

definitions
height difference = level of crane rail at struggled column - level of crane rail at non struggled column.
crane: one 50t bridge crane full loaded or one 16t bridge crane (160t self weight) full loaded
controlled point : point over the top concrete surface of C-frame, in D/L bay, at the axe of column part
used for measure of deformation or "C" frame
Initial measure is before steel column cut

Stiffness characteristics of the "C" frame (prestressed concrete variant)

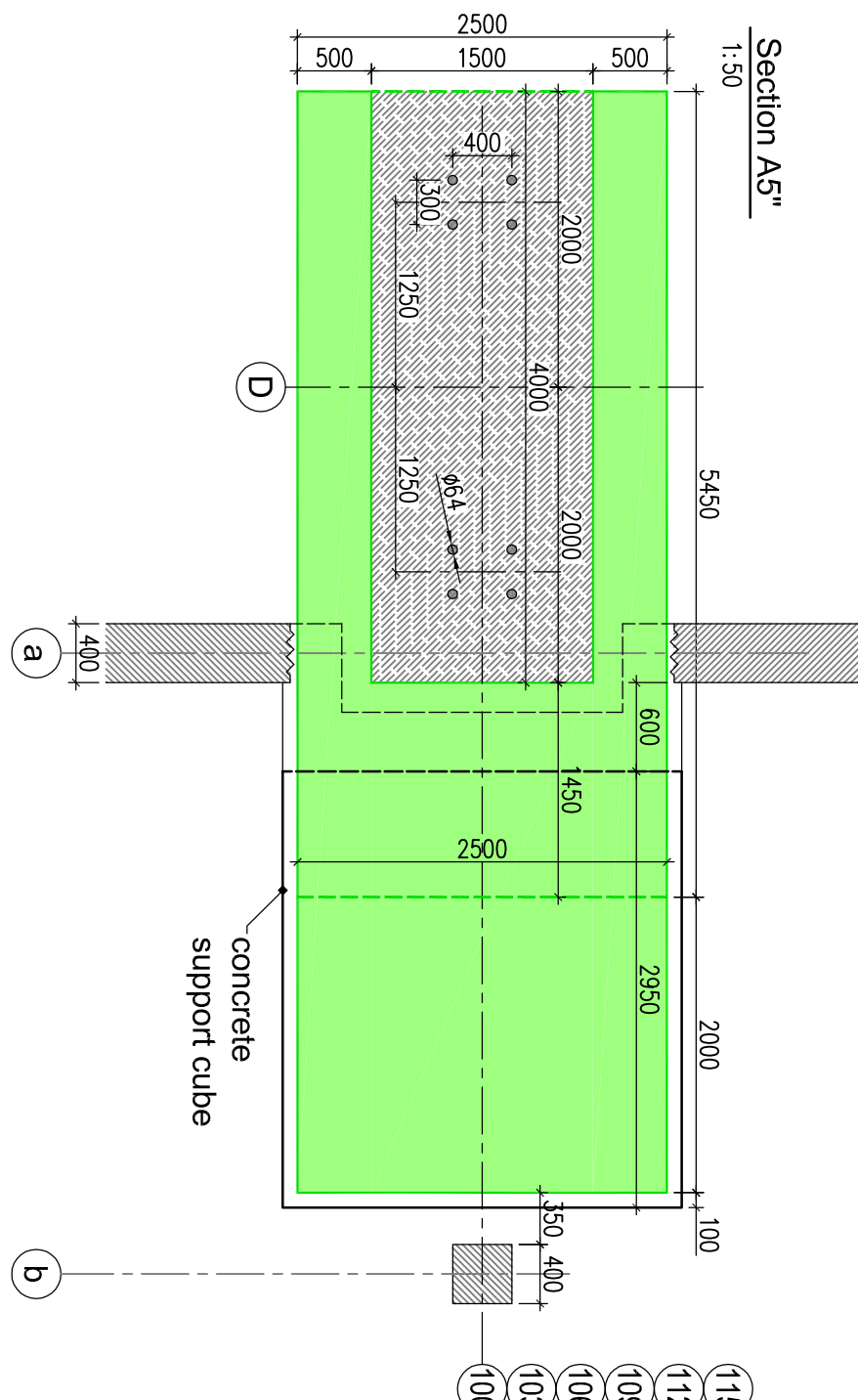
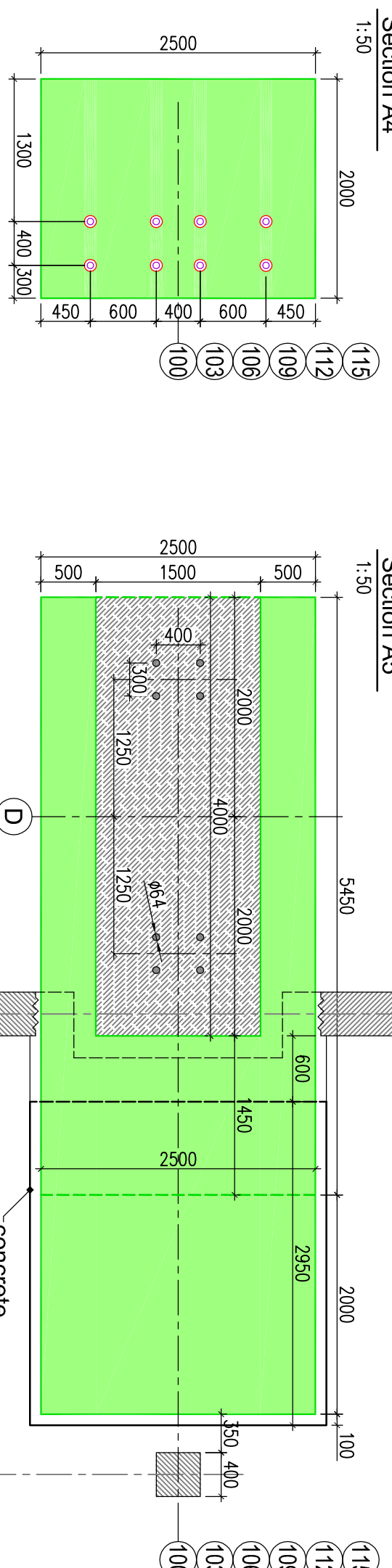
- load : self weight (roof, roof structure, crane beams, column)
deformation at controlled point
a) elastic deformation : -5.4mm
- load : snow
deformation at controlled point
a) elastic deformation : -2.1mm
- load : one crane, situated in D/L bay, over a struggled column
deformation at controlled point
a) elastic deformation : -4.1mm

Program for execution & maintenance

- columns and cantilever part are simultaneously stressed (concrete is over 28 days age)
 - cut the columns
expected deformation at control point : -5.4mm
 - (option) uplift only of crane beams(or just crane rails): $\delta_z=+5.4+2.1+4.1/2=+8.5\text{mm}$
height difference: +8.5-8.4=+3.1mm (not loaded)
height difference: +3.1-2.1=+1mm (when the roof is loaded with snow)
height difference: +3.1-4.1=-1mm (loaded with crane)
height difference: +1-4.1=-3.1mm (loaded with crane and snow)
- With this optional uplift maximum height difference of **+3.1mm** between each 2 columns (loaded with snow or/and one crane in D/L bay) will be achieved.
3.1mm/18000mm=1/5800
- Without this optional uplift maximum height difference of **-11.6mm** between each 2 columns (loaded with snow or/and one crane in D/L bay) will be achieved.
11.6mm/18000mm=1/1550

- Notes
- Concrete grade C25/30 (f_{ck}=25MPa) for fillrd concrete and concrete support cube
 - Concrete grade C30/35 (f_{ck}=30MPa) for structural elements (foundation, column, cantilever)
 - Reinforcement S500 (f_{yk}=500MPa)
 - Structural steel S235JR

02	04/2011	CST	Detailed design Issue
01	12/09/2011	CST	First Issue
00	26/08/2011	CST	Draft
NUM	DATE	NAME	MODIFICATION
REVISIONS			
PROJECT 0489 - LONG RAIL PRODUCTION FOR			
SUBJECT ARCELORMITTAL POLAND S.A.			
SUBJECT STRUTTED COLUMNS			
AUTHOR OF THE PROJECT		CUSTOMER	
Group - IPS		ArcelorMittal	
AUTHOR'S DRAWING NUMBER		CUSTOMER'S DRAWING NUMBER	
0489-SSD-01-04			
PART STRUCTURAL		PHASE DETAILED DESIGN	
DRAWING NAME		SCALE	
Prestressed Concrete Variant		1:50	
Section A		FORMAT	
		A1	
DESIGNED BY		DRAWN BY	
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		CHECKED BY	
		Ic. Jacques Lataine	



Section A" (prestressed concrete variant)

1:50
(see 0489-SSD-01-01)

<u>specification embedded parts</u>			
(100)	steel pipe 108x3.6 length:	m'	6 items
(101)	steel pipe 108x3.6 length:	m'	8 items

