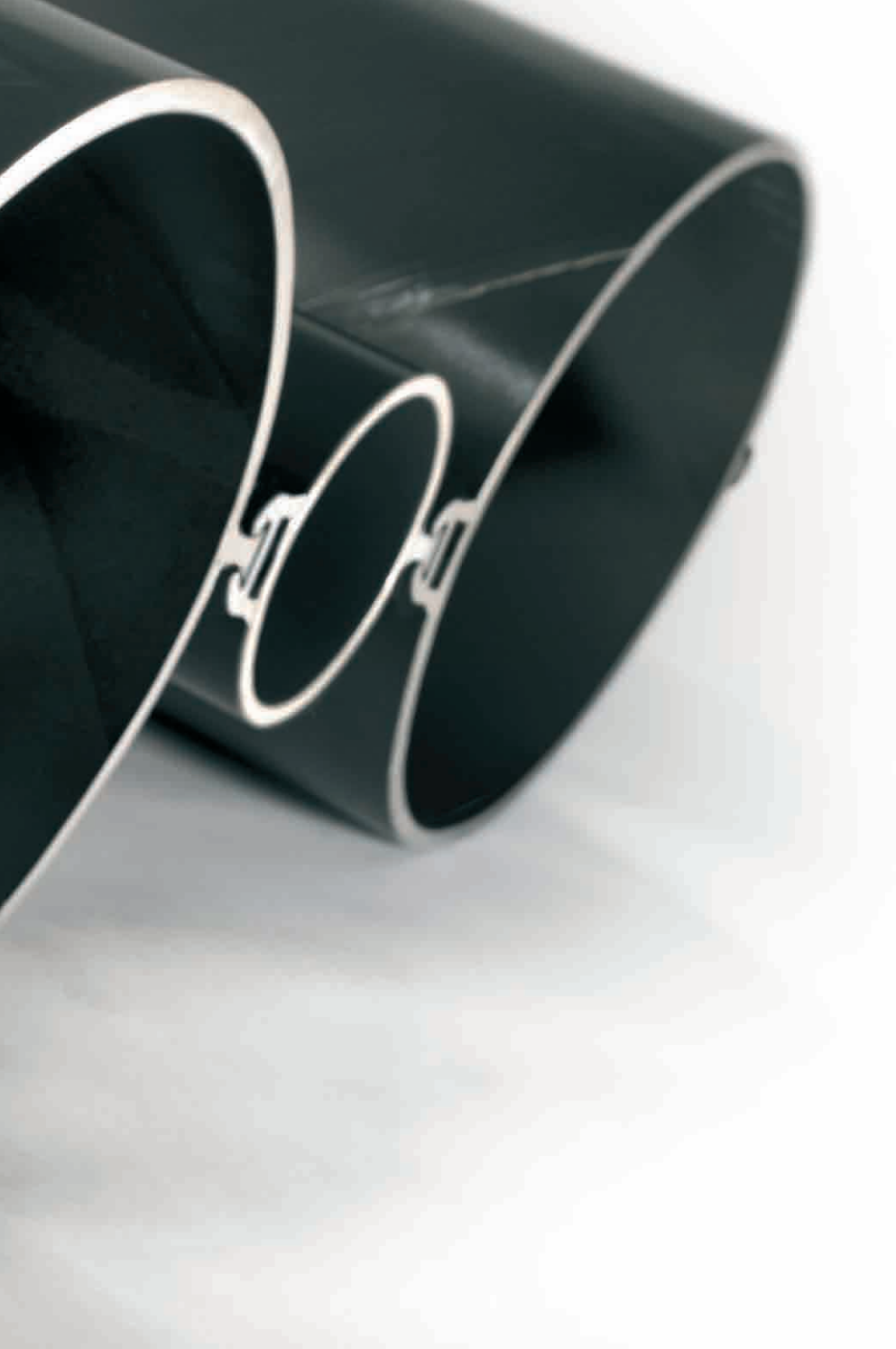


# SSAB RD<sup>®</sup> Pile wall



Retaining wall solution for all conditions





## EXPERTISE IN STEEL AND FOUNDATION CONSTRUCTION

SSAB is one of the leading suppliers of steel foundation structures in Europe. Our domestic market includes the Nordic countries and the Baltic Sea Region, but owing to our effective logistics we are also able to deliver solutions for demanding projects elsewhere in Europe.

SSAB is your skilled partner. The solutions we offer are economically competitive and technically advanced. They are based on versatile expertise and responsible operating procedures. For us, partnership with the customer means not only commitment to high reliability and promptness of delivery but also consulting in the design and implementation stage, if required.

The RD<sup>®</sup> pile wall is SSAB's retaining wall solution based on RD<sup>®</sup> piles. The RD pile wall is specially designed for challenging conditions, for instance, for faster implementation of retaining walls and other foundation structures. You can always find the correct pile size and steel grade from SSAB's extensive RD pile and steel grade range, which allows you to implement a retaining wall or foundation structure with the best overall economy for all soil conditions and loading situations.

By selecting SSAB's delivery package you will also get all other steel components, systems and overall solutions for your project's foundation engineering with ease from one supplier.



## RD® PILE WALL AND APPLICATIONS

### General principle

The RD pile wall is based on SSAB's spirally or longitudinally welded steel pipe piles and interlocking sections attached by welding at the mill. The piles are drilled by the concentric drilling method. The interlocking sections of the steel pipe piles were especially developed for the purpose by SSAB. The matching dimensions of ring bits and interlocking sections allow installing RD pile walls by drilling through stones and boulders and even into bedrock, if necessary. A larger than normal ring bit is used to drill a hole larger than the outer diameter of the pile in soil, stones and bedrock.

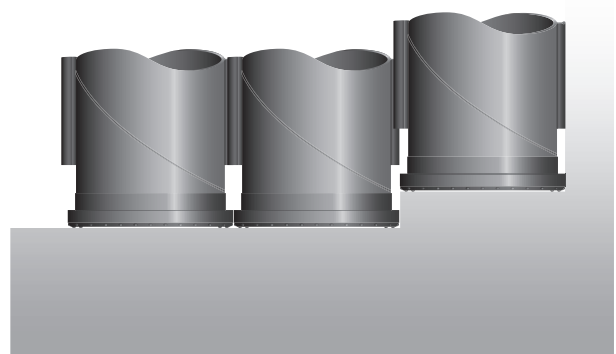


Figure 1. Principle of the RD® pile wall.



### **Permanent structures**

The RD pile wall is best suited for permanent structures that require high vertical and horizontal load-bearing capacity. RD pile walls can also be installed reliably under challenging conditions, whereby the solution brings considerable savings in construction time and produces an end result of good overall economy. RD pile walls may even completely eliminate the need to build temporary retaining walls.

### **Temporary structures**

As a construction-period retaining wall structure the RD pile wall is particularly suitable for challenging soil conditions where the implementation of conventional retaining wall structures is difficult or impossible.

### **Horizontally loaded structures**

The RD pile wall is an excellent solution for projects that require a higher bending stiffness and resistance than conventional sheet pile walls can offer. An RD pile wall built using large diameter RD piles provides high bending stiffness and resistance.

### **Vertically loaded structures**

If the piles are extended to bedrock, the vertical load-bearing capacity of the RD pile wall is very high. Thus the structure can act as a horizontally loaded wall subject to earth pressure and a foundation structure able to bear high vertical loads at the same time.

## RD® PILE WALL PRODUCTS

### Piles used in the RD® pile wall

Pile sizes RD220 to RD1200 can be used in the RD pile wall. The piles are delivered in exact design lengths and bevelled, if necessary. The pile sizes available for the RD pile wall are presented in Table 1.

### Steel grades of piles

S440J2H and S550J2H produced by SSAB for piling purposes can be used for RD pile walls. In pile walls using RD400 or larger piles it is also possible to use steel grades S355J2H, X60 and X70. The selection of the steel grade has a marked impact on the structural resistance of the pile wall. Selecting a stronger steel grade such as S550J2H often allows using piles of smaller diameter or wall thickness. Available steel grades are presented in Table 1. The chemical and mechanical properties of the steel grades are presented in Table 2.

### Interlock types

In the RD pile wall the pile pipes are attached to each other by interlocking sections. Adjacent piles are

always interlocked using a pair of interlocking sections, a narrow and a wide one.

SSAB's RM/RF interlock and the injection channel integrated in it ensure the water tightness of the bottom of the RD pile wall and its rigid contact with rock without separate injection pipes.

The SSAB RM/RF interlock can be used with pile sizes RD220 to RD1200.



Figure 2. SSAB RM/RF interlock.

Weight [kg/m]								
Pile	Diameter [mm]	Wall thickness [mm]						
		10	12,5	14,2	16	18	20	23
RD220	219,1	51,6	63,7					
RD270	273,0	64,9	80,3					
RD320	323,9	77,4	96,0					
RD400	406,4	97,8	121,4					
RD500	508,0	122,8	152,7	172,9	194,1			
RD600	610,0	148,0	184,2	208,6	234,4	262,8		
RD700	711,0	172,9	215,3	244,0	274,2	307,6	340,8	
RD800	813,0	198,0	246,8	279,7	314,5	352,9	391,1	448,1
RD900	914,0	222,9	277,9	315,1	354,3	397,7	440,9	505,4
RD1000	1016,0	248,1	309,3	350,8	394,6	443,0	491,3	563,2
RD1200	1220,0	298,4	372,2	422,3	475,1	533,6	591,9	679,0
			Steel grades S440J2H and S550J2H					
			Steel grades S355J2H, S440J2H and S550J2H					
			Steel grades S355J2H and S440J2H					

Table 1. Pile sizes and steel grades.

Steel grade	Carbon equivalent	Chemical composition max.				Mechanical properties					
		CEV max.	C	Mn	P	S	f <sub>y</sub> min	f <sub>u</sub>	A <sub>5</sub> min	Impact strength	
										T <sup>*)</sup>	KV min
[%]	[%]	[%]	[%]	[%]	[MPa]	[MPa]	[%]	[°C]	[J]		
S355J2H	0,45	0,22	1,6	0,03	0,03	355	470-630	20	-20	27	
S440J2H	0,45	0,16	1,6	0,02	0,02	440	490-630	17	-20	27	
S550J2H	0,47	0,12	1,9	0,02	0,02	550	605-760	14	-20	27	

\*) Testing temperature may also be -40 °C. Demanded impact energy remains the same.

Table 2. Chemical and mechanical properties of steel grades.

## PRODUCTION, QUALITY CONTROL AND DELIVERY TERMS OF PRODUCTS

### Production and quality control

SSAB follows in its operations procedures that comply with the requirements of ISO 9001:2008 quality management system and ISO 14001:2004 environmental management system. Quality management systems ensure the functioning of processes from raw materials procurement to delivery of the end product to the customer.

SSAB steel pipe piles are made of the high grade steel produced at the company's own steel works. Large diameter (≥RD400) steel pipe piles are manufactured by spiral joint welding and small diameter piles (≤RD320) by longitudinal welding.

Interlocking sections are welded simultaneously to both sides of spirally welded RD piles on an automated production line. Special attention has been paid to control of deformations of steel pipes due to the welding of interlocking sections.

The steel piles used in SSAB's RD pile wall are CE marked products and they have been granted an European technical approval ETA-12/0526.

### Technical delivery conditions

The technical delivery conditions of piles comply with standard EN 10219-1. Dimensions and tolerances comply with standard EN 10219-2. A material certificate in accordance with EN 10204 type 3.1 for the pile material is provided.



SSAB is a Nordic and US-based steel company. SSAB offers value added products and services developed in close cooperation with its customers to create a stronger, lighter and more sustainable world. SSAB has employees in over 50 countries. SSAB has production facilities in Sweden, Finland and the US. SSAB is listed on the NASDAQ OMX Nordic Exchange in Stockholm and has a secondary listing on the NASDAQ OMX in Helsinki. [www.ssab.com](http://www.ssab.com)

The accuracy of this instruction sheet has been inspected with utmost care. However, we do not assume responsibility for any mistakes or direct or indirect damages due to incorrect application of the information. The right to make changes is reserved.

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