10.000 Project basis

As basis of this offer is considered:

- Divers exchange of information for project development in December 2018/January 2019
- Phone call with information about new conception mucking cars of 10 December 2018
- Drawings sent on 23 October 2018
- Meeting in Moosseedorf of 3 October 2018
- Request from September 2018

The following parameters were available as the basis for the interpretation of the conveying system and calculation of this offer:

Tunnelling method	TBM with mucking cars
Conveying material	Excavation material, treated on TBM so that conveyable and free-flowing, respose angle approx. 30°
Conveying capacity	max. 650 t/h
Boring diameter	Ø 7.68 m
Altitude	approx. 824 m over sea level, where bunkers will be charged by the mucking cars (Kilometrage 12+600)

20.000 Description of the system

The muck will be transported from the TBM to the conveyor charging point (TM 12+600) by mucking cars.
At once 3 pieces boxes of the mucking cars will be emptied over 3 bunkers. Each bunker will be discharged by an apron steel conveyor. The conveyor belt under these apron steel conveyors will collect the muck and transport it to the conveyor in the logistic tunnel, which is mounted on the ground. This conveyor will transfer its muck to the conveyor line in the VL4 tunnel. The complete conveyor line in the VL4 tunnel will be suspended. The tunnel conveyor line will discharge its muck in front of the portal onto the dump conveyor.

Muck generally:
Principally the muck will be dewatered by customer direct on the TBM and treated so that it will be conveyable by the hereby offered conveyor system. According to customer is no formation of dust expected, so that no activities for dedusting is planned.

Conception discharging bunkers by apron steel conveyors
In order being able to discharge the three bunkers, there is for each bunker an apron steel conveyor planned. The three apron steel conveyors will provide an appropriate operation safety due to its redundancy.
Because of the high forces in the apron steel belt, we have changed from our prior offer (2 apron steel conveyors) to 3 apron steel conveyors.

Lower protection of conveyor
The lower protections of the conveyors still have to be defined. Under options of this offer we have indicated a meter price.

21.000 Description of the conveying system

21.010 Bunkers 100

Intake bunker

Quantity	3	pcs
Dimension	2,4 x 8,4	m
Height	1,5	m
Lump size	0 - 250	mm
Base sheet metal (with reinforcing ribs)	8	mm
Wear resistant plates	10	mm
Flange connection for	connection apron steel conveyor	
Reinforcing	steel profiles	

Substructure (for 3 pcs intake bunkers)

Pillars HEB 280, L = 4,2 m with foot flanges		8	pcs
Traverse tiers L = 5 m		6	pcs

21.020 **Apron steel conveyor 200**

Quantity		2	pc(s)
Length		8,0	m
Difference in altitude		0	m
Conveying capacity (by frequency converter and mech. slide gate)		220 (330)	t/h
Lump size		0 - 250	mm
Belt speed		0,15	m/s
Installed drives		22	kW
Head drive	22 kW		
Motor activation		Frequency converter	
Belt width		1000	mm
Belt type		Steel plates 10 mm S355	
Tensioning system		Spindle tension	
Loading		11	m
Transfer chute		1	pc(s)
Inlet connection height with flange		410	mm

Accessories:

Emergency stop cord both-sided		8,0	m

21.030 **Conveyor 300**

Quantity		1	pc(s)
Length		59	m
Difference in altitude		3,3	m
Conveying capacity		650	t/h
Lump size		0 - 250	mm
Belt speed		3	m/s
Installed drives		30	kW
Head drive	30 kW		
Motor activation		Soft starter	
Belt width		1200	mm
Belt type and covering layer		EP - textile belt 400/3 5+3	
Belt quality		EN 14973, Class A	
Tensioning system		Spindle tension	
Idler station upper stand 3-parts 133 mm impact, every		1	m
Idler station return stand 1-part 108 mm supporting ring, every		2	m
Special tight curves idler stations		0	m
Scrapers		2	pc(s)
Loading station		2	pc(s)
Transfer chute		1	pc(s)
Minimum radius of horizontal curves		>5000	m
Belt construction		not reversible	
System IPE supported type 2			
Length		59	m
Max. stanchion distance		12	m
Max. stanchion height		3	m
Walkway both-sided		12	m
Upper conveyor protection		0	m
Lower conveyor protection		0	m

Accessories:

Emergency stop cord both-sided		59	m
Muck guidance both-sided		30	m

21.040 **Conveyor 400**

Quantity		1	pc(s)
Length		356	m
Difference in altitude		35	m
Conveying capacity		650	t/h
Lump size		0 - 250	mm
Belt speed		3	m/s
Installed drives		160	kW
Head drive	160 kW		
Motor activation		Frequency converter	
Belt width		800	mm
Belt type and covering layer		EP - textile belt 630/3 5+3	
Belt quality		EN 14973, Class A	
Tensioning system		Weight tension	
Idler station upper stand 3-parts 108 mm, every		1,6	m
Idler station return stand 2-parts 89 mm, every		4	m
Special tight curves idler stations		0	m
Scrapers		2	pc(s)
Loading station		1	pc(s)
Transfer chute		1	pc(s)
Minimum radius of horizontal curves		>5000	m
Belt construction		not reversible	
System MME/MTTS supported (ground)			
Length		336	m
Max. stanchion distance		4	m
Max. stanchion height		1	m
System IPE supported type 2			
Length		20	m
Max. stanchion distance		12	m
Max. stanchion height		5	m
Walkway one-sided		20	m
Upper conveyor protection		0	m
Lower conveyor protection		0	m

Accessories:

Emergency stop cord one-sided		356	m

21.060 **Conveyor 600**

Quantity		1	pc(s)
Length		1528	m
Difference in altitude		152	m
Conveying capacity		650	t/h
Lump size		0 - 250	mm
Belt speed		3	m/s
Installed drives		515	kW
Head drive	515 kW		
Motor activation		Frequency converter	
Belt width		800	mm
Belt type and covering layer		ST - steel cord belt 1000 5+4	
Belt quality		EN 14973, Class A	
Tensioning system		Tensioning trolley	
Idler station upper stand 3-parts 108 mm, every		1,6	m
Idler station return stand 2-parts 89 mm, every		4	m
Special tight curves idler stations		30	m
Scrapers		2	pc(s)
Loading station		1	pc(s)
Transfer chute		1	pc(s)
Minimum radius of horizontal curves		>5000	m

	Belt construction		not reversible	
	System MME/MTTS suspended			
	Length		1508	m
	Max. stanchion distance		4	m
	System IPE supported type 2			
	Length		20	m
	Max. stanchion distance		12	m
	Max. stanchion height		5	m
	Walkway one-sided		20	m
	Upper conveyor protection		0	m
	Lower conveyor protection		0	m
	Accessories:			
	Emergency stop buttons, every 250 m		1528	m
21.070	**Conveyor 700**			
	Quantity		1	pc(s)
	Length		317	m
	Difference in altitude		30	m
	Conveying capacity		650	t/h
	Lump size		0 - 250	mm
	Belt speed		3	m/s
	Installed drives		110	kW
	Head drive	110 kW		
	Motor activation		Frequency converter	
	Belt width		800	mm
	Belt type and covering layer		ST - steel cord belt 800 5+4	
	Belt quality		EN 14973, Class A	
	Tensioning system		Weight tension	
	Idler station upper stand 3-parts 108 mm, every		1,6	m
	Idler station return stand 2-parts 89 mm, every		4	m
	Special tight curves idler stations		0	m
	Scrapers		2	pc(s)
	Loading station		1	pc(s)
	Transfer chute		1	pc(s)
	Minimum radius of horizontal curves		200/300	m
	Belt construction		not reversible	
	System MME/MTTS suspended			
	Length		297	m
	Max. stanchion distance		4	m
	System IPE supported type 2			
	Length		20	m
	Max. stanchion distance		12	m
	Max. stanchion height		5	m
	Walkway one-sided		20	m
	Upper conveyor protection		30	m
	Lower conveyor protection		0	m
	Accessories:			
	Emergency stop buttons, every 250 m		317	m
21.080	**Overland conveyor 800**			
	Quantity		1	pc(s)
	Length		82	m
	Difference in altitude		17,4	m
	Conveying capacity		650	t/h
	Lump size		0 - 250	mm
	Belt speed		3	m/s

Installed drives		75	kW
Head drive	75 kW		
Motor activation		Frequency converter	
Belt width		800	mm
Belt type and covering layer		EP - textile belt 800/3 5+3	
Belt quality		(DIN 22102) Y	
Tensioning system		Spindle tension	
Idler station upper stand 3-parts 108 mm, every		1	m
Idler station return stand 2-parts 89 mm, every		3	m
Special tight curves idler stations		0	m
Scrapers		2	pc(s)
Loading station		1	pc(s)
Transfer chute		1	pc(s)
Minimum radius of horizontal curves		>5000	m
Belt construction		not reversible	
System IPE supported type 2			
Length		82	m
Max. stanchion distance		12	m
Max. stanchion height		12	m
Walkway one-sided		82	m
Upper conveyor protection		82	m
Lower conveyor protection		6	m

Accessories:

Emergency stop cord one-sided		82	m

22.000 **Electrical components**

The following list provides an overview of the electrical components included in the scope of delivery:

- Motor control cabinet
- PLC control system
- Emergency stop system
- Operating panel
- Speed sensor
- Turning light and horn as starting warning signals
- Overfill monitor on follow-up belt
- Emergency stop button at possible conveyor extension stations
- Revision boxes and Emergency stop button at all driving and return stations
- Communication connection between the delivered control containers (provided if not excluded in chapter 24.000)

Electrical data

- Voltage 400 V AC
  (for power supply, motors, forces, sockets for welding)
- Voltage 400/230 V AC
  (for general sockets, etc.)
- Voltage 24 V DC / 230 V AC
  (for regulator control elements, valves, etc.)
- Voltage 24 V DC
  (for control, supply of sensors, encoders, etc.)
- Voltage tolerance +/- 10 % U Nenn
- Signals analogue 4…20 mA
- Rated frequency 50 Hz
- Frequency tolerance +/- 1 %

Power supply in accordance with EN50160. Connection point = entrance clamps at the main switch.