



LENGTH 1750-1950-2100 cm

LOADS :Variable 800+ Permanent 1200 = 2000 Dan/ml

Cast in place concrete and self-weight excluded

LENGTH

2100 cm

.DATE (mm-gg-aa) 09-23-2008
 ..Prestressed concrete members pre-tensioned and bonded
 .EUROCODE 2-DESIGN OF STRUCTURES UNI ENV 1992-1-1:
 .General rules and rules for buildings Simple support Beam

.STANDARD GIRDERS
 .P MAX 2000

UNIT MEASURE

UNIT FORCE : daN
 UNIT LENGTH : cm

* Exposure Class XD3 *
 . 3 - Corrosion induced by chlorides
 . Cyclic wet and dry

* Relative Humidity* 55 %

Geometric mechanical properties.

.LOAD 1ø PHASE (Cast in place concrete) 6
 .LOAD 2ø PHASE (perm.) 8
 .LOAD 2ø PHASE (var.) 12
 .HEIGHT Cast in place concrete 20
 .Charact.Cubic Strength. in place concrete 300
 .WIDTH (Cast in place concrete) 120
 .DESIGN LENGHT 2070
 .EFFECTIVE LENGHT 2100
 .SUPERIOR CONVENTIONAL REINFORCING BARS 5
 .SUPERIOR BARS DISTANCE FORM SUP. BORDER 5
 .INFERIOR CONVENTIONAL REINFORCING BARS 8
 .INFERIOR BARS DISTANCE FORM INF. BORDER 6

 .CANTILEVER FINAL MOMENT 15
 .MAX CANTILEVER TRANSPORT-HOISTING 100

 .MAX STRESS BARS CRACKING (1600-4500) 2200
 .like previewed by UNI ENV 1992-1-1 table 4.11

Materials properties

.Rck= 550.00 Rckj= 400.00 Fck= 456.50 Fckj= 332.00
 .Fctmf= 46.72 Fctk= 50.62 Fctmi= 37.78 Fctkj= 40.93
 .Fyk= 4290.23 Ftk= 5387.73 Fpk= 18629.19 Fp1k= 16665.08
 .Jack tension= 14018.27 losses % 1000H = 2.20 losses % 5000H = 2.80

.T_RCAEC2 E-MAIL studio@engisoft.org WEB www.engisoft.org



.T_RCAEC2 ENGISOFT-ing.F.PINARDI-DESENZANO(BS) tel 030-9912152

.
. .
TRACING Prestressing steel 0.6" diam.
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. .

.
. .
950+
. 1000+ O 20
. 950+ O 19
. 900+ O 18
. 850+ O 17
. 800+ O 16
. 750+ O 15
. 700+ O 14
. 650+ O 13
. 600+ O 12
. 550+ O 11
. 500+ O 10
. 450+ * 9
. 400+ * 8
. 350+ O 7
. 300+ * 6
. 250+ *** 5
. 200+ ***** 4
. 150+ ***000*** 3
. 100+ 000000000 2
. 50+ 1

. . .
. @@@ THEORETICAL BARYCENTRE..... 22
. @@@ EFFECTIVE BARYCENTRE 21.90476
. @@@ NUMBER OF Prest. steel..... 21

. .
. TOTAL WEIGHTDaN.. 25527.39
. UNIT WEIGHTDaN/cm 12.1559
. FILE STRUCTURE..... bia6395
. FILE PRETENSION..... bia63135

.T_RCAEC2 ENGISOFT-ing.F.PINARDI-DESENZANO(BS) tel 030-9912152

BENDING verifications

BENDING verifications						

	CONCRETE		BARS			
STRESS MAX.=	.6*Fckj= 199.20		.7*Ftk= 3771.41			
DISTANCE	STRESS SUP.	STRESS INF.	STRESS SUP.	STRESS INF.	BARS sup	BENDING
1050.00	36.72	126.23	241.70	703.38	0.10	6.509E+06
940.00	36.31	126.71	239.57	705.84	0.10	6.456E+06
830.00	34.77	128.50	231.60	715.05	0.10	6.255E+06
720.00	32.10	131.60	217.78	731.03	0.10	5.908E+06
610.00	28.29	136.02	198.11	753.77	0.10	5.413E+06
500.00	23.36	141.75	172.59	783.26	0.10	4.771E+06
390.00	17.29	148.79	141.22	819.52	0.10	3.982E+06
310.00	12.16	154.74	114.73	850.13	0.10	3.316E+06
210.00	8.01	145.15	88.83	796.18	0.27	2.374E+06
200.00	10.39	127.59	96.61	701.08	0.10	2.273E+06
110.00	2.91	136.37	57.94	746.33	2.57	1.310E+06
100.00	2.03	137.40	53.42	751.64	2.97	1.197E+06

HOISTING AND TRANSPORT						

	CONCRETE		BARS			
STRESS MAX.=	.6*Fckj= 199.20		.7*Ftk= 3771.41			
DISTANCE	STRESS SUP.	STRESS INF.	STRESS SUP.	STRESS INF.	BARS sup	BENDING
1050.00	34.64	128.65	230.92	715.84	0.10	6.238E+06
940.00	33.99	129.41	227.55	719.73	0.10	6.154E+06
830.00	32.04	131.67	217.47	731.39	0.10	5.900E+06
720.00	28.78	135.45	200.65	750.82	0.10	5.477E+06
610.00	24.23	140.73	177.11	778.03	0.10	4.885E+06
500.00	18.38	147.53	146.85	813.01	0.10	4.124E+06
390.00	11.22	155.84	109.86	855.76	0.10	3.194E+06
310.00	5.20	162.82	78.74	891.74	0.10	2.411E+06
210.00	-0.21	154.77	46.36	845.75	0.27	1.306E+06
200.00	2.03	137.47	53.40	751.98	0.10	1.188E+06
110.00	-6.67	147.72	8.51	804.83	2.57	6.221E+04
100.00	-7.68	148.92	3.27	811.03	2.97	-6.990E+04

rare load condition = Gk + Qk						

	CONCRETE		BARS			
STRESS MAX.=	0.5*Fck=228.25		.7*Ftk=3771.41			
DISTANCE	STRESS SUP.	STRESS INF.	STRESS SUP.	STRESS INF.	BARS inf.	MOMENT
1050.00	97.63	-13.97	456.48	-34.41	0.10	2.044E+07
940.00	96.42	-12.25	451.20	-26.78	0.10	2.021E+07
830.00	92.77	-7.10	435.36	-3.94	0.10	1.951E+07
720.00	86.70	1.47	408.97	34.09	0.10	1.836E+07

.	610.00	78.19	13.47	372.01	87.32	0.10	1.674E+07
.	500.00	67.25	28.89	324.50	155.76	0.10	1.467E+07
.	390.00	53.88	47.73	266.42	239.39	0.10	1.213E+07
.	310.00	42.63	63.59	217.56	309.76	0.10	9.990E+06
.	210.00	28.95	74.91	156.06	358.22	0.10	6.975E+06
.	200.00	29.62	65.32	156.70	313.74	0.10	6.653E+06
.	110.00	13.26	88.85	85.78	418.26	0.10	3.580E+06
.	100.00	11.35	91.61	77.48	430.52	0.10	3.219E+06

.| DISTANCE |first PHASE(place concrete+løper.)|

.	STRESS SUP.	STRESS INF.	MOMENT	.
.	1.0500E+03	6.4013E+01	6.2096E+01	9.7245E+06
.	9.4000E+02	6.3177E+01	6.2957E+01	9.6147E+06
.	8.3000E+02	6.0670E+01	6.5525E+01	9.2852E+06
.	7.2000E+02	5.6491E+01	6.9799E+01	8.7359E+06
.	6.1000E+02	5.0642E+01	7.5781E+01	7.9670E+06
.	5.0000E+02	4.3121E+01	8.3470E+01	6.9784E+06
.	3.9000E+02	3.3930E+01	9.2866E+01	5.7702E+06
.	3.1000E+02	2.6195E+01	1.0077E+02	4.7534E+06
.	2.1000E+02	1.7482E+01	1.0101E+02	3.3191E+06
.	2.0000E+02	1.8679E+01	9.0340E+01	3.1657E+06
.	1.1000E+02	7.3911E+00	1.0231E+02	1.7033E+06
.	1.0000E+02	6.0719E+00	1.0371E+02	1.5317E+06

.| DISTANCE |second PHASE (2øper+var.)|

.	STRESS SUP.	STRESS INF.	St.place concr.	MOMENT	.
.	1.0500E+03	3.3622E+01	-7.6061E+01	4.1885E+01	1.0712E+07
.	9.4000E+02	3.3242E+01	-7.5202E+01	4.1412E+01	1.0591E+07
.	8.3000E+02	3.2103E+01	-7.2625E+01	3.9993E+01	1.0228E+07
.	7.2000E+02	3.0204E+01	-6.8329E+01	3.7627E+01	9.6233E+06
.	6.1000E+02	2.7545E+01	-6.2315E+01	3.4315E+01	8.7763E+06
.	5.0000E+02	2.4127E+01	-5.4583E+01	3.0057E+01	7.6873E+06
.	3.9000E+02	1.9950E+01	-4.5132E+01	2.4853E+01	6.3563E+06
.	3.1000E+02	1.6435E+01	-3.7180E+01	2.0474E+01	5.2363E+06
.	2.1000E+02	1.1471E+01	-2.6094E+01	1.4313E+01	3.6563E+06
.	2.0000E+02	1.0940E+01	-2.5017E+01	1.3671E+01	3.4873E+06
.	1.1000E+02	5.8729E+00	-1.3459E+01	7.3432E+00	1.8763E+06
.	1.0000E+02	5.2794E+00	-1.2103E+01	6.6017E+00	1.6873E+06

.| | quasi-permanent load = Gk + Qk * .6 |

.| | CONCRETE | |
..|STRESS MAX.= .4 *Fck= 182.6

.	DISTANCE	STRESS SUP.	STRESS INF.	MOMENT	STRANDS APPLIED
.	1050.00	89.57	4.29	1.787E+07	21
.	940.00	88.44	5.80	1.766E+07	21
.	830.00	85.07	10.33	1.706E+07	21
.	720.00	79.45	17.87	1.605E+07	21
.	610.00	71.58	28.42	1.464E+07	21
.	500.00	61.46	41.99	1.282E+07	21

.	390.00	49.09	58.57	1.060E+07	21
.	310.00	38.69	72.51	8.733E+06	21
.	210.00	26.20	81.17	6.098E+06	19
.	200.00	26.99	71.33	5.816E+06	17
.	110.00	11.85	92.08	3.129E+06	17
.	100.00	10.08	94.52	2.814E+06	17

.| DISTANCE |first PHASE(place concrete+løper.)|

.		STRESS SUP.	STRESS INF.	MOMENT	
.	1.0500E+03	6.4013E+01	6.2096E+01	9.7245E+06	
.	9.4000E+02	6.3177E+01	6.2957E+01	9.6147E+06	
.	8.3000E+02	6.0670E+01	6.5525E+01	9.2852E+06	
.	7.2000E+02	5.6491E+01	6.9799E+01	8.7359E+06	
.	6.1000E+02	5.0642E+01	7.5781E+01	7.9670E+06	
.	5.0000E+02	4.3121E+01	8.3470E+01	6.9784E+06	
.	3.9000E+02	3.3930E+01	9.2866E+01	5.7702E+06	
.	3.1000E+02	2.6195E+01	1.0077E+02	4.7534E+06	
.	2.1000E+02	1.7482E+01	1.0101E+02	3.3191E+06	
.	2.0000E+02	1.8679E+01	9.0340E+01	3.1657E+06	
.	1.1000E+02	7.3911E+00	1.0231E+02	1.7033E+06	
.	1.0000E+02	6.0719E+00	1.0371E+02	1.5317E+06	

.| DISTANCE |second PHASE (2øper+var.)|

.		STRESS SUP.	STRESS INF.	St.place concr.	MOMENT	
.	1.0500E+03	2.5553E+01	-5.7807E+01	3.1833E+01	8.1413E+06	
.	9.4000E+02	2.5264E+01	-5.7154E+01	3.1473E+01	8.0494E+06	
.	8.3000E+02	2.4398E+01	-5.5195E+01	3.0395E+01	7.7735E+06	
.	7.2000E+02	2.2955E+01	-5.1930E+01	2.8597E+01	7.3137E+06	
.	6.1000E+02	2.0934E+01	-4.7359E+01	2.6080E+01	6.6700E+06	
.	5.0000E+02	1.8337E+01	-4.1483E+01	2.2844E+01	5.8423E+06	
.	3.9000E+02	1.5162E+01	-3.4300E+01	1.8888E+01	4.8308E+06	
.	3.1000E+02	1.2490E+01	-2.8256E+01	1.5560E+01	3.9796E+06	
.	2.1000E+02	8.7181E+00	-1.9832E+01	1.0878E+01	2.7788E+06	
.	2.0000E+02	8.3146E+00	-1.9013E+01	1.0390E+01	2.6503E+06	
.	1.1000E+02	4.4634E+00	-1.0228E+01	5.5808E+00	1.4260E+06	
.	1.0000E+02	4.0124E+00	-9.1980E+00	5.0173E+00	1.2823E+06	

.| CRACKING VERIFICATION Exposure Class XD3

.| Decompression: COMPRESSED SECTION LEVEL (Respect bottom)

.	DISTANCE	TRANSPORT	MOMENT FINAL		
.		LEVEL SUP.	LEVEL INF.	LEVEL SUP.	LEVEL INF.
.	1050.00	95.00	0.00	95.00	11.89
.	940.00	95.00	0.00	95.00	10.71
.	830.00	95.00	0.00	95.00	6.75
.	720.00	95.00	0.00	95.00	0.00
.	610.00	95.00	0.00	95.00	0.00
.	500.00	95.00	0.00	95.00	0.00

.	390.00	95.00	0.00	95.00	0.00
.	310.00	95.00	0.00	95.00	0.00
.	210.00	94.87	0.00	95.00	0.00
.	200.00	95.00	0.00	95.00	0.00
.	110.00	90.90	0.00	95.00	0.00
.	100.00	90.34	0.00	95.00	0.00

. . PRESTRESSING STEEL MUST REMAIN FOR 2.5 cm
. INSIDE COMPRESSED ZONE
. SATISFIED VERIFICATION

VERIFICATION		STRESS	BARS	FOR	CRACKING			
TRANSPORT		MOMENT FINAL						
DISTANCE	BORDER	AREA	AREA	STRESS	LEMBO	AREA	AREA	STRESS
DISTANCE	MIN.	EFFECT.	MIN.		EFFECT.			
.	1050.00	SEC.COMPRESSED			SEC.COMPRESSED			
.	940.00	SEC.COMPRESSED			SEC.COMPRESSED			
.	830.00	SEC.COMPRESSED			SEC.COMPRESSED			
.	720.00	SEC.COMPRESSED			SEC.COMPRESSED			
.	610.00	SEC.COMPRESSED			SEC.COMPRESSED			
.	500.00	SEC.COMPRESSED			SEC.COMPRESSED			
.	390.00	SEC.COMPRESSED			SEC.COMPRESSED			
.	310.00	SEC.COMPRESSED			SEC.COMPRESSED			
.	210.00	SUP.	0.11	0.27	2044.04	SEC.COMPRESSED		
.	200.00	SEC.COMPRESSED			SEC.COMPRESSED			
.	110.00	SUP.	1.04	2.57	1962.58	SEC.COMPRESSED		
.	100.00	SUP.	1.20	2.97	1960.05	SEC.COMPRESSED		

see Table 4.11 and 4.12 point 4.4.2.3 EC2

PRESTRESSING		STEEL					
DISTANCE	MOMENT	INITIAL	RARE	LOAD	CONDITION		
	STRESS var.	bar.Strands	STRESS var.	bar.Str.	Dbi Str.	N.Str.	
.	1050.00	13274.10	112.76	10948.57	37.33	21.90	21
.	940.00	13271.97	113.05	10935.21	38.48	21.90	21
.	830.00	13263.96	114.14	10894.04	41.92	21.90	21
.	720.00	13250.09	116.03	10825.08	47.66	21.90	21
.	610.00	13230.35	118.73	10728.31	55.69	21.90	21
.	500.00	13204.75	122.22	10603.75	66.01	21.90	21
.	390.00	13173.27	126.51	10451.39	78.62	21.90	21
.	310.00	13146.70	130.14	10323.12	89.23	21.90	21
.	210.00	13201.08	120.42	10455.05	90.92	22.63	19
.	200.00	13290.88	105.95	10756.80	78.92	23.53	17
.	110.00	13250.29	111.25	10564.24	94.43	23.53	17
.	100.00	13245.53	111.87	10541.64	96.25	23.53	17

PRESTRESSING LOSSES						
DISTANCE	Immediate	shrinkage	creep	relaxation	Comb.tot.	Loads
1050.00	300.09	816.42	1457.67	163.94	2413.23	409.60
940.00	300.09	816.42	1468.12	163.94	2423.57	404.31
830.00	300.09	816.42	1499.22	163.94	2454.35	389.78
720.00	300.09	816.42	1550.97	163.94	2505.58	366.00
610.00	300.09	816.42	1623.38	163.94	2577.25	332.96
500.00	300.09	816.42	1716.44	163.94	2669.36	290.67
390.00	300.09	816.42	1830.15	163.94	2781.92	239.13
310.00	300.09	816.42	1925.83	163.94	2876.61	195.83
210.00	300.09	816.42	1835.57	163.94	2789.99	135.64
200.00	300.09	816.42	1619.07	163.94	2577.98	129.86
110.00	300.09	816.42	1759.48	163.94	2717.23	66.99
100.00	300.09	816.42	1775.96	163.94	2733.57	59.62

BOW HEIGHT					
MOMENT INITIAL			MOMENT FINAL		
self-weight	prestress	TOTAL	PERM.+s-weight	VARIABLE	TOTAL
-1.4567E+00	3.1849E+00	1.7283E+00	3.6938E-01	-7.3696E-01	6.6584E-01

Kvisc= 3.797724
Length/Bow Ist.= 5712.986 >=1000 Length/Bow inf.= 1814.814 >=500

*** BENDING ULTIMATE LIMIT STATES

DISTANCE	ELONG%. PRECAST	ELONG%. STRANDS	ELONG%. p.concr.	ELONG%. BARS SUP.	ELONG%. BARS INF.	DIST n-n SUP.BORDER	Mr/Md >1
1050.000	1.005	15.207	3.500	0.334	10.940	7.489	1.199
940.000	1.002	15.204	3.500	0.331	10.945	7.467	1.211
830.000	0.994	15.198	3.500	0.322	10.959	7.398	1.249
720.000	0.979	15.186	3.500	0.307	10.983	7.285	1.318
610.000	0.988	15.024	3.500	0.323	10.858	7.423	1.464
500.000	0.962	15.003	3.500	0.296	10.900	7.218	1.650
390.000	0.960	14.829	3.500	0.300	10.792	7.268	2.010
310.000	0.963	14.658	3.500	0.309	10.673	7.364	2.464
210.000	0.951	14.682	3.500	0.300	10.625	7.308	3.526
200.000	0.943	14.882	3.500	0.290	10.679	7.224	3.671
110.000	0.934	14.702	3.500	0.287	10.584	7.214	6.867
100.000	0.929	14.697	3.500	0.282	10.592	7.177	7.622

Md = 1.4 * Mpp + 1.4 * Mper + 1.5 * Mvar

*** Geometric mechanical properties sections with steel

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.
.Perimeter 483.789          Equivalent area 20.10116          Min.Width 18
.
.SEC. dist.   Area      Dist.Bar.   Mom.In.   Mod.Res.   Mod.Res.   Mod.Res.
. support     A          Dbi        J n-n     Wi         Ws         Wsc
. 1050.00    6.811E+03  6.588E+01  9.278E+06 1.408E+05 3.186E+05 1.889E+05
.  940.00    6.811E+03  6.588E+01  9.278E+06 1.408E+05 3.186E+05 1.889E+05
.  830.00    6.811E+03  6.588E+01  9.278E+06 1.408E+05 3.186E+05 1.889E+05
.  720.00    6.811E+03  6.588E+01  9.278E+06 1.408E+05 3.186E+05 1.889E+05
.  610.00    6.811E+03  6.588E+01  9.278E+06 1.408E+05 3.186E+05 1.889E+05
.  500.00    6.811E+03  6.588E+01  9.278E+06 1.408E+05 3.186E+05 1.889E+05
.  390.00    6.811E+03  6.588E+01  9.278E+06 1.408E+05 3.186E+05 1.889E+05
.  310.00    6.811E+03  6.588E+01  9.278E+06 1.408E+05 3.186E+05 1.889E+05
.  210.00    6.795E+03  6.599E+01  9.246E+06 1.401E+05 3.187E+05 1.887E+05
.  200.00    6.778E+03  6.610E+01  9.213E+06 1.394E+05 3.188E+05 1.884E+05
.  110.00    6.790E+03  6.614E+01  9.220E+06 1.394E+05 3.195E+05 1.887E+05
.  100.00    6.792E+03  6.615E+01  9.222E+06 1.394E+05 3.196E+05 1.888E+05
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*** SHEAR ULTIMATE LIMIT STATES

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.          in SUPPORT (simple reinforced concrete)
.Vsd (shear design) = 56529.9          Vrd1 (concrete)= 13414.03
.Vrd2 (crushing) = 122875.9          SPREAD STIRRUPS = 15.08515
.STIRRUPS TOTAL/ML = 26.90327          loops place concr/ML = .7428135
.
.
.BARS SUPPORT (BENDS+LOOPS)          10.64183 shear from head   cm 15
.STRESS BARS inferior Td/As          1074.609
.
.
.FIRST PRECOMPRESSED SECTION          90          from support
.
.Vsd (shear design) = 51614.25          Vrd1 (concrete)= 27287.68
.Vrd2 (crushing) = 134348          TOTAL STIRRUPS/ML = 7.571768
  LOOPS place concr /ML = .9750995
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LENGTH
1950 cm

.T_RCAEC2 ENGISOFT-ing.F.PINARDI-DESENZANO (BS) tel 030-9912152
.DATE (mm-gg-aa) 09-23-2008
..Prestressed concrete members pre-tensioned and bonded
.EUROCODE 2-DESIGN OF STRUCTURES UNI ENV 1992-1-1:
.General rules and rules for buildings Simple support Beam
.STANDARD GIRDERS
.P MAX 2000
UNIT MEASURE
UNIT FORCE : daN
UNIT LENGTH : cm
* Exposure Class XD3 *
. 3 - Corrosion induced by chlorides
 Cyclic wet and dry
* Relative Humidity* 55 %
Geometric mechanical properties.
.LOAD 1ø PHASE (Cast in place concrete) 6
.LOAD 2ø PHASE (perm.) 8
.LOAD 2ø PHASE (var.) 12
.HEIGHT Cast in place concrete 20
.Charact.Cubic Strength. in place concrete 300
.WIDTH (Cast in place concrete) 120
.DESIGN LENGHT 1920
.EFFECTIVE LENGHT 1950
.SUPERIOR CONVENTIONAL REINFORCING BARS 5
.SUPERIOR BARS DISTANCE FORM SUP. BORDER 5
.INFERIOR CONVENTIONAL REINFORCING BARS 8
.INFERIOR BARS DISTANCE FORM INF. BORDER 6
.CANTILEVER FINAL MOMENT 15
.MAX CANTILEVER TRANSPORT-HOISTING 100
.MAX STRESS BARS CRACKING (1600-4500) 2200
.like previewed by UNI ENV 1992-1-1 table 4.11
Materials properties
.Rck= 550.00 Rckj= 400.00 Fck= 456.50 Fckj= 332.00
.Fctmf= 46.72 Fctk= 50.62 Fctmi= 37.78 Fctkj= 40.93
.Fyk= 4290.23 Ftk= 5387.73 Fpk= 18629.19 Fp1k= 16665.08
.Jack tension= 14018.27 losses % 1000H = 2.20 losses % 5000H = 2.80
.T_RCAEC2 E-MAIL studio@engisoft.org WEB www.engisoft.org

BENDING verifications

BENDING verifications							

INITIAL				MOMENT			

		CONCRETE		BARS			
STRESS MAX.=		.6*Fckj= 199.20		.7*Ftk= 3771.41			

DISTANCE	STRESS SUP.	STRESS INF.	STRESS SUP.	STRESS INF.	BARS sup	BENDING	

975.00	27.63	107.02	185.52	595.03	0.10	5.600E+06	
865.00	27.21	107.50	183.40	597.51	0.10	5.547E+06	
755.00	25.67	109.31	175.45	606.83	0.10	5.346E+06	
645.00	23.01	112.45	161.66	622.99	0.10	4.998E+06	
535.00	19.21	116.91	142.05	645.98	0.10	4.504E+06	
425.00	14.28	122.70	116.60	675.80	0.10	3.862E+06	
315.00	8.23	129.82	85.32	712.46	0.10	3.073E+06	
310.00	7.92	130.17	83.76	714.29	0.10	3.034E+06	
210.00	4.44	119.24	61.13	653.28	1.49	2.183E+06	
200.00	6.90	100.95	69.13	554.21	0.58	2.091E+06	
110.00	0.07	109.08	33.87	596.15	4.52	1.210E+06	
100.00	-0.73	110.04	29.75	601.09	5.07	1.106E+06	

HOISTING AND TRANSPORT							

CONCRETE				BARS			
STRESS MAX.=		.6*Fckj= 199.20		.7*Ftk= 3771.41			

DISTANCE	STRESS SUP.	STRESS INF.	STRESS SUP.	STRESS INF.	BARS sup	BENDING	

975.00	25.18	109.89	172.89	609.83	0.10	5.282E+06	
865.00	24.53	110.66	169.54	613.76	0.10	5.197E+06	
755.00	22.58	112.94	159.48	625.55	0.10	4.943E+06	
645.00	19.34	116.76	142.71	645.20	0.10	4.520E+06	
535.00	14.79	122.10	119.24	672.71	0.10	3.928E+06	
425.00	8.95	128.96	89.06	708.08	0.10	3.167E+06	
315.00	1.81	137.36	52.17	751.31	0.10	2.237E+06	
310.00	1.45	137.77	50.34	753.46	0.10	2.191E+06	
210.00	-3.16	128.28	21.90	699.85	1.49	1.191E+06	
200.00	-0.85	110.23	29.15	602.10	0.58	1.083E+06	
110.00	-8.77	119.73	-11.70	651.10	4.52	5.172E+04	
100.00	-9.69	120.85	-16.46	656.87	5.07	-6.990E+04	

rare load condition = Gk + Qk							

CONCRETE				BARS			
STRESS MAX.=		0.5*Fck=228.25		.7*Ftk=3771.41			

DISTANCE	STRESS SUP.	STRESS INF.	STRESS SUP.	STRESS INF.	BARS inf.	MOMENT	

975.00	80.39	-11.08	375.97	-26.40	0.10	1.758E+07	
865.00	79.18	-9.34	370.71	-18.64	0.10	1.735E+07	
755.00	75.55	-4.11	354.96	4.59	0.10	1.666E+07	
645.00	69.49	4.60	328.70	43.28	0.10	1.550E+07	

.	535.00	61.01	16.79	291.94	97.44	0.10	1.389E+07
.	425.00	50.11	32.47	244.67	167.06	0.10	1.181E+07
.	315.00	36.79	51.62	186.90	252.15	0.10	9.272E+06
.	310.00	36.13	52.58	184.03	256.38	0.10	9.145E+06
.	210.00	23.96	60.84	128.86	291.05	0.10	6.417E+06
.	200.00	24.85	49.67	130.11	239.29	0.10	6.124E+06
.	110.00	9.90	71.64	65.40	336.97	0.10	3.308E+06
.	100.00	8.15	74.22	57.83	348.48	0.10	2.976E+06

.| DISTANCE |first PHASE(place concrete+løper.)|

.		STRESS SUP.	STRESS INF.	MOMENT	
.	9.7500E+02	5.1515E+01	5.4816E+01	8.3662E+06	
.	8.6500E+02	5.0682E+01	5.5698E+01	8.2564E+06	
.	7.5500E+02	4.8186E+01	5.8332E+01	7.9269E+06	
.	6.4500E+02	4.4026E+01	6.2716E+01	7.3777E+06	
.	5.3500E+02	3.8202E+01	6.8851E+01	6.6087E+06	
.	4.2500E+02	3.0714E+01	7.6738E+01	5.6202E+06	
.	3.1500E+02	2.1563E+01	8.6375E+01	4.4119E+06	
.	3.1000E+02	2.1107E+01	8.6855E+01	4.3517E+06	
.	2.1000E+02	1.3437E+01	8.5022E+01	3.0536E+06	
.	2.0000E+02	1.4798E+01	7.2878E+01	2.9138E+06	
.	1.1000E+02	4.4882E+00	8.4172E+01	1.5739E+06	
.	1.0000E+02	3.2828E+00	8.5500E+01	1.4159E+06	

.| DISTANCE |second PHASE (2øper+var.)|

.		STRESS SUP.	STRESS INF.	St.place concr.	MOMENT	
.	9.7500E+02	2.8876E+01	-6.5900E+01	3.6063E+01	9.2160E+06	
.	8.6500E+02	2.8497E+01	-6.5035E+01	3.5589E+01	9.0950E+06	
.	7.5500E+02	2.7360E+01	-6.2439E+01	3.4169E+01	8.7320E+06	
.	6.4500E+02	2.5464E+01	-5.8113E+01	3.1801E+01	8.1270E+06	
.	5.3500E+02	2.2810E+01	-5.2057E+01	2.8487E+01	7.2800E+06	
.	4.2500E+02	1.9398E+01	-4.4270E+01	2.4226E+01	6.1910E+06	
.	3.1500E+02	1.5228E+01	-3.4752E+01	1.9017E+01	4.8600E+06	
.	3.1000E+02	1.5020E+01	-3.4278E+01	1.8758E+01	4.7938E+06	
.	2.1000E+02	1.0525E+01	-2.4186E+01	1.3170E+01	3.3638E+06	
.	2.0000E+02	1.0051E+01	-2.3209E+01	1.2594E+01	3.2098E+06	
.	1.1000E+02	5.4095E+00	-1.2534E+01	6.7852E+00	1.7338E+06	
.	1.0000E+02	4.8642E+00	-1.1276E+01	6.1020E+00	1.5598E+06	

.| | quasi-permanent load = Gk + Qk * .6 |

.| | CONCRETE | |
..|STRESS MAX.= .4 *Fck= 182.6

.	DISTANCE	STRESS SUP.	STRESS INF.	MOMENT	STRANDS APPLIED
.	975.00	73.46	4.73	1.537E+07	17
.	865.00	72.34	6.27	1.517E+07	17
.	755.00	68.98	10.88	1.456E+07	17
.	645.00	63.38	18.55	1.355E+07	17
.	535.00	55.54	29.29	1.214E+07	17
.	425.00	45.46	43.09	1.033E+07	17

.	315.00	33.14	59.96	8.105E+06	17
.	310.00	32.52	60.80	7.995E+06	17
.	210.00	21.44	66.64	5.610E+06	15
.	200.00	22.44	55.24	5.353E+06	13
.	110.00	8.60	74.65	2.892E+06	13
.	100.00	6.98	76.93	2.601E+06	13

.| DISTANCE |first PHASE(place concrete+løper.)|

.		STRESS SUP.	STRESS INF.	MOMENT	
.	9.7500E+02	5.1515E+01	5.4816E+01	8.3662E+06	
.	8.6500E+02	5.0682E+01	5.5698E+01	8.2564E+06	
.	7.5500E+02	4.8186E+01	5.8332E+01	7.9269E+06	
.	6.4500E+02	4.4026E+01	6.2716E+01	7.3777E+06	
.	5.3500E+02	3.8202E+01	6.8851E+01	6.6087E+06	
.	4.2500E+02	3.0714E+01	7.6738E+01	5.6202E+06	
.	3.1500E+02	2.1563E+01	8.6375E+01	4.4119E+06	
.	3.1000E+02	2.1107E+01	8.6855E+01	4.3517E+06	
.	2.1000E+02	1.3437E+01	8.5022E+01	3.0536E+06	
.	2.0000E+02	1.4798E+01	7.2878E+01	2.9138E+06	
.	1.1000E+02	4.4882E+00	8.4172E+01	1.5739E+06	
.	1.0000E+02	3.2828E+00	8.5500E+01	1.4159E+06	

.| DISTANCE |second PHASE (2øper+var.)|

.		STRESS SUP.	STRESS INF.	St.place concr.	MOMENT	
.	9.7500E+02	2.1946E+01	-5.0084E+01	2.7408E+01	7.0042E+06	
.	8.6500E+02	2.1658E+01	-4.9427E+01	2.7048E+01	6.9122E+06	
.	7.5500E+02	2.0793E+01	-4.7454E+01	2.5968E+01	6.6363E+06	
.	6.4500E+02	1.9353E+01	-4.4166E+01	2.4169E+01	6.1765E+06	
.	5.3500E+02	1.7336E+01	-3.9563E+01	2.1650E+01	5.5328E+06	
.	4.2500E+02	1.4742E+01	-3.3645E+01	1.8411E+01	4.7052E+06	
.	3.1500E+02	1.1573E+01	-2.6412E+01	1.4453E+01	3.6936E+06	
.	3.1000E+02	1.1415E+01	-2.6052E+01	1.4256E+01	3.6433E+06	
.	2.1000E+02	7.9992E+00	-1.8381E+01	1.0009E+01	2.5565E+06	
.	2.0000E+02	7.6386E+00	-1.7639E+01	9.5717E+00	2.4394E+06	
.	1.1000E+02	4.1112E+00	-9.5261E+00	5.1567E+00	1.3177E+06	
.	1.0000E+02	3.6968E+00	-8.5699E+00	4.6375E+00	1.1854E+06	

.| CRACKING VERIFICATION Exposure Class XD3

.| Decompression: COMPRESSED SECTION LEVEL (Respect bottom)

.	DISTANCE	TRANSPORT	MOMENT FINAL	
.	LEVEL SUP.	LEVEL INF.	LEVEL SUP.	LEVEL INF.
.	975.00	95.00	0.00	95.00 11.51
.	865.00	95.00	0.00	95.00 10.02
.	755.00	95.00	0.00	95.00 4.90
.	645.00	95.00	0.00	95.00 0.00
.	535.00	95.00	0.00	95.00 0.00
.	425.00	95.00	0.00	95.00 0.00

.	315.00	95.00	0.00	95.00	0.00
.	310.00	95.00	0.00	95.00	0.00
.	210.00	92.71	0.00	95.00	0.00
.	200.00	94.27	0.00	95.00	0.00
.	110.00	88.52	0.00	95.00	0.00
.	100.00	87.95	0.00	95.00	0.00

. PRESTRESSING STEEL MUST REMAIN FOR 2.5 cm
. INSIDE COMPRESSED ZONE
. SATISFIED VERIFICATION

VERIFICATION		STRESS		BARS		FOR		CRACKING	
		TRANSPORT				MOMENT		FINAL	
DISTANCE	BORDER	AREA	AREA	STRESS	LEMBO	AREA	AREA	STRESS	
DISTANCE		MIN.	EFFECT.			MIN.	EFFECT.		
.	975.00	SEC.COMPRESSED				SEC.COMPRESSED			
.	865.00	SEC.COMPRESSED				SEC.COMPRESSED			
.	755.00	SEC.COMPRESSED				SEC.COMPRESSED			
.	645.00	SEC.COMPRESSED				SEC.COMPRESSED			
.	535.00	SEC.COMPRESSED				SEC.COMPRESSED			
.	425.00	SEC.COMPRESSED				SEC.COMPRESSED			
.	315.00	SEC.COMPRESSED				SEC.COMPRESSED			
.	310.00	SEC.COMPRESSED				SEC.COMPRESSED			
.	210.00	SUP.	0.60	1.49	1970.06	SEC.COMPRESSED			
.	200.00	SUP.	0.24	0.58	1996.21	SEC.COMPRESSED			
.	110.00	SUP.	1.81	4.52	1947.02	SEC.COMPRESSED			
.	100.00	SUP.	2.03	5.07	1939.55	SEC.COMPRESSED			

. see Table 4.11 and 4.12 point 4.4.2.3 EC2

PRESTRESSING			STEEL			
DISTANCE	MOMENT	INITIAL	RARE	LOAD	CONDITION	
	STRESS var.	bar.Strands	STRESS var.	bar.Str.	Dbi Str.	N.Str.
.	975.00	13391.28	95.56	11254.87	28.24	17
.	865.00	13389.12	95.87	11241.01	29.47	17
.	755.00	13381.06	97.04	11198.24	33.13	17
.	645.00	13367.07	99.06	11126.57	39.24	17
.	535.00	13347.17	101.95	11026.00	47.78	17
.	425.00	13321.35	105.68	10896.53	58.76	17
.	315.00	13289.62	110.28	10738.15	72.19	17
.	310.00	13288.03	110.51	10730.27	72.86	17
.	210.00	13349.20	99.90	10892.51	73.09	15
.	200.00	13442.83	84.67	11215.86	60.08	13
.	110.00	13405.45	89.87	11032.57	75.23	13
.	100.00	13401.05	90.48	11010.97	77.01	13

PRESTRESSING LOSSES						
DISTANCE	Immediate	shrinkage	creep	relaxation	Comb.tot.	Loads
975.00	300.09	816.42	1229.30	163.94	2190.37	372.37
865.00	300.09	816.42	1240.46	163.94	2201.42	366.78
755.00	300.09	816.42	1273.70	163.94	2234.38	351.42
645.00	300.09	816.42	1329.04	163.94	2289.23	326.27
535.00	300.09	816.42	1406.47	163.94	2365.98	291.35
425.00	300.09	816.42	1505.98	163.94	2464.63	246.66
315.00	300.09	816.42	1627.59	163.94	2585.18	192.18
310.00	300.09	816.42	1633.64	163.94	2591.18	189.48
210.00	300.09	816.42	1523.53	163.94	2484.58	131.91
200.00	300.09	816.42	1290.39	163.94	2255.55	126.38
110.00	300.09	816.42	1428.16	163.94	2392.40	65.42
100.00	300.09	816.42	1444.40	163.94	2408.53	58.23

BOW HEIGHT					
MOMENT INITIAL			MOMENT FINAL		
self-weight	prestress	TOTAL	PERM.+s-weight	VARIABLE	TOTAL
-1.0789E+00	2.3963E+00	1.3174E+00	3.0410E-01	-5.4790E-01	6.0698E-01

Kvisc= 3.797724
Length/Bow Ist.= 7998.205 >=1000 Length/Bow inf.= 2005.649 >=500

*** BENDING ULTIMATE LIMIT STATES

DISTANCE	ELONG%. PRECAST	ELONG%. STRANDS	ELONG%. p.concr.	ELONG%. BARS SUP.	ELONG%. BARS INF.	DIST n-n SUP.BORDER	Mr/Md >1
975.000	0.737	16.551	3.500	0.009	12.235	5.059	1.178
865.000	0.734	16.549	3.500	0.005	12.240	5.037	1.192
755.000	0.725	16.544	3.500	-0.004	12.258	4.972	1.235
645.000	0.713	16.521	3.500	-0.017	12.270	4.886	1.319
535.000	0.717	16.378	3.500	-0.006	12.168	4.955	1.488
425.000	0.696	16.333	3.500	-0.028	12.188	4.807	1.731
315.000	0.686	16.196	3.500	-0.034	12.122	4.765	2.207
310.000	0.684	16.195	3.500	-0.036	12.125	4.753	2.235
210.000	0.678	16.216	3.500	-0.038	12.058	4.737	3.194
200.000	0.676	16.402	3.500	-0.041	12.084	4.716	3.338
110.000	0.667	16.234	3.500	-0.045	11.999	4.687	6.194
100.000	0.665	16.217	3.500	-0.046	11.991	4.680	6.883

Md = 1.4 * Mpp + 1.4 * Mper + 1.5 * Mvar

*** Geometric mechanical properties sections with steel

SEC. dist.	Area	Dist.Bar.	Mom.In.	Mod.Res.	Mod.Res.	Mod.Res.
support	A	Dbi	J n-n	Wi	Ws	Wsc
975.00	6.778E+03	6.606E+01	9.238E+06	1.398E+05	3.192E+05	1.887E+05
865.00	6.778E+03	6.606E+01	9.238E+06	1.398E+05	3.192E+05	1.887E+05
755.00	6.778E+03	6.606E+01	9.238E+06	1.398E+05	3.192E+05	1.887E+05
645.00	6.778E+03	6.606E+01	9.238E+06	1.398E+05	3.192E+05	1.887E+05
535.00	6.778E+03	6.606E+01	9.238E+06	1.398E+05	3.192E+05	1.887E+05
425.00	6.778E+03	6.606E+01	9.238E+06	1.398E+05	3.192E+05	1.887E+05
315.00	6.778E+03	6.606E+01	9.238E+06	1.398E+05	3.192E+05	1.887E+05
310.00	6.778E+03	6.606E+01	9.238E+06	1.398E+05	3.192E+05	1.887E+05
210.00	6.768E+03	6.619E+01	9.206E+06	1.391E+05	3.196E+05	1.886E+05
200.00	6.747E+03	6.629E+01	9.168E+06	1.383E+05	3.194E+05	1.882E+05
110.00	6.766E+03	6.636E+01	9.179E+06	1.383E+05	3.205E+05	1.887E+05
100.00	6.769E+03	6.637E+01	9.180E+06	1.383E+05	3.207E+05	1.888E+05

*** SHEAR ULTIMATE LIMIT STATES

in SUPPORT (simple reinforced concrete)			
.Vsd (shear design) =	52433.53	Vrd1 (concrete)=	13020.32
.Vrd2 (crushing) =	122875.9	SPREAD STIRRUPS =	12.02981
.STIRRUPS TOTAL/ML	=	22.60456	loops place concr/ML = .7080275
.BARS SUPPORT (BENDS+LOOPS) 10.36921 shear from head cm 15			
.STRESS BARS inferior Td/As 1202.303			
.FIRST PRECOMPRESSED SECTION 90 from support			
.Vsd (shear design) =	47517.89	Vrd1 (concrete)=	23039.64
.Vrd2 (crushing) =	134348	TOTAL STIRRUPS/ML	= 7.244972
LOOPS place concr /ML = .9010051			

LENGTH
1750 cm

.T_RCAEC2 ENGISOFT-ing.F.PINARDI-DESENZANO(BS) tel 030-9912152
.DATE (mm-gg-aa) 09-23-2008
..Prestressed concrete members pre-tensioned and bonded
.EUROCODE 2-DESIGN OF STRUCTURES UNI ENV 1992-1-1:
.General rules and rules for buildings Simple support Beam
.STANDARD GIRDERS
.P MAX 2000
.UNIT MEASURE
UNIT FORCE : daN
UNIT LENGTH : cm
. * Exposure Class XD3 *
. 3 - Corrosion induced by chlorides
. Cyclic wet and dry
. * Relative Humidity* 55 %
. Geometric mechanical properties.
.LOAD 1ø PHASE (Cast in place concrete) 6
.LOAD 2ø PHASE (perm.) 8
.LOAD 2ø PHASE (var.) 12
.HEIGHT Cast in place concrete 20
.Charact.Cubic Strength. in place concrete 300
.WIDTH (Cast in place concrete) 120
.DESIGN LENGHT 1720
.EFFECTIVE LENGHT 1750
.SUPERIOR CONVENTIONAL REINFORCING BARS 5
.SUPERIOR BARS DISTANCE FORM SUP. BORDER 5
.INFERIOR CONVENTIONAL REINFORCING BARS 8
.INFERIOR BARS DISTANCE FORM INF. BORDER 6
.CANTILEVER FINAL MOMENT 15
.MAX CANTILEVER TRANSPORT-HOISTING 100
.MAX STRESS BARS CRACKING (1600-4500) 2200
.like previewed by UNI ENV 1992-1-1 table 4.11
.Materials properties
.Rck= 550.00 Rckj= 400.00 Fck= 456.50 Fckj= 332.00
.Fctmf= 46.72 Fctk= 50.62 Fctmi= 37.78 Fctkj= 40.93
.Fyk= 4290.23 Ftk= 5387.73 Fpk= 18629.19 Fp1k= 16665.08
.Jack tension= 14018.27 losses % 1000H = 2.20 losses % 5000H = 2.80
.T_RCAEC2 E-MAIL studio@engisoft.org WEB www.engisoft.org

.T_RCAEC2 ENGISOFT-ing.F.PINARDI-DESENZANO(BS) tel 030-9912152

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TRACING Prestressing steel 0.6" diam.

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. 950+
. 1000+              O 20
. 950+                O 19
. 900+                O 18
. 850+                O 17
. 800+                O 16
. 750+                O 15
. 700+                O 14
. 650+                O 13
. 600+                O 12
. 550+                O 11
. 500+                O 10
. 450+                O 9
. 400+                O 8
. 350+                O 7
. 300+                O 6
. 250+                OOO 5
. 200+                ***** 4
. 150+                **OOOOO** 3
. 100+                OOOOOOOOO 2
. 50+                   1
```

```
.
.                @@@ THEORETICAL BARYCENTRE.....                18.5
.                @@@ EFFECTIVE BARYCENTRE                18.46154
.                @@@ NUMBER OF Prest. steel.....                13
.
.                TOTAL WEIGHT .....DaN..                21272.82
.                UNIT WEIGHT .....DaN/cm                12.1559
.                FILE STRUCTURE.....                bia6395
.                FILE PRETENSION.....                bia63135
```

.T_RCAEC2 ENGISOFT-ing.F.PINARDI-DESENZANO(BS) tel 030-9912152

BENDING verifications

INITIAL MOMENT						
CONCRETE		BARS				
STRESS MAX.=	.6*Fckj=	199.20	.7*Ftk=	3771.41		
DISTANCE	STRESS SUP.	STRESS INF.	STRESS SUP.	STRESS INF.	BARS sup	BENDING
875.00	19.73	85.49	135.29	474.46	0.10	4.494E+06
765.00	19.32	85.98	133.17	476.99	0.10	4.440E+06
655.00	17.78	87.82	125.23	486.46	0.10	4.240E+06
545.00	15.11	91.00	111.46	502.88	0.10	3.892E+06
435.00	11.32	95.53	91.86	526.25	0.10	3.397E+06
325.00	6.39	101.41	66.44	556.57	0.10	2.756E+06
310.00	5.62	102.32	62.49	561.25	0.35	2.657E+06
210.00	3.11	89.60	44.72	490.83	2.22	1.927E+06
200.00	5.72	70.37	53.23	386.68	0.96	1.848E+06
110.00	-0.26	77.62	22.40	424.07	6.31	1.076E+06
100.00	-0.96	78.48	18.76	428.51	7.20	9.846E+05

HOISTING AND TRANSPORT						
CONCRETE		BARS				
STRESS MAX.=	.6*Fckj=	199.20	.7*Ftk=	3771.41		
DISTANCE	STRESS SUP.	STRESS INF.	STRESS SUP.	STRESS INF.	BARS sup	BENDING
875.00	16.93	88.84	120.81	491.73	0.10	4.128E+06
765.00	16.28	89.61	117.46	495.73	0.10	4.044E+06
655.00	14.33	91.94	107.41	507.71	0.10	3.790E+06
545.00	11.08	95.81	90.66	527.68	0.10	3.367E+06
435.00	6.54	101.23	67.21	555.65	0.10	2.775E+06
325.00	0.70	108.21	37.07	591.60	0.10	2.014E+06
310.00	-0.20	109.28	32.42	597.12	0.35	1.897E+06
210.00	-3.70	97.84	9.60	533.34	2.22	1.037E+06
200.00	-1.23	78.85	17.40	430.43	0.96	9.436E+05
110.00	-8.16	87.32	-18.27	474.21	6.31	3.774E+04
100.00	-8.97	88.33	-22.44	479.40	7.20	-6.990E+04

rare load condition = Gk + Qk						
CONCRETE		BARS				
STRESS MAX.=	0.5*Fck=	228.25	.7*Ftk=	3771.41		
DISTANCE	STRESS SUP.	STRESS INF.	STRESS SUP.	STRESS INF.	BARS inf.	MOMENT
875.00	62.38	-9.26	291.54	-23.58	0.10	1.411E+07
765.00	61.15	-7.35	286.27	-15.02	0.10	1.388E+07
655.00	57.47	-1.59	270.43	10.64	0.10	1.319E+07
545.00	51.34	8.00	244.05	53.40	0.10	1.203E+07
435.00	42.79	21.10	207.20	111.78	0.10	1.042E+07
325.00	31.90	37.14	160.05	183.13	0.10	8.339E+06

.	310.00	30.21	39.61	152.74	194.10	0.10	8.020E+06
.	210.00	20.19	43.55	106.57	209.31	0.10	5.673E+06
.	200.00	21.64	28.14	109.35	137.96	0.10	5.418E+06
.	110.00	8.40	48.95	52.40	230.77	0.10	2.945E+06
.	100.00	6.84	51.42	45.69	241.79	0.10	2.651E+06

.| DISTANCE |first PHASE(place concrete+løper.)|

.		STRESS SUP.	STRESS INF.	MOMENT	
.	8.7500E+02	3.9226E+01	4.4105E+01	6.7141E+06	
.	7.6500E+02	3.8379E+01	4.5150E+01	6.6042E+06	
.	6.5500E+02	3.5836E+01	4.8284E+01	6.2747E+06	
.	5.4500E+02	3.1598E+01	5.3507E+01	5.7255E+06	
.	4.3500E+02	2.5702E+01	6.0499E+01	4.9566E+06	
.	3.2500E+02	1.8215E+01	6.8684E+01	3.9680E+06	
.	3.1000E+02	1.7053E+01	6.9944E+01	3.8161E+06	
.	2.1000E+02	1.0903E+01	6.5134E+01	2.6996E+06	
.	2.0000E+02	1.2757E+01	4.8881E+01	2.5779E+06	
.	1.1000E+02	3.5948E+00	6.0221E+01	1.4014E+06	
.	1.0000E+02	2.5164E+00	6.1565E+01	1.2616E+06	

.| DISTANCE |second PHASE (2øper+var.)|

.		STRESS SUP.	STRESS INF.	St.place concr.	MOMENT	
.	8.7500E+02	2.3150E+01	-5.3369E+01	2.8995E+01	7.3960E+06	
.	7.6500E+02	2.2771E+01	-5.2496E+01	2.8520E+01	7.2750E+06	
.	6.5500E+02	2.1635E+01	-4.9876E+01	2.7097E+01	6.9120E+06	
.	5.4500E+02	1.9741E+01	-4.5511E+01	2.4725E+01	6.3070E+06	
.	4.3500E+02	1.7090E+01	-3.9399E+01	2.1405E+01	5.4600E+06	
.	3.2500E+02	1.3681E+01	-3.1541E+01	1.7136E+01	4.3710E+06	
.	3.1000E+02	1.3155E+01	-3.0334E+01	1.6477E+01	4.2038E+06	
.	2.1000E+02	9.2903E+00	-2.1585E+01	1.1662E+01	2.9738E+06	
.	2.0000E+02	8.8822E+00	-2.0737E+01	1.1165E+01	2.8398E+06	
.	1.1000E+02	4.8052E+00	-1.1271E+01	6.0484E+00	1.5438E+06	
.	1.0000E+02	4.3223E+00	-1.0146E+01	5.4418E+00	1.3898E+06	

.| | quasi-permanent load = Gk + Qk * .6 |

.| | CONCRETE |

..|STRESS MAX.= .4 *Fck= 182.6

.	DISTANCE	STRESS SUP.	STRESS INF.	MOMENT	STRANDS APPLIED
.	875.00	56.82	3.54	1.234E+07	13
.	765.00	55.68	5.25	1.213E+07	13
.	655.00	52.28	10.38	1.153E+07	13
.	545.00	46.60	18.92	1.052E+07	13
.	435.00	38.69	30.56	9.106E+06	13
.	325.00	28.61	44.71	7.290E+06	13
.	310.00	27.05	46.89	7.011E+06	13
.	210.00	17.96	48.73	4.960E+06	11
.	200.00	19.51	33.12	4.736E+06	9
.	110.00	7.25	51.65	2.575E+06	9
.	100.00	5.80	53.85	2.318E+06	9


```

-----
.| DISTANCE |first PHASE(place concrete+løper.)|
-----
.|          | STRESS SUP. | STRESS INF. | MOMENT      |
-----
.  8.7500E+02  3.9226E+01  4.4105E+01  6.7141E+06
.  7.6500E+02  3.8379E+01  4.5150E+01  6.6042E+06
.  6.5500E+02  3.5836E+01  4.8284E+01  6.2747E+06
.  5.4500E+02  3.1598E+01  5.3507E+01  5.7255E+06
.  4.3500E+02  2.5702E+01  6.0499E+01  4.9566E+06
.  3.2500E+02  1.8215E+01  6.8684E+01  3.9680E+06
.  3.1000E+02  1.7053E+01  6.9944E+01  3.8161E+06
.  2.1000E+02  1.0903E+01  6.5134E+01  2.6996E+06
.  2.0000E+02  1.2757E+01  4.8881E+01  2.5779E+06
.  1.1000E+02  3.5948E+00  6.0221E+01  1.4014E+06
.  1.0000E+02  2.5164E+00  6.1565E+01  1.2616E+06
.
-----
.| DISTANCE |second PHASE (2øper+var.)|
-----
.|          | STRESS SUP. |STRESS INF|St.place concr.| MOMENT      |
-----
.  8.7500E+02  1.7594E+01 -4.0560E+01  2.2036E+01  5.6210E+06
.  7.6500E+02  1.7306E+01 -3.9897E+01  2.1675E+01  5.5290E+06
.  6.5500E+02  1.6443E+01 -3.7906E+01  2.0594E+01  5.2531E+06
.  5.4500E+02  1.5003E+01 -3.4588E+01  1.8791E+01  4.7933E+06
.  4.3500E+02  1.2988E+01 -2.9943E+01  1.6268E+01  4.1496E+06
.  3.2500E+02  1.0398E+01 -2.3971E+01  1.3023E+01  3.3220E+06
.  3.1000E+02  9.9977E+00 -2.3053E+01  1.2523E+01  3.1949E+06
.  2.1000E+02  7.0606E+00 -1.6404E+01  8.8631E+00  2.2601E+06
.  2.0000E+02  6.7505E+00 -1.5760E+01  8.4856E+00  2.1582E+06
.  1.1000E+02  3.6519E+00 -8.5658E+00  4.5968E+00  1.1733E+06
.  1.0000E+02  3.2850E+00 -7.7110E+00  4.1358E+00  1.0562E+06
.
-----
.| CRACKING VERIFICATION                               Exposure Class   XD3
-----
. Decompression: COMPRESSED SECTION LEVEL (Respect bottom )
-----
.| DISTANCE | TRANSPORT | MOMENT FINAL |
-----
.|          | LEVEL SUP. | LEVEL INF. | LEVEL SUP. | LEVEL INF. |
-----
.  875.00    95.00      0.00         95.00      12.28
.  765.00    95.00      0.00         95.00      10.19
.  655.00    95.00      0.00         95.00       2.56
.  545.00    95.00      0.00         95.00       0.00
.  435.00    95.00      0.00         95.00       0.00
.  325.00    95.00      0.00         95.00       0.00
.  310.00    94.82      0.00         95.00       0.00
.  210.00    91.54      0.00         95.00       0.00
.  200.00    93.54      0.00         95.00       0.00
.  110.00    86.88      0.00         95.00       0.00
.  100.00    86.24      0.00         95.00       0.00
.
.   . PRESTRESSING STEEL MUST REMAIN FOR 2.5 cm
.     INSIDE COMPRESSED ZONE
.     SATIFIED VERIFICATION

```

VERIFICATION		STRESS		BARS		FOR		CRACKING	
		TRANSPORT				MOMENT		FINAL	
DISTANCE	BORDER	AREA	AREA	STRESS	LEMBO	AREA	AREA	STRESS	
DISTANCE		MIN.	EFFECT.			MIN.	EFFECT.		
875.00		SEC.COMPRESSED				SEC.COMPRESSED			
765.00		SEC.COMPRESSED				SEC.COMPRESSED			
655.00		SEC.COMPRESSED				SEC.COMPRESSED			
545.00		SEC.COMPRESSED				SEC.COMPRESSED			
435.00		SEC.COMPRESSED				SEC.COMPRESSED			
325.00		SEC.COMPRESSED				SEC.COMPRESSED			
310.00	SUP.	0.15	0.35	2023.62		SEC.COMPRESSED			
210.00	SUP.	0.90	2.22	1964.89		SEC.COMPRESSED			
200.00	SUP.	0.39	0.96	1980.08		SEC.COMPRESSED			
110.00	SUP.	2.49	6.31	1916.48		SEC.COMPRESSED			
100.00	SUP.	2.81	7.20	1891.81		SEC.COMPRESSED			

see Table 4.11 and 4.12 point 4.4.2.3 EC2

PRESTRESSING			STEEL				
DISTANCE	MOMENT	INITIAL	RARE	LOAD	CONDITION		
	STRESS var.	bar.Strands	STRESS var.	bar.Str.	Dbi Str.	N.Str.	
875.00	13518.73	76.10	11409.66	20.53	18.46	13	
765.00	13516.56	76.43	11408.97	21.82	18.46	13	
655.00	13508.40	77.66	11406.91	25.69	18.46	13	
545.00	13494.27	79.81	11403.48	32.13	18.46	13	
435.00	13474.15	82.86	11364.79	41.14	18.46	13	
325.00	13448.05	86.81	11230.43	52.72	18.46	13	
310.00	13444.03	87.42	11209.77	54.50	18.46	13	
210.00	13513.52	75.64	11387.97	52.42	19.09	11	
200.00	13611.51	59.63	11391.95	38.27	20.00	9	
110.00	13578.40	64.45	11381.19	52.31	20.00	9	
100.00	13574.47	65.02	11379.92	53.98	20.00	9	

PRESTRESSING		LOSSES				
DISTANCE	Immediate	shrinkage	creep	relaxation	Comb.tot.	Loads
875.00	300.09	816.42	979.48	163.94	1946.11	313.09
765.00	300.09	816.42	991.29	163.94	1957.83	307.23
655.00	300.09	816.42	1026.51	163.94	1992.81	291.12
545.00	300.09	816.42	1085.15	163.94	2051.04	264.77
435.00	300.09	816.42	1167.20	163.94	2132.52	228.18
325.00	300.09	816.42	1272.68	163.94	2237.25	181.35
310.00	300.09	816.42	1288.88	163.94	2253.34	174.17
210.00	300.09	816.42	1150.48	163.94	2118.20	122.25
200.00	300.09	816.42	898.70	163.94	1869.93	117.26
110.00	300.09	816.42	1027.07	163.94	1997.68	61.05
100.00	300.09	816.42	1042.32	163.94	2012.85	54.34

```

-----
.|          BOW HEIGHT          |
-----
.|          MOMENT  INITIAL          |          MOMENT  FINAL          |
-----
.| self-weight | prestress | TOTAL.|PERM.+s-weight | VARIABLE | TOTAL |
-----
.
. -6.9653E-01  1.5717E+00  8.7512E-01  2.1644E-01 -3.5501E-01  4.6697E-01
. Kvisc= 3.797724
Length/Bow Ist.= 12629.11  >=1000 Length/Bow inf.= 2487.048  >=500
.
*** BENDING ULTIMATE LIMIT STATES
-----
.| DISTANCE |ELONG%.|ELONG%.|ELONG%. |ELONG%. |ELONG%. |DIST n-n | Mr/Md |
.|          |PRECAST|STRANDS|p.concr.|BARS SUP.|BARS INF.|SUP.BORDER| >1 |
-----
.
.Md = 1.4 * Mpp + 1.4 * Mper + 1.5 * Mvar
.
. 875.000    0.437    17.984    3.500    -0.358    13.710    2.749    1.147
. 765.000    0.435    17.984    3.500    -0.360    13.710    2.737    1.165
. 655.000    0.432    17.970    3.500    -0.362    13.695    2.719    1.226
. 545.000    0.427    17.941    3.500    -0.365    13.664    2.697    1.344
. 435.000    0.427    17.852    3.500    -0.360    13.587    2.711    1.566
. 325.000    0.427    17.698    3.500    -0.355    13.491    2.728    1.975
. 310.000    0.422    17.697    3.500    -0.360    13.500    2.698    2.046
. 210.000    0.422    17.711    3.500    -0.355    13.416    2.717    2.905
. 200.000    0.407    17.811    3.500    -0.376    13.524    2.601    2.993
. 110.000    0.410    17.682    3.500    -0.365    13.386    2.647    5.525
. 100.000    0.410    17.667    3.500    -0.364    13.371    2.651    6.135
.
.
*** Geometric mechanical properties sections with steel
.
.Perimeter 483.789          Equivalent area 20.10116          Min.Width 18
.
.SEC. dist.   Area   Dist.Bar.   Mom.In.   Mod.Res.   Mod.Res.   Mod.Res.
. support     A       Dbi        J n-n     Wi         Ws         Wsc
. 875.00  6.744E+03  6.626E+01  9.182E+06  1.386E+05  3.195E+05  1.884E+05
. 765.00  6.744E+03  6.626E+01  9.182E+06  1.386E+05  3.195E+05  1.884E+05
. 655.00  6.744E+03  6.626E+01  9.182E+06  1.386E+05  3.195E+05  1.884E+05
. 545.00  6.744E+03  6.626E+01  9.182E+06  1.386E+05  3.195E+05  1.884E+05
. 435.00  6.744E+03  6.626E+01  9.182E+06  1.386E+05  3.195E+05  1.884E+05
. 325.00  6.744E+03  6.626E+01  9.182E+06  1.386E+05  3.195E+05  1.884E+05
. 310.00  6.746E+03  6.626E+01  9.183E+06  1.386E+05  3.196E+05  1.884E+05
. 210.00  6.738E+03  6.641E+01  9.150E+06  1.378E+05  3.201E+05  1.883E+05
. 200.00  6.715E+03  6.651E+01  9.108E+06  1.369E+05  3.197E+05  1.878E+05
. 110.00  6.742E+03  6.660E+01  9.123E+06  1.370E+05  3.213E+05  1.885E+05
. 100.00  6.746E+03  6.662E+01  9.125E+06  1.370E+05  3.215E+05  1.886E+05
.
.
*** SHEAR ULTIMATE LIMIT STATES
.
.          in SUPPORT (simple reinforced concrete)
.Vsd (shear design) = 46971.7          Vrd1 (concrete)= 12549.84
.Vrd2 (crushing) = 122875.9          SPREAD STIRRUPS = 8.596736
.STIRRUPS TOTAL/ML = 17.57396          loops place concr/ML = .661589
.

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```
.
.BARS SUPPORT (BENDS+LOOPS)          9.908236 shear from head   cm 15
.STRESS BARS inferior Td/As          1360.296
.
.
.FIRST PRECOMPRESSED SECTION         90                from support
.
.Vsd (shear design) = 42056.06        Vrd1 (concrete)= 18437.62
.Vrd2 (crushing) = 134348             TOTAL STIRRUPS/ML    = 7.033528
  LOOPS place concr /ML = .7873665
.
```