

1.1 INTRODUZIONE

L'intervento in progetto prevede il restauro e la messa in sicurezza delle protezioni laterali del ponte ubicato al km 38+750 della S.P. 306 "Casolana Riolese", in Comune di Palazzuolo sul Senio.

Il presente progetto, meglio descritto nel seguito, prevede la messa in sicurezza delle protezioni laterali del ponte attualmente costituite da parapetti in muratura e la realizzazione di opere di consolidamento e restauro delle strutture portanti in muratura.

La struttura in oggetto è costituita da un ponte ad arco in calcestruzzo con spalle muratura.

Il ponte è collocato fuori dai centri abitati, e sussistono alcune interferenze con alcune reti di sottoservizi che attualmente sono staffate a bordo ponte, su un lato dell'opera d'arte.

2 PRINCIPALI NORMATIVE DI RIFERIMENTO

- Decreto Min. Infrastrutture 14 Gennaio 2008 "Nuove Norme Tecniche per le Costruzioni";
- Circolare Esplicativa n° 617 del 02/02/2009
- Decreto del ministero delle Infrastrutture e dei Trasporti del 21 giugno 2004 n. 2367 "Aggiornamento alle istruzioni tecniche per la progettazione, l'omologazione e l'impiego delle barriere stradali di sicurezza e le prescrizioni tecniche per le prove delle barriere di sicurezza stradale".
- Decreto del Ministero dei Lavori Pubblici del 18 febbraio 1992, n. 223 (G.U. n. 63 del 16/03/1992) "Regolamento recante istruzioni tecniche per la progettazione, l'omologazione e l'impiego delle barriere stradali di sicurezza".
- D.Lg.vo n. 285/1992 e s.m.i. "Nuovo codice della strada"
- D.P.R. n. 495/1992 e s.m.i. "Regolamento di esecuzione e di attuazione del Nuovo Codice della Strada"
- Circolare del Ministero dei Trasporti n. 104862 del 15/11/2007 "Scadenza della validità delle omologazioni delle barriere"

3 RELAZIONE SULLE CARATTERISTICHE, QUALITÀ E DOSATURA DEI MATERIALI

3.1 CONGLOMERATO CEMENTIZIO ARMATO:

3.2 CALCESTRUZZO CLASSE DI RESISTENZA C28/35:

- resistenza caratteristica a compressione a 28 giorni su provini cubici $R_{ck} = 350 daN / cmq$
- resistenza caratteristica a compressione a 28 giorni su provini cilindrici $f_{ck} = 290,50 daN / cmq$
- resistenza media a compressione a 28 giorni su provini cilindrici $f_{cm} = 370,50 daN / cmq$
- modulo elastico istantaneo del calcestruzzo $E_{cm} = 325881 daN / cmq$
- resistenza media a trazione $f_{ctm} = 28,35 daN / cmq$
- resistenza di calcolo a compressione $f_{cd} = 164,62 daN / cmq$

- resistenza di calcolo a trazione $f_{ctd} = 13,23 daN / cmq$
- resistenza tangenziale caratteristica di aderenza $f_{bk} = 44,65 daN / cmq$
- tensione tangenziale di aderenza acciaio-calcestruzzo $f_{bd} = 29,77 daN / cmq$
- classe di esposizione: XF2
- classe di consistenza: S3

Acciaio di tipo B450C:

- resistenza caratteristica di snervamento $f_{yk} \geq 4500 daN / cmq$
- resistenza caratteristica a rottura $f_{tk} \geq 5400 daN / cmq$
- resistenza di calcolo di progetto $f_{yd} = 3913,04 daN / cmq$

Acciaio da carpenteria :

Le caratteristiche del materiale sono le seguenti:

- modulo elastico $E = 210.000 N / mmq$
- densità $\rho = 7850 kg / mc$
- acciaio di tipo S235 con
- tensione caratteristica a snervamento $f_{yk} = 235 N / mmq$
- tensione caratteristica a rottura $f_{tk} = 360 N / mmq$

4 VERIFICA CORDOLO DI FONDAZIONE BARRIERE

4.1 DEFINIZIONE DELLE CARATTERISTICHE FUNZIONALI DELLE BARRIERE

La definizione delle classi minime delle barriere da adottare in progetto é stata operata, secondo quanto previsto dal D.M. LL PP 21.6.2004 in conseguenza della classe funzionale a cui appartiene la strada e della relativa classe di traffico che la impegna.

Per la definizione della classe di traffico che impegna l'asse stradale si fa riferimento alle osservazioni disponibili, dalle quali si desume un TGM bidirezionale >1000 veicoli. La percentuale dei veicoli pesanti rilevata risulta inferiore al 15% e superiore al 5% da cui deriva un tipo di **traffico II** ai sensi del DM. LL PP 21.6.2004.

La SP306, nel tratto in cui é prevista l'installazione delle barriere oggetto di questa relazione, è classificata come *strada di tipo C* ai sensi del D.M. n. 6792 del 5/11/2001.

Definite la classe di traffico e il tipo di strada è possibile determinare le classi minime della barriera da adottare in funzione della sua destinazione, sintetizzate in:

Tipo di strada	Tipo di Traffico	Barriere spartitraffico	Barriere bordo laterale	Barriere di bordo ponte (1)
Strada	II	H2	H1	H2

extraurbana secondaria (C)				
(1) per ponti e viadotti si intendono opere di luce superiore a 10 m; opere di luce minore sono equiparate al bordo laterale				

Tabella 1: classi di barriere prescritte dal D.M. 21.06.2004

Dal momento che l'intervento è finalizzato alla messa in sicurezza del solo tratto in corrispondenza del ponte, si è optato per sistemi di ritenuta da bordo ponte che secondo la tabella devono essere di classe minima H2 di tipo in acciaio. Al fine di consentire un corretto funzionamento delle barriere, il D.M. 21.6.2004 prevede che si estenda la protezione prima e dopo la zona da proteggere con una barriera della medesima classe per uno sviluppo sufficiente a garantire che la barriera funzioni adeguatamente lungo tutto lo sviluppo dell'opera. Il citato D.M. 21.6.2004 prevede che sia posta in opera una barriera di sviluppo almeno pari alla lunghezza di funzionamento (Lf) ponendone circa 2/3 prima del primo punto da proteggere; laddove non risulta possibile estendere il dispositivo di ritenuta oltre le zone da proteggere, per esempio a causa della presenza di un accesso carrabile, si dovranno prevedere degli specifici interventi di adattamento del dispositivo di ritenuta.

Al fine di evitare la realizzazione di cordoli in cemento armato nelle sezioni in sede naturale, il citato D.M. 21.6.2004 ammette il ricorso al cosiddetto "sistema misto" ossia un sistema in cui lo sviluppo minimo di barriere va ottenuto accoppiando la barriera da bordo opera d'arte con una barriera del tipo "da bordo laterale" avendo cura di verificare che la barriera bordo ponte e la barriera da bordo laterale garantiscano la continuità strutturale. Nel caso dei sistemi misti la lunghezza di funzionamento (Lf) della barriera deve essere la maggiore tra quelle dei dispositivi da installare.

Tabella 2: classi di barriere previste nel presente progetto

Tratto	Tipologia	Classe	Lunghezza
SP 306 lato valle	Bordo Ponte + Bordo rilevato	H2	115 m
SP 306 lato monte	Bordo ponte + Bordo rilevato	H2	80 m

Il livello di severità dell'urto deve essere di livello B per il bordo ponte e livello A per il bordo rilevato.

4.2 MODALITÀ DI INSTALLAZIONE DELLE BARRIERE

Ai sensi del D.M. 21.6.2004 le barriere di sicurezza devono essere in generale installate conformemente a quanto previsto nelle prove di crash-test svolte ai sensi delle norme della serie UNI EN 1317.

Allo stato attuale non risulta presente in sommità del muro un cordolo in c.a. su cui installare il dispositivo di ritenuta da bordo opera d'arte; risulta pertanto necessario prevedere la realizzazione di un nuovo cordolo su cui ancorare la barriera di sicurezza stessa.

Per la definizione delle caratteristiche del cordolo si veda di seguito e le tavole grafiche.

4.3 VERIFICA DELLA SEZIONE DEL CORDOLO

L'intervento prevede la realizzazione di nuove barriere di protezione laterali in acciaio-legno di tipo H2 bordo ponte che saranno ancorate su strutture di fondazione costituite da cordoli in cemento armato di sezione 140x70 cm.

Si allegano i risultati riepilogativi del calcolo del cordolo in cemento armato.

DATI**Carichi :**

Ft=	100'000	N	Azione trasversale (5.1.3.10 DM 14/01/2008)
h2=	1	m	Quota dal piano viario
qi=	9	kN/mq	Carico distribuito da ponte (punto 5.1.3.3.5 NTC)
i=	2	m	Fascia di carico distribuito sul cordolo larga 1,5m
Pv=	134'000	N	Peso proprio del veicolo usato nella prova di crash
L=	12	m	Lunghezza veicolo usato nella prova di crash
Qi=	67'000	N	Carico scaricato dai due assi per L=15m
Q1k =	300'000	N	Carico del veicolo Q1k - punto 5.1.3.3.5 (NTC)

Caratteristiche montanti barriera:

fyk=	275	N/mm2	fyk acciaio montanti barriera
W=	61'633	mm3	Modulo resistente sezione palo
ip=	2.25	m	Interasse tra i montanti
it=	17	cm	Interasse longitudinale tra i tirafondi

GeometriaCordolo e muro sottostante:

b=	2.3	m	Larghezza totale del cordolo
h=	0.3	m	Altezza media del codolo
Lc=	40	m	Lunghezza totale del codolo
d=	0.55	m	Distanza esterno muro - baric. cordolo
Db=	15	cm	Distanza centro piastra - sezione di incastro
hcm=	45	cm	Altezza sezione cordolo in corrispondenza del muro
Lsbalzo=	0.6	m	Lunghezza dello sbalzo del cordolo
dd =	43	cm	Altezza utile della sezione di cordolo a sbalzo
Ycordolo=	0.7	m	Larghezza cordolo rialzato ancoraggio piastra
Hcordolo=	0.3	m	Spessore cordolo rialzato ancoraggio piastra
s=	0.6	m	Spessore del muro sottostante

Coefficienti di attrito:

μ terra cls=	0.5
μ muro cls=	0.6

MATERIALI

	Copriferro=	2	cm	
Acciaio		B450C		Tipo di acciaio
	fyk=	450	N/mm2	
	fyd=	391.30	N/mm2	cfr 4.1.2.1.1.3 NTC

Staffe

Diametro =	14	mm	
passo =	20	cm	
n. bracci staffe =	2		
Asw=	1.54	cmq	Area del diametro staffe scelto

Ferri longitudinali

Diametro	16	mm	
n.	18		(su tutto il cordolo)
Asl=	36.19	cmq	

Calcestruzzo

Rck=	35	N/mmq	
fck =	28	N/mmq	resistenza cilindrica
fcd =	15.87	N/mmq	4.1.2.1.1.1 NTC
f'cd =	7.93	N/mmq	4.1.2.1.4 e 4.1.2.3.2 NTC

VERIFICA 1		RIBALTAMENTO - URTO SU BARRIERA
b=	2.30 m	Larghezza del cordolo
h=	0.30 m	Altezza media del codolo
Lc=	40.00 m	Lunghezza totale del tratto di cordolo
P=	690'000 N	Peso cordolo sul baricentro
d=	0.55 m	Distanza cima muro dal baricentro cordolo
Ft=	100'000 N	Azione trasversale
h2=	1.00 m	Quota misurata dal piano viario
Mrib 1 =	130'000 Nm	Momento Ribaltante
Mstab =	379'500 Nm	Momento stabilizzante
γ_F =	1.5	punto 2.6.1 NTC
Verifica EQU		
Mstab / (1,5 Mrib) > 1	1.95 >1	Verificato

VERIFICA 2		RIBALTAMENTO - VEICOLO IN SVIO
b=	2.3 m	Larghezza del cordolo
h=	0.3 m	Altezza media del codolo
Lc=	40 m	Lunghezza totale tratto di cordolo
P=	690'000 N	Peso cordolo sul baricentro
d=	0.55 m	Distanza esterno muro - baric. cordolo
Pv=	134'000 N	Peso proprio del veicolo usato nella prova di crash
Q1k=	300'000 N	Carico del veicolo punto 5.1.3.3.5 (NTC)
Lsbalzo=	0.6 m	Distanza dello sbalzo dall'esterno del muro
Mrib (Pv)=	80'400 Nm	Momento Ribaltante
Mrib (Q1k)=	180'000 Nm	Momento Ribaltante
Mstab=	379'500 Nm	Momento stabilizzante
γ_F =	1.5	punto 2.6.1 NTC
Mstab / (1,5 Mrib) > 1 [Pv] =	3.147 >1	Verificato
Mstab / (1,5 Mrib) > 1 [Q1k] =	1.406 >1	Verificato

VERIFICA 3		TORSIONE E TAGLIO - URTO SU BARRIERA
Calcolo Sollecitazioni		Centro di riduzione baricentro cordolo
<u>Componente n.1</u>	[F urto (sx)]	
Ft=	100'000.00 N	Azione trasversale
h2=	1 m	Quota dal piano viario
h=	0.3 m	Altezza media del codolo
Mft=	115'000'000.00 Nmm	Momento (Ft*h2)
fyk=	275 N/mm2	fyk acciaio montanti barriera
W=	61'633.00 mm3	Modulo resistente sezione palo
Mpal=	16'949'075.00 Nmm	Momento di plasticizzazione del palo (fyk*W)
N paletti=	7	Num paletti interessati (M/Mpal)
Ftp=	14'285.71 N	Confermato da crash-test
		Forza sul singolo palo (Ft/Npaletti)
Mapplicato=	16'428.57 Nm	Momento trasmesso al cordolo da 1 palo (Ftp*(h2+hcordolo/2))
<u>Componente n.2</u>		[Peso cordolo (dx)]
b=	2.3 m	Larghezza del cordolo

h=	0.3	m	Altezza media del codolo
ip=	2.25	m	Interasse tra i montanti
L=	15.75	m	Lunghezza di cordolo coinvolto (conferma da crash test L=12.40)
Pp=	200'812.50	N	Peso cordolo sul baricentro G del cordolo
d=	0.55	m	Distanza esterno muro - baricentro cordolo
Mpp=	110'446.88	Nm	Momento da P cordolo su cima muro (rispetto a G del cordolo)
<u>Componente n.3</u>			[Attrito (sx)]
μ terra cls=	0.5		
Matt=	15'060.94	Nm	Momento forza attrito terreno-cordolo rispetto a G del cordolo

M TOT=	30'658.75	Nm	Momento torcente sollecitante
T TOT=	100'000.00	N	Taglio sollecitante

VERIFICA A TORSIONE

Dati geometrici

h=	30	cm	Altezza della sezione del cordolo
bw=	230	cm	Base della sezione del cordolo
2 x Copriferro=	4	cm	
Hu=	228	cm	Altezza utile x taglio orizzontale
d=	26	cm	Altezza utile
Ycordolo=	70	cm	largh. sez cordolo rialzato ancoraggio piastra
Ycordolo-copriferro=	68	cm	altezza utile a taglio
Hcordolo=	30	cm	Spess. sez cordolo rialzato ancoraggio piastra
Hutile cordolo=	28	cm	h utile cordolo rialzato ancoraggio piastra

Dati Cls

b=	230	cm	Larghezza del cordolo
h=	30	cm	Altezza media del codolo
Ac=	6'900	cmq	area cls
u=	520	cm	perimetro
t=	13.27	cm	spessore teorico sezione cava
$t > 2 (h-d)$	OK		verifica valore di t
$A = (b-t)(h-t) =$	3'626	cmq	
$um = 2[(b-t)+(h-t)] =$	466.92	cm	perimetro medio nucleo resistente
fcd =	15.87	N/mm ²	4.1.2.1.1 NTC
f'cd =	7.93	N/mm ²	4.1.2.1.4 NTC

Dati Armatura

Acciaio	B450C	
fyk=	450	N/mm ²
fyd=	391.30	N/mm ²

Staffe

Diametro	14	mm	
passo	20	cm	
Asw=	1.54	cmq	Area del diametro staffe scelto
Asw xb =	3.08	cmq	Area staffe x taglio (considerando il n.bracci)
as=	7.70	cmq/m	

Ferri longitudinali

Diametro	16	mm
n.	18	

Asl=	36.19 cmq	Area ferri longitudinali
al =	7.75 cmq/m	
cotg Teta =	1.00	valore calcolato sulla base dell'armatura disposta
inf cotg(teta) =	0.4	limite inferiore
sup cotg(teta) =	2.5	limite superiore
cotg(teta=45°) =	1	45°
Teta =	44.90 °	inclinazione bielle
0,4 ≤ cotg(teta) ≤ 2,5	OK	verifica cotg(teta)

VeriFiche per vari cotg(teta)

Teta calcolato		
TRcd =	382.38 kNm	resistenza biella in cls
TRsd =	219.19 kNm	resistenza staffe
TRld =	220.73 kNm	resistenza armature longitud.
<i>inf cotg(teta)</i>		
TRcd =	218.12 kNm	resistenza biella in cls
TRsd =	87.37 kNm	resistenza staffe
TRld =	87.98 kNm	resistenza armature longitud.
<i>sup cotg(teta)</i>		
TRcd =	545.31 kNm	resistenza biella in cls
TRsd =	546.06 kNm	resistenza staffe
TRld =	549.89 kNm	resistenza armature longitud.
<i>cotg(teta=45°)</i>		
TRcd =	381.71 kNm	resistenza biella in cls
TRsd =	218.42 kNm	resistenza staffe
TRld =	219.96 kNm	resistenza armature longitud.
T'sdu=	30.65875 kNm	
γ _f =	1.5	punto 2.6.1 NTC

Tsdu=	45.99 kNm	Torsione sollecitante
Trdu=	219.19 kNm	Torsione resistente
ctg(teta)	1.00	Derivante da calcolo armature
Tsdu/Trdu	0.21 <1	
Tsdu<Trdu	Verificato	Verifica a sola torsione

VERIFICA A TAGLIO

alfa =	90	inclinazione staffe
ctg(alfa)=	0	
alfa c =	1	(cfr. 4.1.2.1.3.2 NTC)

Taglio-trazione

ctg (teta)	1.00	cfr. 4.1.2.1.3.2 NTC
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V _{Rsd} =	1240.39 kN	Resistenza a taglio-trazione (lato armatura)
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Taglio-compressione

V _{Rcd} =	2441.87 kN	Resistenza a taglio-compressione (lato CLS)
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Taglio-trazione

inf ctg(teta) =	1.00	
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V _{Rsd} =	1236.06 kN	Resistenza a taglio-trazione (lato armatura) per ctg(teta)=1
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Taglio-compressione

V _{Rcd} =	2433.33 kN	Resistenza a taglio-compressione (lato CLS)
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Taglio-trazione

sup ctg(teta) = 2.50

$V_{Rsd} =$ 3090.14 kN Resistenza a taglio-trazione (lato armatura)
per ctg(teta)=2,5

Taglio-compressione

$V_{Rcd} =$ 6083.33 kN Resistenza a taglio-compressione (lato CLS)

$V_{Rsd} =$ 1236.06 kN Resistenza a taglio-trazione (lato armatura)

$V_{Rsd} =$ 2433.33 kN Resistenza a taglio-compressione (lato cls)

VERIFICA A TORSIONE E TAGLIO

Tsdu=	45.99 kNm	Torsione sollecitante
Trdu=	219.19 kNm	Torsione resistente
$V'sdu =$	100.00 kN	Taglio sollecitante
$\gamma_f =$	1.50	punto 2.6.1 NTC
Vsdu=	150.00 kN	Taglio sollecitante
Vrdu=	1236.06 kN	Taglio resistente
$(Tsdu/Trdu)$	0.21 <1	
$(Vsdu/Vrsu)$	0.12 <1	
$(Tsdu/Trdu)+(Vsdu/Vrsu)<1$	0.33 <1	Verificato

VERIFICA N.4**TORSIONE E TAGLIO - VEICOLO IN SVIO**

$F_t =$	100'000.00 N	Centro di riduzione baricentro cordolo
$P_v =$	134'000.00 N	Azione trasversale
$L_{sbalzo} =$	0.60 m	Peso proprio del veicolo usato nella prova di crash
$d =$	0.55 m	Lunghezza tratto di cordolo a sbalzo
$M_{ed} =$	154'100.00 Nm	Distanza cima muro da G del cordolo
		Momento torcente dato dal veicolo rispetto a G del cordolo
$b =$	2.30 m	Larghezza del cordolo
$h =$	0.30 m	Altezza media del codolo
$L =$	12.00 m	Lunghezza veicolo
$P_p =$	207'000.00 N	Peso cordolo sul baricentro G del cordolo
$R_v = (P_p + P_v) =$	341'000.00 N	Reazione alla azioni verticali posta sulla cima del muro
$M_{rv} = (M_{rv} \times d) =$	187'550.00 Nm	Momento generato da R_v rispetto a G del cordolo

M TOT=	33'450.00 Nm	Momento torcente per sezione cordolo
T TOT=	100'000.00 N	Taglio applicato alla sezione del cordolo

VERIFICA A TORSIONEDati geometrici

$h =$	30.00 cm	Altezza della sezione del cordolo
$b_w =$	230.00 cm	Base della sezione del cordolo
$2 \times \text{Copriferro} =$	4.00 cm	

Hu=	228.00	cm	Altezza utile x taglio orizzontale
d=	26.00	cm	Altezza utile
Ycordolo=	70.00	cm	Largh. sez cordolo rialzato ancoraggio piastra
Ycordolo-copriferro=	68.00	cm	altezza utile a taglio
Hcordolo=	30.00	cm	Spess.sez cordolo rialzato ancoraggio piastra
Hutile cordolo=	28.00	cm	Hutile cordolo rialzato ancoraggio piastra

Dati Cls

b=	230.00	cm	Larghezza del cordolo
h=	30.00	cm	Altezza media del codolo
Ac=	6900.00	cmq	area cls
u=	520.00	cm	perimetro
t=	13.27	cm	spessore teorico sezione cava
t > 2 (h-d)	OK		verifica valore di t

A =(b-t)(h-t) =	3626.07	cmq	
um = 2[(b-t)+(h-t)] =	466.92	cm	perimetro medio nucleo resistente
fcd =	15.87	N/mm ²	4.1.2.1.1 NTC
f'cd =	7.93	N/mm ²	4.1.2.1.4 NTC

Dati Armatura

Acciaio	B450C	
fyk=	450.00	N/mm ²
fyd=	391.30	N/mm ²

Staffe

Diametro	14.00	mm	
passo	20.00	cm	
Asw=	1.54	cmq	Area del diametro staffe scelto
Asw xb =	3.08	cmq	Area staffe x taglio (considerando il n.bracci)
as=	7.70	cmq/m	

Ferri longitudinali

Diametro	16.00	mm	
n.	18.00		
Asl=	36.19	cmq	Area ferri longitudinali
al =	7.75	cmq/m	
cotg Teta =	1.00		punto 4.1.2.1.4 NTC
inf cotg(teta) =	0.40		(calcolato sulla base dell'armatura disposta)
sup cotg(teta) =	2.50		limite inferiore
cotg(teta=45°) =	1.00		limite superiore
Teta =	44.90	°	45°
0,4 ≤ cotg(teta) ≤ 2,5	OK		inclinazione bielle
			verifica cotg(teta)

Verifiche per vari cotg(teta)

Teta calcolato			
TRcd =	382.38	kNm	resistenza biella in cls
TRsd =	219.19	kNm	resistenza staffe
TRld =	220.73	kNm	resistenza armature longitud.
inf cotg(teta)			
TRcd =	218.12	kNm	resistenza biella in cls
TRsd =	87.37	kNm	resistenza staffe
TRld =	87.98	kNm	resistenza armature longitud.
sup cotg(teta)			
TRcd =	545.31	kNm	resistenza biella in cls

TRsd =	546.06 kNm	resistenza staffe
TRld =	549.89 kNm	resistenza armature longitud.
$\cotg(\theta=45^\circ)$		
TRcd =	381.71 kNm	resistenza biella in cls
TRsd =	218.42 kNm	resistenza staffe
TRld =	219.96 kNm	resistenza armature longitud.
T'sdu=	33.45 kNm	
$\gamma_F=$	1.50	punto 2.6.1 NTC

Tsdu=	50.18 kNm	Torsione sollecitante
Trdu=	219.19 kNm	Torsione resistente
Ctg(θ)	1.00	Derivante da calcolo armature
Tsdu<Trdu	0.23 <1	Verifica a sola torsione
		Verificato

VERIFICA A TAGLIO

alfa =	90.00	angolo inclinazione staffe rispetto ad asse trave
ctg(alfa)=	0.00	
alfa c =	1.00	(cfr. 4.1.2.1.3.2 NTC)

Taglio-trazione

ctg (θ)	1.00	cfr. 4.1.2.1.3.2 NTC
------------------	------	----------------------

$V_{Rsd}=$	1240.39 kN	Resistenza a taglio-trazione (lato armatura)
------------	------------	--

Taglio-compressione

$V_{Rcd}=$	2441.87 kN	Resistenza a taglio-compressione (lato CLS)
------------	------------	---

Taglio-trazione

inf ctg(θ) =	1.00	
-----------------------	------	--

$V_{Rsd}=$	1236.06 kN	Resistenza a taglio-trazione (lato armatura) per ctg(θ)=1
------------	------------	---

Taglio-compressione

$V_{Rcd}=$	2433.33 kN	Resistenza a taglio-compressione (lato CLS)
------------	------------	---

Taglio-trazione

sup ctg(θ) =	2.50	
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$V_{Rsd}=$	3090.14 kN	Resistenza taglio-trazione (lato armatura) per ctg(θ)=2,5
------------	------------	---

Taglio-compressione

$V_{Rcd}=$	6083.33 kN	Resistenza a taglio-compressione (lato CLS)
------------	------------	---

$V_{Rsd}=$	1236.06 kN	Resistenza a taglio-trazione (lato armatura)
------------	------------	--

$V_{Rsd}=$	2433.33 kN	Resistenza a taglio-compressione (lato cls)
------------	------------	---

VERIFICA A TORSIONE E TAGLIO

Tsdu=	50.18 kNm	Torsione sollecitante
Trdu=	219.19 kNm	Torsione resistente
V'sdu=	100.00 kN	Taglio sollecitante
$\gamma_F=$	1.50	punto 2.6.1 NTC
Vsdu=	150.00 kN	Taglio sollecitante

Vrdu=	1236.06	kN	Taglio resistente
(T _{sdu} /T _{rdu})	0.23	<1	Torsione
(V _{sdu} /V _{rsu})	0.12	<1	Taglio
(T_{sdu}/T_{rdu})+(V_{sdu}/V_{rsu})<1	0.35	<1	Verificato

VERIFICA 5	FLESSIONE E TAGLIO - URTO SU BARRIERA
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Db=	15.00	cm	D ancoraggio barriera - sezione di incastro
it=	17.00	cm	Interasse longitudinale tra i tirafondi
b=	47.00	cm	Largh. sezione diffus. a 45°
h=	45.00	cm	H cordolo in corrispondenza della testa del muro
M _{pal} =	16949.08	Nm	Momento di plasticizzazione del palo (f _{yk} x W)
L _{sbalzo} =	0.60	m	Lunghezza cordolo a sbalzo
P _p =	3172.50	N	Peso proprio del cordolo a sbalzo
M _{pp} =	951.75	Nm	Momento peso proprio cordolo a sbalzo
T_{pp}=	3172.50	N	Taglio all'incastro
M _{taglio} =	475.88	Nm	Incremento del momento dovuto al taglio
M_{inc}=	18376.70	Nm	Momento totale agente sulla sezione di incastro

Segue verifica Allegato A

VERIFICA 6	SUPPORTO - URTO SU BARRIERA
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Momento

h=	0.3	m	Altezza media del cordolo
F _t =	100000	N	Azione trasversale
h ₂ =	1	m	Quota misurata dal piano viario
M _{ft} =	130000	Nm	Momento generato dall'urto
γ _f =	1.5		punto 2.6.1 NTC
M_{ft}=	195'000	Nm	Momento generato dall'urto

Carichi verticali

L=	15.75	m	Lunghezza tratto di cordolo coinvolta
s=	0.6	m	Spessore muro sottostante
P _v =	134000	N	Peso del veicolo usato nella prova di crash
Q _{1k} =	300000	N	Carico scaricato dai due assi per L=15m
q _i =	9	kN/m ²	Carico distribuito da ponte (punto 5.1.3.3.5 NTC)
L _c =	40	m	Lunghezza totale del cordolo
L _{distribuito} =	25	m	Lunghezza cordolo soggetta al carico distribuito q _i
i=	1.5	m	Fascia di carico (vedi 5.1.3.3.5 NTC)
P _{qi} =	212625	N	Carico originato dal carico distribuito
b=	2.3	m	Larghezza totale del cordolo
h=	0.3	m	Altezza media cordolo
P _p =	690000	N	Peso proprio del cordolo

Con P_v

N= (P _v +P _{qi} +P _p) =	1036625.00	N	Sforzo normale totale
M=	195000.00	Nm	Momento totale

$e =$	0.19 m	eccentricità
$x =$	0.34 m	asse neutro
$h/6 =$	0.10 m	bordo del terzo medio
$f_m \text{ tot } (Q1k+Pqi+Pp) \text{ min} =$	0.000 N/mmq	tensione massima sul muro
$f_m \text{ tot } (Q1k+Pqi+Pp) \text{ max} =$	0.392 N/mmq	tensione massima sul muro

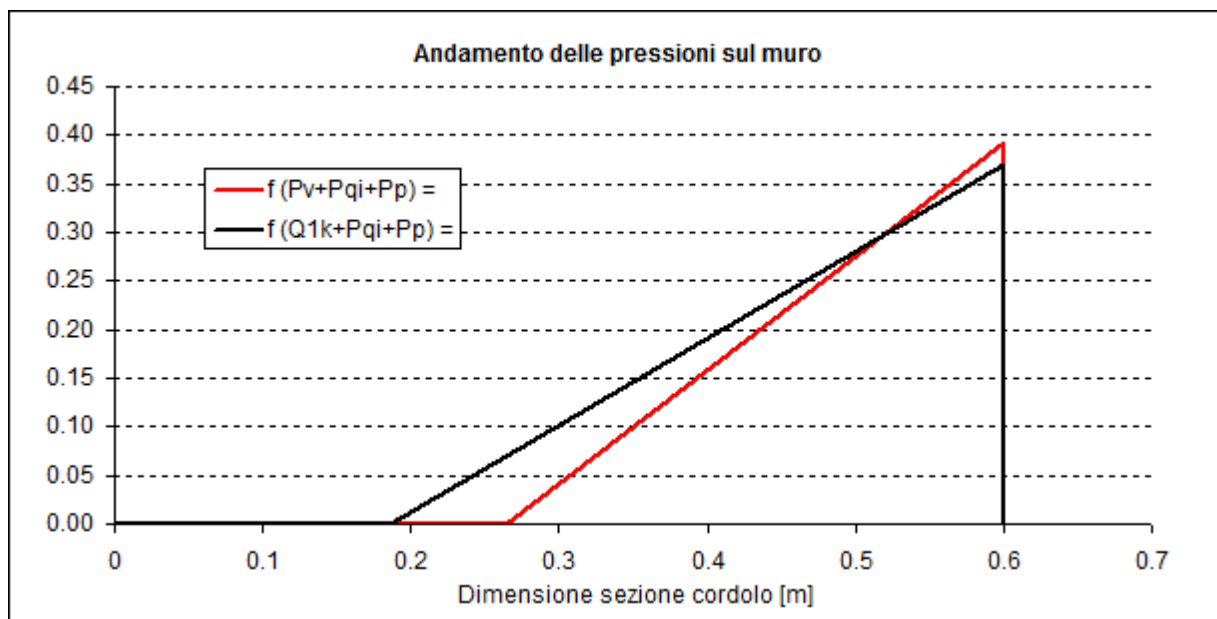
Con Q1k

$N = (Q1k+Pqi+Pp) =$	1202625.00 N	Sforzo normale totale
$M =$	195000.00 Nm	Momento totale
$e =$	0.16 m	eccentricità
$x =$	0.41 m	asse neutro
$h/6 =$	0.1 m	bordo del terzo medio
$f_m \text{ tot } (Q1k+Pqi+Pp) \text{ min} =$	0.000 N/mmq	tensione minima sul muro
$f_m \text{ tot } (Q1k+Pqi+Pp) \text{ max} =$	0.369 N/mmq	tensione massima sul muro

Resistenza

$f_{bk} =$	7.5 N/mmq	resistenza elemento della muratura
	M2,5	tipo di malta
$f_k =$	3.5	(tab. 11.10.VI par. 11.10.3.1.2 NTC)
$\gamma_m =$	2.5	(tab. 4.4.II par. 4.5.6.1. NTC)
$f_d =$	1.40 N/mmq	(vedi 4.5.6.1. NTC)

$f_d > f_m \text{ tot } (Pv+Pqi+Pp) =$	3.57 (= $f_d / f_m \text{ tot}$)	Verificato
$f_d > f_m \text{ tot } (Q1k+Pqi+Pp) =$	3.79 (= $f_d / f_m \text{ tot}$)	Verificato

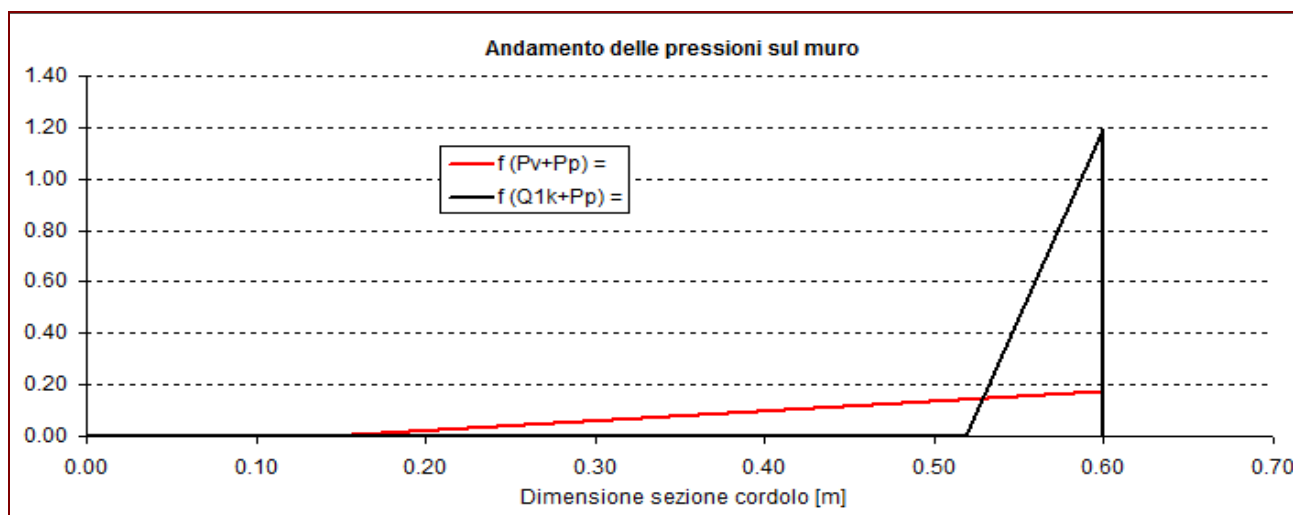


VERIFICA 7

SUPPORTO - VEICOLO IN SVIO

$P_v =$	134000 N	Peso proprio del veicolo usato nella prova di crash
$Q1k =$	300000 N	Carico scaricato dai due assi per $L=15m$
$L_{sbalzo} =$	0.6 m	Distanza dello sbalzo da esterno muro
$M(P_v \times L_{sbalzo}) =$	80400 Nm	Momento dal veicolo in svio sulla cima del cordolo
$M(Q1k \times L_{sbalzo}) =$	180000 Nm	Momento dal veicolo in svio sulla cima del cordolo
$\gamma_F =$	1.5	punto 2.6.1 NTC

M (Pv x Lsbalzo) =	120'600 Nm	Momento veicolo in svio testa cordolo
M (Q1k x Lsbalzo) =	270'000 Nm	Momento veicolo in svio testa cordolo
Lc=	40 m	Lunghezza totale tratto di cordolo
L=	15.75 m	Lunghezza tratto di cordolo coinvolta
i =	2.25 m	Interasse montanti
L=	20.25 m	Lunghezza tratto di cordolo coinvolta
s=	0.6 m	Spessore del muro sottostante
b=	2.3 m	Larghezza cordolo
h=	0.3 m	Altezza cordolo
Pp=	690000 N	Peso proprio del cordolo
Con Pv		
N= (Pv+Pp) =	824000.00 N	Sforzo normale totale
M=	120600.00 Nm	Momento totale
e =	0.15 m	eccentricità
x =	0.46 m	asse neutro
h/6 =	0.1 m	bordo del terzo medio
f_m tot (Q1k+Pp) min =	0.000 N/mmq	tensione minima sul muro
f_m tot (Q1k+Pp) max =	0.177 N/mmq	tensione massima sul muro
Con Q1k		
N= (Q1k+Pp) =	990000.00 N	Sforzo normale totale
M=	270000.00 Nm	Momento totale
e =	0.27 m	eccentricità
x =	0.08 m	asse neutro
h/6 =	0.1 m	bordo del terzo medio
f_m tot (Q1k+Pp) min =	0.00 N/mmq	tensione minima sul muro
f_m tot (Q1k+Pp) max =	1.20 N/mmq	tensione massima sul muro
Resistenza		
fbk =	7.5 N/mmq	resistenza elemento della muratura
	M2,5	tipo di malta
fk =	3.5	(tab. 11.10.VI par. 11.10.3.1.2 NTC)
γ _M =	2.5	
fd =	1.40 N/mmq	(vedi 4.5.6.1. NTC)
fd > f tot (Pv+Pp) =	7.9 (= fd /f_m tot)	Verificato
fd > f tot (Q1k+Pp) =	1.2 (= fd /f_m tot)	Verificato



VERIFICA 8		FLESSIONE E TAGLIO - URTO SU BARRIERA	
		(flessione nel piano orizzontale)	
A)	Tratto interno della barriera: schema Incastro - Incastro		
Ft=	100000	N	Azione trasversale
Geometria Cordolo			
b=	2.3	m	Larghezza del cordolo
h=	0.3	m	Altezza media del codolo
P1m=	17250	N	Peso di un metro di cordolo sul baricentro
μ muro cls=	0.6		
Lct=	9.09	m	Lunghezza tratto di cordolo incastro-incastro
	10	m	Lunghezza adottata per il calcolo
Fa=	103500	N	Forza di attrito
Lunghezza sufficiente a generare attrito uguale all'azione trasversale			
Ti-i=	50000	N	Taglio all'incastro
Mi-i=	125000	Nm	Momento incastro-incastro dato da Ft
Mtaglio=	205000	Nm	Incremento del momento dovuto al taglio
M TOT=	330000	Nm	Momento totale agente
Ttot =	50'000	N	Taglio all'incastro
Mtot =	330'000	Nm	Momento totale agente sulla sezione di incastro

segue verifica – allegato B

VERIFICA A TAGLIO

$F_t=$	100000 N	Azione trasversale
<u>Taglio-trazione</u>		cfr. 4.1.2.1.3.2 NTC
ctg (teta)	1.004	
$V_{Rsd}=$	1240.391 kN	Resistenza a taglio-trazione (lato armatura)
<u>Taglio-compressione</u>		
$V_{Rcd}=$	2441.87 kN	Resistenza a taglio-compressione (lato CLS)
<u>Taglio-trazione</u>		
inf ctg(teta) =	1	
$V_{Rsd}=$	1236.06 kN	Resistenza a taglio-trazione (lato armatura) per ctg(teta)=1

Taglio-compressione

$V_{Rcd} =$ 2433.33 kN Resistenza a taglio-compressione (lato CLS)

Taglio-trazione

$\sup \text{ctg}(\text{teta}) =$ 2.5

$V_{Rsd} =$ 3090.14 kN Resistenza a taglio-trazione (lato armatura)
per $\text{ctg}(\text{teta})=2,5$

Taglio-compressione

$V_{Rcd} =$ 6083.33 kN Resistenza a taglio-compressione (lato CLS)

$V_{Rsd} =$ 1236.06 kN Resistenza a taglio-trazione (lato armatura)

$V_{Rsd} =$ 2433.33 kN Resistenza a taglio-compressione (lato cls)

$V_{sdu} =$ 150.00 kN Taglio sollecitante

$V_{rdu} =$ 1236.06 kN Taglio resistente

$(T_{sdu}/T_{rdu}) + (V_{sdu}/V_{rsu}) < 1$

0.12

Verificato

B) Tratto terminale barriera Schema a sbalzo

$F_t =$ 100000.00 N Azione trasversale
 $b =$ 2.30 m Larghezza del cordolo
 $h =$ 0.30 m Altezza media del codolo
 $P_1 m =$ 17250 N Peso di un metro di cordolo sul baricentro
 $\mu \text{ muro cls} =$ 0.60
 $L_{ct} =$ 9.40 m Lunghezza di cordolo schematizzabile a mensola
 10.00 m Lunghezza adottata per il calcolo
 $F_a =$ 103500 N Forza di attrito (deve essere maggiore di F_t)
Lunghezza sufficiente a generare attrito uguale all'azione trasversale

$F_t =$ 100000.00 N Azione trasversale
 $h_2 =$ 1.00 m Quota dal piano viario
 $h =$ 0.30 m Altezza media del codolo
 $M_{ft} =$ 11500000.00 Nmm Momento ($F_t \cdot h_2$)
 $f_{yk} =$ 275.00 N/mm² f_{yk} acciaio montanti barriera
 $W =$ 61633.00 mm³ Modulo resistente sezione palo
 $M_{pal} =$ 16949075.00 Nmm
 $N \text{ paletti} =$ 7.00 Num paletti interessati (M/M_{pal})
 $i_p =$ 2.25 m Interasse tra i montanti
 $L_p =$ 15.75 m Lunghezza tratto di cordolo coinvolto dai paletti
 $L =$ 15.75 m Lunghezza della mensola [$\max(L_p, L_{ct})$]
 $F_{tp} =$ 14285.71 N Forza sul singolo palo data da $F_t/N_{paletti}$
 $M_i =$ 900000.00 Nm Momento all' incastro (somma M_i paletti)

T tot= 100'000 N **Taglio all'incastro**

M TOT= 900'000 Nm **Momento totale**

segue verifica Allegato C

VERIFICA A TAGLIODati geometrici

$h =$ 30.00 cm Altezza della sezione del cordolo

$bw =$ 230.00 cm Base della sezione del cordolo

2 x Copriferro=	4.00	cm	
Hu=	228.00	cm	Altezza utile x taglio orizzontale
Dati Cls			
b=	230.00	cm	Larghezza del cordolo
h=	30.00	cm	Altezza media del codolo
Ac=	6900.00	cmq	area cls
u=	520.00	cm	perimetro
t=	13.27	cm	spessore teorico sezione cava
A =(b-t)(h-t) =	3626.07	cmq	
um = 2[(b-t)+(h-t)] =	466.92	cm	perimetro medio nucleo resistente
fcd =	15.87	N/mmq	4.1.2.1.1.1 NTC
f'cd =	7.93	N/mmq	4.1.2.1.4 NTC
Dati Armatura			
Acciaio	B450C		
fyk=	450.00	N/mm2	
fyd=	391.30	N/mm2	
<u>Staffe</u>			
Diametro	14.00	mm	
passo	20.00	cm	
Asw=	1.54	cmq	Area del diametro staffe scelto
Asw xb =	3.08	cmq	Area staffe x taglio (considerando il n.bracci)
as=	7.70	cmq/m	
<u>Ferri longitudinali</u>			
Asl=	36.19	cmq	Area ferri longitudinali
al =	7.75	cmq/m	
cotg Teta =	1.00		valore calcolato sulla base dell'armatura disposta
inf cotg(teta) =	0.40		limite inferiore
sup cotg(teta) =	2.50		limite superiore
cotg(teta=45°) =	1.00		45°
Teta =	44.90	°	inclinazione bielle
0,4 ≤ cotg(teta) ≤ 2,5	OK		verifica cotg(teta)
<u>VERIFICA A TAGLIO</u>			
alfa =	90		angolo inclinazione staffe rispetto ad asse trave
ctg(alfa)=	0		
alfa c =	1		(cfr. 4.1.2.1.3.2 NTC)
<u>Taglio-trazione</u>			
ctg (teta)	1.00		cfr. 4.1.2.1.3.2 NTC
V _{Rsd} =	1240.39	kN	Resistenza a taglio-trazione (lato armatura)
<u>Taglio-compressione</u>			
V _{Rcd} =	2441.87	kN	Resistenza a taglio-compressione (lato CLS)
<u>Taglio-trazione</u>			
inf ctg(teta) =	1.00		
V _{Rsd} =	1236.06	kN	Resistenza a taglio-trazione (lato armatura) per ctg(teta)=1
<u>Taglio-compressione</u>			
V _{Rcd} =	2433.33	kN	Resistenza a taglio-compressione (lato CLS)
<u>Taglio-trazione</u>			
sup ctg(teta) =	2.50		

$V_{Rsd} =$	3090.14 kN	Resistenza a taglio-trazione (lato armatura) per $\cotg(\theta) = 2,5$
<u>Taglio-compressione</u>		
$V_{Rcd} =$	6083.33 kN	Resistenza a taglio-compressione (lato CLS)
$V_{Rsd} =$	1236.06 kN	Resistenza a taglio-trazione (lato armatura)
$V_{Rsd} =$	2433.33 kN	Resistenza a taglio-compressione (lato cls)

VERIFICA A TORSIONE E TAGLIO

Vsdu=	100.00 kN	Taglio sollecitante
Vrdu=	1236.06 kN	Taglio resistente
(Tsd/Trdu)+(Vsdu/Vrsu)<1	0.08	Verificato

VERIFICA 9

SCORRIMENTO - UTRO SU BARRIERA

$F_t =$	100000.00 N	Azione trasversale
$b =$	2.30 m	Larghezza del cordolo
$h =$	0.30 m	Altezza media del codolo
$L_c =$	40.00 m	Lunghezza totale del tratto di cordolo
$P =$	690000.00 N	Peso cordolo sul baricentro
$\mu_{\text{terra cls}} =$	0.50	Attrito terra - Cls
$F_{att} =$	345000.00 N	Forza attrito resistente
$\gamma_F =$	1.50	punto 2.6.1 NTC

Fatt/($\gamma_s F_t$) =	2.30 >1	Verificato
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5 ALLEGATO A – VERIFICA N.5

Dati

Nome sezione:sezione

Tipo sezione Rettangolare

Base 40.0 [cm]

Altezza 30.0 [cm]

Caratteristiche geometriche

Area sezione 1200.00 [cmq]

Inerzia in direzione X 160000.0 [cm⁴]

Inerzia in direzione Y 90000.0 [cm⁴]

Inerzia in direzione XY 0.0 [cm⁴]

Ascissa baricentro sezione $X_G = 20.00$ [cm]

Ordinata baricentro sezione $Y_G = 15.00$ [cm]

Elenco ferri

Simbologia adottata

Posizione riferita all'origine

N° numero d'ordine

X Ascissa posizione ferro espresso in [cm]

Y Ordinata posizione ferro espresso in [cm]

d Diametro ferro espresso in [mm]

ω Area del ferro espresso in [cmq]

N°	X	Y	d	ω
1	3.80	3.80	14	1.54
2	3.80	26.20	14	1.54
3	36.20	3.80	14	1.54
4	36.20	26.20	14	1.54

Materiale impiegato : Calcestruzzo armato

Caratteristiche calcestruzzo

Resistenza caratteristica calcestruzzo 250.00 [kg/cmq]

Coeff. omogeneizzazione acciaio/calcestruzzo 15.00

Coeff. omogeneizzazione calcestruzzo teso/compresso 1.00

Forma diagramma tensione-deformazione - PARABOLA-RETTANGOLO

Caratteristiche acciaio per calcestruzzo

Tensione ammissibile acciaio 2600.00 [kg/cmq]

Tensione snervamento acciaio 4400.00 [kg/cmq]

Modulo elastico E 2100000.00 [kg/cmq]

Fattore di incrudimento acciaio 1.00

Combinazioni

Simbologia adottata

N° numero d'ordine della combinazione

N sforzo normale espresso in [N]

e_y eccentricità lungo Y espressa in [cm]

e_x eccentricità lungo X espressa in [cm]
 M_Y momento lungo Y espresso in [Nm]
 M_X momento lungo X espresso in [Nm]
 M_t momento torcente espresso in [Nm]
 T_Y taglio lungo Y espresso in [N]
 T_X taglio lungo X espresso in [N]

N°	N	e_Y	e_X	M_Y	M_X	M_t	T_Y	T_X
1	0.0	0.00	0.00	18377.0	0.0	0.0	3173.0	0.0

Risultati analisi

Combinazione n° 1

Risultati tensioni ammissibili

Caratteristiche asse neutro sezione :

Distanza asse neutro dal lembo più compresso 6.328 [cm]
 Punti di intersezione con perimetro sezione (0.00 ; 23.67) (40.00 ; 23.67)
 Inclinazione asse neutro rispetto all'orizzontale 0.000 [°]

Tensioni :

Tensione massima nel calcestruzzo 54.12 [kg/cmq]
 Tensione minima nel calcestruzzo 0.00 [kg/cmq]
 Tensione tangenziale nel calcestruzzo -0.34 [kg/cmq]
 Tensione massima nel ferro 324.35 [kg/cmq]
 Tensione minima nel ferro -2549.29 [kg/cmq]

Risultati taglio

Simbologia adottata

V_{Rd1} Resistenza di calcolo dell'elemento privo di armatura a taglio

V_{Rd2} Massima forza di taglio di calcolo che può essere sopportata senza rottura delle bielle compresse convenzionali di calcestruzzo

$$V_{Rd1} = 38592.3[N]$$

$$V_{Rd2} = 358149.6[N]$$

Diametro e passo staffe $\phi 10.00 - 20.00$ [cm]

Sollecitazioni ultime

Simbologia adottata

FS Fattore di sicurezza

N_u Sforzo normale ultimo, espresso in [N]

M_{Xu} Momento ultimo in direzione X, espresso in [Nm]

M_{Yu} Momento ultimo in direzione Y, espresso in [Nm]

FS	N_u	M_{Xu}	M_{Yu}
1.55	0.0	0.0	<u>28416.1</u>

Risultati fessurazione

Momento di prima fessurazione $M_X = 0.0$ [Nm] $M_Y = 6688.1$ [Nm]
 Tensione nell'acciaio $\sigma = -927.78$ [kg/cmq]
 Tensione nel calcestruzzo $\sigma_{ct} = -73.68$ [kg/cmq]

Area efficace a trazione	$A_{\text{eff}} = 473.43$	[cmq]
Deformazione media acciaio teso	$\epsilon = 0.1134$	
Distanza media tra le fessure	$S_{\text{rm}} = 208.8420$	[mm]
Ampiezza delle fessure	$w = 0.4024$	[mm]

Dominio 3D

Simbologia adottata

N° numero d'ordine

X_c posizione asse neutro espresso in [cm]

N sforzo normale espresso in [N]

M_x momento lungo X espresso in [Nm]

M_y momento lungo Y espresso in [Nm]

E_c deformazione nel calcestruzzo

E_f deformazione nell'acciaio

N°	X_c	N	M_x	M_y	E_c	E_f
1	-5.31	-231040.6	0.0	0.0	-0.00128	-0.01000
2	-3.67	-231040.6	0.0	0.0	-0.00078	-0.01000
3	-12.34	-231040.6	0.0	0.0	-0.00219	-0.01000
4	-15.94	-231040.6	0.0	0.0	-0.00295	-0.01000
5	-12.50	-231040.6	0.0	0.0	-0.00323	-0.01000
6	-12.50	-231040.6	0.0	0.0	-0.00247	-0.01000
7	-12.50	-231040.6	0.0	0.0	-0.00221	-0.01000
8	-12.50	-231040.6	0.0	0.0	-0.00223	-0.01000
9	-25.00	-231040.6	0.0	0.0	-0.00408	-0.01000
10	-13.52	-231040.6	0.0	0.0	-0.00237	-0.01000
11	-3.79	-231040.6	0.0	0.0	-0.00079	-0.01000
12	-34.78	-231040.6	0.0	0.0	-0.00478	-0.01000
13	-32.50	-231040.6	0.0	0.0	-0.00554	-0.01000
14	-19.48	-231040.6	0.0	0.0	-0.00339	-0.01000
15	-13.00	-231040.6	0.0	0.0	-0.00228	-0.01000
16	-14.06	-231040.6	0.0	0.0	-0.00244	-0.01000
17	-0.68	-192533.9	6238.1	0.0	-0.00018	-0.01000
18	2.29	-192534.3	6281.6	4344.1	0.00055	-0.01000
19	2.66	-192534.1	6280.8	4355.5	0.00064	-0.01000
20	2.56	-192533.9	6284.1	4380.8	0.00072	-0.01000
21	0.58	-192534.5	0.0	4410.6	0.00023	-0.01000
22	2.56	-192534.0	-6284.1	4380.8	0.00072	-0.01000
23	2.66	-192534.6	-6280.7	4355.4	0.00064	-0.01000
24	2.29	-192533.5	-6281.7	4344.2	0.00055	-0.01000
25	-0.68	-192533.1	-6238.2	0.0	-0.00018	-0.01000
26	2.29	-192534.6	-6281.6	-4344.1	0.00055	-0.01000
27	2.66	-192533.7	-6280.9	-4355.5	0.00064	-0.01000
28	2.56	-192533.6	-6284.2	-4380.8	0.00072	-0.01000
29	0.58	-192532.9	0.0	-4410.8	0.00023	-0.01000
30	2.56	-192533.5	6284.2	-4380.8	0.00072	-0.01000
31	2.66	-192533.2	6280.9	-4355.6	0.00064	-0.01000
32	2.29	-192534.0	6281.7	-4344.1	0.00055	-0.01000
33	1.28	-154027.1	12718.0	0.0	0.00037	-0.01000
34	5.30	-154027.8	12855.2	8656.7	0.00139	-0.01000
35	5.85	-154027.1	12725.6	8874.9	0.00153	-0.01000
36	5.17	-154027.9	12520.0	9027.4	0.00157	-0.01000
37	1.56	-154026.7	0.0	9249.6	0.00063	-0.01000
38	5.17	-154028.0	-12519.9	9027.4	0.00157	-0.01000

39	5.85	-154028.0	-12725.4	8874.8	0.00153	-0.01000
40	5.30	-154026.5	-12855.4	8656.9	0.00139	-0.01000
41	1.28	-154027.5	-12717.9	0.0	0.00037	-0.01000
42	5.30	-154027.2	-12855.3	-8656.8	0.00139	-0.01000
43	5.85	-154026.4	-12725.7	-8875.0	0.00153	-0.01000
44	5.17	-154027.3	-12520.1	-9027.4	0.00157	-0.01000
45	1.56	-154027.6	0.0	-9249.5	0.00063	-0.01000
46	5.17	-154027.2	12520.1	-9027.5	0.00157	-0.01000
47	5.85	-154027.8	12725.5	-8874.8	0.00153	-0.01000
48	5.30	-154027.3	12855.3	-8656.8	0.00139	-0.01000
49	2.45	-115519.7	19463.7	0.0	0.00073	-0.01000
50	7.09	-115519.5	19377.8	12164.2	0.00195	-0.01000
51	7.90	-115521.1	18998.8	13222.8	0.00218	-0.01000
52	6.87	-115521.1	18319.1	13629.2	0.00220	-0.01000
53	2.29	-115520.6	0.0	14136.7	0.00096	-0.01000
54	6.87	-115519.4	-18319.3	13629.4	0.00220	-0.01000
55	7.90	-115520.8	-18998.8	13222.8	0.00218	-0.01000
56	7.09	-115520.4	-19377.6	12164.1	0.00195	-0.01000
57	2.45	-115520.3	-19463.6	0.0	0.00073	-0.01000
58	7.09	-115520.6	-19377.6	-12164.1	0.00195	-0.01000
59	7.90	-115520.1	-18998.9	-13222.9	0.00218	-0.01000
60	6.87	-115520.3	-18319.2	-13629.3	0.00220	-0.01000
61	2.29	-115519.7	0.0	-14136.8	0.00096	-0.01000
62	6.87	-115520.2	18319.2	-13629.3	0.00220	-0.01000
63	7.90	-115520.5	18998.9	-13222.9	0.00218	-0.01000
64	7.09	-115520.9	19377.6	-12164.1	0.00195	-0.01000
65	3.38	-77013.8	26173.5	0.0	0.00103	-0.01000
66	8.22	-77013.4	25745.4	13869.3	0.00233	-0.01000
67	9.49	-77014.2	25013.3	17312.0	0.00274	-0.01000
68	8.20	-77013.1	23650.5	18090.6	0.00275	-0.01000
69	2.92	-77014.4	0.0	18979.0	0.00125	-0.01000
70	8.20	-77013.3	-23650.5	18090.5	0.00275	-0.01000
71	9.49	-77013.7	-25013.4	17312.0	0.00274	-0.01000
72	8.22	-77013.1	-25745.4	13869.3	0.00233	-0.01000
73	3.38	-77012.8	-26173.7	0.0	0.00103	-0.01000
74	8.22	-77013.4	-25745.4	-13869.3	0.00233	-0.01000
75	9.49	-77012.9	-25013.5	-17312.1	0.00274	-0.01000
76	8.20	-77014.5	-23650.3	-18090.4	0.00275	-0.01000
77	2.92	-77013.3	0.0	-18979.2	0.00125	-0.01000
78	8.20	-77014.3	23650.3	-18090.4	0.00275	-0.01000
79	9.49	-77013.4	25013.4	-17312.1	0.00274	-0.01000
80	8.22	-77013.7	25745.3	-13869.3	0.00233	-0.01000
81	4.19	-38507.6	32791.7	0.0	0.00131	-0.01000
82	9.22	-38507.5	32010.0	15384.6	0.00269	-0.01000
83	10.83	-38506.2	30770.9	21144.2	0.00325	-0.01000
84	9.32	-38506.5	28548.0	22399.0	0.00324	-0.01000
85	3.48	-38506.3	0.0	23745.6	0.00153	-0.01000
86	9.32	-38506.8	-28548.0	22399.0	0.00324	-0.01000
87	10.83	-38506.8	-30770.8	21144.1	0.00325	-0.01000
88	9.22	-38507.1	-32010.1	15384.6	0.00269	-0.01000
89	4.19	-38506.5	-32791.8	0.0	0.00131	-0.01000
90	9.22	-38505.9	-32010.2	-15384.7	0.00269	-0.01000
91	10.83	-38507.0	-30770.8	-21144.1	0.00325	-0.01000

92	9.32	-38506.8	-28548.0	-22399.0	0.00324	-0.01000
93	3.48	-38507.7	0.0	-23745.4	0.00153	-0.01000
94	9.32	-38506.5	28548.0	-22399.0	0.00324	-0.01000
95	10.83	-38507.5	30770.7	-21144.1	0.00325	-0.01000
96	9.22	-38506.3	32010.2	-15384.7	0.00269	-0.01000
97	4.92	-0.4	39294.8	0.0	0.00157	-0.01000
98	10.12	0.8	38168.4	16681.8	0.00303	-0.01000
99	12.60	0.1	35980.3	24428.2	0.00350	-0.00876
100	10.59	0.4	32747.3	26509.0	0.00350	-0.00908
101	4.01	0.1	0.0	28416.2	0.00181	-0.01000
102	10.59	0.3	-32747.3	26509.0	0.00350	-0.00908
103	12.60	0.4	-35980.3	24428.3	0.00350	-0.00876
104	10.12	-0.5	-38168.2	16681.8	0.00303	-0.01000
105	4.92	0.8	-39295.0	0.0	0.00157	-0.01000
106	10.12	-0.8	-38168.1	-16681.8	0.00303	-0.01000
107	12.60	-0.4	-35980.2	-24428.2	0.00350	-0.00876
108	10.59	-0.5	-32747.2	-26508.9	0.00350	-0.00908
109	4.01	0.0	0.0	-28416.2	0.00181	-0.01000
110	10.59	-0.4	32747.2	-26508.9	0.00350	-0.00908
111	12.60	0.6	35980.3	-24428.3	0.00350	-0.00876
112	10.12	0.5	38168.3	-16681.8	0.00303	-0.01000
113	5.60	37318.1	45470.6	0.0	0.00183	-0.01000
114	10.92	37319.8	44034.8	17704.5	0.00335	-0.01000
115	14.30	37319.2	40595.1	26267.2	0.00350	-0.00730
116	11.91	37319.7	33905.6	30266.7	0.00350	-0.00769
117	4.50	37318.2	0.0	32833.2	0.00208	-0.01000
118	11.91	37319.4	-33905.7	30266.6	0.00350	-0.00769
119	14.30	37319.7	-40595.1	26267.2	0.00350	-0.00730
120	10.92	37318.7	-44034.7	17704.5	0.00335	-0.01000
121	5.60	37319.3	-45470.8	0.0	0.00183	-0.01000
122	10.92	37318.5	-44034.6	-17704.5	0.00335	-0.01000
123	14.30	37318.3	-40595.0	-26267.2	0.00350	-0.00730
124	11.91	37318.1	-33905.7	-30266.5	0.00350	-0.00769
125	4.50	37319.5	0.0	-32833.3	0.00208	-0.01000
126	11.91	37318.3	33905.7	-30266.5	0.00350	-0.00769
127	14.30	37319.0	40595.0	-26267.2	0.00350	-0.00730
128	10.92	37318.2	44034.6	-17704.5	0.00335	-0.01000
129	6.26	74638.1	51504.1	0.0	0.00209	-0.01000
130	11.95	74637.8	49709.9	17148.9	0.00350	-0.00923
131	15.45	74638.7	45351.5	26400.6	0.00350	-0.00650
132	12.89	74638.6	33465.1	33968.0	0.00350	-0.00684
133	4.99	74638.2	0.0	37131.0	0.00235	-0.01000
134	12.89	74638.4	-33465.1	33968.0	0.00350	-0.00684
135	15.45	74638.0	-45351.4	26400.6	0.00350	-0.00650
136	11.95	74638.1	-49709.9	17148.9	0.00350	-0.00923
137	6.26	74637.3	-51504.0	0.0	0.00209	-0.01000
138	11.95	74637.8	-49709.9	-17148.9	0.00350	-0.00923
139	15.45	74637.8	-45351.4	-26400.6	0.00350	-0.00650
140	12.89	74637.0	-33465.1	-33967.9	0.00350	-0.00684
141	4.99	74638.1	0.0	-37131.0	0.00235	-0.01000
142	12.89	74637.3	33465.1	-33967.9	0.00350	-0.00684
143	15.45	74637.3	45351.4	-26400.6	0.00350	-0.00650
144	11.95	74637.6	49709.8	-17148.9	0.00350	-0.00923

145	6.90	111956.7	57384.8	0.0	0.00235	-0.01000
146	13.02	111957.1	55203.0	16371.8	0.00350	-0.00818
147	16.60	111956.6	49831.0	26654.1	0.00350	-0.00580
148	13.86	111956.9	33137.0	37514.3	0.00350	-0.00611
149	5.47	111957.2	0.0	41313.9	0.00264	-0.01000
150	13.86	111956.6	-33137.0	37514.3	0.00350	-0.00611
151	16.60	111957.1	-49831.0	26654.1	0.00350	-0.00580
152	13.02	111957.4	-55203.0	16371.8	0.00350	-0.00818
153	6.90	111957.0	-57384.8	0.0	0.00235	-0.01000
154	13.02	111957.1	-55203.0	-16371.8	0.00350	-0.00818
155	16.60	111956.9	-49831.0	-26654.1	0.00350	-0.00580
156	13.86	111956.6	-33137.0	-37514.3	0.00350	-0.00611
157	5.47	111957.1	0.0	-41313.9	0.00264	-0.01000
158	13.86	111956.9	33137.0	-37514.3	0.00350	-0.00611
159	16.60	111957.5	49831.1	-26654.1	0.00350	-0.00580
160	13.02	111956.8	55202.9	-16371.8	0.00350	-0.00818
161	7.53	149276.0	63119.4	0.0	0.00263	-0.01000
162	14.10	149276.1	60462.9	15631.0	0.00350	-0.00729
163	17.73	149276.0	54029.8	26960.2	0.00350	-0.00521
164	14.82	149276.4	32826.1	40899.1	0.00350	-0.00549
165	5.93	149275.1	0.0	45388.2	0.00293	-0.01000
166	14.82	149276.2	-32826.1	40899.1	0.00350	-0.00549
167	17.73	149275.4	-54029.7	26960.1	0.00350	-0.00521
168	14.10	149275.2	-60462.8	15631.0	0.00350	-0.00729
169	7.53	149275.2	-63119.3	0.0	0.00263	-0.01000
170	14.10	149276.2	-60462.9	-15631.0	0.00350	-0.00729
171	17.73	149276.4	-54029.9	-26960.2	0.00350	-0.00521
172	14.82	149276.1	-32826.1	-40899.1	0.00350	-0.00549
173	5.93	149276.5	0.0	-45388.3	0.00293	-0.01000
174	14.82	149276.4	32826.1	-40899.1	0.00350	-0.00549
175	17.73	149275.8	54029.8	-26960.1	0.00350	-0.00521
176	14.10	149275.9	60462.9	-15631.0	0.00350	-0.00729
177	8.15	186595.1	68716.1	0.0	0.00291	-0.01000
178	15.19	186595.1	65453.1	14934.8	0.00350	-0.00652
179	18.79	186595.4	57506.9	27438.7	0.00350	-0.00472
180	15.76	186595.1	32458.0	44118.9	0.00350	-0.00495
181	6.39	186595.3	0.0	49360.3	0.00323	-0.01000
182	15.76	186594.8	-32458.0	44118.9	0.00350	-0.00495
183	18.79	186594.6	-57506.9	27438.7	0.00350	-0.00472
184	15.19	186594.1	-65452.9	14934.8	0.00350	-0.00652
185	8.15	186594.3	-68715.9	0.0	0.00291	-0.01000
186	15.19	186595.1	-65453.1	-14934.8	0.00350	-0.00652
187	18.79	186595.8	-57506.9	-27438.7	0.00350	-0.00472
188	15.76	186594.8	-32458.0	-44118.9	0.00350	-0.00495
189	6.39	186595.2	0.0	-49360.3	0.00323	-0.01000
190	15.76	186595.1	32458.0	-44118.9	0.00350	-0.00495
191	18.79	186595.1	57506.9	-27438.7	0.00350	-0.00472
192	15.19	186594.8	65453.0	-14934.8	0.00350	-0.00652
193	8.76	223914.4	74182.7	0.0	0.00319	-0.01000
194	16.30	223913.6	70144.7	14286.6	0.00350	-0.00583
195	19.66	223913.7	59261.6	28481.6	0.00350	-0.00436
196	16.68	223914.2	32020.0	47158.2	0.00350	-0.00449
197	6.87	223914.3	0.0	53223.9	0.00350	-0.00986

198	16.68	223913.9	-32020.0	47158.1	0.00350	-0.00449
199	19.66	223914.4	-59261.7	28481.6	0.00350	-0.00436
200	16.30	223913.8	-70144.8	14286.6	0.00350	-0.00583
201	8.76	223913.5	-74182.6	0.0	0.00319	-0.01000
202	16.30	223914.8	-70144.9	-14286.6	0.00350	-0.00583
203	19.66	223914.2	-59261.6	-28481.6	0.00350	-0.00436
204	16.68	223913.9	-32020.0	-47158.1	0.00350	-0.00449
205	6.87	223913.3	0.0	-53223.8	0.00350	-0.00986
206	16.68	223914.1	32020.0	-47158.2	0.00350	-0.00449
207	19.66	223913.5	59261.6	-28481.6	0.00350	-0.00436
208	16.30	223914.5	70144.9	-14286.6	0.00350	-0.00583
209	9.95	261232.5	78862.8	0.0	0.00350	-0.00923
210	17.42	261232.6	74514.7	13687.0	0.00350	-0.00523
211	20.53	261233.2	61001.1	29411.2	0.00350	-0.00402
212	17.46	261232.6	32525.2	48950.5	0.00350	-0.00413
213	7.60	261232.6	0.0	56838.1	0.00350	-0.00857
214	17.46	261232.3	-32525.2	48950.5	0.00350	-0.00413
215	20.53	261233.9	-61001.1	29411.2	0.00350	-0.00402
216	17.42	261232.8	-74514.8	13686.9	0.00350	-0.00523
217	9.95	261232.2	-78862.8	0.0	0.00350	-0.00923
218	17.42	261233.8	-74514.9	-13686.9	0.00350	-0.00523
219	20.53	261232.1	-61001.1	-29411.2	0.00350	-0.00402
220	17.46	261232.3	-32525.2	-48950.5	0.00350	-0.00413
221	7.60	261233.5	0.0	-56838.1	0.00350	-0.00857
222	17.46	261232.6	32525.2	-48950.5	0.00350	-0.00413
223	20.53	261232.9	61001.1	-29411.2	0.00350	-0.00402
224	17.42	261233.5	74514.8	-13686.9	0.00350	-0.00523
225	11.37	298552.6	83016.8	0.0	0.00350	-0.00764
226	18.56	298551.1	78543.6	13134.8	0.00350	-0.00470
227	21.40	298551.4	62704.5	30215.5	0.00350	-0.00372
228	18.20	298551.2	33201.1	50390.3	0.00350	-0.00382
229	8.53	298551.2	0.0	60067.6	0.00350	-0.00725
230	18.20	298552.6	-33201.1	50390.4	0.00350	-0.00382
231	21.40	298552.1	-62704.6	30215.5	0.00350	-0.00372
232	18.56	298551.4	-78543.6	13134.8	0.00350	-0.00470
233	11.37	298552.2	-83016.8	0.0	0.00350	-0.00764
234	18.56	298552.3	-78543.7	-13134.7	0.00350	-0.00470
235	21.40	298551.9	-62704.6	-30215.5	0.00350	-0.00372
236	18.20	298552.6	-33201.1	-50390.4	0.00350	-0.00382
237	8.53	298551.8	0.0	-60067.7	0.00350	-0.00725
238	18.20	298552.9	33201.1	-50390.4	0.00350	-0.00382
239	21.40	298552.7	62704.6	-30215.5	0.00350	-0.00372
240	18.56	298552.0	78543.7	-13134.8	0.00350	-0.00470
241	12.79	335870.8	86729.3	0.0	0.00350	-0.00640
242	19.71	335870.9	82215.5	12627.9	0.00350	-0.00422
243	22.26	335870.6	64344.1	30895.2	0.00350	-0.00344
244	18.96	335871.4	33790.1	51752.1	0.00350	-0.00353
245	9.59	335871.2	0.0	62852.1	0.00350	-0.00606
246	18.96	335871.1	-33790.1	51752.1	0.00350	-0.00353
247	22.26	335871.3	-64344.1	30895.2	0.00350	-0.00344
248	19.71	335871.2	-82215.5	12627.9	0.00350	-0.00422
249	12.79	335870.4	-86729.3	0.0	0.00350	-0.00640
250	19.71	335871.0	-82215.5	-12627.9	0.00350	-0.00422

251	22.26	335871.1	-64344.1	-30895.2	0.00350	-0.00344
252	18.96	335871.1	-33790.1	-51752.1	0.00350	-0.00353
253	9.59	335871.8	0.0	-62852.2	0.00350	-0.00606
254	18.96	335871.4	33790.1	-51752.1	0.00350	-0.00353
255	22.26	335871.9	64344.1	-30895.2	0.00350	-0.00344
256	19.71	335871.9	82215.6	-12627.9	0.00350	-0.00422
257	14.21	373190.8	90000.7	0.0	0.00350	-0.00541
258	20.88	373189.6	85516.8	12163.7	0.00350	-0.00379
259	23.12	373189.8	65877.3	31471.6	0.00350	-0.00318
260	19.72	373190.4	34305.9	53013.2	0.00350	-0.00326
261	10.66	373190.0	0.0	65305.6	0.00350	-0.00510
262	19.72	373190.1	-34305.9	53013.2	0.00350	-0.00326
263	23.12	373190.5	-65877.3	31471.6	0.00350	-0.00318
264	20.88	373189.9	-85516.8	12163.7	0.00350	-0.00379
265	14.21	373190.4	-90000.7	0.0	0.00350	-0.00541
266	20.88	373190.8	-85516.9	-12163.7	0.00350	-0.00379
267	23.12	373190.2	-65877.3	-31471.6	0.00350	-0.00318
268	19.72	373190.1	-34305.9	-53013.2	0.00350	-0.00326
269	10.66	373190.6	0.0	-65305.6	0.00350	-0.00510
270	19.72	373190.4	34305.9	-53013.2	0.00350	-0.00326
271	23.12	373189.5	65877.3	-31471.6	0.00350	-0.00318
272	20.88	373190.5	85516.9	-12163.7	0.00350	-0.00379
273	15.64	410509.0	92830.6	0.0	0.00350	-0.00460
274	22.06	410508.3	88436.4	11739.2	0.00350	-0.00340
275	23.98	410509.0	67267.6	31963.4	0.00350	-0.00294
276	20.49	410509.3	34760.0	54153.8	0.00350	-0.00300
277	11.73	410508.8	0.0	67428.0	0.00350	-0.00432
278	20.49	410509.0	-34760.0	54153.8	0.00350	-0.00300
279	23.98	410508.1	-67267.6	31963.4	0.00350	-0.00294
280	22.06	410508.6	-88436.4	11739.2	0.00350	-0.00340
281	15.64	410508.6	-92830.5	0.0	0.00350	-0.00460
282	22.06	410509.5	-88436.5	-11739.2	0.00350	-0.00340
283	23.98	410509.4	-67267.6	-31963.4	0.00350	-0.00294
284	20.49	410509.0	-34760.0	-54153.8	0.00350	-0.00300
285	11.73	410509.4	0.0	-67428.1	0.00350	-0.00432
286	20.49	410509.3	34760.0	-54153.8	0.00350	-0.00300
287	23.98	410508.7	67267.6	-31963.4	0.00350	-0.00294
288	22.06	410509.2	88436.5	-11739.2	0.00350	-0.00340
289	17.06	447827.1	95219.2	0.0	0.00350	-0.00393
290	23.19	447828.6	90567.8	11566.9	0.00350	-0.00306
291	24.84	447828.1	68484.6	32385.3	0.00350	-0.00272
292	21.27	447827.1	35161.6	55156.0	0.00350	-0.00276
293	12.79	447828.8	0.0	69219.6	0.00350	-0.00367
294	21.27	447828.5	-35161.6	55156.0	0.00350	-0.00276
295	24.84	447827.2	-68484.6	32385.3	0.00350	-0.00272
296	23.19	447827.6	-90567.8	11566.9	0.00350	-0.00306
297	17.06	447828.6	-95219.2	0.0	0.00350	-0.00393
298	23.19	447827.3	-90567.8	-11566.9	0.00350	-0.00306
299	24.84	447828.5	-68484.6	-32385.3	0.00350	-0.00272
300	21.27	447828.5	-35161.6	-55156.0	0.00350	-0.00276
301	12.79	447828.2	0.0	-69219.5	0.00350	-0.00367
302	21.27	447828.8	35161.6	-55156.0	0.00350	-0.00276
303	24.84	447827.8	68484.6	-32385.3	0.00350	-0.00272

304	23.19	447827.0	90567.8	-11566.9	0.00350	-0.00306
305	18.48	485147.2	97166.5	0.0	0.00350	-0.00336
306	24.18	485147.0	91257.5	12032.7	0.00350	-0.00279
307	25.70	485147.4	69502.9	32748.9	0.00350	-0.00251
308	22.06	485146.2	35518.7	56003.9	0.00350	-0.00254
309	13.86	485147.6	0.0	70680.0	0.00350	-0.00312
310	22.06	485147.6	-35518.7	56003.9	0.00350	-0.00254
311	25.70	485146.6	-69502.9	32748.9	0.00350	-0.00251
312	24.18	485147.3	-91257.5	12032.7	0.00350	-0.00279
313	18.48	485146.8	-97166.5	0.0	0.00350	-0.00336
314	24.18	485147.0	-91257.5	-12032.7	0.00350	-0.00279
315	25.70	485147.9	-69502.9	-32748.9	0.00350	-0.00251
316	22.06	485147.6	-35518.7	-56003.9	0.00350	-0.00254
317	13.86	485147.0	0.0	-70680.0	0.00350	-0.00312
318	22.06	485147.9	35518.7	-56003.9	0.00350	-0.00254
319	25.70	485147.2	69502.9	-32748.9	0.00350	-0.00251
320	24.18	485146.7	91257.5	-12032.7	0.00350	-0.00279
321	19.90	522465.3	98672.5	0.0	0.00350	-0.00287
322	25.18	522465.6	91761.6	12469.9	0.00350	-0.00254
323	26.57	522465.7	70300.3	33063.5	0.00350	-0.00231
324	22.86	522465.0	35837.8	56682.9	0.00350	-0.00233
325	14.93	522466.4	0.0	71809.5	0.00350	-0.00264
326	22.86	522466.4	-35837.8	56682.9	0.00350	-0.00233
327	26.57	522466.4	-70300.3	33063.5	0.00350	-0.00231
328	25.18	522466.0	-91761.7	12469.9	0.00350	-0.00254
329	19.90	522466.8	-98672.5	0.0	0.00350	-0.00287
330	25.18	522465.7	-91761.6	-12469.9	0.00350	-0.00254
331	26.57	522466.1	-70300.3	-33063.5	0.00350	-0.00231
332	22.86	522466.4	-35837.8	-56682.9	0.00350	-0.00233
333	14.93	522465.8	0.0	-71809.5	0.00350	-0.00264
334	22.86	522466.6	35837.8	-56682.9	0.00350	-0.00233
335	26.57	522465.4	70300.3	-33063.5	0.00350	-0.00231
336	25.18	522466.7	91761.7	-12470.0	0.00350	-0.00254
337	21.32	559785.4	99737.2	0.0	0.00350	-0.00244
338	26.20	559785.5	92061.1	12880.7	0.00350	-0.00231
339	27.44	559784.8	70857.7	33336.9	0.00350	-0.00213
340	23.67	559785.4	36124.4	57179.9	0.00350	-0.00213
341	15.99	559785.2	0.0	72608.0	0.00350	-0.00223
342	23.67	559785.2	-36124.4	57179.9	0.00350	-0.00213
343	27.44	559785.5	-70857.7	33336.9	0.00350	-0.00213
344	26.20	559785.8	-92061.1	12880.7	0.00350	-0.00231
345	21.32	559785.0	-99737.2	0.0	0.00350	-0.00244
346	26.20	559784.2	-92061.1	-12880.7	0.00350	-0.00231
347	27.44	559785.2	-70857.7	-33336.9	0.00350	-0.00213
348	23.67	559785.1	-36124.4	-57179.9	0.00350	-0.00213
349	15.99	559784.5	0.0	-72608.0	0.00350	-0.00223
350	23.67	559785.4	36124.4	-57179.9	0.00350	-0.00213
351	27.44	559784.5	70857.7	-33336.9	0.00350	-0.00213
352	26.20	559785.2	92061.1	-12880.7	0.00350	-0.00231
353	22.74	597103.5	100360.5	0.0	0.00350	-0.00207
354	27.24	597104.4	92137.9	13266.9	0.00350	-0.00209
355	28.31	597103.5	71158.2	33575.1	0.00350	-0.00196
356	24.48	597104.5	36383.3	57483.0	0.00350	-0.00194

357	17.06	597104.0	0.0	73075.5	0.00350	-0.00188
358	24.48	597104.2	-36383.3	57483.0	0.00350	-0.00194
359	28.31	597104.2	-71158.2	33575.1	0.00350	-0.00196
360	27.24	597104.7	-92137.9	13266.9	0.00350	-0.00209
361	22.74	597103.2	-100360.5	0.0	0.00350	-0.00207
362	27.24	597103.2	-92137.9	-13266.9	0.00350	-0.00209
363	28.31	597104.0	-71158.2	-33575.1	0.00350	-0.00196
364	24.48	597104.2	-36383.3	-57483.0	0.00350	-0.00194
365	17.06	597103.3	0.0	-73075.5	0.00350	-0.00188
366	24.48	597104.5	36383.3	-57483.0	0.00350	-0.00194
367	28.31	597103.3	71158.2	-33575.1	0.00350	-0.00196
368	27.24	597104.2	92137.9	-13266.9	0.00350	-0.00209
369	24.04	634422.2	100014.3	0.0	0.00350	-0.00177
370	28.29	634422.4	91956.5	13643.9	0.00350	-0.00188
371	29.16	634422.6	71059.7	33681.6	0.00350	-0.00180
372	25.27	634422.5	36346.9	57400.2	0.00350	-0.00177
373	17.81	634423.7	0.0	71976.6	0.00350	-0.00165
374	25.27	634422.2	-36346.9	57400.2	0.00350	-0.00177
375	29.16	634423.4	-71059.6	33681.6	0.00350	-0.00180
376	28.29	634422.6	-91956.5	13643.9	0.00350	-0.00188
377	24.04	634423.1	-100014.2	0.0	0.00350	-0.00177
378	28.29	634423.6	-91956.4	-13643.9	0.00350	-0.00188
379	29.16	634423.1	-71059.6	-33681.6	0.00350	-0.00180
380	25.27	634422.2	-36346.9	-57400.2	0.00350	-0.00177
381	17.81	634422.7	0.0	-71976.7	0.00350	-0.00165
382	25.27	634422.5	36346.9	-57400.2	0.00350	-0.00177
383	29.16	634422.3	71059.7	-33681.6	0.00350	-0.00180
384	28.29	634423.3	91956.5	-13643.9	0.00350	-0.00188
385	24.98	671742.3	97876.8	0.0	0.00350	-0.00157
386	29.30	671741.2	90614.3	13711.0	0.00350	-0.00169
387	29.94	671742.3	70177.0	33333.8	0.00350	-0.00166
388	26.00	671742.7	35780.2	56795.5	0.00350	-0.00162
389	18.52	671742.7	0.0	70549.0	0.00350	-0.00145
390	26.00	671742.3	-35780.2	56795.6	0.00350	-0.00162
391	29.94	671741.4	-70177.0	33333.8	0.00350	-0.00166
392	29.30	671741.5	-90614.3	13711.0	0.00350	-0.00169
393	24.98	671741.7	-97876.8	0.0	0.00350	-0.00157
394	29.30	671742.6	-90614.2	-13711.0	0.00350	-0.00169
395	29.94	671741.1	-70177.0	-33333.8	0.00350	-0.00166
396	26.00	671742.3	-35780.2	-56795.6	0.00350	-0.00162
397	18.52	671741.7	0.0	-70549.1	0.00350	-0.00145
398	26.00	671742.6	35780.2	-56795.5	0.00350	-0.00162
399	29.94	671742.0	70177.0	-33333.8	0.00350	-0.00166
400	29.30	671742.3	90614.3	-13711.0	0.00350	-0.00169
401	25.95	709061.1	95637.7	0.0	0.00350	-0.00138
402	30.28	709061.9	88894.4	13593.8	0.00350	-0.00153
403	30.73	709060.7	69130.2	32955.3	0.00350	-0.00153
404	26.73	709061.4	35232.3	56040.3	0.00350	-0.00148
405	19.25	709061.3	0.0	69039.9	0.00350	-0.00126
406	26.73	709061.1	-35232.3	56040.3	0.00350	-0.00148
407	30.73	709061.4	-69130.2	32955.3	0.00350	-0.00153
408	30.28	709060.9	-88894.5	13593.8	0.00350	-0.00153
409	25.95	709060.6	-95637.8	0.0	0.00350	-0.00138

410	30.28	709060.6	-88894.5	-13593.8	0.00350	-0.00153
411	30.73	709061.1	-69130.2	-32955.3	0.00350	-0.00153
412	26.73	709061.1	-35232.3	-56040.3	0.00350	-0.00148
413	19.25	709060.3	0.0	-69039.9	0.00350	-0.00126
414	26.73	709061.4	35232.3	-56040.3	0.00350	-0.00148
415	30.73	709060.4	69130.2	-32955.3	0.00350	-0.00153
416	30.28	709060.3	88894.5	-13593.8	0.00350	-0.00153
417	26.94	746379.7	93278.4	0.0	0.00350	-0.00120
418	31.27	746379.6	86995.7	13482.1	0.00350	-0.00137
419	31.54	746379.5	67921.7	32533.9	0.00350	-0.00140
420	27.48	746380.3	34703.1	55124.8	0.00350	-0.00135
421	19.99	746379.3	0.0	67435.2	0.00350	-0.00109
422	27.48	746380.0	-34703.1	55124.8	0.00350	-0.00135
423	31.54	746380.2	-67921.7	32533.9	0.00350	-0.00140
424	31.27	746379.9	-86995.7	13482.1	0.00350	-0.00137
425	26.94	746380.5	-93278.3	0.0	0.00350	-0.00120
426	31.27	746379.7	-86995.7	-13482.1	0.00350	-0.00137
427	31.54	746380.0	-67921.7	-32533.9	0.00350	-0.00140
428	27.48	746380.0	-34703.1	-55124.8	0.00350	-0.00135
429	19.99	746380.1	0.0	-67435.2	0.00350	-0.00109
430	27.48	746380.3	34703.1	-55124.8	0.00350	-0.00135
431	31.54	746379.2	67921.7	-32533.9	0.00350	-0.00140
432	31.27	746380.7	86995.6	-13482.1	0.00350	-0.00137
433	27.95	783698.9	90780.4	0.0	0.00350	-0.00103
434	32.28	783699.3	84902.7	13375.7	0.00350	-0.00121
435	32.36	783699.0	66552.8	32058.6	0.00350	-0.00127
436	28.24	783699.6	34190.6	54040.6	0.00350	-0.00122
437	20.75	783699.5	0.0	65721.1	0.00350	-0.00092
438	28.24	783699.3	-34190.6	54040.6	0.00350	-0.00122
439	32.36	783698.1	-66552.8	32058.6	0.00350	-0.00127
440	32.28	783699.6	-84902.7	13375.7	0.00350	-0.00121
441	27.95	783699.7	-90780.3	0.0	0.00350	-0.00103
442	32.28	783698.0	-84902.8	-13375.7	0.00350	-0.00121
443	32.36	783699.4	-66552.8	-32058.6	0.00350	-0.00127
444	28.24	783699.3	-34190.6	-54040.6	0.00350	-0.00122
445	20.75	783698.6	0.0	-65721.1	0.00350	-0.00092
446	28.24	783699.6	34190.6	-54040.6	0.00350	-0.00122
447	32.36	783698.7	66552.8	-32058.6	0.00350	-0.00127
448	32.28	783699.0	84902.7	-13375.7	0.00350	-0.00121
449	28.98	821017.3	88126.1	0.0	0.00350	-0.00087
450	33.30	821017.0	82601.2	13274.4	0.00350	-0.00107
451	33.20	821018.1	65024.2	31519.3	0.00350	-0.00115
452	29.00	821017.9	33674.0	52790.8	0.00350	-0.00109
453	21.53	821018.0	0.0	63884.4	0.00350	-0.00076
454	29.00	821017.6	-33674.0	52790.9	0.00350	-0.00109
455	33.20	821017.2	-65024.2	31519.3	0.00350	-0.00115
456	33.30	821017.3	-82601.2	13274.4	0.00350	-0.00107
457	28.98	821018.1	-88126.0	0.0	0.00350	-0.00087
458	33.30	821018.4	-82601.1	-13274.4	0.00350	-0.00107
459	33.20	821018.5	-65024.1	-31519.3	0.00350	-0.00115
460	29.00	821017.6	-33674.0	-52790.9	0.00350	-0.00109
461	21.53	821018.8	0.0	-63884.4	0.00350	-0.00076
462	29.00	821017.9	33674.0	-52790.8	0.00350	-0.00109

463	33.20	821017.8	65024.2	-31519.3	0.00350	-0.00115
464	33.30	821018.1	82601.1	-13274.4	0.00350	-0.00107
465	30.03	858337.7	85298.2	0.0	0.00350	-0.00072
466	34.33	858336.3	80077.2	13177.9	0.00350	-0.00093
467	34.07	858336.4	63335.7	30906.7	0.00350	-0.00103
468	29.78	858337.3	33124.1	51383.7	0.00350	-0.00097
469	22.32	858336.2	0.0	61912.2	0.00350	-0.00061
470	29.78	858337.0	-33124.1	51383.7	0.00350	-0.00097
471	34.07	858337.1	-63335.6	30906.7	0.00350	-0.00103
472	34.33	858336.6	-80077.2	13177.9	0.00350	-0.00093
473	30.03	858337.2	-85298.2	0.0	0.00350	-0.00072
474	34.33	858337.6	-80077.1	-13177.9	0.00350	-0.00093
475	34.07	858336.8	-63335.6	-30906.7	0.00350	-0.00103
476	29.78	858337.0	-33124.1	-51383.7	0.00350	-0.00097
477	22.32	858337.0	0.0	-61912.1	0.00350	-0.00061
478	29.78	858337.3	33124.1	-51383.7	0.00350	-0.00097
479	34.07	858337.7	63335.6	-30906.7	0.00350	-0.00103
480	34.33	858337.3	80077.2	-13177.9	0.00350	-0.00093
481	31.10	895656.3	82280.4	0.0	0.00350	-0.00057
482	35.38	895655.7	77317.8	13085.9	0.00350	-0.00080
483	34.95	895655.3	61486.5	30212.0	0.00350	-0.00092
484	30.58	895656.0	32515.5	49825.7	0.00350	-0.00086
485	23.13	895655.4	0.0	59792.0	0.00350	-0.00046
486	30.58	895655.8	-32515.5	49825.7	0.00350	-0.00086
487	34.95	895656.0	-61486.4	30212.0	0.00350	-0.00092
488	35.38	895656.0	-77317.8	13085.9	0.00350	-0.00080
489	31.10	895655.8	-82280.4	0.0	0.00350	-0.00057
490	35.38	895655.7	-77317.8	-13085.9	0.00350	-0.00080
491	34.95	895655.7	-61486.4	-30212.0	0.00350	-0.00092
492	30.58	895655.7	-32515.5	-49825.7	0.00350	-0.00086
493	23.13	895656.2	0.0	-59792.0	0.00350	-0.00046
494	30.58	895656.0	32515.5	-49825.7	0.00350	-0.00086
495	34.95	895656.5	61486.4	-30212.0	0.00350	-0.00092
496	35.38	895655.4	77317.8	-13085.9	0.00350	-0.00080
497	32.19	932974.9	79056.8	0.0	0.00350	-0.00044
498	36.44	932975.2	74310.5	12998.2	0.00350	-0.00067
499	35.87	932975.2	59475.3	29427.0	0.00350	-0.00081
500	31.40	932974.3	31826.0	48121.9	0.00350	-0.00074
501	23.95	932975.9	0.0	57512.1	0.00350	-0.00033
502	31.40	932975.7	-31826.0	48121.8	0.00350	-0.00074
503	35.87	932974.5	-59475.3	29427.0	0.00350	-0.00081
504	36.44	932975.5	-74310.4	12998.2	0.00350	-0.00067
505	32.19	932974.4	-79056.9	0.0	0.00350	-0.00044
506	36.44	932974.0	-74310.6	-12998.2	0.00350	-0.00067
507	35.87	932975.6	-59475.2	-29427.0	0.00350	-0.00081
508	31.40	932974.1	-31826.0	-48121.9	0.00350	-0.00074
509	23.95	932975.0	0.0	-57512.2	0.00350	-0.00033
510	31.40	932974.3	31826.0	-48121.9	0.00350	-0.00074
511	35.87	932975.0	59475.3	-29427.0	0.00350	-0.00081
512	36.44	932975.0	74310.5	-12998.2	0.00350	-0.00067
513	33.30	970294.6	75612.4	0.0	0.00350	-0.00031
514	37.52	970293.3	71044.7	12913.3	0.00350	-0.00056
515	36.82	970294.0	57300.5	28543.7	0.00350	-0.00069

516	32.24	970294.4	31035.4	46276.1	0.00350	-0.00063
517	24.78	970294.0	0.0	55061.6	0.00350	-0.00020
518	32.24	970294.2	-31035.4	46276.1	0.00350	-0.00063
519	36.82	970293.3	-57300.5	28543.7	0.00350	-0.00069
520	37.52	970293.6	-71044.6	12913.3	0.00350	-0.00056
521	33.30	970294.1	-75612.4	0.0	0.00350	-0.00031
522	37.52	970294.6	-71044.5	-12913.3	0.00350	-0.00056
523	36.82	970294.4	-57300.4	-28543.7	0.00350	-0.00069
524	32.24	970294.1	-31035.4	-46276.1	0.00350	-0.00063
525	24.78	970294.8	0.0	-55061.5	0.00350	-0.00020
526	32.24	970294.4	31035.4	-46276.1	0.00350	-0.00063
527	36.82	970293.8	57300.5	-28543.7	0.00350	-0.00069
528	37.52	970294.3	71044.6	-12913.3	0.00350	-0.00056
529	34.42	1007613.2	71933.0	0.0	0.00350	-0.00018
530	38.61	1007612.4	67528.0	12806.0	0.00350	-0.00044
531	37.80	1007612.0	54960.0	27554.6	0.00350	-0.00059
532	33.12	1007612.1	30125.7	44291.4	0.00350	-0.00052
533	25.63	1007613.2	0.0	52429.6	0.00350	-0.00008
534	33.12	1007613.3	-30125.7	44291.3	0.00350	-0.00052
535	37.80	1007612.6	-54959.9	27554.5	0.00350	-0.00059
536	38.61	1007612.6	-67528.0	12806.0	0.00350	-0.00044
537	34.42	1007612.7	-71933.1	0.0	0.00350	-0.00018
538	38.61	1007613.6	-67527.9	-12805.9	0.00350	-0.00044
539	37.80	1007613.7	-54959.9	-27554.5	0.00350	-0.00059
540	33.12	1007613.3	-30125.7	-44291.3	0.00350	-0.00052
541	25.63	1007612.3	0.0	-52429.6	0.00350	-0.00008
542	33.12	1007613.6	30125.7	-44291.3	0.00350	-0.00052
543	37.80	1007613.1	54959.9	-27554.5	0.00350	-0.00059
544	38.61	1007613.3	67527.9	-12805.9	0.00350	-0.00044
545	35.55	1044932.1	68005.3	0.0	0.00350	-0.00006
546	39.72	1044932.6	63781.5	12635.2	0.00350	-0.00033
547	38.83	1044931.5	52451.3	26452.3	0.00350	-0.00048
548	34.02	1044932.8	29080.3	42170.0	0.00350	-0.00042
549	26.48	1044932.3	0.0	49606.3	0.00350	0.00300
550	34.02	1044932.5	-29080.3	42170.0	0.00350	-0.00042
551	38.83	1044932.0	-52451.2	26452.3	0.00350	-0.00048
552	39.72	1044931.7	-63781.6	12635.2	0.00350	-0.00033
553	35.55	1044931.6	-68005.3	0.0	0.00350	-0.00006
554	39.72	1044931.5	-63781.6	-12635.2	0.00350	-0.00033
555	38.83	1044931.8	-52451.2	-26452.3	0.00350	-0.00048
556	34.02	1044931.0	-29080.4	-42170.1	0.00350	-0.00042
557	26.48	1044931.5	0.0	-49606.4	0.00350	0.00300
558	34.02	1044931.3	29080.4	-42170.1	0.00350	-0.00042
559	38.83	1044932.5	52451.2	-26452.3	0.00350	-0.00048
560	39.72	1044931.2	63781.6	-12635.2	0.00350	-0.00033
561	36.71	1082251.5	63816.4	0.0	0.00350	0.00314
562	40.88	1082251.0	59821.8	12368.5	0.00350	-0.00022
563	39.90	1082251.7	49771.9	25230.1	0.00350	-0.00037
564	34.97	1082251.6	27884.2	39914.0	0.00350	-0.00031
565	27.35	1082250.7	0.0	46582.4	0.00350	0.00301
566	34.97	1082251.4	-27884.2	39914.0	0.00350	-0.00031
567	39.90	1082251.0	-49771.9	25230.1	0.00350	-0.00037
568	40.88	1082250.2	-59821.9	12368.5	0.00350	-0.00022

569	36.71	1082251.0	-63816.5	0.0	0.00350	0.00314
570	40.88	1082251.1	-59821.8	-12368.5	0.00350	-0.00022
571	39.90	1082250.8	-49771.9	-25230.1	0.00350	-0.00037
572	34.97	1082250.0	-27884.2	-39914.1	0.00350	-0.00031
573	27.35	1082251.4	0.0	-46582.4	0.00350	0.00301
574	34.97	1082250.3	27884.2	-39914.1	0.00350	-0.00031
575	39.90	1082250.3	49772.0	-25230.2	0.00350	-0.00037
576	40.88	1082250.8	59821.9	-12368.5	0.00350	-0.00022
577	37.87	1119570.3	59354.7	0.0	0.00350	0.00315
578	42.08	1119569.7	55662.0	11980.7	0.00350	-0.00012
579	41.03	1119568.9	46919.6	23881.6	0.00350	-0.00026
580	35.96	1119570.0	26523.6	37525.2	0.00350	-0.00020
581	28.23	1119569.4	0.0	43349.1	0.00350	0.00303
582	35.96	1119569.8	-26523.6	37525.2	0.00350	-0.00020
583	41.03	1119569.4	-46919.6	23881.6	0.00350	-0.00026
584	42.08	1119570.0	-55662.0	11980.7	0.00350	-0.00012
585	37.87	1119569.9	-59354.8	0.0	0.00350	0.00315
586	42.08	1119570.8	-55661.9	-11980.7	0.00350	-0.00012
587	41.03	1119570.4	-46919.5	-23881.5	0.00350	-0.00026
588	35.96	1119569.8	-26523.6	-37525.2	0.00350	-0.00020
589	28.23	1119570.1	0.0	-43349.1	0.00350	0.00303
590	35.96	1119570.0	26523.6	-37525.2	0.00350	-0.00020
591	41.03	1119569.9	46919.5	-23881.6	0.00350	-0.00026
592	42.08	1119570.6	55661.9	-11980.7	0.00350	-0.00012
593	39.05	1156888.7	54609.1	0.0	0.00350	0.00316
594	43.34	1156889.6	51313.2	11453.4	0.00350	-0.00001
595	42.23	1156889.8	43891.9	22400.9	0.00350	-0.00016
596	37.04	1156889.7	25125.9	34792.1	0.00350	-0.00010
597	29.11	1156889.5	0.0	39898.2	0.00350	0.00304
598	37.04	1156889.5	-25126.0	34792.1	0.00350	-0.00010
599	42.23	1156888.1	-43892.1	22401.0	0.00350	-0.00016
600	43.34	1156889.8	-51313.2	11453.4	0.00350	-0.00001
601	39.05	1156888.2	-54609.1	0.0	0.00350	0.00316
602	43.34	1156888.6	-51313.3	-11453.4	0.00350	-0.00001
603	42.23	1156889.0	-43892.0	-22400.9	0.00350	-0.00016
604	37.04	1156888.3	-25126.0	-34792.2	0.00350	-0.00010
605	29.11	1156888.7	0.0	-39898.2	0.00350	0.00304
606	37.04	1156888.5	25126.0	-34792.2	0.00350	-0.00010
607	42.23	1156888.5	43892.0	-22401.0	0.00350	-0.00016
608	43.34	1156888.4	51313.4	-11453.4	0.00350	-0.00001
609	40.24	1194208.5	49573.9	0.0	0.00350	0.00317
610	44.69	1194207.1	46787.0	10775.8	0.00350	0.00311
611	43.51	1194207.9	40688.3	20783.9	0.00350	-0.00005
612	38.20	1194208.7	23577.1	31846.6	0.00350	0.00305
613	30.01	1194207.6	0.0	36222.2	0.00350	0.00306
614	38.20	1194208.5	-23577.1	31846.7	0.00350	0.00305
615	43.51	1194207.3	-40688.3	20783.9	0.00350	-0.00005
616	44.69	1194207.4	-46786.9	10775.8	0.00350	0.00311
617	40.24	1194208.1	-49574.0	0.0	0.00350	0.00317
618	44.69	1194208.1	-46786.9	-10775.8	0.00350	0.00311
619	43.51	1194208.2	-40688.2	-20783.9	0.00350	-0.00005
620	38.20	1194207.4	-23577.2	-31846.7	0.00350	0.00305
621	30.01	1194208.3	0.0	-36222.2	0.00350	0.00306

622	38.20	1194207.6	23577.2	-31846.7	0.00350	0.00305
623	43.51	1194207.7	40688.3	-20783.9	0.00350	-0.00005
624	44.69	1194207.9	46786.9	-10775.8	0.00350	0.00311
625	41.54	1231527.8	44407.4	0.0	0.00350	0.00318
626	46.15	1231525.9	42096.2	9948.7	0.00350	0.00312
627	44.92	1231527.0	37106.8	19078.5	0.00350	0.00308
628	39.46	1231526.1	21824.0	28762.5	0.00350	0.00306
629	30.97	1231527.8	0.0	32415.5	0.00350	0.00307
630	39.46	1231526.9	-21824.0	28762.4	0.00350	0.00306
631	44.92	1231527.4	-37106.8	19078.5	0.00350	0.00308
632	46.15	1231526.1	-42096.2	9948.7	0.00350	0.00312
633	41.54	1231527.4	-44407.4	0.0	0.00350	0.00318
634	46.15	1231526.8	-42096.1	-9948.7	0.00350	0.00312
635	44.92	1231526.3	-37106.9	-19078.5	0.00350	0.00308
636	39.46	1231526.9	-21824.0	-28762.4	0.00350	0.00306
637	30.97	1231527.1	0.0	-32415.6	0.00350	0.00307
638	39.46	1231527.1	21824.0	-28762.4	0.00350	0.00306
639	44.92	1231525.9	37106.9	-19078.5	0.00350	0.00308
640	46.15	1231526.6	42096.1	-9948.7	0.00350	0.00312
641	43.03	1268845.4	39183.3	0.0	0.00350	0.00319
642	47.77	1268845.3	37261.4	8994.6	0.00350	0.00314
643	46.50	1268846.4	33091.4	17290.1	0.00350	0.00310
644	40.85	1268845.2	19873.2	25544.1	0.00350	0.00307
645	32.06	1268845.9	0.0	28570.4	0.00350	0.00309
646	40.85	1268845.1	-19873.2	25544.1	0.00350	0.00307
647	46.50	1268846.8	-33091.4	17290.1	0.00350	0.00310
648	47.77	1268845.5	-37261.4	8994.6	0.00350	0.00314
649	43.03	1268845.0	-39183.3	0.0	0.00350	0.00319
650	47.77	1268846.1	-37261.3	-8994.6	0.00350	0.00314
651	46.50	1268845.9	-33091.5	-17290.2	0.00350	0.00310
652	40.85	1268846.0	-19873.1	-25544.0	0.00350	0.00307
653	32.06	1268846.4	0.0	-28570.3	0.00350	0.00309
654	40.85	1268846.1	19873.1	-25544.0	0.00350	0.00307
655	46.50	1268845.5	33091.5	-17290.2	0.00350	0.00310
656	47.77	1268845.9	37261.3	-8994.6	0.00350	0.00314

Diagramma Mx-My

N = 0.0 [N] Sforzo normale della combinazione di carico

Simbologia adottata

N° numero d'ordine

M_x momento di calcolo lungo X espresso in [Nm]

M_y momento di calcolo lungo Y espresso in [Nm]

N°	M _x	M _y
1	45470.6	0.0
2	44034.8	17704.5
3	40595.1	26267.2
4	33905.6	30266.7
5	0.0	32833.2
6	-33905.7	30266.6
7	-40595.1	26267.2
8	-44034.7	17704.5
9	-45470.8	0.0

10	-44034.6	-17704.5
11	-40595.0	-26267.2
12	-33905.7	-30266.5
13	0.0	-32833.3
14	33905.7	-30266.5
15	40595.0	-26267.2

Diagramma M-N

$M_R = 18377.0$ [Nm] Momento risultante della combinazione di carico

Simbologia adottata

N° numero d'ordine

N sforzo normale di calcolo espresso in [N]

M momento di calcolo espresso in [Nm]

N°	N	M
1	1268845.4	-28570.3
2	1231527.8	-32415.6
3	1194208.5	-36222.2
4	1156888.7	-39898.2
5	1119570.3	-43349.1
6	1082251.5	-46582.4
7	1044932.1	-49606.4
8	1007613.2	-52429.6
9	970294.6	-55061.5
10	932974.9	-57512.2
11	895656.3	-59792.0
12	858337.7	-61912.1
13	821017.3	-63884.4
14	783698.9	-65721.1
15	746379.7	-67435.2
16	709061.1	-69039.9
17	671742.3	-70549.1
18	634422.2	-71976.7
19	597103.5	-73075.5
20	559785.4	-72608.0
21	522465.3	-71809.5
22	485147.2	-70680.0
23	447827.1	-69219.5
24	410509.0	-67428.1
25	373190.8	-65305.6
26	335870.8	-62852.2
27	298552.6	-60067.7
28	261232.5	-56838.1
29	223914.4	-53223.8
30	186595.1	-49360.3
31	149276.0	-45388.3
32	111956.7	-41313.9
33	74638.1	-37131.0
34	37318.1	-32833.3
35	-0.4	-28416.2
36	-38507.6	-23745.4
37	-77013.8	-18979.2
38	-115519.7	-14136.8

39	-154027.1	-9249.5
40	-192533.9	-4410.8
41	-231040.6	0.0
42	-192533.9	4410.6
43	-154027.1	9249.6
44	-115519.7	14136.7
45	-77013.8	18979.0
46	-38507.6	23745.6
47	-0.4	28416.2
48	37318.1	32833.2
49	74638.1	37131.0
50	111956.7	41313.9
51	149276.0	45388.2
52	186595.1	49360.3
53	223914.4	53223.9
54	261232.5	56838.1
55	298552.6	60067.6
56	335870.8	62852.1
57	373190.8	65305.6
58	410509.0	67428.0
59	447827.1	69219.6
60	485147.2	70680.0
61	522465.3	71809.5
62	559785.4	72608.0
63	597103.5	73075.5
64	634422.2	71976.6
65	671742.3	70549.0
66	709061.1	69039.9
67	746379.7	67435.2
68	783698.9	65721.1
69	821017.3	63884.4
70	858337.7	61912.2
71	895656.3	59792.0
72	932974.9	57512.1
73	970294.6	55061.6
74	1007613.2	52429.6
75	1044932.1	49606.3
76	1082251.5	46582.4
77	1119570.3	43349.1
78	1156888.7	39898.2
79	1194208.5	36222.2
80	1231527.8	32415.5
81	1268845.4	28570.4

Diagramma Momento-Curvatura

Simbologia adottata

N° numero d'ordine

N sforzo normale espresso in [N]

M_x momento di calcolo lungo X espresso in [Nm]

M_y momento di calcolo lungo Y espresso in [Nm]

Φ curvatura

ϵ_c deformazione nel calcestruzzo

ϵ_f deformazione nell'acciaio

	N	M_x	M_y	Φ	ε_{cls}	ε_{acc}
My	0.0	0.0	27133.6	9.586E-5	0.00069	-0.00182
Me	0.0	0.0	18377.0	6.439E-5	0.00046	-0.00123

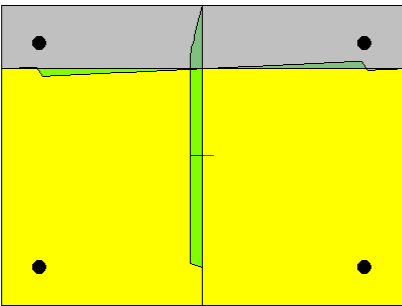
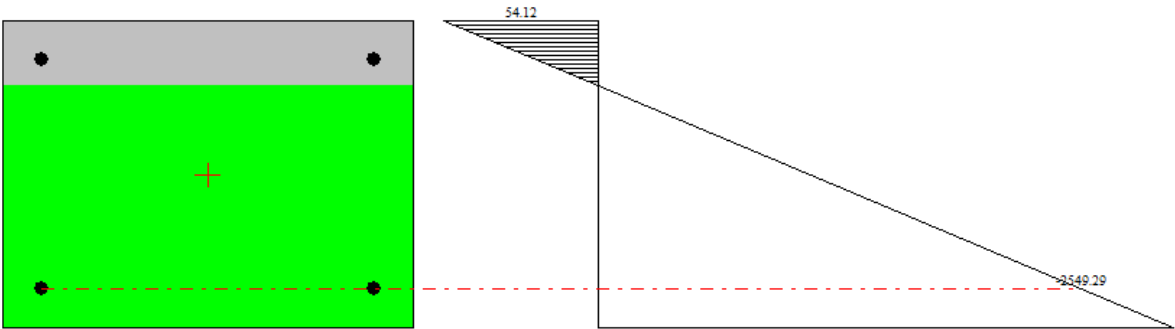
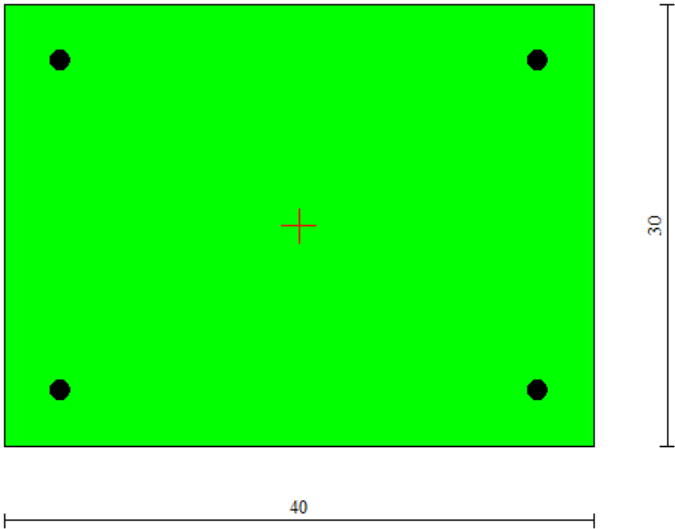


Diagramma Mx - My

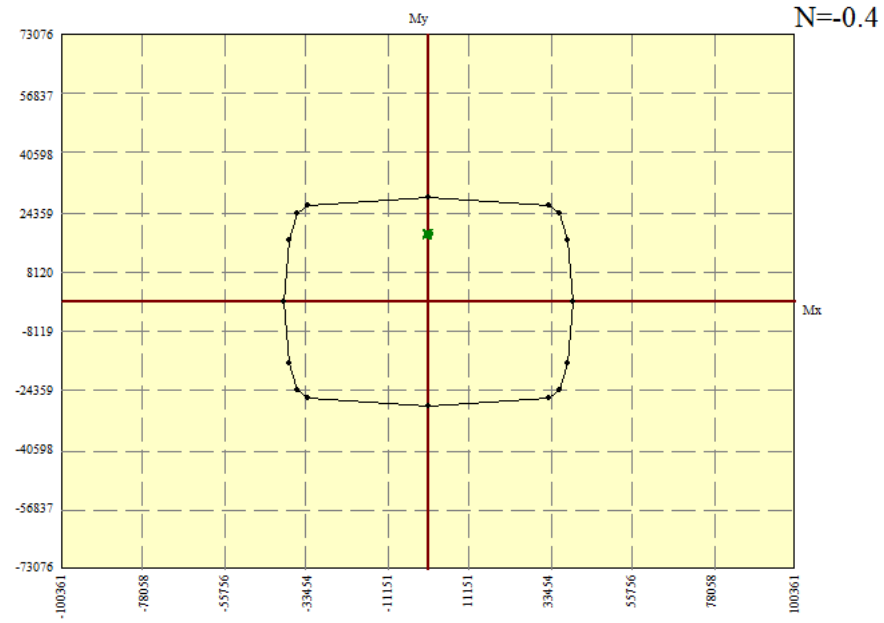
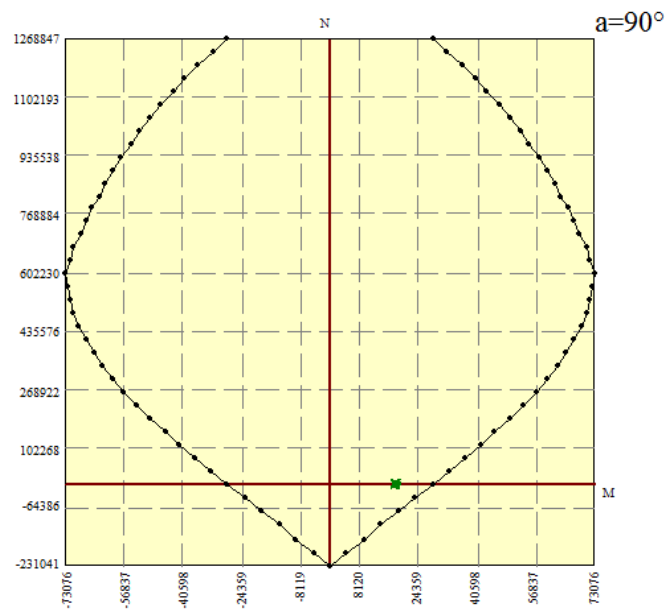


Diagramma M - N



6 ALLEGATO B - VERIFICA N.8 A

Questa verifica si adotta per le porzioni in cui i due cordoli di alloggiamento delle barriere non sono congiunti in un'unica soletta. Per le porzioni in cui vi è il congiungimento fra i due cordoli, oltre a questa, sono manifestamente verificate anche molte altre delle verifiche sopra riportate.

Dati

Nome sezione: Orizzontale

Tipo sezione: Rettangolare

Base 230.0 [cm]

Altezza 30.0 [cm]

Caratteristiche geometriche

Area sezione 6900.00 [cm²]

Inerzia in direzione X 30417500.0 [cm⁴]

Inerzia in direzione Y 517500.0 [cm⁴]

Inerzia in direzione XY 0.0 [cm⁴]

Ascissa baricentro sezione $X_G = 115.00$ [cm]

Ordinata baricentro sezione $Y_G = 15.00$ [cm]

Elenco ferri

Simbologia adottata

Posizione riferita all'origine

N° numero d'ordine

X Ascissa posizione ferro espresso in [cm]

Y Ordinata posizione ferro espresso in [cm]

d Diametro ferro espresso in [mm]

ω Area del ferro espresso in [cm²]

N°	X	Y	d	ω
1	226.20	26.20	16	2.01
2	201.49	26.20	16	2.01
3	176.78	26.20	16	2.01
4	152.07	26.20	16	2.01
5	127.36	26.20	16	2.01
6	102.64	26.20	16	2.01
7	77.93	26.20	16	2.01
8	53.22	26.20	16	2.01
9	28.51	26.20	16	2.01
10	3.80	26.20	16	2.01
11	3.80	3.80	16	2.01
12	28.51	3.80	16	2.01
13	53.22	3.80	16	2.01
14	77.93	3.80	16	2.01
15	102.64	3.80	16	2.01
16	127.36	3.80	16	2.01
17	152.07	3.80	16	2.01
18	176.78	3.80	16	2.01
19	201.49	3.80	16	2.01
20	226.20	3.80	16	2.01

Materiale impiegato : Calcestruzzo armato

Caratteristiche calcestruzzo

Resistenza caratteristica calcestruzzo	30	[kPa]
Coeff. omogeneizzazione acciaio/calcestruzzo	15.00	
Coeff. omogeneizzazione calcestruzzo teso/compresso	1.00	
Forma diagramma tensione-deformazione - PARABOLA-RETTANGOLO		

Caratteristiche acciaio per calcestruzzo

Tensione ammissibile acciaio	254977	[kPa]
Tensione snervamento acciaio	431499	[kPa]
Modulo elastico E	205942924	[kPa]
Fattore di incrudimento acciaio	1.00	

Combinazioni

Simbologia adottata

N° numero d'ordine della combinazione

N sforzo normale espresso in [N]

e_y eccentricità lungo Y espressa in [cm]

e_x eccentricità lungo X espressa in [cm]

M_y momento lungo Y espresso in [Nm]

M_x momento lungo X espresso in [Nm]

M_t momento torcente espresso in [Nm]

T_y taglio lungo Y espresso in [N]

T_x taglio lungo X espresso in [N]

N°	N	e_y	e_x	M_y	M_x	M_t	T_y	T_x
1	0.0	0.00	0.00	0.0	900000.0	0.0	0.0	100000.0
2	0.0	0.00	0.00	0.0	330000.0	0.0	0.0	50000.0

Risultati analisi

Combinazione n° 1

Risultati tensioni ammissibili

Caratteristiche asse neutro sezione :

Distanza asse neutro dal lembo più compresso	50.807	[cm]
Punti di intersezione con perimetro sezione (179.19 ; 30.00) (179.19 ; 0.00)		
Inclinazione asse neutro rispetto all'orizzontale	90.000	[°]

Tensioni :

Tensione massima nel calcestruzzo	6689	[kPa]
Tensione minima nel calcestruzzo	0	[kPa]
Tensione tangenziale nel calcestruzzo	209	[kPa]
Tensione massima nel ferro	92834	[kPa]
Tensione minima nel ferro	-346383	[kPa]

Risultati taglio

Simbologia adottata

V_{Rd1} Resistenza di calcolo dell'elemento privo di armatura a taglio

V_{Rd2} Massima forza di taglio di calcolo che può essere sopportata senza rottura delle bielle compresse convenzionali di calcestruzzo

$$V_{Rd1} = 1.10569251279386E261 \quad [N]$$

$$V_{Rd2} = 2874.7 \quad [N]$$

Diametro e passo staffe $\phi 10.00 - 20.00$ [cm]

Sollecitazioni ultime

Simbologia adottata

FS Fattore di sicurezza

N_u Sforzo normale ultimo, espresso in [N]

M_{Xu} Momento ultimo in direzione X, espresso in [Nm]

M_{Yu} Momento ultimo in direzione Y, espresso in [Nm]

FS	N_u	M_{Xu}	M_{Yu}
0.96	0.0	<u>862663.1</u>	0.0

Risultati fessurazione

Momento di prima fessurazione	$M_x = 3286.8$	[Nm]	$M_y = 0.0$	[Nm]
Tensione nell'acciaio	$\sigma = -1265$	[kPa]		
Tensione nel calcestruzzo	$\sigma_{ct} = -86$	[kPa]		
Area efficace a trazione	$A_{eff} = 6771.67$	[cmq]		
Deformazione media acciaio teso	$\epsilon = 0.1682$			
Distanza media tra le fessure	$S_{fm} = 386.7951$	[mm]		
Ampiezza delle fessure	$w = 1.1060$	[mm]		

Dominio 3D

Simbologia adottata

N° numero d'ordine

X_c posizione asse neutro espresso in [cm]

N sforzo normale espresso in [N]

M_x momento lungo X espresso in [Nm]

M_y momento lungo Y espresso in [Nm]

E_c deformazione nel calcestruzzo

E_f deformazione nell'acciaio

N°	X_c	N	M_x	M_y	E_c	E_f
1	-47.57	-1508836.8	0.0	0.0	-0.00210	-0.01000
2	-56.95	-1508836.8	0.0	0.0	-0.00340	-0.01000
3	-57.99	-1508836.8	0.0	0.0	-0.00689	-0.01000
4	-57.99	-1508836.8	0.0	0.0	-0.00344	-0.01000
5	-57.99	-1508836.8	0.0	0.0	-0.00245	-0.01000
6	-57.99	-1508836.8	0.0	0.0	-0.00209	-0.01000
7	-115.97	-1508836.8	0.0	0.0	-0.00339	-0.01000
8	-104.49	-1508836.8	0.0	0.0	-0.00323	-0.01000
9	-94.76	-1508836.8	0.0	0.0	-0.00347	-0.01000
10	-88.26	-1508836.8	0.0	0.0	-0.00443	-0.01000
11	-85.97	-1508836.8	0.0	0.0	-0.00766	-0.01000
12	-174.20	-1508836.8	0.0	0.0	-0.00611	-0.01000

13	-106.09	-1508836.8	0.0	0.0	-0.00373	-0.01000
14	-65.96	-1508836.8	0.0	0.0	-0.00231	-0.01000
15	-13.48	-1436987.4	79419.3	1926.2	-0.00058	-0.01000
16	-6.53	-1436987.3	77501.0	5056.3	-0.00035	-0.01000
17	-0.97	-1436987.8	75348.5	8047.1	-0.00009	-0.01000
18	-0.62	-1436987.5	0.0	8047.1	-0.00023	-0.01000
19	-0.97	-1436988.0	-75348.3	8047.1	-0.00009	-0.01000
20	-6.53	-1436988.3	-77500.0	5056.3	-0.00035	-0.01000
21	-13.48	-1436987.1	-79419.6	1926.2	-0.00058	-0.01000
22	-19.66	-1436986.6	-79897.4	0.0	-0.00080	-0.01000
23	-13.48	-1436987.9	-79418.8	-1926.2	-0.00058	-0.01000
24	-6.53	-1436988.1	-77500.3	-5056.3	-0.00035	-0.01000
25	-0.97	-1436986.7	-75349.6	-8047.2	-0.00009	-0.01000
26	-0.62	-1436987.2	0.0	-8047.1	-0.00023	-0.01000
27	-0.97	-1436986.5	75349.8	-8047.2	-0.00009	-0.01000
28	-6.53	-1436987.1	77501.3	-5056.3	-0.00035	-0.01000
29	-13.48	-1436986.6	79420.1	-1926.3	-0.00058	-0.01000
30	-0.26	-1365137.5	152692.5	3626.1	-0.00001	-0.01000
31	4.93	-1365137.2	151713.0	7895.8	0.00028	-0.01000
32	7.36	-1365138.9	143538.1	15608.9	0.00071	-0.01000
33	-0.08	-1365137.5	0.0	16094.3	-0.00003	-0.01000
34	7.36	-1365138.1	-143538.8	15609.0	0.00071	-0.01000
35	4.93	-1365138.4	-151711.8	7895.8	0.00028	-0.01000
36	-0.26	-1365137.1	-152692.9	3626.1	-0.00001	-0.01000
37	-6.01	-1365138.8	-152926.5	0.0	-0.00026	-0.01000
38	-0.26	-1365138.2	-152691.8	-3626.1	-0.00001	-0.01000
39	4.93	-1365138.1	-151712.1	-7895.8	0.00028	-0.01000
40	7.36	-1365139.0	-143538.0	-15608.9	0.00071	-0.01000
41	-0.08	-1365138.6	0.0	-16094.2	-0.00003	-0.01000
42	7.36	-1365138.6	143538.4	-15609.0	0.00071	-0.01000
43	4.93	-1365138.0	151712.2	-7895.8	0.00028	-0.01000
44	-0.26	-1365138.6	152691.4	-3626.1	-0.00001	-0.01000
45	4.62	-1293289.1	224470.7	0.0	0.00021	-0.01000
46	9.77	-1293289.1	224224.8	3802.1	0.00047	-0.01000
47	12.74	-1293289.5	221425.9	9602.3	0.00077	-0.01000
48	12.09	-1293288.1	210626.3	19998.9	0.00123	-0.01000
49	0.45	-1293288.2	0.0	24141.9	0.00017	-0.01000
50	12.09	-1293288.6	-210625.9	19998.8	0.00123	-0.01000
51	12.74	-1293287.7	-221427.6	9602.3	0.00077	-0.01000
52	9.77	-1293288.7	-224225.3	3802.1	0.00047	-0.01000
53	4.62	-1293288.1	-224471.7	0.0	0.00021	-0.01000
54	9.77	-1293288.7	-224225.3	-3802.1	0.00047	-0.01000
55	12.74	-1293289.1	-221426.3	-9602.3	0.00077	-0.01000
56	12.09	-1293288.3	-210626.2	-19998.9	0.00123	-0.01000
57	0.45	-1293287.9	0.0	-24141.9	0.00017	-0.01000
58	12.09	-1293287.8	210626.7	-19998.9	0.00123	-0.01000
59	12.74	-1293289.0	221426.4	-9602.3	0.00077	-0.01000
60	9.77	-1293287.8	224226.1	-3802.2	0.00047	-0.01000
61	14.30	-1221439.0	296028.0	0.0	0.00067	-0.01000
62	17.92	-1221438.8	292709.2	4867.1	0.00089	-0.01000
63	18.75	-1221439.1	288050.9	11396.1	0.00117	-0.01000
64	16.35	-1221439.0	277185.8	24437.2	0.00173	-0.01000
65	0.95	-1221440.1	0.0	32190.2	0.00038	-0.01000

66	16.35	-1221439.6	-277185.3	24437.2	0.00173	-0.01000
67	18.75	-1221439.1	-288050.9	11396.1	0.00117	-0.01000
68	17.92	-1221439.8	-292708.2	4867.0	0.00089	-0.01000
69	14.30	-1221439.2	-296027.8	0.0	0.00067	-0.01000
70	17.92	-1221439.8	-292708.3	-4867.0	0.00089	-0.01000
71	18.75	-1221438.6	-288051.4	-11396.2	0.00117	-0.01000
72	16.35	-1221439.1	-277185.7	-24437.2	0.00173	-0.01000
73	0.95	-1221439.7	0.0	-32190.2	0.00038	-0.01000
74	16.35	-1221440.2	277184.8	-24437.1	0.00173	-0.01000
75	18.75	-1221438.5	288051.5	-11396.2	0.00117	-0.01000
76	17.92	-1221438.7	292709.3	-4867.1	0.00089	-0.01000
77	20.76	-1149589.9	360012.6	0.0	0.00101	-0.01000
78	24.75	-1149590.5	358881.0	6148.5	0.00127	-0.01000
79	24.33	-1149589.1	354680.1	13188.0	0.00158	-0.01000
80	19.45	-1149589.1	337471.2	28652.2	0.00213	-0.01000
81	1.44	-1149589.6	0.0	40239.5	0.00058	-0.01000
82	19.45	-1149589.9	-337470.5	28652.2	0.00213	-0.01000
83	24.33	-1149589.2	-354680.0	13188.0	0.00158	-0.01000
84	24.75	-1149589.8	-358881.6	6148.5	0.00127	-0.01000
85	20.76	-1149590.3	-360012.2	0.0	0.00101	-0.01000
86	24.75	-1149589.7	-358881.7	-6148.5	0.00127	-0.01000
87	24.33	-1149590.8	-354678.5	-13188.0	0.00158	-0.01000
88	19.45	-1149589.3	-337471.1	-28652.2	0.00213	-0.01000
89	1.44	-1149590.8	0.0	-40239.3	0.00058	-0.01000
90	19.45	-1149590.6	337469.9	-28652.2	0.00213	-0.01000
91	24.33	-1149590.7	354678.6	-13188.0	0.00158	-0.01000
92	24.75	-1149590.4	358881.1	-6148.5	0.00127	-0.01000
93	26.74	-1077740.5	423660.8	0.0	0.00134	-0.01000
94	30.40	-1077740.5	422495.5	6334.2	0.00161	-0.01000
95	29.44	-1077740.6	420932.5	14811.5	0.00198	-0.01000
96	22.32	-1077740.0	396351.6	31400.7	0.00252	-0.01000
97	1.90	-1077740.6	0.0	48289.0	0.00078	-0.01000
98	22.32	-1077740.7	-396351.1	31400.6	0.00252	-0.01000
99	29.44	-1077740.7	-420932.4	14811.5	0.00198	-0.01000
100	30.40	-1077739.8	-422496.1	6334.2	0.00161	-0.01000
101	26.74	-1077740.9	-423660.5	0.0	0.00134	-0.01000
102	30.40	-1077739.7	-422496.2	-6334.2	0.00161	-0.01000
103	29.44	-1077739.9	-420933.0	-14811.5	0.00198	-0.01000
104	22.32	-1077740.1	-396351.5	-31400.6	0.00252	-0.01000
105	1.90	-1077740.2	0.0	-48289.0	0.00078	-0.01000
106	22.32	-1077741.3	396350.6	-31400.6	0.00252	-0.01000
107	29.44	-1077739.8	420933.1	-14811.5	0.00198	-0.01000
108	30.40	-1077740.4	422495.5	-6334.2	0.00161	-0.01000
109	32.37	-1005891.8	487301.4	0.0	0.00167	-0.01000
110	35.73	-1005891.3	486102.4	6519.2	0.00195	-0.01000
111	33.59	-1005891.4	480082.1	15357.4	0.00232	-0.01000
112	25.41	-1005891.1	451922.1	33313.1	0.00298	-0.01000
113	2.35	-1005891.3	0.0	56338.7	0.00099	-0.01000
114	25.41	-1005891.8	-451921.6	33313.1	0.00298	-0.01000
115	33.59	-1005891.5	-480082.0	15357.4	0.00232	-0.01000
116	35.73	-1005891.6	-486102.1	6519.2	0.00195	-0.01000
117	32.37	-1005891.1	-487302.0	0.0	0.00167	-0.01000
118	35.73	-1005891.5	-486102.2	-6519.2	0.00195	-0.01000

119	33.59	-1005890.8	-480082.6	-15357.4	0.00232	-0.01000
120	25.41	-1005891.2	-451922.0	-33313.1	0.00298	-0.01000
121	2.35	-1005890.9	0.0	-56338.7	0.00099	-0.01000
122	25.41	-1005890.5	451922.6	-33313.1	0.00298	-0.01000
123	33.59	-1005890.7	480082.7	-15357.4	0.00232	-0.01000
124	35.73	-1005891.2	486102.5	-6519.2	0.00195	-0.01000
125	37.70	-934041.9	550932.8	0.0	0.00200	-0.01000
126	41.37	-934041.9	547229.8	5744.3	0.00233	-0.01000
127	37.82	-934041.2	534924.3	15311.7	0.00269	-0.01000
128	28.21	-934042.1	505979.0	35420.3	0.00342	-0.01000
129	2.78	-934042.0	0.0	64388.4	0.00119	-0.01000
130	28.21	-934041.7	-505979.2	35420.3	0.00342	-0.01000
131	37.82	-934041.3	-534924.2	15311.7	0.00269	-0.01000
132	41.37	-934041.1	-547230.4	5744.3	0.00233	-0.01000
133	37.70	-934041.2	-550933.4	0.0	0.00200	-0.01000
134	41.37	-934041.0	-547230.5	-5744.3	0.00233	-0.01000
135	37.82	-934042.0	-534923.7	-15311.7	0.00269	-0.01000
136	28.21	-934041.0	-505979.7	-35420.3	0.00342	-0.01000
137	2.78	-934041.6	0.0	-64388.4	0.00119	-0.01000
138	28.21	-934042.6	505978.6	-35420.3	0.00342	-0.01000
139	37.82	-934041.8	534923.8	-15311.7	0.00269	-0.01000
140	41.37	-934041.8	547229.8	-5744.3	0.00233	-0.01000
141	45.28	-862193.4	604992.5	0.0	0.00250	-0.01000
142	46.69	-862192.4	600962.9	5872.9	0.00271	-0.01000
143	41.81	-862191.9	589753.2	15265.0	0.00306	-0.01000
144	30.42	-862193.2	549938.8	36716.9	0.00350	-0.00925
145	3.20	-862191.5	0.0	72438.1	0.00139	-0.01000
146	30.42	-862191.5	-549939.8	36716.9	0.00350	-0.00925
147	41.81	-862192.0	-589753.1	15265.0	0.00306	-0.01000
148	46.69	-862191.7	-600963.4	5872.9	0.00271	-0.01000
149	45.28	-862191.6	-604993.7	0.0	0.00250	-0.01000
150	46.69	-862191.6	-600963.4	-5872.9	0.00271	-0.01000
151	41.81	-862192.7	-589752.6	-15265.0	0.00306	-0.01000
152	30.42	-862193.4	-549938.7	-36716.9	0.00350	-0.00925
153	3.20	-862192.9	0.0	-72437.9	0.00139	-0.01000
154	30.42	-862192.4	549939.3	-36716.9	0.00350	-0.00925
155	41.81	-862192.6	589752.7	-15265.0	0.00306	-0.01000
156	46.69	-862192.3	600963.0	-5872.9	0.00271	-0.01000
157	50.57	-790344.0	651104.5	0.0	0.00288	-0.01000
158	52.40	-790342.9	649595.9	7170.6	0.00315	-0.01000
159	45.60	-790342.8	644370.5	15281.2	0.00343	-0.01000
160	32.82	-790342.8	591556.5	36509.9	0.00350	-0.00831
161	3.60	-790343.1	0.0	80487.3	0.00159	-0.01000
162	32.82	-790343.6	-591556.0	36509.9	0.00350	-0.00831
163	45.60	-790342.9	-644370.4	15281.2	0.00343	-0.01000
164	52.40	-790343.2	-649595.7	7170.6	0.00315	-0.01000
165	50.57	-790342.1	-651105.7	0.0	0.00288	-0.01000
166	52.40	-790343.2	-649595.7	-7170.6	0.00315	-0.01000
167	45.60	-790343.5	-644370.0	-15281.2	0.00343	-0.01000
168	32.82	-790343.0	-591556.4	-36509.9	0.00350	-0.00831
169	3.60	-790342.6	0.0	-80487.3	0.00159	-0.01000
170	32.82	-790342.1	591556.8	-36509.9	0.00350	-0.00831
171	45.60	-790343.4	644370.1	-15281.2	0.00343	-0.01000

172	52.40	-790342.8	649595.9	-7170.6	0.00315	-0.01000
173	55.57	-718493.7	697203.4	0.0	0.00326	-0.01000
174	57.16	-718493.0	695142.5	7315.2	0.00350	-0.00991
175	50.24	-718494.0	685244.3	15344.7	0.00350	-0.00893
176	35.37	-718493.4	628760.6	37023.7	0.00350	-0.00746
177	3.99	-718493.5	0.0	88536.2	0.00180	-0.01000
178	35.37	-718494.3	-628760.2	37023.7	0.00350	-0.00746
179	50.24	-718494.1	-685244.3	15344.7	0.00350	-0.00893
180	57.16	-718494.5	-695141.6	7315.2	0.00350	-0.00991
181	55.57	-718494.2	-697203.1	0.0	0.00326	-0.01000
182	57.16	-718494.4	-695141.6	-7315.2	0.00350	-0.00991
183	50.24	-718493.2	-685244.7	-15344.7	0.00350	-0.00893
184	35.37	-718493.6	-628760.6	-37023.7	0.00350	-0.00746
185	3.99	-718493.1	0.0	-88536.3	0.00180	-0.01000
186	35.37	-718492.7	628761.0	-37023.7	0.00350	-0.00746
187	50.24	-718494.7	685244.0	-15344.7	0.00350	-0.00893
188	57.16	-718492.9	695142.5	-7315.2	0.00350	-0.00991
189	60.85	-646645.0	739725.8	0.0	0.00350	-0.00951
190	62.98	-646644.5	732890.6	6022.5	0.00350	-0.00867
191	54.18	-646644.1	717040.4	15459.8	0.00350	-0.00803
192	37.50	-646644.5	659391.6	36953.0	0.00350	-0.00684
193	4.36	-646644.6	0.0	96584.7	0.00200	-0.01000
194	37.50	-646644.2	-659391.7	36953.0	0.00350	-0.00684
195	54.18	-646644.2	-717040.4	15459.8	0.00350	-0.00803
196	62.98	-646643.8	-732891.0	6022.5	0.00350	-0.00867
197	60.85	-646643.6	-739726.4	0.0	0.00350	-0.00951
198	62.98	-646643.7	-732891.0	-6022.5	0.00350	-0.00867
199	54.18	-646643.4	-717040.7	-15459.8	0.00350	-0.00803
200	37.50	-646643.4	-659392.0	-36953.0	0.00350	-0.00684
201	4.36	-646644.1	0.0	-96584.7	0.00200	-0.01000
202	37.50	-646645.1	659391.3	-36953.0	0.00350	-0.00684
203	54.17	-646644.7	717040.2	-15459.8	0.00350	-0.00803
204	62.98	-646644.4	732890.7	-6022.5	0.00350	-0.00867
205	68.18	-574794.8	772071.1	0.0	0.00350	-0.00811
206	68.42	-574794.3	763774.4	6763.8	0.00350	-0.00770
207	58.78	-574795.9	748832.7	15574.9	0.00350	-0.00713
208	39.88	-574795.0	689964.7	36770.0	0.00350	-0.00622
209	4.73	-574794.3	0.0	104632.8	0.00220	-0.01000
210	39.88	-574794.7	-689964.8	36770.0	0.00350	-0.00622
211	58.78	-574794.8	-748833.2	15574.9	0.00350	-0.00713
212	68.42	-574795.6	-763773.8	6763.8	0.00350	-0.00770
213	68.18	-574795.3	-772070.9	0.0	0.00350	-0.00811
214	68.42	-574795.5	-763773.9	-6763.8	0.00350	-0.00770
215	58.78	-574795.4	-748833.0	-15574.9	0.00350	-0.00713
216	39.88	-574794.0	-689965.1	-36770.0	0.00350	-0.00622
217	4.73	-574795.9	0.0	-104632.6	0.00220	-0.01000
218	39.88	-574795.5	689964.5	-36770.0	0.00350	-0.00622
219	58.78	-574795.3	748833.0	-15574.9	0.00350	-0.00713
220	68.42	-574794.2	763774.4	-6763.8	0.00350	-0.00770
221	73.48	-502946.1	794991.2	0.0	0.00350	-0.00727
222	73.48	-502945.9	790201.2	5943.4	0.00350	-0.00693
223	62.86	-502946.0	773610.1	15240.9	0.00350	-0.00644
224	42.16	-502946.1	713327.3	37299.4	0.00350	-0.00570

225	5.08	-502946.4	0.0	112680.2	0.00240	-0.01000
226	42.16	-502945.7	-713327.4	37299.4	0.00350	-0.00570
227	62.86	-502946.1	-773610.1	15240.9	0.00350	-0.00644
228	73.49	-502945.1	-790201.4	5943.4	0.00350	-0.00693
229	73.48	-502946.5	-794991.0	0.0	0.00350	-0.00727
230	73.49	-502945.0	-790201.5	-5943.4	0.00350	-0.00693
231	62.86	-502945.2	-773610.3	-15240.9	0.00350	-0.00644
232	42.16	-502946.4	-713327.3	-37299.4	0.00350	-0.00570
233	5.08	-502945.9	0.0	-112680.2	0.00240	-0.01000
234	42.16	-502945.3	713327.5	-37299.4	0.00350	-0.00570
235	62.86	-502945.1	773610.4	-15240.9	0.00350	-0.00644
236	73.49	-502945.8	790201.2	-5943.4	0.00350	-0.00693
237	79.67	-431095.6	817909.2	0.0	0.00350	-0.00644
238	79.25	-431096.2	813484.8	5563.0	0.00350	-0.00617
239	66.82	-431097.1	794275.4	15340.7	0.00350	-0.00585
240	44.27	-431096.0	732686.7	37135.9	0.00350	-0.00526
241	5.42	-431096.3	0.0	120727.4	0.00261	-0.01000
242	44.27	-431095.6	-732686.8	37135.9	0.00350	-0.00526
243	66.82	-431095.8	-794275.8	15340.7	0.00350	-0.00585
244	79.25	-431095.4	-813485.0	5563.0	0.00350	-0.00617
245	79.67	-431096.0	-817909.1	0.0	0.00350	-0.00644
246	79.25	-431095.3	-813485.0	-5563.0	0.00350	-0.00617
247	66.82	-431096.4	-794275.6	-15340.7	0.00350	-0.00585
248	44.27	-431096.2	-732686.7	-37135.9	0.00350	-0.00526
249	5.42	-431095.7	0.0	-120727.4	0.00261	-0.01000
250	44.27	-431096.5	732686.6	-37135.9	0.00350	-0.00526
251	66.82	-431096.3	794275.6	-15340.7	0.00350	-0.00585
252	79.25	-431096.1	813484.9	-5563.0	0.00350	-0.00617
253	85.83	-359246.2	836110.0	0.0	0.00350	-0.00572
254	84.76	-359247.0	829448.4	6578.9	0.00350	-0.00554
255	71.29	-359246.7	814937.0	15440.5	0.00350	-0.00526
256	46.61	-359246.8	752042.6	36972.4	0.00350	-0.00482
257	5.75	-359247.0	0.0	128774.1	0.00281	-0.01000
258	46.61	-359247.7	-752042.3	36972.4	0.00350	-0.00482
259	71.29	-359246.8	-814937.0	15440.5	0.00350	-0.00526
260	84.76	-359246.1	-829448.5	6578.8	0.00350	-0.00554
261	85.83	-359246.7	-836109.9	0.0	0.00350	-0.00572
262	84.76	-359246.1	-829448.5	-6578.8	0.00350	-0.00554
263	71.29	-359247.3	-814936.8	-15440.5	0.00350	-0.00526
264	46.61	-359247.0	-752042.5	-36972.4	0.00350	-0.00482
265	5.75	-359246.5	0.0	-128774.2	0.00281	-0.01000
266	46.61	-359246.1	752042.7	-36972.4	0.00350	-0.00482
267	71.29	-359247.2	814936.9	-15440.5	0.00350	-0.00526
268	84.76	-359246.9	829448.4	-6578.8	0.00350	-0.00554
269	91.19	-287398.2	847833.7	0.0	0.00350	-0.00518
270	90.05	-287397.3	841567.4	6193.0	0.00350	-0.00501
271	75.05	-287398.0	826239.4	15161.5	0.00350	-0.00482
272	48.74	-287397.6	762250.8	37430.2	0.00350	-0.00445
273	6.06	-287396.7	0.0	136820.6	0.00301	-0.01000
274	48.74	-287397.2	-762250.8	37430.2	0.00350	-0.00445
275	75.05	-287398.1	-826239.3	15161.5	0.00350	-0.00482
276	90.05	-287396.6	-841567.6	6193.0	0.00350	-0.00501
277	91.19	-287396.5	-847834.0	0.0	0.00350	-0.00518

278	90.05	-287396.5	-841567.6	-6193.0	0.00350	-0.00501
279	75.05	-287397.2	-826239.5	-15161.5	0.00350	-0.00482
280	48.74	-287397.8	-762250.7	-37430.2	0.00350	-0.00445
281	6.06	-287397.3	0.0	-136820.5	0.00301	-0.01000
282	48.74	-287398.2	762250.7	-37430.2	0.00350	-0.00445
283	75.05	-287397.1	826239.5	-15161.5	0.00350	-0.00482
284	90.05	-287397.2	841567.5	-6193.0	0.00350	-0.00501
285	97.26	-215548.1	859554.2	0.0	0.00350	-0.00464
286	95.59	-215549.0	850903.5	6412.0	0.00350	-0.00452
287	78.99	-215548.7	835609.9	15249.6	0.00350	-0.00441
288	50.89	-215548.0	769519.1	37112.7	0.00350	-0.00412
289	6.37	-215548.4	0.0	144866.5	0.00321	-0.01000
290	50.89	-215548.9	-769519.0	37112.7	0.00350	-0.00412
291	78.99	-215548.9	-835609.9	15249.6	0.00350	-0.00441
292	95.59	-215548.2	-850903.6	6412.0	0.00350	-0.00452
293	97.26	-215548.5	-859554.1	0.0	0.00350	-0.00464
294	95.59	-215548.1	-850903.6	-6412.0	0.00350	-0.00452
295	78.99	-215548.1	-835610.0	-15249.6	0.00350	-0.00441
296	50.89	-215548.2	-769519.0	-37112.7	0.00350	-0.00412
297	6.37	-215547.9	0.0	-144866.6	0.00321	-0.01000
298	50.89	-215547.2	769519.1	-37112.7	0.00350	-0.00412
299	78.99	-215547.9	835610.0	-15249.6	0.00350	-0.00441
300	95.59	-215548.9	850903.5	-6412.0	0.00350	-0.00452
301	102.92	-143698.2	864612.0	0.0	0.00350	-0.00419
302	100.84	-143698.9	854774.7	6911.0	0.00350	-0.00410
303	83.42	-143698.3	842623.4	15440.1	0.00350	-0.00399
304	53.27	-143698.1	775004.8	36736.5	0.00350	-0.00378
305	6.67	-143698.6	0.0	152912.4	0.00342	-0.01000
306	53.27	-143699.1	-775004.8	36736.5	0.00350	-0.00378
307	83.42	-143698.5	-842623.4	15440.1	0.00350	-0.00399
308	100.84	-143698.1	-854774.7	6911.0	0.00350	-0.00410
309	102.92	-143698.7	-864612.0	0.0	0.00350	-0.00419
310	100.84	-143698.0	-854774.7	-6911.0	0.00350	-0.00410
311	83.42	-143699.1	-842623.4	-15440.1	0.00350	-0.00399
312	53.27	-143698.4	-775004.8	-36736.5	0.00350	-0.00378
313	6.67	-143698.0	0.0	-152912.5	0.00342	-0.01000
314	53.27	-143698.7	775004.8	-36736.5	0.00350	-0.00378
315	83.42	-143699.0	842623.4	-15440.1	0.00350	-0.00399
316	100.84	-143698.9	854774.7	-6911.0	0.00350	-0.00410
317	108.29	-71849.7	864986.7	0.0	0.00350	-0.00381
318	106.13	-71848.6	855425.7	6527.6	0.00350	-0.00372
319	87.39	-71848.6	837039.9	15411.0	0.00350	-0.00365
320	55.47	-71848.8	768286.1	36998.1	0.00350	-0.00349
321	7.17	-71849.5	0.0	160957.0	0.00350	-0.00930
322	55.47	-71849.8	-768286.2	36998.1	0.00350	-0.00349
323	87.39	-71848.7	-837040.0	15411.0	0.00350	-0.00365
324	106.13	-71849.9	-855425.7	6527.6	0.00350	-0.00372
325	108.29	-71850.1	-864986.7	0.0	0.00350	-0.00381
326	106.13	-71849.9	-855425.7	-6527.6	0.00350	-0.00372
327	87.39	-71849.3	-837040.0	-15411.0	0.00350	-0.00365
328	55.47	-71849.0	-768286.1	-36998.1	0.00350	-0.00349
329	7.17	-71849.2	0.0	-160957.1	0.00350	-0.00930
330	55.47	-71849.4	768286.2	-36998.1	0.00350	-0.00349

331	87.39	-71849.2	837040.0	-15411.0	0.00350	-0.00365
332	106.13	-71848.5	855425.7	-6527.6	0.00350	-0.00372
333	114.64	0.7	862663.2	0.0	0.00350	-0.00341
334	111.71	0.8	850047.2	6552.4	0.00350	-0.00336
335	91.70	0.6	830278.1	15482.4	0.00350	-0.00331
336	57.75	-0.8	760172.6	36874.5	0.00350	-0.00321
337	7.90	-0.7	0.0	168999.6	0.00350	-0.00810
338	57.75	0.8	-760172.5	36874.5	0.00350	-0.00321
339	91.70	0.5	-830278.1	15482.4	0.00350	-0.00331
340	111.71	-0.6	-850047.3	6552.4	0.00350	-0.00336
341	114.64	0.4	-862663.2	0.0	0.00350	-0.00341
342	111.71	-0.5	-850047.3	-6552.4	0.00350	-0.00336
343	91.70	-0.1	-830278.1	-15482.4	0.00350	-0.00331
344	57.75	0.3	-760172.5	-36874.5	0.00350	-0.00321
345	7.90	0.5	0.0	-168999.7	0.00350	-0.00810
346	57.75	-0.1	760172.6	-36874.5	0.00350	-0.00321
347	91.70	0.0	830278.1	-15482.4	0.00350	-0.00331
348	111.71	0.9	850047.1	-6552.4	0.00350	-0.00336
349	120.49	72196.3	849378.5	0.0	0.00350	-0.00307
350	117.05	72197.9	839342.1	6383.3	0.00350	-0.00305
351	96.10	72197.2	820294.9	15272.7	0.00350	-0.00300
352	60.13	72196.8	748763.7	37120.5	0.00350	-0.00295
353	17.78	72196.4	0.0	161727.1	0.00350	-0.00166
354	60.13	72197.1	-748763.7	37120.5	0.00350	-0.00295
355	96.10	72197.1	-820295.0	15272.7	0.00350	-0.00300
356	117.05	72196.4	-839342.3	6383.3	0.00350	-0.00305
357	120.49	72198.0	-849378.1	0.0	0.00350	-0.00307
358	117.05	72196.5	-839342.3	-6383.3	0.00350	-0.00305
359	96.10	72196.4	-820295.2	-15272.7	0.00350	-0.00300
360	60.13	72196.6	-748763.8	-37120.5	0.00350	-0.00295
361	17.78	72198.0	0.0	-161726.9	0.00350	-0.00166
362	60.13	72197.5	748763.6	-37120.5	0.00350	-0.00295
363	96.10	72196.5	820295.1	-15272.7	0.00350	-0.00300
364	117.05	72198.0	839342.0	-6383.3	0.00350	-0.00305
365	126.44	144394.6	833599.9	0.0	0.00350	-0.00276
366	122.56	144394.0	826632.2	5746.9	0.00350	-0.00275
367	100.06	144393.8	802340.8	15338.1	0.00350	-0.00274
368	62.28	144393.3	729760.2	37120.5	0.00350	-0.00273
369	18.40	144394.7	0.0	153657.9	0.00350	-0.00148
370	62.28	144395.1	-729759.7	37120.5	0.00350	-0.00273
371	100.06	144395.1	-802340.4	15338.1	0.00350	-0.00274
372	122.56	144394.8	-826632.1	5746.9	0.00350	-0.00275
373	126.44	144394.2	-833599.9	0.0	0.00350	-0.00276
374	122.56	144394.8	-826632.1	-5746.9	0.00350	-0.00275
375	100.06	144394.5	-802340.6	-15338.1	0.00350	-0.00274
376	62.28	144394.5	-729759.9	-37120.5	0.00350	-0.00273
377	18.40	144393.9	0.0	-153658.0	0.00350	-0.00148
378	62.28	144394.1	729760.0	-37120.5	0.00350	-0.00273
379	100.06	144394.6	802340.5	-15338.1	0.00350	-0.00274
380	122.56	144394.1	826632.2	-5746.9	0.00350	-0.00275
381	132.88	216591.6	817030.5	0.0	0.00350	-0.00246
382	128.12	216590.7	806303.4	6355.2	0.00350	-0.00248
383	104.35	216591.5	784382.9	15403.6	0.00350	-0.00249

384	64.56	216591.5	710389.5	37005.8	0.00350	-0.00251
385	19.06	216591.2	0.0	145589.3	0.00350	-0.00131
386	64.56	216591.9	-710389.4	37005.8	0.00350	-0.00251
387	104.35	216591.4	-784382.9	15403.6	0.00350	-0.00249
388	128.12	216591.4	-806303.1	6355.2	0.00350	-0.00248
389	132.88	216591.2	-817030.7	0.0	0.00350	-0.00246
390	128.12	216591.5	-806303.1	-6355.2	0.00350	-0.00248
391	104.35	216590.8	-784383.1	-15403.6	0.00350	-0.00249
392	64.56	216591.3	-710389.5	-37005.8	0.00350	-0.00251
393	19.06	216590.4	0.0	-145589.4	0.00350	-0.00131
394	64.56	216591.0	710389.6	-37005.8	0.00350	-0.00251
395	104.35	216590.9	784383.0	-15403.6	0.00350	-0.00249
396	128.12	216590.7	806303.3	-6355.2	0.00350	-0.00248
397	138.33	288787.9	790055.9	0.0	0.00350	-0.00222
398	133.48	288787.6	780493.2	6266.6	0.00350	-0.00224
399	108.47	288787.5	760524.3	15216.9	0.00350	-0.00226
400	66.97	288788.9	690340.4	36766.3	0.00350	-0.00229
401	19.78	288788.3	0.0	137521.0	0.00350	-0.00114
402	66.97	288787.9	-690340.7	36766.3	0.00350	-0.00229
403	108.47	288787.4	-760524.3	15216.9	0.00350	-0.00226
404	133.48	288788.3	-780492.9	6266.6	0.00350	-0.00224
405	138.33	288787.5	-790056.0	0.0	0.00350	-0.00222
406	133.48	288788.4	-780492.9	-6266.6	0.00350	-0.00224
407	108.47	288788.2	-760524.0	-15216.9	0.00350	-0.00226
408	66.97	288788.7	-690340.5	-36766.3	0.00350	-0.00229
409	19.78	288787.5	0.0	-137521.0	0.00350	-0.00114
410	66.97	288788.3	690340.6	-36766.3	0.00350	-0.00229
411	108.47	288788.4	760523.9	-15216.9	0.00350	-0.00226
412	133.48	288787.6	780493.2	-6266.6	0.00350	-0.00224
413	144.24	360985.3	763077.7	0.0	0.00350	-0.00199
414	139.10	360985.9	753082.3	6138.9	0.00350	-0.00201
415	112.43	360985.9	731291.1	15277.2	0.00350	-0.00206
416	69.33	360984.9	666509.4	35827.8	0.00350	-0.00209
417	20.55	360985.1	0.0	129452.8	0.00350	-0.00096
418	69.33	360985.2	-666509.3	35827.8	0.00350	-0.00209
419	112.43	360985.8	-731291.1	15277.2	0.00350	-0.00206
420	139.10	360984.5	-753083.0	6138.9	0.00350	-0.00201
421	144.24	360984.9	-763077.9	0.0	0.00350	-0.00199
422	139.10	360984.5	-753082.9	-6138.9	0.00350	-0.00201
423	112.43	360985.1	-731291.4	-15277.2	0.00350	-0.00206
424	69.33	360984.7	-666509.4	-35827.8	0.00350	-0.00209
425	20.55	360986.3	0.0	-129452.7	0.00350	-0.00096
426	69.33	360985.6	666509.1	-35827.8	0.00350	-0.00209
427	112.43	360985.3	731291.4	-15277.2	0.00350	-0.00206
428	139.10	360986.0	753082.3	-6138.9	0.00350	-0.00201
429	150.27	433182.6	732834.3	0.0	0.00350	-0.00177
430	144.50	433182.2	719856.1	6752.4	0.00350	-0.00180
431	116.68	433181.7	702055.2	15337.4	0.00350	-0.00185
432	71.95	433183.0	641033.5	34597.3	0.00350	-0.00189
433	21.38	433183.0	0.0	121384.6	0.00350	-0.00079
434	71.95	433182.2	-641033.8	34597.3	0.00350	-0.00189
435	116.68	433181.5	-702055.2	15337.4	0.00350	-0.00185
436	144.50	433183.0	-719855.7	6752.4	0.00350	-0.00180

437	150.27	433182.2	-732834.5	0.0	0.00350	-0.00177
438	144.50	433183.1	-719855.6	-6752.4	0.00350	-0.00180
439	116.68	433182.3	-702054.9	-15337.4	0.00350	-0.00185
440	71.95	433182.8	-641033.5	-34597.3	0.00350	-0.00189
441	21.38	433182.3	0.0	-121384.7	0.00350	-0.00079
442	71.95	433182.6	641033.6	-34597.3	0.00350	-0.00189
443	116.68	433182.4	702054.9	-15337.4	0.00350	-0.00185
444	144.50	433182.3	719856.0	-6752.4	0.00350	-0.00180
445	155.73	505379.6	694548.4	0.0	0.00350	-0.00158
446	149.76	505379.6	682028.8	6516.0	0.00350	-0.00162
447	121.00	505379.6	665667.5	14873.4	0.00350	-0.00166
448	74.62	505380.0	609894.5	32968.4	0.00350	-0.00170
449	22.29	505378.9	0.0	113316.5	0.00350	-0.00061
450	74.62	505379.2	-609894.9	32968.4	0.00350	-0.00170
451	121.00	505379.5	-665667.6	14873.4	0.00350	-0.00166
452	149.76	505380.4	-682028.4	6516.0	0.00350	-0.00162
453	155.73	505379.2	-694548.6	0.0	0.00350	-0.00158
454	149.76	505380.4	-682028.4	-6516.0	0.00350	-0.00162
455	121.00	505378.9	-665667.9	-14873.4	0.00350	-0.00166
456	74.62	505379.9	-609894.6	-32968.4	0.00350	-0.00170
457	22.29	505379.9	0.0	-113316.4	0.00350	-0.00061
458	74.62	505379.6	609894.8	-32968.4	0.00350	-0.00170
459	121.00	505379.0	665667.8	-14873.4	0.00350	-0.00166
460	149.76	505379.7	682028.8	-6516.0	0.00350	-0.00162
461	161.60	577575.8	656259.4	0.0	0.00350	-0.00140
462	155.49	577576.5	643286.8	6162.3	0.00350	-0.00143
463	125.74	577576.5	626116.4	14021.5	0.00350	-0.00147
464	77.43	577576.7	575320.3	31208.1	0.00350	-0.00151
465	23.27	577576.5	0.0	105248.0	0.00350	-0.00044
466	77.43	577576.0	-575320.6	31208.1	0.00350	-0.00151
467	125.74	577577.6	-626115.8	14021.5	0.00350	-0.00147
468	155.49	577577.2	-643286.4	6162.3	0.00350	-0.00143
469	161.60	577577.4	-656258.6	0.0	0.00350	-0.00140
470	155.49	577577.3	-643286.4	-6162.3	0.00350	-0.00143
471	125.74	577575.8	-626116.8	-14021.5	0.00350	-0.00147
472	77.43	577576.6	-575320.3	-31208.1	0.00350	-0.00151
473	23.27	577577.4	0.0	-105247.9	0.00350	-0.00044
474	77.43	577577.3	575320.0	-31208.1	0.00350	-0.00151
475	125.74	577575.9	626116.7	-14021.5	0.00350	-0.00147
476	155.49	577576.6	643286.8	-6162.3	0.00350	-0.00143
477	168.38	649773.1	613631.9	0.0	0.00350	-0.00120
478	161.82	649773.4	603053.2	5617.2	0.00350	-0.00124
479	130.86	649773.6	586558.7	13169.7	0.00350	-0.00127
480	80.46	649774.4	540735.6	29448.2	0.00350	-0.00132
481	24.34	649773.9	0.0	97178.8	0.00350	-0.00027
482	80.46	649773.7	-540735.9	29448.2	0.00350	-0.00132
483	130.86	649773.5	-586558.7	13169.7	0.00350	-0.00127
484	161.82	649774.1	-603052.9	5617.2	0.00350	-0.00124
485	168.38	649772.8	-613632.1	0.0	0.00350	-0.00120
486	161.82	649774.1	-603052.8	-5617.2	0.00350	-0.00124
487	130.86	649774.1	-586558.4	-13169.7	0.00350	-0.00127
488	80.46	649774.3	-540735.7	-29448.2	0.00350	-0.00132
489	24.34	649773.4	0.0	-97178.8	0.00350	-0.00027

490	80.46	649773.1	540736.2	-29448.2	0.00350	-0.00132
491	130.86	649774.2	586558.4	-13169.7	0.00350	-0.00127
492	161.82	649773.5	603053.2	-5617.2	0.00350	-0.00124
493	175.83	721971.3	570206.2	0.0	0.00350	-0.00100
494	168.69	721971.4	562811.3	5072.3	0.00350	-0.00104
495	136.41	721971.1	546991.6	12318.2	0.00350	-0.00108
496	83.74	721970.9	506138.3	27688.8	0.00350	-0.00113
497	25.52	721970.5	0.0	89108.6	0.00350	-0.00009
498	83.74	721970.2	-506138.7	27688.9	0.00350	-0.00113
499	136.41	721971.0	-546991.6	12318.2	0.00350	-0.00108
500	168.69	721970.3	-562811.9	5072.3	0.00350	-0.00104
501	175.83	721971.0	-570206.4	0.0	0.00350	-0.00100
502	168.69	721970.4	-562811.8	-5072.3	0.00350	-0.00104
503	136.41	721971.6	-546991.3	-12318.2	0.00350	-0.00108
504	83.74	721970.7	-506138.4	-27688.8	0.00350	-0.00113
505	25.52	721970.0	0.0	-89108.6	0.00350	-0.00009
506	83.74	721971.4	506138.1	-27688.8	0.00350	-0.00113
507	136.41	721971.7	546991.3	-12318.2	0.00350	-0.00108
508	168.69	721971.5	562811.2	-5072.3	0.00350	-0.00104
509	183.96	794167.9	526771.6	0.0	0.00350	-0.00080
510	176.38	794167.5	520623.1	4745.4	0.00350	-0.00085
511	142.45	794167.5	507412.5	11466.9	0.00350	-0.00089
512	87.29	794167.9	471523.5	25930.0	0.00350	-0.00094
513	26.81	794168.2	0.0	81036.5	0.00350	0.00300
514	87.29	794167.3	-471523.8	25930.1	0.00350	-0.00094
515	142.45	794167.4	-507412.5	11466.9	0.00350	-0.00089
516	176.38	794168.0	-520622.7	4745.4	0.00350	-0.00085
517	183.96	794167.6	-526771.7	0.0	0.00350	-0.00080
518	176.38	794168.0	-520622.7	-4745.4	0.00350	-0.00085
519	142.45	794168.0	-507412.3	-11466.9	0.00350	-0.00089
520	87.29	794167.7	-471523.6	-25930.1	0.00350	-0.00094
521	26.81	794167.8	0.0	-81036.6	0.00350	0.00300
522	87.29	794168.3	471523.3	-25930.0	0.00350	-0.00094
523	142.45	794168.0	507412.2	-11466.9	0.00350	-0.00089
524	176.38	794167.5	520623.0	-4745.4	0.00350	-0.00085
525	192.89	866365.6	483322.4	0.0	0.00350	-0.00060
526	184.94	866365.3	477460.2	4526.5	0.00350	-0.00064
527	149.05	866364.3	467816.2	10616.0	0.00350	-0.00069
528	91.25	866364.8	435968.5	23964.4	0.00350	-0.00075
529	28.25	866364.9	0.0	72962.2	0.00350	0.00303
530	91.25	866365.7	-435968.1	23964.3	0.00350	-0.00075
531	149.05	866364.3	-467816.2	10616.0	0.00350	-0.00069
532	184.94	866365.8	-477459.9	4526.5	0.00350	-0.00064
533	192.89	866364.1	-483323.3	0.0	0.00350	-0.00060
534	184.94	866364.5	-477460.7	-4526.5	0.00350	-0.00064
535	149.05	866364.8	-467816.0	-10616.0	0.00350	-0.00069
536	91.25	866364.7	-435968.6	-23964.4	0.00350	-0.00075
537	28.25	866364.5	0.0	-72962.2	0.00350	0.00303
538	91.25	866365.2	435968.3	-23964.4	0.00350	-0.00075
539	149.05	866364.8	467815.9	-10616.0	0.00350	-0.00069
540	184.94	866364.1	477461.0	-4526.5	0.00350	-0.00064
541	202.71	938562.1	439854.7	0.0	0.00350	-0.00041
542	194.36	938562.3	434277.0	4307.6	0.00350	-0.00044

543	156.42	938562.4	427037.3	9891.7	0.00350	-0.00049
544	95.81	938561.9	397089.4	21945.1	0.00350	-0.00055
545	29.84	938562.9	0.0	64884.0	0.00350	0.00305
546	95.81	938561.5	-397089.7	21945.1	0.00350	-0.00055
547	156.42	938562.4	-427037.3	9891.7	0.00350	-0.00049
548	194.36	938562.7	-434276.7	4307.6	0.00350	-0.00044
549	202.71	938561.9	-439854.8	0.0	0.00350	-0.00041
550	194.36	938561.5	-434277.4	-4307.6	0.00350	-0.00044
551	156.42	938561.3	-427038.0	-9891.7	0.00350	-0.00049
552	95.81	938561.8	-397089.5	-21945.1	0.00350	-0.00055
553	29.84	938562.5	0.0	-64884.0	0.00350	0.00305
554	95.81	938562.3	397089.2	-21945.1	0.00350	-0.00055
555	156.42	938562.8	427037.0	-9891.7	0.00350	-0.00049
556	194.36	938561.1	434277.7	-4307.6	0.00350	-0.00044
557	213.59	1010758.7	396360.4	0.0	0.00350	-0.00021
558	205.01	1010758.8	390042.1	3926.0	0.00350	-0.00024
559	165.23	1010758.9	381704.2	8977.1	0.00350	-0.00028
560	100.95	1010759.1	356641.9	20035.8	0.00350	-0.00034
561	31.62	1010758.8	0.0	56802.7	0.00350	0.00308
562	100.95	1010758.7	-356642.1	20035.9	0.00350	-0.00034
563	165.23	1010758.9	-381704.2	8977.1	0.00350	-0.00028
564	205.01	1010759.2	-390041.8	3926.0	0.00350	-0.00024
565	213.59	1010759.6	-396359.9	0.0	0.00350	-0.00021
566	205.01	1010758.2	-390042.5	-3926.0	0.00350	-0.00024
567	165.23	1010759.2	-381704.0	-8977.1	0.00350	-0.00028
568	100.95	1010759.0	-356641.9	-20035.8	0.00350	-0.00034
569	31.62	1010758.5	0.0	-56802.7	0.00350	0.00308
570	100.95	1010759.4	356641.7	-20035.8	0.00350	-0.00034
571	165.23	1010759.3	381703.9	-8977.1	0.00350	-0.00028
572	205.01	1010759.9	390041.4	-3925.9	0.00350	-0.00024
573	227.12	1082955.8	347034.3	0.0	0.00350	0.00344
574	217.29	1082955.9	344007.4	3264.5	0.00350	-0.00003
575	175.14	1082956.8	336140.4	8029.5	0.00350	-0.00007
576	106.67	1082956.7	316168.7	18123.4	0.00350	-0.00013
577	33.64	1082955.3	0.0	48720.0	0.00350	0.00310
578	106.67	1082956.3	-316168.9	18123.4	0.00350	-0.00013
579	175.14	1082955.6	-336141.1	8029.6	0.00350	-0.00007
580	217.29	1082956.2	-344007.2	3264.5	0.00350	-0.00003
581	227.12	1082956.4	-347033.9	0.0	0.00350	0.00344
582	217.29	1082955.3	-344007.8	-3264.5	0.00350	-0.00003
583	175.14	1082955.9	-336140.9	-8029.5	0.00350	-0.00007
584	106.67	1082956.6	-316168.8	-18123.4	0.00350	-0.00013
585	33.64	1082956.5	0.0	-48719.9	0.00350	0.00310
586	106.67	1082956.9	316168.6	-18123.4	0.00350	-0.00013
587	175.14	1082957.1	336140.1	-8029.5	0.00350	-0.00007
588	217.29	1082956.9	344006.8	-3264.5	0.00350	-0.00003
589	242.55	1155153.3	297408.7	0.0	0.00350	0.00345
590	231.96	1155153.2	294920.0	3009.1	0.00350	0.00343
591	186.30	1155153.3	290554.3	7078.5	0.00350	0.00340
592	113.37	1155153.9	274111.3	15869.8	0.00350	0.00335
593	35.93	1155153.4	0.0	40635.9	0.00350	0.00313
594	113.37	1155153.6	-274111.5	15869.8	0.00350	0.00335
595	186.30	1155154.2	-290553.6	7078.5	0.00350	0.00340

596	231.96	1155153.5	-294919.8	3009.1	0.00350	0.00343
597	231.96	1155152.8	-294920.3	-3009.1	0.00350	0.00343
598	186.30	1155152.5	-290554.7	-7078.5	0.00350	0.00340
599	113.37	1155153.8	-274111.4	-15869.8	0.00350	0.00335
600	35.93	1155153.2	0.0	-40636.0	0.00350	0.00313
601	113.37	1155152.5	274112.2	-15869.8	0.00350	0.00335
602	186.30	1155153.6	290554.1	-7078.5	0.00350	0.00340
603	231.96	1155154.0	294919.4	-3009.1	0.00350	0.00343
604	260.24	1227349.6	247781.6	0.0	0.00350	0.00345
605	248.91	1227351.3	245390.0	2787.9	0.00350	0.00343
606	200.10	1227349.5	241150.1	6182.5	0.00350	0.00341
607	121.64	1227350.6	227253.1	13724.2	0.00350	0.00336
608	38.55	1227349.7	0.0	32551.0	0.00350	0.00316
609	121.64	1227350.4	-227253.3	13724.2	0.00350	0.00336
610	200.10	1227350.3	-241149.6	6182.5	0.00350	0.00341
611	248.91	1227350.2	-245390.7	2787.9	0.00350	0.00343
612	200.10	1227350.5	-241149.5	-6182.5	0.00350	0.00341
613	121.64	1227350.6	-227253.2	-13724.2	0.00350	0.00336
614	38.55	1227349.5	0.0	-32551.0	0.00350	0.00316
615	121.64	1227349.5	227253.9	-13724.2	0.00350	0.00336
616	200.10	1227349.7	241150.0	-6182.5	0.00350	0.00341
617	248.91	1227350.7	245390.4	-2787.9	0.00350	0.00343
618	283.44	1299548.2	193230.0	0.0	0.00350	0.00345
619	270.47	1299548.3	192232.6	2063.2	0.00350	0.00344
620	217.15	1299547.7	188971.2	5082.1	0.00350	0.00341
621	131.43	1299547.9	179990.6	11373.5	0.00350	0.00337
622	41.59	1299547.2	0.0	24465.2	0.00350	0.00318
623	131.43	1299547.7	-179990.7	11373.5	0.00350	0.00337
624	217.15	1299547.0	-188971.6	5082.1	0.00350	0.00341
625	270.47	1299546.6	-192233.9	2063.2	0.00350	0.00344
626	217.15	1299547.2	-188971.5	-5082.1	0.00350	0.00341
627	131.43	1299546.7	-179991.4	-11373.6	0.00350	0.00337
628	41.59	1299547.0	0.0	-24465.2	0.00350	0.00318
629	131.43	1299546.9	179991.2	-11373.6	0.00350	0.00337
630	217.15	1299546.6	188972.0	-5082.2	0.00350	0.00341
631	270.47	1299547.9	192232.9	-2063.2	0.00350	0.00344
632	312.49	1371744.7	136779.2	0.0	0.00350	0.00346
633	298.42	1371744.5	135651.3	1807.0	0.00350	0.00344
634	239.43	1371743.9	133561.1	3992.6	0.00350	0.00342
635	144.80	1371743.9	126789.5	8825.4	0.00350	0.00338
636	45.16	1371744.8	0.0	16378.7	0.00350	0.00321
637	144.80	1371745.4	-126788.4	8825.3	0.00350	0.00338
638	239.43	1371744.3	-133560.8	3992.6	0.00350	0.00342
639	298.42	1371744.6	-135651.2	1807.0	0.00350	0.00344
640	239.43	1371744.5	-133560.7	-3992.6	0.00350	0.00342
641	144.80	1371744.7	-126788.9	-8825.3	0.00350	0.00338
642	45.16	1371744.6	0.0	-16378.7	0.00350	0.00321
643	144.80	1371744.8	126788.8	-8825.3	0.00350	0.00338
644	239.43	1371744.0	133561.0	-3992.6	0.00350	0.00342
645	298.42	1371744.1	135651.6	-1807.0	0.00350	0.00344
646	356.99	1443941.7	73950.5	0.0	0.00350	0.00346
647	339.99	1443942.3	73652.6	1229.5	0.00350	0.00345
648	272.03	1443941.0	72874.2	2675.9	0.00350	0.00343

649	164.49	1443942.2	69046.1	5723.7	0.00350	0.00339
650	49.39	1443940.6	0.0	8292.0	0.00350	0.00323
651	164.49	1443942.2	-69046.2	5723.8	0.00350	0.00339
652	272.03	1443941.2	-72874.0	2675.9	0.00350	0.00343
653	339.99	1443941.4	-73653.4	1229.5	0.00350	0.00345
654	164.49	1443941.7	-69046.6	-5723.8	0.00350	0.00339
655	49.39	1443941.8	0.0	-8291.9	0.00350	0.00323
656	164.49	1443941.8	69046.5	-5723.8	0.00350	0.00339
657	272.03	1443942.1	72873.2	-2675.9	0.00350	0.00343
658	339.99	1443941.1	73653.7	-1229.5	0.00350	0.00345
659	465.70	1516139.6	2028.7	0.0	0.00350	0.00347
660	445.13	1516139.1	2029.3	204.0	0.00350	0.00346
661	362.74	1516139.6	2028.7	204.2	0.00350	0.00345
662	225.13	1516139.3	2029.1	204.4	0.00350	0.00342
663	54.51	1516138.5	0.0	205.1	0.00350	0.00326
664	225.13	1516138.9	-2029.6	204.4	0.00350	0.00342
665	362.74	1516139.1	-2029.3	204.3	0.00350	0.00345
666	445.13	1516139.2	-2029.2	204.0	0.00350	0.00346
667	225.13	1516139.0	-2029.4	-204.4	0.00350	0.00342
668	54.51	1516138.4	0.0	-205.1	0.00350	0.00326
669	225.13	1516139.5	2028.9	-204.4	0.00350	0.00342
670	362.74	1516138.7	2029.8	-204.3	0.00350	0.00345
671	445.13	1516139.0	2029.4	-204.0	0.00350	0.00346

Diagramma Mx-My

N = 0.0 [N] Sforzo normale della combinazione di carico

Simbologia adottata

N° numero d'ordine

M_X momento di calcolo lungo X espresso in [Nm]

M_Y momento di calcolo lungo Y espresso in [Nm]

N°	M _X	M _Y
1	849378.5	0.0
2	839342.1	6383.3
3	820294.9	15272.7
4	748763.7	37120.5
5	0.0	161727.1
6	-748763.7	37120.5
7	-820295.0	15272.7
8	-839342.3	6383.3
9	-849378.1	0.0
10	-839342.3	-6383.3
11	-820295.2	-15272.7
12	-748763.8	-37120.5
13	0.0	-161726.9
14	748763.6	-37120.5
15	820295.1	-15272.7

Diagramma M-N

M_R = 900000.0 [Nm] Momento risultante della combinazione di carico

Simbologia adottata

N° numero d'ordine

N sforzo normale di calcolo espresso in [N]

M momento di calcolo espresso in [Nm]

N°	N	M
1	1516139.6	-2029.3
2	1443941.7	-72838.8
3	1371744.7	-134999.9
4	1299548.2	-191291.9
5	1227349.6	-244072.6
6	1155153.3	-294920.0
7	1082955.8	-347033.9
8	1010758.7	-396359.9
9	938562.1	-439854.8
10	866365.6	-483323.3
11	794167.9	-526771.7
12	721971.3	-570206.4
13	649773.1	-613632.1
14	577575.8	-656258.6
15	505379.6	-694548.6
16	433182.6	-732834.5
17	360985.3	-763077.9
18	288787.9	-790056.0
19	216591.6	-817030.7
20	144394.6	-833599.9
21	72196.3	-849378.1
22	0.7	-862663.2
23	-71849.7	-864986.7
24	-143698.2	-864612.0
25	-215548.1	-859554.1
26	-287398.2	-847834.0
27	-359246.2	-836109.9
28	-431095.6	-817909.1
29	-502946.1	-794991.0
30	-574794.8	-772070.9
31	-646645.0	-739726.4
32	-718493.7	-697203.1
33	-790344.0	-651105.7
34	-862193.4	-604993.7
35	-934041.9	-550933.4
36	-1005891.8	-487302.0
37	-1077740.5	-423660.5
38	-1149589.9	-360012.2
39	-1221439.0	-296027.8
40	-1293289.1	-224471.7
41	-1365137.5	-152926.5
42	-1436987.4	-79897.4
43	-1508836.8	0.0
44	-1436987.4	79419.7
45	-1365137.5	152692.0
46	-1293289.1	224470.7
47	-1221439.0	296028.0

48	-1149589.9	360012.6
49	-1077740.5	423660.8
50	-1005891.8	487301.4
51	-934041.9	550932.8
52	-862193.4	604992.5
53	-790344.0	651104.5
54	-718493.7	697203.4
55	-646645.0	739725.8
56	-574794.8	772071.1
57	-502946.1	794991.2
58	-431095.6	817909.2
59	-359246.2	836110.0
60	-287398.2	847833.7
61	-215548.1	859554.2
62	-143698.2	864612.0
63	-71849.7	864986.7
64	0.7	862663.2
65	72196.3	849378.5
66	144394.6	833599.9
67	216591.6	817030.5
68	288787.9	790055.9
69	360985.3	763077.7
70	433182.6	732834.3
71	505379.6	694548.4
72	577575.8	656259.4
73	649773.1	613631.9
74	721971.3	570206.2
75	794167.9	526771.6
76	866365.6	483322.4
77	938562.1	439854.7
78	1010758.7	396360.4
79	1082955.8	347034.3
80	1155153.3	297408.7
81	1227349.6	247781.6
82	1299548.2	193230.0
83	1371744.7	136779.2
84	1443941.7	73950.5
85	1516139.6	2028.7

Diagra mma Momento-Curvatura

Simbologia adottata

N° numero d'ordine

N sforzo normale espresso in [N]

M_x momento di calcolo lungo X espresso in [Nm]

M_y momento di calcolo lungo Y espresso in [Nm]

Φ curvatura

ϵ_c deformazione nel calcestruzzo

ϵ_f deformazione nell'acciaio

	N	M_x	M_y	Φ	ϵ_{cls}	ϵ_{acc}
My	0.0	684354.4	0.0	1.635E-5	0.00188	-0.00182
Mc	0.0	707975.7	0.0	1.743E-5	0.00200	-0.00194

Combinazione n° 2

Risultati tensioni ammissibili

Caratteristiche asse neutro sezione :

Distanza asse neutro dal lembo più compresso	50.807	[cm]
Punti di intersezione con perimetro sezione (179.19 ; 30.00) (179.19 ; 0.00)		
Inclinazione asse neutro rispetto all'orizzontale	-90.000	[°]

Tensioni :

Tensione massima nel calcestruzzo	2453	[kPa]
Tensione minima nel calcestruzzo	0	[kPa]
Tensione tangenziale nel calcestruzzo	-105	[kPa]
Tensione massima nel ferro	34039	[kPa]
Tensione minima nel ferro	-127007	[kPa]

Risultati taglio

Simbologia adottata

V_{Rd1} Resistenza di calcolo dell'elemento privo di armatura a taglio

V_{Rd2} Massima forza di taglio di calcolo che può essere sopportata senza rottura delle bielle compresse convenzionali di calcestruzzo

$$V_{Rd1} = 2565.8 \quad [N]$$

$$V_{Rd2} = 2874.7 \quad [N]$$

Diametro e passo staffe $\phi 10.00 - 20.00$ [cm]

Sollecitazioni ultime

Simbologia adottata

FS Fattore di sicurezza

N_u Sforzo normale ultimo, espresso in [N]

M_{xu} Momento ultimo in direzione X, espresso in [Nm]

M_{yu} Momento ultimo in direzione Y, espresso in [Nm]

FS	N_u	M_{xu}	M_{yu}
2.61	0.0	<u>862663.2</u>	0.0

Risultati fessurazione

Momento di prima fessurazione	$M_x = 3286.8$	[Nm]	$M_y = 0.0$	[Nm]
Tensione nell'acciaio	$\sigma = -1265$	[kPa]		
Tensione nel calcestruzzo	$\sigma_{ct} = -86$	[kPa]		
Area efficace a trazione	$A_{eff} = 6771.67$	[cmq]		
Deformazione media acciaio teso	$\epsilon = 0.0617$			
Distanza media tra le fessure	$S_{rm} = 386.7951$	[mm]		
Ampiezza delle fessure	$w = 0.4055$	[mm]		

Dominio 3D

Simbologia adottata

N° numero d'ordine

X_c posizione asse neutro espresso in [cm]

N sforzo normale espresso in [N]

M_x momento lungo X espresso in [Nm]

M_Y momento lungo Y espresso in [Nm]

E_c deformazione nel calcestruzzo

E_f deformazione nell'acciaio

N°	X_c	N	M_x	M_y	E_c	E_f
1	-47.57	-1508836.8	0.0	0.0	-0.00210	-0.01000
2	-56.95	-1508836.8	0.0	0.0	-0.00340	-0.01000
3	-57.99	-1508836.8	0.0	0.0	-0.00689	-0.01000
4	-57.99	-1508836.8	0.0	0.0	-0.00344	-0.01000
5	-57.99	-1508836.8	0.0	0.0	-0.00245	-0.01000
6	-57.99	-1508836.8	0.0	0.0	-0.00209	-0.01000
7	-115.97	-1508836.8	0.0	0.0	-0.00339	-0.01000
8	-104.49	-1508836.8	0.0	0.0	-0.00323	-0.01000
9	-94.76	-1508836.8	0.0	0.0	-0.00347	-0.01000
10	-88.26	-1508836.8	0.0	0.0	-0.00443	-0.01000
11	-85.97	-1508836.8	0.0	0.0	-0.00766	-0.01000
12	-174.20	-1508836.8	0.0	0.0	-0.00611	-0.01000
13	-106.09	-1508836.8	0.0	0.0	-0.00373	-0.01000
14	-65.96	-1508836.8	0.0	0.0	-0.00231	-0.01000
15	-13.48	-1436987.4	79419.3	1926.2	-0.00058	-0.01000
16	-6.53	-1436987.3	77501.0	5056.3	-0.00035	-0.01000
17	-0.97	-1436987.8	75348.5	8047.1	-0.00009	-0.01000
18	-0.62	-1436987.5	0.0	8047.1	-0.00023	-0.01000
19	-0.97	-1436988.0	-75348.3	8047.1	-0.00009	-0.01000
20	-6.53	-1436988.3	-77500.0	5056.3	-0.00035	-0.01000
21	-13.48	-1436987.1	-79419.6	1926.2	-0.00058	-0.01000
22	-19.66	-1436986.6	-79897.4	0.0	-0.00080	-0.01000
23	-13.48	-1436987.9	-79418.8	-1926.2	-0.00058	-0.01000
24	-6.53	-1436988.1	-77500.3	-5056.3	-0.00035	-0.01000
25	-0.97	-1436986.7	-75349.6	-8047.2	-0.00009	-0.01000
26	-0.62	-1436987.2	0.0	-8047.1	-0.00023	-0.01000
27	-0.97	-1436986.5	75349.8	-8047.2	-0.00009	-0.01000
28	-6.53	-1436987.1	77501.3	-5056.3	-0.00035	-0.01000
29	-13.48	-1436986.6	79420.1	-1926.3	-0.00058	-0.01000
30	-0.26	-1365137.5	152692.5	3626.1	-0.00001	-0.01000
31	4.93	-1365137.2	151713.0	7895.8	0.00028	-0.01000
32	7.36	-1365138.9	143538.1	15608.9	0.00071	-0.01000
33	-0.08	-1365137.5	0.0	16094.3	-0.00003	-0.01000
34	7.36	-1365138.1	-143538.8	15609.0	0.00071	-0.01000
35	4.93	-1365138.4	-151711.8	7895.8	0.00028	-0.01000
36	-0.26	-1365137.1	-152692.9	3626.1	-0.00001	-0.01000
37	-6.01	-1365138.8	-152926.5	0.0	-0.00026	-0.01000
38	-0.26	-1365138.2	-152691.8	-3626.1	-0.00001	-0.01000
39	4.93	-1365138.1	-151712.1	-7895.8	0.00028	-0.01000
40	7.36	-1365139.0	-143538.0	-15608.9	0.00071	-0.01000
41	-0.08	-1365138.6	0.0	-16094.2	-0.00003	-0.01000
42	7.36	-1365138.6	143538.4	-15609.0	0.00071	-0.01000
43	4.93	-1365138.0	151712.2	-7895.8	0.00028	-0.01000
44	-0.26	-1365138.6	152691.4	-3626.1	-0.00001	-0.01000
45	4.62	-1293289.1	224470.7	0.0	0.00021	-0.01000
46	9.77	-1293289.1	224224.8	3802.1	0.00047	-0.01000
47	12.74	-1293289.5	221425.9	9602.3	0.00077	-0.01000
48	12.09	-1293288.1	210626.3	19998.9	0.00123	-0.01000

49	0.45	-1293288.2	0.0	24141.9	0.00017	-0.01000
50	12.09	-1293288.6	-210625.9	19998.8	0.00123	-0.01000
51	12.74	-1293287.7	-221427.6	9602.3	0.00077	-0.01000
52	9.77	-1293288.7	-224225.3	3802.1	0.00047	-0.01000
53	4.62	-1293288.1	-224471.7	0.0	0.00021	-0.01000
54	9.77	-1293288.7	-224225.3	-3802.1	0.00047	-0.01000
55	12.74	-1293289.1	-221426.3	-9602.3	0.00077	-0.01000
56	12.09	-1293288.3	-210626.2	-19998.9	0.00123	-0.01000
57	0.45	-1293287.9	0.0	-24141.9	0.00017	-0.01000
58	12.09	-1293287.8	210626.7	-19998.9	0.00123	-0.01000
59	12.74	-1293289.0	221426.4	-9602.3	0.00077	-0.01000
60	9.77	-1293287.8	224226.1	-3802.2	0.00047	-0.01000
61	14.30	-1221439.0	296028.0	0.0	0.00067	-0.01000
62	17.92	-1221438.8	292709.2	4867.1	0.00089	-0.01000
63	18.75	-1221439.1	288050.9	11396.1	0.00117	-0.01000
64	16.35	-1221439.0	277185.8	24437.2	0.00173	-0.01000
65	0.95	-1221440.1	0.0	32190.2	0.00038	-0.01000
66	16.35	-1221439.6	-277185.3	24437.2	0.00173	-0.01000
67	18.75	-1221439.1	-288050.9	11396.1	0.00117	-0.01000
68	17.92	-1221439.8	-292708.2	4867.0	0.00089	-0.01000
69	14.30	-1221439.2	-296027.8	0.0	0.00067	-0.01000
70	17.92	-1221439.8	-292708.3	-4867.0	0.00089	-0.01000
71	18.75	-1221438.6	-288051.4	-11396.2	0.00117	-0.01000
72	16.35	-1221439.1	-277185.7	-24437.2	0.00173	-0.01000
73	0.95	-1221439.7	0.0	-32190.2	0.00038	-0.01000
74	16.35	-1221440.2	277184.8	-24437.1	0.00173	-0.01000
75	18.75	-1221438.5	288051.5	-11396.2	0.00117	-0.01000
76	17.92	-1221438.7	292709.3	-4867.1	0.00089	-0.01000
77	20.76	-1149589.9	360012.6	0.0	0.00101	-0.01000
78	24.75	-1149590.5	358881.0	6148.5	0.00127	-0.01000
79	24.33	-1149589.1	354680.1	13188.0	0.00158	-0.01000
80	19.45	-1149589.1	337471.2	28652.2	0.00213	-0.01000
81	1.44	-1149589.6	0.0	40239.5	0.00058	-0.01000
82	19.45	-1149589.9	-337470.5	28652.2	0.00213	-0.01000
83	24.33	-1149589.2	-354680.0	13188.0	0.00158	-0.01000
84	24.75	-1149589.8	-358881.6	6148.5	0.00127	-0.01000
85	20.76	-1149590.3	-360012.2	0.0	0.00101	-0.01000
86	24.75	-1149589.7	-358881.7	-6148.5	0.00127	-0.01000
87	24.33	-1149590.8	-354678.5	-13188.0	0.00158	-0.01000
88	19.45	-1149589.3	-337471.1	-28652.2	0.00213	-0.01000
89	1.44	-1149590.8	0.0	-40239.3	0.00058	-0.01000
90	19.45	-1149590.6	337469.9	-28652.2	0.00213	-0.01000
91	24.33	-1149590.7	354678.6	-13188.0	0.00158	-0.01000
92	24.75	-1149590.4	358881.1	-6148.5	0.00127	-0.01000
93	26.74	-1077740.5	423660.8	0.0	0.00134	-0.01000
94	30.40	-1077740.5	422495.5	6334.2	0.00161	-0.01000
95	29.44	-1077740.6	420932.5	14811.5	0.00198	-0.01000
96	22.32	-1077740.0	396351.6	31400.7	0.00252	-0.01000
97	1.90	-1077740.6	0.0	48289.0	0.00078	-0.01000
98	22.32	-1077740.7	-396351.1	31400.6	0.00252	-0.01000
99	29.44	-1077740.7	-420932.4	14811.5	0.00198	-0.01000
100	30.40	-1077739.8	-422496.1	6334.2	0.00161	-0.01000
101	26.74	-1077740.9	-423660.5	0.0	0.00134	-0.01000

102	30.40	-1077739.7	-422496.2	-6334.2	0.00161	-0.01000
103	29.44	-1077739.9	-420933.0	-14811.5	0.00198	-0.01000
104	22.32	-1077740.1	-396351.5	-31400.6	0.00252	-0.01000
105	1.90	-1077740.2	0.0	-48289.0	0.00078	-0.01000
106	22.32	-1077741.3	396350.6	-31400.6	0.00252	-0.01000
107	29.44	-1077739.8	420933.1	-14811.5	0.00198	-0.01000
108	30.40	-1077740.4	422495.5	-6334.2	0.00161	-0.01000
109	32.37	-1005891.8	487301.4	0.0	0.00167	-0.01000
110	35.73	-1005891.3	486102.4	6519.2	0.00195	-0.01000
111	33.59	-1005891.4	480082.1	15357.4	0.00232	-0.01000
112	25.41	-1005891.1	451922.1	33313.1	0.00298	-0.01000
113	2.35	-1005891.3	0.0	56338.7	0.00099	-0.01000
114	25.41	-1005891.8	-451921.6	33313.1	0.00298	-0.01000
115	33.59	-1005891.5	-480082.0	15357.4	0.00232	-0.01000
116	35.73	-1005891.6	-486102.1	6519.2	0.00195	-0.01000
117	32.37	-1005891.1	-487302.0	0.0	0.00167	-0.01000
118	35.73	-1005891.5	-486102.2	-6519.2	0.00195	-0.01000
119	33.59	-1005890.8	-480082.6	-15357.4	0.00232	-0.01000
120	25.41	-1005891.2	-451922.0	-33313.1	0.00298	-0.01000
121	2.35	-1005890.9	0.0	-56338.7	0.00099	-0.01000
122	25.41	-1005890.5	451922.6	-33313.1	0.00298	-0.01000
123	33.59	-1005890.7	480082.7	-15357.4	0.00232	-0.01000
124	35.73	-1005891.2	486102.5	-6519.2	0.00195	-0.01000
125	37.70	-934041.9	550932.8	0.0	0.00200	-0.01000
126	41.37	-934041.9	547229.8	5744.3	0.00233	-0.01000
127	37.82	-934041.2	534924.3	15311.7	0.00269	-0.01000
128	28.21	-934042.1	505979.0	35420.3	0.00342	-0.01000
129	2.78	-934042.0	0.0	64388.4	0.00119	-0.01000
130	28.21	-934041.7	-505979.2	35420.3	0.00342	-0.01000
131	37.82	-934041.3	-534924.2	15311.7	0.00269	-0.01000
132	41.37	-934041.1	-547230.4	5744.3	0.00233	-0.01000
133	37.70	-934041.2	-550933.4	0.0	0.00200	-0.01000
134	41.37	-934041.0	-547230.5	-5744.3	0.00233	-0.01000
135	37.82	-934042.0	-534923.7	-15311.7	0.00269	-0.01000
136	28.21	-934041.0	-505979.7	-35420.3	0.00342	-0.01000
137	2.78	-934041.6	0.0	-64388.4	0.00119	-0.01000
138	28.21	-934042.6	505978.6	-35420.3	0.00342	-0.01000
139	37.82	-934041.8	534923.8	-15311.7	0.00269	-0.01000
140	41.37	-934041.8	547229.8	-5744.3	0.00233	-0.01000
141	45.28	-862193.4	604992.5	0.0	0.00250	-0.01000
142	46.69	-862192.4	600962.9	5872.9	0.00271	-0.01000
143	41.81	-862191.9	589753.2	15265.0	0.00306	-0.01000
144	30.42	-862193.2	549938.8	36716.9	0.00350	-0.00925
145	3.20	-862191.5	0.0	72438.1	0.00139	-0.01000
146	30.42	-862191.5	-549939.8	36716.9	0.00350	-0.00925
147	41.81	-862192.0	-589753.1	15265.0	0.00306	-0.01000
148	46.69	-862191.7	-600963.4	5872.9	0.00271	-0.01000
149	45.28	-862191.6	-604993.7	0.0	0.00250	-0.01000
150	46.69	-862191.6	-600963.4	-5872.9	0.00271	-0.01000
151	41.81	-862192.7	-589752.6	-15265.0	0.00306	-0.01000
152	30.42	-862193.4	-549938.7	-36716.9	0.00350	-0.00925
153	3.20	-862192.9	0.0	-72437.9	0.00139	-0.01000
154	30.42	-862192.4	549939.3	-36716.9	0.00350	-0.00925

155	41.81	-862192.6	589752.7	-15265.0	0.00306	-0.01000
156	46.69	-862192.3	600963.0	-5872.9	0.00271	-0.01000
157	50.57	-790344.0	651104.5	0.0	0.00288	-0.01000
158	52.40	-790342.9	649595.9	7170.6	0.00315	-0.01000
159	45.60	-790342.8	644370.5	15281.2	0.00343	-0.01000
160	32.82	-790342.8	591556.5	36509.9	0.00350	-0.00831
161	3.60	-790343.1	0.0	80487.3	0.00159	-0.01000
162	32.82	-790343.6	-591556.0	36509.9	0.00350	-0.00831
163	45.60	-790342.9	-644370.4	15281.2	0.00343	-0.01000
164	52.40	-790343.2	-649595.7	7170.6	0.00315	-0.01000
165	50.57	-790342.1	-651105.7	0.0	0.00288	-0.01000
166	52.40	-790343.2	-649595.7	-7170.6	0.00315	-0.01000
167	45.60	-790343.5	-644370.0	-15281.2	0.00343	-0.01000
168	32.82	-790343.0	-591556.4	-36509.9	0.00350	-0.00831
169	3.60	-790342.6	0.0	-80487.3	0.00159	-0.01000
170	32.82	-790342.1	591556.8	-36509.9	0.00350	-0.00831
171	45.60	-790343.4	644370.1	-15281.2	0.00343	-0.01000
172	52.40	-790342.8	649595.9	-7170.6	0.00315	-0.01000
173	55.57	-718493.7	697203.4	0.0	0.00326	-0.01000
174	57.16	-718493.0	695142.5	7315.2	0.00350	-0.00991
175	50.24	-718494.0	685244.3	15344.7	0.00350	-0.00893
176	35.37	-718493.4	628760.6	37023.7	0.00350	-0.00746
177	3.99	-718493.5	0.0	88536.2	0.00180	-0.01000
178	35.37	-718494.3	-628760.2	37023.7	0.00350	-0.00746
179	50.24	-718494.1	-685244.3	15344.7	0.00350	-0.00893
180	57.16	-718494.5	-695141.6	7315.2	0.00350	-0.00991
181	55.57	-718494.2	-697203.1	0.0	0.00326	-0.01000
182	57.16	-718494.4	-695141.6	-7315.2	0.00350	-0.00991
183	50.24	-718493.2	-685244.7	-15344.7	0.00350	-0.00893
184	35.37	-718493.6	-628760.6	-37023.7	0.00350	-0.00746
185	3.99	-718493.1	0.0	-88536.3	0.00180	-0.01000
186	35.37	-718492.7	628761.0	-37023.7	0.00350	-0.00746
187	50.24	-718494.7	685244.0	-15344.7	0.00350	-0.00893
188	57.16	-718492.9	695142.5	-7315.2	0.00350	-0.00991
189	60.85	-646645.0	739725.8	0.0	0.00350	-0.00951
190	62.98	-646644.5	732890.6	6022.5	0.00350	-0.00867
191	54.18	-646644.1	717040.4	15459.8	0.00350	-0.00803
192	37.50	-646644.5	659391.6	36953.0	0.00350	-0.00684
193	4.36	-646644.6	0.0	96584.7	0.00200	-0.01000
194	37.50	-646644.2	-659391.7	36953.0	0.00350	-0.00684
195	54.18	-646644.2	-717040.4	15459.8	0.00350	-0.00803
196	62.98	-646643.8	-732891.0	6022.5	0.00350	-0.00867
197	60.85	-646643.6	-739726.4	0.0	0.00350	-0.00951
198	62.98	-646643.7	-732891.0	-6022.5	0.00350	-0.00867
199	54.18	-646643.4	-717040.7	-15459.8	0.00350	-0.00803
200	37.50	-646643.4	-659392.0	-36953.0	0.00350	-0.00684
201	4.36	-646644.1	0.0	-96584.7	0.00200	-0.01000
202	37.50	-646645.1	659391.3	-36953.0	0.00350	-0.00684
203	54.17	-646644.7	717040.2	-15459.8	0.00350	-0.00803
204	62.98	-646644.4	732890.7	-6022.5	0.00350	-0.00867
205	68.18	-574794.8	772071.1	0.0	0.00350	-0.00811
206	68.42	-574794.3	763774.4	6763.8	0.00350	-0.00770
207	58.78	-574795.9	748832.7	15574.9	0.00350	-0.00713

208	39.88	-574795.0	689964.7	36770.0	0.00350	-0.00622
209	4.73	-574794.3	0.0	104632.8	0.00220	-0.01000
210	39.88	-574794.7	-689964.8	36770.0	0.00350	-0.00622
211	58.78	-574794.8	-748833.2	15574.9	0.00350	-0.00713
212	68.42	-574795.6	-763773.8	6763.8	0.00350	-0.00770
213	68.18	-574795.3	-772070.9	0.0	0.00350	-0.00811
214	68.42	-574795.5	-763773.9	-6763.8	0.00350	-0.00770
215	58.78	-574795.4	-748833.0	-15574.9	0.00350	-0.00713
216	39.88	-574794.0	-689965.1	-36770.0	0.00350	-0.00622
217	4.73	-574795.9	0.0	-104632.6	0.00220	-0.01000
218	39.88	-574795.5	689964.5	-36770.0	0.00350	-0.00622
219	58.78	-574795.3	748833.0	-15574.9	0.00350	-0.00713
220	68.42	-574794.2	763774.4	-6763.8	0.00350	-0.00770
221	73.48	-502946.1	794991.2	0.0	0.00350	-0.00727
222	73.48	-502945.9	790201.2	5943.4	0.00350	-0.00693
223	62.86	-502946.0	773610.1	15240.9	0.00350	-0.00644
224	42.16	-502946.1	713327.3	37299.4	0.00350	-0.00570
225	5.08	-502946.4	0.0	112680.2	0.00240	-0.01000
226	42.16	-502945.7	-713327.4	37299.4	0.00350	-0.00570
227	62.86	-502946.1	-773610.1	15240.9	0.00350	-0.00644
228	73.49	-502945.1	-790201.4	5943.4	0.00350	-0.00693
229	73.48	-502946.5	-794991.0	0.0	0.00350	-0.00727
230	73.49	-502945.0	-790201.5	-5943.4	0.00350	-0.00693
231	62.86	-502945.2	-773610.3	-15240.9	0.00350	-0.00644
232	42.16	-502946.4	-713327.3	-37299.4	0.00350	-0.00570
233	5.08	-502945.9	0.0	-112680.2	0.00240	-0.01000
234	42.16	-502945.3	713327.5	-37299.4	0.00350	-0.00570
235	62.86	-502945.1	773610.4	-15240.9	0.00350	-0.00644
236	73.49	-502945.8	790201.2	-5943.4	0.00350	-0.00693
237	79.67	-431095.6	817909.2	0.0	0.00350	-0.00644
238	79.25	-431096.2	813484.8	5563.0	0.00350	-0.00617
239	66.82	-431097.1	794275.4	15340.7	0.00350	-0.00585
240	44.27	-431096.0	732686.7	37135.9	0.00350	-0.00526
241	5.42	-431096.3	0.0	120727.4	0.00261	-0.01000
242	44.27	-431095.6	-732686.8	37135.9	0.00350	-0.00526
243	66.82	-431095.8	-794275.8	15340.7	0.00350	-0.00585
244	79.25	-431095.4	-813485.0	5563.0	0.00350	-0.00617
245	79.67	-431096.0	-817909.1	0.0	0.00350	-0.00644
246	79.25	-431095.3	-813485.0	-5563.0	0.00350	-0.00617
247	66.82	-431096.4	-794275.6	-15340.7	0.00350	-0.00585
248	44.27	-431096.2	-732686.7	-37135.9	0.00350	-0.00526
249	5.42	-431095.7	0.0	-120727.4	0.00261	-0.01000
250	44.27	-431096.5	732686.6	-37135.9	0.00350	-0.00526
251	66.82	-431096.3	794275.6	-15340.7	0.00350	-0.00585
252	79.25	-431096.1	813484.9	-5563.0	0.00350	-0.00617
253	85.83	-359246.2	836110.0	0.0	0.00350	-0.00572
254	84.76	-359247.0	829448.4	6578.9	0.00350	-0.00554
255	71.29	-359246.7	814937.0	15440.5	0.00350	-0.00526
256	46.61	-359246.8	752042.6	36972.4	0.00350	-0.00482
257	5.75	-359247.0	0.0	128774.1	0.00281	-0.01000
258	46.61	-359247.7	-752042.3	36972.4	0.00350	-0.00482
259	71.29	-359246.8	-814937.0	15440.5	0.00350	-0.00526
260	84.76	-359246.1	-829448.5	6578.8	0.00350	-0.00554

261	85.83	-359246.7	-836109.9	0.0	0.00350	-0.00572
262	84.76	-359246.1	-829448.5	-6578.8	0.00350	-0.00554
263	71.29	-359247.3	-814936.8	-15440.5	0.00350	-0.00526
264	46.61	-359247.0	-752042.5	-36972.4	0.00350	-0.00482
265	5.75	-359246.5	0.0	-128774.2	0.00281	-0.01000
266	46.61	-359246.1	752042.7	-36972.4	0.00350	-0.00482
267	71.29	-359247.2	814936.9	-15440.5	0.00350	-0.00526
268	84.76	-359246.9	829448.4	-6578.8	0.00350	-0.00554
269	91.19	-287398.2	847833.7	0.0	0.00350	-0.00518
270	90.05	-287397.3	841567.4	6193.0	0.00350	-0.00501
271	75.05	-287398.0	826239.4	15161.5	0.00350	-0.00482
272	48.74	-287397.6	762250.8	37430.2	0.00350	-0.00445
273	6.06	-287396.7	0.0	136820.6	0.00301	-0.01000
274	48.74	-287397.2	-762250.8	37430.2	0.00350	-0.00445
275	75.05	-287398.1	-826239.3	15161.5	0.00350	-0.00482
276	90.05	-287396.6	-841567.6	6193.0	0.00350	-0.00501
277	91.19	-287396.5	-847834.0	0.0	0.00350	-0.00518
278	90.05	-287396.5	-841567.6	-6193.0	0.00350	-0.00501
279	75.05	-287397.2	-826239.5	-15161.5	0.00350	-0.00482
280	48.74	-287397.8	-762250.7	-37430.2	0.00350	-0.00445
281	6.06	-287397.3	0.0	-136820.5	0.00301	-0.01000
282	48.74	-287398.2	762250.7	-37430.2	0.00350	-0.00445
283	75.05	-287397.1	826239.5	-15161.5	0.00350	-0.00482
284	90.05	-287397.2	841567.5	-6193.0	0.00350	-0.00501
285	97.26	-215548.1	859554.2	0.0	0.00350	-0.00464
286	95.59	-215549.0	850903.5	6412.0	0.00350	-0.00452
287	78.99	-215548.7	835609.9	15249.6	0.00350	-0.00441
288	50.89	-215548.0	769519.1	37112.7	0.00350	-0.00412
289	6.37	-215548.4	0.0	144866.5	0.00321	-0.01000
290	50.89	-215548.9	-769519.0	37112.7	0.00350	-0.00412
291	78.99	-215548.9	-835609.9	15249.6	0.00350	-0.00441
292	95.59	-215548.2	-850903.6	6412.0	0.00350	-0.00452
293	97.26	-215548.5	-859554.1	0.0	0.00350	-0.00464
294	95.59	-215548.1	-850903.6	-6412.0	0.00350	-0.00452
295	78.99	-215548.1	-835610.0	-15249.6	0.00350	-0.00441
296	50.89	-215548.2	-769519.0	-37112.7	0.00350	-0.00412
297	6.37	-215547.9	0.0	-144866.6	0.00321	-0.01000
298	50.89	-215547.2	769519.1	-37112.7	0.00350	-0.00412
299	78.99	-215547.9	835610.0	-15249.6	0.00350	-0.00441
300	95.59	-215548.9	850903.5	-6412.0	0.00350	-0.00452
301	102.92	-143698.2	864612.0	0.0	0.00350	-0.00419
302	100.84	-143698.9	854774.7	6911.0	0.00350	-0.00410
303	83.42	-143698.3	842623.4	15440.1	0.00350	-0.00399
304	53.27	-143698.1	775004.8	36736.5	0.00350	-0.00378
305	6.67	-143698.6	0.0	152912.4	0.00342	-0.01000
306	53.27	-143699.1	-775004.8	36736.5	0.00350	-0.00378
307	83.42	-143698.5	-842623.4	15440.1	0.00350	-0.00399
308	100.84	-143698.1	-854774.7	6911.0	0.00350	-0.00410
309	102.92	-143698.7	-864612.0	0.0	0.00350	-0.00419
310	100.84	-143698.0	-854774.7	-6911.0	0.00350	-0.00410
311	83.42	-143699.1	-842623.4	-15440.1	0.00350	-0.00399
312	53.27	-143698.4	-775004.8	-36736.5	0.00350	-0.00378
313	6.67	-143698.0	0.0	-152912.5	0.00342	-0.01000

314	53.27	-143698.7	775004.8	-36736.5	0.00350	-0.00378
315	83.42	-143699.0	842623.4	-15440.1	0.00350	-0.00399
316	100.84	-143698.9	854774.7	-6911.0	0.00350	-0.00410
317	108.29	-71849.7	864986.7	0.0	0.00350	-0.00381
318	106.13	-71848.6	855425.7	6527.6	0.00350	-0.00372
319	87.39	-71848.6	837039.9	15411.0	0.00350	-0.00365
320	55.47	-71848.8	768286.1	36998.1	0.00350	-0.00349
321	7.17	-71849.5	0.0	160957.0	0.00350	-0.00930
322	55.47	-71849.8	-768286.2	36998.1	0.00350	-0.00349
323	87.39	-71848.7	-837040.0	15411.0	0.00350	-0.00365
324	106.13	-71849.9	-855425.7	6527.6	0.00350	-0.00372
325	108.29	-71850.1	-864986.7	0.0	0.00350	-0.00381
326	106.13	-71849.9	-855425.7	-6527.6	0.00350	-0.00372
327	87.39	-71849.3	-837040.0	-15411.0	0.00350	-0.00365
328	55.47	-71849.0	-768286.1	-36998.1	0.00350	-0.00349
329	7.17	-71849.2	0.0	-160957.1	0.00350	-0.00930
330	55.47	-71849.4	768286.2	-36998.1	0.00350	-0.00349
331	87.39	-71849.2	837040.0	-15411.0	0.00350	-0.00365
332	106.13	-71848.5	855425.7	-6527.6	0.00350	-0.00372
333	114.64	0.7	862663.2	0.0	0.00350	-0.00341
334	111.71	0.8	850047.2	6552.4	0.00350	-0.00336
335	91.70	0.6	830278.1	15482.4	0.00350	-0.00331
336	57.75	-0.8	760172.6	36874.5	0.00350	-0.00321
337	7.90	-0.7	0.0	168999.6	0.00350	-0.00810
338	57.75	0.8	-760172.5	36874.5	0.00350	-0.00321
339	91.70	0.5	-830278.1	15482.4	0.00350	-0.00331
340	111.71	-0.6	-850047.3	6552.4	0.00350	-0.00336
341	114.64	0.4	-862663.2	0.0	0.00350	-0.00341
342	111.71	-0.5	-850047.3	-6552.4	0.00350	-0.00336
343	91.70	-0.1	-830278.1	-15482.4	0.00350	-0.00331
344	57.75	0.3	-760172.5	-36874.5	0.00350	-0.00321
345	7.90	0.5	0.0	-168999.7	0.00350	-0.00810
346	57.75	-0.1	760172.6	-36874.5	0.00350	-0.00321
347	91.70	0.0	830278.1	-15482.4	0.00350	-0.00331
348	111.71	0.9	850047.1	-6552.4	0.00350	-0.00336
349	120.49	72196.3	849378.5	0.0	0.00350	-0.00307
350	117.05	72197.9	839342.1	6383.3	0.00350	-0.00305
351	96.10	72197.2	820294.9	15272.7	0.00350	-0.00300
352	60.13	72196.8	748763.7	37120.5	0.00350	-0.00295
353	17.78	72196.4	0.0	161727.1	0.00350	-0.00166
354	60.13	72197.1	-748763.7	37120.5	0.00350	-0.00295
355	96.10	72197.1	-820295.0	15272.7	0.00350	-0.00300
356	117.05	72196.4	-839342.3	6383.3	0.00350	-0.00305
357	120.49	72198.0	-849378.1	0.0	0.00350	-0.00307
358	117.05	72196.5	-839342.3	-6383.3	0.00350	-0.00305
359	96.10	72196.4	-820295.2	-15272.7	0.00350	-0.00300
360	60.13	72196.6	-748763.8	-37120.5	0.00350	-0.00295
361	17.78	72198.0	0.0	-161726.9	0.00350	-0.00166
362	60.13	72197.5	748763.6	-37120.5	0.00350	-0.00295
363	96.10	72196.5	820295.1	-15272.7	0.00350	-0.00300
364	117.05	72198.0	839342.0	-6383.3	0.00350	-0.00305
365	126.44	144394.6	833599.9	0.0	0.00350	-0.00276
366	122.56	144394.0	826632.2	5746.9	0.00350	-0.00275

367	100.06	144393.8	802340.8	15338.1	0.00350	-0.00274
368	62.28	144393.3	729760.2	37120.5	0.00350	-0.00273
369	18.40	144394.7	0.0	153657.9	0.00350	-0.00148
370	62.28	144395.1	-729759.7	37120.5	0.00350	-0.00273
371	100.06	144395.1	-802340.4	15338.1	0.00350	-0.00274
372	122.56	144394.8	-826632.1	5746.9	0.00350	-0.00275
373	126.44	144394.2	-833599.9	0.0	0.00350	-0.00276
374	122.56	144394.8	-826632.1	-5746.9	0.00350	-0.00275
375	100.06	144394.5	-802340.6	-15338.1	0.00350	-0.00274
376	62.28	144394.5	-729759.9	-37120.5	0.00350	-0.00273
377	18.40	144393.9	0.0	-153658.0	0.00350	-0.00148
378	62.28	144394.1	729760.0	-37120.5	0.00350	-0.00273
379	100.06	144394.6	802340.5	-15338.1	0.00350	-0.00274
380	122.56	144394.1	826632.2	-5746.9	0.00350	-0.00275
381	132.88	216591.6	817030.5	0.0	0.00350	-0.00246
382	128.12	216590.7	806303.4	6355.2	0.00350	-0.00248
383	104.35	216591.5	784382.9	15403.6	0.00350	-0.00249
384	64.56	216591.5	710389.5	37005.8	0.00350	-0.00251
385	19.06	216591.2	0.0	145589.3	0.00350	-0.00131
386	64.56	216591.9	-710389.4	37005.8	0.00350	-0.00251
387	104.35	216591.4	-784382.9	15403.6	0.00350	-0.00249
388	128.12	216591.4	-806303.1	6355.2	0.00350	-0.00248
389	132.88	216591.2	-817030.7	0.0	0.00350	-0.00246
390	128.12	216591.5	-806303.1	-6355.2	0.00350	-0.00248
391	104.35	216590.8	-784383.1	-15403.6	0.00350	-0.00249
392	64.56	216591.3	-710389.5	-37005.8	0.00350	-0.00251
393	19.06	216590.4	0.0	-145589.4	0.00350	-0.00131
394	64.56	216591.0	710389.6	-37005.8	0.00350	-0.00251
395	104.35	216590.9	784383.0	-15403.6	0.00350	-0.00249
396	128.12	216590.7	806303.3	-6355.2	0.00350	-0.00248
397	138.33	288787.9	790055.9	0.0	0.00350	-0.00222
398	133.48	288787.6	780493.2	6266.6	0.00350	-0.00224
399	108.47	288787.5	760524.3	15216.9	0.00350	-0.00226
400	66.97	288788.9	690340.4	36766.3	0.00350	-0.00229
401	19.78	288788.3	0.0	137521.0	0.00350	-0.00114
402	66.97	288787.9	-690340.7	36766.3	0.00350	-0.00229
403	108.47	288787.4	-760524.3	15216.9	0.00350	-0.00226
404	133.48	288788.3	-780492.9	6266.6	0.00350	-0.00224
405	138.33	288787.5	-790056.0	0.0	0.00350	-0.00222
406	133.48	288788.4	-780492.9	-6266.6	0.00350	-0.00224
407	108.47	288788.2	-760524.0	-15216.9	0.00350	-0.00226
408	66.97	288788.7	-690340.5	-36766.3	0.00350	-0.00229
409	19.78	288787.5	0.0	-137521.0	0.00350	-0.00114
410	66.97	288788.3	690340.6	-36766.3	0.00350	-0.00229
411	108.47	288788.4	760523.9	-15216.9	0.00350	-0.00226
412	133.48	288787.6	780493.2	-6266.6	0.00350	-0.00224
413	144.24	360985.3	763077.7	0.0	0.00350	-0.00199
414	139.10	360985.9	753082.3	6138.9	0.00350	-0.00201
415	112.43	360985.9	731291.1	15277.2	0.00350	-0.00206
416	69.33	360984.9	666509.4	35827.8	0.00350	-0.00209
417	20.55	360985.1	0.0	129452.8	0.00350	-0.00096
418	69.33	360985.2	-666509.3	35827.8	0.00350	-0.00209
419	112.43	360985.8	-731291.1	15277.2	0.00350	-0.00206

420	139.10	360984.5	-753083.0	6138.9	0.00350	-0.00201
421	144.24	360984.9	-763077.9	0.0	0.00350	-0.00199
422	139.10	360984.5	-753082.9	-6138.9	0.00350	-0.00201
423	112.43	360985.1	-731291.4	-15277.2	0.00350	-0.00206
424	69.33	360984.7	-666509.4	-35827.8	0.00350	-0.00209
425	20.55	360986.3	0.0	-129452.7	0.00350	-0.00096
426	69.33	360985.6	666509.1	-35827.8	0.00350	-0.00209
427	112.43	360985.3	731291.4	-15277.2	0.00350	-0.00206
428	139.10	360986.0	753082.3	-6138.9	0.00350	-0.00201
429	150.27	433182.6	732834.3	0.0	0.00350	-0.00177
430	144.50	433182.2	719856.1	6752.4	0.00350	-0.00180
431	116.68	433181.7	702055.2	15337.4	0.00350	-0.00185
432	71.95	433183.0	641033.5	34597.3	0.00350	-0.00189
433	21.38	433183.0	0.0	121384.6	0.00350	-0.00079
434	71.95	433182.2	-641033.8	34597.3	0.00350	-0.00189
435	116.68	433181.5	-702055.2	15337.4	0.00350	-0.00185
436	144.50	433183.0	-719855.7	6752.4	0.00350	-0.00180
437	150.27	433182.2	-732834.5	0.0	0.00350	-0.00177
438	144.50	433183.1	-719855.6	-6752.4	0.00350	-0.00180
439	116.68	433182.3	-702054.9	-15337.4	0.00350	-0.00185
440	71.95	433182.8	-641033.5	-34597.3	0.00350	-0.00189
441	21.38	433182.3	0.0	-121384.7	0.00350	-0.00079
442	71.95	433182.6	641033.6	-34597.3	0.00350	-0.00189
443	116.68	433182.4	702054.9	-15337.4	0.00350	-0.00185
444	144.50	433182.3	719856.0	-6752.4	0.00350	-0.00180
445	155.73	505379.6	694548.4	0.0	0.00350	-0.00158
446	149.76	505379.6	682028.8	6516.0	0.00350	-0.00162
447	121.00	505379.6	665667.5	14873.4	0.00350	-0.00166
448	74.62	505380.0	609894.5	32968.4	0.00350	-0.00170
449	22.29	505378.9	0.0	113316.5	0.00350	-0.00061
450	74.62	505379.2	-609894.9	32968.4	0.00350	-0.00170
451	121.00	505379.5	-665667.6	14873.4	0.00350	-0.00166
452	149.76	505380.4	-682028.4	6516.0	0.00350	-0.00162
453	155.73	505379.2	-694548.6	0.0	0.00350	-0.00158
454	149.76	505380.4	-682028.4	-6516.0	0.00350	-0.00162
455	121.00	505378.9	-665667.9	-14873.4	0.00350	-0.00166
456	74.62	505379.9	-609894.6	-32968.4	0.00350	-0.00170
457	22.29	505379.9	0.0	-113316.4	0.00350	-0.00061
458	74.62	505379.6	609894.8	-32968.4	0.00350	-0.00170
459	121.00	505379.0	665667.8	-14873.4	0.00350	-0.00166
460	149.76	505379.7	682028.8	-6516.0	0.00350	-0.00162
461	161.60	577575.8	656259.4	0.0	0.00350	-0.00140
462	155.49	577576.5	643286.8	6162.3	0.00350	-0.00143
463	125.74	577576.5	626116.4	14021.5	0.00350	-0.00147
464	77.43	577576.7	575320.3	31208.1	0.00350	-0.00151
465	23.27	577576.5	0.0	105248.0	0.00350	-0.00044
466	77.43	577576.0	-575320.6	31208.1	0.00350	-0.00151
467	125.74	577577.6	-626115.8	14021.5	0.00350	-0.00147
468	155.49	577577.2	-643286.4	6162.3	0.00350	-0.00143
469	161.60	577577.4	-656258.6	0.0	0.00350	-0.00140
470	155.49	577577.3	-643286.4	-6162.3	0.00350	-0.00143
471	125.74	577575.8	-626116.8	-14021.5	0.00350	-0.00147
472	77.43	577576.6	-575320.3	-31208.1	0.00350	-0.00151

473	23.27	577577.4	0.0	-105247.9	0.00350	-0.00044
474	77.43	577577.3	575320.0	-31208.1	0.00350	-0.00151
475	125.74	577575.9	626116.7	-14021.5	0.00350	-0.00147
476	155.49	577576.6	643286.8	-6162.3	0.00350	-0.00143
477	168.38	649773.1	613631.9	0.0	0.00350	-0.00120
478	161.82	649773.4	603053.2	5617.2	0.00350	-0.00124
479	130.86	649773.6	586558.7	13169.7	0.00350	-0.00127
480	80.46	649774.4	540735.6	29448.2	0.00350	-0.00132
481	24.34	649773.9	0.0	97178.8	0.00350	-0.00027
482	80.46	649773.7	-540735.9	29448.2	0.00350	-0.00132
483	130.86	649773.5	-586558.7	13169.7	0.00350	-0.00127
484	161.82	649774.1	-603052.9	5617.2	0.00350	-0.00124
485	168.38	649772.8	-613632.1	0.0	0.00350	-0.00120
486	161.82	649774.1	-603052.8	-5617.2	0.00350	-0.00124
487	130.86	649774.1	-586558.4	-13169.7	0.00350	-0.00127
488	80.46	649774.3	-540735.7	-29448.2	0.00350	-0.00132
489	24.34	649773.4	0.0	-97178.8	0.00350	-0.00027
490	80.46	649773.1	540736.2	-29448.2	0.00350	-0.00132
491	130.86	649774.2	586558.4	-13169.7	0.00350	-0.00127
492	161.82	649773.5	603053.2	-5617.2	0.00350	-0.00124
493	175.83	721971.3	570206.2	0.0	0.00350	-0.00100
494	168.69	721971.4	562811.3	5072.3	0.00350	-0.00104
495	136.41	721971.1	546991.6	12318.2	0.00350	-0.00108
496	83.74	721970.9	506138.3	27688.8	0.00350	-0.00113
497	25.52	721970.5	0.0	89108.6	0.00350	-0.00009
498	83.74	721970.2	-506138.7	27688.9	0.00350	-0.00113
499	136.41	721971.0	-546991.6	12318.2	0.00350	-0.00108
500	168.69	721970.3	-562811.9	5072.3	0.00350	-0.00104
501	175.83	721971.0	-570206.4	0.0	0.00350	-0.00100
502	168.69	721970.4	-562811.8	-5072.3	0.00350	-0.00104
503	136.41	721971.6	-546991.3	-12318.2	0.00350	-0.00108
504	83.74	721970.7	-506138.4	-27688.8	0.00350	-0.00113
505	25.52	721970.0	0.0	-89108.6	0.00350	-0.00009
506	83.74	721971.4	506138.1	-27688.8	0.00350	-0.00113
507	136.41	721971.7	546991.3	-12318.2	0.00350	-0.00108
508	168.69	721971.5	562811.2	-5072.3	0.00350	-0.00104
509	183.96	794167.9	526771.6	0.0	0.00350	-0.00080
510	176.38	794167.5	520623.1	4745.4	0.00350	-0.00085
511	142.45	794167.5	507412.5	11466.9	0.00350	-0.00089
512	87.29	794167.9	471523.5	25930.0	0.00350	-0.00094
513	26.81	794168.2	0.0	81036.5	0.00350	0.00300
514	87.29	794167.3	-471523.8	25930.1	0.00350	-0.00094
515	142.45	794167.4	-507412.5	11466.9	0.00350	-0.00089
516	176.38	794168.0	-520622.7	4745.4	0.00350	-0.00085
517	183.96	794167.6	-526771.7	0.0	0.00350	-0.00080
518	176.38	794168.0	-520622.7	-4745.4	0.00350	-0.00085
519	142.45	794168.0	-507412.3	-11466.9	0.00350	-0.00089
520	87.29	794167.7	-471523.6	-25930.1	0.00350	-0.00094
521	26.81	794167.8	0.0	-81036.6	0.00350	0.00300
522	87.29	794168.3	471523.3	-25930.0	0.00350	-0.00094
523	142.45	794168.0	507412.2	-11466.9	0.00350	-0.00089
524	176.38	794167.5	520623.0	-4745.4	0.00350	-0.00085
525	192.89	866365.6	483322.4	0.0	0.00350	-0.00060

526	184.94	866365.3	477460.2	4526.5	0.00350	-0.00064
527	149.05	866364.3	467816.2	10616.0	0.00350	-0.00069
528	91.25	866364.8	435968.5	23964.4	0.00350	-0.00075
529	28.25	866364.9	0.0	72962.2	0.00350	0.00303
530	91.25	866365.7	-435968.1	23964.3	0.00350	-0.00075
531	149.05	866364.3	-467816.2	10616.0	0.00350	-0.00069
532	184.94	866365.8	-477459.9	4526.5	0.00350	-0.00064
533	192.89	866364.1	-483323.3	0.0	0.00350	-0.00060
534	184.94	866364.5	-477460.7	-4526.5	0.00350	-0.00064
535	149.05	866364.8	-467816.0	-10616.0	0.00350	-0.00069
536	91.25	866364.7	-435968.6	-23964.4	0.00350	-0.00075
537	28.25	866364.5	0.0	-72962.2	0.00350	0.00303
538	91.25	866365.2	435968.3	-23964.4	0.00350	-0.00075
539	149.05	866364.8	467815.9	-10616.0	0.00350	-0.00069
540	184.94	866364.1	477461.0	-4526.5	0.00350	-0.00064
541	202.71	938562.1	439854.7	0.0	0.00350	-0.00041
542	194.36	938562.3	434277.0	4307.6	0.00350	-0.00044
543	156.42	938562.4	427037.3	9891.7	0.00350	-0.00049
544	95.81	938561.9	397089.4	21945.1	0.00350	-0.00055
545	29.84	938562.9	0.0	64884.0	0.00350	0.00305
546	95.81	938561.5	-397089.7	21945.1	0.00350	-0.00055
547	156.42	938562.4	-427037.3	9891.7	0.00350	-0.00049
548	194.36	938562.7	-434276.7	4307.6	0.00350	-0.00044
549	202.71	938561.9	-439854.8	0.0	0.00350	-0.00041
550	194.36	938561.5	-434277.4	-4307.6	0.00350	-0.00044
551	156.42	938561.3	-427038.0	-9891.7	0.00350	-0.00049
552	95.81	938561.8	-397089.5	-21945.1	0.00350	-0.00055
553	29.84	938562.5	0.0	-64884.0	0.00350	0.00305
554	95.81	938562.3	397089.2	-21945.1	0.00350	-0.00055
555	156.42	938562.8	427037.0	-9891.7	0.00350	-0.00049
556	194.36	938561.1	434277.7	-4307.6	0.00350	-0.00044
557	213.59	1010758.7	396360.4	0.0	0.00350	-0.00021
558	205.01	1010758.8	390042.1	3926.0	0.00350	-0.00024
559	165.23	1010758.9	381704.2	8977.1	0.00350	-0.00028
560	100.95	1010759.1	356641.9	20035.8	0.00350	-0.00034
561	31.62	1010758.8	0.0	56802.7	0.00350	0.00308
562	100.95	1010758.7	-356642.1	20035.9	0.00350	-0.00034
563	165.23	1010758.9	-381704.2	8977.1	0.00350	-0.00028
564	205.01	1010759.2	-390041.8	3926.0	0.00350	-0.00024
565	213.59	1010759.6	-396359.9	0.0	0.00350	-0.00021
566	205.01	1010758.2	-390042.5	-3926.0	0.00350	-0.00024
567	165.23	1010759.2	-381704.0	-8977.1	0.00350	-0.00028
568	100.95	1010759.0	-356641.9	-20035.8	0.00350	-0.00034
569	31.62	1010758.5	0.0	-56802.7	0.00350	0.00308
570	100.95	1010759.4	356641.7	-20035.8	0.00350	-0.00034
571	165.23	1010759.3	381703.9	-8977.1	0.00350	-0.00028
572	205.01	1010759.9	390041.4	-3925.9	0.00350	-0.00024
573	227.12	1082955.8	347034.3	0.0	0.00350	0.00344
574	217.29	1082955.9	344007.4	3264.5	0.00350	-0.00003
575	175.14	1082956.8	336140.4	8029.5	0.00350	-0.00007
576	106.67	1082956.7	316168.7	18123.4	0.00350	-0.00013
577	33.64	1082955.3	0.0	48720.0	0.00350	0.00310
578	106.67	1082956.3	-316168.9	18123.4	0.00350	-0.00013

579	175.14	1082955.6	-336141.1	8029.6	0.00350	-0.00007
580	217.29	1082956.2	-344007.2	3264.5	0.00350	-0.00003
581	227.12	1082956.4	-347033.9	0.0	0.00350	0.00344
582	217.29	1082955.3	-344007.8	-3264.5	0.00350	-0.00003
583	175.14	1082955.9	-336140.9	-8029.5	0.00350	-0.00007
584	106.67	1082956.6	-316168.8	-18123.4	0.00350	-0.00013
585	33.64	1082956.5	0.0	-48719.9	0.00350	0.00310
586	106.67	1082956.9	316168.6	-18123.4	0.00350	-0.00013
587	175.14	1082957.1	336140.1	-8029.5	0.00350	-0.00007
588	217.29	1082956.9	344006.8	-3264.5	0.00350	-0.00003
589	242.55	1155153.3	297408.7	0.0	0.00350	0.00345
590	231.96	1155153.2	294920.0	3009.1	0.00350	0.00343
591	186.30	1155153.3	290554.3	7078.5	0.00350	0.00340
592	113.37	1155153.9	274111.3	15869.8	0.00350	0.00335
593	35.93	1155153.4	0.0	40635.9	0.00350	0.00313
594	113.37	1155153.6	-274111.5	15869.8	0.00350	0.00335
595	186.30	1155154.2	-290553.6	7078.5	0.00350	0.00340
596	231.96	1155153.5	-294919.8	3009.1	0.00350	0.00343
597	231.96	1155152.8	-294920.3	-3009.1	0.00350	0.00343
598	186.30	1155152.5	-290554.7	-7078.5	0.00350	0.00340
599	113.37	1155153.8	-274111.4	-15869.8	0.00350	0.00335
600	35.93	1155153.2	0.0	-40636.0	0.00350	0.00313
601	113.37	1155152.5	274112.2	-15869.8	0.00350	0.00335
602	186.30	1155153.6	290554.1	-7078.5	0.00350	0.00340
603	231.96	1155154.0	294919.4	-3009.1	0.00350	0.00343
604	260.24	1227349.6	247781.6	0.0	0.00350	0.00345
605	248.91	1227351.3	245390.0	2787.9	0.00350	0.00343
606	200.10	1227349.5	241150.1	6182.5	0.00350	0.00341
607	121.64	1227350.6	227253.1	13724.2	0.00350	0.00336
608	38.55	1227349.7	0.0	32551.0	0.00350	0.00316
609	121.64	1227350.4	-227253.3	13724.2	0.00350	0.00336
610	200.10	1227350.3	-241149.6	6182.5	0.00350	0.00341
611	248.91	1227350.2	-245390.7	2787.9	0.00350	0.00343
612	200.10	1227350.5	-241149.5	-6182.5	0.00350	0.00341
613	121.64	1227350.6	-227253.2	-13724.2	0.00350	0.00336
614	38.55	1227349.5	0.0	-32551.0	0.00350	0.00316
615	121.64	1227349.5	227253.9	-13724.2	0.00350	0.00336
616	200.10	1227349.7	241150.0	-6182.5	0.00350	0.00341
617	248.91	1227350.7	245390.4	-2787.9	0.00350	0.00343
618	283.44	1299548.2	193230.0	0.0	0.00350	0.00345
619	270.47	1299548.3	192232.6	2063.2	0.00350	0.00344
620	217.15	1299547.7	188971.2	5082.1	0.00350	0.00341
621	131.43	1299547.9	179990.6	11373.5	0.00350	0.00337
622	41.59	1299547.2	0.0	24465.2	0.00350	0.00318
623	131.43	1299547.7	-179990.7	11373.5	0.00350	0.00337
624	217.15	1299547.0	-188971.6	5082.1	0.00350	0.00341
625	270.47	1299546.6	-192233.9	2063.2	0.00350	0.00344
626	217.15	1299547.2	-188971.5	-5082.1	0.00350	0.00341
627	131.43	1299546.7	-179991.4	-11373.6	0.00350	0.00337
628	41.59	1299547.0	0.0	-24465.2	0.00350	0.00318
629	131.43	1299546.9	179991.2	-11373.6	0.00350	0.00337
630	217.15	1299546.6	188972.0	-5082.2	0.00350	0.00341
631	270.47	1299547.9	192232.9	-2063.2	0.00350	0.00344

632	312.49	1371744.7	136779.2	0.0	0.00350	0.00346
633	298.42	1371744.5	135651.3	1807.0	0.00350	0.00344
634	239.43	1371743.9	133561.1	3992.6	0.00350	0.00342
635	144.80	1371743.9	126789.5	8825.4	0.00350	0.00338
636	45.16	1371744.8	0.0	16378.7	0.00350	0.00321
637	144.80	1371745.4	-126788.4	8825.3	0.00350	0.00338
638	239.43	1371744.3	-133560.8	3992.6	0.00350	0.00342
639	298.42	1371744.6	-135651.2	1807.0	0.00350	0.00344
640	239.43	1371744.5	-133560.7	-3992.6	0.00350	0.00342
641	144.80	1371744.7	-126788.9	-8825.3	0.00350	0.00338
642	45.16	1371744.6	0.0	-16378.7	0.00350	0.00321
643	144.80	1371744.8	126788.8	-8825.3	0.00350	0.00338
644	239.43	1371744.0	133561.0	-3992.6	0.00350	0.00342
645	298.42	1371744.1	135651.6	-1807.0	0.00350	0.00344
646	356.99	1443941.7	73950.5	0.0	0.00350	0.00346
647	339.99	1443942.3	73652.6	1229.5	0.00350	0.00345
648	272.03	1443941.0	72874.2	2675.9	0.00350	0.00343
649	164.49	1443942.2	69046.1	5723.7	0.00350	0.00339
650	49.39	1443940.6	0.0	8292.0	0.00350	0.00323
651	164.49	1443942.2	-69046.2	5723.8	0.00350	0.00339
652	272.03	1443941.2	-72874.0	2675.9	0.00350	0.00343
653	339.99	1443941.4	-73653.4	1229.5	0.00350	0.00345
654	164.49	1443941.7	-69046.6	-5723.8	0.00350	0.00339
655	49.39	1443941.8	0.0	-8291.9	0.00350	0.00323
656	164.49	1443941.8	69046.5	-5723.8	0.00350	0.00339
657	272.03	1443942.1	72873.2	-2675.9	0.00350	0.00343
658	339.99	1443941.1	73653.7	-1229.5	0.00350	0.00345
659	465.70	1516139.6	2028.7	0.0	0.00350	0.00347
660	445.13	1516139.1	2029.3	204.0	0.00350	0.00346
661	362.74	1516139.6	2028.7	204.2	0.00350	0.00345
662	225.13	1516139.3	2029.1	204.4	0.00350	0.00342
663	54.51	1516138.5	0.0	205.1	0.00350	0.00326
664	225.13	1516138.9	-2029.6	204.4	0.00350	0.00342
665	362.74	1516139.1	-2029.3	204.3	0.00350	0.00345
666	445.13	1516139.2	-2029.2	204.0	0.00350	0.00346
667	225.13	1516139.0	-2029.4	-204.4	0.00350	0.00342
668	54.51	1516138.4	0.0	-205.1	0.00350	0.00326
669	225.13	1516139.5	2028.9	-204.4	0.00350	0.00342
670	362.74	1516138.7	2029.8	-204.3	0.00350	0.00345
671	445.13	1516139.0	2029.4	-204.0	0.00350	0.00346

Diagramma Mx-My

N = 0.0 [N] Sforzo normale della combinazione di carico

Simbologia adottata

N° numero d'ordine

M_x momento di calcolo lungo X espresso in [Nm]

M_y momento di calcolo lungo Y espresso in [Nm]

N°	M _x	M _y
1	849378.5	0.0
2	839342.1	6383.3

3	820294.9	15272.7
4	748763.7	37120.5
5	0.0	161727.1
6	-748763.7	37120.5
7	-820295.0	15272.7
8	-839342.3	6383.3
9	-849378.1	0.0
10	-839342.3	-6383.3
11	-820295.2	-15272.7
12	-748763.8	-37120.5
13	0.0	-161726.9
14	748763.6	-37120.5
15	820295.1	-15272.7

Diagramma M-N

$M_R = 330000.0$ [Nm] Momento risultante della combinazione di carico

Simbologia adottata

N° numero d'ordine

N sforzo normale di calcolo espresso in [N]

M momento di calcolo espresso in [Nm]

N°	N	M
1	1516139.6	-2029.3
2	1443941.7	-72838.8
3	1371744.7	-134999.9
4	1299548.2	-191291.9
5	1227349.6	-244072.6
6	1155153.3	-294920.0
7	1082955.8	-347033.9
8	1010758.7	-396359.9
9	938562.1	-439854.8
10	866365.6	-483323.3
11	794167.9	-526771.7
12	721971.3	-570206.4
13	649773.1	-613632.1
14	577575.8	-656258.6
15	505379.6	-694548.6
16	433182.6	-732834.5
17	360985.3	-763077.9
18	288787.9	-790056.0
19	216591.6	-817030.7
20	144394.6	-833599.9
21	72196.3	-849378.1
22	0.7	-862663.2
23	-71849.7	-864986.7
24	-143698.2	-864612.0
25	-215548.1	-859554.1
26	-287398.2	-847834.0
27	-359246.2	-836109.9
28	-431095.6	-817909.1
29	-502946.1	-794991.0

30	-574794.8	-772070.9
31	-646645.0	-739726.4
32	-718493.7	-697203.1
33	-790344.0	-651105.7
34	-862193.4	-604993.7
35	-934041.9	-550933.4
36	-1005891.8	-487302.0
37	-1077740.5	-423660.5
38	-1149589.9	-360012.2
39	-1221439.0	-296027.8
40	-1293289.1	-224471.7
41	-1365137.5	-152926.5
42	-1436987.4	-79897.4
43	-1508836.8	0.0
44	-1436987.4	79419.7
45	-1365137.5	152692.0
46	-1293289.1	224470.7
47	-1221439.0	296028.0
48	-1149589.9	360012.6
49	-1077740.5	423660.8
50	-1005891.8	487301.4
51	-934041.9	550932.8
52	-862193.4	604992.5
53	-790344.0	651104.5
54	-718493.7	697203.4
55	-646645.0	739725.8
56	-574794.8	772071.1
57	-502946.1	794991.2
58	-431095.6	817909.2
59	-359246.2	836110.0
60	-287398.2	847833.7
61	-215548.1	859554.2
62	-143698.2	864612.0
63	-71849.7	864986.7
64	0.7	862663.2
65	72196.3	849378.5
66	144394.6	833599.9
67	216591.6	817030.5
68	288787.9	790055.9
69	360985.3	763077.7
70	433182.6	732834.3
71	505379.6	694548.4
72	577575.8	656259.4
73	649773.1	613631.9
74	721971.3	570206.2
75	794167.9	526771.6
76	866365.6	483322.4
77	938562.1	439854.7
78	1010758.7	396360.4
79	1082955.8	347034.3
80	1155153.3	297408.7
81	1227349.6	247781.6
82	1299548.2	193230.0

83	1371744.7	136779.2
84	1443941.7	73950.5
85	1516139.6	2028.7

Diagramma Momento-Curvatura

Simbologia adottata

N° numero d'ordine

N sforzo normale espresso in [N]

M_x momento di calcolo lungo X espresso in [Nm]

M_y momento di calcolo lungo Y espresso in [Nm]

Φ curvatura

ϵ_c deformazione nel calcestruzzo

ϵ_f deformazione nell'acciaio

	N	M_x	M_y	Φ	ϵ_{cls}	ϵ_{acc}
My	0.0	684354.5	0.0	1.635E-5	0.00188	-0.00182
Mc	0.0	707975.6	0.0	1.743E-5	0.00200	-0.00194
Me	0.0	330000.0	0.0	7.878E-6	0.00090	-0.00088

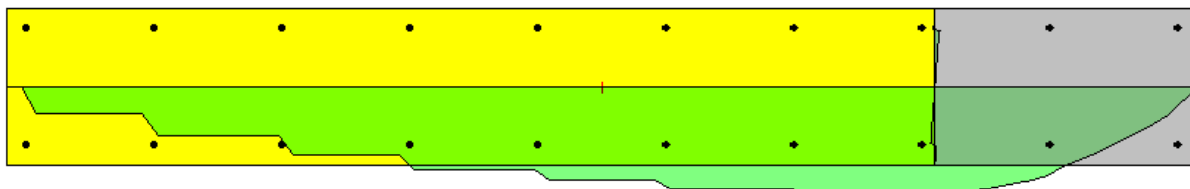
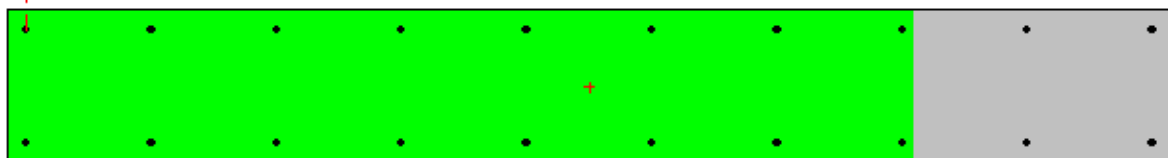
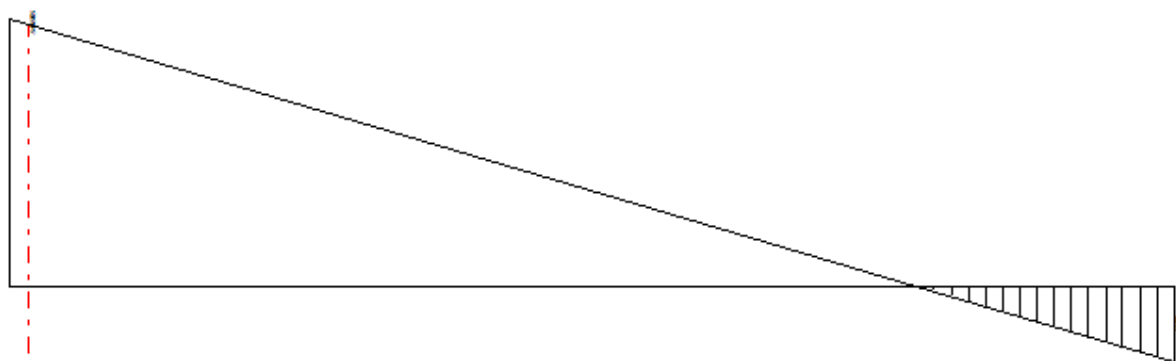
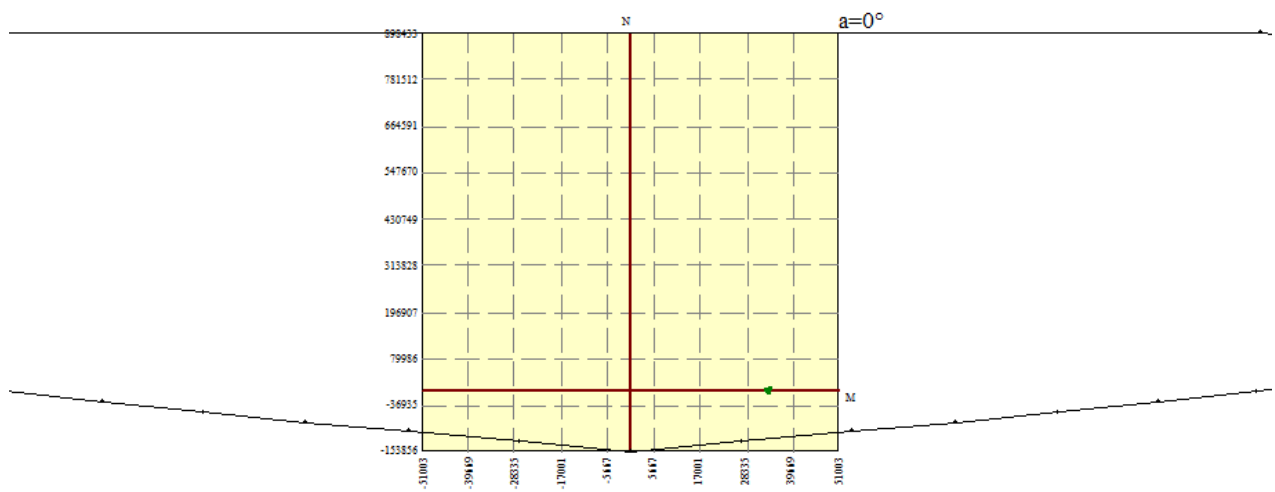


Diagramma M - N



7 ALLEGATO C - VERIFICA N.8 B

Il funzionamento a sbalzo sul piano orizzontale non si verifica in quanto i cordoli di alloggiamento sono collegati alle estremità da cordoli trasversali di chiusura che ne impediscono tale funzionamento (vedi tavole grafiche).