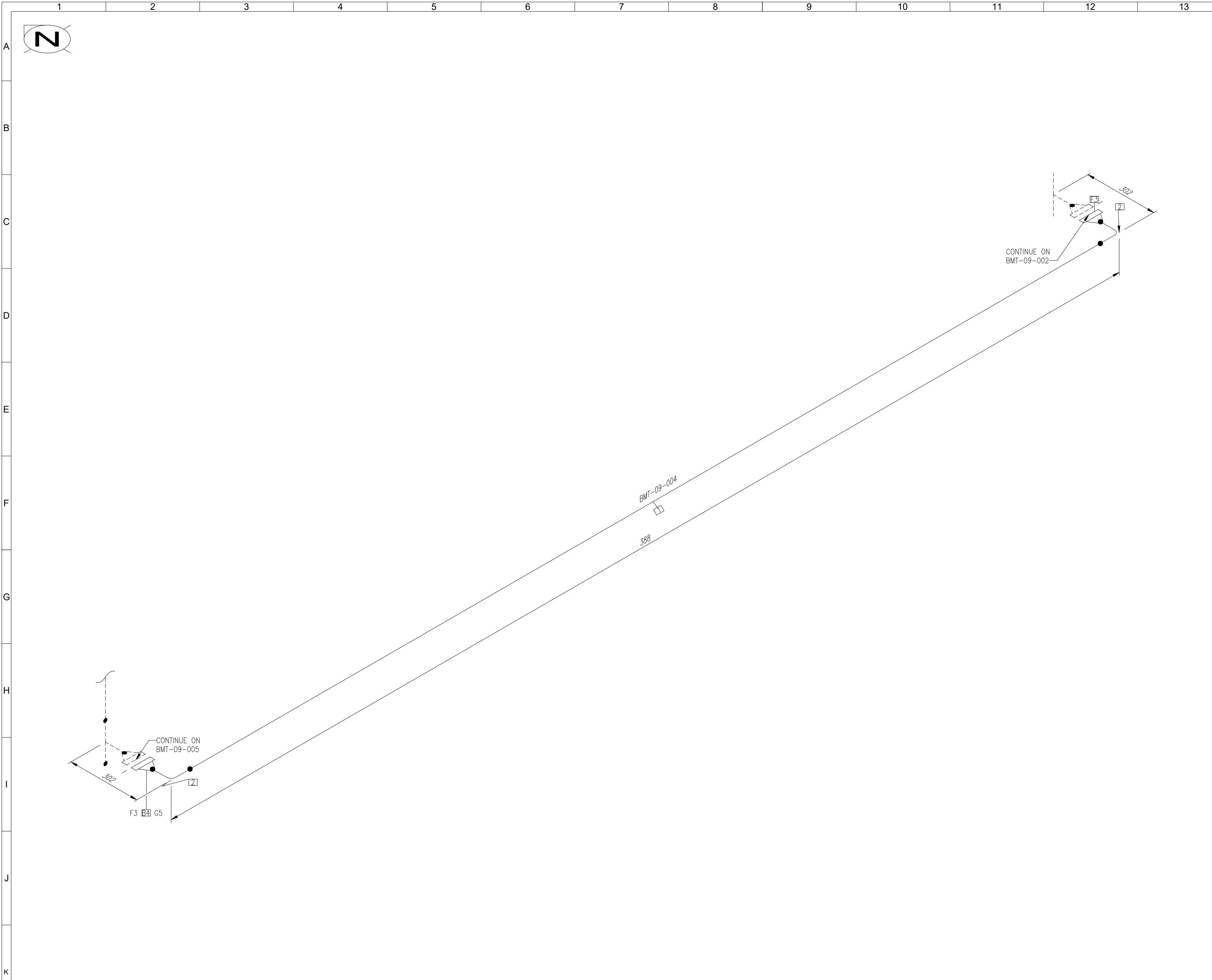




intended to be distributed shall have signed the ILF NOR, non-disclosure and confidentiality agreement regarding all aspects of the project, and this document is to be sent to ILF NOR, prior to being issued with the document.				
FREVAR KF - 5812 - NYTT OPPGRADERINGSANLEGG				Disciplin Formal A2 Date 03.09.26
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		Checked	AKL	Status
		Approved	TJO	Sheet 1/1
	ILF Consulting Engineers Norway AS Asdalfangen 56 3962 Stafelle		Document number 19139-ILF-NOR-RIMek-ISO-1024-02	Rev. 0
14		15		A1



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FREVAR KF - 5812 - NYTT OPPGRADERINGSANLEGG								Discipline	Format
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						03.09.26			
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				Approved	TJO	Sheet	1/1		
 ILF Consulting Engineers Norway AS Asdalangen 56 3962 Stafelle				Document number			Rev.		
				19139-ILF-NOR-RIMek-ISO-1024-09			0		
14				15		A1			



	14		15		16	
BILL OF MATERIALS						
ID	QTY	SIZE	LONG DESCRIPTION (SIZE)			MATERIAL
PIPE						
1	0.2M	80	PIPE, WELDED, NPT			AISI 316L
FITTINGS						
2	2	80	ELBOW 90, WELDED, 3D, TYP A, BW			AISI 316L
FLANGES						
3	2	80	FLANGE WN, PN16, RF, TYP B1			AISI 316L
FASTENERS						
4	8	80	BOLT SET, STUD BOLT, HEX NUT, PN16			A4
5	1	80	GASKET, PN16, RF, TYP B1			

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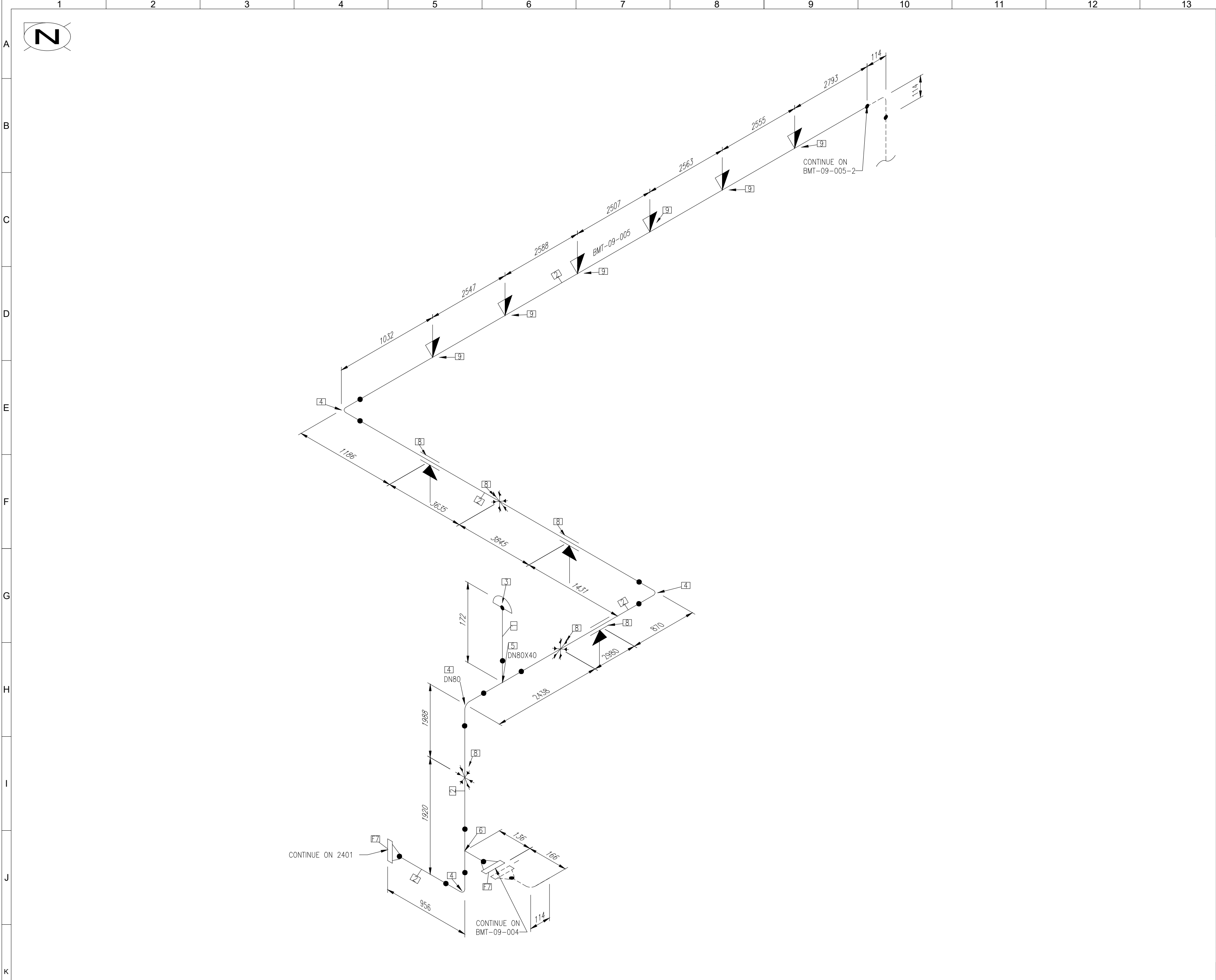
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P&ID NUMBER		-		NDT:				OPERATING PARAMETERS:									4														Date		A2			
LAYOUT NUMBER		-		VT		100%		MT / PT		100 %							PRESSURE MIN/MAX [BARG]		7		ISOMETRIC				Drawn		TJO		Scale		NTS					
PIPING SPECIFICATION		SS1		RT / UT		10 %				TEMPERATURE MIN/MAX [°C]							15		2						Checked		AKL		Status							
SERVICE		BMT		PRESSURE TEST:						DESIGN PARAMETERS:									1						Approved		TJO		Sheet		1/1					
PIPE INSULATION		-		PRESSURE TEST - SERVICE		WATER		PRESSURE MAX [BARG]		10		Rev.		Description		Name		Rev. date		Checked		Approved		ILF Consulting Engineers Norway AS Asdaltangen 56 3962 Stathelle		Document number		Rev.								
TRACING		-		PRESSURE TEST - PRESSURE [BARG]		14.3		TEMPERATURE MIN/MAX [°C]		90		10		11		12		13						19139-ILF-NOR-RIMek-ISO-1024-04		0										
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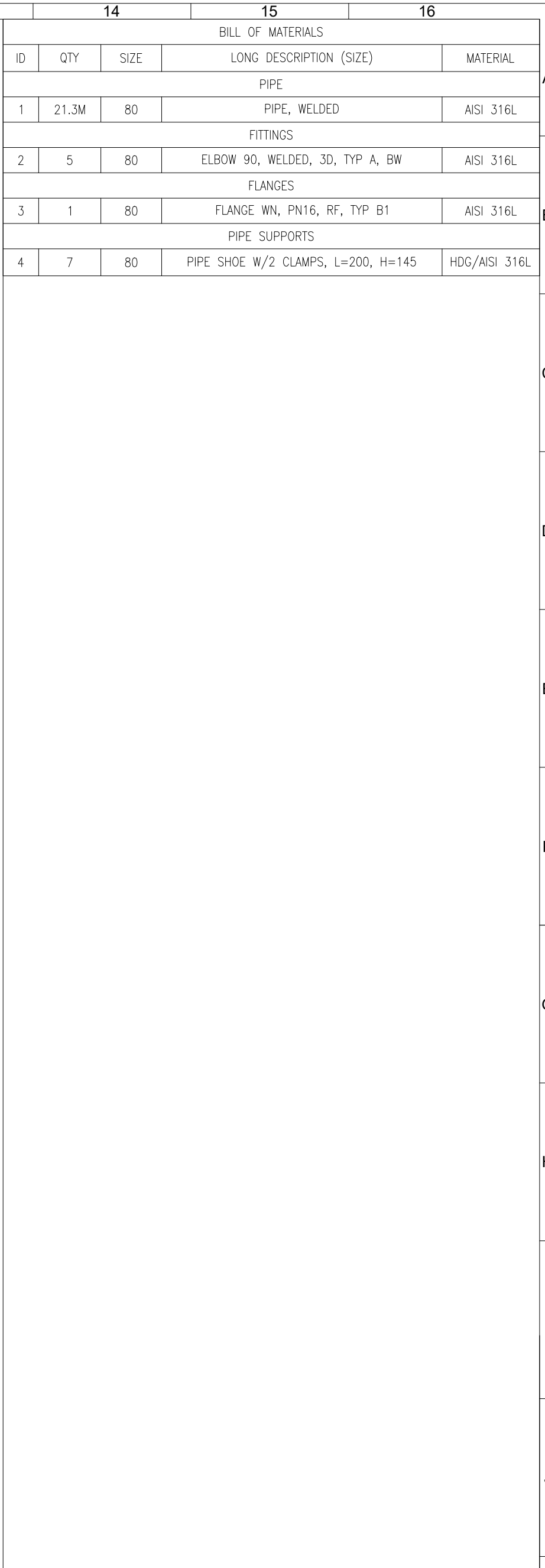
FREVAR KF - 5812 - NYTT OPPGRADERINGSANLEGG



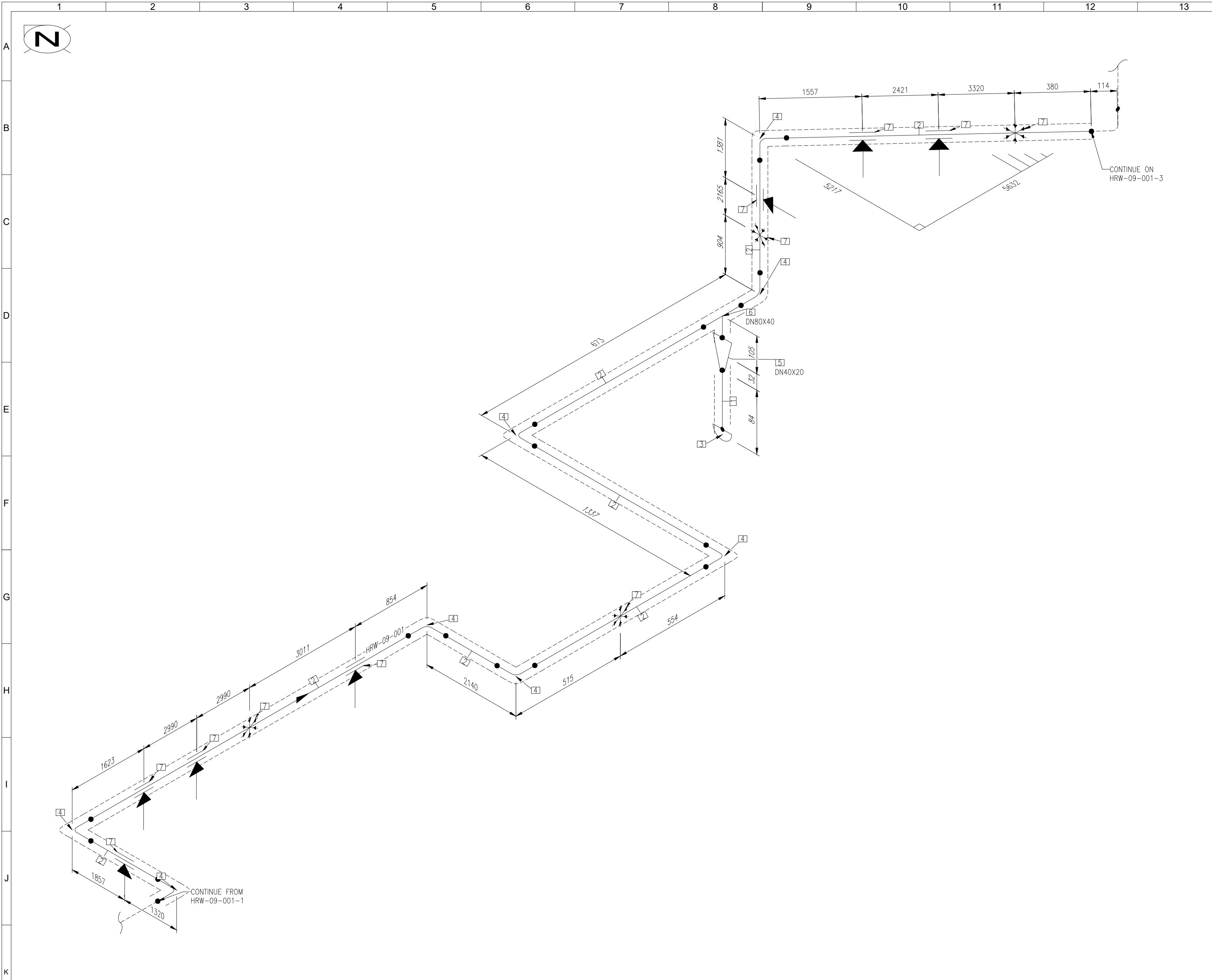


LINE NUMBER	BMT-09-005	SURFACE TREATMENT		-		PED CATEGORY		CAT I	GENERAL NOTES: 1. ALL DIMENSIONS AND PIPE ROUTING SHALL BE CONFIRMED PRIOR TO INSTALLATION. 2. ALL MEASURES NOT GIVEN ON THIS DRAWING SHALL BE ADJUSTED ON SITE. 3. PIPE SUPPORT FINAL POSITION SHALL BE CONFIRMED ON SITE. 4. BEFORE FINAL INSTALLATION SHALL BE PERFORMED CLEANING OF PIPES INSIDE. PIPES SHALL BE CLEANED AND FREE OF LOOSE PARTICLES. 5. DIMENSIONS SHOWN ON ISOMETRICS REFER TO PIPE AXIS. 6. POSITION AND AMOUNT OF WELDS SHALL BE DECIDED BASED ON WORKSHOP DOCUMENTATION. ===== PIPE INSULATION PIPE SUPPORTS:    ===== PIPE HEAT TRACING	5															
P&ID NUMBER	-	NDT:				OPERATING PARAMETERS:				4															
LAYOUT NUMBER	-	VT	100%	MT / PT	100 %	PRESSURE MIN/MAX [BARG]		7		3															
PIPING SPECIFICATION	SS1	RT / UT	10 %			TEMPERATURE MIN/MAX [°C]		15		2															
SERVICE	BMT	PRESSURE TEST:				DESIGN PARAMETERS:				1															
PIPE INSULATION	-	PRESSURE TEST - SERVICE		WATER		PRESSURE MAX [BARG]		10																	
TRACING	-	PRESSURE TEST - PRESSURE [BARG]		14.3		TEMPERATURE MIN/MAX [°C]		90																	
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14			15		16	
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ID	QTY	SIZE	LONG DESCRIPTION (SIZE)		MATERIAL	
PIPE						
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2	36.6M	80	PIPE, WELDED		AISI 316L	
FITTINGS						
3	1	40	CAP, THREADED, NPT, ND 40			
4	4	80	ELBOW 90, WELDED, 3D, TYP A, BW		AISI 316L	
5	1	80X40	TEE, REDUCED, WELDED, TYP B, BW		AISI 316L	
6	1	80	TEE, EQUAL, WELDED, TYP B, BW		AISI 316L	
FLANGES						
7	2	80	FLANGE WN, PN16, RF, TYP B1		AISI 316L	
PIPE SUPPORTS						
8	6	80	PIPE SHOE W/2 CLAMPS, L=200, H=145		HDG/AISI 316L	
9	6	80	PIPE CLAMP HANGER L=350		AISI 316L	
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FREVAR KF - 5812 - NYTT OPPGRADERINGSANLEGG					Disciplin Format A2	
ISOMETRIC BMT-09-005					Date 03.09.26	
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					Checked AKL	Status
Approved TJO					Sheet 1/2	
					Document number 19139-ILF-NOR-RIMek-ISO-1024-04	Rev. 0
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FREVAR KF - 5812 - NYTT OPPGRADERINGSANLEGG					A2
				Date	03.09.26
ISOMETRIC BMT-09-005			Drawn	TJO	Scale NTS
			Checked	AKL	Status
			Approved	TJO	Sheet 2/2
 ILF Consulting Engineers Norway AS Asdalangen 56 3962 Stafhelle		Document number 19139-ILF-NOR-RIMek-ISO-1024-04		Rev.	0
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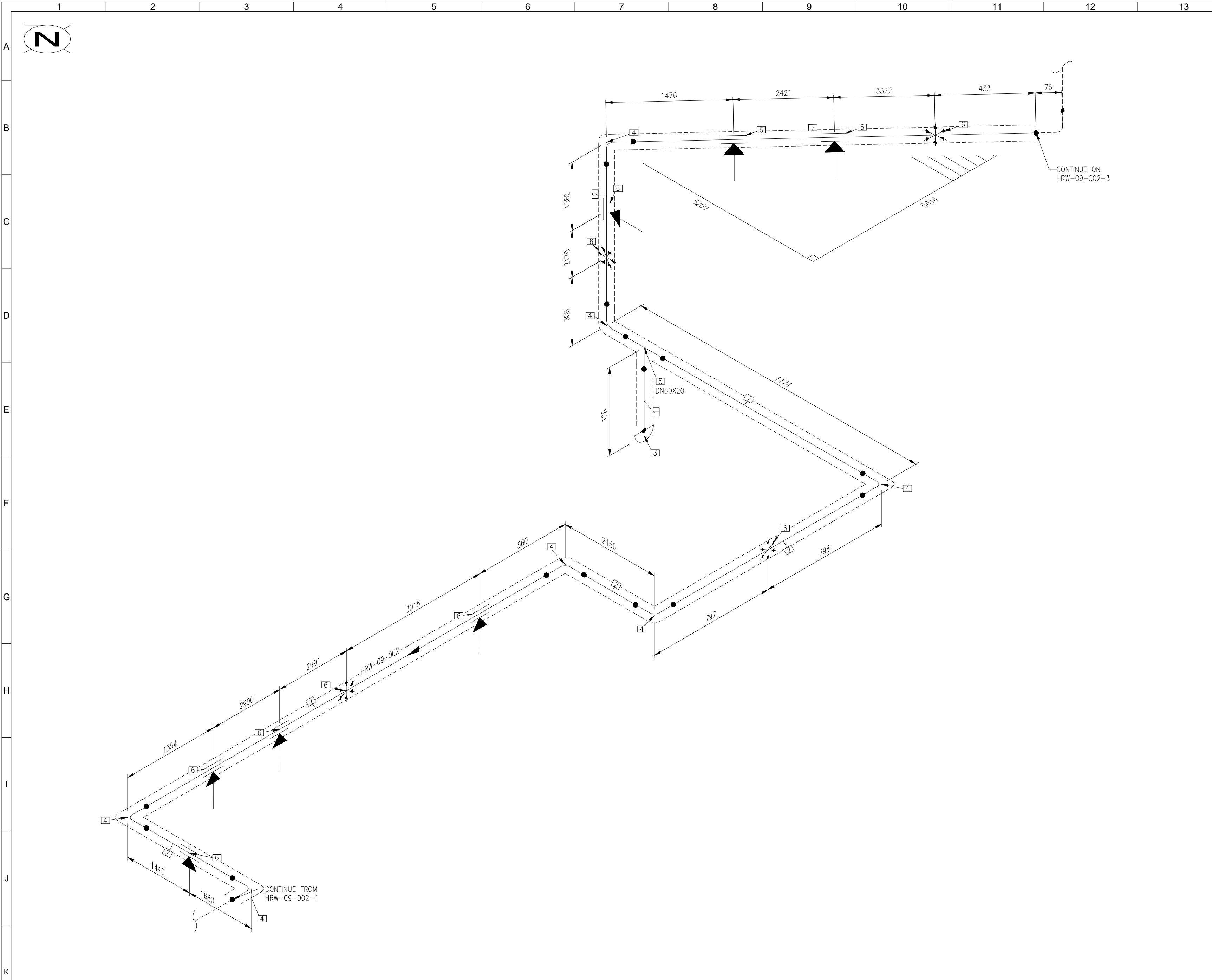


BILL OF MATERIALS				
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2	30.2M	80	PIPE, WELDED	P235GH
FITTINGS				
3	1	20	CAP, THREADED, NPT, ND 20	P235GH
4	8	80	ELBOW 90, WELDED, 3D, TYP A, BW	P235GH
5	1	40X20	REDUCER, CONCENTRIC, WELDED, TYP A, BW	P235GH
6	1	80X40	TEE, REDUCED, WELDED, TYP B, BW	P235GH
PIPE SUPPORTS				
7	11	80	PIPE SHOE W/2 CLAMPS, L=200, H=145	HDG

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L	LINE NUMBER	HRW-09-001	SURFACE TREATMENT		-		PED CATEGORY		SEP	GENERAL NOTES: 1. ALL DIMENSIONS AND PIPE ROUTING SHALL BE CONFIRMED PRIOR TO INSTALLATION. 2. ALL MEASURES NOT GIVEN ON THIS DRAWING SHALL BE ADJUSTED ON SITE. 3. PIPE SUPPORT FINAL POSITION SHALL BE CONFIRMED ON SITE. 4. BEFORE FINAL INSTALLATION SHALL BE PERFORMED CLEANING OF PIPES INSIDE. PIPES SHALL BE CLEANED AND FREE OF LOOSE PARTICLES. 5. DIMENSIONS SHOWN ON ISOMETRICS REFER TO PIPE AXIS. 6. POSITION AND AMOUNT OF WELDS SHALL BE DECIDED BASED ON WORKSHOP DOCUMENTATION. ===== PIPE INSULATION PIPE SUPPORTS:  ANCHOR  GUIDING  HANGER ===== PIPE HEAT TRACING				5											
	P&ID NUMBER	-	NDT:				OPERATING PARAMETERS:							4											
	LAYOUT NUMBER	-	VT	100%	MT / PT	10 %	PRESSURE MIN/MAX [BARG]		3,5	3															
	PIPING SPECIFICATION	CS2	RT / UT	-			TEMPERATURE MIN/MAX [°C]		45	2															
	SERVICE	HRW	PRESSURE TEST:				DESIGN PARAMETERS:			1															
	PIPE INSULATION	75	PRESSURE TEST - SERVICE		WATER		PRESSURE MAX [BARG]		10																
	TRACING	-	PRESSURE TEST - PRESSURE [BARG]		14.3		TEMPERATURE MIN/MAX [°C]		120																
1		2		3		4		5		6		7		8		9		10		11		12		13	

FREVAR KF - 5812 - NYTT OPPGRADERINGSANLEGG			Disciplin	Format
			Date	A2
ISOMETRIC			Scale	NTS
HRW-09-001			Status	
			Sheet	2/3
			Rev.	0
ILF Consulting Engineers Norway AS Asdaltangen 56 3962 Stathelle			Document number	19139-ILF-NOR-RIMek-ISO-1024-05

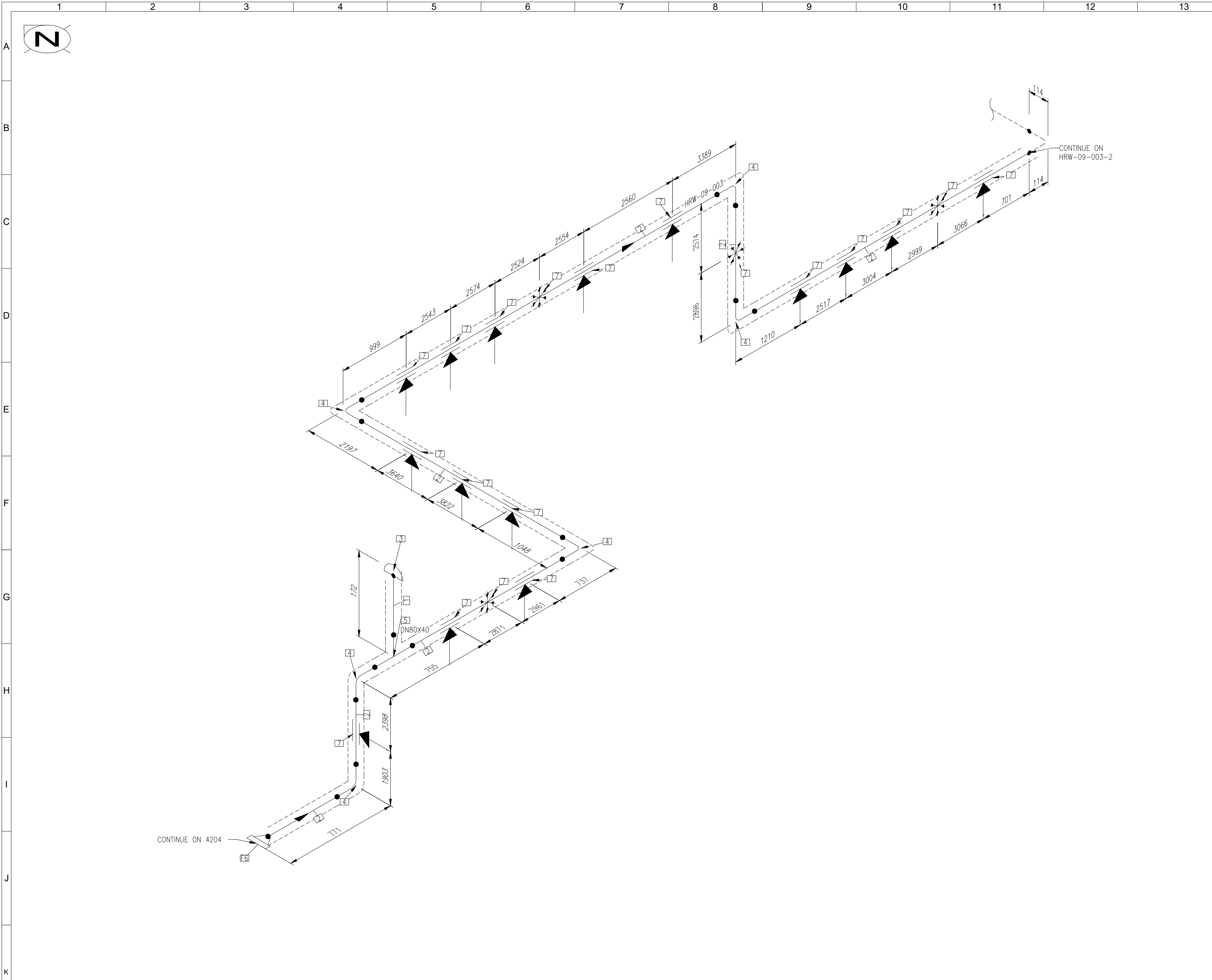


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BILL OF MATERIALS						
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PIPE						
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2	29.4M	50	PIPE, WELDED			P235GH
FITTINGS						
3	1	20	CAP, THREADED, NPT, ND 20			P235GH
4	7	50	ELBOW 90, WELDED, 3D, TYP A, BW			P235GH
5	1	50X20	TEE, REDUCED, WELDED, TYP B, BW			P235GH
PIPE SUPPORTS						
6	11	50	PIPE SHOE W/2 CLAMPS, L=200, H=130			HDG

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L	LINE NUMBER	HRW-09-002	SURFACE TREATMENT		-		PED CATEGORY		SEP	GENERAL NOTES: 1. ALL DIMENSIONS AND PIPE ROUTING SHALL BE CONFIRMED PRIOR TO INSTALLATION. 2. ALL MEASURES NOT GIVEN ON THIS DRAWING SHALL BE ADJUSTED ON SITE. 3. PIPE SUPPORT FINAL POSITION SHALL BE CONFIRMED ON SITE. 4. BEFORE FINAL INSTALLATION SHALL BE PERFORMED CLEANING OF PIPES INSIDE. PIPES SHALL BE CLEANED AND FREE OF LOOSE PARTICLES. 5. DIMENSIONS SHOWN ON ISOMETRICS REFER TO PIPE AXIS. 6. POSITION AND AMOUNT OF WELDS SHALL BE DECIDED BASED ON WORKSHOP DOCUMENTATION. ===== PIPE INSULATION PIPE SUPPORTS: ⌘ ⌘ ⌘ ===== PIPE HEAT TRACING ANCHOR GUIDING HANGER	5														
	P&ID NUMBER	-	NDT:				OPERATING PARAMETERS:				4														
	LAYOUT NUMBER	-	VT	100%	MT / PT	10 %	PRESSURE MIN/MAX [BARG]		3,5		3														
	PIPING SPECIFICATION	CS2	RT / UT	-			TEMPERATURE MIN/MAX [°C]		60		2														
	SERVICE	HRW	PRESSURE TEST:				DESIGN PARAMETERS:				1														
	PIPE INSULATION	75	PRESSURE TEST - SERVICE		WATER		PRESSURE MAX [BARG]		10																
	TRACING	-	PRESSURE TEST - PRESSURE [BARG]		14.3		TEMPERATURE MIN/MAX [°C]		120																
1		2		3		4		5		6		7		8		9		10		11		12		13	

FREVAR KF - 5812 - NYTT OPPGRADERINGSANLEGG				Disciplin	Format
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ISOMETRIC				Scale	NTS
HRW-09-002				Status	
				Sheet	2/3
				Rev.	
ILF Consulting Engineers Norway AS Asdaltangen 56 3962 Stathelle				Document number	19139-ILF-NOR-RIMek-ISO-1024-06
				Rev.	0
				A1	



14			15		16	
BILL OF MATERIALS						
ID	QTY	SIZE	LONG DESCRIPTION (SIZE)		MATERIAL	
PIPE						
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2	57.7M	80	PIPE, WELDED		P235GH	
FITTINGS						
3	1	40	CAP, THREADED, NPT, ND 40		P235GH	
4	6	80	ELBOW 90, WELDED, 3D, TYP A, BW		P235GH	
5	1	80X40	TEE, REDUCED, WELDED, TYP B, BW		P235GH	
FLANGES						
6	1	80	FLANGE WN, PN16, RF, TYP B1		P235GH	
PIPE SUPPORTS						
7	19	80	PIPE SHOE W/2 CLAMPS, L=200, H=145		HDG	

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Discipline

Format

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FREVAR KF - 5812 - NYTT OPPGRADERINGSANLEGG

Date

03.09.26

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Status

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Asdaltangen 56
3962 Stathelle

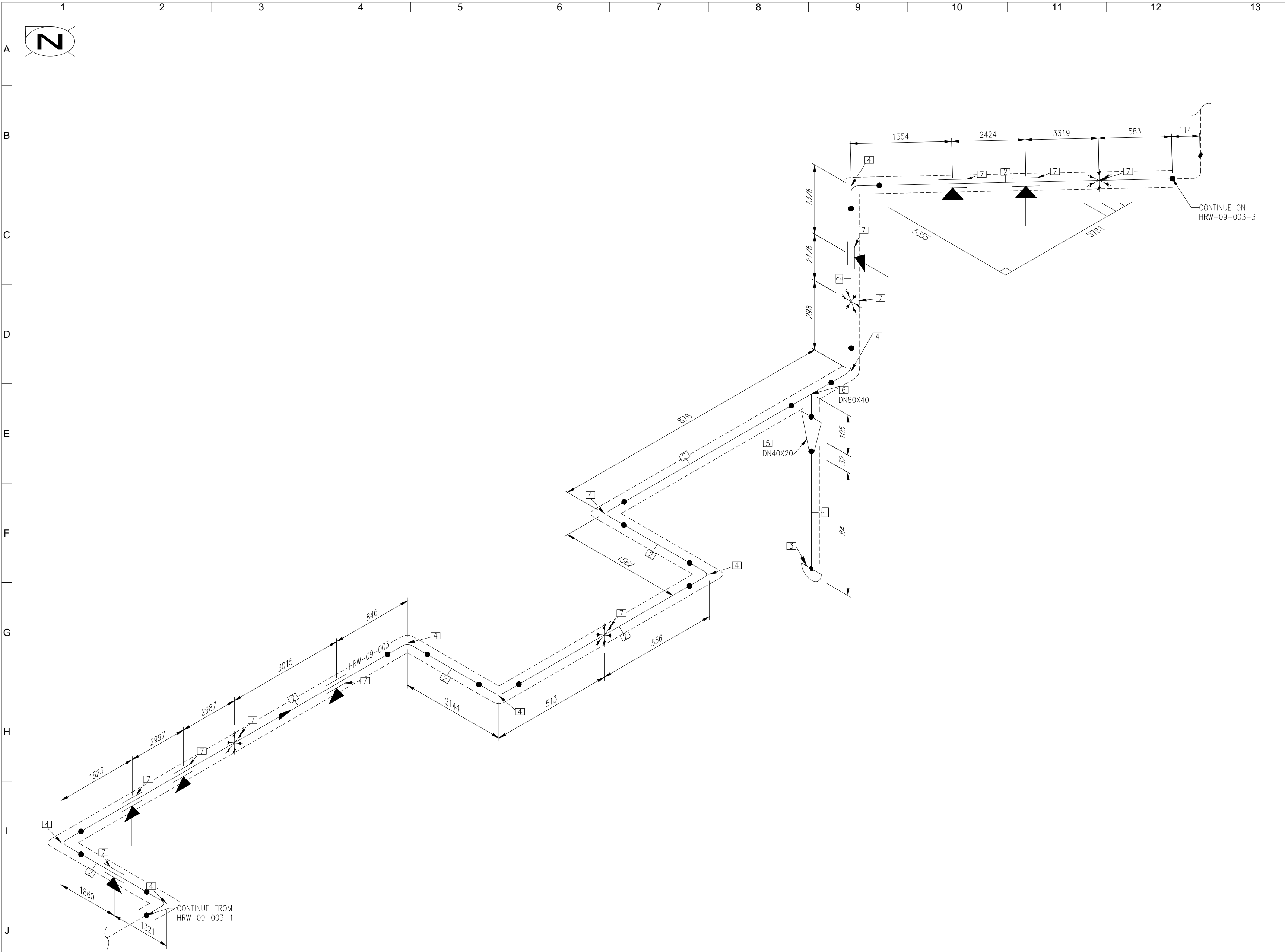
Document number

19139-ILF-NOR-RIMek-ISO-1024-07

Rev.

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L	LINE NUMBER	HRW-09-003	SURFACE TREATMENT		-		PED CATEGORY		SEP	GENERAL NOTES: 1. ALL DIMENSIONS AND PIPE ROUTING SHALL BE CONFIRMED PRIOR TO INSTALLATION. 2. ALL MEASURES NOT GIVEN ON THIS DRAWING SHALL BE ADJUSTED ON SITE. 3. PIPE SUPPORT FINAL POSITION SHALL BE CONFIRMED ON SITE. 4. BEFORE FINAL INSTALLATION SHALL BE PERFORMED CLEANING OF PIPES INSIDE. PIPES SHALL BE CLEANED AND FREE OF LOOSE PARTICLES. 5. DIMENSIONS SHOWN ON ISOMETRICS REFER TO PIPE AXIS. 6. POSITION AND AMOUNT OF WELDS SHALL BE DECIDED BASED ON WORKSHOP DOCUMENTATION. ===== PIPE INSULATION ===== PIPE HEAT TRACING	5							
	P&ID NUMBER	-	NDT:				OPERATING PARAMETERS:				4							
	LAYOUT NUMBER	-	VT	100%	MT / PT	10 %	PRESSURE MIN/MAX [BARG]		3		3							
	PIPING SPECIFICATION	CS2	RT / UT	-			TEMPERATURE MIN/MAX [°C]		60		2							
	SERVICE	HRW	PRESSURE TEST:				DESIGN PARAMETERS:				1							
	PIPE INSULATION	75	PRESSURE TEST - SERVICE		WATER		PRESSURE MAX [BARG]		10		Rev.	Description		Name	Rev. date	Checked	Approved	
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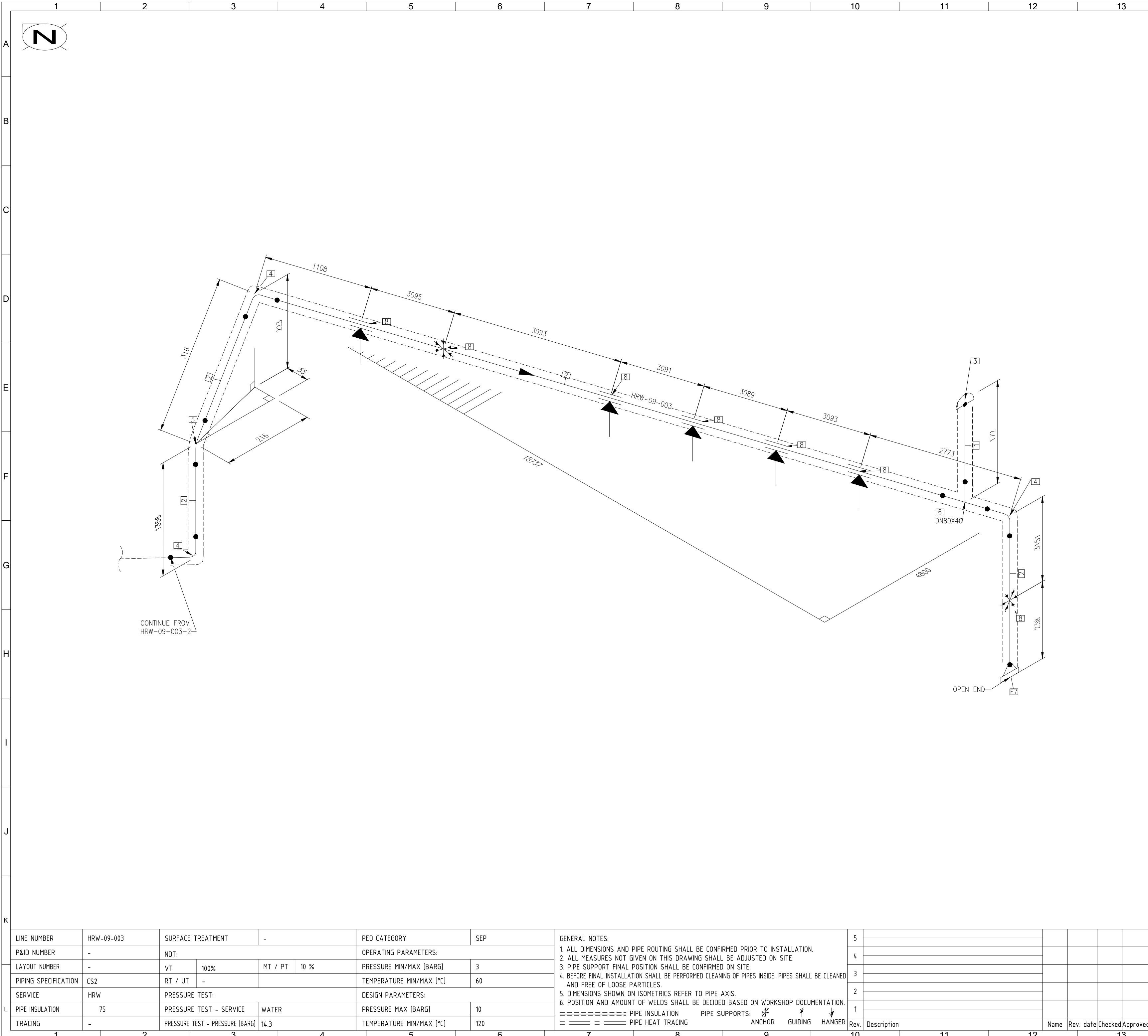
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PIPE				
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FITTINGS				
3	1	20	CAP, THREADED, NPT, ND 20	P235GH
4	8	80	ELBOW 90, WELDED, 3D, TYP A, BW	P235GH
5	1	40X20	REDUCER, CONCENTRIC, WELDED, TYP A, BW	P235GH
6	1	80X40	TEE, REDUCED, WELDED, TYP B, BW	P235GH
PIPE SUPPORTS				
7	11	80	PIPE SHOE W/2 CLAMPS, L=200, H=145	HDG

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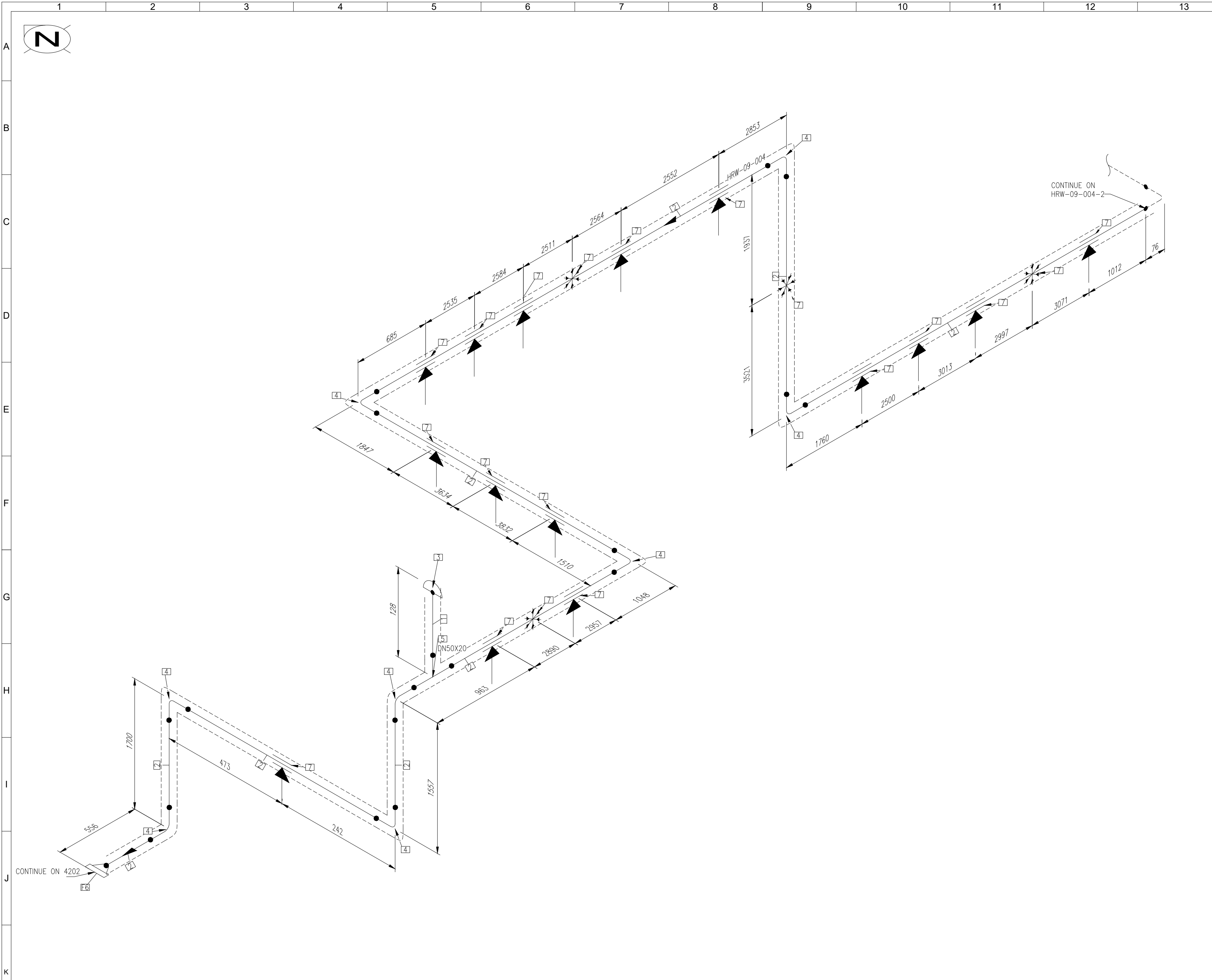
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Approved	TJO
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Rev.	2/3

ILF Consulting Engineers Norway AS
Asdaltangen 56
3962 Stathelle

LINE NUMBER	HRW-09-003	SURFACE TREATMENT	-	PED CATEGORY	SEP	GENERAL NOTES: 1. ALL DIMENSIONS AND PIPE ROUTING SHALL BE CONFIRMED PRIOR TO INSTALLATION. 2. ALL MEASURES NOT GIVEN ON THIS DRAWING SHALL BE ADJUSTED ON SITE. 3. PIPE SUPPORT FINAL POSITION SHALL BE CONFIRMED ON SITE. 4. BEFORE FINAL INSTALLATION SHALL BE PERFORMED CLEANING OF PIPES INSIDE. PIPES SHALL BE CLEANED AND FREE OF LOOSE PARTICLES. 5. DIMENSIONS SHOWN ON ISOMETRICS REFER TO PIPE AXIS. 6. POSITION AND AMOUNT OF WELDS SHALL BE DECIDED BASED ON WORKSHOP DOCUMENTATION. ===== PIPE INSULATION ===== PIPE HEAT TRACING	5						
P&ID NUMBER	-	NDT:		OPERATING PARAMETERS:			4						
LAYOUT NUMBER	-	VT	100%	MT / PT	10 %		3						
PIPING SPECIFICATION	CS2	RT / UT	-				2						
SERVICE	HRW	PRESSURE TEST:		DESIGN PARAMETERS:			1						
PIPE INSULATION	75	PRESSURE TEST - SERVICE	WATER	PRESSURE MAX [BARG]	10								
TRACING	-	PRESSURE TEST - PRESSURE [BARG]	14.3	TEMPERATURE MIN/MAX [°C]	120	PIPE SUPPORTS:							
						ANCHOR							
						GUIDING							
						HANGER							
							Rev.	Description	Name	Rev. date	Checked	Approved	



14			15		16				
BILL OF MATERIALS									
ID	QTY	SIZE	LONG DESCRIPTION (SIZE)		MATERIAL				
PIPE									
1	0.1M	40	PIPE, WELDED, NPT		P235GH				
2	23.6M	80	PIPE, WELDED		P235GH				
FITTINGS									
3	1	40	CAP, THREADED, NPT, ND 40		P235GH				
4	3	80	ELBOW 90, WELDED, 3D, TYP A, BW		P235GH				
5	1	80	ELBOW 45, WELDED, 3D, TYP A, BW		P235GH				
6	1	80X40	TEE, REDUCED, WELDED, TYP B, BW		P235GH				
FLANGES									
7	1	80	FLANGE WN, PN16, RF, TYP B1		P235GH				
PIPE SUPPORTS									
8	7	80	PIPE SHOE W/2 CLAMPS, L=200, H=145		HDG				
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				Approved	TJO				
				Scale	NTS				
				Status					
				Sheet	3/3				
				Rev.	0				
 ILF Consulting Engineers Norway AS Asdaltangen 56 3962 Stafthelle				Document number 19139-ILF-NOR-RIMek-ISO-1024-07					



14			15		16	
BILL OF MATERIALS						
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FITTINGS						
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4	8	50	ELBOW 90, WELDED, 3D, TYP A, BW		P235GH	
5	1	50X20	TEE, REDUCED, WELDED, TYP B, BW		P235GH	
FLANGES						
6	1	50	FLANGE WN, PN16, RF, TYP B1		P235GH	
PIPE SUPPORTS						
7	19	50	PIPE SHOE W/2 CLAMPS, L=200, H=130		HDG	

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Discipline	Format
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Date	03.09.26
Scale	NTS
Status	
Sheet	1/3
Rev.	0

ILF Consulting Engineers Norway AS
Asdaltangen 56
3962 Stathelle

Document number

19139-ILF-NOR-RIMek-ISO-1024-08

LINE NUMBER	HRW-09-004	SURFACE TREATMENT	-	PED CATEGORY	SEP	GENERAL NOTES: 1. ALL DIMENSIONS AND PIPE ROUTING SHALL BE CONFIRMED PRIOR TO INSTALLATION. 2. ALL MEASURES NOT GIVEN ON THIS DRAWING SHALL BE ADJUSTED ON SITE. 3. PIPE SUPPORT FINAL POSITION SHALL BE CONFIRMED ON SITE. 4. BEFORE FINAL INSTALLATION SHALL BE PERFORMED CLEANING OF PIPES INSIDE. PIPES SHALL BE CLEANED AND FREE OF LOOSE PARTICLES. 5. DIMENSIONS SHOWN ON ISOMETRICS REFER TO PIPE AXIS. 6. POSITION AND AMOUNT OF WELDS SHALL BE DECIDED BASED ON WORKSHOP DOCUMENTATION. ===== PIPE INSULATION ===== PIPE HEAT TRACING	5								
P&ID NUMBER	-	NDT:		OPERATING PARAMETERS:			4								
LAYOUT NUMBER	-	VT	100%	MT / PT	10 %		3								
PIPING SPECIFICATION	CS2	RT / UT	-				2								
SERVICE	HRW	PRESSURE TEST:		DESIGN PARAMETERS:			1								
PIPE INSULATION	75	PRESSURE TEST - SERVICE	WATER	PRESSURE MAX [BARG]	10										
TRACING	-	PRESSURE TEST - PRESSURE [BARG]	14.3	TEMPERATURE MIN/MAX [°C]	120										
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	A1



GENERAL NOTES:

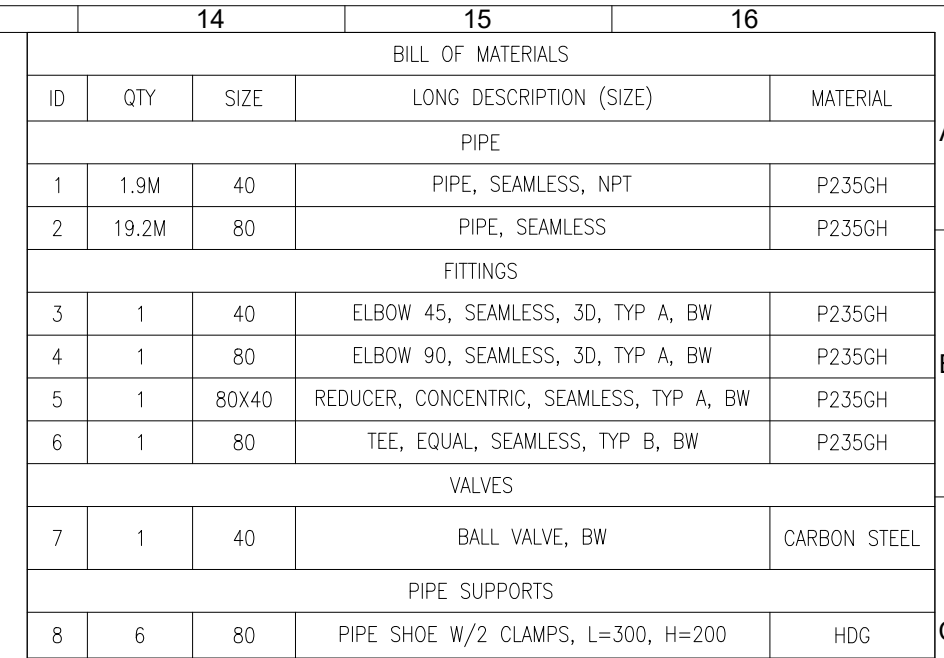
1. ALL DIMENSIONS AND PIPE ROUTING SHALL BE CONFIRMED PRIOR TO INSTALLATION.
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3. PIPE SUPPORT FINAL POSITION SHALL BE CONFIRMED ON SITE.
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5. DIMENSIONS SHOWN ON ISOMETRICS REFER TO PIPE AXIS.
6. POSITION AND AMOUNT OF WELDS SHALL BE DECIDED BASED ON WORKSHOP DOCUMENTATION.

=====	PIPE INSULATION	PIPE SUPPORTS:			
=====	PIPE HEAT TRACING		ANCHOR	GUIDING	HANGER

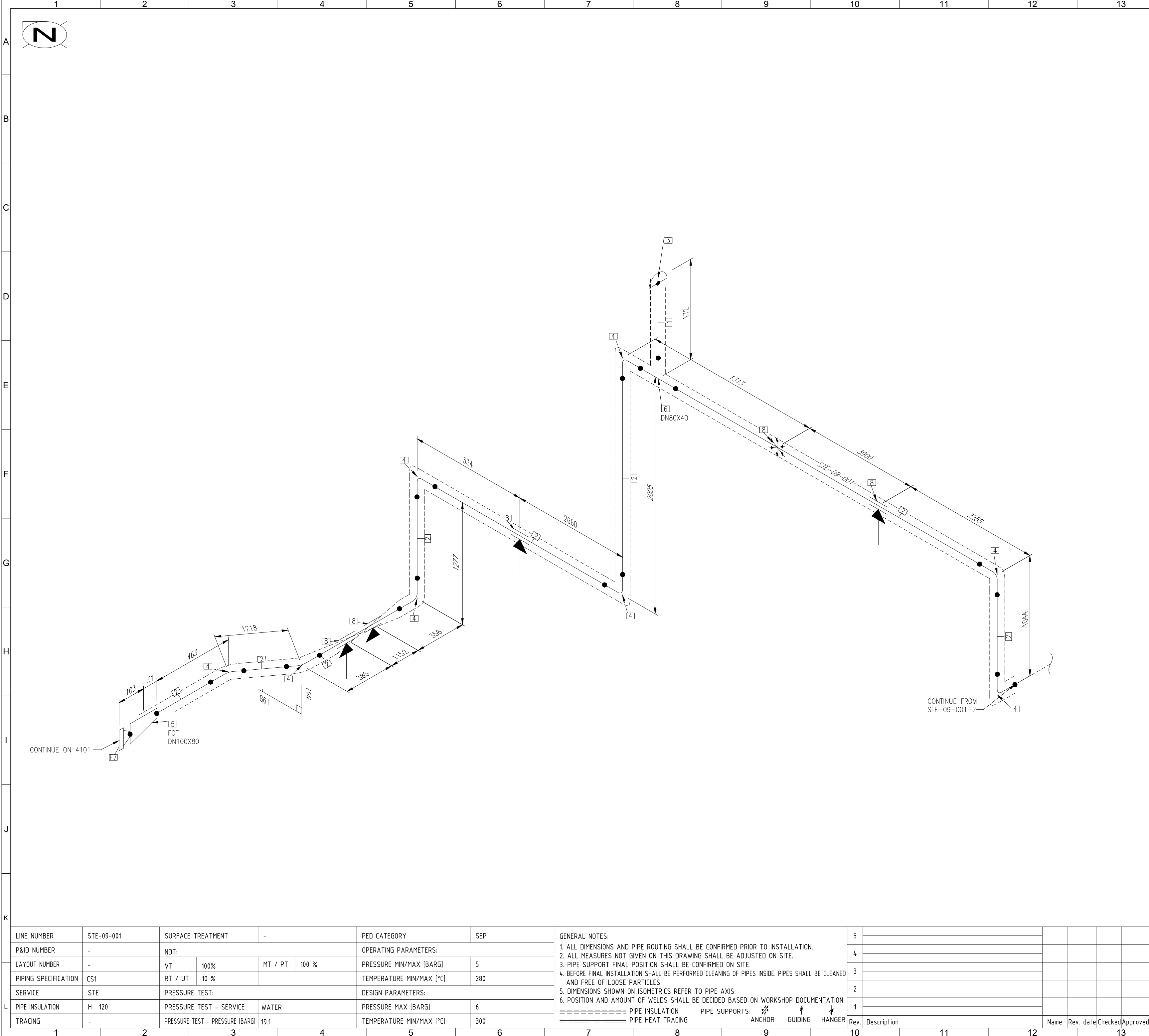
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14			15		16		
BILL OF MATERIALS							
ID	QTY	SIZE	LONG DESCRIPTION (SIZE)		MATERIAL		
PIPE							
1	0.1M	40	PIPE, SEAMLESS, NPT		P235GH		
2	16.5M	80	PIPE, SEAMLESS		P235GH		
FITTINGS							
3	1	40	CAP, THREADED, NPT, ND 40		P235GH		
4	8	80	ELBOW 90, SEAMLESS, 3D, TYP A, BW		P235GH		
5	1	100X80	REDUCER, ECCENTRIC, SEAMLESS, TYP A, BW		P235GH		
6	1	80X40	TEE, REDUCED, SEAMLESS, TYP B, BW		P235GH		
FLANGES							
7	1	100	FLANGE WN, PN16, RF, TYP B1		P235GH		
PIPE SUPPORTS							
8	5	80	PIPE SHOE W/2 CLAMPS, L=300, H=200		HDG		
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