



CALCULATION OVERHEAD CRANE SINGLE GIRDER



COMPANY	PAK CRANE
REVISION .DC	A



PROJECT NAME	SINGLE
TAG NAME	No.1

Project Data



Selection Standard CMAA



Selection Material A.37

TOTAL WEIGHT

949



WEIGHT GIRDER

556



WEIGHT 2 * EC

368.8

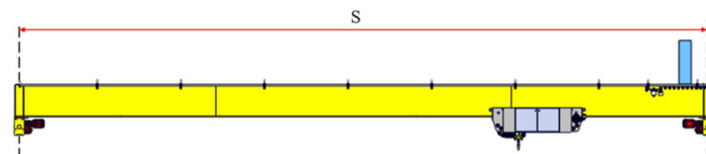


S / H	10.4	---	Span / Height Web	OK
S / B	17.3	---	Span / Width Bottom Flange	OK
H / B	1.7	---	Height Web / Width Bottom Flange	OK
RTL	40 X 30	mm	Rail traveling	OK
S / 7	740.0	mm	Required wheel base (Span / 7)	OK
H / T2	62.5	----	The need for transverse Stiffeners	OK
----	----	----	----	----

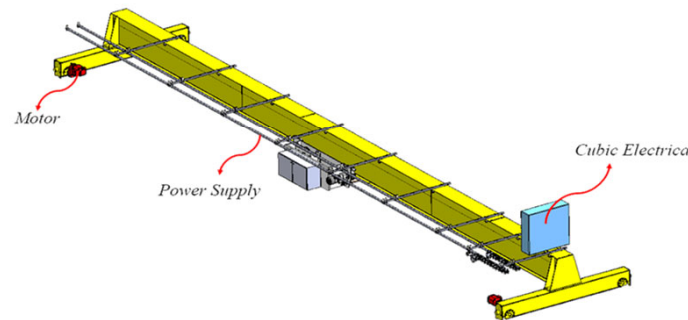
b / T4	21.8	---	Width Diaphragm / Thickness Top Flange	OK
DG	1.7	mm	Deflection Girder	OK
SG	139.2	Mpa	Stress Girder	OK
SEC	72.1	Mpa	Stress End Carriage	OK
GW	70.0	mm	Wheel Groove	OK
Vu	766.8	KN	Shear force design condition	OK
τ_G	3.3	Mpa	Shear Stress Girder	OK
Mu	6.6E+04	N.m	allowable moment section capacity	OK



1 GENERAL CRANE DATA



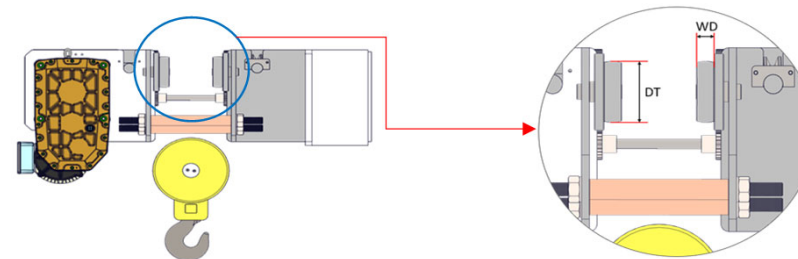
Q	5	Load	T
S	5.18	Span	M
DF	1.1	Dynamic factor	---
WG	M6	Working group	ISO
H.O.L	6000	Height Lift	MM
DFG	L/1000	Deflection Girder limit	---



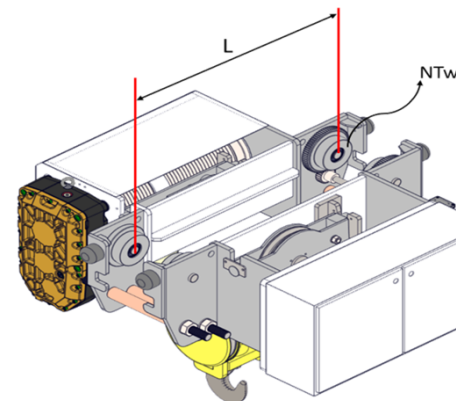
PS	100	Power Supply	KG
CE	200	Cubicle Electrical	KG
Motors , ..	0	Service Platform	KG



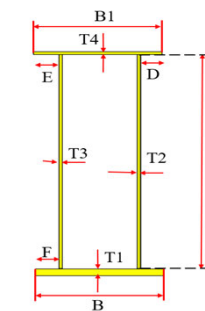
2 TROLLEY HOIST



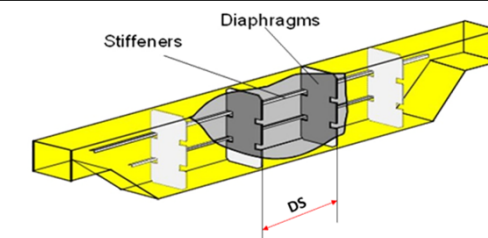
NTw	4	No. Wheel	----
L	1200	Wheel base Trolley (mm)	MM
DT	100	Diameter Wheel Trolley (mm)	MM
TS	20	Trolley Speed (m/min)	M/MIN
WD	45	Width Wheel Trolley	MM
Wt	780	Weight Trolley (kg)	KG
HS	5	Hoist speed (m /min)	M/MIN
Drum	268	Diameter Drum Hoist (mm)	MM
Reeving	2/1	Reeving Hoist	---



3 MAIN GIRDER



H	500	Height Web	MM
B	300	Width Bottom Flange	MM
B1	300	Width Top Flange	MM
T1	10	Thickness Bottom Flange	MM
T2	8	Thickness Web 1	MM
T3	8	Thickness Web 2	MM
T4	8	Thickness Top Flange	MM
C	55	Space Flange	MM
D	55	Space Flange	MM
E	55	Space Flange	MM
RN	NoN	Row Number	---
SF	NoN	Size Stiffener	MM
DS	1800	Diaphragm Distance	MM
DF-TH	8	Diaphragm thickness	MM
Weld	5	Thickness Weld Girder	MM



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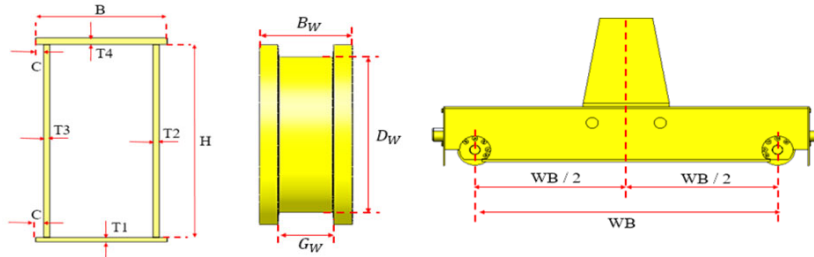


WEIGHT 2 * EC 368.8



4

END CARRIAGE



H	200	Height Web	MM
B	200	Width Top & Bottom Flange	MM
T1	8	Thickness Bottom Flange	MM
T2	6	Thickness Web 1	MM
T3	6	Thickness Web 2	MM
T4	8	Thickness Top Flange	MM
C	15	Space Flange	MM

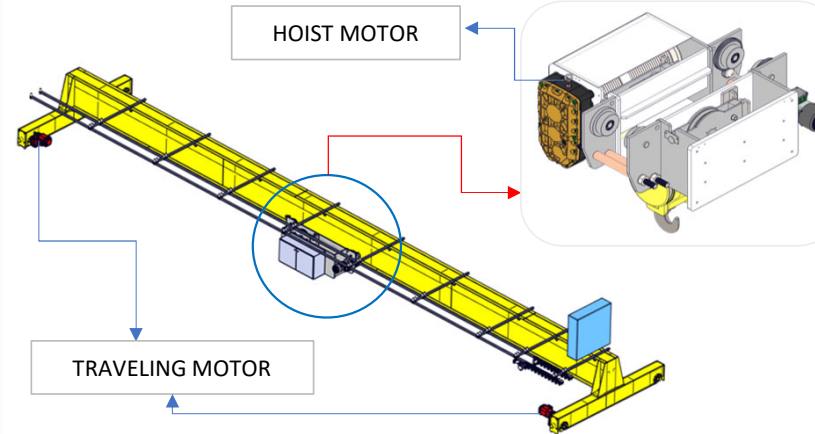
XC	5	WELD THICKNESS	MM
GD	A5	Amplifying coefficient	FEM
BS	20	Bridge Speed	m/min

MWH	> 500	Ultimate strength Wheel	Mpa
Mril	350	Ultimate strength Rail	Mpa
SKF	22212	Bearing	----
RT	40 X 30	Rail Type	----

WB	1200	Distance between center wheel	MM
WW	90	Wheel Width	MM
DW	200	Diameter Wheel	MM
GW	70	Wheel Groove	MM

5

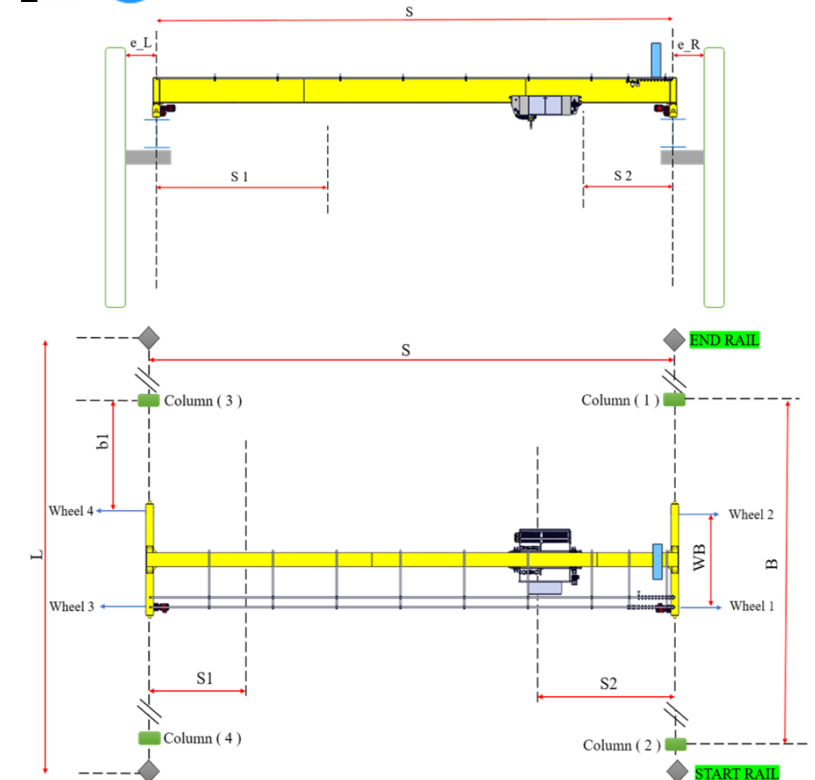
MOTOR DATA



S3	0.6	Operating mode Traveling	%
S3	0.6	Operating mode For Traversing	%
S3	0.6	Operating mode For Hoist	%
T	40	Ambient temperature	C ⁰
H	2500	Installation altitude above sea level	m
f	Top Running	Rolling Friction of Drive	----
E	Anti Friction	chanical efficiency Of Drive machin	----
TM	AC Inverter	Type Of Motor	----
TC	Inverter	Type of control	----
RS	3000	Speed Range	----

6

LOCATION CRANE



L	13000	Crane Runway Beam Span	MM
S1	500	Approach Side Max	MM
S2	600	Approach Side min	MM
e L	300	Runway CL to col CL dist-Right	MM
e R	300	Runway CL to col CL dist-left	MM
b1	401	Distance Between column R1 and wheel 1	MM
B	6000	Distance between Two Column Hall Supp	MM
Beam_w	10	Weight for one meter Beam Hall	KG/M



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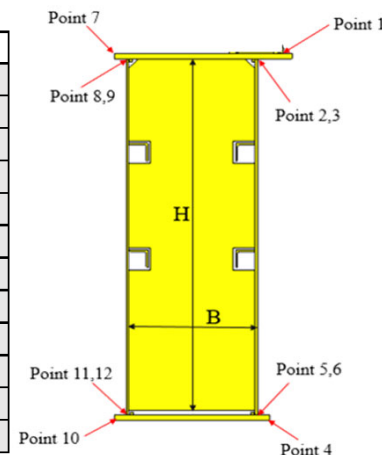
DIMENSION CHECK MAIN GIRDER

S/H	10.4	---	Span / Height Web	OK
S/B	17.3	---	Span / Width Bottom Flange	OK
H/B	1.7	---	Height Web / Width Bottom Flange	OK
b/T4	21.8	---	Width Diaphragm / Thickness Top Flange	OK

I_x	514815690.5	Moment of inertia XX	MM^4
I_y	106790666.7	Moment of inertia YY	MM^4

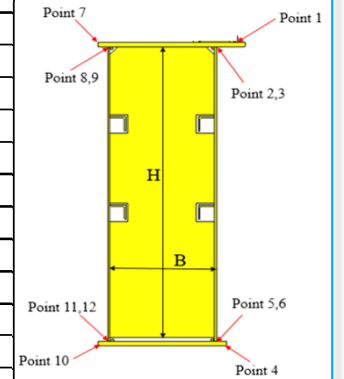
Elastic section modulus

Point	S_x	S_y	Unit
1	1909575	711938	MM^3
2	1967972	1124112	MM^3
3	1967972	1124112	MM^3
4	2072502	711938	MM^3
5	2159435	1124112	MM^3
6	2159435	1124112	MM^3
7	1909575	711938	MM^3
8	1967972	1124112	MM^3
9	1967972	1124112	MM^3
10	2072502	711938	MM^3
11	2159435	1124112	MM^3
12	2159435	1124112	MM^3

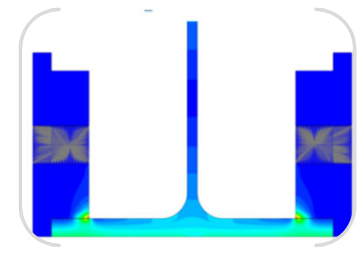
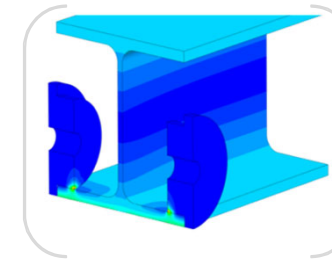


STRESS GIRDER CHECK

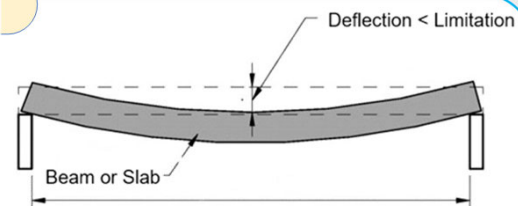
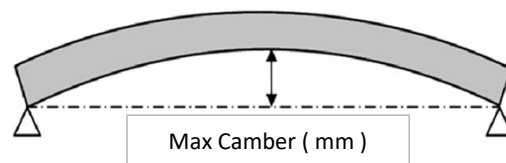
Point	$\sigma x1$	$\sigma x2$	$\sigma x3$	$\sigma x (total)$	$\tau xy1$	$\tau xy2$	$\tau xy (wh)$	$\tau xy (total)$	σz	σeq
1	-54.1	-6.6	0.0	-60.7	0.0	0.0	0.0	0.0	0.0	60.7
2	-52.5	-4.2	0.0	-56.7	3.0	0.0	0.0	3.3	0.0	57.0
3	-52.5	-4.2	0.0	-56.7	3.0	0.0	0.0	3.0	0.0	56.9
4	49.9	6.6	89.5	146.0	0.0	0.0	0.0	0.0	65.1	126.6
5	47.9	4.2	108.5	160.5	1.5	0.0	0.0	1.6	86.9	139.2
6	47.9	4.2	108.5	160.5	1.5	0.0	0.0	1.5	86.9	139.2
7	-54.1	-6.6	0.0	-60.7	0.0	0.0	0.0	0.0	0.0	60.7
8	-52.5	-4.2	0.0	-56.7	3.0	0.0	0.0	3.0	0.0	56.9
9	-52.5	-4.2	0.0	-56.7	3.0	0.0	0.0	3.0	0.0	56.9
10	49.9	6.6	0.0	56.4	0.0	0.0	0.0	0.0	0.0	56.4
11	47.9	4.2	0.0	52.0	1.5	0.0	0.0	1.5	0.0	52.1
12	47.9	4.2	0.0	52.0	1.5	0.0	0.0	1.5	0.0	52.1



SBF	115.7	Bottom Flange Stress	Mpa
V*	55000.0	Design shear force	N
Vm	852000.0	Shear yield capacity	N
Vu	766800.0	nominal shear capacity	N
Vu	766800.0	Shear force design condition	OK



DEFLECTION CHECK



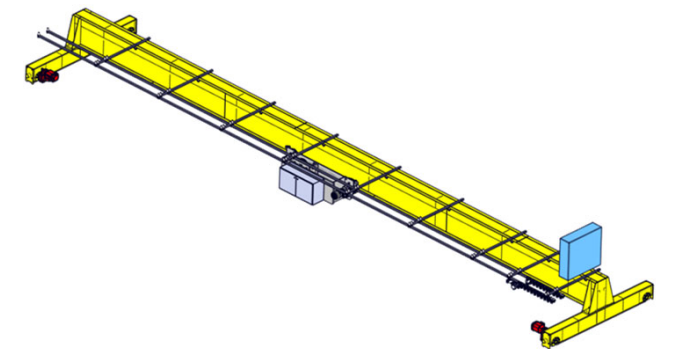
CAMBER	0.9	Camber	MM
LLD	1.7	Live Load Deflection	MM
DLD	0.1	Dead Load Deflection	MM

DG	1.7	mm	Deflection Girder	OK
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SELECTION MOTOR

HMP	4.3	Hoist Motor	KW
TLMP	0.6	Traveling Motor	KW
TSMP	0.6	Traversing Motor	KW

HMR	1.7	Hoist Motor	RPM
TLMR	31.8	Traveling Motor	RPM
TSMR	63.7	Traversing Motor	RPM





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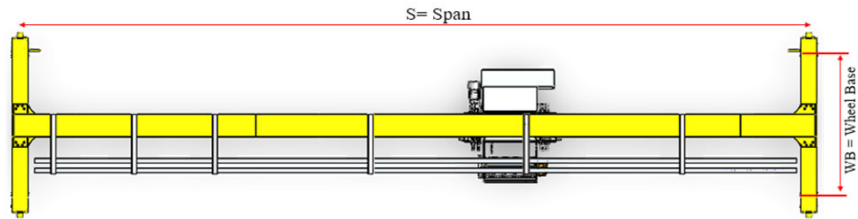


WEIGHT 2 * EC

368.8



END CARRIAGE CALCULATE



S/7	740.0	mm	Required wheel base (Span / 7)	OK
-----	-------	----	--------------------------------	----



RAIL	40 X 30	Rail Size Select	MM
B_eff min	20.1	Min Width for Rail	MM
B_eff	40.0	Width Rail	MM

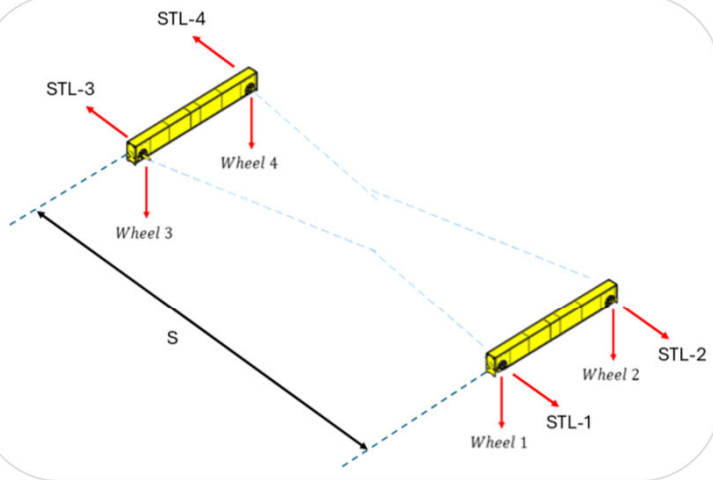
RTL	40 X 30	mm	Rail traveling	OK
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RPM _{wheel}	31.8	ANGULAR VELLOCITY OF WHEEL	Rev/min
RL	13.7	RADIAL LOAD IN BEARING	KN
AL	3.4	AXIAL LOAD IN BEARING	KN
PL	25.0	THE FORCE ACTING ON THE BEARING	KN
L_10H	23137018.8	RATING LIFE (AT 90% RELIABILITY) OPERATING	hr

τ_{Weld}	29.0	SHEAR STRESS OF THE WELD	Mpa
Y_{Max}	0.0	Max Deflection	mm
V	29.7	MAX SHEAR FORCE	N
σ_{equ}	72.1	TOTAL COMBINED STRESS	Mpa

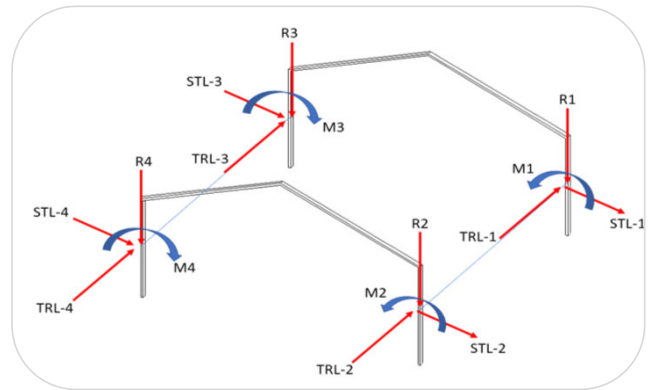
SEC	72.1	Mpa	Stress End Carriage	OK
-----	------	-----	---------------------	----

Wheel Load



Wheel	P-Max	P-Min	STL	TRL	
1	23.6	---	5.5	9.1	KN
2	23.6	---	0.2	0.3	KN
3	---	1.2	5.5	9.1	KN
4	---	1.2	0.2	0.3	KN

P-Max	Wheel Load Max	KN
P-Min	Wheel Load Min	KN
STL	Side Thrust Load	KN
TRL	Tractive Load	KN
R	Reaction Support	KN
M	Moment support	KN.M



Point	R	M
1	45.7	13.7
2	1.7	0.5
3	2.5	0.8
4	0.2	0.1