JARDÍN BOTÁNICO "JOSÉ CELESTINO MUTIS"

TROPICARIO

BOGOTÁ D.C



Proyecto:

DISEÑO ESTRUCTURAL TROPICARIO

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CONTENIDO

1. DESCRIPCIÓN DEL PROYECTO 4
1.1. GENERAL 4
1.2. DESCRIPCIÓN DE LA ESTRUCTURA 5
1.3. CARACTERÍSTICAS DEL SUELO 6
1.4. NORMAS 6
2. ANÁLISIS Y DISEÑO 7
2.1. DESCRIPCIÓN 7
2.2. ESPECIFICACIONES DE LOS MATERIALES 7
2.3. AVALÚO DE CARGAS 8
2.4. COMBINACIONES DE CARGA 11
2.5. DISEÑO ÁRBOLES AR2, AR3 Y AR4 12
2.5.1. NUMERACIÓN DE ELEMENTOS Y NODOS 13
2.5.2. INCIDENCIAS 14
2.5.3. EVALUACIÓN DEL DISEÑO DE LOS ELEMENTOS 14
2.6. DISEÑO ÁRBOL AR5 15
2.6.1. NUMERACIÓN DE LOS ELEMENTOS Y NODOS 16
2.6.2. INCIDENCIAS 20
2.6.3. EVALUACIÓN DEL DISEÑO DE LOS ELEMENTOS 25
2.7. DISEÑO ÁRBOL AR6 30
2.7.1. NUMERACIÓN DE LOS ELEMENTOS Y NODOS 31
2.7.2. INCIDENCIAS 38
2.7.3. EVALUACIÓN DEL DISEÑO DE LOS ELEMENTOS 48
2.8. DISEÑO ÁRBOL BARRIGON 59
2.8.1. NUMERACIÓN DE LOS ELEMENTOS Y NODOS 61
2.8.2. INCIDENCIAS 63
2.8.3. EVALUACIÓN DEL DISEÑO DE LOS ELEMENTOS 66
3. CIMENTACIÓN 69
3.1. CIMENTACIÓN ÁRBOLES AR2, AR3 Y AR4 70
3.2. CIMENTACIÓN ÁRBOL AR5 76
3.3. CIMENTACIÓN ÁRBOL AR6 82
3.4. CIMENTACIÓN ÁRBOL BARRIGON 87

TABLA DE IMÁGENES

Imagen 1 Localización del proyecto (Fuente: Google Earth)..... 4
Imagen 2 Vista en planta de la obra proyectada (Fuente: GD-14-101 – CONSULCIVIL S.A.S)..... 5
Imagen 3 Espectro de diseño..... 9
Imagen 4 Coordenadas del espectro de diseño..... 10
Imagen 5 Combinaciones de servicio (Fuente: NSR-10, sección B.2.3.1)..... 11
Imagen 6 Combinaciones de diseño (Fuente: NSR-10, sección B.2.3.1)..... 11
Imagen 7 Geometría de los árboles AR2, AR3 y AR4..... 12
Imagen 8 Numeración de elementos y nodos modelo representativo de árboles AR2, AR3 y AR4..... 13
Imagen 9 Geometría del árbol AR5..... 15
Imagen 10 Numeración de elementos árbol AR5..... 16
Imagen 11 Numeración de elementos árbol AR5 planta N+1.20 17
Imagen 12 Numeración de elementos árbol AR5 planta N+2.40 17
Imagen 13 Numeración de elementos árbol AR5 planta N+3.60 18
Imagen 14 Numeración de elementos árbol AR5 planta N+4.80 18
Imagen 15 Numeración de elementos árbol AR5 planta N+6.00 19
Imagen 16 Geometría del árbol AR6..... 30
Imagen 17 Numeración de elementos árbol AR6..... 31
Imagen 18 Numeración de elementos árbol AR5 planta N+1.20 32
Imagen 19 Numeración de elementos árbol AR5 planta N+2.40 32
Imagen 20 Numeración de elementos árbol AR5 planta N+3.60 33
Imagen 21 Numeración de elementos árbol AR5 planta N+4.80 33
Imagen 22 Numeración de elementos árbol AR5 planta N+6.00 34
Imagen 23 Numeración de elementos árbol AR5 planta N+7.20 34
Imagen 24 Numeración de elementos árbol AR5 planta N+8.40 35
Imagen 25 Numeración de elementos árbol AR5 planta N+9.60 35
Imagen 26 Numeración de elementos árbol AR5 planta N+10.8 36
Imagen 27 Numeración de elementos árbol AR5 planta N+12.00 36
Imagen 28 Numeración de elementos árbol AR5 planta N+13.20 37
Imagen 29 Numeración de elementos árbol AR5 planta N+14.40 37
Imagen 30 Geometría del árbol Barrigon 59
Imagen 31 Isométrico del árbol Barrigon..... 60
Imagen 32 Numeración de elementos sector inicial del árbol barrigon 61
Imagen 33 Numeración de elementos sector central del árbol barrigon 62
Imagen 34 Numeración de elementos sector final del árbol barrigon..... 62

1. DESCRIPCIÓN DEL PROYECTO

1.1. GENERAL

El presente estudio fue elaborado por ESTRUCTURAS SOSTENIBLES, en desarrollo del proyecto de consultoría estructural.

El proyecto a desarrollar se encuentra ubicado dentro del JARDÍN BOTÁNICO JOSÉ CELESTINO MUTIS en la CARRERA 63 #68-95 de la ciudad de Bogotá D.C.



Imagen 1 Localización del proyecto (Fuente: Google Earth)

En el presente informe y en los planos básicos que lo acompañan, se encuentran desarrollados todos los aspectos referentes al proyecto, tanto en análisis como en diseño.

1.2. DESCRIPCIÓN DE LA ESTRUCTURA

El proyecto “TROPICARIO – JARDÍN BOTÁNICO JOSÉ CELESTINO MUTIS” esta conformado por seis bloques de exhibición los cuales ocupan un área de 2550m².

La clasificación temática de las salas será la siguiente: Bosque seco y xerofítico, que mostrará colecciones de enclaves xerofíticos interandinos, los bosques secos del Caribe y las sabanas rocosas de la Orinoquia. Bosque húmedo tropical, que exhibirá colecciones de la Amazonia y del Chocó biogeográfico. Plantas útiles en Colombia; sobre las plantas útiles que crecen en las regiones agrícolas sub andinas. Colecciones especializadas, que incluirá muestras de orquídeas, quiches y aráceas, entre otras; y un Biodiversario o sala de exhibiciones temporales para albergar exposiciones itinerantes de especial interés botánico, biológico o cultural (tomado del informe GD-14-101 – CONSULCIVIL S.A.S).

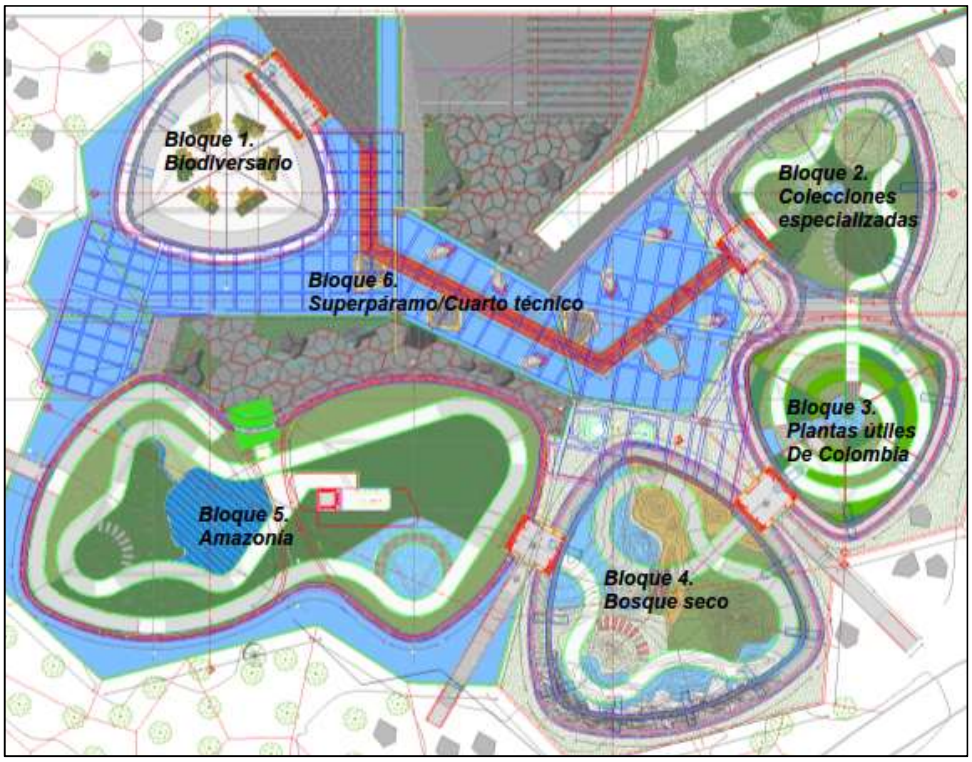


Imagen 2 Vista en planta de la obra proyectada (Fuente: GD-14-101 – CONSULCIVIL S.A.S)

1.3. CARACTERÍSTICAS DEL SUELO

El estudio de suelos fue ejecutado por "**CONSULCIVIL SAS"** el informe fue realizado en el año 2015 y esta nombrado como "GD-14-101". Con base en la información suministrada y de acuerdo a la microzonificación sísmica de Bogotá, el suelo se caracteriza como Lacustre 300. Para el diseño se utilizará el espectro definido por el Decreto 523 del 16 de Diciembre de 2010.

1.4. NORMAS

El diseño de la estructura y todos sus elementos constitutivos, fue realizado cumpliendo con los requerimientos establecidos por el REGLAMENTO COLOMBIANO DE CONSTRUCCIÓN SISMO RESISTENTE NSR-10.



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ESTRUCTURAS SOSTENIBLES S.A.S.

2. ANÁLISIS Y DISEÑO

2.1. DESCRIPCIÓN

Las diferentes estructuras se analizaron mediante el programa SAP 2000, el cual combina las cargas verticales y sismo con los parámetros especificados en la NSR-10, en cuya salida de resultados se muestran las solicitaciones y diseño de los elementos, análisis sísmico (Método de análisis Fuerza Horizontal Equivalente), y demás análisis requeridos.

Los modelos de análisis de la estructura se realizaron utilizando como información de partida los planos arquitectónicos del proyecto, esto con el fin de definir las dimensiones de los elementos que conforman el proyecto.

2.2. ESPECIFICACIONES DE LOS MATERIALES

A continuación se presentan los materiales utilizados en el análisis y en el posterior diseño de la estructura:

Concretos:

- Cimentación f'c = 21.0 MPa

Acero de refuerzo:

- Ø < 3/8" y mayores fy= 420 MPa
- Malla electrosoldada fy= 420 MPa

Acero

- Acero de refuerzo (Fy 4200 Kg/cm²), NTC 2289, ASTM A706.
- Ángulos < 1-1/2" y láminas, Acero A 36 (ASTM A36/A 36M; Especificaciones para acero estructural).
- Ángulos > 1-1/2" incluyendo, Acero A572 GR 50 (ASTM 572/A 572M; Especificaciones para aceros de alta resistencia y bajas aleaciones para calidad de acero estructural).
- Tubería: A-500 GR. C
- IPE-HEA-UPN: A-572 GR-50
- PERFIL WF: A-572 GR-50
- Perlines e>2.0MM ASTM A 1011 GR-50, Fy=3400 Kg/cm²
- Perlines e<1.5MM ASTM A 1008 GR-40, Fy=2750 Kg/cm²

2.3. AVALÚO DE CARGAS

En el siguiente ítem se describe de manera cuantitativa, todas las acciones que se tienen en cuenta para el diseño la estructura. A continuación se muestra una lista con las cargas a considerar y las abreviaturas que se utilizarán en el documento.

Carga muerta (CM)
Carga de sismo en la dirección X (EQX)
Carga de sismo en la dirección Y (EQY)

- **Carga muerta:**
  El peso propio de los elementos metálicos que componen la estructura el programa lo asigna automáticamente mediante el peso unitario del material utilizado; para el acero se utilizó un peso unitario de 7.85Ton/m³. Adicionalmente se asumió una carga muerta de 2880 kg a tres metros de la punta de cada árbol la cual corresponde al peso de las ramas y se calculó de la siguiente manera:

$$Peso\ ramas = 6\ ramas * 6m * 80kg/m = 2880kg$$

  El peso específico utilizado para los elementos de la cimentación es: 2400Kg/m^3

- **Carga de sismo:**
  Para determinar las solicitaciones por sismo se realizó un análisis por el método de la fuerza horizontal equivalente siguiendo lo especificado en el reglamento Colombiano de Construcción Sismo Resistente NSR-10.

  Para la ciudad de Bogotá se tienen los siguientes coeficientes que definen el espectro de diseño:

  - $[Aa]$ Coeficiente de aceleración horizontal pico efectiva: 0.15
  - $[Av]$ Coeficiente de velocidad pico efectiva: 0.20
  - $[Fa]$ Coeficiente de amplificación que afecta la aceleración en la zona de periodos cortos: 1.05
  - $[Fv]$ Coeficiente de amplificación que afecta la aceleración en la zona de periodos intermedios: 2.90
  - Grupo de uso: I edificaciones de ocupación normal
  - $[I]$ Coeficiente de importancia: 1.00

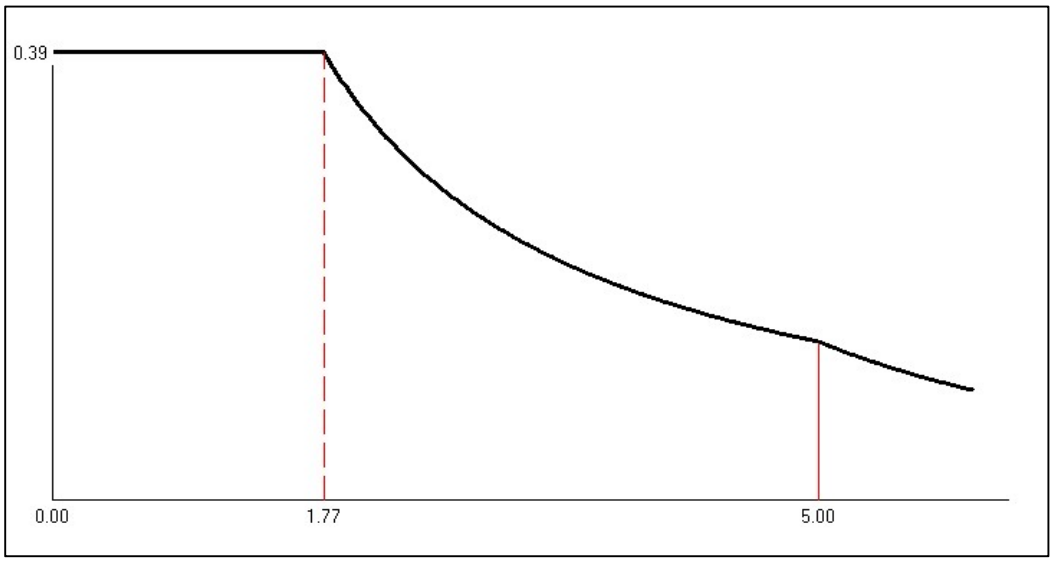


Imagen 3 Espectro de diseño

El espectro se construyó mediante las siguientes expresiones:

- Sector con periodos menores o iguales a $[T_0]$

$$T_0 = 0.10\frac{AaFv}{AaFa}$$

$$S_a = 2.5AaFaI(0.4 + 0.6\frac{T}{T_0})$$

- Sector con periodos mayores a $[T_0]$ y menores o iguales a$[T_C]$

$$T_C = 0.48\frac{AaFv}{AaFa}$$
$$S_a = 2.5AaFaI$$

- Sector con periodos mayores a $[T_C]$ y menores o iguales a$[T_L]$

$$T_C = 2.4Fv$$
$$S_a = \frac{1.2AvFvI}{T}$$

- Sector con periodos mayores a $[T_L]$

$$S_a = \frac{1.2AvFvI}{T^2}$$

Siguiendo las recomendaciones del numeral A.3.6.3.2, las fuerzas de sismo se combinan utilizando el 100% en la dirección longitudinal con el 30% en la dirección transversal y viceversa. Para determinar las acciones del sismo, se emplea el método de fuerza horizontal equivalente descrito en el capítulo A.4. A continuación se muestran las coordenadas del espectro de diseño.

Tn	Sa
0.0	0.394
0.1	0.394
0.2	0.394
0.3	0.394
0.4	0.394
0.5	0.394
0.6	0.394
0.7	0.394
0.8	0.394
0.9	0.394
1.0	0.394
1.1	0.394
1.2	0.394
1.3	0.394
1.4	0.394
1.5	0.394
1.6	0.394
1.7	0.394

Tn	Sa
1.8	0.387
1.9	0.366
2.0	0.348
2.1	0.331
2.2	0.316
2.3	0.303
2.4	0.29
2.5	0.278
2.6	0.268
2.7	0.258
2.8	0.249
2.9	0.24
3.0	0.232
3.1	0.225
3.2	0.218
3.3	0.211
3.4	0.205
3.5	0.199
3.6	0.193

Tn	Sa
3.7	0.188
3.8	0.183
3.9	0.178
4.0	0.174
4.1	0.17
4.2	0.166
4.3	0.162
4.4	0.158
4.5	0.155
4.6	0.151
4.7	0.148
4.8	0.145
4.9	0.142
5	0.139

Imagen 4 Coordenadas del espectro de diseño

2.4. COMBINACIONES DE CARGA

$D+F$	(B.2.3-1)
$D+H+F+L+T$	(B.2.3-2)
$D+H+F+(L_r \text{ ó } G \text{ ó } L_e)$	(B.2.3-3)
$D+H+F+0.75(L+T)+0.75(L_r \text{ ó } G \text{ ó } L_e)$	(B.2.3-4)
$D+H+F+W$	(B.2.3-5)
$D+H+F+0.7E$	(B.2.3-6)
$D+H+F+0.75W+0.75L+0.75(L_r \text{ ó } G \text{ ó } L_e)$	(B.2.3-7)
$D+H+F+0.75(0.7E)+0.75L+0.75(L_r \text{ ó } G \text{ ó } L_e)$	(B.2.3-8)
$0.6D+W+H$	(B.2.3-9)
$0.6D+0.7E+H$	(B.2.3-10)

Imagen 5 Combinaciones de servicio (Fuente: NSR-10, sección B.2.3.1)

$1.4(D+F)$	(B.2.4-1)
$1.2(D+F+T)+1.6(L+H)+0.5(L_r \text{ ó } G \text{ ó } L_e)$	(B.2.4-2)
$1.2D+1.6(L_r \text{ ó } G \text{ ó } L_e)+(L \text{ ó } 0.8W)$	(B.2.4-3)
$1.2D+1.6W+1.0L+0.5(L_r \text{ ó } G \text{ ó } L_e)$	(B.2.4-4)
$1.2D+1.0E+1.0L$	(B.2.4-5)
$0.9D+1.6W+1.6H$	(B.2.4-6)
$0.9D+1.0E+1.6H$	(B.2.4-7)

Imagen 6 Combinaciones de diseño (Fuente: NSR-10, sección B.2.3.1)

2.5. DISEÑO ÁRBOLES AR2, AR3 Y AR4

Los árboles AR2, AR3 y AR4 presentan la misma geometría por lo tanto se realizó un modelo de análisis representativo, los resultados obtenidos serán mostrados a continuación.

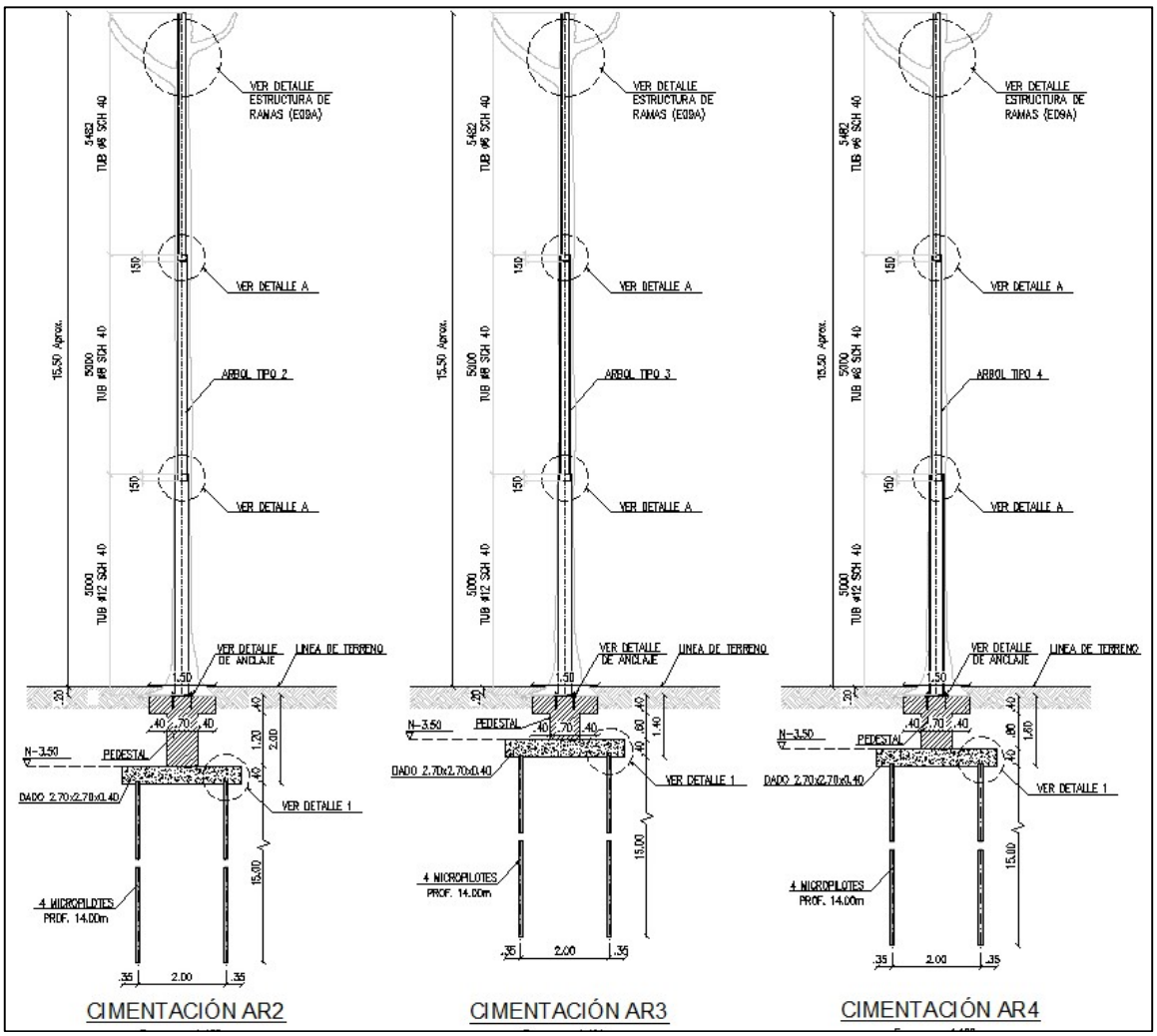


Imagen 7 Geometría de los árboles AR2, AR3 y AR4.

2.5.1. NUMERACIÓN DE ELEMENTOS Y NODOS

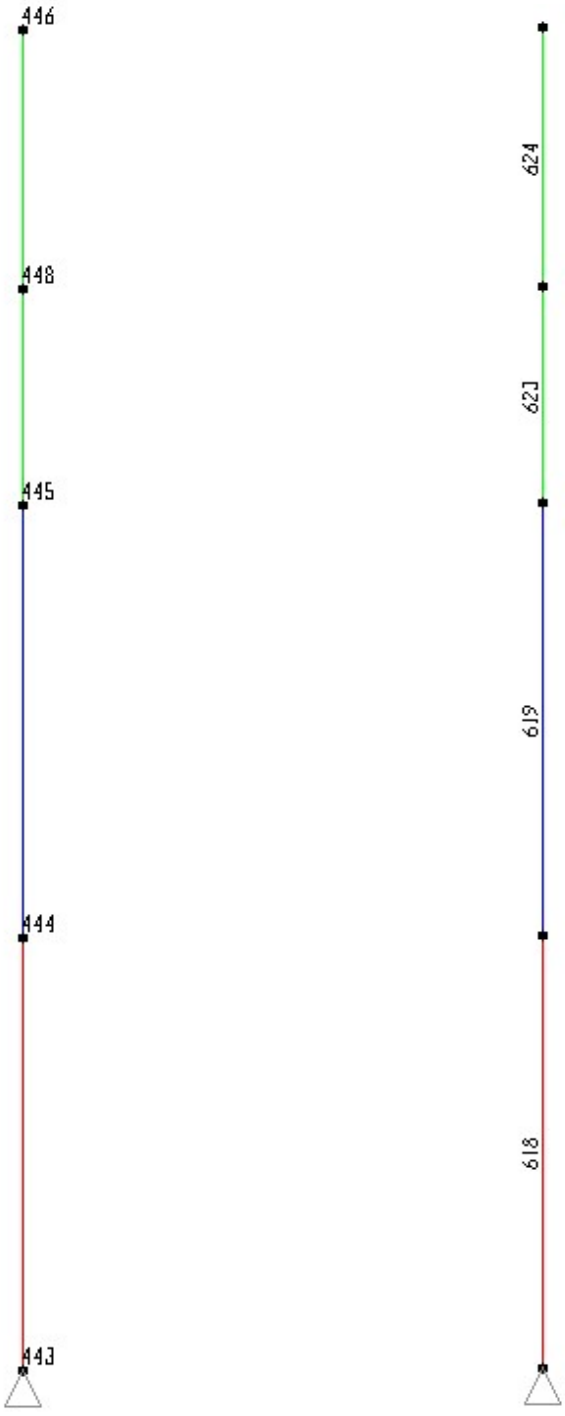


Imagen 8 Numeración de elementos y nodos modelo representativo de árboles AR2, AR3 y AR4.

2.5.2. INCIDENCIAS

A continuación se muestran las secciones asignadas a cada uno de los elementos.

TABLE: Frame Section Assignments					
Frame	**SectionType**	**AutoSelect**	**AnalSect**	**DesignSect**	**MatProp**
Text	Text	Text	Text	Text	Text
618	Pipe	N.A.	TUB. 12 SCH 40	TUB. 12 SCH 40	Default
619	Pipe	N.A.	TUB. 8 SCH 40	TUB. 8 SCH 40	Default
623	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
624	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default

2.5.3. EVALUACIÓN DEL DISEÑO DE LOS ELEMENTOS

TABLE: Steel Design 1 - Summary Data - AISC360-05-IBC2006				
Frame	**DesignSect**	**DesignType**	**Ratio**	**Combo**
Text	Text	Text	Unitless	Text
618	TUB. 12 SCH 40	Column	0.018435	01. 1.4D
619	TUB. 8 SCH 40	Column	0.036825	01. 1.4D
623	TUB. 6 SCH 40	Column	0.072703	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
624	TUB. 6 SCH 40	Column	0.023402	03. 1.2D+0.5L+(+EQX+0.3EQY)/R

Según la tabla del diseño de los elementos, las secciones diseñadas tienen un índice de utilización (*Ratio)* máximo de 0.072 lo cual quiere decir que funciona.

2.6. DISEÑO ÁRBOL AR5

Los resultados obtenidos del análisis y diseño del árbol AR5 serán mostrados a continuación.

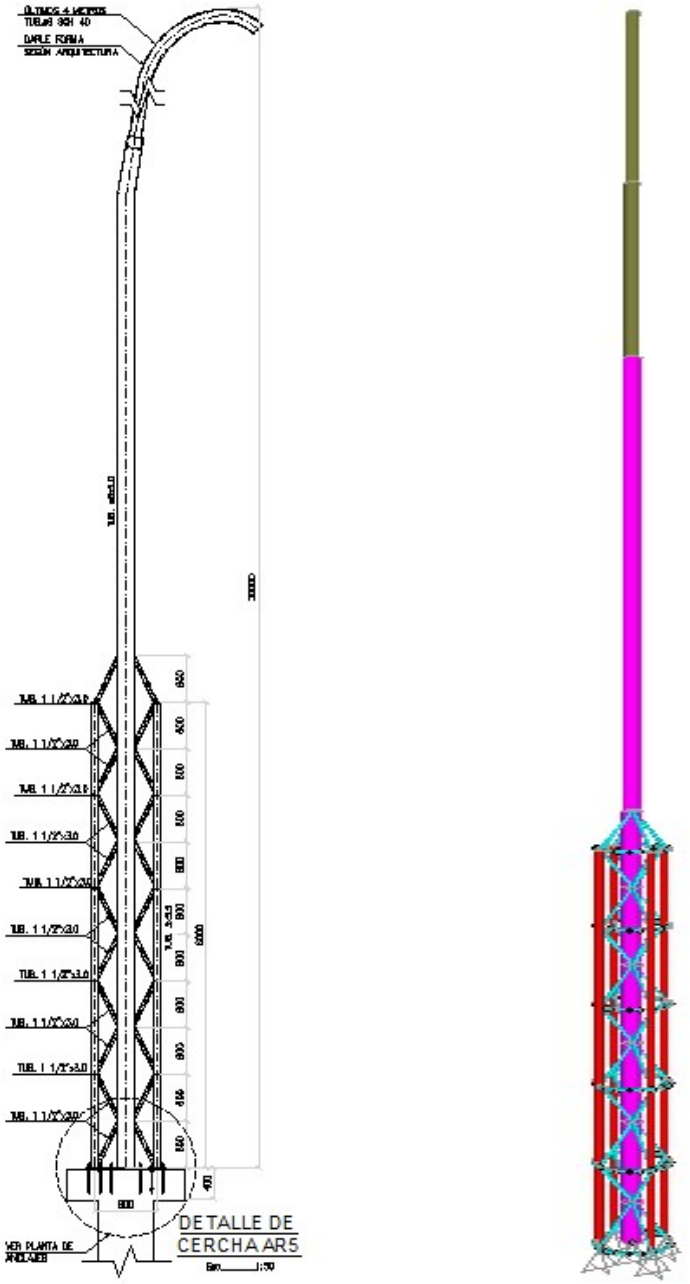


Imagen 9 Geometría del árbol AR5..

2.6.1. NUMERACIÓN DE LOS ELEMENTOS Y NODOS

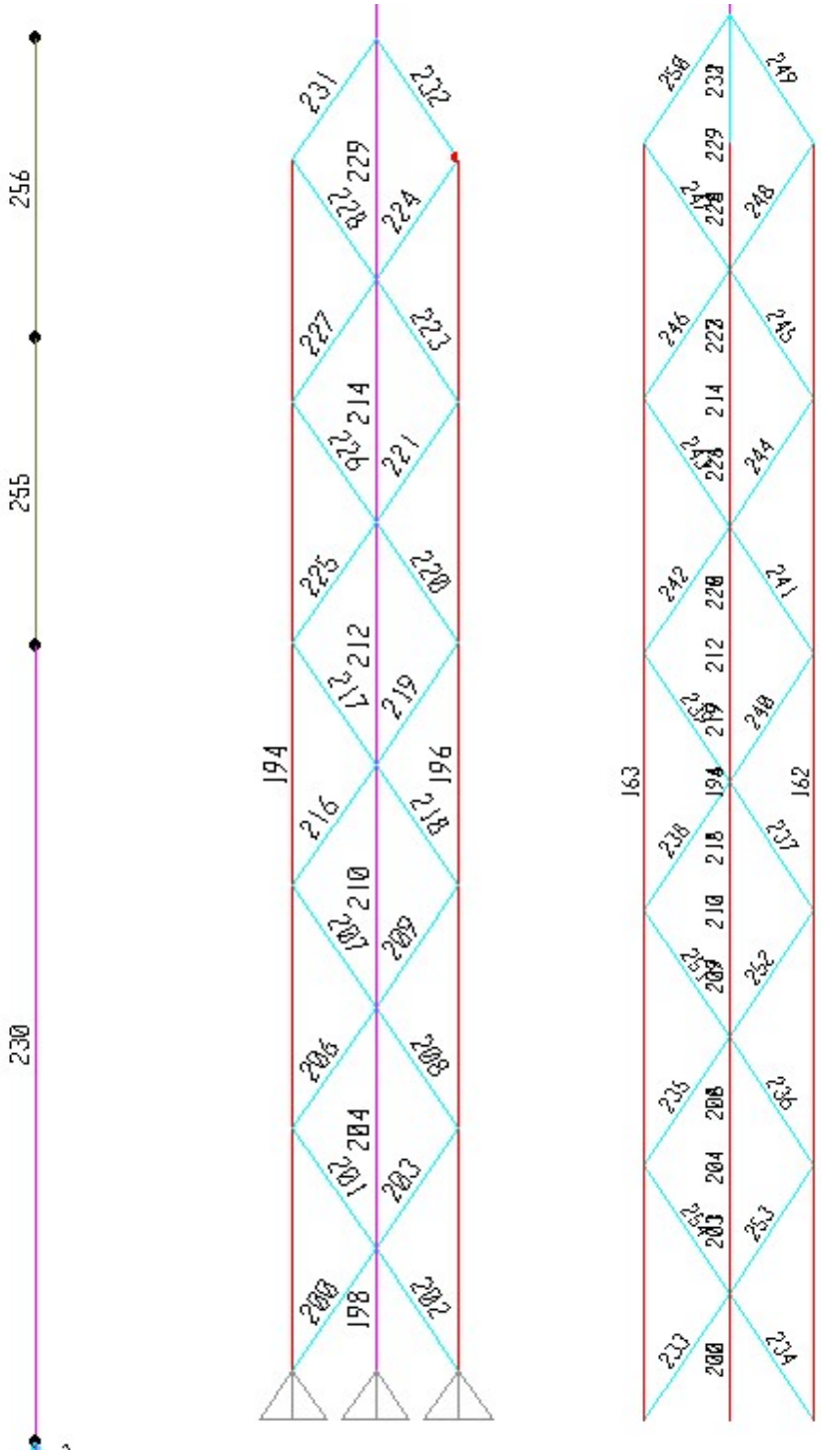


Imagen 10 Numeración de elementos árbol AR5

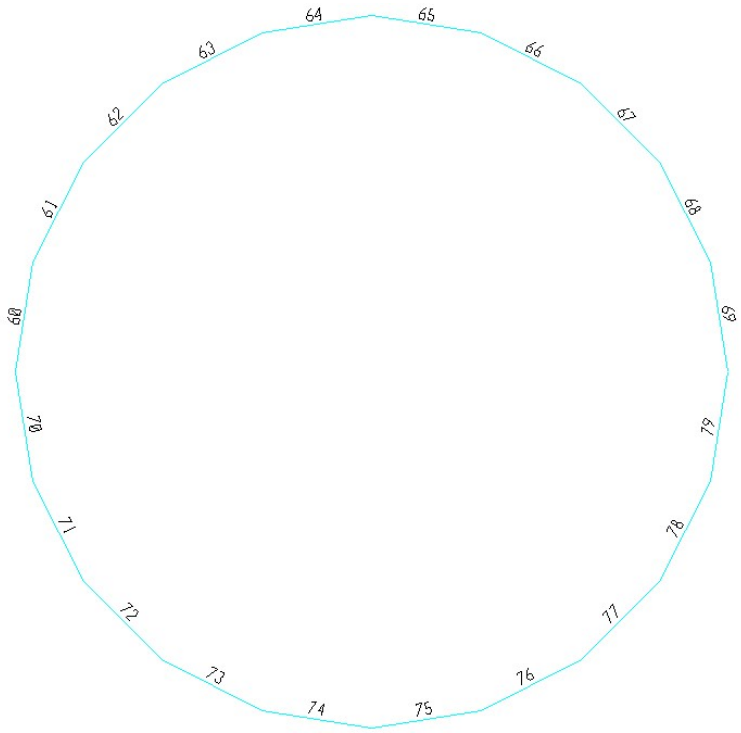


Imagen 11 Numeración de elementos árbol AR5 planta N+1.20

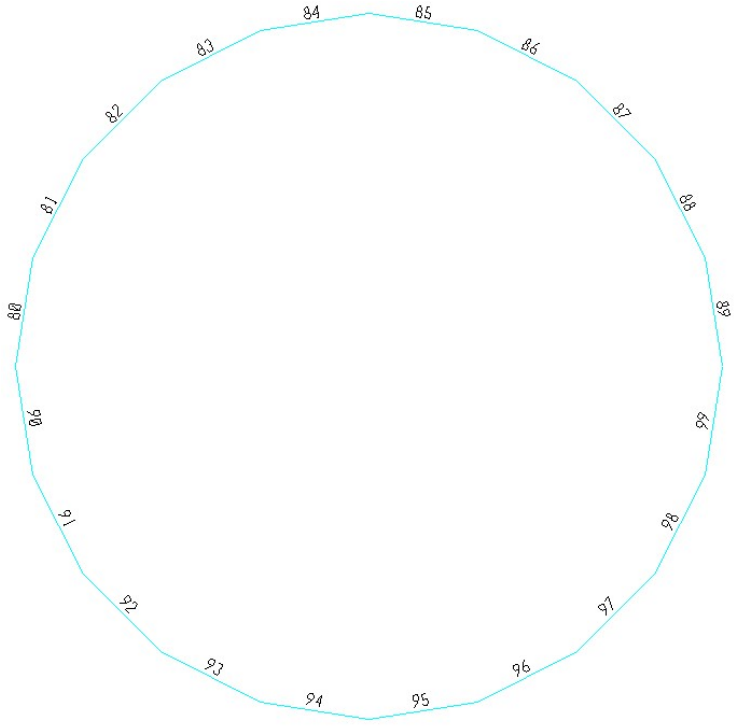


Imagen 12 Numeración de elementos árbol AR5 planta N+2.40

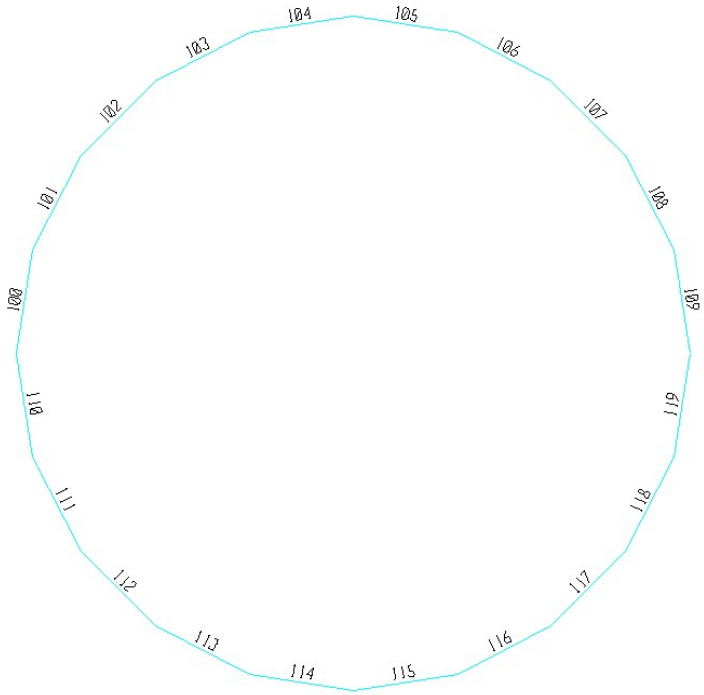


Imagen 13 Numeración de elementos árbol AR5 planta N+3.60

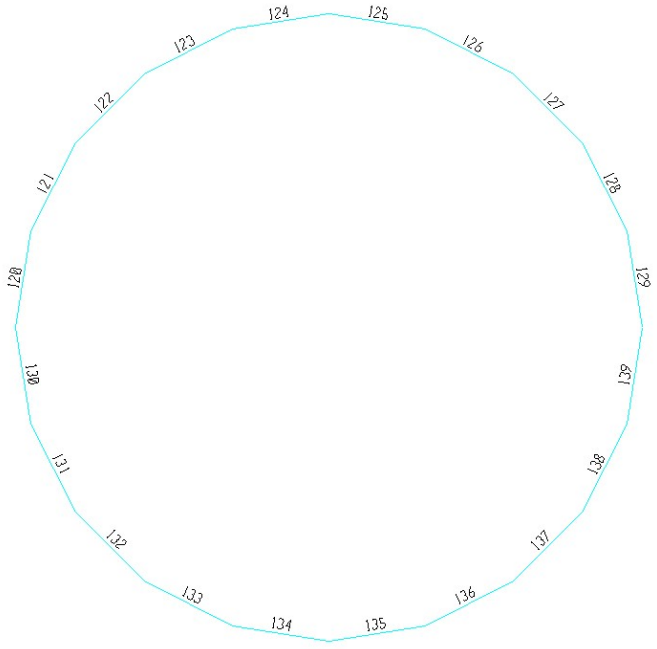


Imagen 14 Numeración de elementos árbol AR5 planta N+4.80

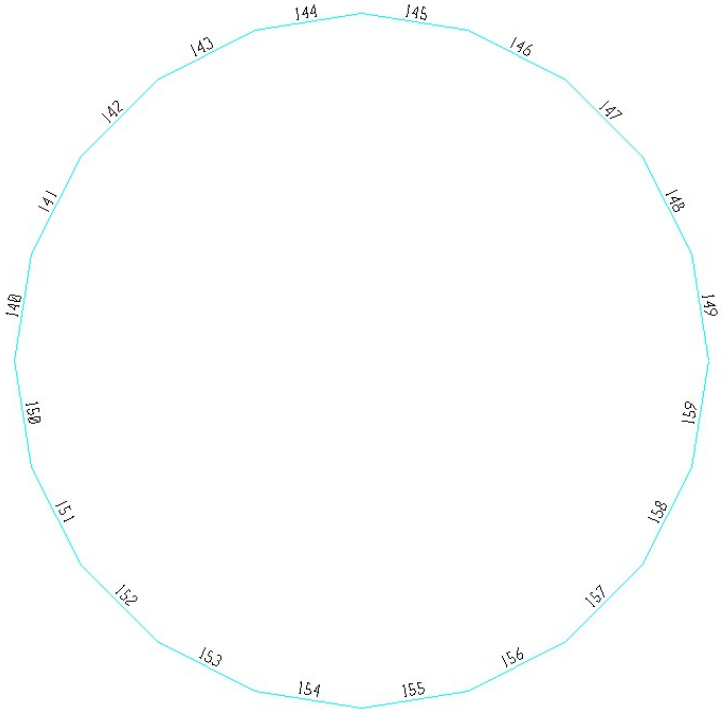


Imagen 15 Numeración de elementos árbol AR5 planta N+6.00

2.6.2. INCIDENCIAS

A continuación se muestran las secciones asignadas a cada uno de los elementos.

TABLE: Frame Section Assignments					
Frame	**SectionType**	**AutoSelect**	**AnalSect**	**DesignSect**	**MatProp**
Text	Text	Text	Text	Text	Text
10	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
11	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
12	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
13	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
14	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
15	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
16	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
17	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
18	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
19	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
50	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
51	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
52	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
53	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
54	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
55	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
56	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
57	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
58	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
59	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
60	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
61	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
62	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
63	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
64	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
65	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
66	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
67	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
68	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
69	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
70	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
71	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
72	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
73	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
74	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
75	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
76	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
77	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
78	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
79	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
80	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
81	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
82	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
83	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
84	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
85	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
86	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
87	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
88	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
89	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
90	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
91	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
92	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
93	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
94	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
95	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
96	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
97	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
98	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
99	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
100	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
101	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
102	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
103	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
104	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
105	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
106	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
107	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
108	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
109	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
110	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
111	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
112	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
113	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
114	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
115	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
116	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
117	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
118	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
119	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
120	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
121	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
122	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
123	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
124	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
125	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
126	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
127	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
128	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
129	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
130	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
131	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
132	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
133	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
134	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
135	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
136	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
137	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
138	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
139	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
140	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
141	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
142	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
143	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
144	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
145	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
146	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
147	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
148	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
149	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
150	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
151	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
152	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
153	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
154	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
155	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
156	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
157	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
158	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
159	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
162	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
163	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
194	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
196	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
198	Pipe	N.A.	TUB. 8x5.0	TUB. 8x5.0	Default
200	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
201	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
202	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
203	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
204	Pipe	N.A.	TUB. 8x5.0	TUB. 8x5.0	Default
206	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
207	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
208	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
209	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
210	Pipe	N.A.	TUB. 8x5.0	TUB. 8x5.0	Default
212	Pipe	N.A.	TUB. 8x5.0	TUB. 8x5.0	Default
214	Pipe	N.A.	TUB. 8x5.0	TUB. 8x5.0	Default
216	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
217	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
218	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
219	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
220	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
221	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
223	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
224	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
225	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
226	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
227	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
228	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
229	Pipe	N.A.	TUB. 8x5.0	TUB. 8x5.0	Default
230	Pipe	N.A.	TUB. 8x5.0	TUB. 8x5.0	Default
231	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
232	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
233	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
234	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
235	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
236	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
237	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
238	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
239	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
240	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
241	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
242	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
243	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
244	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
245	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
246	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
247	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
248	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
249	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
250	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
251	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
252	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
253	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
254	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
255	Pipe	N.A.	TUB. 6x4.0	TUB. 6x4.0	Default
256	Pipe	N.A.	TUB. 6x4.0	TUB. 6x4.0	Default

2.6.3. EVALUACIÓN DEL DISEÑO DE LOS ELEMENTOS

TABLE: Steel Design 1 - Summary Data - AISC360-05-IBC2006				
Frame	**DesignSect**	**DesignType**	**Ratio**	**Combo**
Text	Text	Text	Unitless	Text
10	TUB. 1-1/2x3.0	Beam	0.008741	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
11	TUB. 1-1/2x3.0	Beam	0.005280	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
12	TUB. 1-1/2x3.0	Beam	0.001911	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
13	TUB. 1-1/2x3.0	Beam	0.005280	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
14	TUB. 1-1/2x3.0	Beam	0.008741	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
15	TUB. 1-1/2x3.0	Beam	0.008741	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
16	TUB. 1-1/2x3.0	Beam	0.005280	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
17	TUB. 1-1/2x3.0	Beam	0.001911	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
18	TUB. 1-1/2x3.0	Beam	0.005280	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
19	TUB. 1-1/2x3.0	Beam	0.008741	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
50	TUB. 1-1/2x3.0	Beam	0.008741	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
51	TUB. 1-1/2x3.0	Beam	0.005280	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
52	TUB. 1-1/2x3.0	Beam	0.001911	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
53	TUB. 1-1/2x3.0	Beam	0.005280	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
54	TUB. 1-1/2x3.0	Beam	0.008741	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
55	TUB. 1-1/2x3.0	Beam	0.008741	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
56	TUB. 1-1/2x3.0	Beam	0.005280	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
57	TUB. 1-1/2x3.0	Beam	0.001911	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
58	TUB. 1-1/2x3.0	Beam	0.005280	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
59	TUB. 1-1/2x3.0	Beam	0.008741	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
60	TUB. 1-1/2x3.0	Beam	0.019203	01. 1.4D
61	TUB. 1-1/2x3.0	Beam	0.010716	01. 1.4D
62	TUB. 1-1/2x3.0	Beam	0.010801	01. 1.4D
63	TUB. 1-1/2x3.0	Beam	0.010716	01. 1.4D
64	TUB. 1-1/2x3.0	Beam	0.019203	01. 1.4D
65	TUB. 1-1/2x3.0	Beam	0.019203	01. 1.4D
66	TUB. 1-1/2x3.0	Beam	0.010716	01. 1.4D
67	TUB. 1-1/2x3.0	Beam	0.010801	01. 1.4D
68	TUB. 1-1/2x3.0	Beam	0.010716	01. 1.4D
69	TUB. 1-1/2x3.0	Beam	0.019203	01. 1.4D
70	TUB. 1-1/2x3.0	Beam	0.019203	01. 1.4D
71	TUB. 1-1/2x3.0	Beam	0.010716	01. 1.4D
72	TUB. 1-1/2x3.0	Beam	0.010801	01. 1.4D
73	TUB. 1-1/2x3.0	Beam	0.010716	01. 1.4D

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
74	TUB. 1-1/2x3.0	Beam	0.019203	01. 1.4D
75	TUB. 1-1/2x3.0	Beam	0.019203	01. 1.4D
76	TUB. 1-1/2x3.0	Beam	0.010716	01. 1.4D
77	TUB. 1-1/2x3.0	Beam	0.010801	01. 1.4D
78	TUB. 1-1/2x3.0	Beam	0.010716	01. 1.4D
79	TUB. 1-1/2x3.0	Beam	0.019203	01. 1.4D
80	TUB. 1-1/2x3.0	Beam	0.018724	01. 1.4D
81	TUB. 1-1/2x3.0	Beam	0.010457	01. 1.4D
82	TUB. 1-1/2x3.0	Beam	0.010542	01. 1.4D
83	TUB. 1-1/2x3.0	Beam	0.010457	01. 1.4D
84	TUB. 1-1/2x3.0	Beam	0.018724	01. 1.4D
85	TUB. 1-1/2x3.0	Beam	0.018724	01. 1.4D
86	TUB. 1-1/2x3.0	Beam	0.010457	01. 1.4D
87	TUB. 1-1/2x3.0	Beam	0.010542	01. 1.4D
88	TUB. 1-1/2x3.0	Beam	0.010457	01. 1.4D
89	TUB. 1-1/2x3.0	Beam	0.018724	01. 1.4D
90	TUB. 1-1/2x3.0	Beam	0.018724	01. 1.4D
91	TUB. 1-1/2x3.0	Beam	0.010457	01. 1.4D
92	TUB. 1-1/2x3.0	Beam	0.010542	01. 1.4D
93	TUB. 1-1/2x3.0	Beam	0.010457	01. 1.4D
94	TUB. 1-1/2x3.0	Beam	0.018724	01. 1.4D
95	TUB. 1-1/2x3.0	Beam	0.018724	01. 1.4D
96	TUB. 1-1/2x3.0	Beam	0.010457	01. 1.4D
97	TUB. 1-1/2x3.0	Beam	0.010542	01. 1.4D
98	TUB. 1-1/2x3.0	Beam	0.010457	01. 1.4D
99	TUB. 1-1/2x3.0	Beam	0.018724	01. 1.4D
100	TUB. 1-1/2x3.0	Beam	0.018642	01. 1.4D
101	TUB. 1-1/2x3.0	Beam	0.010409	01. 1.4D
102	TUB. 1-1/2x3.0	Beam	0.010494	01. 1.4D
103	TUB. 1-1/2x3.0	Beam	0.010409	01. 1.4D
104	TUB. 1-1/2x3.0	Beam	0.018642	01. 1.4D
105	TUB. 1-1/2x3.0	Beam	0.018642	01. 1.4D
106	TUB. 1-1/2x3.0	Beam	0.010409	01. 1.4D
107	TUB. 1-1/2x3.0	Beam	0.010494	01. 1.4D
108	TUB. 1-1/2x3.0	Beam	0.010409	01. 1.4D
109	TUB. 1-1/2x3.0	Beam	0.018642	01. 1.4D
110	TUB. 1-1/2x3.0	Beam	0.018642	01. 1.4D
111	TUB. 1-1/2x3.0	Beam	0.010409	01. 1.4D

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
112	TUB. 1-1/2x3.0	Beam	0.010494	01. 1.4D
113	TUB. 1-1/2x3.0	Beam	0.010409	01. 1.4D
114	TUB. 1-1/2x3.0	Beam	0.018642	01. 1.4D
115	TUB. 1-1/2x3.0	Beam	0.018642	01. 1.4D
116	TUB. 1-1/2x3.0	Beam	0.010409	01. 1.4D
117	TUB. 1-1/2x3.0	Beam	0.010494	01. 1.4D
118	TUB. 1-1/2x3.0	Beam	0.010409	01. 1.4D
119	TUB. 1-1/2x3.0	Beam	0.018642	01. 1.4D
120	TUB. 1-1/2x3.0	Beam	0.023049	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
121	TUB. 1-1/2x3.0	Beam	0.011844	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
122	TUB. 1-1/2x3.0	Beam	0.011950	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
123	TUB. 1-1/2x3.0	Beam	0.011844	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
124	TUB. 1-1/2x3.0	Beam	0.023049	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
125	TUB. 1-1/2x3.0	Beam	0.023049	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
126	TUB. 1-1/2x3.0	Beam	0.011844	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
127	TUB. 1-1/2x3.0	Beam	0.011950	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
128	TUB. 1-1/2x3.0	Beam	0.011844	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
129	TUB. 1-1/2x3.0	Beam	0.023049	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
130	TUB. 1-1/2x3.0	Beam	0.023049	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
131	TUB. 1-1/2x3.0	Beam	0.011844	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
132	TUB. 1-1/2x3.0	Beam	0.011950	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
133	TUB. 1-1/2x3.0	Beam	0.011844	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
134	TUB. 1-1/2x3.0	Beam	0.023049	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
135	TUB. 1-1/2x3.0	Beam	0.023049	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
136	TUB. 1-1/2x3.0	Beam	0.011844	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
137	TUB. 1-1/2x3.0	Beam	0.011950	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
138	TUB. 1-1/2x3.0	Beam	0.011844	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
139	TUB. 1-1/2x3.0	Beam	0.023049	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
140	TUB. 1-1/2x3.0	Beam	0.038653	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
141	TUB. 1-1/2x3.0	Beam	0.022126	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
142	TUB. 1-1/2x3.0	Beam	0.022239	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
143	TUB. 1-1/2x3.0	Beam	0.022126	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
144	TUB. 1-1/2x3.0	Beam	0.038653	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
145	TUB. 1-1/2x3.0	Beam	0.038653	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
146	TUB. 1-1/2x3.0	Beam	0.022126	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
147	TUB. 1-1/2x3.0	Beam	0.022239	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
148	TUB. 1-1/2x3.0	Beam	0.022126	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
149	TUB. 1-1/2x3.0	Beam	0.038653	04. 1.2D+0.5L+(+EQX-0.3EQY)/R

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
150	TUB. 1-1/2x3.0	Beam	0.038653	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
151	TUB. 1-1/2x3.0	Beam	0.022126	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
152	TUB. 1-1/2x3.0	Beam	0.022239	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
153	TUB. 1-1/2x3.0	Beam	0.022126	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
154	TUB. 1-1/2x3.0	Beam	0.038653	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
155	TUB. 1-1/2x3.0	Beam	0.038653	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
156	TUB. 1-1/2x3.0	Beam	0.022126	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
157	TUB. 1-1/2x3.0	Beam	0.022239	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
158	TUB. 1-1/2x3.0	Beam	0.022126	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
159	TUB. 1-1/2x3.0	Beam	0.038653	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
162	TUB. 3x5.5	Column	0.037335	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
163	TUB. 3x5.5	Column	0.037335	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
194	TUB. 3x5.5	Column	0.068930	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
196	TUB. 3x5.5	Column	0.068930	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
198	TUB. 8x5.0	Column	0.019634	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
200	TUB. 1-1/2x3.0	Brace	0.036950	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
201	TUB. 1-1/2x3.0	Brace	0.016787	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
202	TUB. 1-1/2x3.0	Brace	0.036950	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
203	TUB. 1-1/2x3.0	Brace	0.016787	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
204	TUB. 8x5.0	Column	0.020503	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
206	TUB. 1-1/2x3.0	Brace	0.017334	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
207	TUB. 1-1/2x3.0	Brace	0.016244	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
208	TUB. 1-1/2x3.0	Brace	0.017334	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
209	TUB. 1-1/2x3.0	Brace	0.016244	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
210	TUB. 8x5.0	Column	0.017317	01. 1.4D
212	TUB. 8x5.0	Column	0.017335	01. 1.4D
214	TUB. 8x5.0	Column	0.019469	01. 1.4D
216	TUB. 1-1/2x3.0	Brace	0.016996	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
217	TUB. 1-1/2x3.0	Brace	0.014532	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
218	TUB. 1-1/2x3.0	Brace	0.016996	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
219	TUB. 1-1/2x3.0	Brace	0.014532	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
220	TUB. 1-1/2x3.0	Brace	0.018521	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
221	TUB. 1-1/2x3.0	Brace	0.006331	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
223	TUB. 1-1/2x3.0	Brace	0.013707	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
224	TUB. 1-1/2x3.0	Brace	0.055937	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
225	TUB. 1-1/2x3.0	Brace	0.018521	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
226	TUB. 1-1/2x3.0	Brace	0.006331	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
227	TUB. 1-1/2x3.0	Brace	0.013707	06. 1.2D+0.5L+(-EQX+0.3EQY)/R

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
228	TUB. 1-1/2x3.0	Brace	0.055937	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
229	TUB. 8x5.0	Column	0.136554	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
230	TUB. 8x5.0	Column	0.165105	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
231	TUB. 1-1/2x3.0	Brace	0.112543	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
232	TUB. 1-1/2x3.0	Brace	0.112543	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
233	TUB. 1-1/2x3.0	Brace	0.036950	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
234	TUB. 1-1/2x3.0	Brace	0.036950	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
235	TUB. 1-1/2x3.0	Brace	0.017334	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
236	TUB. 1-1/2x3.0	Brace	0.017334	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
237	TUB. 1-1/2x3.0	Brace	0.016996	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
238	TUB. 1-1/2x3.0	Brace	0.016996	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
239	TUB. 1-1/2x3.0	Brace	0.014532	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
240	TUB. 1-1/2x3.0	Brace	0.014532	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
241	TUB. 1-1/2x3.0	Brace	0.018521	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
242	TUB. 1-1/2x3.0	Brace	0.018521	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
243	TUB. 1-1/2x3.0	Brace	0.006331	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
244	TUB. 1-1/2x3.0	Brace	0.006331	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
245	TUB. 1-1/2x3.0	Brace	0.013707	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
246	TUB. 1-1/2x3.0	Brace	0.013707	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
247	TUB. 1-1/2x3.0	Brace	0.055937	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
248	TUB. 1-1/2x3.0	Brace	0.055937	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
249	TUB. 1-1/2x3.0	Brace	0.112543	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
250	TUB. 1-1/2x3.0	Brace	0.112543	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
251	TUB. 1-1/2x3.0	Brace	0.016244	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
252	TUB. 1-1/2x3.0	Brace	0.016244	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
253	TUB. 1-1/2x3.0	Brace	0.016787	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
254	TUB. 1-1/2x3.0	Brace	0.016787	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
255	TUB. 6x4.0	Column	0.086188	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
256	TUB. 6x4.0	Column	0.014848	03. 1.2D+0.5L+(+EQX+0.3EQY)/R

Según la tabla del diseño de los elementos, las secciones diseñadas tienen un índice de utilización (*Ratio)* máximo de 0.070 lo cual quiere decir que funciona.

2.7. DISEÑO ÁRBOL AR6

Los resultados obtenidos del análisis y diseño del árbol AR6 serán mostrados a continuación.

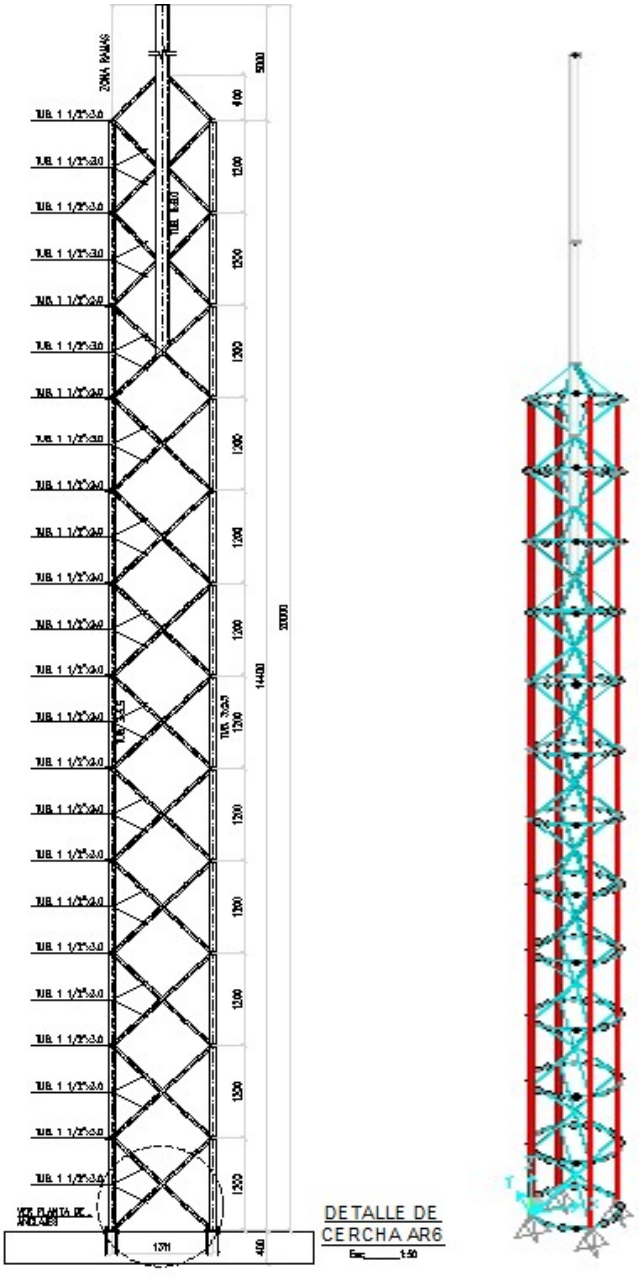


Imagen 16 Geometría del árbol AR6.

2.7.1. NUMERACIÓN DE LOS ELEMENTOS Y NODOS

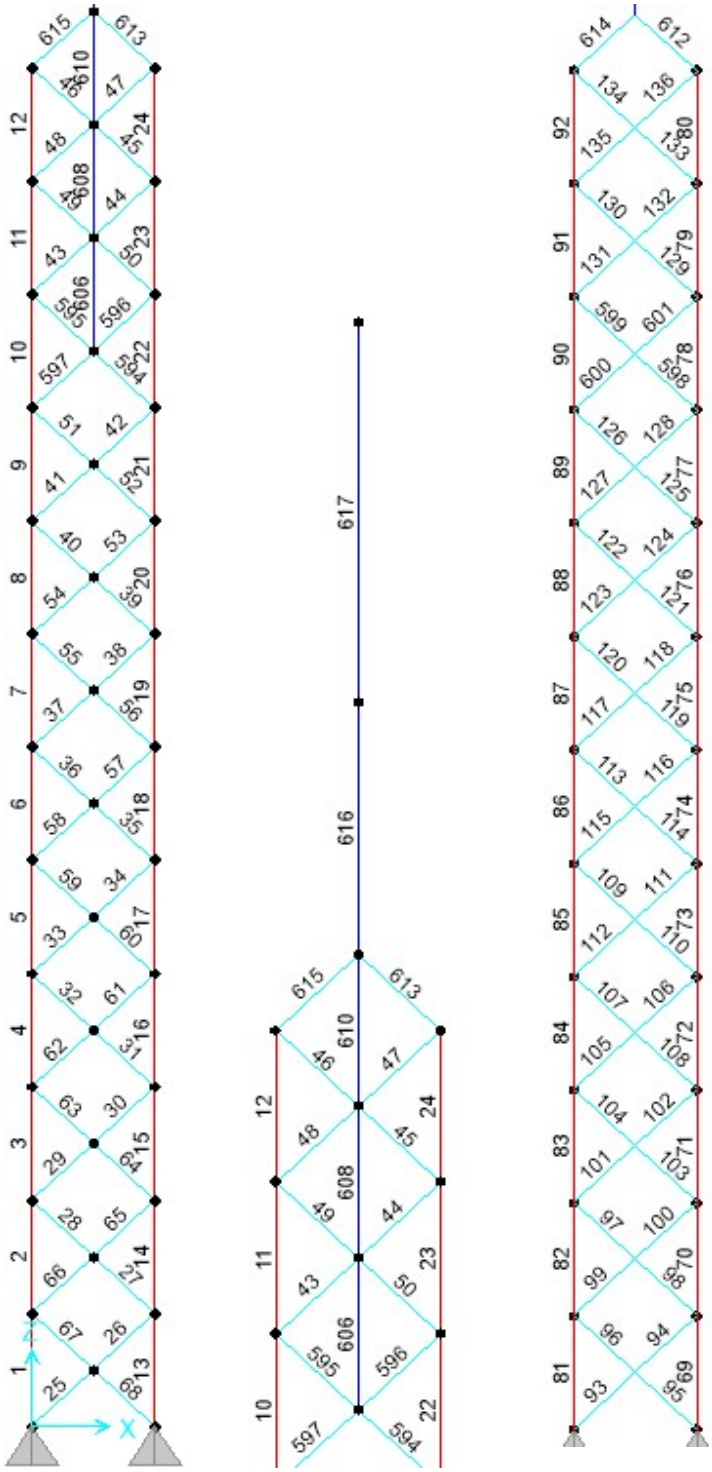


Imagen 17 Numeración de elementos árbol AR6

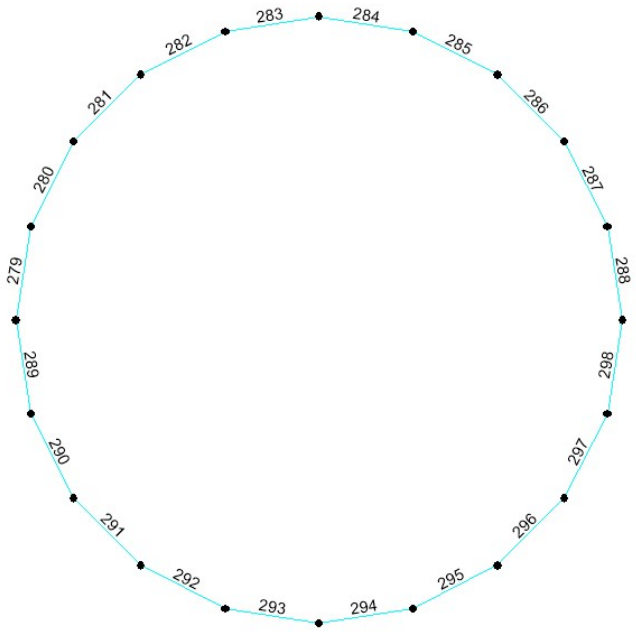


Imagen 18 Numeración de elementos árbol AR5 planta N+1.20

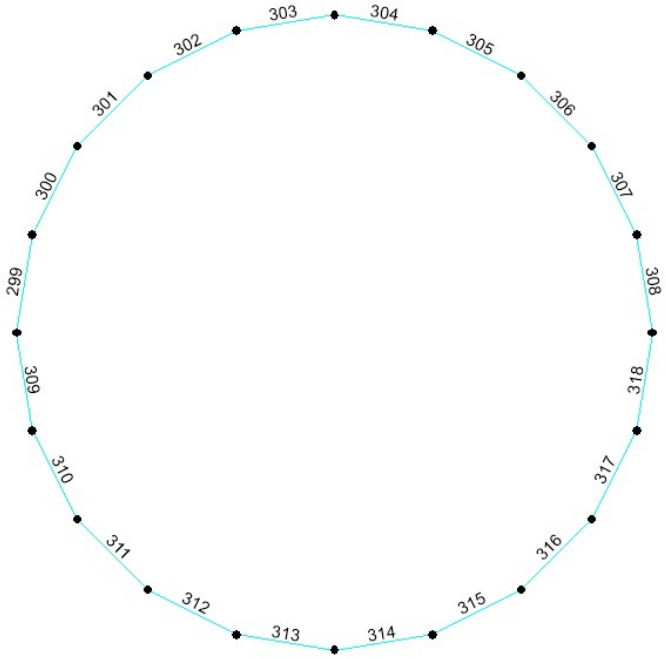


Imagen 19 Numeración de elementos árbol AR5 planta N+2.40

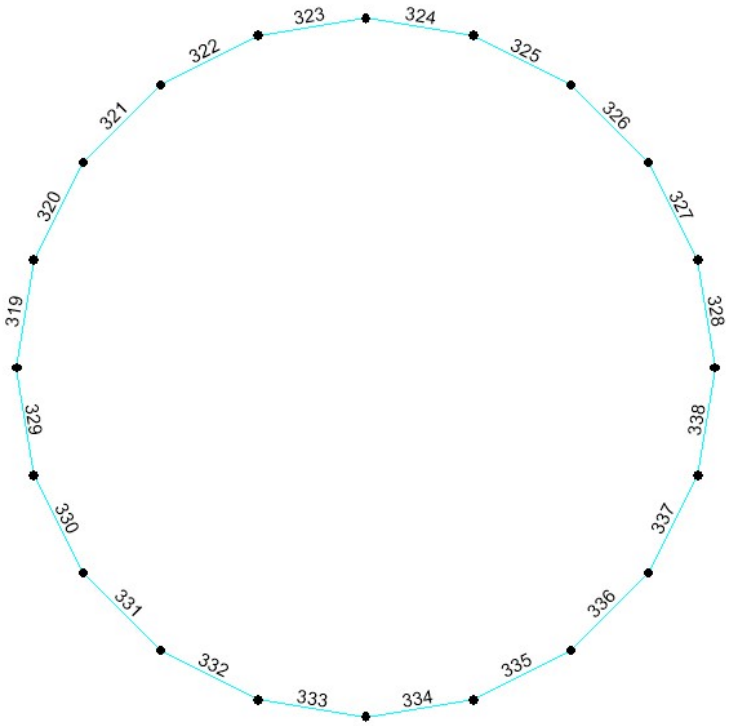


Imagen 20 Numeración de elementos árbol AR5 planta N+3.60

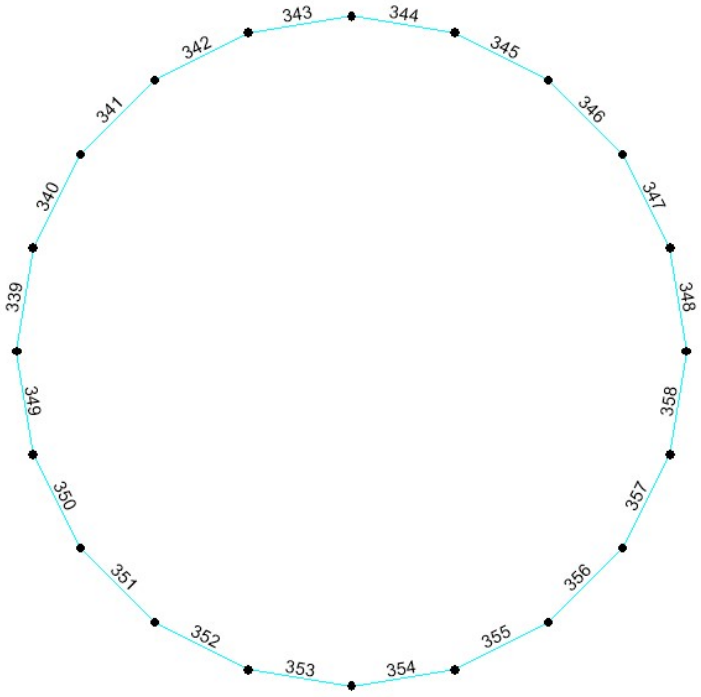


Imagen 21 Numeración de elementos árbol AR5 planta N+4.80

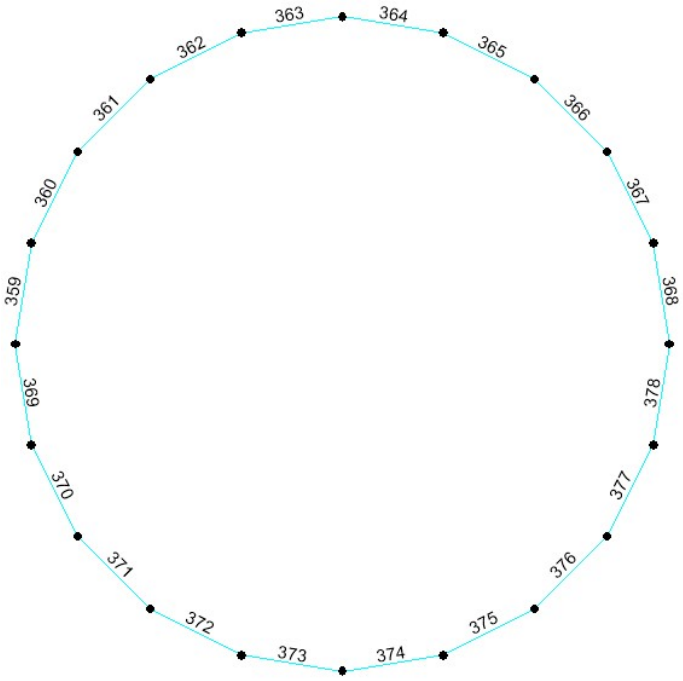


Imagen 22 Numeración de elementos árbol AR5 planta N+6.00

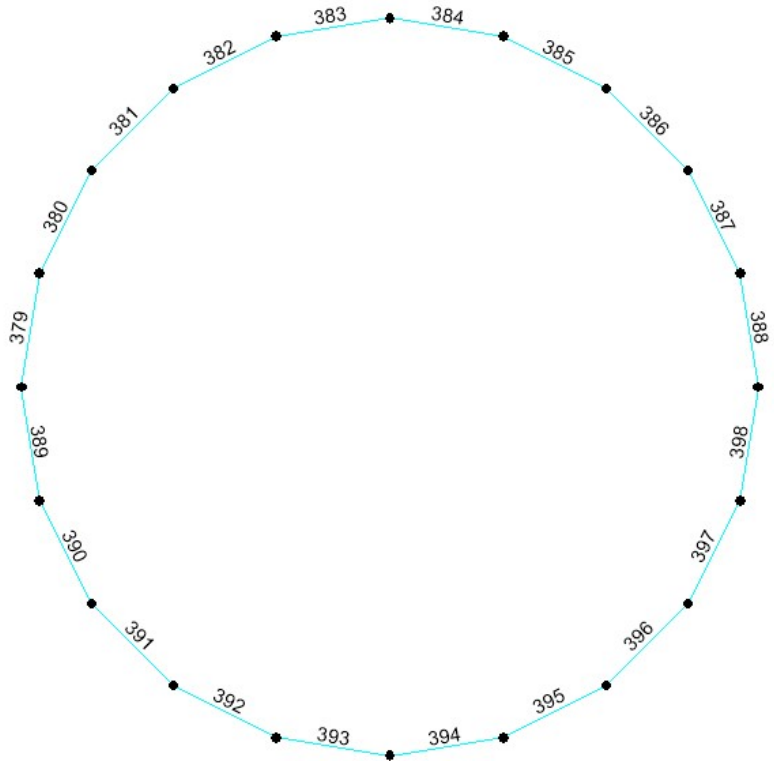


Imagen 23 Numeración de elementos árbol AR5 planta N+7.20

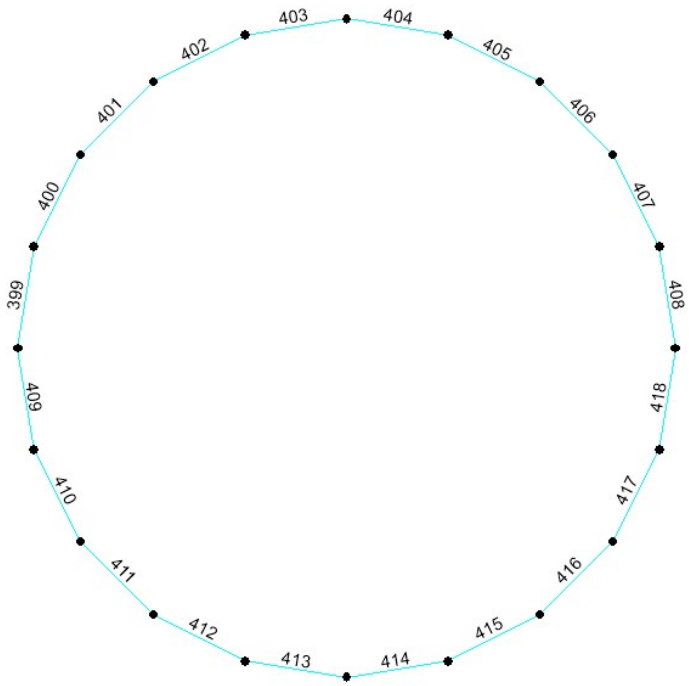


Imagen 24 Numeración de elementos árbol AR5 planta N+8.40

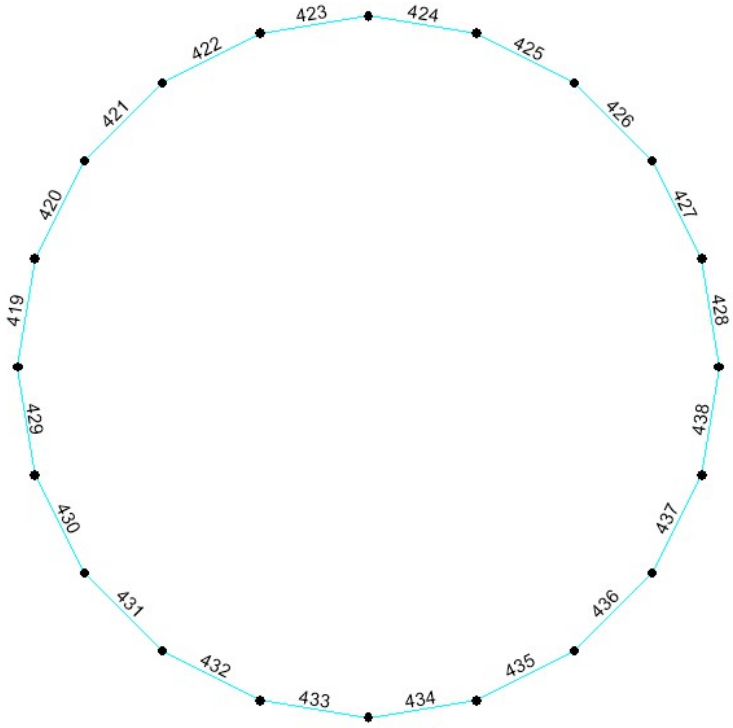


Imagen 25 Numeración de elementos árbol AR5 planta N+9.60

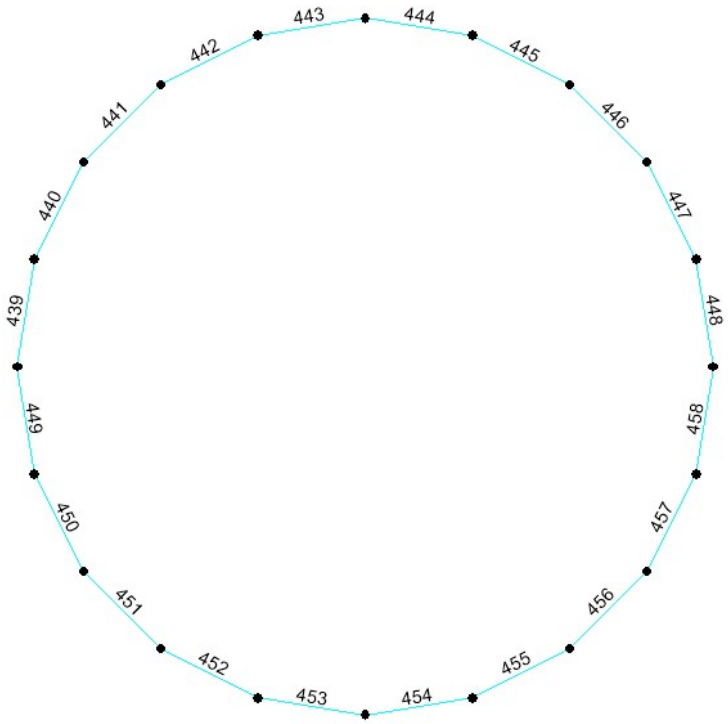


Imagen 26 Numeración de elementos árbol AR5 planta N+10.8

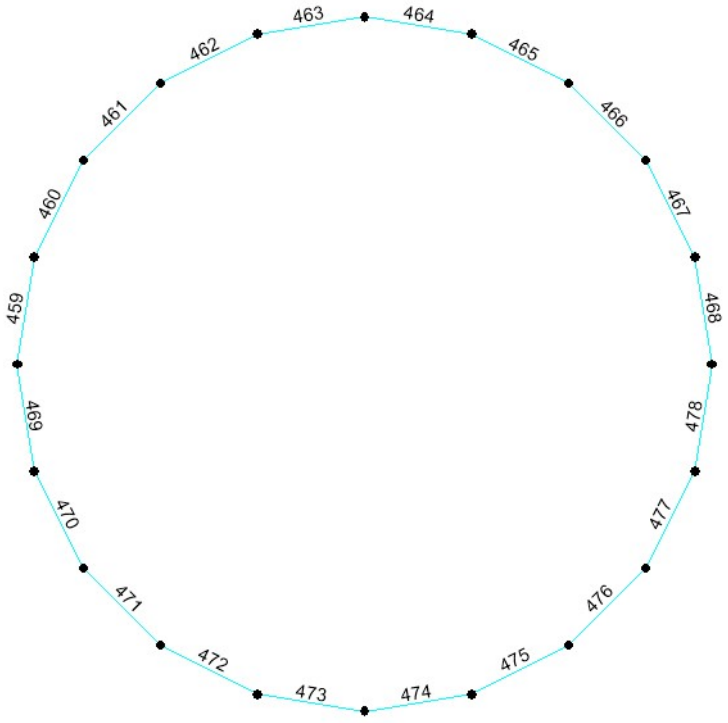


Imagen 27 Numeración de elementos árbol AR5 planta N+12.00

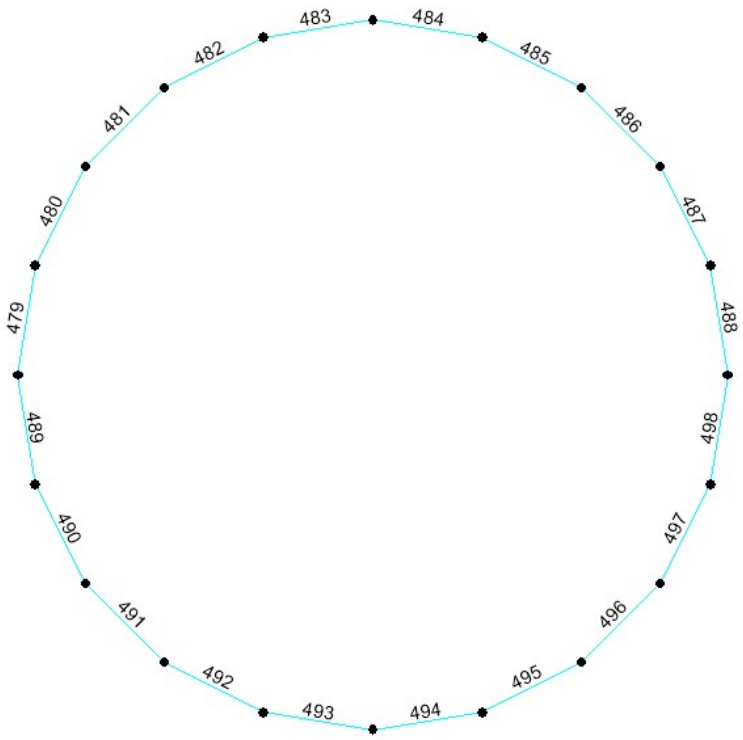


Imagen 28 Numeración de elementos árbol AR5 planta N+13.20

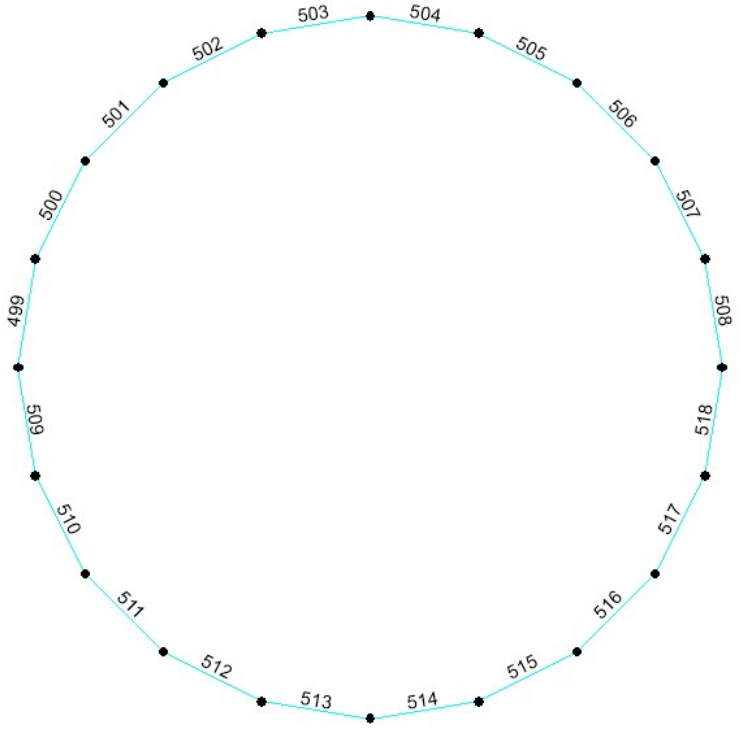


Imagen 29 Numeración de elementos árbol AR5 planta N+14.40

2.7.2. INCIDENCIAS

A continuación se muestran las secciones asignadas a cada uno de los elementos.

TABLE: Frame Section Assignments					
Frame	**SectionType**	**AutoSelect**	**AnalSect**	**DesignSect**	**MatProp**
Text	Text	Text	Text	Text	Text
1	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
2	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
3	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
4	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
5	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
6	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
7	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
8	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
9	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
10	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
11	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
12	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
13	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
14	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
15	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
16	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
17	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
18	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
19	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
20	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
21	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
22	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
23	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
24	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
25	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
26	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
27	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
28	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
29	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
30	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
31	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
32	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
33	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
34	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
35	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
36	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
37	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
38	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
39	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
40	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
41	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
42	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
43	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
44	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
45	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
46	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
47	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
48	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
49	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
50	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
51	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
52	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
53	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
54	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
55	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
56	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
57	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
58	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
59	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
60	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
61	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
62	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
63	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
64	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
65	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
66	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
67	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
68	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
69	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
70	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
71	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
72	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
73	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
74	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
75	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
76	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
77	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
78	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
79	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
80	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
81	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
82	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
83	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
84	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
85	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
86	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
87	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
88	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
89	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
90	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
91	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
92	Pipe	N.A.	TUB. 3x5.5	TUB. 3x5.5	Default
93	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
94	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
95	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
96	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
97	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
98	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
99	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
100	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
101	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
102	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
103	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
104	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
105	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
106	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
107	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
108	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
109	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
110	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
111	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
112	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
113	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
114	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
115	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
116	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
117	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
118	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
119	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
120	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
121	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
122	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
123	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
124	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
125	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
126	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
127	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
128	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
129	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
130	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
131	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
132	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
133	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
134	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
135	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
136	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
279	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
280	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
281	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
282	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
283	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
284	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
285	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
286	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
287	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
288	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
289	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
290	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
291	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
292	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
293	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
294	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
295	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
296	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
297	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
298	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
299	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
300	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
301	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
302	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
303	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
304	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
305	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
306	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
307	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
308	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
309	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
310	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
311	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
312	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
313	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
314	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
315	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
316	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
317	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
318	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
319	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
320	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
321	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
322	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
323	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
324	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
325	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
326	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
327	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
328	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
329	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
330	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
331	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
332	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
333	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
334	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
335	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
336	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
337	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
338	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
339	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
340	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
341	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
342	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
343	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
344	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
345	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
346	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
347	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
348	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
349	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
350	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
351	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
352	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
353	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
354	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
355	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
356	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
357	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
358	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
359	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
360	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
361	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
362	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
363	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
364	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
365	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
366	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
367	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
368	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
369	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
370	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
371	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
372	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
373	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
374	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
375	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
376	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
377	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
378	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
379	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
380	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
381	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
382	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
383	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
384	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
385	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
386	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
387	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
388	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
389	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
390	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
391	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
392	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
393	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
394	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
395	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
396	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
397	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
398	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
399	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
400	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
401	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
402	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
403	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
404	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
405	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
406	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
407	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
408	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
409	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
410	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
411	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
412	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
413	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
414	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
415	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
416	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
417	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
418	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
419	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
420	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
421	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
422	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
423	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
424	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
425	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
426	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
427	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
428	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
429	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
430	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
431	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
432	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
433	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
434	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
435	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
436	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
437	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
438	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
439	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
440	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
441	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
442	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
443	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
444	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
445	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
446	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
447	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
448	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
449	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
450	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
451	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
452	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
453	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
454	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
455	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
456	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
457	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
458	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
459	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
460	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
461	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
462	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
463	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
464	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
465	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
466	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
467	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
468	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
469	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
470	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
471	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
472	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
473	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
474	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
475	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
476	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
477	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
478	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
479	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
480	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
481	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
482	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
483	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
484	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
485	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
486	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
487	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
488	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
489	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
490	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
491	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
492	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
493	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
494	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
495	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
496	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
497	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
498	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
499	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
500	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
501	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
502	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
503	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
504	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
505	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
506	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
507	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
508	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
509	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
510	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
511	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
512	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
513	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
514	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
515	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
516	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
517	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
518	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
594	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
595	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
596	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
597	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
598	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
599	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
600	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
601	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
606	Pipe	N.A.	TUB. 6x6.0	TUB. 6x6.0	Default
608	Pipe	N.A.	TUB. 6x6.0	TUB. 6x6.0	Default
610	Pipe	N.A.	TUB. 6x6.0	TUB. 6x6.0	Default
612	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
613	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
614	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
615	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
616	Pipe	N.A.	TUB. 6x6.0	TUB. 6x6.0	Default
617	Pipe	N.A.	TUB. 6x6.0	TUB. 6x6.0	Default

2.7.3. EVALUACIÓN DEL DISEÑO DE LOS ELEMENTOS

TABLE: Steel Design 1 - Summary Data - AISC360-05-IBC2006				
Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
279	TUB. 1-1/2x3.0	Beam	0.016163	01. 1.4D
280	TUB. 1-1/2x3.0	Beam	0.008683	01. 1.4D
281	TUB. 1-1/2x3.0	Beam	0.008744	01. 1.4D
282	TUB. 1-1/2x3.0	Beam	0.008683	01. 1.4D
283	TUB. 1-1/2x3.0	Beam	0.016163	01. 1.4D
284	TUB. 1-1/2x3.0	Beam	0.016163	01. 1.4D
285	TUB. 1-1/2x3.0	Beam	0.008683	01. 1.4D
286	TUB. 1-1/2x3.0	Beam	0.008744	01. 1.4D
287	TUB. 1-1/2x3.0	Beam	0.008683	01. 1.4D
288	TUB. 1-1/2x3.0	Beam	0.016163	01. 1.4D
289	TUB. 1-1/2x3.0	Beam	0.016163	01. 1.4D
290	TUB. 1-1/2x3.0	Beam	0.008683	01. 1.4D
291	TUB. 1-1/2x3.0	Beam	0.008744	01. 1.4D

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
292	TUB. 1-1/2x3.0	Beam	0.008683	01. 1.4D
293	TUB. 1-1/2x3.0	Beam	0.016163	01. 1.4D
294	TUB. 1-1/2x3.0	Beam	0.016163	01. 1.4D
295	TUB. 1-1/2x3.0	Beam	0.008683	01. 1.4D
296	TUB. 1-1/2x3.0	Beam	0.008744	01. 1.4D
297	TUB. 1-1/2x3.0	Beam	0.008683	01. 1.4D
298	TUB. 1-1/2x3.0	Beam	0.016163	01. 1.4D
299	TUB. 1-1/2x3.0	Beam	0.008914	01. 1.4D
300	TUB. 1-1/2x3.0	Beam	0.004762	01. 1.4D
301	TUB. 1-1/2x3.0	Beam	0.004824	01. 1.4D
302	TUB. 1-1/2x3.0	Beam	0.004762	01. 1.4D
303	TUB. 1-1/2x3.0	Beam	0.008914	01. 1.4D
304	TUB. 1-1/2x3.0	Beam	0.008914	01. 1.4D
305	TUB. 1-1/2x3.0	Beam	0.004762	01. 1.4D
306	TUB. 1-1/2x3.0	Beam	0.004824	01. 1.4D
307	TUB. 1-1/2x3.0	Beam	0.004762	01. 1.4D
308	TUB. 1-1/2x3.0	Beam	0.008914	01. 1.4D
309	TUB. 1-1/2x3.0	Beam	0.008914	01. 1.4D
310	TUB. 1-1/2x3.0	Beam	0.004762	01. 1.4D
311	TUB. 1-1/2x3.0	Beam	0.004824	01. 1.4D
312	TUB. 1-1/2x3.0	Beam	0.004762	01. 1.4D
313	TUB. 1-1/2x3.0	Beam	0.008914	01. 1.4D
314	TUB. 1-1/2x3.0	Beam	0.008914	01. 1.4D
315	TUB. 1-1/2x3.0	Beam	0.004762	01. 1.4D
316	TUB. 1-1/2x3.0	Beam	0.004824	01. 1.4D
317	TUB. 1-1/2x3.0	Beam	0.004762	01. 1.4D
318	TUB. 1-1/2x3.0	Beam	0.008914	01. 1.4D
319	TUB. 1-1/2x3.0	Beam	0.011514	01. 1.4D
320	TUB. 1-1/2x3.0	Beam	0.006148	01. 1.4D
321	TUB. 1-1/2x3.0	Beam	0.006204	01. 1.4D
322	TUB. 1-1/2x3.0	Beam	0.006148	01. 1.4D
323	TUB. 1-1/2x3.0	Beam	0.011514	01. 1.4D
324	TUB. 1-1/2x3.0	Beam	0.011514	01. 1.4D
325	TUB. 1-1/2x3.0	Beam	0.006148	01. 1.4D
326	TUB. 1-1/2x3.0	Beam	0.006204	01. 1.4D
327	TUB. 1-1/2x3.0	Beam	0.006148	01. 1.4D
328	TUB. 1-1/2x3.0	Beam	0.011514	01. 1.4D
329	TUB. 1-1/2x3.0	Beam	0.011514	01. 1.4D

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
330	TUB. 1-1/2x3.0	Beam	0.006148	01. 1.4D
331	TUB. 1-1/2x3.0	Beam	0.006204	01. 1.4D
332	TUB. 1-1/2x3.0	Beam	0.006148	01. 1.4D
333	TUB. 1-1/2x3.0	Beam	0.011514	01. 1.4D
334	TUB. 1-1/2x3.0	Beam	0.011514	01. 1.4D
335	TUB. 1-1/2x3.0	Beam	0.006148	01. 1.4D
336	TUB. 1-1/2x3.0	Beam	0.006204	01. 1.4D
337	TUB. 1-1/2x3.0	Beam	0.006148	01. 1.4D
338	TUB. 1-1/2x3.0	Beam	0.011514	01. 1.4D
339	TUB. 1-1/2x3.0	Beam	0.010107	01. 1.4D
340	TUB. 1-1/2x3.0	Beam	0.005393	01. 1.4D
341	TUB. 1-1/2x3.0	Beam	0.005451	01. 1.4D
342	TUB. 1-1/2x3.0	Beam	0.005393	01. 1.4D
343	TUB. 1-1/2x3.0	Beam	0.010107	01. 1.4D
344	TUB. 1-1/2x3.0	Beam	0.010107	01. 1.4D
345	TUB. 1-1/2x3.0	Beam	0.005393	01. 1.4D
346	TUB. 1-1/2x3.0	Beam	0.005451	01. 1.4D
347	TUB. 1-1/2x3.0	Beam	0.005393	01. 1.4D
348	TUB. 1-1/2x3.0	Beam	0.010107	01. 1.4D
349	TUB. 1-1/2x3.0	Beam	0.010107	01. 1.4D
350	TUB. 1-1/2x3.0	Beam	0.005393	01. 1.4D
351	TUB. 1-1/2x3.0	Beam	0.005451	01. 1.4D
352	TUB. 1-1/2x3.0	Beam	0.005393	01. 1.4D
353	TUB. 1-1/2x3.0	Beam	0.010107	01. 1.4D
354	TUB. 1-1/2x3.0	Beam	0.010107	01. 1.4D
355	TUB. 1-1/2x3.0	Beam	0.005393	01. 1.4D
356	TUB. 1-1/2x3.0	Beam	0.005451	01. 1.4D
357	TUB. 1-1/2x3.0	Beam	0.005393	01. 1.4D
358	TUB. 1-1/2x3.0	Beam	0.010107	01. 1.4D
359	TUB. 1-1/2x3.0	Beam	0.010552	01. 1.4D
360	TUB. 1-1/2x3.0	Beam	0.005636	01. 1.4D
361	TUB. 1-1/2x3.0	Beam	0.005694	01. 1.4D
362	TUB. 1-1/2x3.0	Beam	0.005636	01. 1.4D
363	TUB. 1-1/2x3.0	Beam	0.010552	01. 1.4D
364	TUB. 1-1/2x3.0	Beam	0.010552	01. 1.4D
365	TUB. 1-1/2x3.0	Beam	0.005636	01. 1.4D
366	TUB. 1-1/2x3.0	Beam	0.005694	01. 1.4D
367	TUB. 1-1/2x3.0	Beam	0.005636	01. 1.4D

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
368	TUB. 1-1/2x3.0	Beam	0.010552	01. 1.4D
369	TUB. 1-1/2x3.0	Beam	0.010552	01. 1.4D
370	TUB. 1-1/2x3.0	Beam	0.005636	01. 1.4D
371	TUB. 1-1/2x3.0	Beam	0.005694	01. 1.4D
372	TUB. 1-1/2x3.0	Beam	0.005636	01. 1.4D
373	TUB. 1-1/2x3.0	Beam	0.010552	01. 1.4D
374	TUB. 1-1/2x3.0	Beam	0.010552	01. 1.4D
375	TUB. 1-1/2x3.0	Beam	0.005636	01. 1.4D
376	TUB. 1-1/2x3.0	Beam	0.005694	01. 1.4D
377	TUB. 1-1/2x3.0	Beam	0.005636	01. 1.4D
378	TUB. 1-1/2x3.0	Beam	0.010552	01. 1.4D
379	TUB. 1-1/2x3.0	Beam	0.009448	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
380	TUB. 1-1/2x3.0	Beam	0.005015	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
381	TUB. 1-1/2x3.0	Beam	0.005056	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
382	TUB. 1-1/2x3.0	Beam	0.005015	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
383	TUB. 1-1/2x3.0	Beam	0.009448	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
384	TUB. 1-1/2x3.0	Beam	0.009448	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
385	TUB. 1-1/2x3.0	Beam	0.005015	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
386	TUB. 1-1/2x3.0	Beam	0.005056	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
387	TUB. 1-1/2x3.0	Beam	0.005015	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
388	TUB. 1-1/2x3.0	Beam	0.009448	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
389	TUB. 1-1/2x3.0	Beam	0.009448	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
390	TUB. 1-1/2x3.0	Beam	0.005015	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
391	TUB. 1-1/2x3.0	Beam	0.005056	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
392	TUB. 1-1/2x3.0	Beam	0.005015	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
393	TUB. 1-1/2x3.0	Beam	0.009448	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
394	TUB. 1-1/2x3.0	Beam	0.009448	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
395	TUB. 1-1/2x3.0	Beam	0.005015	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
396	TUB. 1-1/2x3.0	Beam	0.005056	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
397	TUB. 1-1/2x3.0	Beam	0.005015	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
398	TUB. 1-1/2x3.0	Beam	0.009448	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
399	TUB. 1-1/2x3.0	Beam	0.011610	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
400	TUB. 1-1/2x3.0	Beam	0.006216	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
401	TUB. 1-1/2x3.0	Beam	0.006256	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
402	TUB. 1-1/2x3.0	Beam	0.006216	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
403	TUB. 1-1/2x3.0	Beam	0.011610	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
404	TUB. 1-1/2x3.0	Beam	0.011610	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
405	TUB. 1-1/2x3.0	Beam	0.006216	05. 1.2D+0.5L+(-EQX-0.3EQY)/R

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
406	TUB. 1-1/2x3.0	Beam	0.006256	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
407	TUB. 1-1/2x3.0	Beam	0.006216	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
408	TUB. 1-1/2x3.0	Beam	0.011610	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
409	TUB. 1-1/2x3.0	Beam	0.011610	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
410	TUB. 1-1/2x3.0	Beam	0.006216	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
411	TUB. 1-1/2x3.0	Beam	0.006256	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
412	TUB. 1-1/2x3.0	Beam	0.006216	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
413	TUB. 1-1/2x3.0	Beam	0.011610	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
414	TUB. 1-1/2x3.0	Beam	0.011610	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
415	TUB. 1-1/2x3.0	Beam	0.006216	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
416	TUB. 1-1/2x3.0	Beam	0.006256	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
417	TUB. 1-1/2x3.0	Beam	0.006216	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
418	TUB. 1-1/2x3.0	Beam	0.011610	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
419	TUB. 1-1/2x3.0	Beam	0.006540	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
420	TUB. 1-1/2x3.0	Beam	0.003424	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
421	TUB. 1-1/2x3.0	Beam	0.003443	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
422	TUB. 1-1/2x3.0	Beam	0.003424	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
423	TUB. 1-1/2x3.0	Beam	0.006540	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
424	TUB. 1-1/2x3.0	Beam	0.006540	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
425	TUB. 1-1/2x3.0	Beam	0.003424	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
426	TUB. 1-1/2x3.0	Beam	0.003443	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
427	TUB. 1-1/2x3.0	Beam	0.003424	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
428	TUB. 1-1/2x3.0	Beam	0.006540	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
429	TUB. 1-1/2x3.0	Beam	0.006540	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
430	TUB. 1-1/2x3.0	Beam	0.003424	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
431	TUB. 1-1/2x3.0	Beam	0.003443	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
432	TUB. 1-1/2x3.0	Beam	0.003424	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
433	TUB. 1-1/2x3.0	Beam	0.006540	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
434	TUB. 1-1/2x3.0	Beam	0.006540	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
435	TUB. 1-1/2x3.0	Beam	0.003424	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
436	TUB. 1-1/2x3.0	Beam	0.003443	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
437	TUB. 1-1/2x3.0	Beam	0.003424	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
438	TUB. 1-1/2x3.0	Beam	0.006540	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
439	TUB. 1-1/2x3.0	Beam	0.019592	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
440	TUB. 1-1/2x3.0	Beam	0.010550	01. 1.4D
441	TUB. 1-1/2x3.0	Beam	0.010619	01. 1.4D
442	TUB. 1-1/2x3.0	Beam	0.010550	01. 1.4D
443	TUB. 1-1/2x3.0	Beam	0.019592	10. 1.2D+0.5L+(-EQY+0.3EQX)/R

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
444	TUB. 1-1/2x3.0	Beam	0.019592	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
445	TUB. 1-1/2x3.0	Beam	0.010550	01. 1.4D
446	TUB. 1-1/2x3.0	Beam	0.010619	01. 1.4D
447	TUB. 1-1/2x3.0	Beam	0.010550	01. 1.4D
448	TUB. 1-1/2x3.0	Beam	0.019592	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
449	TUB. 1-1/2x3.0	Beam	0.019592	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
450	TUB. 1-1/2x3.0	Beam	0.010550	01. 1.4D
451	TUB. 1-1/2x3.0	Beam	0.010619	01. 1.4D
452	TUB. 1-1/2x3.0	Beam	0.010550	01. 1.4D
453	TUB. 1-1/2x3.0	Beam	0.019592	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
454	TUB. 1-1/2x3.0	Beam	0.019592	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
455	TUB. 1-1/2x3.0	Beam	0.010550	01. 1.4D
456	TUB. 1-1/2x3.0	Beam	0.010619	01. 1.4D
457	TUB. 1-1/2x3.0	Beam	0.010550	01. 1.4D
458	TUB. 1-1/2x3.0	Beam	0.019592	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
459	TUB. 1-1/2x3.0	Beam	0.007121	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
460	TUB. 1-1/2x3.0	Beam	0.003836	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
461	TUB. 1-1/2x3.0	Beam	0.003863	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
462	TUB. 1-1/2x3.0	Beam	0.003836	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
463	TUB. 1-1/2x3.0	Beam	0.007121	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
464	TUB. 1-1/2x3.0	Beam	0.007121	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
465	TUB. 1-1/2x3.0	Beam	0.003836	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
466	TUB. 1-1/2x3.0	Beam	0.003863	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
467	TUB. 1-1/2x3.0	Beam	0.003836	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
468	TUB. 1-1/2x3.0	Beam	0.007121	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
469	TUB. 1-1/2x3.0	Beam	0.007121	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
470	TUB. 1-1/2x3.0	Beam	0.003836	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
471	TUB. 1-1/2x3.0	Beam	0.003863	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
472	TUB. 1-1/2x3.0	Beam	0.003836	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
473	TUB. 1-1/2x3.0	Beam	0.007121	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
474	TUB. 1-1/2x3.0	Beam	0.007121	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
475	TUB. 1-1/2x3.0	Beam	0.003836	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
476	TUB. 1-1/2x3.0	Beam	0.003863	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
477	TUB. 1-1/2x3.0	Beam	0.003836	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
478	TUB. 1-1/2x3.0	Beam	0.007121	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
479	TUB. 1-1/2x3.0	Beam	0.010330	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
480	TUB. 1-1/2x3.0	Beam	0.005470	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
481	TUB. 1-1/2x3.0	Beam	0.005501	10. 1.2D+0.5L+(-EQY+0.3EQX)/R

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
482	TUB. 1-1/2x3.0	Beam	0.005470	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
483	TUB. 1-1/2x3.0	Beam	0.010330	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
484	TUB. 1-1/2x3.0	Beam	0.010330	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
485	TUB. 1-1/2x3.0	Beam	0.005470	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
486	TUB. 1-1/2x3.0	Beam	0.005501	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
487	TUB. 1-1/2x3.0	Beam	0.005470	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
488	TUB. 1-1/2x3.0	Beam	0.010330	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
489	TUB. 1-1/2x3.0	Beam	0.010330	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
490	TUB. 1-1/2x3.0	Beam	0.005470	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
491	TUB. 1-1/2x3.0	Beam	0.005501	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
492	TUB. 1-1/2x3.0	Beam	0.005470	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
493	TUB. 1-1/2x3.0	Beam	0.010330	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
494	TUB. 1-1/2x3.0	Beam	0.010330	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
495	TUB. 1-1/2x3.0	Beam	0.005470	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
496	TUB. 1-1/2x3.0	Beam	0.005501	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
497	TUB. 1-1/2x3.0	Beam	0.005470	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
498	TUB. 1-1/2x3.0	Beam	0.010330	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
499	TUB. 1-1/2x3.0	Beam	0.011561	01. 1.4D
500	TUB. 1-1/2x3.0	Beam	0.006215	01. 1.4D
501	TUB. 1-1/2x3.0	Beam	0.006278	01. 1.4D
502	TUB. 1-1/2x3.0	Beam	0.006215	01. 1.4D
503	TUB. 1-1/2x3.0	Beam	0.011561	01. 1.4D
504	TUB. 1-1/2x3.0	Beam	0.011561	01. 1.4D
505	TUB. 1-1/2x3.0	Beam	0.006215	01. 1.4D
506	TUB. 1-1/2x3.0	Beam	0.006278	01. 1.4D
507	TUB. 1-1/2x3.0	Beam	0.006215	01. 1.4D
508	TUB. 1-1/2x3.0	Beam	0.011561	01. 1.4D
509	TUB. 1-1/2x3.0	Beam	0.011561	01. 1.4D
510	TUB. 1-1/2x3.0	Beam	0.006215	01. 1.4D
511	TUB. 1-1/2x3.0	Beam	0.006278	01. 1.4D
512	TUB. 1-1/2x3.0	Beam	0.006215	01. 1.4D
513	TUB. 1-1/2x3.0	Beam	0.011561	01. 1.4D
514	TUB. 1-1/2x3.0	Beam	0.011561	01. 1.4D
515	TUB. 1-1/2x3.0	Beam	0.006215	01. 1.4D
516	TUB. 1-1/2x3.0	Beam	0.006278	01. 1.4D
517	TUB. 1-1/2x3.0	Beam	0.006215	01. 1.4D
518	TUB. 1-1/2x3.0	Beam	0.011561	01. 1.4D
594	TUB. 1-1/2x3.0	Brace	0.017833	03. 1.2D+0.5L+(+EQX+0.3EQY)/R

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
595	TUB. 1-1/2x3.0	Brace	0.010501	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
596	TUB. 1-1/2x3.0	Brace	0.010501	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
597	TUB. 1-1/2x3.0	Brace	0.017833	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
598	TUB. 1-1/2x3.0	Brace	0.017833	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
599	TUB. 1-1/2x3.0	Brace	0.010501	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
600	TUB. 1-1/2x3.0	Brace	0.017833	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
601	TUB. 1-1/2x3.0	Brace	0.010501	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
606	TUB. 6x6.0	Column	0.008289	01. 1.4D
608	TUB. 6x6.0	Column	0.018224	01. 1.4D
610	TUB. 6x6.0	Column	0.039576	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
612	TUB. 1-1/2x3.0	Brace	0.043341	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
613	TUB. 1-1/2x3.0	Brace	0.043341	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
614	TUB. 1-1/2x3.0	Brace	0.043341	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
615	TUB. 1-1/2x3.0	Brace	0.043341	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
616	TUB. 6x6.0	Column	0.047452	01. 1.4D
617	TUB. 6x6.0	Column	0.010796	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
1	TUB. 3x5.5	Column	0.084277	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
2	TUB. 3x5.5	Column	0.078610	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
3	TUB. 3x5.5	Column	0.071725	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
4	TUB. 3x5.5	Column	0.065576	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
5	TUB. 3x5.5	Column	0.059405	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
6	TUB. 3x5.5	Column	0.053504	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
7	TUB. 3x5.5	Column	0.048098	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
8	TUB. 3x5.5	Column	0.042520	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
9	TUB. 3x5.5	Column	0.038681	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
10	TUB. 3x5.5	Column	0.032461	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
11	TUB. 3x5.5	Column	0.023398	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
12	TUB. 3x5.5	Column	0.015798	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
13	TUB. 3x5.5	Column	0.084277	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
14	TUB. 3x5.5	Column	0.078610	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
15	TUB. 3x5.5	Column	0.071725	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
16	TUB. 3x5.5	Column	0.065576	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
17	TUB. 3x5.5	Column	0.059405	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
18	TUB. 3x5.5	Column	0.053504	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
19	TUB. 3x5.5	Column	0.048098	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
20	TUB. 3x5.5	Column	0.042520	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
21	TUB. 3x5.5	Column	0.038681	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
22	TUB. 3x5.5	Column	0.032461	03. 1.2D+0.5L+(+EQX+0.3EQY)/R

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
23	TUB. 3x5.5	Column	0.023398	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
24	TUB. 3x5.5	Column	0.015798	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
25	TUB. 1-1/2x3.0	Brace	0.022621	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
26	TUB. 1-1/2x3.0	Brace	0.021349	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
27	TUB. 1-1/2x3.0	Brace	0.016067	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
28	TUB. 1-1/2x3.0	Brace	0.015392	11. 0.9D+(+EQX+0.3EQY)/R
29	TUB. 1-1/2x3.0	Brace	0.018330	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
30	TUB. 1-1/2x3.0	Brace	0.017456	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
31	TUB. 1-1/2x3.0	Brace	0.016813	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
32	TUB. 1-1/2x3.0	Brace	0.015980	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
33	TUB. 1-1/2x3.0	Brace	0.016456	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
34	TUB. 1-1/2x3.0	Brace	0.015601	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
35	TUB. 1-1/2x3.0	Brace	0.015816	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
36	TUB. 1-1/2x3.0	Brace	0.014981	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
37	TUB. 1-1/2x3.0	Brace	0.014052	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
38	TUB. 1-1/2x3.0	Brace	0.013173	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
39	TUB. 1-1/2x3.0	Brace	0.015068	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
40	TUB. 1-1/2x3.0	Brace	0.014276	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
41	TUB. 1-1/2x3.0	Brace	0.009317	13. 0.9D+(-EQX-0.3EQY)/R
42	TUB. 1-1/2x3.0	Brace	0.011043	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
43	TUB. 1-1/2x3.0	Brace	0.023186	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
44	TUB. 1-1/2x3.0	Brace	0.009613	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
45	TUB. 1-1/2x3.0	Brace	0.019472	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
46	TUB. 1-1/2x3.0	Brace	0.020403	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
47	TUB. 1-1/2x3.0	Brace	0.020403	04. 1.2D+0.5L+(+EQX-0.3EQY)/R
48	TUB. 1-1/2x3.0	Brace	0.019472	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
49	TUB. 1-1/2x3.0	Brace	0.009613	06. 1.2D+0.5L+(-EQX+0.3EQY)/R
50	TUB. 1-1/2x3.0	Brace	0.023186	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
51	TUB. 1-1/2x3.0	Brace	0.011043	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
52	TUB. 1-1/2x3.0	Brace	0.009317	11. 0.9D+(+EQX+0.3EQY)/R
53	TUB. 1-1/2x3.0	Brace	0.014276	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
54	TUB. 1-1/2x3.0	Brace	0.015068	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
55	TUB. 1-1/2x3.0	Brace	0.013173	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
56	TUB. 1-1/2x3.0	Brace	0.014052	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
57	TUB. 1-1/2x3.0	Brace	0.014981	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
58	TUB. 1-1/2x3.0	Brace	0.015816	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
59	TUB. 1-1/2x3.0	Brace	0.015601	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
60	TUB. 1-1/2x3.0	Brace	0.016456	03. 1.2D+0.5L+(+EQX+0.3EQY)/R

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
61	TUB. 1-1/2x3.0	Brace	0.015980	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
62	TUB. 1-1/2x3.0	Brace	0.016813	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
63	TUB. 1-1/2x3.0	Brace	0.017456	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
64	TUB. 1-1/2x3.0	Brace	0.018330	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
65	TUB. 1-1/2x3.0	Brace	0.015392	13. 0.9D+(-EQX-0.3EQY)/R
66	TUB. 1-1/2x3.0	Brace	0.016067	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
67	TUB. 1-1/2x3.0	Brace	0.021349	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
68	TUB. 1-1/2x3.0	Brace	0.022621	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
69	TUB. 3x5.5	Column	0.046382	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
70	TUB. 3x5.5	Column	0.044894	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
71	TUB. 3x5.5	Column	0.071312	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
72	TUB. 3x5.5	Column	0.039850	03. 1.2D+0.5L+(+EQX+0.3EQY)/R
73	TUB. 3x5.5	Column	0.059048	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
74	TUB. 3x5.5	Column	0.053099	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
75	TUB. 3x5.5	Column	0.047944	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
76	TUB. 3x5.5	Column	0.042520	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
77	TUB. 3x5.5	Column	0.038524	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
78	TUB. 3x5.5	Column	0.032460	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
79	TUB. 3x5.5	Column	0.023245	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
80	TUB. 3x5.5	Column	0.015747	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
81	TUB. 3x5.5	Column	0.046382	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
82	TUB. 3x5.5	Column	0.044894	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
83	TUB. 3x5.5	Column	0.071312	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
84	TUB. 3x5.5	Column	0.039850	05. 1.2D+0.5L+(-EQX-0.3EQY)/R
85	TUB. 3x5.5	Column	0.059048	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
86	TUB. 3x5.5	Column	0.053099	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
87	TUB. 3x5.5	Column	0.047944	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
88	TUB. 3x5.5	Column	0.042520	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
89	TUB. 3x5.5	Column	0.038524	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
90	TUB. 3x5.5	Column	0.032460	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
91	TUB. 3x5.5	Column	0.023245	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
92	TUB. 3x5.5	Column	0.015747	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
93	TUB. 1-1/2x3.0	Brace	0.022621	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
94	TUB. 1-1/2x3.0	Brace	0.021349	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
95	TUB. 1-1/2x3.0	Brace	0.022621	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
96	TUB. 1-1/2x3.0	Brace	0.021349	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
97	TUB. 1-1/2x3.0	Brace	0.015392	15. 0.9D+(+EQY+0.3EQX)/R
98	TUB. 1-1/2x3.0	Brace	0.016067	07. 1.2D+0.5L+(+EQY+0.3EQX)/R

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
99	TUB. 1-1/2x3.0	Brace	0.016067	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
100	TUB. 1-1/2x3.0	Brace	0.015392	17. 0.9D+(-EQY-0.3EQX)/R
101	TUB. 1-1/2x3.0	Brace	0.018330	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
102	TUB. 1-1/2x3.0	Brace	0.017456	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
103	TUB. 1-1/2x3.0	Brace	0.018330	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
104	TUB. 1-1/2x3.0	Brace	0.017456	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
105	TUB. 1-1/2x3.0	Brace	0.016813	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
106	TUB. 1-1/2x3.0	Brace	0.015980	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
107	TUB. 1-1/2x3.0	Brace	0.015980	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
108	TUB. 1-1/2x3.0	Brace	0.016813	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
109	TUB. 1-1/2x3.0	Brace	0.015601	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
110	TUB. 1-1/2x3.0	Brace	0.016456	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
111	TUB. 1-1/2x3.0	Brace	0.015601	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
112	TUB. 1-1/2x3.0	Brace	0.016456	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
113	TUB. 1-1/2x3.0	Brace	0.014981	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
114	TUB. 1-1/2x3.0	Brace	0.015816	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
115	TUB. 1-1/2x3.0	Brace	0.015816	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
116	TUB. 1-1/2x3.0	Brace	0.014981	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
117	TUB. 1-1/2x3.0	Brace	0.014052	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
118	TUB. 1-1/2x3.0	Brace	0.013173	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
119	TUB. 1-1/2x3.0	Brace	0.014052	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
120	TUB. 1-1/2x3.0	Brace	0.013173	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
121	TUB. 1-1/2x3.0	Brace	0.015068	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
122	TUB. 1-1/2x3.0	Brace	0.014276	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
123	TUB. 1-1/2x3.0	Brace	0.015068	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
124	TUB. 1-1/2x3.0	Brace	0.014276	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
125	TUB. 1-1/2x3.0	Brace	0.009317	15. 0.9D+(+EQY+0.3EQX)/R
126	TUB. 1-1/2x3.0	Brace	0.011043	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
127	TUB. 1-1/2x3.0	Brace	0.009317	17. 0.9D+(-EQY-0.3EQX)/R
128	TUB. 1-1/2x3.0	Brace	0.011043	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
129	TUB. 1-1/2x3.0	Brace	0.023186	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
130	TUB. 1-1/2x3.0	Brace	0.009613	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
131	TUB. 1-1/2x3.0	Brace	0.023186	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
132	TUB. 1-1/2x3.0	Brace	0.009613	07. 1.2D+0.5L+(+EQY+0.3EQX)/R
133	TUB. 1-1/2x3.0	Brace	0.019472	08. 1.2D+0.5L+(+EQY-0.3EQX)/R
134	TUB. 1-1/2x3.0	Brace	0.020403	10. 1.2D+0.5L+(-EQY+0.3EQX)/R
135	TUB. 1-1/2x3.0	Brace	0.019472	09. 1.2D+0.5L+(-EQY-0.3EQX)/R
136	TUB. 1-1/2x3.0	Brace	0.020403	07. 1.2D+0.5L+(+EQY+0.3EQX)/R

Según la tabla del diseño de los elementos, las secciones diseñadas tienen un índice de utilización (*Ratio)* máximo de 0.084 lo cual quiere decir que funciona.

2.8. DISEÑO ÁRBOL BARRIGON

Los resultados obtenidos del análisis y diseño del árbol Barrigón serán mostrados a continuación.

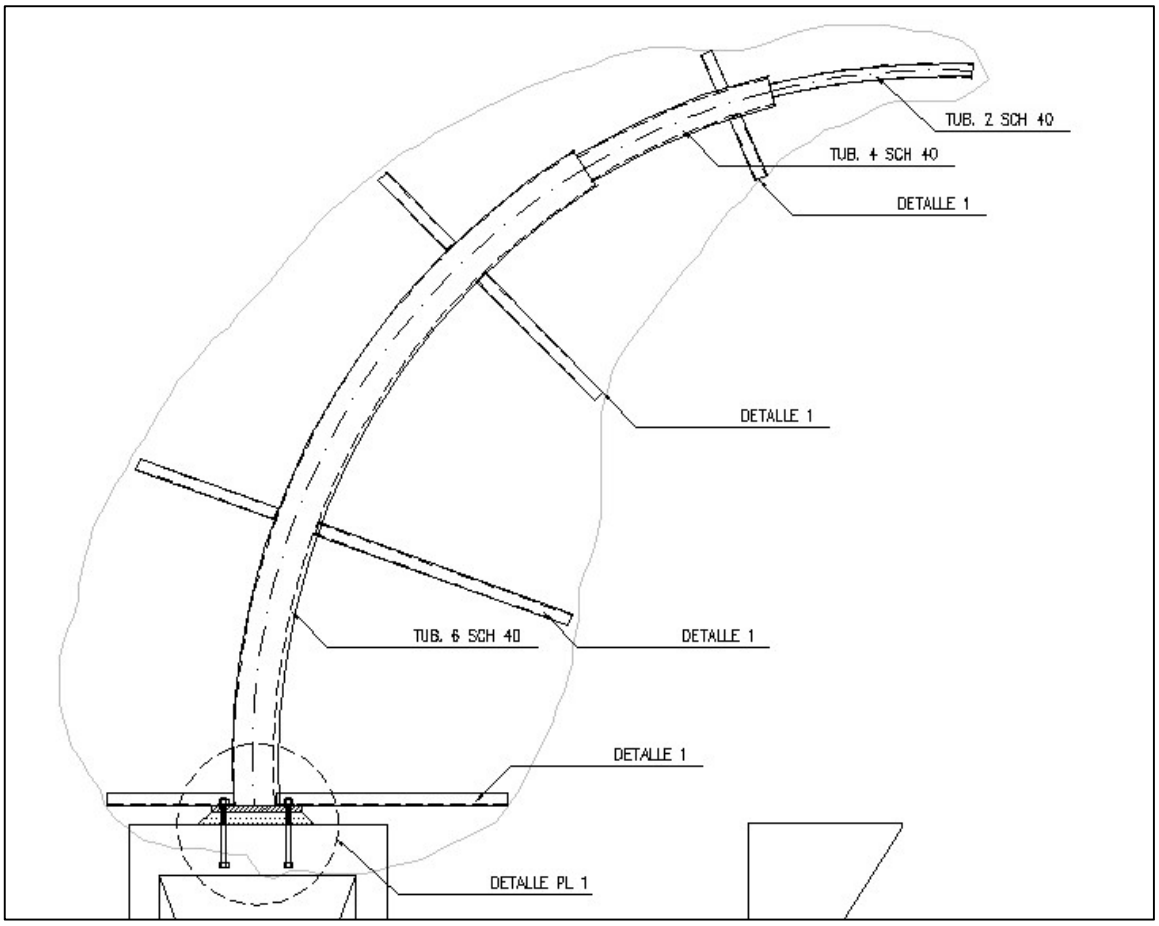


Imagen 30 Geometría del árbol Barrigón

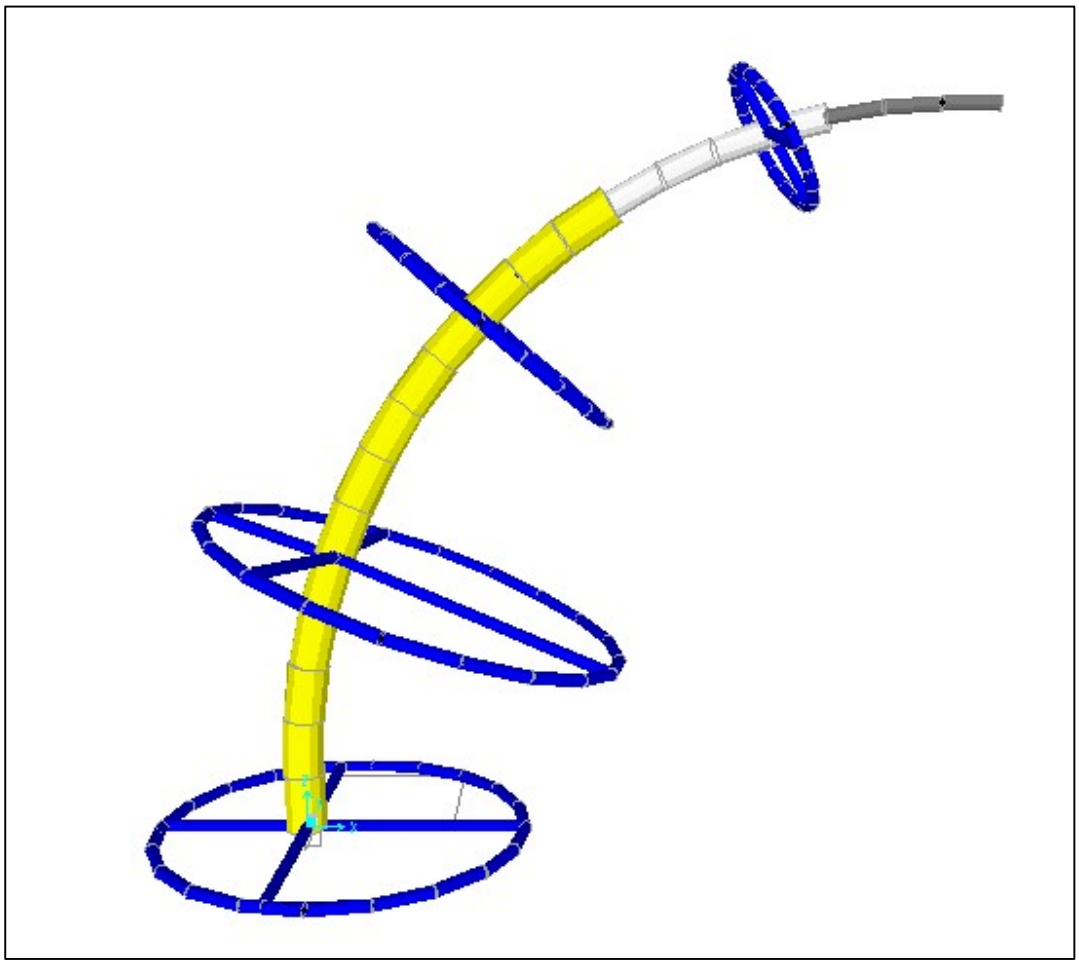


Imagen 31 Isométrico del árbol Barrigón

2.8.1. NUMERACIÓN DE LOS ELEMENTOS Y NODOS

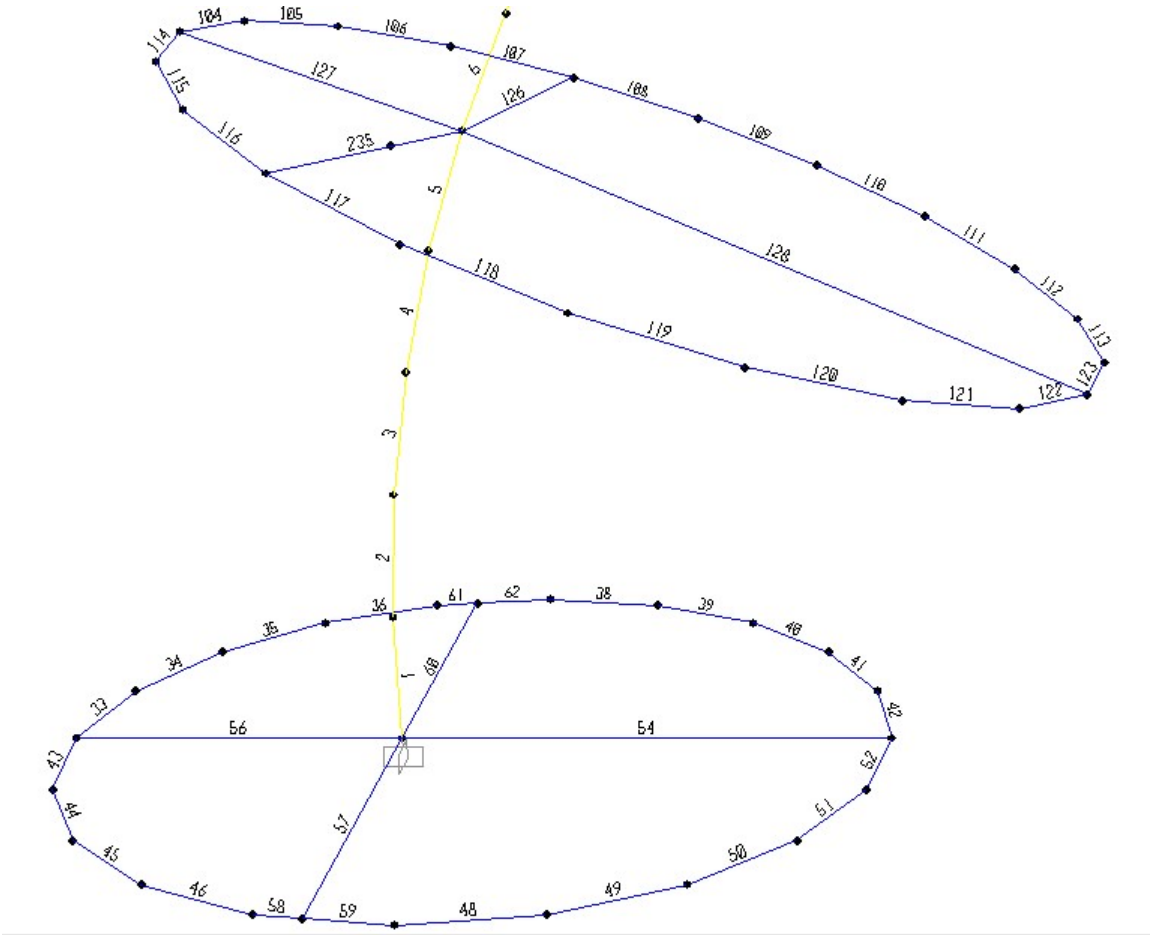


Imagen 32 Numeración de elementos sector inicial del árbol barrigón

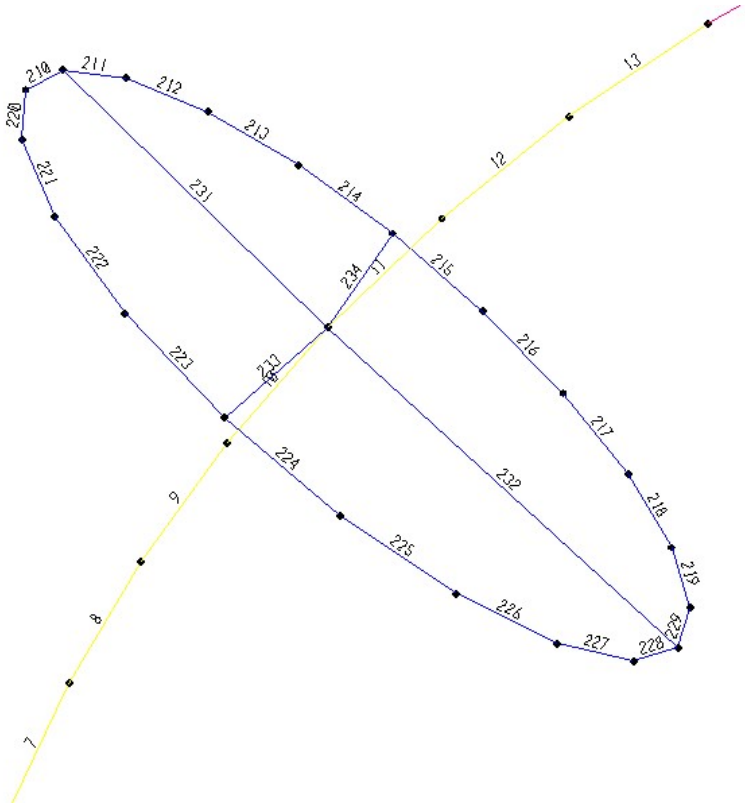


Imagen 33 Numeración de elementos sector central del árbol barrigón

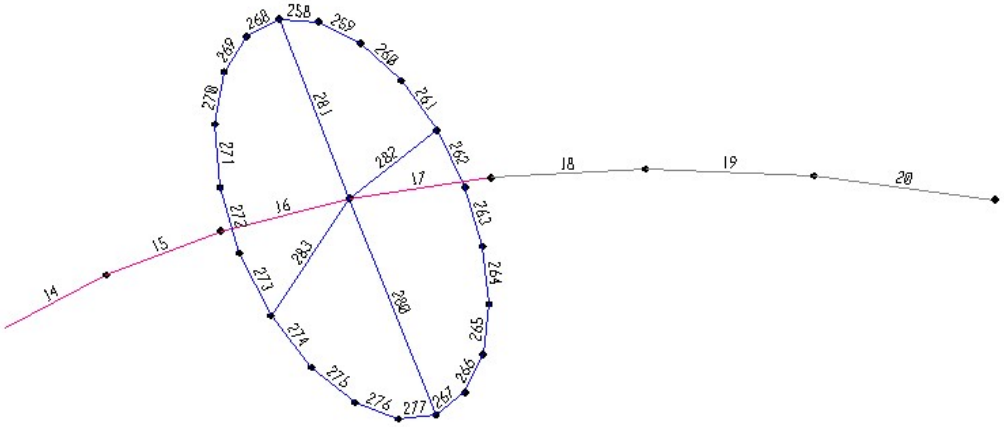


Imagen 34 Numeración de elementos sector final del árbol barrigón

2.8.2. INCIDENCIAS

A continuación se muestran las secciones asignadas a cada uno de los elementos

TABLE: Frame Section Assignments					
Frame	**SectionType**	**AutoSelect**	**AnalSect**	**DesignSect**	**MatProp**
Text	Text	Text	Text	Text	Text
1	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
2	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
3	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
4	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
5	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
6	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
7	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
8	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
9	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
10	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
11	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
12	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
13	Pipe	N.A.	TUB. 6 SCH 40	TUB. 6 SCH 40	Default
14	Pipe	N.A.	TUB. 4 SCH 40	TUB. 4 SCH 40	Default
15	Pipe	N.A.	TUB. 4 SCH 40	TUB. 4 SCH 40	Default
16	Pipe	N.A.	TUB. 4 SCH 40	TUB. 4 SCH 40	Default
17	Pipe	N.A.	TUB. 4 SCH 40	TUB. 4 SCH 40	Default
18	Pipe	N.A.	TUB. 2 SCH 40	TUB. 2 SCH 40	Default
19	Pipe	N.A.	TUB. 2 SCH 40	TUB. 2 SCH 40	Default
20	Pipe	N.A.	TUB. 2 SCH 40	TUB. 2 SCH 40	Default
33	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
34	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
35	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
36	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
38	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
39	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
40	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
41	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
42	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
43	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
44	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
45	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
46	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
48	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
49	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
50	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
51	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
52	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
54	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
56	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
57	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
58	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
59	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
60	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
61	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
62	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
104	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
105	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
106	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
107	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
108	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
109	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
110	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
111	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
112	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
113	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
114	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
115	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
116	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
117	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
118	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
119	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
120	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
121	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
122	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
123	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
126	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
127	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
128	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
210	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
211	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
212	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
213	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
214	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
215	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
216	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
217	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
218	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
219	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
220	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
221	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
222	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
223	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
224	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
225	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
226	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
227	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
228	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
229	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
231	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
232	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
233	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
234	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
235	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
258	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
259	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
260	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
261	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
262	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
263	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
264	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
265	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
266	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
267	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
268	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
269	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
270	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
271	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
272	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
273	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

Frame	SectionType	AutoSelect	AnalSect	DesignSect	MatProp
Text	Text	Text	Text	Text	Text
274	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
275	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
276	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
277	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
280	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
281	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
282	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default
283	Pipe	N.A.	TUB. 1-1/2x3.0	TUB. 1-1/2x3.0	Default

2.8.3. EVALUACIÓN DEL DISEÑO DE LOS ELEMENTOS

TABLE: Steel Design 1 - Summary Data - AISC360-05-IBC2006				
Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
1	TUB. 6 SCH 40	Column	0.245448	01. 1.4D
2	TUB. 6 SCH 40	Column	0.210309	01. 1.4D
3	TUB. 6 SCH 40	Column	0.178286	01. 1.4D
4	TUB. 6 SCH 40	Brace	0.149627	01. 1.4D
5	TUB. 6 SCH 40	Brace	0.124251	01. 1.4D
6	TUB. 6 SCH 40	Brace	0.103754	01. 1.4D
7	TUB. 6 SCH 40	Brace	0.084021	01. 1.4D
8	TUB. 6 SCH 40	Brace	0.067064	01. 1.4D
9	TUB. 6 SCH 40	Brace	0.052721	01. 1.4D
10	TUB. 6 SCH 40	Brace	0.040812	01. 1.4D
11	TUB. 6 SCH 40	Brace	0.031278	01. 1.4D
12	TUB. 6 SCH 40	Brace	0.022843	01. 1.4D
13	TUB. 6 SCH 40	Brace	0.016159	01. 1.4D
14	TUB. 4 SCH 40	Brace	0.026966	01. 1.4D
15	TUB. 4 SCH 40	Brace	0.016942	01. 1.4D
16	TUB. 4 SCH 40	Brace	0.010299	01. 1.4D
17	TUB. 4 SCH 40	Brace	0.006533	01. 1.4D
18	TUB. 2 SCH 40	Brace	0.014099	01. 1.4D
19	TUB. 2 SCH 40	Brace	0.006401	01. 1.4D
20	TUB. 2 SCH 40	Beam	0.003199	01. 1.4D
33	TUB. 1-1/2x3.0	Beam	0.006592	01. 1.4D
34	TUB. 1-1/2x3.0	Beam	0.004949	01. 1.4D
35	TUB. 1-1/2x3.0	Beam	0.004657	01. 1.4D

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
36	TUB. 1-1/2x3.0	Beam	0.006111	01. 1.4D
38	TUB. 1-1/2x3.0	Beam	0.006730	01. 1.4D
39	TUB. 1-1/2x3.0	Beam	0.004666	01. 1.4D
40	TUB. 1-1/2x3.0	Beam	0.003667	01. 1.4D
41	TUB. 1-1/2x3.0	Beam	0.004825	01. 1.4D
42	TUB. 1-1/2x3.0	Beam	0.006906	01. 1.4D
43	TUB. 1-1/2x3.0	Beam	0.006592	01. 1.4D
44	TUB. 1-1/2x3.0	Beam	0.004949	01. 1.4D
45	TUB. 1-1/2x3.0	Beam	0.004657	01. 1.4D
46	TUB. 1-1/2x3.0	Beam	0.006111	01. 1.4D
48	TUB. 1-1/2x3.0	Beam	0.006730	01. 1.4D
49	TUB. 1-1/2x3.0	Beam	0.004666	01. 1.4D
50	TUB. 1-1/2x3.0	Beam	0.003667	01. 1.4D
51	TUB. 1-1/2x3.0	Beam	0.004825	01. 1.4D
52	TUB. 1-1/2x3.0	Beam	0.006906	01. 1.4D
54	TUB. 1-1/2x3.0	Beam	0.028243	01. 1.4D
56	TUB. 1-1/2x3.0	Beam	0.011991	01. 1.4D
57	TUB. 1-1/2x3.0	Beam	0.020577	01. 1.4D
58	TUB. 1-1/2x3.0	Beam	0.006210	01. 1.4D
59	TUB. 1-1/2x3.0	Beam	0.008080	01. 1.4D
60	TUB. 1-1/2x3.0	Beam	0.020577	01. 1.4D
61	TUB. 1-1/2x3.0	Beam	0.006210	01. 1.4D
62	TUB. 1-1/2x3.0	Beam	0.008080	01. 1.4D
104	TUB. 1-1/2x3.0	Brace	0.008860	01. 1.4D
105	TUB. 1-1/2x3.0	Brace	0.007111	01. 1.4D
106	TUB. 1-1/2x3.0	Brace	0.008470	01. 1.4D
107	TUB. 1-1/2x3.0	Brace	0.011057	01. 1.4D
108	TUB. 1-1/2x3.0	Brace	0.015024	01. 1.4D
109	TUB. 1-1/2x3.0	Brace	0.010488	01. 1.4D
110	TUB. 1-1/2x3.0	Brace	0.006868	01. 1.4D
111	TUB. 1-1/2x3.0	Brace	0.004580	01. 1.4D
112	TUB. 1-1/2x3.0	Brace	0.004469	01. 1.4D
113	TUB. 1-1/2x3.0	Brace	0.006404	01. 1.4D
114	TUB. 1-1/2x3.0	Brace	0.008047	01. 1.4D
115	TUB. 1-1/2x3.0	Brace	0.007696	01. 1.4D
116	TUB. 1-1/2x3.0	Brace	0.009842	01. 1.4D
117	TUB. 1-1/2x3.0	Brace	0.014533	01. 1.4D
118	TUB. 1-1/2x3.0	Brace	0.010639	01. 1.4D

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
119	TUB. 1-1/2x3.0	Brace	0.007645	01. 1.4D
120	TUB. 1-1/2x3.0	Brace	0.005729	01. 1.4D
121	TUB. 1-1/2x3.0	Brace	0.006579	01. 1.4D
122	TUB. 1-1/2x3.0	Brace	0.008877	01. 1.4D
123	TUB. 1-1/2x3.0	Brace	0.009967	01. 1.4D
126	TUB. 1-1/2x3.0	Brace	0.030813	01. 1.4D
127	TUB. 1-1/2x3.0	Brace	0.009472	01. 1.4D
128	TUB. 1-1/2x3.0	Brace	0.047043	01. 1.4D
210	TUB. 1-1/2x3.0	Brace	0.004797	01. 1.4D
211	TUB. 1-1/2x3.0	Brace	0.004255	01. 1.4D
212	TUB. 1-1/2x3.0	Brace	0.002711	01. 1.4D
213	TUB. 1-1/2x3.0	Brace	0.002731	01. 1.4D
214	TUB. 1-1/2x3.0	Brace	0.003301	01. 1.4D
215	TUB. 1-1/2x3.0	Brace	0.004158	01. 1.4D
216	TUB. 1-1/2x3.0	Brace	0.002660	01. 1.4D
217	TUB. 1-1/2x3.0	Brace	0.001867	01. 1.4D
218	TUB. 1-1/2x3.0	Brace	0.001856	01. 1.4D
219	TUB. 1-1/2x3.0	Brace	0.002472	01. 1.4D
220	TUB. 1-1/2x3.0	Brace	0.002443	01. 1.4D
221	TUB. 1-1/2x3.0	Brace	0.002464	01. 1.4D
222	TUB. 1-1/2x3.0	Brace	0.002426	01. 1.4D
223	TUB. 1-1/2x3.0	Brace	0.004073	01. 1.4D
224	TUB. 1-1/2x3.0	Brace	0.003885	01. 1.4D
225	TUB. 1-1/2x3.0	Brace	0.002791	01. 1.4D
226	TUB. 1-1/2x3.0	Brace	0.002143	01. 1.4D
227	TUB. 1-1/2x3.0	Brace	0.002550	01. 1.4D
228	TUB. 1-1/2x3.0	Brace	0.003758	01. 1.4D
229	TUB. 1-1/2x3.0	Brace	0.004248	01. 1.4D
231	TUB. 1-1/2x3.0	Brace	0.007864	01. 1.4D
232	TUB. 1-1/2x3.0	Brace	0.012853	01. 1.4D
233	TUB. 1-1/2x3.0	Brace	0.010061	01. 1.4D
234	TUB. 1-1/2x3.0	Brace	0.010461	01. 1.4D
235	TUB. 1-1/2x3.0	Brace	0.022040	01. 1.4D
258	TUB. 1-1/2x3.0	Brace	0.000937	01. 1.4D
259	TUB. 1-1/2x3.0	Brace	0.000508	01. 1.4D
260	TUB. 1-1/2x3.0	Brace	0.000520	01. 1.4D
261	TUB. 1-1/2x3.0	Brace	0.000561	01. 1.4D
262	TUB. 1-1/2x3.0	Brace	0.000768	01. 1.4D

Frame	DesignSect	DesignType	Ratio	Combo
Text	Text	Text	Unitless	Text
263	TUB. 1-1/2x3.0	Brace	0.000429	01. 1.4D
264	TUB. 1-1/2x3.0	Brace	0.000444	01. 1.4D
265	TUB. 1-1/2x3.0	Brace	0.000445	01. 1.4D
266	TUB. 1-1/2x3.0	Brace	0.000448	01. 1.4D
267	TUB. 1-1/2x3.0	Brace	0.001082	01. 1.4D
268	TUB. 1-1/2x3.0	Brace	0.001110	01. 1.4D
269	TUB. 1-1/2x3.0	Brace	0.000479	01. 1.4D
270	TUB. 1-1/2x3.0	Brace	0.000419	01. 1.4D
271	TUB. 1-1/2x3.0	Brace	0.000418	01. 1.4D
272	TUB. 1-1/2x3.0	Brace	0.000394	01. 1.4D
273	TUB. 1-1/2x3.0	Brace	0.000696	01. 1.4D
274	TUB. 1-1/2x3.0	Brace	0.000619	01. 1.4D
275	TUB. 1-1/2x3.0	Brace	0.000542	01. 1.4D
276	TUB. 1-1/2x3.0	Brace	0.000521	01. 1.4D
277	TUB. 1-1/2x3.0	Brace	0.000906	01. 1.4D
280	TUB. 1-1/2x3.0	Brace	0.002101	01. 1.4D
281	TUB. 1-1/2x3.0	Brace	0.001547	01. 1.4D
282	TUB. 1-1/2x3.0	Brace	0.001740	01. 1.4D
283	TUB. 1-1/2x3.0	Brace	0.001943	01. 1.4D

Según la tabla del diseño de los elementos, las secciones diseñadas tienen un índice de utilización (*Ratio)* máximo de 0.01 lo cual quiere decir que funciona.

3. CIMENTACIÓN

A continuación se muestra el análisis y diseño de la cimentación de los árboles.

3.1. CIMENTACIÓN ÁRBOLES AR2, AR3 Y AR4

DISEÑO CIMENTACION ARBOL AR2, AR3, AR4

Carga por metro lineal tronco: 0.10 Ton/m (incluye estructura metalica y acabados)
Carga por metro lineal ramas: 0.06 Ton/m (incluye estructura metalica y acabados)
Longitud Total estimada tronco 15.5 m
Longitud Total estimada ramas 7.3 m

Peso total Arbol= 15.5*0.10+7.3*0.06 = 2.00 Ton
Se toma una excentricidad de aplicación de cargas con respecto a la cimentacion de 0.70 m

P=2.00 Ton
M= 2.00 Ton * 0.70 m = 1.40 Ton-m

Fuerzas sismicas

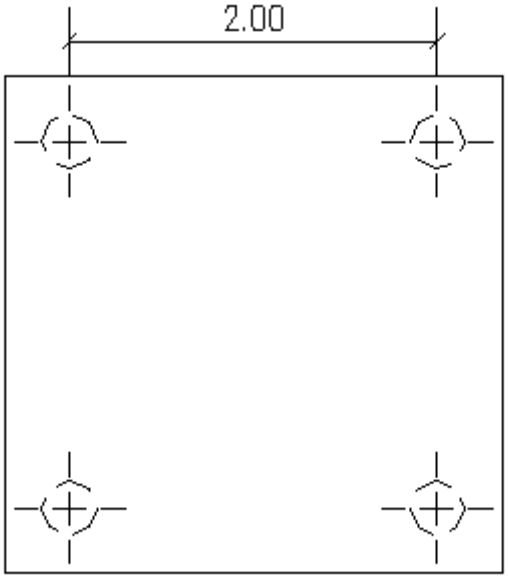
Sa= 0.39
Zona aplicación Fuerza= 0.70 L
L= 15.50 m
0.70*15.50= 10.85 m

Vs= 0.39*2.00 = 0.78 Ton
Momento por sismo= 10.85*0.78 = 8.46 Ton-m
R=2.00
Momento = 8.46/2.0 = 4.23 Ton-m
Momento total = 4.23 + 1.40 = 5.63 Ton-m

Peso pedestal
Volumen Pedestal 0.70*0.70*3= 1.47 m^3
Volumen Placa 1.50*1.50*0.30= 0.68 m^3
Peso (1.47+0.68)*2.4= 5.16 Ton

Carga por tierra
Peso especifico= 1.50 Ton/m^3
Espesor capa de tierra 3.50 m
Area Placa= 2.70 m * 2.70 m = 7.29 m^2
Volumen ocupado = 7.29*3.50-1.47-0.68= 23.36 m^3
Peso tierra= 23.36*1.50 = 35.04 Ton

Peso total= 35.04 Ton + 5.16 Ton + 2.00 Ton = 42.20 Ton

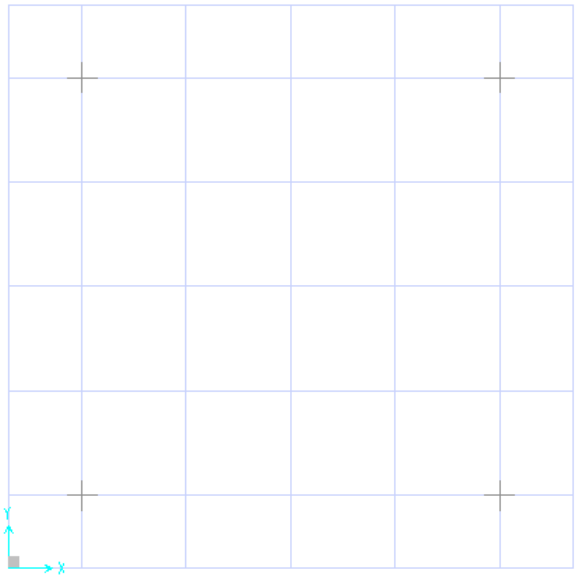


Carga por Pilote

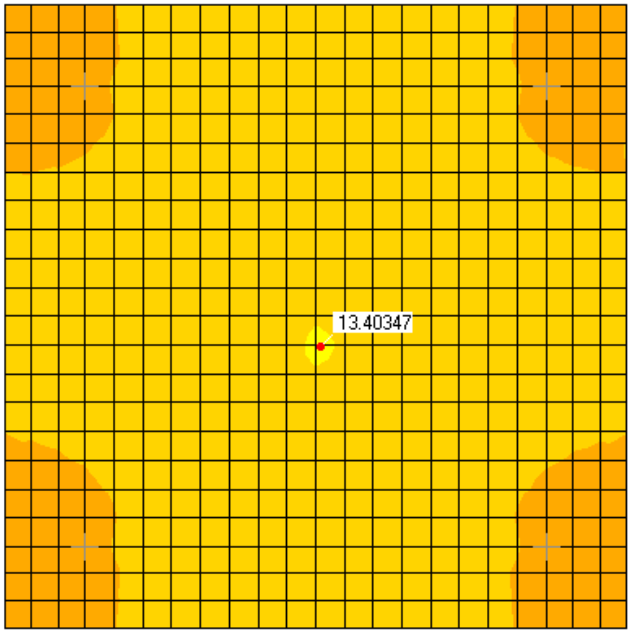
Por peso estructura= 42.20 Ton/4 = 10.55 Ton
Por momento= 5.63 Ton-m/4 = 1.41 Ton
Carga total= 10.55+1.41 = 11.96 Ton

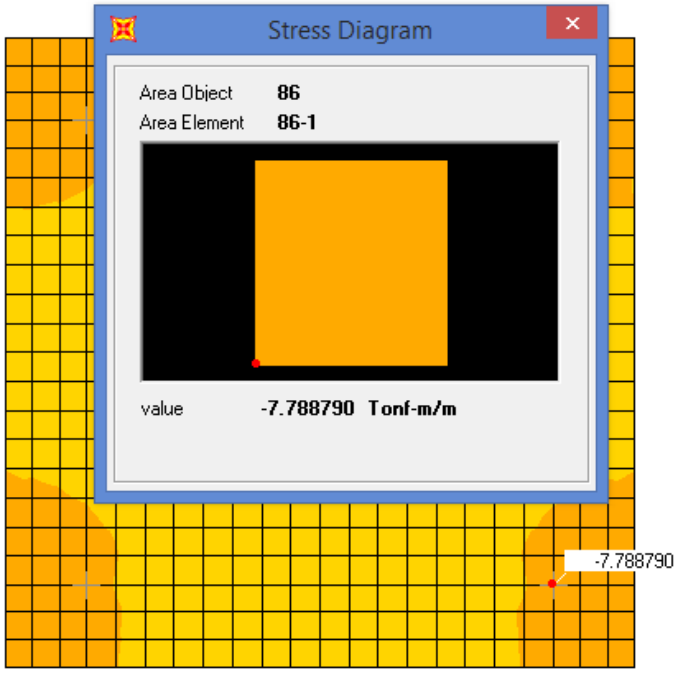
Caracteristicas Pilote
ϕ= 0.30 m
L= 14.00 m

Analisis Placa con cargas



Momentos

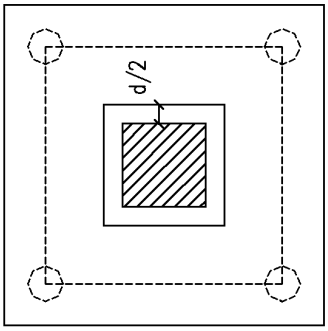

13.40347


Stress Diagram
Area Object 86
Area Element 86-1
value -7.788790 Tonf-m/m
-7.788790

CUANTIA PLACA CUANTIA PLACA

ø	0.9	ø	0.9
f'c (MPa)	21	f'c (MPa)	21
fy (MPa)	420	fy (MPa)	420
b (m)	1.00	b (m)	1.00
d (m)	0.32	d (m)	0.32
h (m)	0.40	h (m)	0.40
Mu (Ton-m)	13.00	Mu (Ton-m)	7.78
ro-calculado	0.00350	ro-calculado	0.00206
ro-min	0.00180	ro-min	0.00180
ro-max	0.01594	ro-max	0.01594
ro -tomado	0.0035	ro -tomado	0.0021
As CM²	11.21	**As CM²**	6.59

Cortantes



Vu	42.20 Ton
ϕ	0.75
F'c	21.00 Mpa
bo	4.08 m
d	0.32 m
β	6
α	40

$Vc = 0.17 * \left(1 + \frac{2}{\beta}\right)\sqrt{f'c}bod$	101.71 Ton
$Vc = 0.083\left(\frac{\alpha d}{bo} + 2\right)\sqrt{f'c}bod$	191.33 Ton
$Vc = 0.33\sqrt{f'c}bod$	148.08 Ton
ϕVc	101.71 Ton
seccion Cumple	

revision como viga		
F'c	21	Mpa
Fy	420	Mpa
B	2.70	m
D	0.32	m
Vu	21.10	Ton
ϕVc	50.48	Ton

3.2. CIMENTACIÓN ÁRBOL AR5

DISEÑO CIMENTACION ARBOL AR5

Carga por metro lineal tronco: 0.10 Ton/m (incluye estructura metalica y acabados)
Carga por metro lineal ramas: 0.06 Ton/m (incluye estructura metalica y acabados)
Longitud Total estimada tronco 13 m
Longitud Total estimada ramas 74 m

Peso total Arbol= 13*0.10+74*0.06 = 5.74Ton
Se toma una excentricidad de aplicación de cargas con respecto a la cimentacion de 0.70 m

P=5.74 Ton
M= 5.74 Ton * 0.70 m = 4.01 Ton-m

Fuerzas sismicas

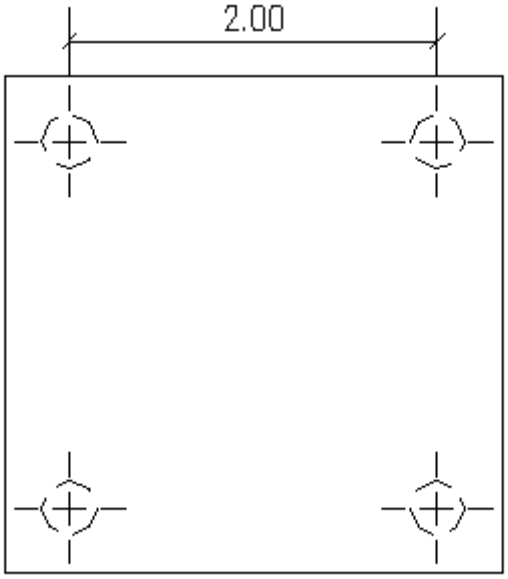
Sa= 0.39
Zona aplicación Fuerza= 0.70 L
L= 20.30 m
0.70*20.30= 14.21 m

Vs= 0.39*5.74 = 2.24 Ton
Momento por sismo= 14.21*2.24 = 31.83 Ton-m
R=2.00
Momento = 31.83/2.0 = 15.92 Ton-m
Momento total = 15.92 + 4.01 = 19.93 Ton-m

Peso pedestal
Volumen Pedestal 0.70*0.70*3= 1.47 m^3
Volumen Placa 1.50*1.50*0.30= 0.68 m^3
Peso (1.47+0.68)*2.4= 5.16 Ton

Carga por tierra
Peso especifico= 1.50 Ton/m^3
Espesor capa de tierra 3.50 m
Area Placa= 2.70 m * 2.70 m = 7.29 m^2
Volumen ocupado = 7.29*3.50-1.47-0.68= 23.36 m^3
Peso tierra= 23.36*1.50 = 35.04 Ton

Peso total= 35.04 Ton + 5.16 Ton + 5.74 Ton = 45.94 Ton

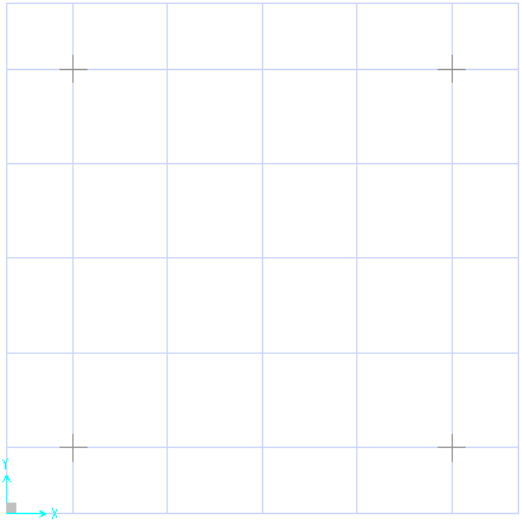


Carga por Pilote

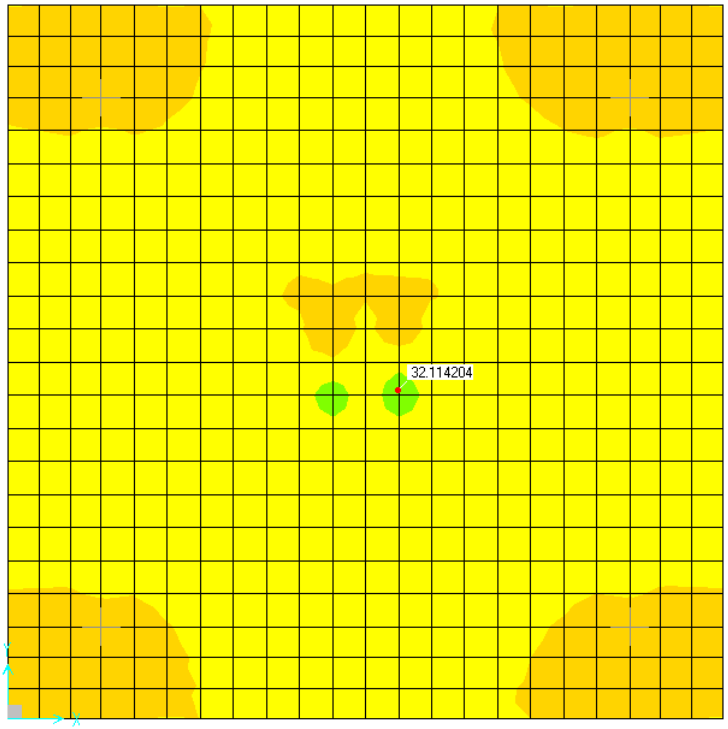
Por peso estructura= 45.94 Ton/4 = 11.49 Ton
Por momento= 19.93 Ton-m/4 = 4.98 Ton
Carga total= 11.49+4.98 = 16.47 Ton

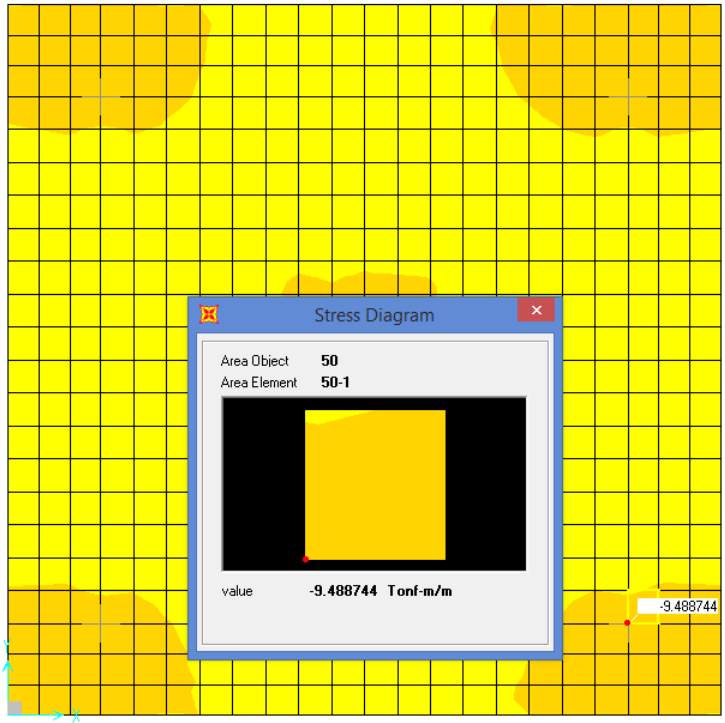
Caracteristicas Pilote
ϕ= 0.30 m
L= 18.00 m Para AR5
L= 15.00 M Para AR2-AR4

Analisis Placa con cargas



Momentos

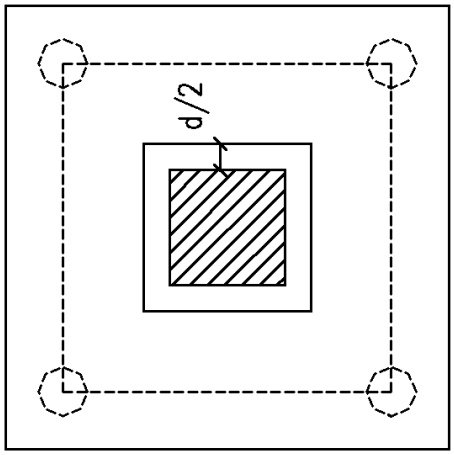

32.114204


Stress Diagram
Area Object 50
Area Element 50-1
value -9.488744 Tonf-m/m
-9.488744

CUANTIA PLACA CUANTIA PLACA

ø	0.9	ø	0.9
f'c (MPa)	21	f'c (MPa)	21
fy (MPa)	420	fy (MPa)	420
b (m)	1.00	b (m)	1.00
d (m)	0.32	d (m)	0.32
h (m)	0.40	h (m)	0.40
Mu (Ton-m)	32.00	Mu (Ton-m)	9.48
ro-calculado	0.00928	ro-calculado	0.00252
ro-min	0.00180	ro-min	0.00180
ro-max	0.01594	ro-max	0.01594
ro -tomado	0.0093	ro -tomado	0.0025
As CM²	29.70	**As CM²**	8.08

Cortantes



Vu	45.94 Ton
ϕ	0.75
F'c	21.00 Mpa
bo	4.08 m
d	0.32 m
β	6
α	40

$Vc = 0.17 * \left(1 + \frac{2}{\beta}\right)\sqrt{f'c}bod$	101.71 Ton
$Vc = 0.083\left(\frac{\alpha d}{bo} + 2\right)\sqrt{f'c}bod$	191.33 Ton
$Vc = 0.33\sqrt{f'c}bod$	148.08 Ton
ϕVc	101.71 Ton
seccion Cumple	

revision como viga		
F'c	21	Mpa
Fy	420	Mpa
B	2.70	m
D	0.32	m
Vu	22.97	Ton
ϕVc	50.48	Ton

3.3. CIMENTACIÓN ÁRBOL AR6

DISEÑO CIMENTACION ARBOL AR6

Carga por metro lineal tronco: 0.25 Ton/m (incluye estructura metalica y acabados)
Longitud Total estimada tronco 21.90 m

Peso total Arbol= 21.90*0.25= 5.48 Ton
Se toma una excentricidad de aplicación de cargas con respecto a la cimentacion de 0.30 m

P=5.48 Ton
M= 2.00 Ton * 0.30 m = 1.64 Ton-m

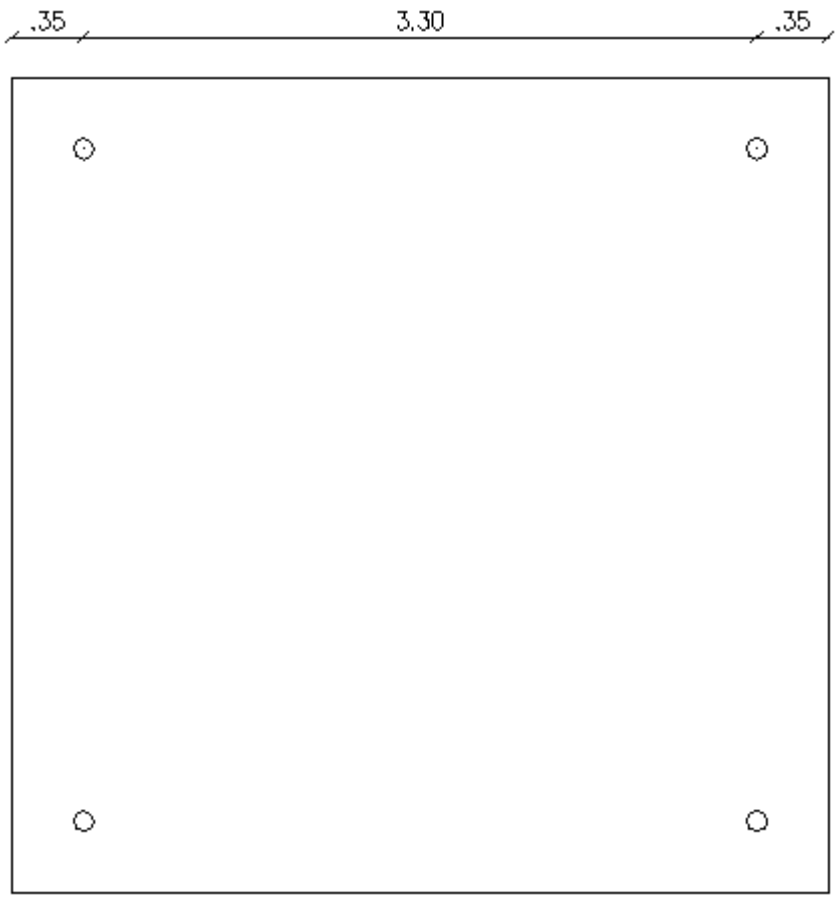
Fuerzas sismicas

Sa= 0.39
Zona aplicación Fuerza= 0.70 L
L= 21.90 m
0.70*21.90= 15.33 m

Vs= 0.39*5.48 = 2.14 Ton
Momento por sismo= 15.33*2.14 = 32.80 Ton-m
R=2.00
Momento = 32.80/2.0 = 16.40 Ton-m
Momento total = 16.40 + 1.64 = 18.03 Ton-m

Peso pedestal
Volumen Pedestal 4.66*3.00= 13.98 m^3
Volumen Placa 4.00*4.00*0.50= 8.00 m^3
Peso (13.98+4.00)*2.4= 52.75Ton

Peso total= 52.75 Ton + 5.48 Ton = 58.23 Ton

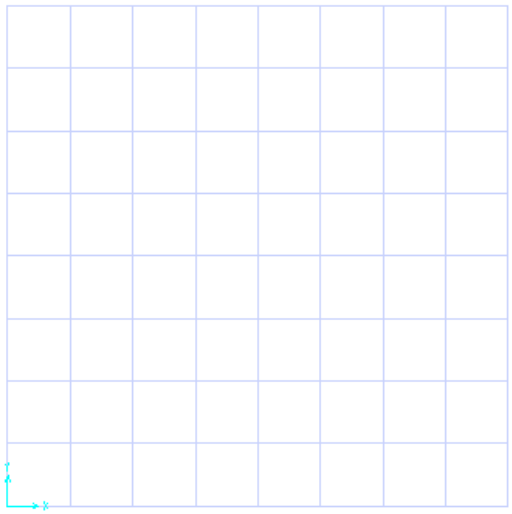


Carga por Pilote

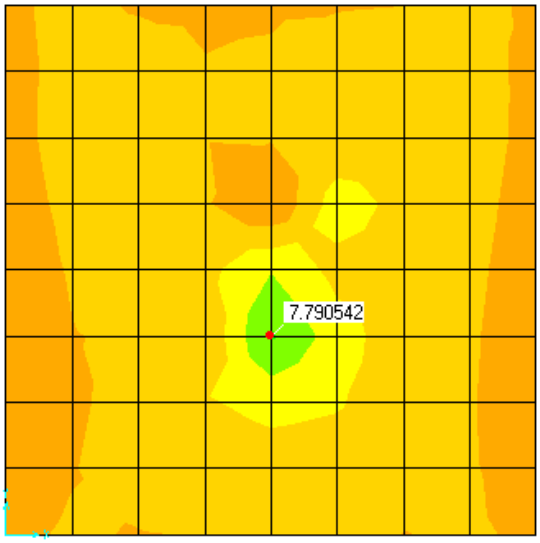
Por peso estructura= 58.23 Ton/4 = 14.56 Ton
Por momento= 18.03 Ton-m/4 = 4.51 Ton
Carga total= 14.56+4.51 = 19.07 Ton

Caracteristicas Pilote
ϕ= 0.30 m
L= 20.00 m

Analisis Placa con cargas



Momentos



CUANTIA PLACA

ø	0.9
f'c (MPa)	21
fy (MPa)	420
b (m)	1.00
d (m)	0.32
h (m)	0.40
Mu (Ton-m)	7.79
ro-calculado	0.00206
ro-min	0.00180
ro-max	0.01594
ro -tomado	0.0021
As CM²	6.60

Cortante

Vu	58.23 Ton
ϕ	0.75
F'c	21.00 Mpa
bo	4.08 m
d	0.32 m
β	6
α	40

$Vc = 0.17 * \left(1 + \frac{2}{\beta}\right)\sqrt{f'c}bod$	101.71 Ton
$Vc = 0.083\left(\frac{\alpha d}{bo} + 2\right)\sqrt{f'c}bod$	191.33 Ton
$Vc = 0.33\sqrt{f'c}bod$	148.08 Ton
ϕVc	101.71 Ton
seccion Cumple	

revision como viga		
F'c	21	Mpa
Fy	420	Mpa
B	2.70	m
D	0.32	m
Vu	29.12	Ton
ϕVc	50.48	Ton

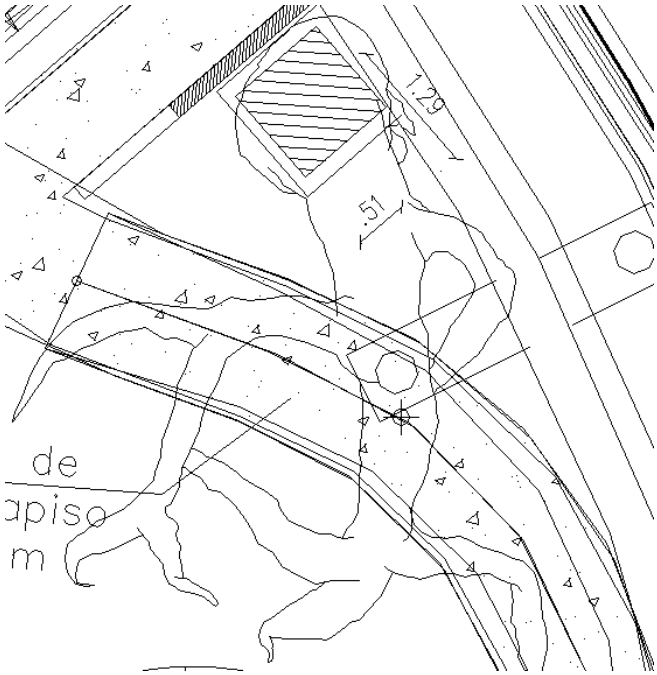
3.4. CIMENTACIÓN ÁRBOL BARRIGON

Diseño Cimentación Arbol Barrigon

Peso estructura metalica: 230 kg
Peso recubrimiento estructura metalica: 130 kg
Peso estrcutura en concreto: 6912 kg

Peso total= 7272 kg

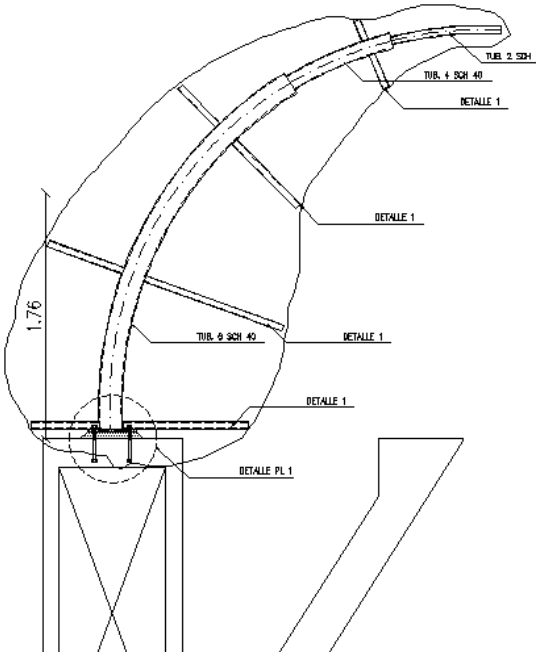
Excentricidad Carga Peso propio Arbol



e1= 1.29 m
e2= 0.51 m

M1= (230+130)*1.29 = 464.4 kg-m = 0.46 Ton-m
M1= (230+130)*0.51 = 183.6 kg-m = 0.18 Ton-m

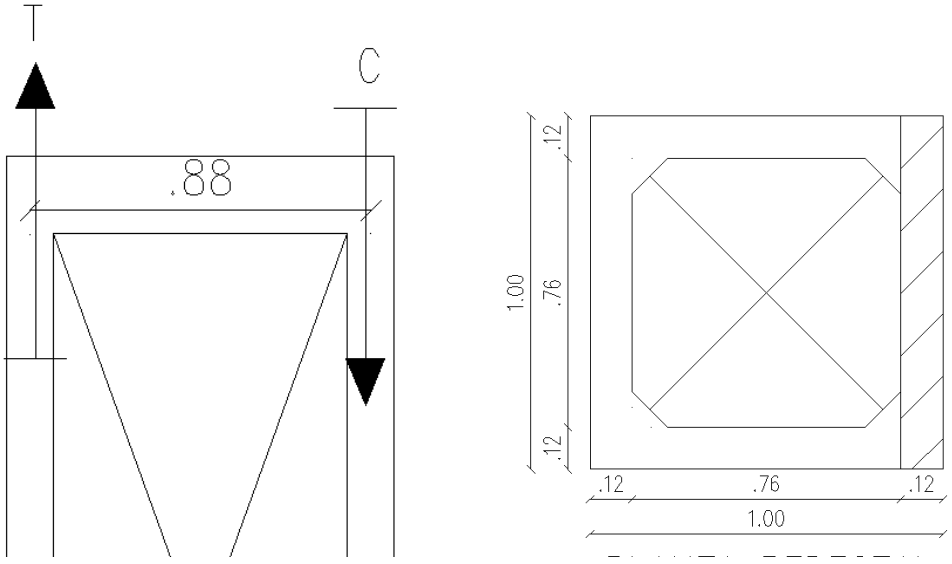
Momento Por sismo



Mu= 1.76 m * 0.36 Ton = 0.63 Ton-m

Mu total= 0.63 Ton-m + 0.46 Ton-m = 1.09 Ton-m

Diseño columna de soporte



T=C= 1.09 Ton-m / 0.88 m = 1.24 Ton

Compresion debida a peso propio= 7.25 Ton/4 = 1.81 Ton

Fuerza efectiva en las paredes Pu= C-T = 1.81 Ton – 1.24 Ton = 0.57 Ton en compresion.

Fuerza resistente de cada cara

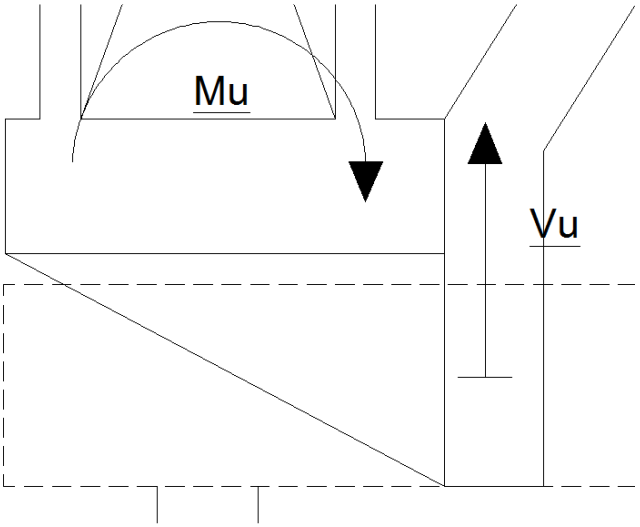
$$\phi Pn = 0.75 * (0.85f'c(Ag - As) + fy * As)$$

$$\phi Pn = 0.75 * (0.85 * 210\ (1200 - 7.62) + 4200 * 7.62)$$

$$\phi Pn = 183632\ kg = 183.6\ Ton$$

$$\phi Pn > Pu$$

Revision Anclaje a estructura de cimentacion.



Vu= 7.27 Ton
Mu= 1.09 Ton-m

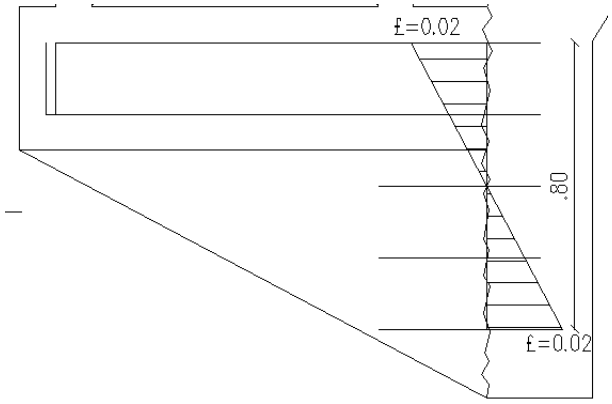
Resistencia Cortante por Friccion.

$$\phi Vn = 0.75 Avfy\mu$$

μ=1.0
fy=4200 kg/cm²
Av= 22.86 cm²

$$\phi Vn = 0.75 * 22.86 * 4200 * 1 = 72000\ kg = 72\ Ton$$
$$\phi Vn > Vu$$

Diagrama de esfuerzos por flexion en el acero de refuerzo



Con base en las deformaciones unitarias de halla el esfuerzo de las barras intermedias teniendo en cuenta que las de los extremos estan en fluencia.

$$\frac{0.02}{0.4} = \frac{x}{0.2}$$

$$x = \frac{0.02 * 0.2}{0.4} = 0.01$$

$$\frac{4200}{0.02} = \frac{x}{0.01}$$

$$x = 2100$$

Mn = 1.27*2*4200*0.4 + 1.27*2*2100*0.2= 4494 kg-m
Mn= 4.49 Ton-m

ϕMn= 0.90*4.49= 4.04 Ton-m

$$\phi Mn > Mu$$