



CONTRATO 094/15
AS N°018

**CIDADE DE SANTA MARIA DE JETIBÁ
IMPLANTAÇÃO DO SISTEMA
DE ESGOTAMENTO
SANITÁRIO DE SANTA MARIA
DE JETIBÁ**

**VOLUME I – PROJETO
ESTRUTURAL**

**MEMORIAL DE CÁLCULO –
ESTRUTURAS DE CONCRETO**

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**SERVIÇOS DE CONSULTORIA PARA ELABORAÇÃO E/OU ESTUDOS DE
CONCEPÇÃO E PROJETOS TÉCNICOS EM SISTEMAS DE ABASTECIMENTO DE
ÁGUA E ESGOTAMENTO SANITÁRIO NA GRANDE VITÓRIA E NO INTERIOR DO
ESTADO DO ESPÍRITO SANTO**

**AS 018 – IMPLANTAÇÃO DO SISTEMA DE ESGOTAMENTO SANITÁRIO DE
SANTA MARIA DE JETIBÁ**

VOLUME 1 - PROJETO ESTRUTURAL

TOMO A

MEMORIAL DE CÁLCULO – ESTRUTURAS DE CONCRETO

RELATÓRIO FINAL

Emitido por:

Engesolo Engenharia Ltda.

Local:

Vitória-ES

APRESENTAÇÃO

O presente trabalho é parte integrante do Contrato nº. 094/2015, firmado entre a CESAN – Companhia Espírito Santense de Saneamento e a Engesolo Engenharia Ltda., referente à prestação de serviços de consultoria para elaboração e/ou estudos de Concepção, Projetos Técnicos, em Sistemas de Abastecimento de Água e Esgotamento Sanitário na Grande Vitória e no Interior do Estado do Espírito Santo.

Os serviços foram desenvolvidos em consonância com a Autorização de Serviço Nº023/094/2015 para Implantação do Sistema de Esgotamento Sanitário de Santa Maria de Jetibá.

O projeto é composto dos seguintes documentos:

VOLUME I – PROJETO ESTRUTURAL

- TOMO A – Memorial de Cálculo – Estruturas de Concreto
- TOMO B – Desenhos

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1. INTRODUÇÃO

Esta memória de cálculo tem como objetivo mostrar os dados utilizados para o dimensionamento, bem como os resultados das estruturas de concreto do Sistema de Esgotamento Sanitário de Santa Maria de Jetibá, localizada no município de Santa Maria de Jetibá – ES. Será apresentado o dimensionamento das estruturas de concreto da ETE e das EEEBs.

1.1. DOCUMENTOS DE REFERÊNCIA

1.1.1. Projeto Hidráulico da ETE

- B-055-000-92-2-XX-0001 a B-055-000-92-2-XX-0045.

1.1.2. Projeto Hidráulico das EEEB-E e EEEB-F

- B-055-000-91-5-XX-0010 a B-055-000-91-5-XX-0013.
- B-055-000-91-5-XX-0036 a B-055-000-91-5-XX-0040.

1.2. NORMAS APLICÁVEIS

- NBR-6118 – Projeto de Estruturas de Concreto – Procedimento.
- NBR-6120 – Cargas para o cálculo de estruturas de edificações
- NBR-6122 – Projeto e Execução de Fundações.
- NBR-6123 – Forças devidas ao vento em edificações
- NBR 8681 – Ações e Segurança nas Estruturas – Procedimento

1.3. ESTRUTURAS DE CONCRETO INTEGRANTES DO PROJETO

- Filtro biológico aerado submerso
- Leito de secagem – Ampliação e novo.
- Tratamento primário.
- Casa de Sopradores.
- UASB.
- Decantador.

- Elevatória de recirculação.
- Dispositivos de drenagem.
- EEEB-E e EEEB-F.

2. CONSIDERAÇÕES PARA O DIMENSIONAMENTO

2.1. CRITÉRIO DE PROJETO

O dimensionamento das peças estruturais será feito seguindo as recomendações das normas da ABNT. Foram considerados os estados limites últimos (ELU) e os estados limites de serviço (ELS). O modelo estrutural trata-se de caixas prismáticas aérea, enterradas e/ou semienterradas, com ou sem tampa sendo que serão considerados os esforços devido ao peso próprio, sobrecarga e empuxo interno de água, empuxo externo do solo nas paredes enterradas ou semienterradas.

2.2. DADOS GERAIS

2.2.1. Concreto

- Classe de agressividade= III(forte)
- Abertura máxima das fissuras= 0,3mm
- Dimensões do agregado= 19mm
- f_{ck} = 30 MPa
- Cobrimento de 4,0 cm
- Aço Ca-50

2.3. PARÂMETROS GEOTÉCNICOS

Para determinação dos parâmetros geotécnicos e tipo de fundações, foram realizadas campanhas de sondagem e apresentadas nos documentos RELATÓRIO_SANTA_MARIA. Conforme a locação dos furos de sondagem foram determinados os parâmetros geotécnicos para cada estrutura. Os parâmetros calculados em função no número N_{SPT} para cada local foram a tensão admissível e o coeficiente de recalque vertical, determinados pelas seguintes equações:

$$\sigma_{adm} = \frac{N_{SPT}}{5} = [kgf/cm^2]$$

$$CRV = N_{SPT} \times 3.000 \text{ (solos argilosos)} [kN/m^3]$$

Os parâmetros comuns adotados para todas as estruturas são peso específico ($\gamma = 18,00 \text{ kN/m}^3$) e coeficiente de empuxo determinado pela equação abaixo, considerado o ângulo de atrito $\varphi = 30^\circ$:

$$K = tg^2 \left(45^\circ - \frac{\varphi}{2} \right) = tg^2 \left(45^\circ - \frac{30^\circ}{2} \right) = 0,333$$

A tabela a seguir apresenta os demais parâmetros adotados no dimensionamento de cada estrutura:

Tabela 1. Parâmetros geotécnicos para cada unidade da ETE/EEEB.

Unidade	Nº SPT	NSPT	Tensão Admissível (kgf/cm²)	Coeficiente de Recalque Vertical (kN/m³)
Filtro biológico	04	9	1,80	27.000,00
Ampliação do leito de secagem	06	5	1,00	15.000,00
Leito de secagem novo	08	11	2,20	33.000,00
Tratamento Primário	01	10	2,00	30.000,00
Casa de sopradores	05	8	1,60	24.000,00
UASB	02	7	1,40	21.000,00
Decantador	04	9	1,80	27.000,00
Elevatória de recirculação	05	5	1,00	15.000,00
EEEB-E	01	2	0,40	6.000,00
EEEB-F	01	6	1,20	18.000,00

2.4. CARGAS

2.4.1. Cargas Permanentes

- Peso próprio gerada eletronicamente pelo programa

2.4.2. Cargas Acidentais

- Sobrecarga = $2,00 \text{ kN/m}^2$
- Sobrecarga de equipamentos sobre as lajes.

2.4.3. Peso específico

- Concreto = $25,00 \text{ kN/m}^3$
- Água = $10,00 \text{ kN/m}^3$

2.4.4. Carregamento nas lajes de fundo

- Peso da água considerando o pior cenário com a estrutura 100% cheia.

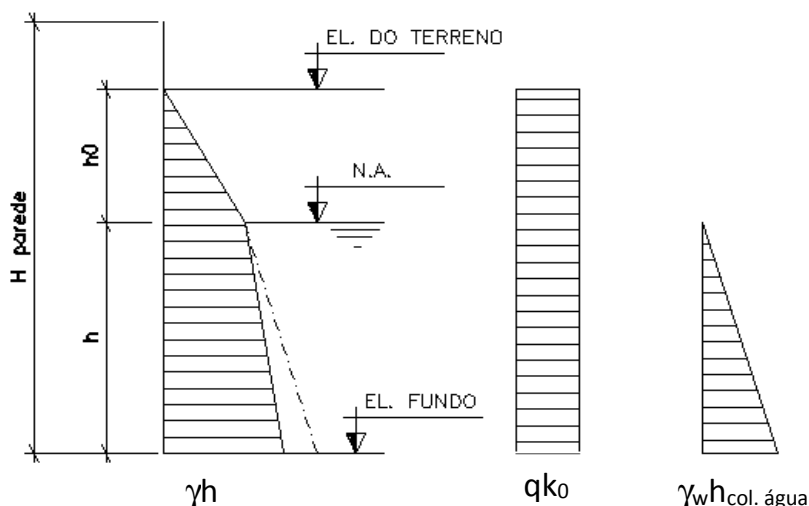
2.4.5. Carregamento nas paredes lado interno

- Considerando a caixa cheia de água temos;

$$P_{\text{agua}} = \gamma_{\text{agua}} \cdot h_{\text{agua}}$$

2.4.6. Carregamento nas paredes lado externo

- Para o trecho aéreo a carga externa será igual a 0.
- Para o trecho enterrado ou semienterrado temos;



A carga q para carga retangular será utilizada nas estruturas sobre efeito de tráfego de veículos, cujo valor será de 25,00 kN/m².

2.5. COMBINAÇÕES

Para o dimensionamento das estruturas foram considerados, de acordo com as normas técnicas da Associação Brasileira de Normas Técnicas (ABNT), os estados limites de utilização (flechas, aberturas de fissuras) e o último (segurança), sempre considerando as questões relativas à durabilidade da estrutura.

As combinações de ações de ações usadas no cálculo foram de acordo com NBR 8691:2003.

Combinações últimas (ELU), que para o edifício em causa são consideradas Normais, “Esgotamento da capacidade resistente para elementos estruturais de concreto armado”, sendo o cálculo das solicitações:

$$F_d = \sum_{i=1}^m \gamma_{gi} F_{Gi,k} + \gamma_q \left[F_{Q1,k} + \sum_{j=2}^n \Psi_{Oj} F_{Qj,k} \right]$$

De acordo com a tabela 11.3 da NBR 6118:2014

Os valores dos Coeficientes de ponderação das ações (γ_f) no estado-limite último (ELU), foram os utilizados nas tabelas 11.1 e 11.2 da NBR 6118:2014.

Combinações de serviço (ELS)

a) Combinações quase permanentes (CQP)

$$F_d = \sum F_{gi,k} + \sum \psi_{2j} F_{gj,k}$$

b) Combinações frequentes (CF)

$$F_d = \sum F_{gi,k} + \psi_1 F_{q1k} + \sum \psi_{2j} F_{gj,k}$$

c) Combinações raras (CR)

$$F_d = \sum F_{gi,k} + F_{q1k} + \sum \psi_{1j} F_{gj,k}$$

De acordo com a tabela 11.4 da NBR 6118:2014

Os valores dos Coeficientes de ponderação das ações (γ_f) no estado-limite de serviço (ELS), foram os utilizados na tabela 11.2 da NBR 6118:2014.

A tabela 2.1 apresenta os coeficientes parciais de segurança utilizados conforme tabela 1 NBR 8681.

Tabela 3.1 – Coeficientes.

	Coeficientes parciais de segurança (γ)		Coeficientes de combinação (ψ)	
	Favorável	Desfavorável	Principal (ψ_p)	Acompanhamento (ψ_a)
Permanente – CP	1,00	1,40	-	-
Sobrecarga – SC	0,00	1,40	1,00	0,80

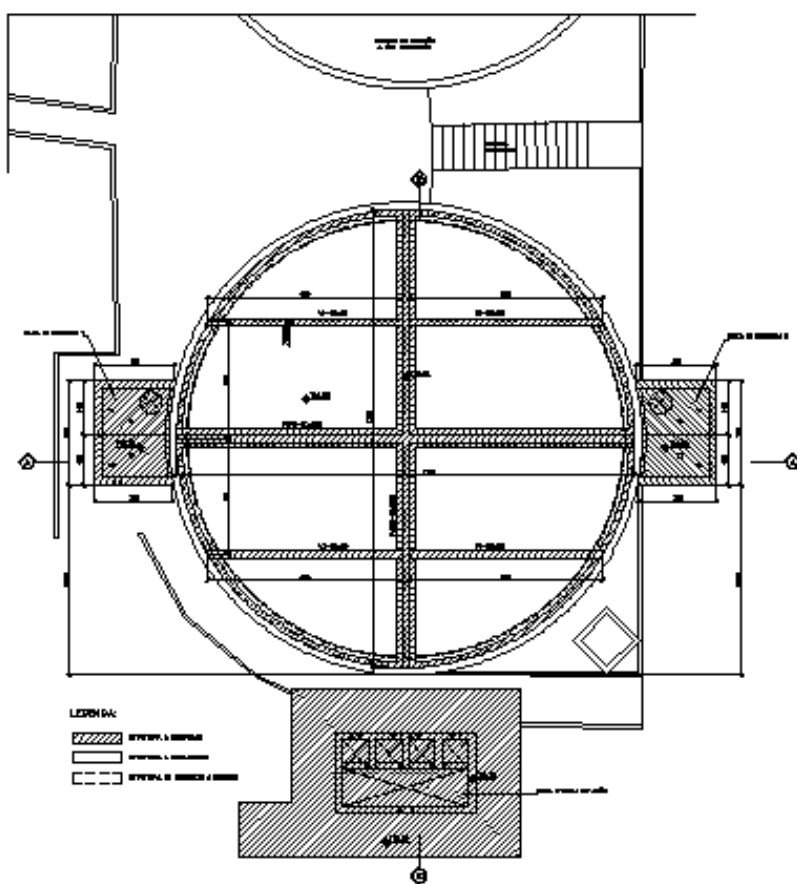
2.6. SOFTWARES UTILIZADOS NO DIMENSIONAMENTO

- Programa SAP 2000
- Strap 12.5
- Planilhas do Excel

3. DIMENSIONAMENTO – FILTRO BIOLÓGICO AERADO SUBMERSO

3.1. MODELAGEM ESTRUTURAL

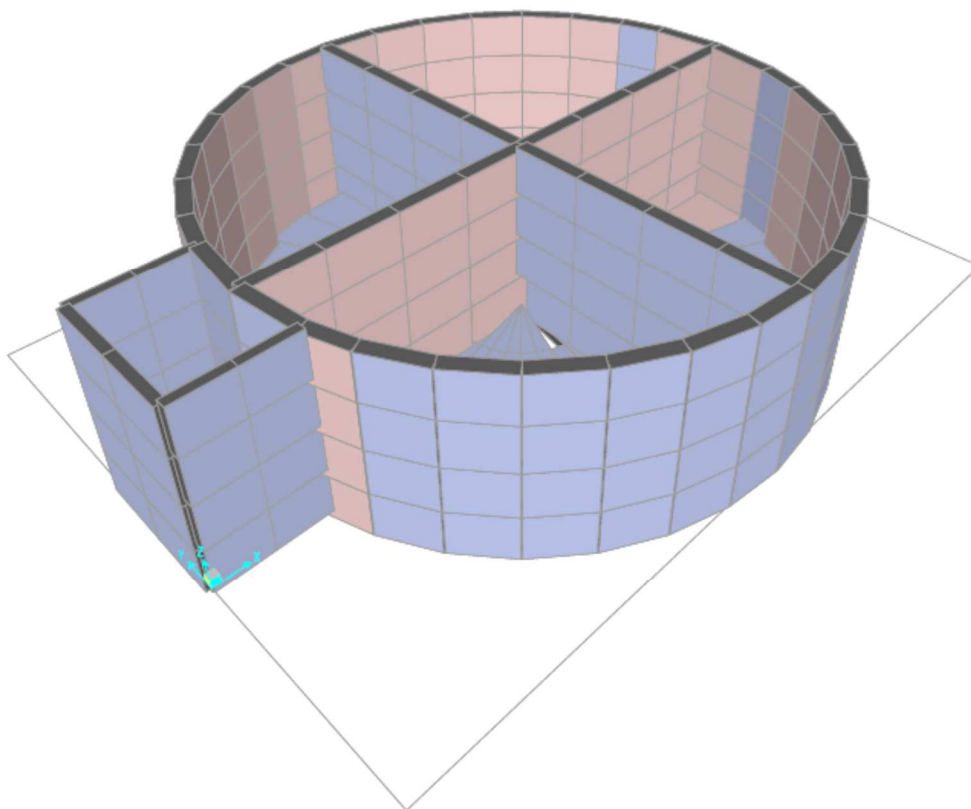
A figura 3.1 apresenta as dimensões em planta do filtro biológico.



Conforme apresentado na figura, parte da estrutura é existente e será reaproveitada. As novas estruturas projetadas são as paredes de separação, vigas, caixas de descarga e caixa divisora de vazão.

A modelagem estrutural foi feita no software SAP-2000 (figura 3.2) considerando os parâmetros apresentados no item 2.

Figura 3.2 – Modelo estrutural 3D.



Os carregamentos utilizados no dimensionamento foram:

- Cargas Permanentes (CP)
Peso próprio
- Sobrecargas (SC)
Carregamento na laje de cobertura (SC)
Carregamento na laje de fundo (SCLF)
Carregamento nas paredes lado interno (SCPI)

Combinação para dimensionamento das barras

Comb 1: $1,4CP + 1,4SC$

Comb 2: $1,4CP + 1,4SC + 1,4SCLF$

Comb 3: $1,4CP + 1,4SC + 1,4SCLF + 1,4SCPI$

3.2. RESULTADOS DA ANÁLISE ESTRUTURAL

Conforme informado no item anterior a análise estrutural foi feita utilizando o software SAP 2000. As tabelas a seguir apresentam os resultados do dimensionamento eletrônico.

As figuras 3.3 e 3.4 apresentam os momentos fletores na nova parede.

Figura 3.3 – Momento na direção X.

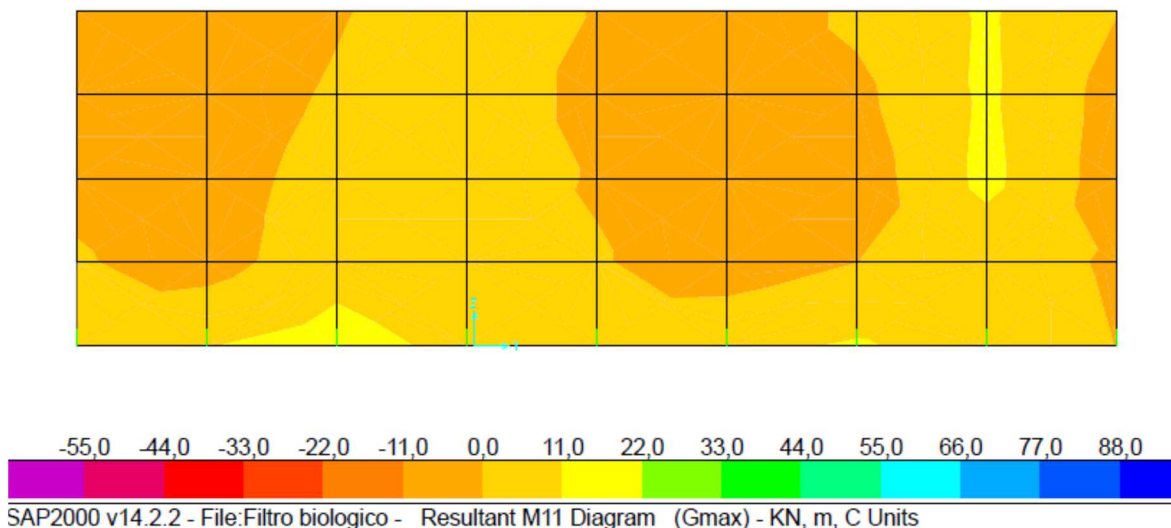
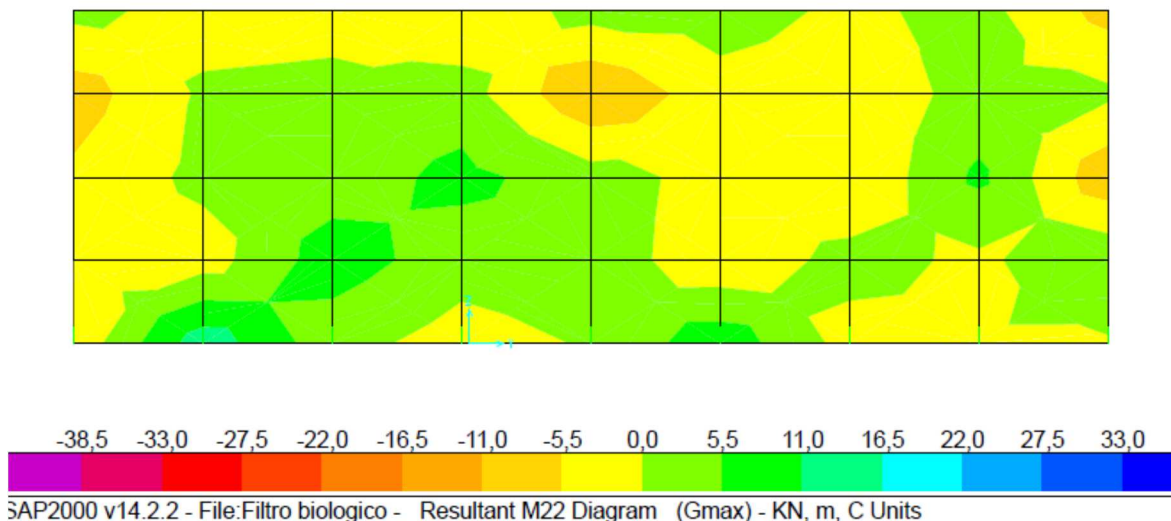


Figura 3.4 – Momento na direção Y.



3.3. ARMAÇÃO NAS PAREDES

Conforme modelagem os esforços máximos nas lajes de fundo são:


$$\text{Parede } e=20\text{cm} \rightarrow \begin{cases} M_x = 19,45 \text{ kNm} \\ M_y = 20,27 \text{ kNm} \end{cases}$$

A figura a seguir apresenta o resultados do dimensionamento

a) Direção x

1) PARÂMETROS DE ENTRADA

$$\begin{aligned} \text{Momento Fletor Máximo} &= 19,45 \text{ kN.m} \\ f_{ck} &= 30,00 \text{ MPa} \end{aligned}$$



$$\begin{aligned} h &= 20 \text{ cm} \\ b &= 100 \text{ cm} \end{aligned}$$

2) DETERMINAÇÃO DA ALTURA ÚTIL

$$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$$

$$\text{Adotaremos } \phi \text{ da armadura} = 8,0 \text{ mm}$$

$$\text{Cobrimento da armadura} = 4,00 \text{ mm}$$

$$d = 14,80 \text{ cm}$$

$$\text{Adotar } d = 14,00 \text{ cm}$$

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0648$$

Conforme tabela temos: $KMD = 0,0648$

$$\rightarrow K_x = 0,0996$$

$$\rightarrow K_z = 0,9602$$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 4,66 \text{ cm}^2/\text{m}$$


$$A_{s,min} = \begin{cases} 0,15\%bh = 3,00 \text{ cm}^2/\text{m} \\ 0,23\%bh = 4,60 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 3,45 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 4,60 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 8.0$ c/10 que equivale a 5,00 cm²/m.

b) Direção y

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 20,27 kN.m
fck = 30,00 MPa

 h = 20 cm
b = 100 cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

d = altura total – cobrimento – 1,5 ϕ armadura

Adotaremos ϕ da armadura = 8,0 mm

Cobrimento da armadura = 4,00 mm

d = 14,80 cm

Adotar d = 14,00 cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0676$$

Conforme tabela temos: $KMD = 0,0676 \rightarrow Kx = 0,1076$
 $\rightarrow Kz = 0,957$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 4,87 \text{ cm}^2/\text{m}$$

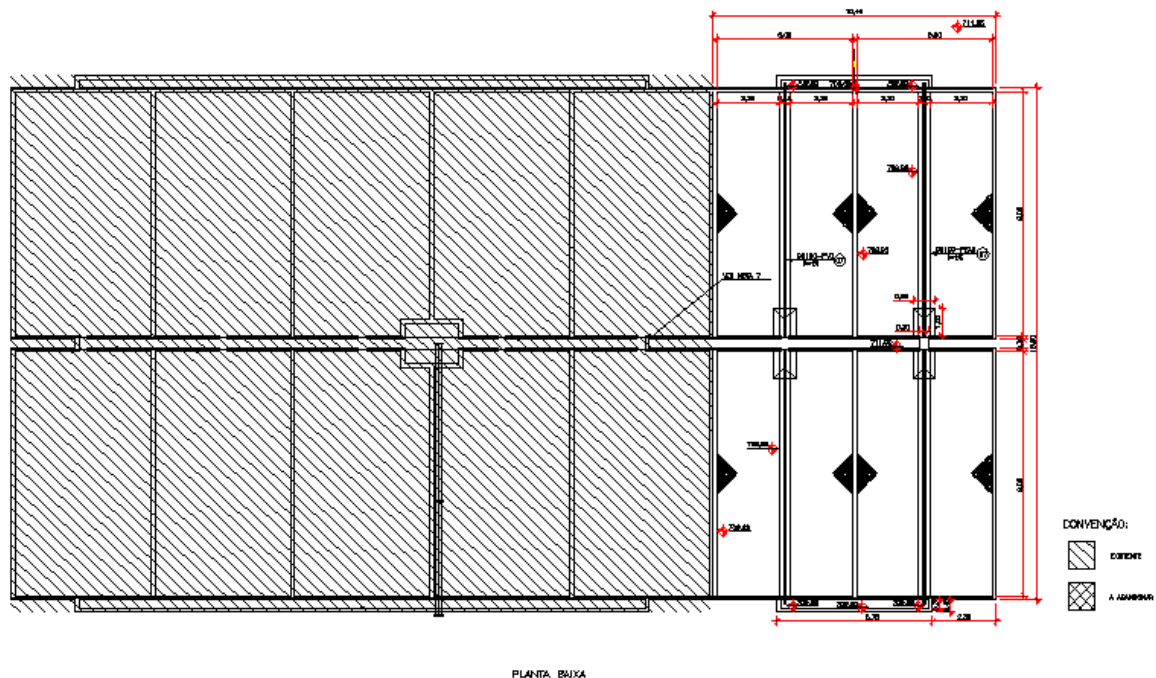
$$A_{s,min} = \begin{cases} 0,15\%bh = 3,00 \text{ cm}^2/\text{m} \\ 0,23\%bh = 4,60 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 3,45 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 4,87 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 8.0$ c/10 que equivale a 5,00 cm²/m.

4. DIMENSIONAMENTO – LEITO DE SECAGEM

4.1. MODELAGEM ESTRUTURAL

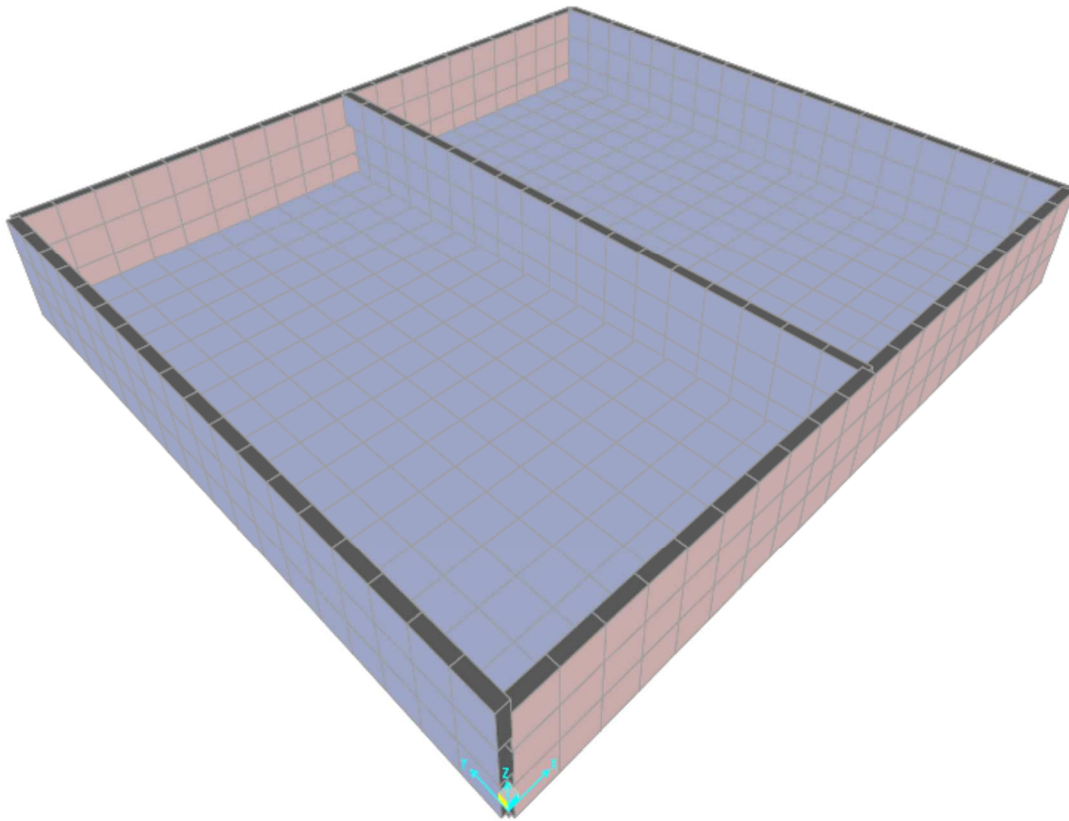
A figura 4.1 apresenta as dimensões em planta e corte do filtro biológico.



O leito de secagem consiste em uma placa de concreto apoiada no solo. As paredes serão em blocos de alvenaria estrutural.

A modelagem estrutural foi feita no software SAP-2000 (figura 4.2) considerando os parâmetros apresentados no item 2.

Figura 4.2 – Modelo estrutural 3D.



Os carregamentos utilizados no dimensionamento foram:

- Cargas Permanentes (CP)
Peso próprio
- Sobrecargas (SC)
Carregamento na laje/tampas de cobertura (SC)
Carregamento na laje de fundo (SCLF)
Carregamento nas paredes lado interno (SCPI)
Carregamento nas paredes lado externo carga (SCPE)

Combinação para dimensionamento das barras

Comb 1: $1,4CP + 1,4SC$

Comb 2: $1,4CP + 1,4SC + 1,4SCLF$

Comb 3: 1,4CP + 1,4SC + 1,4SCLF + 1,4SCPI

Comb 4: 1,4CP + 1,4SC + 1,4SCLF + 1,4SCPI + 1,4SCPE

4.2. RESULTADOS DA ANÁLISE ESTRUTURAL

Conforme informado no item anterior a análise estrutural foi feita utilizando o software SAP 2000. As tabelas a seguir apresentam os resultados do dimensionamento eletrônico.

Tabela 4.1 – Esforços nas placas.

Area	OutputCase	CaseType	Fx	Fy	Mx	My	T
Text	Text	Text	KN/m	KN/m	KN-m/m	KN-m/m	KN-m/m
1	Gmax	Combination	-18,54	-4,02	0,82	-0,44	0,34
1	Gmax	Combination	-41,65	-8,64	-0,75	0,63	0,29
1	Gmax	Combination	-41,53	-8,04	0,19	0,54	0,69
1	Gmax	Combination	-18,42	-3,41	0,21	-0,05	0,74
2	Gmax	Combination	-18,39	-3,41	0,31	-0,03	0,91
2	Gmax	Combination	-23,40	-4,41	-0,18	0,46	0,89
2	Gmax	Combination	-23,15	-3,14	0,12	0,72	0,97
2	Gmax	Combination	-18,14	-2,14	-0,30	-0,29	0,98
3	Gmax	Combination	-14,58	-1,43	-0,22	-0,27	0,99
3	Gmax	Combination	-15,44	-1,60	-0,20	0,66	0,95
3	Gmax	Combination	-15,48	-1,80	0,19	0,90	0,87
3	Gmax	Combination	-14,62	-1,63	-0,61	-0,33	0,91
4	Gmax	Combination	-11,46	-0,99	-0,51	-0,31	0,78
4	Gmax	Combination	-11,39	-0,98	-0,16	0,83	0,74
4	Gmax	Combination	-11,43	-1,14	0,25	1,11	0,56
4	Gmax	Combination	-11,49	-1,16	-0,77	-0,36	0,60
5	Gmax	Combination	-9,17	-0,69	-0,67	-0,34	0,38
5	Gmax	Combination	-9,13	-0,69	-0,10	1,04	0,35
5	Gmax	Combination	-9,18	-0,91	0,32	1,27	0,11
5	Gmax	Combination	-9,22	-0,92	-0,85	-0,33	0,15
6	Gmax	Combination	-7,51	-0,58	-0,74	-0,31	-0,11
6	Gmax	Combination	-7,76	-0,63	-0,08	1,19	-0,14
6	Gmax	Combination	-7,81	-0,86	0,36	1,37	-0,40
6	Gmax	Combination	-7,55	-0,81	-0,85	-0,27	-0,37
7	Gmax	Combination	-6,20	-0,54	-0,75	-0,25	-0,64
7	Gmax	Combination	-6,90	-0,68	-0,04	1,29	-0,66
7	Gmax	Combination	-6,97	-1,01	0,41	1,41	-0,93
7	Gmax	Combination	-6,27	-0,87	-0,78	-0,20	-0,91

8	Gmax	Combination	-5,09	-0,63	-0,67	-0,17	-1,17
8	Gmax	Combination	-6,28	-0,87	-0,03	1,32	-1,17
8	Gmax	Combination	-6,39	-1,43	0,41	1,35	-1,39
8	Gmax	Combination	-5,20	-1,19	-0,61	-0,12	-1,39
9	Gmax	Combination	-3,84	-0,92	-0,51	-0,10	-1,61
9	Gmax	Combination	-6,15	-1,38	0,03	1,28	-1,55
9	Gmax	Combination	-6,32	-2,23	0,28	1,05	-1,67
9	Gmax	Combination	-4,01	-1,77	-0,25	-0,02	-1,72
10	Gmax	Combination	-3,55	-1,68	-0,17	-0,01	-1,83
10	Gmax	Combination	-4,91	-1,95	-0,11	0,98	-1,60
10	Gmax	Combination	-4,67	-0,74	0,18	0,03	-1,43
10	Gmax	Combination	-3,31	-0,47	0,85	0,07	-1,67
11	Gmax	Combination	-11,37	-10,32	2,35	-0,23	0,25
11	Gmax	Combination	-20,15	-12,08	1,03	0,59	0,30
11	Gmax	Combination	-19,80	-10,31	0,16	-0,32	0,71
11	Gmax	Combination	-11,01	-8,55	0,69	-0,09	0,66
12	Gmax	Combination	-11,59	-8,67	0,67	-0,09	0,86
12	Gmax	Combination	-19,77	-10,30	0,26	-0,30	0,91
12	Gmax	Combination	-19,03	-6,62	-0,29	-0,22	0,99
12	Gmax	Combination	-10,85	-4,98	-0,35	-0,69	0,95
13	Gmax	Combination	-11,10	-5,03	-0,37	-0,69	0,95
13	Gmax	Combination	-15,48	-5,91	-0,20	-0,21	0,98
13	Gmax	Combination	-15,15	-4,25	-0,61	-0,34	0,91
13	Gmax	Combination	-10,77	-3,38	-0,98	-0,91	0,88
14	Gmax	Combination	-9,64	-3,15	-1,00	-0,92	0,76
14	Gmax	Combination	-11,99	-3,62	-0,52	-0,33	0,78
14	Gmax	Combination	-11,85	-2,93	-0,77	-0,35	0,61
14	Gmax	Combination	-9,51	-2,47	-1,36	-1,09	0,60
15	Gmax	Combination	-8,05	-2,17	-1,38	-1,10	0,40
15	Gmax	Combination	-9,53	-2,47	-0,67	-0,33	0,40
15	Gmax	Combination	-9,46	-2,12	-0,85	-0,33	0,17
15	Gmax	Combination	-7,98	-1,82	-1,55	-1,15	0,17
16	Gmax	Combination	-6,54	-1,53	-1,58	-1,16	-0,07
16	Gmax	Combination	-7,74	-1,77	-0,74	-0,30	-0,09
16	Gmax	Combination	-7,71	-1,62	-0,85	-0,27	-0,35
16	Gmax	Combination	-6,51	-1,38	-1,60	-1,12	-0,33
17	Gmax	Combination	-5,14	-1,10	-1,63	-1,13	-0,58
17	Gmax	Combination	-6,36	-1,35	-0,75	-0,25	-0,62
17	Gmax	Combination	-6,35	-1,28	-0,78	-0,19	-0,88
17	Gmax	Combination	-5,13	-1,04	-1,49	-0,99	-0,84
18	Gmax	Combination	-3,76	-0,77	-1,52	-0,99	-1,09
18	Gmax	Combination	-5,17	-1,05	-0,67	-0,17	-1,14

18	Gmax	Combination	-5,17	-1,04	-0,60	-0,11	-1,38
18	Gmax	Combination	-3,76	-0,75	-1,17	-0,73	-1,33
19	Gmax	Combination	-2,64	-0,53	-1,20	-0,74	-1,52
19	Gmax	Combination	-3,81	-0,76	-0,50	-0,09	-1,58
19	Gmax	Combination	-3,66	0,01	-0,25	-0,02	-1,73
19	Gmax	Combination	-2,48	0,24	-0,45	-0,33	-1,67
20	Gmax	Combination	-2,10	0,32	-0,48	-0,33	-1,77
20	Gmax	Combination	-3,20	0,10	-0,17	0,00	-1,80
20	Gmax	Combination	-2,54	3,38	0,86	0,14	-1,82
20	Gmax	Combination	-1,44	3,60	1,01	0,20	-1,79
21	Gmax	Combination	-6,55	-14,34	3,45	-0,06	0,17
21	Gmax	Combination	-12,41	-15,52	2,55	0,78	0,23
21	Gmax	Combination	-11,90	-12,96	0,63	-0,37	0,55
21	Gmax	Combination	-6,04	-11,79	1,16	-0,06	0,49
22	Gmax	Combination	-7,40	-12,06	1,17	-0,06	0,67
22	Gmax	Combination	-12,47	-13,08	0,62	-0,37	0,77
22	Gmax	Combination	-11,81	-9,76	-0,34	-0,61	0,87
22	Gmax	Combination	-6,73	-8,75	-0,36	-0,78	0,78
23	Gmax	Combination	-7,55	-8,91	-0,35	-0,77	0,80
23	Gmax	Combination	-12,05	-9,81	-0,36	-0,62	0,88
23	Gmax	Combination	-11,47	-6,91	-0,98	-0,93	0,83
23	Gmax	Combination	-6,97	-6,01	-1,29	-1,14	0,75
24	Gmax	Combination	-7,17	-6,05	-1,28	-1,14	0,67
24	Gmax	Combination	-10,35	-6,68	-1,01	-0,94	0,72
24	Gmax	Combination	-10,00	-4,91	-1,36	-1,09	0,57
24	Gmax	Combination	-6,82	-4,28	-1,87	-1,42	0,52
25	Gmax	Combination	-6,30	-4,17	-1,86	-1,42	0,36
25	Gmax	Combination	-8,54	-4,62	-1,38	-1,09	0,38
25	Gmax	Combination	-8,32	-3,52	-1,55	-1,15	0,18
25	Gmax	Combination	-6,08	-3,07	-2,18	-1,54	0,16
26	Gmax	Combination	-5,20	-2,89	-2,18	-1,54	-0,04
26	Gmax	Combination	-6,88	-3,23	-1,58	-1,16	-0,06
26	Gmax	Combination	-6,73	-2,45	-1,60	-1,12	-0,29
26	Gmax	Combination	-5,05	-2,11	-2,27	-1,52	-0,28
27	Gmax	Combination	-3,99	-1,90	-2,27	-1,51	-0,50
27	Gmax	Combination	-5,36	-2,18	-1,63	-1,13	-0,55
27	Gmax	Combination	-5,23	-1,54	-1,49	-0,99	-0,79
27	Gmax	Combination	-3,86	-1,26	-2,13	-1,34	-0,73
28	Gmax	Combination	-2,82	-1,05	-2,12	-1,34	-0,94
28	Gmax	Combination	-3,86	-1,26	-1,52	-0,99	-1,03
28	Gmax	Combination	-3,69	-0,39	-1,17	-0,73	-1,23
28	Gmax	Combination	-2,64	-0,18	-1,67	-1,00	-1,14

29	Gmax	Combination	-1,84	-0,02	-1,67	-1,00	-1,30
29	Gmax	Combination	-2,56	-0,16	-1,20	-0,73	-1,43
29	Gmax	Combination	-2,21	1,62	-0,46	-0,34	-1,56
29	Gmax	Combination	-1,48	1,76	-0,72	-0,47	-1,44
30	Gmax	Combination	-1,36	1,79	-0,72	-0,47	-1,54
30	Gmax	Combination	-1,82	1,69	-0,48	-0,34	-1,65
30	Gmax	Combination	-1,05	5,55	1,02	0,25	-1,71
30	Gmax	Combination	-0,58	5,64	0,96	0,14	-1,59
31	Gmax	Combination	-3,17	-17,80	4,18	0,09	0,11
31	Gmax	Combination	-7,41	-18,65	3,63	0,87	0,16
31	Gmax	Combination	-6,73	-15,27	1,11	-0,31	0,39
31	Gmax	Combination	-2,49	-14,42	1,56	-0,03	0,34
32	Gmax	Combination	-4,25	-14,77	1,56	-0,03	0,48
32	Gmax	Combination	-8,09	-15,54	1,12	-0,31	0,57
32	Gmax	Combination	-7,41	-12,12	-0,35	-0,71	0,67
32	Gmax	Combination	-3,56	-11,35	-0,29	-0,75	0,57
33	Gmax	Combination	-4,81	-11,60	-0,29	-0,75	0,61
33	Gmax	Combination	-8,22	-12,28	-0,34	-0,71	0,70
33	Gmax	Combination	-7,61	-9,21	-1,29	-1,16	0,68
33	Gmax	Combination	-4,19	-8,53	-1,47	-1,18	0,58
34	Gmax	Combination	-4,86	-8,66	-1,47	-1,18	0,52
34	Gmax	Combination	-7,81	-9,25	-1,29	-1,16	0,59
34	Gmax	Combination	-7,32	-6,77	-1,87	-1,41	0,48
34	Gmax	Combination	-4,37	-6,18	-2,23	-1,50	0,42
35	Gmax	Combination	-4,51	-6,21	-2,23	-1,50	0,29
35	Gmax	Combination	-6,80	-6,67	-1,86	-1,41	0,32
35	Gmax	Combination	-6,43	-4,85	-2,18	-1,54	0,16
35	Gmax	Combination	-4,15	-4,39	-2,64	-1,65	0,13
36	Gmax	Combination	-3,82	-4,32	-2,64	-1,65	-0,03
36	Gmax	Combination	-5,56	-4,67	-2,18	-1,54	-0,05
36	Gmax	Combination	-5,27	-3,24	-2,27	-1,51	-0,24
36	Gmax	Combination	-3,54	-2,89	-2,77	-1,63	-0,22
37	Gmax	Combination	-2,97	-2,78	-2,77	-1,64	-0,40
37	Gmax	Combination	-4,22	-3,03	-2,27	-1,51	-0,46
37	Gmax	Combination	-3,95	-1,70	-2,13	-1,34	-0,65
37	Gmax	Combination	-2,70	-1,45	-2,59	-1,45	-0,59
38	Gmax	Combination	-2,09	-1,32	-2,60	-1,45	-0,75
38	Gmax	Combination	-2,90	-1,49	-2,12	-1,34	-0,86
38	Gmax	Combination	-2,58	0,10	-1,67	-1,00	-1,02
38	Gmax	Combination	-1,77	0,27	-2,04	-1,09	-0,92
39	Gmax	Combination	-1,37	0,35	-2,04	-1,09	-1,05
39	Gmax	Combination	-1,78	0,27	-1,66	-0,99	-1,18

39	Gmax	Combination	-1,30	2,65	-0,72	-0,50	-1,30
39	Gmax	Combination	-0,89	2,73	-0,94	-0,54	-1,16
40	Gmax	Combination	-0,90	2,73	-0,94	-0,54	-1,25
40	Gmax	Combination	-1,18	2,67	-0,72	-0,50	-1,39
40	Gmax	Combination	-0,46	6,25	0,98	0,24	-1,45
40	Gmax	Combination	-0,19	6,30	0,88	0,13	-1,31
41	Gmax	Combination	-0,67	-20,40	4,64	0,20	0,07
41	Gmax	Combination	-3,81	-21,02	4,33	0,87	0,11
41	Gmax	Combination	-3,06	-17,27	1,52	-0,24	0,26
41	Gmax	Combination	0,09	-16,64	1,85	-0,01	0,22
42	Gmax	Combination	-1,90	-17,04	1,86	-0,01	0,32
42	Gmax	Combination	-4,82	-17,62	1,52	-0,24	0,40
42	Gmax	Combination	-4,09	-13,98	-0,28	-0,70	0,47
42	Gmax	Combination	-1,18	-13,40	-0,20	-0,70	0,39
43	Gmax	Combination	-2,67	-13,70	-0,20	-0,70	0,42
43	Gmax	Combination	-5,34	-14,23	-0,28	-0,70	0,51
43	Gmax	Combination	-4,68	-10,97	-1,48	-1,19	0,50
43	Gmax	Combination	-2,02	-10,44	-1,58	-1,13	0,41
44	Gmax	Combination	-3,02	-10,64	-1,58	-1,13	0,38
44	Gmax	Combination	-5,35	-11,10	-1,48	-1,19	0,44
44	Gmax	Combination	-4,79	-8,30	-2,22	-1,49	0,37
44	Gmax	Combination	-2,46	-7,83	-2,47	-1,46	0,30
45	Gmax	Combination	-2,98	-7,94	-2,47	-1,46	0,22
45	Gmax	Combination	-4,94	-8,33	-2,23	-1,49	0,24
45	Gmax	Combination	-4,46	-5,97	-2,64	-1,65	0,12
45	Gmax	Combination	-2,51	-5,58	-2,97	-1,62	0,09
46	Gmax	Combination	-2,65	-5,61	-2,97	-1,62	-0,02
46	Gmax	Combination	-4,14	-5,91	-2,64	-1,65	-0,04
46	Gmax	Combination	-3,74	-3,89	-2,77	-1,63	-0,18
46	Gmax	Combination	-2,24	-3,59	-3,13	-1,62	-0,17
47	Gmax	Combination	-2,12	-3,57	-3,13	-1,62	-0,30
47	Gmax	Combination	-3,17	-3,78	-2,77	-1,63	-0,36
47	Gmax	Combination	-2,79	-1,85	-2,60	-1,45	-0,51
47	Gmax	Combination	-1,73	-1,64	-2,94	-1,45	-0,45
48	Gmax	Combination	-1,54	-1,61	-2,94	-1,45	-0,57
48	Gmax	Combination	-2,17	-1,73	-2,60	-1,45	-0,67
48	Gmax	Combination	-1,74	0,41	-2,03	-1,09	-0,80
48	Gmax	Combination	-1,11	0,53	-2,31	-1,10	-0,70
49	Gmax	Combination	-1,03	0,55	-2,31	-1,10	-0,80
49	Gmax	Combination	-1,34	0,49	-2,04	-1,09	-0,92
49	Gmax	Combination	-0,81	3,13	-0,94	-0,56	-1,02
49	Gmax	Combination	-0,50	3,19	-1,12	-0,56	-0,89

50	Gmax	Combination	-0,64	3,16	-1,12	-0,56	-0,96
50	Gmax	Combination	-0,82	3,13	-0,95	-0,56	-1,10
50	Gmax	Combination	-0,15	6,46	0,89	0,21	-1,16
50	Gmax	Combination	0,03	6,50	0,79	0,11	-1,01
51	Gmax	Combination	1,14	-22,41	4,92	0,30	0,04
51	Gmax	Combination	-1,16	-22,87	4,77	0,85	0,07
51	Gmax	Combination	-0,35	-18,84	1,82	-0,18	0,16
51	Gmax	Combination	1,95	-18,37	2,05	0,00	0,13
52	Gmax	Combination	-0,19	-18,80	2,05	0,00	0,20
52	Gmax	Combination	-2,34	-19,23	1,82	-0,18	0,26
52	Gmax	Combination	-1,58	-15,42	-0,19	-0,65	0,31
52	Gmax	Combination	0,57	-14,99	-0,13	-0,64	0,25
53	Gmax	Combination	-1,10	-15,32	-0,12	-0,64	0,27
53	Gmax	Combination	-3,08	-15,72	-0,19	-0,65	0,34
53	Gmax	Combination	-2,39	-12,29	-1,58	-1,14	0,34
53	Gmax	Combination	-0,41	-11,90	-1,63	-1,06	0,27
54	Gmax	Combination	-1,62	-12,14	-1,63	-1,06	0,25
54	Gmax	Combination	-3,39	-12,49	-1,58	-1,14	0,31
54	Gmax	Combination	-2,78	-9,44	-2,47	-1,45	0,26
54	Gmax	Combination	-1,01	-9,08	-2,63	-1,38	0,20
55	Gmax	Combination	-1,81	-9,24	-2,63	-1,38	0,15
55	Gmax	Combination	-3,30	-9,54	-2,47	-1,45	0,17
55	Gmax	Combination	-2,76	-6,84	-2,97	-1,62	0,09
55	Gmax	Combination	-1,27	-6,54	-3,20	-1,54	0,06
56	Gmax	Combination	-1,73	-6,63	-3,20	-1,54	-0,02
56	Gmax	Combination	-2,90	-6,86	-2,97	-1,62	-0,03
56	Gmax	Combination	-2,41	-4,41	-3,13	-1,62	-0,14
56	Gmax	Combination	-1,24	-4,17	-3,39	-1,55	-0,12
57	Gmax	Combination	-1,47	-4,22	-3,39	-1,55	-0,21
57	Gmax	Combination	-2,28	-4,38	-3,13	-1,62	-0,26
57	Gmax	Combination	-1,81	-2,01	-2,94	-1,45	-0,37
57	Gmax	Combination	-1,00	-1,84	-3,18	-1,40	-0,32
58	Gmax	Combination	-1,13	-1,87	-3,18	-1,40	-0,40
58	Gmax	Combination	-1,62	-1,97	-2,94	-1,45	-0,49
58	Gmax	Combination	-1,12	0,53	-2,31	-1,10	-0,59
58	Gmax	Combination	-0,63	0,62	-2,51	-1,07	-0,50
59	Gmax	Combination	-0,79	0,59	-2,51	-1,07	-0,57
59	Gmax	Combination	-1,03	0,54	-2,31	-1,10	-0,69
59	Gmax	Combination	-0,47	3,33	-1,13	-0,57	-0,76
59	Gmax	Combination	-0,23	3,38	-1,26	-0,55	-0,64
60	Gmax	Combination	-0,48	3,33	-1,26	-0,55	-0,69
60	Gmax	Combination	-0,61	3,30	-1,13	-0,58	-0,83

60	Gmax	Combination	0,01	6,40	0,80	0,19	-0,87
60	Gmax	Combination	0,14	6,42	0,71	0,11	-0,74
61	Gmax	Combination	2,36	-23,83	5,09	0,39	0,02
61	Gmax	Combination	0,79	-24,14	5,02	0,78	0,04
61	Gmax	Combination	1,63	-19,98	2,03	-0,13	0,10
61	Gmax	Combination	3,20	-19,67	2,17	0,00	0,07
62	Gmax	Combination	0,97	-20,11	2,17	0,00	0,11
62	Gmax	Combination	-0,51	-20,41	2,03	-0,12	0,15
62	Gmax	Combination	0,28	-16,46	-0,12	-0,61	0,19
62	Gmax	Combination	1,76	-16,16	-0,07	-0,59	0,15
63	Gmax	Combination	-0,02	-16,52	-0,07	-0,59	0,16
63	Gmax	Combination	-1,39	-16,79	-0,12	-0,61	0,21
63	Gmax	Combination	-0,68	-13,23	-1,64	-1,07	0,22
63	Gmax	Combination	0,69	-12,96	-1,66	-1,00	0,16
64	Gmax	Combination	-0,67	-13,23	-1,66	-1,00	0,15
64	Gmax	Combination	-1,89	-13,47	-1,63	-1,07	0,20
64	Gmax	Combination	-1,24	-10,24	-2,63	-1,38	0,17
64	Gmax	Combination	-0,02	-9,99	-2,72	-1,30	0,12
65	Gmax	Combination	-1,00	-10,19	-2,72	-1,30	0,09
65	Gmax	Combination	-2,04	-10,40	-2,63	-1,38	0,11
65	Gmax	Combination	-1,45	-7,44	-3,20	-1,54	0,06
65	Gmax	Combination	-0,41	-7,23	-3,34	-1,47	0,04
66	Gmax	Combination	-1,10	-7,37	-3,34	-1,47	-0,01
66	Gmax	Combination	-1,91	-7,53	-3,20	-1,54	-0,02
66	Gmax	Combination	-1,36	-4,78	-3,39	-1,55	-0,09
66	Gmax	Combination	-0,55	-4,62	-3,55	-1,48	-0,08
67	Gmax	Combination	-1,02	-4,71	-3,55	-1,48	-0,14
67	Gmax	Combination	-1,59	-4,83	-3,39	-1,55	-0,18
67	Gmax	Combination	-1,06	-2,15	-3,18	-1,40	-0,25
67	Gmax	Combination	-0,48	-2,03	-3,34	-1,34	-0,21
68	Gmax	Combination	-0,84	-2,11	-3,34	-1,34	-0,26
68	Gmax	Combination	-1,19	-2,18	-3,18	-1,40	-0,34
68	Gmax	Combination	-0,64	0,55	-2,51	-1,07	-0,40
68	Gmax	Combination	-0,30	0,62	-2,65	-1,03	-0,33
69	Gmax	Combination	-0,62	0,55	-2,65	-1,03	-0,37
69	Gmax	Combination	-0,80	0,52	-2,51	-1,07	-0,47
69	Gmax	Combination	-0,23	3,37	-1,27	-0,57	-0,52
69	Gmax	Combination	-0,05	3,40	-1,36	-0,55	-0,42
70	Gmax	Combination	-0,39	3,34	-1,36	-0,55	-0,46
70	Gmax	Combination	-0,48	3,32	-1,27	-0,57	-0,57
70	Gmax	Combination	0,11	6,31	0,72	0,15	-0,61
70	Gmax	Combination	0,21	6,32	0,65	0,10	-0,49

71	Gmax	Combination	3,06	-24,76	5,17	0,47	0,01
71	Gmax	Combination	2,14	-24,94	5,15	0,71	0,02
71	Gmax	Combination	2,99	-20,71	2,16	-0,09	0,05
71	Gmax	Combination	3,90	-20,53	2,24	-0,01	0,03
72	Gmax	Combination	1,63	-20,98	2,24	-0,01	0,05
72	Gmax	Combination	0,76	-21,16	2,16	-0,09	0,08
72	Gmax	Combination	1,57	-17,12	-0,06	-0,57	0,10
72	Gmax	Combination	2,44	-16,95	-0,03	-0,56	0,07
73	Gmax	Combination	0,59	-17,32	-0,03	-0,56	0,08
73	Gmax	Combination	-0,22	-17,48	-0,06	-0,57	0,12
73	Gmax	Combination	0,52	-13,82	-1,66	-1,01	0,12
73	Gmax	Combination	1,32	-13,66	-1,67	-0,96	0,08
74	Gmax	Combination	-0,12	-13,95	-1,67	-0,96	0,08
74	Gmax	Combination	-0,84	-14,09	-1,66	-1,01	0,11
74	Gmax	Combination	-0,17	-10,73	-2,72	-1,30	0,09
74	Gmax	Combination	0,55	-10,59	-2,77	-1,25	0,06
75	Gmax	Combination	-0,55	-10,81	-2,77	-1,25	0,05
75	Gmax	Combination	-1,15	-10,93	-2,72	-1,30	0,06
75	Gmax	Combination	-0,53	-7,82	-3,34	-1,47	0,03
75	Gmax	Combination	0,08	-7,69	-3,41	-1,41	0,02
76	Gmax	Combination	-0,73	-7,86	-3,41	-1,41	-0,01
76	Gmax	Combination	-1,21	-7,95	-3,34	-1,47	-0,02
76	Gmax	Combination	-0,63	-5,01	-3,55	-1,48	-0,06
76	Gmax	Combination	-0,15	-4,92	-3,64	-1,43	-0,05
77	Gmax	Combination	-0,76	-5,04	-3,64	-1,43	-0,07
77	Gmax	Combination	-1,09	-5,11	-3,55	-1,48	-0,11
77	Gmax	Combination	-0,52	-2,25	-3,34	-1,34	-0,15
77	Gmax	Combination	-0,19	-2,18	-3,42	-1,30	-0,11
78	Gmax	Combination	-0,67	-2,28	-3,42	-1,30	-0,14
78	Gmax	Combination	-0,88	-2,32	-3,34	-1,34	-0,21
78	Gmax	Combination	-0,31	0,53	-2,64	-1,03	-0,24
78	Gmax	Combination	-0,10	0,57	-2,72	-1,01	-0,18
79	Gmax	Combination	-0,53	0,49	-2,72	-1,01	-0,20
79	Gmax	Combination	-0,64	0,46	-2,65	-1,03	-0,29
79	Gmax	Combination	-0,06	3,36	-1,36	-0,55	-0,32
79	Gmax	Combination	0,05	3,38	-1,42	-0,54	-0,23
80	Gmax	Combination	-0,34	3,30	-1,42	-0,54	-0,24
80	Gmax	Combination	-0,40	3,29	-1,36	-0,55	-0,35
80	Gmax	Combination	0,18	6,20	0,66	0,14	-0,37
80	Gmax	Combination	0,24	6,21	0,61	0,10	-0,26
81	Gmax	Combination	3,25	-25,23	5,21	0,55	0,00
81	Gmax	Combination	2,95	-25,29	5,20	0,63	0,01

81	Gmax	Combination	3,80	-21,04	2,23	-0,05	0,02
81	Gmax	Combination	4,10	-20,98	2,25	-0,03	0,01
82	Gmax	Combination	1,82	-21,44	2,25	-0,03	0,01
82	Gmax	Combination	1,53	-21,50	2,23	-0,05	0,03
82	Gmax	Combination	2,35	-17,42	-0,03	-0,55	0,04
82	Gmax	Combination	2,63	-17,36	-0,02	-0,55	0,02
83	Gmax	Combination	0,76	-17,74	-0,02	-0,55	0,01
83	Gmax	Combination	0,49	-17,79	-0,03	-0,55	0,05
83	Gmax	Combination	1,24	-14,08	-1,67	-0,96	0,05
83	Gmax	Combination	1,50	-14,03	-1,67	-0,95	0,02
84	Gmax	Combination	0,03	-14,32	-1,67	-0,95	0,02
84	Gmax	Combination	-0,21	-14,37	-1,67	-0,96	0,04
84	Gmax	Combination	0,48	-10,95	-2,77	-1,25	0,04
84	Gmax	Combination	0,71	-10,90	-2,79	-1,23	0,01
85	Gmax	Combination	-0,42	-11,13	-2,79	-1,23	0,01
85	Gmax	Combination	-0,62	-11,17	-2,77	-1,25	0,02
85	Gmax	Combination	0,02	-7,98	-3,41	-1,41	0,01
85	Gmax	Combination	0,22	-7,94	-3,44	-1,39	0,00
86	Gmax	Combination	-0,63	-8,11	-3,44	-1,39	0,00
86	Gmax	Combination	-0,79	-8,14	-3,41	-1,41	-0,01
86	Gmax	Combination	-0,18	-5,12	-3,64	-1,43	-0,02
86	Gmax	Combination	-0,03	-5,08	-3,66	-1,41	-0,01
87	Gmax	Combination	-0,68	-5,21	-3,66	-1,41	-0,01
87	Gmax	Combination	-0,80	-5,24	-3,64	-1,43	-0,05
87	Gmax	Combination	-0,21	-2,30	-3,42	-1,30	-0,06
87	Gmax	Combination	-0,09	-2,28	-3,45	-1,29	-0,02
88	Gmax	Combination	-0,63	-2,38	-3,45	-1,29	-0,02
88	Gmax	Combination	-0,69	-2,40	-3,42	-1,30	-0,09
88	Gmax	Combination	-0,11	0,52	-2,72	-1,01	-0,10
88	Gmax	Combination	-0,04	0,53	-2,75	-1,00	-0,04
89	Gmax	Combination	-0,50	0,44	-2,75	-1,00	-0,04
89	Gmax	Combination	-0,54	0,43	-2,72	-1,01	-0,12
89	Gmax	Combination	0,04	3,34	-1,42	-0,54	-0,13
89	Gmax	Combination	0,08	3,35	-1,44	-0,54	-0,05
90	Gmax	Combination	-0,33	3,27	-1,44	-0,54	-0,05
90	Gmax	Combination	-0,35	3,26	-1,42	-0,54	-0,15
90	Gmax	Combination	0,23	6,14	0,61	0,12	-0,15
90	Gmax	Combination	0,24	6,15	0,60	0,11	-0,05
91	Gmax	Combination	2,95	-25,29	5,20	0,63	-0,01
91	Gmax	Combination	3,25	-25,23	5,21	0,55	0,00
91	Gmax	Combination	4,10	-20,98	2,25	-0,03	-0,01
91	Gmax	Combination	3,80	-21,04	2,23	-0,05	-0,02

92	Gmax	Combination	1,53	-21,50	2,23	-0,05	-0,03
92	Gmax	Combination	1,82	-21,44	2,25	-0,03	-0,01
92	Gmax	Combination	2,63	-17,36	-0,02	-0,55	-0,02
92	Gmax	Combination	2,35	-17,42	-0,03	-0,55	-0,04
93	Gmax	Combination	0,49	-17,79	-0,03	-0,55	-0,05
93	Gmax	Combination	0,76	-17,74	-0,02	-0,55	-0,01
93	Gmax	Combination	1,50	-14,03	-1,67	-0,95	-0,02
93	Gmax	Combination	1,24	-14,08	-1,67	-0,96	-0,05
94	Gmax	Combination	-0,21	-14,37	-1,67	-0,96	-0,04
94	Gmax	Combination	0,03	-14,32	-1,67	-0,95	-0,02
94	Gmax	Combination	0,71	-10,90	-2,79	-1,23	-0,01
94	Gmax	Combination	0,48	-10,95	-2,77	-1,25	-0,04
95	Gmax	Combination	-0,62	-11,17	-2,77	-1,25	-0,02
95	Gmax	Combination	-0,42	-11,13	-2,79	-1,23	-0,01
95	Gmax	Combination	0,22	-7,94	-3,44	-1,39	0,00
95	Gmax	Combination	0,02	-7,98	-3,41	-1,41	-0,01
96	Gmax	Combination	-0,79	-8,14	-3,41	-1,41	0,01
96	Gmax	Combination	-0,63	-8,11	-3,44	-1,39	0,00
96	Gmax	Combination	-0,03	-5,08	-3,66	-1,41	0,01
96	Gmax	Combination	-0,18	-5,12	-3,64	-1,43	0,02
97	Gmax	Combination	-0,80	-5,24	-3,64	-1,43	0,05
97	Gmax	Combination	-0,68	-5,21	-3,66	-1,41	0,01
97	Gmax	Combination	-0,09	-2,28	-3,45	-1,29	0,02
97	Gmax	Combination	-0,21	-2,30	-3,42	-1,30	0,06
98	Gmax	Combination	-0,69	-2,40	-3,42	-1,30	0,09
98	Gmax	Combination	-0,63	-2,38	-3,45	-1,29	0,02
98	Gmax	Combination	-0,04	0,53	-2,75	-1,00	0,04
98	Gmax	Combination	-0,11	0,52	-2,72	-1,01	0,10
99	Gmax	Combination	-0,54	0,43	-2,72	-1,01	0,12
99	Gmax	Combination	-0,50	0,44	-2,75	-1,00	0,04
99	Gmax	Combination	0,08	3,35	-1,44	-0,54	0,05
99	Gmax	Combination	0,04	3,34	-1,42	-0,54	0,13
100	Gmax	Combination	-0,35	3,26	-1,42	-0,54	0,15
100	Gmax	Combination	-0,33	3,27	-1,44	-0,54	0,05
100	Gmax	Combination	0,24	6,15	0,60	0,11	0,05
100	Gmax	Combination	0,23	6,14	0,61	0,12	0,15
101	Gmax	Combination	2,14	-24,94	5,15	0,71	-0,02
101	Gmax	Combination	3,06	-24,76	5,17	0,47	-0,01
101	Gmax	Combination	3,90	-20,53	2,24	-0,01	-0,03
101	Gmax	Combination	2,99	-20,71	2,16	-0,09	-0,05
102	Gmax	Combination	0,76	-21,16	2,16	-0,09	-0,08
102	Gmax	Combination	1,63	-20,98	2,24	-0,01	-0,05

102	Gmax	Combination	2,44	-16,95	-0,03	-0,56	-0,07
102	Gmax	Combination	1,57	-17,12	-0,06	-0,57	-0,10
103	Gmax	Combination	-0,22	-17,48	-0,06	-0,57	-0,12
103	Gmax	Combination	0,59	-17,32	-0,03	-0,56	-0,08
103	Gmax	Combination	1,32	-13,66	-1,67	-0,96	-0,08
103	Gmax	Combination	0,52	-13,82	-1,66	-1,01	-0,12
104	Gmax	Combination	-0,84	-14,09	-1,66	-1,01	-0,11
104	Gmax	Combination	-0,12	-13,95	-1,67	-0,96	-0,08
104	Gmax	Combination	0,55	-10,59	-2,77	-1,25	-0,06
104	Gmax	Combination	-0,17	-10,73	-2,72	-1,30	-0,09
105	Gmax	Combination	-1,15	-10,93	-2,72	-1,30	-0,06
105	Gmax	Combination	-0,55	-10,81	-2,77	-1,25	-0,05
105	Gmax	Combination	0,08	-7,69	-3,41	-1,41	-0,02
105	Gmax	Combination	-0,53	-7,82	-3,34	-1,47	-0,03
106	Gmax	Combination	-1,21	-7,95	-3,34	-1,47	0,02
106	Gmax	Combination	-0,73	-7,86	-3,41	-1,41	0,01
106	Gmax	Combination	-0,15	-4,92	-3,64	-1,43	0,05
106	Gmax	Combination	-0,63	-5,01	-3,55	-1,48	0,06
107	Gmax	Combination	-1,09	-5,11	-3,55	-1,48	0,11
107	Gmax	Combination	-0,76	-5,04	-3,64	-1,43	0,07
107	Gmax	Combination	-0,19	-2,18	-3,42	-1,30	0,11
107	Gmax	Combination	-0,52	-2,25	-3,34	-1,34	0,15
108	Gmax	Combination	-0,88	-2,32	-3,34	-1,34	0,21
108	Gmax	Combination	-0,67	-2,28	-3,42	-1,30	0,14
108	Gmax	Combination	-0,10	0,57	-2,72	-1,01	0,18
108	Gmax	Combination	-0,31	0,53	-2,64	-1,03	0,24
109	Gmax	Combination	-0,64	0,46	-2,65	-1,03	0,29
109	Gmax	Combination	-0,53	0,49	-2,72	-1,01	0,20
109	Gmax	Combination	0,05	3,38	-1,42	-0,54	0,23
109	Gmax	Combination	-0,06	3,36	-1,36	-0,55	0,32
110	Gmax	Combination	-0,40	3,29	-1,36	-0,55	0,35
110	Gmax	Combination	-0,34	3,30	-1,42	-0,54	0,24
110	Gmax	Combination	0,24	6,21	0,61	0,10	0,26
110	Gmax	Combination	0,18	6,20	0,66	0,14	0,37
111	Gmax	Combination	0,79	-24,14	5,02	0,78	-0,04
111	Gmax	Combination	2,36	-23,83	5,09	0,39	-0,02
111	Gmax	Combination	3,20	-19,67	2,17	0,00	-0,07
111	Gmax	Combination	1,63	-19,98	2,03	-0,13	-0,10
112	Gmax	Combination	-0,51	-20,41	2,03	-0,12	-0,15
112	Gmax	Combination	0,97	-20,11	2,17	0,00	-0,11
112	Gmax	Combination	1,76	-16,16	-0,07	-0,59	-0,15
112	Gmax	Combination	0,28	-16,46	-0,12	-0,61	-0,19

113	Gmax	Combination	-1,39	-16,79	-0,12	-0,61	-0,21
113	Gmax	Combination	-0,02	-16,52	-0,07	-0,59	-0,16
113	Gmax	Combination	0,69	-12,96	-1,66	-1,00	-0,16
113	Gmax	Combination	-0,68	-13,23	-1,64	-1,07	-0,22
114	Gmax	Combination	-1,89	-13,47	-1,63	-1,07	-0,20
114	Gmax	Combination	-0,67	-13,23	-1,66	-1,00	-0,15
114	Gmax	Combination	-0,02	-9,99	-2,72	-1,30	-0,12
114	Gmax	Combination	-1,24	-10,24	-2,63	-1,38	-0,17
115	Gmax	Combination	-2,04	-10,40	-2,63	-1,38	-0,11
115	Gmax	Combination	-1,00	-10,19	-2,72	-1,30	-0,09
115	Gmax	Combination	-0,41	-7,23	-3,34	-1,47	-0,04
115	Gmax	Combination	-1,45	-7,44	-3,20	-1,54	-0,06
116	Gmax	Combination	-1,91	-7,53	-3,20	-1,54	0,02
116	Gmax	Combination	-1,10	-7,37	-3,34	-1,47	0,01
116	Gmax	Combination	-0,55	-4,62	-3,55	-1,48	0,08
116	Gmax	Combination	-1,36	-4,78	-3,39	-1,55	0,09
117	Gmax	Combination	-1,59	-4,83	-3,39	-1,55	0,18
117	Gmax	Combination	-1,02	-4,71	-3,55	-1,48	0,14
117	Gmax	Combination	-0,48	-2,03	-3,34	-1,34	0,21
117	Gmax	Combination	-1,06	-2,15	-3,18	-1,40	0,25
118	Gmax	Combination	-1,19	-2,18	-3,18	-1,40	0,34
118	Gmax	Combination	-0,84	-2,11	-3,34	-1,34	0,26
118	Gmax	Combination	-0,30	0,62	-2,65	-1,03	0,33
118	Gmax	Combination	-0,64	0,55	-2,51	-1,07	0,40
119	Gmax	Combination	-0,80	0,52	-2,51	-1,07	0,47
119	Gmax	Combination	-0,62	0,55	-2,65	-1,03	0,37
119	Gmax	Combination	-0,05	3,40	-1,36	-0,55	0,42
119	Gmax	Combination	-0,23	3,37	-1,27	-0,57	0,52
120	Gmax	Combination	-0,48	3,32	-1,27	-0,57	0,57
120	Gmax	Combination	-0,39	3,34	-1,36	-0,55	0,46
120	Gmax	Combination	0,21	6,32	0,65	0,10	0,49
120	Gmax	Combination	0,11	6,31	0,72	0,15	0,61
121	Gmax	Combination	-1,16	-22,87	4,77	0,85	-0,07
121	Gmax	Combination	1,14	-22,41	4,92	0,30	-0,04
121	Gmax	Combination	1,95	-18,37	2,05	0,00	-0,13
121	Gmax	Combination	-0,35	-18,84	1,82	-0,18	-0,16
122	Gmax	Combination	-2,34	-19,23	1,82	-0,18	-0,26
122	Gmax	Combination	-0,19	-18,80	2,05	0,00	-0,20
122	Gmax	Combination	0,57	-14,99	-0,13	-0,64	-0,25
122	Gmax	Combination	-1,58	-15,42	-0,19	-0,65	-0,31
123	Gmax	Combination	-3,08	-15,72	-0,19	-0,65	-0,34
123	Gmax	Combination	-1,10	-15,32	-0,12	-0,64	-0,27

123	Gmax	Combination	-0,41	-11,90	-1,63	-1,06	-0,27
123	Gmax	Combination	-2,39	-12,29	-1,58	-1,14	-0,34
124	Gmax	Combination	-3,39	-12,49	-1,58	-1,14	-0,31
124	Gmax	Combination	-1,62	-12,14	-1,63	-1,06	-0,25
124	Gmax	Combination	-1,01	-9,08	-2,63	-1,38	-0,20
124	Gmax	Combination	-2,78	-9,44	-2,47	-1,45	-0,26
125	Gmax	Combination	-3,30	-9,54	-2,47	-1,45	-0,17
125	Gmax	Combination	-1,81	-9,24	-2,63	-1,38	-0,15
125	Gmax	Combination	-1,27	-6,54	-3,20	-1,54	-0,06
125	Gmax	Combination	-2,76	-6,84	-2,97	-1,62	-0,09
126	Gmax	Combination	-2,90	-6,86	-2,97	-1,62	0,03
126	Gmax	Combination	-1,73	-6,63	-3,20	-1,54	0,02
126	Gmax	Combination	-1,24	-4,17	-3,39	-1,55	0,12
126	Gmax	Combination	-2,41	-4,41	-3,13	-1,62	0,14
127	Gmax	Combination	-2,28	-4,38	-3,13	-1,62	0,26
127	Gmax	Combination	-1,47	-4,22	-3,39	-1,55	0,21
127	Gmax	Combination	-1,00	-1,84	-3,18	-1,40	0,32
127	Gmax	Combination	-1,81	-2,01	-2,94	-1,45	0,37
128	Gmax	Combination	-1,62	-1,97	-2,94	-1,45	0,49
128	Gmax	Combination	-1,13	-1,87	-3,18	-1,40	0,40
128	Gmax	Combination	-0,63	0,62	-2,51	-1,07	0,50
128	Gmax	Combination	-1,12	0,53	-2,31	-1,10	0,59
129	Gmax	Combination	-1,03	0,54	-2,31	-1,10	0,69
129	Gmax	Combination	-0,79	0,59	-2,51	-1,07	0,57
129	Gmax	Combination	-0,23	3,38	-1,26	-0,55	0,64
129	Gmax	Combination	-0,47	3,33	-1,13	-0,57	0,76
130	Gmax	Combination	-0,61	3,30	-1,13	-0,58	0,83
130	Gmax	Combination	-0,48	3,33	-1,26	-0,55	0,69
130	Gmax	Combination	0,14	6,42	0,71	0,11	0,74
130	Gmax	Combination	0,01	6,40	0,80	0,19	0,87
131	Gmax	Combination	-3,81	-21,02	4,33	0,87	-0,11
131	Gmax	Combination	-0,67	-20,40	4,64	0,20	-0,07
131	Gmax	Combination	0,09	-16,64	1,85	-0,01	-0,22
131	Gmax	Combination	-3,06	-17,27	1,52	-0,24	-0,26
132	Gmax	Combination	-4,82	-17,62	1,52	-0,24	-0,40
132	Gmax	Combination	-1,90	-17,04	1,86	-0,01	-0,32
132	Gmax	Combination	-1,18	-13,40	-0,20	-0,70	-0,39
132	Gmax	Combination	-4,09	-13,98	-0,28	-0,70	-0,47
133	Gmax	Combination	-5,34	-14,23	-0,28	-0,70	-0,51
133	Gmax	Combination	-2,67	-13,70	-0,20	-0,70	-0,42
133	Gmax	Combination	-2,02	-10,44	-1,58	-1,13	-0,41
133	Gmax	Combination	-4,68	-10,97	-1,48	-1,19	-0,50

134	Gmax	Combination	-5,35	-11,10	-1,48	-1,19	-0,44
134	Gmax	Combination	-3,02	-10,64	-1,58	-1,13	-0,38
134	Gmax	Combination	-2,46	-7,83	-2,47	-1,46	-0,30
134	Gmax	Combination	-4,79	-8,30	-2,22	-1,49	-0,37
135	Gmax	Combination	-4,94	-8,33	-2,23	-1,49	-0,24
135	Gmax	Combination	-2,98	-7,94	-2,47	-1,46	-0,22
135	Gmax	Combination	-2,51	-5,58	-2,97	-1,62	-0,09
135	Gmax	Combination	-4,46	-5,97	-2,64	-1,65	-0,12
136	Gmax	Combination	-4,14	-5,91	-2,64	-1,65	0,04
136	Gmax	Combination	-2,65	-5,61	-2,97	-1,62	0,02
136	Gmax	Combination	-2,24	-3,59	-3,13	-1,62	0,17
136	Gmax	Combination	-3,74	-3,89	-2,77	-1,63	0,18
137	Gmax	Combination	-3,17	-3,78	-2,77	-1,63	0,36
137	Gmax	Combination	-2,12	-3,57	-3,13	-1,62	0,30
137	Gmax	Combination	-1,73	-1,64	-2,94	-1,45	0,45
137	Gmax	Combination	-2,79	-1,85	-2,60	-1,45	0,51
138	Gmax	Combination	-2,17	-1,73	-2,60	-1,45	0,67
138	Gmax	Combination	-1,54	-1,61	-2,94	-1,45	0,57
138	Gmax	Combination	-1,11	0,53	-2,31	-1,10	0,70
138	Gmax	Combination	-1,74	0,41	-2,03	-1,09	0,80
139	Gmax	Combination	-1,34	0,49	-2,04	-1,09	0,92
139	Gmax	Combination	-1,03	0,55	-2,31	-1,10	0,80
139	Gmax	Combination	-0,50	3,19	-1,12	-0,56	0,89
139	Gmax	Combination	-0,81	3,13	-0,94	-0,56	1,02
140	Gmax	Combination	-0,82	3,13	-0,95	-0,56	1,10
140	Gmax	Combination	-0,64	3,16	-1,12	-0,56	0,96
140	Gmax	Combination	0,03	6,50	0,79	0,11	1,01
140	Gmax	Combination	-0,15	6,46	0,89	0,21	1,16
141	Gmax	Combination	-7,41	-18,65	3,63	0,87	-0,16
141	Gmax	Combination	-3,17	-17,80	4,18	0,09	-0,11
141	Gmax	Combination	-2,49	-14,42	1,56	-0,03	-0,34
141	Gmax	Combination	-6,73	-15,27	1,11	-0,31	-0,39
142	Gmax	Combination	-8,09	-15,54	1,12	-0,31	-0,57
142	Gmax	Combination	-4,25	-14,77	1,56	-0,03	-0,48
142	Gmax	Combination	-3,56	-11,35	-0,29	-0,75	-0,57
142	Gmax	Combination	-7,41	-12,12	-0,35	-0,71	-0,67
143	Gmax	Combination	-8,22	-12,28	-0,34	-0,71	-0,70
143	Gmax	Combination	-4,81	-11,60	-0,29	-0,75	-0,61
143	Gmax	Combination	-4,19	-8,53	-1,47	-1,18	-0,58
143	Gmax	Combination	-7,61	-9,21	-1,29	-1,16	-0,68
144	Gmax	Combination	-7,81	-9,25	-1,29	-1,16	-0,59
144	Gmax	Combination	-4,86	-8,66	-1,47	-1,18	-0,52

144	Gmax	Combination	-4,37	-6,18	-2,23	-1,50	-0,42
144	Gmax	Combination	-7,32	-6,77	-1,87	-1,41	-0,48
145	Gmax	Combination	-6,80	-6,67	-1,86	-1,41	-0,32
145	Gmax	Combination	-4,51	-6,21	-2,23	-1,50	-0,29
145	Gmax	Combination	-4,15	-4,39	-2,64	-1,65	-0,13
145	Gmax	Combination	-6,43	-4,85	-2,18	-1,54	-0,16
146	Gmax	Combination	-5,56	-4,67	-2,18	-1,54	0,05
146	Gmax	Combination	-3,82	-4,32	-2,64	-1,65	0,03
146	Gmax	Combination	-3,54	-2,89	-2,77	-1,63	0,22
146	Gmax	Combination	-5,27	-3,24	-2,27	-1,51	0,24
147	Gmax	Combination	-4,22	-3,03	-2,27	-1,51	0,46
147	Gmax	Combination	-2,97	-2,78	-2,77	-1,64	0,40
147	Gmax	Combination	-2,70	-1,45	-2,59	-1,45	0,59
147	Gmax	Combination	-3,95	-1,70	-2,13	-1,34	0,65
148	Gmax	Combination	-2,90	-1,49	-2,12	-1,34	0,86
148	Gmax	Combination	-2,09	-1,32	-2,60	-1,45	0,75
148	Gmax	Combination	-1,77	0,27	-2,04	-1,09	0,92
148	Gmax	Combination	-2,58	0,10	-1,67	-1,00	1,02
149	Gmax	Combination	-1,78	0,27	-1,66	-0,99	1,18
149	Gmax	Combination	-1,37	0,35	-2,04	-1,09	1,05
149	Gmax	Combination	-0,89	2,73	-0,94	-0,54	1,16
149	Gmax	Combination	-1,30	2,65	-0,72	-0,50	1,30
150	Gmax	Combination	-1,18	2,67	-0,72	-0,50	1,39
150	Gmax	Combination	-0,90	2,73	-0,94	-0,54	1,25
150	Gmax	Combination	-0,19	6,30	0,88	0,13	1,31
150	Gmax	Combination	-0,46	6,25	0,98	0,24	1,45
151	Gmax	Combination	-12,41	-15,52	2,55	0,78	-0,23
151	Gmax	Combination	-6,55	-14,34	3,45	-0,06	-0,17
151	Gmax	Combination	-6,04	-11,79	1,16	-0,06	-0,49
151	Gmax	Combination	-11,90	-12,96	0,63	-0,37	-0,55
152	Gmax	Combination	-12,47	-13,08	0,62	-0,37	-0,77
152	Gmax	Combination	-7,40	-12,06	1,17	-0,06	-0,67
152	Gmax	Combination	-6,73	-8,75	-0,36	-0,78	-0,78
152	Gmax	Combination	-11,81	-9,76	-0,34	-0,61	-0,87
153	Gmax	Combination	-12,05	-9,81	-0,36	-0,62	-0,88
153	Gmax	Combination	-7,55	-8,91	-0,35	-0,77	-0,80
153	Gmax	Combination	-6,97	-6,01	-1,29	-1,14	-0,75
153	Gmax	Combination	-11,47	-6,91	-0,98	-0,93	-0,83
154	Gmax	Combination	-10,35	-6,68	-1,01	-0,94	-0,72
154	Gmax	Combination	-7,17	-6,05	-1,28	-1,14	-0,67
154	Gmax	Combination	-6,82	-4,28	-1,87	-1,42	-0,52
154	Gmax	Combination	-10,00	-4,91	-1,36	-1,09	-0,57

155	Gmax	Combination	-8,54	-4,62	-1,38	-1,09	-0,38
155	Gmax	Combination	-6,30	-4,17	-1,86	-1,42	-0,36
155	Gmax	Combination	-6,08	-3,07	-2,18	-1,54	-0,16
155	Gmax	Combination	-8,32	-3,52	-1,55	-1,15	-0,18
156	Gmax	Combination	-6,88	-3,23	-1,58	-1,16	0,06
156	Gmax	Combination	-5,20	-2,89	-2,18	-1,54	0,04
156	Gmax	Combination	-5,05	-2,11	-2,27	-1,52	0,28
156	Gmax	Combination	-6,73	-2,45	-1,60	-1,12	0,29
157	Gmax	Combination	-5,36	-2,18	-1,63	-1,13	0,55
157	Gmax	Combination	-3,99	-1,90	-2,27	-1,51	0,50
157	Gmax	Combination	-3,86	-1,26	-2,13	-1,34	0,73
157	Gmax	Combination	-5,23	-1,54	-1,49	-0,99	0,79
158	Gmax	Combination	-3,86	-1,26	-1,52	-0,99	1,03
158	Gmax	Combination	-2,82	-1,05	-2,12	-1,34	0,94
158	Gmax	Combination	-2,64	-0,18	-1,67	-1,00	1,14
158	Gmax	Combination	-3,69	-0,39	-1,17	-0,73	1,23
159	Gmax	Combination	-2,56	-0,16	-1,20	-0,73	1,43
159	Gmax	Combination	-1,84	-0,02	-1,67	-1,00	1,30
159	Gmax	Combination	-1,48	1,76	-0,72	-0,47	1,44
159	Gmax	Combination	-2,21	1,62	-0,46	-0,34	1,56
160	Gmax	Combination	-1,82	1,69	-0,48	-0,34	1,65
160	Gmax	Combination	-1,36	1,79	-0,72	-0,47	1,54
160	Gmax	Combination	-0,58	5,64	0,96	0,14	1,59
160	Gmax	Combination	-1,05	5,55	1,02	0,25	1,71
161	Gmax	Combination	-20,15	-12,08	1,03	0,59	-0,30
161	Gmax	Combination	-11,37	-10,32	2,35	-0,23	-0,25
161	Gmax	Combination	-11,01	-8,55	0,69	-0,09	-0,66
161	Gmax	Combination	-19,80	-10,31	0,16	-0,32	-0,71
162	Gmax	Combination	-19,77	-10,30	0,26	-0,30	-0,91
162	Gmax	Combination	-11,59	-8,67	0,67	-0,09	-0,86
162	Gmax	Combination	-10,85	-4,98	-0,35	-0,69	-0,95
162	Gmax	Combination	-19,03	-6,62	-0,29	-0,22	-0,99
163	Gmax	Combination	-15,48	-5,91	-0,20	-0,21	-0,98
163	Gmax	Combination	-11,10	-5,03	-0,37	-0,69	-0,95
163	Gmax	Combination	-10,77	-3,38	-0,98	-0,91	-0,88
163	Gmax	Combination	-15,15	-4,25	-0,61	-0,34	-0,91
164	Gmax	Combination	-11,99	-3,62	-0,52	-0,33	-0,78
164	Gmax	Combination	-9,64	-3,15	-1,00	-0,92	-0,76
164	Gmax	Combination	-9,51	-2,47	-1,36	-1,09	-0,60
164	Gmax	Combination	-11,85	-2,93	-0,77	-0,35	-0,61
165	Gmax	Combination	-9,53	-2,47	-0,67	-0,33	-0,40
165	Gmax	Combination	-8,05	-2,17	-1,38	-1,10	-0,40

165	Gmax	Combination	-7,98	-1,82	-1,55	-1,15	-0,17
165	Gmax	Combination	-9,46	-2,12	-0,85	-0,33	-0,17
166	Gmax	Combination	-7,74	-1,77	-0,74	-0,30	0,09
166	Gmax	Combination	-6,54	-1,53	-1,58	-1,16	0,07
166	Gmax	Combination	-6,51	-1,38	-1,60	-1,12	0,33
166	Gmax	Combination	-7,71	-1,62	-0,85	-0,27	0,35
167	Gmax	Combination	-6,36	-1,35	-0,75	-0,25	0,62
167	Gmax	Combination	-5,14	-1,10	-1,63	-1,13	0,58
167	Gmax	Combination	-5,13	-1,04	-1,49	-0,99	0,84
167	Gmax	Combination	-6,35	-1,28	-0,78	-0,19	0,88
168	Gmax	Combination	-5,17	-1,05	-0,67	-0,17	1,14
168	Gmax	Combination	-3,76	-0,77	-1,52	-0,99	1,09
168	Gmax	Combination	-3,76	-0,75	-1,17	-0,73	1,33
168	Gmax	Combination	-5,17	-1,04	-0,60	-0,11	1,38
169	Gmax	Combination	-3,81	-0,76	-0,50	-0,09	1,58
169	Gmax	Combination	-2,64	-0,53	-1,20	-0,74	1,52
169	Gmax	Combination	-2,48	0,24	-0,45	-0,33	1,67
169	Gmax	Combination	-3,66	0,01	-0,25	-0,02	1,73
170	Gmax	Combination	-3,20	0,10	-0,17	0,00	1,80
170	Gmax	Combination	-2,10	0,32	-0,48	-0,33	1,77
170	Gmax	Combination	-1,44	3,60	1,01	0,20	1,79
170	Gmax	Combination	-2,54	3,38	0,86	0,14	1,82
171	Gmax	Combination	-41,65	-8,64	-0,75	0,63	-0,29
171	Gmax	Combination	-18,54	-4,02	0,82	-0,44	-0,34
171	Gmax	Combination	-18,42	-3,41	0,21	-0,05	-0,74
171	Gmax	Combination	-41,53	-8,04	0,19	0,54	-0,69
172	Gmax	Combination	-23,40	-4,41	-0,18	0,46	-0,89
172	Gmax	Combination	-18,39	-3,41	0,31	-0,03	-0,91
172	Gmax	Combination	-18,14	-2,14	-0,30	-0,29	-0,98
172	Gmax	Combination	-23,15	-3,14	0,12	0,72	-0,97
173	Gmax	Combination	-15,44	-1,60	-0,20	0,66	-0,95
173	Gmax	Combination	-14,58	-1,43	-0,22	-0,27	-0,99
173	Gmax	Combination	-14,62	-1,63	-0,61	-0,33	-0,91
173	Gmax	Combination	-15,48	-1,80	0,19	0,90	-0,87
174	Gmax	Combination	-11,39	-0,98	-0,16	0,83	-0,74
174	Gmax	Combination	-11,46	-0,99	-0,51	-0,31	-0,78
174	Gmax	Combination	-11,49	-1,16	-0,77	-0,36	-0,60
174	Gmax	Combination	-11,43	-1,14	0,25	1,11	-0,56
175	Gmax	Combination	-9,13	-0,69	-0,10	1,04	-0,35
175	Gmax	Combination	-9,17	-0,69	-0,67	-0,34	-0,38
175	Gmax	Combination	-9,22	-0,92	-0,85	-0,33	-0,15
175	Gmax	Combination	-9,18	-0,91	0,32	1,27	-0,11

176	Gmax	Combination	-7,76	-0,63	-0,08	1,19	0,14
176	Gmax	Combination	-7,51	-0,58	-0,74	-0,31	0,11
176	Gmax	Combination	-7,55	-0,81	-0,85	-0,27	0,37
176	Gmax	Combination	-7,81	-0,86	0,36	1,37	0,40
177	Gmax	Combination	-6,90	-0,68	-0,04	1,29	0,66
177	Gmax	Combination	-6,20	-0,54	-0,75	-0,25	0,64
177	Gmax	Combination	-6,27	-0,87	-0,78	-0,20	0,91
177	Gmax	Combination	-6,97	-1,01	0,41	1,41	0,93
178	Gmax	Combination	-6,28	-0,87	-0,03	1,32	1,17
178	Gmax	Combination	-5,09	-0,63	-0,67	-0,17	1,17
178	Gmax	Combination	-5,20	-1,19	-0,61	-0,12	1,39
178	Gmax	Combination	-6,39	-1,43	0,41	1,35	1,39
179	Gmax	Combination	-6,15	-1,38	0,03	1,28	1,55
179	Gmax	Combination	-3,84	-0,92	-0,51	-0,10	1,61
179	Gmax	Combination	-4,01	-1,77	-0,25	-0,02	1,72
179	Gmax	Combination	-6,32	-2,23	0,28	1,05	1,67
180	Gmax	Combination	-4,91	-1,95	-0,11	0,98	1,60
180	Gmax	Combination	-3,55	-1,68	-0,17	-0,01	1,83
180	Gmax	Combination	-3,31	-0,47	0,85	0,07	1,67
180	Gmax	Combination	-4,67	-0,74	0,18	0,03	1,43

4.3. VERIFICAÇÃO DAS TENSÕES NO SOLO

A tabela a seguir apresenta as reações das placas no solo.

Tabela 4.2 – Reações no solo.

Joint	OutputCase	CaseType	F1	F2	F3	M1	M2	M3
Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
1	Gmax	Combination	0,000	0,000	6,478	0,000	0,000	0,000
2	Gmax	Combination	0,000	0,000	3,255	0,000	0,000	0,000
3	Gmax	Combination	0,000	0,000	3,256	0,000	0,000	0,000
4	Gmax	Combination	0,000	0,000	6,474	0,000	0,000	0,000
5	Gmax	Combination	0,000	0,000	3,259	0,000	0,000	0,000
6	Gmax	Combination	0,000	0,000	6,467	0,000	0,000	0,000
7	Gmax	Combination	0,000	0,000	3,263	0,000	0,000	0,000
8	Gmax	Combination	0,000	0,000	6,461	0,000	0,000	0,000
9	Gmax	Combination	0,000	0,000	3,268	0,000	0,000	0,000
10	Gmax	Combination	0,000	0,000	6,462	0,000	0,000	0,000
11	Gmax	Combination	0,000	0,000	3,273	0,000	0,000	0,000
12	Gmax	Combination	0,000	0,000	6,469	0,000	0,000	0,000
13	Gmax	Combination	0,000	0,000	3,279	0,000	0,000	0,000

14	Gmax	Combination	0,000	0,000	6,485	0,000	0,000	0,000
15	Gmax	Combination	0,000	0,000	3,286	0,000	0,000	0,000
16	Gmax	Combination	0,000	0,000	6,509	0,000	0,000	0,000
17	Gmax	Combination	0,000	0,000	3,293	0,000	0,000	0,000
18	Gmax	Combination	0,000	0,000	6,540	0,000	0,000	0,000
19	Gmax	Combination	0,000	0,000	3,300	0,000	0,000	0,000
20	Gmax	Combination	0,000	0,000	6,577	0,000	0,000	0,000
21	Gmax	Combination	0,000	0,000	1,654	0,000	0,000	0,000
22	Gmax	Combination	0,000	0,000	3,308	0,000	0,000	0,000
23	Gmax	Combination	0,000	0,000	6,446	0,000	0,000	0,000
24	Gmax	Combination	0,000	0,000	6,436	0,000	0,000	0,000
25	Gmax	Combination	0,000	0,000	6,416	0,000	0,000	0,000
26	Gmax	Combination	0,000	0,000	6,398	0,000	0,000	0,000
27	Gmax	Combination	0,000	0,000	6,389	0,000	0,000	0,000
28	Gmax	Combination	0,000	0,000	6,393	0,000	0,000	0,000
29	Gmax	Combination	0,000	0,000	6,411	0,000	0,000	0,000
30	Gmax	Combination	0,000	0,000	6,445	0,000	0,000	0,000
31	Gmax	Combination	0,000	0,000	6,493	0,000	0,000	0,000
32	Gmax	Combination	0,000	0,000	6,552	0,000	0,000	0,000
33	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
34	Gmax	Combination	0,000	0,000	6,417	0,000	0,000	0,000
35	Gmax	Combination	0,000	0,000	6,402	0,000	0,000	0,000
36	Gmax	Combination	0,000	0,000	6,371	0,000	0,000	0,000
37	Gmax	Combination	0,000	0,000	6,342	0,000	0,000	0,000
38	Gmax	Combination	0,000	0,000	6,325	0,000	0,000	0,000
39	Gmax	Combination	0,000	0,000	6,325	0,000	0,000	0,000
40	Gmax	Combination	0,000	0,000	6,345	0,000	0,000	0,000
41	Gmax	Combination	0,000	0,000	6,388	0,000	0,000	0,000
42	Gmax	Combination	0,000	0,000	6,451	0,000	0,000	0,000
43	Gmax	Combination	0,000	0,000	6,530	0,000	0,000	0,000
44	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
45	Gmax	Combination	0,000	0,000	6,391	0,000	0,000	0,000
46	Gmax	Combination	0,000	0,000	6,372	0,000	0,000	0,000
47	Gmax	Combination	0,000	0,000	6,334	0,000	0,000	0,000
48	Gmax	Combination	0,000	0,000	6,297	0,000	0,000	0,000
49	Gmax	Combination	0,000	0,000	6,272	0,000	0,000	0,000
50	Gmax	Combination	0,000	0,000	6,269	0,000	0,000	0,000
51	Gmax	Combination	0,000	0,000	6,292	0,000	0,000	0,000
52	Gmax	Combination	0,000	0,000	6,341	0,000	0,000	0,000
53	Gmax	Combination	0,000	0,000	6,416	0,000	0,000	0,000
54	Gmax	Combination	0,000	0,000	6,511	0,000	0,000	0,000
55	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000

56	Gmax	Combination	0,000	0,000	6,369	0,000	0,000	0,000
57	Gmax	Combination	0,000	0,000	6,348	0,000	0,000	0,000
58	Gmax	Combination	0,000	0,000	6,305	0,000	0,000	0,000
59	Gmax	Combination	0,000	0,000	6,261	0,000	0,000	0,000
60	Gmax	Combination	0,000	0,000	6,231	0,000	0,000	0,000
61	Gmax	Combination	0,000	0,000	6,226	0,000	0,000	0,000
62	Gmax	Combination	0,000	0,000	6,250	0,000	0,000	0,000
63	Gmax	Combination	0,000	0,000	6,305	0,000	0,000	0,000
64	Gmax	Combination	0,000	0,000	6,389	0,000	0,000	0,000
65	Gmax	Combination	0,000	0,000	6,496	0,000	0,000	0,000
66	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
67	Gmax	Combination	0,000	0,000	6,351	0,000	0,000	0,000
68	Gmax	Combination	0,000	0,000	6,329	0,000	0,000	0,000
69	Gmax	Combination	0,000	0,000	6,282	0,000	0,000	0,000
70	Gmax	Combination	0,000	0,000	6,234	0,000	0,000	0,000
71	Gmax	Combination	0,000	0,000	6,201	0,000	0,000	0,000
72	Gmax	Combination	0,000	0,000	6,194	0,000	0,000	0,000
73	Gmax	Combination	0,000	0,000	6,219	0,000	0,000	0,000
74	Gmax	Combination	0,000	0,000	6,278	0,000	0,000	0,000
75	Gmax	Combination	0,000	0,000	6,369	0,000	0,000	0,000
76	Gmax	Combination	0,000	0,000	6,485	0,000	0,000	0,000
77	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
78	Gmax	Combination	0,000	0,000	6,338	0,000	0,000	0,000
79	Gmax	Combination	0,000	0,000	6,315	0,000	0,000	0,000
80	Gmax	Combination	0,000	0,000	6,266	0,000	0,000	0,000
81	Gmax	Combination	0,000	0,000	6,216	0,000	0,000	0,000
82	Gmax	Combination	0,000	0,000	6,181	0,000	0,000	0,000
83	Gmax	Combination	0,000	0,000	6,172	0,000	0,000	0,000
84	Gmax	Combination	0,000	0,000	6,198	0,000	0,000	0,000
85	Gmax	Combination	0,000	0,000	6,260	0,000	0,000	0,000
86	Gmax	Combination	0,000	0,000	6,356	0,000	0,000	0,000
87	Gmax	Combination	0,000	0,000	6,478	0,000	0,000	0,000
88	Gmax	Combination	0,000	0,000	3,306	0,000	0,000	0,000
89	Gmax	Combination	0,000	0,000	6,330	0,000	0,000	0,000
90	Gmax	Combination	0,000	0,000	6,307	0,000	0,000	0,000
91	Gmax	Combination	0,000	0,000	6,257	0,000	0,000	0,000
92	Gmax	Combination	0,000	0,000	6,205	0,000	0,000	0,000
93	Gmax	Combination	0,000	0,000	6,169	0,000	0,000	0,000
94	Gmax	Combination	0,000	0,000	6,160	0,000	0,000	0,000
95	Gmax	Combination	0,000	0,000	6,186	0,000	0,000	0,000
96	Gmax	Combination	0,000	0,000	6,249	0,000	0,000	0,000
97	Gmax	Combination	0,000	0,000	6,348	0,000	0,000	0,000

98	Gmax	Combination	0,000	0,000	6,473	0,000	0,000	0,000
99	Gmax	Combination	0,000	0,000	3,306	0,000	0,000	0,000
100	Gmax	Combination	0,000	0,000	6,328	0,000	0,000	0,000
101	Gmax	Combination	0,000	0,000	6,304	0,000	0,000	0,000
102	Gmax	Combination	0,000	0,000	6,254	0,000	0,000	0,000
103	Gmax	Combination	0,000	0,000	6,201	0,000	0,000	0,000
104	Gmax	Combination	0,000	0,000	6,165	0,000	0,000	0,000
105	Gmax	Combination	0,000	0,000	6,156	0,000	0,000	0,000
106	Gmax	Combination	0,000	0,000	6,182	0,000	0,000	0,000
107	Gmax	Combination	0,000	0,000	6,246	0,000	0,000	0,000
108	Gmax	Combination	0,000	0,000	6,345	0,000	0,000	0,000
109	Gmax	Combination	0,000	0,000	6,472	0,000	0,000	0,000
110	Gmax	Combination	0,000	0,000	3,306	0,000	0,000	0,000
111	Gmax	Combination	0,000	0,000	6,330	0,000	0,000	0,000
112	Gmax	Combination	0,000	0,000	6,307	0,000	0,000	0,000
113	Gmax	Combination	0,000	0,000	6,257	0,000	0,000	0,000
114	Gmax	Combination	0,000	0,000	6,205	0,000	0,000	0,000
115	Gmax	Combination	0,000	0,000	6,169	0,000	0,000	0,000
116	Gmax	Combination	0,000	0,000	6,160	0,000	0,000	0,000
117	Gmax	Combination	0,000	0,000	6,186	0,000	0,000	0,000
118	Gmax	Combination	0,000	0,000	6,249	0,000	0,000	0,000
119	Gmax	Combination	0,000	0,000	6,348	0,000	0,000	0,000
120	Gmax	Combination	0,000	0,000	6,473	0,000	0,000	0,000
121	Gmax	Combination	0,000	0,000	3,306	0,000	0,000	0,000
122	Gmax	Combination	0,000	0,000	6,338	0,000	0,000	0,000
123	Gmax	Combination	0,000	0,000	6,315	0,000	0,000	0,000
124	Gmax	Combination	0,000	0,000	6,266	0,000	0,000	0,000
125	Gmax	Combination	0,000	0,000	6,216	0,000	0,000	0,000
126	Gmax	Combination	0,000	0,000	6,181	0,000	0,000	0,000
127	Gmax	Combination	0,000	0,000	6,172	0,000	0,000	0,000
128	Gmax	Combination	0,000	0,000	6,198	0,000	0,000	0,000
129	Gmax	Combination	0,000	0,000	6,260	0,000	0,000	0,000
130	Gmax	Combination	0,000	0,000	6,356	0,000	0,000	0,000
131	Gmax	Combination	0,000	0,000	6,478	0,000	0,000	0,000
132	Gmax	Combination	0,000	0,000	3,306	0,000	0,000	0,000
133	Gmax	Combination	0,000	0,000	6,351	0,000	0,000	0,000
134	Gmax	Combination	0,000	0,000	6,329	0,000	0,000	0,000
135	Gmax	Combination	0,000	0,000	6,282	0,000	0,000	0,000
136	Gmax	Combination	0,000	0,000	6,234	0,000	0,000	0,000
137	Gmax	Combination	0,000	0,000	6,201	0,000	0,000	0,000
138	Gmax	Combination	0,000	0,000	6,194	0,000	0,000	0,000
139	Gmax	Combination	0,000	0,000	6,219	0,000	0,000	0,000

140	Gmax	Combination	0,000	0,000	6,278	0,000	0,000	0,000
141	Gmax	Combination	0,000	0,000	6,369	0,000	0,000	0,000
142	Gmax	Combination	0,000	0,000	6,485	0,000	0,000	0,000
143	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
144	Gmax	Combination	0,000	0,000	6,369	0,000	0,000	0,000
145	Gmax	Combination	0,000	0,000	6,348	0,000	0,000	0,000
146	Gmax	Combination	0,000	0,000	6,305	0,000	0,000	0,000
147	Gmax	Combination	0,000	0,000	6,261	0,000	0,000	0,000
148	Gmax	Combination	0,000	0,000	6,231	0,000	0,000	0,000
149	Gmax	Combination	0,000	0,000	6,226	0,000	0,000	0,000
150	Gmax	Combination	0,000	0,000	6,250	0,000	0,000	0,000
151	Gmax	Combination	0,000	0,000	6,305	0,000	0,000	0,000
152	Gmax	Combination	0,000	0,000	6,389	0,000	0,000	0,000
153	Gmax	Combination	0,000	0,000	6,496	0,000	0,000	0,000
154	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
155	Gmax	Combination	0,000	0,000	6,391	0,000	0,000	0,000
156	Gmax	Combination	0,000	0,000	6,372	0,000	0,000	0,000
157	Gmax	Combination	0,000	0,000	6,334	0,000	0,000	0,000
158	Gmax	Combination	0,000	0,000	6,297	0,000	0,000	0,000
159	Gmax	Combination	0,000	0,000	6,272	0,000	0,000	0,000
160	Gmax	Combination	0,000	0,000	6,269	0,000	0,000	0,000
161	Gmax	Combination	0,000	0,000	6,292	0,000	0,000	0,000
162	Gmax	Combination	0,000	0,000	6,341	0,000	0,000	0,000
163	Gmax	Combination	0,000	0,000	6,416	0,000	0,000	0,000
164	Gmax	Combination	0,000	0,000	6,511	0,000	0,000	0,000
165	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
166	Gmax	Combination	0,000	0,000	6,417	0,000	0,000	0,000
167	Gmax	Combination	0,000	0,000	6,402	0,000	0,000	0,000
168	Gmax	Combination	0,000	0,000	6,371	0,000	0,000	0,000
169	Gmax	Combination	0,000	0,000	6,342	0,000	0,000	0,000
170	Gmax	Combination	0,000	0,000	6,325	0,000	0,000	0,000
171	Gmax	Combination	0,000	0,000	6,325	0,000	0,000	0,000
172	Gmax	Combination	0,000	0,000	6,345	0,000	0,000	0,000
173	Gmax	Combination	0,000	0,000	6,388	0,000	0,000	0,000
174	Gmax	Combination	0,000	0,000	6,451	0,000	0,000	0,000
175	Gmax	Combination	0,000	0,000	6,530	0,000	0,000	0,000
176	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
177	Gmax	Combination	0,000	0,000	6,446	0,000	0,000	0,000
178	Gmax	Combination	0,000	0,000	6,436	0,000	0,000	0,000
179	Gmax	Combination	0,000	0,000	6,416	0,000	0,000	0,000
180	Gmax	Combination	0,000	0,000	6,398	0,000	0,000	0,000
181	Gmax	Combination	0,000	0,000	6,389	0,000	0,000	0,000

182	Gmax	Combination	0,000	0,000	6,393	0,000	0,000	0,000
183	Gmax	Combination	0,000	0,000	6,411	0,000	0,000	0,000
184	Gmax	Combination	0,000	0,000	6,445	0,000	0,000	0,000
185	Gmax	Combination	0,000	0,000	6,493	0,000	0,000	0,000
186	Gmax	Combination	0,000	0,000	6,552	0,000	0,000	0,000
187	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
188	Gmax	Combination	0,000	0,000	6,478	0,000	0,000	0,000
189	Gmax	Combination	0,000	0,000	6,474	0,000	0,000	0,000
190	Gmax	Combination	0,000	0,000	6,467	0,000	0,000	0,000
191	Gmax	Combination	0,000	0,000	6,461	0,000	0,000	0,000
192	Gmax	Combination	0,000	0,000	6,462	0,000	0,000	0,000
193	Gmax	Combination	0,000	0,000	6,469	0,000	0,000	0,000
194	Gmax	Combination	0,000	0,000	6,485	0,000	0,000	0,000
195	Gmax	Combination	0,000	0,000	6,509	0,000	0,000	0,000
196	Gmax	Combination	0,000	0,000	6,540	0,000	0,000	0,000
197	Gmax	Combination	0,000	0,000	6,577	0,000	0,000	0,000
198	Gmax	Combination	0,000	0,000	3,308	0,000	0,000	0,000
199	Gmax	Combination	0,000	0,000	3,255	0,000	0,000	0,000
200	Gmax	Combination	0,000	0,000	3,256	0,000	0,000	0,000
201	Gmax	Combination	0,000	0,000	3,259	0,000	0,000	0,000
202	Gmax	Combination	0,000	0,000	3,263	0,000	0,000	0,000
203	Gmax	Combination	0,000	0,000	3,268	0,000	0,000	0,000
204	Gmax	Combination	0,000	0,000	3,273	0,000	0,000	0,000
205	Gmax	Combination	0,000	0,000	3,279	0,000	0,000	0,000
206	Gmax	Combination	0,000	0,000	3,286	0,000	0,000	0,000
207	Gmax	Combination	0,000	0,000	3,293	0,000	0,000	0,000
208	Gmax	Combination	0,000	0,000	3,300	0,000	0,000	0,000
209	Gmax	Combination	0,000	0,000	1,654	0,000	0,000	0,000
210	Gmax	Combination	0,000	0,000	6,474	0,000	0,000	0,000
211	Gmax	Combination	0,000	0,000	3,256	0,000	0,000	0,000
212	Gmax	Combination	0,000	0,000	6,467	0,000	0,000	0,000
213	Gmax	Combination	0,000	0,000	3,259	0,000	0,000	0,000
214	Gmax	Combination	0,000	0,000	6,461	0,000	0,000	0,000
215	Gmax	Combination	0,000	0,000	3,263	0,000	0,000	0,000
216	Gmax	Combination	0,000	0,000	6,462	0,000	0,000	0,000
217	Gmax	Combination	0,000	0,000	3,268	0,000	0,000	0,000
218	Gmax	Combination	0,000	0,000	6,469	0,000	0,000	0,000
219	Gmax	Combination	0,000	0,000	3,273	0,000	0,000	0,000
220	Gmax	Combination	0,000	0,000	6,485	0,000	0,000	0,000
221	Gmax	Combination	0,000	0,000	3,279	0,000	0,000	0,000
222	Gmax	Combination	0,000	0,000	6,509	0,000	0,000	0,000
223	Gmax	Combination	0,000	0,000	3,286	0,000	0,000	0,000

224	Gmax	Combination	0,000	0,000	6,540	0,000	0,000	0,000
225	Gmax	Combination	0,000	0,000	3,293	0,000	0,000	0,000
226	Gmax	Combination	0,000	0,000	6,577	0,000	0,000	0,000
227	Gmax	Combination	0,000	0,000	3,300	0,000	0,000	0,000
228	Gmax	Combination	0,000	0,000	3,308	0,000	0,000	0,000
229	Gmax	Combination	0,000	0,000	1,654	0,000	0,000	0,000
230	Gmax	Combination	0,000	0,000	6,436	0,000	0,000	0,000
231	Gmax	Combination	0,000	0,000	6,416	0,000	0,000	0,000
232	Gmax	Combination	0,000	0,000	6,398	0,000	0,000	0,000
233	Gmax	Combination	0,000	0,000	6,389	0,000	0,000	0,000
234	Gmax	Combination	0,000	0,000	6,393	0,000	0,000	0,000
235	Gmax	Combination	0,000	0,000	6,411	0,000	0,000	0,000
236	Gmax	Combination	0,000	0,000	6,445	0,000	0,000	0,000
237	Gmax	Combination	0,000	0,000	6,493	0,000	0,000	0,000
238	Gmax	Combination	0,000	0,000	6,552	0,000	0,000	0,000
239	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
240	Gmax	Combination	0,000	0,000	6,402	0,000	0,000	0,000
241	Gmax	Combination	0,000	0,000	6,371	0,000	0,000	0,000
242	Gmax	Combination	0,000	0,000	6,342	0,000	0,000	0,000
243	Gmax	Combination	0,000	0,000	6,325	0,000	0,000	0,000
244	Gmax	Combination	0,000	0,000	6,325	0,000	0,000	0,000
245	Gmax	Combination	0,000	0,000	6,345	0,000	0,000	0,000
246	Gmax	Combination	0,000	0,000	6,388	0,000	0,000	0,000
247	Gmax	Combination	0,000	0,000	6,451	0,000	0,000	0,000
248	Gmax	Combination	0,000	0,000	6,530	0,000	0,000	0,000
249	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
250	Gmax	Combination	0,000	0,000	6,372	0,000	0,000	0,000
251	Gmax	Combination	0,000	0,000	6,334	0,000	0,000	0,000
252	Gmax	Combination	0,000	0,000	6,297	0,000	0,000	0,000
253	Gmax	Combination	0,000	0,000	6,272	0,000	0,000	0,000
254	Gmax	Combination	0,000	0,000	6,269	0,000	0,000	0,000
255	Gmax	Combination	0,000	0,000	6,292	0,000	0,000	0,000
256	Gmax	Combination	0,000	0,000	6,341	0,000	0,000	0,000
257	Gmax	Combination	0,000	0,000	6,416	0,000	0,000	0,000
258	Gmax	Combination	0,000	0,000	6,511	0,000	0,000	0,000
259	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
260	Gmax	Combination	0,000	0,000	6,348	0,000	0,000	0,000
261	Gmax	Combination	0,000	0,000	6,305	0,000	0,000	0,000
262	Gmax	Combination	0,000	0,000	6,261	0,000	0,000	0,000
263	Gmax	Combination	0,000	0,000	6,231	0,000	0,000	0,000
264	Gmax	Combination	0,000	0,000	6,226	0,000	0,000	0,000
265	Gmax	Combination	0,000	0,000	6,250	0,000	0,000	0,000

266	Gmax	Combination	0,000	0,000	6,305	0,000	0,000	0,000
267	Gmax	Combination	0,000	0,000	6,389	0,000	0,000	0,000
268	Gmax	Combination	0,000	0,000	6,496	0,000	0,000	0,000
269	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
270	Gmax	Combination	0,000	0,000	6,329	0,000	0,000	0,000
271	Gmax	Combination	0,000	0,000	6,282	0,000	0,000	0,000
272	Gmax	Combination	0,000	0,000	6,234	0,000	0,000	0,000
273	Gmax	Combination	0,000	0,000	6,201	0,000	0,000	0,000
274	Gmax	Combination	0,000	0,000	6,194	0,000	0,000	0,000
275	Gmax	Combination	0,000	0,000	6,219	0,000	0,000	0,000
276	Gmax	Combination	0,000	0,000	6,278	0,000	0,000	0,000
277	Gmax	Combination	0,000	0,000	6,369	0,000	0,000	0,000
278	Gmax	Combination	0,000	0,000	6,485	0,000	0,000	0,000
279	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
280	Gmax	Combination	0,000	0,000	6,315	0,000	0,000	0,000
281	Gmax	Combination	0,000	0,000	6,266	0,000	0,000	0,000
282	Gmax	Combination	0,000	0,000	6,216	0,000	0,000	0,000
283	Gmax	Combination	0,000	0,000	6,181	0,000	0,000	0,000
284	Gmax	Combination	0,000	0,000	6,172	0,000	0,000	0,000
285	Gmax	Combination	0,000	0,000	6,198	0,000	0,000	0,000
286	Gmax	Combination	0,000	0,000	6,260	0,000	0,000	0,000
287	Gmax	Combination	0,000	0,000	6,356	0,000	0,000	0,000
288	Gmax	Combination	0,000	0,000	6,478	0,000	0,000	0,000
289	Gmax	Combination	0,000	0,000	3,306	0,000	0,000	0,000
290	Gmax	Combination	0,000	0,000	6,307	0,000	0,000	0,000
291	Gmax	Combination	0,000	0,000	6,257	0,000	0,000	0,000
292	Gmax	Combination	0,000	0,000	6,205	0,000	0,000	0,000
293	Gmax	Combination	0,000	0,000	6,169	0,000	0,000	0,000
294	Gmax	Combination	0,000	0,000	6,160	0,000	0,000	0,000
295	Gmax	Combination	0,000	0,000	6,186	0,000	0,000	0,000
296	Gmax	Combination	0,000	0,000	6,249	0,000	0,000	0,000
297	Gmax	Combination	0,000	0,000	6,348	0,000	0,000	0,000
298	Gmax	Combination	0,000	0,000	6,473	0,000	0,000	0,000
299	Gmax	Combination	0,000	0,000	3,306	0,000	0,000	0,000
300	Gmax	Combination	0,000	0,000	6,304	0,000	0,000	0,000
301	Gmax	Combination	0,000	0,000	6,254	0,000	0,000	0,000
302	Gmax	Combination	0,000	0,000	6,201	0,000	0,000	0,000
303	Gmax	Combination	0,000	0,000	6,165	0,000	0,000	0,000
304	Gmax	Combination	0,000	0,000	6,156	0,000	0,000	0,000
305	Gmax	Combination	0,000	0,000	6,182	0,000	0,000	0,000
306	Gmax	Combination	0,000	0,000	6,246	0,000	0,000	0,000
307	Gmax	Combination	0,000	0,000	6,345	0,000	0,000	0,000

308	Gmax	Combination	0,000	0,000	6,472	0,000	0,000	0,000
309	Gmax	Combination	0,000	0,000	3,306	0,000	0,000	0,000
310	Gmax	Combination	0,000	0,000	6,307	0,000	0,000	0,000
311	Gmax	Combination	0,000	0,000	6,257	0,000	0,000	0,000
312	Gmax	Combination	0,000	0,000	6,205	0,000	0,000	0,000
313	Gmax	Combination	0,000	0,000	6,169	0,000	0,000	0,000
314	Gmax	Combination	0,000	0,000	6,160	0,000	0,000	0,000
315	Gmax	Combination	0,000	0,000	6,186	0,000	0,000	0,000
316	Gmax	Combination	0,000	0,000	6,249	0,000	0,000	0,000
317	Gmax	Combination	0,000	0,000	6,348	0,000	0,000	0,000
318	Gmax	Combination	0,000	0,000	6,473	0,000	0,000	0,000
319	Gmax	Combination	0,000	0,000	3,306	0,000	0,000	0,000
320	Gmax	Combination	0,000	0,000	6,315	0,000	0,000	0,000
321	Gmax	Combination	0,000	0,000	6,266	0,000	0,000	0,000
322	Gmax	Combination	0,000	0,000	6,216	0,000	0,000	0,000
323	Gmax	Combination	0,000	0,000	6,181	0,000	0,000	0,000
324	Gmax	Combination	0,000	0,000	6,172	0,000	0,000	0,000
325	Gmax	Combination	0,000	0,000	6,198	0,000	0,000	0,000
326	Gmax	Combination	0,000	0,000	6,260	0,000	0,000	0,000
327	Gmax	Combination	0,000	0,000	6,356	0,000	0,000	0,000
328	Gmax	Combination	0,000	0,000	6,478	0,000	0,000	0,000
329	Gmax	Combination	0,000	0,000	3,306	0,000	0,000	0,000
330	Gmax	Combination	0,000	0,000	6,329	0,000	0,000	0,000
331	Gmax	Combination	0,000	0,000	6,282	0,000	0,000	0,000
332	Gmax	Combination	0,000	0,000	6,234	0,000	0,000	0,000
333	Gmax	Combination	0,000	0,000	6,201	0,000	0,000	0,000
334	Gmax	Combination	0,000	0,000	6,194	0,000	0,000	0,000
335	Gmax	Combination	0,000	0,000	6,219	0,000	0,000	0,000
336	Gmax	Combination	0,000	0,000	6,278	0,000	0,000	0,000
337	Gmax	Combination	0,000	0,000	6,369	0,000	0,000	0,000
338	Gmax	Combination	0,000	0,000	6,485	0,000	0,000	0,000
339	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
340	Gmax	Combination	0,000	0,000	6,348	0,000	0,000	0,000
341	Gmax	Combination	0,000	0,000	6,305	0,000	0,000	0,000
342	Gmax	Combination	0,000	0,000	6,261	0,000	0,000	0,000
343	Gmax	Combination	0,000	0,000	6,231	0,000	0,000	0,000
344	Gmax	Combination	0,000	0,000	6,226	0,000	0,000	0,000
345	Gmax	Combination	0,000	0,000	6,250	0,000	0,000	0,000
346	Gmax	Combination	0,000	0,000	6,305	0,000	0,000	0,000
347	Gmax	Combination	0,000	0,000	6,389	0,000	0,000	0,000
348	Gmax	Combination	0,000	0,000	6,496	0,000	0,000	0,000
349	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000

350	Gmax	Combination	0,000	0,000	6,372	0,000	0,000	0,000
351	Gmax	Combination	0,000	0,000	6,334	0,000	0,000	0,000
352	Gmax	Combination	0,000	0,000	6,297	0,000	0,000	0,000
353	Gmax	Combination	0,000	0,000	6,272	0,000	0,000	0,000
354	Gmax	Combination	0,000	0,000	6,269	0,000	0,000	0,000
355	Gmax	Combination	0,000	0,000	6,292	0,000	0,000	0,000
356	Gmax	Combination	0,000	0,000	6,341	0,000	0,000	0,000
357	Gmax	Combination	0,000	0,000	6,416	0,000	0,000	0,000
358	Gmax	Combination	0,000	0,000	6,511	0,000	0,000	0,000
359	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
360	Gmax	Combination	0,000	0,000	6,402	0,000	0,000	0,000
361	Gmax	Combination	0,000	0,000	6,371	0,000	0,000	0,000
362	Gmax	Combination	0,000	0,000	6,342	0,000	0,000	0,000
363	Gmax	Combination	0,000	0,000	6,325	0,000	0,000	0,000
364	Gmax	Combination	0,000	0,000	6,325	0,000	0,000	0,000
365	Gmax	Combination	0,000	0,000	6,345	0,000	0,000	0,000
366	Gmax	Combination	0,000	0,000	6,388	0,000	0,000	0,000
367	Gmax	Combination	0,000	0,000	6,451	0,000	0,000	0,000
368	Gmax	Combination	0,000	0,000	6,530	0,000	0,000	0,000
369	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
370	Gmax	Combination	0,000	0,000	6,436	0,000	0,000	0,000
371	Gmax	Combination	0,000	0,000	6,416	0,000	0,000	0,000
372	Gmax	Combination	0,000	0,000	6,398	0,000	0,000	0,000
373	Gmax	Combination	0,000	0,000	6,389	0,000	0,000	0,000
374	Gmax	Combination	0,000	0,000	6,393	0,000	0,000	0,000
375	Gmax	Combination	0,000	0,000	6,411	0,000	0,000	0,000
376	Gmax	Combination	0,000	0,000	6,445	0,000	0,000	0,000
377	Gmax	Combination	0,000	0,000	6,493	0,000	0,000	0,000
378	Gmax	Combination	0,000	0,000	6,552	0,000	0,000	0,000
379	Gmax	Combination	0,000	0,000	3,307	0,000	0,000	0,000
380	Gmax	Combination	0,000	0,000	6,474	0,000	0,000	0,000
381	Gmax	Combination	0,000	0,000	6,467	0,000	0,000	0,000
382	Gmax	Combination	0,000	0,000	6,461	0,000	0,000	0,000
383	Gmax	Combination	0,000	0,000	6,462	0,000	0,000	0,000
384	Gmax	Combination	0,000	0,000	6,469	0,000	0,000	0,000
385	Gmax	Combination	0,000	0,000	6,485	0,000	0,000	0,000
386	Gmax	Combination	0,000	0,000	6,509	0,000	0,000	0,000
387	Gmax	Combination	0,000	0,000	6,540	0,000	0,000	0,000
388	Gmax	Combination	0,000	0,000	6,577	0,000	0,000	0,000
389	Gmax	Combination	0,000	0,000	3,308	0,000	0,000	0,000
390	Gmax	Combination	0,000	0,000	3,256	0,000	0,000	0,000
391	Gmax	Combination	0,000	0,000	3,259	0,000	0,000	0,000

392	Gmax	Combination	0,000	0,000	3,263	0,000	0,000	0,000
393	Gmax	Combination	0,000	0,000	3,268	0,000	0,000	0,000
394	Gmax	Combination	0,000	0,000	3,273	0,000	0,000	0,000
395	Gmax	Combination	0,000	0,000	3,279	0,000	0,000	0,000
396	Gmax	Combination	0,000	0,000	3,286	0,000	0,000	0,000
397	Gmax	Combination	0,000	0,000	3,293	0,000	0,000	0,000
398	Gmax	Combination	0,000	0,000	3,300	0,000	0,000	0,000
399	Gmax	Combination	0,000	0,000	1,654	0,000	0,000	0,000

A tensão no solo será determinada pela equação;

$$\sigma_{solo} = \frac{P_{concreto} + P_{agua} + SC}{A}$$

Conforme somatório da coluna F3 que são as reações em z e equivale ao somatório do numerador da equação, temos 2293,32 kN. A área do apoio no solo é de 197,47 m². Temos uma tensão no solo de;

$$\sigma = \frac{2293,32}{197,47} = 11,61 \frac{kN}{m^2} = 0,12 \frac{kgf}{cm^2} \leq 1,00 \frac{kgf}{cm^2} (ok)$$

Logo a fundação não poderá ser do tipo direta.

4.4. ARMAÇÃO NA LAJE DE FUNDO

As figuras 4.3 e 4.4 apresentam os momentos fletores na laje de fundo.

Figura 4.3 – Momento na direção X.

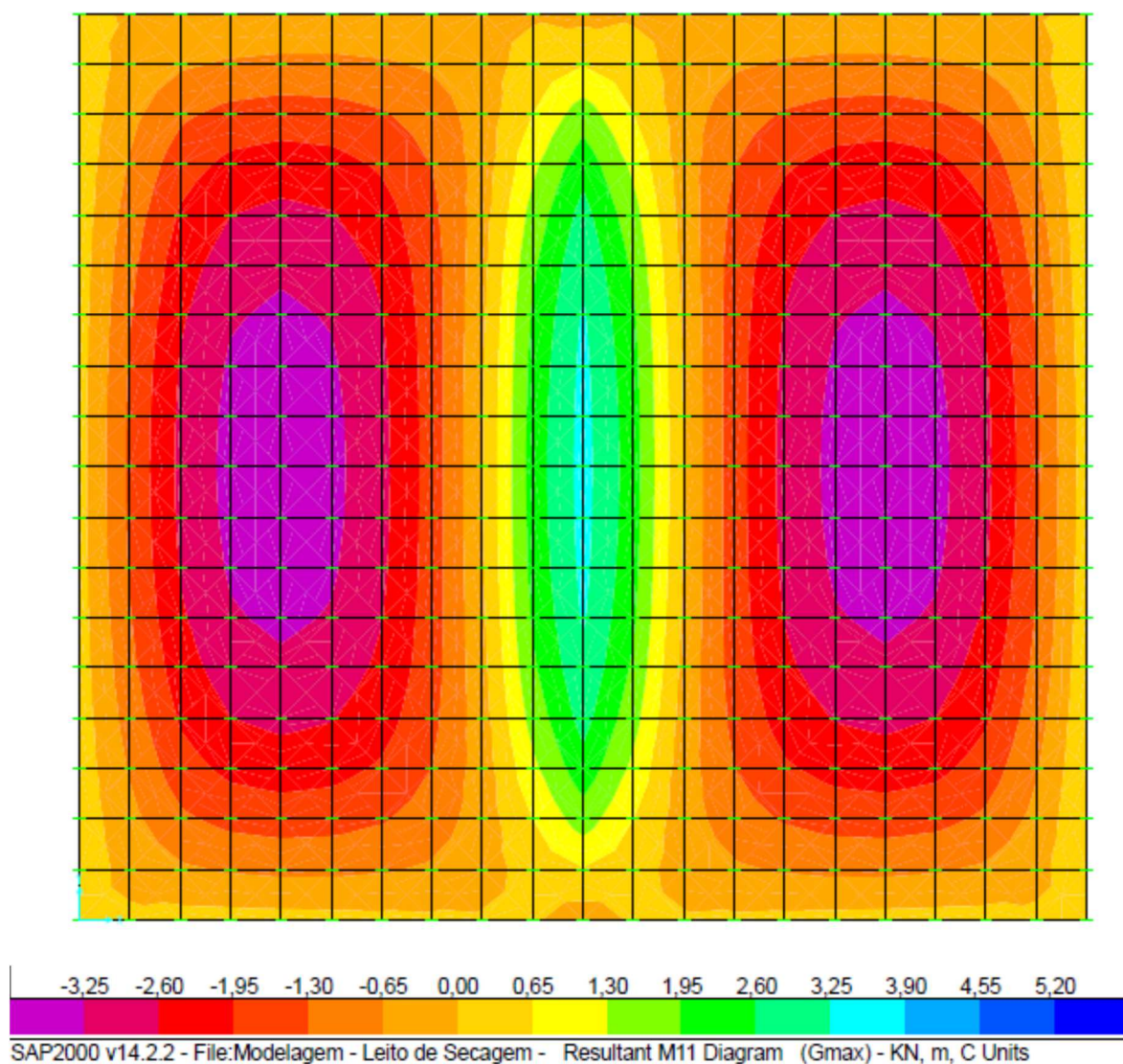
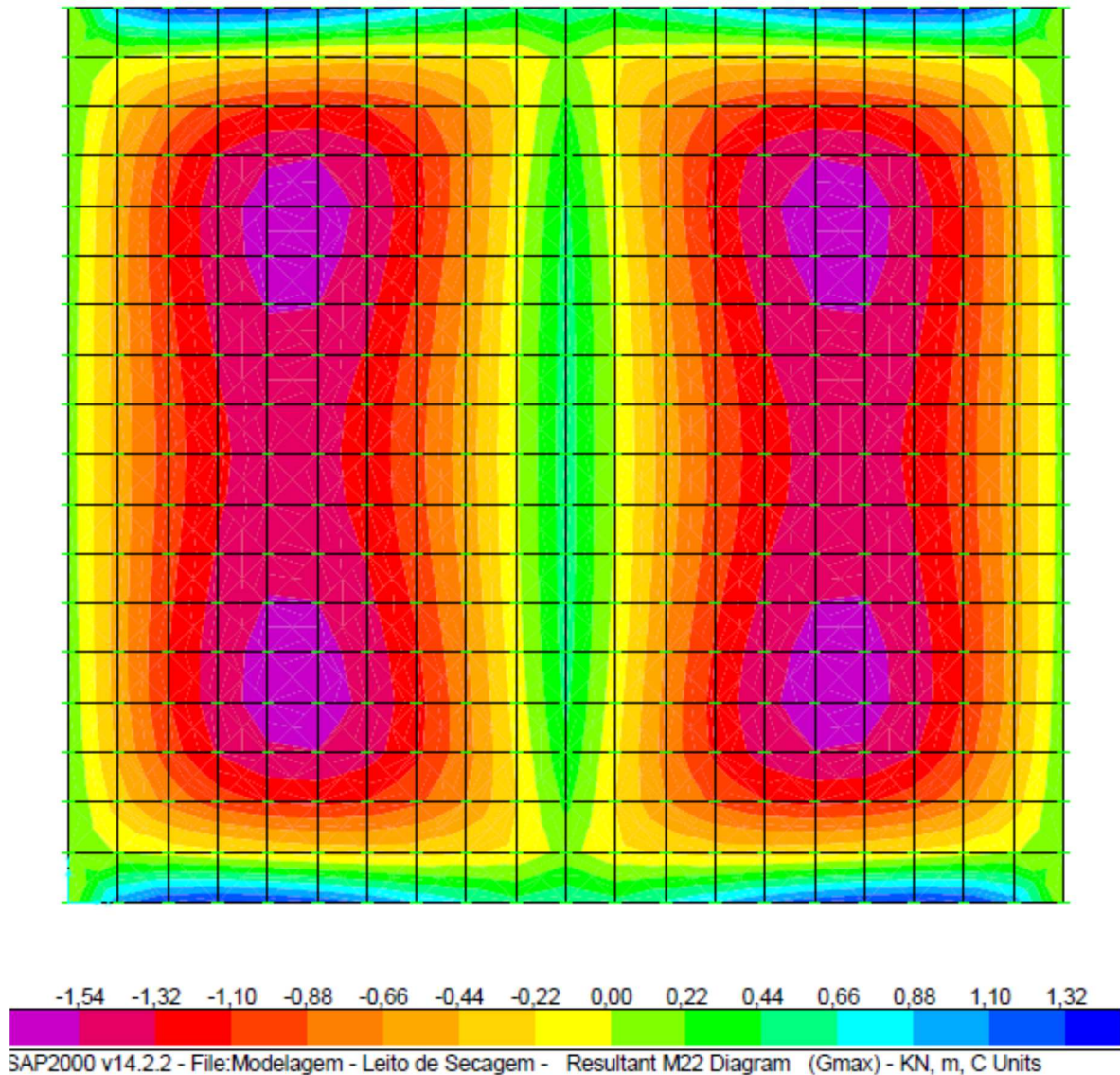


Figura 4.4 – Momento na direção Y.



Conforme modelagem os esforços máximos nas lajes de fundo são:

$$\text{Parede } e=20\text{cm} \rightarrow \begin{cases} M_x = 17,25 \text{ kNm} \\ M_y = 18,02 \text{ kNm} \end{cases}$$

A figura a seguir apresenta o resultados do dimensionamento

a) Direção x

1) PARÂMETROS DE ENTRADA

$$\begin{aligned} \text{Momento Fletor Máximo} &= 17,25 \text{ kN.m} \\ f_{ck} &= 30,00 \text{ MPa} \end{aligned}$$



$$b = 100 \text{ cm} \quad h = 20 \text{ cm}$$

2) DETERMINAÇÃO DA ALTURA ÚTIL

$$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$$

$$\text{Adotaremos } \phi \text{ da armadura} = 8,0 \text{ mm}$$

$$\text{Cobrimento da armadura} = 4,00 \text{ mm}$$

$$d = 14,80 \text{ cm}$$

$$\text{Adotar } d = 14,00 \text{ cm}$$

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0575$$

$$\text{Conforme tabela temos: } KMD = 0,0575 \rightarrow Kx = 0,0916$$

$$\rightarrow Kz = 0,9634$$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 4,12 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 3,00 \text{ cm}^2/\text{m} \\ 0,23\%bh = 4,60 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 3,45 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 4,60 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 10.0$ c/15 que equivale a 5,20 cm²/m.

b) Direção y

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 18,02 kN.m
fck = 30,00 MPa

 h = 20 cm
b = 100 cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

d = altura total – cobrimento – 1,5 ϕ armadura

Adotaremos ϕ da armadura = 8,0 mm

Cobrimento da armadura = 4,00 mm

d = 14,80 cm

Adotar d = 14,00 cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0601$$

Conforme tabela temos: KMD = 0,0601

→ Kx = 0,0916

→ Kz = 0,9634

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 4,30 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 3,00 \text{ cm}^2/\text{m} \\ 0,23\%bh = 4,60 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 3,45 \text{ cm}^2/\text{m} \end{cases}$$

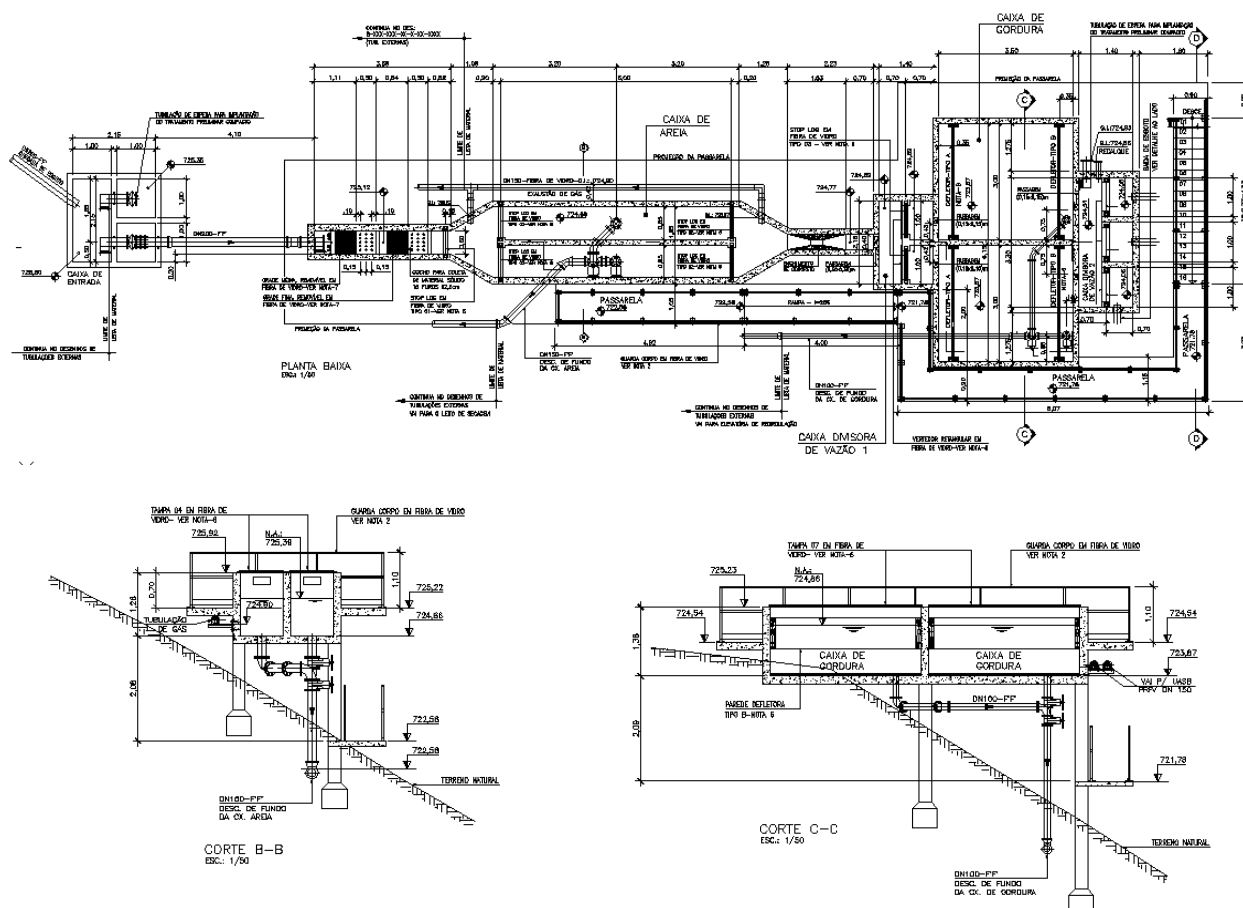
Para calcula da área de aço será considerada a taxa de aço de 4,60 cm²/m. Será utilizada armadura dupla (face superior e inferior) de ϕ 10.0 c/15 que equivale a 5,20 cm²/m.

5. DIMENSIONAMENTO – TRATAMENTO PRIMÁRIO

5.1. MODELAGEM ESTRUTURAL

A figura 5.1 apresenta as dimensões em planta e corte do tratamento primário.

Figura 5.1 – Dimensões tratamento primário.



A modelagem estrutural foi feita no software SAP-2000 (figuras 5.2 e 5.3) considerando os parâmetros apresentados no item 2.

Figura 5.2 – Modelo estrutural 3D vista 1.

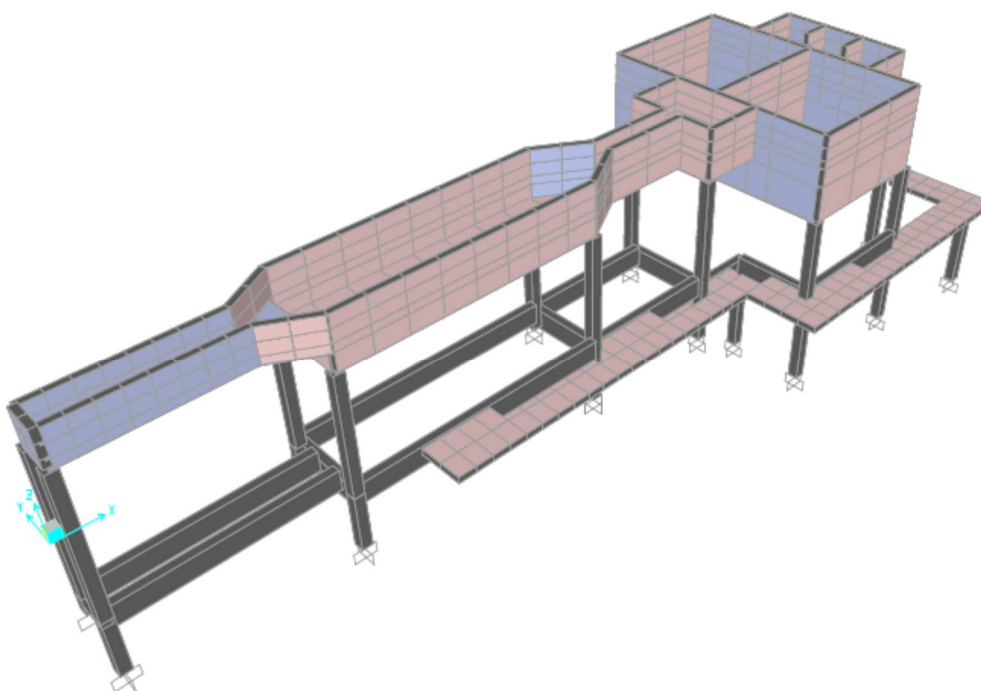
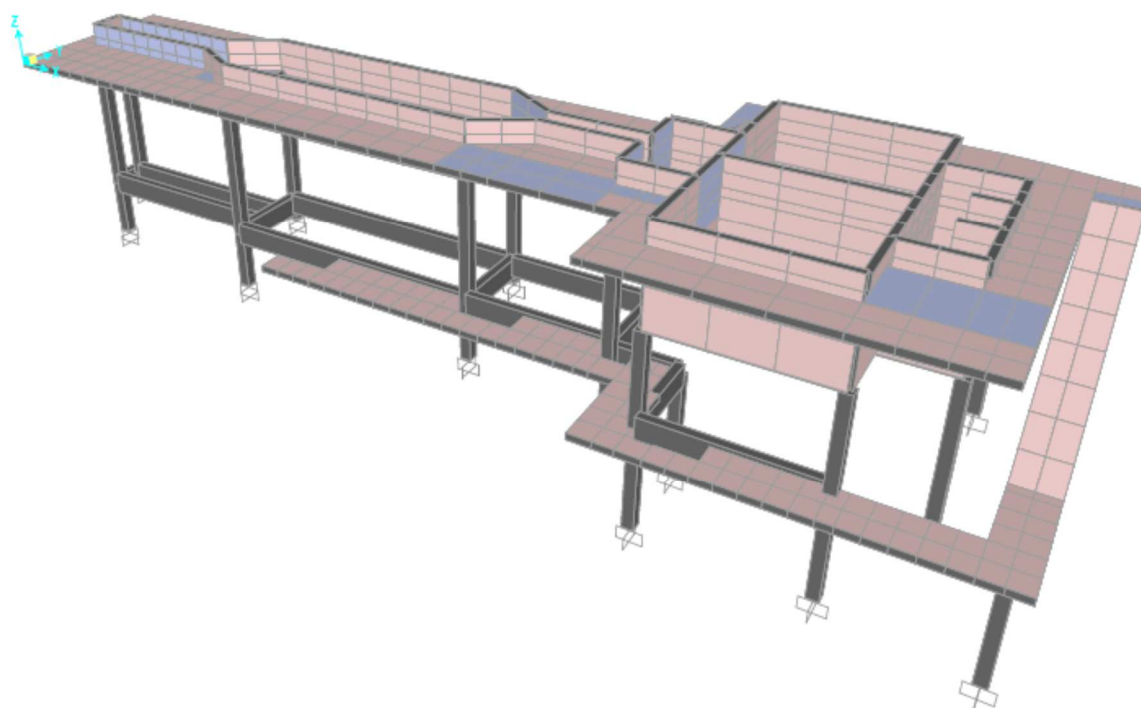


Figura 3.3 – Modelo estrutural 3D vista 2.



Os carregamentos utilizados no dimensionamento foram:

- Cargas Permanentes (CP)
Peso próprio
- Sobrecargas (SC)
Carregamento na laje/tampas de cobertura (SC)
Carregamento na laje de fundo (SCLF)
Carregamento nas paredes lado interno (SCPI)

Combinação para dimensionamento das barras

Comb 1: $1,4CP + 1,4SC$

Comb 2: $1,4CP + 1,4SC + 1,4SCLF$

Comb 3: $1,4CP + 1,4SC + 1,4SCLF + 1,4SCPI$

5.2. RESULTADOS DA ANÁLISE ESTRUTURAL

Conforme informado no item anterior a análise estrutural foi feita utilizando o software SAP 2000. As tabelas a seguir apresentam os resultados do dimensionamento eletrônico.

Tabela 5.1 – Esforços nas placas.

Area	OutputCase	CaseType	Fx	Fy	Mx	My	T
Text	Text	Text	KN/m	KN/m	KN-m/m	KN-m/m	KN-m/m
1	Gmax	Combination	-17,340	-43,170	4,465	0,222	-0,317
1	Gmax	Combination	-13,590	-24,420	-2,293	1,359	-1,037
1	Gmax	Combination	18,860	-17,920	0,848	1,200	-0,461
1	Gmax	Combination	15,110	-36,670	-1,599	-0,213	0,260
2	Gmax	Combination	13,970	-42,380	-1,662	-0,525	-0,100
2	Gmax	Combination	17,930	-22,580	0,866	1,290	0,785
2	Gmax	Combination	-2,890	-26,750	-2,665	1,585	1,360
2	Gmax	Combination	-6,850	-46,550	5,713	1,168	0,475
3	Gmax	Combination	44,180	-12,860	-0,489	1,719	-0,371
3	Gmax	Combination	43,760	-14,970	0,005	2,438	-0,260
3	Gmax	Combination	23,740	-18,970	-0,006	1,804	-0,025
3	Gmax	Combination	24,160	-16,860	-0,324	0,965	-0,135
4	Gmax	Combination	23,230	-21,520	-0,306	1,056	0,281
4	Gmax	Combination	23,800	-18,650	-0,012	1,774	0,056
4	Gmax	Combination	40,950	-15,220	0,241	3,192	0,341

4	Gmax	Combination	40,380	-18,090	-0,977	1,922	0,566
5	Gmax	Combination	57,830	-12,160	0,397	2,517	-0,273
5	Gmax	Combination	56,930	-16,660	-0,287	2,936	-0,257
5	Gmax	Combination	50,560	-17,940	0,095	2,459	-0,055
5	Gmax	Combination	51,460	-13,430	-0,165	1,772	-0,072
6	Gmax	Combination	51,520	-13,110	-0,171	1,743	0,150
6	Gmax	Combination	50,610	-17,680	0,096	2,466	0,151
6	Gmax	Combination	51,220	-17,560	-0,218	3,608	0,350
6	Gmax	Combination	52,130	-12,990	0,683	3,280	0,349
7	Gmax	Combination	70,700	-13,910	0,051	3,004	-0,118
7	Gmax	Combination	70,870	-13,100	-0,064	3,242	-0,097
7	Gmax	Combination	62,550	-14,760	-0,065	2,710	-0,005
7	Gmax	Combination	62,380	-15,570	-0,089	2,422	-0,026
8	Gmax	Combination	62,440	-15,310	-0,087	2,430	0,105
8	Gmax	Combination	62,680	-14,070	-0,066	2,704	0,044
8	Gmax	Combination	65,620	-13,480	-0,055	3,819	0,120
8	Gmax	Combination	65,380	-14,730	0,137	3,679	0,181
9	Gmax	Combination	73,980	-12,470	-0,109	3,233	-0,015
9	Gmax	Combination	74,640	-9,160	0,086	3,401	0,003
9	Gmax	Combination	66,980	-10,690	-0,113	2,696	0,024
9	Gmax	Combination	66,320	-14,010	-0,087	2,706	0,006
10	Gmax	Combination	66,460	-13,310	-0,088	2,700	0,031
10	Gmax	Combination	66,900	-11,120	-0,111	2,704	0,001
10	Gmax	Combination	71,130	-10,280	0,020	3,730	-0,015
10	Gmax	Combination	70,690	-12,470	0,099	3,849	0,015
11	Gmax	Combination	67,970	-10,500	-0,218	3,341	0,083
11	Gmax	Combination	69,480	-2,920	0,363	3,309	0,061
11	Gmax	Combination	63,440	-4,130	-0,205	2,549	0,015
11	Gmax	Combination	61,920	-11,710	-0,012	2,716	0,036
12	Gmax	Combination	61,830	-12,140	-0,010	2,724	-0,022
12	Gmax	Combination	62,750	-7,570	-0,210	2,523	-0,039
12	Gmax	Combination	68,560	-6,410	0,130	3,372	-0,130
12	Gmax	Combination	67,640	-10,970	-0,048	3,717	-0,113
13	Gmax	Combination	54,690	-5,880	-0,290	3,178	0,090
13	Gmax	Combination	55,340	-2,650	0,496	3,162	0,126
13	Gmax	Combination	49,180	-3,890	0,010	2,228	0,035
13	Gmax	Combination	48,530	-7,110	0,033	2,596	-0,001
14	Gmax	Combination	47,840	-10,550	0,028	2,570	-0,063
14	Gmax	Combination	50,020	0,340	0,028	2,321	-0,121
14	Gmax	Combination	58,650	2,060	0,296	2,782	-0,268
14	Gmax	Combination	56,470	-8,820	-0,227	3,301	-0,210
15	Gmax	Combination	24,950	-8,730	-0,351	2,993	0,225

15	Gmax	Combination	31,580	24,460	1,183	3,375	0,198
15	Gmax	Combination	43,800	26,900	-0,146	1,545	0,100
15	Gmax	Combination	37,170	-6,290	0,365	2,299	0,128
16	Gmax	Combination	38,010	-2,060	0,383	2,392	-0,187
16	Gmax	Combination	38,350	-0,390	-0,212	1,213	-0,042
16	Gmax	Combination	19,200	-4,220	1,337	3,354	-0,160
16	Gmax	Combination	18,860	-5,890	-0,113	2,700	-0,305
17	Gmax	Combination	15,320	23,690	-1,913	-0,566	0,094
17	Gmax	Combination	-70,110	6,600	-6,117	-1,274	-0,599
17	Gmax	Combination	-100,110	-24,490	0,398	0,020	1,453
17	Gmax	Combination	25,230	0,580	-1,209	-0,989	0,501
18	Gmax	Combination	25,760	50,730	1,915	0,466	0,216
18	Gmax	Combination	8,810	47,340	2,254	1,022	0,808
18	Gmax	Combination	-33,240	-43,220	-0,537	-0,899	0,723
18	Gmax	Combination	-6,020	-37,770	1,040	0,149	0,335
19	Gmax	Combination	4,380	1,140	-1,283	-1,822	-0,673
19	Gmax	Combination	18,190	38,840	-0,022	-1,627	-0,223
19	Gmax	Combination	21,140	39,460	-0,562	-1,976	0,052
19	Gmax	Combination	1,850	0,690	1,301	-1,763	-0,988
20	Gmax	Combination	-16,120	-9,630	0,926	0,014	0,448
20	Gmax	Combination	-8,500	14,530	-0,858	-3,034	0,364
20	Gmax	Combination	6,170	17,470	-0,018	-1,612	-0,457
20	Gmax	Combination	5,020	-5,400	-1,180	-1,301	-0,094
21	Gmax	Combination	24,070	6,180	1,916	0,621	0,434
21	Gmax	Combination	22,650	-0,910	-1,636	1,614	0,407
21	Gmax	Combination	4,580	-4,530	-1,317	-2,866	0,393
21	Gmax	Combination	6,000	2,570	0,256	-0,795	0,420
22	Gmax	Combination	38,370	2,230	-0,097	1,921	0,473
22	Gmax	Combination	37,890	-0,210	0,112	2,879	0,332
22	Gmax	Combination	35,610	-0,670	-1,255	-4,275	0,203
22	Gmax	Combination	36,100	1,780	-1,973	-2,997	0,343
23	Gmax	Combination	68,640	5,940	1,012	3,059	0,095
23	Gmax	Combination	68,280	4,140	-0,259	2,788	-0,020
23	Gmax	Combination	52,440	0,970	-1,072	-4,285	-0,037
23	Gmax	Combination	52,800	2,770	-1,758	-4,376	0,079
24	Gmax	Combination	86,250	7,730	0,040	2,848	0,066
24	Gmax	Combination	86,150	7,240	0,118	2,734	0,086
24	Gmax	Combination	60,730	2,150	-1,354	-4,396	0,039
24	Gmax	Combination	60,830	2,650	-1,229	-4,316	0,019
25	Gmax	Combination	84,440	6,900	0,025	2,715	0,117
25	Gmax	Combination	84,670	8,010	0,004	2,531	0,151
25	Gmax	Combination	58,610	2,800	-1,288	-4,537	0,065

25	Gmax	Combination	58,380	1,680	-1,320	-4,389	0,032
26	Gmax	Combination	64,520	3,980	-0,340	2,463	0,239
26	Gmax	Combination	65,230	7,550	1,106	2,456	0,112
26	Gmax	Combination	44,200	3,340	-1,751	-4,791	-0,006
26	Gmax	Combination	43,480	-0,220	-1,075	-4,494	0,122
27	Gmax	Combination	35,450	1,590	-0,163	2,202	-0,042
27	Gmax	Combination	35,790	3,320	-0,460	1,608	0,080
27	Gmax	Combination	16,280	-0,580	-1,302	-4,349	0,033
27	Gmax	Combination	15,930	-2,310	-1,169	-4,674	-0,088
28	Gmax	Combination	-27,060	-9,250	-1,699	1,360	0,457
28	Gmax	Combination	-23,620	7,930	4,041	2,093	0,166
28	Gmax	Combination	-3,160	12,030	-1,326	-5,009	-0,108
28	Gmax	Combination	-6,600	-5,160	-0,581	-4,204	0,183
29	Gmax	Combination	3,550	-9,680	0,271	-0,722	-0,362
29	Gmax	Combination	5,100	-1,930	-1,310	-2,834	-0,133
29	Gmax	Combination	22,370	1,520	-1,713	1,512	-0,406
29	Gmax	Combination	20,820	-6,220	3,399	1,804	-0,635
30	Gmax	Combination	36,610	4,370	-1,967	-2,965	-0,282
30	Gmax	Combination	35,390	-1,730	-1,258	-4,291	-0,230
30	Gmax	Combination	41,010	-0,610	0,132	3,018	-0,315
30	Gmax	Combination	42,230	5,490	-0,653	1,723	-0,367
31	Gmax	Combination	52,590	1,710	-1,761	-4,392	-0,072
31	Gmax	Combination	52,370	0,610	-1,070	-4,277	0,082
31	Gmax	Combination	69,610	4,060	-0,226	2,938	0,074
31	Gmax	Combination	69,830	5,150	1,275	3,247	-0,080
32	Gmax	Combination	60,760	2,290	-1,227	-4,309	0,014
32	Gmax	Combination	60,720	2,100	-1,356	-4,403	-0,024
32	Gmax	Combination	87,270	7,410	0,156	2,979	-0,050
32	Gmax	Combination	87,310	7,600	-0,028	2,977	-0,013
33	Gmax	Combination	58,370	1,630	-1,321	-4,396	-0,013
33	Gmax	Combination	58,640	2,980	-1,284	-4,518	-0,039
33	Gmax	Combination	84,750	8,200	0,072	2,817	-0,109
33	Gmax	Combination	84,480	6,850	0,111	2,970	-0,083
34	Gmax	Combination	43,520	-0,046	-1,071	-4,475	-0,104
34	Gmax	Combination	44,170	3,220	-1,763	-4,850	0,017
34	Gmax	Combination	63,630	7,110	1,195	2,938	-0,070
34	Gmax	Combination	62,980	3,850	-0,312	2,741	-0,191
35	Gmax	Combination	15,910	-2,430	-1,181	-4,733	0,155
35	Gmax	Combination	16,750	1,780	-1,273	-4,200	0,040
35	Gmax	Combination	32,330	4,890	-0,436	1,560	-0,088
35	Gmax	Combination	31,490	0,680	-0,062	2,687	0,027
36	Gmax	Combination	-6,130	-2,800	-0,551	-4,056	-0,395

36	Gmax	Combination	-3,860	8,540	-1,363	-5,194	-0,108
36	Gmax	Combination	-31,890	2,940	4,514	4,363	0,107
36	Gmax	Combination	-34,160	-8,410	-1,752	1,297	-0,181
37	Gmax	Combination	-50,170	-2,850	-2,744	-3,211	-0,337
37	Gmax	Combination	-51,760	-10,840	-0,182	-4,035	0,011
37	Gmax	Combination	26,760	4,870	1,879	1,173	-0,223
37	Gmax	Combination	28,360	12,860	-0,571	0,087	-0,571
38	Gmax	Combination	-27,150	1,750	2,868	3,236	-0,357
38	Gmax	Combination	-31,300	-19,020	-0,832	0,280	-0,216
38	Gmax	Combination	37,170	-5,330	1,735	-0,312	-1,061
38	Gmax	Combination	41,320	15,450	0,538	-0,094	-1,202
39	Gmax	Combination	11,850	7,790	1,571	1,076	-0,334
39	Gmax	Combination	3,850	-32,250	-3,714	-7,240	0,284
39	Gmax	Combination	-1,150	-33,250	0,375	0,117	-0,993
39	Gmax	Combination	6,860	6,790	1,229	0,933	-1,612
40	Gmax	Combination	1,150	14,280	-0,591	-1,218	0,289
40	Gmax	Combination	-5,080	-16,860	0,190	2,021	0,188
40	Gmax	Combination	7,420	-14,360	-2,300	-0,171	0,753
40	Gmax	Combination	13,650	16,790	1,321	-0,177	0,855
41	Gmax	Combination	2,160	25,700	-0,093	1,872	-0,370
41	Gmax	Combination	-1,600	6,890	-0,200	0,503	-0,316
41	Gmax	Combination	-0,280	7,150	-0,192	0,112	-0,299
41	Gmax	Combination	3,480	25,970	-0,633	-1,428	-0,352
42	Gmax	Combination	18,150	55,910	-4,699	0,237	1,436
42	Gmax	Combination	6,880	-0,420	5,019	6,303	1,621
42	Gmax	Combination	7,030	-0,390	-0,108	-3,528	1,331
42	Gmax	Combination	18,300	55,950	-0,216	1,796	1,146
43	Gmax	Combination	3,060	-10,510	-0,103	-3,504	-0,682
43	Gmax	Combination	5,000	-0,800	-0,416	-3,589	0,495
43	Gmax	Combination	30,350	4,270	4,917	6,282	0,534
43	Gmax	Combination	28,400	-5,440	4,876	6,086	-0,643
44	Gmax	Combination	7,950	72,940	0,305	-2,295	-1,076
44	Gmax	Combination	49,820	81,310	6,460	0,519	-1,431
44	Gmax	Combination	32,640	-4,590	-5,272	-6,166	-1,793
44	Gmax	Combination	-9,230	-12,960	0,291	3,541	-1,437
45	Gmax	Combination	10,960	19,960	-5,137	-6,893	0,256
45	Gmax	Combination	15,370	20,840	-4,589	-5,255	-0,996
45	Gmax	Combination	20,000	43,990	5,097	1,048	-1,150
45	Gmax	Combination	15,580	43,110	5,377	3,153	0,101
46	Gmax	Combination	15,870	23,330	-4,602	-5,324	-2,147
46	Gmax	Combination	18,100	23,770	1,085	7,843	-1,317
46	Gmax	Combination	24,740	56,950	0,215	-0,625	-0,990

46	Gmax	Combination	22,500	56,500	5,031	0,718	-1,821
47	Gmax	Combination	34,080	22,940	-4,991	-6,661	0,159
47	Gmax	Combination	29,040	21,930	-4,222	-5,120	0,186
47	Gmax	Combination	29,380	23,640	-4,418	-5,221	-0,133
47	Gmax	Combination	34,420	24,650	-5,035	-6,873	-0,160
48	Gmax	Combination	30,830	30,890	-4,246	-5,240	0,707
48	Gmax	Combination	39,060	32,540	1,436	7,715	0,671
48	Gmax	Combination	38,110	27,780	1,311	7,888	-0,683
48	Gmax	Combination	29,880	26,130	-4,432	-5,290	-0,646
49	Gmax	Combination	44,280	53,620	7,142	3,927	-0,380
49	Gmax	Combination	25,120	49,780	4,953	0,665	0,851
49	Gmax	Combination	19,150	19,950	-4,241	-5,124	1,156
49	Gmax	Combination	38,320	23,780	-5,387	-6,741	-0,075
50	Gmax	Combination	26,920	58,790	4,932	0,564	1,659
50	Gmax	Combination	20,450	57,490	-0,007	-0,453	0,882
50	Gmax	Combination	14,480	27,620	1,091	7,646	1,309
50	Gmax	Combination	20,940	28,920	-4,265	-5,244	2,087
51	Gmax	Combination	9,780	46,720	-3,042	-0,283	-0,387
51	Gmax	Combination	1,590	5,730	2,179	1,197	-0,771
51	Gmax	Combination	28,130	11,040	-0,619	0,563	-0,185
51	Gmax	Combination	36,320	52,020	-2,335	-2,966	0,198
52	Gmax	Combination	10,460	67,630	0,566	1,510	-0,399
52	Gmax	Combination	-0,260	14,000	-1,964	-1,493	-0,295
52	Gmax	Combination	3,390	14,730	1,928	-0,056	-0,635
52	Gmax	Combination	14,110	68,360	-3,244	-1,295	-0,739
53	Gmax	Combination	-0,260	42,640	1,145	-0,331	0,679
53	Gmax	Combination	-3,890	24,490	0,309	1,953	0,024
53	Gmax	Combination	2,070	25,680	-2,006	-1,703	-0,042
53	Gmax	Combination	5,700	43,830	0,596	1,662	0,613
54	Gmax	Combination	3,990	28,900	-0,513	-1,515	0,349
54	Gmax	Combination	0,370	10,820	-0,395	-0,707	0,260
54	Gmax	Combination	-0,870	10,570	-0,332	-0,158	0,029
54	Gmax	Combination	2,750	28,650	-0,019	2,242	0,119
55	Gmax	Combination	12,610	21,260	0,758	1,474	-0,350
55	Gmax	Combination	12,270	19,550	-0,020	1,875	-0,487
55	Gmax	Combination	1,700	17,440	-0,222	0,157	-0,080
55	Gmax	Combination	2,040	19,140	-0,566	-1,779	0,057
56	Gmax	Combination	18,170	24,090	1,050	7,666	1,395
56	Gmax	Combination	14,620	23,380	-4,586	-5,485	1,910
56	Gmax	Combination	20,670	53,640	5,511	1,681	1,511
56	Gmax	Combination	24,220	54,350	0,296	-0,220	0,996
57	Gmax	Combination	39,030	32,390	1,445	7,761	-0,693

57	Gmax	Combination	27,500	30,090	-4,180	-5,416	-0,693
57	Gmax	Combination	26,640	25,790	-4,387	-5,445	0,622
57	Gmax	Combination	38,170	28,090	1,275	7,711	0,621
58	Gmax	Combination	19,260	51,530	0,031	-0,267	-1,022
58	Gmax	Combination	26,990	53,070	4,619	1,162	-1,604
58	Gmax	Combination	22,180	29,020	-4,174	-5,415	-1,964
58	Gmax	Combination	14,450	27,480	1,100	7,692	-1,383
59	Gmax	Combination	4,700	45,230	0,725	1,802	-0,700
59	Gmax	Combination	1,330	28,370	-1,659	-1,744	-0,092
59	Gmax	Combination	-3,300	27,440	0,383	2,322	0,007
59	Gmax	Combination	0,069	44,300	0,951	-1,299	-0,601
60	Gmax	Combination	24,590	55,590	-3,346	-2,511	0,234
60	Gmax	Combination	17,940	22,320	1,520	1,627	0,416
60	Gmax	Combination	-0,620	18,610	-1,712	-2,008	0,372
60	Gmax	Combination	6,040	51,880	0,746	1,908	0,191
61	Gmax	Combination	20,260	2,460	2,257	0,640	-0,034
61	Gmax	Combination	23,110	16,750	-1,882	-4,192	-0,307
61	Gmax	Combination	11,240	14,380	-0,020	1,877	-0,749
61	Gmax	Combination	8,380	0,087	0,609	0,730	-0,475
62	Gmax	Combination	14,180	21,220	-4,518	-5,146	0,623
62	Gmax	Combination	10,100	20,400	-4,767	-5,934	-0,069
62	Gmax	Combination	14,740	43,620	4,479	-0,926	0,188
62	Gmax	Combination	18,830	44,430	5,267	0,458	0,880
63	Gmax	Combination	25,810	21,630	-4,124	-5,136	-0,198
63	Gmax	Combination	22,920	21,050	-4,828	-6,051	-0,216
63	Gmax	Combination	23,320	23,040	-4,681	-5,917	0,091
63	Gmax	Combination	26,200	23,620	-4,319	-5,107	0,109
64	Gmax	Combination	24,840	42,330	4,426	0,195	-0,679
64	Gmax	Combination	41,580	45,680	6,308	0,903	0,170
64	Gmax	Combination	37,230	23,910	-5,231	-6,132	-0,184
64	Gmax	Combination	20,490	20,560	-4,118	-5,135	-1,032
65	Gmax	Combination	43,970	46,160	-1,635	0,031	0,087
65	Gmax	Combination	35,850	5,580	0,439	0,277	-0,018
65	Gmax	Combination	13,710	1,150	1,371	0,883	-0,059
65	Gmax	Combination	21,820	41,730	-2,818	0,127	0,046
66	Gmax	Combination	14,140	19,190	-1,096	-2,090	-1,586
66	Gmax	Combination	12,830	12,660	-0,110	-3,618	-1,773
66	Gmax	Combination	8,370	11,760	4,813	6,164	-1,153
66	Gmax	Combination	9,680	18,290	-4,680	-0,079	-0,966
67	Gmax	Combination	19,660	4,750	4,799	5,906	0,551
67	Gmax	Combination	21,590	14,410	4,727	6,147	-0,592
67	Gmax	Combination	15,050	13,100	-0,385	-3,673	-0,521

67	Gmax	Combination	13,120	3,440	-0,202	-3,676	0,621
68	Gmax	Combination	40,380	39,650	6,230	0,511	1,004
68	Gmax	Combination	6,180	32,810	0,761	1,132	1,372
68	Gmax	Combination	-0,230	0,770	0,402	3,717	1,726
68	Gmax	Combination	33,970	7,610	-5,202	-5,987	1,358
69	Gmax	Combination	27,700	19,580	-0,453	0,310	0,389
69	Gmax	Combination	21,450	-11,670	2,807	4,693	0,000
69	Gmax	Combination	-54,990	-26,960	-0,346	-4,852	0,409
69	Gmax	Combination	-48,740	4,290	-2,678	-2,881	0,797
70	Gmax	Combination	47,380	23,510	0,340	-0,333	1,094
70	Gmax	Combination	41,530	-5,730	2,407	0,586	0,907
70	Gmax	Combination	-31,570	-20,350	-0,748	0,702	0,594
70	Gmax	Combination	-25,720	8,890	2,802	2,906	0,782
71	Gmax	Combination	-77,380	-7,800	2,178	2,947	-0,753
71	Gmax	Combination	-79,210	-16,920	-2,365	5,743	0,742
71	Gmax	Combination	-31,770	-7,430	0,420	3,506	0,929
71	Gmax	Combination	-29,940	1,690	0,541	3,117	-0,566
72	Gmax	Combination	-29,960	-18,520	0,209	2,880	-0,201
72	Gmax	Combination	-25,750	2,530	0,494	2,610	0,011
72	Gmax	Combination	-47,940	-1,910	0,799	3,168	-0,011
72	Gmax	Combination	-52,150	-22,960	0,304	3,216	-0,223
73	Gmax	Combination	-25,960	-0,290	0,537	2,241	0,316
73	Gmax	Combination	-24,960	4,730	0,364	3,452	-1,300
73	Gmax	Combination	-76,960	-5,670	-2,426	5,435	-1,092
73	Gmax	Combination	-77,960	-10,690	2,190	3,008	0,524
74	Gmax	Combination	-49,720	-23,130	-0,040	2,006	-0,003
74	Gmax	Combination	-45,950	-4,290	0,619	2,257	-0,119
74	Gmax	Combination	-26,330	-0,360	0,506	2,672	-0,129
74	Gmax	Combination	-30,100	-19,210	0,221	2,942	-0,012
75	Gmax	Combination	-60,580	-19,940	-0,309	-2,943	-0,236
75	Gmax	Combination	-56,590	-1,960	-0,258	-3,218	-0,094
75	Gmax	Combination	-34,710	2,410	0,166	-0,482	-0,303
75	Gmax	Combination	-40,750	-15,970	0,030	-2,598	0,133
76	Gmax	Combination	-31,240	2,500	0,104	-3,342	-0,180
76	Gmax	Combination	-27,470	7,040	-0,249	-4,927	-0,180
76	Gmax	Combination	-38,120	4,910	1,349	1,639	-0,713
76	Gmax	Combination	-55,170	-2,280	-0,566	-0,714	-0,529
77	Gmax	Combination	-61,360	-17,490	-0,293	-2,864	-0,142
77	Gmax	Combination	-51,070	-15,430	0,228	-1,605	-0,283
77	Gmax	Combination	-41,440	1,010	-0,543	-0,873	0,320
77	Gmax	Combination	-53,930	-1,490	-0,223	-3,041	-0,043
78	Gmax	Combination	-58,450	-2,610	-1,171	-0,846	0,376

78	Gmax	Combination	-50,910	-0,480	2,560	4,159	0,677
78	Gmax	Combination	-32,130	3,280	-0,298	-5,171	0,418
78	Gmax	Combination	-29,340	3,210	0,109	-3,317	0,545
79	Gmax	Combination	-59,880	-247,480	0,734	2,194	0,461
79	Gmax	Combination	13,850	121,180	-0,896	-2,348	0,449
79	Gmax	Combination	68,920	132,200	-0,886	-3,122	-0,190
79	Gmax	Combination	-4,820	-236,460	-0,011	-0,568	-0,177
80	Gmax	Combination	26,100	123,630	-0,844	-2,338	-0,203
80	Gmax	Combination	-47,050	-242,100	0,468	1,152	-0,423
80	Gmax	Combination	-30,000	-238,690	-0,190	-2,137	-0,029
80	Gmax	Combination	43,140	127,040	-1,516	-3,248	0,191
81	Gmax	Combination	-16,840	-13,990	0,068	-0,180	0,118
81	Gmax	Combination	49,360	-0,760	0,103	0,456	0,090
81	Gmax	Combination	57,100	37,930	0,961	5,542	0,008
81	Gmax	Combination	-9,100	24,690	-1,597	-5,258	0,035
82	Gmax	Combination	-11,140	8,120	-1,039	-4,015	0,015
82	Gmax	Combination	56,320	21,610	0,982	5,239	0,175
82	Gmax	Combination	51,950	-0,240	0,138	0,463	0,162
82	Gmax	Combination	-15,510	-13,730	0,133	-0,167	0,002
83	Gmax	Combination	-58,180	14,870	-3,243	-5,587	0,116
83	Gmax	Combination	47,880	36,090	1,641	5,678	-0,747
83	Gmax	Combination	52,960	61,480	0,601	4,529	-0,805
83	Gmax	Combination	-53,100	40,270	1,718	-0,915	0,058
84	Gmax	Combination	4,820	51,850	1,365	-0,986	-0,084
84	Gmax	Combination	27,640	56,420	1,175	4,644	0,309
84	Gmax	Combination	-15,020	-156,870	-0,193	0,510	0,380
84	Gmax	Combination	-37,830	-161,440	-1,509	-0,601	-0,012
85	Gmax	Combination	-82,130	-180,980	-1,750	-0,649	0,076
85	Gmax	Combination	20,180	-160,520	-0,190	0,701	-0,324
85	Gmax	Combination	70,430	90,720	1,209	4,627	-0,386
85	Gmax	Combination	-31,880	70,250	1,233	-0,740	0,014
86	Gmax	Combination	-22,540	72,120	1,597	-0,668	-0,089
86	Gmax	Combination	57,620	88,160	0,382	4,462	0,593
86	Gmax	Combination	43,810	19,110	1,533	5,349	0,637
86	Gmax	Combination	-36,350	3,080	-2,309	-4,269	-0,044
87	Gmax	Combination	-7,310	-7,810	0,976	0,504	0,103
87	Gmax	Combination	48,340	3,320	-0,138	-0,876	0,396
87	Gmax	Combination	54,550	34,340	-0,525	-2,607	0,405
87	Gmax	Combination	-1,110	23,210	-0,811	-0,017	0,113
88	Gmax	Combination	-2,420	6,750	-0,599	0,151	0,096
88	Gmax	Combination	57,140	18,660	-0,722	-3,094	-0,248
88	Gmax	Combination	54,310	4,520	-0,153	-0,879	-0,205

88	Gmax	Combination	-5,250	-7,400	0,802	0,469	0,139
89	Gmax	Combination	-21,410	19,150	-0,757	-0,007	0,186
89	Gmax	Combination	43,810	32,190	-0,877	-2,677	-0,075
89	Gmax	Combination	48,000	53,190	-0,124	-1,982	-0,208
89	Gmax	Combination	-17,210	40,140	-0,203	0,389	0,053
90	Gmax	Combination	4,880	44,560	-0,024	0,425	-0,091
90	Gmax	Combination	41,970	51,980	-0,259	-2,009	-0,294
90	Gmax	Combination	4,890	-133,450	0,143	-0,199	-0,219
90	Gmax	Combination	-32,210	-140,870	0,736	0,344	-0,017
91	Gmax	Combination	-71,040	-162,350	1,020	0,474	-0,175
91	Gmax	Combination	43,450	-139,460	0,215	-0,085	0,161
91	Gmax	Combination	87,060	78,590	-0,366	-2,539	0,325
91	Gmax	Combination	-27,430	55,690	-0,017	0,120	-0,011
92	Gmax	Combination	9,020	62,980	0,293	0,182	0,062
92	Gmax	Combination	59,370	73,050	-0,027	-2,472	0,167
92	Gmax	Combination	48,130	16,860	-0,964	-3,143	0,101
92	Gmax	Combination	-2,220	6,790	-0,580	0,155	-0,005
93	Gmax	Combination	5,350	1,290	-0,357	-0,038	-0,054
93	Gmax	Combination	12,680	2,760	-0,527	-0,419	0,286
93	Gmax	Combination	-23,600	-178,650	0,399	-0,892	0,239
93	Gmax	Combination	-30,930	-180,120	0,062	-0,376	-0,102
94	Gmax	Combination	59,900	14,080	1,023	0,054	0,174
94	Gmax	Combination	-33,950	-4,690	0,214	-0,790	-0,107
94	Gmax	Combination	-72,690	-198,360	-0,377	-0,420	-0,029
94	Gmax	Combination	21,170	-179,590	-0,324	0,189	0,252
95	Gmax	Combination	-15,520	1,640	-0,035	0,038	0,040
95	Gmax	Combination	16,830	8,110	0,047	0,093	0,115
95	Gmax	Combination	-22,460	-188,320	-0,347	0,184	0,135
95	Gmax	Combination	-54,800	-194,790	-0,240	-0,393	0,059
96	Gmax	Combination	7,990	3,920	-0,152	-0,385	0,180
96	Gmax	Combination	-31,950	-4,070	-0,285	-0,067	0,030
96	Gmax	Combination	-31,450	-1,550	0,172	0,118	0,027
96	Gmax	Combination	8,500	6,440	-0,064	0,032	0,177
97	Gmax	Combination	12,240	7,490	-0,001	0,010	-0,011
97	Gmax	Combination	-23,390	0,360	0,272	0,131	0,144
97	Gmax	Combination	-23,960	-2,470	-0,297	-0,069	0,144
97	Gmax	Combination	11,680	4,650	-0,114	-0,377	-0,011
98	Gmax	Combination	-41,320	-8,040	-0,489	-0,065	0,094
98	Gmax	Combination	-40,320	-3,020	0,432	0,163	0,080
98	Gmax	Combination	18,860	8,820	-0,083	-0,006	0,191
98	Gmax	Combination	17,860	3,790	-0,162	-0,346	0,205
99	Gmax	Combination	15,830	64,340	0,268	-1,525	-0,384

99	Gmax	Combination	-0,600	-17,810	0,340	-0,019	-0,635
99	Gmax	Combination	23,320	-13,020	0,412	0,612	0,020
99	Gmax	Combination	39,740	69,120	-0,952	-0,848	0,270
100	Gmax	Combination	3,460	-17,000	0,437	0,000	0,159
100	Gmax	Combination	7,580	3,620	-1,141	-0,686	0,318
100	Gmax	Combination	6,160	3,340	-0,583	-3,422	-0,710
100	Gmax	Combination	2,040	-17,280	0,342	0,598	-0,868
101	Gmax	Combination	-9,950	41,590	0,151	0,257	-0,096
101	Gmax	Combination	-16,700	7,830	-0,358	-0,126	-0,015
101	Gmax	Combination	38,510	18,870	-0,493	-0,520	0,023
101	Gmax	Combination	45,260	52,640	0,459	-0,764	-0,058
102	Gmax	Combination	8,620	12,900	-0,372	-0,129	-0,123
102	Gmax	Combination	-29,940	-179,920	0,125	-0,240	-0,119
102	Gmax	Combination	-15,650	-177,060	0,533	0,836	0,111
102	Gmax	Combination	22,920	15,760	-0,623	-0,545	0,107
103	Gmax	Combination	6,040	42,410	1,813	3,838	-0,506
103	Gmax	Combination	-33,400	-154,830	-1,198	0,311	-0,378
103	Gmax	Combination	-37,780	-155,700	0,777	4,606	-0,451
103	Gmax	Combination	1,670	41,540	0,814	2,162	-0,578
104	Gmax	Combination	-46,980	39,450	1,746	3,689	0,162
104	Gmax	Combination	-48,570	31,490	1,594	3,794	-0,253
104	Gmax	Combination	13,960	43,990	0,699	2,139	-0,273
104	Gmax	Combination	15,550	51,960	0,580	2,383	0,142
105	Gmax	Combination	-41,190	-172,800	-1,564	0,241	0,319
105	Gmax	Combination	3,260	49,500	1,884	3,716	0,434
105	Gmax	Combination	17,580	52,360	0,936	2,454	0,573
105	Gmax	Combination	-26,870	-169,930	0,331	4,212	0,458
106	Gmax	Combination	3,890	40,570	-1,028	-1,785	-0,083
106	Gmax	Combination	-32,410	-140,910	0,962	0,533	-0,227
106	Gmax	Combination	-28,410	-140,110	-0,062	-0,018	0,615
106	Gmax	Combination	7,890	41,370	-1,021	-3,764	0,759
107	Gmax	Combination	-47,550	36,970	-0,965	-1,692	-0,195
107	Gmax	Combination	-48,950	30,000	-0,892	-1,758	0,126
107	Gmax	Combination	21,240	44,040	-0,852	-3,730	0,177
107	Gmax	Combination	22,630	51,010	-0,753	-4,125	-0,143
108	Gmax	Combination	-38,210	-161,510	1,383	1,020	0,308
108	Gmax	Combination	3,530	47,190	-1,017	-1,702	0,150
108	Gmax	Combination	20,420	50,570	-1,201	-4,214	-0,925
108	Gmax	Combination	-21,320	-158,130	0,475	0,868	-0,767
109	Gmax	Combination	-118,320	-256,350	-1,004	0,239	-0,187
109	Gmax	Combination	-54,800	61,260	0,951	2,857	0,005
109	Gmax	Combination	38,830	79,990	0,574	1,492	0,223

109	Gmax	Combination	-24,700	-237,630	-0,070	1,759	0,031
110	Gmax	Combination	-1,520	71,920	0,808	2,828	-0,085
110	Gmax	Combination	-17,430	-7,600	0,385	2,826	-0,079
110	Gmax	Combination	38,650	3,610	0,909	3,110	0,115
110	Gmax	Combination	54,550	83,130	0,070	1,391	0,109
111	Gmax	Combination	-3,190	-4,760	0,625	2,874	0,051
111	Gmax	Combination	-1,860	1,910	0,541	3,191	0,039
111	Gmax	Combination	70,740	16,430	0,739	2,856	0,052
111	Gmax	Combination	69,410	9,760	0,350	2,999	0,064
112	Gmax	Combination	-6,150	1,050	0,628	3,209	0,108
112	Gmax	Combination	-6,490	-0,610	0,557	3,187	0,140
112	Gmax	Combination	88,380	18,360	0,599	2,750	0,129
112	Gmax	Combination	88,710	20,020	0,505	2,809	0,098
113	Gmax	Combination	-6,730	-0,660	0,538	3,183	0,226
113	Gmax	Combination	-6,590	0,056	0,642	3,192	0,231
113	Gmax	Combination	86,810	18,740	0,346	2,480	0,203
113	Gmax	Combination	86,670	18,020	0,619	2,754	0,199
114	Gmax	Combination	1,580	1,690	0,501	3,163	0,303
114	Gmax	Combination	1,250	0,031	0,698	2,963	0,308
114	Gmax	Combination	66,330	13,050	0,177	2,323	0,265
114	Gmax	Combination	66,660	14,710	0,791	2,569	0,259
115	Gmax	Combination	-16,100	-3,440	0,429	2,909	0,380
115	Gmax	Combination	-5,850	47,800	0,697	2,807	0,362
115	Gmax	Combination	46,790	58,330	-0,157	1,195	0,218
115	Gmax	Combination	36,550	7,090	0,822	2,452	0,235
116	Gmax	Combination	23,510	53,680	0,421	2,752	0,310
116	Gmax	Combination	-27,640	-202,070	0,629	1,384	0,265
116	Gmax	Combination	-67,200	-209,990	0,093	2,787	0,280
116	Gmax	Combination	-16,060	45,760	0,840	1,394	0,326
117	Gmax	Combination	-0,580	6,640	0,209	1,201	-0,076
117	Gmax	Combination	-3,780	-9,370	0,241	1,380	0,213
117	Gmax	Combination	-51,330	-18,880	-0,129	-3,676	0,113
117	Gmax	Combination	-48,130	-2,860	-0,594	-2,409	-0,176
118	Gmax	Combination	-10,090	-10,630	0,365	1,405	0,223
118	Gmax	Combination	0,300	41,290	-0,227	-0,198	-0,119
118	Gmax	Combination	-22,950	36,640	-0,835	-1,756	-0,070
118	Gmax	Combination	-33,340	-15,290	-1,056	-3,861	0,272
119	Gmax	Combination	0,280	12,820	-0,205	-1,450	-0,115
119	Gmax	Combination	-3,920	-8,170	-0,547	-1,993	-0,367
119	Gmax	Combination	-48,510	-17,090	0,047	3,131	-0,285
119	Gmax	Combination	-44,310	3,900	0,374	1,742	-0,032
120	Gmax	Combination	-10,980	-9,580	-0,474	-1,978	-0,256

120	Gmax	Combination	-0,990	40,350	0,511	-0,557	-0,031
120	Gmax	Combination	-18,530	36,840	0,639	-0,255	-0,223
120	Gmax	Combination	-28,520	-13,090	0,954	3,313	-0,448
121	Gmax	Combination	-96,150	-254,730	0,662	-0,878	0,261
121	Gmax	Combination	-33,210	59,980	-0,893	-2,909	0,094
121	Gmax	Combination	36,860	73,990	-0,686	-2,044	-0,318
121	Gmax	Combination	-26,080	-240,720	0,327	-0,098	-0,152
122	Gmax	Combination	-5,230	65,580	-0,799	-2,890	0,090
122	Gmax	Combination	-19,450	-5,520	-0,504	-3,234	0,134
122	Gmax	Combination	42,500	6,870	-0,892	-3,079	-0,032
122	Gmax	Combination	56,720	77,970	-0,066	-1,920	-0,076
123	Gmax	Combination	1,330	-1,370	-0,737	-3,280	0,035
123	Gmax	Combination	1,820	1,090	-0,594	-3,495	0,020
123	Gmax	Combination	71,810	15,080	-0,824	-3,063	-0,009
123	Gmax	Combination	71,320	12,630	-0,403	-2,981	0,006
124	Gmax	Combination	-6,130	-0,510	-0,682	-3,513	-0,054
124	Gmax	Combination	-6,020	0,056	-0,621	-3,504	-0,056
124	Gmax	Combination	89,620	19,180	-0,614	-2,958	-0,049
124	Gmax	Combination	89,510	18,620	-0,481	-2,995	-0,047
125	Gmax	Combination	-6,600	-0,060	-0,600	-3,500	-0,140
125	Gmax	Combination	-6,570	0,087	-0,700	-3,467	-0,171
125	Gmax	Combination	86,870	18,770	-0,458	-2,855	-0,156
125	Gmax	Combination	86,840	18,630	-0,700	-2,975	-0,125
126	Gmax	Combination	0,290	1,460	-0,553	-3,437	-0,258
126	Gmax	Combination	0,130	0,690	-0,729	-3,306	-0,254
126	Gmax	Combination	64,940	13,650	-0,183	-2,481	-0,196
126	Gmax	Combination	65,100	14,420	-0,822	-2,928	-0,200
127	Gmax	Combination	-19,560	-3,250	-0,435	-3,248	-0,300
127	Gmax	Combination	-9,160	48,760	-0,845	-2,908	-0,295
127	Gmax	Combination	43,190	59,230	-0,152	-2,441	-0,241
127	Gmax	Combination	32,790	7,220	-0,897	-2,624	-0,246
128	Gmax	Combination	20,610	54,710	-0,607	-2,860	-0,461
128	Gmax	Combination	-31,500	-205,840	-0,335	-1,462	-0,427
128	Gmax	Combination	-75,400	-214,620	0,563	0,296	0,041
128	Gmax	Combination	-23,290	45,930	-1,012	-2,613	0,008
129	Gmax	Combination	-31,590	44,920	-0,343	-0,070	-0,246
129	Gmax	Combination	8,690	52,980	-0,401	-2,173	-0,161
129	Gmax	Combination	-42,930	-205,130	-0,386	-0,707	-0,057
129	Gmax	Combination	-83,210	-213,190	0,017	-2,101	-0,142
130	Gmax	Combination	-30,230	0,720	0,471	2,412	-0,393
130	Gmax	Combination	-15,230	3,710	-0,088	-1,315	0,021
130	Gmax	Combination	-5,970	50,050	-0,505	-2,193	0,023

130	Gmax	Combination	-20,960	47,050	0,131	0,025	-0,391
131	Gmax	Combination	9,850	49,540	-0,655	-2,247	0,138
131	Gmax	Combination	-44,200	38,730	-0,545	-0,997	-0,202
131	Gmax	Combination	-95,680	-218,680	0,340	0,496	-0,198
131	Gmax	Combination	-41,630	-207,870	-0,063	-0,885	0,142
132	Gmax	Combination	-15,850	9,600	0,019	-1,617	-0,133
132	Gmax	Combination	-37,900	5,190	0,299	1,716	0,271
132	Gmax	Combination	-30,650	41,440	0,029	-0,883	0,245
132	Gmax	Combination	-8,600	45,850	-0,712	-2,258	-0,159
133	Gmax	Combination	-14,790	-125,770	-0,192	0,216	0,413
133	Gmax	Combination	16,870	32,480	3,385	3,349	-0,625
133	Gmax	Combination	32,930	35,700	0,108	-0,077	-0,626
133	Gmax	Combination	1,280	-122,560	-0,170	2,299	0,412
134	Gmax	Combination	-36,860	-130,190	-0,475	0,541	1,260
134	Gmax	Combination	-2,680	40,700	0,668	-0,521	0,795
134	Gmax	Combination	8,250	42,880	-2,515	-0,510	0,617
134	Gmax	Combination	-25,930	-128,000	1,629	0,734	1,082
135	Gmax	Combination	-22,870	24,530	0,117	2,696	-0,972
135	Gmax	Combination	-25,010	13,860	-1,683	-1,502	-0,408
135	Gmax	Combination	43,760	27,610	-0,155	-0,654	-0,952
135	Gmax	Combination	45,890	38,290	-0,185	-0,135	-1,516
136	Gmax	Combination	-3,120	-127,400	-0,872	0,655	0,579
136	Gmax	Combination	30,370	40,050	-0,275	-1,400	0,959
136	Gmax	Combination	31,850	40,350	-0,634	-1,724	0,081
136	Gmax	Combination	-1,640	-127,100	1,082	3,478	-0,299
137	Gmax	Combination	-24,220	29,140	-1,021	-1,549	0,678
137	Gmax	Combination	-28,450	7,960	1,871	0,842	0,614
137	Gmax	Combination	47,300	23,110	-0,047	-1,447	0,860
137	Gmax	Combination	51,530	44,290	0,257	-1,546	0,924
138	Gmax	Combination	11,780	42,910	0,616	-0,498	-1,159
138	Gmax	Combination	-23,080	-131,390	-1,414	0,263	-1,248
138	Gmax	Combination	-50,250	-136,830	2,116	1,045	-1,080
138	Gmax	Combination	-15,390	37,470	-2,955	-0,410	-0,991
139	Gmax	Combination	-65,730	-2,830	2,098	0,766	-1,015
139	Gmax	Combination	-65,040	0,640	-1,987	0,459	-0,711
139	Gmax	Combination	-11,780	11,300	1,051	2,527	-0,459
139	Gmax	Combination	-12,470	7,830	-0,157	-0,269	-0,763
140	Gmax	Combination	-51,040	8,660	-2,236	0,224	0,722
140	Gmax	Combination	-52,820	-0,240	2,468	0,840	0,748
140	Gmax	Combination	-11,140	8,090	-0,223	-0,282	0,539
140	Gmax	Combination	-9,370	16,990	0,658	2,110	0,513
141	Gmax	Combination	-41,560	-82,290	-1,030	-0,705	-0,149

141	Gmax	Combination	-63,260	-86,630	-1,542	0,390	0,021
141	Gmax	Combination	-41,480	22,260	1,129	-1,261	-0,179
141	Gmax	Combination	-19,780	26,600	0,186	-0,728	-0,348
142	Gmax	Combination	-63,920	17,770	-0,015	-0,768	-1,016
142	Gmax	Combination	-32,140	24,120	1,492	-1,188	-0,952
142	Gmax	Combination	-34,580	11,950	-1,928	-2,364	-0,719
142	Gmax	Combination	-66,350	5,590	0,900	-0,491	-0,783
143	Gmax	Combination	-17,640	-79,730	0,785	0,183	0,200
143	Gmax	Combination	-56,050	-87,410	0,881	-0,221	0,065
143	Gmax	Combination	-35,320	16,250	0,240	1,405	-0,183
143	Gmax	Combination	3,090	23,930	-0,226	0,169	-0,049
144	Gmax	Combination	-33,350	14,800	0,953	2,387	1,057
144	Gmax	Combination	-53,700	-86,940	-0,853	-1,974	0,928
144	Gmax	Combination	-18,420	-79,880	-1,610	-1,750	0,202
144	Gmax	Combination	1,930	21,860	1,885	4,200	0,330
145	Gmax	Combination	-17,780	14,450	0,966	2,530	-0,328
145	Gmax	Combination	-17,050	18,060	0,828	2,362	0,239
145	Gmax	Combination	-52,690	10,930	1,666	4,156	0,229
145	Gmax	Combination	-53,410	7,320	1,845	4,183	-0,339
146	Gmax	Combination	-41,430	-82,270	-1,207	-2,053	-1,044
146	Gmax	Combination	-22,270	13,550	1,102	2,558	-1,191
146	Gmax	Combination	-3,160	17,370	1,983	4,211	-0,426
146	Gmax	Combination	-22,320	-78,440	-2,050	-2,187	-0,279
147	Gmax	Combination	-36,760	-28,530	-0,795	-1,829	0,241
147	Gmax	Combination	0,890	-21,000	-0,325	0,122	-0,164
147	Gmax	Combination	-12,800	-89,470	0,148	0,055	-0,181
147	Gmax	Combination	-50,450	-97,000	0,373	1,085	0,225
148	Gmax	Combination	-67,070	-85,030	1,460	1,451	-0,176
148	Gmax	Combination	44,540	-62,710	1,119	0,530	0,272
148	Gmax	Combination	55,270	-9,070	-0,292	0,348	0,291
148	Gmax	Combination	-56,340	-31,400	-0,825	-1,885	-0,157
149	Gmax	Combination	8,940	-31,300	-0,111	-0,697	-0,013
149	Gmax	Combination	-14,670	-36,030	0,152	-0,095	0,077
149	Gmax	Combination	-11,970	-22,520	-0,905	-1,901	0,077
149	Gmax	Combination	11,640	-17,800	-0,315	0,344	-0,013
150	Gmax	Combination	-29,660	7,380	-0,224	0,242	0,104
150	Gmax	Combination	-7,320	11,850	-0,463	-1,057	0,123
150	Gmax	Combination	-16,990	-36,490	0,232	-0,079	0,090
150	Gmax	Combination	-39,330	-40,960	0,014	-0,672	0,071
151	Gmax	Combination	-23,110	1,760	0,137	-0,541	0,078
151	Gmax	Combination	-25,780	1,230	0,143	0,023	0,096
151	Gmax	Combination	-24,340	8,440	-0,507	-1,065	0,125

151	Gmax	Combination	-21,670	8,980	-0,235	0,239	0,107
152	Gmax	Combination	-10,540	-23,290	-0,763	-1,823	-0,029
152	Gmax	Combination	-4,790	5,430	0,318	0,058	-0,024
152	Gmax	Combination	-40,040	-1,620	0,298	-0,509	0,117
152	Gmax	Combination	-45,780	-30,330	-0,457	0,095	0,112
153	Gmax	Combination	-5,850	22,140	0,129	-0,294	0,099
153	Gmax	Combination	-6,720	17,780	0,708	1,100	0,183
153	Gmax	Combination	7,070	20,540	0,019	-1,624	-0,306
153	Gmax	Combination	7,940	24,900	1,339	3,831	-0,390
154	Gmax	Combination	-11,260	16,870	0,645	1,087	-0,247
154	Gmax	Combination	-30,170	-77,650	-1,100	0,176	-0,198
154	Gmax	Combination	-7,780	-73,170	-0,680	1,619	0,154
154	Gmax	Combination	11,130	21,350	0,115	-1,605	0,105
155	Gmax	Combination	7,800	29,830	0,907	1,501	0,084
155	Gmax	Combination	1,100	-3,670	-0,807	-1,416	-0,026
155	Gmax	Combination	-19,840	-7,850	-0,264	0,340	-0,167
155	Gmax	Combination	-13,140	25,650	-0,115	-1,074	-0,058
156	Gmax	Combination	-14,050	-6,700	-0,660	-1,386	-0,061
156	Gmax	Combination	-31,350	-93,180	0,096	0,107	-0,015
156	Gmax	Combination	-11,810	-89,270	0,005	-0,841	-0,001
156	Gmax	Combination	5,490	-2,790	-0,279	0,337	-0,048
157	Gmax	Combination	-21,630	23,950	-0,248	-0,023	0,019
157	Gmax	Combination	1,690	28,610	0,012	0,606	0,068
157	Gmax	Combination	-20,640	-83,000	0,686	0,093	-0,226
157	Gmax	Combination	-43,950	-87,660	0,343	0,045	-0,274
158	Gmax	Combination	-42,690	18,420	-0,524	-1,940	-0,656
158	Gmax	Combination	-64,740	-91,820	0,507	0,627	-0,690
158	Gmax	Combination	-20,830	-83,040	0,567	-1,443	-0,524
158	Gmax	Combination	1,210	27,200	-0,973	-1,510	-0,490
159	Gmax	Combination	-18,450	15,120	-0,627	-1,725	0,241
159	Gmax	Combination	-16,750	23,610	-0,571	-1,949	-0,147
159	Gmax	Combination	-51,620	16,630	-0,837	-1,483	-0,199
159	Gmax	Combination	-53,320	8,150	-0,840	-1,066	0,190
160	Gmax	Combination	-46,940	-79,280	0,878	0,585	0,629
160	Gmax	Combination	-28,460	13,120	-0,557	-1,711	0,604
160	Gmax	Combination	-2,230	18,370	-0,892	-1,077	0,558
160	Gmax	Combination	-20,710	-74,030	0,744	-2,173	0,583
161	Gmax	Combination	-42,040	12,340	0,061	-0,508	0,439
161	Gmax	Combination	-1,450	20,460	1,236	-1,628	0,255
161	Gmax	Combination	-20,340	-73,960	-1,292	0,480	-0,006
161	Gmax	Combination	-60,920	-82,080	-0,516	-0,566	0,179
162	Gmax	Combination	-21,700	9,310	0,792	-0,698	1,050

162	Gmax	Combination	-60,860	1,480	-2,697	-2,856	0,924
162	Gmax	Combination	-59,380	8,870	1,590	-1,558	1,218
162	Gmax	Combination	-20,220	16,700	-0,177	-0,555	1,344
163	Gmax	Combination	-3,050	28,300	-0,641	-1,629	-1,164
163	Gmax	Combination	21,680	33,250	1,014	-3,689	-0,853
163	Gmax	Combination	-15,900	-154,660	-3,960	-9,176	-0,659
163	Gmax	Combination	-40,630	-159,610	0,277	-0,369	-0,970
164	Gmax	Combination	-3,960	5,010	0,758	0,841	-1,319
164	Gmax	Combination	-41,390	-2,470	1,014	0,135	-1,095
164	Gmax	Combination	-41,950	-5,280	-2,700	-0,458	-0,844
164	Gmax	Combination	-4,520	2,200	-1,664	-1,371	-1,069
165	Gmax	Combination	13,390	-8,210	2,214	2,312	-1,183
165	Gmax	Combination	-7,440	-12,370	0,823	1,167	-1,665
165	Gmax	Combination	-2,470	12,440	-1,864	-2,371	-1,534
165	Gmax	Combination	18,350	16,600	-0,493	8,159	-1,052
166	Gmax	Combination	46,780	0,110	-0,782	-2,563	-0,550
166	Gmax	Combination	-5,650	-10,370	-0,801	-6,381	-0,844
166	Gmax	Combination	2,300	29,380	-1,101	-4,112	-0,803
166	Gmax	Combination	54,730	39,860	0,264	-1,448	-0,508
167	Gmax	Combination	-37,410	12,100	0,571	0,810	-1,176
167	Gmax	Combination	-94,160	0,740	1,257	0,002	-1,201
167	Gmax	Combination	-97,030	-13,600	0,594	0,051	-1,284
167	Gmax	Combination	-40,280	-2,250	1,352	0,960	-1,259
168	Gmax	Combination	0,160	18,660	0,820	1,724	-0,851
168	Gmax	Combination	-37,600	11,110	0,552	0,719	-0,951
168	Gmax	Combination	-43,750	-19,640	1,418	1,286	-1,369
168	Gmax	Combination	-5,990	-12,080	0,099	1,889	-1,269
169	Gmax	Combination	61,690	7,170	-0,749	-3,010	-0,357
169	Gmax	Combination	10,080	-3,150	-1,285	-6,458	-0,397
169	Gmax	Combination	9,240	-7,400	-1,112	-6,443	-0,473
169	Gmax	Combination	60,840	2,920	-0,323	-2,471	-0,433
170	Gmax	Combination	-66,690	13,830	0,559	0,551	-0,592
170	Gmax	Combination	-147,650	-2,360	0,725	0,001	-0,614
170	Gmax	Combination	-149,230	-10,270	1,109	-0,028	-0,862
170	Gmax	Combination	-68,270	5,920	0,745	0,845	-0,841
171	Gmax	Combination	13,620	14,510	0,180	0,864	-0,402
171	Gmax	Combination	-69,900	-2,190	0,565	0,581	-0,526
171	Gmax	Combination	-68,470	4,930	0,727	0,754	-0,783
171	Gmax	Combination	15,040	21,640	0,509	1,661	-0,658
172	Gmax	Combination	75,040	7,800	-0,626	-3,249	-0,171
172	Gmax	Combination	8,280	-5,550	-1,701	-6,447	-0,187
172	Gmax	Combination	8,700	-3,430	-0,795	-6,360	-0,186

172	Gmax	Combination	75,470	9,920	-0,550	-2,970	-0,170
173	Gmax	Combination	-76,650	12,700	0,550	0,448	-0,189
173	Gmax	Combination	-183,690	-8,700	0,511	-0,016	-0,199
173	Gmax	Combination	-183,870	-9,600	0,828	0,022	-0,375
173	Gmax	Combination	-76,830	11,810	0,406	0,520	-0,364
174	Gmax	Combination	12,750	16,800	-0,289	0,612	-0,098
174	Gmax	Combination	-79,520	-1,650	0,550	0,446	-0,140
174	Gmax	Combination	-80,030	-4,220	0,412	0,550	-0,352
174	Gmax	Combination	12,230	14,230	0,669	0,961	-0,311
175	Gmax	Combination	78,300	9,100	-0,576	-3,363	0,003
175	Gmax	Combination	9,880	-4,580	-1,832	-5,886	0,045
175	Gmax	Combination	9,740	-5,260	-0,449	-6,196	-0,011
175	Gmax	Combination	78,160	8,430	-0,732	-3,270	-0,053
176	Gmax	Combination	-82,860	12,420	0,623	0,470	0,142
176	Gmax	Combination	-190,710	-9,150	0,462	-0,030	0,143
176	Gmax	Combination	-190,910	-10,150	0,695	0,021	-0,012
176	Gmax	Combination	-83,050	11,420	0,198	0,377	-0,013
177	Gmax	Combination	14,100	16,510	-0,539	0,579	0,140
177	Gmax	Combination	-86,040	-3,520	0,620	0,459	0,142
177	Gmax	Combination	-85,930	-2,930	0,197	0,375	-0,015
177	Gmax	Combination	14,210	17,090	0,963	0,863	-0,017
178	Gmax	Combination	72,030	9,820	-0,340	-3,195	0,125
178	Gmax	Combination	8,550	-2,880	-1,827	-4,979	0,218
178	Gmax	Combination	8,140	-4,930	-0,160	-5,552	0,209
178	Gmax	Combination	71,620	7,760	-0,885	-3,425	0,115
179	Gmax	Combination	-77,420	9,110	0,703	0,506	0,463
179	Gmax	Combination	-178,800	-11,170	0,485	0,004	0,470
179	Gmax	Combination	-177,890	-6,590	0,701	0,018	0,314
179	Gmax	Combination	-76,500	13,690	0,143	0,374	0,307
180	Gmax	Combination	12,240	15,570	-0,670	0,807	0,400
180	Gmax	Combination	-79,810	-2,840	0,715	0,567	0,449
180	Gmax	Combination	-79,690	-2,250	0,141	0,363	0,281
180	Gmax	Combination	12,360	16,160	1,133	0,913	0,232
181	Gmax	Combination	58,320	12,260	-0,362	-3,036	0,224
181	Gmax	Combination	3,470	1,290	-1,490	-2,913	0,420
181	Gmax	Combination	2,390	-4,110	0,148	-4,584	0,343
181	Gmax	Combination	57,240	6,860	-0,913	-3,310	0,146
182	Gmax	Combination	-62,820	8,000	0,576	0,828	0,774
182	Gmax	Combination	-142,770	-7,990	0,240	-0,132	0,811
182	Gmax	Combination	-141,930	-3,800	0,757	0,058	0,650
182	Gmax	Combination	-61,980	12,190	0,154	0,397	0,613
183	Gmax	Combination	6,120	14,540	-0,675	1,163	0,630

183	Gmax	Combination	-64,330	0,450	0,529	0,590	0,689
183	Gmax	Combination	-64,370	0,250	0,166	0,457	0,589
183	Gmax	Combination	6,080	14,340	1,305	1,202	0,530
184	Gmax	Combination	27,290	3,010	-0,559	-3,225	0,215
184	Gmax	Combination	-4,910	-3,430	-1,268	-1,984	0,282
184	Gmax	Combination	-4,270	-0,260	0,141	-2,587	0,295
184	Gmax	Combination	27,930	6,180	-0,899	-3,144	0,228
185	Gmax	Combination	-50,700	-4,790	-0,908	0,044	0,845
185	Gmax	Combination	-74,870	-9,630	-1,538	0,354	0,896
185	Gmax	Combination	-71,700	6,220	0,540	-0,072	0,928
185	Gmax	Combination	-47,530	11,060	0,117	0,736	0,878
186	Gmax	Combination	-3,060	5,800	-0,376	2,480	0,406
186	Gmax	Combination	-50,480	-3,690	-0,717	1,002	0,679
186	Gmax	Combination	-49,040	3,510	0,070	0,498	0,903
186	Gmax	Combination	-1,620	12,990	0,957	1,489	0,630
187	Gmax	Combination	8,530	30,390	0,944	1,933	1,330
187	Gmax	Combination	19,730	32,630	0,273	6,501	1,199
187	Gmax	Combination	-20,640	-169,230	3,248	9,240	1,082
187	Gmax	Combination	-31,840	-171,470	-0,235	0,984	1,212
188	Gmax	Combination	-12,680	6,750	-1,478	-1,181	1,576
188	Gmax	Combination	-36,680	1,950	-1,131	-0,164	1,270
188	Gmax	Combination	-38,860	-8,970	3,772	0,638	0,939
188	Gmax	Combination	-14,870	-4,170	3,116	2,062	1,245
189	Gmax	Combination	13,600	1,990	-1,834	-4,033	1,726
189	Gmax	Combination	-14,770	-3,680	-1,512	-1,350	2,072
189	Gmax	Combination	-15,800	-8,850	3,218	2,574	1,740
189	Gmax	Combination	12,570	-3,180	-0,433	-9,166	1,394
190	Gmax	Combination	44,850	4,260	1,025	3,327	0,640
190	Gmax	Combination	-8,660	-6,450	0,926	7,238	0,821
190	Gmax	Combination	-1,710	28,350	1,238	6,694	1,001
190	Gmax	Combination	51,810	39,050	-0,266	1,691	0,820
191	Gmax	Combination	-46,460	13,410	-0,708	-1,124	1,477
191	Gmax	Combination	-105,580	1,590	-1,619	0,008	1,502
191	Gmax	Combination	-108,380	-12,390	-0,827	-0,103	1,638
191	Gmax	Combination	-49,250	-0,570	-1,745	-1,234	1,613
192	Gmax	Combination	-3,550	19,110	-0,909	-1,935	1,000
192	Gmax	Combination	-47,060	10,410	-0,701	-1,090	1,286
192	Gmax	Combination	-51,340	-11,000	-1,779	-1,404	1,701
192	Gmax	Combination	-7,830	-2,300	-0,869	-3,840	1,414
193	Gmax	Combination	56,440	8,560	0,978	3,694	0,428
193	Gmax	Combination	-0,140	-2,760	1,170	7,196	0,454
193	Gmax	Combination	-0,550	-4,820	1,658	7,385	0,531

193	Gmax	Combination	56,030	6,490	0,477	3,218	0,505
194	Gmax	Combination	-75,690	14,210	-0,550	-0,669	0,682
194	Gmax	Combination	-164,030	-3,460	-0,913	-0,014	0,719
194	Gmax	Combination	-165,410	-10,380	-1,396	0,053	1,066
194	Gmax	Combination	-77,080	7,290	-1,001	-1,182	1,029
195	Gmax	Combination	3,600	15,970	-0,492	-1,112	0,422
195	Gmax	Combination	-78,630	-0,480	-0,553	-0,685	0,580
195	Gmax	Combination	-77,680	4,290	-0,994	-1,148	0,913
195	Gmax	Combination	4,560	20,740	-0,176	-1,789	0,755
196	Gmax	Combination	70,260	9,680	0,900	3,871	0,133
196	Gmax	Combination	0,870	-4,200	1,246	6,959	0,128
196	Gmax	Combination	1,210	-2,490	1,345	7,232	0,249
196	Gmax	Combination	70,600	11,390	0,606	3,619	0,255
197	Gmax	Combination	-88,370	13,600	-0,496	-0,515	0,162
197	Gmax	Combination	-198,860	-8,500	-0,707	0,003	0,179
197	Gmax	Combination	-199,260	-10,500	-0,929	-0,017	0,417
197	Gmax	Combination	-88,770	11,590	-0,597	-0,679	0,400
198	Gmax	Combination	5,270	17,830	-0,328	-0,910	0,104
198	Gmax	Combination	-91,390	-1,500	-0,496	-0,520	0,149
198	Gmax	Combination	-91,710	-3,100	-0,600	-0,694	0,335
198	Gmax	Combination	4,960	16,240	-0,316	-1,077	0,289
199	Gmax	Combination	75,040	9,290	0,714	3,722	-0,048
199	Gmax	Combination	2,480	-5,220	1,373	6,512	-0,101
199	Gmax	Combination	2,760	-3,820	1,210	6,952	-0,065
199	Gmax	Combination	75,320	10,690	0,766	3,844	-0,012
200	Gmax	Combination	-92,620	13,050	-0,530	-0,553	-0,238
200	Gmax	Combination	-206,270	-9,680	-0,696	0,010	-0,241
200	Gmax	Combination	-206,330	-9,990	-0,736	-0,003	-0,044
200	Gmax	Combination	-92,680	12,740	-0,468	-0,510	-0,040
201	Gmax	Combination	7,100	17,910	-0,112	-0,913	-0,229
201	Gmax	Combination	-95,760	-2,660	-0,525	-0,530	-0,237
201	Gmax	Combination	-95,700	-2,360	-0,469	-0,514	-0,030
201	Gmax	Combination	7,160	18,210	-0,363	-0,917	-0,023
202	Gmax	Combination	72,120	11,430	0,587	3,330	-0,282
202	Gmax	Combination	5,490	-1,900	1,263	5,536	-0,402
202	Gmax	Combination	4,920	-4,740	0,942	6,426	-0,283
202	Gmax	Combination	71,560	8,590	0,893	3,757	-0,163
203	Gmax	Combination	-85,850	8,010	-0,624	-0,650	-0,664
203	Gmax	Combination	-191,640	-13,150	-0,775	-0,021	-0,677
203	Gmax	Combination	-190,310	-6,490	-0,746	0,000	-0,460
203	Gmax	Combination	-84,520	14,670	-0,416	-0,530	-0,447
204	Gmax	Combination	8,700	14,170	-0,074	-1,149	-0,548

204	Gmax	Combination	-88,510	-5,270	-0,644	-0,751	-0,611
204	Gmax	Combination	-87,660	-1,040	-0,412	-0,508	-0,423
204	Gmax	Combination	9,550	18,400	-0,543	-0,999	-0,360
205	Gmax	Combination	57,250	-4,950	0,078	2,613	-0,371
205	Gmax	Combination	5,290	-15,340	1,273	4,284	-0,542
205	Gmax	Combination	8,080	-1,380	0,662	5,416	-0,599
205	Gmax	Combination	60,040	9,010	1,003	3,413	-0,428
206	Gmax	Combination	-63,400	10,110	-0,601	-1,009	-1,101
206	Gmax	Combination	-160,100	-9,230	-0,538	0,112	-1,140
206	Gmax	Combination	-159,600	-6,740	-0,866	-0,039	-0,927
206	Gmax	Combination	-62,900	12,600	-0,445	-0,615	-0,888
207	Gmax	Combination	10,340	9,930	-0,024	-2,202	-0,908
207	Gmax	Combination	-66,510	-5,440	-0,528	-0,645	-1,047
207	Gmax	Combination	-65,560	-0,680	-0,465	-0,715	-0,829
207	Gmax	Combination	11,300	14,690	-0,675	-1,270	-0,689
208	Gmax	Combination	28,670	43,120	0,466	3,317	-0,268
208	Gmax	Combination	29,520	43,290	0,164	-0,552	-0,631
208	Gmax	Combination	18,310	-12,730	0,692	4,168	-0,562
208	Gmax	Combination	17,460	-12,900	1,036	2,804	-0,199
209	Gmax	Combination	-53,230	-0,250	1,068	-0,066	-1,166
209	Gmax	Combination	-93,700	-8,340	1,822	-0,331	-1,210
209	Gmax	Combination	-91,120	4,570	-0,734	0,073	-1,300
209	Gmax	Combination	-50,650	12,660	-0,431	-0,975	-1,256
210	Gmax	Combination	25,280	22,110	-0,191	-2,328	-0,864
210	Gmax	Combination	-51,840	6,680	0,796	-1,427	-1,027
210	Gmax	Combination	-53,760	-2,890	-0,358	-0,611	-1,244
210	Gmax	Combination	23,370	12,530	-0,605	-2,318	-1,082
211	Gmax	Combination	61,050	6,520	2,580	-0,872	0,815
211	Gmax	Combination	43,320	-82,140	1,152	0,740	0,147
211	Gmax	Combination	23,110	-86,180	0,184	-0,779	0,115
211	Gmax	Combination	40,840	2,470	1,010	1,464	0,784
212	Gmax	Combination	26,680	4,140	3,854	0,007	0,610
212	Gmax	Combination	20,350	-27,490	1,718	-0,031	0,160
212	Gmax	Combination	55,670	-20,420	0,974	-0,150	0,119
212	Gmax	Combination	61,990	11,200	2,927	0,864	0,569
213	Gmax	Combination	7,630	-163,580	1,281	2,821	0,059
213	Gmax	Combination	56,410	80,340	-0,249	-2,942	-0,314
213	Gmax	Combination	-32,670	62,530	0,862	3,887	0,168
213	Gmax	Combination	-81,460	-181,390	-1,250	-6,285	0,541
214	Gmax	Combination	37,810	-83,240	1,071	0,724	-0,026
214	Gmax	Combination	59,430	24,820	1,847	-0,735	-0,692
214	Gmax	Combination	30,100	18,950	-0,690	-2,152	-1,185

214	Gmax	Combination	8,490	-89,110	0,340	-0,748	-0,520
215	Gmax	Combination	19,870	-27,580	1,801	-0,015	-0,372
215	Gmax	Combination	27,100	8,530	2,396	0,205	-0,679
215	Gmax	Combination	57,380	14,580	2,275	1,406	-0,434
215	Gmax	Combination	50,160	-21,530	0,893	-0,166	-0,127
216	Gmax	Combination	41,800	77,420	-0,092	-2,911	-0,381
216	Gmax	Combination	-4,150	-152,310	1,210	7,349	-0,278
216	Gmax	Combination	-72,910	-166,060	-0,501	-6,565	-0,299
216	Gmax	Combination	-26,960	63,670	0,444	3,804	-0,401
217	Gmax	Combination	-43,340	-173,580	1,004	4,240	0,071
217	Gmax	Combination	0,780	46,990	0,501	2,514	-0,622
217	Gmax	Combination	-60,090	34,820	0,886	2,530	-0,668
217	Gmax	Combination	-104,200	-185,750	-0,758	1,467	0,025
218	Gmax	Combination	-27,450	41,350	0,357	2,485	-0,322
218	Gmax	Combination	-34,890	4,180	0,537	3,095	-0,083
218	Gmax	Combination	-14,240	8,310	0,405	2,926	-0,028
218	Gmax	Combination	-6,810	45,480	0,742	2,501	-0,267
219	Gmax	Combination	33,470	-57,820	2,080	-0,647	-0,711
219	Gmax	Combination	48,730	18,490	-1,042	-1,162	-1,380
219	Gmax	Combination	-7,160	7,310	-0,323	-1,607	-0,922
219	Gmax	Combination	-22,420	-68,990	-1,317	-7,365	-0,253
220	Gmax	Combination	-48,680	-0,990	-1,152	-1,184	-0,710
220	Gmax	Combination	-45,150	16,680	-0,139	-0,244	-0,289
220	Gmax	Combination	-31,860	19,340	-0,129	-0,231	-0,121
220	Gmax	Combination	-35,390	1,670	-0,467	-1,636	-0,542
221	Gmax	Combination	63,720	-13,280	4,613	-0,201	-0,927
221	Gmax	Combination	68,230	9,250	-2,140	-0,017	-1,527
221	Gmax	Combination	45,990	4,800	-1,059	-1,247	-1,428
221	Gmax	Combination	41,490	-17,720	2,151	-0,294	-0,828
222	Gmax	Combination	-55,380	-15,470	-1,439	0,123	-0,858
222	Gmax	Combination	-49,140	15,730	-0,296	-0,022	-0,456
222	Gmax	Combination	-45,180	16,520	-0,133	-0,215	-0,418
222	Gmax	Combination	-51,420	-14,680	-1,169	-1,269	-0,820
223	Gmax	Combination	19,930	9,340	1,533	0,183	0,701
223	Gmax	Combination	16,770	-6,500	-2,432	-0,028	0,857
223	Gmax	Combination	-16,680	-13,190	-2,207	-2,424	0,768
223	Gmax	Combination	-13,520	2,650	1,099	-0,314	0,612
224	Gmax	Combination	89,670	8,080	-2,849	-0,111	1,289
224	Gmax	Combination	86,300	-8,760	4,677	0,133	0,819
224	Gmax	Combination	52,860	-15,450	2,320	0,397	0,887
224	Gmax	Combination	56,230	1,400	-2,006	-2,384	1,356
225	Gmax	Combination	-13,290	3,750	1,177	0,071	0,335

225	Gmax	Combination	-13,900	0,720	-2,141	-2,092	0,520
225	Gmax	Combination	-18,280	-0,150	-1,112	-4,960	0,250
225	Gmax	Combination	-17,670	2,880	-0,753	-3,760	0,065
226	Gmax	Combination	59,010	15,310	-1,940	-2,052	1,329
226	Gmax	Combination	44,840	-55,540	1,967	-1,366	1,078
226	Gmax	Combination	-10,200	-66,550	-1,181	-8,010	0,756
226	Gmax	Combination	3,970	4,300	-1,306	-4,998	1,007
227	Gmax	Combination	-19,520	-6,360	0,583	2,921	0,021
227	Gmax	Combination	-11,950	31,450	0,637	3,784	0,116
227	Gmax	Combination	6,000	35,040	0,068	0,801	0,093
227	Gmax	Combination	-1,560	-2,770	0,535	2,097	-0,003
228	Gmax	Combination	10,290	35,900	0,443	3,745	0,497
228	Gmax	Combination	-31,120	-171,140	1,227	4,029	0,851
228	Gmax	Combination	-110,080	-186,930	0,992	5,330	1,145
228	Gmax	Combination	-68,680	20,110	0,920	0,971	0,792
229	Gmax	Combination	-34,360	4,290	0,604	3,108	-0,038
229	Gmax	Combination	-35,950	-3,660	0,590	3,335	0,002
229	Gmax	Combination	-1,600	3,210	0,535	3,165	0,025
229	Gmax	Combination	-0,009	11,160	0,645	2,974	-0,015
230	Gmax	Combination	-89,360	7,840	-0,146	-0,245	-0,093
230	Gmax	Combination	-91,650	-3,600	-0,203	-0,103	0,005
230	Gmax	Combination	-33,610	8,010	-0,123	-0,231	0,018
230	Gmax	Combination	-31,320	19,450	-0,061	-0,218	-0,081
231	Gmax	Combination	-162,860	-7,020	-0,446	-0,052	-0,155
231	Gmax	Combination	-162,400	-4,720	-0,143	0,021	0,009
231	Gmax	Combination	-88,930	9,970	-0,204	-0,112	0,019
231	Gmax	Combination	-89,390	7,680	-0,140	-0,216	-0,144
232	Gmax	Combination	-46,750	-5,820	0,550	3,327	0,076
232	Gmax	Combination	-45,900	-1,560	0,602	3,417	0,161
232	Gmax	Combination	-5,040	6,610	0,559	3,197	0,167
232	Gmax	Combination	-5,890	2,350	0,622	3,182	0,081
233	Gmax	Combination	-114,160	-8,100	-0,156	-0,094	0,081
233	Gmax	Combination	-112,980	-2,190	-0,186	-0,104	0,138
233	Gmax	Combination	-43,240	11,760	-0,120	-0,191	0,141
233	Gmax	Combination	-44,420	5,850	-0,163	-0,239	0,084
234	Gmax	Combination	-188,740	-9,990	-0,226	0,005	0,073
234	Gmax	Combination	-187,950	-6,020	-0,209	-0,001	0,145
234	Gmax	Combination	-110,650	9,440	-0,185	-0,101	0,145
234	Gmax	Combination	-111,450	5,470	-0,158	-0,102	0,073
235	Gmax	Combination	-43,170	-1,010	0,600	3,417	0,187
235	Gmax	Combination	-44,140	-5,860	0,558	3,427	0,285
235	Gmax	Combination	-6,250	1,720	0,640	3,182	0,284

235	Gmax	Combination	-5,280	6,560	0,540	3,193	0,187
236	Gmax	Combination	-110,170	-1,630	-0,186	-0,104	0,214
236	Gmax	Combination	-111,100	-6,270	-0,140	-0,079	0,256
236	Gmax	Combination	-41,430	7,660	-0,169	-0,209	0,257
236	Gmax	Combination	-40,500	12,310	-0,122	-0,191	0,215
237	Gmax	Combination	-183,800	-5,190	-0,214	-0,002	0,201
237	Gmax	Combination	-184,720	-9,830	-0,194	0,002	0,265
237	Gmax	Combination	-108,780	5,360	-0,140	-0,082	0,266
237	Gmax	Combination	-107,850	10,000	-0,185	-0,101	0,201
238	Gmax	Combination	-34,290	-3,890	0,627	3,441	0,343
238	Gmax	Combination	-32,000	7,560	0,700	3,433	0,362
238	Gmax	Combination	4,200	14,800	0,704	2,993	0,350
238	Gmax	Combination	1,910	3,350	0,499	3,154	0,332
239	Gmax	Combination	-82,380	-0,530	-0,183	-0,087	0,317
239	Gmax	Combination	-81,420	4,240	-0,082	-0,183	0,404
239	Gmax	Combination	-30,630	14,400	-0,016	-0,143	0,398
239	Gmax	Combination	-31,590	9,630	-0,100	-0,195	0,311
240	Gmax	Combination	-144,030	-1,690	-0,126	0,015	0,315
240	Gmax	Combination	-145,490	-8,990	-0,343	-0,033	0,452
240	Gmax	Combination	-81,510	3,810	-0,080	-0,172	0,443
240	Gmax	Combination	-80,050	11,110	-0,183	-0,091	0,307
241	Gmax	Combination	-14,310	11,100	0,662	3,426	0,387
241	Gmax	Combination	-16,560	-0,190	0,370	2,793	0,548
241	Gmax	Combination	-15,400	0,044	0,679	2,721	0,505
241	Gmax	Combination	-13,140	11,330	0,435	2,939	0,343
242	Gmax	Combination	-29,500	14,620	-0,081	-0,183	0,567
242	Gmax	Combination	-35,550	-15,670	-0,946	-1,029	0,875
242	Gmax	Combination	-19,000	-12,360	-0,454	-1,330	0,731
242	Gmax	Combination	-12,940	17,940	-0,053	-0,151	0,424
243	Gmax	Combination	-41,470	11,820	-0,238	-0,012	0,711
243	Gmax	Combination	-46,920	-15,430	-1,095	0,070	1,012
243	Gmax	Combination	-35,030	-13,050	-0,950	-1,049	0,975
243	Gmax	Combination	-29,580	14,200	-0,079	-0,171	0,675
244	Gmax	Combination	32,600	9,640	0,632	2,845	0,617
244	Gmax	Combination	10,660	-100,080	1,008	2,861	0,386
244	Gmax	Combination	-7,990	-103,810	0,683	1,652	0,328
244	Gmax	Combination	13,960	5,920	0,404	2,666	0,559
245	Gmax	Combination	44,050	0,250	-0,870	-1,014	1,408
245	Gmax	Combination	38,680	-26,600	2,053	0,085	0,940
245	Gmax	Combination	24,800	-29,380	-0,801	-6,183	0,595
245	Gmax	Combination	30,170	-2,520	-0,193	-1,277	1,062
246	Gmax	Combination	43,100	2,570	-1,641	-0,040	1,459

246	Gmax	Combination	41,100	-7,420	3,903	-0,048	0,971
246	Gmax	Combination	42,580	-7,120	2,074	0,192	0,932
246	Gmax	Combination	44,580	2,870	-0,874	-1,033	1,420
247	Gmax	Combination	8,880	19,420	0,514	2,869	0,070
247	Gmax	Combination	0,930	-20,300	0,658	3,664	0,150
247	Gmax	Combination	-6,260	-21,740	0,108	0,714	0,141
247	Gmax	Combination	1,690	17,980	0,319	1,754	0,061
248	Gmax	Combination	-8,120	-22,110	0,764	3,685	0,253
248	Gmax	Combination	2,830	32,650	0,034	0,289	0,127
248	Gmax	Combination	-1,610	31,760	0,188	1,878	0,050
248	Gmax	Combination	-12,560	-23,000	0,232	0,739	0,175
249	Gmax	Combination	5,200	15,340	-0,317	-0,564	0,147
249	Gmax	Combination	0,410	-8,600	0,312	0,345	0,016
249	Gmax	Combination	3,390	-8,000	-0,068	0,035	0,038
249	Gmax	Combination	8,180	15,930	0,031	0,453	0,170
250	Gmax	Combination	4,520	-7,780	0,689	0,420	-0,269
250	Gmax	Combination	10,140	20,340	-2,203	-1,048	0,786
250	Gmax	Combination	-0,041	18,300	0,149	0,863	0,780
250	Gmax	Combination	-5,660	-9,810	0,038	0,056	-0,275
251	Gmax	Combination	-1,060	2,880	-0,509	-0,215	-0,018
251	Gmax	Combination	-2,370	-3,680	0,438	0,167	0,058
251	Gmax	Combination	1,550	-2,890	0,262	0,094	0,078
251	Gmax	Combination	2,860	3,660	-0,235	-0,152	0,001
252	Gmax	Combination	8,360	-1,530	0,493	0,178	0,135
252	Gmax	Combination	10,160	7,480	-2,396	-0,477	0,480
252	Gmax	Combination	7,460	6,940	-2,085	-0,457	0,471
252	Gmax	Combination	5,660	-2,070	0,639	0,169	0,126
253	Gmax	Combination	-2,560	-3,280	-0,219	-1,262	-0,146
253	Gmax	Combination	32,730	3,780	-0,061	-2,735	-0,044
253	Gmax	Combination	12,010	-99,810	-1,230	-2,158	0,033
253	Gmax	Combination	-23,280	-106,870	-1,047	-4,013	-0,070
254	Gmax	Combination	-12,960	15,050	-0,180	-1,775	0,111
254	Gmax	Combination	5,010	18,650	-0,546	-3,093	0,066
254	Gmax	Combination	0,760	-2,610	-0,592	-2,841	0,111
254	Gmax	Combination	-17,220	-6,210	-0,323	-1,283	0,156
255	Gmax	Combination	30,040	-9,700	0,882	1,977	-0,584
255	Gmax	Combination	58,080	-4,090	0,876	0,939	-0,992
255	Gmax	Combination	54,190	-23,500	-1,858	0,481	-0,534
255	Gmax	Combination	26,150	-29,110	0,468	6,331	-0,125
256	Gmax	Combination	4,320	15,160	0,037	-0,176	0,141
256	Gmax	Combination	24,150	19,130	0,140	0,287	-0,084
256	Gmax	Combination	17,900	-12,120	1,106	0,985	-0,538

256	Gmax	Combination	-1,930	-16,090	0,351	1,871	-0,313
257	Gmax	Combination	58,030	-4,350	0,933	1,220	-0,995
257	Gmax	Combination	74,100	-1,130	1,695	0,065	-0,972
257	Gmax	Combination	74,160	-0,810	-3,946	-0,095	-0,502
257	Gmax	Combination	58,090	-4,020	-2,074	-0,599	-0,524
258	Gmax	Combination	21,820	7,450	0,119	0,183	-0,294
258	Gmax	Combination	41,500	11,390	0,466	0,039	-0,353
258	Gmax	Combination	37,540	-8,440	1,138	-0,046	-0,648
258	Gmax	Combination	17,850	-12,380	1,163	1,266	-0,589
259	Gmax	Combination	-47,750	-175,890	-0,675	-2,252	0,108
259	Gmax	Combination	-4,300	41,350	-0,624	-3,350	0,698
259	Gmax	Combination	-38,290	34,550	-0,799	-2,436	0,666
259	Gmax	Combination	-81,740	-182,690	0,296	-2,706	0,076
260	Gmax	Combination	-20,160	38,180	-0,575	-3,340	0,393
260	Gmax	Combination	-26,500	6,440	-0,575	-3,453	0,152
260	Gmax	Combination	-16,660	8,410	-0,532	-3,369	0,095
260	Gmax	Combination	-10,310	40,150	-0,704	-2,417	0,336
261	Gmax	Combination	38,190	-65,870	-2,409	0,910	0,843
261	Gmax	Combination	56,280	24,610	1,199	1,253	1,630
261	Gmax	Combination	-10,320	11,290	0,480	2,169	1,188
261	Gmax	Combination	-28,410	-79,190	1,258	7,414	0,401
262	Gmax	Combination	-43,130	4,720	1,339	1,282	0,886
262	Gmax	Combination	-41,130	14,710	0,115	0,303	0,388
262	Gmax	Combination	-24,170	18,100	0,156	0,199	0,175
262	Gmax	Combination	-26,170	8,120	0,529	2,178	0,673
263	Gmax	Combination	81,990	-15,790	-5,318	0,148	1,093
263	Gmax	Combination	87,860	13,530	2,444	0,041	1,774
263	Gmax	Combination	52,660	6,490	1,230	1,411	1,669
263	Gmax	Combination	46,790	-22,830	-2,531	0,299	0,988
264	Gmax	Combination	-51,120	-14,270	1,642	-0,119	1,040
264	Gmax	Combination	-45,200	15,370	0,322	0,021	0,585
264	Gmax	Combination	-40,830	16,240	0,105	0,252	0,542
264	Gmax	Combination	-46,750	-13,390	1,371	1,439	0,997
265	Gmax	Combination	-33,880	4,960	-0,740	-3,486	0,083
265	Gmax	Combination	-35,720	-4,270	-0,661	-3,735	0,067
265	Gmax	Combination	2,270	3,330	-0,587	-3,461	0,049
265	Gmax	Combination	4,120	12,560	-0,764	-3,416	0,065
266	Gmax	Combination	-86,420	5,650	0,152	0,311	0,161
266	Gmax	Combination	-88,010	-2,270	0,187	0,088	0,046
266	Gmax	Combination	-33,130	8,710	0,132	0,228	0,030
266	Gmax	Combination	-31,550	16,630	-0,010	0,166	0,146
267	Gmax	Combination	-160,650	-7,730	0,479	0,052	0,235

267	Gmax	Combination	-160,010	-4,510	0,125	-0,022	0,053
267	Gmax	Combination	-85,470	10,400	0,190	0,102	0,039
267	Gmax	Combination	-86,120	7,180	0,142	0,260	0,221
268	Gmax	Combination	-45,140	-6,160	-0,646	-3,732	0,005
268	Gmax	Combination	-44,170	-1,300	-0,617	-3,742	-0,106
268	Gmax	Combination	-4,710	6,590	-0,624	-3,515	-0,109
268	Gmax	Combination	-5,680	1,740	-0,675	-3,479	0,001
269	Gmax	Combination	-113,980	-7,460	0,151	0,081	-0,029
269	Gmax	Combination	-112,950	-2,350	0,182	0,105	-0,064
269	Gmax	Combination	-41,520	11,940	0,172	0,201	-0,065
269	Gmax	Combination	-42,540	6,820	0,146	0,231	-0,030
270	Gmax	Combination	-187,860	-10,080	0,215	-0,004	-0,012
270	Gmax	Combination	-186,980	-5,680	0,214	0,001	-0,083
270	Gmax	Combination	-110,560	9,600	0,181	0,100	-0,082
270	Gmax	Combination	-111,440	5,200	0,154	0,095	-0,011
271	Gmax	Combination	-43,770	-1,220	-0,708	-3,760	-0,137
271	Gmax	Combination	-44,710	-5,920	-0,618	-3,724	-0,203
271	Gmax	Combination	-6,230	1,780	-0,698	-3,458	-0,199
271	Gmax	Combination	-5,290	6,470	-0,602	-3,511	-0,133
272	Gmax	Combination	-110,330	-1,830	0,195	0,107	-0,139
272	Gmax	Combination	-111,150	-5,920	0,144	0,084	-0,207
272	Gmax	Combination	-41,940	7,920	0,171	0,219	-0,207
272	Gmax	Combination	-41,130	12,020	0,081	0,183	-0,138
273	Gmax	Combination	-185,070	-5,300	0,208	0,000	-0,137
273	Gmax	Combination	-185,990	-9,870	0,222	0,000	-0,207
273	Gmax	Combination	-108,860	5,550	0,145	0,090	-0,207
273	Gmax	Combination	-107,940	10,130	0,194	0,102	-0,137
274	Gmax	Combination	-35,410	-4,060	-0,684	-3,738	-0,263
274	Gmax	Combination	-32,980	8,090	-0,653	-3,651	-0,326
274	Gmax	Combination	3,050	15,290	-0,737	-3,343	-0,316
274	Gmax	Combination	0,620	3,150	-0,552	-3,428	-0,253
275	Gmax	Combination	-83,790	-0,440	0,207	0,097	-0,280
275	Gmax	Combination	-82,830	4,350	0,122	0,222	-0,346
275	Gmax	Combination	-31,680	14,580	0,120	0,211	-0,335
275	Gmax	Combination	-32,640	9,790	0,105	0,206	-0,268
276	Gmax	Combination	-145,230	-1,720	0,139	-0,016	-0,266
276	Gmax	Combination	-146,680	-8,940	0,406	0,034	-0,414
276	Gmax	Combination	-82,940	3,800	0,118	0,203	-0,405
276	Gmax	Combination	-81,500	11,030	0,208	0,103	-0,256
277	Gmax	Combination	-16,540	11,370	-0,736	-3,668	-0,354
277	Gmax	Combination	-18,850	-0,160	-0,425	-2,910	-0,524
277	Gmax	Combination	-18,950	-0,180	-0,816	-2,763	-0,457

277	Gmax	Combination	-16,640	11,350	-0,442	-3,284	-0,287
278	Gmax	Combination	-30,680	14,780	0,129	0,223	-0,523
278	Gmax	Combination	-36,640	-15,030	1,004	1,057	-0,911
278	Gmax	Combination	-21,200	-11,950	0,457	1,500	-0,759
278	Gmax	Combination	-15,240	17,870	0,036	0,194	-0,371
279	Gmax	Combination	-42,430	11,910	0,285	0,010	-0,695
279	Gmax	Combination	-47,870	-15,270	1,198	-0,065	-1,026
279	Gmax	Combination	-36,220	-12,940	1,013	1,105	-0,989
279	Gmax	Combination	-30,790	14,240	0,125	0,205	-0,657
280	Gmax	Combination	28,460	9,300	-0,635	-2,952	-0,714
280	Gmax	Combination	6,260	-101,690	-0,997	-3,846	-0,551
280	Gmax	Combination	-11,370	-105,210	-0,469	-2,131	-0,564
280	Gmax	Combination	10,820	5,770	-0,578	-2,716	-0,728
281	Gmax	Combination	42,250	0,740	0,954	1,047	-1,489
281	Gmax	Combination	36,610	-27,430	-1,968	0,051	-0,973
281	Gmax	Combination	20,460	-30,660	0,995	6,115	-0,642
281	Gmax	Combination	26,100	-2,480	0,247	1,458	-1,158
282	Gmax	Combination	45,270	3,360	1,739	0,043	-1,506
282	Gmax	Combination	43,060	-7,700	-3,830	0,034	-1,037
282	Gmax	Combination	40,460	-8,220	-2,009	-0,156	-1,000
282	Gmax	Combination	42,670	2,840	0,964	1,095	-1,469
283	Gmax	Combination	16,910	13,780	-1,864	-0,131	-0,886
283	Gmax	Combination	12,140	-10,070	2,533	-0,013	-0,968
283	Gmax	Combination	-17,710	-16,040	2,256	2,515	-0,918
283	Gmax	Combination	-12,940	7,810	-1,133	0,600	-0,836
284	Gmax	Combination	111,190	9,740	2,981	0,077	-1,477
284	Gmax	Combination	107,090	-10,770	-5,424	-0,012	-0,921
284	Gmax	Combination	59,960	-20,200	-2,645	-0,184	-0,934
284	Gmax	Combination	64,060	0,320	1,992	2,462	-1,490
285	Gmax	Combination	-11,550	14,740	-1,204	0,242	-0,540
285	Gmax	Combination	-15,270	-3,850	2,192	2,194	-0,708
285	Gmax	Combination	-11,920	-3,190	0,927	5,921	-0,291
285	Gmax	Combination	-8,200	15,410	1,000	3,245	-0,123
286	Gmax	Combination	66,500	12,500	1,928	2,141	-1,474
286	Gmax	Combination	51,350	-63,240	-2,324	1,421	-1,111
286	Gmax	Combination	-22,020	-77,910	1,097	7,741	-0,909
286	Gmax	Combination	-6,870	-2,170	1,426	6,021	-1,272
287	Gmax	Combination	-16,570	-26,440	0,075	-1,346	0,214
287	Gmax	Combination	-2,450	44,150	-0,457	-1,022	0,031
287	Gmax	Combination	35,310	52,720	0,215	1,219	0,337
287	Gmax	Combination	21,190	-17,880	-0,803	-3,175	0,527
288	Gmax	Combination	2,680	45,720	0,032	-0,935	-0,893

288	Gmax	Combination	-41,270	-174,050	-1,000	-2,767	-1,320
288	Gmax	Combination	-201,060	-205,470	0,850	-6,352	-1,943
288	Gmax	Combination	-157,320	13,260	-2,887	0,582	-1,530
289	Gmax	Combination	2,810	22,660	-0,292	-2,615	-0,238
289	Gmax	Combination	-5,520	-18,990	-1,465	-5,119	-0,064
289	Gmax	Combination	-6,100	-19,100	-0,503	-1,776	-0,136
289	Gmax	Combination	2,230	22,550	-0,322	-2,035	-0,310
290	Gmax	Combination	-6,780	-19,240	-0,806	-4,988	-0,264
290	Gmax	Combination	1,960	24,470	1,106	1,723	-0,749
290	Gmax	Combination	-4,420	23,200	0,471	-0,754	-0,486
290	Gmax	Combination	-13,160	-20,510	-0,430	-1,762	-0,002
291	Gmax	Combination	-0,940	13,980	0,046	0,550	-0,026
291	Gmax	Combination	-4,190	-2,260	0,097	0,150	-0,188
291	Gmax	Combination	-2,100	-1,850	-0,387	0,269	-0,183
291	Gmax	Combination	1,150	14,390	0,212	-0,097	-0,022
292	Gmax	Combination	1,160	-1,200	-0,223	0,086	-0,332
292	Gmax	Combination	1,700	1,490	2,008	-0,020	-0,953
292	Gmax	Combination	-2,820	0,590	0,815	0,268	-0,998
292	Gmax	Combination	-3,360	-2,100	0,271	0,400	-0,378
293	Gmax	Combination	-11,850	1,560	0,161	0,204	-0,020
293	Gmax	Combination	-12,480	-1,560	0,049	-0,087	-0,158
293	Gmax	Combination	-3,690	0,200	0,128	0,301	-0,166
293	Gmax	Combination	-3,070	3,320	-0,039	0,128	-0,027
294	Gmax	Combination	6,750	2,290	0,084	-0,079	-0,371
294	Gmax	Combination	5,920	-1,880	2,060	0,121	-0,647
294	Gmax	Combination	0,820	-2,900	1,971	-0,203	-0,708
294	Gmax	Combination	1,650	1,270	-0,192	0,237	-0,433
295	Gmax	Combination	73,760	-1,560	-3,887	-0,067	0,426
295	Gmax	Combination	73,960	-0,580	1,880	0,080	0,871
295	Gmax	Combination	58,100	-3,750	1,073	1,354	0,892
295	Gmax	Combination	57,900	-4,730	-1,984	-0,492	0,446
296	Gmax	Combination	34,240	-8,520	1,354	-0,025	0,505
296	Gmax	Combination	38,260	11,580	0,140	-0,064	0,244
296	Gmax	Combination	16,140	7,160	-0,045	0,088	0,168
296	Gmax	Combination	12,110	-12,940	1,311	1,401	0,429
297	Gmax	Combination	54,060	-23,940	-1,778	0,540	0,504
297	Gmax	Combination	58,050	-3,980	1,015	1,063	0,869
297	Gmax	Combination	24,740	-10,640	0,905	2,366	0,519
297	Gmax	Combination	20,750	-30,600	0,469	6,118	0,154
298	Gmax	Combination	12,070	-13,180	1,252	1,110	0,345
298	Gmax	Combination	18,270	17,820	-0,009	0,268	-0,046
298	Gmax	Combination	5,630	15,290	0,244	0,294	-0,275

298	Gmax	Combination	-0,570	-15,710	0,423	2,270	0,117
299	Gmax	Combination	6,550	-101,630	-1,361	-3,030	-0,028
299	Gmax	Combination	26,340	-2,680	-0,178	-3,050	0,146
299	Gmax	Combination	-1,720	-8,290	-0,500	-1,468	0,276
299	Gmax	Combination	-21,510	-107,240	-0,688	-4,010	0,102
300	Gmax	Combination	1,030	-7,750	-0,660	-3,146	-0,198
300	Gmax	Combination	7,290	23,560	-0,375	-2,799	-0,252
300	Gmax	Combination	-13,910	19,320	-0,031	-1,866	-0,263
300	Gmax	Combination	-20,170	-11,980	-0,556	-1,479	-0,209
301	Gmax	Combination	-9,210	-87,230	-1,882	-0,311	1,042
301	Gmax	Combination	15,260	35,130	2,224	0,023	0,841
301	Gmax	Combination	-4,590	31,160	0,911	0,690	0,945
301	Gmax	Combination	-29,060	-91,200	-1,083	-2,496	1,146
302	Gmax	Combination	2,210	-60,130	-2,380	-0,548	0,283
302	Gmax	Combination	18,640	22,040	1,144	0,435	1,268
302	Gmax	Combination	12,400	20,790	2,319	0,499	1,364
302	Gmax	Combination	-4,040	-61,380	-2,112	-1,464	0,379
303	Gmax	Combination	35,030	-29,560	-7,794	2,523	0,397
303	Gmax	Combination	43,780	14,210	4,372	-0,447	2,001
303	Gmax	Combination	15,960	8,640	1,113	0,279	1,615
303	Gmax	Combination	7,210	-35,130	-2,344	-0,371	0,010
304	Gmax	Combination	8,340	25,750	2,622	-0,589	-1,856
304	Gmax	Combination	-13,130	-81,570	-4,743	0,886	-0,490
304	Gmax	Combination	-13,110	-81,570	-2,082	-3,081	-0,518
304	Gmax	Combination	8,350	25,750	0,930	1,072	-1,883
305	Gmax	Combination	26,780	6,510	1,110	0,000	-1,060
305	Gmax	Combination	22,790	-13,410	-3,039	-0,407	-1,263
305	Gmax	Combination	-0,430	-18,060	-5,282	-1,807	-1,305
305	Gmax	Combination	3,560	1,860	2,907	0,839	-1,101
306	Gmax	Combination	-12,350	-5,530	3,018	0,267	-1,451
306	Gmax	Combination	-12,390	-5,760	-5,584	-0,322	-1,018
306	Gmax	Combination	25,860	1,890	-3,100	-0,710	-0,957
306	Gmax	Combination	25,900	2,120	1,192	0,409	-1,389
307	Gmax	Combination	-30,170	-91,420	1,457	-0,279	-0,666
307	Gmax	Combination	-7,970	19,590	1,076	1,379	-0,533
307	Gmax	Combination	15,220	24,230	3,183	2,341	-0,339
307	Gmax	Combination	-6,990	-86,780	-0,273	-0,186	-0,472
308	Gmax	Combination	-4,910	20,200	1,075	1,379	-0,100
308	Gmax	Combination	-5,670	16,400	-2,192	-0,322	-0,481
308	Gmax	Combination	-25,290	12,480	-0,923	2,298	-0,496
308	Gmax	Combination	-24,520	16,280	-0,085	1,688	-0,115
309	Gmax	Combination	6,090	-59,360	3,454	0,968	-0,690

309	Gmax	Combination	19,530	7,870	-0,377	0,485	-0,932
309	Gmax	Combination	-11,550	1,650	1,017	1,087	-0,860
309	Gmax	Combination	-25,000	-65,570	1,641	0,639	-0,618
310	Gmax	Combination	-23,930	-0,820	0,339	0,628	-0,121
310	Gmax	Combination	-20,390	16,860	-2,703	-2,247	0,244
310	Gmax	Combination	-4,960	19,950	-2,150	-0,108	0,004
310	Gmax	Combination	-8,500	2,270	1,017	1,087	-0,361
311	Gmax	Combination	-21,810	-40,930	0,684	-0,932	-1,462
311	Gmax	Combination	-15,990	-11,820	-0,928	-0,510	-0,060
311	Gmax	Combination	16,910	-5,240	-0,497	-0,112	-0,080
311	Gmax	Combination	11,090	-34,350	3,597	1,685	-1,482
312	Gmax	Combination	-2,110	-9,040	-0,651	-0,455	0,421
312	Gmax	Combination	4,080	21,890	-0,322	0,454	-0,126
312	Gmax	Combination	-20,370	17,000	-2,352	-0,492	-0,055
312	Gmax	Combination	-26,550	-13,930	0,219	0,031	0,492
313	Gmax	Combination	-37,160	-49,970	-0,141	1,497	-0,416
313	Gmax	Combination	-35,010	-49,540	-0,815	0,369	-0,266
313	Gmax	Combination	-22,750	11,780	0,078	-1,268	-0,435
313	Gmax	Combination	-24,890	11,350	-0,592	-1,788	-0,586
314	Gmax	Combination	-56,350	5,060	0,137	-1,642	-0,734
314	Gmax	Combination	-66,880	2,960	-0,123	-1,308	-1,008
314	Gmax	Combination	-66,630	4,210	1,125	0,632	-0,543
314	Gmax	Combination	-56,100	6,310	1,594	0,869	-0,270
315	Gmax	Combination	-14,700	-13,930	-0,105	-0,611	-0,893
315	Gmax	Combination	-30,590	-17,110	-0,554	-0,570	-0,895
315	Gmax	Combination	-27,510	-1,760	-0,438	-1,020	-0,313
315	Gmax	Combination	-11,630	1,420	-0,080	-0,088	-0,311
316	Gmax	Combination	-81,240	-12,500	-0,156	-0,104	-0,165
316	Gmax	Combination	-58,970	-8,050	0,291	-0,874	-0,315
316	Gmax	Combination	-55,390	9,860	1,562	0,705	-0,147
316	Gmax	Combination	-77,650	5,410	2,543	0,484	0,003
317	Gmax	Combination	-42,240	-7,780	-0,108	-0,261	-0,868
317	Gmax	Combination	-12,270	-1,780	-0,046	-0,319	-0,895
317	Gmax	Combination	-11,770	0,760	-0,095	-0,164	-0,258
317	Gmax	Combination	-41,730	-5,230	0,765	0,323	-0,231
318	Gmax	Combination	-30,870	-3,060	-0,485	0,073	0,078
318	Gmax	Combination	-81,370	-13,160	-0,171	-0,179	0,203
318	Gmax	Combination	-77,630	5,540	2,492	0,228	-0,368
318	Gmax	Combination	-27,130	15,640	1,252	-0,600	-0,493
319	Gmax	Combination	-33,440	-49,230	0,620	4,503	-1,114
319	Gmax	Combination	-23,230	1,840	0,271	0,290	-1,290
319	Gmax	Combination	-24,670	1,550	0,912	1,608	-1,483

319	Gmax	Combination	-34,880	-49,510	-0,214	2,909	-1,308
320	Gmax	Combination	-5,490	-12,090	-0,402	-1,659	-1,412
320	Gmax	Combination	-1,900	5,890	-0,409	-0,438	-1,148
320	Gmax	Combination	-23,270	1,610	-0,008	-1,107	-1,013
320	Gmax	Combination	-26,870	-16,370	-0,796	-2,579	-1,276
321	Gmax	Combination	-13,790	-2,090	0,702	-0,064	-1,323
321	Gmax	Combination	-13,340	0,200	-1,285	-0,021	-1,180
321	Gmax	Combination	-2,610	2,350	-0,498	-0,883	-1,223
321	Gmax	Combination	-3,060	0,060	0,024	0,468	-1,366
322	Gmax	Combination	-15,620	3,360	0,047	0,246	-0,537
322	Gmax	Combination	-14,170	10,580	0,120	0,478	0,473
322	Gmax	Combination	-18,730	9,670	0,628	1,359	0,474
322	Gmax	Combination	-20,180	2,450	0,776	1,581	-0,536
323	Gmax	Combination	-25,230	1,220	-0,457	-0,448	-0,416
323	Gmax	Combination	-25,300	0,870	-0,711	-0,751	0,357
323	Gmax	Combination	-15,730	2,790	-0,188	-1,059	0,348
323	Gmax	Combination	-15,660	3,130	-0,233	-1,152	-0,425
324	Gmax	Combination	-6,110	1,640	-0,798	0,076	-0,307
324	Gmax	Combination	-6,410	0,140	-0,882	-0,043	0,309
324	Gmax	Combination	-26,240	-3,830	-0,777	-1,080	0,296
324	Gmax	Combination	-25,940	-2,320	-0,546	-0,892	-0,320
325	Gmax	Combination	-25,750	8,260	0,156	0,486	1,185
325	Gmax	Combination	-38,400	-55,010	0,624	2,799	1,052
325	Gmax	Combination	-47,680	-56,860	0,168	3,131	1,191
325	Gmax	Combination	-35,030	6,410	0,752	1,384	1,324
326	Gmax	Combination	3,190	6,570	-0,589	-0,727	1,171
326	Gmax	Combination	-0,058	-9,690	0,169	-0,675	1,384
326	Gmax	Combination	-30,560	-15,790	-0,630	-3,467	1,255
326	Gmax	Combination	-27,310	0,470	-0,152	-1,052	1,042
327	Gmax	Combination	-8,770	-0,340	-1,462	-0,159	1,074
327	Gmax	Combination	-9,210	-2,540	1,255	0,340	1,159
327	Gmax	Combination	1,810	-0,330	0,527	1,114	1,259
327	Gmax	Combination	2,250	1,870	-0,655	-1,055	1,175
328	Gmax	Combination	-11,510	-49,630	-0,542	-4,870	0,371
328	Gmax	Combination	-11,620	-49,650	0,752	0,017	0,245
328	Gmax	Combination	-0,710	4,910	-0,481	-1,109	-0,026
328	Gmax	Combination	-0,600	4,930	-0,077	0,274	0,099
329	Gmax	Combination	5,460	6,140	0,019	-3,305	-0,303
329	Gmax	Combination	8,630	21,990	0,210	1,123	-0,296
329	Gmax	Combination	-6,480	18,970	0,804	1,581	0,017
329	Gmax	Combination	-9,650	3,120	0,204	0,084	0,010
330	Gmax	Combination	0,770	-9,530	-0,169	0,654	0,583

330	Gmax	Combination	-3,670	-10,410	0,845	2,064	0,691
330	Gmax	Combination	-1,790	-1,000	-0,125	0,033	-0,128
330	Gmax	Combination	2,650	-0,120	-0,246	0,188	-0,235
331	Gmax	Combination	-6,010	-1,850	0,449	-0,248	-0,324
331	Gmax	Combination	-7,110	-7,340	0,306	0,041	-0,391
331	Gmax	Combination	3,170	-5,280	-0,064	-0,247	-0,465
331	Gmax	Combination	4,270	0,210	0,907	1,134	-0,398
332	Gmax	Combination	-12,040	-3,100	-0,801	0,001	0,364
332	Gmax	Combination	2,640	-0,170	-0,308	-0,042	0,363
332	Gmax	Combination	2,940	1,330	-0,262	0,110	-0,070
332	Gmax	Combination	-11,740	-1,600	-0,258	-0,029	-0,070
333	Gmax	Combination	9,250	2,590	0,997	-0,167	-0,316
333	Gmax	Combination	7,910	-4,100	-0,101	0,045	-0,379
333	Gmax	Combination	-7,060	-7,090	0,271	-0,134	-0,374
333	Gmax	Combination	-5,720	-0,400	0,557	0,295	-0,311
334	Gmax	Combination	-4,910	19,280	0,864	1,254	-0,044
334	Gmax	Combination	-23,300	-72,660	0,159	5,725	-0,312
334	Gmax	Combination	-29,410	-73,880	-1,618	-2,410	-0,252
334	Gmax	Combination	-11,030	18,060	0,741	1,568	0,016
335	Gmax	Combination	19,270	-2,060	0,179	0,016	-0,324
335	Gmax	Combination	21,080	6,990	-1,046	-0,623	-0,133
335	Gmax	Combination	-8,550	1,060	-1,192	-1,033	-0,214
335	Gmax	Combination	-10,360	-7,990	0,590	-0,116	-0,405
336	Gmax	Combination	-3,730	-6,420	-0,002	0,065	-0,182
336	Gmax	Combination	-2,010	2,160	-0,732	-0,056	-0,186
336	Gmax	Combination	21,040	6,770	-1,015	-0,465	-0,191
336	Gmax	Combination	19,320	-1,810	0,144	-0,160	-0,186
337	Gmax	Combination	3,060	-6,710	-0,119	-0,777	-0,166
337	Gmax	Combination	-33,870	-14,100	-0,614	-0,926	0,413
337	Gmax	Combination	-47,070	-80,100	-0,289	-2,224	0,443
337	Gmax	Combination	-10,140	-72,710	-1,868	-8,038	-0,136
338	Gmax	Combination	-65,220	-81,040	-0,035	-6,654	-0,070
338	Gmax	Combination	-66,310	-81,260	0,731	-2,192	-0,542
338	Gmax	Combination	-49,630	2,140	-0,618	-0,854	-0,250
338	Gmax	Combination	-48,540	2,360	-0,423	-1,597	0,222
339	Gmax	Combination	-11,150	-18,440	0,023	-0,741	0,239
339	Gmax	Combination	-23,000	-20,810	-0,708	-1,252	0,268
339	Gmax	Combination	-17,110	8,650	-0,368	-1,586	0,356
339	Gmax	Combination	-5,260	11,020	-0,698	-0,870	0,327
340	Gmax	Combination	-10,270	-2,900	-0,397	-0,729	0,059
340	Gmax	Combination	-9,430	-2,730	-0,377	-1,481	0,046
340	Gmax	Combination	-12,630	-18,740	-0,040	-1,118	-0,023

340	Gmax	Combination	-13,470	-18,900	0,102	-0,725	-0,009
341	Gmax	Combination	-26,980	-4,760	0,011	-0,634	0,197
341	Gmax	Combination	-9,390	-1,240	-0,623	-1,126	0,229
341	Gmax	Combination	-9,690	-2,790	-0,168	-1,439	0,298
341	Gmax	Combination	-27,290	-6,310	-0,442	-0,738	0,267
342	Gmax	Combination	-9,570	-9,240	-0,146	-0,783	-0,242
342	Gmax	Combination	-7,910	-0,940	-0,375	-1,076	-0,205
342	Gmax	Combination	-5,990	-0,560	0,186	-0,599	-0,211
342	Gmax	Combination	-7,650	-8,850	-0,582	-0,920	-0,247
343	Gmax	Combination	21,090	-25,250	0,949	0,888	0,507
343	Gmax	Combination	-1,550	-29,780	0,337	1,502	-0,082
343	Gmax	Combination	7,730	16,640	1,264	7,625	0,005
343	Gmax	Combination	30,370	21,170	-0,777	-0,005	0,594
344	Gmax	Combination	1,060	2,980	0,913	0,659	-0,500
344	Gmax	Combination	-50,480	-7,320	2,472	5,883	-0,054
344	Gmax	Combination	-51,970	-14,780	0,144	1,238	0,085
344	Gmax	Combination	-0,430	-4,470	0,912	0,758	-0,362
345	Gmax	Combination	-19,680	-4,180	-0,156	1,512	0,420
345	Gmax	Combination	-11,100	-2,460	-0,902	0,148	0,430
345	Gmax	Combination	-11,960	-6,780	0,868	0,750	0,323
345	Gmax	Combination	-20,540	-8,500	0,199	1,249	0,312
346	Gmax	Combination	-9,620	-3,710	0,297	1,889	-0,015
346	Gmax	Combination	-6,810	-3,140	0,729	0,434	0,011
346	Gmax	Combination	-6,490	-1,540	-0,675	0,193	0,082
346	Gmax	Combination	-9,300	-2,110	0,513	1,646	0,056
347	Gmax	Combination	-7,990	5,730	-0,095	1,518	0,230
347	Gmax	Combination	-3,780	6,570	-0,987	0,168	0,204
347	Gmax	Combination	-5,680	-2,920	0,648	0,418	0,269
347	Gmax	Combination	-9,890	-3,760	0,506	1,931	0,294
348	Gmax	Combination	-2,980	-30,070	1,002	0,899	-0,203
348	Gmax	Combination	4,690	8,270	-1,000	0,165	-0,177
348	Gmax	Combination	-6,520	6,030	0,154	1,568	-0,202
348	Gmax	Combination	-14,190	-32,310	0,310	1,496	-0,227
349	Gmax	Combination	5,200	-12,980	0,936	0,244	-0,092
349	Gmax	Combination	24,300	-9,160	1,068	1,484	0,324
349	Gmax	Combination	28,480	11,730	-1,173	-1,987	0,315
349	Gmax	Combination	9,380	7,910	-1,103	-0,941	-0,101
350	Gmax	Combination	9,970	4,560	0,893	-0,422	-0,022
350	Gmax	Combination	1,020	2,770	0,550	-1,157	-0,342
350	Gmax	Combination	-0,820	-6,410	1,026	1,333	-0,198
350	Gmax	Combination	8,140	-4,620	0,951	0,122	0,122
351	Gmax	Combination	-10,700	-0,470	-1,040	-0,542	0,241

351	Gmax	Combination	10,830	3,840	-1,104	-0,217	0,075
351	Gmax	Combination	9,180	-4,410	1,018	0,136	0,022
351	Gmax	Combination	-12,350	-8,710	0,983	1,324	0,188
352	Gmax	Combination	-6,470	-1,460	0,797	0,776	0,130
352	Gmax	Combination	-5,210	-1,210	0,489	0,059	0,225
352	Gmax	Combination	-4,820	0,710	-0,574	-0,111	0,227
352	Gmax	Combination	-6,090	0,460	-0,813	-0,496	0,132
353	Gmax	Combination	-4,810	1,440	-1,132	-0,554	0,122
353	Gmax	Combination	-4,260	1,550	-1,163	-0,207	0,017
353	Gmax	Combination	-4,800	-1,130	0,549	0,071	0,064
353	Gmax	Combination	-5,340	-1,240	0,717	0,760	0,169
354	Gmax	Combination	18,280	-10,370	0,892	0,235	0,162
354	Gmax	Combination	21,710	6,750	-1,032	-0,181	0,137
354	Gmax	Combination	3,660	3,140	-1,144	-0,556	-0,034
354	Gmax	Combination	0,240	-13,980	1,121	1,495	-0,009
355	Gmax	Combination	-11,870	23,890	-0,428	0,065	0,345
355	Gmax	Combination	-20,820	22,100	-0,741	0,073	0,303
355	Gmax	Combination	-20,400	24,190	-0,167	0,570	0,239
355	Gmax	Combination	-11,450	25,980	-0,865	-0,146	0,280
356	Gmax	Combination	-47,130	13,880	0,269	0,268	-0,329
356	Gmax	Combination	1,130	23,540	0,550	1,467	-0,156
356	Gmax	Combination	3,040	33,060	-0,599	0,056	-0,072
356	Gmax	Combination	-45,230	23,410	-0,200	0,282	-0,244
357	Gmax	Combination	-40,480	-15,160	0,317	0,148	0,238
357	Gmax	Combination	-28,050	-12,670	-0,015	0,024	0,170
357	Gmax	Combination	-19,820	28,490	-0,034	0,315	0,042
357	Gmax	Combination	-32,240	26,010	-0,920	-0,008	0,110
358	Gmax	Combination	28,560	12,990	0,385	-0,491	0,080
358	Gmax	Combination	-30,620	1,150	0,745	0,942	0,098
358	Gmax	Combination	-33,600	-13,780	0,017	0,030	0,137
358	Gmax	Combination	25,570	-1,950	0,250	0,134	0,119
359	Gmax	Combination	44,620	7,800	0,292	0,103	0,113
359	Gmax	Combination	-39,210	-8,970	0,088	0,038	0,085
359	Gmax	Combination	-37,460	-0,210	0,984	0,990	0,101
359	Gmax	Combination	46,370	16,550	0,569	-0,454	0,129
360	Gmax	Combination	-24,090	21,450	-0,333	0,085	0,158
360	Gmax	Combination	-29,800	-7,080	0,043	0,029	0,051
360	Gmax	Combination	-51,110	-11,350	0,355	0,115	0,003
360	Gmax	Combination	-45,410	17,180	-1,022	0,017	0,110
361	Gmax	Combination	-32,450	4,530	-0,281	-0,058	0,162
361	Gmax	Combination	-15,050	8,010	-0,373	0,340	0,239
361	Gmax	Combination	-14,150	12,510	-1,153	-1,586	0,182

361	Gmax	Combination	-31,550	9,030	-1,008	0,463	0,105
362	Gmax	Combination	-31,400	-1,230	-0,276	0,234	-0,073
362	Gmax	Combination	-50,940	-5,140	0,013	-1,010	-0,171
362	Gmax	Combination	-48,040	9,360	-0,154	0,512	-0,258
362	Gmax	Combination	-28,500	13,270	0,177	0,177	-0,160
363	Gmax	Combination	-25,780	-1,340	0,058	0,388	0,094
363	Gmax	Combination	-53,060	-6,790	0,060	0,046	0,073
363	Gmax	Combination	-49,910	8,990	0,024	0,147	-0,019
363	Gmax	Combination	-22,630	14,440	0,012	0,545	0,002
364	Gmax	Combination	-29,320	7,640	0,423	-0,666	0,132
364	Gmax	Combination	-49,040	3,690	0,643	0,906	0,106
364	Gmax	Combination	-51,060	-6,390	0,075	0,049	0,132
364	Gmax	Combination	-31,340	-2,450	0,090	0,394	0,158
365	Gmax	Combination	-37,760	-1,740	0,147	0,333	0,058
365	Gmax	Combination	-53,380	-4,870	0,127	0,063	0,081
365	Gmax	Combination	-51,780	3,150	0,954	0,968	0,077
365	Gmax	Combination	-36,160	6,270	0,663	-0,618	0,053
366	Gmax	Combination	-39,190	3,180	-0,398	-0,081	0,151
366	Gmax	Combination	-40,270	-2,250	0,125	0,063	0,123
366	Gmax	Combination	-28,360	0,140	0,102	0,324	0,118
366	Gmax	Combination	-27,270	5,570	-0,278	0,360	0,146
367	Gmax	Combination	-43,360	11,140	-0,509	0,030	0,107
367	Gmax	Combination	-30,610	13,690	-0,259	0,052	0,080
367	Gmax	Combination	-34,790	-7,190	-1,144	-0,216	0,219
367	Gmax	Combination	-47,540	-9,740	-0,430	0,380	0,245
368	Gmax	Combination	-53,690	-11,380	0,412	0,320	-0,204
368	Gmax	Combination	-32,580	-7,160	-0,324	-0,007	-0,200
368	Gmax	Combination	-28,910	11,200	0,176	0,172	-0,003
368	Gmax	Combination	-50,010	6,980	-0,010	0,119	-0,007
369	Gmax	Combination	-51,670	0,160	0,122	0,355	0,063
369	Gmax	Combination	-70,670	-3,640	0,145	-0,029	0,065
369	Gmax	Combination	-69,310	3,120	0,083	0,138	0,006
369	Gmax	Combination	-50,320	6,920	0,023	0,142	0,005
370	Gmax	Combination	-48,780	5,010	0,412	-0,248	0,099
370	Gmax	Combination	-88,450	-2,930	0,539	0,825	0,111
370	Gmax	Combination	-89,340	-7,380	0,122	-0,034	0,120
370	Gmax	Combination	-49,670	0,560	0,136	0,358	0,108
371	Gmax	Combination	-53,260	-4,280	0,176	0,307	0,094
371	Gmax	Combination	-86,670	-10,960	0,147	-0,015	0,075
371	Gmax	Combination	-84,920	-2,220	0,926	0,902	0,067
371	Gmax	Combination	-51,520	4,460	0,723	-0,186	0,086
372	Gmax	Combination	-61,510	7,510	-0,380	0,056	0,135

372	Gmax	Combination	-64,310	-6,490	0,171	-0,010	0,115
372	Gmax	Combination	-40,160	-1,650	0,174	0,306	0,114
372	Gmax	Combination	-37,360	12,340	-0,376	0,029	0,134
373	Gmax	Combination	-9,510	14,380	-0,193	0,025	0,295
373	Gmax	Combination	-44,100	7,460	-0,509	0,029	0,262
373	Gmax	Combination	-48,240	-13,240	-0,473	0,165	0,177
373	Gmax	Combination	-13,650	-6,320	-1,031	0,030	0,210
374	Gmax	Combination	-45,380	-8,330	0,227	0,068	-0,158
374	Gmax	Combination	-53,400	-9,930	0,396	0,241	-0,143
374	Gmax	Combination	-50,150	6,300	-0,018	0,082	-0,103
374	Gmax	Combination	-42,130	7,900	0,202	0,002	-0,118
375	Gmax	Combination	-68,610	6,650	0,194	0,214	0,066
375	Gmax	Combination	-98,720	0,630	0,256	-0,055	0,069
375	Gmax	Combination	-99,570	-3,580	0,143	-0,010	-0,005
375	Gmax	Combination	-69,450	2,440	0,076	0,101	-0,008
376	Gmax	Combination	-88,170	-1,530	0,362	-0,062	0,140
376	Gmax	Combination	-142,090	-12,320	0,176	0,191	0,135
376	Gmax	Combination	-141,200	-7,870	0,309	-0,044	0,154
376	Gmax	Combination	-87,280	2,920	0,171	0,209	0,159
377	Gmax	Combination	-84,240	1,200	0,189	0,193	0,032
377	Gmax	Combination	-140,630	-10,080	0,307	-0,060	0,033
377	Gmax	Combination	-141,040	-12,110	0,641	0,284	0,031
377	Gmax	Combination	-84,650	-0,830	0,749	0,016	0,029
378	Gmax	Combination	-92,770	-2,270	-0,331	-0,002	0,189
378	Gmax	Combination	-92,400	-0,430	0,262	-0,069	0,122
378	Gmax	Combination	-61,880	5,680	0,213	0,198	0,105
378	Gmax	Combination	-62,240	3,830	-0,381	0,055	0,172
379	Gmax	Combination	1,570	3,200	-2,154	-1,738	-1,944
379	Gmax	Combination	0,390	-2,700	0,757	5,238	-1,116
379	Gmax	Combination	-2,300	-3,240	-0,569	-0,784	0,102
379	Gmax	Combination	-1,110	2,670	2,817	0,907	-0,727
380	Gmax	Combination	-0,063	-4,950	1,978	4,518	0,456
380	Gmax	Combination	0,670	-1,300	-0,024	6,359	0,096
380	Gmax	Combination	0,670	-1,300	-0,187	0,515	-1,341
380	Gmax	Combination	-0,058	-4,950	0,024	9,150	-0,982
381	Gmax	Combination	11,910	17,720	0,343	2,660	0,532
381	Gmax	Combination	8,730	1,820	0,183	-0,936	0,453
381	Gmax	Combination	1,920	0,460	-0,709	-0,925	0,260
381	Gmax	Combination	5,100	16,360	0,470	-0,683	0,338
382	Gmax	Combination	-0,670	-0,370	-0,093	0,051	0,253
382	Gmax	Combination	-5,790	-25,990	0,491	0,576	0,206
382	Gmax	Combination	3,540	-24,120	0,590	1,098	0,450

382	Gmax	Combination	8,660	1,500	-0,507	-1,590	0,497
383	Gmax	Combination	22,520	0,920	-0,316	0,214	0,100
383	Gmax	Combination	20,760	-7,840	0,732	0,068	0,056
383	Gmax	Combination	-3,120	-12,620	0,534	0,789	0,093
383	Gmax	Combination	-1,370	-3,860	-0,129	-0,133	0,137
384	Gmax	Combination	13,180	2,710	-0,718	-1,116	0,053
384	Gmax	Combination	-1,560	-71,000	-1,197	-6,544	0,113
384	Gmax	Combination	-27,970	-76,280	0,130	0,275	-0,121
384	Gmax	Combination	-13,230	-2,570	-0,562	-0,895	-0,180
385	Gmax	Combination	31,260	-18,580	0,686	0,615	-0,192
385	Gmax	Combination	39,580	23,010	-0,876	-0,337	-0,262
385	Gmax	Combination	16,310	18,360	1,131	5,099	0,014
385	Gmax	Combination	7,990	-23,230	-0,311	0,918	0,084
386	Gmax	Combination	3,380	-11,320	0,699	0,061	-0,009
386	Gmax	Combination	7,140	7,460	-1,149	-0,509	0,050
386	Gmax	Combination	37,690	13,570	-1,018	-1,051	-0,096
386	Gmax	Combination	33,940	-5,210	0,729	0,828	-0,156
387	Gmax	Combination	-2,520	-1,940	0,023	3,493	0,362
387	Gmax	Combination	-1,620	2,560	6,195	-0,069	-0,532
387	Gmax	Combination	0,730	3,030	-0,962	0,152	-1,413
387	Gmax	Combination	-0,180	-1,470	1,827	-0,193	-0,519
388	Gmax	Combination	4,970	16,330	-0,217	0,621	-0,221
388	Gmax	Combination	-24,320	10,470	-0,536	-1,462	-0,014
388	Gmax	Combination	-39,160	-63,680	0,229	-0,528	-0,299
388	Gmax	Combination	-9,860	-57,820	-1,218	-7,262	-0,507
389	Gmax	Combination	18,490	3,470	-0,768	0,312	0,094
389	Gmax	Combination	1,730	0,110	-0,353	-0,058	-0,090
389	Gmax	Combination	-0,440	-10,720	0,949	3,574	-0,743
389	Gmax	Combination	16,330	-7,360	0,225	1,046	-0,560
390	Gmax	Combination	0,140	-3,560	-0,861	0,064	-0,065
390	Gmax	Combination	17,800	-0,029	-0,811	0,097	-0,029
390	Gmax	Combination	18,410	3,060	-0,032	-0,237	-0,385
390	Gmax	Combination	0,760	-0,470	-0,349	-0,117	-0,421
391	Gmax	Combination	-4,200	35,400	-0,048	-0,015	0,007
391	Gmax	Combination	-13,070	-8,960	-0,205	-0,195	0,082
391	Gmax	Combination	8,010	-4,740	-0,002	-0,249	0,007
391	Gmax	Combination	16,880	39,620	0,027	0,100	-0,069
392	Gmax	Combination	-10,580	31,420	-0,019	0,106	-0,056
392	Gmax	Combination	-10,010	34,240	-0,036	-0,013	-0,054
392	Gmax	Combination	41,460	44,530	-0,020	0,091	-0,052
392	Gmax	Combination	40,900	41,720	-0,039	-0,046	-0,053
393	Gmax	Combination	-6,530	-11,930	0,395	-0,202	-0,045

As figuras 5.4 e 5.5 apresentam os momentos fletores nas lajes e paredes.

Figura 5.4 – Momento na direção X.

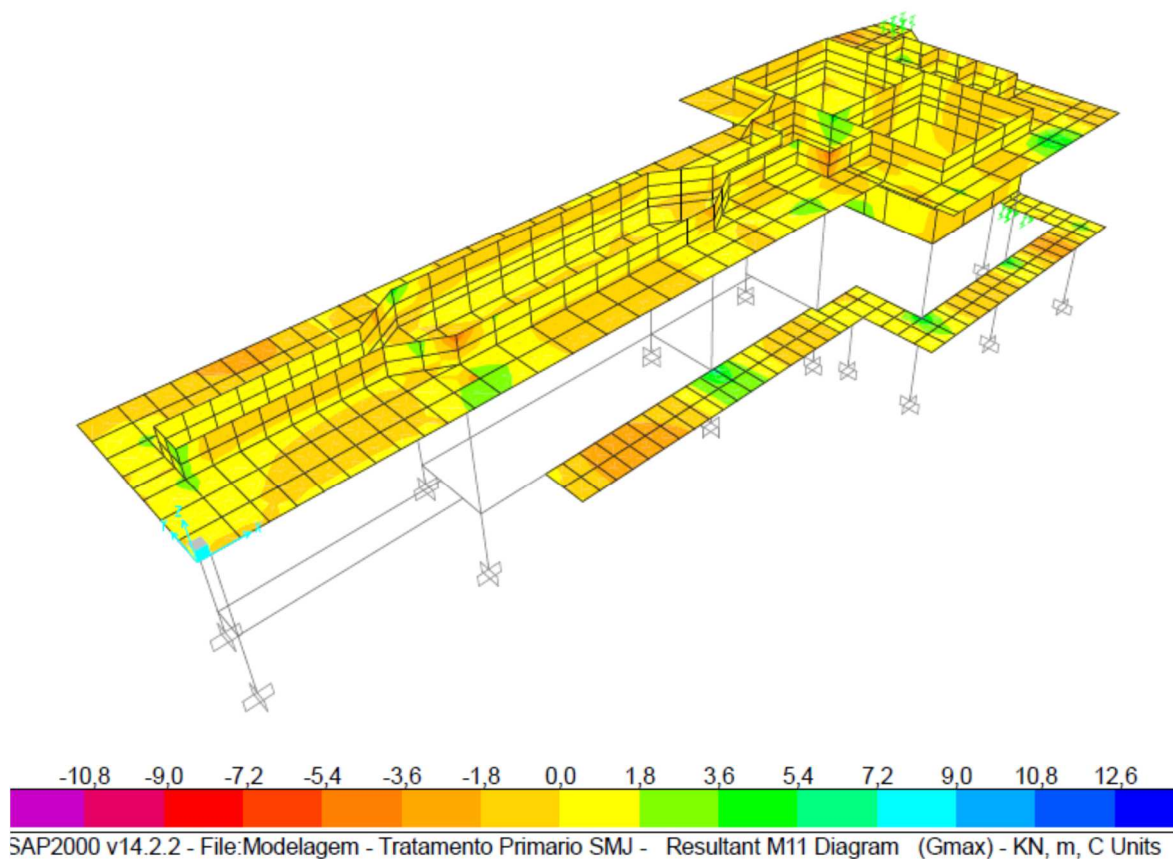
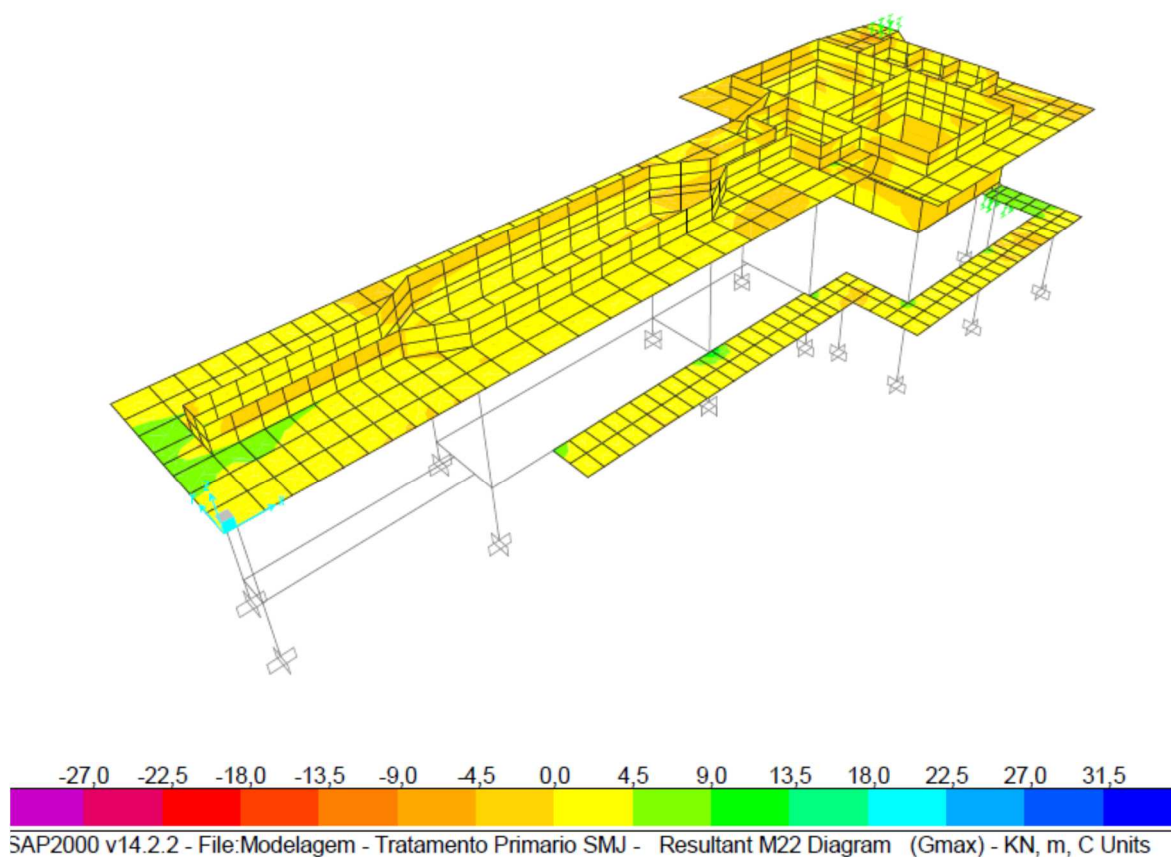


Figura 5.5 – Momento na direção Y.



5.3. ARMAÇÃO LAJES DE FUNDO

Conforme modelagem os esforços máximos nas lajes de fundo são:


$$\text{Laje } h=15\text{cm} \rightarrow \begin{cases} M_x = 20,04 \text{ kNm} \\ M_y = 19,87 \text{ kNm} \end{cases}$$

As figuras a seguir apresenta o resultados do dimensionamento

a) Direção x

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 20,04 kN.m
 $f_{ck} = 30,00$ MPa

 $h = 15$ cm
 $b = 100$ cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$

Adotaremos ϕ da armadura = 10,0 mm

Cobrimento da armadura = 4,00 mm

$d = 9,50$ cm

Adotar $d = 9,00$ cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,1616$$

Conforme tabela temos: $KMD = 0,1616 \rightarrow K_x = 0,1016$

$\rightarrow K_z = 0,957$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$A_s = \frac{M_d}{k_z \cdot d \cdot f_{yd}} = 7,49 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 2,25 \text{ cm}^2/\text{m} \\ 0,23\%bh = 3,45 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 2,59 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 7,49 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 10.0$ c/15 que equivale a 10,40 cm²/m.

b) Direção y

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 19,87 kN.m
 $f_{ck} = 30,00$ MPa

 $h = 15$ cm
 $b = 100$ cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$

Adotaremos ϕ da armadura = 10,0 mm

Cobrimento da armadura = 4,00 mm

$d = 9,50$ cm

Adotar $d = 9,00$ cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,1603$$

Conforme tabela temos: $KMD = 0,1603 \rightarrow K_x = 0,2630$

$\rightarrow K_z = 0,8948$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 7,94 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 2,25 \text{ cm}^2/\text{m} \\ 0,23\%bh = 3,45 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 2,59 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 7,94 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 10.0$ c/15 que equivale a 10,40 cm²/m.

5.4. ARMAÇÃO DAS PAREDES


Conforme modelagem os esforços máximos nas lajes de fundo são:

$$\text{Paredes } e=15\text{cm} \rightarrow \begin{cases} M_x = 20,55 \text{ kNm} \\ M_y = 21,15 \text{ kNm} \end{cases}$$

a) Direção x

1) PARÂMETROS DE ENTRADA

$$\begin{aligned} \text{Momento Fletor Máximo} &= 20,55 \text{ kN.m} \\ f_{ck} &= 30,00 \text{ MPa} \end{aligned}$$



$$\begin{aligned} h &= 15 \text{ cm} \\ b &= 100 \text{ cm} \end{aligned}$$

2) DETERMINAÇÃO DA ALTURA ÚTIL

$$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$$

$$\text{Adotaremos } \phi \text{ da armadura} = 10,0 \text{ mm}$$

$$\text{Cobrimento da armadura} = 4,00 \text{ mm}$$

$$d = 9,50 \text{ cm}$$

$$\text{Adotar } d = 9,00 \text{ cm}$$

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,1658$$

Conforme tabela temos: $KMD = 0,1658$

$$\rightarrow K_x = 0,2818$$

$$\rightarrow K_z = 0,8873$$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$A_s = \frac{M_d}{k_z \cdot d \cdot f_{yd}} = 8,29 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 2,25 \text{ cm}^2/\text{m} \\ 0,23\%bh = 3,45 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 2,59 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 8,29 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 10.0$ c/15 que equivale a 10,40 cm²/m.

b) Direção y

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 21,15 kN.m
fck = 30,00 MPa


h = 15 cm
b = 100 cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

d = altura total – cobrimento – 1,5Øarmadura

Adotaremos Ø da armadura = 10,0 mm

Cobrimento da armadura = 4,00 mm

d = 9,50 cm

Adotar d = 9,00 cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{bf \cdot d^2 \cdot f_{cd}} = 0,1706$$

Conforme tabela temos: $KMD = 0,1706 \rightarrow Kx = 0,2818$
 $\rightarrow Kz = 0,8873$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 8,53 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 2,25 \text{ cm}^2/\text{m} \\ 0,23\%bh = 3,45 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{vd}} = 2,59 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 8,53 cm²/m. Será utilizada armadura dupla (face superior e inferior) de Ø10.0 c/15 que equivale a 10,40 cm²/m.

5.5. ARMAÇÃO DA LAJE SUPERIOR

A laje superior será do tipo lisa em balanço engastada nas paredes. As figuras 5.6 e 5.7 apresentam os momentos fletores na laje superior.

Figura 5.6 – Momento na direção X laje superior.

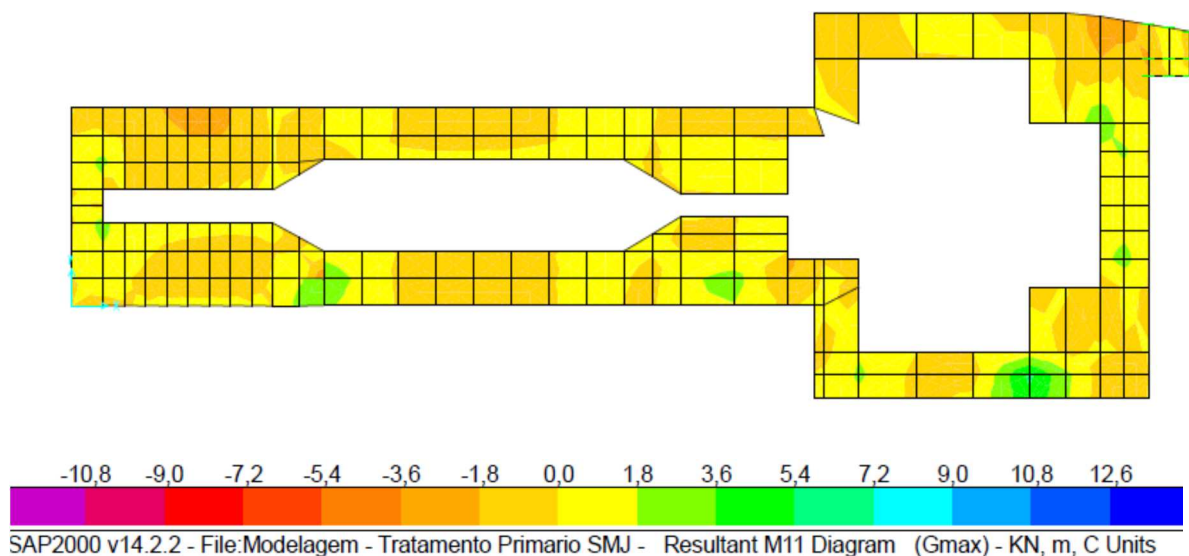
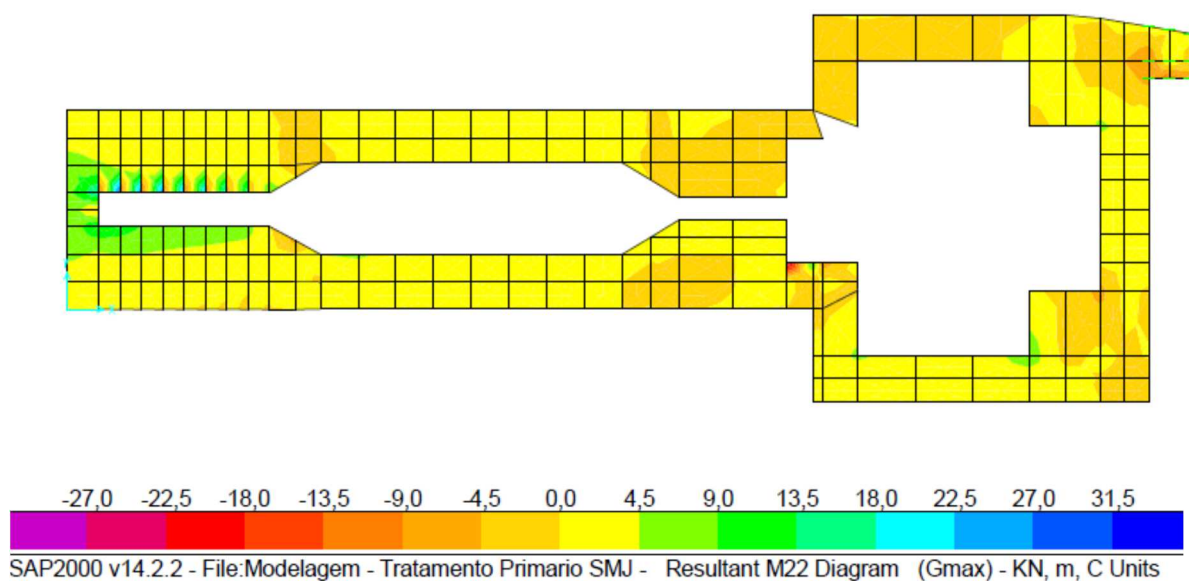


Figura 5.7 – Momento na direção Y laje superior.



Armadura de Flexão Negativa

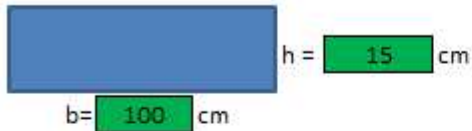
Conforme modelagem o esforço máximo de flexão no engaste do balanço da laje

$$M \rightarrow \begin{cases} M_x = 19,20 \text{ kNm} \\ M_y = 17,52 \text{ kNm} \end{cases}$$

a) Direção x

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 19,20 kN.m
fck = 30,00 MPa



2) DETERMINAÇÃO DA ALTURA ÚTIL

d = altura total – cobrimento – 1,5Øarmadura

Adotaremos Ø da armadura = 10,0 mm

Cobrimento da armadura = 4,00 mm

d = 9,50 cm

Adotar d = 9,00 cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{bf \cdot d^2 \cdot f_{cd}} = 0,1549$$

Conforme tabela temos: KMD = 0,1549

→ Kx = 0,2537

→ Kz = 0,8985

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 7,65 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 2,25 \text{ cm}^2/\text{m} \\ 0,23\%bh = 3,45 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 2,59 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 7,65 cm²/m. Será utilizada armadura dupla (face superior e inferior) de Ø10.0 c/10 que equivale a 7,80 cm²/m.

b) Direção y

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 17,52 kN.m
 $f_{ck} = 30,00$ MPa

 $h = 15$ cm
 $b = 100$ cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$

Adotaremos ϕ da armadura = 10,0 mm

Cobrimento da armadura = 4,00 mm

$d = 9,50$ cm

Adotar $d = 9,00$ cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,1413$$

Conforme tabela temos: $KMD = 0,1413$

$\rightarrow K_x = 0,2264$

$\rightarrow K_z = 0,9094$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$A_s = \frac{M_d}{k_z \cdot d \cdot f_{yd}} = 6,89 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 2,25 \text{ cm}^2/\text{m} \\ 0,23\%bh = 3,45 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 2,59 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 6,89 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 10.0$ c/10 que equivale a 7,80 cm²/m.

A armadura posivita será a ramadura mínima para combater a fissura de $\phi 5.0$ c/10

5.6. ARMAÇÃO DOS PILARES

A seguir será apresentada o dimensionamento dos pilares.

Pilar - TRATAMENTO PRIMARIO P-01

Cobrim. da Armadura = 4 cm $F_{ck} = 30$ MPa Aço CA-50 Diâm. Agreg.=19mm(Brita 1)

Coef. de Majoração: Gama F = 1,4 Gama C = 1,4 Gama S = 1,15

Dimensões do Pilar: Base =25 cm Altura =25 cm Área Total =625 cm²

Valor de $L_0 = 425$ cm Alturas: Viga Sup.=15 cm Viga Inf.=90 cm

Valor de $l_e = 477,5$ cm $\lambda_{Ed}(b) = 66,09$ $\lambda_{Ed}(h) = 66,09$

Esforços: $N = 10,06$ tf $M_{Ax} = 0,05$ tfm $M_{Bx} = 0,57$ tfm $M_{Ay} = 0$ tfm $M_{By} = 0$ tfm

$\alpha_B(b) = 1$ $\alpha_B(h) = 0,758842105263158$

Seção A : $\lambda_{bd}(b) = 35$ $\lambda_{bd}(h) = 46,12$

Seção B : $\lambda_{bd}(b) = 35$ $\lambda_{bd}(h) = 46,12$

A N A L I S E :



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Nd = 14,08 t

----- Seção A Direção b -----

Flexo-Compressão-Normal - Excentricidade accidental 1a.Ordem (mín.):Ea=2,25 cm

LambdaE = 66,09 > Lambda1 = 35 Efeito local de 2a ordem!

Ni = 0,105 - 1/r = 0,02 1/cm

Exc. Inicial = 0 cm

Exc. 2a ordem (Curv.Aprox.)= 6,81 cm

Rig. K Aprox.= 6,8179 - Exc. 2a ordem (Rig. Aprox.)= 5,13 cm

Exc. p/ dimensionamento = 5,13 cm

----- Seção A Direção h -----

Excentricidade accidental 1a.Ordem (mín.):Ea=2,25 cm

LambdaE = 66,09 > Lambda1 = 46,12 - Efeito local de 2a ordem:

Ni = 0,105 - 1/r = 0,02 1/cm

Exc. Inicial = 0,5 cm

Exc. 2a ordem (Curv.Aprox.)= 6,27 cm

Rig. K Aprox.= 6,2962 - Exc. 2a ordem (Rig. Aprox.)= 4,36 cm

Exc. p/ dimensionamento = 4,36 cm

----- Seção B Direção b -----

Flexo-Compressão-Normal - Excentricidade accidental 1a.Ordem (mín.):Ea=2,25 cm

LambdaE = 66,09 > Lambda1 = 35 - Efeito local de 2a ordem!

Ni = 0,105 - 1/r = 0,02 1/cm

Exc. Inicial = 0 cm

Exc. 2a ordem (Curv.Aprox.)= 6,81 cm

Rig. K Aprox.= 6,8179 - Exc. 2a ordem (Rig. Aprox.)= 5,13 cm

Exc. p/ dimensionamento = 5,13 cm

----- Seção B Direção h -----

Excentricidade accidental 1a.Ordem (mín.):Ea=2,25 cm

LambdaE = 66,09 > Lambda1 = 46,12 - Efeito local de 2a ordem:

Ni = 0,105 - 1/r = 0,02 1/cm

Exc. Inicial = 5,67 cm

Exc. 2a ordem (Curv.Aprox.)= 8,86 cm

Rig. K Aprox.= 8,5865 - Exc. 2a ordem (Rig. Aprox.)= 7,76 cm

Exc. p/ dimensionamento = 13,42 cm

===== Dimensionamento =====

Seção A - 1a Hipótese - FCN direção de b

Nd=14,08t, eb=5,13 cm (Mb = 0,72 t.m) e eh = 0 cm

2a Hipótese - FCN direção de h

Nd=14,08t, eb=0 cm, eh = 4,36 cm (Mh = 0,61 t.m)

=====

Seção B

3a Hipótese - FCN direção de b

Nd=14,08t, eb=5,13 cm (Mb = 0,72 t.m) e eh = 0 cm

4a Hipótese - FCN direção de h

Nd=14,08t, eb=0 cm, eh = 13,42 cm (Mh = 1,89 t.m)

=====

Ferragem - Resultado - Área de Cálculo (1a Hip.) = 2,5 cm² - Área de Cálculo (2a Hip.) = 2,5 cm²

Área de Cálculo (3a Hip.) = 2,5 cm² - Área de Cálculo (4a Hip.) = 2,5 cm²

Diâmetro : 12,5 mm - Ferragem distribuída : 4 ferros nos cantos

Ferros ao longo de b (de cada lado): 0 - Ferros ao longo de h (de cada lado): 0 -

Total de Ferros : 4 - Área do Total de Ferros : 4,91 Estribo - Diâmetro = 5 mm

espaçados a cada 15 cm

Pilar - TRATAMENTO PRIMARIO P-05

Cobrim. da Armadura = 4 cm Fck = 30 MPa Aço CA-50 Diâm.Agreg.=19mm(Brita 1)

Coef. de Majoração: Gama F = 1,4 Gama C = 1,4 Gama S = 1,15

Dimensões do Pilar: Base = 20 cm Altura = 56 cm Área Total = 1120 cm²

Valor de Lo = 335 cm Alturas: Viga Sup.=15 cm Viga Inf.=90 cm

Valor de le = 387,5 cm LambdaE(b) = 67,04 LambdaE(h) = 23,94

Esforços:N = 7,87 tf MAX = 0,05 tfm MBx = 0,57 tfm MAy = 0 tfm MBy = 0 tfm

AlfaB (b) = 1 AlfaB (h) = 0,775625263157895



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E-mail: engesolo@engesolo.com.br - www.engesolo.com.br

Seção A : $\lambda(b) = 35$ $\lambda(h) = 45,12$

Seção B : $\lambda(b) = 35$ $\lambda(h) = 45,12$

A N A L I S E :

$N_d = 11,02$ t

----- Seção A Direção b -----

Flexo-Compressão-Normal - Excentricidade accidental 1a.Ordem (mín.): $E_a = 2,1$ cm

$\lambda E = 67,04 > \lambda = 35$ Efeito local de 2a ordem!

$N_i = 0,046$ - $1/r = 0,025$ 1/cm

Exc. Inicial = 0 cm

Exc. 2a ordem (Curv.Aprox.) = 5,85 cm

Rig. K Aprox. = 3,1605 - Exc. 2a ordem (Rig. Aprox.) = 4,61 cm

Exc. p/ dimensionamento = 4,61 cm

----- Seção A Direção h -----

Excentricidade accidental 1a.Ordem (mín.): $E_a = 3,18$ cm

$\lambda E = 23,94$ - $\lambda = 45,12$ - $\lambda > \lambda E$: Desconsideração do efeito local de 2a. ordem!

Exc. Inicial = 0,64 cm

Exc. p/ dimensionamento = 3,18 cm

----- Seção B Direção b -----

Flexo-Compressão-Normal - Excentricidade accidental 1a.Ordem (mín.): $E_a = 2,1$ cm

$\lambda E = 67,04 > \lambda = 35$ - Efeito local de 2a ordem!

$N_i = 0,046$ - $1/r = 0,025$ 1/cm

Exc. Inicial = 0 cm

Exc. 2a ordem (Curv.Aprox.) = 5,85 cm

Rig. K Aprox. = 3,1605 - Exc. 2a ordem (Rig. Aprox.) = 4,61 cm

Exc. p/ dimensionamento = 4,61 cm

----- Seção B Direção h -----

Excentricidade accidental 1a.Ordem (mín.): $E_a = 3,18$ cm

$\lambda E = 23,94$ - $\lambda = 45,12$ - $\lambda > \lambda E$: Desconsideração do efeito local de 2a. ordem!

Exc. Inicial = 7,24 cm

Exc. p/ dimensionamento = 7,24 cm

===== Dimensionamento =====

Seção A - 1a Hipótese - FCN direção de b

$N_d = 11,02$ t, $e_b = 4,61$ cm ($M_b = 0,51$ t.m) e $e_h = 0$ cm

2a Hipótese - FCN direção de h

$N_d = 11,02$ t, $e_b = 0$ cm, $e_h = 3,18$ cm ($M_h = 0,35$ t.m)

Seção B

3a Hipótese - FCN direção de b

$N_d = 11,02$ t, $e_b = 4,61$ cm ($M_b = 0,51$ t.m) e $e_h = 0$ cm

4a Hipótese - FCN direção de h

$N_d = 11,02$ t, $e_b = 0$ cm, $e_h = 7,24$ cm ($M_h = 0,8$ t.m)

Ferragem - Resultado - Área de Cálculo (1a Hip.) = 4,48 cm² - Área de Cálculo (2a Hip.) = 4,48 cm²

Área de Cálculo (3a Hip.) = 4,48 cm² - Área de Cálculo (4a Hip.) = 4,48 cm²

Diâmetro : 10 mm - Ferragem distribuída : 4 ferros nos cantos

Ferros ao longo de b (de cada lado): 0 - Ferros ao longo de h (de cada lado): 1 -

Total de Ferros : 6 - Área do Total de Ferros : 4,71 Estribo - Diâmetro = 5 mm

espaçados a cada 12 cm

5.7. FUNDAÇÕES

A figura 5.8 apresenta o quadro de cargas dos pilares.

Figura 5.8 – Quadro de cargas tratamento primário.

PLANO DE CARGAS								
Pilar	Dimensões (cm)	Caso	Fx (kN)	Fy (kN)	Fz (kN)	Mx (kN.m)	My (kN.m)	Mz (kN.m)
P01	25x25	Gmax	1,77	0,86	57,95	-1,21	-1,17	0,07
		gmin	1,26	0,61	41,38	-0,87	-0,83	0,05
P02	25x25	Gmax	7,78	1,69	151,61	-1,98	-0,20	-0,08
		gmin	5,56	1,21	108,25	-1,41	-0,14	-0,05
P03	25x25	Gmax	-8,42	3,77	141,49	-1,43	0,72	0,01
		gmin	-6,01	2,69	101,02	-1,02	0,52	0,01
P04	25x25	Gmax	0,48	13,85	82,22	-3,94	0,70	-0,03
		gmin	0,34	9,89	58,70	-2,81	0,50	-0,02
P05	25x25	Gmax	-0,78	13,72	161,51	-12,05	-0,74	0,14
		gmin	-0,56	9,80	115,32	-8,61	-0,53	0,10
P06	25x25	Gmax	-1,83	16,27	141,34	-13,93	-1,26	-0,04
		gmin	-1,31	11,62	100,91	-9,95	-0,90	-0,03
P07	25x25	Gmax	-0,59	4,68	132,88	-6,29	-0,54	0,09
		gmin	-0,42	3,34	94,88	-4,49	-0,38	0,06
P08	25x25	Gmax	1,30	-0,76	62,47	0,24	0,52	0,02
		gmin	0,93	-0,55	44,60	0,17	0,37	0,02
P09	25x25	Gmax	6,91	-0,95	172,74	0,26	3,08	0,02
		gmin	4,93	-0,68	123,34	0,19	2,20	0,02
P10	25x25	Gmax	-3,96	-4,72	206,05	1,98	-1,69	0,00
		gmin	-2,83	-3,37	147,12	1,41	-1,21	0,00
P11	25x25	Gmax	-1,15	-0,92	115,97	0,06	-0,51	0,06
		gmin	-0,82	-0,66	82,80	0,04	-0,36	0,05
P11A	25x25	Gmax	-0,58	-0,29	7,29	-0,10	-0,47	0,11
		gmin	-0,41	-0,21	5,21	-0,07	-0,33	0,08
P12	25x25	Gmax	0,89	-1,02	204,82	0,46	0,98	0,14
		gmin	0,64	-0,73	146,24	0,33	0,70	0,10
P13	25x25	Gmax	-0,12	-1,20	162,99	-0,15	0,18	0,17
		gmin	-0,08	-0,86	116,37	-0,10	0,13	0,12
P14	25x25	Gmax	-0,49	1,98	127,55	-3,55	-0,50	0,03
		gmin	-0,35	1,42	91,07	-2,54	-0,36	0,02
P15	25x25	Gmax	-1,23	2,82	15,18	-3,86	-0,59	0,12
		gmin	-0,88	2,01	10,84	-2,76	-0,42	0,08

As fundações serão do tipo diretas em sapatas, cujo o dimensionamento será apresentado a seguir.

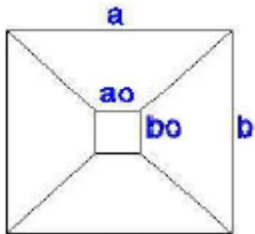
a) Sapatas Grupo I

DIMENSIONAMENTO DE SAPATAS ISOLADAS		
CLIENTE: ENGESOLO		
OBRA: TRATAMENTO PRIMÁRIO - ETE SANTA MARIA DE JETIBÁ		FOLHA 01/04
SAPATA: S01	SONDAGEM: SP 01	DATA: 20/06/2016

1) PARÂMETROS DE ENTRADA

Dimensões do pilar	ao =	25	cm
	bo =	25	cm
Esforços	N =	82,22	kN
	M =	3,94	kN.m
Tensão admissível	σ_{adm} =	2,00	kgf/cm ²
Concreto	fck =	30	MPa
Aço a ser utilizado	CA	50	
Cobrimento	c =	4,0	cm

Nota: Editar somente células verdes



2) DETERMINAÇÃO DAS DIMENSÕES EM PLANTA

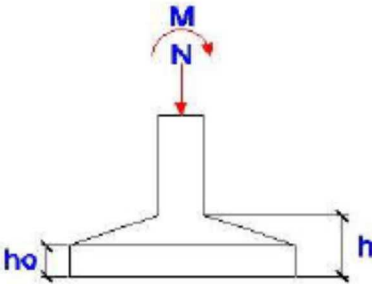
$$S = \frac{1,10N}{\sigma_{adm}} = 4522,1 \text{ cm}^2$$

$$a = \left(\frac{a_0 - b_0}{2} \right) + \sqrt{\frac{(a_0 - b_0)^2}{4} + S} = 67 \text{ cm}$$

$$b = \frac{S}{a_0} = 67 \text{ cm}$$

Adotar as dimensões superiores múltiplas de 5 cm

a = 80 cm
b = 80 cm



3) VERIFICAÇÃO DO TOMBAMENTO

3.1) Cálculo da Excentricidade

$$e = \frac{M}{N} = 0,05$$

Se $e \leq \frac{a}{6}$ não há tensões de tração na sapata e aforça normal se encontra no núcleo central, caso contrário deverá aumentar a e b

$$\frac{a}{6} = 13,33$$

3.2) Cálculo das Tensões Máximas e Mínimas

$$\left. \begin{matrix} \sigma_{max} \\ \sigma_{min} \end{matrix} \right\} = \frac{N}{S} \times \left(1 \pm \frac{6e}{a} \right) \Rightarrow \begin{matrix} \sigma_{max} = 1,75 \text{ kgf/cm}^2 \\ \sigma_{min} = 0,82 \text{ kgf/cm}^2 \end{matrix}$$

$$\begin{matrix} 1,3\sigma_{adm} = 2,60 \text{ kgf/cm}^2 \\ \frac{\sigma_{max} + \sigma_{min}}{2} = 1,28 \text{ kgf/cm}^2 \end{matrix}$$

Condições:

Se $\sigma_{max} \leq 1,3\sigma_{adm}$ e $\frac{\sigma_{max} + \sigma_{min}}{2} \leq \sigma_{adm}$ ok, caso contrário aumentar a e b

Valores finais das dimensões da sapata

a = 80 cm
b = 80 cm

DIMENSIONAMENTO DE SAPATAS ISOLADAS		
CLIENTE: ENGESOLO		
OBRA: TRATAMENTO PRIMÁRIO - ETE SANTA MARIA DE JETIBÁ		FOLHA 02/04
SAPATA: S01	SONDAGEM: SP 01	DATA: 20/06/2016

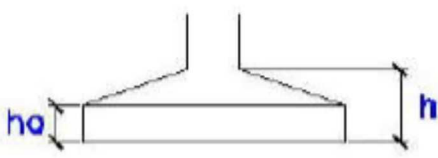
4) DETERMINAÇÃO DA ALTURA h

$$d \geq \begin{cases} \frac{a - a_0}{3} = 18,33 \text{ cm} \\ \frac{b - b_0}{3} = 18,33 \text{ cm} \\ 1,44 \sqrt{\frac{1,96 \times N}{0,85 f_{ck}}} = 11,45 \text{ cm} \end{cases}$$

Adotar $d = 19 \text{ cm}$

$h = d + \text{cobrimento} = 23,00 \text{ cm}$

Adotar $h = 25 \text{ cm}$



$h_0 = \frac{h}{3} = 8,33 \text{ cm}$
 Adotar $h_0 = 15 \text{ cm}$

5) DETERMINAÇÃO DA ARMADURA LONGITUDINAL

5.1) Cálculo do Momento Fletor

5.1.1) Direção Paralela a "a"

$$L_x = \frac{a - a_0}{2} = 0,28 \text{ m}$$

$$L_a = L_x + 0,15a_0 = 0,31 \text{ m}$$

Módulo de resistência a flexão

$$W = \frac{a^2 \times b}{6} = 0,08533 \text{ m}^3$$

Tensões máximas e mínimas

$$\begin{cases} \sigma_{max} = \frac{1,10 \times N_d}{S} + \frac{M_d}{W} \\ \sigma_{min} = \frac{1,10 \times N_d}{S} - \frac{M_d}{W} \end{cases}$$

$\sigma_{max} = 262,48 \text{ kN/m}^2$ $\sigma_{min} = 133,20 \text{ kN/m}^2$

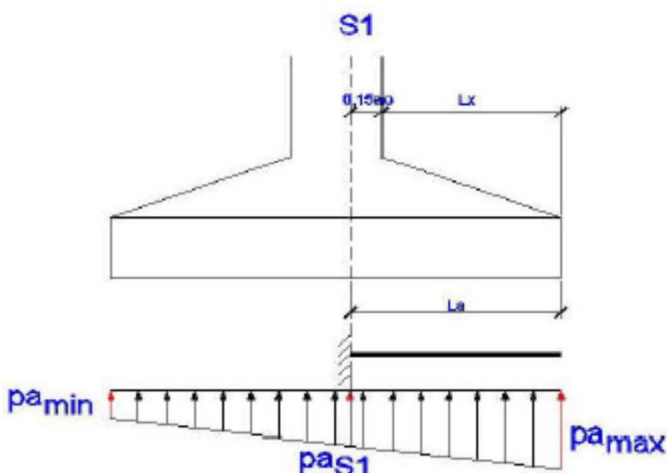
$pa_{max} = \sigma_{max} \times b = 209,99 \text{ kN/m}$ $pa_{min} = \sigma_{min} \times b = 106,56 \text{ kN/m}$

Por semelhança geométrica $pa_{s1} = 146,96 \text{ kN/m}$

Logo:

$$M_{sda} = \frac{pa_{s1} \cdot L_a^2}{2} + \left(\frac{\sigma_{max} - pa_{s1}}{2} \right) \times \frac{2}{3} L_a^2$$

$M_{sda} = 9,23 \text{ kN.m}$



DIMENSIONAMENTO DE SAPATAS ISOLADAS														
CLIENTE: ENGESOLO														
OBRA: TRATAMENTO PRIMÁRIO - ETE SANTA MARIA DE JETIBÁ	FOLHA 03/04													
SAPATA: S01	SONDAGEM: SP 01	DATA: 20/06/2016												
<p>5.1.2) Direção Paralela a "b"</p> $L_y = \frac{b - b_0}{2} = 0,28 \text{ m}$ $L_b = L_y + 0,15b_0 = 0,31 \text{ m}$ <p>Tensões máximas e mínimas</p> $\sigma_{max} = \sigma_{min} = \frac{\sigma_{max} + \sigma_{min}}{2} = 197,8 \text{ kN/m}^2$ $pb_{max} = pb_{min} = \sigma_{max} \times a = 158,3 \text{ kN/m}$ <p>Logo:</p> $M_{Sdb} = \frac{pb_{S1} \cdot L_b^2}{2} \qquad M_{Sdb} = 7,73 \text{ kN.m}$ <p>5.2) Cálculo da Armadura</p> <p>5.2.1) Direção Paralela a "a"</p> $A_{sa} = \frac{M_d}{0,8 \cdot d \cdot f_{yd}} = 1,95 \text{ cm}^2$ $A_{smin} = 0,15\% \cdot b \cdot h = 3,00 \text{ cm}^2$ <p>Será adotada, como base, a armadura de mínima se $A_{smin} > A_{sa}$</p> <p>Armadura adotada = 3,00 cm²</p> <p>Aço a ser utilizado:</p> <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Ø (mm)</th> <th>Nº de Barras</th> </tr> </thead> <tbody> <tr><td>8,0</td><td>6</td></tr> <tr><td>10,0</td><td>4</td></tr> <tr><td>12,5</td><td>3</td></tr> <tr><td>16,0</td><td>2</td></tr> <tr><td>20,0</td><td>1</td></tr> </tbody> </table> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>Ø da barra escolhida = 8</p> <p>Nº de Barras = 6</p> </div> <p>Avaliação do espaçamento</p> $s = \frac{b - 2(c + \phi_{barra})}{N^\circ \text{ de barras} - 1} = 14,08 \text{ cm}$ $s_{max} = \begin{cases} 20 \text{ cm} \\ 2 \cdot h = 50 \text{ cm} \end{cases}$ <p>Escolher o menor valor e comparar com s calculado: Se $s \leq s_{max}$ "ok" caso contrário escolher uma barra de maior diâmetro</p>			Ø (mm)	Nº de Barras	8,0	6	10,0	4	12,5	3	16,0	2	20,0	1
Ø (mm)	Nº de Barras													
8,0	6													
10,0	4													
12,5	3													
16,0	2													
20,0	1													

DIMENSIONAMENTO DE SAPATAS ISOLADAS

CLIENTE: ENGESOLO

OBRA: TRATAMENTO PRIMÁRIO - ETE SANTA MARIA DE JETIBÁ

FOLHA 04/04

SAPATA: S01

SONDA GEM: SP 01

DATA: 20/06/2016

5.2.2) Direção Paralela a "b"

$$A_{sb} = \frac{M_d}{0,8 \cdot d \cdot f_{yd}} = 1,33 \text{ cm}^2$$

$$A_{smin} = 0,15\% \cdot b \cdot h = 3,00 \text{ cm}^2$$

Será adotada, como base, a armadura de mínima se

$$A_{smin} > A_{sa}$$

 Armadura adotada = 3 cm²

Aço a ser utilizado:

Ø (mm)	Nº de Barras
8,0	6
10,0	4
12,5	3
16,0	2
20,0	1

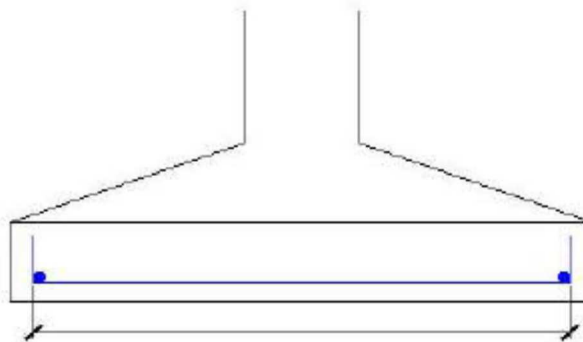
Ø da barra escolhida = 8
 Nº de Barras = 6

Avaliação do espaçamento

$$s = \frac{b - 2(c + \phi_{barra})}{N^{\circ} \text{ de barras} - 1} = 14,08 \text{ cm}$$

$$s_{max} = \begin{cases} 20 \text{ cm} \\ 2 \cdot h = 50 \text{ cm} \end{cases}$$

Escolher o menor valo e comparar com s calculado:

 Se $s \leq s_{max}$ "ok" caso contrário escolher uma barra de maior diâmetro


Direção a	6	Ø	8	C/	12	cm
Direção b	6	Ø	8	C/	11	cm

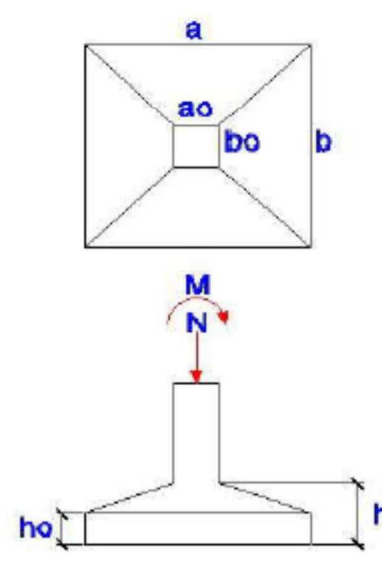
b) Sapatas Grupo II

DIMENSIONAMENTO DE SAPATAS ISOLADAS		
CLIENTE: ENGESOLO		
OBRA: TRATAMENTO PRIMÁRIO - ETE SANTA MARIA DE JETIBÁ		FOLHA 01/04
SAPATA: S02	SONDAGEM: SP 01	DATA: 20/06/2016

1) PARÂMETROS DE ENTRADA

Dimensões do pilar	ao =	25	cm
	bo =	25	cm
Esforços	N =	162,99	kN
	M =	0,18	kN.m
Tensão admissível	σ_{adm} =	2,00	kgf/cm ²
Concreto	fck =	30	MPa
Aço a ser utilizado	CA	50	
Cobrimento	c =	4,0	cm

Nota: Editar somente células verdes



2) DETERMINAÇÃO DAS DIMENSÕES EM PLANTA

$$S = \frac{1,10N}{\sigma_{adm}} = \frac{1,10 \times 162,99}{2,00} = 896,45 \text{ cm}^2$$

$$a = \left(\frac{a_0 - b_0}{2} \right) + \sqrt{\frac{(a_0 - b_0)^2}{4} + S} = 95 \text{ cm}$$

$$b = \frac{S}{a} = 95 \text{ cm}$$

Adotar as dimensões superiores múltiplas de 5 cm

$a = 100 \text{ cm}$
 $b = 100 \text{ cm}$

3) VERIFICAÇÃO DO TOMBAMENTO

3.1) Cálculo da Excentricidade

$$e = \frac{M}{N} = 0,00$$

Se $e \leq \frac{a}{6}$ não há tensões de tração na sapata e aforça normal se encontra no núcleo central, caso contrário deverá aumentar a e b

$$\frac{a}{6} = 16,67$$

3.2) Cálculo das Tensões Máximas e Mínimas

$$\left. \begin{matrix} \sigma_{max} \\ \sigma_{min} \end{matrix} \right\} = \frac{N}{S} \left(1 \pm \frac{6e}{a} \right) \Rightarrow \begin{matrix} \sigma_{max} = 1,64 \text{ kgf/cm}^2 \\ \sigma_{min} = 1,62 \text{ kgf/cm}^2 \end{matrix}$$

$$1,3\sigma_{adm} = 2,60 \text{ kgf/cm}^2$$

$$\frac{\sigma_{max} + \sigma_{min}}{2} = 1,63 \text{ kgf/cm}^2$$

Condições:

Se $\sigma_{max} \leq 1,3\sigma_{adm}$ e $\frac{\sigma_{max} + \sigma_{min}}{2} \leq \sigma_{adm}$ ok, caso contrário aumentar a e b

Valores finais das dimensões da sapata

$a = 100 \text{ cm}$
 $b = 100 \text{ cm}$

DIMENSIONAMENTO DE SAPATAS ISOLADAS

CLIENTE: ENGESOLO

OBRA: TRATAMENTO PRIMÁRIO - ETE SANTA MARIA DE JETIBÁ

FOLHA 02/04

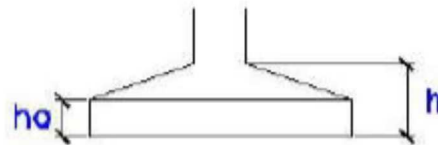
SAPATA: S02

SONDAGEM: SP 01

DATA: 20/06/2016

4) DETERMINAÇÃO DA ALTURA h

$$d \geq \begin{cases} \frac{a - a_0}{3} = 25,00 \text{ cm} \\ \frac{b - b_0}{3} = 25,00 \text{ cm} \\ 1,44 \sqrt{\frac{1,96 \times N}{0,85 f_{ck}}} = 16,12 \text{ cm} \end{cases}$$



Adotar $d = 25 \text{ cm}$

$h = d + \text{cobrimento} = 29,00 \text{ cm}$

$$h_0 = \frac{h}{3} = 10,00 \text{ cm}$$

Adotar $h = 30 \text{ cm}$

Adotar $h_0 = 15 \text{ cm}$

5) DETERMINAÇÃO DA ARMADURA LONGITUDINAL

5.1) Cálculo do Momento Fletor

5.1.1) Direção Paralela a "a"

$$L_x = \frac{a - a_0}{2} = 0,38 \text{ m}$$

$$L_a = L_x + 0,15a_0 = 0,41 \text{ m}$$

Módulo de resistência a flexão

$$W = \frac{a^2 \times b}{6} = 0,16667 \text{ m}^3$$

Tensões máximas e mínimas

$$\begin{cases} \sigma_{max} = \frac{1,10 \times N_d}{S} + \frac{M_d}{W} \\ \sigma_{min} = \frac{1,10 \times N_d}{S} - \frac{M_d}{W} \end{cases}$$

$$\sigma_{max} = 252,52 \text{ kN/m}^2$$

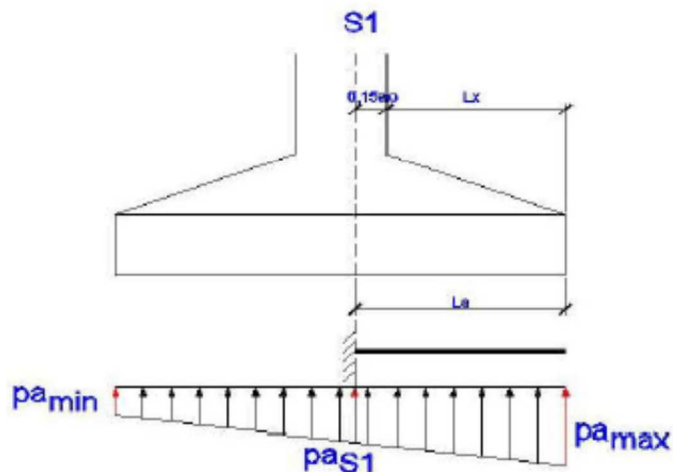
$$\sigma_{min} = 249,49 \text{ kN/m}^2$$

$$pa_{max} = \sigma_{max} \times b = 252,52 \text{ kN/m} \quad pa_{min} = \sigma_{min} \times b = 249,49 \text{ kN/m}$$

Por semelhança geométrica $pa_{s1} = 250,74 \text{ kN/m}$

Logo:

$$M_{sda} = \frac{pa_{s1} \cdot La^2}{2} + \left(\frac{\sigma_{max} - pa_{s1}}{2} \right) \times \frac{2}{3} La^2 \quad M_{sda} = 21,43 \text{ kN.m}$$



DIMENSIONAMENTO DE SAPATAS ISOLADAS														
CLIENTE: ENGESOLO														
OBRA: TRATAMENTO PRIMÁRIO - ETE SANTA MARIA DE JETIBÁ	FOLHA 03/04													
SAPATA: S02	SONDAGEM: SP 01	DATA: 20/06/2016												
<p>5.1.2) Direção Paralela a "b"</p> $L_y = \frac{b - b_0}{2} = 0,38 \text{ m}$ $L_b = L_y + 0,15b_0 = 0,41 \text{ m}$ <p>Tensões máximas e mínimas</p> $\sigma_{max} = \sigma_{min} = \frac{\sigma_{max} + \sigma_{min}}{2} = 251,0 \text{ kN/m}^2$ $pb_{max} = pb_{min} = \sigma_{max} \times a = 251,0 \text{ kN/m}$ <p>Logo:</p> $M_{sdb} = \frac{pb_{s1} \cdot L_b^2}{2} \quad M_{sdb} = 21,36 \text{ kN.m}$ <p>5.2) Cálculo da Armadura</p> <p>5.2.1) Direção Paralela a "a"</p> $A_{sa} = \frac{M_d}{0,8 \cdot d \cdot f_{yd}} = 3,45 \text{ cm}^2$ $A_{smin} = 0,15\% \cdot b \cdot h = 4,50 \text{ cm}^2$ <p>Será adotada, como base, a armadura de mínima se $A_{smin} > A_{sa}$</p> <p>Armadura adotada = 4,50 cm²</p> <p>Aço a ser utilizado:</p> <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Ø (mm)</th> <th>Nº de Barras</th> </tr> </thead> <tbody> <tr><td>8,0</td><td>9</td></tr> <tr><td>10,0</td><td>6</td></tr> <tr><td>12,5</td><td>4</td></tr> <tr><td>16,0</td><td>3</td></tr> <tr><td>20,0</td><td>2</td></tr> </tbody> </table> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>Ø da barra escolhida = 8</p> <p>Nº de Barras = 9</p> </div> <p>Avaliação do espaçamento</p> $s = \frac{b - 2(c + \phi_{barra})}{N^{\circ} \text{ de barras} - 1} = 11,30 \text{ cm}$ <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> $s_{max} = \begin{cases} 20 \text{ cm} \\ 2 \cdot h = 60 \text{ cm} \end{cases}$ </div> <div> <p>Escolher o menor valor e comparar com s calculado:</p> <p>Se $s \leq s_{max}$ "ok" caso contrário escolher uma barra de maior diâmetro</p> </div> </div>			Ø (mm)	Nº de Barras	8,0	9	10,0	6	12,5	4	16,0	3	20,0	2
Ø (mm)	Nº de Barras													
8,0	9													
10,0	6													
12,5	4													
16,0	3													
20,0	2													

DIMENSIONAMENTO DE SAPATAS ISOLADAS

CLIENTE: ENGESOLO

OBRA: TRATAMENTO PRIMÁRIO - ETE SANTA MARIA DE JETIBÁ

FOLHA 04/04

SAPATA: S02

SONDAÇÃO: SP 01

DATA: 20/06/2016

5.2.2) Direção Paralela a "b"

$$A_{sb} = \frac{M_d}{0,8 \cdot d \cdot f_{yd}} = 2,80 \text{ cm}^2$$

$$A_{smin} = 0,15\% \cdot b \cdot h = 4,50 \text{ cm}^2$$

Será adotada, como base, a armadura de mínima se

$$A_{smin} > A_{sa}$$

 Armadura adotada = 4,5 cm²

Aço a ser utilizado:

Ø (mm)	Nº de Barras
8,0	9
10,0	6
12,5	4
16,0	3
20,0	2

Ø da barra escolhida = 8

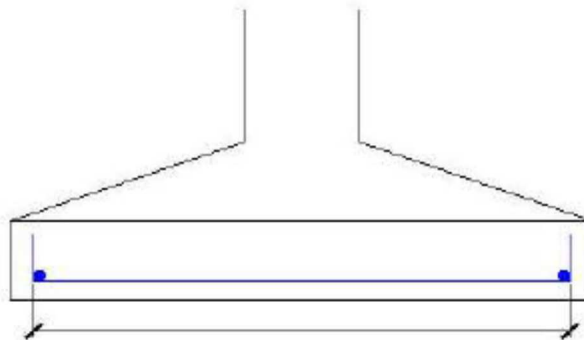
Nº de Barras = 9

Avaliação do espaçamento

$$s = \frac{b - 2(c + \phi_{barra})}{N^{\circ} \text{ de barras} - 1} = 11,30 \text{ cm}$$

$$s_{max} = \begin{cases} 20 \text{ cm} \\ 2 \cdot h = 60 \text{ cm} \end{cases}$$

Escolher o menor valor e comparar com s calculado:

 Se $s \leq s_{max}$ "ok" caso contrário escolher uma barra de maior diâmetro


Direção a	9	Ø	8	C/	10	cm
Direção b	9	Ø	8	C/	10	cm

c) Sapatas Grupo III

DIMENSIONAMENTO DE SAPATAS ISOLADAS		
CLIENTE: ENGESOLO		
OBRA: TRATAMENTO PRIMÁRIO - ETE SANTA MARIA DE JETIBÁ		FOLHA 01/04
SAPATA: S09	SONDAGEM: SP 01	DATA: 20/06/2016

1) PARÂMETROS DE ENTRADA

Dimensões do pilar

Esforços

Tensão admissível σ_{adm}

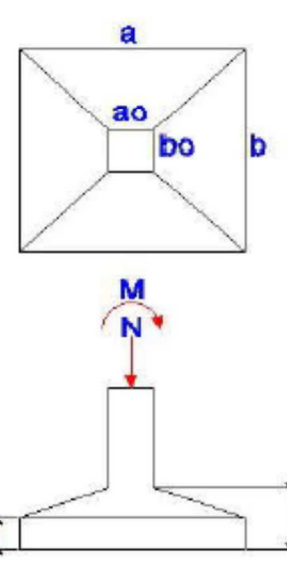
Concreto

Aço a ser utilizado

Cobrimento

Nota: Editar somente células verdes

$a_0 = 25 \text{ cm}$
 $b_0 = 25 \text{ cm}$
 $N = 206,05 \text{ kN}$
 $M = 1,98 \text{ kN.m}$
 $\sigma_{adm} = 2,00 \text{ kgf/cm}^2$
 $f_{ck} = 30 \text{ MPa}$
 $CA = 50$
 $c = 4,0 \text{ cm}$



2) DETERMINAÇÃO DAS DIMENSÕES EM PLANTA

$$S = \frac{1,10N}{\sigma_{adm}} = 11332,8 \text{ cm}^2$$

$$a = \left(\frac{a_0 - b_0}{2} \right) + \sqrt{\frac{(a_0 - b_0)^2}{4} + S} = 106 \text{ cm}$$

$$b = \frac{S}{a_0} = 106 \text{ cm}$$

Adotar as dimensões superiores múltiplas de 5 cm

$a = 110 \text{ cm}$
 $b = 110 \text{ cm}$

3) VERIFICAÇÃO DO TOMBAMENTO

3.1) Cálculo da Excentricidade

$$e = \frac{M}{N} = 0,01$$

Se $e \leq \frac{a}{6}$ não há tensões de tração na sapata e aforça normal se encontra no núcleo central, caso contrário deverá aumentar a e b

$$\frac{a}{6} = 18,33$$

3.2) Cálculo das Tensões Máximas e Mínimas

$$\left. \begin{matrix} \sigma_{max} \\ \sigma_{min} \end{matrix} \right\} = \frac{N}{S} \times \left(1 \pm \frac{6e}{a} \right) \Rightarrow \begin{matrix} \sigma_{max} = 1,79 \text{ kgf/cm}^2 \\ \sigma_{min} = 1,61 \text{ kgf/cm}^2 \end{matrix}$$

$$1,3\sigma_{adm} = 2,60 \text{ kgf/cm}^2$$

$$\frac{\sigma_{max} + \sigma_{min}}{2} = 1,70 \text{ kgf/cm}^2$$

Condições:

Se $\sigma_{max} \leq 1,3\sigma_{adm}$ e $\frac{\sigma_{max} + \sigma_{min}}{2} \leq \sigma_{adm}$ ok, caso contrário aumentar a e b

Valores finais das dimensões da sapata

$a = 110 \text{ cm}$
 $b = 110 \text{ cm}$

DIMENSIONAMENTO DE SAPATAS ISOLADAS														
CLIENTE: ENGESOLO														
OBRA: TRATAMENTO PRIMÁRIO - ETE SANTA MARIA DE JETIBÁ	FOLHA 03/04													
SAPATA: S09	SONDAGEM: SP 01	DATA: 20/06/2016												
<p>5.1.2) Direção Paralela a "b"</p> $L_y = \frac{b - b_0}{2} = 0,43 \text{ m}$ $L_b = L_y + 0,15b_0 = 0,46 \text{ m}$ <p>Tensões máximas e mínimas</p> $\sigma_{max} = \sigma_{min} = \frac{\sigma_{max} + \sigma_{min}}{2} = 262,2 \text{ kN/m}^2$ $pb_{max} = pb_{min} = \sigma_{max} \times a = 288,5 \text{ kN/m}$ <p>Logo:</p> $M_{Sdb} = \frac{pb_{S1} \cdot L_b^2}{2} \qquad M_{Sdb} = 30,85 \text{ kN.m}$ <p>5.2) Cálculo da Armadura</p> <p>5.2.1) Direção Paralela a "a"</p> $A_{sa} = \frac{M_d}{0,8 \cdot d \cdot f_{yd}} = 4,41 \text{ cm}^2$ $A_{smin} = 0,15\% \cdot b \cdot h = 5,78 \text{ cm}^2$ <p>Será adotada, como base, a armadura de mínima se $A_{smin} > A_{sa}$</p> <p>Armadura adotada = 5,78 cm²</p> <p>Aço a ser utilizado:</p> <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Ø (mm)</th> <th>Nº de Barras</th> </tr> </thead> <tbody> <tr><td>8,0</td><td>12</td></tr> <tr><td>10,0</td><td>8</td></tr> <tr><td>12,5</td><td>5</td></tr> <tr><td>16,0</td><td>3</td></tr> <tr><td>20,0</td><td>2</td></tr> </tbody> </table> <div style="margin-left: 20px;"> <p>Ø da barra escolhida = 10</p> <p>Nº de Barras = 8</p> </div> <p>Avaliação do espaçamento</p> $s = \frac{b - 2(c + \phi_{barra})}{N^\circ \text{ de barras} - 1} = 14,29 \text{ cm}$ $s_{max} = \begin{cases} 20 \text{ cm} \\ 2 \cdot h = 70 \text{ cm} \end{cases}$ <p>Escolher o menor valor e comparar com s calculado: Se $s \leq s_{max}$ "ok" caso contrário escolher uma barra de maior diâmetro</p>			Ø (mm)	Nº de Barras	8,0	12	10,0	8	12,5	5	16,0	3	20,0	2
Ø (mm)	Nº de Barras													
8,0	12													
10,0	8													
12,5	5													
16,0	3													
20,0	2													

DIMENSIONAMENTO DE SAPATAS ISOLADAS

CLIENTE: ENGESOLO

OBRA: TRATAMENTO PRIMÁRIO - ETE SANTA MARIA DE JETIBÁ

FOLHA 04/04

SAPATA: S09

SONDAGEM: SP 01

DATA: 20/06/2016

5.2.2) Direção Paralela a "b"

$$A_{sb} = \frac{M_d}{0,8 \cdot d \cdot f_{yd}} = 3,49 \text{ cm}^2$$

$$A_{smin} = 0,15\% \cdot b \cdot h = 5,78 \text{ cm}^2$$

Será adotada, como base, a armadura de mínima se

$$A_{smin} > A_{sa}$$

Armadura adotada = 5,78 cm²

Aço a ser utilizado:

Ø (mm)	Nº de Barras
8,0	12
10,0	8
12,5	5
16,0	3
20,0	2

Ø da barra escolhida = 10
Nº de Barras = 8

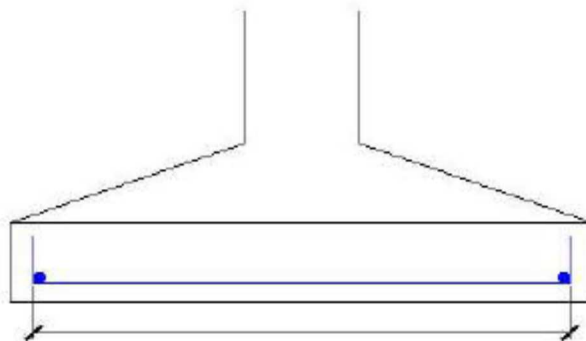
Avaliação do espaçamento

$$s = \frac{b - 2(c + \phi_{barra})}{N^{\circ} \text{ de barras} - 1} = 14,29 \text{ cm}$$

$$s_{max} = \begin{cases} 20 \text{ cm} \\ 2 \cdot h = 70 \text{ cm} \end{cases}$$

Escolher o menor valor e comparar com s calculado:

Se $s \leq s_{max}$ "ok" caso contrário escolher uma barra de maior diâmetro



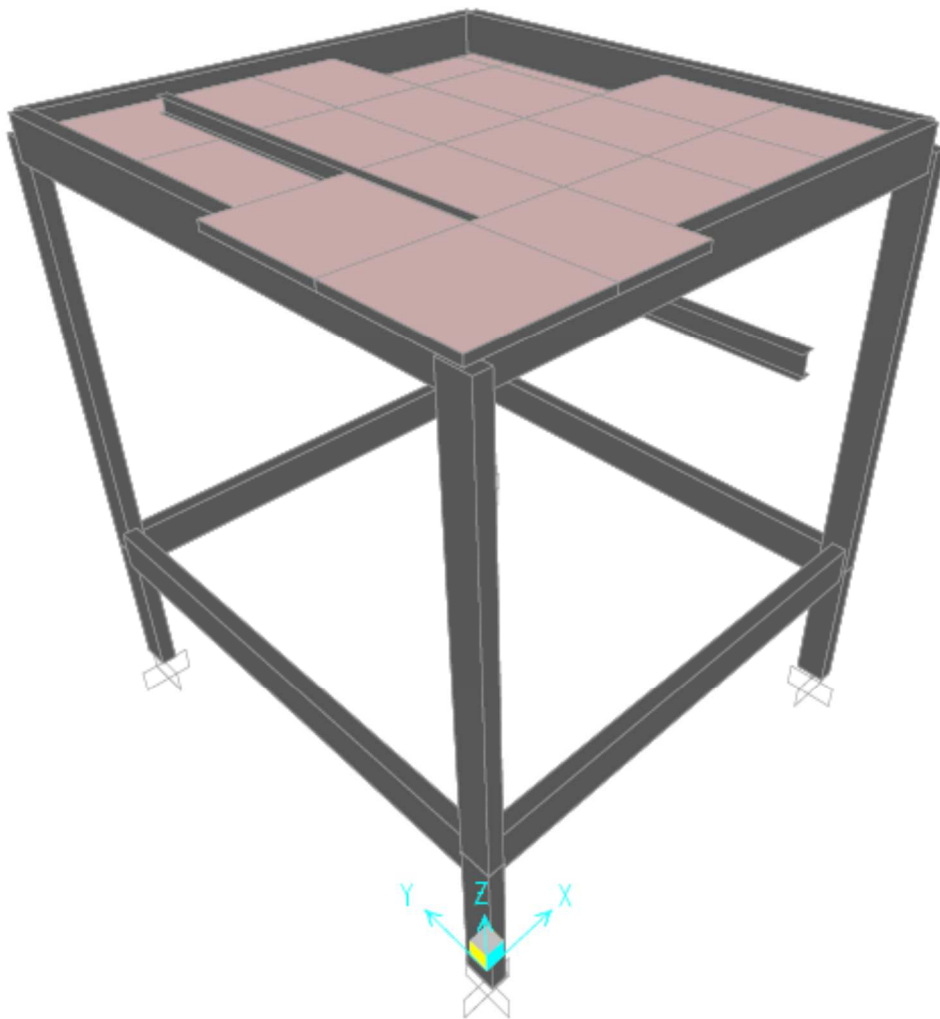
Direção a	8	Ø	10	C/	12	cm
Direção b	8	Ø	10	C/	12	cm

6. DIMENSIONAMENTO – CASA DE SOPRADORES

6.1. MODELAGEM ESTRUTURAL

A modelagem estrutural foi feita no software SAP-2000 considerando os parâmetros apresentados no item 2.

Figura 6.1 – Modelo estrutural 3D Casa de sopradores.



Os carregamentos utilizados no dimensionamento foram:

- Cargas Permanentes (CP)

Peso próprio

Alvenaria

Cobertura em telha de fibrocimento

- Sobrecargas (SC)

Sobrecarga de laje de piso (SCP)

Sobrecarga de laje de cobertura (SCC)

Carregamento da monovia (SCM)

Combinação para dimensionamento das barras

Comb 1: $1,4CP + 1,4SC$

Comb 2: $1,4CP + 1,4SC + 1,4SCP$

Comb 3: $1,4CP + 1,4SC + 1,4SCP + 1,4SCC$

Comb 4: $1,4CP + 1,4SC + 1,4SCCP + 1,4SCC + 1,4SCM$

6.2. RESULTADOS DA ANÁLISE ESTRUTURAL

Conforme informado no item anterior a análise estrutural foi feita utilizando o software SAP 2000. As tabelas a seguir apresentam os resultados do dimensionamento eletrônico.

Tabela 6.1 – Esforços.

Frame	Estrutura	Tipo de Estruturas	Status	Localização	Combinação	Situação
1	P1530	Column	No Messages	0,00	ENVOLTORIA	PASSA
1	P1530	Column	No Messages	0,75	ENVOLTORIA	PASSA
1	P1530	Column	No Messages	1,50	ENVOLTORIA	PASSA
2	P1530	Column	No Messages	0,00	ENVOLTORIA	PASSA
2	P1530	Column	No Messages	0,75	ENVOLTORIA	PASSA
2	P1530	Column	No Messages	1,50	ENVOLTORIA	PASSA
3	P1530	Column	No Messages	0,00	ENVOLTORIA	PASSA
3	P1530	Column	No Messages	0,75	ENVOLTORIA	PASSA
3	P1530	Column	No Messages	1,50	ENVOLTORIA	PASSA
4	P1530	Column	No Messages	0,00	ENVOLTORIA	PASSA
4	P1530	Column	No Messages	0,75	ENVOLTORIA	PASSA
4	P1530	Column	No Messages	1,50	ENVOLTORIA	PASSA
5	P1530	Column	No Messages	0,00	ENVOLTORIA	PASSA
5	P1530	Column	No Messages	2,12	ENVOLTORIA	PASSA
5	P1530	Column	No Messages	4,23	ENVOLTORIA	PASSA
6	P1530	Column	No Messages	0,00	ENVOLTORIA	PASSA
6	P1530	Column	No Messages	2,12	ENVOLTORIA	PASSA
6	P1530	Column	No Messages	4,23	ENVOLTORIA	PASSA

7	P1530	Column	No Messages	0,00	ENVOLTORIA	PASSA
7	P1530	Column	No Messages	2,12	ENVOLTORIA	PASSA
7	P1530	Column	No Messages	4,23	ENVOLTORIA	PASSA
8	P1530	Column	No Messages	0,00	ENVOLTORIA	PASSA
8	P1530	Column	No Messages	2,12	ENVOLTORIA	PASSA
8	P1530	Column	No Messages	4,23	ENVOLTORIA	PASSA
9	V1540	Beam	No Messages	0,00	ENVOLTORIA	PASSA
9	V1540	Beam	No Messages	0,47	ENVOLTORIA	PASSA
9	V1540	Beam	No Messages	0,95	ENVOLTORIA	PASSA
9	V1540	Beam	No Messages	1,42	ENVOLTORIA	PASSA
9	V1540	Beam	No Messages	1,89	ENVOLTORIA	PASSA
9	V1540	Beam	No Messages	2,36	ENVOLTORIA	PASSA
9	V1540	Beam	No Messages	2,84	ENVOLTORIA	PASSA
9	V1540	Beam	No Messages	3,31	ENVOLTORIA	PASSA
9	V1540	Beam	No Messages	3,78	ENVOLTORIA	PASSA
9	V1540	Beam	No Messages	4,25	ENVOLTORIA	PASSA
9	V1540	Beam	No Messages	4,73	ENVOLTORIA	PASSA
9	V1540	Beam	No Messages	5,20	ENVOLTORIA	PASSA
10	V1540	Beam	No Messages	0,00	ENVOLTORIA	PASSA
10	V1540	Beam	No Messages	0,47	ENVOLTORIA	PASSA
10	V1540	Beam	No Messages	0,95	ENVOLTORIA	PASSA
10	V1540	Beam	No Messages	1,42	ENVOLTORIA	PASSA
10	V1540	Beam	No Messages	1,89	ENVOLTORIA	PASSA
10	V1540	Beam	No Messages	2,36	ENVOLTORIA	PASSA
10	V1540	Beam	No Messages	2,84	ENVOLTORIA	PASSA
10	V1540	Beam	No Messages	3,31	ENVOLTORIA	PASSA
10	V1540	Beam	No Messages	3,78	ENVOLTORIA	PASSA
10	V1540	Beam	No Messages	4,25	ENVOLTORIA	PASSA
10	V1540	Beam	No Messages	4,73	ENVOLTORIA	PASSA
10	V1540	Beam	No Messages	5,20	ENVOLTORIA	PASSA
11	V1540	Beam	No Messages	0,00	ENVOLTORIA	PASSA
11	V1540	Beam	No Messages	0,49	ENVOLTORIA	PASSA
11	V1540	Beam	No Messages	0,97	ENVOLTORIA	PASSA
11	V1540	Beam	No Messages	1,46	ENVOLTORIA	PASSA
11	V1540	Beam	No Messages	1,94	ENVOLTORIA	PASSA
11	V1540	Beam	No Messages	2,43	ENVOLTORIA	PASSA
11	V1540	Beam	No Messages	2,91	ENVOLTORIA	PASSA
11	V1540	Beam	No Messages	3,40	ENVOLTORIA	PASSA
11	V1540	Beam	No Messages	3,88	ENVOLTORIA	PASSA
11	V1540	Beam	No Messages	4,37	ENVOLTORIA	PASSA
11	V1540	Beam	No Messages	4,85	ENVOLTORIA	PASSA
12	V1540	Beam	No Messages	0,00	ENVOLTORIA	PASSA

12	V1540	Beam	No Messages	0,49	ENVOLTORIA	PASSA
12	V1540	Beam	No Messages	0,97	ENVOLTORIA	PASSA
12	V1540	Beam	No Messages	1,46	ENVOLTORIA	PASSA
12	V1540	Beam	No Messages	1,94	ENVOLTORIA	PASSA
12	V1540	Beam	No Messages	2,43	ENVOLTORIA	PASSA
12	V1540	Beam	No Messages	2,91	ENVOLTORIA	PASSA
12	V1540	Beam	No Messages	3,40	ENVOLTORIA	PASSA
12	V1540	Beam	No Messages	3,88	ENVOLTORIA	PASSA
12	V1540	Beam	No Messages	4,37	ENVOLTORIA	PASSA
12	V1540	Beam	No Messages	4,85	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	0,00	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	0,43	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	0,87	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	1,30	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	1,30	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	1,73	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	2,17	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	2,60	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	2,60	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	3,03	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	3,47	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	3,90	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	3,90	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	4,33	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	4,77	ENVOLTORIA	PASSA
13	V1540	Beam	No Messages	5,20	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	0,00	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	0,43	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	0,87	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	1,30	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	1,30	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	1,73	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	2,17	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	2,60	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	2,60	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	3,03	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	3,47	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	3,90	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	3,90	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	4,33	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	4,77	ENVOLTORIA	PASSA
14	V1540	Beam	No Messages	5,20	ENVOLTORIA	PASSA

15	V1540	Beam	No Messages	0,00	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	0,41	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	0,82	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	1,23	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	1,23	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	1,68	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	2,14	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	2,14	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	2,59	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	3,04	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	3,04	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	3,49	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	3,95	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	3,95	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	4,40	ENVOLTORIA	PASSA
15	V1540	Beam	No Messages	4,85	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	0,00	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	0,41	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	0,82	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	1,23	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	1,23	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	1,68	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	2,14	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	2,14	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	2,59	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	3,04	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	3,04	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	3,49	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	3,95	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	3,95	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	4,40	ENVOLTORIA	PASSA
16	V1540	Beam	No Messages	4,85	ENVOLTORIA	PASSA

6.3. ARMAÇÃO DOS PILARES

A seguir será apresentada o dimensionamento dos pilares.

Pilar - CASA DE SOPRADORES P-01

Cobrim. da Armadura = 4 cm f_{ck} = 30 MPa Aço CA-50 Diâm.Agreg.=19mm(Brita 1)

Coef. de Majoração: Gama F = 1,4 Gama C = 1,4 Gama S = 1,15

Dimensões do Pilar: Base =30 cm Altura =15 cm Área Total =450 cm²

Valor de l_0 = 266 cm Alturas: Viga Sup.=15 cm Viga Inf.=90 cm

Valor de l_e = 318,5 cm $\lambda_{E(b)}$ = 55,1 $\lambda_{E(h)}$ = 55,1

Esforços: N = 6,89 tf MAX = 0,05 tfm MBx = 0,57 tfm MAY = 0 tfm MBy = 0 tfm

AlfaB (b) = 1 AlfaB (h) = 0,701536842105263



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E-mail: engesolo@engesolo.com.br - www.engesolo.com.br

Seção A : $\lambda_{bd1}(b) = 35$ $\lambda_{bd1}(h) = 49,89$

Seção B : $\lambda_{bd1}(b) = 35$ $\lambda_{bd1}(h) = 49,89$

A N A L I S E :

$N_d = 9,65$ t

----- Seção A Direção b -----

Flexo-Compressão-Normal - Excentricidade accidental 1a.Ordem (mín.): $E_a = 2,1$ cm

$\lambda_{bdaE} = 55,1 > \lambda_{bd1} = 35$ Efeito local de 2a ordem!

$N_i = 0,113$ - $1/r = 0,025$ 1/cm

Exc. Inicial = 0 cm

Exc. 2a ordem (Curv.Aprox.) = 4,64 cm

Rig. K Aprox. = 6,84 - Exc. 2a ordem (Rig. Aprox.) = 3,6 cm

Exc. p/ dimensionamento = 3,6 cm

----- Seção A Direção h -----

Excentricidade accidental 1a.Ordem (mín.): $E_a = 2,1$ cm

$\lambda_{bdaE} = 55,1 > \lambda_{bd1} = 49,89$ - Efeito local de 2a ordem:

$N_i = 0,113$ - $1/r = 0,025$ 1/cm

Exc. Inicial = 0,73 cm

Exc. 2a ordem (Curv.Aprox.) = 4,01 cm

Rig. K Aprox. = 6,0915 - Exc. 2a ordem (Rig. Aprox.) = 2,77 cm

Exc. p/ dimensionamento = 2,77 cm

----- Seção B Direção b -----

Flexo-Compressão-Normal - Excentricidade accidental 1a.Ordem (mín.): $E_a = 2,1$ cm

$\lambda_{bdaE} = 55,1 > \lambda_{bd1} = 35$ - Efeito local de 2a ordem!

$N_i = 0,113$ - $1/r = 0,025$ 1/cm

Exc. Inicial = 0 cm

Exc. 2a ordem (Curv.Aprox.) = 4,64 cm

Rig. K Aprox. = 6,84 - Exc. 2a ordem (Rig. Aprox.) = 3,6 cm

Exc. p/ dimensionamento = 3,6 cm

----- Seção B Direção h -----

Excentricidade accidental 1a.Ordem (mín.): $E_a = 2,1$ cm

$\lambda_{bdaE} = 55,1 > \lambda_{bd1} = 49,89$ - Efeito local de 2a ordem:

$N_i = 0,113$ - $1/r = 0,025$ 1/cm

Exc. Inicial = 8,27 cm

Exc. 2a ordem (Curv.Aprox.) = 8,34 cm

Rig. K Aprox. = 11,0492 - Exc. 2a ordem (Rig. Aprox.) = 8,27 cm

Exc. p/ dimensionamento = 16,55 cm

===== Dimensionamento =====

Seção A - 1a Hipótese - FCN direção de b

$N_d = 9,65$ t, $e_b = 3,6$ cm ($M_b = 0,35$ t.m) e $e_h = 0$ cm

2a Hipótese - FCN direção de h

$N_d = 9,65$ t, $e_b = 0$ cm, $e_h = 2,77$ cm ($M_h = 0,27$ t.m)

=====

Seção B

3a Hipótese - FCN direção de b

$N_d = 9,65$ t, $e_b = 3,6$ cm ($M_b = 0,35$ t.m) e $e_h = 0$ cm

4a Hipótese - FCN direção de h

$N_d = 9,65$ t, $e_b = 0$ cm, $e_h = 16,55$ cm ($M_h = 1,6$ t.m)

=====

Ferragem - Resultado - Área de Cálculo (1a Hip.) = 1,6 cm² - Área de Cálculo (2a Hip.) = 1,6 cm²

Área de Cálculo (3a Hip.) = 1,6 cm² - Área de Cálculo (4a Hip.) = 3,04 cm²

Diâmetro : 10 mm - Ferragem distribuída : 4 ferros nos cantos

Ferros ao longo de b (de cada lado): 0 - Ferros ao longo de h (de cada lado): 0 -

Total de Ferros : 4 - Área do Total de Ferros : 3,14 Estribo - Diâmetro = 5 mm

espaçados a cada 12 cm

6.4. FUNDAÇÕES

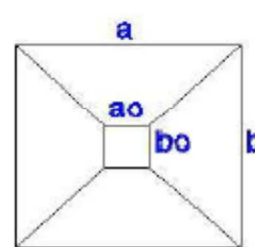
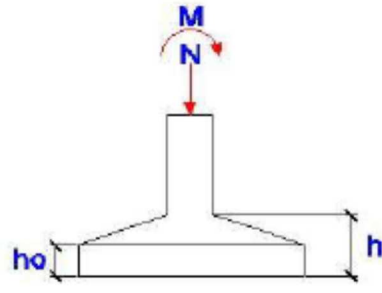
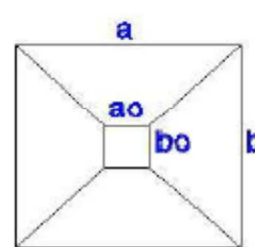
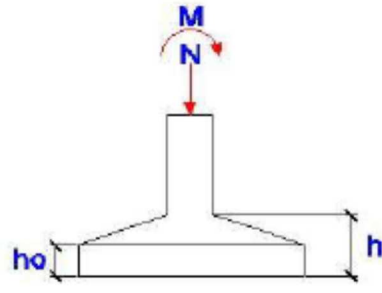
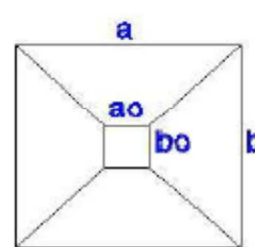
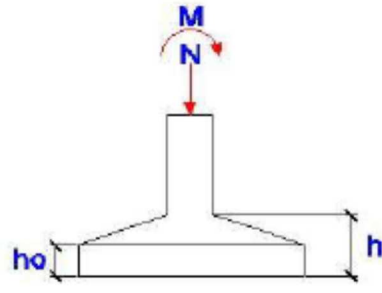
A figura 6.2 apresenta o quadro de cargas dos pilares.

Figura 6.2 – Quadro de cargas casa de operação.

PLANO DE CARGAS								
Pilar	Dimensões (cm)	Caso	Fx (kN)	Fy (kN)	Fz (kN)	Mx (kN.m)	My (kN.m)	Mz (kN.m)
P01	15x30	Gmax	5,08	-6,99	103,05	3,23	2,50	0,00
		gmin	3,63	-4,99	73,58	2,31	1,78	0,00
P02	15x30	Gmax	-5,10	-7,90	90,88	3,68	-2,51	0,00
		gmin	-3,64	-5,64	64,89	2,62	-1,79	0,00
P03	15x30	Gmax	4,93	7,00	115,34	-3,34	2,43	0,00
		gmin	3,52	5,00	82,35	-2,38	1,73	0,00
P04	15x30	Gmax	-4,92	7,89	94,96	-3,69	-2,41	0,00
		gmin	-3,51	5,63	67,80	-2,63	-1,72	0,00

As fundações serão do tipo diretas em sapatas, cujo o dimensionamento será apresentado a seguir.

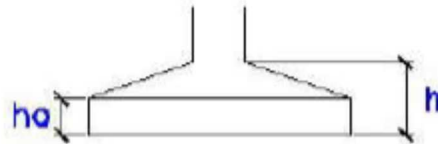
a) Sapatas Grupo I

DIMENSIONAMENTO DE SAPATAS ISOLADAS																																			
CLIENTE: ENGESOLO																																			
OBRA: CASA DOS SOPRADORES - ETE SANTA MARIA DE JETIBÁ		FOLHA 01/04																																	
SAPATA: S01	SONDAGEM: SP 05	DATA: 01/06/2016																																	
1) PARÂMETROS DE ENTRADA <div style="float: right; font-size: small;">Nota: Editar somente células verdes</div> <div style="clear: both;"></div> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">Dimensões do pilar</td> <td style="width: 10%;">ao =</td> <td style="width: 10%; background-color: #90EE90;">30</td> <td style="width: 10%;">cm</td> <td rowspan="4" style="width: 40%; text-align: center; vertical-align: middle;">  </td> </tr> <tr> <td></td> <td>bo =</td> <td style="background-color: #90EE90;">15</td> <td>cm</td> </tr> <tr> <td rowspan="2">Esforços</td> <td>N =</td> <td style="background-color: #90EE90;">115,34</td> <td>kN</td> </tr> <tr> <td>M =</td> <td style="background-color: #90EE90;">3,34</td> <td>kN.m</td> </tr> <tr> <td>Tensão admissível</td> <td>σ_{adm} =</td> <td style="background-color: #90EE90;">1,60</td> <td>kgf/cm²</td> </tr> <tr> <td>Concreto</td> <td>fck =</td> <td style="background-color: #90EE90;">30</td> <td>MPa</td> <td rowspan="3" style="text-align: center; vertical-align: middle;">  </td> </tr> <tr> <td>Aço a ser utilizado</td> <td>CA =</td> <td style="background-color: #90EE90;">50</td> <td></td> </tr> <tr> <td>Cobrimento</td> <td>c =</td> <td style="background-color: #90EE90;">4,0</td> <td>cm</td> </tr> </table>			Dimensões do pilar	ao =	30	cm			bo =	15	cm	Esforços	N =	115,34	kN	M =	3,34	kN.m	Tensão admissível	σ_{adm} =	1,60	kgf/cm ²	Concreto	fck =	30	MPa		Aço a ser utilizado	CA =	50		Cobrimento	c =	4,0	cm
Dimensões do pilar	ao =	30	cm																																
	bo =	15	cm																																
Esforços	N =	115,34	kN																																
	M =	3,34	kN.m																																
Tensão admissível	σ_{adm} =	1,60	kgf/cm ²																																
Concreto	fck =	30	MPa																																
Aço a ser utilizado	CA =	50																																	
Cobrimento	c =	4,0	cm																																
2) DETERMINAÇÃO DAS DIMENSÕES EM PLANTA <div style="float: right; font-size: small;">Nota: Editar somente células verdes</div> <div style="clear: both;"></div> $S = \frac{1,10N}{\sigma_{adm}} = \frac{1,10 \times 115,34}{1,60} = 7929,63 \text{ cm}^2$ $a = \left(\frac{a_0 - b_0}{2} \right) + \sqrt{\left(\frac{a_0 - b_0}{2} \right)^2 + S} = 97 \text{ cm}$ $b = \frac{S}{a} = 82 \text{ cm}$ <p>Adotar as dimensões superiores múltiplas de 5 cm</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">a =</td> <td style="width: 10%; background-color: #90EE90;">100</td> <td style="width: 10%;">cm</td> <td rowspan="2" style="width: 50%;"></td> </tr> <tr> <td>b =</td> <td style="background-color: #90EE90;">85</td> <td>cm</td> </tr> </table>			a =	100	cm		b =	85	cm																										
a =	100	cm																																	
b =	85	cm																																	
3) VERIFICAÇÃO DO TOMBAMENTO																																			
3.1) Cálculo da Excentricidade																																			
$e = \frac{M}{N} = 0,03$	Se $e \leq \frac{a}{6}$ não há tensões de tração na sapata e aforça normal se																																		
$\frac{a}{6} = 16,67$	encontra no núcleo central, caso contrário deverá aumentar a e b																																		
3.2) Cálculo das Tensões Máximas e Mínimas																																			
$\sigma_{max} = \frac{N}{S} \times \left(1 + \frac{6e}{a} \right)$	$\sigma_{max} = 1,59$	kgf/cm ²																																	
$\sigma_{min} = \frac{N}{S} \times \left(1 - \frac{6e}{a} \right)$	$\sigma_{min} = 1,12$	kgf/cm ²																																	
	$1,3\sigma_{adm} = 2,08$	kgf/cm ²																																	
	$\frac{\sigma_{max} + \sigma_{min}}{2} = 1,36$	kgf/cm ²																																	
Condições:																																			
Se $\sigma_{max} \leq 1,3\sigma_{adm}$ e $\frac{\sigma_{max} + \sigma_{min}}{2} \leq \sigma_{adm}$ ok, caso contrário aumentar a e b																																			
Valores finais das dimensões da sapata																																			
a =	100	cm																																	
b =	85	cm																																	

DIMENSIONAMENTO DE SAPATAS ISOLADAS		
CLIENTE: ENGESOLO		
OBRA: CASA DOS SOPRADORES - ETE SANTA MARIA DE JETIBÁ		FOLHA 02/04
SAPATA: S01	SONDAGEM: SP 05	DATA: 01/06/2016

4) DETERMINAÇÃO DA ALTURA h

$$d \geq \begin{cases} \frac{a - a_0}{3} = 23,33 \text{ cm} \\ \frac{b - b_0}{3} = 23,33 \text{ cm} \\ 1,44 \sqrt{\frac{1,96 \times N}{0,85 f_{ck}}} = 13,56 \text{ cm} \end{cases}$$



Adotar $d = 24 \text{ cm}$

$h = d + \text{cobrimento} = 28,00 \text{ cm}$

Adotar $h = 30 \text{ cm}$

$h_0 = \frac{h}{3} = 10,00 \text{ cm}$

Adotar $h_0 = 15 \text{ cm}$

5) DETERMINAÇÃO DA ARMADURA LONGITUDINAL

5.1) Cálculo do Momento Fletor

5.1.1) Direção Paralela a "a"

$Lx = \frac{a - a_0}{2} = 0,35 \text{ m}$

$La = Lx + 0,15a_0 = 0,40 \text{ m}$

Módulo de resistência a flexão

$W = \frac{a^2 \times b}{6} = 0,14167 \text{ m}^3$

Tensões máximas e mínimas

$$\begin{cases} \sigma_{max} = \frac{1,10 \times N_d}{S} + \frac{M_d}{W} \\ \sigma_{min} = \frac{1,10 \times N_d}{S} - \frac{M_d}{W} \end{cases}$$

$\sigma_{max} = 241,98 \text{ kN/m}^2$

$\sigma_{min} = 175,96 \text{ kN/m}^2$

$pa_{max} = \sigma_{max} \times b = 205,68 \text{ kN/m}$

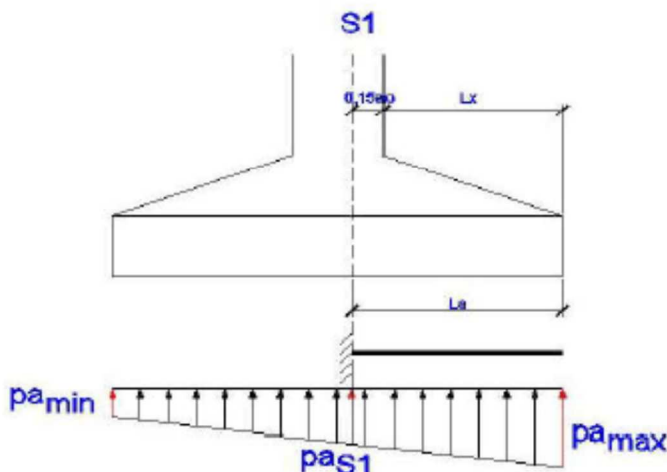
$pa_{min} = \sigma_{min} \times b = 149,57 \text{ kN/m}$

Por semelhança geométrica $pa_{s1} = 171,73 \text{ kN/m}$

Logo:

$M_{sda} = \frac{pa_{s1} \cdot La^2}{2} + \left(\frac{\sigma_{max} - pa_{s1}}{2} \right) \times \frac{2}{3} La^2$

$M_{sda} = 15,16 \text{ kN.m}$



DIMENSIONAMENTO DE SAPATAS ISOLADAS														
CLIENTE: ENGESOLO														
OBRA: CASA DOS SOPRADORES - ETE SANTA MARIA DE JETIBÁ		FOLHA 03/04												
SAPATA: S01	SONDAGEM: SP 05	DATA: 01/06/2016												
<p>5.1.2) Direção Paralela a "b"</p> $L_y = \frac{b - b_0}{2} = 0,35 \text{ m}$ $L_b = L_y + 0,15b_0 = 0,37 \text{ m}$ <p>Tensões máximas e mínimas</p> $\sigma_{max} = \sigma_{min} = \frac{\sigma_{max} + \sigma_{min}}{2} = 209,0 \text{ kN/m}^2$ $pb_{max} = pb_{min} = \sigma_{max} \times a = 209,0 \text{ kN/m}$ <p>Logo:</p> $M_{Sdb} = \frac{pb_{S1} \cdot L_b^2}{2} \qquad M_{Sdb} = 14,50 \text{ kN.m}$ <p>5.2) Cálculo da Armadura</p> <p>5.2.1) Direção Paralela a "a"</p> $A_{sa} = \frac{M_d}{0,8 \cdot d \cdot f_{yd}} = 2,54 \text{ cm}^2$ $A_{smin} = 0,15\% \cdot b \cdot h = 3,83 \text{ cm}^2$ <p>Será adotada, como base, a armadura de mínima se $A_{smin} > A_{sa}$</p> <p>Armadura adotada = 3,83 cm²</p> <p>Aço a ser utilizado:</p> <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Ø (mm)</th> <th>Nº de Barras</th> </tr> </thead> <tbody> <tr><td>8,0</td><td>8</td></tr> <tr><td>10,0</td><td>5</td></tr> <tr><td>12,5</td><td>4</td></tr> <tr><td>16,0</td><td>2</td></tr> <tr><td>20,0</td><td>2</td></tr> </tbody> </table> <div style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>Ø da barra escolhida = 10</p> <p>Nº de Barras = 5</p> </div> <p>Avaliação do espaçamento</p> $s = \frac{b - 2(c + \phi_{barra})}{N^\circ \text{ de barras} - 1} = 18,75 \text{ cm}$ $s_{max} = \begin{cases} 20 \text{ cm} \\ 2 \cdot h = 60 \text{ cm} \end{cases}$ <p>Escolher o menor valor e comparar com s calculado: Se $s \leq s_{max}$ "ok" caso contrário escolher uma barra de maior diâmetro</p>			Ø (mm)	Nº de Barras	8,0	8	10,0	5	12,5	4	16,0	2	20,0	2
Ø (mm)	Nº de Barras													
8,0	8													
10,0	5													
12,5	4													
16,0	2													
20,0	2													

DIMENSIONAMENTO DE SAPATAS ISOLADAS

CLIENTE: ENGESOLO

OBRA: CASA DOS SOPRADORES - ETE SANTA MARIA DE JETIBÁ

FOLHA 04/04

SAPATA: S01

SONDAGEM: SP 05

DATA: 01/06/2016

5.2.2) Direção Paralela a "b"

$$A_{sb} = \frac{M_d}{0,8 \cdot d \cdot f_{yd}} = 1,98 \text{ cm}^2$$

$$A_{smin} = 0,15\% \cdot b \cdot h = 4,50 \text{ cm}^2$$

Será adotada, como base, a armadura de mínima se

$$A_{smin} > A_{sa}$$

 Armadura adotada = 4,5 cm²

Aço a ser utilizado:

Ø (mm)	Nº de Barras
8,0	9
10,0	6
12,5	4
16,0	3
20,0	2

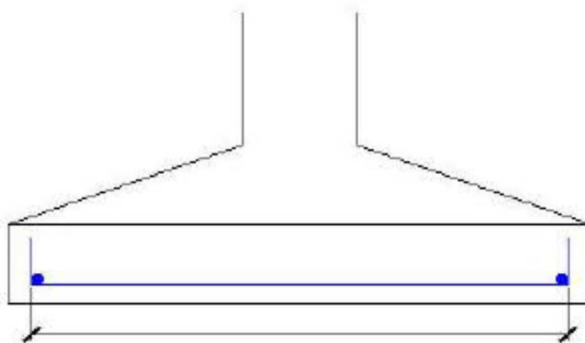
Ø da barra escolhida = 10
 Nº de Barras = 6

Avaliação do espaçamento

$$s = \frac{b - 2(c + \phi_{barra})}{N^{\circ} \text{ de barras} - 1} = 18,00 \text{ cm}$$

$$s_{max} = \begin{cases} 20 \text{ cm} \\ 2 \cdot h = 60 \text{ cm} \end{cases}$$

Escolher o menor valor e comparar com s calculado:

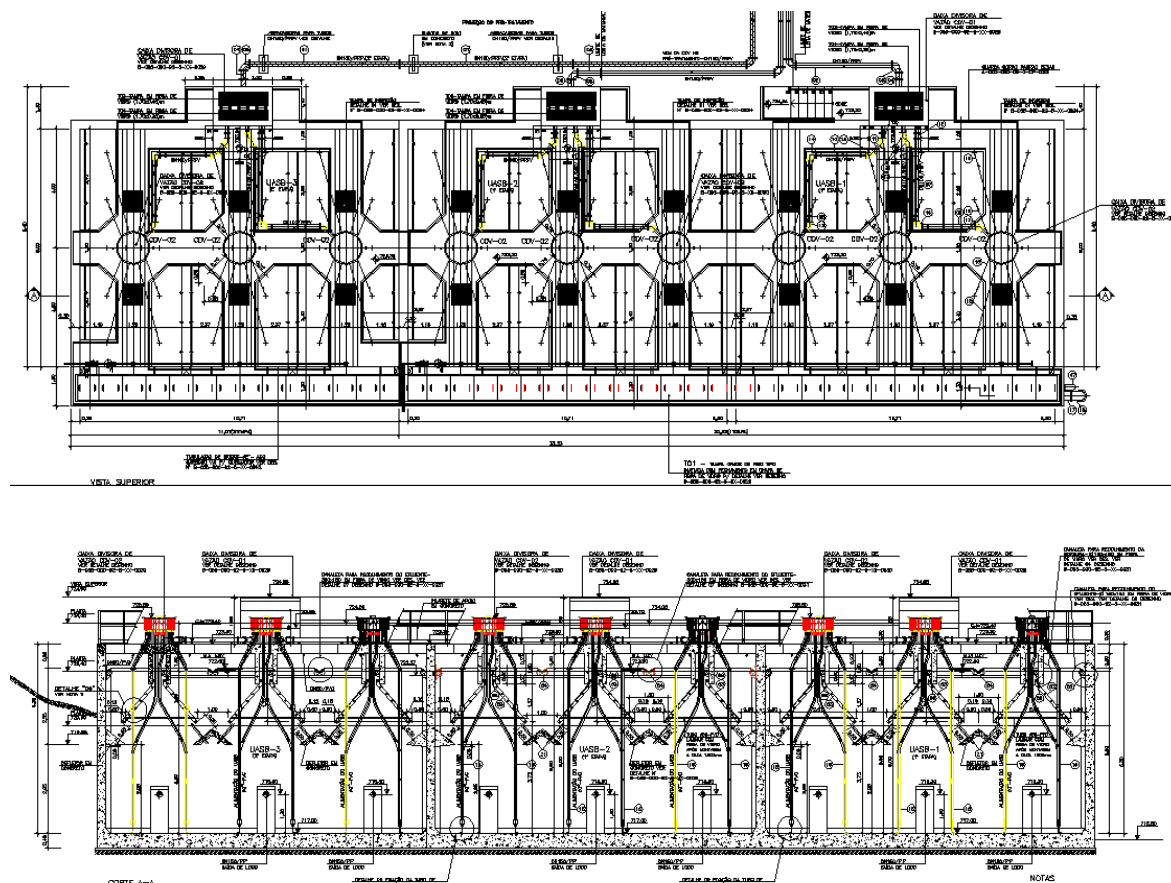
 Se $s \leq s_{max}$ "ok" caso contrário escolher uma barra de maior diâmetro


Direção a	5	Ø	10	C/	15	cm
Direção b	6	Ø	10	C/	15	cm

7. DIMENSIONAMENTO – UASB

7.1. MODELAGEM ESTRUTURAL

A figura 7.1 apresenta as dimensões em planta e corte da UASB.



A modelagem estrutural foi feita no software SAP-2000 (figuras 7.2 e 7.3) considerando os parâmetros apresentados no item 2.

Figura 7.2 – Modelo estrutural 3D – Vista 1.

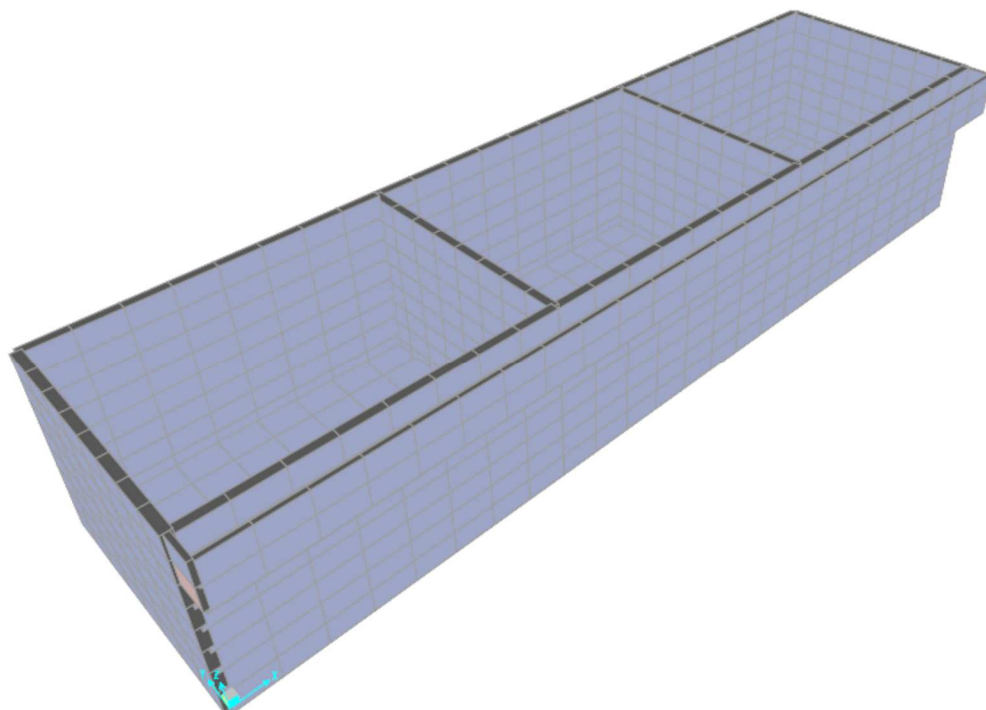
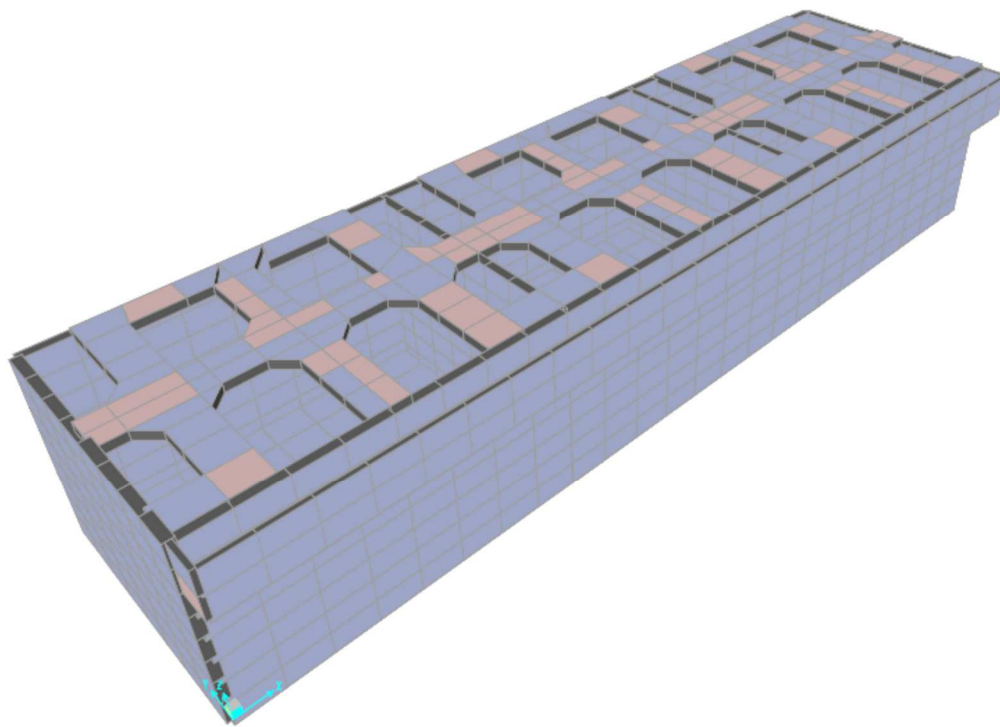


Figura 7.3 – Modelo estrutural 3D – Vista 2.



Os carregamentos utilizados no dimensionamento foram:

- Cargas Permanentes (CP)
Peso próprio
- Sobrecargas (SC)
Carregamento na laje/tampas de cobertura (SC)
Carregamento na laje de fundo (SCLF)
Carregamento nas paredes lado interno (SCPI)
Carregamento nas paredes lado externo carga (SCPE)

Combinação para dimensionamento das barras

Comb 1: $1,4CP + 1,4SC$

Comb 2: $1,4CP + 1,4SC + 1,4SCLF$

Comb 3: $1,4CP + 1,4SC + 1,4SCLF + 1,4SCPI$

Comb 4: $1,4CP + 1,4SC + 1,4SCLF + 1,4SCPI + 1,4SCPE$

7.2. RESULTADOS DA ANÁLISE ESTRUTURAL

Conforme informado no item anterior a análise estrutural foi feita utilizando o software SAP 2000. As tabelas a seguir apresentam os resultados do dimensionamento eletrônico.

Tabela 7.1 – Esforços nas placas.

Area	OutputCase	CaseType	Fx	Fy	Mx	My	T
Text	Text	Text	KN/m	KN/m	KN-m/m	KN-m/m	KN-m/m
1	Gmax	Combination	-16,740	-25,290	15,851	-1,289	30,181
1	Gmax	Combination	-26,680	-27,280	0,991	1,341	28,802
1	Gmax	Combination	-24,160	-14,630	0,538	20,031	30,336
1	Gmax	Combination	-14,210	-12,650	-16,869	-17,834	31,715
2	Gmax	Combination	-11,840	-21,980	22,141	3,417	23,866
2	Gmax	Combination	-16,260	-22,860	15,876	-1,164	28,508
2	Gmax	Combination	-14,580	-14,490	-16,824	-17,609	28,132
2	Gmax	Combination	-10,160	-13,610	-25,151	-25,694	23,489
3	Gmax	Combination	-8,280	-16,460	23,988	4,125	11,828
3	Gmax	Combination	-10,830	-16,970	22,165	3,540	17,889

3	Gmax	Combination	-10,180	-13,690	-25,156	-25,720	17,637
3	Gmax	Combination	-7,620	-13,180	-27,629	-24,994	11,576
4	Gmax	Combination	-6,890	-12,560	23,758	4,297	0,402
4	Gmax	Combination	-7,520	-12,690	23,887	3,620	5,913
4	Gmax	Combination	-7,530	-12,730	-27,611	-24,905	5,882
4	Gmax	Combination	-6,890	-12,600	-27,018	-22,720	0,372
5	Gmax	Combination	-6,630	-12,840	22,402	4,102	-9,971
5	Gmax	Combination	-6,950	-12,900	23,700	4,007	-4,966
5	Gmax	Combination	-6,800	-12,140	-27,003	-22,645	-4,754
5	Gmax	Combination	-6,480	-12,080	-24,521	-20,642	-9,760
6	Gmax	Combination	-8,980	-16,140	19,821	3,661	-19,287
6	Gmax	Combination	-7,220	-15,790	22,280	3,493	-14,800
6	Gmax	Combination	-6,470	-12,060	-24,487	-20,473	-14,370
6	Gmax	Combination	-8,230	-12,410	-19,995	-18,257	-18,857
7	Gmax	Combination	-13,460	-23,690	14,161	-0,286	-26,334
7	Gmax	Combination	-10,360	-23,070	19,725	3,182	-23,365
7	Gmax	Combination	-8,010	-11,320	-19,975	-18,154	-22,991
7	Gmax	Combination	-11,110	-11,940	-12,339	-11,092	-25,960
8	Gmax	Combination	-19,550	-26,610	0,746	1,367	-25,339
8	Gmax	Combination	-13,820	-25,470	13,999	-1,097	-26,652
8	Gmax	Combination	-10,880	-10,790	-12,341	-11,100	-28,338
8	Gmax	Combination	-16,620	-11,940	0,405	14,396	-27,025
9	Gmax	Combination	-18,220	-13,450	-16,415	-17,743	26,654
9	Gmax	Combination	-19,300	-13,660	0,608	20,045	26,839
9	Gmax	Combination	-18,260	-8,440	5,060	26,309	20,964
9	Gmax	Combination	-17,180	-8,220	-16,872	-24,389	20,779
10	Gmax	Combination	-14,900	-14,560	-24,946	-25,653	20,845
10	Gmax	Combination	-18,590	-15,300	-16,370	-17,518	24,076
10	Gmax	Combination	-17,220	-8,430	-16,854	-24,295	19,447
10	Gmax	Combination	-13,530	-7,690	-29,903	-40,538	16,216
11	Gmax	Combination	-12,840	-14,220	-27,423	-24,953	10,969
11	Gmax	Combination	-14,920	-14,640	-24,951	-25,679	15,474
11	Gmax	Combination	-13,660	-8,340	-29,897	-40,503	13,201
11	Gmax	Combination	-11,580	-7,920	-35,693	-41,456	8,696
12	Gmax	Combination	-10,980	-13,420	-26,881	-22,693	0,877
12	Gmax	Combination	-12,750	-13,770	-27,405	-24,864	5,359
12	Gmax	Combination	-11,580	-7,900	-35,703	-41,505	5,064
12	Gmax	Combination	-9,810	-7,540	-36,182	-38,107	0,582
13	Gmax	Combination	-10,760	-12,930	-24,365	-20,611	-8,259
13	Gmax	Combination	-10,890	-12,960	-26,866	-22,617	-4,203
13	Gmax	Combination	-9,650	-6,760	-36,191	-38,149	-2,883
13	Gmax	Combination	-9,520	-6,740	-32,773	-34,449	-6,939

14	Gmax	Combination	-10,500	-12,860	-19,900	-18,238	-16,339
14	Gmax	Combination	-10,750	-12,910	-24,331	-20,442	-12,840
14	Gmax	Combination	-9,230	-5,300	-32,783	-34,501	-10,012
14	Gmax	Combination	-8,980	-5,250	-25,491	-29,266	-13,511
15	Gmax	Combination	-10,200	-11,750	-11,840	-10,992	-22,497
15	Gmax	Combination	-10,280	-11,770	-19,880	-18,135	-20,156
15	Gmax	Combination	-8,740	-4,050	-25,505	-29,332	-15,825
15	Gmax	Combination	-8,660	-4,040	-13,823	-16,225	-18,166
16	Gmax	Combination	-4,720	-9,560	-0,017	14,311	-24,788
16	Gmax	Combination	-9,970	-10,610	-11,841	-11,001	-24,231
16	Gmax	Combination	-8,700	-4,260	-13,842	-16,323	-19,442
16	Gmax	Combination	-3,450	-3,210	3,257	16,343	-19,999
17	Gmax	Combination	-17,530	-8,300	-17,050	-24,425	14,458
17	Gmax	Combination	-12,300	-7,250	5,495	26,396	14,536
17	Gmax	Combination	-12,150	-6,520	4,774	28,108	8,887
17	Gmax	Combination	-17,390	-7,570	-14,148	-26,196	8,809
18	Gmax	Combination	-17,950	-8,570	-29,938	-40,545	11,985
18	Gmax	Combination	-17,570	-8,500	-17,032	-24,331	13,337
18	Gmax	Combination	-16,950	-5,370	-14,134	-26,128	8,464
18	Gmax	Combination	-17,320	-5,450	-26,082	-46,009	7,111
19	Gmax	Combination	-16,640	-8,930	-35,662	-41,449	6,924
19	Gmax	Combination	-18,080	-9,220	-29,931	-40,510	9,125
19	Gmax	Combination	-17,210	-4,880	-26,073	-45,961	6,178
19	Gmax	Combination	-15,780	-4,600	-31,694	-48,451	3,976
20	Gmax	Combination	-15,670	-8,710	-36,126	-38,096	1,023
20	Gmax	Combination	-16,640	-8,910	-35,672	-41,499	3,430
20	Gmax	Combination	-15,640	-3,910	-31,689	-48,428	2,684
20	Gmax	Combination	-14,670	-3,710	-32,568	-44,984	0,277
21	Gmax	Combination	-13,890	-7,610	-32,727	-34,440	-4,598
21	Gmax	Combination	-15,520	-7,940	-36,134	-38,138	-2,372
21	Gmax	Combination	-14,460	-2,630	-32,568	-44,985	-1,047
21	Gmax	Combination	-12,830	-2,300	-29,525	-40,413	-3,273
22	Gmax	Combination	-11,480	-5,750	-25,508	-29,270	-9,372
22	Gmax	Combination	-13,610	-6,170	-32,738	-34,492	-7,572
22	Gmax	Combination	-12,590	-1,110	-29,527	-40,425	-4,404
22	Gmax	Combination	-10,470	-0,680	-22,890	-33,632	-6,204
23	Gmax	Combination	-5,380	-3,380	-13,850	-16,231	-12,743
23	Gmax	Combination	-11,240	-4,550	-25,521	-29,336	-11,598
23	Gmax	Combination	-10,370	-0,230	-22,896	-33,660	-6,997
23	Gmax	Combination	-4,520	0,950	-12,236	-18,348	-8,142
24	Gmax	Combination	6,790	-1,170	3,517	16,395	-14,351
24	Gmax	Combination	-5,430	-3,610	-13,869	-16,329	-13,852

24	Gmax	Combination	-5,010	-1,520	-12,242	-18,377	-8,589
24	Gmax	Combination	7,210	0,930	2,721	15,430	-9,089
25	Gmax	Combination	-18,120	-7,710	-14,453	-26,257	3,895
25	Gmax	Combination	-14,040	-6,900	5,841	28,322	3,962
25	Gmax	Combination	-13,900	-6,180	5,113	28,116	-0,632
25	Gmax	Combination	-17,970	-6,990	-13,024	-26,338	-0,699
26	Gmax	Combination	-19,720	-5,930	-26,086	-46,009	3,322
26	Gmax	Combination	-17,680	-5,520	-14,439	-26,189	3,508
26	Gmax	Combination	-17,640	-5,340	-13,009	-26,267	-0,550
26	Gmax	Combination	-19,680	-5,750	-24,038	-46,420	-0,736
27	Gmax	Combination	-19,920	-5,420	-31,749	-48,462	2,089
27	Gmax	Combination	-19,600	-5,360	-26,077	-45,962	2,390
27	Gmax	Combination	-19,390	-4,290	-24,028	-46,367	-0,308
27	Gmax	Combination	-19,700	-4,350	-29,154	-49,045	-0,609
28	Gmax	Combination	-18,780	-4,530	-32,572	-44,985	0,475
28	Gmax	Combination	-19,780	-4,730	-31,744	-48,438	0,820
28	Gmax	Combination	-19,470	-3,200	-29,150	-49,027	-0,019
28	Gmax	Combination	-18,470	-3,000	-29,970	-45,552	-0,363
29	Gmax	Combination	-16,620	-3,060	-29,556	-40,419	-1,134
29	Gmax	Combination	-18,560	-3,450	-32,572	-44,986	-0,823
29	Gmax	Combination	-18,220	-1,780	-29,972	-45,563	0,259
29	Gmax	Combination	-16,290	-1,390	-27,214	-40,834	-0,052
30	Gmax	Combination	-12,080	-1,010	-22,881	-33,630	-2,486
30	Gmax	Combination	-16,380	-1,870	-29,558	-40,431	-2,246
30	Gmax	Combination	-16,090	-0,400	-27,221	-40,869	0,501
30	Gmax	Combination	-11,790	0,460	-21,212	-33,922	0,260
31	Gmax	Combination	-3,880	1,070	-12,406	-18,382	-3,474
31	Gmax	Combination	-11,990	-0,550	-22,886	-33,658	-3,285
31	Gmax	Combination	-11,810	0,370	-21,221	-33,972	0,649
31	Gmax	Combination	-3,700	1,990	-11,364	-18,734	0,460
32	Gmax	Combination	10,150	1,520	3,311	15,548	-4,183
32	Gmax	Combination	-4,370	-1,390	-12,411	-18,411	-3,937
32	Gmax	Combination	-4,130	-0,160	-11,374	-18,784	0,538
32	Gmax	Combination	10,390	2,740	2,527	14,409	0,292
33	Gmax	Combination	-20,140	-7,430	-13,248	-26,383	-5,044
33	Gmax	Combination	-16,690	-6,740	5,839	28,261	-4,942
33	Gmax	Combination	-16,810	-7,320	4,223	26,106	-9,281
33	Gmax	Combination	-20,260	-8,010	-13,596	-25,269	-9,383
34	Gmax	Combination	-21,610	-6,130	-23,974	-46,407	-4,132
34	Gmax	Combination	-19,810	-5,770	-13,234	-26,312	-4,882
34	Gmax	Combination	-20,060	-6,990	-13,593	-25,256	-8,845
34	Gmax	Combination	-21,850	-7,350	-24,742	-42,913	-8,094

35	Gmax	Combination	-21,950	-4,800	-29,179	-49,050	-2,383
35	Gmax	Combination	-21,320	-4,670	-23,963	-46,354	-3,713
35	Gmax	Combination	-21,720	-6,710	-24,741	-42,911	-6,303
35	Gmax	Combination	-22,360	-6,830	-29,713	-44,288	-4,973
36	Gmax	Combination	-20,910	-3,490	-29,968	-45,552	-0,240
36	Gmax	Combination	-21,720	-3,650	-29,175	-49,032	-1,789
36	Gmax	Combination	-22,290	-6,480	-29,712	-44,285	-2,571
36	Gmax	Combination	-21,480	-6,320	-30,323	-40,619	-1,023
37	Gmax	Combination	-18,600	-1,850	-27,242	-40,839	1,859
37	Gmax	Combination	-20,660	-2,260	-29,970	-45,563	0,388
37	Gmax	Combination	-21,290	-5,370	-30,323	-40,616	1,453
37	Gmax	Combination	-19,220	-4,950	-27,434	-36,532	2,924
38	Gmax	Combination	-14,030	0,013	-21,148	-33,909	3,583
38	Gmax	Combination	-18,400	-0,860	-27,249	-40,874	2,417
38	Gmax	Combination	-18,900	-3,340	-27,432	-36,521	5,074
38	Gmax	Combination	-14,520	-2,470	-21,404	-30,921	6,241
39	Gmax	Combination	-5,990	1,530	-11,619	-18,785	4,632
39	Gmax	Combination	-14,040	-0,078	-21,158	-33,959	3,961
39	Gmax	Combination	-14,380	-1,780	-21,400	-30,901	7,763
39	Gmax	Combination	-6,330	-0,170	-11,488	-17,597	8,433
40	Gmax	Combination	7,110	2,080	3,480	14,599	4,808
40	Gmax	Combination	-6,420	-0,620	-11,629	-18,836	4,739
40	Gmax	Combination	-6,590	-1,470	-11,483	-17,573	9,074
40	Gmax	Combination	6,940	1,240	1,998	13,510	9,143
41	Gmax	Combination	-22,400	-8,440	-13,855	-25,321	-14,008
41	Gmax	Combination	-21,640	-8,280	5,403	26,342	-13,724
41	Gmax	Combination	-21,520	-7,660	3,185	21,095	-18,383
41	Gmax	Combination	-22,270	-7,810	-13,416	-22,238	-18,667
42	Gmax	Combination	-23,900	-7,760	-24,632	-42,891	-11,586
42	Gmax	Combination	-22,190	-7,420	-13,852	-25,308	-13,458
42	Gmax	Combination	-22,690	-9,880	-13,343	-21,872	-17,362
42	Gmax	Combination	-24,390	-10,220	-22,614	-33,906	-15,491
43	Gmax	Combination	-22,590	-6,880	-29,735	-44,292	-6,665
43	Gmax	Combination	-23,770	-7,110	-24,632	-42,889	-9,749
43	Gmax	Combination	-25,050	-13,550	-22,579	-33,727	-12,047
43	Gmax	Combination	-23,870	-13,310	-25,855	-32,631	-8,964
44	Gmax	Combination	-21,160	-6,260	-30,342	-40,623	-0,801
44	Gmax	Combination	-22,520	-6,530	-29,735	-44,289	-4,207
44	Gmax	Combination	-24,190	-14,870	-25,853	-32,621	-4,697
44	Gmax	Combination	-22,830	-14,600	-25,532	-28,861	-1,290
45	Gmax	Combination	-19,440	-5,000	-27,481	-36,541	4,896
45	Gmax	Combination	-20,970	-5,310	-30,342	-40,620	1,734

45	Gmax	Combination	-22,770	-14,290	-25,545	-28,926	2,874
45	Gmax	Combination	-21,230	-13,980	-22,924	-26,232	6,036
46	Gmax	Combination	-17,310	-3,020	-21,319	-30,904	9,625
46	Gmax	Combination	-19,120	-3,390	-27,479	-36,530	7,092
46	Gmax	Combination	-20,780	-11,720	-22,950	-26,362	9,646
46	Gmax	Combination	-18,980	-11,360	-18,154	-23,408	12,178
47	Gmax	Combination	-11,230	-1,150	-11,822	-17,664	12,699
47	Gmax	Combination	-17,170	-2,340	-21,315	-30,884	11,172
47	Gmax	Combination	-18,080	-6,870	-18,199	-23,633	14,809
47	Gmax	Combination	-12,140	-5,680	-10,001	-14,205	16,336
48	Gmax	Combination	-1,330	-0,410	3,199	13,750	13,553
48	Gmax	Combination	-11,490	-2,450	-11,817	-17,640	13,369
48	Gmax	Combination	-11,690	-3,430	-10,066	-14,531	17,462
48	Gmax	Combination	-1,520	-1,400	1,269	11,778	17,647
49	Gmax	Combination	-27,680	-8,890	-13,619	-22,279	-22,911
49	Gmax	Combination	-20,240	-7,400	3,899	21,238	-22,523
49	Gmax	Combination	-20,810	-10,240	0,750	10,947	-24,504
49	Gmax	Combination	-28,250	-11,730	-2,360	-12,834	-24,892
50	Gmax	Combination	-22,860	-9,910	-22,561	-33,895	-18,155
50	Gmax	Combination	-28,100	-10,960	-13,546	-21,913	-21,400
50	Gmax	Combination	-30,270	-21,830	-2,544	-13,754	-22,696
50	Gmax	Combination	-25,030	-20,780	-0,835	-14,848	-19,452
51	Gmax	Combination	-20,650	-12,660	-26,055	-32,671	-9,923
51	Gmax	Combination	-23,530	-13,240	-22,526	-33,717	-14,513
51	Gmax	Combination	-26,300	-27,120	-0,968	-15,512	-14,494
51	Gmax	Combination	-23,420	-26,540	3,667	-11,392	-9,903
52	Gmax	Combination	-18,880	-13,810	-25,714	-28,898	-0,898
52	Gmax	Combination	-20,960	-14,220	-26,053	-32,661	-5,419
52	Gmax	Combination	-24,020	-29,520	3,629	-11,582	-4,988
52	Gmax	Combination	-21,940	-29,100	6,141	-8,885	-0,467
53	Gmax	Combination	-17,870	-13,310	-23,119	-26,270	7,501
53	Gmax	Combination	-18,820	-13,500	-25,726	-28,963	3,443
53	Gmax	Combination	-21,950	-29,160	6,176	-8,711	3,813
53	Gmax	Combination	-21,000	-28,970	5,472	-8,586	7,871
54	Gmax	Combination	-17,970	-11,150	-18,074	-23,392	14,743
54	Gmax	Combination	-17,420	-11,040	-23,145	-26,401	11,282
54	Gmax	Combination	-20,490	-26,400	5,577	-8,061	11,740
54	Gmax	Combination	-21,040	-26,510	2,409	-9,852	15,202
55	Gmax	Combination	-21,390	-7,530	-10,444	-14,293	19,709
55	Gmax	Combination	-17,070	-6,660	-18,119	-23,617	17,471
55	Gmax	Combination	-19,850	-20,590	2,569	-9,053	18,535
55	Gmax	Combination	-24,170	-21,460	0,775	-8,224	20,773

56	Gmax	Combination	-11,630	-3,420	2,742	12,073	21,056
56	Gmax	Combination	-20,940	-5,280	-10,509	-14,619	20,967
56	Gmax	Combination	-22,050	-10,840	0,970	-7,248	22,155
56	Gmax	Combination	-12,740	-8,980	0,219	7,060	22,244
57	Gmax	Combination	-23,080	-10,700	-3,516	-13,065	-23,291
57	Gmax	Combination	-45,040	-15,090	4,234	11,644	-23,158
57	Gmax	Combination	-47,870	-29,230	0,314	4,411	-11,052
57	Gmax	Combination	-25,900	-24,830	46,556	2,552	-11,185
58	Gmax	Combination	-17,830	-19,340	-1,387	-14,958	-17,247
58	Gmax	Combination	-25,100	-20,790	-3,700	-13,985	-20,288
58	Gmax	Combination	-29,340	-42,010	47,184	5,694	-10,055
58	Gmax	Combination	-22,080	-40,560	82,918	11,765	-7,014
59	Gmax	Combination	-14,730	-24,800	3,086	-11,508	-8,201
59	Gmax	Combination	-19,100	-25,680	-1,520	-15,623	-11,526
59	Gmax	Combination	-23,750	-48,920	83,334	13,845	-5,930
59	Gmax	Combination	-19,380	-48,050	100,355	16,623	-2,605
60	Gmax	Combination	-13,320	-27,380	5,753	-8,962	-0,371
60	Gmax	Combination	-15,320	-27,780	3,048	-11,698	-3,056
60	Gmax	Combination	-19,730	-49,800	100,462	17,158	-1,967
60	Gmax	Combination	-17,730	-49,400	102,431	18,094	0,718
61	Gmax	Combination	-13,340	-27,440	5,033	-8,674	6,328
61	Gmax	Combination	-13,330	-27,440	5,788	-8,788	3,976
61	Gmax	Combination	-17,440	-47,960	102,315	17,512	1,131
61	Gmax	Combination	-17,450	-47,960	92,661	16,831	3,482
62	Gmax	Combination	-15,690	-25,440	2,146	-9,904	12,639
62	Gmax	Combination	-12,830	-24,870	5,137	-8,149	10,319
62	Gmax	Combination	-16,620	-43,820	92,310	15,077	3,932
62	Gmax	Combination	-19,480	-44,390	71,407	12,926	6,251
63	Gmax	Combination	-22,760	-21,170	-0,217	-8,423	18,341
63	Gmax	Combination	-14,510	-19,520	2,305	-9,106	16,444
63	Gmax	Combination	-18,010	-37,050	70,874	10,259	6,915
63	Gmax	Combination	-26,270	-38,700	38,136	5,674	8,812
64	Gmax	Combination	-53,690	-17,170	3,619	7,740	20,029
64	Gmax	Combination	-20,640	-10,560	-0,022	-7,447	20,104
64	Gmax	Combination	-22,990	-22,290	37,434	2,164	9,445
64	Gmax	Combination	-56,030	-28,900	-1,341	4,151	9,370
65	Gmax	Combination	-27,330	-25,120	46,159	2,473	9,997
65	Gmax	Combination	-48,980	-29,450	0,951	4,538	9,791
65	Gmax	Combination	-46,020	-14,610	3,485	11,465	21,802
65	Gmax	Combination	-24,360	-10,280	-3,479	-12,561	22,008
66	Gmax	Combination	-23,440	-40,830	82,539	11,689	6,149
66	Gmax	Combination	-30,760	-42,300	46,787	5,614	9,015

66	Gmax	Combination	-26,420	-20,590	-3,664	-13,483	19,148
66	Gmax	Combination	-19,100	-19,130	-1,720	-14,404	16,282
67	Gmax	Combination	-20,830	-48,340	99,964	16,545	2,094
67	Gmax	Combination	-25,120	-49,190	82,955	13,769	5,222
67	Gmax	Combination	-20,410	-25,670	-1,853	-15,068	10,790
67	Gmax	Combination	-16,130	-24,820	2,666	-10,949	7,663
68	Gmax	Combination	-19,190	-49,690	102,087	18,025	-0,840
68	Gmax	Combination	-21,180	-50,090	100,071	17,080	1,645
68	Gmax	Combination	-16,730	-27,810	2,628	-11,140	2,730
68	Gmax	Combination	-14,740	-27,410	5,269	-8,431	0,245
69	Gmax	Combination	-18,970	-48,270	92,316	16,762	-3,225
69	Gmax	Combination	-18,900	-48,250	101,970	17,443	-1,067
69	Gmax	Combination	-14,760	-27,530	5,304	-8,257	-3,894
69	Gmax	Combination	-14,820	-27,540	4,612	-8,155	-6,052
70	Gmax	Combination	-20,900	-44,670	71,116	12,867	-5,635
70	Gmax	Combination	-18,140	-44,120	91,966	15,008	-3,496
70	Gmax	Combination	-14,280	-24,850	4,716	-7,630	-9,845
70	Gmax	Combination	-17,050	-25,400	1,808	-9,422	-11,983
71	Gmax	Combination	-27,840	-39,020	37,821	5,612	-7,901
71	Gmax	Combination	-19,440	-37,340	70,582	10,201	-6,154
71	Gmax	Combination	-15,840	-19,370	1,968	-8,625	-15,593
71	Gmax	Combination	-24,250	-21,050	-0,222	-8,019	-17,340
72	Gmax	Combination	-57,790	-29,250	-0,622	4,295	-8,312
72	Gmax	Combination	-24,560	-22,600	37,119	2,102	-8,437
72	Gmax	Combination	-22,050	-10,080	-0,027	-7,041	-18,965
72	Gmax	Combination	-55,290	-16,730	2,969	7,519	-18,840
73	Gmax	Combination	-32,850	-11,970	-2,673	-12,400	23,511
73	Gmax	Combination	-25,580	-10,520	1,376	11,043	23,011
73	Gmax	Combination	-24,960	-7,460	3,417	21,285	20,817
73	Gmax	Combination	-32,230	-8,910	-13,672	-21,253	21,316
74	Gmax	Combination	-29,560	-21,220	-1,083	-14,277	18,400
74	Gmax	Combination	-34,910	-22,290	-2,857	-13,322	21,440
74	Gmax	Combination	-32,710	-11,270	-13,598	-20,882	20,013
74	Gmax	Combination	-27,360	-10,200	-23,079	-32,625	16,972
75	Gmax	Combination	-27,860	-27,160	3,229	-10,837	9,315
75	Gmax	Combination	-30,870	-27,760	-1,216	-14,941	13,662
75	Gmax	Combination	-28,070	-13,760	-23,042	-32,443	13,575
75	Gmax	Combination	-25,060	-13,160	-26,763	-31,372	9,229
76	Gmax	Combination	-26,380	-29,740	5,674	-8,350	0,344
76	Gmax	Combination	-28,460	-30,160	3,191	-11,027	4,615
76	Gmax	Combination	-25,420	-14,930	-26,761	-31,360	5,009
76	Gmax	Combination	-23,330	-14,510	-26,540	-27,647	0,738

77	Gmax	Combination	-25,490	-29,670	5,034	-8,070	-7,544
77	Gmax	Combination	-26,400	-29,860	5,709	-8,176	-3,728
77	Gmax	Combination	-23,250	-14,090	-26,553	-27,712	-3,318
77	Gmax	Combination	-22,340	-13,900	-23,846	-25,063	-7,135
78	Gmax	Combination	-25,750	-27,140	2,152	-9,353	-14,452
78	Gmax	Combination	-24,960	-26,980	5,138	-7,546	-11,211
78	Gmax	Combination	-21,870	-11,560	-23,873	-25,196	-10,649
78	Gmax	Combination	-22,670	-11,720	-18,633	-22,293	-13,889
79	Gmax	Combination	-29,080	-22,020	0,453	-7,884	-19,665
79	Gmax	Combination	-24,540	-21,110	2,312	-8,556	-17,598
79	Gmax	Combination	-21,690	-6,840	-18,679	-22,522	-16,396
79	Gmax	Combination	-26,220	-7,750	-10,528	-13,473	-18,464
80	Gmax	Combination	-17,730	-9,220	0,727	7,071	-20,927
80	Gmax	Combination	-26,880	-11,050	0,649	-6,906	-20,916
80	Gmax	Combination	-25,720	-5,250	-10,594	-13,804	-19,590
80	Gmax	Combination	-16,570	-3,420	2,063	11,913	-19,602
81	Gmax	Combination	-30,200	-8,500	-13,753	-21,269	16,863
81	Gmax	Combination	-29,480	-8,360	3,648	21,331	16,491
81	Gmax	Combination	-29,570	-8,810	4,609	26,323	11,654
81	Gmax	Combination	-30,290	-8,950	-14,029	-23,754	12,026
82	Gmax	Combination	-31,840	-11,100	-23,048	-32,619	14,133
82	Gmax	Combination	-30,670	-10,870	-13,679	-20,899	15,771
82	Gmax	Combination	-30,200	-8,530	-14,026	-23,739	11,607
82	Gmax	Combination	-31,380	-8,760	-25,477	-40,768	9,968
83	Gmax	Combination	-31,100	-14,360	-26,581	-31,336	8,168
83	Gmax	Combination	-32,550	-14,660	-23,011	-32,437	10,934
83	Gmax	Combination	-31,340	-8,590	-25,476	-40,764	8,452
83	Gmax	Combination	-29,880	-8,290	-30,911	-41,984	5,686
84	Gmax	Combination	-30,080	-15,860	-26,340	-27,607	1,130
84	Gmax	Combination	-31,450	-16,140	-26,579	-31,323	4,185
84	Gmax	Combination	-29,810	-7,930	-30,910	-41,980	3,629
84	Gmax	Combination	-28,440	-7,650	-31,689	-38,340	0,574
85	Gmax	Combination	-28,660	-15,170	-23,670	-25,028	-5,569
85	Gmax	Combination	-29,990	-15,430	-26,353	-27,672	-2,749
85	Gmax	Combination	-28,250	-6,730	-31,688	-38,337	-1,539
85	Gmax	Combination	-26,920	-6,460	-28,675	-34,385	-4,359
86	Gmax	Combination	-26,650	-12,510	-18,626	-22,292	-11,153
86	Gmax	Combination	-28,190	-12,820	-23,697	-25,161	-8,912
86	Gmax	Combination	-26,520	-4,470	-28,673	-34,376	-6,174
86	Gmax	Combination	-24,980	-4,160	-22,198	-29,054	-8,415
87	Gmax	Combination	-20,310	-6,560	-10,401	-13,448	-14,889
87	Gmax	Combination	-25,670	-7,640	-18,671	-22,521	-13,561

87	Gmax	Combination	-24,780	-3,160	-22,194	-29,035	-9,679
87	Gmax	Combination	-19,410	-2,090	-12,085	-16,433	-11,008
88	Gmax	Combination	-10,320	-2,170	1,781	11,857	-16,017
88	Gmax	Combination	-19,810	-4,070	-10,467	-13,779	-15,889
88	Gmax	Combination	-19,520	-2,630	-12,080	-16,411	-11,531
88	Gmax	Combination	-10,030	-0,730	2,554	13,508	-11,659
89	Gmax	Combination	-31,010	-9,100	-14,109	-23,770	7,078
89	Gmax	Combination	-29,970	-8,890	4,781	26,357	6,971
89	Gmax	Combination	-29,810	-8,060	5,134	27,821	2,246
89	Gmax	Combination	-30,840	-8,270	-13,536	-24,368	2,353
90	Gmax	Combination	-31,770	-8,840	-25,496	-40,772	6,180
90	Gmax	Combination	-30,920	-8,670	-14,106	-23,755	6,665
90	Gmax	Combination	-30,800	-8,040	-13,516	-24,265	2,360
90	Gmax	Combination	-31,640	-8,200	-24,875	-43,104	1,875
91	Gmax	Combination	-32,180	-8,750	-30,906	-41,983	3,827
91	Gmax	Combination	-31,740	-8,660	-25,495	-40,768	4,716
91	Gmax	Combination	-31,420	-7,070	-24,861	-43,030	1,867
91	Gmax	Combination	-31,860	-7,160	-30,430	-45,161	0,978
92	Gmax	Combination	-31,400	-8,240	-31,653	-38,333	0,799
92	Gmax	Combination	-32,110	-8,380	-30,905	-41,979	1,832
92	Gmax	Combination	-31,650	-6,090	-30,425	-45,136	0,966
92	Gmax	Combination	-30,940	-5,950	-31,373	-41,599	-0,067
93	Gmax	Combination	-29,310	-6,940	-28,646	-34,379	-2,220
93	Gmax	Combination	-31,220	-7,320	-31,652	-38,329	-1,250
93	Gmax	Combination	-30,630	-4,400	-31,376	-41,612	-0,081
93	Gmax	Combination	-28,720	-4,020	-28,477	-37,183	-1,051
94	Gmax	Combination	-24,990	-4,160	-22,204	-29,055	-4,744
94	Gmax	Combination	-28,910	-4,940	-28,644	-34,370	-3,983
94	Gmax	Combination	-28,520	-2,980	-28,485	-37,227	-1,063
94	Gmax	Combination	-24,600	-2,200	-22,048	-30,981	-1,824
95	Gmax	Combination	-17,480	-1,700	-12,032	-16,423	-6,418
95	Gmax	Combination	-24,790	-3,170	-22,200	-29,036	-5,978
95	Gmax	Combination	-24,470	-1,520	-22,062	-31,051	-1,829
95	Gmax	Combination	-17,150	-0,059	-11,915	-17,160	-2,269
96	Gmax	Combination	-5,440	0,190	2,348	13,467	-6,999
96	Gmax	Combination	-17,590	-2,240	-12,028	-16,400	-6,913
96	Gmax	Combination	-17,390	-1,240	-11,931	-17,238	-2,289
96	Gmax	Combination	-5,240	1,190	2,612	13,829	-2,375
97	Gmax	Combination	-30,690	-8,230	-13,531	-24,367	-2,356
97	Gmax	Combination	-29,820	-8,060	5,108	27,816	-2,249
97	Gmax	Combination	-30,000	-8,990	4,785	26,361	-6,968
97	Gmax	Combination	-30,870	-9,160	-14,115	-23,773	-7,075

98	Gmax	Combination	-31,650	-8,210	-24,877	-43,104	-1,875
98	Gmax	Combination	-30,640	-8,000	-13,510	-24,264	-2,359
98	Gmax	Combination	-30,770	-8,620	-14,112	-23,757	-6,666
98	Gmax	Combination	-31,770	-8,830	-25,502	-40,774	-6,182
99	Gmax	Combination	-31,830	-7,150	-30,429	-45,161	-0,978
99	Gmax	Combination	-31,420	-7,070	-24,862	-43,030	-1,867
99	Gmax	Combination	-31,760	-8,770	-25,502	-40,770	-4,717
99	Gmax	Combination	-32,170	-8,850	-30,916	-41,984	-3,828
100	Gmax	Combination	-30,840	-5,930	-31,373	-41,599	0,067
100	Gmax	Combination	-31,620	-6,080	-30,424	-45,136	-0,966
100	Gmax	Combination	-32,080	-8,380	-30,916	-41,980	-1,832
100	Gmax	Combination	-31,300	-8,220	-31,665	-38,335	-0,799
101	Gmax	Combination	-28,840	-4,040	-28,477	-37,183	1,050
101	Gmax	Combination	-30,530	-4,380	-31,376	-41,612	0,081
101	Gmax	Combination	-31,130	-7,360	-31,664	-38,331	1,249
101	Gmax	Combination	-29,430	-7,020	-28,659	-34,384	2,219
102	Gmax	Combination	-24,480	-2,180	-22,046	-30,981	1,822
102	Gmax	Combination	-28,630	-3,010	-28,486	-37,227	1,062
102	Gmax	Combination	-29,020	-4,960	-28,657	-34,374	3,983
102	Gmax	Combination	-24,870	-4,130	-22,216	-29,063	4,743
103	Gmax	Combination	-17,290	-0,087	-11,926	-17,162	2,265
103	Gmax	Combination	-24,350	-1,500	-22,060	-31,051	1,827
103	Gmax	Combination	-24,680	-3,150	-22,212	-29,044	5,972
103	Gmax	Combination	-17,620	-1,730	-12,051	-16,438	6,409
104	Gmax	Combination	-5,420	1,150	2,681	13,842	2,339
104	Gmax	Combination	-17,530	-1,270	-11,941	-17,240	2,259
104	Gmax	Combination	-17,720	-2,220	-12,046	-16,416	6,922
104	Gmax	Combination	-5,610	0,200	2,395	13,452	7,002
105	Gmax	Combination	-30,260	-9,040	-14,032	-23,756	-12,026
105	Gmax	Combination	-29,390	-8,860	4,612	26,327	-11,653
105	Gmax	Combination	-29,270	-8,230	3,665	21,330	-16,498
105	Gmax	Combination	-30,130	-8,410	-13,761	-21,271	-16,871
106	Gmax	Combination	-31,170	-8,710	-25,485	-40,770	-9,971
106	Gmax	Combination	-30,150	-8,500	-14,029	-23,741	-11,610
106	Gmax	Combination	-30,670	-11,070	-13,687	-20,902	-15,776
106	Gmax	Combination	-31,690	-11,280	-23,055	-32,620	-14,137
107	Gmax	Combination	-29,740	-8,360	-30,921	-41,985	-5,688
107	Gmax	Combination	-31,160	-8,650	-25,484	-40,766	-8,455
107	Gmax	Combination	-32,350	-14,600	-23,018	-32,438	-10,939
107	Gmax	Combination	-30,930	-14,320	-26,592	-31,336	-8,172
108	Gmax	Combination	-28,450	-7,650	-31,701	-38,342	-0,575
108	Gmax	Combination	-29,650	-7,890	-30,920	-41,981	-3,631

108	Gmax	Combination	-31,320	-16,290	-26,590	-31,323	-4,188
108	Gmax	Combination	-30,130	-16,050	-26,353	-27,607	-1,132
109	Gmax	Combination	-26,770	-6,490	-28,688	-34,389	4,358
109	Gmax	Combination	-28,270	-6,790	-31,700	-38,339	1,538
109	Gmax	Combination	-30,000	-15,440	-26,366	-27,672	2,747
109	Gmax	Combination	-28,500	-15,140	-23,686	-25,032	5,568
110	Gmax	Combination	-25,180	-4,190	-22,212	-29,062	8,414
110	Gmax	Combination	-26,360	-4,420	-28,686	-34,380	6,173
110	Gmax	Combination	-28,040	-12,860	-23,712	-25,165	8,911
110	Gmax	Combination	-26,870	-12,620	-18,644	-22,304	11,151
111	Gmax	Combination	-19,440	-2,100	-12,087	-16,445	11,001
111	Gmax	Combination	-24,990	-3,210	-22,208	-29,043	9,674
111	Gmax	Combination	-25,870	-7,630	-18,690	-22,532	13,562
111	Gmax	Combination	-20,320	-6,520	-10,409	-13,468	14,889
112	Gmax	Combination	-10,120	-0,700	2,484	13,470	11,666
112	Gmax	Combination	-19,530	-2,590	-12,083	-16,423	11,540
112	Gmax	Combination	-19,820	-4,020	-10,476	-13,798	15,869
112	Gmax	Combination	-10,410	-2,140	1,722	11,814	15,995
113	Gmax	Combination	-31,850	-8,750	-13,668	-21,252	-21,323
113	Gmax	Combination	-24,780	-7,340	3,388	21,275	-20,825
113	Gmax	Combination	-25,480	-10,820	1,409	11,060	-23,019
113	Gmax	Combination	-32,540	-12,230	-2,675	-12,409	-23,518
114	Gmax	Combination	-27,140	-10,370	-23,089	-32,627	-16,979
114	Gmax	Combination	-32,380	-11,420	-13,594	-20,883	-20,020
114	Gmax	Combination	-34,520	-22,120	-2,858	-13,325	-21,448
114	Gmax	Combination	-29,280	-21,070	-1,068	-14,268	-18,407
115	Gmax	Combination	-24,890	-13,110	-26,774	-31,372	-9,234
115	Gmax	Combination	-27,810	-13,690	-23,052	-32,444	-13,582
115	Gmax	Combination	-30,680	-28,060	-1,202	-14,937	-13,668
115	Gmax	Combination	-27,760	-27,480	3,244	-10,827	-9,321
116	Gmax	Combination	-23,070	-14,640	-26,554	-27,648	-0,741
116	Gmax	Combination	-25,280	-15,080	-26,771	-31,359	-5,013
116	Gmax	Combination	-28,290	-30,120	3,206	-11,020	-4,620
116	Gmax	Combination	-26,070	-29,670	5,689	-8,342	-0,348
117	Gmax	Combination	-22,470	-13,940	-23,862	-25,068	7,133
117	Gmax	Combination	-22,950	-14,030	-26,567	-27,712	3,316
117	Gmax	Combination	-26,140	-29,990	5,723	-8,170	3,723
117	Gmax	Combination	-25,660	-29,900	5,042	-8,068	7,540
118	Gmax	Combination	-22,570	-11,760	-18,649	-22,305	13,888
118	Gmax	Combination	-22,020	-11,650	-23,889	-25,200	10,647
118	Gmax	Combination	-25,090	-27,000	5,147	-7,545	11,209
118	Gmax	Combination	-25,640	-27,110	2,153	-9,359	14,449

119	Gmax	Combination	-26,570	-7,770	-10,554	-13,497	18,465
119	Gmax	Combination	-21,580	-6,770	-18,695	-22,533	16,397
119	Gmax	Combination	-24,450	-21,130	2,313	-8,563	17,594
119	Gmax	Combination	-29,440	-22,130	0,443	-7,900	19,662
120	Gmax	Combination	-16,950	-3,450	2,119	11,894	19,589
120	Gmax	Combination	-26,070	-5,270	-10,620	-13,827	19,575
120	Gmax	Combination	-27,220	-11,030	0,639	-6,923	20,932
120	Gmax	Combination	-18,110	-9,210	0,752	7,058	20,947
121	Gmax	Combination	-24,100	-10,540	-3,476	-12,569	-22,020
121	Gmax	Combination	-45,700	-14,860	3,488	11,476	-21,807
121	Gmax	Combination	-48,540	-29,050	0,915	4,469	-9,775
121	Gmax	Combination	-26,930	-24,730	46,218	2,510	-9,987
122	Gmax	Combination	-18,670	-18,950	-1,707	-14,396	-16,285
122	Gmax	Combination	-26,080	-20,430	-3,659	-13,486	-19,150
122	Gmax	Combination	-30,550	-42,800	46,843	5,634	-9,008
122	Gmax	Combination	-23,150	-41,320	82,621	11,693	-6,143
123	Gmax	Combination	-15,680	-25,060	2,681	-10,940	-7,668
123	Gmax	Combination	-20,070	-25,940	-1,841	-15,064	-10,793
123	Gmax	Combination	-24,670	-48,950	83,040	13,790	-5,219
123	Gmax	Combination	-20,280	-48,080	100,070	16,561	-2,093
124	Gmax	Combination	-14,720	-27,400	5,284	-8,423	-0,251
124	Gmax	Combination	-16,210	-27,700	2,642	-11,132	-2,734
124	Gmax	Combination	-20,740	-50,360	100,178	17,104	-1,650
124	Gmax	Combination	-19,250	-50,060	102,189	18,038	0,833
125	Gmax	Combination	-14,510	-27,670	4,620	-8,152	6,044
125	Gmax	Combination	-14,780	-27,720	5,318	-8,251	3,888
125	Gmax	Combination	-18,880	-48,210	102,074	17,462	1,056
125	Gmax	Combination	-18,610	-48,160	92,407	16,774	3,212
126	Gmax	Combination	-17,390	-25,460	1,808	-9,429	11,977
126	Gmax	Combination	-13,940	-24,770	4,724	-7,629	9,838
126	Gmax	Combination	-17,830	-44,230	92,057	15,027	3,480
126	Gmax	Combination	-21,280	-44,920	71,178	12,874	5,619
127	Gmax	Combination	-24,360	-21,110	-0,223	-8,033	17,334
127	Gmax	Combination	-16,190	-19,480	1,968	-8,632	15,585
127	Gmax	Combination	-19,770	-37,370	70,645	10,210	6,141
127	Gmax	Combination	-27,940	-39,000	37,861	5,612	7,889
128	Gmax	Combination	-55,760	-16,740	2,911	7,490	18,856
128	Gmax	Combination	-22,140	-10,010	-0,027	-7,056	18,976
128	Gmax	Combination	-24,670	-22,650	37,159	2,102	8,412
128	Gmax	Combination	-58,290	-29,370	-0,658	4,292	8,292
129	Gmax	Combination	-25,060	-24,350	46,633	2,593	11,260
129	Gmax	Combination	-47,400	-28,820	0,201	4,327	11,084

129	Gmax	Combination	-44,860	-16,110	4,581	12,067	23,167
129	Gmax	Combination	-22,510	-11,640	-3,511	-13,184	23,342
130	Gmax	Combination	-21,400	-40,970	83,017	11,772	7,037
130	Gmax	Combination	-28,670	-42,430	47,260	5,717	10,083
130	Gmax	Combination	-24,200	-20,100	-3,678	-14,022	20,359
130	Gmax	Combination	-16,940	-18,640	-1,237	-14,911	17,312
131	Gmax	Combination	-19,180	-47,850	100,514	16,650	2,618
131	Gmax	Combination	-22,930	-48,600	83,434	13,869	5,961
131	Gmax	Combination	-18,460	-26,250	-1,379	-15,620	11,578
131	Gmax	Combination	-14,710	-25,500	3,235	-11,564	8,235
132	Gmax	Combination	-17,150	-49,640	102,608	18,121	-0,732
132	Gmax	Combination	-19,640	-50,140	100,623	17,192	1,972
132	Gmax	Combination	-15,100	-27,480	3,198	-11,749	3,052
132	Gmax	Combination	-12,620	-26,990	5,858	-8,986	0,349
133	Gmax	Combination	-17,800	-48,000	92,805	16,854	-3,511
133	Gmax	Combination	-16,780	-47,790	102,493	17,546	-1,151
133	Gmax	Combination	-12,720	-27,490	5,893	-8,812	-4,018
133	Gmax	Combination	-13,740	-27,700	5,096	-8,674	-6,378
134	Gmax	Combination	-19,320	-44,530	71,506	12,940	-6,286
134	Gmax	Combination	-17,020	-44,070	92,456	15,106	-3,965
134	Gmax	Combination	-13,150	-24,750	5,200	-8,152	-10,372
134	Gmax	Combination	-15,450	-25,210	2,179	-9,903	-12,694
135	Gmax	Combination	-26,840	-38,780	38,168	5,673	-8,844
135	Gmax	Combination	-17,810	-36,980	70,973	10,276	-6,948
135	Gmax	Combination	-14,320	-19,550	2,339	-9,105	-16,502
135	Gmax	Combination	-23,360	-21,360	-0,211	-8,420	-18,398
136	Gmax	Combination	-56,620	-29,040	-1,319	4,160	-9,410
136	Gmax	Combination	-23,570	-22,430	37,466	2,163	-9,491
136	Gmax	Combination	-21,190	-10,510	-0,016	-7,444	-20,141
136	Gmax	Combination	-54,230	-17,120	3,677	7,787	-20,060
137	Gmax	Combination	-27,320	-12,600	-2,346	-12,951	24,846
137	Gmax	Combination	-20,020	-11,140	0,967	11,344	24,553
137	Gmax	Combination	-18,950	-5,780	2,994	20,003	22,794
137	Gmax	Combination	-26,250	-7,240	-13,224	-21,520	23,086
138	Gmax	Combination	-24,290	-20,120	-0,707	-14,809	19,576
138	Gmax	Combination	-29,010	-21,070	-2,514	-13,794	22,831
138	Gmax	Combination	-27,250	-12,250	-13,210	-21,454	21,619
138	Gmax	Combination	-22,520	-11,300	-22,178	-34,298	18,365
139	Gmax	Combination	-22,370	-27,020	3,825	-11,446	9,914
139	Gmax	Combination	-25,800	-27,720	-0,848	-15,514	14,583
139	Gmax	Combination	-22,790	-12,620	-22,127	-34,040	14,544
139	Gmax	Combination	-19,350	-11,920	-25,893	-32,841	9,876

140	Gmax	Combination	-22,400	-28,940	6,250	-8,908	0,414
140	Gmax	Combination	-22,770	-29,020	3,788	-11,631	4,955
140	Gmax	Combination	-19,780	-14,050	-25,891	-32,835	5,331
140	Gmax	Combination	-19,400	-13,980	-25,669	-28,938	0,790
141	Gmax	Combination	-20,490	-29,050	5,536	-8,586	-7,942
141	Gmax	Combination	-22,500	-29,450	6,285	-8,734	-3,885
141	Gmax	Combination	-19,250	-13,210	-25,683	-29,006	-3,540
141	Gmax	Combination	-17,240	-12,810	-23,109	-26,268	-7,597
142	Gmax	Combination	-21,680	-26,450	2,441	-9,850	-15,271
142	Gmax	Combination	-19,900	-26,100	5,641	-8,064	-11,814
142	Gmax	Combination	-16,860	-10,920	-23,135	-26,399	-11,367
142	Gmax	Combination	-18,640	-11,280	-18,075	-23,386	-14,825
143	Gmax	Combination	-24,260	-21,540	0,795	-8,219	-20,840
143	Gmax	Combination	-20,550	-20,790	2,601	-9,053	-18,606
143	Gmax	Combination	-17,710	-6,590	-18,120	-23,612	-17,543
143	Gmax	Combination	-21,420	-7,340	-10,434	-14,276	-19,778
144	Gmax	Combination	-13,410	-8,950	0,180	7,088	-22,282
144	Gmax	Combination	-22,100	-10,690	0,990	-7,243	-22,201
144	Gmax	Combination	-21,020	-5,290	-10,500	-14,602	-21,047
144	Gmax	Combination	-12,330	-3,550	2,704	12,139	-21,127
145	Gmax	Combination	-19,610	-5,920	-13,126	-21,500	19,550
145	Gmax	Combination	-19,430	-5,880	2,365	19,877	18,650
145	Gmax	Combination	-20,730	-12,370	9,078	33,651	14,093
145	Gmax	Combination	-20,910	-12,410	-12,545	-28,085	14,993
146	Gmax	Combination	-22,610	-11,320	-22,137	-34,290	15,555
146	Gmax	Combination	-20,610	-10,920	-13,113	-21,435	17,854
146	Gmax	Combination	-19,630	-5,990	-12,402	-27,373	13,546
146	Gmax	Combination	-21,620	-6,390	-24,735	-43,365	11,248
147	Gmax	Combination	-24,750	-13,010	-25,700	-32,801	8,806
147	Gmax	Combination	-22,870	-12,630	-22,085	-34,029	11,893
147	Gmax	Combination	-21,610	-6,340	-24,759	-43,484	9,454
147	Gmax	Combination	-23,490	-6,730	-29,905	-44,387	6,366
148	Gmax	Combination	-21,770	-14,450	-25,486	-28,901	1,145
148	Gmax	Combination	-25,170	-15,130	-25,699	-32,797	4,516
148	Gmax	Combination	-23,360	-6,060	-29,908	-44,399	3,998
148	Gmax	Combination	-19,960	-5,380	-30,455	-40,600	0,627
149	Gmax	Combination	-22,070	-13,770	-22,916	-26,229	-6,143
149	Gmax	Combination	-21,620	-13,680	-25,499	-28,969	-3,004
149	Gmax	Combination	-19,860	-4,900	-30,455	-40,598	-1,864
149	Gmax	Combination	-20,310	-4,990	-27,547	-36,502	-5,003
150	Gmax	Combination	-18,620	-11,270	-18,154	-23,402	-12,261
150	Gmax	Combination	-21,690	-11,890	-22,943	-26,361	-9,740

150	Gmax	Combination	-19,970	-3,260	-27,545	-36,491	-7,178
150	Gmax	Combination	-16,900	-2,650	-21,352	-30,882	-9,699
151	Gmax	Combination	-12,900	-5,630	-10,003	-14,190	-16,403
151	Gmax	Combination	-17,690	-6,590	-18,199	-23,628	-14,881
151	Gmax	Combination	-16,810	-2,200	-21,347	-30,862	-11,242
151	Gmax	Combination	-12,020	-1,240	-11,842	-17,644	-12,764
152	Gmax	Combination	-2,040	-1,490	1,321	11,863	-17,723
152	Gmax	Combination	-12,490	-3,580	-10,068	-14,516	-17,542
152	Gmax	Combination	-12,270	-2,470	-11,837	-17,620	-13,414
152	Gmax	Combination	-1,820	-0,380	3,282	13,853	-13,595
153	Gmax	Combination	-17,880	-11,800	-12,207	-28,018	8,346
153	Gmax	Combination	-6,120	-9,450	8,406	33,517	11,168
153	Gmax	Combination	-4,850	-3,090	-0,892	10,986	6,447
153	Gmax	Combination	-16,610	-5,450	-17,128	-26,302	3,624
154	Gmax	Combination	-23,930	-6,860	-24,926	-43,403	7,443
154	Gmax	Combination	-16,600	-5,370	-12,065	-27,305	7,750
154	Gmax	Combination	-16,260	-3,690	-17,281	-27,065	4,012
154	Gmax	Combination	-23,600	-5,190	-25,089	-46,676	3,702
155	Gmax	Combination	-20,440	-6,120	-29,889	-44,382	4,697
155	Gmax	Combination	-23,930	-6,800	-24,948	-43,518	5,902
155	Gmax	Combination	-23,400	-4,170	-25,056	-46,512	3,438
155	Gmax	Combination	-19,920	-3,490	-29,712	-49,055	2,232
156	Gmax	Combination	-22,730	-5,930	-30,445	-40,598	0,875
156	Gmax	Combination	-20,310	-5,450	-29,892	-44,396	2,380
156	Gmax	Combination	-19,810	-2,920	-29,705	-49,018	1,683
156	Gmax	Combination	-22,220	-3,400	-30,208	-45,477	0,177
157	Gmax	Combination	-18,330	-4,590	-27,502	-36,493	-3,009
157	Gmax	Combination	-22,630	-5,450	-30,445	-40,596	-1,556
157	Gmax	Combination	-21,980	-2,220	-30,209	-45,484	-0,444
157	Gmax	Combination	-17,690	-1,360	-27,367	-40,782	-1,897
158	Gmax	Combination	-15,400	-2,350	-21,441	-30,900	-6,300
158	Gmax	Combination	-17,990	-2,870	-27,500	-36,482	-5,139
158	Gmax	Combination	-17,530	-0,570	-27,374	-40,815	-2,454
158	Gmax	Combination	-14,950	-0,054	-21,213	-33,887	-3,614
159	Gmax	Combination	-6,230	-0,084	-11,489	-17,574	-8,487
159	Gmax	Combination	-15,310	-1,900	-21,437	-30,879	-7,817
159	Gmax	Combination	-14,960	-0,110	-21,222	-33,936	-3,992
159	Gmax	Combination	-5,870	1,700	-11,637	-18,771	-4,662
160	Gmax	Combination	6,330	1,250	1,959	13,589	-9,179
160	Gmax	Combination	-6,470	-1,310	-11,484	-17,550	-9,107
160	Gmax	Combination	-6,320	-0,530	-11,647	-18,821	-4,794
160	Gmax	Combination	6,480	2,030	3,439	14,660	-4,867

161	Gmax	Combination	-22,860	-6,700	-16,228	-26,122	1,972
161	Gmax	Combination	-18,280	-5,780	-3,930	10,378	-0,258
161	Gmax	Combination	-17,110	0,075	10,450	30,375	-5,374
161	Gmax	Combination	-21,690	-0,840	-14,887	-28,774	-3,144
162	Gmax	Combination	-16,630	-3,790	-25,366	-46,728	0,898
162	Gmax	Combination	-22,510	-4,940	-16,380	-26,881	1,082
162	Gmax	Combination	-22,670	-5,710	-14,792	-28,298	-2,544
162	Gmax	Combination	-16,780	-4,560	-26,501	-46,372	-2,725
163	Gmax	Combination	-21,630	-3,830	-29,642	-49,041	0,652
163	Gmax	Combination	-16,430	-2,790	-25,334	-46,568	0,436
163	Gmax	Combination	-16,790	-4,600	-26,510	-46,419	-2,047
163	Gmax	Combination	-21,990	-5,640	-32,102	-48,539	-1,830
164	Gmax	Combination	-16,880	-2,330	-30,223	-45,480	0,386
164	Gmax	Combination	-21,510	-3,260	-29,635	-49,004	0,073
164	Gmax	Combination	-21,890	-5,140	-32,098	-48,522	-0,662
164	Gmax	Combination	-17,260	-4,220	-32,753	-44,965	-0,348
165	Gmax	Combination	-17,320	-1,290	-27,337	-40,776	0,060
165	Gmax	Combination	-16,650	-1,160	-30,224	-45,487	-0,234
165	Gmax	Combination	-17,040	-3,110	-32,753	-44,967	0,903
165	Gmax	Combination	-17,710	-3,250	-29,675	-40,400	1,196
166	Gmax	Combination	-11,190	0,700	-21,274	-33,899	-0,265
166	Gmax	Combination	-17,160	-0,500	-27,343	-40,809	-0,495
166	Gmax	Combination	-17,480	-2,060	-29,677	-40,411	2,283
166	Gmax	Combination	-11,500	-0,870	-22,954	-33,634	2,514
167	Gmax	Combination	-4,490	1,980	-11,398	-18,723	-0,472
167	Gmax	Combination	-11,200	0,640	-21,284	-33,948	-0,655
167	Gmax	Combination	-11,400	-0,340	-22,960	-33,664	3,296
167	Gmax	Combination	-4,690	1,000	-12,451	-18,394	3,478
168	Gmax	Combination	10,090	2,750	2,605	14,493	-0,337
168	Gmax	Combination	-4,940	-0,250	-11,408	-18,773	-0,575
168	Gmax	Combination	-5,180	-1,470	-12,457	-18,422	3,951
168	Gmax	Combination	9,840	1,530	3,364	15,600	4,189
169	Gmax	Combination	-14,010	0,700	-13,721	-28,541	-9,435
169	Gmax	Combination	-17,450	0,006	4,954	29,276	-10,168
169	Gmax	Combination	-20,510	-15,260	6,814	29,705	-15,511
169	Gmax	Combination	-17,060	-14,570	-16,232	-24,429	-14,777
170	Gmax	Combination	-19,650	-5,120	-26,636	-46,399	-6,535
170	Gmax	Combination	-14,980	-4,190	-13,626	-28,065	-8,136
170	Gmax	Combination	-15,940	-8,990	-16,213	-24,334	-13,442
170	Gmax	Combination	-20,610	-9,920	-29,406	-41,008	-11,841
171	Gmax	Combination	-13,570	-3,960	-31,979	-48,514	-3,645
171	Gmax	Combination	-19,660	-5,170	-26,645	-46,446	-5,788

171	Gmax	Combination	-20,730	-10,550	-29,390	-40,927	-8,824
171	Gmax	Combination	-14,650	-9,330	-35,602	-41,662	-6,681
172	Gmax	Combination	-15,840	-3,930	-32,756	-44,966	-0,104
172	Gmax	Combination	-13,470	-3,460	-31,976	-48,498	-2,456
172	Gmax	Combination	-14,520	-8,670	-35,614	-41,723	-3,215
172	Gmax	Combination	-16,880	-9,150	-36,168	-38,179	-0,864
173	Gmax	Combination	-11,730	-2,050	-29,637	-40,393	3,364
173	Gmax	Combination	-15,620	-2,830	-32,757	-44,967	1,168
173	Gmax	Combination	-16,730	-8,400	-36,175	-38,216	2,501
173	Gmax	Combination	-12,840	-7,620	-32,809	-34,480	4,697
174	Gmax	Combination	-11,290	-0,830	-22,965	-33,636	6,252
174	Gmax	Combination	-11,490	-0,870	-29,639	-40,403	4,470
174	Gmax	Combination	-12,490	-5,890	-32,820	-34,536	7,650
174	Gmax	Combination	-12,300	-5,850	-25,588	-29,315	9,433
175	Gmax	Combination	-4,290	1,080	-12,266	-18,357	8,166
175	Gmax	Combination	-11,190	-0,300	-22,971	-33,666	7,030
175	Gmax	Combination	-12,080	-4,750	-25,599	-29,373	11,652
175	Gmax	Combination	-5,190	-3,370	-13,895	-16,266	12,788
176	Gmax	Combination	6,620	0,890	2,675	15,462	9,114
176	Gmax	Combination	-4,790	-1,390	-12,272	-18,385	8,621
176	Gmax	Combination	-5,190	-3,420	-13,915	-16,365	13,875
176	Gmax	Combination	6,210	-1,140	3,476	16,417	14,368
177	Gmax	Combination	-19,500	-15,060	-15,796	-24,342	-21,315
177	Gmax	Combination	-20,590	-15,280	5,744	29,491	-21,093
177	Gmax	Combination	-19,810	-11,340	0,526	19,892	-26,696
177	Gmax	Combination	-18,710	-11,120	-16,416	-17,324	-26,918
178	Gmax	Combination	-11,890	-8,180	-29,510	-41,029	-16,342
178	Gmax	Combination	-18,380	-9,480	-15,777	-24,247	-19,733
178	Gmax	Combination	-19,800	-16,600	-16,380	-17,145	-24,435
178	Gmax	Combination	-13,320	-15,300	-24,728	-25,701	-21,044
179	Gmax	Combination	-12,740	-8,950	-35,602	-41,662	-8,586
179	Gmax	Combination	-12,020	-8,800	-29,494	-40,948	-13,165
179	Gmax	Combination	-13,090	-14,150	-24,735	-25,736	-15,568
179	Gmax	Combination	-13,810	-14,290	-27,337	-25,111	-10,988
180	Gmax	Combination	-8,420	-7,460	-36,229	-38,191	-0,456
180	Gmax	Combination	-12,610	-8,290	-35,614	-41,722	-4,952
180	Gmax	Combination	-13,790	-14,200	-27,314	-24,996	-5,323
180	Gmax	Combination	-9,600	-13,360	-26,891	-22,768	-0,828
181	Gmax	Combination	-10,350	-7,120	-32,850	-34,489	7,028
181	Gmax	Combination	-8,270	-6,710	-36,236	-38,228	2,982
181	Gmax	Combination	-9,410	-12,370	-26,883	-22,727	4,274
181	Gmax	Combination	-11,490	-12,790	-24,434	-20,672	8,321

182	Gmax	Combination	-8,330	-5,060	-25,568	-29,311	13,583
182	Gmax	Combination	-10,010	-5,390	-32,861	-34,544	10,084
182	Gmax	Combination	-11,560	-13,140	-24,398	-20,489	12,910
182	Gmax	Combination	-9,880	-12,800	-19,973	-18,271	16,410
183	Gmax	Combination	-9,340	-4,200	-13,884	-16,264	18,227
183	Gmax	Combination	-8,110	-3,960	-25,580	-29,369	15,890
183	Gmax	Combination	-9,610	-11,450	-19,959	-18,203	20,229
183	Gmax	Combination	-10,840	-11,700	-11,898	-11,029	22,566
184	Gmax	Combination	-3,750	-3,130	3,322	16,386	20,045
184	Gmax	Combination	-9,350	-4,250	-13,904	-16,363	19,486
184	Gmax	Combination	-10,660	-10,800	-11,899	-11,030	24,319
184	Gmax	Combination	-5,060	-9,680	-0,012	14,350	24,878
185	Gmax	Combination	-14,080	-10,200	-16,783	-17,398	-31,742
185	Gmax	Combination	-24,190	-12,220	0,419	19,870	-30,333
185	Gmax	Combination	-27,280	-27,670	1,124	1,432	-28,839
185	Gmax	Combination	-17,170	-25,650	15,737	-1,281	-30,247
186	Gmax	Combination	-10,980	-14,830	-24,953	-25,746	-23,698
186	Gmax	Combination	-15,170	-15,670	-16,748	-17,218	-28,297
186	Gmax	Combination	-16,160	-20,580	15,755	-1,192	-28,621
186	Gmax	Combination	-11,960	-19,740	21,998	3,395	-24,023
187	Gmax	Combination	-6,480	-12,830	-27,549	-25,154	-11,662
187	Gmax	Combination	-10,750	-13,680	-24,960	-25,781	-17,786
187	Gmax	Combination	-11,270	-16,280	22,035	3,580	-18,045
187	Gmax	Combination	-7,000	-15,430	23,929	4,171	-11,922
188	Gmax	Combination	-7,810	-13,000	-27,031	-22,796	-0,376
188	Gmax	Combination	-6,460	-12,730	-27,526	-25,038	-5,908
188	Gmax	Combination	-6,160	-11,210	23,811	3,579	-5,964
188	Gmax	Combination	-7,500	-11,480	23,692	4,223	-0,432
189	Gmax	Combination	-5,620	-11,620	-24,593	-20,703	9,819
189	Gmax	Combination	-7,610	-12,010	-27,023	-22,755	4,771
189	Gmax	Combination	-7,770	-12,810	23,664	4,082	4,979
189	Gmax	Combination	-5,780	-12,410	22,409	4,140	10,027
190	Gmax	Combination	-8,890	-12,600	-20,067	-18,290	18,921
190	Gmax	Combination	-5,690	-11,970	-24,556	-20,521	14,442
190	Gmax	Combination	-6,290	-15,000	22,272	3,456	14,874
190	Gmax	Combination	-9,490	-15,640	19,821	3,600	19,353
191	Gmax	Combination	-10,790	-11,690	-12,395	-11,128	26,051
191	Gmax	Combination	-8,620	-11,250	-20,053	-18,222	23,061
191	Gmax	Combination	-11,020	-23,290	19,753	3,263	23,449
191	Gmax	Combination	-13,200	-23,720	14,207	-0,296	26,439
192	Gmax	Combination	-17,100	-12,090	0,351	14,423	27,117
192	Gmax	Combination	-10,610	-10,790	-12,395	-11,129	28,444

192	Gmax	Combination	-13,510	-25,260	14,036	-1,149	26,737
192	Gmax	Combination	-19,990	-26,550	0,722	1,354	25,410
193	Gmax	Combination	33,490	67,570	-10,805	-1,364	-2,255
193	Gmax	Combination	2,800	61,430	0,047	1,306	-4,318
193	Gmax	Combination	-21,480	-59,940	2,887	14,454	-7,543
193	Gmax	Combination	9,210	-53,810	2,506	5,809	-5,479
194	Gmax	Combination	26,910	40,610	-13,437	-3,080	-1,261
194	Gmax	Combination	28,140	40,860	-10,634	-0,510	-2,018
194	Gmax	Combination	12,230	-38,700	2,483	5,696	-3,473
194	Gmax	Combination	10,990	-38,940	0,051	2,311	-2,715
195	Gmax	Combination	16,480	18,360	-13,497	-2,993	-0,918
195	Gmax	Combination	22,700	19,610	-13,206	-1,923	-1,262
195	Gmax	Combination	13,630	-25,740	-0,009	2,012	-1,706
195	Gmax	Combination	7,410	-26,990	-1,373	0,979	-1,362
196	Gmax	Combination	-4,230	2,810	4,288	-3,434	7,147
196	Gmax	Combination	-4,610	2,740	-6,092	0,089	4,224
196	Gmax	Combination	-5,080	0,380	1,434	8,120	6,415
196	Gmax	Combination	-4,700	0,460	-2,606	12,872	9,338
197	Gmax	Combination	14,350	7,300	-12,947	-3,058	-0,611
197	Gmax	Combination	14,260	7,280	-13,337	-2,190	-0,901
197	Gmax	Combination	8,740	-20,320	-1,418	0,753	-0,830
197	Gmax	Combination	8,830	-20,300	-1,731	1,028	-0,540
198	Gmax	Combination	7,270	2,140	-12,112	-2,416	-0,156
198	Gmax	Combination	13,570	3,400	-12,747	-2,059	-0,484
198	Gmax	Combination	9,530	-16,800	-1,784	0,763	-0,063
198	Gmax	Combination	3,230	-18,060	-1,098	1,871	0,265
199	Gmax	Combination	12,130	4,360	-10,353	-2,808	0,998
199	Gmax	Combination	7,530	3,440	-12,091	-2,307	0,148
199	Gmax	Combination	3,770	-15,380	-1,110	1,811	0,998
199	Gmax	Combination	8,370	-14,460	-0,071	4,370	1,848
200	Gmax	Combination	-4,380	3,860	-6,023	0,432	2,821
200	Gmax	Combination	12,710	7,280	-10,088	-1,482	1,656
200	Gmax	Combination	9,340	-9,590	-0,142	4,017	3,251
200	Gmax	Combination	-7,760	-13,010	1,422	8,062	4,416
201	Gmax	Combination	11,560	-53,340	1,921	5,692	-6,045
201	Gmax	Combination	-13,540	-58,360	3,009	14,478	-6,793
201	Gmax	Combination	-14,310	-62,220	3,351	16,276	-5,919
201	Gmax	Combination	10,790	-57,190	3,973	10,571	-5,171
202	Gmax	Combination	18,410	-37,460	-0,054	2,290	-3,586
202	Gmax	Combination	14,580	-38,230	1,899	5,579	-4,565
202	Gmax	Combination	10,980	-56,240	3,982	10,615	-4,612
202	Gmax	Combination	14,810	-55,480	4,356	6,663	-3,633

203	Gmax	Combination	19,750	-24,520	-1,424	0,969	-1,796
203	Gmax	Combination	21,050	-24,260	-0,114	1,991	-2,591
203	Gmax	Combination	16,030	-49,400	4,377	6,769	-2,850
203	Gmax	Combination	14,720	-49,660	4,376	4,835	-2,055
204	Gmax	Combination	-7,510	-0,100	2,039	13,801	8,092
204	Gmax	Combination	13,520	4,100	0,032	7,840	6,175
204	Gmax	Combination	5,260	-37,170	5,856	14,120	5,531
204	Gmax	Combination	-15,760	-41,380	5,477	25,248	7,448
205	Gmax	Combination	14,460	-19,180	-1,724	1,030	-0,524
205	Gmax	Combination	21,080	-17,850	-1,469	0,743	-1,179
205	Gmax	Combination	16,270	-41,880	4,390	4,910	-1,270
205	Gmax	Combination	9,650	-43,210	4,405	4,690	-0,615
206	Gmax	Combination	15,940	-15,520	-1,212	1,848	0,738
206	Gmax	Combination	15,160	-15,680	-1,777	0,764	0,026
206	Gmax	Combination	10,860	-37,140	4,419	4,759	0,127
206	Gmax	Combination	11,650	-36,980	4,629	6,157	0,838
207	Gmax	Combination	4,100	-15,310	0,055	4,395	2,317
207	Gmax	Combination	16,480	-12,830	-1,224	1,788	1,480
207	Gmax	Combination	12,570	-32,370	4,632	6,173	1,636
207	Gmax	Combination	0,190	-34,840	4,889	9,082	2,473
208	Gmax	Combination	10,840	-9,290	0,021	7,782	4,637
208	Gmax	Combination	5,070	-10,440	-0,015	4,042	3,493
208	Gmax	Combination	0,700	-32,300	4,906	9,164	3,222
208	Gmax	Combination	6,470	-31,150	5,891	14,295	4,366
209	Gmax	Combination	2,300	-58,890	4,136	10,603	-4,206
209	Gmax	Combination	-7,480	-60,850	3,159	16,238	-4,272
209	Gmax	Combination	-7,440	-60,630	3,246	15,491	-2,874
209	Gmax	Combination	2,350	-58,680	4,323	11,949	-2,808
210	Gmax	Combination	12,070	-56,020	4,286	6,649	-3,255
210	Gmax	Combination	2,490	-57,940	4,145	10,648	-3,685
210	Gmax	Combination	2,680	-57,020	4,317	11,922	-2,754
210	Gmax	Combination	12,260	-55,110	5,424	9,198	-2,324
211	Gmax	Combination	14,830	-49,640	4,302	4,821	-1,946
211	Gmax	Combination	13,290	-49,940	4,307	6,755	-2,510
211	Gmax	Combination	12,650	-53,150	5,417	9,165	-2,011
211	Gmax	Combination	14,190	-52,840	6,125	7,670	-1,447
212	Gmax	Combination	-4,290	-39,080	5,661	25,285	4,903
212	Gmax	Combination	-3,870	-39,000	5,705	14,090	4,979
212	Gmax	Combination	-0,470	-22,020	5,323	17,597	3,356
212	Gmax	Combination	-0,890	-22,100	3,709	20,682	3,280
213	Gmax	Combination	17,210	-41,690	4,342	4,677	-0,601
213	Gmax	Combination	16,390	-41,860	4,317	4,895	-1,196

213	Gmax	Combination	14,880	-49,420	6,120	7,648	-1,026
213	Gmax	Combination	15,700	-49,260	6,525	7,650	-0,431
214	Gmax	Combination	11,790	-36,950	4,553	6,142	0,753
214	Gmax	Combination	18,420	-35,630	4,356	4,747	0,138
214	Gmax	Combination	16,700	-44,220	6,520	7,627	0,035
214	Gmax	Combination	10,080	-45,550	6,629	9,200	0,650
215	Gmax	Combination	13,820	-32,120	4,947	9,094	2,232
215	Gmax	Combination	12,720	-32,340	4,556	6,157	1,544
215	Gmax	Combination	11,060	-40,620	6,626	9,183	1,139
215	Gmax	Combination	12,160	-40,400	6,353	12,462	1,827
216	Gmax	Combination	-2,660	-32,980	5,739	14,265	3,919
216	Gmax	Combination	14,330	-29,580	4,963	9,176	3,169
216	Gmax	Combination	13,360	-34,410	6,343	12,417	2,343
216	Gmax	Combination	-3,630	-37,810	5,288	17,419	3,093
217	Gmax	Combination	0,590	-59,030	4,432	11,971	-1,524
217	Gmax	Combination	-5,490	-60,240	3,043	15,450	-1,390
217	Gmax	Combination	-5,040	-58,040	3,096	14,488	-0,049
217	Gmax	Combination	1,030	-56,820	4,202	11,791	-0,183
218	Gmax	Combination	6,620	-56,240	5,409	9,195	-1,413
218	Gmax	Combination	0,920	-57,380	4,427	11,944	-1,452
218	Gmax	Combination	1,440	-54,800	4,204	11,799	-0,323
218	Gmax	Combination	7,140	-53,660	5,373	9,615	-0,284
219	Gmax	Combination	12,070	-53,260	6,112	7,668	-0,965
219	Gmax	Combination	7,020	-54,270	5,403	9,162	-1,114
219	Gmax	Combination	7,500	-51,840	5,377	9,635	-0,374
219	Gmax	Combination	12,560	-50,830	6,190	8,440	-0,225
220	Gmax	Combination	-10,580	-24,040	4,211	20,782	2,084
220	Gmax	Combination	9,450	-20,030	5,297	17,592	1,606
220	Gmax	Combination	6,210	-36,250	5,990	17,111	0,079
220	Gmax	Combination	-13,820	-40,260	5,153	25,545	0,557
221	Gmax	Combination	13,360	-49,720	6,496	7,644	-0,358
221	Gmax	Combination	12,760	-49,840	6,107	7,646	-0,561
221	Gmax	Combination	13,100	-48,140	6,194	8,460	-0,261
221	Gmax	Combination	13,700	-48,020	6,659	8,558	-0,058
222	Gmax	Combination	13,770	-44,810	6,597	9,193	0,309
222	Gmax	Combination	14,370	-44,690	6,491	7,621	0,089
222	Gmax	Combination	14,390	-44,560	6,663	8,579	-0,074
222	Gmax	Combination	13,800	-44,680	6,729	10,121	0,147
223	Gmax	Combination	8,410	-41,150	6,345	12,461	0,960
223	Gmax	Combination	14,760	-39,880	6,593	9,176	0,772
223	Gmax	Combination	14,910	-39,100	6,733	10,141	0,115
223	Gmax	Combination	8,560	-40,370	6,400	13,087	0,302

7.3. VERIFICAÇÃO DAS TENSÕES NO SOLO

A tabela a seguir apresenta as reações das placas no solo.

Tabela 7.2 – Reações no solo.

Joint	OutputCase	CaseType	F1	F2	F3	M1	M2	M3
Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
1	Gmax	Combination	0	0	84,794	0	0	0
2	Gmax	Combination	0	0	43,582	0	0	0
3	Gmax	Combination	0	0	86,304	0	0	0
4	Gmax	Combination	0	0	159,633	0	0	0
5	Gmax	Combination	0	0	82,673	0	0	0
6	Gmax	Combination	0	0	148,314	0	0	0
7	Gmax	Combination	0	0	80,677	0	0	0
8	Gmax	Combination	0	0	140,313	0	0	0
9	Gmax	Combination	0	0	78,753	0	0	0
10	Gmax	Combination	0	0	135,61	0	0	0
11	Gmax	Combination	0	0	76,885	0	0	0
12	Gmax	Combination	0	0	133,878	0	0	0
13	Gmax	Combination	0	0	75,07	0	0	0
14	Gmax	Combination	0	0	134,828	0	0	0
15	Gmax	Combination	0	0	73,344	0	0	0
16	Gmax	Combination	0	0	138,088	0	0	0
17	Gmax	Combination	0	0	35,905	0	0	0
18	Gmax	Combination	0	0	71,164	0	0	0
19	Gmax	Combination	0	0	85,777	0	0	0
20	Gmax	Combination	0	0	152,097	0	0	0
21	Gmax	Combination	0	0	135,294	0	0	0
22	Gmax	Combination	0	0	124,004	0	0	0
23	Gmax	Combination	0	0	118,492	0	0	0
24	Gmax	Combination	0	0	118,276	0	0	0
25	Gmax	Combination	0	0	122,813	0	0	0
26	Gmax	Combination	0	0	131,289	0	0	0
27	Gmax	Combination	0	0	70,774	0	0	0
28	Gmax	Combination	0	0	85,355	0	0	0
29	Gmax	Combination	0	0	148,076	0	0	0
30	Gmax	Combination	0	0	128,49	0	0	0
31	Gmax	Combination	0	0	115,417	0	0	0
32	Gmax	Combination	0	0	109,401	0	0	0
33	Gmax	Combination	0	0	109,953	0	0	0
34	Gmax	Combination	0	0	116,365	0	0	0
35	Gmax	Combination	0	0	127,527	0	0	0

36	Gmax	Combination	0	0	70,454	0	0	0
37	Gmax	Combination	0	0	84,974	0	0	0
38	Gmax	Combination	0	0	146,87	0	0	0
39	Gmax	Combination	0	0	126,908	0	0	0
40	Gmax	Combination	0	0	113,592	0	0	0
41	Gmax	Combination	0	0	107,514	0	0	0
42	Gmax	Combination	0	0	108,185	0	0	0
43	Gmax	Combination	0	0	114,867	0	0	0
44	Gmax	Combination	0	0	126,414	0	0	0
45	Gmax	Combination	0	0	70,146	0	0	0
46	Gmax	Combination	0	0	84,63	0	0	0
47	Gmax	Combination	0	0	148,132	0	0	0
48	Gmax	Combination	0	0	129,935	0	0	0
49	Gmax	Combination	0	0	117,802	0	0	0
50	Gmax	Combination	0	0	112,106	0	0	0
51	Gmax	Combination	0	0	112,327	0	0	0
52	Gmax	Combination	0	0	117,831	0	0	0
53	Gmax	Combination	0	0	127,691	0	0	0
54	Gmax	Combination	0	0	69,839	0	0	0
55	Gmax	Combination	0	0	84,351	0	0	0
56	Gmax	Combination	0	0	151,982	0	0	0
57	Gmax	Combination	0	0	137,725	0	0	0
58	Gmax	Combination	0	0	128,138	0	0	0
59	Gmax	Combination	0	0	123,191	0	0	0
60	Gmax	Combination	0	0	122,354	0	0	0
61	Gmax	Combination	0	0	125,235	0	0	0
62	Gmax	Combination	0	0	131,351	0	0	0
63	Gmax	Combination	0	0	69,559	0	0	0
64	Gmax	Combination	0	0	84,174	0	0	0
65	Gmax	Combination	0	0	158,081	0	0	0
66	Gmax	Combination	0	0	149,384	0	0	0
67	Gmax	Combination	0	0	143,12	0	0	0
68	Gmax	Combination	0	0	138,974	0	0	0
69	Gmax	Combination	0	0	136,597	0	0	0
70	Gmax	Combination	0	0	135,874	0	0	0
71	Gmax	Combination	0	0	136,785	0	0	0
72	Gmax	Combination	0	0	69,335	0	0	0
73	Gmax	Combination	0	0	83,996	0	0	0
74	Gmax	Combination	0	0	162,4	0	0	0
75	Gmax	Combination	0	0	157,419	0	0	0
76	Gmax	Combination	0	0	153,078	0	0	0
77	Gmax	Combination	0	0	149,25	0	0	0

78	Gmax	Combination	0	0	145,859	0	0	0
79	Gmax	Combination	0	0	142,88	0	0	0
80	Gmax	Combination	0	0	140,354	0	0	0
81	Gmax	Combination	0	0	69,114	0	0	0
82	Gmax	Combination	0	0	83,767	0	0	0
83	Gmax	Combination	0	0	157,614	0	0	0
84	Gmax	Combination	0	0	149,19	0	0	0
85	Gmax	Combination	0	0	143,096	0	0	0
86	Gmax	Combination	0	0	139,011	0	0	0
87	Gmax	Combination	0	0	136,588	0	0	0
88	Gmax	Combination	0	0	135,716	0	0	0
89	Gmax	Combination	0	0	136,387	0	0	0
90	Gmax	Combination	0	0	68,987	0	0	0
91	Gmax	Combination	0	0	83,541	0	0	0
92	Gmax	Combination	0	0	151,127	0	0	0
93	Gmax	Combination	0	0	137,475	0	0	0
94	Gmax	Combination	0	0	128,266	0	0	0
95	Gmax	Combination	0	0	123,452	0	0	0
96	Gmax	Combination	0	0	122,508	0	0	0
97	Gmax	Combination	0	0	125,052	0	0	0
98	Gmax	Combination	0	0	130,631	0	0	0
99	Gmax	Combination	0	0	68,866	0	0	0
100	Gmax	Combination	0	0	83,424	0	0	0
101	Gmax	Combination	0	0	147,013	0	0	0
102	Gmax	Combination	0	0	129,858	0	0	0
103	Gmax	Combination	0	0	118,387	0	0	0
104	Gmax	Combination	0	0	112,925	0	0	0
105	Gmax	Combination	0	0	112,948	0	0	0
106	Gmax	Combination	0	0	117,851	0	0	0
107	Gmax	Combination	0	0	126,774	0	0	0
108	Gmax	Combination	0	0	68,812	0	0	0
109	Gmax	Combination	0	0	83,391	0	0	0
110	Gmax	Combination	0	0	145,679	0	0	0
111	Gmax	Combination	0	0	127,362	0	0	0
112	Gmax	Combination	0	0	115,115	0	0	0
113	Gmax	Combination	0	0	109,413	0	0	0
114	Gmax	Combination	0	0	109,75	0	0	0
115	Gmax	Combination	0	0	115,442	0	0	0
116	Gmax	Combination	0	0	125,488	0	0	0
117	Gmax	Combination	0	0	68,801	0	0	0
118	Gmax	Combination	0	0	83,428	0	0	0
119	Gmax	Combination	0	0	147,02	0	0	0

120	Gmax	Combination	0	0	129,865	0	0	0
121	Gmax	Combination	0	0	118,394	0	0	0
122	Gmax	Combination	0	0	112,933	0	0	0
123	Gmax	Combination	0	0	112,956	0	0	0
124	Gmax	Combination	0	0	117,859	0	0	0
125	Gmax	Combination	0	0	126,783	0	0	0
126	Gmax	Combination	0	0	68,819	0	0	0
127	Gmax	Combination	0	0	83,548	0	0	0
128	Gmax	Combination	0	0	151,142	0	0	0
129	Gmax	Combination	0	0	137,492	0	0	0
130	Gmax	Combination	0	0	128,283	0	0	0
131	Gmax	Combination	0	0	123,47	0	0	0
132	Gmax	Combination	0	0	122,526	0	0	0
133	Gmax	Combination	0	0	125,071	0	0	0
134	Gmax	Combination	0	0	130,653	0	0	0
135	Gmax	Combination	0	0	68,88	0	0	0
136	Gmax	Combination	0	0	83,778	0	0	0
137	Gmax	Combination	0	0	157,638	0	0	0
138	Gmax	Combination	0	0	149,217	0	0	0
139	Gmax	Combination	0	0	143,125	0	0	0
140	Gmax	Combination	0	0	139,042	0	0	0
141	Gmax	Combination	0	0	136,62	0	0	0
142	Gmax	Combination	0	0	135,75	0	0	0
143	Gmax	Combination	0	0	136,424	0	0	0
144	Gmax	Combination	0	0	69,007	0	0	0
145	Gmax	Combination	0	0	83,994	0	0	0
146	Gmax	Combination	0	0	162,403	0	0	0
147	Gmax	Combination	0	0	157,445	0	0	0
148	Gmax	Combination	0	0	153,112	0	0	0
149	Gmax	Combination	0	0	149,287	0	0	0
150	Gmax	Combination	0	0	145,9	0	0	0
151	Gmax	Combination	0	0	142,925	0	0	0
152	Gmax	Combination	0	0	140,404	0	0	0
153	Gmax	Combination	0	0	69,142	0	0	0
154	Gmax	Combination	0	0	84,174	0	0	0
155	Gmax	Combination	0	0	158,075	0	0	0
156	Gmax	Combination	0	0	149,371	0	0	0
157	Gmax	Combination	0	0	143,12	0	0	0
158	Gmax	Combination	0	0	138,984	0	0	0
159	Gmax	Combination	0	0	136,621	0	0	0
160	Gmax	Combination	0	0	135,914	0	0	0
161	Gmax	Combination	0	0	136,842	0	0	0

162	Gmax	Combination	0	0	69,372	0	0	0
163	Gmax	Combination	0	0	84,367	0	0	0
164	Gmax	Combination	0	0	151,972	0	0	0
165	Gmax	Combination	0	0	137,648	0	0	0
166	Gmax	Combination	0	0	128,059	0	0	0
167	Gmax	Combination	0	0	123,14	0	0	0
168	Gmax	Combination	0	0	122,34	0	0	0
169	Gmax	Combination	0	0	125,258	0	0	0
170	Gmax	Combination	0	0	131,411	0	0	0
171	Gmax	Combination	0	0	69,605	0	0	0
172	Gmax	Combination	0	0	84,651	0	0	0
173	Gmax	Combination	0	0	147,969	0	0	0
174	Gmax	Combination	0	0	129,708	0	0	0
175	Gmax	Combination	0	0	117,61	0	0	0
176	Gmax	Combination	0	0	111,984	0	0	0
177	Gmax	Combination	0	0	112,274	0	0	0
178	Gmax	Combination	0	0	117,838	0	0	0
179	Gmax	Combination	0	0	127,753	0	0	0
180	Gmax	Combination	0	0	69,895	0	0	0
181	Gmax	Combination	0	0	84,864	0	0	0
182	Gmax	Combination	0	0	146,374	0	0	0
183	Gmax	Combination	0	0	126,535	0	0	0
184	Gmax	Combination	0	0	113,329	0	0	0
185	Gmax	Combination	0	0	107,354	0	0	0
186	Gmax	Combination	0	0	108,114	0	0	0
187	Gmax	Combination	0	0	114,869	0	0	0
188	Gmax	Combination	0	0	126,483	0	0	0
189	Gmax	Combination	0	0	70,211	0	0	0
190	Gmax	Combination	0	0	85,366	0	0	0
191	Gmax	Combination	0	0	147,837	0	0	0
192	Gmax	Combination	0	0	128,21	0	0	0
193	Gmax	Combination	0	0	115,206	0	0	0
194	Gmax	Combination	0	0	109,273	0	0	0
195	Gmax	Combination	0	0	109,901	0	0	0
196	Gmax	Combination	0	0	116,382	0	0	0
197	Gmax	Combination	0	0	127,611	0	0	0
198	Gmax	Combination	0	0	70,529	0	0	0
199	Gmax	Combination	0	0	85,807	0	0	0
200	Gmax	Combination	0	0	152,122	0	0	0
201	Gmax	Combination	0	0	135,233	0	0	0
202	Gmax	Combination	0	0	123,929	0	0	0
203	Gmax	Combination	0	0	118,448	0	0	0

204	Gmax	Combination	0	0	118,278	0	0	0
205	Gmax	Combination	0	0	122,867	0	0	0
206	Gmax	Combination	0	0	131,399	0	0	0
207	Gmax	Combination	0	0	70,858	0	0	0
208	Gmax	Combination	0	0	86,336	0	0	0
209	Gmax	Combination	0	0	159,714	0	0	0
210	Gmax	Combination	0	0	148,375	0	0	0
211	Gmax	Combination	0	0	140,359	0	0	0
212	Gmax	Combination	0	0	135,664	0	0	0
213	Gmax	Combination	0	0	133,956	0	0	0
214	Gmax	Combination	0	0	134,939	0	0	0
215	Gmax	Combination	0	0	138,237	0	0	0
216	Gmax	Combination	0	0	71,258	0	0	0
217	Gmax	Combination	0	0	43,6	0	0	0
218	Gmax	Combination	0	0	84,843	0	0	0
219	Gmax	Combination	0	0	82,734	0	0	0
220	Gmax	Combination	0	0	80,748	0	0	0
221	Gmax	Combination	0	0	78,832	0	0	0
222	Gmax	Combination	0	0	76,97	0	0	0
223	Gmax	Combination	0	0	75,162	0	0	0
224	Gmax	Combination	0	0	73,443	0	0	0
225	Gmax	Combination	0	0	35,959	0	0	0

A tensão no solo será determinada pela equação;

$$\sigma_{solo} = \frac{P_{concreto} + P_{agua} + SC}{A}$$

Conforme somatório da coluna F3 que são as reações em z e equivale ao somatório do numerador da equação, temos 26078,51 kN. A área do apoio no solo é de 276,64 m². Temos uma tensão no solo de;

$$\sigma = \frac{26078,51}{276,64} = 94,27 \frac{kN}{m^2} = 0,94 \frac{kgf}{cm^2} \leq 1,40 \frac{kgf}{cm^2} (ok)$$

Logo a fundação não poderá ser do tipo direta.

7.4. ARMAÇÃO NA LAJE DE FUNDO

As figuras 7.3 e 7.4 apresentam os momentos fletores na laje de fundo.

Figura 7.3 – Momento na direção X.

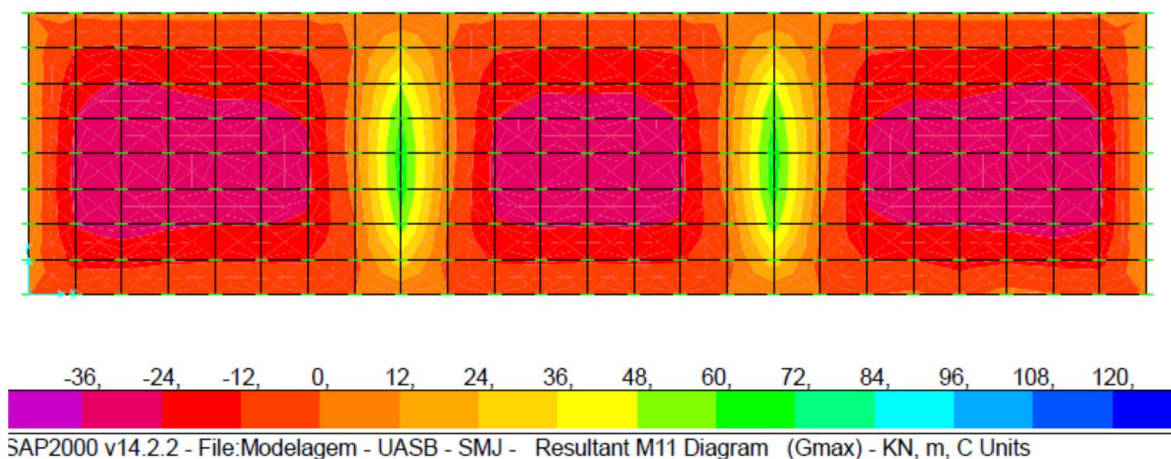
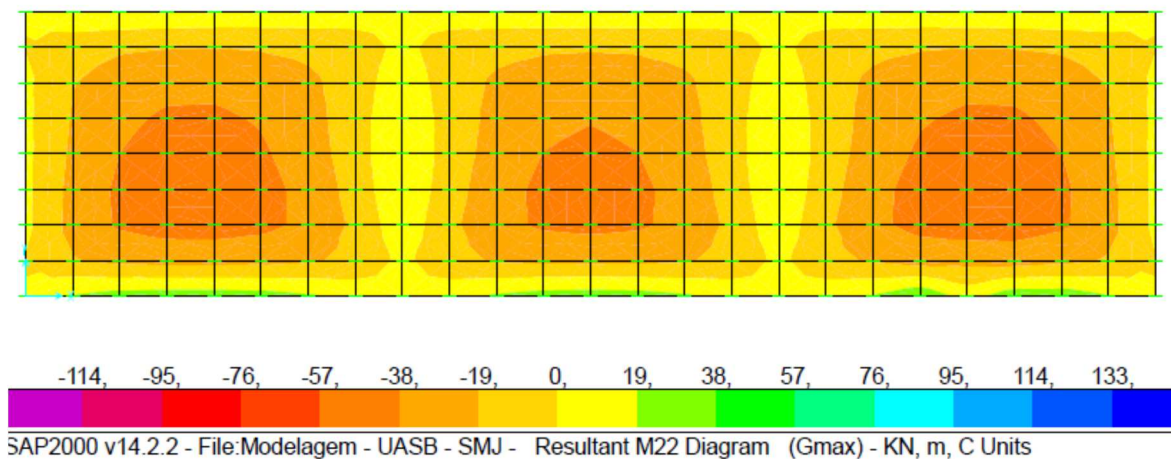


Figura 7.4 – Momento na direção Y.



Conforme modelagem os esforços máximos nas lajes de fundo são:

$$\text{Laje } h=45\text{cm} \rightarrow \begin{cases} M_x = 30,28 \text{ kNm} \\ M_y = 48,47 \text{ kNm} \end{cases}$$

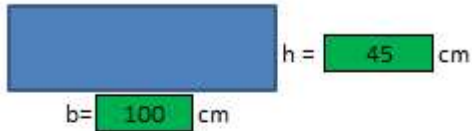
$$\text{Engastes (apoio das paredes centrais)} \rightarrow M = 62,93 \text{ kNm}$$

A figura a seguir apresenta o resultados do dimensionamento

a) Direção x

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 30,28 kN.m
 $f_{ck} = 30,00$ MPa



2) DETERMINAÇÃO DA ALTURA ÚTIL

$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$

Adotaremos ϕ da armadura = 12,5 mm

Cobrimento da armadura = 4,00 mm

$d = 39,13$ cm

Adotar $d = 39,00$ cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0130$$

Conforme tabela temos: $KMD = 0,0130 \rightarrow K_x = 0,0223$
 $\rightarrow K_z = 0,9911$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$A_s = \frac{M_d}{k_z \cdot d \cdot f_{y,d}} = 2,52 \text{ cm}^2/\text{m}$$

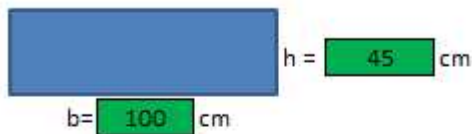
$$A_{s,min} = \begin{cases} 0,15\%bh = 6,75 \text{ cm}^2/\text{m} \\ 0,23\%bh = 10,35 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{y,d}} = 7,76 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 10,35 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 12.5$ c/10 que equivale a 12,30 cm²/m.

b) Direção y

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 48,47 kN.m
fck = 30,00 MPa



2) DETERMINAÇÃO DA ALTURA ÚTIL

d = altura total – cobrimento – 1,5Øarmadura

Adotaremos Ø da armadura = 12,5 mm

Cobrimento da armadura = 4,00 mm

d = 39,13 cm

Adotar d = 39,00 cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0208$$

Conforme tabela temos: $KMD = 0,0208 \rightarrow Kx = 0,0298$
 $\rightarrow Kz = 0,9981$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 4,01 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 6,75 \text{ cm}^2/\text{m} \\ 0,23\%bh = 10,35 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 7,76 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 10,35 cm²/m. Será utilizada armadura dupla (face superior e inferior) de Ø12.5 c/10 que equivale a 12,30 cm²/m.

c) Engaste

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 62,93 kN.m
 $f_{ck} = 30,00$ MPa



$b = 100$ cm
 $h = 45$ cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$

Adotaremos ϕ da armadura = 12,5 mm

Cobrimento da armadura = 4,00 mm

$d = 39,13$ cm

Adotar $d = 39,00$ cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0270$$

Conforme tabela temos: $KMD = 0,0270 \rightarrow K_x = 0,0449$
 $\rightarrow K_z = 0,982$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 5,29 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 6,75 \text{ cm}^2/\text{m} \\ 0,23\%bh = 10,35 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 7,76 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 10,35 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 12.5$ c/10 que equivale a 12,30 cm²/m.

7.5. ARMAÇÃO NA LAJE SUPERIOR

As figuras 7.5 e 7.6 apresentam os momentos fletores na laje superior.

Figura 7.5 – Momento na direção X.

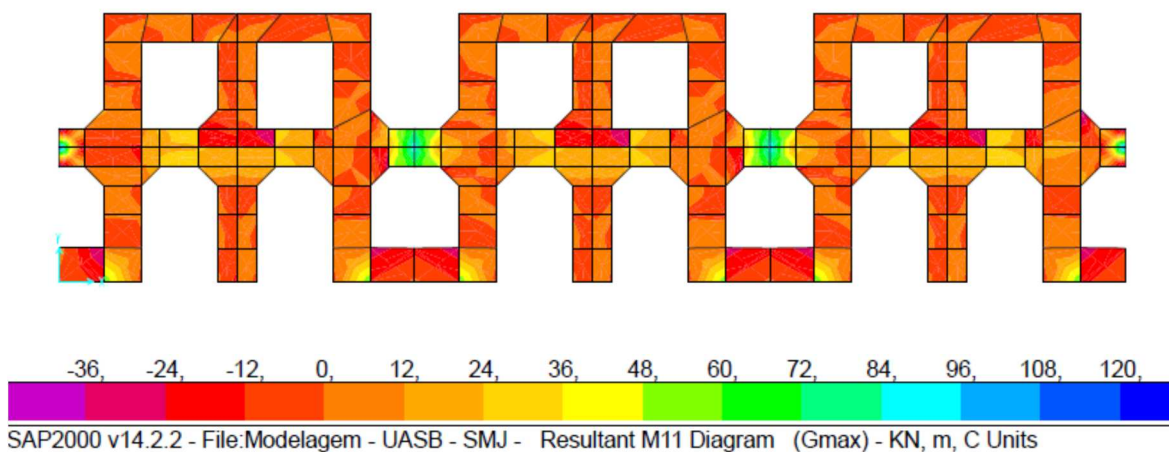
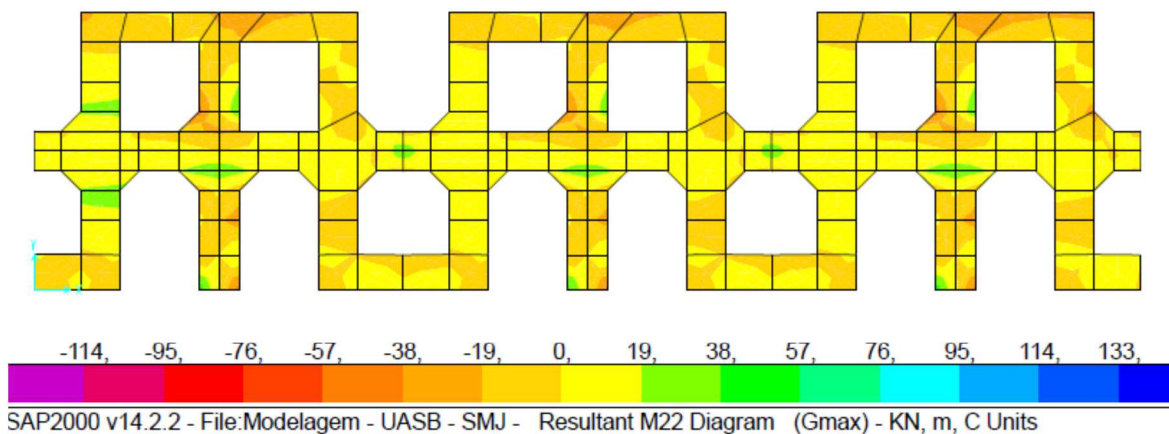


Figura 7.6 – Momento na direção Y.



Conforme modelagem os esforços máximos nas lajes de fundo são:

$$\text{Laje } h=30\text{cm} \rightarrow \begin{cases} M_x = 20,88 \text{ kNm} \\ M_y = 53,40 \text{ kNm} \end{cases}$$

A figura a seguir apresenta o resultados do dimensionamento



ENGESOLO ENGENHARIA LTDA.

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a) Direção x

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 20,88 kN.m
fck = 30,00 MPa

 h = 30 cm
b = 100 cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

d = altura total – cobrimento – 1,5 ϕ armadura

Adotaremos ϕ da armadura = 10,0 mm

Cobrimento da armadura = 4,00 mm

d = 24,50 cm

Adotar d = 24,00 cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{bf \cdot d^2 \cdot f_{cd}} = 0,0237$$

Conforme tabela temos: KMD = 0,0237

→ Kx = 0,0526

→ Kz = 0,9790

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 2,86 \text{ cm}^2/\text{m}$$


$$A_{s,min} = \begin{cases} 0,15\%bh = 4,50 \text{ cm}^2/\text{m} \\ 0,23\%bh = 6,90 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 5,18 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 6,90 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 10.0$ c/10 que equivale a 7,80 cm²/m.

b) Direção y

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 53,40 kN.m
fck = 30,00 MPa

 h = 30 cm
b = 100 cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

d = altura total – cobrimento – 1,5øarmadura

Adotaremos ø da armadura = 10,0 mm

Cobrimento da armadura = 4,00 mm

d = 24,50 cm

Adotar d = 24,00 cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{bf \cdot d^2 \cdot f_{cd}} = 0,0606$$

Conforme tabela temos: KMD = 0,0606 → Kx = 0,0916

→ Kz = 0,9634

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 7,44 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 4,50 \text{ cm}^2/\text{m} \\ 0,23\%bh = 6,90 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 5,18 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 7,44 cm²/m. Será utilizada armadura dupla (face superior e inferior) de ø10.0 c/10 que equivale a 7,80 cm²/m.

7.6. ARMAÇÃO NAS PAREDES

As figuras 7.7 e 7.8 apresentam os momentos fletores nas paredes.

Figura 7.7 – Momento na direção X.

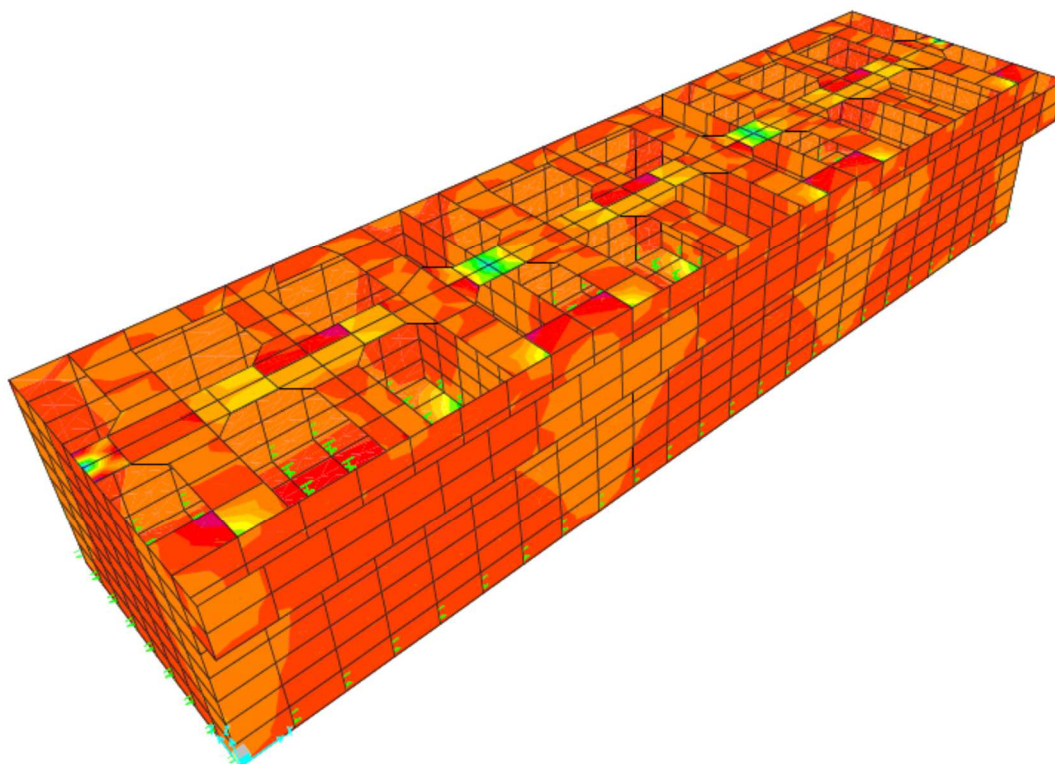
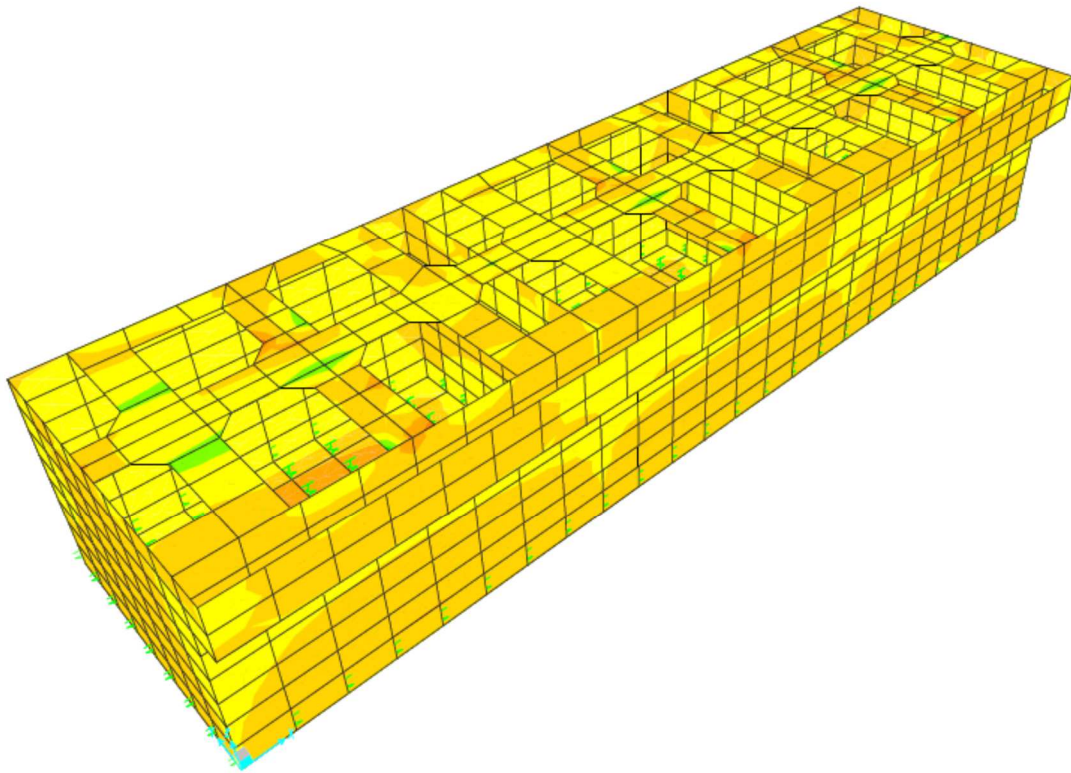


Figura 7.8 – Momento na direção Y.



Conforme modelagem os esforços máximos nas lajes de fundo são:

$$\text{Paredes } e=30\text{cm} \rightarrow \begin{cases} M_x = 38,40 \text{ kNm} \\ M_y = 36,70 \text{ kNm} \end{cases}$$


$$\text{Engastes (entre paredes centrais)} \rightarrow M = 51,02 \text{ kNm}$$

A figura a seguir apresenta o resultados do dimensionamento

a) Direção x

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 38,40 kN.m
fck = 30,00 MPa

 h = 30 cm
b = 100 cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

d = altura total – cobrimento – 1,5øarmadura

Adotaremos ø da armadura = 12,5 mm

Cobrimento da armadura = 4,00 mm

d = 24,13 cm

Adotar d = 24,00 cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0436$$

Conforme tabela temos: KMD = 0,0436 → Kx = 0,0680

→ Kz = 0,9728

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 5,30 \text{ cm}^2/\text{m}$$


$$A_{s,min} = \begin{cases} 0,15\%bh = 4,50 \text{ cm}^2/\text{m} \\ 0,23\%bh = 6,90 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 5,18 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 6,90 cm²/m. Será utilizada armadura dupla (face superior e inferior) de ø10.0 c/10 que equivale a 7,80 cm²/m.

b) Direção y

1) PARÂMETROS DE ENTRADA

$$\begin{aligned} \text{Momento Fletor Máximo} &= 36,70 \text{ kN.m} \\ f_{ck} &= 30,00 \text{ MPa} \end{aligned}$$



$$\begin{aligned} h &= 30 \text{ cm} \\ b &= 100 \text{ cm} \end{aligned}$$

2) DETERMINAÇÃO DA ALTURA ÚTIL

$$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$$

$$\text{Adotaremos } \phi \text{ da armadura} = 12,5 \text{ mm}$$

$$\text{Cobrimento da armadura} = 4,00 \text{ mm}$$

$$d = 24,13 \text{ cm}$$

$$\text{Adotar } d = 24,00 \text{ cm}$$

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0416$$

$$\text{Conforme tabela temos: } KMD = 0,0416 \rightarrow Kx = 0,068$$

$$\rightarrow Kz = 0,9728$$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 5,06 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 4,50 \text{ cm}^2/\text{m} \\ 0,23\%bh = 6,90 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 5,18 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 6,90 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 10.0$ c/10 que equivale a 7,80 cm²/m.

c) Engaste

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = $51,02$ kN.m
 $f_{ck} = 30,00$ MPa



$h = 30$ cm
 $b = 100$ cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0579$$

Conforme tabela temos: $KMD = 0,0579 \rightarrow K_x = 0,1016$
 $\rightarrow K_z = 0,9570$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$A_s = \frac{M_d}{k_z \cdot d \cdot f_{yd}} = 7,15 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 4,50 \text{ cm}^2/\text{m} \\ 0,23\%bh = 6,90 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 5,18 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de $7,15 \text{ cm}^2/\text{m}$. Será utilizada armadura dupla (face superior e inferior) de $\varnothing 10.0 \text{ c}/10$ que equivale a $7,80 \text{ cm}^2/\text{m}$.

2) DETERMINAÇÃO DA ALTURA ÚTIL

$d = \text{altura total} - \text{cobrimento} - 1,5\varnothing \text{armadura}$

Adotaremos \varnothing da armadura = $12,5$ mm

Cobrimento da armadura = $4,00$ mm

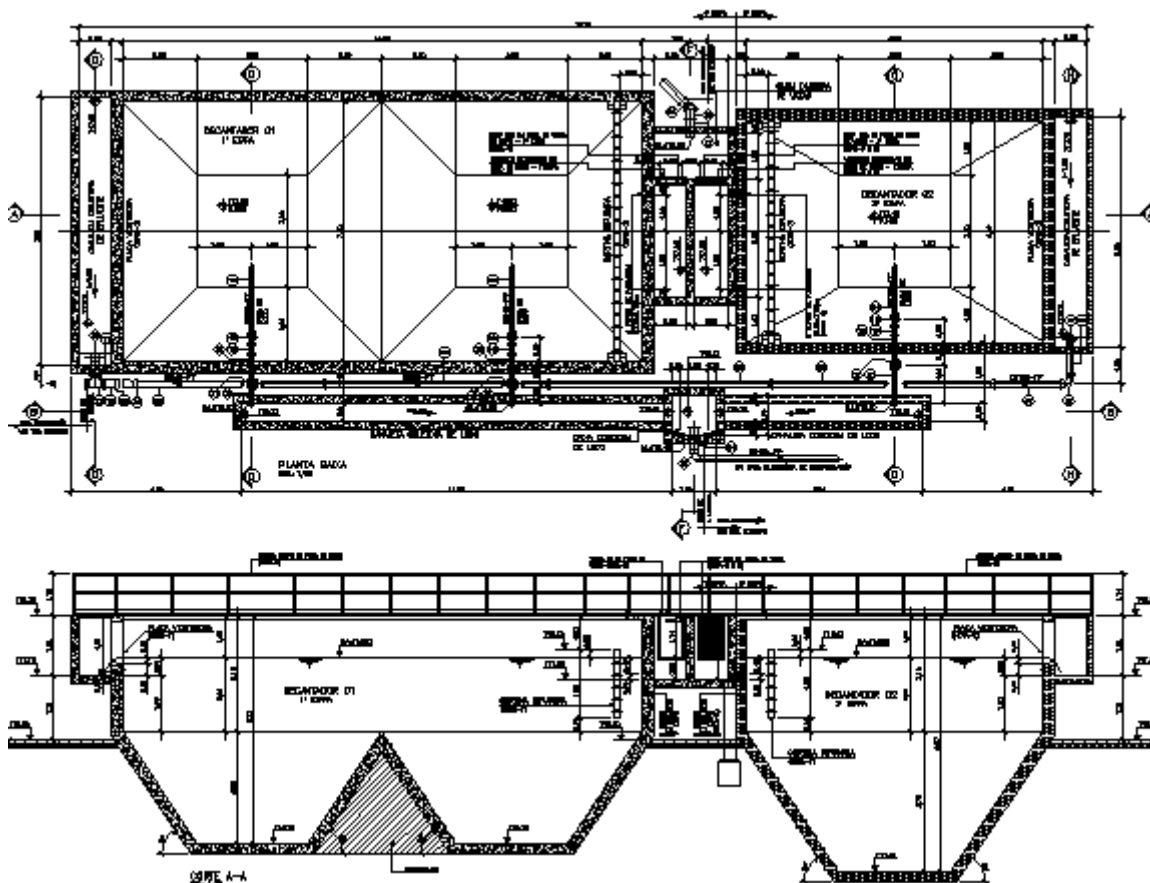
$d = 24,13$ cm

Adotar $d = 24,00$ cm

8. DIMENSIONAMENTO – DECANTADOR

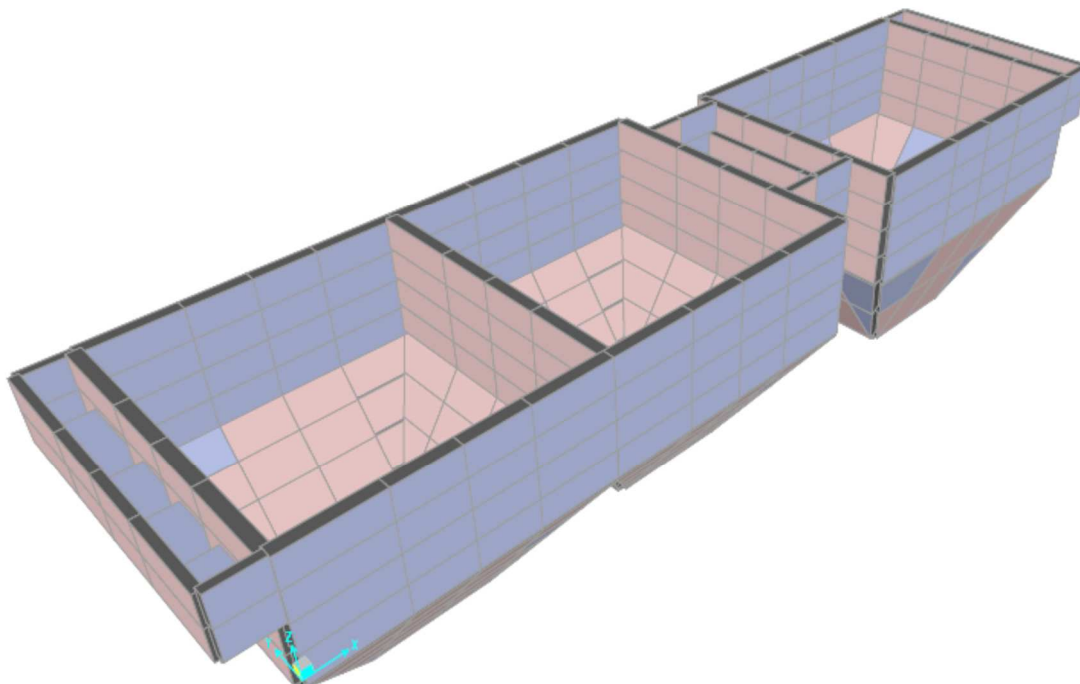
8.1. MODELAGEM ESTRUTURAL

A figura 8.1 apresenta as dimensões em planta e corte do decantador.



A modelagem estrutural foi feita no software SAP-2000 (figura 8.2) considerando os parâmetros apresentados no item 2.

Figura 8.2 – Modelo estrutural 3D – Vista 1.



Os carregamentos utilizados no dimensionamento foram:

- Cargas Permanentes (CP)
Peso próprio
- Sobrecargas (SC)
Carregamento na laje/tampas de cobertura (SC)
Carregamento na laje de fundo (SCLF)
Carregamento nas paredes lado interno (SCPI)
Carregamento nas paredes lado externo carga (SCPE)

Combinação para dimensionamento das barras

Comb 1: $1,4CP + 1,4SC$

Comb 2: $1,4CP + 1,4SC + 1,4SCLF$

Comb 3: $1,4CP + 1,4SC + 1,4SCLF + 1,4SCPI$

Comb 4: $1,4CP + 1,4SC + 1,4SCLF + 1,4SCPI + 1,4SCPE$

8.2. RESULTADOS DA ANÁLISE ESTRUTURAL

Conforme informado no item anterior a análise estrutural foi feita utilizando o software SAP 2000. As tabelas a seguir apresentam os resultados do dimensionamento eletrônico.

Tabela 8.1 – Esforços nas placas.

Area	OutputCase	CaseType	Fx	Fy	Mx	My	T
Text	Text	Text	KN/m	KN/m	KN-m/m	KN-m/m	KN-m/m
1	Gmax	Combination	-42,07	-69,62	-11,03	-12,73	-0,95
1	Gmax	Combination	-60,23	-160,43	-2,89	-46,61	-2,65
1	Gmax	Combination	-173,74	-183,14	38,98	42,86	-4,40
1	Gmax	Combination	-155,58	-92,32	-40,67	-0,20	-2,70
2	Gmax	Combination	-54,75	-159,34	-3,97	-46,82	1,87
2	Gmax	Combination	-46,60	-118,59	-11,63	-13,05	0,64
2	Gmax	Combination	-165,30	-142,33	-40,11	1,13	2,60
2	Gmax	Combination	-173,45	-183,08	39,41	42,95	3,83
3	Gmax	Combination	-155,52	-92,04	-40,67	-0,21	2,56
3	Gmax	Combination	-173,91	-183,97	38,99	42,88	4,26
3	Gmax	Combination	-61,38	-161,47	-2,88	-46,81	2,51
3	Gmax	Combination	-42,99	-69,53	-11,11	-12,86	0,81
4	Gmax	Combination	-173,62	-183,92	39,41	42,97	-3,96
4	Gmax	Combination	-165,24	-142,02	-40,12	1,08	-2,71
4	Gmax	Combination	-47,42	-118,46	-11,55	-13,05	-0,73
4	Gmax	Combination	-55,79	-160,35	-3,97	-47,03	-1,98
5	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
5	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
5	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
5	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
6	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
6	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
6	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
6	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
7	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
7	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
7	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
7	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
8	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
8	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
8	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
8	Gmax	Combination	0,00	0,00	0,00	0,00	0,00
9	Gmax	Combination	-62,92	-98,91	11,29	17,78	-4,66

9	Gmax	Combination	-293,12	-144,95	55,04	-2,70	-4,66
9	Gmax	Combination	-300,55	-182,08	-61,12	-63,34	-5,63
9	Gmax	Combination	-70,34	-136,04	5,56	54,04	-5,63
10	Gmax	Combination	-293,19	-145,26	55,06	-2,59	4,78
10	Gmax	Combination	-64,48	-99,52	11,24	17,68	4,78
10	Gmax	Combination	-72,02	-137,23	5,54	54,08	5,76
10	Gmax	Combination	-300,73	-182,97	-61,12	-63,38	5,76
11	Gmax	Combination	-285,44	-179,91	-60,89	-63,33	-5,74
11	Gmax	Combination	-74,20	-137,67	5,07	53,98	-5,91
11	Gmax	Combination	-63,66	-84,98	11,44	17,58	-5,01
11	Gmax	Combination	-274,90	-127,23	54,38	-1,78	-4,84
12	Gmax	Combination	-72,33	-136,44	5,16	53,96	6,05
12	Gmax	Combination	-285,26	-179,02	-60,88	-63,30	5,90
12	Gmax	Combination	-274,87	-127,07	54,37	-1,81	5,00
12	Gmax	Combination	-61,94	-84,49	11,37	17,51	5,16
13	Gmax	Combination	-68,46	-227,91	-4,61	-47,30	-4,20
13	Gmax	Combination	-99,15	-234,05	24,12	12,30	-6,12
13	Gmax	Combination	-69,05	-83,59	-6,97	-15,60	-12,71
13	Gmax	Combination	-38,37	-77,45	-9,56	-12,09	-10,78
14	Gmax	Combination	-84,28	-159,71	23,57	9,54	-3,51
14	Gmax	Combination	-121,17	-167,09	28,10	26,33	0,53
14	Gmax	Combination	-112,30	-122,74	10,32	7,89	-3,98
14	Gmax	Combination	-75,41	-115,36	-6,26	-12,06	-8,02
15	Gmax	Combination	-114,86	-135,55	27,71	24,35	0,51
15	Gmax	Combination	-195,15	-151,61	21,59	27,57	2,66
15	Gmax	Combination	-190,10	-126,35	13,81	18,54	4,43
15	Gmax	Combination	-109,81	-110,29	11,19	12,28	2,28
16	Gmax	Combination	-190,94	-130,56	21,41	26,67	3,06
16	Gmax	Combination	-345,81	-161,54	4,88	-5,72	2,29
16	Gmax	Combination	-324,97	-57,36	10,62	5,28	5,76
16	Gmax	Combination	-170,11	-26,38	14,35	21,21	6,53
17	Gmax	Combination	-34,65	-32,51	-9,14	-12,20	10,42
17	Gmax	Combination	-72,76	-40,13	-4,47	-15,49	12,27
17	Gmax	Combination	-112,06	-236,63	23,94	12,26	5,23
17	Gmax	Combination	-73,95	-229,01	-4,09	-47,20	3,39
18	Gmax	Combination	-79,77	-75,20	-3,73	-11,76	7,42
18	Gmax	Combination	-97,56	-78,76	13,48	8,64	3,36
18	Gmax	Combination	-114,98	-165,85	28,16	26,34	-1,40
18	Gmax	Combination	-97,19	-162,30	23,38	9,51	2,65
19	Gmax	Combination	-98,17	-81,82	14,44	13,43	-3,02
19	Gmax	Combination	-162,75	-94,74	17,07	20,04	-4,99
19	Gmax	Combination	-173,24	-147,23	21,21	27,49	-3,06

19	Gmax	Combination	-108,67	-134,31	27,77	24,36	-1,09
20	Gmax	Combination	-152,12	-41,61	17,61	22,77	-7,13
20	Gmax	Combination	-330,72	-77,33	10,11	4,36	-6,35
20	Gmax	Combination	-347,64	-161,90	6,00	-5,50	-2,27
20	Gmax	Combination	-169,04	-126,18	21,03	26,59	-3,05
21	Gmax	Combination	-109,34	-0,36	-9,92	-9,40	9,03
21	Gmax	Combination	-127,41	-3,97	-5,19	-9,82	10,44
21	Gmax	Combination	-165,05	-192,16	24,22	18,97	4,55
21	Gmax	Combination	-146,98	-188,55	-0,60	-41,33	3,14
22	Gmax	Combination	-133,44	-34,08	-4,49	-6,33	5,00
22	Gmax	Combination	-117,64	-30,92	9,97	12,20	0,71
22	Gmax	Combination	-124,78	-66,63	24,45	31,15	-2,15
22	Gmax	Combination	-140,58	-69,79	23,70	16,34	2,14
23	Gmax	Combination	-114,80	-16,75	11,02	17,46	-5,55
23	Gmax	Combination	-100,08	-13,81	12,87	16,18	-7,42
23	Gmax	Combination	-99,32	-10,02	10,54	21,33	-4,12
23	Gmax	Combination	-114,04	-12,97	24,00	28,91	-2,25
24	Gmax	Combination	-93,64	18,39	13,23	18,02	-8,80
24	Gmax	Combination	-68,07	23,50	-0,85	-13,83	-5,55
24	Gmax	Combination	-65,53	36,22	-9,49	-44,37	-0,66
24	Gmax	Combination	-91,10	31,10	10,51	21,22	-3,91
25	Gmax	Combination	-146,67	-188,49	-0,56	-41,33	-3,09
25	Gmax	Combination	-164,78	-192,11	24,21	18,97	-4,52
25	Gmax	Combination	-126,97	-3,08	-5,32	-9,79	-10,38
25	Gmax	Combination	-108,87	0,54	-10,01	-9,30	-8,95
26	Gmax	Combination	-140,30	-69,74	23,69	16,34	-2,12
26	Gmax	Combination	-123,87	-66,45	24,46	31,15	2,17
26	Gmax	Combination	-116,57	-29,92	9,72	12,13	-0,67
26	Gmax	Combination	-133,00	-33,21	-4,62	-6,31	-4,95
27	Gmax	Combination	-113,14	-12,79	24,01	28,91	2,30
27	Gmax	Combination	-98,15	-9,79	10,55	21,34	4,20
27	Gmax	Combination	-98,98	-13,95	12,65	15,98	7,48
27	Gmax	Combination	-113,97	-16,94	10,77	17,34	5,58
28	Gmax	Combination	-89,93	31,34	10,53	21,23	4,04
28	Gmax	Combination	-65,12	36,30	-9,53	-44,38	0,82
28	Gmax	Combination	-68,19	20,94	-0,85	-13,80	5,67
28	Gmax	Combination	-93,00	15,98	13,01	17,77	8,89
29	Gmax	Combination	-157,62	-75,36	31,79	16,54	-11,77
29	Gmax	Combination	-102,49	-142,15	54,19	16,92	-25,78
29	Gmax	Combination	-86,27	-61,10	-3,35	13,53	-18,23
30	Gmax	Combination	-88,27	-186,89	9,02	7,63	-9,12
30	Gmax	Combination	-62,09	-55,96	-48,62	-5,59	-18,71

30	Gmax	Combination	-122,07	-38,35	-59,89	-38,85	-18,88
30	Gmax	Combination	-145,51	-155,53	2,41	-10,33	-13,77
31	Gmax	Combination	-195,17	-38,25	13,83	18,55	3,54
31	Gmax	Combination	-168,97	92,76	-27,63	1,84	-7,07
31	Gmax	Combination	-88,62	-163,32	-51,75	-28,31	-12,29
31	Gmax	Combination	-86,27	-151,54	10,15	12,07	-1,67
32	Gmax	Combination	-130,70	276,02	-30,04	-9,38	-0,85
32	Gmax	Combination	-175,64	51,35	14,22	21,18	5,90
32	Gmax	Combination	-309,44	-176,07	7,90	4,73	6,98
32	Gmax	Combination	-306,36	-160,66	-14,78	7,55	0,25
33	Gmax	Combination	-270,78	-11,74	-30,66	-13,55	13,23
33	Gmax	Combination	-134,86	-47,27	-63,13	-18,39	24,10
33	Gmax	Combination	-121,80	18,05	6,72	-7,44	15,41
34	Gmax	Combination	-134,33	1,78	-47,12	1,93	16,88
34	Gmax	Combination	-146,33	-58,22	7,02	11,61	5,84
34	Gmax	Combination	-179,82	-67,80	4,78	-4,48	9,13
34	Gmax	Combination	-174,29	-40,20	-66,95	-35,83	16,28
35	Gmax	Combination	-73,37	-21,07	-39,52	-7,72	3,64
35	Gmax	Combination	-81,35	-60,93	15,01	16,61	-6,63
35	Gmax	Combination	-144,60	-47,98	9,58	17,17	-0,35
35	Gmax	Combination	-131,42	17,95	-52,11	-26,10	10,38
36	Gmax	Combination	-43,62	6,11	4,45	28,97	5,00
36	Gmax	Combination	-33,88	54,80	-3,90	-14,44	-8,60
36	Gmax	Combination	-73,20	-19,71	13,53	18,08	-12,48
36	Gmax	Combination	-106,02	-183,81	-40,34	-15,04	0,68
37	Gmax	Combination	-64,73	-17,60	10,18	9,17	-9,33
37	Gmax	Combination	-78,88	-20,43	7,48	15,97	-11,22
37	Gmax	Combination	-118,01	-216,07	-23,53	-10,28	-5,10
37	Gmax	Combination	-103,86	-213,24	1,49	41,74	-3,21
38	Gmax	Combination	-87,42	-63,14	6,75	12,31	-7,07
38	Gmax	Combination	-82,40	-62,13	-10,46	-7,07	-3,30
38	Gmax	Combination	-96,68	-133,55	-26,65	-24,82	1,14
38	Gmax	Combination	-101,71	-134,55	-22,98	-7,54	-2,63
39	Gmax	Combination	-82,95	-64,87	-11,38	-11,67	2,88
39	Gmax	Combination	-107,06	-69,69	-14,38	-19,79	5,00
39	Gmax	Combination	-117,14	-120,09	-20,06	-28,82	3,03
39	Gmax	Combination	-93,03	-115,27	-26,24	-22,77	0,91
40	Gmax	Combination	-97,79	-23,30	-15,07	-23,24	7,39
40	Gmax	Combination	-201,45	-44,04	-9,19	-6,70	6,96
40	Gmax	Combination	-219,62	-134,87	-3,83	0,97	2,75
40	Gmax	Combination	-115,95	-114,14	-19,80	-27,51	3,19
41	Gmax	Combination	-103,57	-213,18	1,53	41,75	3,35

41	Gmax	Combination	-118,82	-216,23	-23,55	-10,28	5,22
41	Gmax	Combination	-79,93	-21,82	7,68	16,11	11,33
41	Gmax	Combination	-64,69	-18,77	10,23	9,17	9,45
42	Gmax	Combination	-102,51	-134,71	-23,00	-7,55	2,72
42	Gmax	Combination	-97,17	-133,64	-26,65	-24,82	-1,07
42	Gmax	Combination	-83,04	-62,99	-10,34	-6,98	3,39
42	Gmax	Combination	-88,38	-64,06	6,94	12,43	7,17
43	Gmax	Combination	-93,52	-115,37	-26,24	-22,77	-0,85
43	Gmax	Combination	-117,31	-120,12	-20,06	-28,82	-2,98
43	Gmax	Combination	-107,27	-69,92	-14,30	-19,77	-4,94
43	Gmax	Combination	-83,48	-65,17	-11,27	-11,61	-2,81
44	Gmax	Combination	-116,12	-114,17	-19,80	-27,51	-3,14
44	Gmax	Combination	-218,92	-134,73	-3,83	0,97	-2,70
44	Gmax	Combination	-200,66	-43,44	-9,16	-6,70	-6,90
44	Gmax	Combination	-97,86	-22,88	-14,99	-23,21	-7,33
45	Gmax	Combination	-232,17	-59,81	-30,82	-16,54	13,29
45	Gmax	Combination	-64,97	-62,99	-59,09	-19,80	26,78
45	Gmax	Combination	-57,35	-24,85	6,45	-13,31	18,18
46	Gmax	Combination	-96,20	20,03	-55,35	-6,37	20,26
46	Gmax	Combination	-120,84	-103,19	11,70	8,28	9,03
46	Gmax	Combination	-125,93	-111,43	5,39	-9,94	13,32
46	Gmax	Combination	-101,29	11,77	-64,89	-40,21	19,08
47	Gmax	Combination	-122,65	114,89	-39,04	-2,91	8,16
47	Gmax	Combination	-164,28	-93,23	18,02	20,23	-4,00
47	Gmax	Combination	-119,77	-100,79	13,18	13,18	1,70
47	Gmax	Combination	-92,76	34,26	-58,87	-30,88	13,50
48	Gmax	Combination	-123,47	48,08	11,43	-12,82	1,94
48	Gmax	Combination	-117,35	127,77	40,79	13,89	3,16
48	Gmax	Combination	-150,53	-38,13	-17,84	-22,82	-8,39
48	Gmax	Combination	-146,20	-65,58	-6,52	-3,64	-8,45
49	Gmax	Combination	-84,95	1,93	3,20	-13,83	-17,04
49	Gmax	Combination	-99,69	-71,74	-59,91	-18,10	-25,45
49	Gmax	Combination	-224,65	-26,01	-32,58	-13,65	-10,87
50	Gmax	Combination	-111,12	-107,12	8,63	6,70	-8,89
50	Gmax	Combination	-84,34	26,81	-55,70	-7,90	-19,62
50	Gmax	Combination	-124,52	26,46	-65,47	-39,01	-18,99
50	Gmax	Combination	-150,54	-103,65	2,37	-10,48	-12,97
51	Gmax	Combination	-124,03	-65,25	15,62	20,04	3,73
51	Gmax	Combination	-91,50	97,40	-39,01	-2,25	-8,39
51	Gmax	Combination	-90,50	5,04	-59,04	-30,61	-13,35
51	Gmax	Combination	-111,97	-102,28	9,96	11,39	-1,71
52	Gmax	Combination	-93,90	-69,10	4,76	5,81	8,83

52	Gmax	Combination	-78,50	7,91	-11,45	13,74	-1,62
52	Gmax	Combination	-88,13	100,13	-41,29	-15,67	-2,81
52	Gmax	Combination	-111,98	-19,12	15,53	23,33	8,31
53	Gmax	Combination	-35,72	-33,17	9,15	12,35	-10,59
53	Gmax	Combination	-73,26	-40,68	4,50	15,46	-12,41
53	Gmax	Combination	-112,53	-237,02	-24,12	-12,58	-5,35
53	Gmax	Combination	-74,99	-229,51	4,12	47,38	-3,54
54	Gmax	Combination	-80,29	-75,80	3,75	11,72	-7,49
54	Gmax	Combination	-97,29	-79,20	-13,51	-8,77	-3,40
54	Gmax	Combination	-114,65	-166,02	-28,29	-26,56	1,36
54	Gmax	Combination	-97,65	-162,62	-23,57	-9,82	-2,73
55	Gmax	Combination	-97,76	-81,57	-14,47	-13,59	3,02
55	Gmax	Combination	-161,37	-94,29	-17,03	-20,09	4,99
55	Gmax	Combination	-172,02	-147,53	-21,24	-27,51	3,03
55	Gmax	Combination	-108,41	-134,81	-27,89	-24,59	1,06
56	Gmax	Combination	-150,60	-40,44	-17,58	-22,83	7,11
56	Gmax	Combination	-327,09	-75,74	-10,05	-4,35	6,30
56	Gmax	Combination	-344,28	-161,71	-5,93	5,65	2,20
56	Gmax	Combination	-167,79	-126,41	-21,06	-26,62	3,01
57	Gmax	Combination	-69,40	-228,39	4,55	47,47	4,10
57	Gmax	Combination	-98,51	-234,21	-24,26	-12,61	6,02
57	Gmax	Combination	-68,01	-81,71	6,72	15,37	12,67
57	Gmax	Combination	-38,90	-75,89	9,57	12,20	10,75
58	Gmax	Combination	-83,63	-159,81	-23,71	-9,85	3,44
58	Gmax	Combination	-119,20	-166,93	-28,24	-26,55	-0,61
58	Gmax	Combination	-110,03	-121,09	-10,44	-8,17	3,86
58	Gmax	Combination	-74,47	-113,98	6,02	11,85	7,91
59	Gmax	Combination	-112,96	-135,72	-27,85	-24,58	-0,58
59	Gmax	Combination	-191,85	-151,49	-21,61	-27,58	-2,73
59	Gmax	Combination	-186,70	-125,77	-13,82	-18,56	-4,55
59	Gmax	Combination	-107,81	-109,99	-11,31	-12,51	-2,40
60	Gmax	Combination	-187,62	-130,38	-21,43	-26,69	-3,14
60	Gmax	Combination	-343,35	-161,52	-4,83	5,87	-2,38
60	Gmax	Combination	-322,95	-59,55	-10,52	-5,09	-5,88
60	Gmax	Combination	-167,23	-28,40	-14,34	-21,20	-6,64
61	Gmax	Combination	-85,63	1,33	-3,08	13,95	17,17
61	Gmax	Combination	-100,81	-74,59	60,28	18,16	25,63
61	Gmax	Combination	-226,66	-26,87	32,87	13,70	10,91
62	Gmax	Combination	-58,70	-25,26	6,54	-13,25	-18,33
62	Gmax	Combination	-66,52	-64,33	-59,51	-19,92	-26,99
62	Gmax	Combination	-233,41	-60,21	-31,03	-16,73	-13,49
63	Gmax	Combination	-85,65	23,91	-55,91	-7,97	19,77

63	Gmax	Combination	-112,12	-108,44	8,49	6,61	9,00
63	Gmax	Combination	-151,81	-104,86	2,24	-10,59	13,09
63	Gmax	Combination	-126,35	22,43	-65,86	-39,25	19,16
64	Gmax	Combination	-97,18	17,40	55,72	6,35	-20,36
64	Gmax	Combination	-121,51	-104,25	-11,71	-8,41	-9,07
64	Gmax	Combination	-127,41	-112,27	-5,46	9,88	-13,40
64	Gmax	Combination	-103,16	8,94	65,32	40,39	-19,18
65	Gmax	Combination	-92,54	94,66	-39,18	-2,32	8,52
65	Gmax	Combination	-124,68	-66,04	15,55	20,02	-3,65
65	Gmax	Combination	-112,92	-103,11	9,83	11,32	1,82
65	Gmax	Combination	-91,85	2,24	-59,29	-30,81	13,48
66	Gmax	Combination	-123,09	112,02	39,30	2,85	-8,20
66	Gmax	Combination	-164,18	-93,44	-17,99	-20,28	4,01
66	Gmax	Combination	-120,42	-101,26	-13,19	-13,33	-1,69
66	Gmax	Combination	-93,86	31,57	59,25	30,98	-13,55
67	Gmax	Combination	-88,90	98,34	-41,45	-15,71	2,93
67	Gmax	Combination	-76,94	5,84	-11,57	13,70	1,72
67	Gmax	Combination	-91,98	-69,38	4,70	5,80	-8,75
67	Gmax	Combination	-112,45	-19,38	15,46	23,31	-8,23
68	Gmax	Combination	-120,94	45,16	11,55	-12,85	-1,97
68	Gmax	Combination	-143,12	-65,71	-6,40	-3,62	8,44
68	Gmax	Combination	-150,28	-37,86	-17,81	-22,88	8,40
68	Gmax	Combination	-117,52	125,93	41,05	13,87	-3,20
69	Gmax	Combination	-157,59	-74,22	-31,59	-16,61	11,90
69	Gmax	Combination	-101,04	-139,13	-54,07	-16,93	25,73
69	Gmax	Combination	-85,16	-59,74	3,58	-13,31	18,19
70	Gmax	Combination	-134,04	-46,80	62,95	18,26	-23,97
70	Gmax	Combination	-120,82	19,31	-6,53	7,42	-15,33
70	Gmax	Combination	-270,41	-10,61	30,66	13,43	-13,12
71	Gmax	Combination	-132,36	5,14	46,70	-1,87	-16,71
71	Gmax	Combination	-144,84	-57,25	-6,80	-11,54	-5,75
71	Gmax	Combination	-178,99	-67,02	-4,60	4,46	-9,06
71	Gmax	Combination	-173,06	-37,38	66,71	35,70	-16,24
72	Gmax	Combination	-120,37	-35,03	59,73	38,72	18,77
72	Gmax	Combination	-144,17	-154,03	-2,62	10,13	13,64
72	Gmax	Combination	-86,31	-184,54	-9,16	-7,91	8,94
72	Gmax	Combination	-59,85	-52,27	48,34	5,45	18,50
73	Gmax	Combination	-79,14	-60,37	14,73	16,39	6,66
73	Gmax	Combination	-70,28	-16,06	-38,92	-7,68	-3,53
73	Gmax	Combination	-129,13	22,48	-51,64	-25,88	-10,30
73	Gmax	Combination	-143,23	-48,00	9,34	17,05	0,42
74	Gmax	Combination	-164,39	96,84	-27,29	1,98	6,83

74	Gmax	Combination	-191,42	-38,34	13,80	18,56	-3,71
74	Gmax	Combination	-84,48	-150,66	10,28	12,30	1,49
74	Gmax	Combination	-85,69	-156,74	-51,43	-27,99	12,09
75	Gmax	Combination	-102,70	-177,56	39,73	14,84	-0,65
75	Gmax	Combination	-42,05	14,28	-4,49	-28,46	-4,87
75	Gmax	Combination	-34,04	54,34	3,77	14,38	8,62
75	Gmax	Combination	-71,39	-21,00	-13,28	-17,82	12,44
76	Gmax	Combination	-300,37	-152,15	14,57	-7,35	-0,46
76	Gmax	Combination	-126,40	278,76	29,69	9,15	0,70
76	Gmax	Combination	-172,36	48,98	-14,21	-21,17	-6,04
76	Gmax	Combination	-305,02	-175,41	-7,88	-4,56	-7,12
77	Gmax	Combination	-47,01	-121,34	-10,98	-13,93	-0,86
77	Gmax	Combination	-54,05	-156,53	-3,64	-45,90	-1,94
77	Gmax	Combination	-167,54	-179,23	38,70	42,12	-3,78
77	Gmax	Combination	-160,50	-144,04	-37,63	2,25	-2,70
78	Gmax	Combination	-59,31	-157,58	-2,95	-45,77	2,51
78	Gmax	Combination	-39,67	-59,41	-11,30	-11,28	0,68
78	Gmax	Combination	-153,43	-82,16	-42,02	-1,46	2,50
78	Gmax	Combination	-173,06	-180,33	38,55	42,09	4,33
79	Gmax	Combination	-160,54	-144,21	-37,63	2,24	2,46
79	Gmax	Combination	-167,56	-179,34	38,70	42,14	3,53
79	Gmax	Combination	-54,62	-156,75	-3,58	-45,85	1,72
79	Gmax	Combination	-47,59	-121,62	-11,07	-14,05	0,65
80	Gmax	Combination	-173,09	-180,44	38,56	42,11	-4,54
80	Gmax	Combination	-153,52	-82,61	-42,04	-1,57	-2,70
80	Gmax	Combination	-40,18	-59,94	-11,17	-11,16	-0,89
80	Gmax	Combination	-59,74	-157,78	-2,94	-45,73	-2,74
81	Gmax	Combination	-72,98	-225,96	-4,07	-46,35	-4,19
81	Gmax	Combination	-113,69	-234,10	23,84	11,93	-6,22
81	Gmax	Combination	-72,86	-29,99	-7,48	-16,27	-12,55
81	Gmax	Combination	-32,16	-21,85	-9,29	-10,13	-10,52
82	Gmax	Combination	-99,19	-161,62	23,30	9,22	-3,22
82	Gmax	Combination	-110,42	-163,86	27,84	25,72	0,98
82	Gmax	Combination	-90,77	-65,64	10,80	6,59	-3,92
82	Gmax	Combination	-79,54	-63,39	-6,79	-12,82	-8,12
83	Gmax	Combination	-104,24	-132,97	27,46	23,79	1,12
83	Gmax	Combination	-169,81	-146,08	20,77	26,96	3,42
83	Gmax	Combination	-157,24	-83,23	15,92	18,36	4,92
83	Gmax	Combination	-91,67	-70,12	11,65	10,86	2,61
84	Gmax	Combination	-166,15	-127,79	20,60	26,09	3,68
84	Gmax	Combination	-329,25	-160,41	5,59	-6,27	2,82
84	Gmax	Combination	-310,42	-66,23	11,01	5,70	6,40

84	Gmax	Combination	-147,32	-33,61	16,42	20,88	7,26
85	Gmax	Combination	-39,04	-81,48	-9,11	-13,58	10,34
85	Gmax	Combination	-61,97	-86,07	-4,12	-14,63	12,04
85	Gmax	Combination	-90,66	-229,50	23,67	11,89	4,99
85	Gmax	Combination	-67,73	-224,91	-4,30	-46,39	3,29
86	Gmax	Combination	-68,21	-117,28	-3,39	-10,94	7,16
86	Gmax	Combination	-108,89	-125,41	12,43	9,08	3,40
86	Gmax	Combination	-116,83	-165,15	27,76	25,70	-0,90
86	Gmax	Combination	-76,16	-157,01	23,12	9,18	2,85
87	Gmax	Combination	-107,12	-116,59	13,37	13,74	-2,57
87	Gmax	Combination	-182,55	-131,68	14,74	18,92	-4,43
87	Gmax	Combination	-186,08	-149,34	21,28	27,06	-2,33
87	Gmax	Combination	-110,65	-134,25	27,37	23,77	-0,47
88	Gmax	Combination	-163,36	-35,74	15,31	21,74	-6,32
88	Gmax	Combination	-322,77	-67,62	11,01	4,48	-5,48
88	Gmax	Combination	-341,83	-162,93	3,95	-6,60	-1,73
88	Gmax	Combination	-182,42	-131,05	21,11	26,19	-2,57
89	Gmax	Combination	-54,85	-16,89	-8,74	-9,34	9,65
89	Gmax	Combination	-68,10	-19,54	-6,94	-15,87	11,53
89	Gmax	Combination	-107,32	-215,62	23,15	10,65	5,41
89	Gmax	Combination	-94,07	-212,98	-2,76	-43,16	3,53
90	Gmax	Combination	-76,75	-62,78	-6,20	-12,18	7,43
90	Gmax	Combination	-70,35	-61,50	10,75	6,90	3,61
90	Gmax	Combination	-85,60	-137,72	26,64	25,22	-0,98
90	Gmax	Combination	-91,99	-139,00	22,60	7,92	2,84
91	Gmax	Combination	-71,64	-67,93	11,71	11,71	-2,70
91	Gmax	Combination	-99,49	-73,50	14,69	19,41	-4,94
91	Gmax	Combination	-110,38	-127,94	20,20	29,31	-3,00
91	Gmax	Combination	-82,53	-122,37	26,21	23,09	-0,76
92	Gmax	Combination	-91,18	-31,92	15,46	23,26	-7,22
92	Gmax	Combination	-188,87	-51,46	11,40	8,73	-6,76
92	Gmax	Combination	-208,08	-147,48	4,34	0,09	-3,02
92	Gmax	Combination	-110,38	-127,94	19,91	27,85	-3,47
93	Gmax	Combination	-94,52	-213,07	-2,71	-43,15	-3,36
93	Gmax	Combination	-106,20	-215,40	23,12	10,65	-5,27
93	Gmax	Combination	-66,57	-17,25	-6,87	-15,73	-11,38
93	Gmax	Combination	-54,89	-14,92	-8,75	-9,26	-9,47
94	Gmax	Combination	-90,87	-138,78	22,57	7,92	-2,75
94	Gmax	Combination	-88,09	-138,22	26,65	25,23	1,05
94	Gmax	Combination	-72,07	-58,15	10,57	6,93	-3,49
94	Gmax	Combination	-74,86	-58,71	-6,14	-12,07	-7,28
95	Gmax	Combination	-85,02	-122,87	26,22	23,09	0,88

95	Gmax	Combination	-108,26	-127,52	20,27	29,32	3,09
95	Gmax	Combination	-96,12	-66,82	14,68	19,60	4,98
95	Gmax	Combination	-72,88	-62,17	11,52	11,64	2,76
96	Gmax	Combination	-108,26	-127,52	19,98	27,86	3,13
96	Gmax	Combination	-217,55	-149,37	3,46	-0,09	2,46
96	Gmax	Combination	-195,69	-40,08	10,46	10,11	6,90
96	Gmax	Combination	-86,40	-18,22	15,43	23,31	7,57
97	Gmax	Combination	-240,43	-48,81	31,91	14,66	-11,71
97	Gmax	Combination	-64,66	-57,75	58,82	18,82	-25,50
97	Gmax	Combination	-55,47	-11,81	-3,20	14,14	-17,85
98	Gmax	Combination	-120,74	-93,83	8,95	6,22	-9,78
98	Gmax	Combination	-95,97	30,02	-55,85	-7,61	-19,81
98	Gmax	Combination	-103,72	24,98	-64,41	-38,64	-19,07
98	Gmax	Combination	-128,54	-99,12	2,34	-10,99	-13,83
99	Gmax	Combination	-160,19	-86,01	17,18	18,61	3,27
99	Gmax	Combination	-116,95	130,17	-40,40	-4,40	-8,17
99	Gmax	Combination	-90,88	54,45	-59,05	-30,32	-13,77
99	Gmax	Combination	-120,57	-94,00	10,40	10,61	-2,55
100	Gmax	Combination	-111,77	143,08	-42,05	-14,69	-3,12
100	Gmax	Combination	-146,92	-32,66	16,84	20,96	7,73
100	Gmax	Combination	-148,32	-53,74	6,91	4,88	8,00
100	Gmax	Combination	-123,77	69,04	-13,04	12,63	-2,02
101	Gmax	Combination	-204,98	-26,91	-31,93	-13,98	11,31
101	Gmax	Combination	-95,67	-65,07	-59,56	-18,38	25,72
101	Gmax	Combination	-83,16	-2,54	4,03	-13,68	17,10
102	Gmax	Combination	-78,89	24,56	-57,58	-7,94	20,28
102	Gmax	Combination	-104,44	-103,20	8,81	6,52	9,30
102	Gmax	Combination	-140,92	-100,76	3,09	-10,32	13,19
102	Gmax	Combination	-114,40	31,84	-65,39	-38,85	18,80
103	Gmax	Combination	-79,46	110,52	-42,00	-2,86	9,46
103	Gmax	Combination	-115,18	-68,11	16,47	19,76	-3,33
103	Gmax	Combination	-105,80	-102,99	10,26	11,42	2,05
103	Gmax	Combination	-81,76	17,22	-61,04	-31,57	13,96
104	Gmax	Combination	-81,98	16,06	-13,04	13,20	2,19
104	Gmax	Combination	-99,79	-72,99	4,53	7,36	-8,67
104	Gmax	Combination	-104,68	-25,48	16,34	23,43	-7,99
104	Gmax	Combination	-73,30	131,41	-44,45	-17,71	3,68
105	Gmax	Combination	-111,87	0,34	11,02	9,00	-8,47
105	Gmax	Combination	-129,02	-3,09	5,63	9,87	-9,85
105	Gmax	Combination	-165,93	-187,64	-23,78	-17,56	-4,14
105	Gmax	Combination	-148,78	-184,21	-0,66	38,68	-2,75
106	Gmax	Combination	-134,96	-32,80	4,96	6,54	-4,60

106	Gmax	Combination	-118,07	-29,43	-9,37	-11,51	-0,51
106	Gmax	Combination	-124,61	-62,11	-23,70	-29,33	2,21
106	Gmax	Combination	-141,50	-65,49	-23,27	-15,02	-1,88
107	Gmax	Combination	-115,05	-14,28	-10,36	-16,45	5,46
107	Gmax	Combination	-100,83	-11,44	-12,37	-15,67	7,23
107	Gmax	Combination	-99,58	-5,19	-10,06	-20,42	4,06
107	Gmax	Combination	-113,80	-8,04	-23,28	-27,23	2,28
108	Gmax	Combination	-94,84	18,53	-12,64	-17,04	8,55
108	Gmax	Combination	-67,99	23,89	1,11	13,73	5,31
108	Gmax	Combination	-63,80	44,89	9,44	43,86	0,64
108	Gmax	Combination	-90,64	39,52	-10,09	-20,54	3,88
109	Gmax	Combination	-148,95	-184,25	-0,58	38,69	2,98
109	Gmax	Combination	-166,55	-187,77	-23,81	-17,56	4,35
109	Gmax	Combination	-130,05	-5,24	5,91	10,02	10,02
109	Gmax	Combination	-112,45	-1,72	11,02	9,03	8,65
110	Gmax	Combination	-142,12	-65,62	-23,30	-15,03	2,05
110	Gmax	Combination	-125,48	-62,29	-23,70	-29,32	-2,06
110	Gmax	Combination	-119,23	-31,04	-9,12	-11,37	0,66
110	Gmax	Combination	-135,88	-34,37	5,24	6,68	4,77
111	Gmax	Combination	-114,66	-8,21	-23,28	-27,23	-2,17
111	Gmax	Combination	-100,10	-5,30	-10,07	-20,42	-3,97
111	Gmax	Combination	-101,41	-11,86	-12,17	-15,55	-7,13
111	Gmax	Combination	-115,97	-14,78	-10,11	-16,30	-5,33
112	Gmax	Combination	-91,16	39,41	-10,09	-20,54	-3,82
112	Gmax	Combination	-63,39	44,97	9,43	43,86	-0,56
112	Gmax	Combination	-67,42	24,81	1,08	13,46	-5,18
112	Gmax	Combination	-95,19	19,26	-12,44	-16,92	-8,44
113	Gmax	Combination	-140,68	-78,43	-29,79	-17,72	12,83
113	Gmax	Combination	-100,36	-140,52	-52,82	-17,47	26,11
113	Gmax	Combination	-85,74	-67,44	6,07	-12,59	17,93
114	Gmax	Combination	-55,51	-57,26	-47,33	-4,94	18,63
114	Gmax	Combination	-82,19	-190,65	11,21	8,84	8,26
114	Gmax	Combination	-136,50	-156,54	5,03	-9,26	12,94
114	Gmax	Combination	-110,88	-28,43	-58,56	-39,17	18,34
115	Gmax	Combination	-162,86	103,14	-26,53	2,41	7,17
115	Gmax	Combination	-189,54	-30,25	14,63	18,90	-3,93
115	Gmax	Combination	-80,48	-156,49	12,34	13,54	0,95
115	Gmax	Combination	-84,66	-177,39	-50,56	-28,24	11,94
116	Gmax	Combination	-308,65	-171,13	13,75	-7,18	-0,06
116	Gmax	Combination	-121,10	303,67	28,99	9,22	1,01
116	Gmax	Combination	-170,97	54,36	-15,12	-21,70	-6,03
116	Gmax	Combination	-313,01	-192,97	-7,93	-3,86	-6,95

117	Gmax	Combination	-113,17	22,95	5,63	-7,62	-14,85
117	Gmax	Combination	-127,47	-48,53	-61,69	-17,87	-23,04
117	Gmax	Combination	-282,23	-10,86	-30,29	-12,85	-12,48
118	Gmax	Combination	-145,78	-56,29	6,51	10,94	-5,48
118	Gmax	Combination	-131,99	12,64	-44,30	1,64	-15,95
118	Gmax	Combination	-171,47	-36,74	-65,08	-34,77	-15,98
118	Gmax	Combination	-177,64	-67,60	3,86	-4,77	-8,72
119	Gmax	Combination	-79,70	-60,33	14,39	16,07	6,60
119	Gmax	Combination	-71,60	-19,85	-37,23	-7,75	-2,90
119	Gmax	Combination	-129,79	24,02	-49,13	-24,82	-9,68
119	Gmax	Combination	-143,54	-44,68	8,93	16,17	0,38
120	Gmax	Combination	-33,29	61,03	-3,85	-14,28	8,21
120	Gmax	Combination	-43,20	11,47	4,96	28,29	-4,42
120	Gmax	Combination	-105,96	-191,83	-37,75	-13,38	-0,11
120	Gmax	Combination	-71,65	-20,30	12,88	17,09	12,13
121	Gmax	Combination	-39,72	-82,25	9,11	13,71	-10,48
121	Gmax	Combination	-62,82	-86,87	4,14	14,43	-12,13
121	Gmax	Combination	-91,17	-228,64	-23,68	-12,30	-5,12
121	Gmax	Combination	-68,07	-224,02	4,31	46,34	-3,48
122	Gmax	Combination	-68,88	-117,19	3,41	10,76	-7,20
122	Gmax	Combination	-108,14	-125,04	-12,34	-9,15	-3,42
122	Gmax	Combination	-115,88	-163,71	-27,59	-25,71	0,84
122	Gmax	Combination	-76,62	-155,86	-23,14	-9,60	-2,94
123	Gmax	Combination	-106,04	-114,53	-13,27	-13,83	2,53
123	Gmax	Combination	-178,69	-129,06	-14,51	-18,71	4,34
123	Gmax	Combination	-182,38	-147,52	-21,02	-26,57	2,22
123	Gmax	Combination	-109,73	-132,99	-27,20	-23,77	0,40
124	Gmax	Combination	-159,40	-32,61	-15,07	-21,51	6,14
124	Gmax	Combination	-312,08	-63,14	-10,75	-4,28	5,29
124	Gmax	Combination	-331,41	-159,78	-3,95	6,62	1,58
124	Gmax	Combination	-178,72	-129,24	-20,85	-25,74	2,44
125	Gmax	Combination	-73,20	-225,05	3,98	46,27	3,97
125	Gmax	Combination	-111,58	-232,72	-23,80	-12,32	6,00
125	Gmax	Combination	-70,60	-27,84	7,20	15,79	12,33
125	Gmax	Combination	-32,22	-20,16	9,32	10,09	10,30
126	Gmax	Combination	-97,02	-159,94	-23,26	-9,62	3,08
126	Gmax	Combination	-107,03	-161,94	-27,70	-25,73	-1,11
126	Gmax	Combination	-87,53	-64,44	-10,65	-6,75	3,66
126	Gmax	Combination	-77,52	-62,44	6,52	12,35	7,85
127	Gmax	Combination	-100,88	-131,22	-27,31	-23,79	-1,25
127	Gmax	Combination	-164,63	-143,97	-20,53	-26,47	-3,50
127	Gmax	Combination	-152,44	-83,00	-15,54	-17,99	-5,03

127	Gmax	Combination	-88,69	-70,25	-11,52	-11,09	-2,78
128	Gmax	Combination	-160,98	-125,70	-20,36	-25,64	-3,75
128	Gmax	Combination	-323,60	-158,22	-5,40	6,33	-2,98
128	Gmax	Combination	-305,59	-68,14	-10,44	-4,97	-6,60
128	Gmax	Combination	-142,96	-35,62	-16,00	-20,33	-7,38
129	Gmax	Combination	-114,60	21,43	-5,39	7,76	14,99
129	Gmax	Combination	-129,33	-52,26	61,80	17,87	23,19
129	Gmax	Combination	-283,29	-12,31	30,54	12,93	12,54
130	Gmax	Combination	-86,40	-67,82	6,16	-12,37	-18,00
130	Gmax	Combination	-101,25	-142,10	-53,19	-17,50	-26,23
130	Gmax	Combination	-143,05	-79,15	-29,99	-17,89	-13,01
131	Gmax	Combination	-133,32	7,73	-44,39	1,46	16,07
131	Gmax	Combination	-146,62	-58,77	6,26	10,80	5,63
131	Gmax	Combination	-179,31	-69,46	3,62	-4,91	8,88
131	Gmax	Combination	-173,88	-42,32	-65,20	-34,90	16,14
132	Gmax	Combination	-57,42	-61,69	47,46	4,80	-18,64
132	Gmax	Combination	-83,10	-190,07	-11,08	-8,90	-8,26
132	Gmax	Combination	-137,35	-156,45	-5,09	9,06	-12,94
132	Gmax	Combination	-113,01	-34,71	58,91	39,20	-18,37
133	Gmax	Combination	-73,99	-23,63	-37,16	-7,62	3,10
133	Gmax	Combination	-81,29	-60,11	14,18	15,95	-6,44
133	Gmax	Combination	-144,26	-45,89	8,67	16,01	-0,26
133	Gmax	Combination	-131,59	17,47	-49,21	-24,90	9,81
134	Gmax	Combination	-161,52	95,56	26,72	-2,42	-7,19
134	Gmax	Combination	-186,86	-31,13	-14,41	-18,69	3,89
134	Gmax	Combination	-81,22	-154,92	-12,22	-13,62	-0,97
134	Gmax	Combination	-86,20	-179,84	50,73	28,22	-11,93
135	Gmax	Combination	-107,09	-189,81	-37,68	-13,31	0,33
135	Gmax	Combination	-43,66	7,47	4,77	27,84	4,48
135	Gmax	Combination	-33,31	59,22	-3,88	-14,02	-8,06
135	Gmax	Combination	-72,98	-19,27	12,69	16,97	-11,91
136	Gmax	Combination	-296,97	-175,34	13,91	-7,28	-0,07
136	Gmax	Combination	-299,76	-189,29	-7,57	-3,65	6,77
136	Gmax	Combination	-168,10	53,69	-14,89	-21,48	5,92
136	Gmax	Combination	-120,23	293,02	29,16	9,14	-1,06
137	Gmax	Combination	-237,79	-47,24	-31,42	-14,51	11,74
137	Gmax	Combination	-61,72	-54,13	-58,42	-18,73	25,11
137	Gmax	Combination	-52,94	-10,27	3,40	-13,67	17,54
138	Gmax	Combination	-99,05	-64,83	58,77	18,20	-25,38
138	Gmax	Combination	-86,21	-0,64	-3,90	13,58	-16,89
138	Gmax	Combination	-197,70	-22,94	31,50	13,81	-11,17
139	Gmax	Combination	-75,05	31,43	56,52	7,90	-19,91

139	Gmax	Combination	-101,84	-102,52	-8,75	-6,57	-9,09
139	Gmax	Combination	-141,66	-97,04	-3,00	10,24	-12,99
139	Gmax	Combination	-114,33	39,60	64,46	38,39	-18,60
140	Gmax	Combination	-100,33	26,85	63,85	38,17	18,65
140	Gmax	Combination	-125,25	-97,71	-2,47	10,55	13,39
140	Gmax	Combination	-116,21	-91,26	-8,81	-6,38	9,43
140	Gmax	Combination	-91,20	33,75	54,62	6,88	19,39
141	Gmax	Combination	-118,41	-55,77	16,08	19,88	3,42
141	Gmax	Combination	-84,04	116,09	-40,86	-2,67	-9,09
141	Gmax	Combination	-79,53	19,15	-59,89	-30,98	-13,66
141	Gmax	Combination	-102,99	-98,14	10,15	11,37	-1,92
142	Gmax	Combination	-111,11	129,24	-39,38	-4,31	7,70
142	Gmax	Combination	-154,20	-86,20	16,73	18,23	-3,52
142	Gmax	Combination	-116,26	-92,78	10,29	10,85	2,30
142	Gmax	Combination	-85,99	58,55	-57,95	-30,01	13,33
143	Gmax	Combination	-77,68	134,48	43,25	17,01	-3,49
143	Gmax	Combination	-75,43	22,33	12,93	-13,12	-1,84
143	Gmax	Combination	-94,10	-71,04	-5,69	-9,16	9,08
143	Gmax	Combination	-106,33	-8,77	-16,02	-23,43	8,19
144	Gmax	Combination	-121,46	74,71	11,79	-12,86	1,96
144	Gmax	Combination	-107,00	137,94	40,85	13,82	3,00
144	Gmax	Combination	-141,55	-34,78	-16,39	-20,41	-7,95
144	Gmax	Combination	-146,94	-52,68	-6,72	-4,23	-8,04
145	Gmax	Combination	-56,58	-57,73	9,08	23,94	-8,20
145	Gmax	Combination	-110,25	-68,46	-16,60	-10,49	-9,76
145	Gmax	Combination	-139,40	-214,22	-32,96	-35,44	-3,67
145	Gmax	Combination	-85,74	-203,49	6,68	50,44	-2,11
146	Gmax	Combination	-107,98	-57,11	-16,69	-10,94	2,63
146	Gmax	Combination	-326,73	-100,86	-18,55	-14,50	5,28
146	Gmax	Combination	-340,11	-167,78	-10,52	-2,35	3,11
146	Gmax	Combination	-121,36	-124,03	-32,61	-33,67	0,47
147	Gmax	Combination	-83,76	-203,09	6,62	50,43	2,78
147	Gmax	Combination	-139,75	-214,29	-32,95	-35,44	4,24
147	Gmax	Combination	-112,13	-76,23	-14,18	-9,03	10,07
147	Gmax	Combination	-56,14	-65,04	9,46	23,41	8,62
148	Gmax	Combination	-121,71	-124,10	-32,59	-33,67	-0,56
148	Gmax	Combination	-330,48	-165,85	-10,70	-2,39	-3,41
148	Gmax	Combination	-316,54	-96,14	-17,91	-14,49	-5,33
148	Gmax	Combination	-107,77	-54,39	-14,30	-9,63	-2,47
149	Gmax	Combination	-121,40	-246,50	-2,29	48,37	4,08
149	Gmax	Combination	-70,30	-236,28	-54,78	-50,03	4,06
149	Gmax	Combination	-34,75	-58,55	-12,66	-12,94	11,53

149	Gmax	Combination	-85,85	-68,77	18,23	23,88	11,55
150	Gmax	Combination	-56,35	-166,52	-54,40	-48,12	-2,35
150	Gmax	Combination	-315,34	-218,32	-6,75	2,39	-5,89
150	Gmax	Combination	-294,96	-116,42	-15,29	-14,33	-10,55
150	Gmax	Combination	-35,97	-64,62	-12,87	-14,01	-7,02
151	Gmax	Combination	-86,49	-71,21	18,25	23,89	-11,68
151	Gmax	Combination	-35,69	-61,05	-12,33	-12,81	-11,63
151	Gmax	Combination	-70,75	-236,37	-54,80	-50,03	-4,19
151	Gmax	Combination	-121,55	-246,53	-2,24	48,38	-4,24
152	Gmax	Combination	-36,48	-65,00	-12,54	-13,86	6,93
152	Gmax	Combination	-294,07	-116,52	-15,21	-14,34	10,48
152	Gmax	Combination	-314,39	-218,13	-6,75	2,39	5,84
152	Gmax	Combination	-56,80	-166,61	-54,41	-48,12	2,29
153	Gmax	Combination	-257,22	-91,08	-39,91	-28,21	29,89
153	Gmax	Combination	-22,47	-80,03	-100,82	-24,90	20,90
153	Gmax	Combination	-15,00	-42,63	31,00	16,61	11,86
154	Gmax	Combination	-147,30	-95,48	100,91	28,13	-30,86
154	Gmax	Combination	-141,17	-64,84	-37,29	-14,63	-14,08
154	Gmax	Combination	-207,75	-78,16	35,85	29,30	-24,14
155	Gmax	Combination	-96,72	145,30	-91,00	-25,62	8,01
155	Gmax	Combination	-111,81	96,77	-16,50	10,01	-4,24
155	Gmax	Combination	-160,45	-146,39	9,46	13,16	-10,88
155	Gmax	Combination	-149,06	-116,37	26,98	16,83	-6,25
156	Gmax	Combination	-123,94	178,98	-93,82	-40,00	-21,62
156	Gmax	Combination	-178,90	-95,82	31,88	13,98	2,31
156	Gmax	Combination	-175,74	-120,28	9,15	12,62	5,53
156	Gmax	Combination	-132,12	97,82	-19,03	4,00	-6,00
157	Gmax	Combination	-98,66	-61,68	18,80	25,23	-11,89
157	Gmax	Combination	-30,72	-48,09	-13,71	-15,35	-11,49
157	Gmax	Combination	-68,14	-235,19	-55,96	-52,74	-3,97
157	Gmax	Combination	-136,08	-248,77	-3,38	48,51	-4,37
158	Gmax	Combination	-32,91	-59,07	-13,91	-16,37	7,46
158	Gmax	Combination	-261,65	-104,81	-14,58	-11,10	11,05
158	Gmax	Combination	-281,01	-201,59	-5,37	6,12	6,13
158	Gmax	Combination	-52,27	-155,84	-55,63	-51,05	2,54
159	Gmax	Combination	-136,39	-248,84	-3,39	48,51	4,27
159	Gmax	Combination	-67,10	-234,98	-56,10	-52,76	3,86
159	Gmax	Combination	-29,29	-45,91	-13,74	-15,17	11,41
159	Gmax	Combination	-98,58	-59,76	18,79	25,08	11,82
160	Gmax	Combination	-51,24	-155,63	-55,76	-51,08	-2,60
160	Gmax	Combination	-286,28	-202,64	-4,74	6,25	-5,93
160	Gmax	Combination	-265,77	-100,09	-14,07	-12,04	-11,05

160	Gmax	Combination	-30,72	-53,08	-13,93	-16,10	-7,71
161	Gmax	Combination	-264,06	-84,11	40,08	29,48	-31,60
161	Gmax	Combination	-19,88	-67,22	102,03	24,72	-20,66
161	Gmax	Combination	-13,22	-33,94	-32,80	-19,17	-11,45
162	Gmax	Combination	-137,75	-103,55	99,98	27,83	30,81
162	Gmax	Combination	-223,44	-87,40	36,79	28,87	23,71
162	Gmax	Combination	-130,82	-68,87	-34,66	-13,13	14,37
163	Gmax	Combination	-92,87	147,66	91,59	24,48	-6,88
163	Gmax	Combination	-100,23	99,77	15,24	-9,93	4,96
163	Gmax	Combination	-147,10	-134,55	-7,06	-9,59	11,27
163	Gmax	Combination	-144,30	-109,54	-28,41	-19,26	7,50
164	Gmax	Combination	-120,90	157,65	-92,93	-40,35	22,18
164	Gmax	Combination	-122,10	102,27	-18,20	3,03	6,05
164	Gmax	Combination	-164,26	-108,49	8,25	12,56	-5,27
164	Gmax	Combination	-171,20	-93,84	29,56	12,69	-1,79
165	Gmax	Combination	-57,16	-62,92	9,55	23,40	-8,51
165	Gmax	Combination	-109,76	-73,44	-14,25	-9,36	-9,98
165	Gmax	Combination	-137,75	-213,39	-32,96	-35,71	-4,15
165	Gmax	Combination	-85,15	-202,87	6,48	50,39	-2,69
166	Gmax	Combination	-105,97	-54,47	-14,37	-9,95	2,59
166	Gmax	Combination	-313,63	-96,01	-17,50	-13,90	5,52
166	Gmax	Combination	-327,28	-164,27	-10,52	-2,11	3,55
166	Gmax	Combination	-119,62	-122,74	-32,61	-33,96	0,62
167	Gmax	Combination	-87,33	-203,31	6,64	50,42	2,20
167	Gmax	Combination	-139,65	-213,77	-32,98	-35,72	3,71
167	Gmax	Combination	-110,59	-68,44	-16,72	-10,86	9,79
167	Gmax	Combination	-58,26	-57,98	9,10	24,16	8,28
168	Gmax	Combination	-121,52	-123,12	-32,63	-33,97	-0,40
168	Gmax	Combination	-334,95	-165,80	-10,40	-2,09	-3,03
168	Gmax	Combination	-321,44	-98,24	-18,37	-14,30	-5,23
168	Gmax	Combination	-108,01	-55,55	-16,79	-11,24	-2,60
169	Gmax	Combination	-219,21	-84,74	36,54	28,80	-23,68
169	Gmax	Combination	-135,90	-99,84	99,47	27,64	-30,53
169	Gmax	Combination	-129,29	-66,76	-34,56	-13,42	-14,20
170	Gmax	Combination	-22,09	-65,69	-101,18	-24,59	20,52
170	Gmax	Combination	-15,46	-32,53	32,26	18,88	11,41
170	Gmax	Combination	-258,27	-81,09	-39,84	-29,29	31,39
171	Gmax	Combination	-93,72	153,48	-90,83	-24,37	6,88
171	Gmax	Combination	-95,36	108,24	-15,05	10,11	-5,19
171	Gmax	Combination	-143,13	-130,62	7,98	10,82	-11,56
171	Gmax	Combination	-145,34	-104,61	28,02	18,92	-7,48
172	Gmax	Combination	-118,12	161,79	-92,38	-40,08	-21,91

172	Gmax	Combination	-169,18	-93,49	29,47	12,97	2,05
172	Gmax	Combination	-162,86	-108,08	8,08	12,02	5,41
172	Gmax	Combination	-119,99	106,26	-17,44	3,32	-5,87
173	Gmax	Combination	-23,02	-83,42	100,96	24,92	-21,00
173	Gmax	Combination	-15,24	-44,51	-30,70	-16,48	-11,97
173	Gmax	Combination	-260,36	-93,54	40,16	28,27	-29,92
174	Gmax	Combination	-147,97	-96,00	-101,33	-28,16	30,95
174	Gmax	Combination	-141,69	-64,63	37,55	15,03	14,10
174	Gmax	Combination	-211,16	-78,52	-36,01	-29,55	24,36
175	Gmax	Combination	-97,90	141,51	91,13	25,70	-8,16
175	Gmax	Combination	-110,24	94,25	16,57	-9,92	4,13
175	Gmax	Combination	-158,37	-146,39	-9,37	-13,17	10,78
175	Gmax	Combination	-149,58	-116,86	-26,71	-16,70	6,12
176	Gmax	Combination	-125,54	175,61	94,17	39,92	21,61
176	Gmax	Combination	-179,62	-94,80	-32,06	-14,29	-2,36
176	Gmax	Combination	-172,01	-118,72	-8,87	-12,40	-5,53
176	Gmax	Combination	-129,39	94,36	19,12	-4,07	5,97
177	Gmax	Combination	298,26	22,23	-1,40	0,23	-1,05
177	Gmax	Combination	149,05	-7,61	-2,16	0,63	-1,13
177	Gmax	Combination	144,46	-30,58	-3,92	0,95	-0,41
177	Gmax	Combination	293,67	-0,74	-3,14	-0,03	-0,33
178	Gmax	Combination	154,02	17,22	-2,03	1,25	-1,32
178	Gmax	Combination	18,59	-9,86	-4,06	1,04	-1,27
178	Gmax	Combination	9,03	-57,65	-4,49	0,56	-0,27
178	Gmax	Combination	144,46	-30,57	-3,94	0,82	-0,32
179	Gmax	Combination	19,83	-3,66	-4,03	1,17	-1,18
179	Gmax	Combination	-112,25	-30,07	-6,68	-1,51	-1,30
179	Gmax	Combination	-125,69	-97,28	-4,66	0,52	-0,38
179	Gmax	Combination	6,39	-70,86	-4,49	0,56	-0,26
180	Gmax	Combination	-112,58	-31,74	-6,39	-0,08	-1,84
180	Gmax	Combination	-330,32	-75,29	-10,76	-6,30	-3,04
180	Gmax	Combination	-345,55	-151,44	-3,72	6,68	-1,66
180	Gmax	Combination	-127,81	-107,90	-4,81	-0,18	-0,46
181	Gmax	Combination	348,56	10,24	-3,18	-0,04	0,34
181	Gmax	Combination	171,06	-25,26	-3,91	0,95	0,47
181	Gmax	Combination	170,93	-25,93	-0,78	1,09	1,27
181	Gmax	Combination	348,42	9,57	0,03	-0,14	1,14
182	Gmax	Combination	171,06	-25,25	-3,94	0,82	0,37
182	Gmax	Combination	16,17	-56,22	-4,53	0,56	0,31
182	Gmax	Combination	21,30	-30,57	-2,95	1,81	1,46
182	Gmax	Combination	176,19	0,41	-0,79	1,05	1,52
183	Gmax	Combination	13,53	-69,43	-4,53	0,56	0,14

183	Gmax	Combination	-158,68	-103,88	-4,65	0,53	0,07
183	Gmax	Combination	-145,15	-36,24	-6,18	0,05	1,28
183	Gmax	Combination	27,06	-1,80	-2,98	1,63	1,35
184	Gmax	Combination	-160,80	-114,49	-4,79	-0,18	-0,56
184	Gmax	Combination	-343,72	-151,08	-4,71	6,48	0,62
184	Gmax	Combination	-320,79	-36,43	-13,07	-7,34	3,30
184	Gmax	Combination	-137,88	0,15	-6,02	0,84	2,13
185	Gmax	Combination	-92,49	64,42	11,28	2,37	-0,99
185	Gmax	Combination	-123,46	58,23	12,67	-8,16	-1,56
185	Gmax	Combination	-142,66	-37,76	-7,86	-5,72	-3,52
185	Gmax	Combination	-111,68	-31,56	-6,61	-0,12	-2,94
186	Gmax	Combination	-32,95	33,25	7,59	2,73	-1,92
186	Gmax	Combination	-101,46	19,55	12,15	6,70	-1,64
186	Gmax	Combination	-111,35	-29,89	-6,90	-1,56	-2,53
186	Gmax	Combination	-42,84	-16,19	-4,14	1,15	-2,81
187	Gmax	Combination	77,22	17,48	2,53	-1,31	-1,46
187	Gmax	Combination	-40,83	-6,13	7,65	3,03	-1,75
187	Gmax	Combination	-44,08	-22,40	-4,17	1,02	-2,86
187	Gmax	Combination	73,97	1,22	-1,77	1,30	-2,57
188	Gmax	Combination	203,36	23,50	1,07	-0,96	-1,37
188	Gmax	Combination	73,22	-2,53	2,94	0,73	-1,56
188	Gmax	Combination	69,01	-23,62	-1,90	0,68	-1,87
188	Gmax	Combination	199,14	2,41	-0,97	0,32	-1,67
189	Gmax	Combination	-146,20	-1,52	-6,44	0,75	4,23
189	Gmax	Combination	-289,81	-30,24	-8,43	-6,41	4,61
189	Gmax	Combination	-287,88	-20,62	19,83	-2,99	2,26
189	Gmax	Combination	-144,27	8,10	16,05	2,77	1,88
190	Gmax	Combination	6,09	-5,99	-2,86	1,66	3,29
190	Gmax	Combination	-153,47	-37,90	-6,60	-0,03	3,39
190	Gmax	Combination	-148,37	-12,36	16,46	4,81	2,33
190	Gmax	Combination	11,20	19,55	10,70	2,93	2,23
191	Gmax	Combination	168,71	-1,09	-0,86	1,04	2,72
191	Gmax	Combination	0,34	-34,76	-2,82	1,83	3,04
191	Gmax	Combination	5,94	-6,75	10,57	2,28	1,95
191	Gmax	Combination	174,31	26,93	6,13	0,80	1,64
192	Gmax	Combination	328,29	5,55	0,93	0,04	2,13
192	Gmax	Combination	163,44	-27,42	-0,85	1,07	2,29
192	Gmax	Combination	168,92	-0,02	6,10	0,67	1,54
192	Gmax	Combination	333,77	32,95	2,61	0,14	1,38
193	Gmax	Combination	-56,67	71,59	11,43	1,58	2,28
193	Gmax	Combination	-78,73	-38,72	-5,16	-0,73	4,70
193	Gmax	Combination	-92,60	-41,49	-6,60	-9,16	4,78

193	Gmax	Combination	-70,54	68,81	14,04	-5,05	2,36
194	Gmax	Combination	5,07	40,85	2,47	-5,26	3,19
194	Gmax	Combination	-10,11	-35,04	-0,43	3,00	5,27
194	Gmax	Combination	-80,82	-49,18	-5,80	-3,96	5,08
194	Gmax	Combination	-65,64	26,71	13,37	11,31	2,99
195	Gmax	Combination	18,32	5,70	-2,16	-4,32	1,89
195	Gmax	Combination	14,52	-13,31	1,90	2,98	3,33
195	Gmax	Combination	-6,61	-17,54	-0,18	4,28	4,17
195	Gmax	Combination	-2,81	1,47	3,60	0,38	2,73
196	Gmax	Combination	46,69	-7,83	-7,00	-1,58	1,52
196	Gmax	Combination	48,05	-1,06	4,31	0,64	2,97
196	Gmax	Combination	15,68	-7,53	1,53	1,17	2,92
196	Gmax	Combination	14,32	-14,31	-1,02	1,37	1,47
197	Gmax	Combination	-45,29	27,90	-0,61	0,02	-0,03
197	Gmax	Combination	-56,63	-28,80	0,12	-0,17	-0,01
197	Gmax	Combination	-47,62	-27,00	0,06	0,19	-0,01
197	Gmax	Combination	-36,28	29,70	-0,52	-0,32	-0,02
198	Gmax	Combination	-9,10	15,49	-0,32	-0,09	0,05
198	Gmax	Combination	-14,49	-11,43	-0,06	-0,10	-0,02
198	Gmax	Combination	-54,77	-19,48	0,14	-0,10	-0,03
198	Gmax	Combination	-49,39	7,43	-0,66	-0,18	0,04
199	Gmax	Combination	-2,26	-8,39	-0,14	0,08	0,07
199	Gmax	Combination	-1,52	-4,68	-0,12	-0,07	0,02
199	Gmax	Combination	-13,62	-7,10	-0,06	-0,11	0,00
199	Gmax	Combination	-14,36	-10,81	-0,32	-0,08	0,05
200	Gmax	Combination	23,50	-29,11	-0,04	-0,01	0,06
200	Gmax	Combination	31,59	11,34	-0,17	0,00	0,03
200	Gmax	Combination	0,43	5,11	-0,11	-0,03	0,04
200	Gmax	Combination	-7,65	-35,34	-0,17	-0,06	0,07
201	Gmax	Combination	-34,01	-24,28	0,05	-0,19	0,03
201	Gmax	Combination	-33,27	-20,55	-0,07	-0,13	0,11
201	Gmax	Combination	-78,70	-29,64	-0,12	-0,65	0,04
201	Gmax	Combination	-79,45	-33,37	0,27	0,23	-0,04
202	Gmax	Combination	-20,58	-12,64	-0,03	-0,10	0,07
202	Gmax	Combination	-22,31	-21,31	-0,05	-0,08	0,10
202	Gmax	Combination	-33,88	-23,62	-0,08	-0,17	0,10
202	Gmax	Combination	-32,15	-14,96	0,06	-0,11	0,07
203	Gmax	Combination	4,50	-3,48	-0,12	-0,08	0,06
203	Gmax	Combination	3,32	-9,37	-0,03	-0,03	0,10
203	Gmax	Combination	-20,89	-14,21	-0,05	-0,09	0,10
203	Gmax	Combination	-19,71	-8,32	-0,03	-0,10	0,06
204	Gmax	Combination	23,69	9,76	-0,14	0,00	0,07

204	Gmax	Combination	20,25	-7,45	-0,05	0,01	0,10
204	Gmax	Combination	3,02	-10,89	-0,04	-0,05	0,09
204	Gmax	Combination	6,46	6,31	-0,11	-0,03	0,07
205	Gmax	Combination	-33,46	-20,59	-0,07	-0,13	0,09
205	Gmax	Combination	-34,02	-23,43	0,10	-0,20	0,13
205	Gmax	Combination	-78,86	-32,39	0,23	-0,01	0,18
205	Gmax	Combination	-78,29	-29,56	-0,15	-0,66	0,14
206	Gmax	Combination	-22,28	-21,30	-0,05	-0,08	0,11
206	Gmax	Combination	-20,45	-12,16	0,07	-0,08	0,13
206	Gmax	Combination	-32,24	-14,52	0,11	-0,15	0,12
206	Gmax	Combination	-34,07	-23,66	-0,07	-0,17	0,10
207	Gmax	Combination	3,28	-9,38	-0,03	-0,03	0,10
207	Gmax	Combination	4,48	-3,38	0,02	-0,04	0,12
207	Gmax	Combination	-19,66	-8,21	0,08	-0,04	0,13
207	Gmax	Combination	-20,86	-14,21	-0,05	-0,09	0,11
208	Gmax	Combination	19,73	-7,55	-0,07	0,01	0,12
208	Gmax	Combination	23,13	9,48	0,08	-0,05	0,11
208	Gmax	Combination	6,38	6,13	0,03	0,01	0,11
208	Gmax	Combination	2,97	-10,90	-0,03	-0,05	0,11
209	Gmax	Combination	-56,20	-27,86	0,15	-0,19	0,15
209	Gmax	Combination	-44,95	28,35	-0,14	-0,01	0,03
209	Gmax	Combination	-36,11	30,12	-0,37	-0,35	0,03
209	Gmax	Combination	-47,35	-26,09	0,14	-0,02	0,15
210	Gmax	Combination	-14,40	-10,95	0,05	-0,08	0,15
210	Gmax	Combination	-9,00	16,09	0,34	0,11	-0,04
210	Gmax	Combination	-49,01	8,09	-0,16	-0,12	-0,03
210	Gmax	Combination	-54,41	-18,95	0,16	-0,14	0,17
211	Gmax	Combination	-1,73	-4,62	0,03	-0,03	0,12
211	Gmax	Combination	-2,31	-7,54	0,69	0,27	-0,05
211	Gmax	Combination	-14,20	-9,92	0,31	-0,03	-0,04
211	Gmax	Combination	-13,61	-7,00	0,05	-0,04	0,13
212	Gmax	Combination	30,85	11,02	-0,02	-0,07	0,09
212	Gmax	Combination	23,05	-27,95	0,97	0,20	-0,05
212	Gmax	Combination	-7,62	-34,08	0,66	0,14	-0,05
212	Gmax	Combination	0,18	4,89	0,04	0,01	0,09
213	Gmax	Combination	-69,43	-36,86	-4,70	-0,64	3,55
213	Gmax	Combination	-84,58	-112,61	-0,87	-1,60	0,95
213	Gmax	Combination	-220,60	-139,81	-3,72	2,41	1,94
213	Gmax	Combination	-205,45	-64,06	-9,32	-9,71	4,55
214	Gmax	Combination	-10,46	-35,11	-0,61	2,97	2,58
214	Gmax	Combination	-20,50	-85,32	1,76	3,71	0,58
214	Gmax	Combination	-81,57	-97,53	-0,53	0,09	0,94

214	Gmax	Combination	-71,52	-47,32	-5,34	-3,87	2,93
215	Gmax	Combination	51,83	-5,85	2,24	3,05	2,04
215	Gmax	Combination	46,81	-30,97	2,35	2,13	0,53
215	Gmax	Combination	-11,99	-42,73	2,31	6,49	0,61
215	Gmax	Combination	-6,96	-17,61	-0,35	4,24	2,12
216	Gmax	Combination	123,80	14,09	2,65	0,31	1,59
216	Gmax	Combination	119,32	-8,32	3,43	-0,17	0,59
216	Gmax	Combination	48,51	-22,48	2,53	3,03	0,70
216	Gmax	Combination	52,99	-0,07	1,88	1,24	1,70
217	Gmax	Combination	-84,46	-112,58	-0,86	-1,60	-0,89
217	Gmax	Combination	-69,23	-36,42	-4,70	-0,66	-3,49
217	Gmax	Combination	-204,68	-63,51	-9,27	-9,68	-4,49
217	Gmax	Combination	-219,91	-139,67	-3,73	2,41	-1,89
218	Gmax	Combination	-20,93	-85,41	1,70	3,69	-0,53
218	Gmax	Combination	-10,75	-34,52	-0,71	2,80	-2,47
218	Gmax	Combination	-71,27	-46,63	-5,34	-3,87	-2,84
218	Gmax	Combination	-81,44	-97,51	-0,52	0,10	-0,90
219	Gmax	Combination	46,73	-30,99	2,36	2,13	-0,39
219	Gmax	Combination	51,84	-5,45	2,18	3,02	-1,94
219	Gmax	Combination	-7,30	-17,27	-0,45	4,10	-2,03
219	Gmax	Combination	-12,41	-42,81	2,25	6,47	-0,49
220	Gmax	Combination	119,11	-8,36	3,42	-0,17	-0,46
220	Gmax	Combination	123,61	14,15	2,63	0,29	-1,47
220	Gmax	Combination	52,93	0,02	1,83	1,23	-1,58
220	Gmax	Combination	48,43	-22,50	2,54	3,03	-0,57
221	Gmax	Combination	-78,59	-38,30	-5,20	-0,76	-4,59
221	Gmax	Combination	-57,03	69,53	11,69	1,61	-2,19
221	Gmax	Combination	-69,03	67,13	14,14	-5,11	-2,27
221	Gmax	Combination	-90,60	-40,70	-6,52	-9,13	-4,67
222	Gmax	Combination	-10,46	-34,47	-0,42	2,86	-5,18
222	Gmax	Combination	4,31	39,40	2,66	-5,15	-3,08
222	Gmax	Combination	-65,86	25,37	13,62	11,26	-2,88
222	Gmax	Combination	-80,63	-48,50	-5,84	-3,97	-4,97
223	Gmax	Combination	14,19	-12,98	1,82	2,95	-3,23
223	Gmax	Combination	17,81	5,16	-1,73	-4,19	-1,86
223	Gmax	Combination	-3,38	0,92	3,77	0,41	-2,68
223	Gmax	Combination	-7,01	-17,22	-0,16	4,16	-4,05
224	Gmax	Combination	48,09	-0,95	4,26	0,62	-2,88
224	Gmax	Combination	46,72	-7,82	-6,51	-1,51	-1,49
224	Gmax	Combination	13,90	-14,38	-0,61	1,44	-1,43
224	Gmax	Combination	15,28	-7,51	1,46	1,16	-2,82
225	Gmax	Combination	294,25	21,97	1,19	-0,22	0,94

225	Gmax	Combination	146,81	-7,52	2,00	-0,67	1,02
225	Gmax	Combination	142,25	-30,32	3,83	-0,96	0,27
225	Gmax	Combination	289,69	-0,83	3,07	0,04	0,19
226	Gmax	Combination	151,76	17,23	1,88	-1,28	1,21
226	Gmax	Combination	17,72	-9,58	3,92	-1,10	1,16
226	Gmax	Combination	8,14	-57,49	4,42	-0,60	0,14
226	Gmax	Combination	142,18	-30,68	3,85	-0,84	0,19
227	Gmax	Combination	19,00	-3,18	3,89	-1,23	1,06
227	Gmax	Combination	-111,03	-29,18	6,57	1,47	1,19
227	Gmax	Combination	-124,65	-97,27	4,59	-0,61	0,26
227	Gmax	Combination	5,38	-71,26	4,42	-0,60	0,13
228	Gmax	Combination	-111,41	-31,06	6,28	0,03	1,75
228	Gmax	Combination	-326,77	-74,13	10,67	6,31	2,97
228	Gmax	Combination	-342,22	-151,37	3,70	-6,81	1,56
228	Gmax	Combination	-126,86	-108,30	4,73	0,10	0,34
229	Gmax	Combination	343,08	9,84	3,09	0,04	-0,48
229	Gmax	Combination	167,67	-25,24	3,84	-0,96	-0,60
229	Gmax	Combination	167,62	-25,51	0,82	-1,08	-1,40
229	Gmax	Combination	343,02	9,57	0,03	0,11	-1,27
230	Gmax	Combination	167,60	-25,60	3,86	-0,84	-0,50
230	Gmax	Combination	15,52	-56,01	4,45	-0,60	-0,45
230	Gmax	Combination	20,57	-30,75	2,96	-1,82	-1,59
230	Gmax	Combination	172,65	-0,34	0,82	-1,04	-1,65
231	Gmax	Combination	12,76	-69,78	4,45	-0,60	-0,27
231	Gmax	Combination	-157,24	-103,78	4,58	-0,61	-0,21
231	Gmax	Combination	-143,90	-37,06	6,17	-0,13	-1,42
231	Gmax	Combination	26,11	-3,06	3,00	-1,65	-1,48
232	Gmax	Combination	-159,45	-114,82	4,72	0,09	0,42
232	Gmax	Combination	-341,28	-151,19	4,64	-6,62	-0,74
232	Gmax	Combination	-318,55	-37,53	12,97	7,09	-3,42
232	Gmax	Combination	-136,72	-1,17	6,01	-0,90	-2,26
233	Gmax	Combination	-92,41	62,45	-11,49	-2,37	0,98
233	Gmax	Combination	-120,82	56,77	-12,82	8,15	1,56
233	Gmax	Combination	-139,51	-36,68	7,75	5,72	3,46
233	Gmax	Combination	-111,10	-31,00	6,46	0,07	2,88
234	Gmax	Combination	-33,38	31,86	-8,09	-2,79	1,93
234	Gmax	Combination	-101,25	18,29	-12,36	-6,73	1,66
234	Gmax	Combination	-110,73	-29,12	6,75	1,51	2,43
234	Gmax	Combination	-42,86	-15,55	4,05	-1,20	2,70
235	Gmax	Combination	75,87	16,77	-2,99	1,20	1,42
235	Gmax	Combination	-41,08	-6,62	-8,15	-3,11	1,71
235	Gmax	Combination	-44,14	-21,95	4,08	-1,07	2,79

235	Gmax	Combination	72,80	1,44	1,59	-1,33	2,50
236	Gmax	Combination	201,37	23,11	-1,58	0,90	1,33
236	Gmax	Combination	71,96	-2,77	-3,39	-0,82	1,53
236	Gmax	Combination	67,85	-23,31	1,72	-0,72	1,79
236	Gmax	Combination	197,26	2,57	0,79	-0,30	1,60
237	Gmax	Combination	-143,70	-2,56	6,43	-0,82	-4,35
237	Gmax	Combination	-285,49	-30,92	8,42	6,18	-4,75
237	Gmax	Combination	-283,17	-19,29	-19,55	3,02	-2,41
237	Gmax	Combination	-141,37	9,07	-15,77	-2,75	-2,01
238	Gmax	Combination	5,06	-7,27	2,87	-1,67	-3,40
238	Gmax	Combination	-150,88	-38,45	6,58	-0,05	-3,51
238	Gmax	Combination	-145,43	-11,20	-16,17	-4,74	-2,42
238	Gmax	Combination	10,51	19,99	-10,37	-2,86	-2,31
239	Gmax	Combination	163,94	-2,08	0,90	-1,03	-2,84
239	Gmax	Combination	-0,48	-34,96	2,83	-1,84	-3,15
239	Gmax	Combination	5,31	-6,01	-10,25	-2,22	-2,03
239	Gmax	Combination	169,73	26,87	-5,78	-0,76	-1,72
240	Gmax	Combination	319,20	4,80	-0,90	-0,07	-2,24
240	Gmax	Combination	158,91	-27,25	0,89	-1,07	-2,41
240	Gmax	Combination	164,42	0,32	-5,75	-0,60	-1,63
240	Gmax	Combination	324,71	32,38	-2,20	-0,04	-1,46
241	Gmax	Combination	-143,87	8,18	15,58	2,68	-1,76
241	Gmax	Combination	-287,13	-20,47	18,38	-3,29	-2,21
241	Gmax	Combination	-289,93	-34,47	-8,38	-5,36	-4,33
241	Gmax	Combination	-146,66	-5,82	-6,82	0,84	-3,88
242	Gmax	Combination	10,44	19,40	10,35	2,86	-1,98
242	Gmax	Combination	-147,96	-12,28	15,99	4,72	-2,08
242	Gmax	Combination	-153,64	-40,69	-6,98	0,03	-3,13
242	Gmax	Combination	4,76	-9,01	-3,23	1,54	-3,03
243	Gmax	Combination	173,48	26,76	5,99	0,77	-1,42
243	Gmax	Combination	5,18	-6,90	10,22	2,21	-1,72
243	Gmax	Combination	-0,50	-35,31	-3,18	1,82	-2,79
243	Gmax	Combination	167,79	-1,65	-1,24	1,01	-2,49
244	Gmax	Combination	330,78	32,35	2,60	0,14	-1,18
244	Gmax	Combination	168,09	-0,19	5,96	0,64	-1,34
244	Gmax	Combination	162,86	-26,33	-1,24	1,03	-2,07
244	Gmax	Combination	325,55	6,20	0,55	0,02	-1,91
245	Gmax	Combination	344,08	9,91	-0,37	-0,17	-0,86
245	Gmax	Combination	161,93	-26,52	-1,17	1,04	-1,02
245	Gmax	Combination	161,85	-26,92	-4,12	1,03	-0,24
245	Gmax	Combination	344,00	9,51	-3,42	0,10	-0,09
246	Gmax	Combination	166,87	-1,84	-1,17	1,03	-1,26

246	Gmax	Combination	19,71	-31,27	-3,32	1,79	-1,16
246	Gmax	Combination	15,00	-54,82	-4,67	0,28	-0,07
246	Gmax	Combination	162,15	-25,39	-4,16	0,81	-0,16
247	Gmax	Combination	24,97	-4,97	-3,38	1,51	-1,02
247	Gmax	Combination	-143,77	-38,71	-6,44	0,14	-0,97
247	Gmax	Combination	-156,58	-102,79	-4,53	0,61	0,12
247	Gmax	Combination	12,15	-69,04	-4,57	0,77	0,08
248	Gmax	Combination	-136,80	-3,84	-6,28	0,95	-1,83
248	Gmax	Combination	-317,23	-39,93	-13,40	-6,37	-2,92
248	Gmax	Combination	-340,58	-156,69	-4,15	7,10	-0,27
248	Gmax	Combination	-160,15	-120,60	-4,69	-0,20	0,82
249	Gmax	Combination	266,72	-5,95	-3,33	0,11	0,48
249	Gmax	Combination	136,98	-31,90	-4,18	1,02	0,69
249	Gmax	Combination	142,39	-4,87	-2,42	0,17	1,33
249	Gmax	Combination	272,13	21,08	-1,94	-0,35	1,12
250	Gmax	Combination	137,29	-30,37	-4,22	0,79	0,55
250	Gmax	Combination	2,01	-57,42	-4,64	0,29	0,33
250	Gmax	Combination	8,12	-26,86	-4,37	2,32	1,41
250	Gmax	Combination	143,40	0,20	-2,20	1,26	1,63
251	Gmax	Combination	-0,84	-71,64	-4,54	0,77	0,28
251	Gmax	Combination	-112,78	-94,03	-4,41	0,63	0,46
251	Gmax	Combination	-104,00	-50,14	-7,53	-1,44	1,36
251	Gmax	Combination	7,94	-27,76	-4,72	0,55	1,19
252	Gmax	Combination	-116,34	-111,84	-4,57	-0,18	0,61
252	Gmax	Combination	-328,00	-154,17	-3,36	7,25	1,84
252	Gmax	Combination	-311,43	-71,30	-11,10	-6,82	2,96
252	Gmax	Combination	-99,77	-28,97	-7,16	0,41	1,73
253	Gmax	Combination	-96,92	-28,40	-7,85	0,27	2,23
253	Gmax	Combination	-146,73	-38,36	-8,46	-6,29	3,06
253	Gmax	Combination	-122,07	84,96	13,84	-10,16	1,25
253	Gmax	Combination	-72,26	94,92	13,76	2,69	0,43
254	Gmax	Combination	-1,53	-29,65	-4,70	0,56	3,16
254	Gmax	Combination	-101,16	-49,58	-8,22	-1,58	2,52
254	Gmax	Combination	-76,78	72,34	14,95	8,65	0,47
254	Gmax	Combination	22,85	92,26	7,37	5,27	1,11
255	Gmax	Combination	48,79	-18,72	-2,22	1,26	2,41
255	Gmax	Combination	-1,35	-28,75	-4,35	2,33	3,16
255	Gmax	Combination	10,56	30,80	6,13	-0,91	0,75
255	Gmax	Combination	60,70	40,83	-0,99	-2,37	0,01
256	Gmax	Combination	126,76	-7,99	-0,53	-0,07	2,02
256	Gmax	Combination	47,78	-23,79	-2,43	0,16	1,80
256	Gmax	Combination	54,52	9,89	-0,20	1,56	0,12

256	Gmax	Combination	133,50	25,69	-5,45	0,65	0,34
257	Gmax	Combination	-139,33	9,48	-15,76	-2,74	1,60
257	Gmax	Combination	-274,28	-17,52	-18,51	3,22	2,04
257	Gmax	Combination	-277,42	-33,20	8,06	5,23	4,15
257	Gmax	Combination	-142,46	-6,21	6,53	-0,88	3,70
258	Gmax	Combination	9,40	19,77	-10,68	-2,92	1,84
258	Gmax	Combination	-143,38	-10,79	-16,15	-4,73	1,94
258	Gmax	Combination	-149,01	-38,93	6,68	-0,12	2,92
258	Gmax	Combination	3,77	-8,38	2,96	-1,63	2,82
259	Gmax	Combination	167,20	26,36	-6,46	-0,90	1,29
259	Gmax	Combination	4,20	-6,24	-10,55	-2,28	1,58
259	Gmax	Combination	-1,41	-34,31	2,92	-1,83	2,57
259	Gmax	Combination	161,58	-1,71	0,99	-1,02	2,28
260	Gmax	Combination	318,79	31,20	-3,21	-0,24	1,05
260	Gmax	Combination	161,89	-0,18	-6,43	-0,73	1,21
260	Gmax	Combination	156,82	-25,50	0,98	-1,08	1,87
260	Gmax	Combination	313,72	5,88	-0,78	0,00	1,72
261	Gmax	Combination	332,90	9,72	0,09	0,17	0,66
261	Gmax	Combination	156,75	-25,51	0,91	-1,10	0,79
261	Gmax	Combination	156,61	-26,19	3,97	-0,88	0,01
261	Gmax	Combination	332,76	9,04	3,30	0,02	-0,11
262	Gmax	Combination	161,50	-1,72	0,92	-1,03	1,02
262	Gmax	Combination	19,05	-30,21	3,07	-1,80	0,96
262	Gmax	Combination	14,46	-53,17	4,45	-0,49	-0,13
262	Gmax	Combination	156,91	-24,68	3,97	-0,88	-0,07
263	Gmax	Combination	24,23	-4,29	3,11	-1,60	0,82
263	Gmax	Combination	-139,46	-37,02	6,16	-0,23	0,75
263	Gmax	Combination	-152,37	-101,59	4,39	-0,67	-0,35
263	Gmax	Combination	11,32	-68,86	4,42	-0,63	-0,29
264	Gmax	Combination	-132,91	-4,30	6,01	-0,98	1,63
264	Gmax	Combination	-307,29	-39,17	13,08	6,23	2,76
264	Gmax	Combination	-330,11	-153,27	4,09	-7,25	0,08
264	Gmax	Combination	-155,73	-118,40	4,51	-0,06	-1,04
265	Gmax	Combination	260,87	-5,34	3,18	0,00	-0,75
265	Gmax	Combination	132,10	-31,09	4,03	-0,86	-0,81
265	Gmax	Combination	137,18	-5,72	2,51	-0,64	-1,40
265	Gmax	Combination	265,95	20,03	2,16	-0,16	-1,34
266	Gmax	Combination	132,40	-29,58	4,03	-0,87	-0,67
266	Gmax	Combination	2,23	-55,62	4,42	-0,50	-0,61
266	Gmax	Combination	7,58	-28,87	4,49	-1,48	-1,61
266	Gmax	Combination	137,75	-2,83	2,49	-0,77	-1,67
267	Gmax	Combination	-0,91	-71,30	4,39	-0,63	-0,58

267	Gmax	Combination	-108,88	-92,90	4,29	-0,69	-0,65
267	Gmax	Combination	-100,24	-49,68	7,18	1,02	-1,49
267	Gmax	Combination	7,73	-28,09	4,57	-1,10	-1,42
268	Gmax	Combination	-112,24	-109,70	4,41	-0,08	-0,81
268	Gmax	Combination	-322,30	-151,71	3,22	-7,42	-2,10
268	Gmax	Combination	-306,33	-71,83	10,67	6,54	-3,18
268	Gmax	Combination	-96,27	-29,81	6,97	-0,02	-1,88
269	Gmax	Combination	-96,27	-29,82	7,58	0,10	-2,56
269	Gmax	Combination	-145,36	-39,63	8,31	6,07	-3,17
269	Gmax	Combination	-120,12	86,58	-12,94	8,82	-1,26
269	Gmax	Combination	-71,03	96,40	-12,29	-3,40	-0,65
270	Gmax	Combination	-0,88	-29,81	4,45	-1,12	-3,00
270	Gmax	Combination	-100,25	-49,68	7,79	1,14	-2,75
270	Gmax	Combination	-76,06	71,27	-12,92	-6,52	-0,68
270	Gmax	Combination	23,31	91,14	-5,41	-2,68	-0,93
271	Gmax	Combination	49,39	-20,51	2,55	-0,76	-2,58
271	Gmax	Combination	-1,04	-30,59	4,38	-1,50	-2,89
271	Gmax	Combination	12,01	34,67	-5,14	-1,33	-0,75
271	Gmax	Combination	62,44	44,75	1,23	0,79	-0,44
272	Gmax	Combination	119,54	-9,25	0,85	-0,42	-1,90
272	Gmax	Combination	48,81	-23,39	2,58	-0,63	-2,04
272	Gmax	Combination	55,61	10,59	1,13	0,27	-0,50
272	Gmax	Combination	126,34	24,74	5,92	1,11	-0,37
273	Gmax	Combination	-44,47	100,48	-13,23	-0,10	-2,25
273	Gmax	Combination	-74,20	-48,16	6,68	5,10	-4,72
273	Gmax	Combination	-99,06	-53,13	7,05	10,32	-4,65
273	Gmax	Combination	-69,33	95,51	-15,60	6,05	-2,18
274	Gmax	Combination	3,58	88,41	-7,41	-3,20	-5,75
274	Gmax	Combination	-27,10	-65,01	4,04	10,27	-7,35
274	Gmax	Combination	-79,67	-75,52	7,35	8,49	-5,41
274	Gmax	Combination	-48,99	77,90	-15,33	-10,62	-3,81
275	Gmax	Combination	3,13	29,32	1,53	4,63	-4,71
275	Gmax	Combination	-2,70	0,18	-4,98	-5,28	-5,55
275	Gmax	Combination	-14,54	-2,19	-0,14	-10,60	-7,04
275	Gmax	Combination	-8,71	26,95	-6,92	-0,75	-6,20
276	Gmax	Combination	28,89	4,77	5,86	1,29	-3,93
276	Gmax	Combination	28,45	2,59	-7,51	-0,54	-4,81
276	Gmax	Combination	-3,49	-3,80	-4,61	-3,45	-4,83
276	Gmax	Combination	-3,06	-1,62	0,34	-1,33	-3,95
277	Gmax	Combination	-81,91	-49,70	6,50	5,07	-3,62
277	Gmax	Combination	-97,78	-129,07	2,69	6,81	-1,07
277	Gmax	Combination	-208,84	-151,28	4,20	-1,18	-1,98

277	Gmax	Combination	-192,96	-71,91	10,90	11,09	-4,53
278	Gmax	Combination	-29,44	-65,48	1,82	9,83	-2,95
278	Gmax	Combination	-35,14	-93,97	1,26	6,80	-0,10
278	Gmax	Combination	-93,08	-105,55	2,33	5,04	-0,68
278	Gmax	Combination	-87,38	-77,06	7,18	8,45	-3,53
279	Gmax	Combination	31,16	6,95	-4,68	-5,22	-2,96
279	Gmax	Combination	21,95	-39,11	-3,63	-4,00	-0,46
279	Gmax	Combination	-26,09	-48,72	-1,93	-9,15	-0,15
279	Gmax	Combination	-16,88	-2,66	-2,36	-11,05	-2,66
280	Gmax	Combination	61,13	9,13	-6,07	-0,25	-2,58
280	Gmax	Combination	56,47	-14,16	-5,44	0,18	-0,55
280	Gmax	Combination	25,71	-20,31	-3,80	-4,85	-0,68
280	Gmax	Combination	30,36	2,97	-4,31	-3,39	-2,71
281	Gmax	Combination	-88,24	-127,16	2,93	6,86	0,48
281	Gmax	Combination	-69,49	-33,39	4,34	2,86	3,24
281	Gmax	Combination	-199,55	-59,40	10,39	12,67	4,13
281	Gmax	Combination	-218,30	-153,17	4,06	-1,21	1,38
282	Gmax	Combination	-41,07	-95,15	1,16	6,78	1,69
282	Gmax	Combination	-31,43	-46,94	-0,37	-0,86	3,99
282	Gmax	Combination	-73,89	-55,44	4,98	6,07	3,26
282	Gmax	Combination	-83,54	-103,64	2,57	5,09	0,95
283	Gmax	Combination	18,20	-39,86	-3,58	-3,99	1,69
283	Gmax	Combination	25,92	-1,24	-3,59	-3,80	3,79
283	Gmax	Combination	-24,30	-11,29	-1,26	-5,34	4,21
283	Gmax	Combination	-32,02	-49,90	-2,03	-9,17	2,10
284	Gmax	Combination	70,10	-11,43	-5,62	0,15	1,39
284	Gmax	Combination	74,16	8,89	-4,27	-0,32	3,10
284	Gmax	Combination	26,02	-0,74	-3,26	-2,16	3,30
284	Gmax	Combination	21,96	-21,06	-3,75	-4,84	1,59
285	Gmax	Combination	-83,21	-36,13	4,52	2,90	5,38
285	Gmax	Combination	-56,10	99,38	-11,43	-0,64	2,99
285	Gmax	Combination	-64,93	97,62	-15,47	5,59	2,82
285	Gmax	Combination	-92,03	-37,90	7,52	12,10	5,21
286	Gmax	Combination	-21,28	-44,92	0,19	-0,75	6,63
286	Gmax	Combination	5,20	87,52	-5,12	-0,60	5,07
286	Gmax	Combination	-61,13	74,25	-13,33	-10,13	4,22
286	Gmax	Combination	-87,62	-58,18	5,17	6,11	5,78
287	Gmax	Combination	3,88	-5,65	-3,54	-3,79	5,59
287	Gmax	Combination	11,94	34,65	1,75	4,46	4,01
287	Gmax	Combination	-6,09	31,04	-5,51	-2,56	4,82
287	Gmax	Combination	-14,15	-9,26	-0,71	-5,23	6,40
288	Gmax	Combination	30,44	0,15	-5,95	-0,66	4,81

288	Gmax	Combination	31,57	5,79	6,28	1,64	3,62
288	Gmax	Combination	5,11	0,50	0,73	-0,61	3,66
288	Gmax	Combination	3,98	-5,15	-3,21	-2,15	4,85
289	Gmax	Combination	210,70	-8,35	-9,55	-0,03	0,04
289	Gmax	Combination	92,93	-31,91	-9,97	0,26	0,25
289	Gmax	Combination	98,29	-5,06	-6,08	-0,34	0,96
289	Gmax	Combination	216,07	18,50	-4,66	0,33	0,75
290	Gmax	Combination	90,55	-43,79	-10,14	-0,58	0,17
290	Gmax	Combination	-14,57	-64,81	-10,75	-2,16	0,07
290	Gmax	Combination	-3,02	-7,07	-8,43	-1,73	1,03
290	Gmax	Combination	102,10	13,95	-5,76	1,26	1,13
291	Gmax	Combination	-21,07	-97,29	-10,83	-2,56	-0,06
291	Gmax	Combination	-136,09	-120,30	-11,08	-4,64	-0,05
291	Gmax	Combination	-117,04	-25,06	-11,94	-6,88	0,88
291	Gmax	Combination	-2,02	-2,06	-8,10	-0,06	0,87
292	Gmax	Combination	-140,15	-140,62	-11,38	-6,15	-0,28
292	Gmax	Combination	-342,78	-181,15	-11,03	-3,05	0,73
292	Gmax	Combination	-319,97	-67,06	-17,75	-15,63	2,47
292	Gmax	Combination	-117,33	-26,53	-11,41	-4,24	1,47
293	Gmax	Combination	210,22	17,64	-4,98	-0,37	-0,79
293	Gmax	Combination	98,42	-4,72	-5,82	-0,74	-1,12
293	Gmax	Combination	92,99	-31,89	-10,06	0,24	-0,54
293	Gmax	Combination	204,79	-9,53	-9,44	-0,01	-0,21
294	Gmax	Combination	98,22	-5,75	-5,43	1,23	-1,43
294	Gmax	Combination	-19,37	-29,27	-8,20	-0,82	-1,25
294	Gmax	Combination	-26,97	-67,29	-10,69	-2,15	-0,23
294	Gmax	Combination	90,61	-43,78	-10,23	-0,60	-0,42
295	Gmax	Combination	-18,68	-25,83	-8,24	-1,01	-0,99
295	Gmax	Combination	-106,32	-43,36	-11,49	-6,90	-1,11
295	Gmax	Combination	-121,11	-117,30	-11,06	-4,64	-0,33
295	Gmax	Combination	-33,47	-99,77	-10,77	-2,54	-0,20
296	Gmax	Combination	-103,05	-26,98	-10,90	-3,96	-1,73
296	Gmax	Combination	-311,02	-68,57	-16,74	-14,95	-2,66
296	Gmax	Combination	-333,15	-179,22	-11,21	-3,09	-1,00
296	Gmax	Combination	-125,17	-137,62	-11,36	-6,15	-0,07
297	Gmax	Combination	105,17	21,67	5,07	0,61	-0,49
297	Gmax	Combination	34,12	7,46	9,87	3,41	-0,49
297	Gmax	Combination	28,91	-18,63	-5,71	-0,72	-2,00
297	Gmax	Combination	99,95	-4,42	-3,47	-0,07	-2,00
298	Gmax	Combination	43,50	54,34	8,70	-2,43	-0,35
298	Gmax	Combination	-3,78	44,88	15,75	3,32	-0,78
298	Gmax	Combination	-18,58	-29,11	-8,27	-0,83	-3,17

298	Gmax	Combination	28,70	-19,65	-5,31	1,26	-2,73
299	Gmax	Combination	10,67	117,14	15,96	4,39	-0,87
299	Gmax	Combination	-99,92	95,02	22,99	12,12	-0,10
299	Gmax	Combination	-128,48	-47,79	-12,03	-7,01	-2,20
299	Gmax	Combination	-17,90	-25,67	-8,31	-1,03	-2,98
300	Gmax	Combination	-90,47	142,26	21,33	3,83	1,30
300	Gmax	Combination	-119,80	136,39	22,97	-2,07	1,68
300	Gmax	Combination	-154,53	-37,28	-11,42	-13,88	-1,74
300	Gmax	Combination	-125,21	-31,41	-11,45	-4,06	-2,12
301	Gmax	Combination	172,76	9,83	-4,15	0,43	1,55
301	Gmax	Combination	45,74	-15,57	-5,29	-0,18	1,84
301	Gmax	Combination	47,61	-6,20	10,39	2,32	1,18
301	Gmax	Combination	174,63	19,20	7,74	-1,22	0,89
302	Gmax	Combination	49,54	3,44	-4,98	1,41	3,00
302	Gmax	Combination	-55,77	-17,62	-9,13	-1,87	3,18
302	Gmax	Combination	-50,41	9,18	18,01	7,18	0,93
302	Gmax	Combination	54,90	30,24	9,48	-2,23	0,75
303	Gmax	Combination	-54,77	-12,61	-8,79	-0,20	2,55
303	Gmax	Combination	-138,70	-29,39	-11,77	-6,85	2,01
303	Gmax	Combination	-120,61	61,07	22,23	11,59	0,81
303	Gmax	Combination	-36,67	77,86	17,03	2,29	1,35
304	Gmax	Combination	-138,99	-30,86	-11,25	-4,21	2,57
304	Gmax	Combination	-165,37	-36,14	-12,48	-14,58	2,07
304	Gmax	Combination	-133,62	122,62	24,20	-1,06	-1,74
304	Gmax	Combination	-107,24	127,89	20,77	4,32	-1,23
305	Gmax	Combination	-56,97	137,95	-21,68	-3,39	-5,34
305	Gmax	Combination	-103,22	-93,30	8,70	-1,12	-6,89
305	Gmax	Combination	-172,61	-107,17	12,21	14,09	-7,57
305	Gmax	Combination	-126,36	124,07	-22,91	10,21	-6,02
306	Gmax	Combination	22,18	89,63	-7,54	1,55	-5,11
306	Gmax	Combination	-11,02	-76,39	1,01	-5,15	-7,89
306	Gmax	Combination	-103,54	-94,90	9,34	2,07	-7,78
306	Gmax	Combination	-70,34	71,13	-23,82	-14,10	-5,00
307	Gmax	Combination	45,29	28,32	-2,83	2,45	-3,51
307	Gmax	Combination	32,74	-34,45	-1,16	-3,32	-4,39
307	Gmax	Combination	-4,11	-41,82	0,96	-5,41	-5,71
307	Gmax	Combination	8,45	20,95	-7,81	0,21	-4,83
308	Gmax	Combination	97,60	3,79	4,73	0,74	-2,61
308	Gmax	Combination	94,83	-10,08	-5,04	-0,39	-4,14
308	Gmax	Combination	35,23	-22,00	-0,90	-2,00	-4,09
308	Gmax	Combination	38,00	-8,13	-3,77	-2,28	-2,56
309	Gmax	Combination	-93,13	-91,28	7,56	-1,35	-5,06

309	Gmax	Combination	-113,78	-194,55	2,59	1,39	-1,40
309	Gmax	Combination	-318,79	-235,55	7,02	-0,99	-2,51
309	Gmax	Combination	-298,13	-132,28	14,94	14,64	-6,17
310	Gmax	Combination	15,17	-71,15	2,03	-4,95	-4,19
310	Gmax	Combination	1,27	-140,69	-2,61	-9,91	-1,06
310	Gmax	Combination	-107,35	-162,41	2,26	-0,28	-1,59
310	Gmax	Combination	-93,45	-92,88	8,20	1,84	-4,72
311	Gmax	Combination	117,89	-17,42	-1,89	-3,46	-2,82
311	Gmax	Combination	109,11	-61,32	-2,43	-3,03	-0,63
311	Gmax	Combination	13,31	-80,48	-2,44	-9,06	-0,89
311	Gmax	Combination	22,09	-36,58	1,98	-5,21	-3,08
312	Gmax	Combination	255,86	22,12	-3,14	-0,01	-2,21
312	Gmax	Combination	248,82	-13,07	-3,58	0,01	-0,72
312	Gmax	Combination	113,34	-40,17	-2,57	-3,70	-0,86
312	Gmax	Combination	120,38	-4,97	-1,63	-2,14	-2,35
313	Gmax	Combination	-113,86	-194,57	2,58	1,39	1,35
313	Gmax	Combination	-93,02	-90,38	7,55	-1,33	4,99
313	Gmax	Combination	-297,00	-131,17	14,83	14,59	6,10
313	Gmax	Combination	-317,84	-235,36	7,03	-0,99	2,46
314	Gmax	Combination	0,70	-140,80	-2,56	-9,90	1,00
314	Gmax	Combination	14,79	-70,37	2,11	-4,77	4,08
314	Gmax	Combination	-93,34	-91,99	8,19	1,86	4,63
314	Gmax	Combination	-107,43	-162,42	2,25	-0,28	1,55
315	Gmax	Combination	109,05	-61,33	-2,44	-3,03	0,49
315	Gmax	Combination	117,92	-17,00	-1,87	-3,46	2,71
315	Gmax	Combination	21,61	-36,26	2,05	-5,07	2,99
315	Gmax	Combination	12,74	-80,60	-2,39	-9,05	0,77
316	Gmax	Combination	248,71	-13,10	-3,57	0,02	0,58
316	Gmax	Combination	255,76	22,15	-3,16	0,02	2,08
316	Gmax	Combination	120,33	-4,93	-1,61	-2,14	2,22
316	Gmax	Combination	113,28	-40,18	-2,58	-3,71	0,72
317	Gmax	Combination	-103,14	-92,40	8,71	-1,10	6,75
317	Gmax	Combination	-57,64	135,13	-21,91	-3,38	5,24
317	Gmax	Combination	-125,00	121,66	-22,94	10,34	5,94
317	Gmax	Combination	-170,50	-105,87	12,10	14,04	7,45
318	Gmax	Combination	-11,31	-75,59	1,00	-4,99	7,80
318	Gmax	Combination	21,35	87,73	-7,74	1,40	5,01
318	Gmax	Combination	-70,81	69,30	-24,06	-14,10	4,88
318	Gmax	Combination	-103,47	-94,02	9,35	2,09	7,66
319	Gmax	Combination	32,41	-34,10	-1,12	-3,31	4,29
319	Gmax	Combination	44,77	27,66	-3,26	2,35	3,48
319	Gmax	Combination	7,86	20,28	-7,96	0,26	4,79

319	Gmax	Combination	-4,49	-41,48	0,94	-5,29	5,61
320	Gmax	Combination	95,02	-10,00	-5,04	-0,35	4,06
320	Gmax	Combination	97,80	3,91	4,20	0,60	2,59
320	Gmax	Combination	37,61	-8,13	-4,21	-2,39	2,53
320	Gmax	Combination	34,83	-22,03	-0,86	-1,99	4,00
321	Gmax	Combination	-36,26	153,10	20,47	1,55	4,12
321	Gmax	Combination	-84,03	-85,76	-7,70	3,32	5,83
321	Gmax	Combination	-158,54	-100,66	-10,40	-10,57	7,19
321	Gmax	Combination	-110,76	138,20	21,80	-10,68	5,48
322	Gmax	Combination	21,01	119,21	16,91	4,30	4,26
322	Gmax	Combination	-20,20	-86,86	-8,59	0,48	6,23
322	Gmax	Combination	-86,92	-100,21	-8,33	0,16	5,74
322	Gmax	Combination	-45,70	105,86	22,70	12,67	3,77
323	Gmax	Combination	30,15	51,67	8,11	-1,05	4,34
323	Gmax	Combination	16,65	-15,83	1,42	3,39	3,59
323	Gmax	Combination	-6,94	-20,55	-8,14	2,74	4,49
323	Gmax	Combination	6,56	46,95	16,92	4,32	5,24
324	Gmax	Combination	86,47	17,93	4,56	-0,44	2,81
324	Gmax	Combination	82,29	-3,00	3,47	0,14	3,24
324	Gmax	Combination	16,59	-16,14	1,23	2,49	3,50
324	Gmax	Combination	20,78	4,79	8,76	2,21	3,07
325	Gmax	Combination	-97,00	-88,36	-8,60	3,14	4,98
325	Gmax	Combination	-115,68	-181,77	-0,49	2,06	1,68
325	Gmax	Combination	-283,77	-215,39	-5,66	4,78	2,94
325	Gmax	Combination	-265,08	-121,97	-13,95	-11,28	6,24
326	Gmax	Combination	2,03	-82,42	-1,14	1,97	2,98
326	Gmax	Combination	-5,84	-121,78	2,80	15,74	-0,34
326	Gmax	Combination	-107,76	-142,16	-0,17	3,63	1,25
326	Gmax	Combination	-99,89	-102,80	-9,23	-0,02	4,58
327	Gmax	Combination	101,80	1,20	0,06	3,12	0,83
327	Gmax	Combination	87,98	-67,89	1,19	1,21	-0,08
327	Gmax	Combination	1,48	-85,19	0,57	4,57	-0,31
327	Gmax	Combination	15,30	-16,10	-0,68	4,23	0,61
328	Gmax	Combination	193,20	19,18	3,22	0,09	1,42
328	Gmax	Combination	185,47	-19,47	0,78	-0,07	-0,04
328	Gmax	Combination	94,01	-37,76	1,28	1,64	-0,09
328	Gmax	Combination	101,74	0,89	-0,12	2,21	1,36
329	Gmax	Combination	-105,55	-179,74	-0,78	2,00	-1,12
329	Gmax	Combination	-84,50	-74,52	-6,65	4,72	-4,62
329	Gmax	Combination	-268,00	-111,22	-13,61	-12,43	-5,88
329	Gmax	Combination	-289,04	-216,44	-5,37	4,84	-2,38
330	Gmax	Combination	-12,77	-123,17	3,12	15,81	-0,78

330	Gmax	Combination	-1,78	-68,21	0,81	10,86	-3,75
330	Gmax	Combination	-86,63	-85,18	-7,26	1,68	-4,29
330	Gmax	Combination	-97,63	-140,14	-0,46	3,58	-1,32
331	Gmax	Combination	84,56	-68,57	1,13	1,20	-0,83
331	Gmax	Combination	97,23	-5,24	-0,75	2,02	-1,29
331	Gmax	Combination	7,22	-23,24	-1,49	-0,62	-1,68
331	Gmax	Combination	-5,45	-86,57	0,89	4,64	-1,22
332	Gmax	Combination	196,39	-17,28	0,92	-0,04	-0,48
332	Gmax	Combination	203,50	18,28	1,88	0,16	-1,71
332	Gmax	Combination	97,70	-2,88	-0,90	1,26	-1,70
332	Gmax	Combination	90,59	-38,44	1,22	1,63	-0,48
333	Gmax	Combination	-95,35	-76,69	-5,82	4,88	-6,42
333	Gmax	Combination	-49,32	153,46	18,96	2,00	-4,92
333	Gmax	Combination	-108,81	141,56	21,63	-10,36	-6,17
333	Gmax	Combination	-154,84	-88,59	-10,93	-11,89	-7,68
334	Gmax	Combination	-14,44	-70,74	-5,11	9,68	-5,49
334	Gmax	Combination	24,08	121,89	15,03	2,53	-3,59
334	Gmax	Combination	-58,96	105,28	20,99	12,15	-4,21
334	Gmax	Combination	-97,49	-87,35	-6,42	1,84	-6,11
335	Gmax	Combination	22,80	-20,13	0,22	2,22	-3,57
335	Gmax	Combination	37,94	55,59	7,95	-0,83	-3,76
335	Gmax	Combination	9,69	49,94	15,62	5,51	-3,94
335	Gmax	Combination	-5,45	-25,78	-7,41	-1,81	-3,76
336	Gmax	Combination	82,18	-5,98	2,32	0,25	-3,21
336	Gmax	Combination	87,20	19,12	4,05	-0,81	-2,58
336	Gmax	Combination	28,29	7,33	8,43	1,58	-2,87
336	Gmax	Combination	23,27	-17,77	0,07	1,45	-3,50
337	Gmax	Combination	205,52	-8,27	9,38	0,14	0,11
337	Gmax	Combination	90,62	-31,25	9,78	-0,15	-0,08
337	Gmax	Combination	95,90	-4,86	5,85	0,27	-0,81
337	Gmax	Combination	210,80	18,12	4,37	-0,34	-0,62
338	Gmax	Combination	88,27	-43,00	9,91	0,49	0,00
338	Gmax	Combination	-15,07	-63,67	10,52	1,93	0,07
338	Gmax	Combination	-3,64	-6,51	8,21	1,66	-0,90
338	Gmax	Combination	99,70	14,16	5,54	-1,28	-0,97
339	Gmax	Combination	-21,67	-96,68	10,66	2,63	0,22
339	Gmax	Combination	-134,84	-119,31	10,90	4,49	0,22
339	Gmax	Combination	-115,70	-23,57	11,73	6,75	-0,73
339	Gmax	Combination	-2,52	-0,93	7,87	-0,07	-0,74
340	Gmax	Combination	-138,87	-139,44	11,17	5,86	0,44
340	Gmax	Combination	-337,63	-179,19	10,88	2,72	-0,60
340	Gmax	Combination	-314,74	-64,77	17,56	15,46	-2,39

340	Gmax	Combination	-115,98	-25,01	11,21	4,13	-1,35
341	Gmax	Combination	206,38	17,00	5,05	-0,06	0,97
341	Gmax	Combination	95,07	-5,26	5,76	0,29	1,18
341	Gmax	Combination	89,84	-31,41	9,88	-0,13	0,64
341	Gmax	Combination	201,16	-9,15	9,23	0,11	0,43
342	Gmax	Combination	94,66	-7,33	5,53	-0,86	1,47
342	Gmax	Combination	-19,91	-30,24	8,22	1,47	1,42
342	Gmax	Combination	-27,08	-66,07	10,45	1,92	0,46
342	Gmax	Combination	87,49	-43,16	10,01	0,51	0,51
343	Gmax	Combination	-19,18	-26,59	8,01	0,44	1,20
343	Gmax	Combination	-103,89	-43,53	11,18	6,51	1,23
343	Gmax	Combination	-118,38	-116,02	10,90	4,49	0,47
343	Gmax	Combination	-33,68	-99,08	10,59	2,62	0,44
344	Gmax	Combination	-100,59	-27,06	10,71	4,17	1,88
344	Gmax	Combination	-308,14	-68,57	16,44	14,66	2,87
344	Gmax	Combination	-329,96	-177,66	11,03	2,75	1,21
344	Gmax	Combination	-122,41	-136,15	11,17	5,86	0,22
345	Gmax	Combination	100,20	21,71	-4,58	0,69	0,55
345	Gmax	Combination	34,28	8,53	-9,10	-1,98	0,76
345	Gmax	Combination	28,87	-18,50	5,74	0,29	2,16
345	Gmax	Combination	94,79	-5,32	3,60	-0,35	1,95
346	Gmax	Combination	43,93	56,79	-8,44	1,30	0,70
346	Gmax	Combination	-2,24	47,56	-14,84	-5,06	0,89
346	Gmax	Combination	-17,71	-29,80	8,15	1,46	2,98
346	Gmax	Combination	28,46	-20,57	5,51	-0,86	2,80
347	Gmax	Combination	12,15	119,50	-14,29	-2,33	0,80
347	Gmax	Combination	-98,25	97,42	-21,37	-10,77	0,25
347	Gmax	Combination	-127,38	-48,23	11,58	6,59	2,38
347	Gmax	Combination	-16,98	-26,15	7,95	0,42	2,93
348	Gmax	Combination	-88,62	145,60	-20,09	-4,37	-1,24
348	Gmax	Combination	-117,71	139,78	-22,45	1,47	-1,72
348	Gmax	Combination	-153,18	-37,58	11,32	13,64	1,98
348	Gmax	Combination	-124,09	-31,76	11,11	4,25	2,46
349	Gmax	Combination	170,04	9,96	3,91	-0,43	-1,45
349	Gmax	Combination	44,35	-15,17	5,04	0,11	-1,73
349	Gmax	Combination	46,10	-6,43	-10,82	-2,40	-1,13
349	Gmax	Combination	171,79	18,70	-8,23	1,18	-0,84
350	Gmax	Combination	48,16	3,85	4,73	-1,44	-2,89
350	Gmax	Combination	-55,77	-16,94	8,95	1,81	-3,07
350	Gmax	Combination	-50,67	8,58	-18,44	-7,25	-0,88
350	Gmax	Combination	53,26	29,36	-9,92	2,12	-0,70
351	Gmax	Combination	-54,65	-11,36	8,60	0,08	-2,42

351	Gmax	Combination	-137,41	-27,91	11,53	6,71	-1,88
351	Gmax	Combination	-119,93	59,47	-22,42	-11,61	-0,81
351	Gmax	Combination	-37,18	76,02	-17,46	-2,35	-1,35
352	Gmax	Combination	-137,70	-29,36	11,01	4,09	-2,50
352	Gmax	Combination	-162,01	-34,22	12,25	14,40	-2,01
352	Gmax	Combination	-131,07	120,44	-24,31	1,10	1,73
352	Gmax	Combination	-106,77	125,31	-20,96	-4,33	1,24
353	Gmax	Combination	-51,75	-12,42	-2,39	-0,23	-1,19
353	Gmax	Combination	-46,05	16,09	0,83	-0,04	-1,07
353	Gmax	Combination	17,23	28,75	2,16	1,00	-0,90
353	Gmax	Combination	11,53	0,24	-2,47	-0,80	-1,02
354	Gmax	Combination	11,02	-0,18	-2,46	-0,80	1,00
354	Gmax	Combination	16,93	29,37	2,15	1,00	0,87
354	Gmax	Combination	-45,55	16,88	0,83	-0,03	1,05
354	Gmax	Combination	-51,46	-12,67	-2,38	-0,23	1,17
355	Gmax	Combination	-1,01	-2,77	-2,18	-0,91	0,22
355	Gmax	Combination	9,02	47,43	1,61	0,88	0,25
355	Gmax	Combination	21,02	49,83	2,07	0,59	0,60
355	Gmax	Combination	10,98	-0,37	-2,40	-0,47	0,56
356	Gmax	Combination	11,48	0,00	-2,40	-0,47	-0,59
356	Gmax	Combination	21,34	49,33	2,08	0,59	-0,62
356	Gmax	Combination	8,91	46,84	1,61	0,87	-0,28
356	Gmax	Combination	-0,96	-2,49	-2,18	-0,91	-0,25
357	Gmax	Combination	-52,15	8,07	0,66	-0,23	0,98
357	Gmax	Combination	-55,42	-8,24	-2,24	0,67	1,52
357	Gmax	Combination	6,32	4,10	-0,27	-1,19	1,41
357	Gmax	Combination	9,59	20,41	2,45	1,17	0,88
358	Gmax	Combination	9,17	20,98	2,44	1,17	-0,85
358	Gmax	Combination	5,71	3,68	-0,25	-1,19	-1,39
358	Gmax	Combination	-54,93	-8,45	-2,25	0,67	-1,49
358	Gmax	Combination	-51,48	8,85	0,66	-0,23	-0,96
359	Gmax	Combination	16,12	18,79	1,81	0,83	-0,29
359	Gmax	Combination	16,89	22,62	0,74	-0,83	-0,35
359	Gmax	Combination	9,19	21,08	0,00	0,09	-0,72
359	Gmax	Combination	8,42	17,25	2,28	0,39	-0,66
360	Gmax	Combination	8,85	16,74	2,29	0,39	0,69
360	Gmax	Combination	9,82	21,57	-0,01	0,09	0,74
360	Gmax	Combination	16,96	23,00	0,74	-0,83	0,38
360	Gmax	Combination	16,00	18,17	1,81	0,83	0,32
361	Gmax	Combination	6,95	-18,41	6,75	10,56	4,52
361	Gmax	Combination	-3,89	-20,58	-33,84	-48,98	0,85
361	Gmax	Combination	3,63	17,02	18,02	-3,19	2,97

361	Gmax	Combination	14,47	19,19	-1,22	-9,94	6,63
362	Gmax	Combination	6,61	-9,58	-13,57	-2,94	0,13
362	Gmax	Combination	6,88	-8,24	10,35	2,98	-0,22
362	Gmax	Combination	-1,77	-9,97	17,35	-6,55	-2,23
362	Gmax	Combination	-2,04	-11,31	-25,35	-6,53	-1,88
363	Gmax	Combination	17,59	-11,17	-10,04	-2,38	-1,82
363	Gmax	Combination	20,16	1,70	4,81	0,16	-1,57
363	Gmax	Combination	8,40	-0,66	11,04	6,39	-0,64
363	Gmax	Combination	5,82	-13,53	-13,45	-2,37	-0,89
364	Gmax	Combination	21,55	8,64	-5,03	-1,22	-3,62
364	Gmax	Combination	21,08	8,54	0,75	2,78	-3,77
364	Gmax	Combination	16,50	-14,36	-0,96	-9,19	-1,36
364	Gmax	Combination	16,97	-14,26	12,81	16,21	-1,21
365	Gmax	Combination	18,11	19,92	-3,50	-10,40	-2,45
365	Gmax	Combination	-12,99	13,70	17,02	-3,39	0,62
365	Gmax	Combination	-19,48	-18,73	-7,78	-43,91	-4,18
365	Gmax	Combination	11,63	-12,51	1,20	9,87	-7,25
366	Gmax	Combination	27,42	-4,13	9,83	2,87	-0,06
366	Gmax	Combination	32,00	18,74	8,91	1,28	0,09
366	Gmax	Combination	-13,81	9,58	0,72	-1,41	1,71
366	Gmax	Combination	-18,39	-13,30	16,35	-6,75	1,57
367	Gmax	Combination	2,22	-1,89	-2,32	-1,27	1,45
367	Gmax	Combination	4,36	8,78	17,72	3,02	1,99
367	Gmax	Combination	31,07	14,12	8,99	1,64	1,05
367	Gmax	Combination	28,94	3,45	10,52	6,29	0,51
368	Gmax	Combination	0,39	-11,06	-14,28	14,14	7,51
368	Gmax	Combination	23,15	-6,51	-1,92	-8,53	7,88
368	Gmax	Combination	26,37	9,60	-1,30	2,37	-2,06
368	Gmax	Combination	3,61	5,05	2,11	0,21	-2,42
369	Gmax	Combination	24,73	6,30	4,77	0,42	-0,80
369	Gmax	Combination	25,51	10,20	-2,43	0,33	-1,03
369	Gmax	Combination	-50,26	-4,95	0,73	-0,72	-1,03
369	Gmax	Combination	-51,04	-8,85	0,64	0,57	-0,79
370	Gmax	Combination	57,63	0,08	8,31	1,32	-0,98
370	Gmax	Combination	60,23	13,07	-5,16	-0,47	-1,21
370	Gmax	Combination	24,66	5,95	-2,68	-0,90	-1,14
370	Gmax	Combination	22,06	-7,04	4,90	1,02	-0,91
371	Gmax	Combination	24,61	5,99	-4,87	-0,44	0,78
371	Gmax	Combination	25,44	10,13	2,41	-0,33	1,01
371	Gmax	Combination	-49,92	-4,94	-0,78	0,71	1,00
371	Gmax	Combination	-50,75	-9,08	-0,73	-0,58	0,77
372	Gmax	Combination	57,37	0,03	-8,30	-1,30	0,96

372	Gmax	Combination	59,97	13,01	5,06	0,45	1,19
372	Gmax	Combination	24,60	5,94	2,66	0,90	1,11
372	Gmax	Combination	22,00	-7,04	-4,99	-1,04	0,89
373	Gmax	Combination	-10,16	3,07	-2,64	-1,38	0,42
373	Gmax	Combination	-10,64	0,65	1,15	0,97	1,04
373	Gmax	Combination	26,93	8,17	0,34	1,82	1,17
373	Gmax	Combination	27,42	10,58	0,01	1,62	0,55
374	Gmax	Combination	-46,91	-8,36	-4,69	-1,36	0,18
374	Gmax	Combination	-44,56	3,39	1,84	0,49	0,92
374	Gmax	Combination	-8,66	10,57	1,08	0,62	0,98
374	Gmax	Combination	-11,01	-1,18	-2,42	-0,28	0,24
375	Gmax	Combination	-30,70	-3,36	1,13	0,97	0,73
375	Gmax	Combination	-31,01	-4,94	0,71	0,94	0,32
375	Gmax	Combination	47,20	10,70	-0,05	1,64	0,31
375	Gmax	Combination	47,52	12,28	1,22	1,99	0,72
376	Gmax	Combination	-121,88	-12,08	1,15	0,35	0,67
376	Gmax	Combination	-121,02	-7,75	1,28	-0,18	0,29
376	Gmax	Combination	-27,85	10,88	0,75	1,12	0,29
376	Gmax	Combination	-28,71	6,56	1,06	0,61	0,67
377	Gmax	Combination	-30,93	-4,93	0,71	0,94	-0,30
377	Gmax	Combination	-30,63	-3,41	1,13	0,97	-0,69
377	Gmax	Combination	48,09	12,34	1,27	2,00	-0,68
377	Gmax	Combination	47,79	10,82	-0,04	1,65	-0,30
378	Gmax	Combination	-121,27	-7,80	1,28	-0,18	-0,26
378	Gmax	Combination	-122,13	-12,06	1,15	0,35	-0,63
378	Gmax	Combination	-28,62	6,64	1,06	0,61	-0,64
378	Gmax	Combination	-27,77	10,90	0,75	1,12	-0,26
379	Gmax	Combination	-10,57	0,60	1,15	0,97	-0,99
379	Gmax	Combination	-10,09	3,02	-2,61	-1,38	-0,42
379	Gmax	Combination	28,12	10,67	-0,03	1,62	-0,55
379	Gmax	Combination	27,64	8,25	0,33	1,81	-1,12
380	Gmax	Combination	-44,91	3,38	1,83	0,48	-0,89
380	Gmax	Combination	-47,27	-8,44	-4,61	-1,34	-0,17
380	Gmax	Combination	-10,92	-1,17	-2,39	-0,27	-0,22
380	Gmax	Combination	-8,56	10,65	1,08	0,62	-0,94
381	Gmax	Combination	-6,32	2,98	3,09	1,43	-0,28
381	Gmax	Combination	-6,00	4,59	-0,89	-0,79	-0,67
381	Gmax	Combination	20,47	9,88	-0,15	-2,04	-0,84
381	Gmax	Combination	20,15	8,28	0,65	-1,50	-0,45
382	Gmax	Combination	-24,60	-4,84	5,25	1,59	0,14
382	Gmax	Combination	-22,65	4,94	-1,22	-0,51	-0,63
382	Gmax	Combination	-5,23	8,42	-0,83	-0,48	-0,71

382	Gmax	Combination	-7,19	-1,35	2,88	0,35	0,06
383	Gmax	Combination	-23,28	1,13	-0,73	-0,76	-0,66
383	Gmax	Combination	-23,47	0,18	-0,67	-1,07	-0,40
383	Gmax	Combination	16,61	8,20	0,54	-1,79	-0,43
383	Gmax	Combination	16,80	9,15	-1,76	-2,36	-0,69
384	Gmax	Combination	-82,38	-7,01	-0,73	-0,41	-0,61
384	Gmax	Combination	-82,02	-5,21	-1,18	0,20	-0,27
384	Gmax	Combination	-22,15	6,76	-0,70	-1,23	-0,28
384	Gmax	Combination	-22,51	4,96	-0,67	-0,44	-0,62
385	Gmax	Combination	-23,43	0,19	-0,67	-1,07	0,38
385	Gmax	Combination	-23,24	1,09	-0,73	-0,76	0,62
385	Gmax	Combination	17,41	9,23	-1,80	-2,35	0,65
385	Gmax	Combination	17,23	8,32	0,53	-1,79	0,41
386	Gmax	Combination	-82,28	-5,27	-1,18	0,20	0,24
386	Gmax	Combination	-82,62	-6,98	-0,73	-0,41	0,58
386	Gmax	Combination	-22,45	5,05	-0,67	-0,44	0,58
386	Gmax	Combination	-22,11	6,77	-0,70	-1,23	0,25
387	Gmax	Combination	-5,96	4,55	-0,90	-0,79	0,62
387	Gmax	Combination	-6,28	2,94	3,05	1,41	0,28
387	Gmax	Combination	20,81	8,35	0,69	-1,50	0,45
387	Gmax	Combination	21,14	9,97	-0,15	-2,02	0,80
388	Gmax	Combination	-23,04	4,94	-1,21	-0,50	0,60
388	Gmax	Combination	-25,01	-4,92	5,15	1,58	-0,15
388	Gmax	Combination	-7,14	-1,35	2,84	0,35	-0,07
388	Gmax	Combination	-5,17	8,51	-0,83	-0,48	0,68
389	Gmax	Combination	21,69	8,58	-3,12	0,24	1,03
389	Gmax	Combination	23,48	17,54	7,87	0,35	0,51
389	Gmax	Combination	-53,33	2,18	1,93	1,45	0,50
389	Gmax	Combination	-55,12	-6,78	1,07	-0,75	1,02
390	Gmax	Combination	61,07	12,30	-5,55	-0,61	1,29
390	Gmax	Combination	58,87	1,29	11,81	1,54	0,86
390	Gmax	Combination	18,62	-6,76	8,14	1,70	0,74
390	Gmax	Combination	20,83	4,25	-3,39	-1,08	1,17
391	Gmax	Combination	21,54	8,50	3,09	-0,24	-1,01
391	Gmax	Combination	23,27	17,13	-7,92	-0,37	-0,49
391	Gmax	Combination	-52,86	1,90	-2,01	-1,46	-0,48
391	Gmax	Combination	-54,59	-6,73	-1,09	0,74	-1,00
392	Gmax	Combination	60,82	12,24	5,43	0,59	-1,27
392	Gmax	Combination	58,63	1,29	-11,76	-1,52	-0,84
392	Gmax	Combination	18,49	-6,74	-8,19	-1,71	-0,72
392	Gmax	Combination	20,68	4,21	3,36	1,08	-1,14
393	Gmax	Combination	6,84	-36,46	2,02	7,72	-1,87

393	Gmax	Combination	-18,71	-41,57	-0,35	-0,68	-0,28
393	Gmax	Combination	-4,87	27,62	-1,04	0,87	0,52
393	Gmax	Combination	20,67	32,73	-1,30	-7,95	-1,07
394	Gmax	Combination	17,03	32,00	1,80	8,05	1,44
394	Gmax	Combination	2,40	-41,12	-1,54	-8,32	1,77
394	Gmax	Combination	-19,18	-45,44	0,37	1,08	-0,14
394	Gmax	Combination	-4,55	27,69	1,04	-0,87	-0,46
395	Gmax	Combination	-12,62	-11,14	-0,24	-0,16	0,28
395	Gmax	Combination	-6,71	-9,95	0,04	0,03	0,19
395	Gmax	Combination	-3,07	8,21	-0,92	-0,04	0,00
395	Gmax	Combination	-8,99	7,03	-1,15	0,29	0,09
396	Gmax	Combination	-8,67	7,09	1,16	-0,29	-0,23
396	Gmax	Combination	-12,65	-12,83	0,25	0,45	-0,40
396	Gmax	Combination	-6,46	-11,59	-0,06	-0,04	-0,25
396	Gmax	Combination	-2,48	8,33	0,89	0,03	-0,08
397	Gmax	Combination	14,40	-50,21	-2,36	-8,04	2,09
397	Gmax	Combination	-23,89	-57,87	0,57	-0,30	1,23
397	Gmax	Combination	-9,72	12,99	0,36	-2,32	0,43
397	Gmax	Combination	28,58	20,65	0,34	1,69	1,29
398	Gmax	Combination	23,29	19,59	-0,43	-1,71	-0,62
398	Gmax	Combination	8,19	-55,91	1,28	8,48	-1,36
398	Gmax	Combination	-15,15	-60,57	-0,34	-0,60	-0,39
398	Gmax	Combination	-0,05	14,92	-2,28	1,94	0,35
399	Gmax	Combination	-16,11	-18,97	0,23	-1,98	0,48
399	Gmax	Combination	-24,79	-20,70	-0,06	-0,50	-0,02
399	Gmax	Combination	-17,76	14,42	1,29	1,14	0,11
399	Gmax	Combination	-9,08	16,16	1,01	0,94	0,61
400	Gmax	Combination	0,58	18,09	-2,94	-1,32	0,10
400	Gmax	Combination	-7,14	-20,53	0,00	1,12	0,14
400	Gmax	Combination	-27,59	-24,62	-0,01	0,66	0,61
400	Gmax	Combination	-19,87	14,00	-2,92	-1,47	0,58

8.3. VERIFICAÇÃO DAS TENSÕES NO SOLO

A tabela a seguir apresenta as reações das placas no solo.

Tabela 8.2 – Reações no solo.

Joint	OutputCase	CaseType	F1	F2	F3	M1	M2	M3
Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
1	Gmax	Combination	31,28	-36,23	145,88	0,00	0,00	0,00
2	Gmax	Combination	0,00	-56,35	231,76	0,00	0,00	0,00

3	Gmax	Combination	0,00	0,00	376,04	0,00	0,00	0,00
4	Gmax	Combination	49,88	0,00	232,30	0,00	0,00	0,00
5	Gmax	Combination	-38,16	-33,56	141,25	0,00	0,00	0,00
6	Gmax	Combination	-60,65	0,00	224,75	0,00	0,00	0,00
7	Gmax	Combination	0,00	57,05	231,46	0,00	0,00	0,00
8	Gmax	Combination	31,22	36,65	145,84	0,00	0,00	0,00
9	Gmax	Combination	-37,95	34,01	140,96	0,00	0,00	0,00
10	Gmax	Combination	0,00	0,00	29,13	0,00	0,00	0,00
11	Gmax	Combination	0,00	0,00	58,25	0,00	0,00	0,00
12	Gmax	Combination	0,00	0,00	116,50	0,00	0,00	0,00
13	Gmax	Combination	0,00	0,00	58,25	0,00	0,00	0,00
14	Gmax	Combination	0,00	0,00	29,13	0,00	0,00	0,00
15	Gmax	Combination	0,00	0,00	58,25	0,00	0,00	0,00
16	Gmax	Combination	0,00	0,00	58,25	0,00	0,00	0,00
17	Gmax	Combination	0,00	0,00	29,13	0,00	0,00	0,00
18	Gmax	Combination	0,00	0,00	29,13	0,00	0,00	0,00
19	Gmax	Combination	136,80	-98,46	259,11	0,00	0,00	0,00
20	Gmax	Combination	196,42	0,00	379,33	0,00	0,00	0,00
21	Gmax	Combination	0,00	0,00	487,14	0,00	0,00	0,00
22	Gmax	Combination	0,00	-126,30	307,69	0,00	0,00	0,00
23	Gmax	Combination	136,13	100,36	258,73	0,00	0,00	0,00
24	Gmax	Combination	0,00	128,84	307,48	0,00	0,00	0,00
25	Gmax	Combination	-116,71	105,39	253,74	0,00	0,00	0,00
26	Gmax	Combination	-168,48	0,00	372,65	0,00	0,00	0,00
27	Gmax	Combination	-117,31	-103,20	253,75	0,00	0,00	0,00
28	Gmax	Combination	0,00	-101,11	69,01	0,00	0,00	0,00
29	Gmax	Combination	0,00	-71,00	48,46	0,00	0,00	0,00
30	Gmax	Combination	0,00	-89,43	61,04	0,00	0,00	0,00
31	Gmax	Combination	0,00	-82,07	56,02	0,00	0,00	0,00
32	Gmax	Combination	0,00	-87,00	59,38	0,00	0,00	0,00
33	Gmax	Combination	0,00	-93,64	63,92	0,00	0,00	0,00
34	Gmax	Combination	0,00	-46,75	31,91	0,00	0,00	0,00
35	Gmax	Combination	0,00	-53,24	36,34	0,00	0,00	0,00
36	Gmax	Combination	0,00	-76,78	52,41	0,00	0,00	0,00
37	Gmax	Combination	0,00	-89,53	61,11	0,00	0,00	0,00
38	Gmax	Combination	0,00	-102,61	70,04	0,00	0,00	0,00
39	Gmax	Combination	0,00	-58,32	39,80	0,00	0,00	0,00
40	Gmax	Combination	-78,96	0,00	50,14	0,00	0,00	0,00
41	Gmax	Combination	-107,86	0,00	68,48	0,00	0,00	0,00
42	Gmax	Combination	-92,02	0,00	58,43	0,00	0,00	0,00
43	Gmax	Combination	-97,44	0,00	61,87	0,00	0,00	0,00
44	Gmax	Combination	-106,90	0,00	67,87	0,00	0,00	0,00

45	Gmax	Combination	-97,90	0,00	62,16	0,00	0,00	0,00
46	Gmax	Combination	-1,04	0,00	78,39	0,00	0,00	0,00
47	Gmax	Combination	-0,70	0,00	67,49	0,00	0,00	0,00
48	Gmax	Combination	-78,46	0,00	49,82	0,00	0,00	0,00
49	Gmax	Combination	-91,36	0,00	58,00	0,00	0,00	0,00
50	Gmax	Combination	-106,04	0,00	67,33	0,00	0,00	0,00
51	Gmax	Combination	-0,66	0,00	77,93	0,00	0,00	0,00
52	Gmax	Combination	-21,35	-18,06	25,89	0,00	0,00	0,00
53	Gmax	Combination	-41,36	-35,80	50,70	0,00	0,00	0,00
54	Gmax	Combination	-59,50	-53,22	74,10	0,00	0,00	0,00
55	Gmax	Combination	-0,75	-66,83	90,52	0,00	0,00	0,00
56	Gmax	Combination	68,80	0,00	46,96	0,00	0,00	0,00
57	Gmax	Combination	93,00	0,00	63,48	0,00	0,00	0,00
58	Gmax	Combination	83,26	0,00	56,83	0,00	0,00	0,00
59	Gmax	Combination	85,81	0,00	58,57	0,00	0,00	0,00
60	Gmax	Combination	99,31	0,00	67,78	0,00	0,00	0,00
61	Gmax	Combination	87,42	0,00	59,67	0,00	0,00	0,00
62	Gmax	Combination	59,05	0,00	40,30	0,00	0,00	0,00
63	Gmax	Combination	49,37	0,00	33,70	0,00	0,00	0,00
64	Gmax	Combination	68,75	0,00	46,92	0,00	0,00	0,00
65	Gmax	Combination	83,28	0,00	56,84	0,00	0,00	0,00
66	Gmax	Combination	99,39	0,00	67,83	0,00	0,00	0,00
67	Gmax	Combination	59,13	0,00	40,36	0,00	0,00	0,00
68	Gmax	Combination	18,64	-21,10	27,12	0,00	0,00	0,00
69	Gmax	Combination	38,35	-42,51	55,19	0,00	0,00	0,00
70	Gmax	Combination	58,57	-63,83	83,54	0,00	0,00	0,00
71	Gmax	Combination	36,21	-38,90	51,27	0,00	0,00	0,00
72	Gmax	Combination	0,00	77,41	52,83	0,00	0,00	0,00
73	Gmax	Combination	0,00	101,93	69,57	0,00	0,00	0,00
74	Gmax	Combination	0,00	89,96	61,40	0,00	0,00	0,00
75	Gmax	Combination	0,00	89,77	61,27	0,00	0,00	0,00
76	Gmax	Combination	0,00	102,75	70,13	0,00	0,00	0,00
77	Gmax	Combination	0,00	86,95	59,35	0,00	0,00	0,00
78	Gmax	Combination	0,00	58,20	39,72	0,00	0,00	0,00
79	Gmax	Combination	0,00	46,54	31,77	0,00	0,00	0,00
80	Gmax	Combination	0,00	71,57	48,85	0,00	0,00	0,00
81	Gmax	Combination	0,00	82,30	56,17	0,00	0,00	0,00
82	Gmax	Combination	0,00	93,43	63,77	0,00	0,00	0,00
83	Gmax	Combination	0,00	52,86	36,08	0,00	0,00	0,00
84	Gmax	Combination	18,62	21,27	27,22	0,00	0,00	0,00
85	Gmax	Combination	38,33	42,72	55,32	0,00	0,00	0,00
86	Gmax	Combination	58,59	63,95	83,64	0,00	0,00	0,00

87	Gmax	Combination	36,27	38,87	51,29	0,00	0,00	0,00
88	Gmax	Combination	-21,16	18,21	25,87	0,00	0,00	0,00
89	Gmax	Combination	-40,86	35,90	50,44	0,00	0,00	0,00
90	Gmax	Combination	-58,54	53,06	73,38	0,00	0,00	0,00
91	Gmax	Combination	-0,32	66,20	89,44	0,00	0,00	0,00
92	Gmax	Combination	36,77	-33,69	141,75	0,00	0,00	0,00
93	Gmax	Combination	0,00	-55,51	229,30	0,00	0,00	0,00
94	Gmax	Combination	0,00	0,00	371,49	0,00	0,00	0,00
95	Gmax	Combination	58,34	0,00	224,88	0,00	0,00	0,00
96	Gmax	Combination	-31,74	-35,05	142,47	0,00	0,00	0,00
97	Gmax	Combination	-50,44	0,00	226,81	0,00	0,00	0,00
98	Gmax	Combination	0,00	56,51	228,27	0,00	0,00	0,00
99	Gmax	Combination	36,50	34,37	141,35	0,00	0,00	0,00
100	Gmax	Combination	-31,40	35,60	141,61	0,00	0,00	0,00
101	Gmax	Combination	0,00	-99,95	68,22	0,00	0,00	0,00
102	Gmax	Combination	0,00	-74,54	50,88	0,00	0,00	0,00
103	Gmax	Combination	0,00	-88,71	60,55	0,00	0,00	0,00
104	Gmax	Combination	0,00	-86,72	59,19	0,00	0,00	0,00
105	Gmax	Combination	0,00	-86,47	59,02	0,00	0,00	0,00
106	Gmax	Combination	0,00	-98,88	67,49	0,00	0,00	0,00
107	Gmax	Combination	0,00	-46,46	31,71	0,00	0,00	0,00
108	Gmax	Combination	0,00	-55,77	38,07	0,00	0,00	0,00
109	Gmax	Combination	0,00	-71,45	48,77	0,00	0,00	0,00
110	Gmax	Combination	0,00	-83,28	56,84	0,00	0,00	0,00
111	Gmax	Combination	0,00	-95,86	65,43	0,00	0,00	0,00
112	Gmax	Combination	0,00	-54,90	37,47	0,00	0,00	0,00
113	Gmax	Combination	-69,24	0,00	43,96	0,00	0,00	0,00
114	Gmax	Combination	-93,13	0,00	59,13	0,00	0,00	0,00
115	Gmax	Combination	-83,24	0,00	52,85	0,00	0,00	0,00
116	Gmax	Combination	-85,08	0,00	54,02	0,00	0,00	0,00
117	Gmax	Combination	-98,37	0,00	62,45	0,00	0,00	0,00
118	Gmax	Combination	-85,63	0,00	54,37	0,00	0,00	0,00
119	Gmax	Combination	-57,85	0,00	36,73	0,00	0,00	0,00
120	Gmax	Combination	-47,87	0,00	30,39	0,00	0,00	0,00
121	Gmax	Combination	-68,38	0,00	43,42	0,00	0,00	0,00
122	Gmax	Combination	-82,07	0,00	52,11	0,00	0,00	0,00
123	Gmax	Combination	-96,87	0,00	61,50	0,00	0,00	0,00
124	Gmax	Combination	-57,07	0,00	36,24	0,00	0,00	0,00
125	Gmax	Combination	-18,81	-19,28	25,10	0,00	0,00	0,00
126	Gmax	Combination	-38,51	-38,92	51,02	0,00	0,00	0,00
127	Gmax	Combination	-58,55	-58,54	77,13	0,00	0,00	0,00
128	Gmax	Combination	-36,01	-35,70	47,23	0,00	0,00	0,00

129	Gmax	Combination	76,46	0,00	52,19	0,00	0,00	0,00
130	Gmax	Combination	104,39	0,00	71,25	0,00	0,00	0,00
131	Gmax	Combination	89,46	0,00	61,06	0,00	0,00	0,00
132	Gmax	Combination	94,86	0,00	64,75	0,00	0,00	0,00
133	Gmax	Combination	104,46	0,00	71,30	0,00	0,00	0,00
134	Gmax	Combination	95,97	0,00	65,51	0,00	0,00	0,00
135	Gmax	Combination	76,02	0,00	51,88	0,00	0,00	0,00
136	Gmax	Combination	89,03	0,00	60,77	0,00	0,00	0,00
137	Gmax	Combination	104,05	0,00	71,02	0,00	0,00	0,00
138	Gmax	Combination	20,66	-19,29	27,27	0,00	0,00	0,00
139	Gmax	Combination	40,19	-38,33	53,59	0,00	0,00	0,00
140	Gmax	Combination	58,01	-57,10	78,57	0,00	0,00	0,00
141	Gmax	Combination	0,00	72,30	49,35	0,00	0,00	0,00
142	Gmax	Combination	0,00	100,86	68,84	0,00	0,00	0,00
143	Gmax	Combination	0,00	83,59	57,06	0,00	0,00	0,00
144	Gmax	Combination	0,00	88,68	60,53	0,00	0,00	0,00
145	Gmax	Combination	0,00	95,35	65,08	0,00	0,00	0,00
146	Gmax	Combination	0,00	85,52	58,37	0,00	0,00	0,00
147	Gmax	Combination	0,00	54,09	36,92	0,00	0,00	0,00
148	Gmax	Combination	0,00	45,44	31,02	0,00	0,00	0,00
149	Gmax	Combination	0,00	74,89	51,11	0,00	0,00	0,00
150	Gmax	Combination	0,00	86,21	58,84	0,00	0,00	0,00
151	Gmax	Combination	0,00	97,21	66,35	0,00	0,00	0,00
152	Gmax	Combination	0,00	54,18	36,98	0,00	0,00	0,00
153	Gmax	Combination	20,49	19,53	27,32	0,00	0,00	0,00
154	Gmax	Combination	39,83	38,52	53,48	0,00	0,00	0,00
155	Gmax	Combination	57,49	56,97	78,12	0,00	0,00	0,00
156	Gmax	Combination	-18,50	19,35	24,96	0,00	0,00	0,00
157	Gmax	Combination	-37,68	38,59	50,26	0,00	0,00	0,00
158	Gmax	Combination	-56,98	57,31	75,29	0,00	0,00	0,00
159	Gmax	Combination	-34,84	34,51	45,67	0,00	0,00	0,00
160	Gmax	Combination	0,00	-204,21	86,40	0,00	0,00	0,00
161	Gmax	Combination	0,00	-177,71	75,18	0,00	0,00	0,00
162	Gmax	Combination	0,00	-119,36	50,50	0,00	0,00	0,00
163	Gmax	Combination	0,00	-84,72	35,84	0,00	0,00	0,00
164	Gmax	Combination	0,00	-195,46	82,70	0,00	0,00	0,00
165	Gmax	Combination	0,00	-113,38	47,97	0,00	0,00	0,00
166	Gmax	Combination	-269,01	0,00	182,79	0,00	0,00	0,00
167	Gmax	Combination	-249,70	0,00	169,67	0,00	0,00	0,00
168	Gmax	Combination	-165,98	0,00	112,78	0,00	0,00	0,00
169	Gmax	Combination	-166,02	0,00	112,81	0,00	0,00	0,00
170	Gmax	Combination	-248,93	0,00	169,14	0,00	0,00	0,00

171	Gmax	Combination	-165,73	0,00	112,61	0,00	0,00	0,00
172	Gmax	Combination	-100,06	-117,55	117,72	0,00	0,00	0,00
173	Gmax	Combination	-86,49	-97,05	99,83	0,00	0,00	0,00
174	Gmax	Combination	256,36	0,00	174,19	0,00	0,00	0,00
175	Gmax	Combination	275,71	0,00	187,34	0,00	0,00	0,00
176	Gmax	Combination	149,66	0,00	101,69	0,00	0,00	0,00
177	Gmax	Combination	148,99	0,00	101,24	0,00	0,00	0,00
178	Gmax	Combination	254,43	0,00	172,88	0,00	0,00	0,00
179	Gmax	Combination	148,39	0,00	100,83	0,00	0,00	0,00
180	Gmax	Combination	102,91	-108,24	115,72	0,00	0,00	0,00
181	Gmax	Combination	78,24	-86,18	89,62	0,00	0,00	0,00
182	Gmax	Combination	0,00	195,33	82,64	0,00	0,00	0,00
183	Gmax	Combination	0,00	178,37	75,47	0,00	0,00	0,00
184	Gmax	Combination	0,00	110,73	46,85	0,00	0,00	0,00
185	Gmax	Combination	0,00	83,31	35,25	0,00	0,00	0,00
186	Gmax	Combination	0,00	205,56	86,97	0,00	0,00	0,00
187	Gmax	Combination	0,00	118,29	50,05	0,00	0,00	0,00
188	Gmax	Combination	101,87	107,89	114,86	0,00	0,00	0,00
189	Gmax	Combination	76,90	83,73	87,68	0,00	0,00	0,00
190	Gmax	Combination	-99,56	118,48	117,78	0,00	0,00	0,00
191	Gmax	Combination	-86,14	96,67	99,43	0,00	0,00	0,00

A tensão no solo será determinada pela equação;

$$\sigma_{solo} = \frac{P_{concreto} + P_{agua} + SC}{A}$$

Conforme somatório da coluna F3 que são as reações em z e equivale ao somatório do numerador da equação, temos 17138,56 kN. A área do apoio no solo é de 167,70 m². Temos uma tensão no solo de;

$$\sigma = \frac{17138,56}{167,70} = 102,20 \frac{kN}{m^2} = 1,02 \frac{kgf}{cm^2} \leq 1,80 \frac{kgf}{cm^2} (ok)$$

Logo a fundação não poderá ser do tipo direta.

8.4. ARMAÇÃO NA LAJE DE FUNDO

As figuras 8.2 e 8.3 apresentam os momentos fletores na laje de fundo.



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Figura 8.2 – Momento na direção X.

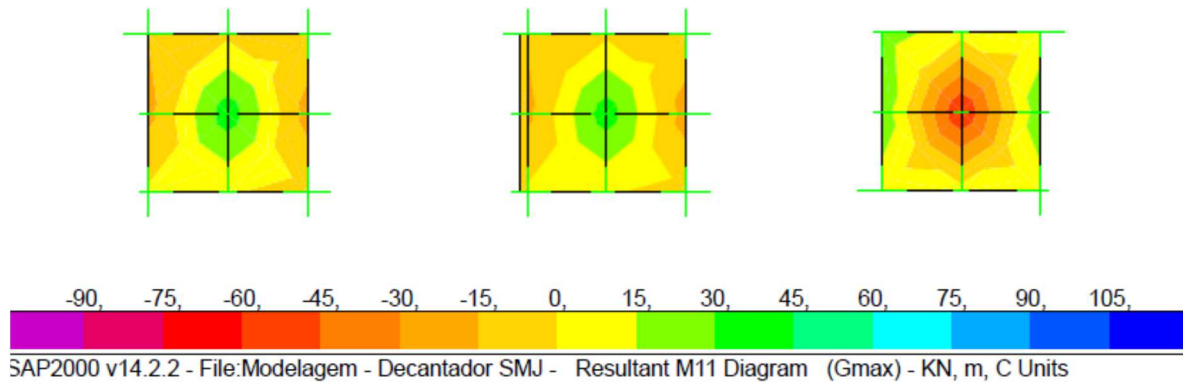
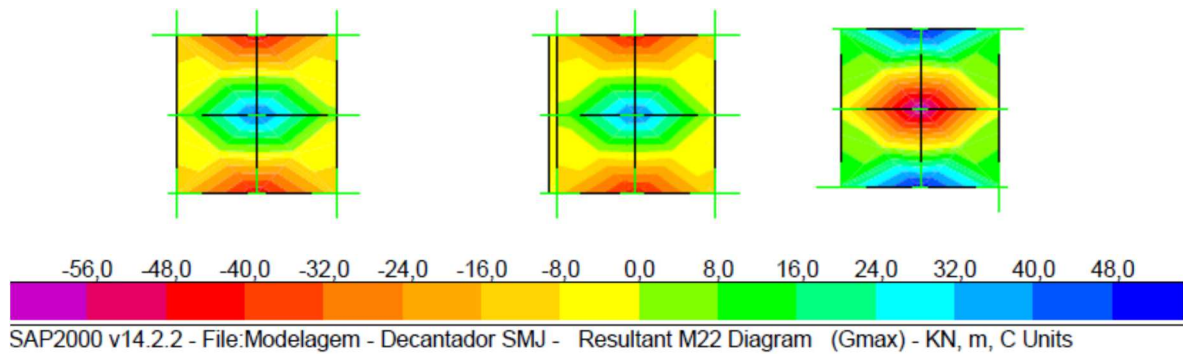


Figura 8.3 – Momento na direção Y.



Conforme modelagem os esforços máximos nas lajes de fundo são:

8.4.1. Laje de fundo 1ª etapa

$$\text{Laje } h=30 \text{ cm} \rightarrow \begin{cases} M_x = 39,20 \text{ kNm} \\ M_y = 42,56 \text{ kNm} \end{cases}$$


$$\text{Engastes (apoio das paredes centrais)} \rightarrow M = 46,61 \text{ kNm}$$

A figura a seguir apresenta o resultados do dimensionamento

a) Direção x

1) PARÂMETROS DE ENTRADA

$$\begin{aligned} \text{Momento Fletor Máximo} &= 39,20 \text{ kN.m} \\ f_{ck} &= 30,00 \text{ MPa} \end{aligned}$$



$$\begin{aligned} h &= 30 \text{ cm} \\ b &= 100 \text{ cm} \end{aligned}$$

2) DETERMINAÇÃO DA ALTURA ÚTIL

$$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$$

$$\text{Adotaremos } \phi \text{ da armadura} = 10,0 \text{ mm}$$

$$\text{Cobrimento da armadura} = 4,00 \text{ mm}$$

$$d = 24,50 \text{ cm}$$

$$\text{Adotar } d = 24,00 \text{ cm}$$

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0445$$

$$\begin{aligned} \text{Conforme tabela temos: } KMD &= 0,0445 \rightarrow Kx = 0,0680 \\ &\rightarrow Kz = 0,9728 \end{aligned}$$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$\begin{aligned} As &= \frac{M_d}{kz \cdot d \cdot f_{yd}} = 5,41 \text{ cm}^2/\text{m} \\ A_{s,min} &= \begin{cases} 0,15\%bh = 4,50 \text{ cm}^2/\text{m} \\ 0,23\%bh = 6,90 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 5,18 \text{ cm}^2/\text{m} \end{cases} \end{aligned}$$


Para calcula da área de aço será considerada a taxa de aço de 6,90 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 10.0$ c/10 que equivale a 7,80 cm²/m.

b) Direção y

1) PARÂMETROS DE ENTRADA

$$\text{Momento Fletor Máximo} = 42,56 \text{ kN.m}$$

$$f_{ck} = 30,00 \text{ MPa}$$



$$h = 30 \text{ cm}$$

$$b = 100 \text{ cm}$$

2) DETERMINAÇÃO DA ALTURA ÚTIL

$$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$$

$$\text{Adotaremos } \phi \text{ da armadura} = 10,0 \text{ mm}$$

$$\text{Cobrimento da armadura} = 4,00 \text{ mm}$$

$$d = 24,50 \text{ cm}$$

$$\text{Adotar } d = 24,00 \text{ cm}$$

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b f_c d^2 f_{cd}} = 0,0483$$

Conforme tabela temos: $KMD = 0,0483$

$$\rightarrow K_x = 0,0758$$

$$\rightarrow K_z = 0,9697$$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$A_s = \frac{M_d}{k_z d f_{yd}} = 5,89 \text{ cm}^2/\text{m}$$


$$A_{s,min} = \begin{cases} 0,15\%bh = 4,50 \text{ cm}^2/\text{m} \\ 0,23\%bh = 6,90 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 5,18 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 6,90 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 10.0$ c/10 que equivale a 7,80 cm²/m.

c) Engaste

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 46,61 kN.m
 $f_{ck} = 30,00$ MPa


 $b = 100$ cm
 $h = 30$ cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$

Adotaremos ϕ da armadura = 10,0 mm

Cobrimento da armadura = 4,00 mm

$d = 24,50$ cm

Adotar $d = 24,00$ cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0529$$

Conforme tabela temos: $KMD = 0,0529$

$\rightarrow K_x = 0,0758$

$\rightarrow K_z = 0,9697$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$A_s = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 6,45 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 4,50 \text{ cm}^2/\text{m} \\ 0,23\%bh = 6,90 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 5,18 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 6,90 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 10.0$ c/10 que equivale a 7,80 cm²/m.

8.4.2. Laje de fundo 2ª etapa

Laje $h=30$ cm $\rightarrow \begin{cases} M_x = 61,00 \text{ kNm} \\ M_y = 63,34 \text{ kNm} \end{cases}$


Engastes (apoio das paredes centrais) $\rightarrow M = 54,00 \text{ kNm}$

A figura a seguir apresenta o resultados do dimensionamento

a) Direção x

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 61,00 kN.m
fck = 30,00 MPa

 h = 30 cm
b = 100 cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

d = altura total – cobrimento – 1,5 ϕ armadura

Adotaremos ϕ da armadura = 12,5 mm

Cobrimento da armadura = 4,00 mm

d = 24,13 cm

Adotar d = 24,00 cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0692$$

Conforme tabela temos: KMD = 0,0692

→ Kx = 0,1016

→ Kz = 0,9570

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 8,55 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 4,50 \text{ cm}^2/\text{m} \\ 0,23\%bh = 6,90 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 5,18 \text{ cm}^2/\text{m} \end{cases}$$


Para calcula da área de aço será considerada a taxa de aço de 8,55 cm²/m. Será utilizada armadura dupla (face superior e inferior) de ϕ 12.5 c/10 que equivale a 12,30 cm²/m.

b) Direção y

1) PARÂMETROS DE ENTRADA

$$\text{Momento Fletor Máximo} = 63,34 \text{ kN.m}$$

$$f_{ck} = 30,00 \text{ MPa}$$



$$h = 30 \text{ cm}$$

$$b = 100 \text{ cm}$$

2) DETERMINAÇÃO DA ALTURA ÚTIL

$$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$$

$$\text{Adotaremos } \phi \text{ da armadura} = 12,5 \text{ mm}$$

$$\text{Cobrimento da armadura} = 4,00 \text{ mm}$$

$$d = 24,13 \text{ cm}$$

$$\text{Adotar } d = 24,00 \text{ cm}$$

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0718$$

Conforme tabela temos: $KMD = 0,0718$

$$\rightarrow K_x = 0,1016$$

$$\rightarrow K_z = 0,9570$$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$A_s = \frac{M_d}{k_z \cdot d \cdot f_{yd}} = 8,88 \text{ cm}^2/\text{m}$$


$$A_{s,min} = \begin{cases} 0,15\%bh = 4,50 \text{ cm}^2/\text{m} \\ 0,23\%bh = 6,90 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 5,18 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 8,88 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 12,5$ c/10 que equivale a 12,30 cm²/m.

c) Engaste

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 54,00 kN.m
 $f_{ck} = 30,00$ MPa


 $b = 100$ cm
 $h = 30$ cm

2) DETERMINAÇÃO DA ALTURA ÚTIL

$d = \text{altura total} - \text{cobrimento} - 1,5\phi_{\text{armadura}}$

Adotaremos ϕ da armadura = 12,5 mm

Cobrimento da armadura = 4,00 mm

$d = 24,13$ cm

Adotar $d = 24,00$ cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0613$$

Conforme tabela temos: $KMD = 0,0613$

$\rightarrow Kx = 0,0916$

$\rightarrow Kz = 0,9634$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 7,52 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 4,50 \text{ cm}^2/\text{m} \\ 0,23\%bh = 6,90 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 5,18 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 7,52 cm²/m. Será utilizada armadura dupla (face superior e inferior) de $\phi 12.5$ c/10 que equivale a 12,30 cm²/m.

8.5. ARMAÇÃO NAS PAREDES

As figuras 8.4 e 8.5 apresentam os momentos fletores nas paredes.

Figura 8.4 – Momento na direção X.

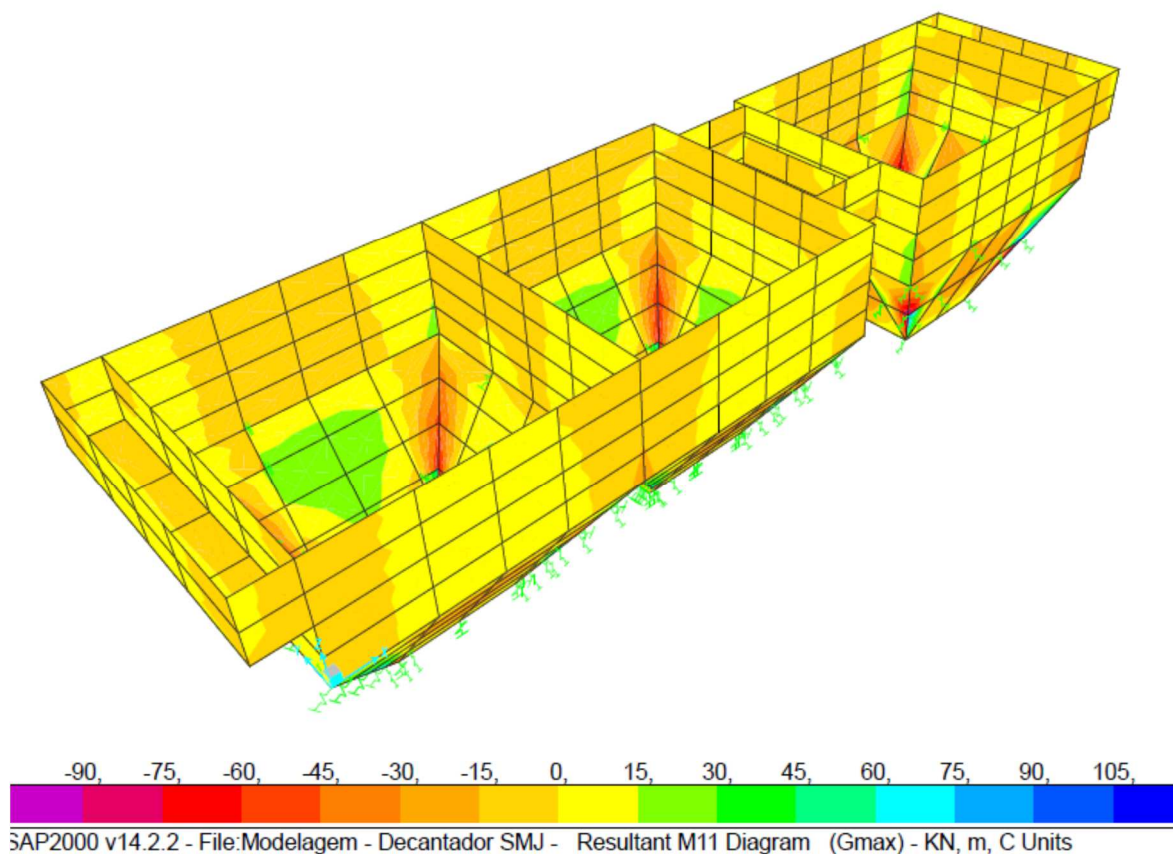
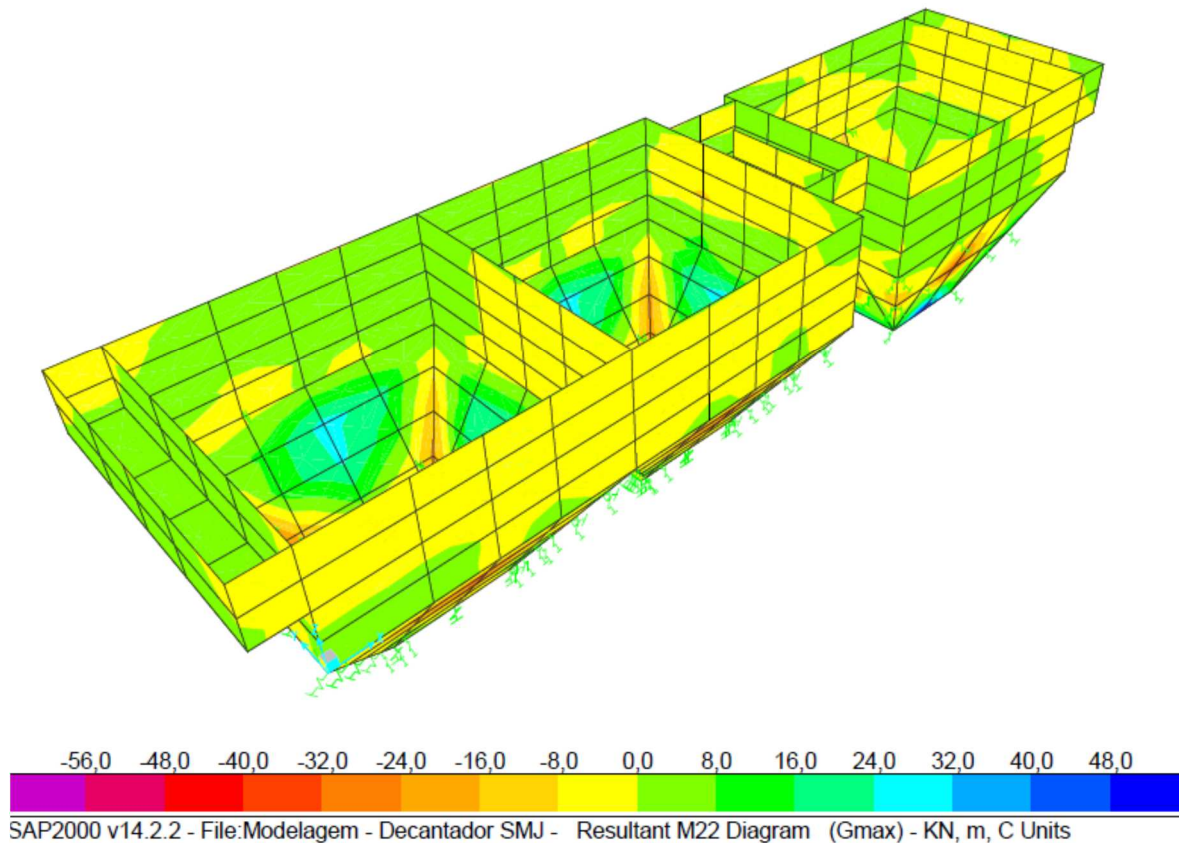


Figura 8.5 – Momento na direção Y.



Conforme modelagem os esforços máximos nas lajes de fundo são:

$$\text{Paredes } e=20\text{cm} \rightarrow \begin{cases} M_x = 18,50 \text{ kNm} \\ M_y = 18,50 \text{ kNm} \end{cases}$$

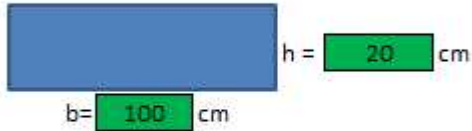
$$\text{Paredes } e=30\text{cm} \rightarrow \begin{cases} M_x = 12,40 \text{ kNm} \\ M_y = 12,40 \text{ kNm} \end{cases}$$

A figura a seguir apresenta o resultados do dimensionamento

a) Parede de 20 cm direção x/y

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 18,50 kN.m
fck = 30,00 MPa



2) DETERMINAÇÃO DA ALTURA ÚTIL

d = altura total – cobrimento – 1,5øarmadura

Adotaremos ø da armadura = 10,0 mm

Cobrimento da armadura = 4,00 mm

d = 14,50 cm

Adotar d = 14,00 cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0617$$

Conforme tabela temos: $KMD = 0,0617 \rightarrow Kx = 0,0916$
 $\rightarrow Kz = 0,9634$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 4,42 \text{ cm}^2/\text{m}$$

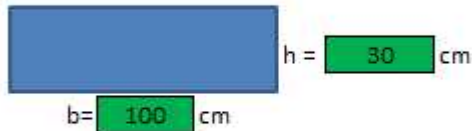
$$A_{s,min} = \begin{cases} 0,15\%bh = 3,00 \text{ cm}^2/\text{m} \\ 0,23\%bh = 4,60 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 3,45 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 4,60 cm²/m. Será utilizada armadura dupla (face superior e inferior) de ø8.0 c/10 que equivale a 5,00 cm²/m.

b) Parede de 30 cm direção x/y

1) PARÂMETROS DE ENTRADA

Momento Fletor Máximo = 12,40 kN.m
fck = 30,00 MPa



2) DETERMINAÇÃO DA ALTURA ÚTIL

d = altura total – cobrimento – 1,5Øarmadura

Adotaremos Ø da armadura = 10,0 mm

Cobrimento da armadura = 4,00 mm

d = 24,50 cm

Adotar d = 24,00 cm

2) DETERMINAÇÃO DE KMD

$$KMD = \frac{M_d}{b \cdot f \cdot d^2 \cdot f_{cd}} = 0,0141$$

Conforme tabela temos: $KMD = 0,0141 \rightarrow Kx = 0,0223$
 $\rightarrow Kz = 0,9911$

3) DETERMINAÇÃO DA ÁREA DE AÇO

$$As = \frac{M_d}{kz \cdot d \cdot f_{yd}} = 1,68 \text{ cm}^2/\text{m}$$

$$A_{s,min} = \begin{cases} 0,15\%bh = 4,50 \text{ cm}^2/\text{m} \\ 0,23\%bh = 6,90 \text{ cm}^2/\text{m} \\ 3,5\%bh \frac{f_{cd}}{f_{yd}} = 5,18 \text{ cm}^2/\text{m} \end{cases}$$

Para calcula da área de aço será considerada a taxa de aço de 6,90 cm²/m. Será utilizada armadura dupla (face superior e inferior) de Ø10.0 c/10 que equivale a 7,80 cm²/m.

9. DIMENSIONAMENTO – EEEB-E

9.1. MODELAGEM ESTRUTURAL

As figuras 9.1 e 9.2 apresentam as dimensões em planta e corte.

Figura 9.1 – Dimensões da EEEB-E – Planta.

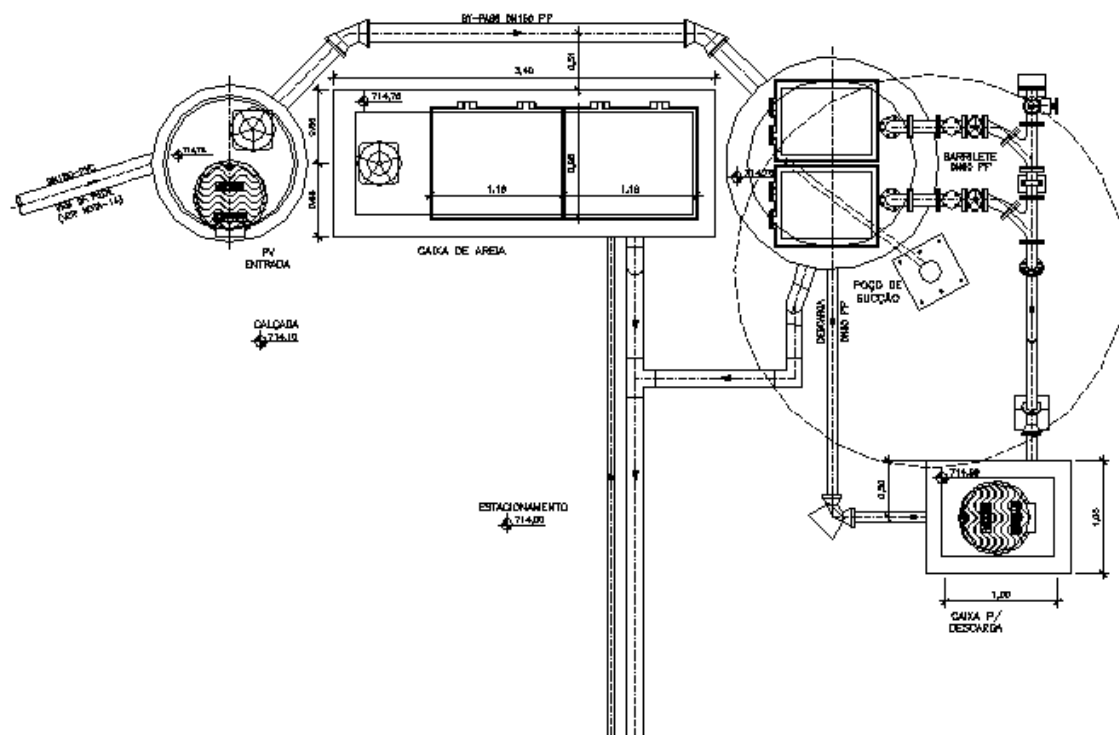
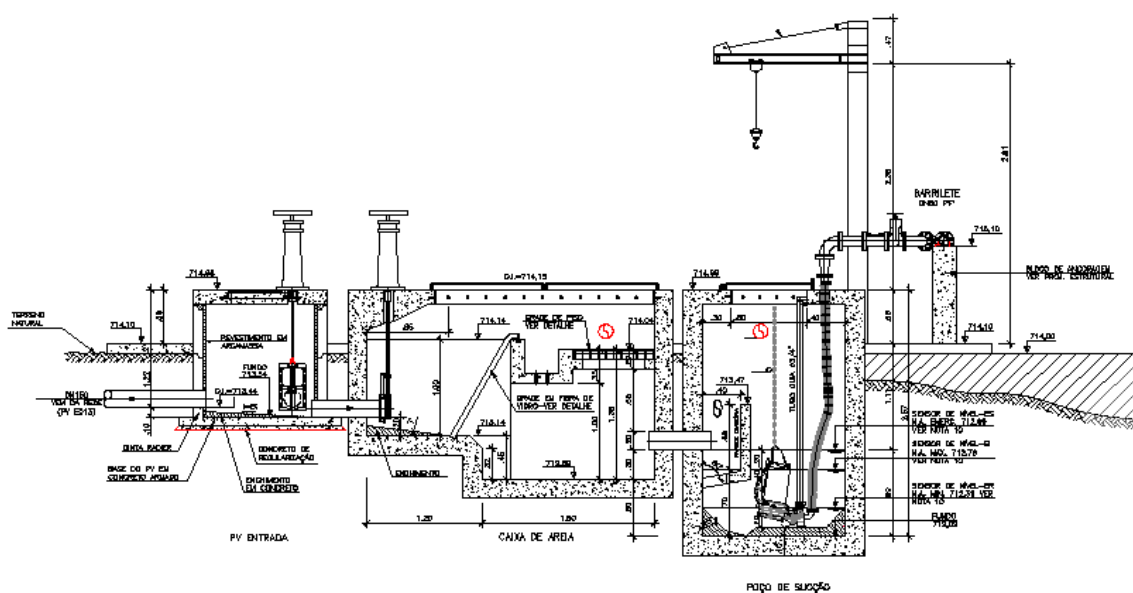


Figura 9.2 – Dimensões da EEEB-E – Corte.



A modelagem estrutural foi feita no software SAP-2000 considerando os parâmetros apresentados no item 2.

Os carregamentos utilizados no dimensionamento foram:

- Cargas Permanentes (CP)
Peso próprio
- Sobrecargas (SC)
Carregamento na laje/tampas de cobertura (SC)
Carregamento na laje de fundo (SCLF)
Carregamento nas paredes lado interno (SCPI)
Carregamento nas paredes lado externo carga (SCPE)

Combinação para dimensionamento das barras

Comb 1: $1,4CP + 1,4SC$

Comb 2: $1,4CP + 1,4SC + 1,4SCLF$

Comb 3: $1,4CP + 1,4SC + 1,4SCLF + 1,4SCPI$

Comb 4: $1,4CP + 1,4SC + 1,4SCLF + 1,4SCPI + 1,4SCPE$

9.2. RESULTADOS DA ANÁLISE ESTRUTURAL

Conforme informado no item anterior a análise estrutural foi feita utilizando o software SAP 2000. As tabelas a seguir apresentam os resultados do dimensionamento eletrônico.

Tabela 9.1 – Esforços nas placas.

Area	OutputCase	CaseType	Fx	Fy	Mx	My	T
Text	Text	Text	KN/m	KN/m	KN-m/m	KN-m/m	KN-m/m
1	Gmax	Combination	-5,400	-9,550	-1,014	0,078	-0,094
1	Gmax	Combination	0,770	-8,320	0,048	-0,034	-0,433
1	Gmax	Combination	3,690	6,250	0,152	0,884	-0,626
1	Gmax	Combination	-2,490	5,020	0,642	1,571	-0,287
2	Gmax	Combination	-0,089	-7,980	0,021	-0,050	0,417
2	Gmax	Combination	-6,060	-9,180	-1,015	0,072	0,078
2	Gmax	Combination	-3,220	5,010	0,643	1,572	0,278
2	Gmax	Combination	2,750	6,210	0,206	0,882	0,618

3	Gmax	Combination	-0,180	5,510	0,530	1,548	-0,222
3	Gmax	Combination	1,220	5,790	0,258	0,905	-0,554
3	Gmax	Combination	1,720	8,290	0,387	1,853	-0,476
3	Gmax	Combination	0,320	8,010	0,706	2,679	-0,144
4	Gmax	Combination	2,580	6,150	0,187	0,878	0,538
4	Gmax	Combination	-0,230	5,590	0,530	1,550	0,215
4	Gmax	Combination	0,160	7,530	0,706	2,680	0,119
4	Gmax	Combination	2,970	8,090	0,372	1,787	0,442
5	Gmax	Combination	5,390	9,110	0,635	2,665	-0,148
5	Gmax	Combination	-2,770	7,480	0,453	1,866	-0,313
5	Gmax	Combination	-3,080	5,890	0,534	2,878	-0,100
5	Gmax	Combination	5,070	7,520	1,303	2,806	0,065
6	Gmax	Combination	2,370	7,950	0,430	1,799	0,275
6	Gmax	Combination	5,920	8,660	0,636	2,666	0,118
6	Gmax	Combination	5,690	7,520	1,302	2,802	-0,090
6	Gmax	Combination	2,150	6,810	0,540	2,775	0,067
7	Gmax	Combination	-0,280	6,420	1,393	2,824	0,203
7	Gmax	Combination	-5,420	5,400	0,493	2,870	0,427
7	Gmax	Combination	2,670	45,850	0,836	3,250	0,424
7	Gmax	Combination	7,810	46,870	-0,585	0,757	0,200
8	Gmax	Combination	-2,400	5,960	0,477	2,762	-0,456
8	Gmax	Combination	-0,073	6,430	1,392	2,820	-0,228
8	Gmax	Combination	8,000	46,780	-0,581	0,774	-0,249
8	Gmax	Combination	5,670	46,310	0,702	3,072	-0,477
9	Gmax	Combination	-4,000	-30,720	-0,111	-0,840	0,012
9	Gmax	Combination	3,970	9,160	-0,282	-1,531	-0,015
9	Gmax	Combination	4,550	9,270	-0,638	-1,519	-0,074
9	Gmax	Combination	-3,430	-30,610	-0,068	-1,773	-0,047
10	Gmax	Combination	-3,620	-31,630	-0,065	-1,761	-0,005
10	Gmax	Combination	5,000	11,460	-0,640	-1,528	0,037
10	Gmax	Combination	5,430	11,550	-0,267	-1,614	-0,030
10	Gmax	Combination	-3,180	-31,540	-0,085	-0,900	-0,072
11	Gmax	Combination	4,970	9,530	-0,240	-1,523	-0,316
11	Gmax	Combination	4,310	7,630	-0,123	-0,500	-0,457
11	Gmax	Combination	-6,990	5,770	-0,515	-1,159	-0,186
11	Gmax	Combination	-7,820	6,870	-0,641	-1,519	-0,045
12	Gmax	Combination	-6,760	8,870	-0,643	-1,529	0,005
12	Gmax	Combination	-7,780	5,220	-0,511	-1,138	0,137
12	Gmax	Combination	7,770	8,200	-0,164	-0,611	0,412
12	Gmax	Combination	7,430	11,750	-0,279	-1,616	0,279
13	Gmax	Combination	3,620	7,990	-0,179	-0,511	-0,529
13	Gmax	Combination	0,650	-6,890	-0,070	0,033	-0,371

13	Gmax	Combination	-5,440	-8,500	0,919	-0,072	-0,101
13	Gmax	Combination	-2,350	6,900	-0,580	-1,172	-0,259
14	Gmax	Combination	-2,630	6,000	-0,575	-1,151	0,203
14	Gmax	Combination	-5,260	-8,470	0,923	-0,052	0,056
14	Gmax	Combination	0,690	-7,150	-0,024	0,011	0,340
14	Gmax	Combination	3,640	7,220	-0,198	-0,617	0,487
15	Gmax	Combination	-28,730	10,620	-0,148	0,103	-0,059
15	Gmax	Combination	50,420	26,450	0,120	-0,683	-0,149
15	Gmax	Combination	43,270	-9,300	0,026	0,486	0,021
15	Gmax	Combination	-35,880	-25,130	0,684	0,092	0,111
16	Gmax	Combination	50,550	26,480	-0,110	0,625	0,211
16	Gmax	Combination	43,410	-9,240	0,037	-0,374	0,061
16	Gmax	Combination	-34,740	-24,870	-0,735	-0,255	-0,029
16	Gmax	Combination	-27,590	10,850	0,257	-0,074	0,121
17	Gmax	Combination	1,410	-4,910	-0,179	-0,913	-0,946
17	Gmax	Combination	3,820	-4,430	0,212	-0,020	-1,132
17	Gmax	Combination	5,360	3,260	-1,118	-0,147	-0,889
17	Gmax	Combination	2,940	2,780	0,082	0,119	-0,702
18	Gmax	Combination	3,670	-3,250	0,209	-0,036	-1,203
18	Gmax	Combination	7,890	-2,410	0,347	0,094	-1,197
18	Gmax	Combination	8,400	0,130	-2,301	-0,654	-0,944
18	Gmax	Combination	4,170	-0,720	-1,112	-0,118	-0,950
19	Gmax	Combination	7,430	-0,880	0,350	0,105	-1,156
19	Gmax	Combination	2,690	-1,820	0,550	0,084	-1,176
19	Gmax	Combination	1,910	-1,760	-3,229	-0,232	-0,911
19	Gmax	Combination	7,690	-0,610	-2,315	-0,715	-0,890
20	Gmax	Combination	-1,300	-5,540	-0,400	-1,990	-0,736
20	Gmax	Combination	5,640	-4,150	0,503	-0,086	-0,928
20	Gmax	Combination	5,660	-4,060	0,193	-0,023	-1,093
20	Gmax	Combination	-1,280	-5,450	-0,093	-0,896	-0,901
21	Gmax	Combination	6,020	-2,620	0,483	-0,173	-0,995
21	Gmax	Combination	4,320	-2,960	1,057	0,396	-1,001
21	Gmax	Combination	4,290	-3,130	0,395	0,105	-1,167
21	Gmax	Combination	5,990	-2,790	0,190	-0,040	-1,161
22	Gmax	Combination	4,990	-1,090	1,055	0,388	-0,978
22	Gmax	Combination	9,510	-0,190	1,484	0,010	-0,994
22	Gmax	Combination	9,450	-0,470	0,359	0,044	-1,153
22	Gmax	Combination	4,930	-1,370	0,397	0,115	-1,137
23	Gmax	Combination	-4,660	-2,570	-0,770	-2,466	-0,278
23	Gmax	Combination	2,290	-1,180	0,229	-0,504	-0,405
23	Gmax	Combination	1,530	-4,970	0,479	-0,085	-0,666
23	Gmax	Combination	-5,420	-6,360	-0,294	-1,971	-0,539

24	Gmax	Combination	1,750	-3,130	0,298	-0,168	-0,423
24	Gmax	Combination	8,320	-1,810	1,217	0,524	-0,400
24	Gmax	Combination	8,240	-2,180	1,085	0,402	-0,735
24	Gmax	Combination	1,680	-3,490	0,457	-0,179	-0,758
25	Gmax	Combination	8,360	-1,440	1,212	0,502	-0,381
25	Gmax	Combination	11,360	-0,840	1,733	0,028	-0,373
25	Gmax	Combination	11,840	0,280	1,395	-0,006	-0,704
25	Gmax	Combination	8,500	-0,390	1,083	0,390	-0,712
26	Gmax	Combination	-8,010	-7,870	-0,665	-4,949	0,228
26	Gmax	Combination	3,270	-5,610	0,641	1,290	0,097
26	Gmax	Combination	4,240	-0,790	0,275	-0,494	-0,106
26	Gmax	Combination	-7,040	-3,050	-0,825	-2,477	0,030
27	Gmax	Combination	3,900	-3,420	0,395	0,048	0,410
27	Gmax	Combination	7,770	-2,650	1,454	0,485	0,428
27	Gmax	Combination	7,920	-1,890	1,194	0,518	-0,011
27	Gmax	Combination	4,050	-2,670	0,342	-0,158	-0,029
28	Gmax	Combination	8,130	-1,240	1,454	0,488	0,370
28	Gmax	Combination	10,580	-0,750	1,781	-0,011	0,356
28	Gmax	Combination	10,810	-0,950	1,731	0,029	0,006
28	Gmax	Combination	8,000	-1,510	1,191	0,500	0,019
29	Gmax	Combination	3,070	-1,920	0,138	-1,273	0,244
29	Gmax	Combination	2,480	-2,030	0,967	-0,023	0,826
29	Gmax	Combination	1,010	-9,370	0,385	-1,100	0,640
29	Gmax	Combination	1,600	-9,260	-0,560	-2,479	0,056
30	Gmax	Combination	3,220	-2,040	0,930	-0,260	1,043
30	Gmax	Combination	8,210	-1,040	11,326	20,379	0,939
30	Gmax	Combination	7,890	-2,630	11,370	20,462	0,738
30	Gmax	Combination	2,910	-3,620	10,609	20,093	0,841
31	Gmax	Combination	7,060	-0,660	11,331	20,369	0,919
31	Gmax	Combination	13,120	0,550	11,543	20,039	0,906
31	Gmax	Combination	12,960	-0,270	11,906	20,014	0,659
31	Gmax	Combination	6,890	-1,480	11,364	20,472	0,672
32	Gmax	Combination	5,870	-3,530	-0,167	-0,726	0,762
32	Gmax	Combination	1,810	-4,340	0,318	0,083	1,005
32	Gmax	Combination	1,190	-2,290	1,025	-0,011	0,842
32	Gmax	Combination	5,590	-1,410	0,028	-1,300	0,606
33	Gmax	Combination	1,330	-1,550	0,325	0,119	1,106
33	Gmax	Combination	6,260	-0,560	0,292	-0,049	1,168
33	Gmax	Combination	4,980	-1,690	1,291	0,371	1,128
33	Gmax	Combination	1,450	-2,400	0,984	-0,247	1,066
34	Gmax	Combination	3,620	-1,530	0,298	-0,029	1,149
34	Gmax	Combination	11,360	0,015	0,172	0,075	1,180

34	Gmax	Combination	8,620	-0,350	1,636	-0,009	1,111
34	Gmax	Combination	6,440	-0,790	1,293	0,359	1,079
35	Gmax	Combination	2,210	1,420	0,036	0,086	0,637
35	Gmax	Combination	5,710	2,120	-1,527	-0,241	0,871
35	Gmax	Combination	4,530	-3,800	0,298	0,078	1,057
35	Gmax	Combination	1,020	-4,500	-0,136	-0,719	0,819

Tabela 3.2 – Reações no solo.

Joint	OutputCase	CaseType	F1	F2	F3	M1	M2	M3
Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m
1	Gmax	Combination	0	0	2,256	0	0	0
2	Gmax	Combination	0	0	2,256	0	0	0
3	Gmax	Combination	0	0	52,452	0	0	0
4	Gmax	Combination	0	0	2,256	0	0	0
5	Gmax	Combination	0	0	2,256	0	0	0
6	Gmax	Combination	0	0	2,256	0	0	0
7	Gmax	Combination	0	0	2,256	0	0	0
8	Gmax	Combination	0	0	2,256	0	0	0
9	Gmax	Combination	0	0	2,256	0	0	0
10	Gmax	Combination	0	0	2,256	0	0	0
11	Gmax	Combination	0	0	2,256	0	0	0
12	Gmax	Combination	0	0	2,256	0	0	0
13	Gmax	Combination	0	0	2,256	0	0	0
14	Gmax	Combination	0	0	2,256	0	0	0
15	Gmax	Combination	0	0	2,256	0	0	0
16	Gmax	Combination	0	0	2,256	0	0	0
17	Gmax	Combination	0	0	2,256	0	0	0
18	Gmax	Combination	0	0	2,256	0	0	0
19	Gmax	Combination	0	0	2,256	0	0	0
20	Gmax	Combination	0	0	2,256	0	0	0
21	Gmax	Combination	0	0	2,256	0	0	0
22	Gmax	Combination	0	0	2,256	0	0	0
23	Gmax	Combination	0	0	2,256	0	0	0
24	Gmax	Combination	0	0	2,256	0	0	0
25	Gmax	Combination	0	0	2,256	0	0	0

A tensão no solo será determinada pela equação;

$$\sigma_{solo} = \frac{P_{concreto} + P_{agua} + SC}{A}$$

Conforme somatório da coluna F3 que são as reações em z e equivale ao somatório do numerador da equação, temos 106,60 kN. A área do apoio no solo é de 7,44 m². Temos uma tensão no solo de;

$$\sigma = \frac{106,60}{7,44} = 14,33 \frac{kN}{m^2} = 0,14 \frac{kgf}{cm^2} \leq 0,40 \frac{kgf}{cm^2} (ok)$$

Logo a fundação não poderá ser do tipo direta.

9.3. ARMAÇÃO LAJES E PAREDES

Conforme modelagem os esforços máximos nas lajes de fundo são:

$$\text{Laje e Parede } h=20\text{cm} \rightarrow \begin{cases} M_x = 11,91 \text{ kNm} \\ M_y = 20,47 \text{ kNm} \end{cases}$$

Altura útil = altura total – cobrimento – 1,5 ϕ armadura.

Para este caso adotaremos o aço $\phi 10,0\text{mm}$ e o cobrimento de 4,00 cm, logo;

$$d = 20 - 4,0 - 1,5 \times 1,0 = 14,50 \text{ cm} \cong 14 \text{ cm}$$

Direção x

$$KMD = \frac{M_d}{bf \cdot d^2 \cdot f_{cd}} = \frac{1,4 \times 1,4 \times 11,91}{1,00 \times 0,14^2 \times 30.000} = 0,0298$$

Direção y

$$KMD = \frac{M_d}{bf \cdot d^2 \cdot f_{cd}} = \frac{1,4 \times 1,4 \times 20,47}{1,00 \times 0,14^2 \times 30.000} = 0,0512$$

Conforme tabela temos:

$$KMD = 0,0298 \rightarrow K_x = 0,0449 \text{ e } K_z = 0,9820$$

$$KMD = 0,0512 \rightarrow K_x = 0,0758 \text{ e } K_z = 0,9697$$



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E-mail: engesolo@engesolo.com.br - www.engesolo.com.br

Área de aço longitudinal:

Direção x

$$A_{sx} = \frac{M_d}{kz.d.f_{yd}} = \frac{1,4 \times 1,15 \times 11,91}{0,9820 \times 0,14 \times 50} = 2,79 \text{ cm}^2/\text{m}$$

Direção y

$$A_{sy} = \frac{M_d}{kz.d.f_{yd}} = \frac{1,4 \times 1,15 \times 20,47}{0,9697 \times 0,14 \times 50} = 4,86 \text{ cm}^2/\text{m}$$

$$A_{s_{min}} = 0,23\%bh = 0,23\% \times 15 \times 100 = 4,60 \text{ cm}^2/\text{m}$$

Para calcula da área de aço será considerada a taxa de aço de 4,86 cm²/m.

Será utilizada armadura dupla (face superior e inferior) de Ø10.0 c/15 que equivale a 10,40 cm²/m

10. DIMENSIONAMENTO – EEEB-F

10.1. MODELAGEM ESTRUTURAL

As figuras 10.1 e 10.2 apresentam as dimensões em planta e corte.

Figura 10.1 – Dimensões da EEEB-F – Planta.

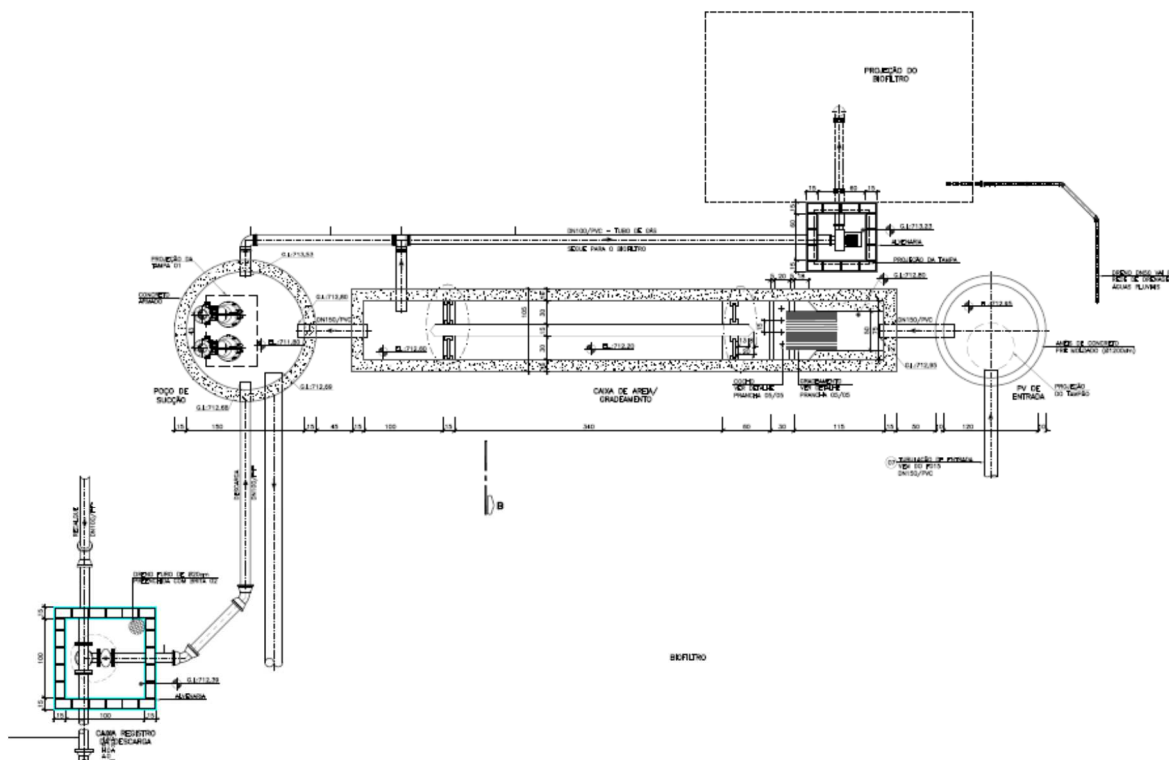
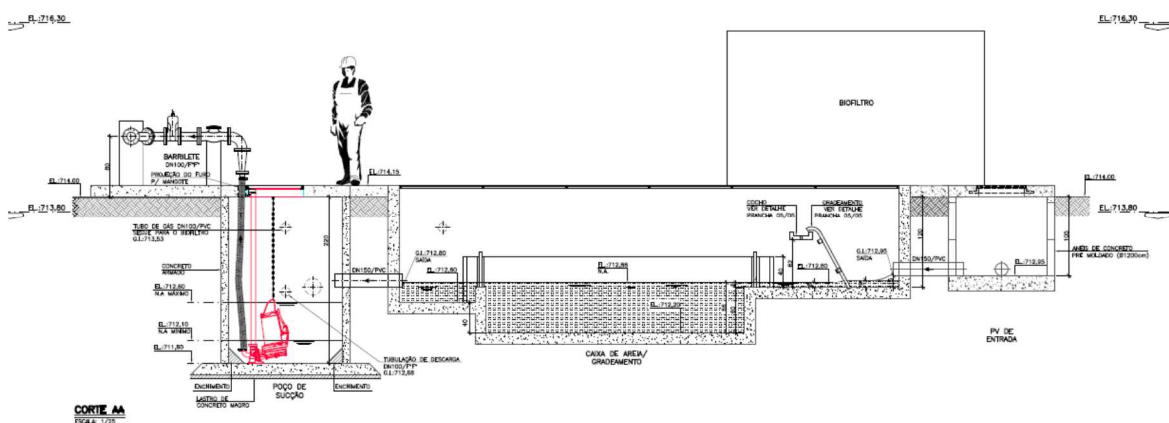


Figura 10.2 – Dimensões da EEEB-F – Corte.



A modelagem estrutural foi feita no software SAP-2000 com metodologia igual a da EEEB-E.

10.2. RESULTADOS DA ANÁLISE ESTRUTURAL

Da mesma forma que a EEEB-E os resultados foram apresentados em tabelas.

Conforme somatório da coluna F3 que são as reações em z e equivale ao somatório do numerador da equação, temos 264,25 kN. A área do apoio no solo é de 10,13 m². Temos uma tensão no solo de;

$$\sigma = \frac{264,25}{10,13} = 26,09 \frac{kN}{m^2} = 0,26 \frac{kgf}{cm^2} \leq 1,20 \frac{kgf}{cm^2} (ok)$$

Logo a fundação não poderá ser do tipo direta.

10.3. ARMAÇÃO LAJES E PAREDES

A armação das lajes e paredes foi realizada com a mesma metodologia da EEEB-F.

1. RELAÇÃO DE DESENHOS

RELAÇÃO DE DESENHOS – VOLUME 1 – TOMO A

ITEM	Nº ENGESOLO	Nº CESAN	TÍTULO
01	SA_PR064_15_DE_11_023_001_A	B-055-000-92-4-XX-0001	ETE - PROJETO ESTRUTURAL – FILTRO BIOLÓGICO AERADO SUBMERSO - FORMA E ARMAÇÃO - FOLHA 01/06
02	SA_PR064_15_DE_11_023_002_A	B-055-000-92-4-XX-0002	ETE - PROJETO ESTRUTURAL – FILTRO BIOLÓGICO AERADO SUBMERSO - FORMA E ARMAÇÃO - FOLHA 02/06
03	SA_PR064_15_DE_11_023_003_A	B-055-000-92-4-XX-0003	ETE - PROJETO ESTRUTURAL – FILTRO BIOLÓGICO AERADO SUBMERSO - FORMA E ARMAÇÃO - FOLHA 03/06
04	SA_PR064_15_DE_11_023_004_A	B-055-000-92-4-XX-0004	ETE - PROJETO ESTRUTURAL – FILTRO BIOLÓGICO AERADO SUBMERSO - FORMA E ARMAÇÃO - FOLHA 04/06
05	SA_PR064_15_DE_11_023_005_A	B-055-000-92-4-XX-0005	ETE - PROJETO ESTRUTURAL – FILTRO BIOLÓGICO AERADO SUBMERSO - FORMA E ARMAÇÃO - FOLHA 05/06
06	SA_PR064_15_DE_11_023_006_A	B-055-000-92-4-XX-0006	ETE - PROJETO ESTRUTURAL – FILTRO BIOLÓGICO AERADO SUBMERSO - FORMA E ARMAÇÃO - FOLHA 06/06
07	SA_PR064_15_DE_11_023_007_A	B-055-000-92-4-XX-0007	ETE - PROJETO ESTRUTURAL – AMPLIAÇÃO DO LEITO DE SECAGEM - FORMA E ARMAÇÃO - FOLHA 01/02
08	SA_PR064_15_DE_11_023_008_A	B-055-000-92-4-XX-0008	ETE - PROJETO ESTRUTURAL – AMPLIAÇÃO DO LEITO DE SECAGEM - FORMA E ARMAÇÃO - FOLHA 02/02
09	SA_PR064_15_DE_11_023_009_A	B-055-000-92-4-XX-0009	ETE - PROJETO ESTRUTURAL – LEITO DE SECAGEM - FORMA E ARMAÇÃO - FOLHA 01/03
10	SA_PR064_15_DE_11_023_010_A	B-055-000-92-4-XX-0010	ETE - PROJETO ESTRUTURAL – LEITO DE SECAGEM - FORMA E ARMAÇÃO - FOLHA 02/03
11	SA_PR064_15_DE_11_023_011_A	B-055-000-92-4-XX-0011	ETE - PROJETO ESTRUTURAL – LEITO DE SECAGEM - FORMA E ARMAÇÃO - FOLHA 03/03
12	SA_PR064_15_DE_11_023_012_A	B-055-000-92-4-XX-0012	ETE - PROJETO ESTRUTURAL – TRATAMENTO PRELIMINAR - FORMA E ARMAÇÃO - FOLHA 01/11
13	SA_PR064_15_DE_11_023_013_A	B-055-000-92-4-XX-0013	ETE - PROJETO ESTRUTURAL – TRATAMENTO PRELIMINAR - FORMA E ARMAÇÃO - FOLHA 02/11
14	SA_PR064_15_DE_11_023_014_A	B-055-000-92-4-XX-0014	ETE - PROJETO ESTRUTURAL – TRATAMENTO PRELIMINAR - FORMA E ARMAÇÃO - FOLHA 03/11
15	SA_PR064_15_DE_11_023_015_A	B-055-000-92-4-XX-0015	ETE - PROJETO ESTRUTURAL – TRATAMENTO PRELIMINAR - FORMA E ARMAÇÃO - FOLHA 04/11
16	SA_PR064_15_DE_11_023_016_A	B-055-000-92-4-XX-0016	ETE - PROJETO ESTRUTURAL – TRATAMENTO PRELIMINAR - FORMA E ARMAÇÃO - FOLHA 05/11
17	SA_PR064_15_DE_11_023_017_A	B-055-000-92-4-XX-0017	ETE - PROJETO ESTRUTURAL – TRATAMENTO PRELIMINAR - FORMA E ARMAÇÃO - FOLHA 06/11
18	SA_PR064_15_DE_11_023_018_A	B-055-000-92-4-XX-0018	ETE - PROJETO ESTRUTURAL – TRATAMENTO PRELIMINAR - FORMA E ARMAÇÃO - FOLHA 07/11
19	SA_PR064_15_DE_11_023_019_A	B-055-000-92-4-XX-0019	ETE - PROJETO ESTRUTURAL – TRATAMENTO PRELIMINAR - FORMA E ARMAÇÃO - FOLHA 08/11

20	SA_PR064_15_DE_11_023_020_A	B-055-000-92-4-XX-0020	ETE - PROJETO ESTRUTURAL – TRATAMENTO PRELIMINAR - FORMA E ARMAÇÃO - FOLHA 09/11
21	SA_PR064_15_DE_11_023_021_A	B-055-000-92-4-XX-0021	ETE - PROJETO ESTRUTURAL – TRATAMENTO PRELIMINAR - FORMA E ARMAÇÃO - FOLHA 10/11
22	SA_PR064_15_DE_11_023_022_A	B-055-000-92-4-XX-0022	ETE - PROJETO ESTRUTURAL – TRATAMENTO PRELIMINAR - FORMA E ARMAÇÃO - FOLHA 11/11
23	SA_PR064_15_DE_11_023_023_A	B-055-000-92-4-XX-0023	ETE - PROJETO ESTRUTURAL – CASA DE SOPRADORES - FORMA E ARMAÇÃO - FOLHA 01/02
24	SA_PR064_15_DE_11_023_024_A	B-055-000-92-4-XX-0024	ETE - PROJETO ESTRUTURAL – CASA DE SOPRADORES - FORMA E ARMAÇÃO - FOLHA 02/02
25	SA_PR064_15_DE_11_023_025_A	B-055-000-92-4-XX-0025	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 01/14
26	SA_PR064_15_DE_11_023_026_A	B-055-000-92-4-XX-0026	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 02/14
27	SA_PR064_15_DE_11_023_027_A	B-055-000-92-4-XX-0027	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 03/14
28	SA_PR064_15_DE_11_023_028_A	B-055-000-92-4-XX-0028	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 04/14
29	SA_PR064_15_DE_11_023_029_A	B-055-000-92-4-XX-0029	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 05/14
30	SA_PR064_15_DE_11_023_030_A	B-055-000-92-4-XX-0030	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 06/14
31	SA_PR064_15_DE_11_023_031_A	B-055-000-92-4-XX-0031	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 07/14
32	SA_PR064_15_DE_11_023_032_A	B-055-000-92-4-XX-0032	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 08/14
33	SA_PR064_15_DE_11_023_033_A	B-055-000-92-4-XX-0033	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 09/14
34	SA_PR064_15_DE_11_023_034_A	B-055-000-92-4-XX-0034	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 10/14
35	SA_PR064_15_DE_11_023_035_A	B-055-000-92-4-XX-0035	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 11/14
36	SA_PR064_15_DE_11_023_036_A	B-055-000-92-4-XX-0036	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 12/14
36	SA_PR064_15_DE_11_023_037_A	B-055-000-92-4-XX-0037	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 13/14
38	SA_PR064_15_DE_11_023_038_A	B-055-000-92-4-XX-0038	ETE - PROJETO ESTRUTURAL – UASB - FORMA E ARMAÇÃO - FOLHA 14/14
39	SA_PR064_15_DE_11_023_039_A	B-055-000-92-4-XX-0039	ETE - PROJETO ESTRUTURAL – DECANTADOR - FORMA E ARMAÇÃO - FOLHA 01/09
40	SA_PR064_15_DE_11_023_040_A	B-055-000-92-4-XX-0040	ETE - PROJETO ESTRUTURAL – DECANTADOR - FORMA E ARMAÇÃO - FOLHA 02/09
41	SA_PR064_15_DE_11_023_041_A	B-055-000-92-4-XX-0041	ETE - PROJETO ESTRUTURAL – DECANTADOR - FORMA E ARMAÇÃO - FOLHA 03/09

42	SA_PR064_15_DE_11_023_042_A	B-055-000-92-4-XX-0042	ETE - PROJETO ESTRUTURAL – DECANTADOR - FORMA E ARMAÇÃO - FOLHA 04/09
43	SA_PR064_15_DE_11_023_043_A	B-055-000-92-4-XX-0043	ETE - PROJETO ESTRUTURAL – DECANTADOR - FORMA E ARMAÇÃO - FOLHA 05/09
44	SA_PR064_15_DE_11_023_044_A	B-055-000-92-4-XX-0044	ETE - PROJETO ESTRUTURAL – DECANTADOR - FORMA E ARMAÇÃO - FOLHA 06/09
45	SA_PR064_15_DE_11_023_045_A	B-055-000-92-4-XX-0045	ETE - PROJETO ESTRUTURAL – DECANTADOR - FORMA E ARMAÇÃO - FOLHA 07/09
46	SA_PR064_15_DE_11_023_046_A	B-055-000-92-4-XX-0046	ETE - PROJETO ESTRUTURAL – DECANTADOR - FORMA E ARMAÇÃO - FOLHA 08/09
47	SA_PR064_15_DE_11_023_047_A	B-055-000-92-4-XX-0047	ETE - PROJETO ESTRUTURAL – DECANTADOR - FORMA E ARMAÇÃO - FOLHA 09/09
48	SA_PR064_15_DE_11_023_048_A	B-055-000-92-4-XX-0048	ETE - PROJETO ESTRUTURAL – ELEVATORIA DE RECIRCULAÇÃO - FORMA E ARMAÇÃO - FOLHA 01/01
49	SA_PR064_15_DE_11_023_049_A	B-055-000-92-4-XX-0049	ETE - PROJETO ESTRUTURAL – DISPOSITIVO DE DRENAGEM - FORMA E ARMAÇÃO - FOLHA 01/01
50	SA_PR064_15_DE_11_018_001_A	B-055-000-90-4-MC-0001	ELEVATÓRIA E ESGOTO BRUTO - PROJETO ESTRUTURAL – EEEB E - FORMA E ARMAÇÃO - FOLHA 01/02
51	SA_PR064_15_DE_11_018_002_A	B-055-000-90-4-MC-0002	ELEVATÓRIA E ESGOTO BRUTO - PROJETO ESTRUTURAL – EEEB E - FORMA E ARMAÇÃO - FOLHA 02/02
52	SA_PR064_15_DE_11_018_003_A	B-055-000-90-4-MC-0003	ELEVATÓRIA E ESGOTO BRUTO - PROJETO ESTRUTURAL – EEEB F - FORMA E ARMAÇÃO - FOLHA 01/02
53	SA_PR064_15_DE_11_018_004_A	B-055-000-90-4-MC-0004	ELEVATÓRIA E ESGOTO BRUTO - PROJETO ESTRUTURAL – EEEB F - FORMA E ARMAÇÃO - FOLHA 02/02