CGH Nordic A/S
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SPEED CHASSIS

SPEED CHASSIS – a foundation frame with ready-made reinforcement. The tank is delivered to a construction site on a steel foundation frame, and the whole structure is fastened with bands at the CGH factory.

Advantages:

- cost saving of foundation execution
- time saving on site
- safety during unloading and pitting

Comments and recommendations for earthworks

- Ground tests should be made when making a construction project for a given location.
- When filling the foundation, if possible, use the soil from the excavation and lay it in layers with a thickness of ca 0.3 m using thorough compaction.

Description of tank foundation elements

The frame structure of 'SPEED CHASSIS' consists of the I-sections welded to the shape of 'K' letter. The frame and the tank is inserted into the excavation and then leveled. After placement of additional reinforcement, if required, the frame is concreted creating a foundation block. For tank foundation purposes a foundation block of a fixed thickness of 300 mm and project dimensions equal to the diameter of the tank x the length of the tank was assumed.

Table: Maximum ground water level measured from the ground level (hw) in [m]

Tank diameter	Ø 1600						Ø 2000							Ø 2500							Ø 2900					
Nominal volume	3	5	7	10	13	16	10	13	16	20	25	30	36	20	25	30	40	50	60	70	40	50	60	70	80	100
Tank length [mm]	2040	3040	3840	5540	7040	8540	3660	4660	5660	6810	8660	10160	11960	4800	5800	6800	8800	10800	12800	14800	6900	8400	9900	11400	12900	15900
Foundation data																										
Foundation width [m]	1,60	1,60	1,60	1,60	1,60	1,60	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,50	2,50	2,50	2,50	2,50	2,50	2,50	2,90	2,90	2,90	2,90	2,90	2,90
Foundation length [m]	2,04	3,04	3,84	5,54	7,04	8,54	3,66	4,66	5,66	6,81	8,66	10,16	11,96	4,80	5,80	6,80	8,80	10,80	12,80	14,80	6,90	8,40	9,90	11,40	12,90	15,90
Foundation height [m]	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30	0,30
Results for a double-skinned tank	MAXIMUM GROUND WATER LEVEL MEASURED FROM THE GROUND LEVEL (h_w) in [m]																									
For 1 inspection hatch	0,60	0,50	0,80	0,40	0,40	0,40	0,70	0,70	0,70	0,70	0,70	0,70	0,70	1,00	1,00	1,00	1,10	1,10	1,10	1,10	1,30	1,30	1,30	1,30	1,30	1,30
For 2 inspection hatch	1,20	1,00	0,90	0,80	0,60	0,60	1,00	1,00	0,90	0,80	0,80	0,80	0,80	1,20	1,20	1,10	1,10	1,10	1,10	1,10	1,40	1,40	1,40	1,40	1,40	1,30
For 3 inspection hatch		1,20	1,10	0,90	0,80	0,70	1,20	1,10	1,10	1,00	1,00	0,90	0,80	1,30	1,20	1,20	1,20	1,10	1,10	1,10	1,40	1,40	1,40	1,40	1,40	1,30
For 4 inspection hatch		1,40	1,30	1,10	1,00	0,90	1,30	1,20	1,20	1,10	1,00	1,00	1,00	1,40	1,30	1,30	1,20	1,20	1,20	1,10	1,50	1,50	1,40	1,40	1,40	1,40
For 5 inspection hatch			1,40	1,20	1,10	1,00		1,30	1,20	1,20	1,10	1,00	1,00	1,40	1,40	1,30	1,30	1,20	1,20	1,20	1,50	1,50	1,50	1,50	1,40	1,40
For 6 inspection hatch				1,30	1,20	1,10		1,40	1,30	1,20	1,20	1,10	1,10		1,40	1,40	1,30	1,30	1,20	1,20	1,60	1,50	1,50	1,50	1,50	1,40

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Remarks for concrete works

- Proper care of concrete at the construction site is very important due to the formation of shrinkage stresses. The concrete care method must be determined before the start of concreting.
- The concrete mix should be laid and compacted so as not to cause segregation. Compaction should be carried out continuously during laying of each concrete layer.

Assumptions for calculations

- There is a supporting ground under the foundation.
- The tank will be covered with non-cohesive soil, laid and compacted in layers, y = 18 kN/m³ was assumed.
- To calculate the uplift pressure of the tank the density of concrete in the foundation slab of y = 22 kN/m³ was assumed.
- For calculations, the weights of tanks were taken from the technical sheets of CGH Poland.
- Tank placement depth - 0.8 m (surcharge layer over the tank).
- Assumed exposure class of the foundation slab - XC2. Concrete accepted for this category of exposure - C16/20 (B20). If more aggressive water to concrete than to category XC2 appears in the ground, modify the composition and the brand of the concrete mix.
- hw - water level below ground level.

Foundation diagram