Maestría en Ingeniería Civil

Evaluación de los índices de sobre esfuerzo y cálculo de deformaciones de dos puentes vehiculares de acuerdo con la norma AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO 2012).

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Bogotá, D.C., 08 de Agosto de 2019

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Tesis para optar al título de magíster en Ingeniería Civil, con énfasis en estructuras

Jaime Garzón -Director

Bogotá, D.C., 08 de Agosto de 2019

La tesis de maestría titulada “EVALUACIÓN DE LOS ÍNDICES DE SOBRE ESFUERZO Y CÁLCULO DE DEFORMACIONES DE DOS PUENTES VEHICULARES DE ACUERDO CON LA NORMA AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO 2012).”, presentada por Luis Alexander Mora Cuellar, cumple con los requisitos establecidos para optar al título de Magíster en Ingeniería Civil con énfasis en Estructuras.

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Dedicatoria

Este trabajo está dedicado a mi madre Gloria Cuellar, quien a pesar una ser una buena mujer, la vida no la trato bien. Que en paz descanse.

Resumen

En convenio entre la Escuela Colombiana de Ingeniería y la universidad de Purdue (USA) se propuso desarrollar el trabajo académico, cuyo objetivo principal fue determinar los índices de sobre esfuerzo y cálculo de deformaciones bajo la carga del camión de diseño HL-93 y la Norma AASHTO 2012, para la superestructura de dos puentes vehiculares, localizados en el estado de Indiana Estados Unidos, diseñados y construidos bajo la norma AASHTO de 1949.

Los puentes en estudio llevan en servicio 69 y 61 años respectivamente, siendo el más antiguo el que se denominó como puente No 1, cuya superestructura está compuesta por seis vigas de sección T en concreto reforzado y de una luz. El otro puente se nombró para el estudio como puente No 2, su superestructura está compuesta por una losa maciza continua dividida en tres luces.

El trabajo aquí realizado se desarrolló en cuatro etapas; En la primera, se realizó un estudio de la norma AASHTO 2012, además de la información suministrada por universidad de Purdue, la cual consistió en veintitrés (23) planos en formato PDF, copia de los originales de diseño e intervenciones realizadas a los puentes. En la segunda etapa se transcribió la información relevante de los planos de diseño a Autocad.

Una vez estudiado y entendido los requerimientos exigidos en la norma AASHTO 2012, para el diseño de puentes más la información obtenida de los planos de diseño, se procedió con la tercera etapa, la cual consistió en determinar las solicitaciones por corte y flexión para la superestructura de los dos puentes. Las solicitaciones se calcularon manualmente y con la ayuda del programa SAP2000, esto último para tener un punto de comparación de resultados, los métodos empleados para determinar las solicitaciones manualmente fueron el teorema de Barret para el puente No 1 y líneas de influencia para el puente No 2.

En la cuarta etapa, se calcularon los índices de sobre esfuerzo por corte y flexión, así como las deformaciones de los puentes. Obteniendo índices por flexión para el puente No 1 hasta un 16% por encima de la capacidad de las vigas, según requerimientos de la norma, además de no cumplir los límites para deformaciones. En el puente No 2 se obtuvieron índices de sobre esfuerzo por corte y flexión por debajo de la capacidad de

resistencia de los elementos. Concluyendo que el puente No-1 a pesar de obtenerse índices superiores a la unidad, el puente puede seguir en funcionamiento y el puente No-2 cumple con los requerimientos de capacidad establecidos en la Norma AASHTO 2012.

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Introducción

En el desarrollo económico, social, cultural y productivo de una sociedad existen diferentes factores, que juegan un papel muy importante. Uno de estos entre muchos otros, es el estado de conservación de las vías de comunicación y sus componentes tales como: bermas, señalizaciones, calzadas, andenes, cunetas túneles, viaductos y puentes. Una vía en buen estado se traduce para una sociedad en; reducción en tiempos de viaje, facilita el desplazamiento de los usuarios y mercancías, además de contribuir al desarrollo y sostenibilidad económica de las regiones entre otros.

Actualmente, uno de los ítems que mide a nivel mundial el desarrollo de una nación es el estado de conservación de sus vías de comunicación, por otro lado una vía para una nación es una inversión productiva, con el reintegro de los costos invertidos en tiempos relativamente rápidos, seguros y bien multiplicados.

Ninguna nación o sociedad crece con un defectuoso sistema de vías, por lo tanto para que una vía preste la función básica para la cual fue proyectada y no margine o retrase el desarrollo de una región, es indispensable implementar un plan mantenimiento periódico para esta y para cada uno de los elementos que la componen.

Cuando se habla de una vía, dependiendo de la topografía que atraviese, esta puede estar compuesta por diferentes elementos, los cuales también se deben tener en cuenta en el momento de realizar un mantenimiento o una ampliación vial, tal es el caso de los puentes vehiculares, los cuales son elementos estructurales que se aprovechan en las vías para salvar accidentes topográficos, o cualquier obstáculo físico como: un río, un caño, un humedal, un cruce vial o una vía férrea.

La función principal de un puente es conectar dos (2) puntos para mejorar o permitir la movilidad vial entre estos. Otras funciones de los puentes son: mejorar la circulación vial en sitios muy concurridos, permitir el paso peatonal, permitir el paso de animales o paso de tuberías, entre otras.

Además del mantenimiento preventivo que se les debe realizar a los puentes, en ocasiones es necesario realizar una evaluación de la capacidad de carga, ya sea por el

deterioro normal por el paso de los años, por vulnerabilidad sísmica, por actualización de códigos, o por el aumento del tráfico y/o cargas que lo atraviesan.

Viendo la importancia de las vías y de sus componentes como los puentes para una sociedad, es de vital importancia que sus dirigentes se preocupen por el estado de conservación y de capacidad de carga de estos, tal es el caso de un cierto tipo de puentes en el estado de Indiana (Estados Unidos) que está desarrollando la universidad de Purdue ubicada en el mismo estado.

Como parte del proceso de acercamiento entre la Universidad de Purdue y la Escuela Colombiana de Ingeniería, se planteó este trabajo dirigido cuyo objetivo es evaluar la capacidad de carga de la superestructura de dos puentes vehiculares utilizando la metodología empleada para este fin en Colombia.

Capitulo I
Marco Teórico

En la siguiente sección se presentan la teoría que sirvió de base para el análisis estructural de los puentes, más la descripción general de los métodos que se emplearon para calcular las solicitaciones máximas, valores que fueron cotejados con los obtenidos con la ayuda del programa SAP2000, con el objeto de evitar desviaciones importantes en los datos base del estudio que aquí se propone.

En Colombia no existe una normativa clara para evaluar la capacidad de carga de los puentes, sin embargo mediante resolución número 000108 de 2015 se reglamentó la NORMA COLOMBIANA DE DISEÑO SÍSMICO DE PUENTES CCP-14, norma que como su nombre lo indica es para el diseño de estructuras nuevas y en ninguno de sus capítulos se presentan recomendaciones para la evaluación de estructuras existentes, por lo tanto el trabajo que aquí se desarrolló consistió en obtener las solicitaciones y deflexiones máximas de acuerdo con la geometría actual de las estructuras y normativa vigente, para luego calcular las solicitaciones resistentes de acuerdo con la información consignada en los planos como son; dimensiones, materiales y refuerzo.

Finalmente con los valores de las solicitaciones obtenidas, se calcularon los índices de sobre esfuerzo de las estructuras más sus deformaciones o deflexiones máximas.

Como los puentes a analizar se localizan en el estado de Indiana (Estados Unidos), se seguirán las recomendaciones dadas en la NORMA AASHTO 2012, norma en la que se basa el código colombiano CCP-14.

En este capítulo se incluye también una breve descripción de las recomendaciones dadas en la norma AASHTO LRFD 2012 para el diseño de puentes, recomendaciones que servirán cumplir con los objetivos de este trabajo.

1.1. Puente tipo losa

Un puente tipo losa es una estructura conformado por una placa maciza con espesor considerable, generalmente en concreto reforzado y simplemente apoyada, este tipo de puente se emplean para salvar luces pequeñas entre 6 a 18,0 m. (Véase Figura 1).

Figura 1 Puente tipo losa en concreto reforzado

Fuente: (Oldcastle Precast)

1.2. Puente tipo viga - losa

Un puente tipo viga losa es una estructura conformada por una losa superior apoyada sobre vigas descolgadas generalmente en concreto reforzado, algunas veces trabajando en sección compuesta. Las vigas pueden tener diferentes configuraciones como son; vigas en I, vigas rectangulares y vigas tipo cajón, estos elementos pueden ser de sección constante o variable. Este tipo de puentes generalmente se emplean para luces comprendidas entre 25,0 m y 35,0 m para luces continuas o simples. (Véase. Figura 2).

Figura 2 Puente tipo viga - losa en concreto reforzado

Fuente: (PACADAR, 2016)

1.3. Componentes de un puente

Los puentes generalmente están conformados por los siguientes elementos (Véase Figura 3):

1. Superficie y Equipamientos:
    - Superficie de rodadura.
    - Juntas. de expansión
    - Andenes y/o bordillos
    - Barandas
    - Iluminación
    - Señalización
    - Drenajes.
2. Sub estructura:
    - Aletas.
    - Estribos
    - Pilas

3. Superestructura:

- Losa.
- Vigas
- Riostras
- Arcos
- Apoyos

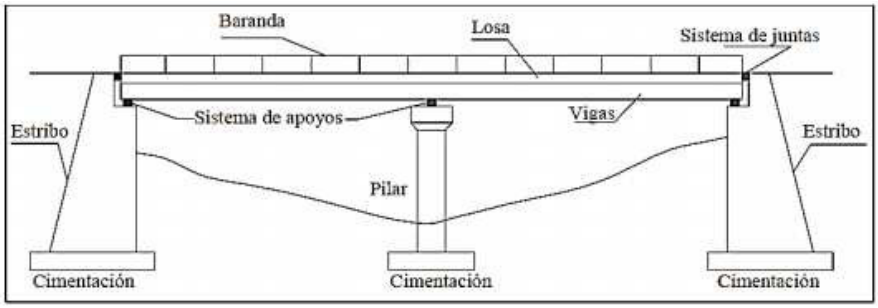


Figura 3 Componentes de un puente

Fuente: (INVIAS, 2006)

1.4. Teorema de Barret

El teorema predice que cuando hay más de una carga sobre un elemento simplemente apoyado, el momento máximo se produce en una posición de las cargas de tal manera que; el centro luz es equidistante de la resultante de la carga más pesada y más cercana a esta resultante. El momento máximo se producirá debajo de la carga más alta y más cercana al centro luz (Serquen, 2016). (Véase Figura 4).

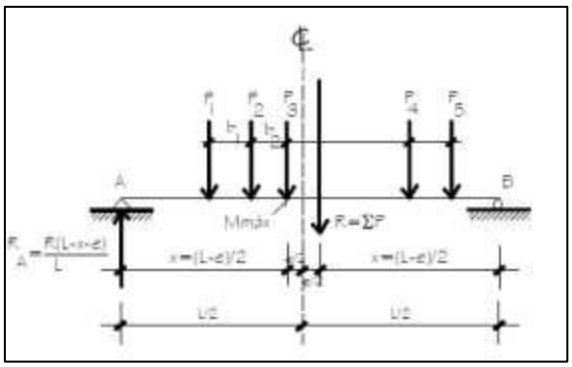


Figura 4 Esquema teorema de Barret.

Fuente: (Serquen, 2016)

1.5. Líneas de influencia

La línea de influencia es la representación gráfica del efecto que una carga móvil tiene sobre una acción interna, (momento o cortante), una reacción o una deformación en una sección específica de una estructura.

Para determinar la línea de influencia de una reacción, fuerza interna o deformación, basta con desplazar una carga unitaria puntual P=1 sobre la estructura y analizar su efecto sobre la fuerza interna, reacción o deformación en una sección de interés. La línea que une las ordenadas N, bajo las diferentes posiciones de la carga, representa la línea de influencia de la reacción o de la fuerza interna (momento o cortante) correspondiente.

Los diagramas de fuerza normal N, fuerza cortante V, el momento flector M y torsor T son la representación gráfica del efecto causado por un tren de cargas inmóvil, es decir cuya posición es fija, a lo largo de diferentes secciones de una estructura. Por el contrario, la línea de influencia representa el efecto que una carga móvil produce sobre una reacción, sobre una fuerza interna, sobre un momento flector o momento torsor, sobre una deformación en una sección determinada de una estructura.

Diagrama de fuerzas internas: La carga es móvil. El diagrama indica el efecto de la carga móvil en todas las secciones de la estructura.

Línea de influencia: La carga es móvil y la sección considerada es fija. Por facilidad de cálculo se acostumbra suponer que la carga móvil igual a la unidad. La línea de influencia representa el efecto de una carga móvil sobre una reacción, una fuerza interna (N, V, M, T) o una deformación en una sección determinada de la estructura.

La gráfica siguiente muestra la diferencia entre los diagramas de fuerza cortante y momento flector, referidos a una viga simplemente apoyada, y la línea de influencia de la reacción en A, RA, la reacción en B, RB y el momento flector en C. (Bahena, Curso de puentes en concreto, Codigo Colombiano de Diseño Sismico de Puentes - 1995, 2004)

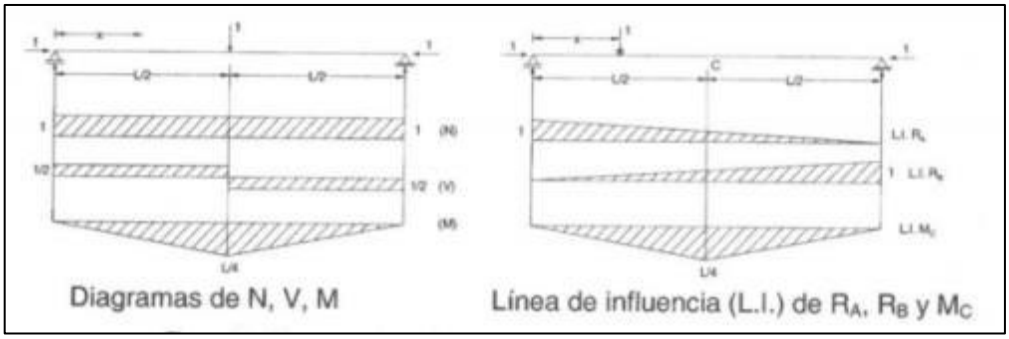


Figura 5 Diagrama de acciones internas y las líneas de influencia

Fuente: (Bahena, Fundamentos de diseño de puentes, 2018)

1.6. Especificaciones y requerimientos de la norma AASTHO 2012

En buena parte del continente americano, el diseño de puentes se ha practicado teniendo como referencia de primera mano las especificaciones americanas AASHTO [AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS], cuya primera norma, “STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES AND INCIDENTAL STRUCTURES”, ampliamente reconocida, fue publicada en 1931 Posteriormente se denominó AASHTO [AMERICAN ASSOCIATION OF STATE

HIGHWAYS AND TRANSPORTATION OFFICIALS] y se creó el "AASHTO HIGHWAY SUBCOMMITTEE ON BRIDGES AND STRUCTURES", autor y guardián de esta primera especificación. El titulo original de la especificación fue simplificado y en sus últimas ediciones consecutivas, con intervalos aproximados de cuatro años, lo hemos conocido como "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES". Su edición final, la "17th edition", fue publicada en el año 2002.

En la introducción de la especificación AASHTO LRFD, 6a edición, se expresa: "EI volumen de conocimientos relacionados con el diseño de puentes de carretera ha crecido enormemente desde 1931 y continua haciéndolo. La teoría y la práctica ha evolucionado significativamente, reflejando los avances de la investigación en el conocimiento de las propiedades de los materiales, sus mejoras, en el más racional y preciso análisis del comportamiento de las estructuras, en el advenimiento de los computadores y el rápido avance de su tecnología, en el estudio de los eventos externos que representan amenaza para los puentes, tales como eventos sísmicos, crecientes de los ríos y muchas otras áreas."

En 1986, el subcomité de AASHTO encargado de estos asuntos manifestó el interés por efectuar una evaluación de las especificaciones AASHTO vigentes, revisar las especificaciones y códigos extranjeros y, lo más importante, considerar las alternativas de filosofía de diseño a las especificaciones estándar [Standard Specifications] que se estaban utilizando corrientemente. EI trabajo fue realizado identificando y enmendando vacíos, inconsistencias y algunos conflictos. Y aún más, encontrando que la especificación no reflejaba los más recientes desarrollos de la filosofía de diseño con factores de diseño de carga y resistencia LRFD, enfoque que venía ganando terreno en otras áreas de la ingeniería estructural y en otras partes del mundo como Canadá y Europa. Finalmente, en 1994 AASHTO publica su primera edición de especificaciones para diseño de puentes basada en la filosofía LRFD, "AASHTO LRFD Bridge Design Specifications" Su más reciente publicación es la 7 más edición de 2014 (AASHTO, 2012)

1.6.1 Filosofía De Diseño

La filosofía de la norma AASHTO 2012, está basada en el concepto de estados límites, el cual se basa en la disminución de la probabilidad de falla de la estructura para ciertos estados límites, considerados importantes a valores aceptables.

La metodología de diseño por estados límite tiene dos características básicas: (1) trata de considerar todos los estados límites posibles y (2) está basado en métodos probabilistas.

Los estados límite deben estar suficientemente bien definidos, de tal manera que un diseñador sepa qué es considerado como aceptable o inaceptable. De mayor importancia es prevenir que los estados límites sean alcanzados, pero hay otras metas igualmente deseables: funcionalidad, apariencia y economía. No es económico diseñar un puente para que ninguno de sus componentes falle. Por lo tanto, es necesario determinar cuál es el nivel de riesgo o probabilidad de falla aceptable.

El criterio de diseño para estados límites se puede expresar matemáticamente de varias formas. Una de ellas, que utiliza coeficientes de carga y de resistencia, se puede expresar mediante la siguiente fórmula general, empleada en las Normas:

$$\emptyset \mathrm{Rn} \geq \sum \Upsilon \mathrm{k} * \mathrm{Qk}$$

En donde el lado izquierdo de la ecuación se refiere a la resistencia de la estructura y el lado derecho al efecto de las cargas que actúan sobre ella. Los términos tienen el siguiente significado:

Ø = Coeficiente de reducción de capacidad, también llamado coeficiente de resistencia, siempre menor o igual a uno.

R_n = resistencia nominal, calculada con una fórmula de un código estructural, utilizando las dimensiones nominales del elemento y las propiedades nominales del material. Es una fuerza interna generalizada: fuerza axial, momento flector o corte, asociada con el estado límite de capacidad o de funcionalidad en estudio.

Y_k = Coeficiente de carga que refleja la posibilidad de que se presenten sobrecargas y las incertidumbres inherentes al cálculo de los efectos de la carga. El subíndice k representa las varias cargas así: D para la carga muerta, L para la viva, E para el sismo, W para el viento, etc.

Q_k = Efecto de la carga de diseño

1.6.2 Sistema de unidades.

En el estudio de los puentes se empleará como sistema principal de unidades el sistema internacional de unidades (S.I.), con su equivalencia en el sistema inglés (U.S), tal como se presenta a continuación:

- **Sistema Internacional de unidades (S.I)**

  - Longitud :Metros (m)
    Milímetros (mm)
  - Área :Metros cuadrados (m^2)
    Milímetros cuadrados (mm^2)
  - Fuerza :Newton (N)
    Kilonewtons (kN)
  - Masa :Kilogramo (kg)

- **Sistema Internacional de unidades inglés (U.S)**

  - Longitud :Pie (ft)
    Pulgada (in)
  - Área :Pies cuadrados (ft^2)
    Pulgadas cuadradas (in^2)
  - Fuerza :libra (lb)
  - Masa :libra-masa (lbm)

1.6.3 Clasificación de los puentes

De acuerdo al capítulo 4 de la norma AASTHO 2012 los puentes se deben clasificar en una de las tipologías que se indica en la tabla 4.6.2.2.1-1, la cual se presentan a continuación.

Table 4.6.2.2.1-1—Common Deck Superstructures Covered in Articles 4.6.2.2.2 and 4.6.2.2.3

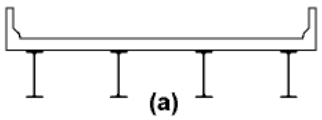
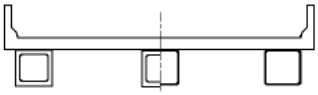
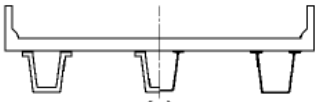
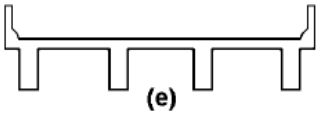
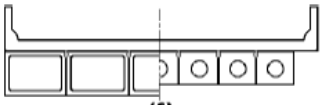
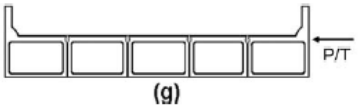
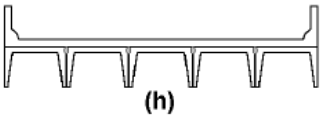
Supporting Components	Type Of Deck	Typical Cross-Section
Steel Beam	Cast-in-place concrete slab, precast concrete slab, steel grid, glued/spiked panels, stressed wood	 (a)
Closed Steel or Precast Concrete Boxes	Cast-in-place concrete slab	 (b)
Open Steel or Precast Concrete Boxes	Cast-in-place concrete slab, precast concrete deck slab	 (c)
Cast-in-Place Concrete Multicell Box	Monolithic concrete	(d)
Cast-in-Place Concrete Tee Beam	Monolithic concrete	 (e)
Precast Solid, Voided or Cellular Concrete Boxes with Shear Keys	Cast-in-place concrete overlay	 (f)
Precast Solid, Voided, or Cellular Concrete Box with Shear Keys and with or without Transverse Post-Tensioning	Integral concrete	 (g)
Precast Concrete Channel Sections with Shear Keys	Cast-in-place concrete overlay	 (h)

Figura 6 Superestructuras comunes cubiertas en los artículos 4.6.2.2.2 y 4.6.2.2.3

Fuente: (AASHTO, 2012)

1.6.4 Chequeo de dimensiones

Dentro del análisis propuesto, se realizará una verificación de dimensiones de las superestructuras de los puentes, partiendo de la información consignada en los planos de diseño, contra las recomendadas en la tabla 2.5.2.6.3 -1 de la norma.

Table 2.5.2.6.3-1—Traditional Minimum Depths for Constant Depth Superstructures

Superstructure		Minimum Depth (Including Deck) When variable depth members are used, values may be adjusted to account for changes in relative stiffness of positive and negative moment sections	
Material	Type	Simple Spans	Continuous Spans
Reinforced Concrete	Slabs with main reinforcement parallel to traffic	$\frac{1.2\ S+10}{30}$	$\frac{S+10}{30} \geq 0.54$ ft.
	T-Beams	$0.070L$	$0.065L$
	Box Beams	$0.060L$	$0.055L$
	Pedestrian Structure Beams	$0.035L$	$0.033L$
Prestressed Concrete	Slabs	$0.030L \geq 6.5$ in.	$0.027L \geq 6.5$ in.
	CIP Box Beams	$0.045L$	$0.040L$
	Precast I-Beams	$0.045L$	$0.040L$
	Pedestrian Structure Beams	$0.033L$	$0.030L$
	Adjacent Box Beams	$0.030L$	$0.025L$
Steel	Overall Depth of Composite I-Beam	$0.040L$	$0.032L$
	Depth of I-Beam Portion of Composite I-Beam	$0.033L$	$0.027L$
	Trusses	$0.100L$	$0.100L$

Figura 7 Profundidades mínimas para superestructuras de profundidad constante

Fuente: (AASHTO, 2012)

1.6.5 Cargas y factores de carga

La norma clasifica las cargas de la siguiente forma:

- Cargas permanentes = Peso propio y cargas muertas
- Cargas variables = Carga viva (Camiones de diseño)

1.6.5.1. Peso Propio y Cargas Muertas

Corresponde al peso propio de la estructura y el peso de los elementos que permanecerán fijos durante la vida útil de la estructura (cargas permanentes o comunes) para cada puente se realiza una evaluación particular de acuerdo con su geometría, componentes y el peso unitario de los materiales que se presentan en la tabla 3.5.1.-1 de la norma.

Table 3.5.1-1—Unit Weights

Material		Unit Weight (kcf)
Aluminum Alloys		0.175
Bituminous Wearing Surfaces		0.140
Cast Iron		0.450
Cinder Filling		0.060
Compacted Sand, Silt, or Clay		0.120
Concrete	Lightweight	0.110
	Sand-Lightweight	0.120
	Normal Weight with $f'_c \leq 5.0$ ksi	0.145
	Normal Weight with $5.0 < f'_c \leq 15.0$ ksi	$0.140 + 0.001\, f'_c$
Loose Sand, Silt, or Gravel		0.100
Soft Clay		0.100
Rolled Gravel, Macadam, or Ballast		0.140
Steel		0.490
Stone Masonry		0.170
Wood	Hard	0.060
	Soft	0.050
Water	Fresh	0.0624
	Salt	0.0640
Item		Weight per Unit Length (klf)
Transit Rails, Ties, and Fastening per Track		0.200

Figura 8 Peso unitarios de materiales para diseño de puentes

Fuente: (AASHTO, 2012)

1.6.5.2. Cargas vivas de vehículos

La carga viva vehicular mínima a considerar para determinar los índices de sobre esfuerzo de la superestructura de los puentes, es la establecida en el capítulo 3 de la norma, tal como se presenta en las siguientes figuras.

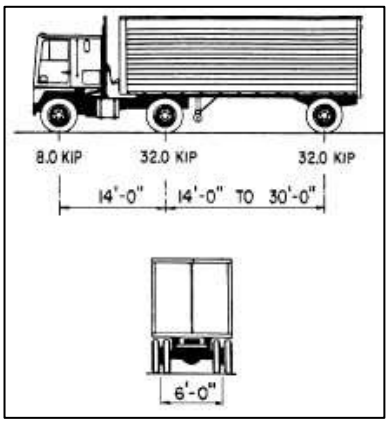


Figura 9 Cargas camión de diseño HL-93

Fuente: (AASHTO, 2012)

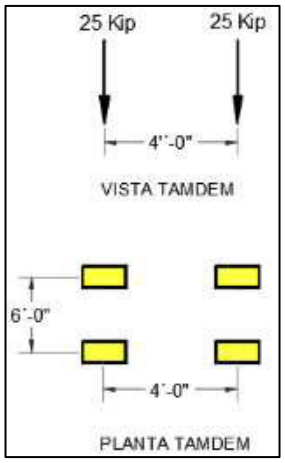


Figura 10 Cargas de diseño – Tándem

Fuente: Elaboración propia

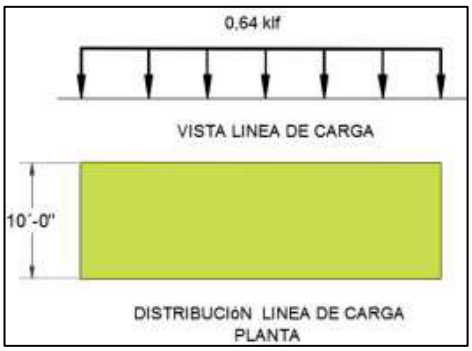


Figura 11 Carga de diseño – Línea de carga

Fuente: Elaboración propia

De acuerdo al capítulo 3.6.1.3 de Norma, el efecto extremo por el paso de vehículos sobre un puente, se debe tomar como la mayor de los siguientes:

1. Camión de diseño más línea de carga.

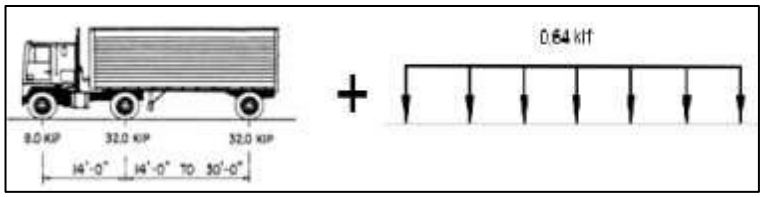


Figura 12 Combinación camión HL-93 más línea de carga

Fuente: Elaboración propia

2. Tándem de diseño más línea de carga.

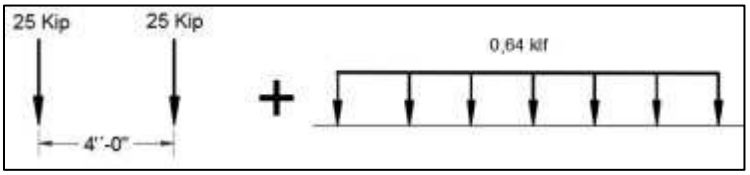


Figura 13 Combinación Tándem de diseño más línea de carga

Fuente: Elaboración propia

Adicionalmente los efectos estáticos del camión o tándem de diseño, deben incrementarse por el porcentaje especificado en la siguiente tabla. Para tener en cuenta en el diseño efectos dinámicos.

Tabla 1 Amplificación de Carga viva (IM

Table 3.6.2.1-1—Dynamic Load Allowance, *IM*

Component	IM
Deck Joints—All Limit States	75%
All Other Components:	
• Fatigue and Fracture Limit State	15%
• All Other Limit States	33%

Fuente: (AASHTO, 2012)

1.6.6 Factores de distribución

La norma divide el diseño de los elementos internos de los elementos externos, esta división se realiza con los factores de distribución, empleados para las solicitaciones por flexión y cortante, de acuerdo con lo indicado en el numeral 4.6.2.2.2. El factor de distribución es el porcentaje de momento flector o cortante que recibe cada uno de los elementos de un puente, debido a la acción de la carga viva. Las ecuaciones para el cálculo del factor de distribución para momento o cortante depende de si el elemento en estudio es interior o exterior y del número de carriles cargados. En las siguientes tablas se presentan las ecuaciones para calcular estos valores.

Tabla 2 Distribución de cargas vivas para momentos en vigas interiores - 1

Table 4.6.2.2.2b-1—Distribution of Live Loads for Moment in Interior Beams

Type of Superstructure	Applicable Cross-Section from Table 4.6.2.2.1-1	Distribution Factors	Range of Applicability
Wood Deck on Wood or Steel Beams	a, 1	See Table 4.6.2.2.2a-1	
Concrete Deck on Wood Beams	1	One Design Lane Loaded: $S/12.0$ Two or More Design Lanes Loaded: $S/10.0$	$S \le 6.0$
Concrete Deck, Filled Grid, Partially Filled Grid, or Unfilled Grid Deck Composite with Reinforced Concrete Slab on Steel or Concrete Beams; Concrete T-Beams, T- and Double T-Sections	a, e, k and also i, j if sufficiently connected to act as a unit	One Design Lane Loaded: $0.06+\left(\frac{S}{14}\right)^{0.4}\left(\frac{S}{L}\right)^{0.3}\left(\frac{K_g}{12.0Lt_s^3}\right)^{0.1}$ Two or More Design Lanes Loaded: $0.075+\left(\frac{S}{9.5}\right)^{0.6}\left(\frac{S}{L}\right)^{0.2}\left(\frac{K_g}{12.0Lt_s^3}\right)^{0.1}$	$3.5 \le S \le 16.0$ $4.5 \le t_s \le 12.0$ $20 \le L \le 240$ $N_b \ge 4$ $10{,}000 \le K_g \le 7{,}000{,}000$
		use lesser of the values obtained from the equation above with $N_b = 3$ or the lever rule	$N_b = 3$
Cast-in-Place Concrete Multicell Box	d	One Design Lane Loaded: $\left(1.75+\frac{S}{3.6}\right)\left(\frac{1}{L}\right)^{0.35}\left(\frac{1}{N_c}\right)^{0.45}$ Two or More Design Lanes Loaded: $\left(\frac{13}{N_c}\right)^{0.3}\left(\frac{S}{5.8}\right)\left(\frac{1}{L}\right)^{0.25}$	$7.0 \le S \le 13.0$ $60 \le L \le 240$ $N_c \ge 3$ If $N_c > 8$ use $N_c = 8$
Concrete Deck on Concrete Spread Box Beams	b, c	One Design Lane Loaded: $\left(\frac{S}{3.0}\right)^{0.35}\left(\frac{Sd}{12.0L^2}\right)^{0.25}$ Two or More Design Lanes Loaded: $\left(\frac{S}{6.3}\right)^{0.6}\left(\frac{Sd}{12.0L^2}\right)^{0.125}$	$6.0 \le S \le 18.0$ $20 \le L \le 140$ $18 \le d \le 65$ $N_b \ge 3$
		Use Lever Rule	$S > 18.0$
Concrete Beams used in Multibeam Decks	f	One Design Lane Loaded: $k\left(\frac{b}{33.3L}\right)^{0.5}\left(\frac{I}{J}\right)^{0.25}$ where: $k = 2.5(N_b)^{-0.2} \ge 1.5$ Two or More Design Lanes Loaded: $k\left(\frac{b}{305}\right)^{0.6}\left(\frac{b}{12.0L}\right)^{0.2}\left(\frac{I}{J}\right)^{0.06}$	$35 \le b \le 60$ $20 \le L \le 120$ $5 \le N_b \le 20$
	g if sufficiently connected to act as a unit		

Fuente: (AASHTO, 2012)

Tabla 3 Distribución de cargas vivas para momentos en vigas interiores - 2

Table 4.6.2.2.2b-1 (continued)—Distribution of Live Loads for Moment in Interior Beams

Type of Superstructure	Applicable Cross-Section from Table 4.6.2.2.1-1	Distribution Factors	Range of Applicability
	h	Regardless of Number of Loaded Lanes: S/D where: $C = K(W/L) \le K$ $D = 11.5 - N_L + 1.4N_L(1-0.2C)^2$	Skew ≤ 45° $N_L \le 6$
	g, i, j if connected only enough to prevent relative vertical displacement at the interface	when C ≤ 5 $D = 11.5 - N_L$ when $C > 5$ $K = \sqrt{\frac{(1+\mu)I}{J}}$ for preliminary design, the following values of K may be used: Beam Type — K Nonvoided rectangular beams — 0.7 Rectangular beams with circular voids: — 0.8 Box section beams — 1.0 Channel beams — 2.2 T-beam — 2.0 Double T-beam — 2.0	
Open Steel Grid Deck on Steel Beams	a	One Design Lane Loaded: $S/7.5$ If $t_g < 4.0$ $S/10.0$ If $t_g \ge 4.0$ Two or More Design Lanes Loaded: $S/8.0$ If $t_g < 4.0$ $S/10.0$ If $t_g \ge 4.0$	$S \le 6.0$ $S \le 10.5$
Concrete Deck on Multiple Steel Box Girders	b, c	Regardless of Number of Loaded Lanes: $0.05 + 0.85\frac{N_L}{N_b} + \frac{0.425}{N_L}$	$0.5 \le \frac{N_L}{N_b} \le 1.5$

Fuente: (AASHTO, 2012)

Tabla 4 Distribución de cargas vivas para momentos en vigas exteriores

Table 4.6.2.2.2d-1—Distribution of Live Loads for Moment in Exterior Longitudinal Beams

Type of Superstructure	Applicable Cross-Section from Table 4.6.2.2.1-1	One Design Lane Loaded	Two or More Design Lanes Loaded	Range of Applicability
Wood Deck on Wood or Steel Beams	a, l	Lever Rule	Lever Rule	N/A
Concrete Deck on Wood Beams	l	Lever Rule	Lever Rule	N/A
Concrete Deck, Filled Grid, Partially Filled Grid, or Unfilled Grid Deck Composite with Reinforced Concrete Slab on Steel or Concrete Beams; Concrete T-Beams, T- and Double T-Sections	a, e, k and also i, j if sufficiently connected to act as a unit	Lever Rule	$g = e\, g_{interior}$ $e = 0.77 + \frac{d_e}{9.1}$	$-1.0 \le d_e \le 5.5$
			use lesser of the values obtained from the equation above with $N_b = 3$ or the lever rule	$N_b = 3$
Cast-in-Place Concrete Multicell Box	d	$g = \frac{W_e}{14}$	$g = \frac{W_e}{14}$	$W_e \le S$
		or the provisions for a whole-width design specified in Article 4.6.2.2.1		
Concrete Deck on Concrete Spread Box Beams	b, c	Lever Rule	$g = e\, g_{interior}$ $e = 0.97 + \frac{d_e}{28.5}$	$0 \le d_e \le 4.5$ $6.0 < S \le 18.0$
			Use Lever Rule	$S > 18.0$
Concrete Box Beams Used in Multibeam Decks	f, g	$g = e\, g_{interior}$ $e = 1.125 + \frac{d_e}{30} \ge 1.0$	$g = e\, g_{interior}$ $e = 1.04 + \frac{d_e}{25} \ge 1.0$	$d_e \le 2.0$
Concrete Beams Other than Box Beams Used in Multibeam Decks	h	Lever Rule	Lever Rule	N/A
	i, j if connected only enough to prevent relative vertical displacement at the interface			
Open Steel Grid Deck on Steel Beams	a	Lever Rule	Lever Rule	N/A
Concrete Deck on Multiple Steel Box Girders	b, c	As specified in Table 4.6.2.2.2b-1		

Fuente: (AASHTO, 2012)

Tabla 5 Factores de distribución de carga para momentos en vigas longitudinales sobre apoyos enviados

Table 4.6.2.2.2e-1—Reduction of Load Distribution Factors for Moment in Longitudinal Beams on Skewed Supports

Type of Superstructure	Applicable Cross-Section from Table 4.6.2.2.1-1	Any Number of Design Lanes Loaded	Range of Applicability
Concrete Deck, Filled Grid, Partially Filled Grid, or Unfilled Grid Deck Composite with Reinforced Concrete Slab on Steel or Concrete Beams; Concrete T-Beams, T- and Double T- Sections	a, e, k and also i, j if sufficiently connected to act as a unit	$1-c_1(\tan\theta)^{1.5}$ $c_1 = 0.25\left(\frac{K_g}{12.0Lt_s^3}\right)^{0.25}\left(\frac{S}{L}\right)^{0.5}$ If $\theta < 30°$ then $c_1 = 0.0$ If $\theta > 60°$ use $\theta = 60°$	$30° \le \theta \le 60°$ $3.5 \le S \le 16.0$ $20 \le L \le 240$ $N_b \ge 4$
Concrete Deck on Concrete Spread Box Beams, Cast-in-Place Multicell Box Concrete Box Beams and Double T-Sections used in Multibeam Decks	b, c, d, f, g	$1.05 - 0.25\tan\theta \le 1.0$ If $\theta > 60°$ use $\theta = 60°$	$0° \le \theta \le 60°$

Fuente: (AASHTO, 2012)

Tabla 6 Distribución de carga viva para cortante en vigas interiores

Table 4.6.2.2.3a-1—Distribution of Live Load for Shear in Interior Beams

Type of Superstructure	Applicable Cross-Section from Table 4.6.2.2.1-1	One Design Lane Loaded	Two or More Design Lanes Loaded	Range of Applicability
Wood Deck on Wood or Steel Beams	a, l	See Table 4.6.2.2.2a-1		
Concrete Deck on Wood Beams	l	Lever Rule	Lever Rule	N/A
Concrete Deck, Filled Grid, Partially Filled Grid, or Unfilled Grid Deck Composite with Reinforced Concrete Slab on Steel or Concrete Beams; Concrete T-Beams, T-and Double T-Sections	a, e, k and also i, j if sufficiently connected to act as a unit	$0.36+\frac{S}{25.0}$	$0.2+\frac{S}{12}-\left(\frac{S}{35}\right)^{2.0}$	$3.5 \le S \le 16.0$ $20 \le L \le 240$ $4.5 \le t_s \le 12.0$ $N_b \ge 4$
		Lever Rule	Lever Rule	$N_b = 3$
Cast-in-Place Concrete Multicell Box	d	$\left(\frac{S}{9.5}\right)^{0.6}\left(\frac{d}{12.0L}\right)^{0.1}$	$\left(\frac{S}{7.3}\right)^{0.9}\left(\frac{d}{12.0L}\right)^{0.1}$	$6.0 \le S \le 13.0$ $20 \le L \le 240$ $35 \le d \le 110$ $N_c \ge 3$
Concrete Deck on Concrete Spread Box Beams	b, c	$\left(\frac{S}{10}\right)^{0.6}\left(\frac{d}{12.0L}\right)^{0.1}$	$\left(\frac{S}{7.4}\right)^{0.8}\left(\frac{d}{12.0L}\right)^{0.1}$	$6.0 \le S \le 18.0$ $20 \le L \le 140$ $18 \le d \le 65$ $N_b \ge 3$
		Lever Rule	Lever Rule	$S > 18.0$
Concrete Box Beams Used in Multibeam Decks	f, g	$\left(\frac{b}{130L}\right)^{0.15}\left(\frac{I}{J}\right)^{0.05}$	$\left(\frac{b}{156}\right)^{0.4}\left(\frac{b}{12.0L}\right)^{0.1}\left(\frac{I}{J}\right)^{0.05}\left(\frac{b}{48}\right)$ $\frac{b}{48} \ge 1.0$	$35 \le b \le 60$ $20 \le L \le 120$ $5 \le N_b \le 20$ $25,000 \le J \le 610,000$ $40,000 \le I \le 610,000$
Concrete Beams Other Than Box Beams Used in Multibeam Decks	h	Lever Rule	Lever Rule	N/A
	i, j if connected only enough to prevent relative vertical displacement at the interface			
Open Steel Grid Deck on Steel Beams	a	Lever Rule	Lever Rule	N/A
Concrete Deck on Multiple Steel Box Beams	b, c	As specified in Table 4.6.2.2.2b-1		

Fuente: (AASHTO, 2012)

Tabla 7 Distribución de carga viva para cortante en vigas exteriores

Table 4.6.2.2.3b-1—Distribution of Live Load for Shear in Exterior Beams

Type of Superstructure	Applicable Cross-Section from Table 4.6.2.2.1-1	One Design Lane Loaded	Two or More Design Lanes Loaded	Range of Applicability
Wood Deck on Wood or Steel Beams	a, l	Lever Rule	Lever Rule	N/A
Concrete Deck on Wood Beams	l	Lever Rule	Lever Rule	N/A
Concrete Deck, Filled Grid, Partially Filled Grid, or Unfilled Grid Deck Composite with Reinforced Concrete Slab on Steel or Concrete Beams; Concrete T-Beams, T- and Double T-Beams	a, e, k and also i, j if sufficiently connected to act as a unit	Lever Rule	$g = e\,g_{interior}$ $e = 0.6 + \frac{d_e}{10}$	$-1.0 \le d_e \le 5.5$
			Lever Rule	$N_b = 3$
Cast-in-Place Concrete Multicell Box	d	Lever Rule	$g = e\,g_{interior}$ $e = 0.64 + \frac{d_e}{12.5}$	$-2.0 \le d_e \le 5.0$
		or the provisions for a whole-width design specified in Article 4.6.2.2.1		
Concrete Deck on Concrete Spread Box Beams	b, c	Lever Rule	$g = e\,g_{interior}$ $e = 0.8 + \frac{d_e}{10}$	$0 \le d_e \le 4.5$
			Lever Rule	$S > 18.0$
Concrete Box Beams Used in Multibeam Decks	f, g	$g = e\,g_{interior}$ $e = 1.25 + \frac{d_e}{20} \ge 1.0$	$g = e\,g_{interior}\left(\frac{48}{b}\right)$ $\frac{48}{b} \le 1.0$ $e = 1 + \left(\frac{d_e + \frac{b}{12} - 2.0}{40}\right)^{0.5} \ge 1.0$	$d_e \le 2.0$ $35 \le b \le 60$
Concrete Beams Other Than Box Beams Used in Multibeam Decks	h	Lever Rule	Lever Rule	N/A
	i, j if connected only enough to prevent relative vertical displacement at the interface			
Open Steel Grid Deck on Steel Beams	a	Lever Rule	Lever Rule	N/A
Concrete Deck on Multiple Steel Box Beams	b, c	As specified in Table 4.6.2.2.2b-1		

Fuente: (AASHTO, 2012)

1.6.7 Combinaciones de Carga

En la siguiente tabla se presentan las combinaciones de carga básicas para el diseño estructural de puentes recomendadas en el capítulo 3 de la norma AASHTO LRFD 2012.

Tabla 8 Combinaciones básicas de carga

Table 3.4.1-1—Load Combinations and Load Factors

Load Combination Limit State	*DC DD DW EH EV ES EL PS CR SH*	*LL IM CE BR PL LS*	*WA*	*WS*	*WL*	*FR*	*TU*	*TG*	*SE*	Use One of These at a Time				
										EQ	*BL*	*IC*	*CT*	*CV*
Strength I (unless noted)	γ_p	1.75	1.00	—	—	1.00	0.50/1.20	γ_{TG}	γ_{SE}	—	—	—	—	—
Strength II	γ_p	1.35	1.00	—	—	1.00	0.50/1.20	γ_{TG}	γ_{SE}	—	—	—	—	—
Strength III	γ_p	—	1.00	1.40	—	1.00	0.50/1.20	γ_{TG}	γ_{SE}	—	—	—	—	—
Strength IV	γ_p	—	1.00	—	—	1.00	0.50/1.20	—	—	—	—	—	—	—
Strength V	γ_p	1.35	1.00	0.40	1.0	1.00	0.50/1.20	γ_{TG}	γ_{SE}	—	—	—	—	—
Extreme Event I	γ_p	γEQ	1.00	—	—	1.00	—	—	—	1.00	—	—	—	—
Extreme Event II	γ_p	0.50	1.00	—	—	1.00	—	—	—	—	1.00	1.00	1.00	1.00
Service I	1.00	1.00	1.00	0.30	1.0	1.00	1.00/1.20	γ_{TG}	γ_{SE}	—	—	—	—	—
Service II	1.00	1.30	1.00	—	—	1.00	1.00/1.20	—	—	—	—	—	—	—
Service III	1.00	0.80	1.00	—	—	1.00	1.00/1.20	γ_{TG}	γ_{SE}	—	—	—	—	—
Service IV	1.00	—	1.00	0.70	—	1.00	1.00/1.20	—	1.0	—	—	—	—	—
Fatigue I— *LL, IM & CE* only	—	1.50	—	—	—	—	—	—	—	—	—	—	—	—
Fatigue II— *LL, IM & CE* only	—	0.75	—	—	—	—	—	—	—	—	—	—	—	—

Fuente: (AASHTO, 2012)

Para determinar los índices de sobre esfuerzo y deformaciones de los dos puentes, se emplearan las siguientes combinaciones:

- Combinación Servicio 1-1 = 1.0 D.C+1.0 DW+1.0 HL-93*IM+1.0 LÍNEA DE CARGA.
- Combinación Servicio 1-2 = 1.0 D.C+1.0 DW+1.0 TÁNDEM*IM+1.0 LÍNEA DE CARGA.

- Combinación Resistencia 1-1 = 1.25 D.C+1.50 DW+1.75 HL-93*IM+1.75 LÍNEA DE CARGA.
- Combinación Resistencia 1-2 = 1.25 D.C+1.50 DW+1.75 TÁNDEM*IM+1.75 LÍNEA DE CARGA

Dónde: IM = 1.33

El chequeo de deflexiones se realizara con las con las siguientes combinaciones

- Combinación DFL1 = HL-93*25%+1.0 LÍNEA DE CARGA
- Combinación DFL2 = TÁNDEM*25%+1.0 LÍNEA DE CARGA
- Combinación DFL3 = HL-93

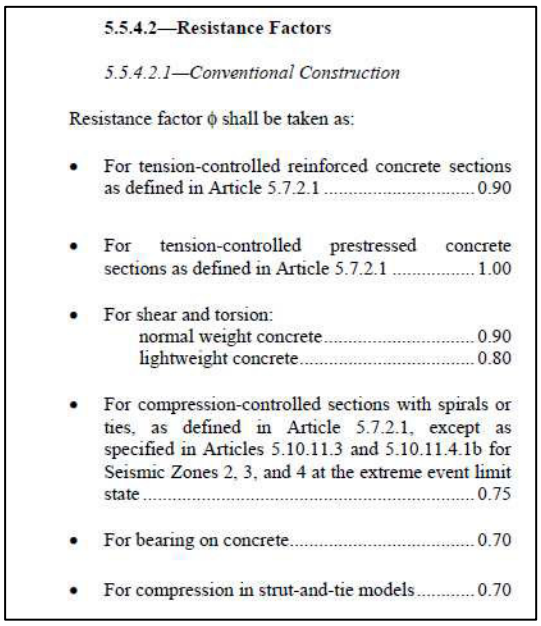
1.6.8 Momento resistente

En el capítulo 5.7.3.2 de la norma se indica que la resistencia a flexión de un elemento deber ser igual a:

$M_r = \Phi M_n$ Ecuación (5.7.3.2.1-1)

Dónde:

Φ = Factor de resistencia especificado en el artículo 5.5.4.2



5.5.4.2—Resistance Factors

5.5.4.2.1—Conventional Construction

Resistance factor ϕ shall be taken as:

- For tension-controlled reinforced concrete sections as defined in Article 5.7.2.1 ..... 0.90
- For tension-controlled prestressed concrete sections as defined in Article 5.7.2.1 ..... 1.00
- For shear and torsion:
  normal weight concrete 0.90
  lightweight concrete 0.80
- For compression-controlled sections with spirals or ties, as defined in Article 5.7.2.1, except as specified in Articles 5.10.11.3 and 5.10.11.4.1b for Seismic Zones 2, 3, and 4 at the extreme event limit state 0.75
- For bearing on concrete 0.70
- For compression in strut-and-tie models 0.70

Figura 14 Factores de resistencia recomendados en la norma

Fuente: (AASHTO, 2012)

M_n = (Resistencia nominal)

$$M_n = A_{ps} f_{ps}\left(d_p - \frac{a}{2}\right) + A_s f_s\left(d_s - \frac{a}{2}\right) -$$

$$A'_s f'_s\left(d'_s - \frac{a}{2}\right) + 0.85 f'_c (b - b_w) h_f \left(\frac{a}{2} - \frac{h_f}{2}\right) \qquad (5.7.3.2.2\text{-}1)$$

Figura 15 Ecuación para calcular la resistencia a flexión de elementos estructurales

Fuente: (AASHTO, 2012)

1.6.9 Cortante resistente

En el capítulo 5.8.1.1 de la norma AASHTO 2012 se indica que, cuando sea razonable suponer que las secciones planas permanecen planas después de la

carga, las regiones de los elementos deben diseñarse para cortante y torsión usando, ya sea el modelo seccional especificado en el Artículo 5.8.3, o el modelo de puntal-tensor especificado en el Artículo 5.6.3, por lo tanto; la resistencia a cortante de un elemento empelando el modelo del artículo 5.8.3 debe calcularse como:

$V_r = \Phi V_n$ Ecuación (5.8.2.1-2)

Dónde:

Φ = Factor de resistencia especificado en el artículo 5.5.4.2

V_n = Resistencia nominal a cortante

5.8.3.3—Nominal Shear Resistance

The nominal shear resistance, V_n, shall be determined as the lesser of:

$$V_n = V_c + V_s + V_p \quad (5.8.3.3\text{-}1)$$

$$V_n = 0.25 f'_c b_v d_v + V_p \quad (5.8.3.3\text{-}2)$$

in which:

$V_c = 0.0316 \beta \sqrt{f'_c}\, b_v d_v$, if the procedures of Articles 5.8.3.4.1 or 5.8.3.4.2 are used (5.8.3.3-3)

V_c = the lesser of V_{ci} and V_{cw}, if the procedures of Article 5.8.3.4.3 are used

$$V_s = \frac{A_v f_y d_v (\cot\theta + \cot\alpha)\sin\alpha}{s} \quad (5.8.3.3\text{-}4)$$

Where transverse reinforcement consists of a single longitudinal bar or a single group of parallel longitudinal bars bent up at the same distance from the support, the shear resistance V_s provided by these bars shall be determined as:

$$V_s = A_v f_y \sin\alpha \le 0.095 \sqrt{f'_c} b_v d_v \quad (5.8.3.3\text{-}5)$$

Figura 16 Resistencia nominal a corte de una sección

Fuente: (AASHTO, 2012)

1.6.10 Parámetros para deflexiones

Para el cálculo de deflexiones instantáneas se indica en el capítulo 5.7.3.6.2 que se debe realizar empleando el módulo de elasticidad del concreto especificado en el capítulo 5.4.2.4 tomando el momento de inercia bruto Ig o un momento de inercia efectivo Ie

5.4.2.4—Modulus of Elasticity

In the absence of measured data, the modulus of elasticity, E_c, for concretes with unit weights between 0.090 and 0.155 kcf and specified compressive strengths up to 15.0 ksi may be taken as:

$$E_c = 33{,}000\, K_1\, w_c^{1.5}\, \sqrt{f'_c} \qquad (5.4.2.4\text{-}1)$$

Figura 17 Ecuación para calcular módulo de elasticidad del concreto

Fuente: (AASHTO, 2012)

$$I_e = \left(\frac{M_{cr}}{M_a}\right)^3 I_g + \left[1 - \left(\frac{M_{cr}}{M_a}\right)^3\right] I_{cr} \le I_g \qquad (5.7.3.6.2\text{-}1)$$

in which:

$$M_{cr} = f_r \frac{I_g}{y_t} \qquad (5.7.3.6.2\text{-}2)$$

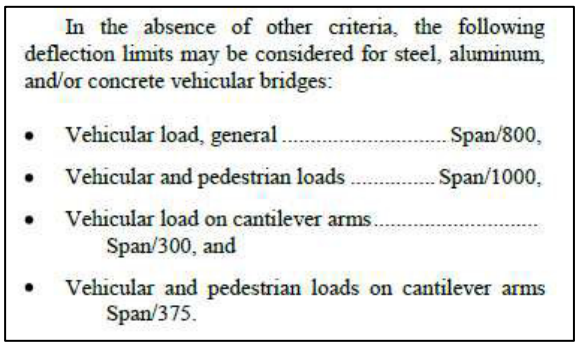
where:

M_{cr} = cracking moment (kip-in.)
f_r = modulus of rupture of concrete as specified in Article 5.4.2.6 (ksi)

Figura 18 Ecuación para calcular momento efectivo de inercia

Fuente: (AASHTO, 2012)

Los límites para el chequeo de deflexiones, en puentes vehiculares se presentan en el capítulo 2.5.2.6.2 de la norma los cuales se presentan a continuación.



In the absence of other criteria, the following deflection limits may be considered for steel, aluminum, and/or concrete vehicular bridges:

- Vehicular load, general Span/800,
- Vehicular and pedestrian loads Span/1000,
- Vehicular load on cantilever arms..... Span/300, and
- Vehicular and pedestrian loads on cantilever arms Span/375.

Figura 19 Límites para deflexiones verticales

Fuente: (AASHTO, 2012)

1.6.11 Método puntal tensor

El método de puntal tensor tiene su origen en los modelos de armaduras propuestos a principios del siglo XX, para explicar el comportamiento a cortante en vigas de concreto reforzado. El método está basado en la teoría de plasticidad y sirve para calcular la resistencia de un elemento estructural una vez éste ha alcanzado el estado límite de agrietamiento. El método se emplea en elementos estructurales en los cuales, debido a la magnitud de las fuerzas o a la geometría del elemento, no son válidas las hipótesis en las que se basa el diseño a flexión de vigas, es decir, la distribución de esfuerzos no es uniforme; a estos elementos o zonas de disturbio se le llama" Regiones de discontinuidad o regiones D", en la actualidad, el método ha sido calibrado y plasmado en códigos de diseño como la AASTHO 2012 (SCRIBD)

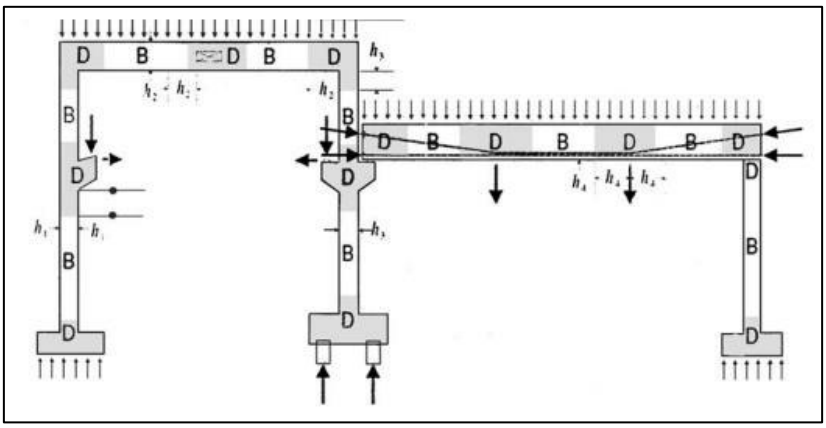


Figura 20 Representación Zonas “D” en modelo puntal tensor

Fuente: (SCRIBD)

De acuerdo a la norma AASTHO 2012 los modelos de puntal- tensor pueden usarse para determinar las fuerzas internas cerca de los apoyos y en los puntos de aplicación de cargas concentradas, en los estados límite de resistencia y evento extremo. El modelo de puntal-tensor debería considerarse para el diseño de cimentaciones profundas y dados de pilotes o en todas las situaciones en las cuales la distancia entre los centros de aplicación de carga y las reacciones es menor que aproximadamente dos veces el espesor del miembro.

- **Modelación**; La estructura, un elemento o una región de la misma, puede modelarse como un sistema de tensores de acero a tracción y puntales de concreto a compresión interconectados en nudos para formar una cercha capaz de llevar todas las cargas aplicadas a los apoyos. Deben considerarse los espesores requeridos de los puntales a compresión y de los tensores a tracción para determinar la geometría de la cercha.

  La resistencia, P_r, de los puntales y los tensores debe tomarse como la de los elementos cargados axialmente:

  $P_r = \Phi P_n$ (5.6.3.2-1)

Dónde:

P_n= Resistencia del puntal o tensor (kips).

Φ = Factor de resistencia para tracción o compresión

- **Resistencia del puntal sin refuerzo**

  La resistencia nominal de un puntal de compresión sin refuerzo debe tomarse como:

  $P_n = f_{cu} * A_{cs}$ (5.6.3.3.1-1)

  Dónde:

  P_n= Resistencia nominal del puntal de compresión (kip).

  f_{cu} = Limite del esfuerzo de compresión especificado en el artículo 5.6.3.3.3 (ksi)

  A_{cs} = Área transversal efectiva del puntal especificada en el Artículo 5.6.3.3.2 (in^2)

- **Área transversal efectiva del puntal**

  EI valor de A_{cs} debe determinarse considerando el área disponible de concreto y las condiciones de anclaje en los extremos del puntal, como se muestra en la Figura 21 y Figura 22. Cuando el puntal está anclado con refuerzo, puede considerarse que el área efectiva de concreto se extiende una distancia de hasta seis diámetros de la barra de anclaje, como se muestra en la Figura 22.

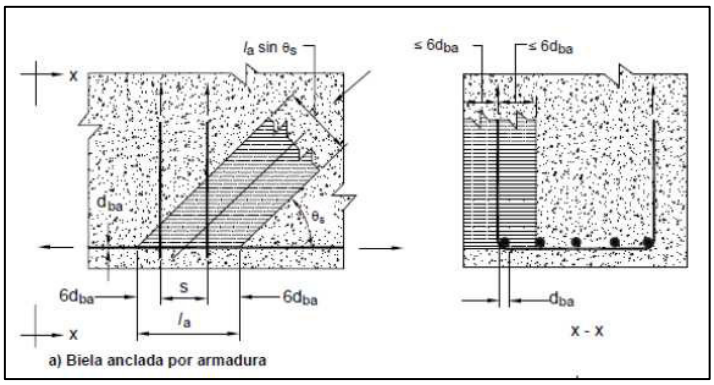


Figura 21 Detalle biela anclada con armadura

Fuente: (AIS, 2014)

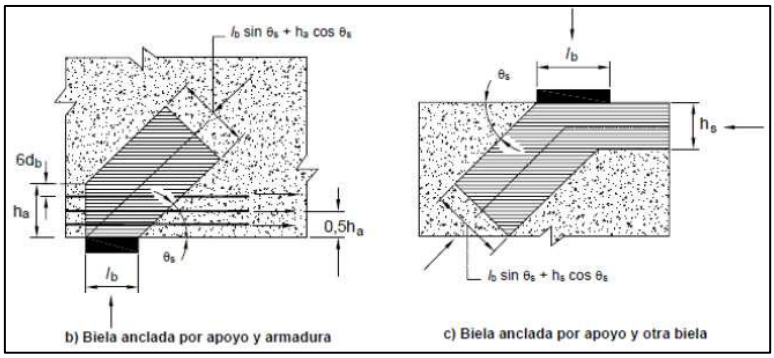


Figura 22 Detalle biela anclada con apoyo y otra biela

Fuente: (AIS, 2014)

- **Esfuerzo límite de compresión en el puntal**

El esfuerzo límite de compresión, $f_{cu,}$ debe ser;

$$f_{cu} = \frac{f_c'}{0.8 + 170\varepsilon_1} \leq 0.85 f_c' \qquad (5.6.3.3.3\text{-}1)$$

in which:

$$\varepsilon_1 = \varepsilon_s + (\varepsilon_s + 0.002)\cot^2 \alpha_s \qquad (5.6.3.3.3\text{-}2)$$

Dónde:

α_s = El menor Angulo entre el puntal de compresión y los tensores adyacentes de tracción (Grados).

ε_s = Deformación unitaria de tracción en el concreto en la dirección del tensor de tracción (in/in).

f´c= Resistencia especificada a la compresión (ksi)

- **Resistencia del tensor**

  EI refuerzo del tensor de tracción debe anclarse en las zonas nodales por medio de longitudes de refuerzo embebido en el concreto, de ganchos, o de anclajes mecánicos especificados. Las fuerzas de tracción deben desarrollarse en la cara interior de la zona nodal.

  La resistencia nominal del tensor de tracción en kips debe ser:

$$P_n = f_y A_{st} + A_{ps}\left[f_{pe} + f_y\right] \qquad (5.6.3.4.1\text{-}1)$$

  Dónde:

  A_{st} = Área total de refuerzo no tensionado longitudinal en el tensor (in^2)

  A_{ps} = Área del acero de preesfuerzo (in^2)

  f_y = Resistencia de fluencia del acero dulce de refuerzo longitudinal (ksi)

  F_{pe} = Esfuerzo en el acero de preesfuerzo debida al preesforzado después de descontadas las pérdidas (ksi)

- **Dimensionamiento de las regiones del nudo**

  A menos que se proporcione refuerzo de confinamiento y que su efecto esté soportado mediante análisis o experimentación, los esfuerzos de compresión en las regiones del nudo del puntal no deben exceder:

  - Para regiones de nudo limitadas por puntales de compresión y área de apoyo: O.85f

- Para regiones de nodo que anclan un tensor de tracción unidireccional: O.75f
- Para regiones de nodo que anclan tensores de tracción en más de una dirección: 065f

Dónde:

Φ = factor de resistencia para apoyo en concreto, como se especifica en el Artículo 5.5.4.2.

El refuerzo del tensor debe estar uniformemente distribuido sobre un área efectiva de concreto, por lo menos, igual a La fuerza en el tensor de tracción dividida por los límites de esfuerzo especificados.

Además de satisfacer los criterios de resistencia para puntales de compresión y tensores de tracción, las regiones de nodo deben diseñarse para cumplir con los límites de esfuerzo y anclaje especificados en los Artículos 5.63.4.1 y 6.3.4.2.

EI esfuerzo de aplastamiento en la región del nodo, producido por las cargas concentradas o por las reacciones, debe satisfacer los requisitos especificados en el Artículo 5.7.5.

1.7. Definición índice de sobre esfuerzo.

Un índice de sobre esfuerzo se define como la división entre la solicitación actuante sobre la solicitación resistente, de acuerdo a lo anterior a continuación se presenta la fórmula empleada para calcular los índices de sobre esfuerzo para momento y cortante de los puentes en estudio:

- Índice de sobre esfuerzo para momento ISM = Mu/ΦMn
- Índice de sobre esfuerzo para momento ISV = Vu/ΦVn

Capitulo II
Metodología

Actualmente Colombia cuenta con el manual de inspección de puentes (SIPUCOL) y el manual para la inspección visual de puentes y pontones del INVIAS, manuales donde se brindan recomendaciones para determinar el estado de conservación y mantenimiento de los puentes, realizando una inspección visual y registro de daños únicamente. Sin embargo para determinar la capacidad de carga de estos, desde el punto de vista estructural, no se cuenta con una metodología o reglamento bien definido, caso contrario ocurre en Estados Unidos, donde se localizan los puentes en estudio, que cuenta con el manual para evaluación de puentes (MBE) "The Manual for Bridge Evaluation (MBE)". Dado que el proyecto propuesto es determinar la capacidad de carga de dos puentes vehiculares localizados en el estado de Indiana Estados Unidos, empleando la metodología Colombiana, pero como se indicó anteriormente en el país no contamos con normas para este fin, por tal razón la metodología que se propone es; Seguir las recomendaciones dadas en la norma estadounidense AASHTO LRDF 2012 para el diseño estructural de puentes nuevos. Lo anterior con el propósito de obtener las solicitaciones actuantes en la superestructura de los puentes y sus deformaciones, para luego calcular los momentos y cortantes resistentes de acuerdo a la información registrada en los planos de diseño. Finalmente con los resultados obtenidos; de solicitaciones actuantes vs resistentes se obtienen los índices de sobres esfuerzo y se comparan las deformaciones con límites recomendados en la norma.

2.1. Objetivo general

Determinar los índices de sobre esfuerzo y cálculo de deformaciones bajo la carga del camión de diseño HL-93 y la Norma AASHTO LRFD 2012, para la superestructura de dos puentes vehiculares.

2.2. Etapas del estudio

El trabajo se desarrolló en cuatro etapas, las cuales se presentan a continuación, aclarando que cuando se mencione “norma” en el desarrollo del trabajo, se refiere a la **AASTHO LRFD 2012**, a menos que se realice cualquier otra aclaración.

2.2.1 Primera etapa

En esta etapa, se hizo un estudio detallado de la información suministrada por la universidad de Purdue, la cual consto de veinte cuatro (24) planos, que sirvieron de base para identificar: La localización y tipo de puentes, materiales, refuerzo suministrado, numero de calzadas, geometría, dimensiones, intervenciones realizadas, antigüedad de los puentes y norma con que fueron diseñados.

En esta etapa también se realizó una revisión bibliográfica, y estudio de la Norma AASHTO LRFD 2012 y CCP-14.

2.2.2 Segunda etapa

En esta etapa se procedió a transcribir la información extraída de los planos de diseño a AutoCAD, información que servicio de base para realizar la evaluación de cargas muertas de cada uno de los puentes, además de determinar cuantías de acero de refuerzo suministrado a los elementos en estudio. Paralelamente a este trabajo se definieron: Combinaciones de carga, anchos de franjas y se calcularon los factores de distribución para el análisis de los elementos tanto internos como externos.

2.2.3 Tercera etapa

En esta etapa se procedió a calcular las solicitaciones actuantes bajo las cargas sobreimpuestas en las vigas del puente No 1 y en los anchos de franja del puente No 2, empleando el teorema de Barret para el puente No 1 y las líneas de influencia en el puente No 2. La tarea anterior se realizó nuevamente en los dos puentes pero con la ayuda del programa SAP2000.

Una vez obtenidos los resultados por las dos metodologías, se hizo una comparación de resultados con el ánimo de evitar desviaciones importantes en los

datos con que se determinaron los índices de sobre esfuerzo de los puentes. En esta etapa también se calcularán las deflexiones de acuerdo a lo indicado en la norma.

2.2.4 Cuarta etapa

Finalmente en esta etapa se determinaron los momentos y cortantes resistentes de las vigas del puente No 1 y las franjas del puente No 2, de acuerdo con los requerimientos establecidos en la norma e información consignada en los planos de diseño. Con los valores obtenidos finalmente se determinaron los índices de sobre esfuerzo de las vigas del puente No 1 y las franjas del puente No 2 además de comparar las deflexiones de los puentes contra los límites recomendados en la norma.

Capitulo III
Resultados

En este capítulo se presentara las limitaciones del proyecto, localización de los puentes, una breve descripción de los mismos, además de los resultados obtenidos. El estudio de los puentes se presenta tal como se indica a continuación.

1. Resultados del puente denominado como No 1
2. Resultados del puente denominado No 2.

3.1. Limitaciones

Para la revisión de los puentes se partirá de la información extraída de los planos, asumiendo para los cálculos la información plasmada en estos como son: La geometría de los puentes, dimensiones, materiales y refuerzo suministrado, esto por tratarse de un trabajo puramente académica, caso contrario cuando se requiera realizar estudios de vulnerabilidad a puentes existentes, para lo cual se debe confrontar la información consignada en los planos de diseño contra los resultados obtenidos en los trabajos de campo, dentro de los cuales se deben realizar como mínimo los siguientes:

1. Levantamiento topográfico detallado, tanto de la geometría del puente como de sus dimensiones.
2. Inspección visual detallada, para registro de daños.
3. Toma de muestras.
4. Ensayos de laboratorio:
    a. Ensayos con esclerómetro.
    b. Ensayos de carbonatación.
    c. Ensayos de resistencia
    d. Apiques

El trabajo que aquí se desarrolla, se analiza únicamente para cargas gravitacionales, dado que dentro de la información suministrada por universidad de Purdue, no se entregaron paramentos sísmicos para su análisis, o estudio

geotécnico en su lugar, además por la localización de los puentes, es zona de amenaza sísmica baja.

3.2. Localización puentes

Los puentes en estudio se localizan en la ruta 31 en el estado de Indiana Estados Unidos, tal como se presenta en la siguiente figura.

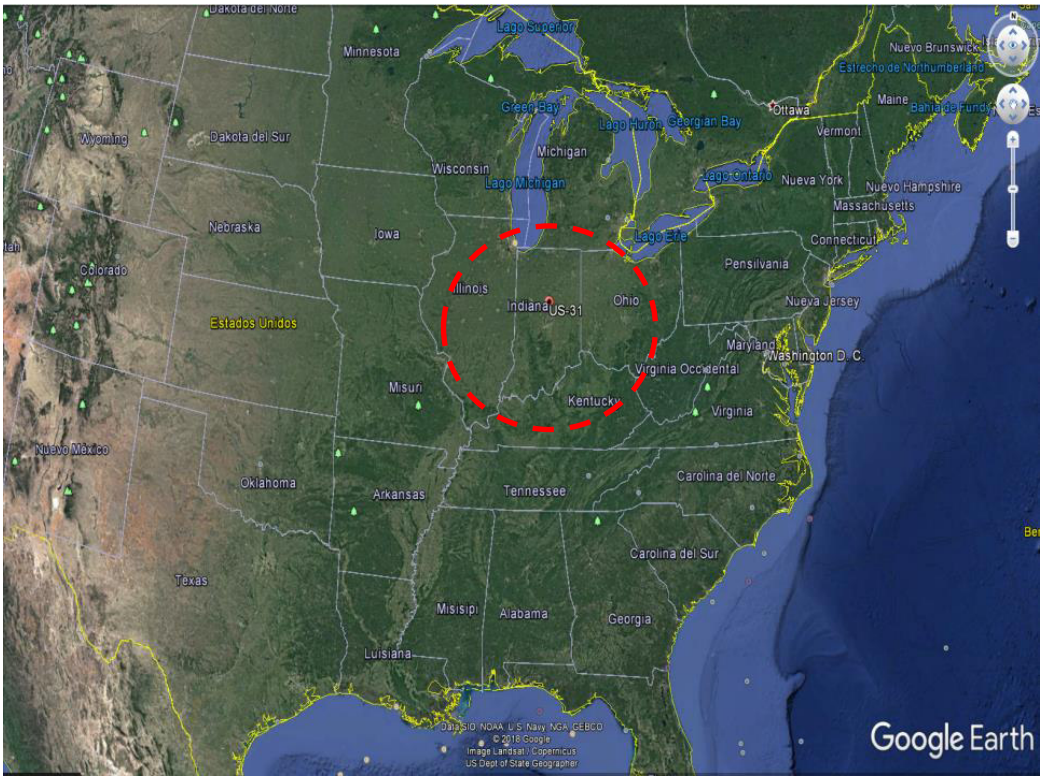


Figura 23 Localización general puentes

Fuente: Google Earth

3.3. Descripción general de los puentes

Para facilitar el estudio que aquí se propone, se denominó como puente No 1 el que da paso a los vehículos en sentido Norte – Sur, y puente No 2 al que da vía en sentido Sur – Norte.

3.3.1 Descripción puente No 1

Según información recibida, el puente No 1, fue aprobado y adoptado por la comisión estatal de carreteras del estado de indiana el cinco (5) de marzo de 1951, y fue diseñado acorde con la especificación A.A.S.H.O. de 1949 con el camión de diseño H 20-S 16-44 como carga viva, y en concreto reforzado tipo "E" para la cimentación y tipo "F" para la superestructura. La geometría en planta presenta esviaje de 30 grados respecto al eje longitudinal del puente, tanto a la entrada como a la salida, la superestructura consta de seis vigas simplemente apoyadas de sección en T, separadas entre sí 8,0 ft (2,43 m), cada viga cuenta con una altura de 2,0 ft y 4 in (0, 71 m) por 1,0 ft y 8,50 in (0,52 m) de base, las aletas de las vigas tienen un espesor de 7,25 in (0,18 m) por 8,0 ft (2,43 m), de ancho para las vigas interiores y 68, in (1,72 m) para las vigas exteriores. La superestructura se apoya en sus extremos sobre estribos tipo muro, los cuales cuentan con una cimentación superficial del tipo zapatas corridas. El ancho total tablero fuera a fuera es de 43 ft y 8 in (13, 30 m), el cual está divido en dos carriles centrales de 12,0 ft (3, 65 m), dos sobre anchos o bermas de 8,0 ft y 6 ft (2, 60 m) una en cada costado y dos barandas de 1,0 ft y 4,0 in (0,40 m) de ancho por 2,0 ft y 4 in (0,71 m) de alto. En septiembre 30 de 1992 fue aprobado por parte del departamento de indiana una intervención para realizar la instalación de barandas laterales de protección, además de la instalación de un revestimiento de protección con geotextiles a los estribos.

En la Figura 24 a Figura 27 se presentan; La planta, sección transversal, el perfil longitudinal y las notas generales del diseño estructural del puente No 1, tomadas de los planos suministrados. En la Figura 28 Figura 31 se presenta nuevamente la

planta, sección transversal y perfil longitudinal del puente, transcrita en AutoCAD de los planos originales, y en la Fotografía 1 se presenta una imagen tomada con la ayuda del programa Google Earth del estado de conservación del puente en la actualidad.

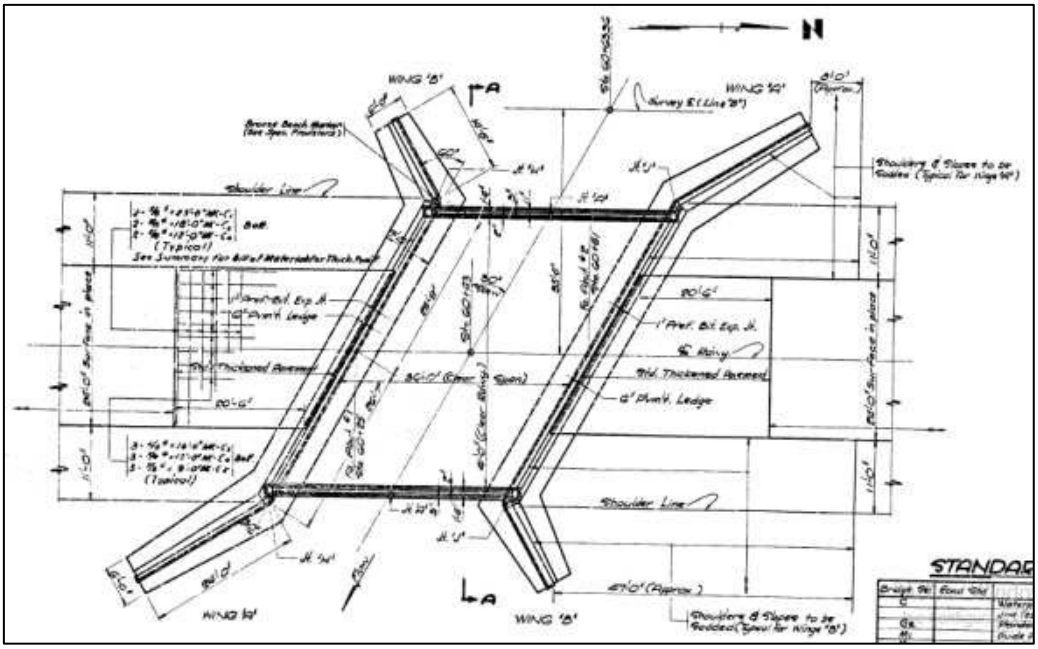


Figura 24 Planta puente No 1 – Planos de diseño

Fuente: Universidad de Purdue

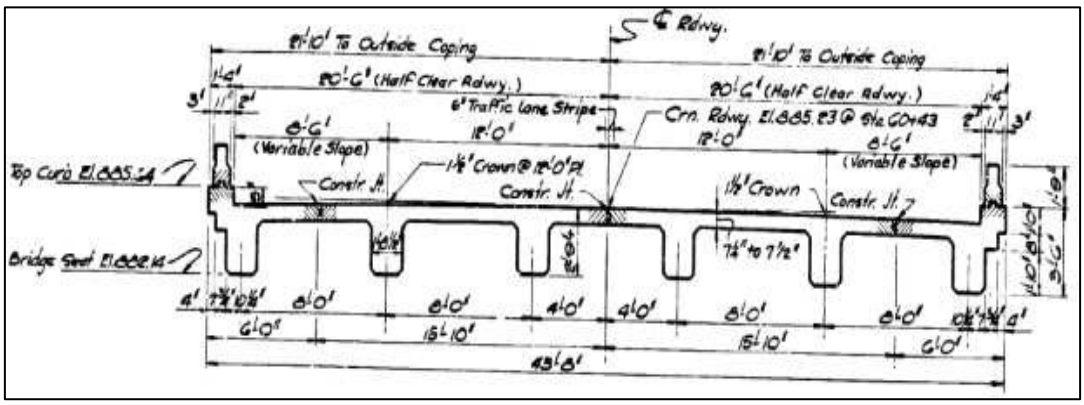


Figura 25 Sección transversal puente No 1 – Planos de diseño.

Fuente: Universidad de Purdue

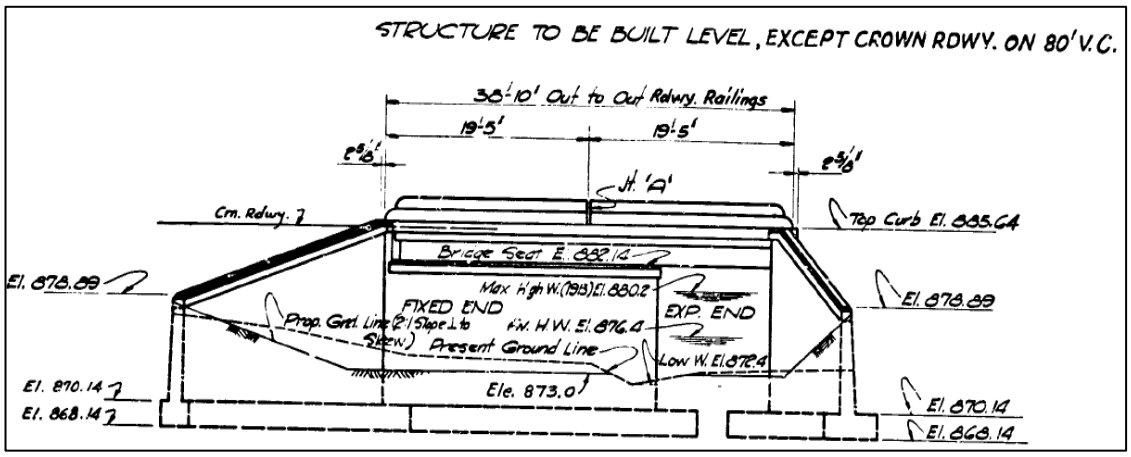


Figura 26 Perfil longitudinal puente No 1 – Planos de diseño.

Fuente: Universidad de Purdue

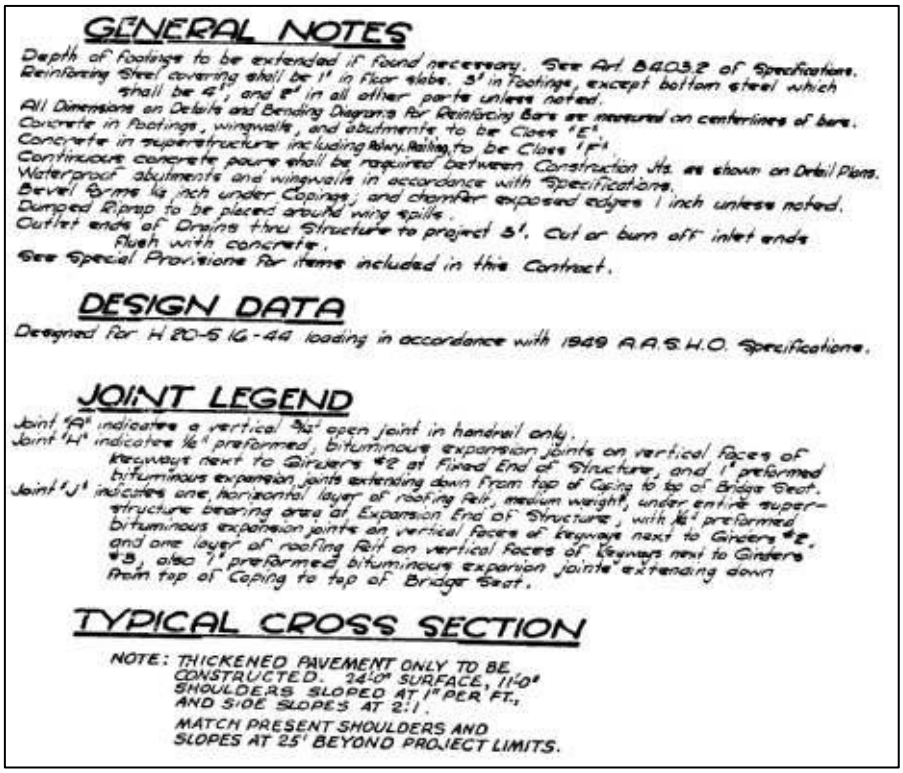


Figura 27 Notas generales de diseño puente No 1 – Planos de diseño

Fuente: Universidad de Purdue

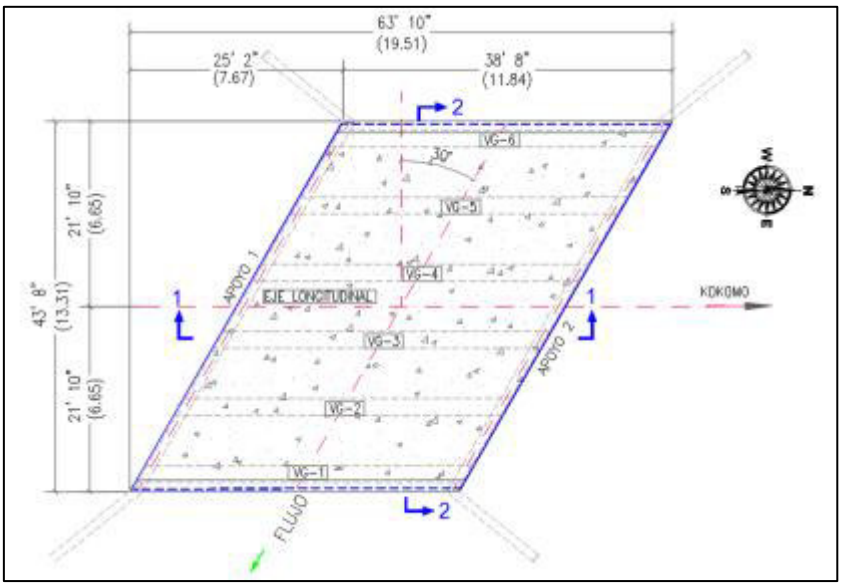


Figura 28 Planta puente No 1 – Información Transcrita

Fuente: Elaboración propia

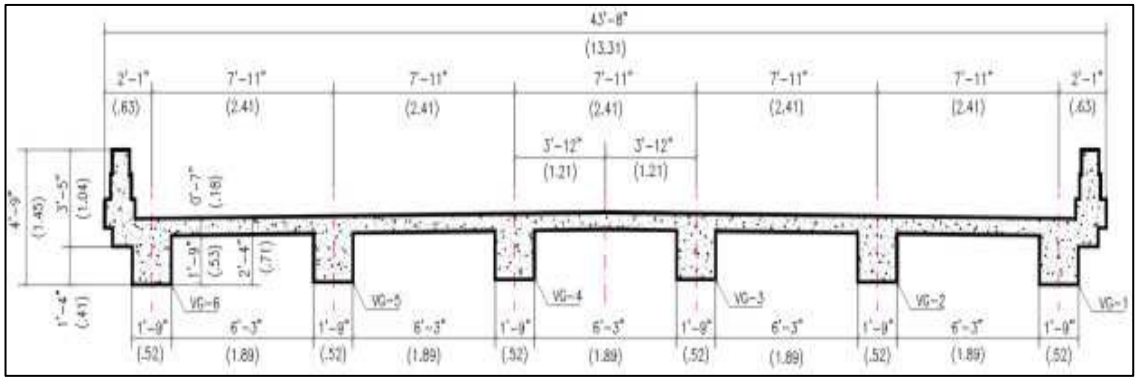


Figura 29 Sección transversal puente No 1 – Información Transcrita.

Fuente: Elaboración propia

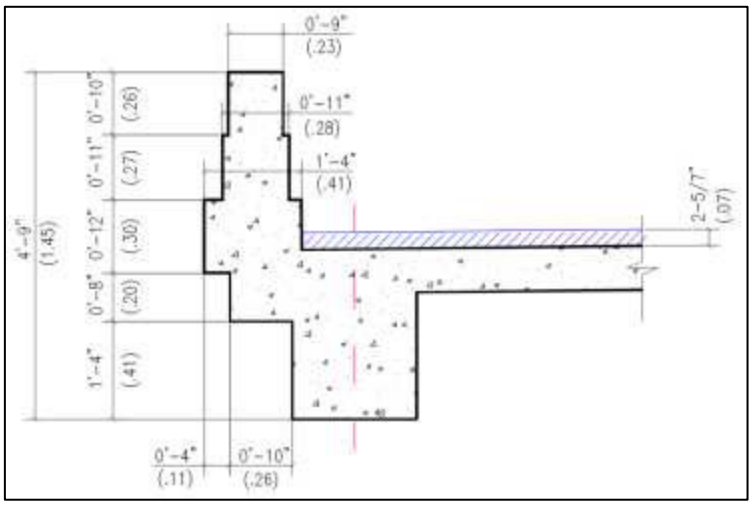


Figura 30 Dimensiones baranda puente No 1 – Información Transcrita

Fuente: Elaboración propia

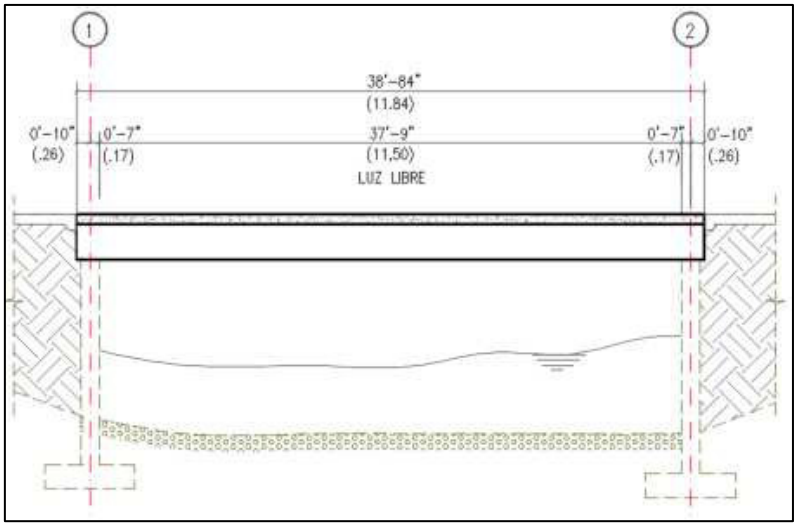


Figura 31 Perfil longitudinal puente No 1 – Información Transcrita.

Fuente: Elaboración propia

Fotografía 1 Estado actual del puente No 1.

Fuente: Google Earth

3.3.2 Descripción puente No 2

El puente No 2, fue aprobado y adoptado por la comisión estatal de carreteras del estado de indiana el trece (13) de enero de 1959, fue diseñado acorde con la especificación A.A.S.H.O. de 1957 con el camión de diseño H 20-S16-44 como carga viva y en concreto reforzado tipo "E" para la cimentación y estribos y concreto tipo "F" para la superestructura. La geometría en planta presenta esviaje de 30 grados respecto al eje longitudinal del puente, tanto a la entrada como a la salida, el puente tiene tres luces distribuidas de la siguiente manera; Dos luces de 28,0 ft y 1,50 in (8,56 m) de longitud, una en cada extremo y una luz central de 37,0 ft y 6 in (11,42 m), para una longitud total de 93 ft y 9,0 in (28, 57 m), la superestructura consta de una losa maciza de 1,0 ft y 6,0 in (0,457 m) de espesor, apoyada en sus extremos sobre una viga cabezal, la cual a su vez transmite las cargas al terreno de fundación por medio de una cimentación profunda compuesta por pilotes. Los apoyos intermedios de la superestructura están compuestos por estribos tipo muros, cimentados sobre zapatas corridas.

El ancho total tablero fuera a fuera es de 43 ft y 8 in (13, 20 m), el cual está divido en dos carriles centrales de 12,0 ft (3, 65 m), dos sobre anchos o bermas de 8,0 ft y 6 ft (2, 60 m) una cada costado y dos barandas de 1,0 ft y 4,0 in (0,40 m) de ancho por 2,0 ft y 4 in (0,71 m) de alto.

En septiembre 30 de 1992 fue aprobado por parte del departamento de indiana una intervención para realizar la remoción y construcción de nuevas losas de aproche al puente más barandas laterales de protección y la instalación de un revestimiento de protección con geotextiles a los estribos intermedios y vigas cabezal.

En la Figura 32, a Figura 35 se presenta; La planta, sección transversal, el perfil longitudinal y las notas generales de diseño estructural del puente No 2, tomadas de los planos suministrados. En la Figura 36 a Figura 39, se presenta nuevamente la planta, sección transversal y perfil longitudinal del puente, transcrita en AutoCAD de los planos originales, en la Fotografía 2 se presenta una imagen tomada con la ayuda del programa Google Earth del estado de conservación del puente en la actualidad.

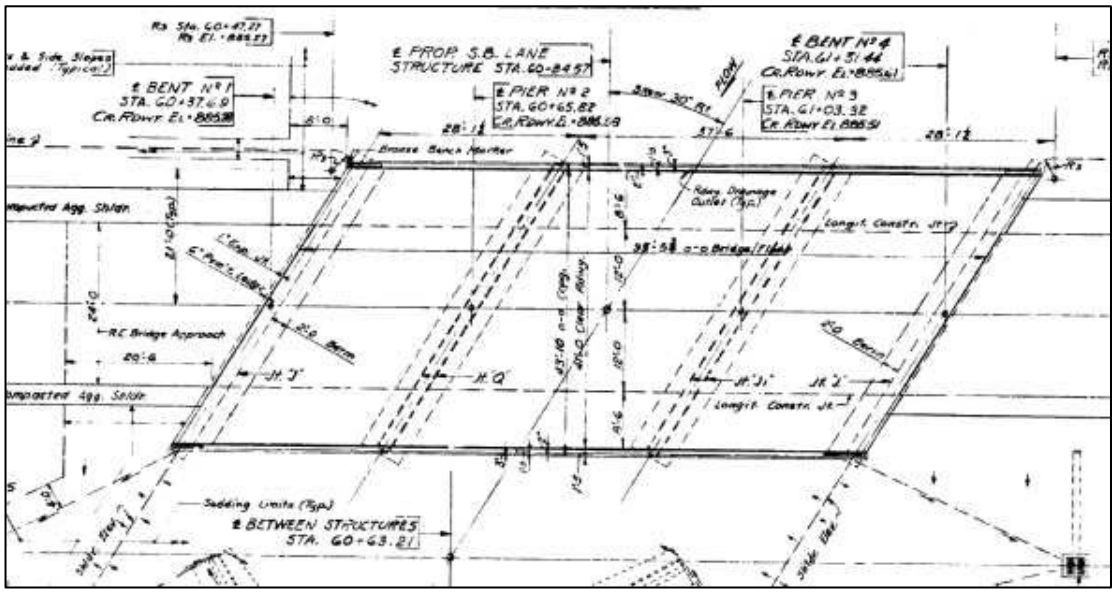


Figura 32 Planta puente No 2 – Planos de diseño

Fuente: Universidad de Purdue

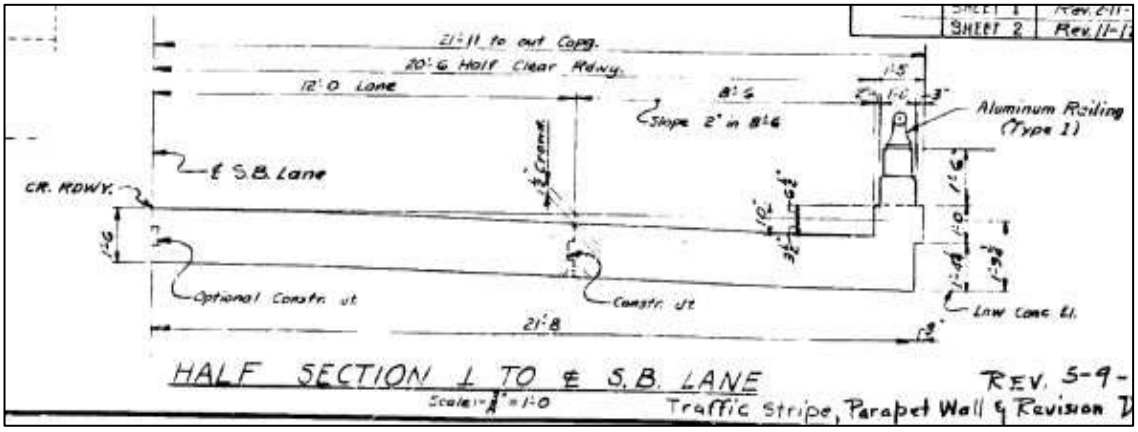


Figura 33 Sección transversal puente No 2 – Planos de diseño

Fuente: Universidad de Purdue

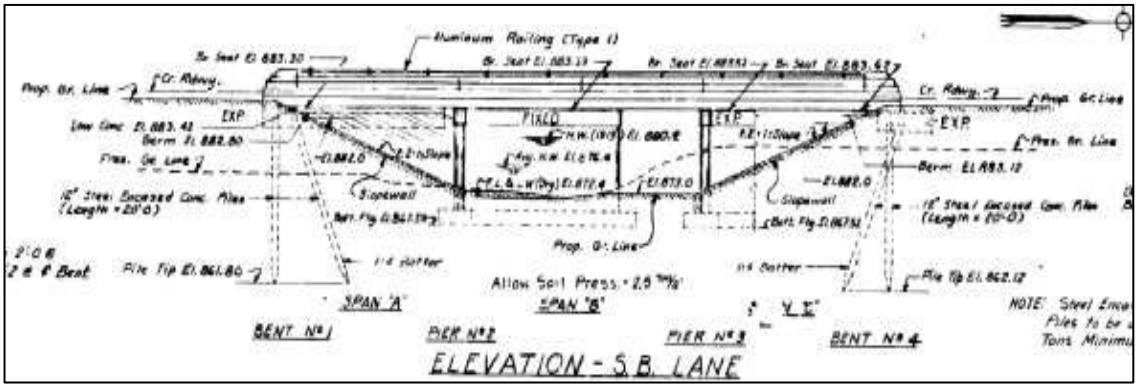
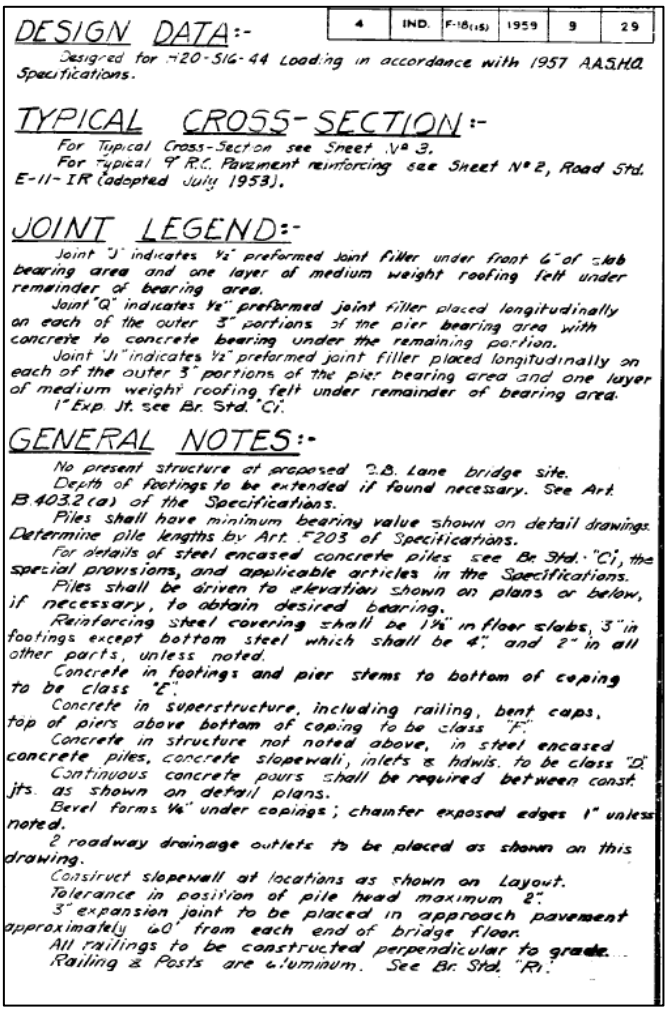


Figura 34 Perfil longitudinal puente No 2 – Planos de diseño

Fuente: Universidad de Purdue



4	IND.	F-18(15)	1959	9	29

DESIGN DATA:-

Designed for H20-S16-44 Loading in accordance with 1957 AASHO Specifications.

TYPICAL CROSS-SECTION:-

For Typical Cross-Section see Sheet No 3.
For Typical 9" R.C. Pavement reinforcing see Sheet N° 2, Road Std. E-11-IR (adopted July 1953).

JOINT LEGEND:-

Joint "J" indicates ½" preformed joint filler under front 6" of slab bearing area and one layer of medium weight roofing felt under remainder of bearing area.
Joint "Q" indicates ½" preformed joint filler placed longitudinally on each of the outer 3" portions of the pier bearing area with concrete to concrete bearing under the remaining portion.
Joint "J1" indicates ½" preformed joint filler placed longitudinally on each of the outer 3" portions of the pier bearing area and one layer of medium weight roofing felt under remainder of bearing area.
1" Exp. Jt. see Br. Std. "C".

GENERAL NOTES:-

No present structure at proposed S.B. Lane bridge site.
Depth of footings to be extended if found necessary. See Art. B.403.2(a) of the Specifications.
Piles shall have minimum bearing value shown on detail drawings. Determine pile lengths by Art. 1203 of Specifications.
For details of steel encased concrete piles see Br Std. "C", the special provisions, and applicable articles in the Specifications.
Piles shall be driven to elevation shown on plans or below, if necessary, to obtain desired bearing.
Reinforcing steel covering shall be 1½" in floor slabs, 3" in footings except bottom steel which shall be 4", and 2" in all other parts, unless noted.
Concrete in footings and pier stems to bottom of coping to be class "E".
Concrete in superstructure, including railing, bent caps, top of piers above bottom of coping to be class "F".
Concrete in structure not noted above, in steel encased concrete piles, concrete slopewall, inlets & hdwls. to be class "D".
Continuous concrete pours shall be required between const. jts. as shown on detail plans.
Bevel forms ¾" under copings; chamfer exposed edges 1" unless noted.
2 roadway drainage outlets to be placed as shown on this drawing.
Construct slopewall at locations as shown on Layout.
Tolerance in position of pile head maximum 2".
3" expansion joint to be placed in approach pavement approximately 40' from each end of bridge floor.
All railings to be constructed perpendicular to grade.
Railing & Posts are aluminum. See Br. Std. "R1".

Figura 35 Notas generales de diseño puente No 2 – Planos de diseño.

Fuente: Universidad de Purdue

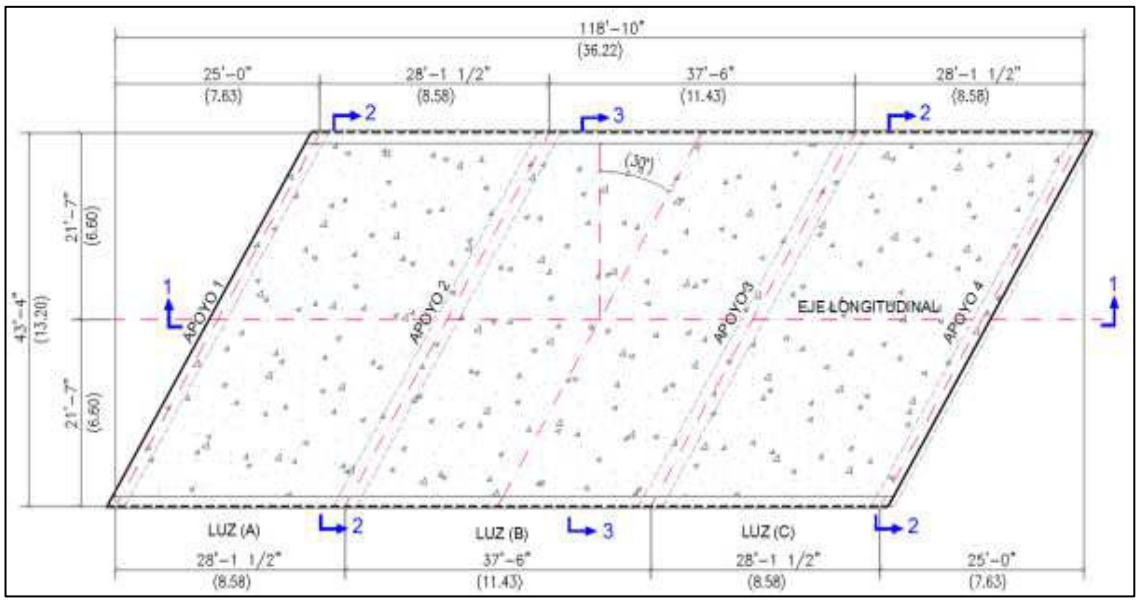


Figura 36 Planta puente No 2 – Información Transcrita

Fuente: Elaboración propia

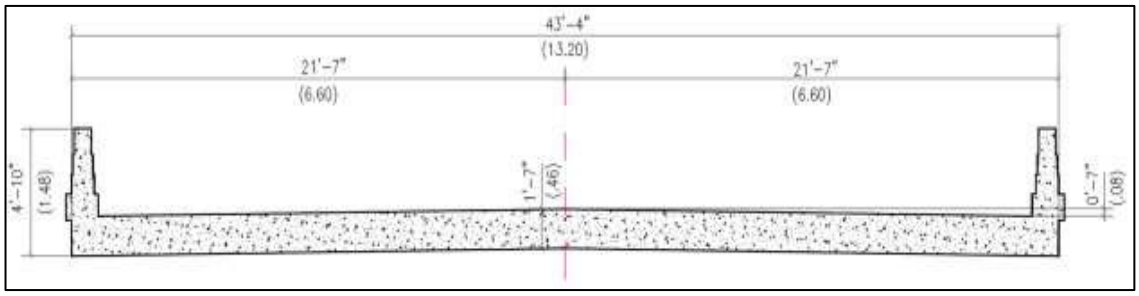


Figura 37 Sección transversal puente No 2 – Información Transcrita.

Fuente: Elaboración propia

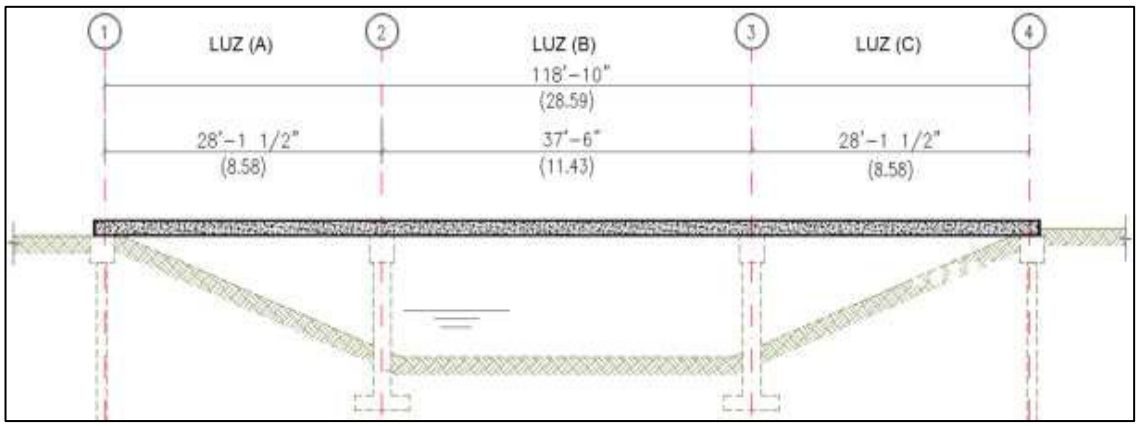


Figura 38 Perfil longitudinal puente No 2 – Información Transcrita

Fuente: Elaboración propia

Fotografía 2 Estado actual del puente No 2

Fuente: Google Earth

3.4. Análisis puente No 1

Dado que el puente es simétrico respecto a su eje longitudinal se analizará una viga de exterior y una intermedia para cargas verticales, esto por no contar con

información de geotecnia y parámetros sísmicos donde se localiza el puente. Las vigas se analizaron siguiendo la secuencia que se presenta a continuación:

1. Evaluación de cargas
2. Calculo de factores de distribución para momento y cortante
3. Calculo de solicitaciones con el Teorema de Barret
4. Calculo de solicitaciones ayuda de SAP2000
5. Comparación de solicitaciones calculadas con teorema de Barret Vs SAP2000
6. Calculo de los índices de sobre esfuerzo por momento y cortante en vigas
7. Chequeo deformaciones.

3.4.1 Materiales Puente No 1

De acuerdo con la información suministrada la superestructura del puente fue diseña con concreto clase “F” y acero de refuerzo PDR 60, a continuación se presentan las propiedades de estos materiales:

- Concreto estructural clase “F”:

  - Resistencia mínima a la compresión, f’c = 14,0 MPa
    = 2030 PSI
  - Módulo de Elasticidad, Ec = 17.585,8 MPa
    = 2550487 PSI

- Acero de refuerzo:

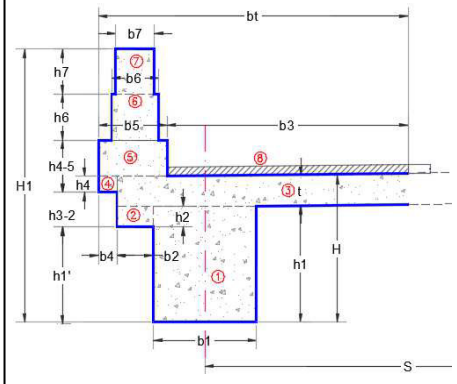
  - Esfuerzo de fluencia, fy = 420 MPa
    = 60 ksi
  - Módulo de Elasticidad, Es = 200.000 MPa
    = 29000. ksi

3.4.2 Análisis viga externa (VGE)

3.4.2.1. Carga muerta “DC” y “DW”

Acorde con la sección 3.3.2 de la norma, el patrón de carga denominado DC corresponde al peso propio de los componentes estructurales y accesorios no estructurales, sin embargo la carpeta de rodadura que se indica en los planos pero que no se observa en las imágenes tomadas con ayuda del Google Earth, es considerada como un accesorio no estructural, debido a que hace parte integral e indispensable para el funcionamiento del puente, pero la cual puede ser removida sin afectar el funcionamiento del puente, pero puede ser altamente susceptibles de cambios en el tiempo, por tal razón se clasifica dentro del grupo de cargas DW.

En la siguiente tabla se presenta el avaluó de cargas muertas para la viga VGE.



b1=	0.52m	= 1.7 ft		h3-2 =	0.20m	= 0.7 ft	
b2=	0.26m	= 0.9 ft		h4 =	0.09m	= 0.3 ft	
b3=	1.43m	= 4.7 ft		h4-5 =	0.30m	= 1.0 ft	
b4=	0.11m	= 0.4 ft		h6=	0.27m	= 0.9 ft	
b5=	0.41m	= 1.3 ft		h7	0.26m	= 0.9 ft	
b6=	0.28m	= 0.9 ft		H=	0.71m	= 2.3 ft	
b7=	0.23m	= 0.8 ft		H1=	1.60m	= 5.2 ft	
bt=	1.84m	= 6.0 ft					
h1=	0.53m	= 1.7 ft					
h1'=	0.41m	= 1.3 ft					
h2=	0.11m	= 0.4 ft					
t=	0.18m	= 0.6 ft					
e=	0.07	= 0.2 ft	Espesor carpeta asfáltica				

Densidad de materiales

Υ(Con) =	24	kN/m3	0.15 kips/ft3	Densidad del concreto
Υ(Asf) =	22.5	kN/m3	0.14 kips/ft3	Densidad carpeta asfáltica

Cargas por metro lineal

DC1 =	6.61	kN/m	453.23 lb/ft	DW=	2.25	kN/m	154.33 lb/ft Carpeta Asfáltica
DC2 =	0.69	kN/m	47.03 lb/ft				
DC3 =	7.47	kN/m	512.10 lb/ft				
DC4 =	0.24	kN/m	16.28 lb/ft				
DC5 =	2.07	kN/m	141.59 lb/ft				
DC6 =	1.81	kN/m	124.33 lb/ft				
DC7 =	1.44	kN/m	98.34 lb/ft				
DC =	20.33	kN/m	1672.97 lb/ft	Carga total			

Tabla 9 Evaluación de cargas muertas para VGE– Puente 1.

Fuente: Elaboración propia

3.4.2.2. Carga viva “L”

El puente se analizó con las cargas generadas por el camión de diseño HL-93, el tándem de diseño y la línea de carga, tal como se indica en el numeral 1.6.5.2 de este documento.

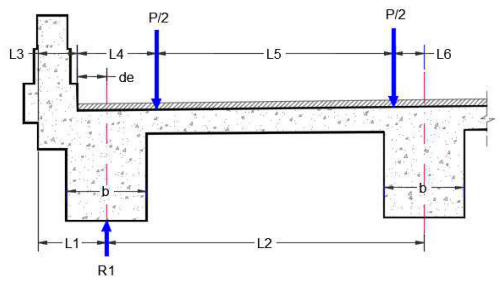
3.4.2.3. Factores de distribución para momento y cortante - VGE

De acuerdo al capítulo 4 de la norma los momentos y cortantes generados por carga viva se deben afectar por unos factores de distribución “g”, esto para tener en cuenta la presencia múltiple de los vehículos sobre la viga, antes de calcular los factores de distribución, se presenta la clasificación del puente de acuerdo con la norma, labor que es necesaria para calcular los factores de distribución.

- De acuerdo con el capítulo 4 de la norma y Figura 6 de este documento el puente No 1 se clasifica como tipo (e), viga T de concreto fundido in situ con tablero monolítico.

A continuación se presenta el cálculo de los factores de distribución para momento y cortante para la viga externa.

Factor de distribución para momento VGE.



L1=	0.52 m	= 1.7 ft
L2=	2.41 m	= 7.9 ft
L3=	0.30 m	= 1.0 ft
L4=	0.60 m	= 2.0 ft
L5=	1.80 m	= 5.9 ft
L6=	0.23 m	= 0.8 ft
b=	0.52 m	= 1.7 ft Base de la viga
de=	0.53 m	= 1.7 ft
L=	11.84	= 38.8 ft
gmi=	0.70	Factor de distribucion VGI
tan 30	0.5773	

Verificación rango de aplicación Tabla 4.6.2.2.2.2d-1

-1.0 ft ≤ de ≤ 6 ft Cumple

Factor de distribución un carril cargado (gme1) Tabla 4.6.2.2.2.2d-1

Regla de la palanca

gme1= 0.469

Como se utilizo la regla de la palanca para determinar el factor de distribución este debe ser afectado por el factor presencia múltiple de 1.2 tomado de la tabla 3.6.1.1.2-1

Number of Loaded Lanes	Multiple Presence Factors, m
1	1.20
2	1.00
3	0.85
>3	0.65

gme1= 0.563 No rige

Factor de distribución para dos carriles cargados (gme2)

$$g = e\, g_{interior}$$

$$e = 0.77 + \frac{d_e}{9.1}$$

e= 0.961

gme2= 0.673 Rige

Debido al que el puente es esviado el factor de distribución "g" para momento de la viga exterior debe reducido de acuerdo con el resultado de la siguiente ecuación:

$$1 - c_1 (\tan\theta)^{1.5}$$

$$c_1 = 0.25 \left(\frac{K_g}{12.0 L t_s^3} \right)^{0.25} \left(\frac{S}{L} \right)^{0.5}$$

$$\text{If } \theta < 30^\circ \text{ then } c_1 = 0.0$$

$$\text{If } \theta > 60^\circ \text{ use } \theta = 60^\circ$$

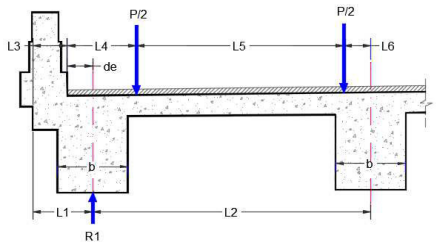
c1= 0.101

fr = 0.96

Factor de distribución para diseño

g-VG= 0.643

Factor de distribución para cortante VGE



L1=	0.52 m	= 1.7 ft	
L2=	2.41 m	= 7.9 ft	
L3=	0.30 m	= 1.0 ft	
L4=	0.60 m	= 2.0 ft	
L5=	1.80 m	= 5.9 ft	
L6=	0.23 m	= 0.8 ft	
b=	0.52 m	= 1.7 ft	Base de la viga
de=	0.53 m	= 1.7 ft	
t=	0.18 m	= 0.6 ft	
L=	11.84	= 38.8 ft	
Tan 30° :	0.5773		
gvi=	0.819	Facto distribución VGI	

Verificación rango de aplicación Tabla 4.6.2.23b-1

-1.0 ft ≤ de ≤ 5.5 ft Cumple

Factor de distribución un carril cargado (gve1) Tabla 4.6.2.23b-1

Regla de la palanca

gve1= 0.469

Como se utilizo la regla de la palanca para determinar el factor de distribución este debe ser afectado por el factor presencia múltiple de 1.2 tomado de la tabla 3.6.1.1.2-1

Number of Loaded Lanes	Multiple Presence Factors, *m*
1	1.20
2	1.00
3	0.85
>3	0.65

gve1= 0.563

Factor de distribución dos carriles cargado (gv2) Tabla 4.6.2.23b-1

$$g = e\, g_{interior}$$

$$e = 0.6 + \frac{d_e}{10}$$

e= 0.774

gve2 = 0.634

Debido al que el puente es esviado el factor de distribución "g" para cortante de la viga debe reducido de acuerdo con la siguiente expresión:

$$1.0 + 0.20\left(\frac{12.0Lt_s^{\,3}}{K_g}\right)^{0.3}\tan\theta$$

frv= 1.00

Factor de distribución de diseño (gv)

gve = 0.634

3.4.2.4. Cálculo de momentos y cortante por el teorema de Barret – VGE

Para facilitar el análisis y posterior evaluación de los índices de sobre esfuerzo en las vigas, esta fueron divididas en toda su longitud en veinte

espacios iguales, obteniendo así 21 puntos donde se calcularon las solicitaciones y deformaciones. En la siguiente figura se presenta la división de la viga y la numeración de los puntos para el análisis.

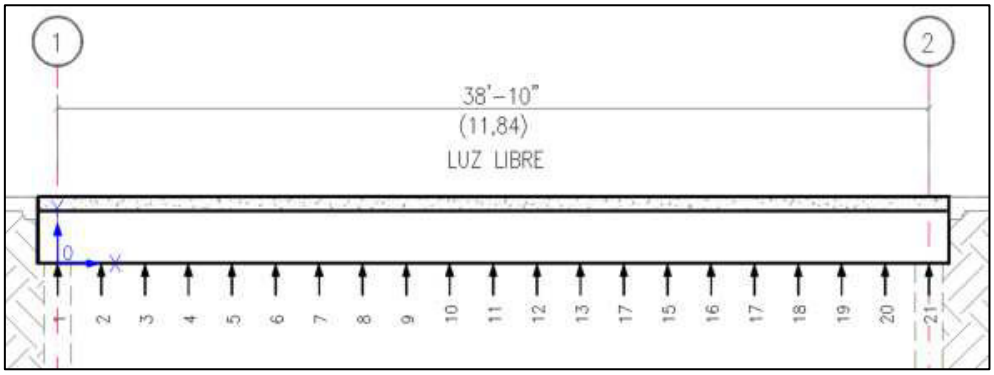


Figura 39 Numeración puntos para el análisis de las vigas – Puente 1.

Fuente: Elaboración propia

Las solicitaciones en la viga externa se calcularon con las combinaciones que se definieron en el capítulo 1.6.7 de este documento, y los factores de distribución calculados para esta viga. En las siguientes tablas se presentan los valores de momentos y cortantes para la viga en estudio.

Tabla 10 Cortantes y momentos combinación servicio 1-1 – VGE

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
1	0	0.0	501.7	112.78	0.0	0.0
2	0.59	1.9	461.5	103.75	278.8	205.6
3	1.18	3.9	421.3	94.71	521.2	384.4
4	1.78	5.8	381.1	85.68	727.2	536.4
5	2.37	7.8	340.9	76.64	896.8	661.5
6	2.96	9.7	300.7	67.61	1034.0	762.6
7	3.55	11.7	262.9	59.11	1143.4	843.3
8	4.14	13.6	225.1	50.60	1226.2	904.4
9	4.74	15.5	187.3	42.10	1275.4	940.7
10	5.33	17.5	149.4	33.59	1291.0	952.2
11	5.92	19.4	111.6	25.09	1301.0	959.6
12	6.51	21.4	148.7	33.42	1304.1	961.8
13	7.10	23.3	-188.9	-42.46	1280.4	944.4
14	7.70	25.2	-229.1	-51.49	1223.3	902.2

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
15	8.29	27.2	-266.9	-60.00	1149.3	847.7
16	8.88	29.1	-304.7	-68.50	1041.8	768.4
17	9.47	31.1	-342.5	-77.01	900.6	664.3
18	10.06	33.0	-380.4	-85.51	725.9	535.4
19	10.66	35.0	-418.2	-94.01	517.5	381.7
20	11.25	36.9	-456.0	-102.52	275.6	203.2
21	11.84	38.8	-493.8	-111.02	0.0	0.0

Fuente: Elaboración propia

Tabla 11 Cortantes y momentos combinación servicio 1-2 – VGE

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
1	0	0.0	455.6	102.43	0.0	0.0
2	0.59	1.9	421.9	94.86	258.8	190.9
3	1.18	3.9	388.3	87.28	494.3	364.5
4	1.78	5.8	354.6	79.71	701.0	517.0
5	2.37	7.8	320.9	72.14	879.0	648.4
6	2.96	9.7	287.2	64.56	1028.4	758.5
7	3.55	11.7	253.5	56.99	1149.0	847.5
8	4.14	13.6	219.8	49.42	1241.0	915.3
9	4.74	15.5	186.1	41.85	1304.3	962.0
10	5.33	17.5	152.5	34.27	1338.8	987.5
11	5.92	19.4	118.8	26.70	1344.7	991.8
12	6.51	21.4	151.6	34.07	1339.3	987.8
13	7.10	23.3	-185.2	-41.64	1305.3	962.8
14	7.70	25.2	-218.9	-49.22	1242.6	916.5
15	8.29	27.2	-252.6	-56.79	1151.2	849.1
16	8.88	29.1	-286.3	-64.36	1031.1	760.5
17	9.47	31.1	-320.0	-71.94	882.2	650.7
18	10.06	33.0	-353.7	-79.51	704.7	519.8
19	10.66	35.0	-387.4	-87.08	498.5	367.7
20	11.25	36.9	-421.0	-94.65	263.6	194.4
21	11.84	38.8	-454.7	-102.23	0.0	0.0

Fuente: Elaboración propia

Tabla 12 Cortantes y momentos combinación Resistencia 1-1 – VGE

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
1	0	0.0	614.1	138.07	0.0	0.0
2	0.59	1.9	563.8	126.75	344.4	254.0

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
3	1.18	3.9	513.5	115.43	644.6	475.4
4	1.78	5.8	463.1	104.11	900.6	664.3
5	2.37	7.8	412.8	92.80	1112.5	820.5
6	2.96	9.7	362.4	81.48	1284.6	947.5
7	3.55	11.7	314.7	70.75	1422.3	1049.0
8	4.14	13.6	267.0	60.02	1526.7	1126.1
9	4.74	15.5	219.3	49.29	1590.2	1172.9
10	5.33	17.5	171.5	38.57	1612.6	1189.4
11	5.92	19.4	123.8	27.84	1625.4	1198.8
12	6.51	21.4	170.7	38.38	1627.3	1200.2
13	7.10	23.3	-221.1	-49.69	1595.8	1177.0
14	7.70	25.2	-271.4	-61.01	1523.4	1123.6
15	8.29	27.2	-319.1	-71.74	1428.9	1053.9
16	8.88	29.1	-366.8	-82.47	1293.4	953.9
17	9.47	31.1	-414.6	-93.20	1116.8	823.7
18	10.06	33.0	-462.3	-103.93	899.1	663.2
19	10.66	35.0	-510.0	-114.65	640.5	472.4
20	11.25	36.9	-557.7	-125.38	340.8	251.3
21	11.84	38.8	-605.5	-136.11	0.0	0.0

Fuente: Elaboración propia

Tabla 13 Cortantes y momentos combinación Resistencia 1-2 – VGE

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
1	0	0.0	563.0	126.58	0.0	0.0
2	0.59	1.9	519.9	116.88	321.9	237.4
3	1.18	3.9	476.8	107.19	614.3	453.1
4	1.78	5.8	433.7	97.49	871.1	642.5
5	2.37	7.8	390.5	87.80	1092.5	805.8
6	2.96	9.7	347.4	78.10	1278.3	942.8
7	3.55	11.7	304.3	68.41	1428.6	1053.7
8	4.14	13.6	261.2	58.71	1543.4	1138.3
9	4.74	15.5	218.0	49.01	1622.6	1196.8
10	5.33	17.5	174.9	39.32	1666.3	1229.0
11	5.92	19.4	131.8	29.62	1674.6	1235.1
12	6.51	21.4	173.9	39.09	1666.9	1229.5
13	7.10	23.3	-217.0	-48.79	1623.8	1197.7
14	7.70	25.2	-260.2	-58.49	1545.2	1139.7
15	8.29	27.2	-303.3	-68.18	1431.0	1055.4
16	8.88	29.1	-346.4	-77.88	1281.3	945.0
17	9.47	31.1	-389.5	-87.57	1096.1	808.4
18	10.06	33.0	-432.7	-97.27	875.3	645.6

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
19	10.66	35.0	-475.8	-106.96	619.1	456.6
20	11.25	36.9	-518.9	-116.66	327.3	241.4
21	11.84	38.8	-562.0	-126.35	0.0	0.0

Fuente: Elaboración propia

3.4.2.5. Cálculo de momentos y cortantes con SAP2000

Para realizar una verificación de los resultados de momentos y cortantes actuantes en las vigas obtenidos manualmente, estos mismos elementos se analizaron con la ayuda del programa SAP2000, elaborando un modelo matemático con elementos tipo frame en 3D, asignado las mismas cargas, combinaciones, geometría, dimensiones y materiales con que se analizaron manualmente. En las siguientes tablas se presentan los resultados obtenidos para las combinaciones de resistencia únicamente, combinaciones en las que se espera obtener los índices de sobre esfuerzo más altos.

Tabla 14 Cortantes y momentos combinación resistencia 1-1 – Sap2000 VGE

TABLE: Element Forces - Frames						
Frame	DISTANCIA		CORTANTE SAP2000 V2		MOMENTO SAP2000 M3	
Text	m	ft	KN	kips	KN-m	kips-ft
1	0	0.0	624.9	140.5	0.0	0.0
2	0.59	1.9	551.0	123.9	350.4	258.4
3	1.18	3.9	500.7	112.6	656.9	484.5
4	1.78	5.8	450.4	101.3	919.2	678.0
5	2.37	7.8	400.1	89.9	1,137.4	838.9
6	2.96	9.7	351.2	78.9	1,311.5	967.3
7	3.55	11.7	351.2	78.9	1,446.5	1,066.9
8	4.14	13.6	303.5	68.2	1,544.2	1,139.0
9	4.74	15.5	255.8	57.5	1,614.7	1,190.9
10	5.33	17.5	208.1	46.8	1,646.6	1,214.5

TABLE: Element Forces - Frames						
			CORTANTE SAP2000		MOMENTO SAP2000	
Frame	DISTANCIA		V2		M3	
11	5.92	19.4	160.4	36.1	1,646.4	1,214.3
12	6.51	21.4	112.7	25.3	1,646.5	1,214.4
13	7.10	23.3	-181.3	-40.8	1,614.6	1,190.9
14	7.70	25.2	-229.0	-51.5	1,544.1	1,138.9
15	8.29	27.2	-276.7	-62.2	1,446.5	1,066.9
16	8.88	29.1	-324.4	-72.9	1,311.5	967.3
17	9.47	31.1	-373.3	-83.9	1,137.5	838.9
18	10.06	33.0	-423.6	-95.2	919.3	678.0
19	10.66	35.0	-473.9	-106.5	654.0	482.4
20	11.25	36.9	-524.3	-117.9	350.6	258.6
21	11.84	38.8	-624.9	-140.5	0.0	0.0

Fuente: Elaboración propia

Tabla 15 Cortantes y momentos combinación resistencia 1-2 – Sap2000 VGE

TABLE: Element Forces - Frames						
			CORTANTE SAP2000		MOMENTO SAP2000	
Frame	DISTANCIA		V2		M3	
Text	m	ft	KN	kips	KN-m	kips-ft
1	0	0.0	578.2	130.0	0.0	0.0
2	0.59	1.9	518.7	116.6	326.7	241.0
3	1.18	3.9	475.6	106.9	618.2	455.9
4	1.78	5.8	432.5	97.2	874.1	644.7
5	2.37	7.8	389.4	87.5	1,094.6	807.3
6	2.96	9.7	346.3	77.9	1,279.6	943.8
7	3.55	11.7	303.2	68.2	1,429.1	1,054.1
8	4.14	13.6	260.1	58.5	1,543.2	1,138.2
9	4.74	15.5	217.0	48.8	1,621.7	1,196.1
10	5.33	17.5	173.3	39.0	1,664.8	1,227.9
11	5.92	19.4	130.0	29.2	1,672.4	1,233.5
12	6.51	21.4	87.7	19.7	1,664.7	1,227.8
13	7.10	23.3	-233.4	-52.5	1,621.6	1,196.0
14	7.70	25.2	-276.5	-62.1	1,543.1	1,138.1
15	8.29	27.2	-319.6	-71.8	1,429.1	1,054.0
16	8.88	29.1	-362.7	-81.5	1,279.6	943.8

TABLE: Element Forces - Frames						
			CORTANTE SAP2000		MOMENTO SAP2000	
Frame	DISTANCIA		V2		M3	
17	9.47	31.1	-405.8	-91.2	1,094.6	807.4
18	10.06	33.0	-448.9	-100.9	874.2	644.8
19	10.66	35.0	-492.0	-110.6	618.3	456.0
20	11.25	36.9	-535.1	-120.3	326.9	241.1
21	11.84	38.8	-578.2	-130.0	0.0	0.0

Fuente: Elaboración propia

3.4.2.6. Comparación resultados obtenidos con teorema de Barret vs SAP2000 –VGE.

En las siguientes figuras se presenta la superposición de las solicitaciones obtenidas con las combinaciones de resistencia, por el teorema de Barret (línea azul) versus las obtenidas con la ayuda del programa SAP2000 (línea roja), tarea que se realizó para verificar los valores de momentos y cortantes obtenidos manualmente (Teorema de Barret).

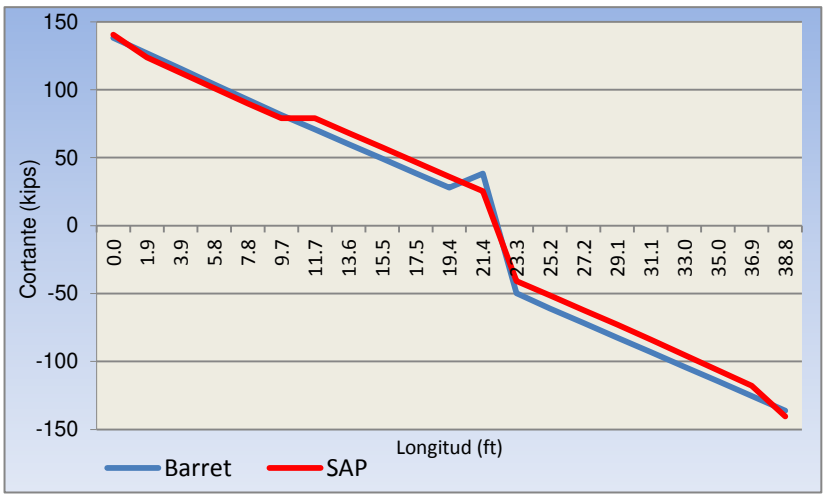


Figura 40 Diagrama de cortante combinación resistencia 1-1 Barret vs SAP2000.

Fuente: Elaboración propia

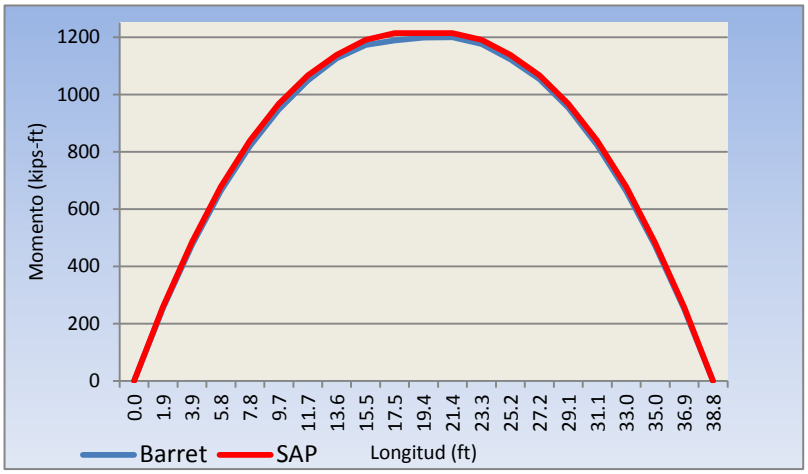


Figura 41 Diagrama de momento combinación resistencia 1-1 Barret vs SAP2000.

Fuente: Elaboración propia

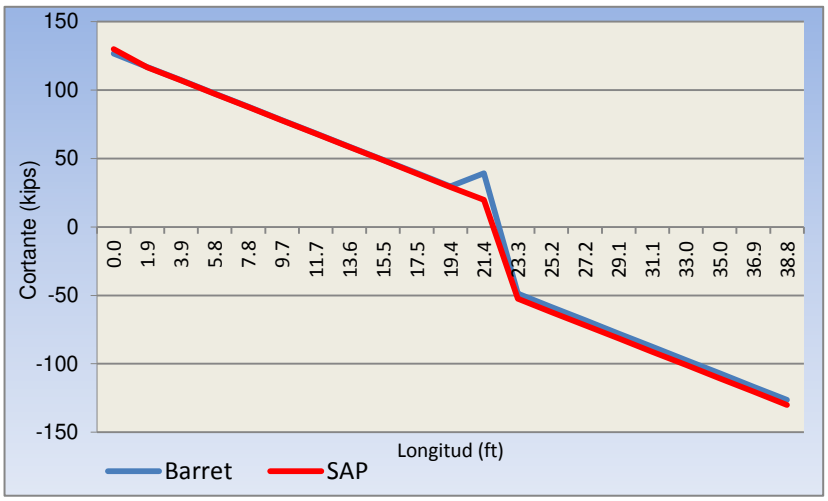


Figura 42 Diagrama de cortante combinación resistencia 1-2 Barret vs SAP2000

Fuente: Elaboración propia.

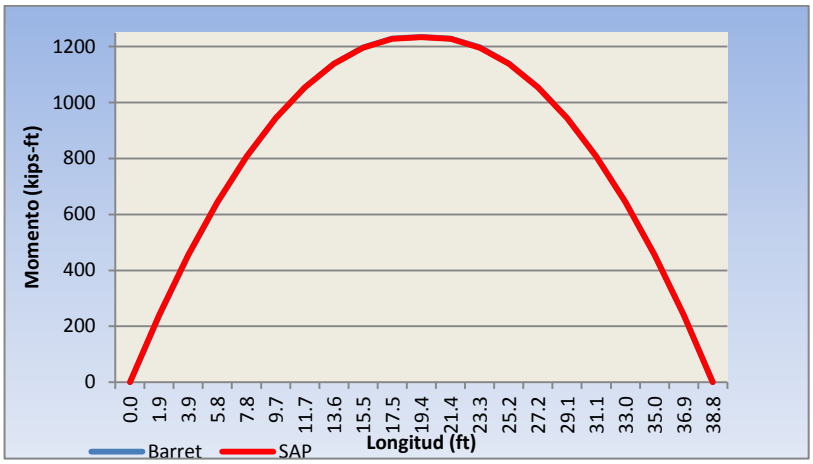


Figura 43 Diagrama de momento combinación resistencia 1-2 Barret vs SAP2000.

Fuente: Elaboración propia

De acuerdo a las figuras anteriores se presentan algunas diferencias de los valores en algunos puntos de la viga, pero en general los valores máximos de momentos y cortantes coinciden en los calculados por las dos metodologías sin embargo, los índices de sobre esfuerzo se calcularon con los datos obtenidos con la ayuda del programa SAP2000, esto para aprovechar la envolvente de solicitaciones que genera el programa.

3.4.2.7. Refuerzo suministrado a viga- VGE

El refuerzo de la viga se determinó con gran dificultad dada la antigüedad del puente y la poca legibilidad de la información registrada en los planos de diseño (Véase Figura 44 a Figura 46), sin embargo se logró extraer el refuerzo que se presenta en la Figura 47, Figura 48 y Figura 49.

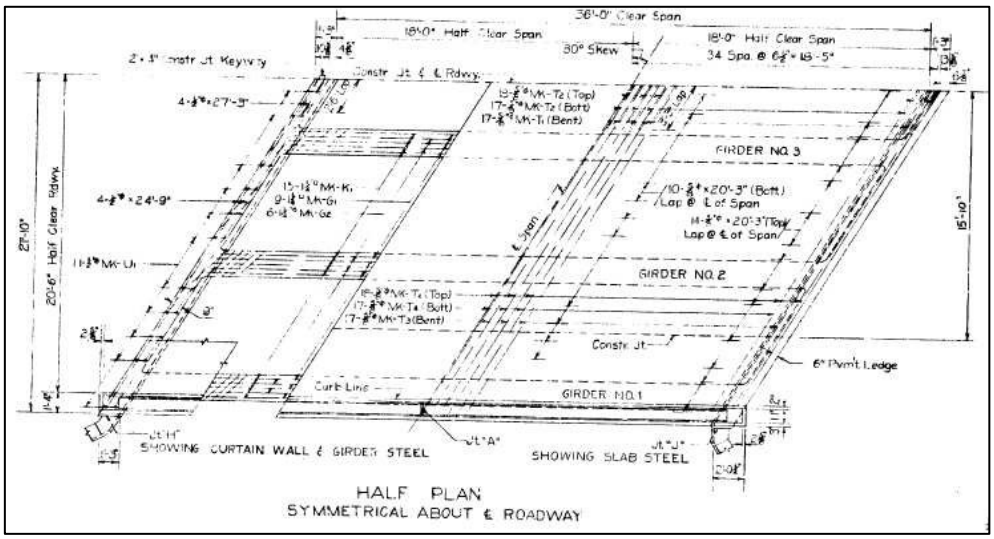


Figura 44 Planta refuerzo superestructura puente No 1

Fuente: Universidad de Purdue.

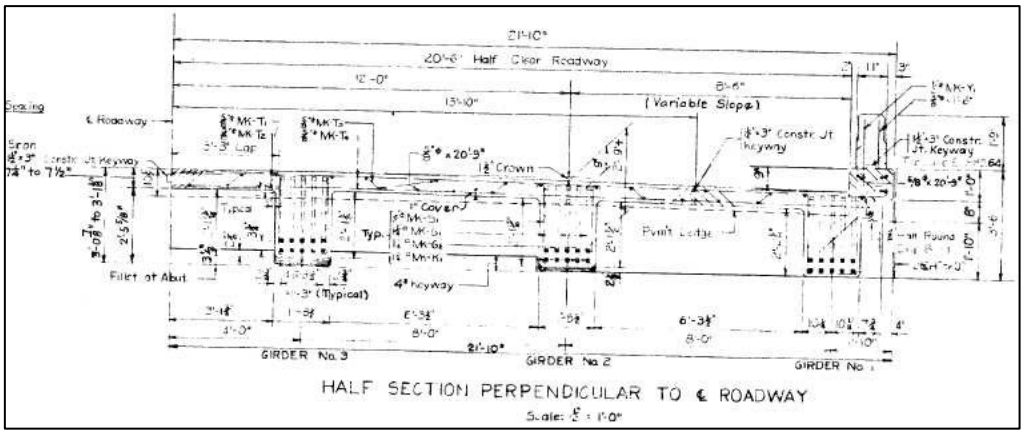


Figura 45 Sección transversal refuerzo superestructura puente No 1

Fuente: Universidad de Purdue.

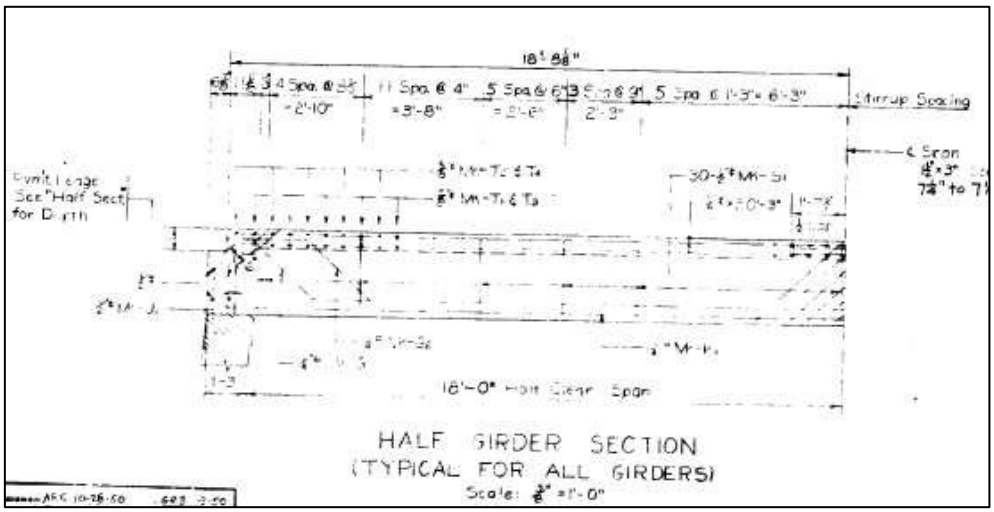


Figura 46 Detalle refuerzo en zona media de la viga puente No 1

Fuente: Universidad de Purdue.

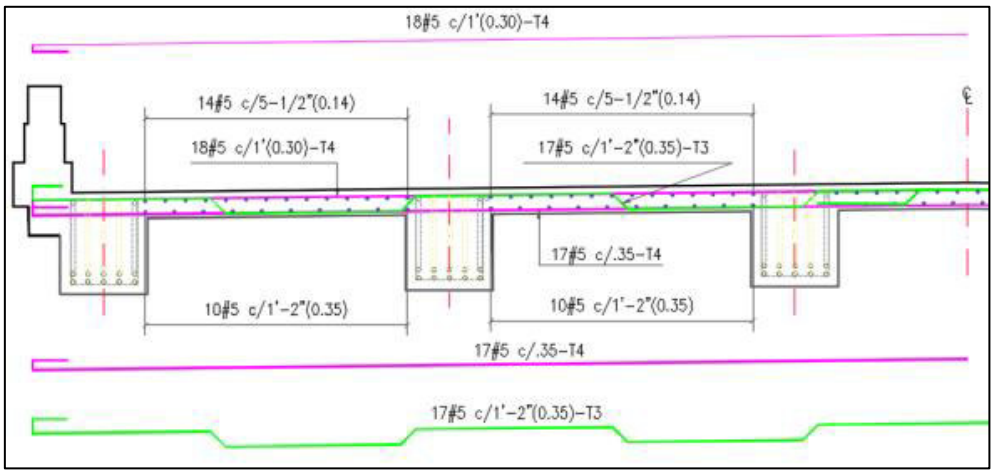


Figura 47 Sección transversal puente No 1- refuerzo losa - transcrita

Fuente: Elaboración propia.

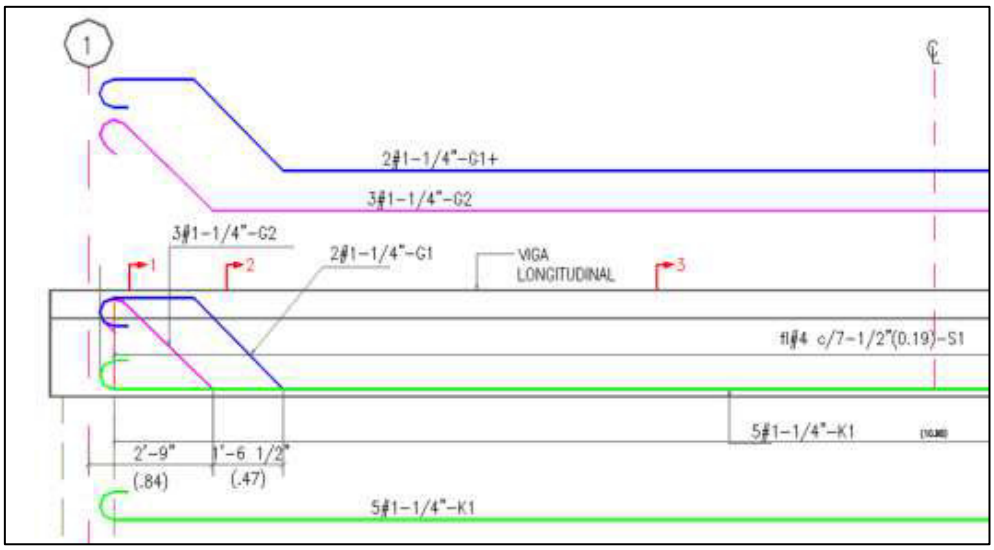


Figura 48 Refuerzo longitudinal viga – VGE – transcrita

Fuente: Elaboración propia.

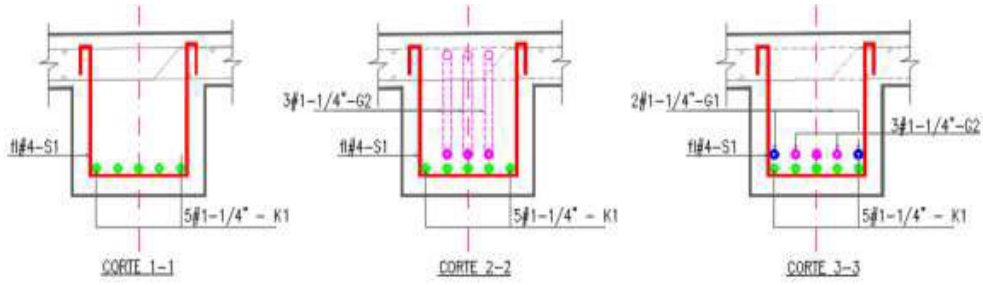


Figura 49 Detalle refuerzo longitudinal viga – VGE – informacion transcrita

Fuente: Elaboración propia.

3.4.2.8. Momento resistente "Mn" y cortante resistente "Vn" en viga VGE

Los momentos y cortantes resistentes se calcularon de acuerdo a la geometría de la viga, especificaciones de materiales y refuerzo suministrado, empleando las ecuaciones que se presentan en los numerales 1.6.8 y 1.6.9 de este documento.

Los mementos resistentes en la viga se calcularon en los corte 1-1, corte 2-2 y corte 3-3 que se indican en la Figura 48, de acuerdo con la configuración del refuerzo suministrado en la viga.

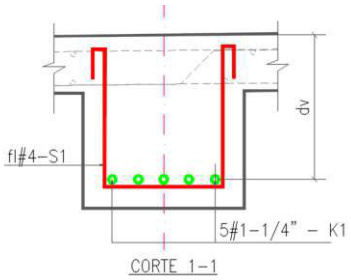
Dado que el corte 1-1 se localiza en la zona del apoyo, se debe afectar el valor de la resistencia a fluencia del acero de refuerzo, en la zona donde se desarrolla la longitud de anclaje de las barras de acero, además se consideró el aporte a la resistencia a cortante del elemento de las barras principales que presentan un dobles cerca al apoyo (barras de color morado y azul en la figura 48). A continuación se presentan los cálculos.

Resistencia nominal a flexión Mn corte 1-1 - VGE

Lon-d= 0.86m = 2.8 ft Longitu de desarrollo barras

Materiales

f'c=	14	Mpa =	292.4	kips/ft²	292.4
fy=	420	Mpa =	8771.9	kips/ft²	
fy=	287.45	Mpa =	6003.4	kips/ft²	Afectado
Es=	2E+07	Mpa =	417708685.5	kips/ft²	



Geometría viga

bfs=	1.73m	= 5.7 ft
bv=	0.52m	= 1.7 ft
H=	0.71m	= 2.3 ft
dv=	0.62m	= 2.0 ft
Rec =	0.07m	= 0.2 ft

Cuantía de refuerzo suministrado

Ref-prin=	1-1/4"		Diámetro de refuerzo para flexión
Ash=	40cm2	= 6.15 ft²	Área total de refuerzo para flexión
ρ =	0.00441		Cuantía de refuerzo a flexión

Resistencia nominal a flexión

c = As*fy / .85*f'c*b*β1 5.7.3.1.2-4 AASTHO β1= 0.85 Para concretos menores a 28MPa 5.7.2.2

c = 0.07m = 0.2 ft Profundidad del bloque de compresiones

a= ρ*d*fy / .85 * f'c

a= 0.07m = 0.2 ft

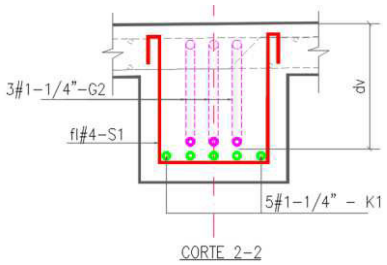
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO

Mn= 603 kN-m = 444.6 kips-ft

Resistencia nominal a flexión Mn corte 2-2 - VGE

Materiales

f'c=	14 Mpa =	292.4	kips/ft²	
fy=	420 Mpa =	8771.9	kips/ft²	
Es=	2E+07 Mpa =	417708685.5	kips/ft²	



Geometría viga

bfs=	1.73m	= 5.7 ft
bv=	0.52m	= 1.7 ft
H=	0.71m	= 2.3 ft
dv=	0.57m	= 1.9 ft
Rec =	0.07m	= 0.2 ft

Cuantía de refuerzo suministrado

Ref-prin=	1-1/4"		Diámetro de refuerzo para flexión
Ash=	64cm2	= 9.85 ft²	Área total de refuerzo para flexión
ρ =	0.00706		Cuantía de refuerzo a flexión

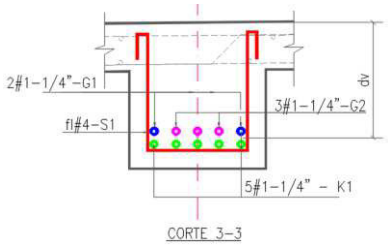
Resistencia nominal a flexión

c =	As*fy / .85*f'c*b*β1	5.7.3.1.2-4 AASTHO	β1=	0.85	Para concretos menores a 28MPa 5.7.2.2
c =	0.15m = 0.5 ft	Profundidad del bloque de compresiones			
a=	ρ*d*fy / .85 * f'c				
a=	0.14m = 0.5 ft				
Mn=	ϕ*As*fy*(d-a/2)	5.7.3.2 AASTHO - Resistencia a flexión	ϕ =	0.9	5.5.4.2 AASTHO
Mn=	1198 kN-m =	884.174 kips-ft			

Resistencia nominal a flexión Mn corte 3-3 - VGE

Materiales

f'c=	14 Mpa =	292.4	kips/ft²	
fy=	420 Mpa =	8771.9	kips/ft²	
Es=	2E+07 Mpa =	417708685.5	kips/ft²	



Geometría viga

bfs=	1.73m	= 5.7 ft
bv=	0.52m	= 1.7 ft
H=	0.71m	= 2.3 ft
dv=	0.57m	= 1.9 ft
Rec =	0.07m	= 0.2 ft

Cuantía de refuerzo suministrado

Ref-prin=	1-1/4"		Diámetro de refuerzo para flexión
Ash=	79cm2	= 12.31 ft²	Área total de refuerzo para flexión
ρ =	0.00883		Cuantía de refuerzo a flexión

Resistencia nominal a flexión

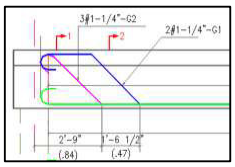
c =	As*fy / .85*f'c*b*β1	5.7.3.1.2-4 AASTHO	β1=	0.85	Para concretos menores a 28MPa 5.7.2.2
c =	0.19m = 0.6 ft	Profundidad del bloque de compresiones			
a=	ρ*d*fy / .85 * f'c				
a=	0.18m = 0.6 ft				
Mn=	ϕ*As*fy*(d-a/2)	5.7.3.2 AASTHO - Resistencia a flexión	ϕ =	0.9	5.5.4.2 AASTHO
Mn=	1444 kN-m =	1065.89 kips-ft			

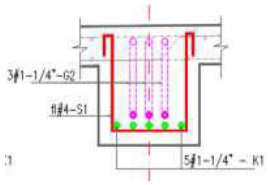
Según la norma, la resistencia a cortante de la sección se debe calcular con el momento y cortante actuante en el punto en estudio, por tal razón a continuación se presenta los cálculos para los punto 1, 2 y 3, el cálculo en los demás puntos se presentan en se presentan en el Anexo 2.

Capacidad a cortante Vn puntos 1 y 2 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft²	
fy=	420 Mpa =	8771.88	kips/ft²	
Es=	200000 Mpa =	4177087	kips/ft²	





Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft²	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2" + 1-1/4"			Diámetro de estribos +Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft²	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos
Asv=	23.7 cm2	= 0.026	ft²	Área de acero inclinado
α =	37.3°			Angulo de inclinación del acero

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1AASTHO

Av=	0.73 cm2	= 0.001	ft²	Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	502 kN	= 112.78	kips	Cortante actuante en punto de estudio
Mu=	0 kN-m	= 0.00	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0006

θ (29+3500εs) = 31.2°

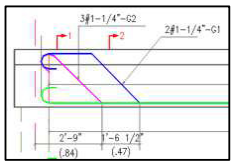
β = 3.3°

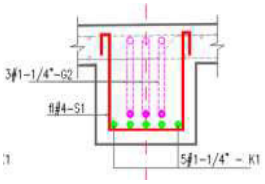
Vc=	310 KN	= 69.92	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vs2=	740 KN	= 166.73	kips	Resistencia refuerzo inclinado
Vn2=	1381 KN	= 311.31	kips	Resistencia a cortante 2
Vnd =	1074 KN	= 241.98	kips	Mínimo entre Vn1y Vn2

Capacidad a cortante Vn punto 3 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	877188	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	





Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2" + 1-1/4"			Diámetro de estribos +Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos
Asv=	15.8 cm2	= 0.017	ft^2	Área de acero inclinado
α =	37.3°			Angulo de inclinación del acero

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	461 kN	= 103.75	kips	Cortante actuante en punto de estudio
Mu=	279 kN-m	= 205.75	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0012

θ (29+3500εs) : 33.1°

β = 2.6°

Vc=	243 KN	= 54.75	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vs2=	493 KN	= 111.15	kips	Resistencia refuerzo inclinado
Vn2=	1067 KN	= 240.56	kips	Resistencia a cortante 2
Vnd =	1067 KN	= 240.56	kips	Mínimo entre Vn1 y Vn2

3.4.2.9. Índices de sobre esfuerzo por momentos y cortantes

Antes de calcular los índices de sobre esfuerzo se verifica que la viga cumpla con las dimensiones mínimas recomendadas en la norma, la cual indica que para vigas tipo T simplemente apoyadas el límite es 0,070*L

- Luz Puente = 466 in
  - h= 466*.070
  - h =32.62 in

De acuerdo con la información suministrada la altura de las vigas es de 28 in < 32.62 in, lo que indica que no cumple con la altura mínima recomendada en la norma. En la siguiente imagen se presenta las dimensiones de la viga tomada de los planos de diseño y esta misma información transcritas en AutoCAD.

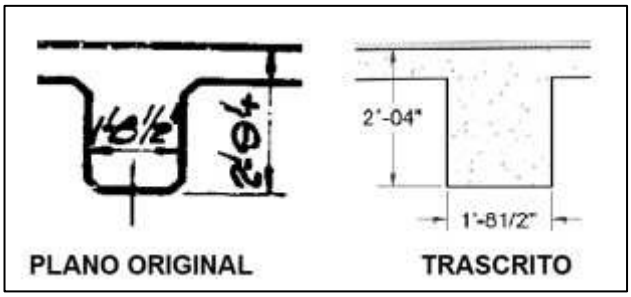


Figura 50 Revisión dimensiones viga

Fuente: Elaboración propia.

Los índices de sobre esfuerzo se presentan de dos formas diferentes:

1. La primera en tablas resaltando en color rojo los índices que sobrepasan el 100% de capacidad de la viga así como su localización.
2. Representación gráfica. (La línea roja representa la capacidad del elemento y las líneas azules representan las solicitaciones por corte y momento actuantes en el elemento).

Tabla 16 Índices de sobre esfuerzo por corte combinación servicio 1-1 VGE

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-1 V							
PUNTO	DIST (0)		CORTANTE - SAP2000		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kips	KN	kips	%
1	0.00	0.00	501.69	113.06	1074.00	242.03	47%
2	0.59	1.94	461.50	104.00	1067.00	240.45	43%
3	1.18	3.88	421.31	94.94	1067.00	240.45	39%
4	1.77	5.82	381.12	85.89	512.00	115.38	74%
5	2.37	7.76	340.93	76.83	497.00	112.00	69%
6	2.96	9.70	300.74	67.77	487.00	109.75	62%
7	3.55	11.64	262.92	59.25	480.00	108.17	55%
8	4.14	13.58	225.09	50.72	475.00	107.04	47%
9	4.73	15.52	187.26	42.20	473.00	106.59	40%
10	5.32	17.47	149.43	33.67	473.00	106.59	32%
11	5.92	19.41	111.60	25.15	473.00	106.59	24%
12	6.51	21.35	148.68	33.50	473.00	106.59	31%
13	7.10	23.29	-188.86	-42.56	473.00	106.59	40%
14	7.69	25.23	-229.05	-51.62	473.00	106.59	48%
15	8.28	27.17	-266.88	-60.14	475.00	107.04	56%
16	8.87	29.11	-304.71	-68.67	480.00	108.17	63%
17	9.46	31.05	-342.54	-77.19	487.00	109.75	70%
18	10.06	32.99	-380.37	-85.72	497.00	112.00	77%
19	10.65	34.93	-418.19	-94.24	1067.00	240.45	39%
20	11.24	36.87	-456.02	-102.76	1067.00	240.45	43%
21	11.83	38.81	-493.85	-111.29	1074.00	242.03	46%

Fuente: Elaboración propia.

Tabla 17 Índices de sobre esfuerzo por corte combinación servicio 1-2 VGE

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-2 V							
PUNTO	DIST (0)		CORTANTE - SAP2000		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	455.63	102.68	1074.00	242.03	42%
2	0.59	1.94	421.94	95.08	1067.00	240.45	40%
3	1.18	3.88	388.26	87.49	1067.00	240.45	36%
4	1.77	5.82	354.57	79.90	512.00	115.38	69%
5	2.37	7.76	320.88	72.31	497.00	112.00	65%
6	2.96	9.70	287.20	64.72	487.00	109.75	59%
7	3.55	11.64	253.51	57.13	480.00	108.17	53%
8	4.14	13.58	219.83	49.54	475.00	107.04	46%
9	4.73	15.52	186.14	41.95	473.00	106.59	39%
10	5.32	17.47	152.45	34.36	473.00	106.59	32%
11	5.92	19.41	118.77	26.76	473.00	106.59	25%
12	6.51	21.35	151.55	34.15	473.00	106.59	32%
13	7.10	23.29	-185.24	-41.74	473.00	106.59	39%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-2 V							
PUNTO	DIST (0)		CORTANTE - SAP2000		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
14	7.69	25.23	-218.93	-49.33	473.00	106.59	46%
15	8.28	27.17	-252.61	-56.93	475.00	107.04	53%
16	8.87	29.11	-286.30	-64.52	480.00	108.17	60%
17	9.46	31.05	-319.98	-72.11	487.00	109.75	66%
18	10.06	32.99	-353.67	-79.70	497.00	112.00	71%
19	10.65	34.93	-387.36	-87.29	1067.00	240.45	36%
20	11.24	36.87	-421.04	-94.88	1067.00	240.45	39%
21	11.83	38.81	-454.73	-102.47	1074.00	242.03	42%

Fuente: Elaboración propia.

Tabla 18 Índices de sobre esfuerzo por momento combinación servicio 1-1 VGE

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-1 M							
PUNTO	DIST (0)		MOMENTO - SAP2000		ϕ Mn		ÍNDICE
	m	ft	KN -m	kip-ft	KN-m	kip-ft	%
1	0.00	0.0	0.00	0.00	603.00	445.01	0%
2	0.59	1.9	278.80	205.75	603.00	445.01	46%
3	1.18	3.9	521.20	384.65	1198.00	884.12	44%
4	1.77	5.8	727.21	536.68	1444.00	1065.67	50%
5	2.37	7.8	896.82	661.86	1444.00	1065.67	62%
6	2.96	9.7	1034.00	763.09	1444.00	1065.67	72%
7	3.55	11.6	1143.42	843.84	1444.00	1065.67	79%
8	4.14	13.6	1226.23	904.96	1444.00	1065.67	85%
9	4.73	15.5	1275.44	941.27	1444.00	1065.67	88%
10	5.32	17.5	1291.04	952.79	1444.00	1065.67	89%
11	5.92	19.4	1301.00	960.14	1444.00	1065.67	90%
12	6.51	21.3	1304.07	962.40	1444.00	1065.67	90%
13	7.10	23.3	1280.39	944.93	1444.00	1065.67	89%
14	7.69	25.2	1223.27	902.78	1444.00	1065.67	85%
15	8.28	27.2	1149.33	848.20	1444.00	1065.67	80%
16	8.87	29.1	1041.77	768.83	1444.00	1065.67	72%
17	9.46	31.0	900.62	664.66	1444.00	1065.67	62%
18	10.06	33.0	725.87	535.69	1444.00	1065.67	50%
19	10.65	34.9	517.51	381.93	1198.00	884.12	43%
20	11.24	36.9	275.56	203.36	603.00	445.01	46%
21	11.83	38.8	0.00	0.00	603.00	445.01	0%

Fuente: Elaboración propia.

Tabla 19 Índices de sobre esfuerzo por momento combinación servicio 1-2 VGE

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-2 M							
PUNTO	DIST (0)		MOMENTO - SAP2000		ϕ Mn		ÍNDICE
	m	ft	KN -m	kip-ft	KN-m	kip-ft	%
1	0.00	0.0	0.00	0.00	603.00	445.01	0%
2	0.59	1.9	258.81	191.01	603.00	445.01	43%
3	1.18	3.9	494.26	364.76	1198.00	884.12	41%
4	1.77	5.8	701.00	517.34	1444.00	1065.67	49%
5	2.37	7.8	879.05	648.74	1444.00	1065.67	61%
6	2.96	9.7	1028.39	758.95	1444.00	1065.67	71%
7	3.55	11.6	1149.04	847.99	1444.00	1065.67	80%
8	4.14	13.6	1241.00	915.86	1444.00	1065.67	86%
9	4.73	15.5	1304.25	962.54	1444.00	1065.67	90%
10	5.32	17.5	1338.81	988.04	1444.00	1065.67	93%
11	5.92	19.4	1344.67	992.37	1444.00	1065.67	93%
12	6.51	21.3	1339.34	988.43	1444.00	1065.67	93%
13	7.10	23.3	1305.32	963.32	1444.00	1065.67	90%
14	7.69	25.2	1242.59	917.03	1444.00	1065.67	86%
15	8.28	27.2	1151.17	849.57	1444.00	1065.67	80%
16	8.87	29.1	1031.06	760.92	1444.00	1065.67	71%
17	9.46	31.0	882.24	651.09	1444.00	1065.67	61%
18	10.06	33.0	704.73	520.09	1444.00	1065.67	49%
19	10.65	34.9	498.52	367.90	1198.00	884.12	42%
20	11.24	36.9	263.61	194.54	603.00	445.01	44%
21	11.83	38.8	0.00	0.00	603.00	445.01	0%

Fuente: Elaboración propia.

Tabla 20 Índices de sobre esfuerzo por corte combinación resistencia 1-1 VGE

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-1 V							
PUNTO	DIST (0)		CORTANTE - SAP2000		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	624.93	140.83	1074.00	242.03	58%
2	0.59	1.94	551.03	124.17	1044.00	235.27	53%
3	1.18	3.88	500.71	112.83	1044.00	235.27	48%
4	1.77	5.82	450.39	101.50	489.00	110.20	92%
5	2.37	7.76	400.07	90.16	474.00	106.82	84%
6	2.96	9.70	351.16	79.13	465.00	104.79	76%
7	3.55	11.64	351.16	79.13	457.00	102.98	77%
8	4.14	13.58	303.47	68.39	453.00	102.08	67%
9	4.73	15.52	255.77	57.64	451.00	101.63	57%
10	5.32	17.47	208.08	46.89	451.00	101.63	46%
11	5.92	19.41	160.39	36.14	451.00	101.63	36%
12	6.51	21.35	112.69	25.40	451.00	101.63	25%
13	7.10	23.29	-181.31	-40.86	451.00	101.63	40%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-1 V							
PUNTO	DIST (0)		CORTANTE - SAP2000		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
14	7.69	25.23	-229.01	-51.61	451.00	101.63	51%
15	8.28	27.17	-276.70	-62.35	453.00	102.08	61%
16	8.87	29.11	-324.39	-73.10	457.00	102.98	71%
17	9.46	31.05	-373.29	-84.12	465.00	104.79	80%
18	10.06	32.99	-423.61	-95.46	474.00	106.82	89%
19	10.65	34.93	-473.93	-106.80	1044.00	235.27	45%
20	11.24	36.87	-524.25	-118.14	1044.00	235.27	50%
21	11.83	38.81	-624.93	-140.83	1074.00	242.03	58%

Fuente: Elaboración propia.

Tabla 21 Índices de sobre esfuerzo por corte combinación resistencia 1-2 VGE

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-2 V							
PUNTO	DIST (0)		CORTANTE - SAP2000		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN-m	kip	KN	kip	%
1	0.00	0.00	578.21	130.30	1074.00	242.03	54%
2	0.59	1.94	518.72	116.89	1044.00	235.27	50%
3	1.18	3.88	475.62	107.18	1044.00	235.27	46%
4	1.77	5.82	432.52	97.47	489.00	110.20	88%
5	2.37	7.76	389.41	87.75	474.00	106.82	82%
6	2.96	9.70	346.31	78.04	465.00	104.79	74%
7	3.55	11.64	303.20	68.33	457.00	102.98	66%
8	4.14	13.58	260.10	58.61	453.00	102.08	57%
9	4.73	15.52	216.98	48.90	451.00	101.63	48%
10	5.32	17.47	173.30	39.05	451.00	101.63	38%
11	5.92	19.41	130.00	29.30	451.00	101.63	29%
12	6.51	21.35	87.68	19.76	451.00	101.63	19%
13	7.10	23.29	-233.35	-52.59	451.00	101.63	52%
14	7.69	25.23	-276.45	-62.30	451.00	101.63	61%
15	8.28	27.17	-319.56	-72.01	453.00	102.08	71%
16	8.87	29.11	-362.66	-81.73	457.00	102.98	79%
17	9.46	31.05	-405.76	-91.44	465.00	104.79	87%
18	10.06	32.99	-448.87	-101.15	474.00	106.82	95%
19	10.65	34.93	-491.97	-110.87	1044.00	235.27	47%
20	11.24	36.87	-535.08	-120.58	1044.00	235.27	51%
21	11.83	38.81	-578.21	-130.30	1074.00	242.03	54%

Fuente: Elaboración propia.

Tabla 22 Índices de sobre esfuerzo por momento combinación resistencia 1-1 VGE

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-1 M							
PUNTO	DIST (0)		MOMENTO - SAP2000		ϕ Mn		ÍNDICE
	m	ft	KN -m	kip-ft	KN-m	kip-ft	%
1	0.00	0.0	0.00	0.00	603.00	445.01	0%
2	0.59	1.9	350.40	258.60	603.00	445.01	58%
3	1.18	3.9	656.89	484.78	1198.00	884.12	55%
4	1.77	5.8	919.23	678.39	1444.00	1065.67	64%
5	2.37	7.8	1137.44	839.43	1444.00	1065.67	79%
6	2.96	9.7	1311.52	967.90	1444.00	1065.67	91%
7	3.55	11.6	1446.54	1067.55	1444.00	1065.67	100%
8	4.14	13.6	1544.22	1139.63	1444.00	1065.67	107%
9	4.73	15.5	1614.69	1191.64	1444.00	1065.67	112%
10	5.32	17.5	1646.59	1215.18	1444.00	1065.67	114%
11	5.92	19.4	1646.40	1215.04	1444.00	1065.67	114%
12	6.51	21.3	1646.47	1215.09	1444.00	1065.67	114%
13	7.10	23.3	1614.63	1191.60	1444.00	1065.67	112%
14	7.69	25.2	1544.13	1139.57	1444.00	1065.67	107%
15	8.28	27.2	1446.50	1067.52	1444.00	1065.67	100%
16	8.87	29.1	1311.49	967.88	1444.00	1065.67	91%
17	9.46	31.0	1137.46	839.45	1444.00	1065.67	79%
18	10.06	33.0	919.30	678.44	1444.00	1065.67	64%
19	10.65	34.9	654.00	482.65	1198.00	884.12	55%
20	11.24	36.9	350.57	258.72	603.00	445.01	58%
21	11.83	38.8	0.00	0.00	603.00	445.01	0%

Fuente: Elaboración propia.

Tabla 23 Índices de sobre esfuerzo por momento combinación resistencia 1-2 VGE

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-2 M							
PUNTO	DIST (0)		MOMENTO - SAP2000		ϕ Mn		ÍNDICE
	m	ft	KN -m	kip-ft	KN-m	kip-ft	%
1	0.00	0.0	0.00	0.00	603.00	445.01	0%
2	0.59	1.9	326.74	241.13	603.00	445.01	54%
3	1.18	3.9	618.17	456.21	1198.00	884.12	52%
4	1.77	5.8	874.13	645.11	1444.00	1065.67	61%
5	2.37	7.8	1094.60	807.81	1444.00	1065.67	76%
6	2.96	9.7	1279.60	944.34	1444.00	1065.67	89%
7	3.55	11.6	1429.11	1054.68	1444.00	1065.67	99%
8	4.14	13.6	1543.15	1138.84	1444.00	1065.67	107%
9	4.73	15.5	1621.71	1196.82	1444.00	1065.67	112%
10	5.32	17.5	1664.79	1228.62	1444.00	1065.67	115%
11	5.92	19.4	1672.40	1234.23	1444.00	1065.67	116%
12	6.51	21.3	1664.66	1228.52	1444.00	1065.67	115%
13	7.10	23.3	1621.61	1196.75	1444.00	1065.67	112%

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-2 M							
PUNTO	DIST (0)		MOMENTO - SAP2000		ϕ Mn		ÍNDICE
	m	ft	KN -m	kip-ft	KN-m	kip-ft	%
14	7.69	25.2	1543.09	1138.80	1444.00	1065.67	107%
15	8.28	27.2	1429.08	1054.66	1444.00	1065.67	99%
16	8.87	29.1	1279.60	944.34	1444.00	1065.67	89%
17	9.46	31.0	1094.63	807.84	1444.00	1065.67	76%
18	10.06	33.0	874.19	645.15	1444.00	1065.67	61%
19	10.65	34.9	618.27	456.28	1198.00	884.12	52%
20	11.24	36.9	326.88	241.24	603.00	445.01	54%
21	11.83	38.8	0.00	0.00	603.00	445.01	0%

Fuente: Elaboración propia.

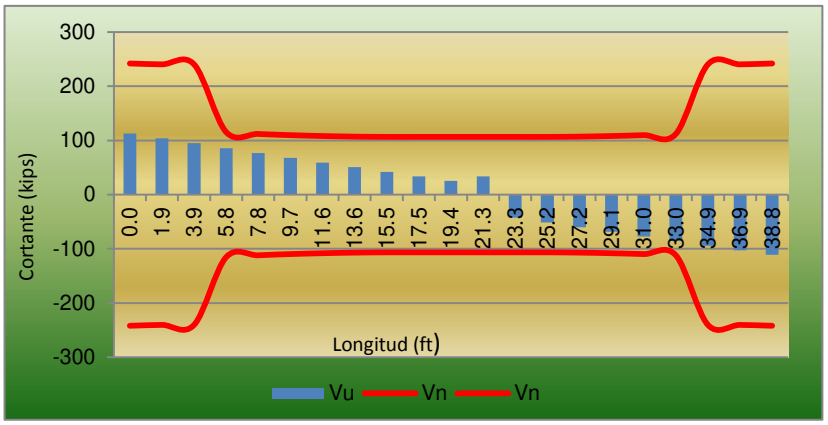


Figura 51 Representacion gráfica índices por corte combinacion servicio 1-1 VGE.

Fuente: Elaboración propia.

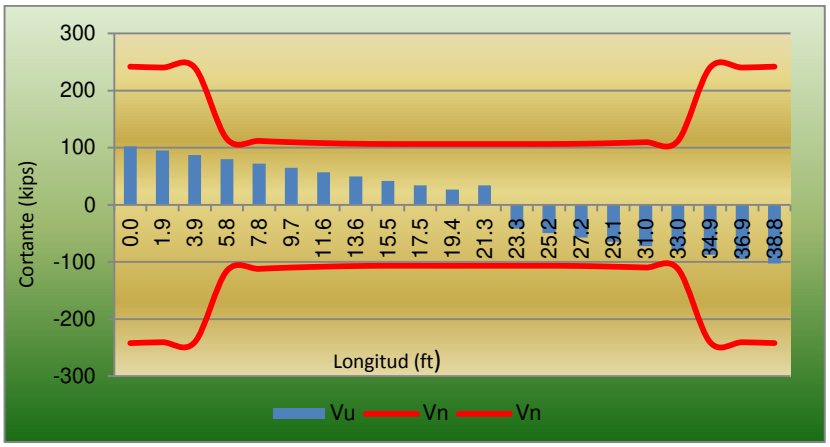


Figura 52 Representacion gráfica índices por corte combinacion servicio 1-2 VGE.

Fuente: Elaboración propia.

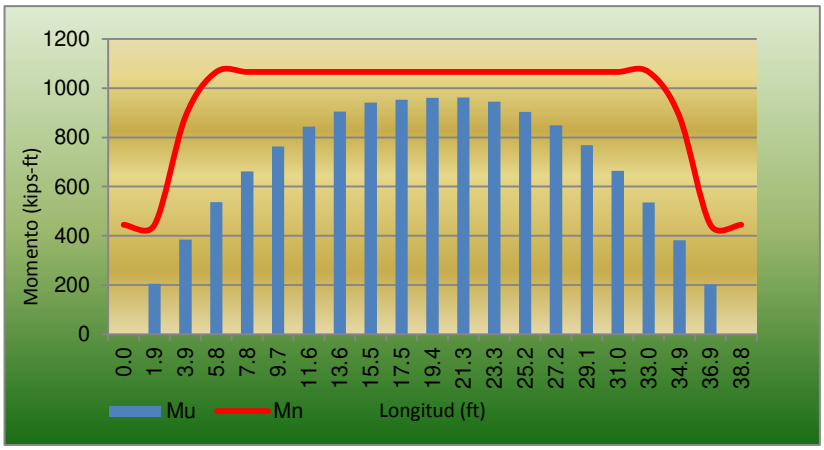


Figura 53 Representacion gráfica índices por momento combinacion servicio 1-1 – VGE

Fuente: Elaboración propia.

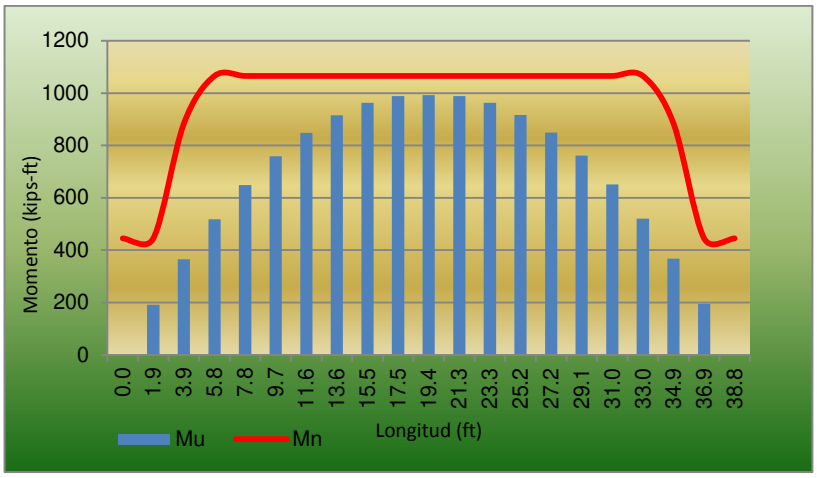


Figura 54 Representacion gráfica índices por momento combinacion servicio 1-2 – VGE

Fuente: Elaboración propia.

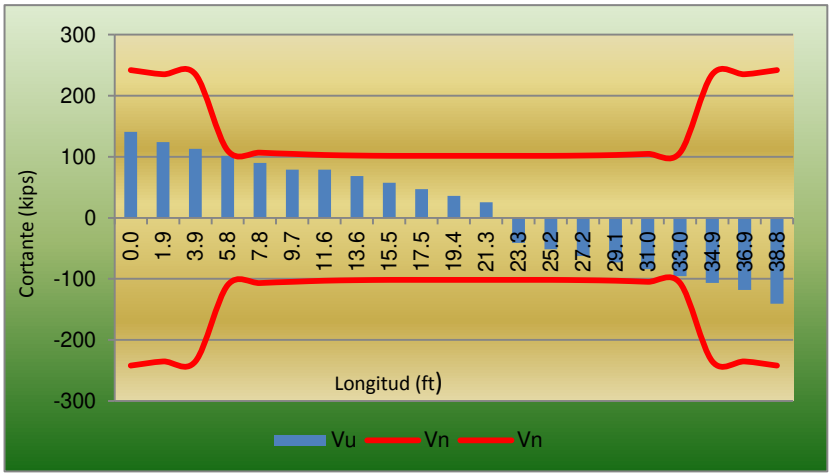


Figura 55 Representacion gráfica índices por corte combinacion resistencia 1-1 – VGE

Fuente: Elaboración propia.

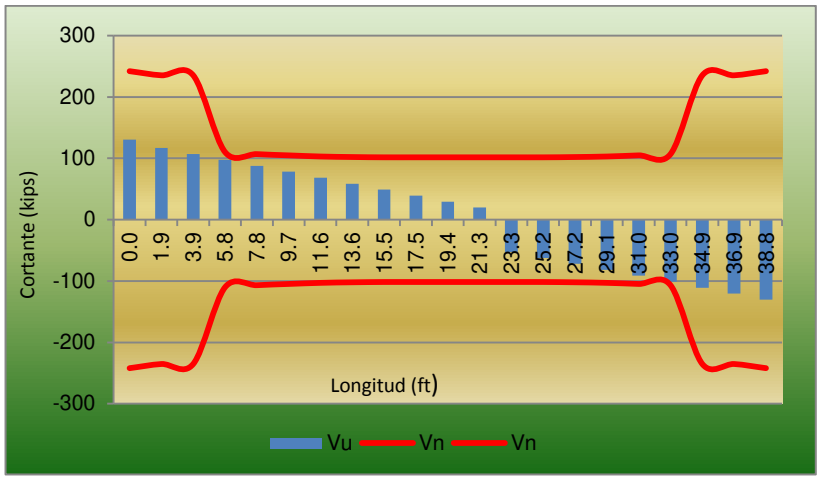


Figura 56 Representacion gráfica índices por corte combinacion resistencia 1-2 – VGE

Fuente: Elaboración propia.

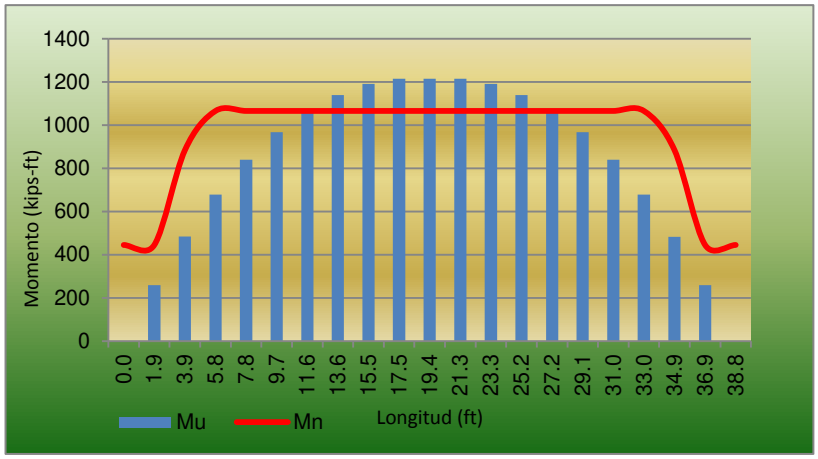


Figura 57 Representacion gráfica índices por momento combinacion resistencia 1-1 – VGE

Fuente: Elaboración propia.

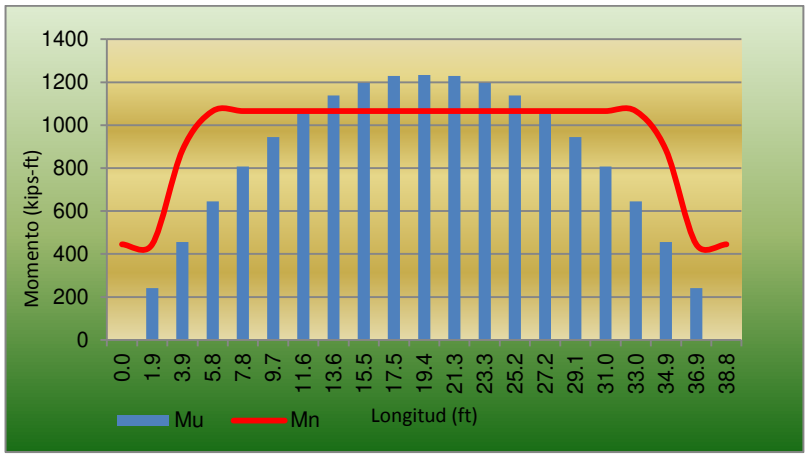


Figura 58 Representacion gráfica índices por momento combinacion resistencia 1-2 – VGE

Fuente: Elaboración propia.

3.4.2.10. Chequeo de deformaciones

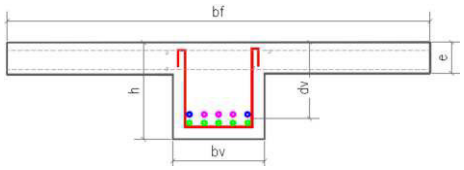
El chequeo de deformaciones se realizó con el momento de inercia efectivo del elemento, tal como se recomienda en la norma. A continuación se presentan los cálculos.

Materiales

f'c=	14	Mpa =	292.6	kips/ft²
fy=	420	Mpa =	60.9	kips/ft²
Es=	200000	Mpa =	367.543	kips/ft²

Geometría viga

bfs=	1.73 m	= 5.7 ft	
e=	0.18 m	= 0.6 ft	
bv=	0.52 m	= 1.7 ft	
h=	0.71 m	= 2.3 ft	
dv=	0.57 m	= 1.9 ft	
Rec =	0.08 m	= 0.2 ft	



Propiedades

Barras = 10			
# =	10		
As =	0.008 m2	= 0.09 ft 2	Area de refuerzo suministrado en punto de estudio
n=	11.14		Relación modular
n*As =	0.091	= 0.98 ft 2	
X=	0.18 m	= 0.6 ft	Distancia del eje centroidal

Momento de inercia efectivo

$$I_e = \left(\frac{M_{cr}}{M_a}\right)^3 I_g + \left[1 - \left(\frac{M_{cr}}{M_a}\right)^3\right] I_{cr} \leq I_g$$

Ig=	0.026 m4	= 3.0 ft 4	
yt =	0.45 m4	= 52.5 ft 4	Distancia dese el eje neutro a la fibra extrema a tracción
fr =	2320 kN/m2		Modulo de rotura del concreto
Mcr =	132 kN-m	= 97 kips-ft	Momento de fisuracion
Ma=	577 kN-m	= 426 kips-ft	Momento en el concreto para la cual se calcula la deformación
Icr=	0.017 m4	= 2.0 ft 4	Momento de inercia de la sección transformada
Ie =	0.0173 m4	= 2.0 ft 4	Momento de inercia efectivo

Tabla 24 Revisión deflexiones viga VGE

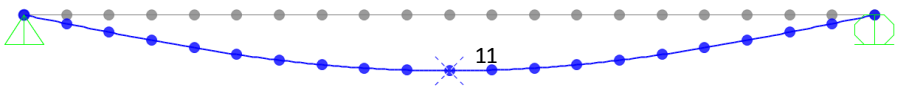


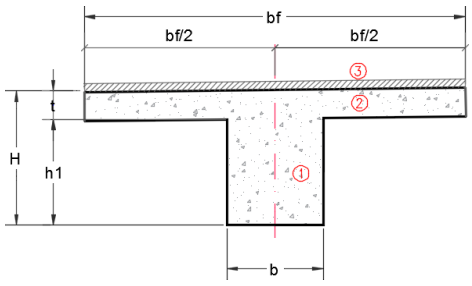
TABLE: Joint Displacements								
Joint	OutputCase	CaseType	StepType	U3		Δmax = L/800		Cumple
Text	Text	Text	Text	mm	In	mm	In	
11	HL93	LinMoving	Min	-26.7	-1.1	14.8	0.6	No cumple
11	DFL1	Combination	Max	-7.9	-0.3	14.8	0.6	Cumple
11	DFL1	Combination	Min	-14.5	-0.6	14.8	0.6	Cumple
11	DFL2	Combination	Max	-7.9	-0.3	14.8	0.6	Cumple
11	DFL2	Combination	Min	-14.1	-0.6	14.8	0.6	Cumple
11	DFL3	Combination		-19.3	-0.8	14.8	0.6	No cumple

Fuente: Elaboración propia.

3.4.3 Análisis viga interna (VGI)

El análisis de la viga interior se realizó aplicando la misma secuencia empleada en la viga externa, por tal razón a continuación se presentan los cálculos, omitiendo algunos pasos que se presentaron en el análisis de la viga anterior

3.4.3.1. Cargas muertas "DC" y "DW" - VGI



b=	0.52m	= 1.7 ft	
bf=	2.43m	= 8.0 ft	
bf/2=	1.22m	= 4.0 ft	
t=	0.18m	= 0.6 ft	
h1	0.53m	= 1.7 ft	
H=	0.71m	= 2.3 ft	
e=	0.07m	= 0.2 ft	Espesor carpeta asfáltica

Evaluación carga muerta

ϒ (Con) =	24	kN/m3	1.50 kip/ft3	Densidad del concreto
ϒ (Asf) =	22.5	kN/m3	1.40 kip/ft3	Densidad carpeta asfáltica

W1 =	6.61	kN/m	0.45 kip/ft				
W2 =	10.50	kN/m	0.72 kip/ft		DW =	3.83 kN/m	0.26 kip/ft Carpeta Asfáltica
DC =	17.11	kN/m	1.17 kip/ft	Peso propio			

Tabla 25 Evaluación de cargas muertas para viga interior - VGI.

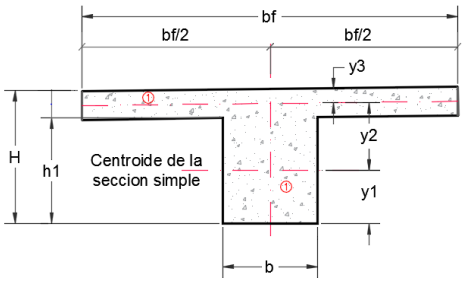
Fuente: Elaboración propia.

3.4.3.2. Cargas vivas "L"

El análisis de la viga interior se analizó, con las cargas generadas por el camión de diseño HL-93, el tándem de diseño y la línea de carga, tal como se indica en el numeral 1.6.5.2 de este documento.

3.4.3.3. Factores de distribución para momento y cortante – VGI.

Factor de distribución para momento - VGI



bf=	2.41 m	= 7.91 ft	Ancho efectivo
bf/2=	1.21 m	= 3.95 ft	
b=	0.52 m	= 1.71 ft	Base
t=	0.18 m	= 0.59 ft	Espesor de la placa
h1=	0.53 m	= 1.74 ft	Altura de la viga
H=	0.71 m	= 2.33 ft	Altura sección compuesta
y1=	0.27 m	= 0.87 ft	
y2=	0.36 m	= 1.16 ft	
y3=	0.09 m	= 0.30 ft	
s=	2.41 m	= 7.91 ft	Separación entre vigas
Ixx-vg=	0.01 m4	= 0.75 ft4	Momento de inercia viga
A-vg=	0.28 m2	= 1.01 ft2	Área viga
L=	11.84 m	= 38.85 ft	
Nb=	6		Numero de vigas

Verificación rango de aplicación Tabla 4.6.2.2.2b-1

3.5 ft	≤	S	≤	16 ft	Cumple
20 ft	≤	L	≤	240 ft	Cumple
4.5 ft	≤	ts	≤	12 ft	Cumple
Nb ≥ 4					Cumple
1E+05	≤	kg	≤	7E+06	Cumple

Factor de distribución un carril cargado (g_{m1}) Tabla 4.6.2.2.2b-1

One Design Lane Loaded:

$$0.06+\left(\frac{S}{14}\right)^{0.4}\left(\frac{S}{L}\right)^{0.3}\left(\frac{K_g}{12.0Lt_s^3}\right)^{0.1}$$

n= 1 Relación modular E-viga/E-Losa
eg= 0.36
Kg = 0.041 ft4
g_{m1}= 0.527 No rige

Factor de distribución dos carriles cargado (g_{m2}) Tabla 4.6.2.2.2b-1

Two or More Design Lanes Loaded:

$$0.075+\left(\frac{S}{9.5}\right)^{0.6}\left(\frac{S}{L}\right)^{0.2}\left(\frac{K_g}{12.0\,Lt_s^3}\right)^{0.1}$$

g_{m2}= 0.693 Rige

Reducción de factores de distribución viga f,r

$$c_1 = 0.25\left(\frac{K_g}{12.0Lt_s^3}\right)^{0.25}\left(\frac{S}{L}\right)^{0.5}$$

c1= 0.102

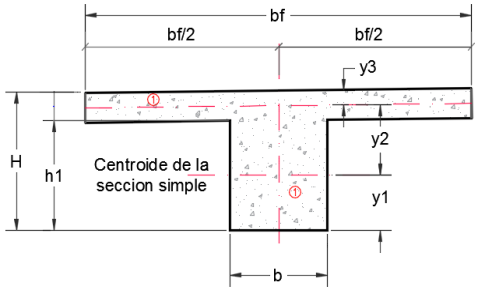
$$1-c_1(\tan\theta)^{1.5}$$

f.r= 0.955

Factor de distribución para diseño - momento

f.d.d = 0.662

Factor de distribución para cortante - VGI



bf=	2.41 m	= 7.91ft	Ancho efectivo
bf/2=	1.21 m	= 3.95 ft	
b=	0.52 m	= 1.71ft	Base
t=	0.18 m	= 0.59 ft	Espesor de la placa
h1=	0.53 m	= 1.74 ft	Altura de la viga
H=	0.71 m	= 2.33 ft	Altura sección compuesta
y1=	0.27 m	= 0.87 ft	
y2=	0.36 m	= 1.16 ft	
y3=	0.09 m	= 0.30 ft	
s=	2.41 m	= 7.91ft	Separación entre vigas
L=	11.84 m	= 38.85 ft	
Nb=	6		Numero de vigas

Verificación rango de aplicación Tabla 4.6.2.23b-1

3.5 ft	≤	S	≤	16 ft	Cumple
20 ft	≤	L	≤	240 ft	Cumple
4.5 ft	≤	ts	≤	12 ft	Cumple
Nb ≥ 4					Cumple

Factor de distribución un carril cargados (g_{v1}) Tabla 4.6.2.23b-1

$g_{vi1} = 0.36 + \frac{S}{25.0}$

g_{vi1} = 0.68 No rige

Factor de distribución dos carriles cargado (g_{v2}) Tabla 4.6.2.23b-1

$g_{vi2} = 0.2 + \frac{S}{12} - \left(\frac{S}{35}\right)^{2.0}$

g_{vi2} = 0.835 Rige

Factor de reducción f,r

$1.0 + 0.20\left(\frac{12.0Lt_s^3}{K_g}\right)^{0.3}\tan\theta$

f.r = 1.0

Factor de distribución para diseño - cortante

f.d.v = 0.83

3.4.3.4. Calculo de momentos y cortantes por teorema de Barret - VGI

La viga interna se dividió para su análisis de igual forma que la viga externa (Véase Figura 39). A continuación se presentan los resultados de los cálculos.

Tabla 26 Cortantes y momentos combinación servicio 1-1 – VGI

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
1	0	0.0	492.0	110.60	0.0	0.0
2	0.59	1.9	452.8	101.78	273.3	201.6
3	1.18	3.9	413.5	92.97	510.9	376.8
4	1.78	5.8	374.3	84.15	712.6	525.6
5	2.37	7.8	335.1	75.34	878.4	647.9
6	2.96	9.7	295.9	66.52	1012.4	746.7
7	3.55	11.7	259.0	58.23	1119.3	825.5
8	4.14	13.6	222.2	49.95	1200.1	885.1
9	4.74	15.5	185.3	41.66	1247.8	920.4
10	5.33	17.5	148.5	33.38	1262.6	931.2
11	5.92	19.4	111.6	25.09	1272.3	938.4
12	6.51	21.4	147.7	33.21	1275.6	940.8
13	7.10	23.3	-186.9	-42.02	1252.8	924.0
14	7.70	25.2	-226.1	-50.84	1197.1	883.0
15	8.29	27.2	-263.0	-59.12	1125.2	829.9
16	8.88	29.1	-299.9	-67.41	1020.2	752.5
17	9.47	31.1	-336.7	-75.70	882.2	650.7
18	10.06	33.0	-373.6	-83.98	711.2	524.6
19	10.66	35.0	-410.4	-92.27	507.2	374.1
20	11.25	36.9	-447.3	-100.55	270.1	199.2
21	11.84	38.8	-484.1	-108.84	0.0	0.0

Fuente: Elaboración propia.

Tabla 27 Cortantes y momentos combinación servicio 1-2 – VGI

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
1	0	0.0	445.9	100.25	0.0	0.0
2	0.59	1.9	413.2	92.89	253.4	186.9
3	1.18	3.9	380.5	85.54	483.9	356.9
4	1.78	5.8	347.8	78.18	686.3	506.2

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
5	2.37	7.8	315.1	70.83	860.7	634.8
6	2.96	9.7	282.3	63.47	1006.8	742.6
7	3.55	11.7	249.6	56.12	1124.9	829.7
8	4.14	13.6	216.9	48.76	1214.8	896.0
9	4.74	15.5	184.2	41.41	1276.7	941.6
10	5.33	17.5	151.5	34.05	1310.4	966.5
11	5.92	19.4	118.8	26.70	1315.9	970.6
12	6.51	21.4	150.6	33.85	1310.9	966.9
13	7.10	23.3	-183.3	-41.21	1277.7	942.4
14	7.70	25.2	-216.0	-48.56	1216.4	897.2
15	8.29	27.2	-248.7	-55.92	1127.0	831.3
16	8.88	29.1	-281.4	-63.27	1009.5	744.6
17	9.47	31.1	-314.2	-70.63	863.8	637.1
18	10.06	33.0	-346.9	-77.98	690.1	509.0
19	10.66	35.0	-379.6	-85.34	488.2	360.1
20	11.25	36.9	-412.3	-92.69	258.1	190.4
21	11.84	38.8	-445.0	-100.04	0.0	0.0

Fuente: Elaboración propia.

Tabla 28 Cortantes y momentos combinación resistencia 1-1 – VGI

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
1	0	0.0	711.6	159.98	0.0	0.0
2	0.59	1.9	654.9	147.24	347.0	256.0
3	1.18	3.9	598.3	134.50	649.3	478.9
4	1.78	5.8	541.6	121.76	906.7	668.8
5	2.37	7.8	485.0	109.02	1119.4	825.6
6	2.96	9.7	428.3	96.28	1291.9	952.8
7	3.55	11.7	375.1	84.31	1429.7	1054.5
8	4.14	13.6	321.8	72.35	1534.2	1131.6
9	4.74	15.5	268.6	60.38	1597.2	1178.1
10	5.33	17.5	215.3	48.41	1618.7	1193.9
11	5.92	19.4	162.1	36.44	1631.5	1203.3
12	6.51	21.4	214.2	48.16	1634.0	1205.2
13	7.10	23.3	-270.9	-60.90	1603.1	1182.4
14	7.70	25.2	-327.6	-73.64	1530.8	1129.0
15	8.29	27.2	-380.8	-85.61	1436.7	1059.6
16	8.88	29.1	-434.0	-97.58	1301.0	959.6
17	9.47	31.1	-487.3	-109.55	1123.8	828.9
18	10.06	33.0	-540.5	-121.51	905.2	667.6
19	10.66	35.0	-593.8	-133.48	645.0	475.7
20	11.25	36.9	-647.0	-145.45	343.2	253.2

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
21	11.84	38.8	-700.2	-157.42	0.0	0.0

Fuente: Elaboración propia.

Tabla 29 Cortantes y momentos combinación resistencia 1-2 – VGI

PUNTO	DISTANCIA		CORTANTE		MOMENTO	
	m	ft	kN	kips	kN-m	kips-ft
1	0	0.0	644.7	144.94	0.0	0.0
2	0.59	1.9	597.5	134.32	323.6	238.7
3	1.18	3.9	550.3	123.71	617.7	455.6
4	1.78	5.8	503.1	113.09	876.0	646.1
5	2.37	7.8	455.8	102.48	1098.5	810.2
6	2.96	9.7	408.6	91.86	1285.3	948.0
7	3.55	11.7	361.4	81.24	1436.3	1059.4
8	4.14	13.6	314.2	70.63	1551.6	1144.4
9	4.74	15.5	266.9	60.01	1631.0	1203.0
10	5.33	17.5	219.7	49.40	1674.7	1235.2
11	5.92	19.4	172.5	38.78	1682.7	1241.1
12	6.51	21.4	218.4	49.10	1675.4	1235.7
13	7.10	23.3	-265.6	-59.72	1632.3	1203.9
14	7.70	25.2	-312.9	-70.33	1553.4	1145.8
15	8.29	27.2	-360.1	-80.95	1438.8	1061.2
16	8.88	29.1	-407.3	-91.57	1288.4	950.3
17	9.47	31.1	-454.5	-102.18	1102.3	813.0
18	10.06	33.0	-501.7	-112.80	880.4	649.3
19	10.66	35.0	-549.0	-123.41	622.7	459.3
20	11.25	36.9	-596.2	-134.03	329.2	242.8
21	11.84	38.8	-643.4	-144.64	0.0	0.0

Fuente: Elaboración propia.

3.4.3.5. Cálculo de momentos y cortantes con SAP2000-VGI

Tabla 30 Cortantes y momentos combinación resistencia 1-1 –SAP2000-VGI

TABLE: Element Forces - Frames						
			CORTANTE SAP2000		MOMENTO SAP2000	
Frame	DISTANCIA		V2		M3	
Text	m	ft	KN	kips	KN-m	kips-ft
1	0	0.0	725.53	163.1	0.00	0
2	0.59	1.9	638.05	143.4	353.21	260.5
3	1.18	3.9	581.42	130.7	661.91	488.2
4	1.78	5.8	524.80	118.0	925.87	682.9
5	2.37	7.8	468.18	105.3	1145.10	844.6
6	2.96	9.7	413.40	92.9	1319.60	973.3
7	3.55	11.7	360.22	81.0	1454.66	1,072.9
8	4.14	13.6	307.03	69.0	1552.06	1,144.7
9	4.74	15.5	253.84	57.1	1622.37	1,196.6
10	5.33	17.5	200.66	45.1	1653.78	1,219.8
11	5.92	19.4	147.47	33.2	1653.80	1,219.8
12	6.51	21.4	94.29	21.2	1653.78	1,219.8
13	7.10	23.3	-281.28	-63.2	1622.80	1,196.9
14	7.70	25.2	-334.42	-75.2	1551.97	1,144.7
15	8.29	27.2	-387.60	-87.1	1451.61	1,070.7
16	8.88	29.1	-442.37	-99.4	1319.57	973.3
17	9.47	31.1	-498.99	-112.2	1145.12	844.6
18	10.06	33.0	-555.61	-124.9	925.94	682.9
19	10.66	35.0	-612.24	-137.6	662.03	488.3
20	11.25	36.9	-668.86	-150.4	353.38	260.6
21	11.84	38.8	-725.53	-163.1	0.00	0

Fuente: Elaboración propia.

Tabla 31 Cortantes y momentos combinación resistencia 1-2 –SAP2000-VGI

TABLE: Element Forces - Frames						
			CORTANTE SAP2000		MOMENTO SAP2000	
Frame	DISTANCIA		V2		M3	
Text	m	ft	KN	kips	KN-m	kips-ft

TABLE: Element Forces - Frames						
			CORTANTE SAP2000		MOMENTO SAP2000	
Frame	DISTANCIA		V2		M3	
1	0	0.0	664.39	149.4	0.00	-
2	0.59	1.9	595.77	133.9	328.56	242.3
3	1.18	3.9	548.59	123.3	621.58	458.5
4	1.78	5.8	501.41	112.7	878.88	648.2
5	2.37	7.8	454.23	102.1	1100.47	811.7
6	2.96	9.7	407.05	91.5	1286.35	948.8
7	3.55	11.7	359.87	80.9	1436.51	1,059.5
8	4.14	13.6	312.69	70.3	1550.95	1,143.9
9	4.74	15.5	265.51	59.7	1629.68	1,202.0
10	5.33	17.5	218.33	49.1	1672.70	1,233.7
11	5.92	19.4	171.15	38.5	1672.80	1,233.8
12	6.51	21.4	123.97	27.9	1672.56	1,233.6
13	7.10	23.3	-286.91	-64.5	1629.58	1,201.9
14	7.70	25.2	-334.09	-75.1	1550.88	1,143.9
15	8.29	27.2	-381.27	-85.7	1436.47	1,059.5
16	8.88	29.1	-428.45	-96.3	1286.35	948.8
17	9.47	31.1	-475.63	-106.9	1100.51	811.7
18	10.06	33.0	-522.81	-117.5	878.95	648.3
19	10.66	35.0	-569.99	-128.1	621.68	458.5
20	11.25	36.9	-617.17	-138.7	328.70	242.4
21	11.84	38.8	-664.39	-149.4	0.00	-

Fuente: Elaboración propia.

3.4.3.6. Comparación resultados obtenidos con teorema de Barret Vs SAP2000 – VGI

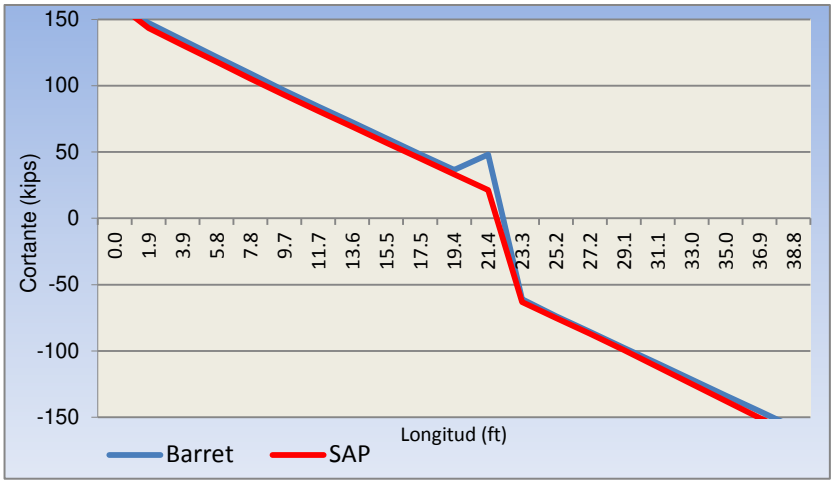


Figura 59 Diagrama de cortante combinación resistencia 1-1 Barret vs SAP2000 - VGI.

Fuente: Elaboración propia.

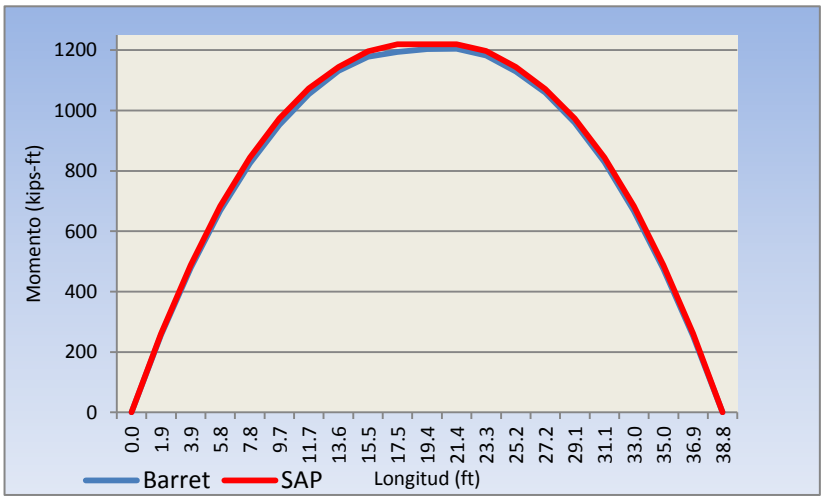


Figura 60 Diagrama de momento combinación resistencia 1-1 Barret vs SAP2000 - VGI.

Fuente: Elaboración propia.

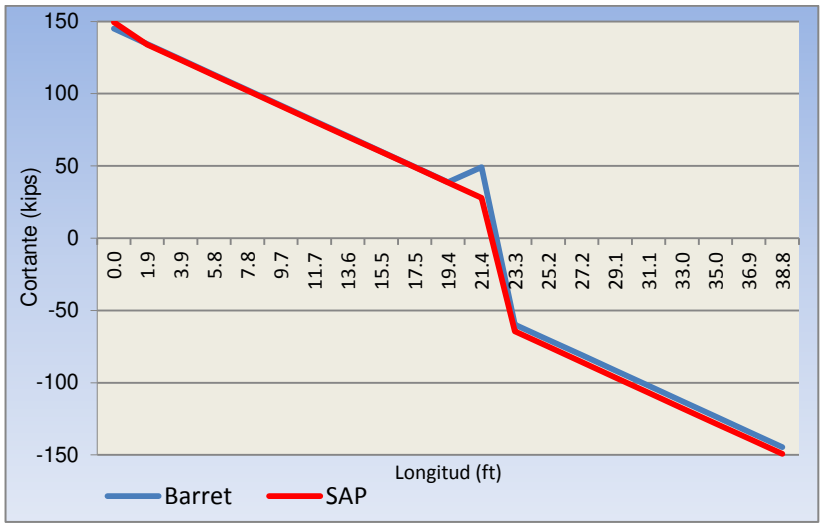


Figura 61 Diagrama de cortante combinación resistencia 1-2 Barret vs SAP2000 - VGI.

Fuente: Elaboración propia.

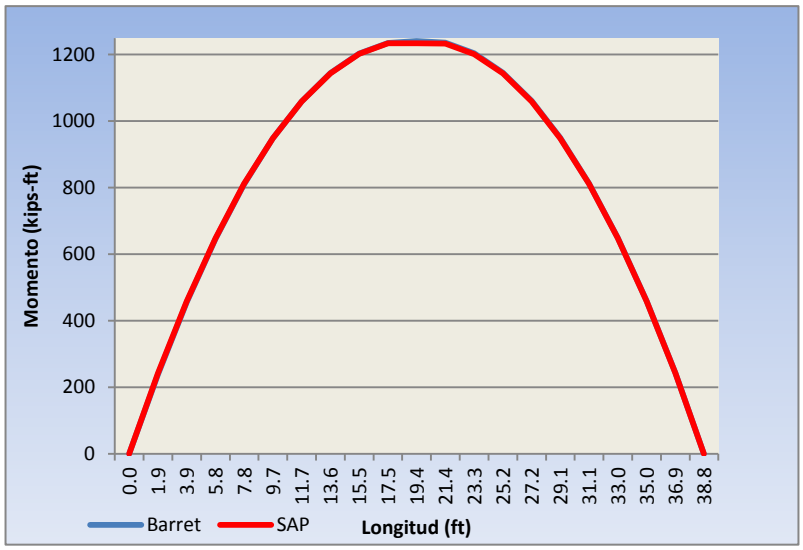


Figura 62 Diagrama de momento combinación resistencia 1-2 Barret vs SAP2000 - VGI.

Fuente: Elaboración propia.

3.4.3.7. Refuerzo suministrado a viga -VGI

Según planos de diseño las vigas internas presentan el mismo refuerzo de las vigas externas que se presentó en el capítulo 3.4.2.7

3.4.3.8. Momento y cortante resistente - VGI

Los momentos y cortantes resistentes se calcularon de acuerdo a la geometría de la viga, especificaciones de materiales y refuerzo suministrado. Empleando las ecuaciones que se presentan en los numerales 1.6.8 y 1.6.9 de este documento.

Los momentos resistentes en la viga, se calcularon en los corte 1-1, corte 2-2 y corte 3-3 que se indican en la Figura 48. A continuación se presentan los cálculos.

Resistencia nominal a flexión Mn corte 1-1 - VGI

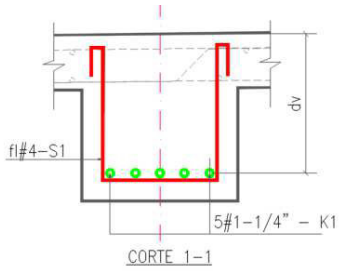
Lon-d= 0.86m = 2.8 ft Longitu de desarrollo barras

Materiales

f'c=	14	Mpa =	292.4	kips/ft^2	
fy=	420	Mpa =	8771.9	kips/ft^2	
fy=	287.45	Mpa =	6003.4	kips/ft^2	Afectado
Es=	2E+07	Mpa =	417708685.5	kips/ft^2	

Geometría viga

bfs=	2.41m	= 7.9 ft
bv=	0.52m	= 1.7 ft
H=	0.71m	= 2.3 ft
dv=	0.62m	= 2.0 ft
Rec =	0.07m	= 0.2 ft



Cuantía de refuerzo suministrado

Ref-prin=	1-1/4"		Diámetro de refuerzo para flexión
Ash=	40cm2	= 6.15 ft^2	Área total de refuerzo para flexión
ρ =	0.00317		Cuantía de refuerzo a flexión

Resistencia nominal a flexión

c =	As*fy / .85*f'c*b*β1	5.7.3.1.2-4 AASTHO	β1=	0.85	Para concretos menores a 28MPa 5.7.2.2
c =	0.05m	= 0.2 ft	Profundidad del bloque de compresiones		
a=	ρ*d*fy / .85 * f'c				
a=	0.05m	= 0.2 ft			
Mn=	ϕ*As*fy*(d-a/2)	5.7.3.2 AASTHO - Resistencia a flexión	ϕ =	0.9	5.5.4.2 AASTHO
Mn=	612 kN-m	= 451.7 kips-ft			

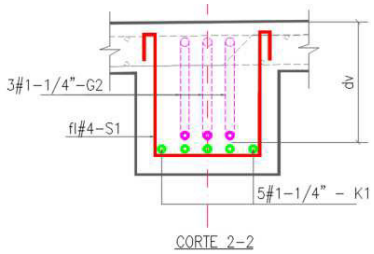
Resistencia nominal a flexión Mn corte 2-2 VGI

Materiales

f'c=	14	Mpa =	292.6	kips/ft²
fy=	420	Mpa =	60.9	kips/ft²
Es=	2E+07	Mpa =	367.543	kips/ft²

Geometría viga

bfs=	2.41m	= 7.9 ft
bv=	0.52m	= 1.7 ft
H=	0.71m	= 2.3 ft
dv=	0.57m	= 1.9 ft
Rec =	0.07m	= 0.2 ft



Cuantía de refuerzo suministrado

Ref-prin=	1-1/4"		Diámetro de refuerzo para flexión
Ash=	64cm2	= 9.85 ft²	Área total de refuerzo para flexión
ρ =	0.00507		Cuantía de refuerzo a flexión

Resistencia nominal a flexión

c =	As*fy / .85*f'c*b*β1	5.7.3.1.2-4 AASTHO	β1=	0.85	Para concretos menores a 28MPa 5.7.2.2
c =	0.11m = 0.4 ft	Profundidad del bloque de compresiones			
a=	ρ*d*fy / .85 * f'c				
a=	0.10m = 0.3 ft				
Mn=	ϕ*As*fy*(d-a/2)	5.7.3.2 AASTHO - Resistencia a flexión	ϕ =	0.9	5.5.4.2 AASTHO
Mn=	1246 kN-m =	919.685 kips-ft			

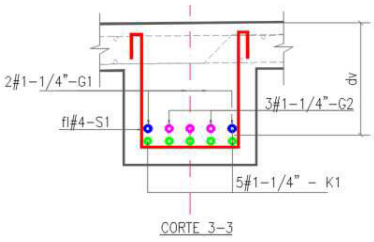
Resistencia nominal a flexión Mn corte 3-3 VGI

Materiales

f'c=	14	Mpa =	292.6	kips/ft²
fy=	420	Mpa =	60.9	kips/ft²
Es=	2E+07	Mpa =	367.543	kips/ft²

Geometría viga

bfs=	2.41m	= 7.9 ft
bv=	0.52m	= 1.7 ft
H=	0.71m	= 2.3 ft
dv=	0.57m	= 1.9 ft
Rec =	0.07m	= 0.2 ft



Cuantía de refuerzo suministrado

Ref-prin=	1-1/4"		Diámetro de refuerzo para flexión
Ash=	79cm2	= 12.31 ft²	Área total de refuerzo para flexión
ρ =	0.00634		Cuantía de refuerzo a flexión

Resistencia nominal a flexión

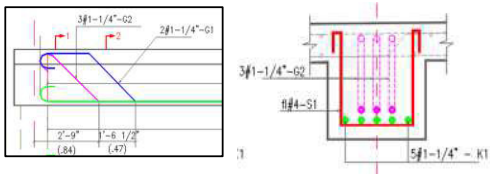
c =	As*fy / .85*f'c*b*β1	5.7.3.1.2-4 AASTHO	β1=	0.85	Para concretos menores a 28MPa 5.7.2.2
c =	0.14m = 0.4 ft	Profundidad del bloque de compresiones			
a=	ρ*d*fy / .85 * f'c				
a=	0.13m = 0.4 ft				
Mn=	ϕ*As*fy*(d-a/2)	5.7.3.2 AASTHO - Resistencia a flexión	ϕ =	0.9	5.5.4.2 AASTHO
Mn=	1519 kN-m =	1121.37 kips-ft			

Según la norma la resistencia a cortante de la sección se debe calcular con el momento y cortante actuante en el punto en estudio, por tal razón a continuación se presenta los cálculos para los punto 1, 2 y 3, el cálculo en los demás puntos se presentan en se presentan en el Anexo 2.

Capacidad a cortante Vn puntos 1 y 2 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2" + 1-1/4"			Diámetro de estribos +Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos
Asv=	23.7 cm2	= 0.026	ft^2	Área de acero inclinado
α =	37.3°			Angulo de inclinación del acero

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1AASTHO

Av=	0.73 cm2	= 0.001	ft^2	Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	422 kN	= 94.79	kips	Cortante actuante en punto de estudio
Mu=	0 kN-m	= 0.00	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

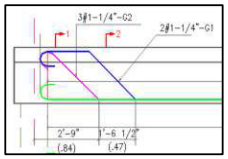
$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

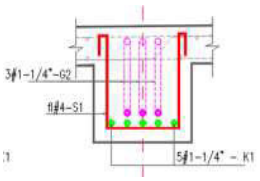
εs =	0.0005			
θ (29+3500εs) =	30.9°			
β =	3.4°			
Vc=	327 KN	= 73.71	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vs2=	740 KN	= 166.73	kips	Resistencia refuerzo inclinado
Vn2=	1398 KN	= 315.09	kips	Resistencia a cortante 2
Vnd =	1074 KN	= 241.98	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 3 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	





Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2" + 1-1/4"			Diámetro de estribos +Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos
Asv=	15.8 cm2	= 0.017	ft^2	Área de acero inclinado
α =	37.3°			Angulo de inclinación del acero

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1AASTHO

Av=	0.73 cm2	= 0.001	ft^2	Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	372 kN	= 83.57	kips	Cortante actuante en punto de estudio
Mu=	235 kN-m	= 173.07	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0010

θ (29+3500εs) = 32.4°

β = 2.8°

Vc=	265 KN	= 59.69	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vs2=	493 KN	= 111.15	kips	Resistencia refuerzo inclinado
Vn2=	1089 KN	= 245.50	kips	Resistencia a cortante 2
Vnd =	1074 KN	= 241.98	kips	Mínimo entre Vn1 y Vn2

3.4.3.9. Índices de sobre esfuerzo para momentos y cortantes viga – VGI

La viga interna presenta la misma altura que la viga exterior, por lo tanto esta no cumple con las recomendaciones mínimas de altura de la norma.

Los índices de sobre esfuerzo de la viga interna se presentan de la misma forma que la viga externa; en tablas y representación gráfica.

Tabla 32 Índices de sobre esfuerzo por corte combinación servicio 1-1 VGI

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-1 V							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	421.64	95.02	1074.00	242.03	39%
2	0.59	1.94	371.75	83.77	1074.00	242.03	35%
3	1.18	3.88	337.83	76.13	1074.00	242.03	31%
4	1.77	5.82	303.92	68.49	533.00	120.11	57%
5	2.37	7.76	270.00	60.84	516.00	116.28	52%
6	2.96	9.70	237.04	53.42	505.00	113.80	47%
7	3.55	11.64	204.91	46.18	498.00	112.22	41%
8	4.14	13.58	172.77	38.93	494.00	111.32	35%
9	4.73	15.52	140.64	31.69	491.00	110.65	29%
10	5.32	17.47	108.51	24.45	491.00	110.65	22%
11	5.92	19.41	76.37	17.21	491.00	110.65	16%
12	6.51	21.35	44.24	9.97	491.00	110.65	9%
13	7.10	23.29	-154.82	-34.89	491.00	110.65	32%
14	7.69	25.23	-186.96	-42.13	494.00	111.32	38%
15	8.28	27.17	-219.09	-49.37	498.00	112.22	44%
16	8.87	29.11	-252.04	-56.80	505.00	113.80	50%
17	9.46	31.05	-285.96	-64.44	516.00	116.28	55%
18	10.06	32.99	-319.87	-72.08	533.00	120.11	60%
19	10.65	34.93	-353.79	-79.73	1074.00	242.03	33%
20	11.24	36.87	-387.70	-87.37	1074.00	242.03	36%
21	11.83	38.81	-421.64	-95.02	1074.00	242.03	39%

Fuente: Elaboración propia.

Tabla 33 Índices de sobre esfuerzo por corte combinación servicio 1-2 VGI

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-2 V							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	389.98	87.88	1074.00	242.03	36%
2	0.59	1.94	349.85	78.84	1074.00	242.03	33%
3	1.18	3.88	320.83	72.30	1074.00	242.03	30%
4	1.77	5.82	291.80	65.76	533.00	120.11	55%
5	2.37	7.76	262.78	59.22	516.00	116.28	51%
6	2.96	9.70	233.75	52.68	505.00	113.80	46%
7	3.55	11.64	204.73	46.14	498.00	112.22	41%
8	4.14	13.58	175.71	39.60	494.00	111.32	36%
9	4.73	15.52	146.68	33.05	491.00	110.65	30%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-2 V							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
10	5.32	17.47	117.66	26.51	491.00	110.65	24%
11	5.92	19.41	88.63	19.97	491.00	110.65	18%
12	6.51	21.35	59.61	13.43	491.00	110.65	12%
13	7.10	23.29	-157.76	-35.55	491.00	110.65	32%
14	7.69	25.23	-186.79	-42.09	494.00	111.32	38%
15	8.28	27.17	-215.81	-48.63	498.00	112.22	43%
16	8.87	29.11	-244.84	-55.17	505.00	113.80	48%
17	9.46	31.05	-273.86	-61.71	516.00	116.28	53%
18	10.06	32.99	-302.89	-68.26	533.00	120.11	57%
19	10.65	34.93	-331.91	-74.80	1074.00	242.03	31%
20	11.24	36.87	-360.94	-81.34	1074.00	242.03	34%
21	11.83	38.81	-389.98	87.88	1074.00	242.03	36%

Fuente: Elaboración propia.

Tabla 34 Índices de sobre esfuerzo por momento combinación servicio 1-1 VGI

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-1 M							
PUNTO	DIST (0)		MOMENTO - SAP200		ϕ Mn		ÍNDICE
	m	ft	KN -m	kip-ft	KN-m	kip-ft	%
1	0.00	0.0	0.00	0.00	878.00	647.96	0%
2	0.59	1.9	234.51	173.07	878.00	647.96	27%
3	1.18	3.9	439.63	324.45	1246.00	919.55	35%
4	1.77	5.8	615.23	454.04	1519.00	1121.02	41%
5	2.37	7.8	761.29	561.83	1519.00	1121.02	50%
6	2.96	9.7	877.82	647.83	1519.00	1121.02	58%
7	3.55	11.6	968.21	714.54	1519.00	1121.02	64%
8	4.14	13.6	1033.62	762.81	1519.00	1121.02	68%
9	4.73	15.5	1080.81	797.64	1519.00	1121.02	71%
10	5.32	17.5	1102.28	813.48	1519.00	1121.02	73%
11	5.92	19.4	1102.30	813.50	1519.00	1121.02	73%
12	6.51	21.3	1102.28	813.48	1519.00	1121.02	73%
13	7.10	23.3	1080.77	797.61	1519.00	1121.02	71%
14	7.69	25.2	1033.56	762.76	1519.00	1121.02	68%
15	8.28	27.2	968.19	714.52	1519.00	1121.02	64%
16	8.87	29.1	877.80	647.82	1519.00	1121.02	58%
17	9.46	31.0	761.30	561.84	1519.00	1121.02	50%
18	10.06	33.0	615.27	454.07	1519.00	1121.02	41%
19	10.65	34.9	439.71	324.51	1246.00	919.55	35%
20	11.24	36.9	234.62	173.15	878.00	647.96	27%
21	11.83	38.8	0.00	0.00	878.00	647.96	0%

Fuente: Elaboración propia.

Tabla 35 Índices de sobre esfuerzo por momento combinación servicio 1-2 VGI

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-2 M							
PUNTO	DIST (0)		MOMENTO - SAP200		ϕ Mn		ÍNDICE
	m	ft	KN -m	kip-ft	KN-m	kip-ft	%
1	0.00	0.0	0.00	0.00	878.00	647.96	0%
2	0.59	1.9	218.70	161.40	878.00	647.96	25%
3	1.18	3.9	413.77	305.36	1246.00	919.55	33%
4	1.77	5.8	585.09	431.80	1519.00	1121.02	39%
5	2.37	7.8	732.66	540.70	1519.00	1121.02	48%
6	2.96	9.7	856.49	632.09	1519.00	1121.02	56%
7	3.55	11.6	956.57	705.95	1519.00	1121.02	63%
8	4.14	13.6	1032.91	762.29	1519.00	1121.02	68%
9	4.73	15.5	1085.50	801.10	1519.00	1121.02	71%
10	5.32	17.5	1114.26	822.32	1519.00	1121.02	73%
11	5.92	19.4	1119.46	826.16	1519.00	1121.02	74%
12	6.51	21.3	1114.26	822.32	1519.00	1121.02	73%
13	7.10	23.3	1085.43	801.05	1519.00	1121.02	71%
14	7.69	25.2	1032.86	762.25	1519.00	1121.02	68%
15	8.28	27.2	956.55	705.93	1519.00	1121.02	63%
16	8.87	29.1	856.49	632.09	1519.00	1121.02	56%
17	9.46	31.0	732.68	540.72	1519.00	1121.02	48%
18	10.06	33.0	585.13	431.83	1519.00	1121.02	39%
19	10.65	34.9	413.13	304.89	1246.00	919.55	33%
20	11.24	36.9	218.79	161.47	878.00	647.96	25%
21	11.83	38.8	0.00	0.00	878.00	647.96	0%

Fuente: Elaboración propia.

Tabla 36 Índices de sobre esfuerzo por corte combinación resistencia 1-1 VGI

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-1 V							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	725.53	163.50	1074.00	242.03	68%
2	0.59	1.94	638.05	143.78	1035.00	233.24	62%
3	1.18	3.88	581.42	131.02	1035.00	233.24	56%
4	1.77	5.82	524.80	118.26	533.00	120.11	98%
5	2.37	7.76	468.18	105.50	516.00	116.28	91%
6	2.96	9.70	413.40	93.16	462.00	104.11	89%
7	3.55	11.64	360.22	81.18	456.00	102.76	79%
8	4.14	13.58	307.03	69.19	452.00	101.86	68%
9	4.73	15.52	253.84	57.20	450.00	101.41	56%
10	5.32	17.47	200.66	45.22	450.00	101.41	45%
11	5.92	19.41	147.47	33.23	450.00	101.41	33%
12	6.51	21.35	94.29	21.25	450.00	101.41	21%
13	7.10	23.29	-281.28	-63.39	450.00	101.41	63%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-1 V							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
14	7.69	25.23	-334.42	-75.36	452.00	101.86	74%
15	8.28	27.17	-387.60	-87.35	456.00	102.76	85%
16	8.87	29.11	-442.37	-99.69	462.00	104.11	96%
17	9.46	31.05	-498.99	-112.45	516.00	116.28	97%
18	10.06	32.99	-555.61	-125.21	533.00	120.11	104%
19	10.65	34.93	-612.24	-137.97	1035.00	233.24	59%
20	11.24	36.87	-668.86	-150.73	1035.00	233.24	65%
21	11.83	38.81	-725.53	-163.50	1074.00	242.03	68%

Fuente: Elaboración propia.

Tabla 37 Índices de sobre esfuerzo por corte combinación resistencia 1-2 VGI

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-2 V							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN-m	kip	KN	kip	%
1	0.00	0.00	664.39	149.72	1074.00	242.03	62%
2	0.59	1.94	595.77	134.26	1035.00	233.24	58%
3	1.18	3.88	548.59	123.62	1035.00	233.24	53%
4	1.77	5.82	501.41	112.99	533.00	120.11	94%
5	2.37	7.76	454.23	102.36	513.00	115.60	89%
6	2.96	9.70	407.05	91.73	462.00	104.11	88%
7	3.55	11.64	359.87	81.10	456.00	102.76	79%
8	4.14	13.58	312.69	70.46	452.00	101.86	69%
9	4.73	15.52	265.51	59.83	450.00	101.41	59%
10	5.32	17.47	218.33	49.20	450.00	101.41	49%
11	5.92	19.41	171.15	38.57	450.00	101.41	38%
12	6.51	21.35	123.97	27.94	450.00	101.41	28%
13	7.10	23.29	-286.91	-64.66	450.00	101.41	64%
14	7.69	25.23	-334.09	-75.29	452.00	101.86	74%
15	8.28	27.17	-381.27	-85.92	456.00	102.76	84%
16	8.87	29.11	-428.45	-96.55	462.00	104.11	93%
17	9.46	31.05	-475.63	-107.18	513.00	115.60	93%
18	10.06	32.99	-522.81	-117.82	533.00	120.11	98%
19	10.65	34.93	-569.99	-128.45	1035.00	233.24	55%
20	11.24	36.87	-617.17	-139.08	1035.00	233.24	60%
21	11.83	38.81	-664.39	-149.72	1074.00	242.03	62%

Fuente: Elaboración propia.

Tabla 38 Índices de sobre esfuerzo por momento combinación resistencia 1-1 VGI

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-1 M							
PUNTO	DIST (0)		MOMENTO - SAP200		ϕ Mn		ÍNDICE
	m	ft	KN -m	kip-ft	KN-m	kip-ft	%
1	0.00	0.0	0.00	0.00	878.00	647.96	0%
2	0.59	1.9	353.21	260.67	878.00	647.96	40%
3	1.18	3.9	661.91	488.49	1246.00	919.55	53%
4	1.77	5.8	925.87	683.29	1519.00	1121.02	61%
5	2.37	7.8	1145.10	845.08	1519.00	1121.02	75%
6	2.96	9.7	1319.60	973.86	1519.00	1121.02	87%
7	3.55	11.6	1454.66	1073.54	1519.00	1121.02	96%
8	4.14	13.6	1552.06	1145.42	1519.00	1121.02	102%
9	4.73	15.5	1622.37	1197.31	1519.00	1121.02	107%
10	5.32	17.5	1653.78	1220.49	1519.00	1121.02	109%
11	5.92	19.4	1653.80	1220.50	1519.00	1121.02	109%
12	6.51	21.3	1653.78	1220.49	1519.00	1121.02	109%
13	7.10	23.3	1622.80	1197.63	1519.00	1121.02	107%
14	7.69	25.2	1551.97	1145.35	1519.00	1121.02	102%
15	8.28	27.2	1451.61	1071.29	1519.00	1121.02	96%
16	8.87	29.1	1319.57	973.84	1519.00	1121.02	87%
17	9.46	31.0	1145.12	845.10	1519.00	1121.02	75%
18	10.06	33.0	925.94	683.34	1519.00	1121.02	61%
19	10.65	34.9	662.03	488.58	1246.00	919.55	53%
20	11.24	36.9	353.38	260.79	878.00	647.96	40%
21	11.83	38.8	0.00	0.00	878.00	647.96	0%

Fuente: Elaboración propia.

Tabla 39 Índices de sobre esfuerzo por momento combinación resistencia 1-2 VGI

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-2 M							
PUNTO	DIST (0)		MOMENTO - SAP200		ϕ Mn		ÍNDICE
	m	ft	KN -m	kip-ft	KN-m	kip-ft	%
1	0.00	0.0	0.00	0.00	878.00	647.96	0%
2	0.59	1.9	328.56	242.48	878.00	647.96	37%
3	1.18	3.9	621.58	458.73	1246.00	919.55	50%
4	1.77	5.8	878.88	648.61	1519.00	1121.02	58%
5	2.37	7.8	1100.47	812.15	1519.00	1121.02	72%
6	2.96	9.7	1286.35	949.33	1519.00	1121.02	85%
7	3.55	11.6	1436.51	1060.14	1519.00	1121.02	95%
8	4.14	13.6	1550.95	1144.60	1519.00	1121.02	102%
9	4.73	15.5	1629.68	1202.70	1519.00	1121.02	107%
10	5.32	17.5	1672.70	1234.45	1519.00	1121.02	110%
11	5.92	19.4	1672.80	1234.53	1519.00	1121.02	110%
12	6.51	21.3	1672.56	1234.35	1519.00	1121.02	110%
13	7.10	23.3	1629.58	1202.63	1519.00	1121.02	107%

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-2 M							
PUNTO	DIST (0)		MOMENTO - SAP200		ϕ Mn		ÍNDICE
	m	ft	KN -m	kip-ft	KN-m	kip-ft	%
14	7.69	25.2	1550.88	1144.55	1519.00	1121.02	102%
15	8.28	27.2	1436.47	1060.11	1519.00	1121.02	95%
16	8.87	29.1	1286.35	949.33	1519.00	1121.02	85%
17	9.46	31.0	1100.51	812.18	1519.00	1121.02	72%
18	10.06	33.0	878.95	648.67	1519.00	1121.02	58%
19	10.65	34.9	621.68	458.80	1246.00	919.55	50%
20	11.24	36.9	328.70	242.58	878.00	647.96	37%
21	11.83	38.8	0.00	0.00	878.00	647.96	0%

Fuente: Elaboración propia.

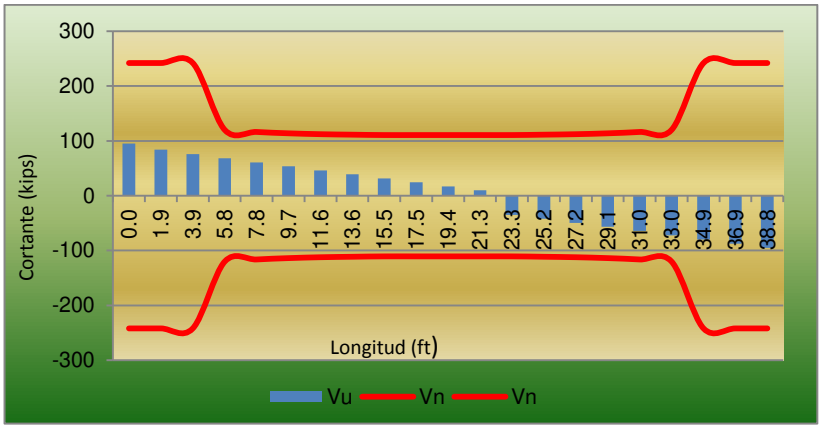


Figura 63 Representacion gráfica índices por corte combinacion servicio 1-1 – VGI

Fuente: Elaboración propia.

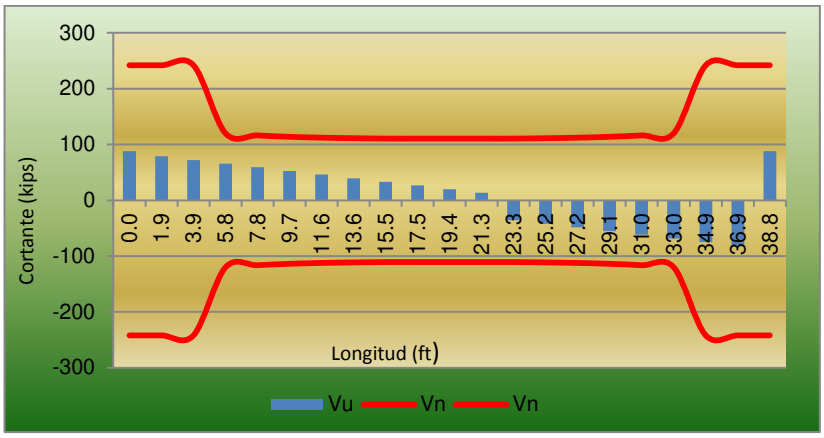


Figura 64 Representacion gráfica índices por corte combinacion servicio 1-2 – VGI

Fuente: Elaboración propia.

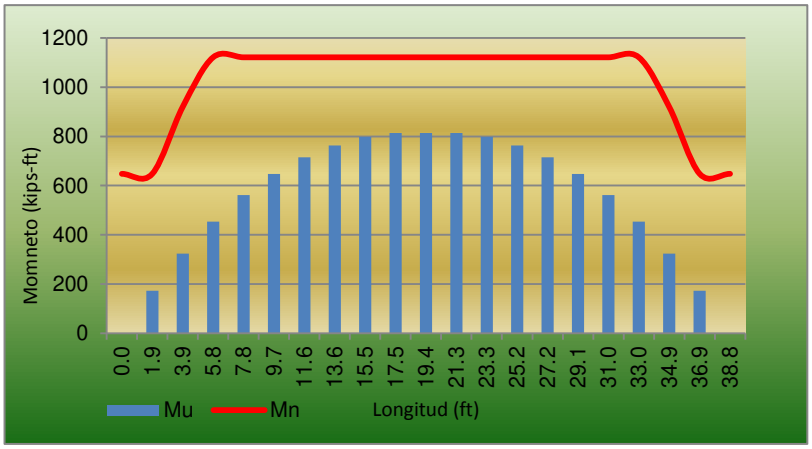


Figura 65 Representacion gráfica índices por momento combinacion servicio 1-1 – VGI

Fuente: Elaboración propia.

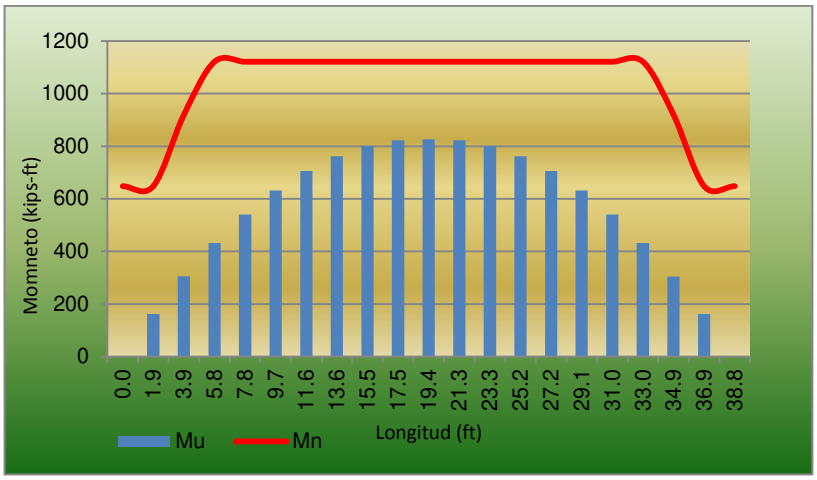


Figura 66 Representacion gráfica índices por momento combinacion servicio 1-2 – VGI

Fuente: Elaboración propia.

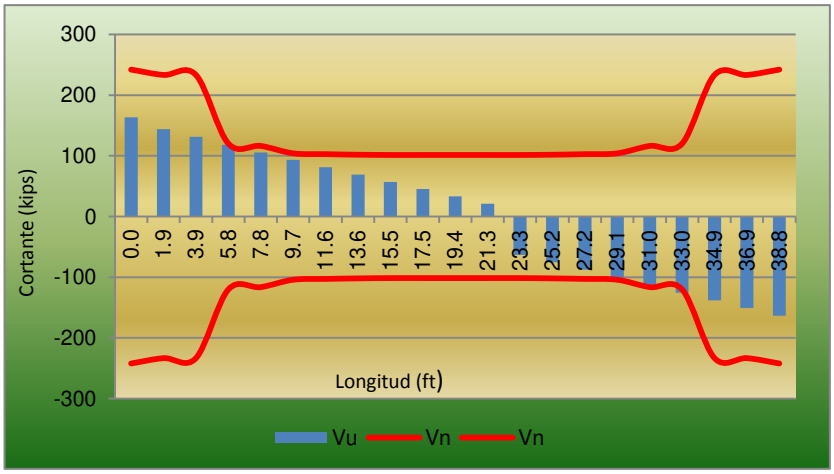


Figura 67 Representacion gráfica índices por corte combinacion resietncia 1-1– VGI

Fuente: Elaboración propia.

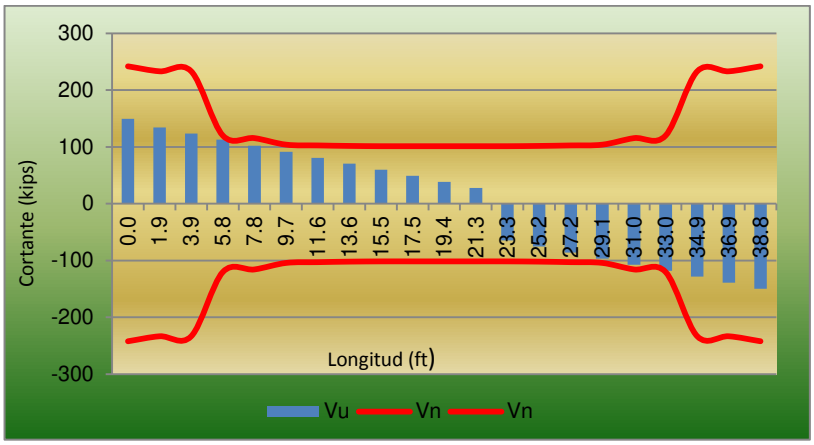


Figura 68 Representacion gráfica índices por corte combinacion resietncia 1-2– VGI

Fuente: Elaboración propia.

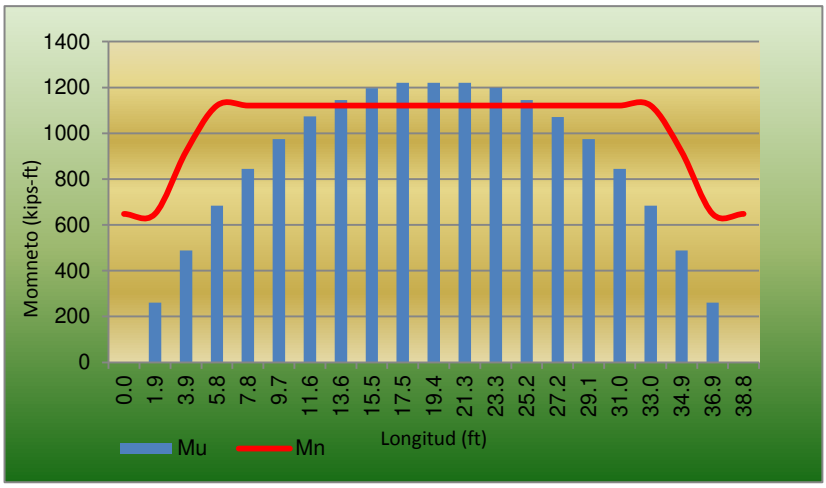


Figura 69 Representacion grafica índices por momento combinacion resietncia 1-1– VGI

Fuente: Elaboración propia.

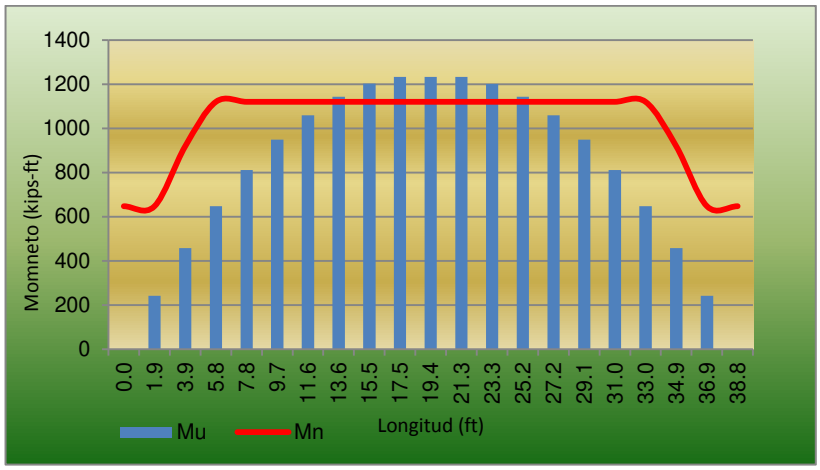


Figura 70 Representacion grafica indices por momento combinacion resietncia 1-2– VGI

Fuente: Elaboración propia.

3.4.3.10. Chequeo de deformaciones – VGI

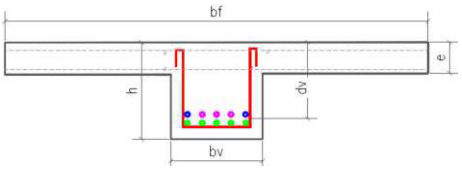
El chequeo de deformaciones se realizó con el momento de inercia efectivo del elemento, tal como se recomienda en la norma. A continuación se presentan los cálculos.

Materiales

f'c=	14	Mpa =	292.6	kips/ft²
fy=	420	Mpa =	60.9	kips/ft²
Es=	200000	Mpa =	367.543	kips/ft²

Geometría viga

bfs=	2.41 m	= 7.9 ft
e=	0.18 m	= 0.6 ft
bv=	0.52 m	= 1.7 ft
h=	0.71 m	= 2.3 ft
dv=	0.57 m	= 1.9 ft
Rec =	0.08 m	= 0.2 ft



Propiedades

Barras = 10			
# =	10		
As =	0.008 m2	= 0.09 ft 2	Área de refuerzo suministrado en punto de estudio
n=	11.14		Relación modular
n*As =	0.091	= 0.98 ft 2	
X=	0.18 m	= 0.6 ft	Distancia del eje centroidal

Momento de inercia efectivo

$$I_e = \left(\frac{M_{cr}}{M_a}\right)^3 I_g + \left[1 - \left(\frac{M_{cr}}{M_a}\right)^3\right] I_{cr} \leq I_g$$

Ig=	0.026 m4	= 3.0 ft 4	
yt =	0.45 m4	= 52.5 ft 4	Distancia dese el eje neutro a la fibra extrema a tracción
fr =	2320 kN/m2		Modulo de rotura del concreto
Mcr =	132 kN-m	= 97 kips-ft	Momento de fisuracion
Ma=	577 kN-m	= 426 kips-ft	Momento en el concreto para la cual se calcula la deformación
Icr=	0.019 m4	= 2.2 ft 4	Momento de inercia de la sección transformada
Ie =	0.0186 m4	= 2.2 ft 4	Momento de inercia efectivo

Tabla 40 Revisión deflexiones viga VGI

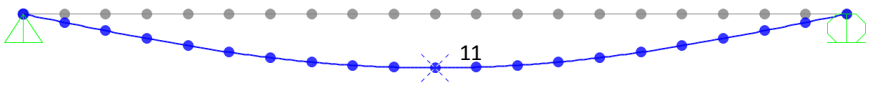


TABLE: Joint Displacements								
Joint	OutputCase	CaseType	StepType	U3		Δmax = L/800		Cumple
Text	Text	Text	Text	mm	In	mm	In	
11	HL93	LinMoving	Min	-24.9	-1.0	14.8	0.6	No cumple
11	DFL1	Combination	Max	-7.3	-0.3	14.8	0.6	Cumple
11	DFL1	Combination	Min	-13.6	-0.5	14.8	0.6	Cumple
11	DFL2	Combination	Max	-7.3	-0.3	14.8	0.6	Cumple
11	DFL2	Combination	Min	-13.2	-0.5	14.8	0.6	Cumple
11	DFL3	Combination		-16.5	-0.6	14.8	0.6	No cumple

Fuente: Elaboración propia.

3.5. Análisis puente No 2

Dada la tipología del puente "tipo losa" con refuerzo principal paralelo al tráfico, la norma recomienda en el capítulo 4.6.2.1 analizar el puente por el método de las franjas, por tal razón y por la simetría del puente respecto a su eje longitudinal se determinaron y analizaran dos franjas; externa e interna respectivamente, para cargas verticales únicamente, esto por no contar con información de geotecnia y parámetros sísmicos. Las franjas se analizaran siguiendo la secuencia que se presenta a continuación:

1. Definición ancho de franja
2. Evaluación de cargas
3. Calculo de solicitaciones manualmente (líneas de influencia)
4. Calculo de solicitaciones con ayuda del SAP2000
5. Comparación de solicitaciones calculadas manualmente Vs SAP2000
6. Calculo de los índices de sobre esfuerzo por momento y cortante en la superestructura
7. Chequeo de deformaciones

3.5.1 Materiales Puente No 2

De acuerdo con la información suministrada la superestructura del puente fue diseña con concreto clase "F" y acero de refuerzo PDR 60, a continuación se presentan las propiedades de estos materiales con que se analizara el puente.

- Concreto estructural clase "F":
  - Resistencia mínima a la compresión, f'c = 14,0 MPa
    = 2030 PSI
  - Módulo de Elasticidad, Ec = 17.585,8 MPa
    = 2550487PSI
- Acero de refuerzo:
  - Esfuerzo de fluencia, fy = 420 MPa

		=	60 ksi
▪ Módulo de Elasticidad,	Es	=	200.000 MPa
		=	29000 ksi.

3.5.2 Análisis franja externa - FEX

La longitud de la franja externa se determinó de acuerdo a las recomendaciones dadas en la norma, para puentes con luces mayores a 4,50 m. A continuación se presentan los cálculos:

Calculo ancho de franja externa - FEX
De acuerdo con el al articulo 4.6.2.1.4 b se debe tomar el ancho de franja equivalente el menor valor entre :
1. E_{int} = Ancho de granja para un carril cargado
2. E_{borde} = Ancho de borde
3. E_{max} = Ancho máximo
1. Eint

$$E = 10.0 + 5.0\sqrt{L_1 W_1}$$

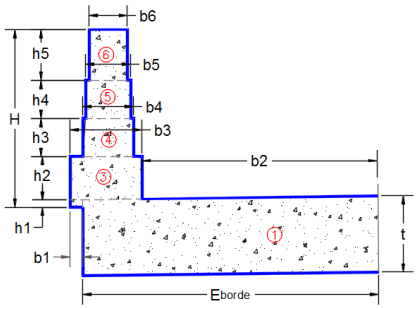
W1=	9.0m	= 29.5 ft
L1=	18.0m	= 59.1ft
E=	5.6m	= 18.4 ft
2. Eborde=	2.1m	= 6.9 ft
3. Emax =	1.8m	= 5.9 ft
Ancho de franja externa	**1.8m**	= 5.9 ft

3.5.2.1. Cargas muertas “DC” y “DW”

Acorde con la sección 3.3.2 de la norma AASTHO 2012, el patrón de carga denominado DC corresponde al peso propio de los componentes estructurales y accesorios no estructurales, sin embargo la carpeta de rodadura que se indica en los planos pero que no se observa en las imágenes tomadas con ayuda del Google Earth, es considerada como un accesorio no estructural, debido a que hace parte integral e indispensable para el funcionamiento del puente, pero la cual puede ser removida sin afectar el funcionamiento del puente, pero puede ser altamente susceptible de cambios en el tiempo, por tal razón se clasifica dentro del grupo de cargas DW.

En la siguientes tablas se presenta el avaluó de cargas muertas para la viga franja externa - FEX

Evaluacion de carga muerta "DC"



b1=	0.08m	= 0.3 ft		h3=	0.23m	= 0.8 ft
b2=	1.45m	= 4.8 ft		h4 =	0.23m	= 0.8 ft
b3=	0.43m	= 1.4 ft		h5 =	0.30m	= 1.0 ft
b3'=	0.08m	= 0.3 ft		H=	1.06m	= 3.5 ft
b4=	0.30m	= 1.0 ft				
b5=	0.27m	= 0.9 ft				
b6=	0.23m	= 0.8 ft				
t=	0.46m	= 1.5 ft				
h1=	0.04m	= 0.1 ft				
h2=	0.26m	= 0.9 ft				
Eborde=	1.8	= 5.9 ft	Ancho de franja exterior			

Evaluación carga muerta

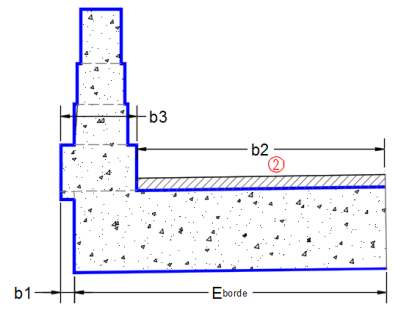
ϒ(Con) =	24	kN/m3	= 1.50 kip/ft3	Densidad del concreto

DC1 =	19.87	kN/m	1361.66	lb/ft
DC3 =	2.68	kN/m	183.86	lb/ft
DC3A =	0.08	kN/m	5.26	lb/ft
DC4 =	1.66	kN/m	113.47	lb/ft
DC5 =	1.49	kN/m	102.12	lb/ft
DC6 =	1.66	kN/m	113.47	lb/ft
DC =	27.43	kN/m	1879.85	lb/ft
DC=	15.24	kN/m/m	318.32	lb/ft/ft

Tabla 41 Evaluación carga muerta franja exterior - FEX.

Fuente: Elaboración propia.

Evaluacion carga por carpeta de rodadura "DW"



b1=	0.08m	= 0.3 ft				
b3=	0.43m	= 1.4 ft				
b3'=	0.35m	= 1.1 ft				
e=	0.07	= 0.2 ft	Espesor carpeta asfáltica			
Eext=	1.8	= 5.9 ft	Ancho de franja exterior			

Evaluación carga muerta

ϒ(Asf) =	22.5	kN/m3	= 1.40 kip/ft3	Densidad carpeta asfáltica
DW=	1.27	kN/m/m	86.94 lb/ft/ft	Carpeta Asfáltica

Tabla 42 Evaluación carga por carpeta de rodadura franja exterior - FEX.

Fuente: Elaboración propia.

3.5.2.2. Cargas vivas “L”

El puente se analizó con las cargas generadas por el camión de diseño HL-93, el tándem de diseño y la línea de carga, tal como se indica en el numeral 1.6.5.2 de este documento.

3.5.2.3. Cálculo de momentos y cortantes por líneas de influencia - FEX

Para facilitar el análisis y posterior evaluación de los índices de sobre esfuerzo en las franjas, estas fueron divididas en toda su longitud en cincuenta (50) espacios iguales, obteniendo así cincuenta y un puntos (51) donde se obtendrán las solicitaciones y deflexiones. En la siguiente figura se presenta la división de las franjas y los puntos para el análisis.

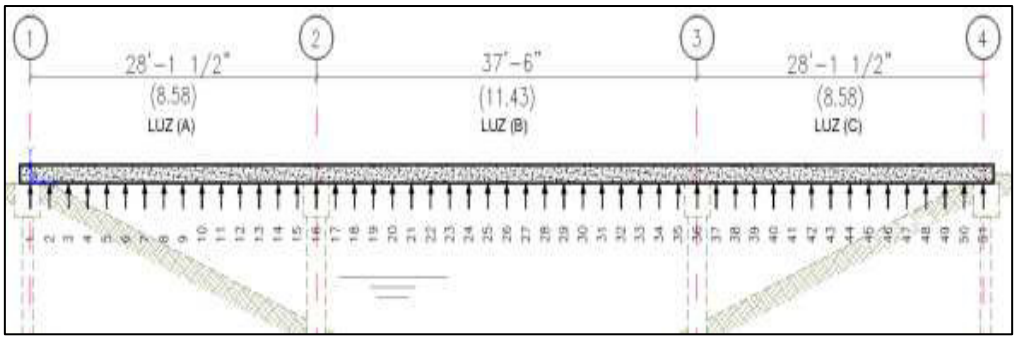


Figura 71 Puntos de análisis para franjas – Puente 2

Fuente: Elaboración propia.

Las solicitaciones en la franja externa se obtuvieron para cargas verticales con las combinaciones que se definieron en el capítulo 1.6.7 de este documento. En las siguientes tablas se presentan los cálculos obtenidos aplicando el método de las líneas de influencia.

Tabla 43 Cortantes y momentos por combinación servicio 1-1 – FEX

PUNTO	DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
1	0.00	0.00	154.87	34.90	0.00	0.00	0.00	0.00
2	0.57	1.88	131.81	29.70	-3.91	-2.88	83.66	61.74
3	1.14	3.75	109.18	24.60	-7.81	-5.77	149.29	110.18
4	1.72	5.63	87.04	19.61	-11.72	-8.65	196.22	144.81
5	2.29	7.51	65.44	14.75	-15.63	-11.53	225.30	166.27
6	2.86	9.38	46.17	10.41	-19.53	-14.42	237.52	175.29
7	3.43	11.26	48.28	10.88	-23.44	-17.30	233.98	172.68
8	4.00	13.14	65.62	14.79	-27.35	-20.18	215.90	159.33
9	4.58	15.01	82.54	18.60	-31.26	-23.07	200.49	147.96
10	5.15	16.89	99.04	22.32	-35.16	-25.95	173.79	128.26
11	5.72	18.77	119.57	26.94	-39.07	-28.83	132.65	97.89
12	6.29	20.64	142.19	32.04	-50.89	-37.56	83.84	61.88
13	6.86	22.52	164.33	37.03	-109.67	-80.93	54.80	40.44
14	7.44	24.40	185.94	41.90	-180.49	-133.20	21.76	16.06
15	8.01	26.27	206.95	46.64	-256.74	-189.48	21.27	15.69
16	8.58	28.15	234.94	52.94	-327.05	-241.36	22.79	16.82
17	9.15	30.02	215.04	48.46	-226.13	-166.89	17.66	13.03
18	9.72	31.90	194.84	43.91	-155.62	-114.85	28.10	20.74
19	10.29	33.77	174.46	39.31	-92.03	-67.92	51.33	37.88
20	10.87	35.65	153.97	34.70	-40.40	-29.82	85.36	63.00
21	11.44	37.52	133.47	30.08	-36.91	-27.24	151.26	111.63
22	12.01	39.40	113.05	25.48	-33.41	-24.66	203.73	150.35
23	12.58	41.27	92.78	20.91	-29.91	-22.08	242.59	179.03
24	13.15	43.15	75.16	16.94	-26.42	-19.50	267.86	197.68
25	13.72	45.02	58.13	13.10	-22.92	-16.92	279.73	206.44
26	14.3	46.90	40.91	9.22	-19.59	-14.46	283.27	209.05
27	14.87	48.77	56.43	12.72	-23.11	-17.06	280.66	207.13
28	15.44	50.65	76.82	17.31	-26.64	-19.66	264.60	195.27
29	16.01	52.52	97.31	21.93	-30.16	-22.26	235.06	173.48
30	16.58	54.40	117.81	26.55	-33.69	-24.86	192.22	141.86
31	17.15	56.27	138.23	31.15	-37.21	-27.46	136.40	100.66
32	17.72	58.15	158.50	35.72	-40.74	-30.06	68.74	50.73
33	18.3	60.02	178.54	40.23	-99.04	-73.09	39.88	29.43
34	18.87	61.90	198.27	44.68	-156.99	-115.86	24.11	17.79
35	19.44	63.77	217.60	49.04	-226.68	-167.29	13.58	10.02
36	20.01	65.65	221.66	49.95	-335.81	-247.83	17.52	12.93

PUNTO	DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
37	20.58	67.53	201.08	45.31	-252.99	-186.71	16.35	12.06
38	21.15	69.40	179.95	40.55	-171.15	-126.31	39.55	29.19
39	21.73	71.28	158.34	35.68	-100.71	-74.33	72.21	53.29
40	22.3	73.16	136.30	30.71	-54.21	-40.01	98.11	72.40
41	22.87	75.03	117.79	26.54	-42.09	-31.06	145.74	107.56
42	23.44	76.91	100.04	22.54	-37.88	-27.95	184.91	136.47
43	24.01	78.79	81.86	18.45	-33.67	-24.85	206.80	152.62
44	24.59	80.66	64.72	14.59	-29.46	-21.74	220.62	162.82
45	25.16	82.54	47.16	10.63	-25.25	-18.64	236.13	174.26
46	25.73	84.42	50.30	11.33	-21.04	-15.53	236.59	174.61
47	26.3	86.29	71.42	16.09	-16.83	-12.42	220.94	163.05
48	26.87	88.17	93.03	20.97	-12.63	-9.32	190.83	140.83
49	27.45	90.05	115.08	25.93	-8.42	-6.21	145.51	107.39
50	28.02	91.92	137.49	30.98	-4.21	-3.11	82.11	60.60
51	28.59	93.80	160.22	36.11	0.00	0.00	0.00	0.00

Fuente: Elaboración propia.

Tabla 44 Cortantes y momentos por combinación servicio 1-2 – FEX

PUNTO	DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
1	0.00	0.00	158.85	35.80	0.00	0.00	0.00	0.00
2	0.57	1.88	137.76	31.04	-5.69	-4.20	84.28	62.20
3	1.14	3.75	116.80	26.32	-11.38	-8.40	154.48	114.01
4	1.72	5.63	96.02	21.64	-17.07	-12.60	207.71	153.29
5	2.29	7.51	75.48	17.01	-22.76	-16.79	244.31	180.30
6	2.86	9.38	55.20	12.44	-28.45	-20.99	264.72	195.36
7	3.43	11.26	57.75	13.01	-34.14	-25.19	269.50	198.89
8	4.00	13.14	77.86	17.55	-39.83	-29.39	259.74	191.68
9	4.58	15.01	97.39	21.95	-45.51	-33.59	241.33	178.10
10	5.15	16.89	116.33	26.21	-51.20	-37.79	208.31	153.73
11	5.72	18.77	134.68	30.35	-56.89	-41.99	161.50	119.18
12	6.29	20.64	152.44	34.35	-70.50	-52.03	109.72	80.97
13	6.86	22.52	169.60	38.22	-118.48	-87.44	80.48	59.39
14	7.44	24.40	186.17	41.95	-188.84	-139.36	47.45	35.02
15	8.01	26.27	202.15	45.55	-260.43	-192.20	22.26	16.43
16	8.58	28.15	224.26	50.54	-331.01	-244.28	23.85	17.60
17	9.15	30.02	207.43	46.74	-231.23	-170.65	18.54	13.68

PUNTO	DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
18	9.72	31.90	190.12	42.84	-167.05	-123.28	43.81	32.33
19	10.29	33.77	172.41	38.85	-109.79	-81.03	67.71	49.97
20	10.87	35.65	154.36	34.79	-55.92	-41.27	99.39	73.35
21	11.44	37.52	136.05	30.66	-51.08	-37.70	163.11	120.37
22	12.01	39.40	118.62	26.73	-46.24	-34.13	215.86	159.30
23	12.58	41.27	101.01	22.76	-41.40	-30.56	257.05	189.70
24	13.15	43.15	83.03	18.71	-36.56	-26.98	286.27	211.27
25	13.72	45.02	64.68	14.58	-31.73	-23.41	303.24	223.79
26	14.3	46.90	51.34	11.57	-26.89	-19.84	308.05	227.34
27	14.87	48.77	69.75	15.72	-31.67	-23.37	303.62	224.07
28	15.44	50.65	87.82	19.79	-36.50	-26.93	286.81	211.67
29	16.01	52.52	105.50	23.77	-41.33	-30.50	257.74	190.21
30	16.58	54.40	122.79	27.67	-46.16	-34.06	216.67	159.90
31	17.15	56.27	139.67	31.47	-50.99	-37.63	164.00	121.03
32	17.72	58.15	156.11	35.18	-55.82	-41.20	100.31	74.03
33	18.3	60.02	172.10	38.78	-109.68	-80.94	68.67	50.68
34	18.87	61.90	189.58	42.72	-166.93	-123.19	45.19	33.35
35	19.44	63.77	206.93	46.63	-231.10	-170.55	19.76	14.58
36	20.01	65.65	218.26	49.18	-330.89	-244.20	23.89	17.63
37	20.58	67.53	200.66	45.22	-260.33	-192.12	22.29	16.45
38	21.15	69.40	182.62	41.15	-189.01	-139.49	46.34	34.20
39	21.73	71.28	165.57	37.31	-118.52	-87.47	79.34	58.55
40	22.3	73.16	147.92	33.33	-70.53	-52.05	108.64	80.18
41	22.87	75.03	129.68	29.22	-56.92	-42.01	160.55	118.49
42	23.44	76.91	110.85	24.98	-51.23	-37.81	207.57	153.19
43	24.01	78.79	91.42	20.60	-45.54	-33.61	240.86	177.76
44	24.59	80.66	71.41	16.09	-39.85	-29.41	259.60	191.58
45	25.16	82.54	51.42	11.59	-34.15	-25.21	269.93	199.21
46	25.73	84.42	56.20	12.67	-28.46	-21.00	265.51	195.95
47	26.3	86.29	75.87	17.10	-22.77	-16.80	245.51	181.18
48	26.87	88.17	95.74	21.58	-17.08	-12.60	209.35	154.50
49	27.45	90.05	115.94	26.13	-11.38	-8.40	156.59	115.57
50	28.02	91.92	136.88	30.85	-5.69	-4.20	86.89	64.13
51	28.59	93.80	167.03	37.64	0.00	0.00	0.00	0.00

Fuente: Elaboración propia.

Tabla 45 Cortantes y momentos por combinación resistencia 1-1 – FEX

PUNTO	DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
1	0.00	0.00	298.20	67.20	0.00	0.00	0.00	0.00
2	0.57	1.88	256.06	57.70	-9.09	-6.71	162.41	119.86
3	1.14	3.75	214.94	48.44	-18.19	-13.42	289.46	213.62
4	1.72	5.63	174.94	39.42	-27.28	-20.13	379.56	280.12
5	2.29	7.51	136.20	30.69	-36.37	-26.84	434.74	320.84
6	2.86	9.38	102.90	23.19	-45.47	-33.55	457.28	337.47
7	3.43	11.26	105.40	23.75	-54.56	-40.27	449.72	331.90
8	4.00	13.14	134.23	30.25	-63.65	-46.98	414.92	306.21
9	4.58	15.01	162.07	36.52	-72.75	-53.69	392.93	289.98
10	5.15	16.89	188.93	42.58	-81.84	-60.40	351.27	259.24
11	5.72	18.77	225.18	50.75	-90.93	-67.11	282.60	208.56
12	6.29	20.64	266.31	60.01	-110.91	-81.85	195.14	144.02
13	6.86	22.52	306.30	69.03	-207.43	-153.08	127.55	94.13
14	7.44	24.40	345.05	77.76	-325.40	-240.14	50.64	37.37
15	8.01	26.27	382.42	86.18	-449.40	-331.65	49.50	36.53
16	8.58	28.15	431.55	97.25	-552.97	-408.09	53.03	39.14
17	9.15	30.02	396.76	89.41	-380.66	-280.93	41.10	30.33
18	9.72	31.90	361.29	81.42	-272.54	-201.14	65.40	48.27
19	10.29	33.77	325.36	73.32	-173.94	-128.37	119.46	88.16
20	10.87	35.65	289.21	65.17	-94.04	-69.40	196.12	144.74
21	11.44	37.52	253.02	57.02	-85.90	-63.39	313.27	231.19
22	12.01	39.40	217.01	48.90	-77.76	-57.39	405.75	299.44
23	12.58	41.27	181.36	40.87	-69.63	-51.38	473.15	349.18
24	13.15	43.15	151.89	34.23	-61.49	-45.38	515.49	380.43
25	13.72	45.02	123.77	27.89	-53.35	-39.37	533.25	393.54
26	14.3	46.90	95.21	21.45	-45.59	-33.64	538.18	397.18
27	14.87	48.77	119.82	27.00	-53.79	-39.70	535.40	395.12
28	15.44	50.65	155.75	35.10	-62.00	-45.75	507.90	374.83
29	16.01	52.52	191.90	43.25	-70.20	-51.81	455.63	336.25
30	16.58	54.40	228.09	51.40	-78.41	-57.86	378.97	279.68
31	17.15	56.27	264.10	59.51	-86.61	-63.92	278.69	205.67
32	17.72	58.15	299.75	67.55	-94.81	-69.97	157.44	116.19
33	18.3	60.02	334.86	75.46	-190.26	-140.41	92.81	68.50
34	18.87	61.90	369.25	83.21	-275.71	-203.48	56.11	41.41
35	19.44	63.77	402.73	90.76	-381.94	-281.87	31.62	23.33
36	20.01	65.65	405.11	91.29	-573.36	-423.14	40.77	30.09

PUNTO	DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
37	20.58	67.53	368.75	83.10	-440.67	-325.22	38.05	28.08
38	21.15	69.40	331.12	74.62	-303.65	-224.10	92.06	67.94
39	21.73	71.28	292.35	65.88	-186.60	-137.71	168.07	124.03
40	22.3	73.16	252.58	56.92	-118.63	-87.55	228.35	168.52
41	22.87	75.03	221.04	49.81	-97.95	-72.29	313.07	231.05
42	23.44	76.91	191.27	43.10	-88.16	-65.06	377.16	278.34
43	24.01	78.79	160.50	36.17	-78.36	-57.83	407.61	300.82
44	24.59	80.66	132.14	29.78	-68.57	-50.60	425.91	314.32
45	25.16	82.54	102.81	23.17	-58.77	-43.37	454.71	335.58
46	25.73	84.42	112.49	25.35	-48.98	-36.14	455.11	335.87
47	26.3	86.29	150.12	33.83	-39.18	-28.92	424.59	313.35
48	26.87	88.17	188.89	42.57	-29.39	-21.69	367.03	270.86
49	27.45	90.05	228.66	51.53	-19.59	-14.46	280.65	207.12
50	28.02	91.92	269.30	60.69	-9.80	-7.23	158.80	117.20
51	28.59	93.80	310.65	70.01	0.00	0.00	0.00	0.00

Fuente: Elaboración propia.

Tabla 46 Cortantes y momentos por combinación resistencia 1-2 – FEX

PUNTO	DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
1	0.00	0.00	307.47	69.29	0.00	0.00	0.00	0.00
2	0.57	1.88	269.91	60.82	-13.24	-9.77	163.86	120.93
3	1.14	3.75	232.67	52.43	-26.48	-19.54	301.53	222.53
4	1.72	5.63	195.85	44.13	-39.73	-29.32	406.30	299.85
5	2.29	7.51	159.56	35.96	-52.97	-39.09	478.98	353.48
6	2.86	9.38	123.92	27.92	-66.21	-48.86	520.58	384.19
7	3.43	11.26	127.44	28.72	-79.45	-58.63	532.40	392.91
8	4.00	13.14	162.72	36.67	-92.69	-68.41	516.94	381.51
9	4.58	15.01	196.64	44.31	-105.93	-78.18	487.98	360.13
10	5.15	16.89	229.18	51.65	-119.18	-87.95	431.61	318.53
11	5.72	18.77	260.35	58.67	-132.42	-97.72	349.74	258.11
12	6.29	20.64	290.15	65.38	-156.54	-115.53	255.37	188.47
13	6.86	22.52	318.56	71.79	-227.96	-168.23	187.32	138.24
14	7.44	24.40	345.59	77.88	-344.83	-254.49	110.44	81.51
15	8.01	26.27	371.24	83.66	-457.99	-337.99	51.80	38.23
16	8.58	28.15	406.71	91.65	-562.17	-414.88	55.51	40.96
17	9.15	30.02	379.05	85.42	-392.52	-289.68	43.14	31.84

PUNTO	DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
18	9.72	31.90	350.29	78.94	-299.14	-220.76	101.97	75.25
19	10.29	33.77	320.60	72.25	-215.28	-158.87	157.58	116.30
20	10.87	35.65	290.12	65.38	-130.15	-96.05	228.77	168.83
21	11.44	37.52	259.02	58.37	-118.89	-87.74	340.85	251.55
22	12.01	39.40	229.98	51.83	-107.63	-79.43	433.98	320.28
23	12.58	41.27	200.53	45.19	-96.36	-71.12	506.81	374.02
24	13.15	43.15	170.19	38.35	-85.10	-62.81	558.35	412.06
25	13.72	45.02	139.03	31.33	-73.84	-54.49	587.96	433.92
26	14.3	46.90	119.49	26.93	-62.58	-46.18	595.87	439.75
27	14.87	48.77	150.83	33.99	-73.71	-54.39	588.84	434.57
28	15.44	50.65	181.34	40.86	-84.95	-62.69	559.61	412.99
29	16.01	52.52	210.97	47.54	-96.19	-70.99	508.41	375.21
30	16.58	54.40	239.69	54.02	-107.43	-79.28	435.87	321.67
31	17.15	56.27	267.45	60.27	-118.67	-87.58	342.93	253.08
32	17.72	58.15	294.19	66.30	-129.93	-95.89	230.93	170.43
33	18.3	60.02	319.88	72.08	-215.02	-158.68	159.83	117.96
34	18.87	61.90	349.03	78.65	-298.86	-220.56	105.18	77.62
35	19.44	63.77	377.89	85.16	-392.22	-289.46	45.99	33.94
36	20.01	65.65	397.20	89.51	-561.91	-414.69	55.60	41.03
37	20.58	67.53	367.77	82.88	-457.74	-337.81	51.89	38.30
38	21.15	69.40	337.34	76.02	-345.22	-254.77	107.87	79.61
39	21.73	71.28	309.18	69.67	-228.04	-168.29	184.67	136.29
40	22.3	73.16	279.64	63.02	-156.62	-115.59	252.86	186.61
41	22.87	75.03	248.71	56.05	-132.49	-97.78	347.53	256.48
42	23.44	76.91	216.42	48.77	-119.24	-88.00	429.90	317.26
43	24.01	78.79	182.75	41.18	-105.99	-78.22	486.90	359.33
44	24.59	80.66	147.71	33.29	-92.74	-68.44	516.63	381.27
45	25.16	82.54	112.72	25.40	-79.49	-58.67	533.40	393.65
46	25.73	84.42	126.24	28.45	-66.24	-48.89	522.43	385.55
47	26.3	86.29	160.47	36.16	-52.99	-39.11	481.77	355.55
48	26.87	88.17	195.20	43.99	-39.75	-29.33	410.13	302.68
49	27.45	90.05	230.67	51.98	-26.50	-19.56	306.45	226.16
50	28.02	91.92	267.88	60.37	-13.25	-9.78	169.93	125.41
51	28.59	93.80	326.50	73.58	0.00	0.00	0.00	0.00

Fuente: Elaboración propia.

3.5.2.4. Cálculo de momentos y cortantes con SAP2000 - FEX

Para realizar una verificación de los resultados de momentos y cortantes actuantes en la franja obtenidos manualmente, este elemento se analizó con la ayuda del programa SAP2000, elaborando un modelo matemático con elementos tipo frame en 3D, asignado las cargas, combinaciones, geometría, dimensiones y materiales con que se analizaron manualmente.

En las siguientes tablas se presentan los resultados obtenidos, para las combinaciones de resistencia únicamente, combinaciones en las que se espera obtener los índices de sobre esfuerzo más altos.

Tabla 47 Cortantes y momentos combinación resistencia 1-1 SAP2000 – FEX

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	Kips-ft
1	0	E-RESIST1-1	Combination	Max	-57.20	-12.89	0.00	0.00
1	0.572	E-RESIST1-1	Combination	Max	-40.54	-9.14	166.20	122.66
1	0	E-RESIST1-1	Combination	Min	-324.18	-73.05	0.00	0.00
1	0.572	E-RESIST1-1	Combination	Min	-258.13	-58.17	27.95	20.63
2	0	E-RESIST1-1	Combination	Max	-40.54	-9.14	166.20	122.66
2	0.572	E-RESIST1-1	Combination	Max	-11.74	-2.64	295.13	217.81
2	0	E-RESIST1-1	Combination	Min	-258.13	-58.17	27.95	20.63
2	0.572	E-RESIST1-1	Combination	Min	-217.87	-49.10	46.38	34.23
3	0	E-RESIST1-1	Combination	Max	-11.74	-2.64	295.13	217.81
3	0.572	E-RESIST1-1	Combination	Max	20.69	4.66	387.98	286.33
3	0	E-RESIST1-1	Combination	Min	-217.87	-49.10	46.38	34.23
3	0.572	E-RESIST1-1	Combination	Min	-178.54	-40.23	55.28	40.80
4	0	E-RESIST1-1	Combination	Max	20.69	4.66	387.98	286.33
4	0.572	E-RESIST1-1	Combination	Max	52.08	11.74	446.43	329.47
4	0	E-RESIST1-1	Combination	Min	-178.54	-40.23	55.28	40.80
4	0.572	E-RESIST1-1	Combination	Min	-140.27	-31.61	54.66	40.34
5	0	E-RESIST1-1	Combination	Max	52.08	11.74	446.43	329.47
5	0.572	E-RESIST1-1	Combination	Max	82.45	18.58	472.46	348.68
5	0	E-RESIST1-1	Combination	Min	-140.27	-31.61	54.66	40.34
5	0.572	E-RESIST1-1	Combination	Min	-103.21	-23.26	44.50	32.84
6	0	E-RESIST1-1	Combination	Max	82.45	18.58	472.46	348.68
6	0.572	E-RESIST1-1	Combination	Max	111.80	25.19	468.37	345.66
6	0	E-RESIST1-1	Combination	Min	-103.21	-23.26	44.50	32.84
6	0.572	E-RESIST1-1	Combination	Min	-67.49	-15.21	24.83	18.32
7	0	E-RESIST1-1	Combination	Max	111.80	25.19	468.37	345.66
7	0.572	E-RESIST1-1	Combination	Max	140.64	31.69	436.78	322.35

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	Kips-ft
7	0	E-RESIST1-1	Combination	Min	-67.49	-15.21	24.83	18.32
7	0.572	E-RESIST1-1	Combination	Min	-36.03	-8.12	-4.38	-3.23
8	0	E-RESIST1-1	Combination	Max	140.64	31.69	436.78	322.35
8	0.572	E-RESIST1-1	Combination	Max	169.00	38.08	408.97	301.82
8	0	E-RESIST1-1	Combination	Min	-36.03	-8.12	-4.38	-3.23
8	0.572	E-RESIST1-1	Combination	Min	-8.22	-1.85	-43.10	-31.81
9	0	E-RESIST1-1	Combination	Max	169.00	38.08	408.97	301.82
9	0.572	E-RESIST1-1	Combination	Max	199.20	44.89	379.04	279.73
9	0	E-RESIST1-1	Combination	Min	-8.22	-1.85	-43.10	-31.81
9	0.572	E-RESIST1-1	Combination	Min	18.97	4.28	-91.36	-67.42
10	0	E-RESIST1-1	Combination	Max	199.20	44.89	379.04	279.73
10	0.572	E-RESIST1-1	Combination	Max	238.12	53.66	315.39	232.76
10	0	E-RESIST1-1	Combination	Min	18.97	4.28	-91.36	-67.42
10	0.572	E-RESIST1-1	Combination	Min	45.06	10.15	-149.14	-110.07
11	0	E-RESIST1-1	Combination	Max	238.12	53.66	315.39	232.76
11	0.572	E-RESIST1-1	Combination	Max	278.72	62.81	220.12	162.45
11	0	E-RESIST1-1	Combination	Min	45.06	10.15	-149.14	-110.07
11	0.572	E-RESIST1-1	Combination	Min	70.17	15.81	-216.45	-159.74
12	0	E-RESIST1-1	Combination	Max	278.72	62.81	220.12	162.45
12	0.572	E-RESIST1-1	Combination	Max	318.13	71.69	101.56	74.95
12	0	E-RESIST1-1	Combination	Min	70.17	15.81	-216.45	-159.74
12	0.572	E-RESIST1-1	Combination	Min	94.67	21.33	-293.28	-216.44
13	0	E-RESIST1-1	Combination	Max	318.13	71.69	101.56	74.95
13	0.572	E-RESIST1-1	Combination	Max	356.22	80.27	-23.02	-16.99
13	0	E-RESIST1-1	Combination	Min	94.67	21.33	-293.28	-216.44
13	0.572	E-RESIST1-1	Combination	Min	118.47	26.70	-379.64	-280.17
14	0	E-RESIST1-1	Combination	Max	356.22	80.27	-23.02	-16.99
14	0.572	E-RESIST1-1	Combination	Max	392.87	88.53	-148.71	-109.75
14	0	E-RESIST1-1	Combination	Min	118.47	26.70	-379.64	-280.17
14	0.572	E-RESIST1-1	Combination	Min	137.10	30.90	-478.63	-353.23
15	0	E-RESIST1-1	Combination	Max	392.87	88.53	-148.71	-109.75
15	0.572	E-RESIST1-1	Combination	Max	427.97	96.44	-247.54	-182.69
15	0	E-RESIST1-1	Combination	Min	137.10	30.90	-478.63	-353.23
15	0.572	E-RESIST1-1	Combination	Min	153.76	34.65	-620.11	-457.64
16	0	E-RESIST1-1	Combination	Max	-145.51	-32.79	-247.54	-182.69
16	0.5715	E-RESIST1-1	Combination	Max	-128.87	-29.04	-158.13	-116.70
16	0	E-RESIST1-1	Combination	Min	-431.10	-97.15	-620.11	-457.64
16	0.5715	E-RESIST1-1	Combination	Min	-396.26	-89.30	-454.19	-335.20
17	0	E-RESIST1-1	Combination	Max	-128.87	-29.04	-158.13	-116.70
17	0.5715	E-RESIST1-1	Combination	Max	-112.23	-25.29	-32.36	-23.89
17	0	E-RESIST1-1	Combination	Min	-396.26	-89.30	-454.19	-335.20
17	0.5715	E-RESIST1-1	Combination	Min	-361.18	-81.39	-311.36	-229.78
18	0	E-RESIST1-1	Combination	Max	-112.23	-25.29	-32.36	-23.89
18	0.5715	E-RESIST1-1	Combination	Max	-93.93	-21.17	82.60	60.96
18	0	E-RESIST1-1	Combination	Min	-361.18	-81.39	-311.36	-229.78
18	0.5715	E-RESIST1-1	Combination	Min	-326.43	-73.56	-207.93	-153.45
19	0	E-RESIST1-1	Combination	Max	-93.93	-21.17	82.60	60.96
19	0.5715	E-RESIST1-1	Combination	Max	-69.44	-15.65	199.76	147.42
19	0	E-RESIST1-1	Combination	Min	-326.43	-73.56	-207.93	-153.45

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	Kips-ft
19	0.5715	E-RESIST1-1	Combination	Min	-291.05	-65.59	-134.19	-99.03
20	0	E-RESIST1-1	Combination	Max	-69.44	-15.65	199.76	147.42
20	0.5715	E-RESIST1-1	Combination	Max	-40.22	-9.06	316.49	233.57
20	0	E-RESIST1-1	Combination	Min	-291.05	-65.59	-134.19	-99.03
20	0.5715	E-RESIST1-1	Combination	Min	-255.21	-57.51	-69.95	-51.62
21	0	E-RESIST1-1	Combination	Max	-40.22	-9.06	316.49	233.57
21	0.5715	E-RESIST1-1	Combination	Max	-11.40	-2.57	409.81	302.44
21	0	E-RESIST1-1	Combination	Min	-255.21	-57.51	-69.95	-51.62
21	0.5715	E-RESIST1-1	Combination	Min	-219.10	-49.37	-15.23	-11.24
22	0	E-RESIST1-1	Combination	Max	-11.40	-2.57	409.81	302.44
22	0.5715	E-RESIST1-1	Combination	Max	16.87	3.80	478.96	353.48
22	0	E-RESIST1-1	Combination	Min	-219.10	-49.37	-15.23	-11.24
22	0.5715	E-RESIST1-1	Combination	Min	-183.56	-41.36	22.91	16.91
23	0	E-RESIST1-1	Combination	Max	16.87	3.80	478.96	353.48
23	0.5715	E-RESIST1-1	Combination	Max	44.56	10.04	526.44	388.51
23	0	E-RESIST1-1	Combination	Min	-183.56	-41.36	22.91	16.91
23	0.5715	E-RESIST1-1	Combination	Min	-148.95	-33.56	50.39	37.19
24	0	E-RESIST1-1	Combination	Max	44.56	10.04	526.44	388.51
24	0.5715	E-RESIST1-1	Combination	Max	72.29	16.29	551.98	407.36
24	0	E-RESIST1-1	Combination	Min	-148.95	-33.56	50.39	37.19
24	0.5715	E-RESIST1-1	Combination	Min	-117.75	-26.53	68.35	50.44
25	0	E-RESIST1-1	Combination	Max	72.29	16.29	551.98	407.36
25	0.5715	E-RESIST1-1	Combination	Max	101.06	22.77	552.89	408.03
25	0	E-RESIST1-1	Combination	Min	-117.75	-26.53	68.35	50.44
25	0.5715	E-RESIST1-1	Combination	Min	-88.97	-20.05	76.81	56.69
26	0	E-RESIST1-1	Combination	Max	101.06	22.77	552.89	408.03
26	0.5715	E-RESIST1-1	Combination	Max	132.24	29.80	551.93	407.33
26	0	E-RESIST1-1	Combination	Min	-88.97	-20.05	76.81	56.69
26	0.5715	E-RESIST1-1	Combination	Min	-61.24	-13.80	68.35	50.44
27	0	E-RESIST1-1	Combination	Max	132.24	29.80	551.93	407.33
27	0.5715	E-RESIST1-1	Combination	Max	166.85	37.60	526.41	388.49
27	0	E-RESIST1-1	Combination	Min	-61.24	-13.80	68.35	50.44
27	0.5715	E-RESIST1-1	Combination	Min	-33.55	-7.56	50.38	37.18
28	0	E-RESIST1-1	Combination	Max	166.85	37.60	526.41	388.49
28	0.5715	E-RESIST1-1	Combination	Max	202.40	45.61	478.93	353.45
28	0	E-RESIST1-1	Combination	Min	-33.55	-7.56	50.38	37.18
28	0.5715	E-RESIST1-1	Combination	Min	-5.28	-1.19	22.91	16.90
29	0	E-RESIST1-1	Combination	Max	202.40	45.61	478.93	353.45
29	0.5715	E-RESIST1-1	Combination	Max	238.50	53.75	409.79	302.42
29	0	E-RESIST1-1	Combination	Min	-5.28	-1.19	22.91	16.90
29	0.5715	E-RESIST1-1	Combination	Min	23.54	5.30	-15.23	-11.24
30	0	E-RESIST1-1	Combination	Max	238.50	53.75	409.79	302.42
30	0.5715	E-RESIST1-1	Combination	Max	274.34	61.82	316.48	233.56
30	0	E-RESIST1-1	Combination	Min	23.54	5.30	-15.23	-11.24
30	0.5715	E-RESIST1-1	Combination	Min	52.77	11.89	-69.95	-51.62
31	0	E-RESIST1-1	Combination	Max	274.34	61.82	316.48	233.56
31	0.5715	E-RESIST1-1	Combination	Max	309.73	69.80	199.76	147.42
31	0	E-RESIST1-1	Combination	Min	52.77	11.89	-69.95	-51.62
31	0.5715	E-RESIST1-1	Combination	Min	77.26	17.41	-134.19	-99.03

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	Kips-ft
32	0	E-RESIST1-1	Combination	Max	309.73	69.80	199.76	147.42
32	0.5715	E-RESIST1-1	Combination	Max	344.48	77.63	82.62	60.98
32	0	E-RESIST1-1	Combination	Min	77.26	17.41	-134.19	-99.03
32	0.5715	E-RESIST1-1	Combination	Min	95.59	21.54	-207.93	-153.45
33	0	E-RESIST1-1	Combination	Max	344.48	77.63	82.62	60.98
33	0.5715	E-RESIST1-1	Combination	Max	379.56	85.53	-32.34	-23.87
33	0	E-RESIST1-1	Combination	Min	95.59	21.54	-207.93	-153.45
33	0.5715	E-RESIST1-1	Combination	Min	112.23	25.29	-311.35	-229.77
34	0	E-RESIST1-1	Combination	Max	379.56	85.53	-32.34	-23.87
34	0.5715	E-RESIST1-1	Combination	Max	414.40	93.39	-158.12	-116.69
34	0	E-RESIST1-1	Combination	Min	112.23	25.29	-311.35	-229.77
34	0.5715	E-RESIST1-1	Combination	Min	128.87	29.04	-454.19	-335.19
35	0	E-RESIST1-1	Combination	Max	414.40	93.39	-158.12	-116.69
35	0.5715	E-RESIST1-1	Combination	Max	448.35	101.04	-247.54	-182.69
35	0	E-RESIST1-1	Combination	Min	128.87	29.04	-454.19	-335.19
35	0.5715	E-RESIST1-1	Combination	Min	145.51	32.79	-620.09	-457.63
36	0	E-RESIST1-1	Combination	Max	-153.76	-34.65	-247.54	-182.69
36	0.572	E-RESIST1-1	Combination	Max	-135.15	-30.46	-148.75	-109.78
36	0	E-RESIST1-1	Combination	Min	-409.60	-92.30	-620.09	-457.63
36	0.572	E-RESIST1-1	Combination	Min	-372.95	-84.04	-478.63	-353.23
37	0	E-RESIST1-1	Combination	Max	-135.15	-30.46	-148.75	-109.78
37	0.572	E-RESIST1-1	Combination	Max	-111.35	-25.09	-23.07	-17.03
37	0	E-RESIST1-1	Combination	Min	-372.95	-84.04	-478.63	-353.23
37	0.572	E-RESIST1-1	Combination	Min	-334.86	-75.46	-379.65	-280.18
38	0	E-RESIST1-1	Combination	Max	-111.35	-25.09	-23.07	-17.03
38	0.572	E-RESIST1-1	Combination	Max	-86.85	-19.57	101.53	74.93
38	0	E-RESIST1-1	Combination	Min	-334.86	-75.46	-379.65	-280.18
38	0.572	E-RESIST1-1	Combination	Min	-295.46	-66.58	-293.29	-216.45
39	0	E-RESIST1-1	Combination	Max	-86.85	-19.57	101.53	74.93
39	0.572	E-RESIST1-1	Combination	Max	-61.74	-13.91	220.12	162.45
39	0	E-RESIST1-1	Combination	Min	-295.46	-66.58	-293.29	-216.45
39	0.572	E-RESIST1-1	Combination	Min	-254.86	-57.43	-216.45	-159.74
40	0	E-RESIST1-1	Combination	Max	-61.74	-13.91	220.12	162.45
40	0.572	E-RESIST1-1	Combination	Max	-35.66	-8.04	315.42	232.78
40	0	E-RESIST1-1	Combination	Min	-254.86	-57.43	-216.45	-159.74
40	0.572	E-RESIST1-1	Combination	Min	-215.90	-48.65	-149.15	-110.07
41	0	E-RESIST1-1	Combination	Max	-35.66	-8.04	315.42	232.78
41	0.572	E-RESIST1-1	Combination	Max	-8.47	-1.91	379.10	279.78
41	0	E-RESIST1-1	Combination	Min	-215.90	-48.65	-149.15	-110.07
41	0.572	E-RESIST1-1	Combination	Min	-185.69	-41.84	-91.37	-67.43
42	0	E-RESIST1-1	Combination	Max	-8.47	-1.91	379.10	279.78
42	0.572	E-RESIST1-1	Combination	Max	19.33	4.36	409.07	301.89
42	0	E-RESIST1-1	Combination	Min	-185.69	-41.84	-91.37	-67.43
42	0.572	E-RESIST1-1	Combination	Min	-157.33	-35.45	-43.11	-31.81
43	0	E-RESIST1-1	Combination	Max	19.33	4.36	409.07	301.89
43	0.572	E-RESIST1-1	Combination	Max	50.78	11.44	436.69	322.28
43	0	E-RESIST1-1	Combination	Min	-157.33	-35.45	-43.11	-31.81
43	0.572	E-RESIST1-1	Combination	Min	-128.49	-28.96	-4.38	-3.23
44	0	E-RESIST1-1	Combination	Max	50.78	11.44	436.69	322.28

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	Kips-ft
44	0.572	E-RESIST1-1	Combination	Max	86.49	19.49	468.30	345.61
44	0	E-RESIST1-1	Combination	Min	-128.49	-28.96	-4.38	-3.23
44	0.572	E-RESIST1-1	Combination	Min	-99.15	-22.34	24.82	18.32
45	0	E-RESIST1-1	Combination	Max	86.49	19.49	468.30	345.61
45	0.572	E-RESIST1-1	Combination	Max	123.55	27.84	472.42	348.64
45	0	E-RESIST1-1	Combination	Min	-99.15	-22.34	24.82	18.32
45	0.572	E-RESIST1-1	Combination	Min	-68.79	-15.50	44.50	32.84
46	0	E-RESIST1-1	Combination	Max	123.55	27.84	472.42	348.64
46	0.572	E-RESIST1-1	Combination	Max	161.81	36.46	446.42	329.46
46	0	E-RESIST1-1	Combination	Min	-68.79	-15.50	44.50	32.84
46	0.572	E-RESIST1-1	Combination	Min	-37.40	-8.43	54.65	40.33
47	0	E-RESIST1-1	Combination	Max	161.81	36.46	446.42	329.46
47	0.572	E-RESIST1-1	Combination	Max	201.13	45.33	388.01	286.35
47	0	E-RESIST1-1	Combination	Min	-37.40	-8.43	54.65	40.33
47	0.572	E-RESIST1-1	Combination	Min	-4.98	-1.12	55.28	40.80
48	0	E-RESIST1-1	Combination	Max	201.13	45.33	388.01	286.35
48	0.572	E-RESIST1-1	Combination	Max	241.39	54.40	295.20	217.86
48	0	E-RESIST1-1	Combination	Min	-4.98	-1.12	55.28	40.80
48	0.572	E-RESIST1-1	Combination	Min	23.89	5.38	46.38	34.23
49	0	E-RESIST1-1	Combination	Max	241.39	54.40	295.20	217.86
49	0.572	E-RESIST1-1	Combination	Max	282.44	63.65	166.32	122.74
49	0	E-RESIST1-1	Combination	Min	23.89	5.38	46.38	34.23
49	0.572	E-RESIST1-1	Combination	Min	40.54	9.14	27.95	20.63
50	0	E-RESIST1-1	Combination	Max	282.44	63.65	166.32	122.74
50	0.572	E-RESIST1-1	Combination	Max	324.18	73.05	0.00	0.00
50	0	E-RESIST1-1	Combination	Min	40.54	9.14	27.95	20.63
50	0.572	E-RESIST1-1	Combination	Min	57.19	12.89	0.00	0.00

Fuente: Elaboración propia.

Tabla 48 Cortantes y momentos combinación resistencia 1-2 SAP2000 – FEX

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	kips - ft
1	0	E-RESIST1-2	Combination	Max	-59.5	-13.4	0.0	0.0
1	0.572	E-RESIST1-2	Combination	Max	-36.3	-8.2	169.6	125.2
1	0	E-RESIST1-2	Combination	Min	-326.1	-73.5	0.0	0.0
1	0.572	E-RESIST1-2	Combination	Min	-267.6	-60.3	29.3	21.6
2	0	E-RESIST1-2	Combination	Max	-36.3	-8.2	169.6	125.2
2	0.572	E-RESIST1-2	Combination	Max	-10.2	-2.3	306.0	225.8
2	0	E-RESIST1-2	Combination	Min	-267.6	-60.3	29.3	21.6
2	0.572	E-RESIST1-2	Combination	Min	-230.4	-51.9	49.0	36.2
3	0	E-RESIST1-2	Combination	Max	-10.2	-2.3	306.0	225.8
3	0.572	E-RESIST1-2	Combination	Max	24.2	5.5	409.5	302.2
3	0	E-RESIST1-2	Combination	Min	-230.4	-51.9	49.0	36.2
3	0.572	E-RESIST1-2	Combination	Min	-193.7	-43.6	59.2	43.7

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	kips - ft
4	0	E-RESIST1-2	Combination	Max	24.2	5.5	409.5	302.2
4	0.572	E-RESIST1-2	Combination	Max	59.6	13.4	481.1	355.0
4	0	E-RESIST1-2	Combination	Min	-193.7	-43.6	59.2	43.7
4	0.572	E-RESIST1-2	Combination	Min	-157.5	-35.5	59.9	44.2
5	0	E-RESIST1-2	Combination	Max	59.6	13.4	481.1	355.0
5	0.572	E-RESIST1-2	Combination	Max	94.8	21.4	521.6	385.0
5	0	E-RESIST1-2	Combination	Min	-157.5	-35.5	59.9	44.2
5	0.572	E-RESIST1-2	Combination	Min	-121.9	-27.5	51.1	37.7
6	0	E-RESIST1-2	Combination	Max	94.8	21.4	521.6	385.0
6	0.572	E-RESIST1-2	Combination	Max	129.6	29.2	532.6	393.0
6	0	E-RESIST1-2	Combination	Min	-121.9	-27.5	51.1	37.7
6	0.572	E-RESIST1-2	Combination	Min	-87.1	-19.6	32.7	24.1
7	0	E-RESIST1-2	Combination	Max	129.6	29.2	532.6	393.0
7	0.572	E-RESIST1-2	Combination	Max	163.9	36.9	515.9	380.7
7	0	E-RESIST1-2	Combination	Min	-87.1	-19.6	32.7	24.1
7	0.572	E-RESIST1-2	Combination	Min	-53.2	-12.0	4.8	3.5
8	0	E-RESIST1-2	Combination	Max	163.9	36.9	515.9	380.7
8	0.572	E-RESIST1-2	Combination	Max	197.6	44.5	487.2	359.5
8	0	E-RESIST1-2	Combination	Min	-53.2	-12.0	4.8	3.5
8	0.572	E-RESIST1-2	Combination	Min	-20.2	-4.6	-32.6	-24.1
9	0	E-RESIST1-2	Combination	Max	197.6	44.5	487.2	359.5
9	0.572	E-RESIST1-2	Combination	Max	230.1	51.8	431.0	318.1
9	0	E-RESIST1-2	Combination	Min	-20.2	-4.6	-32.6	-24.1
9	0.572	E-RESIST1-2	Combination	Min	11.7	2.6	-79.6	-58.7
10	0	E-RESIST1-2	Combination	Max	230.1	51.8	431.0	318.1
10	0.572	E-RESIST1-2	Combination	Max	261.1	58.8	349.4	257.8
10	0	E-RESIST1-2	Combination	Min	11.7	2.6	-79.6	-58.7
10	0.572	E-RESIST1-2	Combination	Min	42.3	9.5	-136.0	-100.4
11	0	E-RESIST1-2	Combination	Max	261.1	58.8	349.4	257.8
11	0.572	E-RESIST1-2	Combination	Max	290.8	65.5	244.3	180.3
11	0	E-RESIST1-2	Combination	Min	42.3	9.5	-136.0	-100.4
11	0.572	E-RESIST1-2	Combination	Min	71.7	16.2	-202.0	-149.1
12	0	E-RESIST1-2	Combination	Max	290.8	65.5	244.3	180.3
12	0.572	E-RESIST1-2	Combination	Max	319.1	71.9	118.2	87.2
12	0	E-RESIST1-2	Combination	Min	71.7	16.2	-202.0	-149.1
12	0.572	E-RESIST1-2	Combination	Min	96.9	21.8	-277.5	-204.8
13	0	E-RESIST1-2	Combination	Max	319.1	71.9	118.2	87.2
13	0.572	E-RESIST1-2	Combination	Max	349.3	78.7	-26.3	-19.4
13	0	E-RESIST1-2	Combination	Min	96.9	21.8	-277.5	-204.8
13	0.572	E-RESIST1-2	Combination	Min	117.7	26.5	-368.6	-272.0
14	0	E-RESIST1-2	Combination	Max	349.3	78.7	-26.3	-19.4
14	0.572	E-RESIST1-2	Combination	Max	378.9	85.4	-142.3	-105.1
14	0	E-RESIST1-2	Combination	Min	117.7	26.5	-368.6	-272.0
14	0.572	E-RESIST1-2	Combination	Min	136.8	30.8	-525.7	-388.0
15	0	E-RESIST1-2	Combination	Max	378.9	85.4	-142.3	-105.1
15	0.572	E-RESIST1-2	Combination	Max	407.1	91.7	-245.2	-181.0
15	0	E-RESIST1-2	Combination	Min	136.8	30.8	-525.7	-388.0
15	0.572	E-RESIST1-2	Combination	Min	153.5	34.6	-702.8	-518.7
16	0	E-RESIST1-2	Combination	Max	-144.6	-32.6	-245.2	-181.0

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	kips - ft
16	0.5715	E-RESIST1-2	Combination	Max	-126.9	-28.6	-140.9	-104.0
16	0	E-RESIST1-2	Combination	Min	-405.3	-91.3	-702.8	-518.7
16	0.5715	E-RESIST1-2	Combination	Min	-377.5	-85.1	-527.5	-389.3
17	0	E-RESIST1-2	Combination	Max	-126.9	-28.6	-140.9	-104.0
17	0.5715	E-RESIST1-2	Combination	Max	-105.2	-23.7	-24.7	-18.2
17	0	E-RESIST1-2	Combination	Min	-377.5	-85.1	-527.5	-389.3
17	0.5715	E-RESIST1-2	Combination	Min	-348.7	-78.6	-368.2	-271.8
18	0	E-RESIST1-2	Combination	Max	-105.2	-23.7	-24.7	-18.2
18	0.5715	E-RESIST1-2	Combination	Max	-80.9	-18.2	101.5	74.9
18	0	E-RESIST1-2	Combination	Min	-348.7	-78.6	-368.2	-271.8
18	0.5715	E-RESIST1-2	Combination	Min	-318.9	-71.9	-233.8	-172.5
19	0	E-RESIST1-2	Combination	Max	-80.9	-18.2	101.5	74.9
19	0.5715	E-RESIST1-2	Combination	Max	-53.7	-12.1	230.7	170.3
19	0	E-RESIST1-2	Combination	Min	-318.9	-71.9	-233.8	-172.5
19	0.5715	E-RESIST1-2	Combination	Min	-288.4	-65.0	-140.2	-103.5
20	0	E-RESIST1-2	Combination	Max	-53.7	-12.1	230.7	170.3
20	0.5715	E-RESIST1-2	Combination	Max	-26.2	-5.9	342.6	252.9
20	0	E-RESIST1-2	Combination	Min	-288.4	-65.0	-140.2	-103.5
20	0.5715	E-RESIST1-2	Combination	Min	-257.2	-58.0	-75.4	-55.7
21	0	E-RESIST1-2	Combination	Max	-26.2	-5.9	342.6	252.9
21	0.5715	E-RESIST1-2	Combination	Max	2.2	0.5	435.5	321.4
21	0	E-RESIST1-2	Combination	Min	-257.2	-58.0	-75.4	-55.7
21	0.5715	E-RESIST1-2	Combination	Min	-228.4	-51.5	-20.2	-14.9
22	0	E-RESIST1-2	Combination	Max	2.2	0.5	435.5	321.4
22	0.5715	E-RESIST1-2	Combination	Max	31.2	7.0	507.9	374.9
22	0	E-RESIST1-2	Combination	Min	-228.4	-51.5	-20.2	-14.9
22	0.5715	E-RESIST1-2	Combination	Min	-198.8	-44.8	25.5	18.8
23	0	E-RESIST1-2	Combination	Max	31.2	7.0	507.9	374.9
23	0.5715	E-RESIST1-2	Combination	Max	60.9	13.7	559.0	412.6
23	0	E-RESIST1-2	Combination	Min	-198.8	-44.8	25.5	18.8
23	0.5715	E-RESIST1-2	Combination	Min	-168.5	-38.0	61.8	45.6
24	0	E-RESIST1-2	Combination	Max	60.9	13.7	559.0	412.6
24	0.5715	E-RESIST1-2	Combination	Max	90.9	20.5	588.2	434.1
24	0	E-RESIST1-2	Combination	Min	-168.5	-38.0	61.8	45.6
24	0.5715	E-RESIST1-2	Combination	Min	-138.0	-31.1	88.5	65.3
25	0	E-RESIST1-2	Combination	Max	90.9	20.5	588.2	434.1
25	0.5715	E-RESIST1-2	Combination	Max	121.3	27.3	595.2	439.2
25	0	E-RESIST1-2	Combination	Min	-138.0	-31.1	88.5	65.3
25	0.5715	E-RESIST1-2	Combination	Min	-107.6	-24.2	105.7	78.0
26	0	E-RESIST1-2	Combination	Max	121.3	27.3	595.2	439.2
26	0.5715	E-RESIST1-2	Combination	Max	151.8	34.2	588.1	434.0
26	0	E-RESIST1-2	Combination	Min	-107.6	-24.2	105.7	78.0
26	0.5715	E-RESIST1-2	Combination	Min	-77.6	-17.5	88.5	65.3
27	0	E-RESIST1-2	Combination	Max	151.8	34.2	588.1	434.0
27	0.5715	E-RESIST1-2	Combination	Max	182.2	41.0	558.9	412.5
27	0	E-RESIST1-2	Combination	Min	-77.6	-17.5	88.5	65.3
27	0.5715	E-RESIST1-2	Combination	Min	-47.9	-10.8	61.8	45.6
28	0	E-RESIST1-2	Combination	Max	182.2	41.0	558.9	412.5
28	0.5715	E-RESIST1-2	Combination	Max	211.7	47.7	507.9	374.8

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	kips - ft
28	0	E-RESIST1-2	Combination	Min	-47.9	-10.8	61.8	45.6
28	0.5715	E-RESIST1-2	Combination	Min	-18.9	-4.2	25.5	18.8
29	0	E-RESIST1-2	Combination	Max	211.7	47.7	507.9	374.8
29	0.5715	E-RESIST1-2	Combination	Max	240.5	54.2	435.4	321.3
29	0	E-RESIST1-2	Combination	Min	-18.9	-4.2	25.5	18.8
29	0.5715	E-RESIST1-2	Combination	Min	9.5	2.1	-20.2	-14.9
30	0	E-RESIST1-2	Combination	Max	240.5	54.2	435.4	321.3
30	0.5715	E-RESIST1-2	Combination	Max	271.7	61.2	342.6	252.8
30	0	E-RESIST1-2	Combination	Min	9.5	2.1	-20.2	-14.9
30	0.5715	E-RESIST1-2	Combination	Min	37.0	8.3	-75.4	-55.7
31	0	E-RESIST1-2	Combination	Max	271.7	61.2	342.6	252.8
31	0.5715	E-RESIST1-2	Combination	Max	302.2	68.1	230.7	170.2
31	0	E-RESIST1-2	Combination	Min	37.0	8.3	-75.4	-55.7
31	0.5715	E-RESIST1-2	Combination	Min	64.3	14.5	-140.2	-103.5
32	0	E-RESIST1-2	Combination	Max	302.2	68.1	230.7	170.2
32	0.5715	E-RESIST1-2	Combination	Max	332.0	74.8	101.4	74.9
32	0	E-RESIST1-2	Combination	Min	64.3	14.5	-140.2	-103.5
32	0.5715	E-RESIST1-2	Combination	Min	88.5	20.0	-233.8	-172.5
33	0	E-RESIST1-2	Combination	Max	332.0	74.8	101.4	74.9
33	0.5715	E-RESIST1-2	Combination	Max	360.9	81.3	-24.7	-18.3
33	0	E-RESIST1-2	Combination	Min	88.5	20.0	-233.8	-172.5
33	0.5715	E-RESIST1-2	Combination	Min	110.3	24.8	-368.2	-271.7
34	0	E-RESIST1-2	Combination	Max	360.9	81.3	-24.7	-18.3
34	0.5715	E-RESIST1-2	Combination	Max	388.7	87.6	-140.9	-104.0
34	0	E-RESIST1-2	Combination	Min	110.3	24.8	-368.2	-271.7
34	0.5715	E-RESIST1-2	Combination	Min	128.0	28.8	-527.5	-389.3
35	0	E-RESIST1-2	Combination	Max	388.7	87.6	-140.9	-104.0
35	0.5715	E-RESIST1-2	Combination	Max	415.5	93.6	-245.2	-181.0
35	0	E-RESIST1-2	Combination	Min	128.0	28.8	-527.5	-389.3
35	0.5715	E-RESIST1-2	Combination	Min	144.6	32.6	-702.8	-518.7
36	0	E-RESIST1-2	Combination	Max	-153.5	-34.6	-245.2	-181.0
36	0.572	E-RESIST1-2	Combination	Max	-134.4	-30.3	-142.3	-105.0
36	0	E-RESIST1-2	Combination	Min	-395.6	-89.2	-702.8	-518.7
36	0.572	E-RESIST1-2	Combination	Min	-366.0	-82.5	-525.7	-388.0
37	0	E-RESIST1-2	Combination	Max	-134.4	-30.3	-142.3	-105.0
37	0.572	E-RESIST1-2	Combination	Max	-113.6	-25.6	-26.3	-19.4
37	0	E-RESIST1-2	Combination	Min	-366.0	-82.5	-525.7	-388.0
37	0.572	E-RESIST1-2	Combination	Min	-335.8	-75.7	-368.6	-272.0
38	0	E-RESIST1-2	Combination	Max	-113.6	-25.6	-26.3	-19.4
38	0.572	E-RESIST1-2	Combination	Max	-88.4	-19.9	118.2	87.3
38	0	E-RESIST1-2	Combination	Min	-335.8	-75.7	-368.6	-272.0
38	0.572	E-RESIST1-2	Combination	Min	-307.5	-69.3	-277.5	-204.8
39	0	E-RESIST1-2	Combination	Max	-88.4	-19.9	118.2	87.3
39	0.572	E-RESIST1-2	Combination	Max	-59.0	-13.3	244.3	180.3
39	0	E-RESIST1-2	Combination	Min	-307.5	-69.3	-277.5	-204.8
39	0.572	E-RESIST1-2	Combination	Min	-277.8	-62.6	-202.0	-149.1
40	0	E-RESIST1-2	Combination	Max	-59.0	-13.3	244.3	180.3
40	0.572	E-RESIST1-2	Combination	Max	-28.4	-6.4	349.4	257.9
40	0	E-RESIST1-2	Combination	Min	-277.8	-62.6	-202.0	-149.1

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	kips - ft
40	0.572	E-RESIST1-2	Combination	Min	-246.8	-55.6	-136.0	-100.4
41	0	E-RESIST1-2	Combination	Max	-28.4	-6.4	349.4	257.9
41	0.572	E-RESIST1-2	Combination	Max	3.5	0.8	431.1	318.2
41	0	E-RESIST1-2	Combination	Min	-246.8	-55.6	-136.0	-100.4
41	0.572	E-RESIST1-2	Combination	Min	-214.4	-48.3	-79.5	-58.7
42	0	E-RESIST1-2	Combination	Max	3.5	0.8	431.1	318.2
42	0.572	E-RESIST1-2	Combination	Max	36.5	8.2	487.3	359.6
42	0	E-RESIST1-2	Combination	Min	-214.4	-48.3	-79.5	-58.7
42	0.572	E-RESIST1-2	Combination	Min	-180.6	-40.7	-32.6	-24.1
43	0	E-RESIST1-2	Combination	Max	36.5	8.2	487.3	359.6
43	0.572	E-RESIST1-2	Combination	Max	70.4	15.9	516.0	380.8
43	0	E-RESIST1-2	Combination	Min	-180.6	-40.7	-32.6	-24.1
43	0.572	E-RESIST1-2	Combination	Min	-146.3	-33.0	4.8	3.6
44	0	E-RESIST1-2	Combination	Max	70.4	15.9	516.0	380.8
44	0.572	E-RESIST1-2	Combination	Max	105.2	23.7	532.5	393.0
44	0	E-RESIST1-2	Combination	Min	-146.3	-33.0	4.8	3.6
44	0.572	E-RESIST1-2	Combination	Min	-111.5	-25.1	32.7	24.1
45	0	E-RESIST1-2	Combination	Max	105.2	23.7	532.5	393.0
45	0.572	E-RESIST1-2	Combination	Max	140.7	31.7	521.6	384.9
45	0	E-RESIST1-2	Combination	Min	-111.5	-25.1	32.7	24.1
45	0.572	E-RESIST1-2	Combination	Min	-76.4	-17.2	51.1	37.7
46	0	E-RESIST1-2	Combination	Max	140.7	31.7	521.6	384.9
46	0.572	E-RESIST1-2	Combination	Max	176.9	39.9	481.0	355.0
46	0	E-RESIST1-2	Combination	Min	-76.4	-17.2	51.1	37.7
46	0.572	E-RESIST1-2	Combination	Min	-40.9	-9.2	59.9	44.2
47	0	E-RESIST1-2	Combination	Max	176.9	39.9	481.0	355.0
47	0.572	E-RESIST1-2	Combination	Max	213.7	48.2	409.5	302.2
47	0	E-RESIST1-2	Combination	Min	-40.9	-9.2	59.9	44.2
47	0.572	E-RESIST1-2	Combination	Min	-6.5	-1.5	59.2	43.7
48	0	E-RESIST1-2	Combination	Max	213.7	48.2	409.5	302.2
48	0.572	E-RESIST1-2	Combination	Max	250.8	56.5	306.0	225.8
48	0	E-RESIST1-2	Combination	Min	-6.5	-1.5	59.2	43.7
48	0.572	E-RESIST1-2	Combination	Min	19.6	4.4	49.0	36.2
49	0	E-RESIST1-2	Combination	Max	250.8	56.5	306.0	225.8
49	0.572	E-RESIST1-2	Combination	Max	288.4	65.0	169.7	125.2
49	0	E-RESIST1-2	Combination	Min	19.6	4.4	49.0	36.2
49	0.572	E-RESIST1-2	Combination	Min	42.8	9.7	29.3	21.6
50	0	E-RESIST1-2	Combination	Max	288.4	65.0	169.7	125.2
50	0.572	E-RESIST1-2	Combination	Max	326.1	73.5	0.0	0.0
50	0	E-RESIST1-2	Combination	Min	42.8	9.7	29.3	21.6
50	0.572	E-RESIST1-2	Combination	Min	59.5	13.4	0.0	0.0

Fuente: Elaboración propia.

3.5.2.5. Comparación resultados líneas Vs SAP2000 –FEX

En las siguientes figuras se presenta la superposición de las solicitaciones obtenidas con las combinaciones de resistencia, por líneas de influencia (línea azul) versus las obtenidas con la ayuda del programa SAP2000 (línea roja), tarea que se realizó para verificar los valores numéricos de momentos y cortantes obtenidos manualmente (Líneas de influencia).

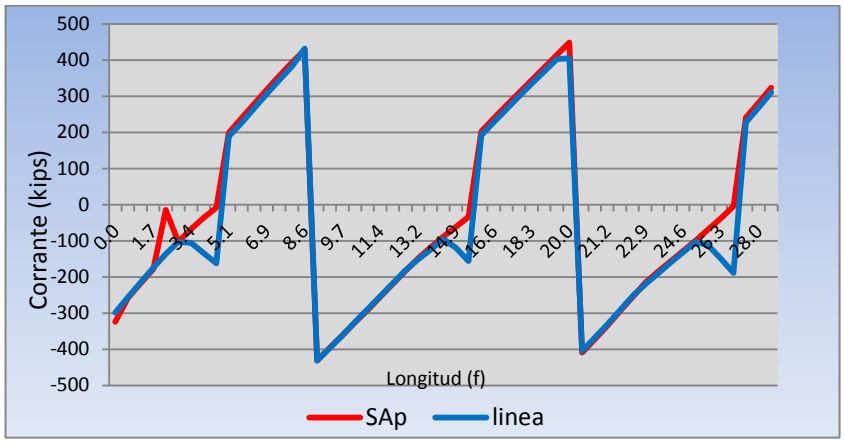


Figura 72 Diagrama de cortante combinación resistencia 1-1 Línea vs SAP2000

Fuente: Elaboración propia.

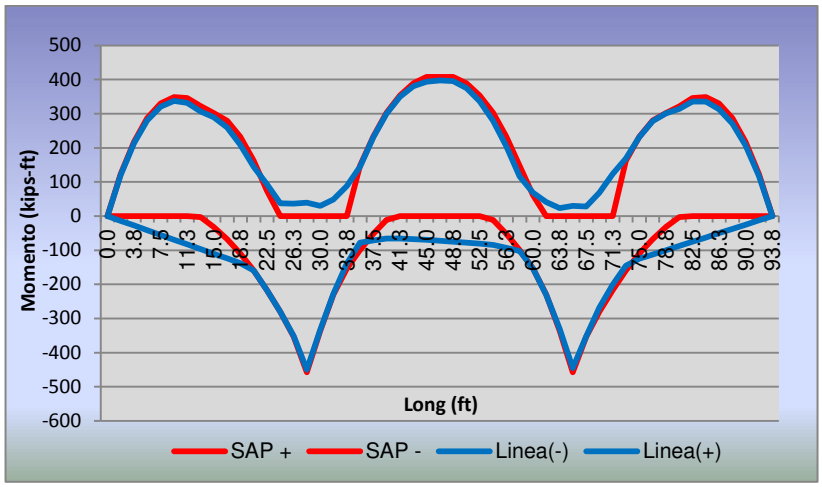


Figura 73 Diagrama de momento combinación resistencia 1-1 Línea vs SAP2000.

Fuente: Elaboración propia.

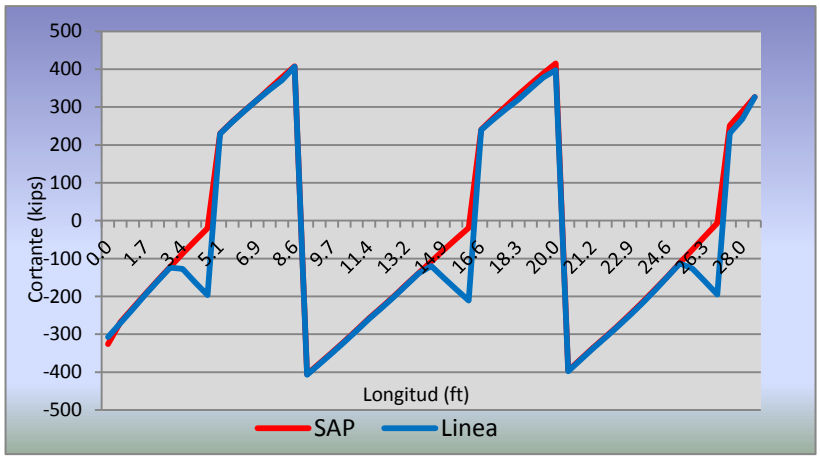


Figura 74 Diagrama de cortante combinación resistencia 1-2 Línea vs SAP2000

Fuente: Elaboración propia.

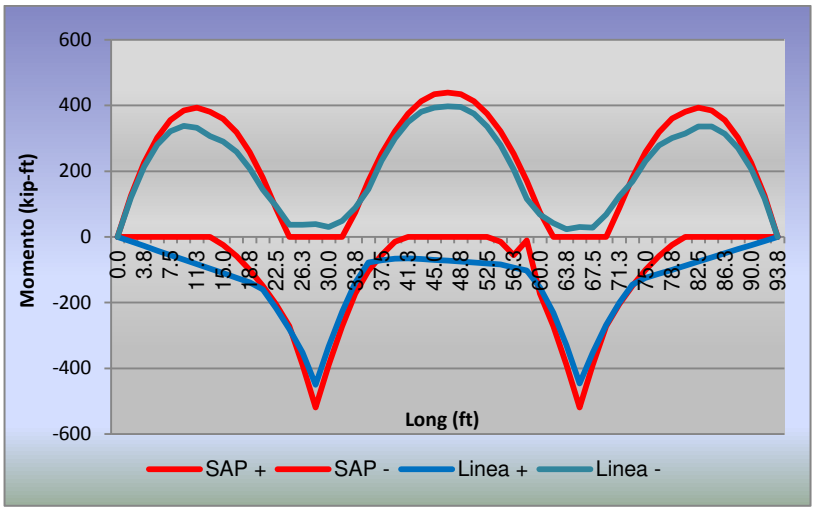


Figura 75 Diagrama de momento combinación resistencia 1-2 Línea vs SAP2000

Fuente: Elaboración propia.

De acuerdo a las figuras anteriores se presentan algunas diferencias de los valores en algunos puntos de la franja, pero en general los valores máximos de momentos y cortantes coinciden en los calculados por las dos metodologías sin embargo, los índices de sobre esfuerzo se calcularon con los datos obtenidos con la ayuda del programa SAP2000, esto para aprovechar la envolvente de solicitaciones que genera el programa.

3.5.2.6. Refuerzo suministrado a franja externa - FEX

El refuerzo de la franja exterior se determinó con gran dificultad dada la antigüedad del puente y la poca legibilidad de la información registrada en los planos de diseño (Véase Figura 76, Figura 77 y Figura 78), sin embargo se logró extraer el refuerzo que se presenta en la Figura 79 a Figura 87.

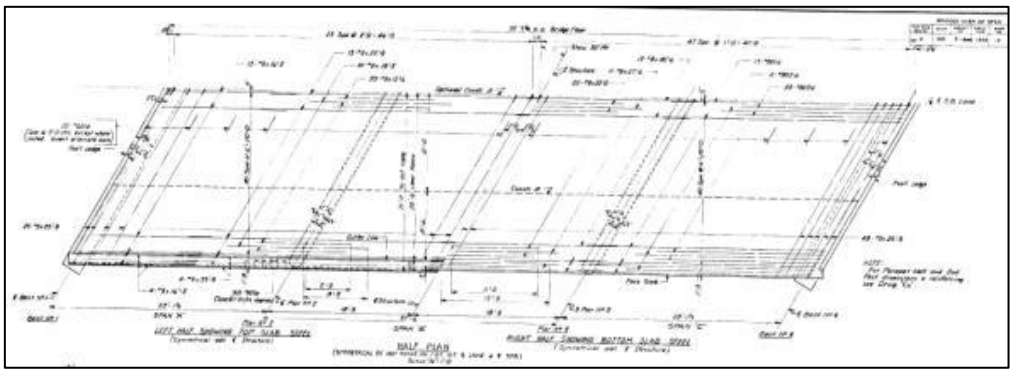


Figura 76 Planta refuerzo inferior y superior de superestructura puente No 2

Fuente: Universidad de Purdue.

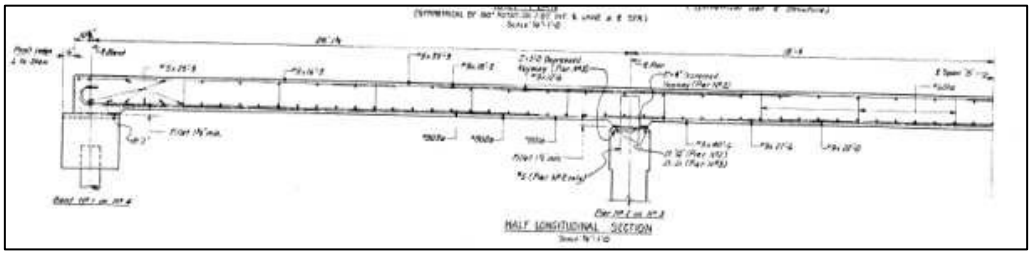


Figura 77 Detalle refuerzo longitudinal superestructura puente No 2

Fuente: Universidad de Purdue.

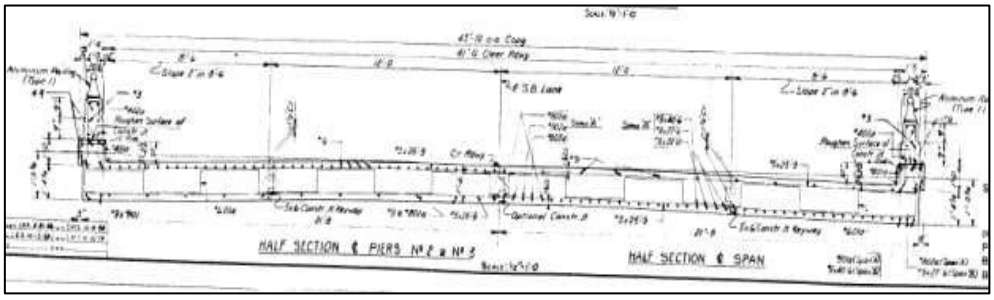


Figura 78 Sección refuerzo transversal superestructura puente No 2

Fuente: Universidad de Purdue.

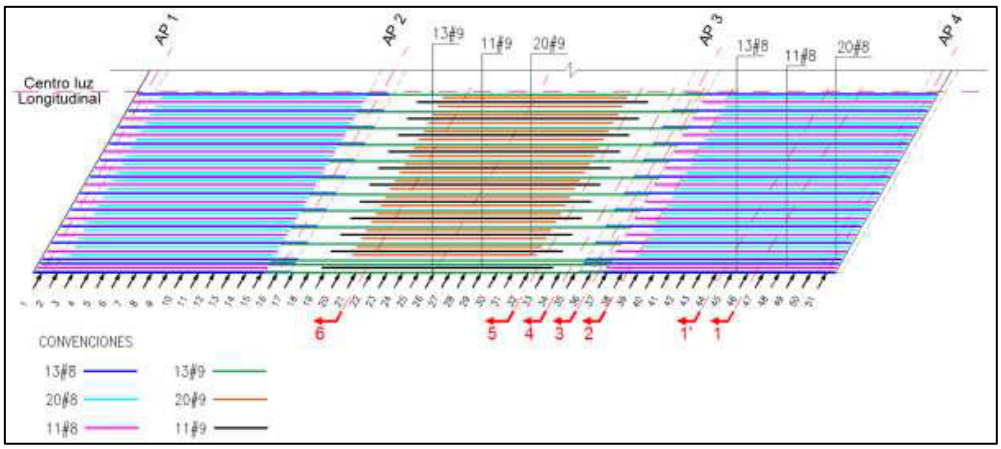


Figura 79 Planta refuerzo inferior superestructura puente No 2.

Fuente: Elaboración Propia

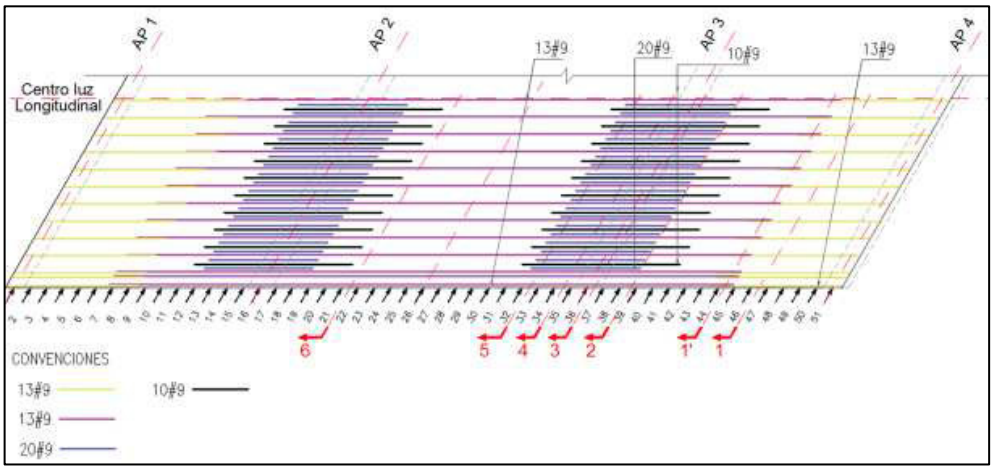


Figura 80 Planta refuerzo superior superestructura puente No 2

Fuente: Elaboración Propia

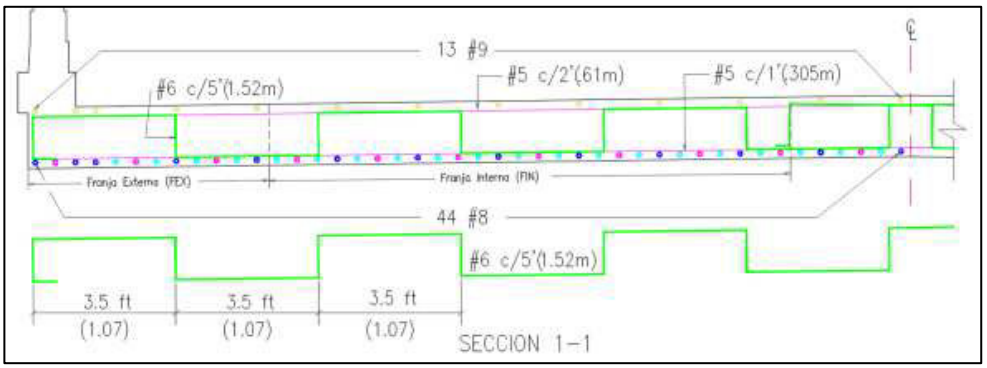


Figura 81 Refuerzo sección 1-1 - puente No 2

Fuente: Elaboración Propia.

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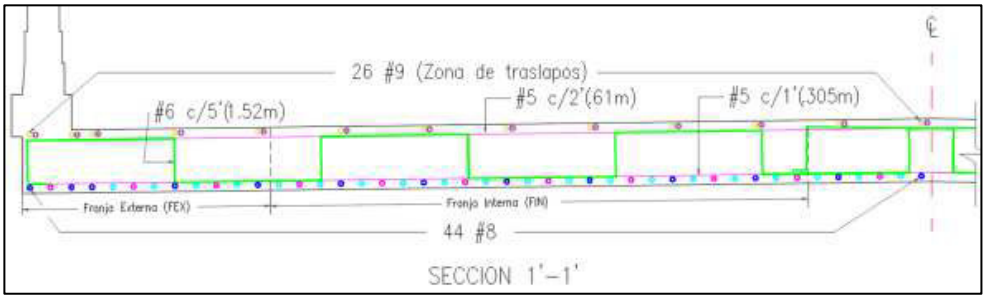


Figura 82 Refuerzo sección 1'-1' - puente No 2

Fuente: Elaboración Propia

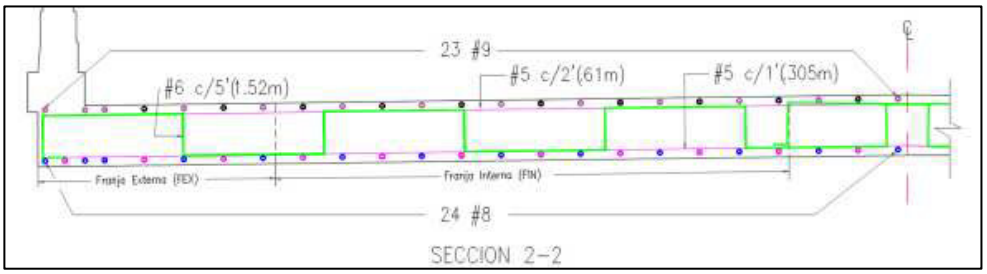


Figura 83 Refuerzo sección 2-2 - puente No 2

Fuente: Elaboración Propia

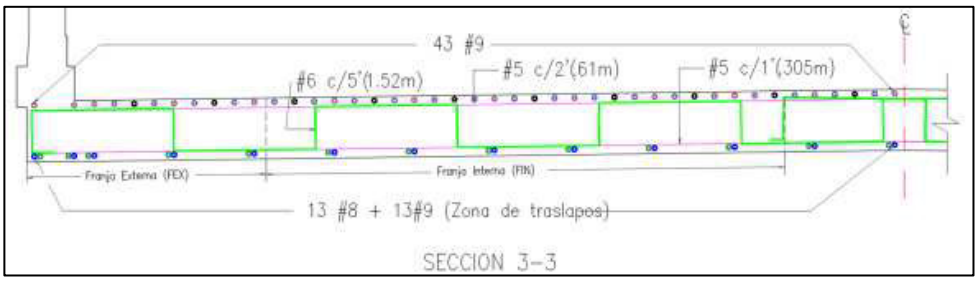


Figura 84 Refuerzo sección 3-3 - puente No 2

Fuente: Elaboración Propia.

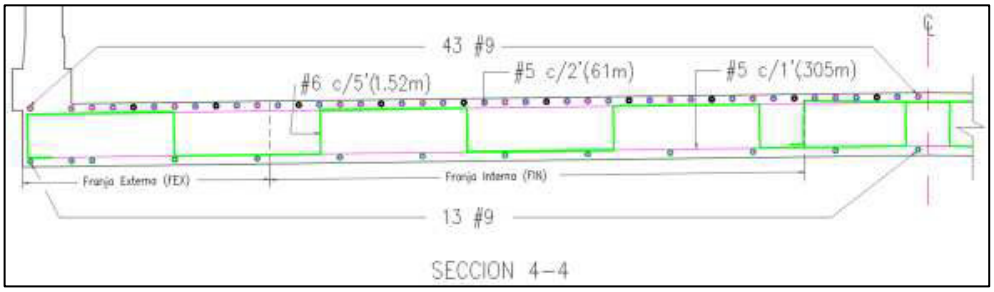


Figura 85 Refuerzo sección 4-4 - puente No 2

Fuente: Elaboración Propia..

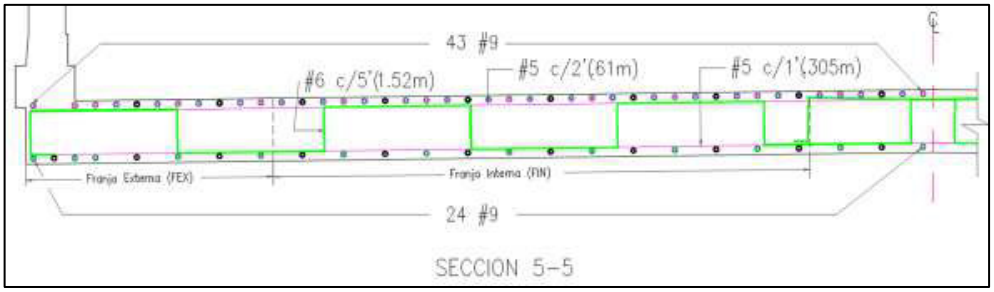


Figura 86 Refuerzo sección 5-5 - puente No 2

Fuente: Elaboración Propia.

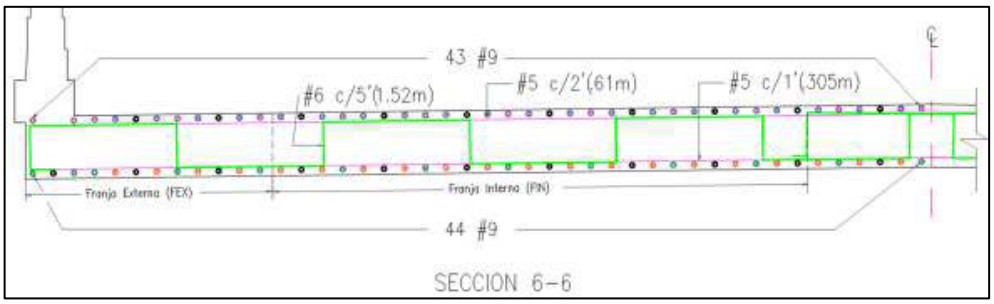


Figura 87 Refuerzo sección 6-6 - puente No 2

Fuente: Elaboración Propia.

3.5.2.7. Momento "Mn" y cortante resistente "Vn"

Los momentos y cortantes resistentes se calcularon de acuerdo a la geometría de la franja externa, especificaciones de materiales y refuerzo suministrado, empleando las ecuaciones que se presentan en los numerales 1.6.8 y 1.6.9 de este documento.

Los momentos resistentes de la franja externa se calcularon en los cortes que se presentan en la Figura 80, estos para tener en cuenta los traslapos y distribución del refuerzo en el puente.

Dado que el corte 1-1 se localiza en la zona del apoyo, se debe afectar el valor de la resistencia a fluencia del acero de refuerzo, en la zona donde se desarrolla la longitud de anclaje de las barras de acero. A continuación se presentan los cálculos.

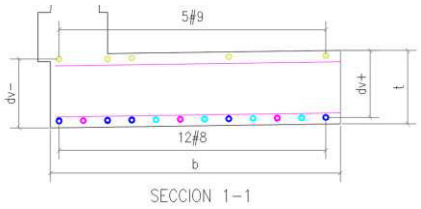
Resistencia nominal a flexión Mn + corte 1-1 - FEX

Lon-d= 0.67m = 2.8 ft Longitud de desarrollo barras

Materiales

f'c= 14 Mpa
fy= 420 Mpa
fy= 367.9 Mpa

Es= 2E+07 Mpa



SECCION 1-1

Geometría viga

b 1.80m
t= 0.46m = 1.5 ft
rec= 0.06
dv= 0.40m = 1.3 ft
Ref-prin= # 8 Diámetro de refuerzo para flexión
As = 5.1cm2
No Barr= 12
As= 61cm2 Área total de refuerzo para flexión
ρ = 0.0085 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 11 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 704 kN-m/m = 954.07 kips -ft/ft

Resistencia nominal a flexión - momento negativo

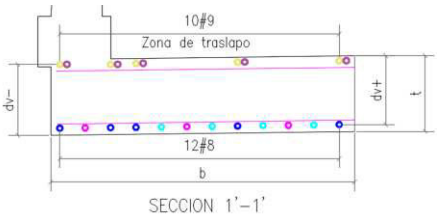
Geometría viga

t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 9 Diámetro de refuerzo para flexión
As = 6.3cm2
No Barr= 5
As= 32cm2 Área total de refuerzo para flexión
ρ = 0.0044 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 5 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 391 kN-m/m = 529.445 kips -ft/ft

Resistencia nominal a flexión Mn + corte 1a-1a - FEX

Materiales

f'c= 14 Mpa
fy= 420 Mpa
Es= 2E+07 Mpa



SECCION 1'-1'

Geometría viga

b 1.80m
t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 8 Diámetro de refuerzo para flexión
As = 5.1cm2
No Barr= 12
As= 61cm2 Área total de refuerzo para flexión
ρ = 0.0085 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 12 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 787 kN-m/m = 1065.78 kips -ft/ft

Resistencia nominal a flexión - momento negativo

Geometría viga

t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 9 Diámetro de refuerzo para flexión
As = 6.3cm2
No Barr= 10
As= 63cm2 Área total de refuerzo para flexión
ρ = 0.00879 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 12 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 809 kN-m/m = 1095.67 kips -ft/ft

MOMENTO RESISTENTE SECCION 2-2

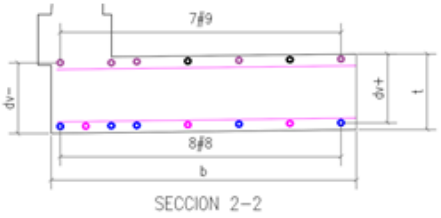
Resistencia nominal a flexión Mn + corte 2-2 - FEX

Materiales

f'c= 14 Mpa
fy= 420 Mpa
Es= 2E+07 Mpa

Geometría viga

b 1.80m
t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft



SECCION 2-2

Ref-prin= # 8 Diámetro de refuerzo para flexión
As = 5.1cm2
No Barr= 8
As= 41cm2 Área total de refuerzo para flexión
ρ = 0.00567 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 8 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 555 kN-m/m = 752.312 kips -ft/ft

Resistencia nominal a flexión - momento negativo

Geometría viga

t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 9 Diámetro de refuerzo para flexión
As = 6.3cm2
No Barr= 7
As= 44cm2 Área total de refuerzo para flexión
ρ = 0.00615 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 9 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 597 kN-m/m = 809.223 kips -ft/ft

MOMENTO RESISTENTE SECCION 3-3

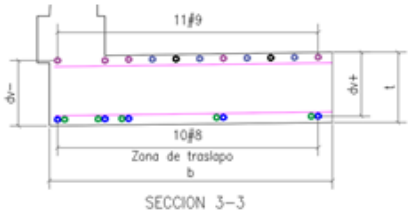
Resistencia nominal a flexión Mn + corte 3-3 - FEX

Materiales

f'c= 14 Mpa
fy= 420 Mpa
Es= 2E+07 Mpa

Geometría viga

b 1.80m
t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft



SECCION 3–3

Ref-prin= # 8 Diámetro de refuerzo para flexión
As = 5.1cm2
No Barr= 10
As= 51cm2 Área total de refuerzo para flexión
ρ = 0.00708 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 10 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 675 kN-m/m = 914.268 kips -ft/ft

Resistencia nominal a flexión - momento negativo

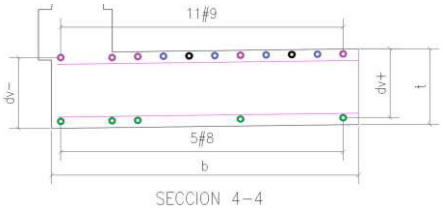
Geometría viga

t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 9 Diámetro de refuerzo para flexión
As = 6.3cm2
No Barr= 11
As= 70cm2 Área total de refuerzo para flexión
ρ = 0.00967 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 14 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 873 kN-m/m = 1183.11 kips -ft/ft

Resistencia nominal a flexión Mn + corte 4-4 - FEX

Materiales

f'c= 14 Mpa
fy= 420 Mpa
Es= 2E+07 Mpa



SECCION 4-4

Geometría viga

b 1.80m
t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 8 Diámetro de refuerzo para flexión
As = 5.1cm2
No Barr= 5
As= 26cm2 Área total de refuerzo para flexión
ρ = 0.00354 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 5 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 361 kN-m/m = 489.787 kips -ft/ft

Resistencia nominal a flexión - momento negativo

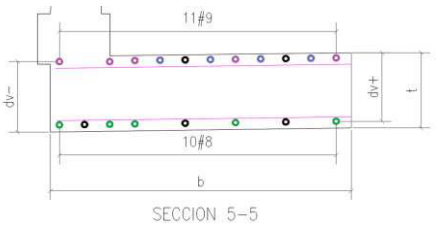
Geometría viga

t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 9 Diámetro de refuerzo para flexión
As = 6.3cm2
No Barr= 11
As= 70cm2 Área total de refuerzo para flexión
ρ = 0.00967 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 14 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 873 kN-m/m = 1183.11 kips -ft/ft

Resistencia nominal a flexión Mn + corte 5-5 - FEX

Materiales

f'c= 14 Mpa
fy= 420 Mpa
Es= 2E+07 Mpa



SECCION 5-5

Geometría viga

b 1.80m
t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 8 Diámetro de refuerzo para flexión
As = 5.1cm2
No Barr= 10
As= 51cm2 Área total de refuerzo para flexión
ρ = 0.00708 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 10 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 675 kN-m/m = 914.268 kips -ft/ft

Resistencia nominal a flexión - momento negativo

Geometría viga

t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 9 Diámetro de refuerzo para flexión
As = 6.3cm2
No Barr= 11
As= 70cm2 Área total de refuerzo para flexión
ρ = 0.00967 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 14 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 873 kN-m/m = 1183.11 kips -ft/ft

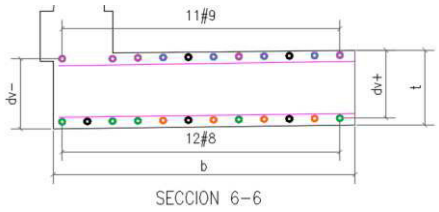
Resistencia nominal a flexión Mn + corte 6-6 - FEX

Materiales

f'c=	14	Mpa	
fy=	420	Mpa	
Es=	2E+07	Mpa	

Geometría viga

b	1.80m		
t=	0.46m	= 1.5 ft	
rec=	0.06		
d+=	0.40m	= 1.3 ft	
Ref-prin=	# 8		Diámetro de refuerzo para flexión
As =	5.1cm2		
No Barr=	12		
As=	61cm2		Área total de refuerzo para flexión
ρ =	0.0085		Cuantía de refuerzo a flexión
a=	ρ*d*fy / .85 * f'c		
a=	12 cm		
Mn=	ϕ*As*fy*(d-a/2)		5.7.3.2 AASTHO - Resistencia a flexión
Mn=	787	kN-m/m =	1065.78 kips -ft/ft



SECCION 6-6

ϕ = 0.9 5.5.4.2 AASTHO

Resistencia nominal a flexión - momento negativo

Geometría viga

t=	0.46m	= 1.5 ft	
rec=	0.06		
d+=	0.40m	= 1.3 ft	
Ref-prin=	# 9		Diámetro de refuerzo para flexión
As =	6.3cm2		
No Barr=	5		
As=	32cm2		Área total de refuerzo para flexión
ρ =	0.0044		Cuantía de refuerzo a flexión
a=	ρ*d*fy / .85 * f'c		
a=	6 cm		
Mn=	ϕ*As*fy*(d-a/2)		5.7.3.2 AASTHO - Resistencia a flexión
Mn=	441	kN-m/m =	598.137 kips -ft/ft

ϕ = 0.9 5.5.4.2 AASTHO

Según la norma, la resistencia a cortante de la sección se debe calcular con el momento y cortante actuante en el punto en estudio, por tal razón a continuación se presenta los cálculos para los punto 1, el cálculo en los demás puntos se presentan en se presentan en el Anexo 5

CAPACIDAD A CORTANTE SECCION φVn - FEX COMBINACION SERVICIO 1-1 PTO -1

Materiales

f'c=	14 Mpa =	292.6	kips/ft²	
fy=	420 Mpa =	60.9	kips/ft²	
Es=	200000 Mpa =	367.543	kips/ft²	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft²	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	0		Diámetro de estribos
Cant=	0		
Asv=	0.00 cm2	= 0.00 ft²	Área de acero transversal- Estribos
As-corte =	0.0 cm2	= 0.00 ft²	Área total de refuerzo a flexión - Punto en estudio
S=	0.00m	= 0.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.01 cm2 = 0.00 ft² **No cumple efuerzo minimo**

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	166 kN	= 37.32	kips	Cortante ultimo actuante en punto de estudio
Mu=	0 kN-m	= 0.00	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\; b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

Es = 0.00014

θ (29+3500Es) 29.5°

β = 4.4°

Vc=	877 KN	= 197.58	kips	
Vs=	0 KN	= 0.00	kips	
ϕVn1=	789 KN	= 177.82	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv =	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	789 KN	= 177.82	kips	Mínimo entre Vn1 y Vn2

3.5.2.8. Índices de sobre esfuerzo por momentos y cortantes – FEX

Antes de calcular los índices de sobre esfuerzo, se verifica que el espesor de la franja externa cumpla con las dimensiones mínimas recomendadas en la norma, la cual indica que para losas continuas el límite es 0,027*L>6,5 in

- Luz Máxima Puente = 450 in
  - h= 450*0,027
  - h =12,15 in

De acuerdo con la información suministrada la altura de la losa es de 18.1 in > 12,15 in, lo que indica que la losa cumple con la altura mínima recomendada por la norma. En la siguiente imagen se presenta las dimensiones de la losa tomada de los planos de diseño y la transcrita en AutoCAD.

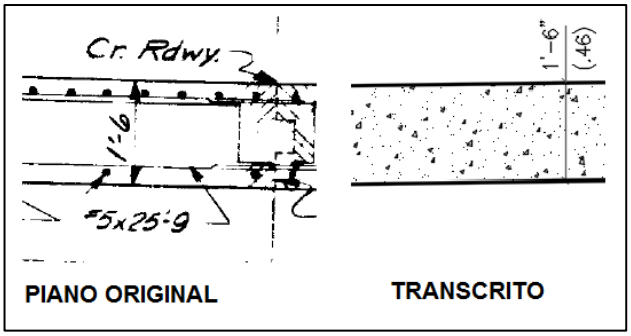


Figura 88 Revisión dimensiones losa

Fuente: Elaboración propia.

Los índices de sobre esfuerzo que se presentan a continuación se calcularon con las solicitaciones obtenidas con ayuda del programa SAP200.

Los resultados se presentan de dos formas diferentes:

1. La primera en tablas, resaltando en color rojo los índices que sobrepasan el 100% de capacidad de la franja, así como su localización.
3. Representación gráfica. (La línea roja representa la capacidad del elemento y las líneas azules representan las solicitaciones por corte y momento actuantes en el elemento).

Tabla 49 Índices de sobre esfuerzo por corte combinación servicio 1-1 Franja –FEX

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-1 V							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	-166.02	-37.41	789.09	177.82	21%
2	0.57	1.88	-132.69	-29.90	726.56	163.73	18%
3	1.14	3.75	-110.44	-24.89	673.40	151.75	16%
4	1.72	5.63	-88.59	-19.96	645.79	145.53	14%
5	2.29	7.51	-61.19	-13.79	625.88	141.04	10%
6	2.86	9.38	-46.31	-10.44	619.88	139.69	7%
7	3.43	11.26	-26.01	-5.86	626.59	141.20	4%
8	4.00	13.14	68.86	15.52	627.52	141.41	11%
9	4.58	15.01	85.40	19.24	636.34	143.40	13%
10	5.15	16.89	103.43	23.31	814.43	183.53	13%
11	5.72	18.77	125.11	28.19	762.97	171.94	16%
12	6.29	20.64	147.51	33.24	710.94	160.21	21%
13	6.86	22.52	169.39	38.17	660.21	148.78	26%
14	7.44	24.40	190.71	42.98	530.50	119.55	36%
15	8.01	26.27	211.41	47.64	479.75	108.11	44%
16	8.58	28.15	231.45	52.16	476.04	107.28	49%
16	8.58	28.15	-234.72	-52.89	476.04	107.28	49%
17	9.15	30.02	-214.80	-48.41	384.81	86.72	56%
18	9.72	31.90	-194.78	-43.89	454.60	102.44	43%
19	10.29	33.77	-174.90	-39.41	663.38	149.49	26%
20	10.87	35.65	-154.74	-34.87	747.69	168.49	21%
21	11.44	37.52	-134.40	-30.29	804.44	181.28	17%
22	12.01	39.40	-113.93	-25.67	630.12	142.00	18%
23	12.58	41.27	-93.71	-21.12	607.26	136.85	15%
24	13.15	43.15	-73.89	-16.65	593.75	133.80	12%
25	13.72	45.02	-55.54	-12.52	588.20	132.55	9%
26	14.3	46.90	-38.23	-8.62	591.04	133.19	6%
27	14.87	48.77	-21.36	-4.81	588.20	132.55	4%
28	15.44	50.65	84.69	19.08	593.75	133.80	14%
29	16.01	52.52	101.81	22.94	607.26	136.85	17%
30	16.58	54.40	122.27	27.55	630.12	142.00	19%
31	17.15	56.27	142.62	32.14	804.44	181.28	18%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-1 V							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
32	17.72	58.15	162.77	36.68	747.69	168.49	22%
33	18.3	60.02	182.65	41.16	663.38	149.49	28%
34	18.87	61.90	202.67	45.67	454.60	102.44	45%
35	19.44	63.77	222.59	50.16	384.81	86.72	58%
36	20.01	65.65	242.13	54.56	476.04	107.28	51%
37	20.01	65.65	-223.55	-50.38	476.04	107.28	47%
37	20.58	67.53	-202.85	-45.71	479.75	108.11	42%
38	21.15	69.40	-181.53	-40.91	530.50	119.55	34%
39	21.73	71.28	-159.65	-35.98	660.21	148.78	24%
40	22.3	73.16	-137.25	-30.93	710.94	160.21	19%
41	22.87	75.03	-115.56	-26.04	762.97	171.94	15%
42	23.44	76.91	-97.49	-21.97	814.43	183.53	12%
43	24.01	78.79	-80.49	-18.14	636.34	143.40	13%
44	24.59	80.66	-63.14	-14.23	627.52	141.41	10%
45	25.16	82.54	-45.58	-10.27	626.59	141.20	7%
46	25.73	84.42	-27.58	-6.22	619.88	139.69	4%
47	26.3	86.29	-9.15	-2.06	625.88	141.04	1%
48	26.87	88.17	98.29	22.15	645.79	145.53	15%
49	27.45	90.05	120.24	27.10	673.40	151.75	18%
50	28.02	91.92	143.13	32.25	726.56	163.73	20%
51	28.59	93.80	166.02	37.41	789.09	177.82	21%

Fuente: Elaboración Propia

Tabla 50 Índices de sobre esfuerzo por corte combinación servicio 1-2 Franja –FEX

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-2							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	-166.85	-37.60	789.09	177.82	21%
2	0.57	1.88	-136.75	-30.82	726.56	163.73	19%
3	1.14	3.75	-115.82	-26.10	673.40	151.75	17%
4	1.72	5.63	-95.08	-21.43	645.79	145.53	15%
5	2.29	7.51	-74.57	-16.80	625.88	141.04	12%
6	2.86	9.38	-54.35	-12.25	619.88	139.69	9%
7	3.43	11.26	-34.44	-7.76	626.59	141.20	5%
8	4.00	13.14	-14.91	-3.36	627.52	141.41	2%
9	4.58	15.01	97.81	22.04	636.34	143.40	15%
10	5.15	16.89	116.69	26.30	814.43	183.53	14%
11	5.72	18.77	134.99	30.42	762.97	171.94	18%
12	6.29	20.64	152.70	34.41	710.94	160.21	21%
13	6.86	22.52	169.82	38.27	660.21	148.78	26%
14	7.44	24.40	187.75	42.31	530.50	119.55	35%
15	8.01	26.27	205.41	46.29	479.75	108.11	43%
16	8.58	28.15	222.48	50.14	476.04	107.28	47%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-2							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
16	8.58	28.15	-223.65	-50.40	476.04	107.28	47%
17	9.15	30.02	-206.76	-46.59	384.81	86.72	54%
18	9.72	31.90	-189.41	-42.68	454.60	102.44	42%
19	10.29	33.77	-171.67	-38.69	663.38	149.49	26%
20	10.87	35.65	-153.60	-34.61	747.69	168.49	21%
21	11.44	37.52	-135.33	-30.50	804.44	181.28	17%
22	12.01	39.40	-117.91	-26.57	630.12	142.00	19%
23	12.58	41.27	-100.28	-22.60	607.26	136.85	17%
24	13.15	43.15	-82.27	-18.54	593.75	133.80	14%
25	13.72	45.02	-64.22	-14.47	588.20	132.55	11%
26	14.3	46.90	-46.23	-10.42	591.04	133.19	8%
27	14.87	48.77	-28.37	-6.39	588.20	132.55	5%
28	15.44	50.65	88.16	19.87	593.75	133.80	15%
29	16.01	52.52	105.79	23.84	607.26	136.85	17%
30	16.58	54.40	123.14	27.75	630.12	142.00	20%
31	17.15	56.27	141.48	31.88	804.44	181.28	18%
32	17.72	58.15	159.55	35.95	747.69	168.49	21%
33	18.3	60.02	177.29	39.95	663.38	149.49	27%
34	18.87	61.90	194.64	43.86	454.60	102.44	43%
35	19.44	63.77	211.53	47.67	384.81	86.72	55%
36	20.01	65.65	228.03	51.39	476.04	107.28	48%
37	20.01	65.65	-217.54	-49.02	476.04	107.28	46%
37	20.58	67.53	-199.88	-45.04	479.75	108.11	42%
38	21.15	69.40	-181.94	-41.00	530.50	119.55	34%
39	21.73	71.28	-164.83	-37.14	660.21	148.78	25%
40	22.3	73.16	-147.12	-33.15	710.94	160.21	21%
41	22.87	75.03	-128.83	-29.03	762.97	171.94	17%
42	23.44	76.91	-109.94	-24.77	814.43	183.53	13%
43	24.01	78.79	-90.50	-20.39	636.34	143.40	14%
44	24.59	80.66	-70.81	-15.96	627.52	141.41	11%
45	25.16	82.54	-50.90	-11.47	626.59	141.20	8%
46	25.73	84.42	-30.84	-6.95	619.88	139.69	5%
47	26.3	86.29	-10.65	-2.40	625.88	141.04	2%
48	26.87	88.17	103.68	23.36	645.79	145.53	16%
49	27.45	90.05	124.61	28.08	673.40	151.75	19%
50	28.02	91.92	145.68	32.83	726.56	163.73	20%
51	28.59	93.80	166.85	37.60	789.09	177.82	21%

Fuente: Elaboración Propia

Tabla 51 Índices de sobre esfuerzo por momento combinación servicio 1-1 Franja –FEX

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-1												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
1	0.00	0.00	0.00	0.00	0.00	0.00	-441.00	-325.46	787.00	580.81	0%	0%

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-1												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
2	0.57	1.88	0.00	0.00	85.29	62.94	-441.00	-325.46	787.00	580.81	0%	11%
3	1.14	3.75	0.00	0.00	151.72	111.97	-441.00	-325.46	787.00	580.81	0%	19%
4	1.72	5.63	0.00	0.00	193.83	143.05	-441.00	-325.46	787.00	580.81	0%	25%
5	2.29	7.51	0.00	0.00	230.32	169.98	-441.00	-325.46	787.00	580.81	0%	29%
6	2.86	9.38	0.00	0.00	244.05	180.11	-441.00	-325.46	787.00	580.81	0%	31%
7	3.43	11.26	0.00	0.00	242.00	178.60	-809.00	-597.04	787.00	580.81	0%	31%
8	4.00	13.14	0.00	0.00	225.30	166.27	-809.00	-597.04	787.00	580.81	0%	29%
9	4.58	15.01	0.00	0.00	207.40	153.06	-597.00	-440.59	787.00	580.81	0%	26%
10	5.15	16.89	-16.35	-12.07	185.75	137.08	-597.00	-440.59	787.00	580.81	3%	24%
11	5.72	18.77	-52.81	-38.97	146.75	108.30	-597.00	-440.59	787.00	580.81	9%	19%
12	6.29	20.64	-96.19	-70.99	91.38	67.44	-873.00	-644.27	787.00	580.81	11%	12%
13	6.86	22.52	-146.49	-108.11	23.15	17.08	-873.00	-644.27	787.00	580.81	17%	3%
14	7.44	24.40	-203.72	-150.35	0.00	0.00	-873.00	-644.27	555.00	409.59	23%	0%
15	8.01	26.27	-269.21	-198.68	0.00	0.00	-873.00	-644.27	555.00	409.59	31%	0%
16	8.58	28.15	-355.79	-262.57	0.00	0.00	-873.00	-644.27	675.00	498.15	41%	0%
17	9.15	30.02	-257.63	-190.13	0.00	0.00	-873.00	-644.27	361.00	266.42	30%	0%
18	9.72	31.90	-172.22	-127.10	0.00	0.00	-873.00	-644.27	361.00	266.42	20%	0%
19	10.29	33.77	-106.67	-78.72	18.26	13.48	-597.00	-440.59	675.00	498.15	18%	3%
20	10.866	35.65	-56.49	-41.69	86.98	64.19	-597.00	-440.59	675.00	498.15	9%	13%
21	11.4375	37.52	-13.34	-9.84	152.69	112.69	-441.00	-325.46	787.00	580.81	3%	19%
22	12.009	39.40	0.00	0.00	205.52	151.67	-441.00	-325.46	787.00	580.81	0%	26%
23	12.5805	41.27	0.00	0.00	245.13	180.91	-441.00	-325.46	787.00	580.81	0%	31%
24	13.152	43.15	0.00	0.00	272.60	201.18	-441.00	-325.46	787.00	580.81	0%	35%
25	13.7235	45.02	0.00	0.00	287.82	212.41	-441.00	-325.46	787.00	580.81	0%	37%
26	14.295	46.90	0.00	0.00	289.62	213.74	-441.00	-325.46	787.00	580.81	0%	37%
27	14.8665	48.77	0.00	0.00	287.80	212.40	-441.00	-325.46	787.00	580.81	0%	37%
28	15.438	50.65	0.00	0.00	272.59	201.17	-441.00	-325.46	787.00	580.81	0%	35%
29	16.0095	52.52	0.00	0.00	245.11	180.89	-441.00	-325.46	787.00	580.81	0%	31%
30	16.581	54.40	0.00	0.00	205.51	151.67	-441.00	-325.46	787.00	580.81	0%	26%
31	17.1525	56.27	-13.34	-9.84	152.69	112.69	-441.00	-325.46	787.00	580.81	3%	19%
32	17.724	58.15	-56.50	-41.70	86.98	64.19	-597.00	-440.59	675.00	498.15	9%	13%
33	18.2955	60.02	-106.57	-78.65	18.27	13.48	-597.00	-440.59	675.00	498.15	18%	3%
34	18.867	61.90	-172.21	-127.09	0.00	0.00	-873.00	-644.27	361.00	266.42	20%	0%
35	19.4385	63.77	-257.63	-190.13	0.00	0.00	-873.00	-644.27	361.00	266.42	30%	0%
36	20.01	65.65	-355.78	-262.57	0.00	0.00	-873.00	-644.27	675.00	498.15	41%	0%
37	20.582	67.53	-269.21	-198.68	0.00	0.00	-873.00	-644.27	555.00	409.59	31%	0%
38	21.154	69.40	-203.72	-150.35	0.00	0.00	-873.00	-644.27	555.00	409.59	23%	0%
39	21.726	71.28	-146.49	-108.11	23.14	17.08	-873.00	-644.27	787.00	580.81	17%	3%
40	22.298	73.16	-96.19	-70.99	91.38	67.44	-873.00	-644.27	787.00	580.81	11%	12%
41	22.87	75.03	-52.81	-38.97	146.79	108.33	-597.00	-440.59	787.00	580.81	9%	19%
42	23.442	76.91	-16.36	-12.07	185.77	137.10	-597.00	-440.59	787.00	580.81	3%	24%
43	24.014	78.79	0.00	0.00	207.44	153.09	-597.00	-440.59	787.00	580.81	0%	26%
44	24.586	80.66	0.00	0.00	225.26	166.24	-809.00	-597.04	787.00	580.81	0%	29%
45	25.158	82.54	0.00	0.00	241.97	178.57	-809.00	-597.04	787.00	580.81	0%	31%
46	25.73	84.42	0.00	0.00	244.03	180.09	-441.00	-325.46	787.00	580.81	0%	31%
47	26.302	86.29	0.00	0.00	230.31	169.97	-441.00	-325.46	787.00	580.81	0%	29%
48	26.874	88.17	0.00	0.00	199.84	147.48	-441.00	-325.46	787.00	580.81	0%	25%
49	27.446	90.05	0.00	0.00	151.75	111.99	-441.00	-325.46	787.00	580.81	0%	19%

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-1												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
50	28.018	91.92	0.00	0.00	85.34	62.98	-441.00	-325.46	787.00	580.81	0%	11%
51	28.59	93.80	0.00	0.00	0.00	0.00	-441.00	-325.46	787.00	580.81	0%	0%

Fuente: Elaboración Propia

Tabla 52 Índices de sobre esfuerzo por momento combinación servicio 1-2 Franja –FEX

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-2												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
1	0.00	0.00	0.00	0.00	0.00	0.00	-441.00	-325.46	787.00	580.81	0%	0%
2	0.57	1.88	0.00	0.00	86.75	64.02	-441.00	-325.46	787.00	580.81	0%	15%
3	1.14	3.75	0.00	0.00	156.38	115.41	-441.00	-325.46	787.00	580.81	0%	27%
4	1.72	5.63	0.00	0.00	209.08	154.30	-441.00	-325.46	787.00	580.81	0%	36%
5	2.29	7.51	0.00	0.00	245.19	180.95	-441.00	-325.46	787.00	580.81	0%	42%
6	2.86	9.38	0.00	0.00	265.17	195.70	-441.00	-325.46	787.00	580.81	0%	46%
7	3.43	11.26	0.00	0.00	269.58	198.95	-809.00	-597.04	787.00	580.81	0%	46%
8	4.00	13.14	0.00	0.00	259.28	191.35	-809.00	-597.04	787.00	580.81	0%	45%
9	4.58	15.01	0.00	0.00	240.99	177.85	-597.00	-440.59	787.00	580.81	0%	41%
10	5.15	16.89	-11.29	-8.33	208.09	153.57	-597.00	-440.59	787.00	580.81	3%	36%
11	5.72	18.77	-47.17	-34.81	161.37	119.09	-597.00	-440.59	787.00	580.81	11%	28%
12	6.29	20.64	-89.99	-66.41	101.77	75.11	-873.00	-644.27	787.00	580.81	14%	18%
13	6.86	22.52	-139.73	-103.12	30.30	22.36	-873.00	-644.27	787.00	580.81	22%	5%
14	7.44	24.40	-198.97	-146.84	0.00	0.00	-873.00	-644.27	555.00	409.59	31%	0%
15	8.01	26.27	-289.45	-213.61	0.00	0.00	-873.00	-644.27	555.00	409.59	45%	0%
16	8.58	28.15	-391.34	-288.81	0.00	0.00	-873.00	-644.27	675.00	498.15	61%	0%
17	9.15	30.02	-289.11	-213.36	0.00	0.00	-873.00	-644.27	361.00	266.42	45%	0%
18	9.72	31.90	-196.65	-145.13	0.00	0.00	-873.00	-644.27	361.00	266.42	31%	0%
19	10.29	33.77	-117.67	-86.84	0.00	0.00	-597.00	-440.59	675.00	498.15	27%	0%
20	10.866	35.65	-59.08	-43.60	100.40	74.10	-597.00	-440.59	675.00	498.15	13%	20%
21	11.4375	37.52	-15.70	-11.59	163.93	120.98	-441.00	-325.46	787.00	580.81	5%	28%
22	12.009	39.40	0.00	0.00	216.55	159.81	-441.00	-325.46	787.00	580.81	0%	37%
23	12.5805	41.27	0.00	0.00	257.57	190.09	-441.00	-325.46	787.00	580.81	0%	44%
24	13.152	43.15	0.00	0.00	286.60	211.51	-441.00	-325.46	787.00	580.81	0%	49%
25	13.7235	45.02	0.00	0.00	303.37	223.89	-441.00	-325.46	787.00	580.81	0%	52%
26	14.295	46.90	0.00	0.00	307.78	227.14	-441.00	-325.46	787.00	580.81	0%	53%
27	14.8665	48.77	0.00	0.00	303.33	223.86	-441.00	-325.46	787.00	580.81	0%	52%
28	15.438	50.65	0.00	0.00	286.57	211.49	-441.00	-325.46	787.00	580.81	0%	49%
29	16.0095	52.52	0.00	0.00	257.54	190.06	-441.00	-325.46	787.00	580.81	0%	44%
30	16.581	54.40	0.00	0.00	216.52	159.79	-441.00	-325.46	787.00	580.81	0%	37%
31	17.1525	56.27	-15.70	-11.59	163.91	120.97	-441.00	-325.46	787.00	580.81	5%	28%
32	17.724	58.15	-59.08	-43.60	100.27	74.00	-597.00	-440.59	675.00	498.15	13%	20%
33	18.2955	60.02	-117.66	-86.83	26.36	19.45	-597.00	-440.59	675.00	498.15	27%	5%
34	18.867	61.90	-196.65	-145.13	0.00	0.00	-873.00	-644.27	361.00	266.42	31%	0%
35	19.4385	63.77	-289.11	-213.36	0.00	0.00	-873.00	-644.27	361.00	266.42	45%	0%
36	20.01	65.65	-391.33	-288.80	0.00	0.00	-873.00	-644.27	675.00	498.15	61%	0%

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-2												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
37	20.582	67.53	-289.45	-213.61	0.00	0.00	-873.00	-644.27	555.00	409.59	45%	0%
38	21.154	69.40	-198.97	-146.84	0.00	0.00	-873.00	-644.27	555.00	409.59	31%	0%
39	21.726	71.28	-139.72	-103.11	0.00	0.00	-873.00	-644.27	787.00	580.81	22%	0%
40	22.298	73.16	-89.98	-66.41	101.79	75.12	-873.00	-644.27	787.00	580.81	14%	18%
41	22.87	75.03	-47.17	-34.81	161.40	119.11	-597.00	-440.59	787.00	580.81	11%	28%
42	23.442	76.91	-11.29	-8.33	208.12	153.59	-597.00	-440.59	787.00	580.81	3%	36%
43	24.014	78.79	0.00	0.00	241.03	177.88	-597.00	-440.59	787.00	580.81	0%	41%
44	24.586	80.66	0.00	0.00	259.34	191.39	-809.00	-597.04	787.00	580.81	0%	45%
45	25.158	82.54	0.00	0.00	269.54	198.92	-809.00	-597.04	787.00	580.81	0%	46%
46	25.73	84.42	0.00	0.00	265.15	195.68	-441.00	-325.46	787.00	580.81	0%	46%
47	26.302	86.29	0.00	0.00	245.18	180.94	-441.00	-325.46	787.00	580.81	0%	42%
48	26.874	88.17	0.00	0.00	209.09	154.31	-441.00	-325.46	787.00	580.81	0%	36%
49	27.446	90.05	0.00	0.00	156.40	115.42	-441.00	-325.46	787.00	580.81	0%	27%
50	28.018	91.92	0.00	0.00	86.79	64.05	-441.00	-325.46	787.00	580.81	0%	15%
51	28.59	93.80	0.00	0.00	0.00	0.00	-441.00	-325.46	787.00	580.81	0%	0%

Fuente: Elaboración Propia.

Tabla 53 Índices de sobre esfuerzo por corte combinación resistencia 1-1 Franja –FEX

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-1							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	-324.18	-73.05	725.29	163.44	45%
2	0.57	1.88	-258.13	-58.17	621.01	139.94	42%
3	1.14	3.75	-217.87	-49.10	549.18	123.76	40%
4	1.72	5.63	-178.54	-40.23	508.96	114.69	35%
5	2.29	7.51	-14.27	-3.22	509.28	114.77	3%
6	2.86	9.38	-103.21	-23.26	483.27	108.91	21%
7	3.43	11.26	-67.49	-15.21	490.58	110.55	14%
8	4.00	13.14	-36.06	-8.13	510.14	114.96	7%
9	4.58	15.01	-8.22	-1.85	528.78	119.16	2%
10	5.15	16.89	199.20	44.89	698.21	157.34	29%
11	5.72	18.77	238.72	53.80	638.65	143.92	37%
12	6.29	20.64	278.72	62.81	582.54	131.28	48%
13	6.86	22.52	318.13	71.69	530.89	119.64	60%
14	7.44	24.40	356.22	80.27	396.26	89.30	90%
15	8.01	26.27	392.87	88.53	354.29	79.84	111%
16	8.58	28.15	427.97	96.44	354.53	79.89	121%
16	8.58	28.15	-431.10	-97.15	354.53	79.89	122%
17	9.15	30.02	-396.26	-89.30	270.59	60.98	146%
18	9.72	31.90	-361.18	-81.39	327.88	73.89	110%
19	10.29	33.77	-326.43	-73.56	539.95	121.68	60%
20	10.87	35.65	-291.05	-65.59	635.72	143.26	46%
21	11.44	37.52	-255.52	-57.58	699.24	157.57	37%
22	12.01	39.40	-219.10	-49.37	492.33	110.95	45%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-1							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
23	12.58	41.27	-183.56	-41.37	468.71	105.62	39%
24	13.15	43.15	-148.95	-33.57	455.18	102.58	33%
25	13.72	45.02	-117.74	-26.53	449.89	101.38	26%
26	14.3	46.90	-88.97	-20.05	453.37	102.17	20%
27	14.87	48.77	-61.32	-13.82	449.89	101.38	14%
28	15.44	50.65	-33.54	-7.56	455.18	102.58	7%
29	16.01	52.52	202.40	45.61	468.71	105.62	43%
30	16.58	54.40	238.50	53.75	492.33	110.95	48%
31	17.15	56.27	274.34	61.82	699.24	157.57	39%
32	17.72	58.15	309.73	69.80	635.72	143.26	49%
33	18.3	60.02	344.48	77.63	539.95	121.68	64%
34	18.87	61.90	379.56	85.53	327.88	73.89	116%
35	19.44	63.77	414.40	93.39	270.59	60.98	153%
36	20.01	65.65	448.35	101.04	354.53	79.89	126%
37	20.01	65.65	-409.59	-92.30	354.53	79.89	116%
37	20.58	67.53	-372.94	-84.04	354.29	79.84	105%
38	21.15	69.40	-334.86	-75.46	396.26	89.30	85%
39	21.73	71.28	-295.46	-66.58	530.89	119.64	56%
40	22.3	73.16	-254.86	-57.43	582.54	131.28	44%
41	22.87	75.03	-215.90	-48.65	638.65	143.92	34%
42	23.44	76.91	-185.69	-41.85	698.21	157.34	27%
43	24.01	78.79	-157.33	-35.45	528.78	119.16	30%
44	24.59	80.66	-128.49	-28.96	510.14	114.96	25%
45	25.16	82.54	-99.14	-22.34	490.58	110.55	20%
46	25.73	84.42	-68.79	-15.50	483.27	108.91	14%
47	26.3	86.29	-37.40	-8.43	509.28	114.77	7%
48	26.87	88.17	-4.98	-1.12	508.96	114.69	1%
49	27.45	90.05	241.39	54.40	549.18	123.76	44%
50	28.02	91.92	282.44	63.65	621.01	139.94	45%
51	28.59	93.80	324.18	73.05	725.29	163.44	45%

Fuente: Elaboración Propia.

Tabla 54 Índices de sobre esfuerzo por cortante combinación resistencia 1-2 Franja –FEX

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-2							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	-326.12	-73.49	724.57	163.28	45%
2	0.57	1.88	-267.57	-60.30	616.20	138.86	43%
3	1.14	3.75	-230.40	-51.92	540.82	121.87	43%
4	1.72	5.63	-193.65	-43.64	496.53	111.89	39%
5	2.29	7.51	-157.45	-35.48	471.64	106.28	33%
6	2.86	9.38	-121.90	-27.47	460.70	103.82	26%
7	3.43	11.26	-87.11	-19.63	461.32	103.96	19%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-2							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
8	4.00	13.14	-53.18	-11.98	472.74	106.53	11%
9	4.58	15.01	-20.23	-4.56	489.80	110.38	4%
10	5.15	16.89	230.07	51.85	698.85	157.48	33%
11	5.72	18.77	261.13	58.85	642.48	144.78	41%
12	6.29	20.64	290.81	65.53	588.91	132.71	49%
13	6.86	22.52	319.12	71.91	538.93	121.45	59%
14	7.44	24.40	349.34	78.72	402.04	90.60	87%
15	8.01	26.27	378.91	85.39	340.84	76.81	111%
16	8.58	28.15	407.11	91.74	335.60	75.63	121%
16	8.58	28.15	-405.33	-91.34	335.60	75.63	121%
17	9.15	30.02	-377.55	-85.08	252.07	56.80	150%
18	9.72	31.90	-348.69	-78.58	305.88	68.93	114%
19	10.29	33.77	-318.91	-71.87	525.54	118.43	61%
20	10.87	35.65	-288.38	-64.99	631.97	142.41	46%
21	11.44	37.52	-257.23	-57.97	693.73	156.33	37%
22	12.01	39.40	-228.36	-51.46	479.87	108.14	48%
23	12.58	41.27	-198.84	-44.81	455.39	102.62	44%
24	13.15	43.15	-168.45	-37.96	440.83	99.34	38%
25	13.72	45.02	-137.96	-31.09	434.55	97.93	32%
26	14.3	46.90	-107.55	-24.24	435.91	98.23	25%
27	14.87	48.77	-77.55	-17.48	434.55	97.93	18%
28	15.44	50.65	-47.92	-10.80	440.83	99.34	11%
29	16.01	52.52	-18.85	-4.25	455.39	102.62	4%
30	16.58	54.40	240.54	54.21	479.87	108.14	50%
31	17.15	56.27	271.69	61.23	693.73	156.33	39%
32	17.72	58.15	302.23	68.11	631.97	142.41	48%
33	18.3	60.02	332.01	74.82	525.54	118.43	63%
34	18.87	61.90	360.87	81.32	305.88	68.93	118%
35	19.44	63.77	388.65	87.58	252.07	56.80	154%
36	20.01	65.65	415.53	93.64	335.60	75.63	124%
37	20.01	65.65	-395.61	-89.15	335.60	75.63	118%
37	20.58	67.53	-366.04	-82.49	340.84	76.81	107%
38	21.15	69.40	-335.81	-75.67	402.04	90.60	84%
39	21.73	71.28	-307.51	-69.30	538.93	121.45	57%
40	22.3	73.16	-277.83	-62.61	588.91	132.71	47%
41	22.87	75.03	-246.78	-55.61	642.48	144.78	38%
42	23.44	76.91	-214.35	-48.30	698.85	157.48	31%
43	24.01	78.79	-180.64	-40.71	489.80	110.38	37%
44	24.59	80.66	-146.32	-32.97	472.74	106.53	31%
45	25.16	82.54	-111.54	-25.14	461.32	103.96	24%
46	25.73	84.42	-76.37	-17.21	460.70	103.82	17%
47	26.3	86.29	-40.91	-9.22	471.64	106.28	9%
48	26.87	88.17	-6.53	-1.47	496.53	111.89	1%
49	27.45	90.05	250.85	56.53	540.82	121.87	46%
50	28.02	91.92	288.35	64.98	616.20	138.86	47%
51	28.59	93.80	326.12	73.49	724.57	163.28	45%

Fuente: Elaboración Propia.

Tabla 55 Índices de sobre esfuerzo por momento combinación resistencia 1-1 Franja –FEX

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-1												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
1	0.00	0.00	0.00	0.00	0.00	0.00	-441.00	-325.46	787.00	580.81	0%	0%
2	0.57	1.88	0.00	0.00	166.20	122.66	-441.00	-325.46	787.00	580.81	0%	21%
3	1.14	3.75	0.00	0.00	295.13	217.81	-441.00	-325.46	787.00	580.81	0%	38%
4	1.72	5.63	0.00	0.00	387.98	286.33	-441.00	-325.46	787.00	580.81	0%	49%
5	2.29	7.51	0.00	0.00	446.43	329.47	-441.00	-325.46	787.00	580.81	0%	57%
6	2.86	9.38	0.00	0.00	472.46	348.68	-441.00	-325.46	787.00	580.81	0%	60%
7	3.43	11.26	0.00	0.00	468.37	345.66	-809.00	-597.04	787.00	580.81	0%	60%
8	4.00	13.14	-4.38	-3.23	436.78	322.34	-809.00	-597.04	787.00	580.81	1%	55%
9	4.58	15.01	-43.10	-31.81	408.97	301.82	-597.00	-440.59	787.00	580.81	7%	52%
10	5.15	16.89	-91.36	-67.42	379.04	279.73	-597.00	-440.59	787.00	580.81	15%	48%
11	5.72	18.77	-149.14	-110.07	315.39	232.76	-597.00	-440.59	787.00	580.81	25%	40%
12	6.29	20.64	-216.45	-159.74	220.12	162.45	-873.00	-644.27	787.00	580.81	25%	28%
13	6.86	22.52	-293.28	-216.44	101.56	74.95	-873.00	-644.27	787.00	580.81	34%	13%
14	7.44	24.40	-379.64	-280.17	0.00	0.00	-873.00	-644.27	555.00	409.59	43%	0%
15	8.01	26.27	-478.63	-353.23	0.00	0.00	-873.00	-644.27	555.00	409.59	55%	0%
16	8.58	28.15	-620.11	-457.64	0.00	0.00	-873.00	-644.27	675.00	498.15	71%	0%
17	9.15	30.02	-454.19	-335.19	0.00	0.00	-873.00	-644.27	361.00	266.42	52%	0%
18	9.72	31.90	-311.36	-229.78	0.00	0.00	-873.00	-644.27	361.00	266.42	36%	0%
19	10.29	33.77	-207.93	-153.45	0.00	0.00	-597.00	-440.59	675.00	498.15	35%	0%
20	10.866	35.65	-134.19	-99.03	199.75	147.42	-597.00	-440.59	675.00	498.15	22%	30%
21	11.4375	37.52	-69.95	-51.62	316.49	233.57	-441.00	-325.46	787.00	580.81	16%	40%
22	12.009	39.40	-15.23	-11.24	409.81	302.44	-441.00	-325.46	787.00	580.81	3%	52%
23	12.5805	41.27	0.00	0.00	478.96	353.47	-441.00	-325.46	787.00	580.81	0%	61%
24	13.152	43.15	0.00	0.00	526.44	388.51	-441.00	-325.46	787.00	580.81	0%	67%
25	13.7235	45.02	0.00	0.00	551.98	407.36	-441.00	-325.46	787.00	580.81	0%	70%
26	14.295	46.90	0.00	0.00	552.89	408.03	-441.00	-325.46	787.00	580.81	0%	70%
27	14.8665	48.77	0.00	0.00	551.93	407.32	-441.00	-325.46	787.00	580.81	0%	70%
28	15.438	50.65	0.00	0.00	526.41	388.49	-441.00	-325.46	787.00	580.81	0%	67%
29	16.0095	52.52	0.00	0.00	478.93	353.45	-441.00	-325.46	787.00	580.81	0%	61%
30	16.581	54.40	-15.23	-11.24	409.79	302.43	-441.00	-325.46	787.00	580.81	3%	52%
31	17.1525	56.27	-69.95	-51.62	316.48	233.56	-441.00	-325.46	787.00	580.81	16%	40%
32	17.724	58.15	-134.19	-99.03	199.76	147.42	-597.00	-440.59	675.00	498.15	22%	30%
33	18.2955	60.02	-207.93	-153.45	82.62	60.97	-597.00	-440.59	675.00	498.15	35%	12%
34	18.867	61.90	-311.35	-229.78	0.00	0.00	-873.00	-644.27	361.00	266.42	36%	0%
35	19.4385	63.77	-454.19	-335.19	0.00	0.00	-873.00	-644.27	361.00	266.42	52%	0%
36	20.01	65.65	-620.09	-457.63	0.00	0.00	-873.00	-644.27	675.00	498.15	71%	0%
37	20.582	67.53	-478.63	-353.23	0.00	0.00	-873.00	-644.27	555.00	409.59	55%	0%
38	21.154	69.40	-379.65	-280.18	0.00	0.00	-873.00	-644.27	555.00	409.59	43%	0%
39	21.726	71.28	-293.29	-216.45	0.00	0.00	-873.00	-644.27	787.00	580.81	34%	0%
40	22.298	73.16	-216.45	-159.74	220.12	162.45	-873.00	-644.27	787.00	580.81	25%	28%
41	22.87	75.03	-149.15	-110.07	315.42	232.78	-597.00	-440.59	787.00	580.81	25%	40%
42	23.442	76.91	-91.37	-67.43	379.10	279.78	-597.00	-440.59	787.00	580.81	15%	48%
43	24.014	78.79	-43.11	-31.82	409.07	301.89	-597.00	-440.59	787.00	580.81	7%	52%
44	24.586	80.66	-4.38	-3.23	435.59	321.47	-809.00	-597.04	787.00	580.81	1%	55%
45	25.158	82.54	0.00	0.00	468.30	345.61	-809.00	-597.04	787.00	580.81	0%	60%

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-1												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
46	25.73	84.42	0.00	0.00	472.42	348.65	-441.00	-325.46	787.00	580.81	0%	60%
47	26.302	86.29	0.00	0.00	446.42	329.46	-441.00	-325.46	787.00	580.81	0%	57%
48	26.874	88.17	0.00	0.00	388.01	286.35	-441.00	-325.46	787.00	580.81	0%	49%
49	27.446	90.05	0.00	0.00	295.20	217.86	-441.00	-325.46	787.00	580.81	0%	38%
50	28.018	91.92	0.00	0.00	166.32	122.74	-441.00	-325.46	787.00	580.81	0%	21%
51	28.59	93.80	0.00	0.00	0.00	0.00	-441.00	-325.46	787.00	580.81	0%	0%

Fuente: Elaboración Propia.

Tabla 56 Índices de sobre esfuerzo por momento combinación resistencia 1-2 Franja –FEX

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-2												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
1	0.00	0.00	0.00	0.00	0.00	0.00	-441.00	-325.46	787.00	580.81	0%	0%
2	0.57	1.88	0.00	0.00	169.61	125.17	-441.00	-325.46	787.00	580.81	0%	22%
3	1.14	3.75	0.00	0.00	305.97	225.81	-441.00	-325.46	787.00	580.81	0%	39%
4	1.72	5.63	0.00	0.00	409.52	302.23	-441.00	-325.46	787.00	580.81	0%	52%
5	2.29	7.51	0.00	0.00	481.05	355.01	-441.00	-325.46	787.00	580.81	0%	61%
6	2.86	9.38	0.00	0.00	521.63	384.96	-441.00	-325.46	787.00	580.81	0%	66%
7	3.43	11.26	0.00	0.00	532.56	393.03	-809.00	-597.04	787.00	580.81	0%	68%
8	4.00	13.14	0.00	0.00	515.88	380.72	-809.00	-597.04	787.00	580.81	0%	66%
9	4.58	15.01	-32.61	-24.07	487.17	359.53	-597.00	-440.59	787.00	580.81	5%	62%
10	5.15	16.89	-79.55	-58.71	431.04	318.11	-597.00	-440.59	787.00	580.81	13%	55%
11	5.72	18.77	-136.02	-100.38	349.37	257.84	-597.00	-440.59	787.00	580.81	23%	44%
12	6.29	20.64	-202.02	-149.09	244.30	180.29	-873.00	-644.27	787.00	580.81	23%	31%
13	6.86	22.52	-277.57	-204.85	118.21	87.24	-873.00	-644.27	787.00	580.81	32%	15%
14	7.44	24.40	-368.58	-272.01	0.00	0.00	-873.00	-644.27	555.00	409.59	42%	0%
15	8.01	26.27	-525.75	-388.00	0.00	0.00	-873.00	-644.27	555.00	409.59	60%	0%
16	8.58	28.15	-702.85	-518.70	0.00	0.00	-873.00	-644.27	675.00	498.15	81%	0%
17	9.15	30.02	-527.45	-389.26	0.00	0.00	-873.00	-644.27	361.00	266.42	60%	0%
18	9.72	31.90	-368.23	-271.75	0.00	0.00	-873.00	-644.27	361.00	266.42	42%	0%
19	10.29	33.77	-233.77	-172.52	101.50	74.91	-597.00	-440.59	675.00	498.15	39%	15%
20	10.866	35.65	-140.20	-103.47	230.73	170.28	-597.00	-440.59	675.00	498.15	23%	34%
21	11.4375	37.52	-75.45	-55.68	342.65	252.88	-441.00	-325.46	787.00	580.81	17%	44%
22	12.009	39.40	-20.20	-14.91	435.48	321.38	-441.00	-325.46	787.00	580.81	5%	55%
23	12.5805	41.27	0.00	0.00	507.93	374.85	-441.00	-325.46	787.00	580.81	0%	65%
24	13.152	43.15	0.00	0.00	559.03	412.56	-441.00	-325.46	787.00	580.81	0%	71%
25	13.7235	45.02	0.00	0.00	588.19	434.08	-441.00	-325.46	787.00	580.81	0%	75%
26	14.295	46.90	0.00	0.00	595.16	439.23	-441.00	-325.46	787.00	580.81	0%	76%
27	14.8665	48.77	0.00	0.00	588.09	434.01	-441.00	-325.46	787.00	580.81	0%	75%
28	15.438	50.65	0.00	0.00	558.95	412.51	-441.00	-325.46	787.00	580.81	0%	71%
29	16.0095	52.52	0.00	0.00	507.86	374.80	-441.00	-325.46	787.00	580.81	0%	65%
30	16.581	54.40	-20.20	-14.91	435.42	321.34	-441.00	-325.46	787.00	580.81	5%	55%
31	17.1525	56.27	-75.44	-55.67	342.59	252.83	-441.00	-325.46	787.00	580.81	17%	44%
32	17.724	58.15	-14.20	-10.48	230.68	170.24	-597.00	-440.59	675.00	498.15	2%	34%

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-2												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
33	18.2955	60.02	-233.76	-172.51	101.48	74.89	-597.00	-440.59	675.00	498.15	39%	15%
34	18.867	61.90	-368.22	-271.75	0.00	0.00	-873.00	-644.27	361.00	266.42	42%	0%
35	19.4385	63.77	-527.46	-389.27	0.00	0.00	-873.00	-644.27	361.00	266.42	60%	0%
36	20.01	65.65	-702.84	-518.70	0.00	0.00	-873.00	-644.27	675.00	498.15	81%	0%
37	20.582	67.53	-527.74	-389.47	0.00	0.00	-873.00	-644.27	555.00	409.59	60%	0%
38	21.154	69.40	-368.57	-272.00	0.00	0.00	-873.00	-644.27	555.00	409.59	42%	0%
39	21.726	71.28	-277.53	-204.82	118.24	87.26	-873.00	-644.27	787.00	580.81	32%	15%
40	22.298	73.16	-202.01	-149.08	244.34	180.32	-873.00	-644.27	787.00	580.81	23%	31%
41	22.87	75.03	-136.02	-100.38	349.42	257.87	-597.00	-440.59	787.00	580.81	23%	44%
42	23.442	76.91	-79.55	-58.71	431.11	318.16	-597.00	-440.59	787.00	580.81	13%	55%
43	24.014	78.79	-32.61	-24.07	487.60	359.85	-597.00	-440.59	787.00	580.81	5%	62%
44	24.586	80.66	0.00	0.00	515.99	380.80	-809.00	-597.04	787.00	580.81	0%	66%
45	25.158	82.54	0.00	0.00	532.47	392.96	-809.00	-597.04	787.00	580.81	0%	68%
46	25.73	84.42	0.00	0.00	521.57	384.92	-441.00	-325.46	787.00	580.81	0%	66%
47	26.302	86.29	0.00	0.00	481.02	354.99	-441.00	-325.46	787.00	580.81	0%	61%
48	26.874	88.17	0.00	0.00	409.53	302.23	-441.00	-325.46	787.00	580.81	0%	52%
49	27.446	90.05	0.00	0.00	306.02	225.84	-441.00	-325.46	787.00	580.81	0%	39%
50	28.018	91.92	0.00	0.00	169.70	125.24	-441.00	-325.46	787.00	580.81	0%	22%
51	28.59	93.80	0.00	0.00	0.00	0.00	-441.00	-325.46	787.00	580.81	0%	0%

Fuente: Elaboración Propia.

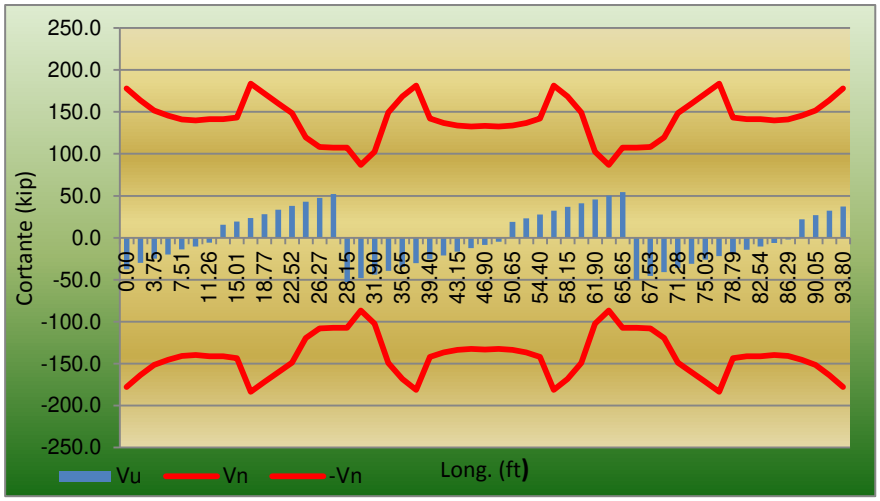


Figura 89 Representacion gráfica índices por corte combinacion servicio 1-1 – FEX

Fuente: Elaboración Propia.

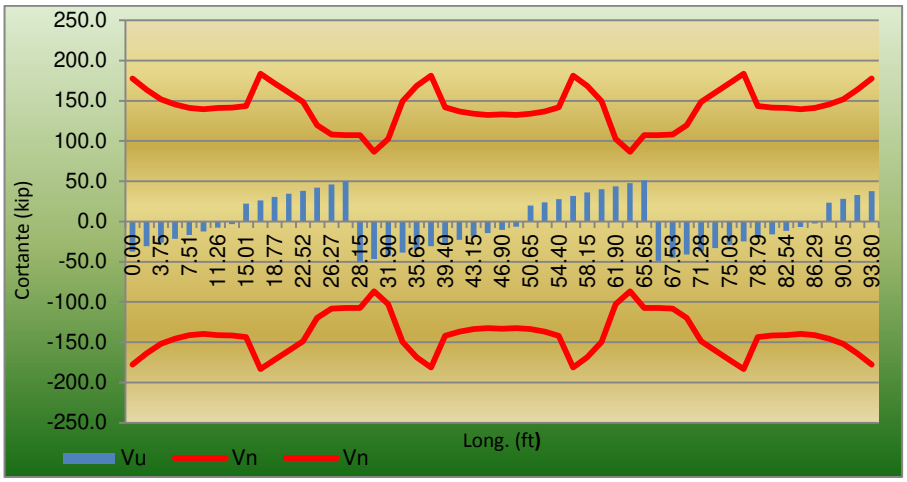


Figura 90 Representacion gráfica índices por corte combinacion servicio 1-2 – FEX

Fuente: Elaboración Propia.

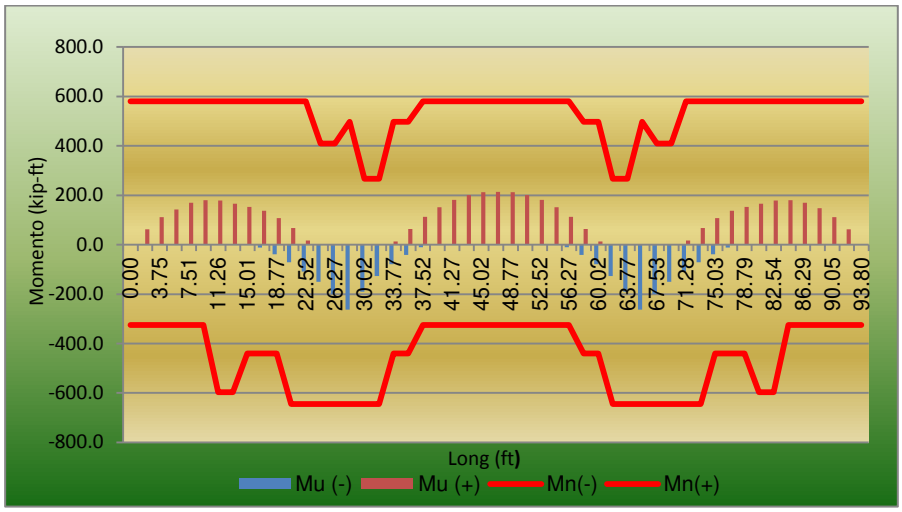


Figura 91 Representacion gráfica índices por momento combinacion servicio 1-1 – FEX.

Fuente: Elaboración Propia.

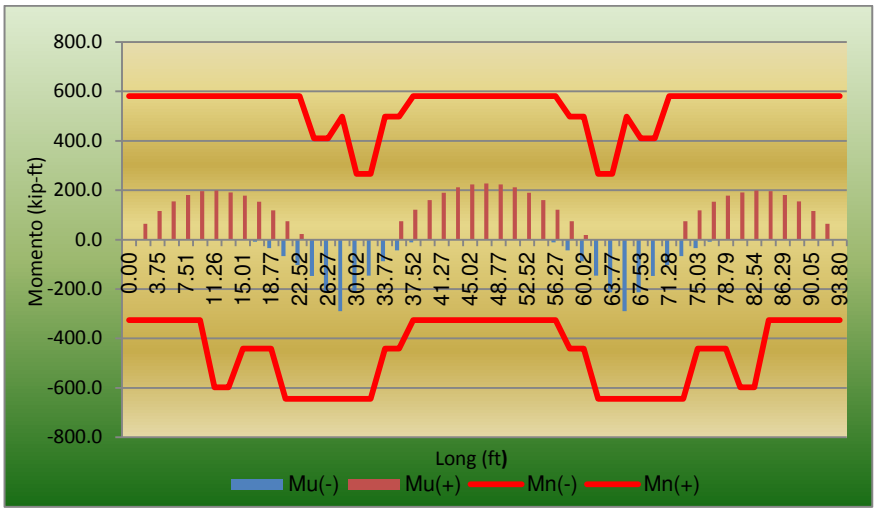


Figura 92 Representacion gráfica índices por momento combinacion servicio 1-2 – FEX

Fuente: Elaboración Propia.

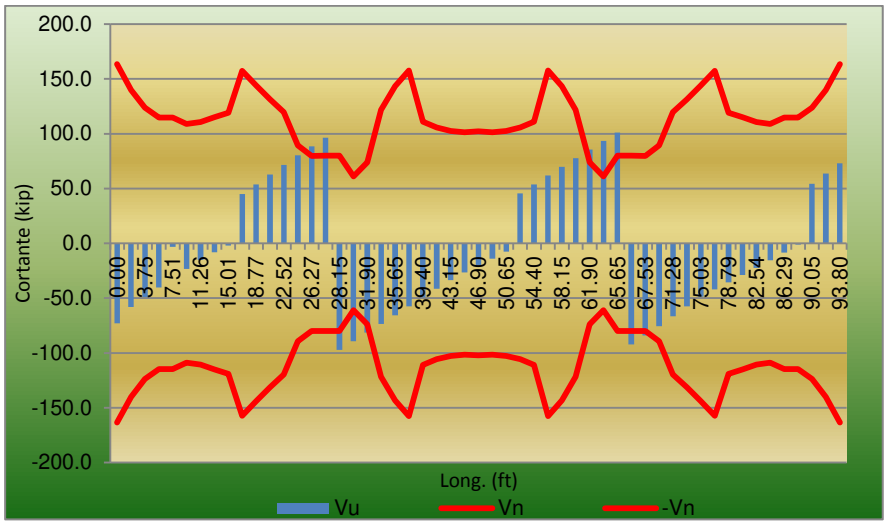


Figura 93 Representacion gráfica índices por corte combinacion resistencia 1-1 – FEX

Fuente: Elaboración Propia.

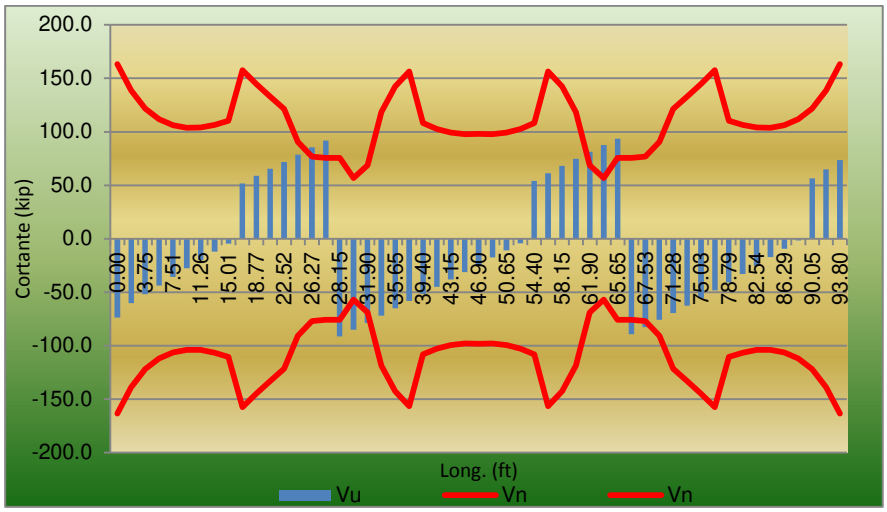


Figura 94 Representacion gráfica índices por corte combinacion resistencia 1-2 – FEX

Fuente: Elaboración Propia.

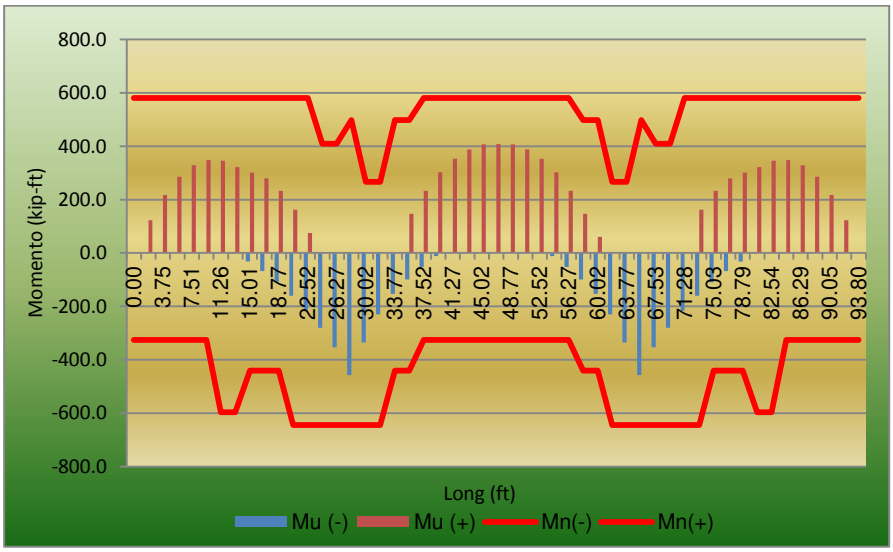


Figura 95 Representacion gráfica índices por momento combinacion resistencia 1-1 – FEX.

Fuente: Elaboración Propia.

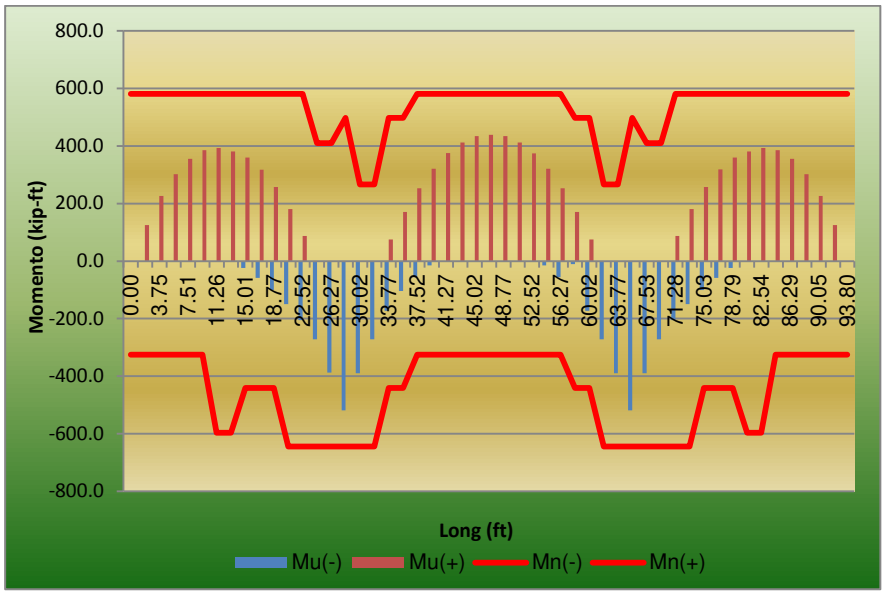
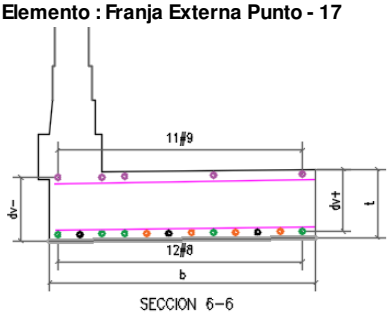


Figura 96 Representacion gráfica índices por momento combinacion resistencia 1-2 – FEX.

Fuente: Elaboración Propia.

Dado que los índices de sobre esfuerzo por cortante, sobrepasan el 100 % cerca a los apoyos intermedios, se decide realizar una verificación de la capacidad a cortante de la placa, por el método del puntal tensor. A continuación se presentan los cálculos y la representación gráfica de los resultados.

Revisión a corte por el método del Puntal-Tensor
Elemento : Franja Externa Punto - 17



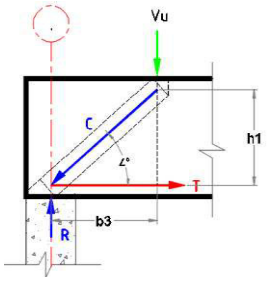
Geometría

h=	0.46m	= 1.5 ft	b1=	1.8	= 5.9 ft Ancho de apoyo
Rec =	0.06m	= 0.2 ft			
d=	0.40m	= 1.3 ft			

Materiales

f'c=	14 Mpa =	2000	PSI	
fy=	420 Mpa =	59997	PSI	

Esquema puntal - tensor



h1 =	0.34	
b3 =	0.57	
Angulo	30.82 °	Mayor a 22°- cumple,"Nocumple
Vu=	396 kN	= 89.0 kips
C=	368 kN	= 82.7 kips
T=	311 kN	= 70.0 kips

Cuantía de refuerzo suministrado

Ref-prin=	12 # 8"			Diámetro de refuerzo para flexión
Ash=	61cm2	= 9.49 ft²		Área de refuerzo a dv
Ld=	0.00m	= 2.8 ft		Longitud de desarrollo barras
fy=	420 Mpa =	59997	PSI	fy-Afectado por Ld

Resistencia del tensor (T)

$$P_u = \phi P_n = \phi f_y A_{st}$$

ϕ = 1.00

ϕPn = 2570 kN = 578 kips Refuerzo cumple > T Índice = 12%

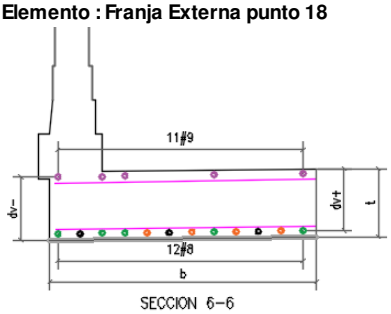
Resistencia del puntal de compresión sin refuerzo (C)

$$P_n = f_{cu} A_{cs} \quad \text{Donde ;} \quad f_{cu} = \frac{f_c'}{0.8 + 170\varepsilon_1} \le 0.85 f_c' \qquad \varepsilon_1 = \varepsilon_s + (\varepsilon_s + 0.002)\cot^2 \alpha_s$$

,

αs =	30.82 °	=	0.54 Rad	Menor Angulo entre el puntal de compresión y el tensores adyacentes de tracción
cot (αs)^2 =	2.812			
εs =	0.002	Deformación unitaria de tracción en el concreto		
ε1 =	0.01325			
fcu =	4.6 MPa	Cumple		
.85*f'c =	11.9 MPa	Limite		
Barra #	1" =	25 mm	Refuerzo para calculo Acs	
6dba=	0.15m			
b-Franja =	1.80m			
Acs =	0.55m2			
ϕ =	0.80			
ϕPn =	2013 kN			Índice = 18%

Revisión a corte por el método del Puntal-Tensor
Elemento : Franja Externa punto 18



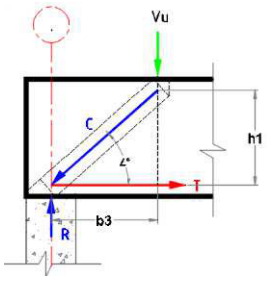
Geometría

h=	0.46m	= 1.5 ft	b1=	1.8	= 5.9 ft	Ancho de apoyo
Rec =	0.06m	= 0.2 ft				
d=	0.41m	= 1.3 ft				

Materiales

f'c=	14 Mpa =	2000	PSI	
fy=	420 Mpa =	59997	PSI	

Esquema puntal - tensor



h1 =	0.35		
b3 =	0.865		
Angulo	22 °	Mayor a 22°- cumple	
Vu=	327 kN	= 73.5 kips	
C=	426 kN	= 95.8 kips	
T=	394 kN	= 88.6 kips	

Cuantía de refuerzo suministrado

Ref-prin=	12 # 8"			Diámetro de refuerzo para flexión
Ash=	61cm2	= 9.49 ft^2		Área de refuerzo a dv
Ld=	0.00m	= 2.8 ft		Longitud de desarrollo barras
fy=	420 Mpa =	59997	PSI	fy-Afectado por Ld

Resistencia del tensor (T)

$$P_u = \phi P_n = \phi f_y A_{st}$$

ϕ = 1.00

ϕPn = 2570 kN = 578 kips Refuerzo cumple > T Índice = 15%

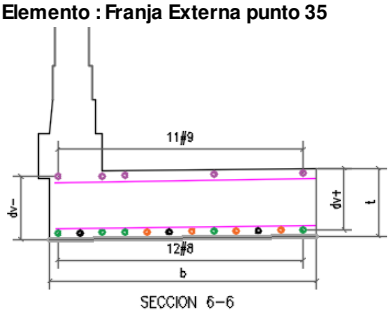
Resistencia del puntal de compresión sin refuerzo (C)

$$P_n = f_{cu} A_{cs} \quad \text{Donde ;} \quad f_{cu} = \frac{f'_c}{0.8 + 170\varepsilon_l} \le 0.85 f'_c \qquad \varepsilon_1 = \varepsilon_s + (\varepsilon_s + 0.002)\cot^2 \alpha_s$$

,

αs =	22.03 °	= 0.38 Rad	Menor Angulo entre el puntal de compresión y el tensores adyacentes de tracción
cot (αs)^2 =	6.111		
εs =	0.002	Deformación unitaria de tracción en el concreto	
ε1 =	0.02644		
fcu =	2.6 MPa	Cumple	
.85*f'c =	11.9 MPa	Limite	
Barra #	1" =	25 mm Refuerzo para calculo Acs	
6dba=	0.15m		
b-Franja =	1.80m		
Acs =	0.55m2		
ϕ =	0.80		
ϕPn =	1160 kN		Índice = 37%

Revisión a corte por el método del Puntal-Tensor
Elemento : Franja Externa punto 35



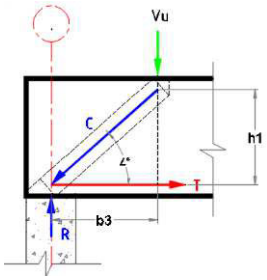
Geometría

h=	0.46m	= 1.5 ft	b1=	1.8	= 5.9 ft	Ancho de apoyo
Rec =	0.06m	= 0.2 ft				
d=	0.41m	= 1.3 ft				

Materiales

f'c=	14 Mpa =	2000	PSI	
fy=	420 Mpa =	59997	PSI	

Esquema puntal - tensor



h1 =	0.35		
b3 =	0.865		
Angulo	22 °	Mayor a 22°- cumple	
Vu=	414 kN	= 93.1 kips	
C=	540 kN	= 121.4 kips	
T=	498 kN	= 112.0 kips	

Cuantía de refuerzo suministrado

Ref-prin=	12 # 8"			Diámetro de refuerzo para flexión
Ash=	61cm2	= 9.49 ft^2		Área de refuerzo a dv
Ld=	0.00m	= 2.8 ft		Longitud de desarrollo barras
fy=	420 Mpa =	59997	PSI	fy-Afectado por Ld

Resistencia del tensor (T)

$$P_u = \phi P_n = \phi f_y A_{st}$$

ϕ = 1.00

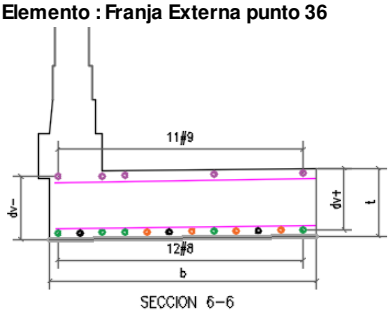
ϕPn = 2570 kN = 578 kips Refuerzo cumple > T Índice = 19%

Resistencia del puntal de compresión sin refuerzo (C)

$$P_n = f_{cu} A_{cs} \quad \text{Donde ;} \quad f_{cu} = \frac{f'_c}{0.8 + 170\varepsilon_1} \le 0.85 f'_c \quad , \quad \varepsilon_1 = \varepsilon_s + (\varepsilon_s + 0.002)\cot^2 \alpha_s$$

αs =	22.03 °	= 0.38 Rad	Menor Angulo entre el puntal de compresión y el tensores adyacentes de tracción
cot (αs)^2 =	6.111		
εs =	0.002	Deformación unitaria de tracción en el concreto	
ε1 =	0.02644		
fcu =	2.6 MPa	Cumple	
.85*f'c =	11.9 MPa	Limite	
Barra #	1" =	25 mm Refuerzo para calculo Acs	
6dba=	0.15m		
b-Franja =	1.80m		
Acs =	0.55m2		
ϕ =	0.80		
ϕPn =	1160 kN		Índice = 47%

Revisión a corte por el método del Puntal-Tensor
Elemento : Franja Externa punto 36



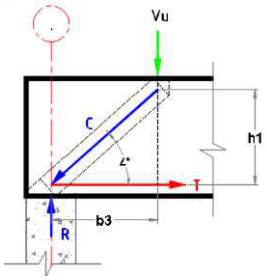
Geometría

h=	0.46m	= 1.5 ft	b1=	1.8	= 5.9 ft	Ancho de apoyo
Rec =	0.06m	= 0.2 ft				
d=	0.41m	= 1.3 ft				

Materiales

f'c=	14 Mpa =	2000	PSI	
fy=	420 Mpa =	59997	PSI	

Esquema puntal - tensor



h1 =	0.34		
b3 =	0.57		
Angulo	31 °	Mayor a 22°- cumple	
Vu=	448 kN	= 100.7 kips	
C=	417 kN	= 93.7 kips	
T=	352 kN	= 79.1kips	

Cuantía de refuerzo suministrado

Ref-prin=	12 # 8"			Diámetro de refuerzo para flexión
Ash=	61cm2	= 9.49 ft²		Área de refuerzo a dv
Ld=	0.00m	= 2.8 ft		Longitud de desarrollo barras
fy=	420 Mpa =	59997	PSI	fy-Afectado por Ld

Resistencia del tensor (T)

$$P_u = \phi P_n = \phi f_y A_{st}$$

ϕ = 1.00

ϕPn = 2570 kN = 578 kips Refuerzo cumple > T Índice = 14%

Resistencia del puntal de compresión sin refuerzo (C)

$$P_n = f_{cu} A_{cs} \quad \text{Donde ;} \quad f_{cu} = \frac{f'_c}{0.8 + 170\varepsilon_1} \le 0.85 f'_c \quad , \quad \varepsilon_1 = \varepsilon_s + (\varepsilon_s + 0.002)\cot^2 \alpha_s$$

αs =	30.82 °	= 0.54 Rad	Menor Angulo entre el puntal de compresión y el tensores adyacentes de tracción
cot (αs)^2 =	2.812		
εs =	0.002	Deformación unitaria de tracción en el concreto	
ε1 =	0.01325		
fcu =	4.6 MPa	Cumple	
.85*f'c =	11.9 MPa	Limite	
Barra #	1" =	25 mm Refuerzo para cálculo Acs	
6dba=	0.15m		
b-Franja =	1.80m		
Acs =	0.55m2		
ϕ =	0.80		
ϕPn =	2013 kN		Índice = 21%

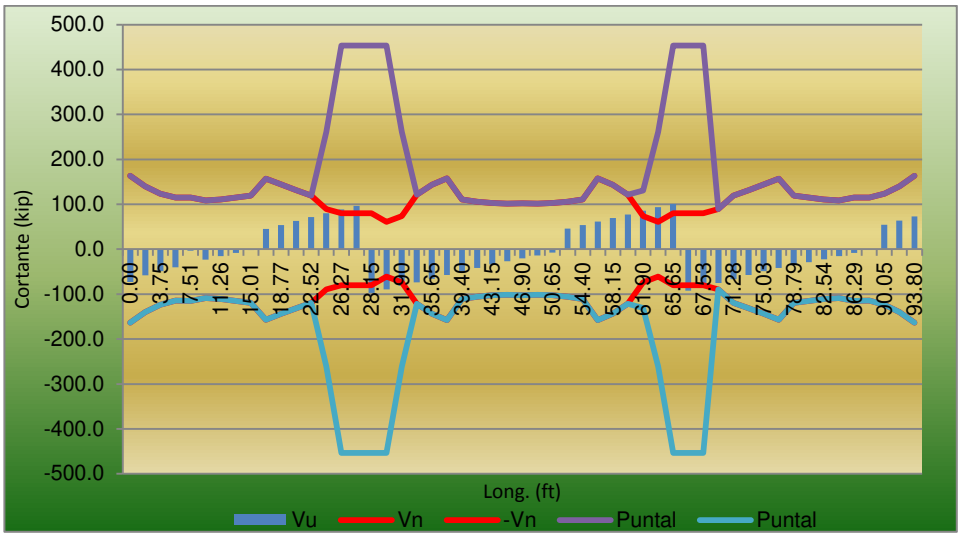


Figura 97 Representacion gráfica revision cortante por el metodo del puntal tensor resistencia 1-1 – FEX

Fuente: Elaboración Propia.

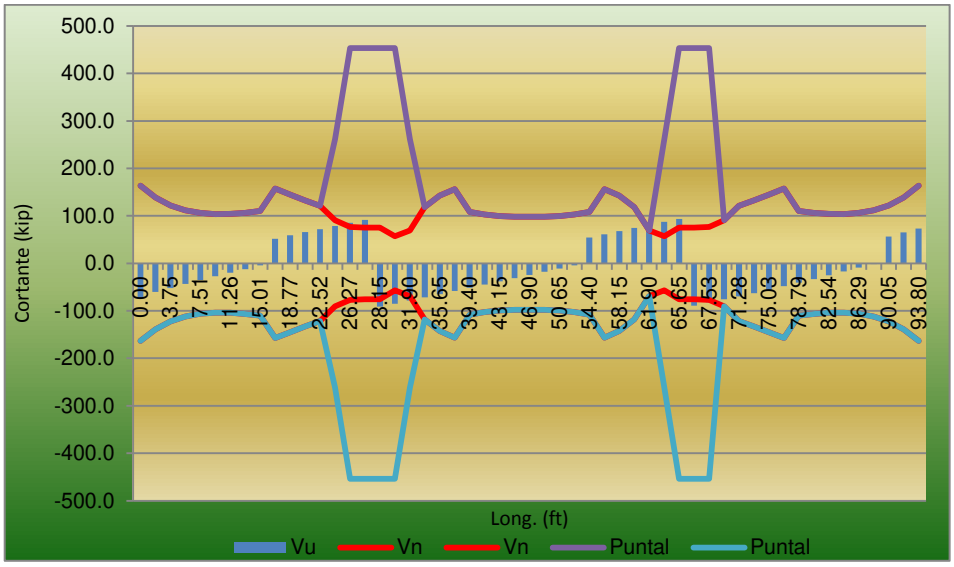


Figura 98 Representacion gráfica revision cortante por el metodo del puntal tensor resistencia 1-2 – FEX

Fuente: Elaboración Propia.

3.5.2.9. Chequeo de deformaciones franja externa – FEX

El chequeo de deformaciones se realizó con el momento de inercia efectivo del elemento, tal como se recomienda en la norma. A continuación se presentan los cálculos.

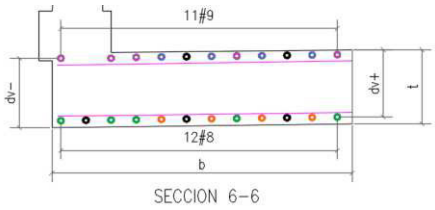
Momento de inercia efectivo corte 1-1

Materiales

f'c=	14	Mpa =	292.6	kips/ft^2
fy=	420	Mpa =	60.9	kips/ft^2
Es=	200000	Mpa =	367.543	kips/ft^2

Geometría viga

bfs=	1.80 m	= 5.9 ft
e=	0.46 m	= 1.5 ft
bv=	0.00 m	= 0.0 ft
h=	0.00 m	= 0.0 ft
dv=	0.40 m	= 1.3 ft
Rec =	0.06 m	= 0.2 ft



SECCION 6-6

Propiedades

Barras = 12

# =	8		
As =	0.006 m2	= 0.07 ft 2	Área de refuerzo suministrado en punto de estudio
n=	11.14		Relación modular
n*As =	0.068	= 0.73 ft 2	
X=	0.20 m	= 0.7 ft	Distancia del eje centroidal

Momento de inercia efectivo

$$I_e = \left(\frac{M_{cr}}{M_a}\right)^3 I_g + \left[1 - \left(\frac{M_{cr}}{M_a}\right)^3\right] I_{cr} \leq I_g$$

Ig=	0.015 m4	= 1.7 ft 4	
yt =	0.23 m4	= 26.6 ft 4	Distancia dese el eje neutro a la fibra extrema a tracción
fr =	2320 kN/m2		Modulo de rotura del concreto
Mcr =	147 kN-m	= 109 kips-ft	Momento de fisuracion
Ma=	130 kN-m	= 96 kips-ft	Momento en el concreto para la cual se calcula la deformación
Icr=	0.008 m4	= 0.9 ft 4	Momento de inercia de la sección transformada
Ie =	0.0179 m4	= 2.1ft 4	Momento de inercia efectivo

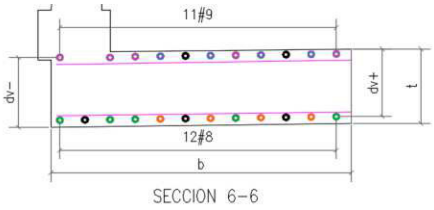
Momento de inercia efectivo corte 6-6

Materiales

f'c=	14	Mpa =	292.6	kips/ft^2
fy=	420	Mpa =	60.9	kips/ft^2
Es=	200000	Mpa =	367.543	kips/ft^2

Geometría viga

bfs=	1.80 m	= 5.9 ft
e=	0.46 m	= 1.5 ft
bv=	0.00 m	= 0.0 ft
h=	0.00 m	= 0.0 ft
dv=	0.40 m	= 1.3 ft
Rec =	0.06 m	= 0.2 ft



SECCION 6-6

Propiedades

Barras = 12

# =	8		
As =	0.006 m2	= 0.07 ft 2	Área de refuerzo suministrado en punto de estudio
n=	11.14		Relación modular
n*As =	0.068	= 0.73 ft 2	
X=	0.20 m	= 0.7 ft	Distancia del eje centroidal

Momento de inercia efectivo

$$I_e = \left(\frac{M_{cr}}{M_a}\right)^3 I_g + \left[1 - \left(\frac{M_{cr}}{M_a}\right)^3\right] I_{cr} \leq I_g$$

Ig=	0.015 m4	= 1.7 ft 4	
yt =	0.23 m4	= 26.6 ft 4	Distancia dese el eje neutro a la fibra extrema a tracción
fr =	2320 kN/m2		Modulo de rotura del concreto
Mcr =	147 kN-m	= 109 kips-ft	Momento de fisuracion
Ma=	163 kN-m	= 120 kips-ft	Momento en el concreto para la cual se calcula la deformación
Icr=	0.008 m4	= 0.9 ft 4	Momento de inercia de la sección transformada
Ie =	0.0127 m4	= 1.5 ft 4	Momento de inercia efectivo

Tabla 57 Revisión deflexiones franja FEX

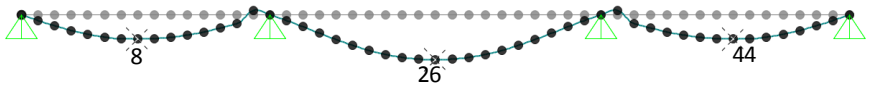


TABLE: Joint Displacements								
Joint	OutputCase	CaseType	StepType	U3		Δmax = L/800		Cumple
Text	Text	Text	Text	mm	in	mm	in	
8	HL93 +	LinMoving	Max	2.42	0.10	10.5	0.41	Cumple
8	HL93 +	LinMoving	Min	-4.15	-0.16	10.5	0.41	Cumple
8	DFL1	Combination	Max	0.09	0.00	10.5	0.41	Cumple
8	DFL1	Combination	Min	-1.55	-0.06	10.5	0.41	Cumple
8	DFL2	Combination	Max	0.05	0.00	10.5	0.41	Cumple
8	DFL2	Combination	Min	-1.70	-0.07	10.5	0.41	Cumple
8	DFL3	Combination		-1.80	-0.07	10.5	0.41	Cumple
26	HL93 +	LinMoving	Max	2.09	0.08	14.3	0.56	Cumple
26	HL93 +	LinMoving	Min	-7.69	-0.30	14.3	0.56	Cumple
26	DFL1	Combination	Max	-0.62	-0.02	14.3	0.56	Cumple
26	DFL1	Combination	Min	-3.06	-0.12	14.3	0.56	Cumple
26	DFL2	Combination	Max	-0.59	-0.02	14.3	0.56	Cumple
26	DFL2	Combination	Min	-3.05	-0.12	14.3	0.56	Cumple
26	DFL3	Combination		-4.02	-0.16	14.3	0.56	Cumple
44	HL93 +	LinMoving	Max	2.42	0.10	10.5	0.41	Cumple
44	HL93 +	LinMoving	Min	-4.15	-0.16	10.5	0.41	Cumple
44	DFL1	Combination	Max	0.09	0.00	10.5	0.41	Cumple
44	DFL1	Combination	Min	-1.55	-0.06	10.5	0.41	Cumple
44	DFL2	Combination	Max	0.05	0.00	10.5	0.41	Cumple
44	DFL2	Combination	Min	-1.70	-0.07	10.5	0.41	Cumple
44	DFL3	Combination		-1.80	-0.07	10.5	0.41	Cumple

Fuente: Elaboración Propia.

3.5.3 Análisis franja interna FIN

El análisis de la franja interna se realizó aplicando la misma secuencia empleada en la franja externa, por tal razón a continuación se presentan los cálculos, omitiendo algunos pasos que se presentaron en el análisis de la franja anterior

La longitud de la franja interna se determinó de acuerdo a las recomendaciones dadas en la norma para puente con luces mayores a 4,50 m. A continuación se presentan los cálculos:

Calculo ancho de franja interna - FIN

De acuerdo con el al articulo 4.6.2.3 el ancho de franja equivalente para puentes con luces mayores a 14.46 ft (4,5m) se determina de la siguiente manera :

1. Para un carril cargado

$$E = 84.0 + 1.44\sqrt{L_1 W_1} \le \frac{12.0W}{N_L}$$

W1= 9.0m = 29.5 ft
L1= 18.0m = 59.1 ft
Eint1= 5.6m = 18.4 ft

2. Para dos carriles cargados

W1= 12.5m = 41.0 ft
L1= 18.0m = 59.1 ft

$$E = 10.0 + 5.0\sqrt{L_1 W_1}$$

Eint2= 3.90m = 12.8 ft

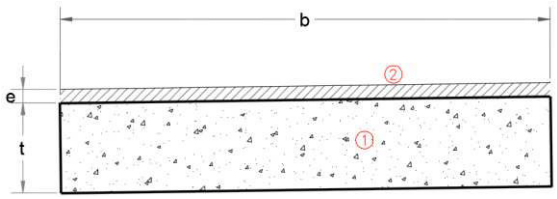
3. Limite ancho de franja

Limite= 12*W/NL
W= 13.2m = 43.3 ft
NL= 2
Limite = 6.6

Ancho de franja Interna 3.90m = 12.8 ft

3.5.3.1. Cargas muertas “DC” y “DW”

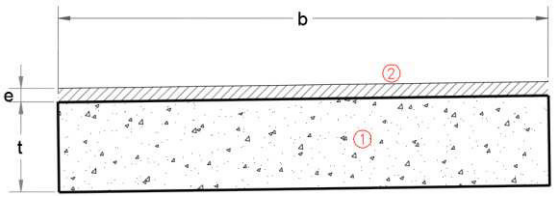
Evaluacion caga muerta "DC" - FIN



b= 3.90m = 12.8 ft
t= 0.46m = 1.5 ft

ϒ(Con) = 24 kN/m3 = 1.50 kip/ft3 Densidad del concreto
DC = 11.04 kN/m = 0.76 kip/ft Peso propio

Evaluacion caga por carpeta de rodadura "DW" - FIN



b= 3.90m = 12.8 ft
e= 0.07m = 0.2 ft Espesor carpeta asfáltica

ϒ(Asf) = 22.5 kN/m3 = 1.40 kip/ft3 Densidad carpeta asfáltica
DW = 1.58 kN/m = 0.11 kip/ft Carpeta Asfáltica

3.5.3.2. Cargas vivas “L”

El análisis de la franja interior se analizó con las cargas generadas por el camión de diseño HL-93, el tándem de diseño y la línea de carga, tal como se indica en el numeral 1.6.5.2 de este documento.

3.5.3.3. Cálculo de momentos y cortantes por líneas de influencia

Para el análisis de la franja interior, esta se dividió de la misma forma que la franja exterior, calculando las solicitaciones en los puntos que se indican en la Figura 71. A continuación se presentan los cálculos.

Tabla 58 Cortantes y momentos combinación servicio 1-1 – FIN

PUNTO	DIST (R)		DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
1	0.00	0	0.00	0.00	246.73	55.60	0.00	0.00	0.00	0.00
2	0.57	1.877	0.57	1.88	212.29	47.84	-7.81	-5.77	134.62	99.35
3	0.57	1.877	1.14	3.75	178.71	40.27	-15.63	-11.53	239.87	177.02
4	0.57	1.877	1.72	5.63	146.11	32.92	-23.44	-17.30	314.38	232.01
5	0.57	1.877	2.29	7.51	114.58	25.82	-31.26	-23.07	359.89	265.60
6	0.57	1.877	2.86	9.38	87.72	19.77	-39.07	-28.83	378.35	279.22
7	0.57	1.877	3.43	11.26	89.51	20.17	-46.88	-34.60	371.96	274.51
8	0.57	1.877	4.00	13.14	112.52	25.36	-54.70	-40.37	343.17	253.26
9	0.57	1.877	4.58	15.01	134.68	30.35	-62.51	-46.13	326.39	240.87
10	0.57	1.877	5.15	16.89	156.00	35.15	-70.32	-51.90	293.72	216.76
11	0.57	1.877	5.72	18.77	185.39	41.78	-78.14	-57.67	238.84	176.27
12	0.57	1.877	6.29	20.64	218.97	49.34	-94.15	-69.49	167.68	123.75
13	0.57	1.877	6.86	22.52	251.57	56.69	-170.94	-126.16	109.60	80.89
14	0.57	1.877	7.44	24.40	283.10	63.80	-265.16	-195.69	43.52	32.11
15	0.57	1.877	8.01	26.27	313.46	70.64	-363.54	-268.29	42.53	31.39
16	0.57	1.877	8.58	28.15	353.23	79.60	-443.37	-327.21	45.57	33.63
17	0.57	1.875	9.15	30.02	325.09	73.26	-304.86	-224.99	35.32	26.06
18	0.57	1.875	9.72	31.90	296.38	66.79	-220.51	-162.73	56.20	41.48
19	0.57	1.875	10.29	33.77	267.27	60.23	-143.32	-105.77	102.65	75.76
20	0.57	1.875	10.87	35.65	237.96	53.62	-80.80	-59.63	168.14	124.09
21	0.57	1.875	11.44	37.52	208.62	47.01	-73.81	-54.47	263.27	194.29
22	0.57	1.875	12.01	39.40	179.44	40.44	-66.82	-49.31	338.21	249.60

PUNTO	DIST (R)		DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
23	0.57	1.875	12.58	41.27	150.56	33.93	-59.83	-44.15	392.61	289.74
24	0.57	1.875	13.15	43.15	127.00	28.62	-52.84	-38.99	426.48	314.74
25	0.57	1.875	13.72	45.02	104.59	23.57	-45.84	-33.83	440.23	324.89
26	0.57	1.875	14.3	46.90	81.81	18.44	-39.17	-28.91	443.96	327.65
27	0.57	1.875	14.87	48.77	101.20	22.81	-46.22	-34.11	442.08	326.25
28	0.57	1.875	15.44	50.65	130.31	29.37	-53.27	-39.32	419.96	309.93
29	0.57	1.875	16.01	52.52	159.62	35.97	-60.32	-44.52	377.55	278.63
30	0.57	1.875	16.58	54.40	188.96	42.58	-67.37	-49.72	315.20	232.61
31	0.57	1.875	17.15	56.27	218.14	49.16	-74.42	-54.92	233.55	172.36
32	0.57	1.875	17.72	58.15	247.02	55.67	-81.47	-60.13	134.90	99.55
33	0.57	1.875	18.3	60.02	275.43	62.07	-157.34	-116.12	79.75	58.86
34	0.57	1.875	18.87	61.90	303.22	68.33	-223.23	-164.74	48.21	35.58
35	0.57	1.875	19.44	63.77	330.23	74.42	-305.96	-225.80	27.17	20.05
36	0.57	1.875	20.01	65.65	331.19	74.63	-460.89	-340.14	35.03	25.85
37	0.57	1.877	20.58	67.53	301.71	67.99	-356.05	-262.76	32.70	24.13
38	0.57	1.877	21.15	69.40	271.14	61.10	-246.47	-181.90	79.10	58.38
39	0.57	1.877	21.73	71.28	239.58	53.99	-153.04	-112.95	144.42	106.58
40	0.57	1.877	22.3	73.16	207.17	46.69	-100.79	-74.38	196.22	144.81
41	0.57	1.877	22.87	75.03	181.83	40.97	-84.17	-62.12	265.03	195.59
42	0.57	1.877	23.44	76.91	158.01	35.61	-75.75	-55.91	315.97	233.18
43	0.57	1.877	24.01	78.79	133.33	30.05	-67.34	-49.69	339.01	250.19
44	0.57	1.877	24.59	80.66	110.73	24.95	-58.92	-43.48	352.61	260.22
45	0.57	1.877	25.16	82.54	87.28	19.67	-50.50	-37.27	376.25	277.67
46	0.57	1.877	25.73	84.42	95.97	21.63	-42.09	-31.06	376.48	277.85
47	0.57	1.877	26.3	86.29	126.54	28.52	-33.67	-24.85	351.16	259.16
48	0.57	1.877	26.87	88.17	158.09	35.63	-25.25	-18.64	303.61	224.06
49	0.57	1.877	27.45	90.05	190.51	42.93	-16.83	-12.42	232.30	171.44
50	0.57	1.877	28.02	91.92	223.66	50.40	-8.42	-6.21	131.52	97.07
51	0.57	1.877	28.59	93.80	257.44	58.01	0.00	0.00	0.00	0.00

Fuente: Elaboración Propia.

Tabla 59 Cortantes y momentos combinación servicio 1-2 – FIN

PUNTO	DIST (R)		DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
1	0.00	0	0.00	0.00	254.70	57.40	0.00	0.00	0.00	0.00
2	0.57	1.877	0.57	1.88	224.19	50.52	-11.38	-8.40	135.87	100.27
3	0.57	1.877	1.14	3.75	193.95	43.71	-22.76	-16.79	250.24	184.68
4	0.57	1.877	1.72	5.63	164.07	36.97	-34.14	-25.19	337.36	248.97
5	0.57	1.877	2.29	7.51	134.65	30.34	-45.51	-33.59	397.90	293.65
6	0.57	1.877	2.86	9.38	105.78	23.84	-56.89	-41.99	432.74	319.36
7	0.57	1.877	3.43	11.26	108.44	24.44	-68.27	-50.38	443.00	326.94
8	0.57	1.877	4.00	13.14	137.00	30.87	-79.65	-58.78	430.83	317.96

PUNTO	DIST (R)		DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
9	0.57	1.877	4.58	15.01	164.38	37.04	-91.03	-67.18	408.07	301.15
10	0.57	1.877	5.15	16.89	190.59	42.95	-102.41	-75.58	362.76	267.71
11	0.57	1.877	5.72	18.77	215.61	48.59	-113.79	-83.97	296.53	218.84
12	0.57	1.877	6.29	20.64	239.45	53.96	-133.37	-98.42	219.44	161.95
13	0.57	1.877	6.86	22.52	262.11	59.07	-188.58	-139.17	160.96	118.79
14	0.57	1.877	7.44	24.40	283.57	63.90	-281.85	-208.01	94.90	70.04
15	0.57	1.877	8.01	26.27	303.85	68.47	-370.92	-273.74	44.52	32.85
16	0.57	1.877	8.58	28.15	331.88	74.79	-451.28	-333.04	47.70	35.20
17	0.57	1.875	9.15	30.02	309.88	69.83	-315.05	-232.51	37.07	27.36
18	0.57	1.875	9.72	31.90	286.93	64.66	-243.36	-179.60	87.62	64.66
19	0.57	1.875	10.29	33.77	263.17	59.31	-178.84	-131.98	135.41	99.93
20	0.57	1.875	10.87	35.65	238.74	53.80	-111.84	-82.53	196.19	144.79
21	0.57	1.875	11.44	37.52	213.77	48.17	-102.16	-75.39	286.97	211.78
22	0.57	1.875	12.01	39.40	190.58	42.95	-92.48	-68.25	362.47	267.50
23	0.57	1.875	12.58	41.27	167.03	37.64	-82.80	-61.11	421.53	311.09
24	0.57	1.875	13.15	43.15	142.73	32.16	-73.13	-53.97	463.30	341.92
25	0.57	1.875	13.72	45.02	117.71	26.52	-63.45	-46.83	487.24	359.59
26	0.57	1.875	14.3	46.90	102.68	23.14	-53.77	-39.69	493.54	364.23
27	0.57	1.875	14.87	48.77	127.85	28.81	-63.33	-46.74	488.00	360.14
28	0.57	1.875	15.44	50.65	152.30	34.32	-72.99	-53.87	464.39	342.72
29	0.57	1.875	16.01	52.52	176.01	39.66	-82.65	-61.00	422.91	312.11
30	0.57	1.875	16.58	54.40	198.93	44.83	-92.31	-68.13	364.09	268.70
31	0.57	1.875	17.15	56.27	221.02	49.81	-101.97	-75.26	288.76	213.10
32	0.57	1.875	17.72	58.15	242.24	54.59	-111.65	-82.39	198.05	146.16
33	0.57	1.875	18.3	60.02	262.55	59.17	-178.61	-131.82	137.34	101.36
34	0.57	1.875	18.87	61.90	285.84	64.41	-243.12	-179.42	90.38	66.70
35	0.57	1.875	19.44	63.77	308.88	69.61	-314.79	-232.31	39.52	29.16
36	0.57	1.875	20.01	65.65	324.39	73.10	-451.05	-332.88	47.77	35.26
37	0.57	1.877	20.58	67.53	300.87	67.80	-370.71	-273.59	44.59	32.91
38	0.57	1.877	21.15	69.40	276.48	62.30	-282.19	-208.25	92.69	68.40
39	0.57	1.877	21.73	71.28	254.04	57.25	-188.65	-139.22	158.68	117.11
40	0.57	1.877	22.3	73.16	230.42	51.93	-133.43	-98.47	217.28	160.35
41	0.57	1.877	22.87	75.03	205.61	46.33	-113.84	-84.02	294.64	217.45
42	0.57	1.877	23.44	76.91	179.62	40.48	-102.46	-75.62	361.28	266.63
43	0.57	1.877	24.01	78.79	152.45	34.35	-91.08	-67.21	407.14	300.47
44	0.57	1.877	24.59	80.66	124.10	27.97	-79.69	-58.81	430.56	317.76
45	0.57	1.877	25.16	82.54	95.80	21.59	-68.31	-50.41	443.86	327.57
46	0.57	1.877	25.73	84.42	107.78	24.29	-56.92	-42.01	434.33	320.53
47	0.57	1.877	26.3	86.29	135.43	30.52	-45.54	-33.61	400.30	295.42
48	0.57	1.877	26.87	88.17	163.51	36.85	-34.15	-25.21	340.65	251.40
49	0.57	1.877	27.45	90.05	192.23	43.32	-22.77	-16.80	254.48	187.80
50	0.57	1.877	28.02	91.92	222.44	50.13	-11.38	-8.40	141.09	104.12
51	0.57	1.877	28.59	93.80	271.06	61.08	0.00	0.00	0.00	0.00

Fuente: Elaboración Propia.

Tabla 60 Cortantes y momentos combinación resistencia 1-1 – FIN

PUNTO	DIST (R)		DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
1	0.00	0	0.00	0.00	516.89	116.48	0.00	0.00	0.00	0.00
2	0.57	1.877	0.57	1.88	447.36	100.81	-18.19	-13.42	283.56	209.26
3	0.57	1.877	1.14	3.75	379.84	85.60	-36.37	-26.84	504.82	372.56
4	0.57	1.877	1.72	5.63	314.58	70.89	-54.56	-40.27	660.63	487.55
5	0.57	1.877	2.29	7.51	251.83	56.75	-72.75	-53.69	755.01	557.20
6	0.57	1.877	2.86	9.38	199.96	45.06	-90.93	-67.11	792.53	584.89
7	0.57	1.877	3.43	11.26	201.90	45.50	-109.12	-80.53	778.30	574.38
8	0.57	1.877	4.00	13.14	244.83	55.17	-127.31	-93.95	717.99	529.88
9	0.57	1.877	4.58	15.01	285.77	64.40	-145.49	-107.37	691.74	510.50
10	0.57	1.877	5.15	16.89	324.77	73.19	-163.68	-120.80	634.58	468.32
11	0.57	1.877	5.72	18.77	382.54	86.21	-181.87	-134.22	531.81	392.48
12	0.57	1.877	6.29	20.64	450.06	101.42	-212.20	-156.60	390.29	288.03
13	0.57	1.877	6.86	22.52	515.32	116.13	-353.81	-261.11	255.09	188.26
14	0.57	1.877	7.44	24.40	578.07	130.27	-529.88	-391.05	101.28	74.75
15	0.57	1.877	8.01	26.27	638.09	143.79	-709.59	-523.67	99.00	73.06
16	0.57	1.877	8.58	28.15	715.91	161.33	-840.02	-619.93	106.07	78.28
17	0.57	1.875	9.15	30.02	661.05	148.97	-575.32	-424.58	82.20	60.66
18	0.57	1.875	9.72	31.90	604.83	136.30	-430.58	-317.77	130.81	96.54
19	0.57	1.875	10.29	33.77	547.70	123.42	-296.46	-218.79	238.92	176.33
20	0.57	1.875	10.87	35.65	490.11	110.45	-188.07	-138.80	388.99	287.08
21	0.57	1.875	11.44	37.52	432.45	97.45	-171.80	-126.79	577.01	425.83
22	0.57	1.875	12.01	39.40	375.15	84.54	-155.53	-114.78	724.13	534.41
23	0.57	1.875	12.58	41.27	318.57	71.79	-139.25	-102.77	829.48	612.15
24	0.57	1.875	13.15	43.15	274.34	61.82	-122.98	-90.76	893.14	659.14
25	0.57	1.875	13.72	45.02	232.82	52.46	-106.70	-78.75	916.03	676.03
26	0.57	1.875	14.3	46.90	190.41	42.91	-91.18	-67.29	921.69	680.21
27	0.57	1.875	14.87	48.77	224.93	50.69	-107.59	-79.40	920.33	679.21
28	0.57	1.875	15.44	50.65	282.06	63.56	-124.00	-91.51	877.96	647.93
29	0.57	1.875	16.01	52.52	339.65	76.54	-140.40	-103.62	794.44	586.30
30	0.57	1.875	16.58	54.40	397.30	89.53	-156.81	-115.73	670.55	494.87
31	0.57	1.875	17.15	56.27	454.60	102.44	-173.22	-127.84	507.85	374.79
32	0.57	1.875	17.72	58.15	511.19	115.20	-189.63	-139.95	311.62	229.98
33	0.57	1.875	18.3	60.02	566.69	127.70	-329.10	-242.88	185.63	136.99
34	0.57	1.875	18.87	61.90	620.75	139.89	-436.91	-322.44	112.21	82.81
35	0.57	1.875	19.44	63.77	672.99	151.66	-577.87	-426.47	63.23	46.67
36	0.57	1.875	20.01	65.65	668.74	150.70	-880.79	-650.02	81.54	60.17

PUNTO	DIST (R)		DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
37	0.57	1.877	20.58	67.53	610.75	137.63	-692.14	-510.80	76.10	56.16
38	0.57	1.877	21.15	69.40	550.22	123.99	-486.39	-358.96	184.11	135.88
39	0.57	1.877	21.73	71.28	487.42	109.84	-312.14	-230.36	336.13	248.06
40	0.57	1.877	22.3	73.16	422.61	95.24	-227.64	-168.00	456.69	337.04
41	0.57	1.877	22.87	75.03	374.25	84.34	-195.91	-144.58	592.76	437.46
42	0.57	1.877	23.44	76.91	329.45	74.24	-176.32	-130.12	686.35	506.53
43	0.57	1.877	24.01	78.79	282.63	63.69	-156.73	-115.66	721.10	532.17
44	0.57	1.877	24.59	80.66	240.66	54.23	-137.14	-101.21	739.96	546.09
45	0.57	1.877	25.16	82.54	196.72	44.33	-117.54	-86.75	788.28	581.75
46	0.57	1.877	25.73	84.42	219.15	49.38	-97.95	-72.29	788.19	581.69
47	0.57	1.877	26.3	86.29	279.68	63.03	-78.36	-57.83	734.70	542.21
48	0.57	1.877	26.87	88.17	342.49	77.18	-58.77	-43.37	635.56	469.04
49	0.57	1.877	27.45	90.05	407.29	91.78	-39.18	-28.92	487.21	359.56
50	0.57	1.877	28.02	91.92	473.83	106.78	-19.59	-14.46	276.35	203.94
51	0.57	1.877	28.59	93.80	541.81	122.10	0.00	0.00	0.00	0.00

Fuente: Elaboración Propia.

Tabla 61 Cortantes y momentos combinación resistencia 1-2 – FIN

PUNTO	DIST (R)		DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
1	0.00	0	0.00	0.00	535.44	120.66	0.00	0.00	0.00	0.00
2	0.57	1.877	0.57	1.88	475.05	107.05	-26.48	-19.54	286.46	211.41
3	0.57	1.877	1.14	3.75	415.30	93.59	-52.97	-39.09	528.97	390.38
4	0.57	1.877	1.72	5.63	356.40	80.31	-79.45	-58.63	714.11	527.02
5	0.57	1.877	2.29	7.51	298.56	67.28	-105.93	-78.18	843.48	622.49
6	0.57	1.877	2.86	9.38	242.00	54.53	-132.42	-97.72	919.14	678.32
7	0.57	1.877	3.43	11.26	245.98	55.43	-158.90	-117.27	943.65	696.41
8	0.57	1.877	4.00	13.14	301.81	68.01	-185.39	-136.81	922.04	680.47
9	0.57	1.877	4.58	15.01	354.91	79.98	-211.87	-156.36	881.85	650.80
10	0.57	1.877	5.15	16.89	405.27	91.33	-238.35	-175.90	795.26	586.90
11	0.57	1.877	5.72	18.77	452.88	102.06	-264.84	-195.45	666.09	491.57
12	0.57	1.877	6.29	20.64	497.74	112.17	-303.46	-223.96	510.75	376.93
13	0.57	1.877	6.86	22.52	539.84	121.65	-394.85	-291.40	374.63	276.48
14	0.57	1.877	7.44	24.40	579.17	130.52	-568.74	-419.73	220.88	163.01
15	0.57	1.877	8.01	26.27	615.73	138.75	-726.77	-536.35	103.61	76.46
16	0.57	1.877	8.58	28.15	666.23	150.13	-858.43	-633.52	111.01	81.93

PUNTO	DIST (R)		DIST (0)		CORTANTE		MTO -		MTO +	
	m	ft	m	ft	KN	kips	KN-m	kips - ft	KN-m	kips - ft
17	0.57	1.875	9.15	30.02	625.63	140.98	-599.02	-442.08	86.29	63.68
18	0.57	1.875	9.72	31.90	582.84	131.34	-483.77	-357.02	203.94	150.51
19	0.57	1.875	10.29	33.77	538.17	121.28	-379.13	-279.80	315.17	232.59
20	0.57	1.875	10.87	35.65	491.94	110.86	-260.30	-192.10	454.28	335.26
21	0.57	1.875	11.44	37.52	444.44	100.16	-237.78	-175.48	632.18	466.55
22	0.57	1.875	12.01	39.40	401.09	90.39	-215.25	-158.86	780.58	576.07
23	0.57	1.875	12.58	41.27	356.90	80.43	-192.73	-142.23	896.80	661.84
24	0.57	1.875	13.15	43.15	310.95	70.07	-170.21	-125.61	978.85	722.39
25	0.57	1.875	13.72	45.02	263.34	59.34	-147.68	-108.99	1025.46	756.79
26	0.57	1.875	14.3	46.90	238.99	53.86	-125.16	-92.37	1037.07	765.36
27	0.57	1.875	14.87	48.77	286.94	64.66	-147.41	-108.79	1027.22	758.09
28	0.57	1.875	15.44	50.65	333.24	75.09	-169.89	-125.38	981.37	724.25
29	0.57	1.875	16.01	52.52	377.79	85.14	-192.38	-141.97	900.00	664.20
30	0.57	1.875	16.58	54.40	420.51	94.76	-214.86	-158.56	784.36	578.85
31	0.57	1.875	17.15	56.27	461.30	103.95	-237.34	-175.16	636.34	469.62
32	0.57	1.875	17.72	58.15	500.07	112.69	-259.86	-191.77	458.60	338.45
33	0.57	1.875	18.3	60.02	536.72	120.95	-378.61	-279.42	319.67	235.91
34	0.57	1.875	18.87	61.90	580.31	130.77	-483.21	-356.61	210.36	155.25
35	0.57	1.875	19.44	63.77	623.30	140.46	-598.42	-441.64	91.98	67.88
36	0.57	1.875	20.01	65.65	652.91	147.13	-857.90	-633.13	111.19	82.06
37	0.57	1.877	20.58	67.53	608.79	137.19	-726.27	-535.99	103.78	76.59
38	0.57	1.877	21.15	69.40	562.66	126.79	-569.52	-420.30	215.73	159.21
39	0.57	1.877	21.73	71.28	521.07	117.42	-395.02	-291.52	369.34	272.57
40	0.57	1.877	22.3	73.16	476.72	107.43	-303.61	-224.07	505.71	373.22
41	0.57	1.877	22.87	75.03	429.61	96.81	-264.97	-195.55	661.68	488.32
42	0.57	1.877	23.44	76.91	379.74	85.58	-238.48	-176.00	791.83	584.37
43	0.57	1.877	24.01	78.79	327.13	73.72	-211.98	-156.44	879.68	649.20
44	0.57	1.877	24.59	80.66	271.79	61.25	-185.48	-136.89	921.41	680.00
45	0.57	1.877	25.16	82.54	216.55	48.80	-158.98	-117.33	945.65	697.89
46	0.57	1.877	25.73	84.42	246.65	55.58	-132.49	-97.78	922.83	681.05
47	0.57	1.877	26.3	86.29	300.37	67.69	-105.99	-78.22	849.07	626.61
48	0.57	1.877	26.87	88.17	355.09	80.02	-79.49	-58.67	721.77	532.66
49	0.57	1.877	27.45	90.05	411.31	92.69	-52.99	-39.11	538.82	397.65
50	0.57	1.877	28.02	91.92	470.99	106.14	-26.50	-19.56	298.60	220.37
51	0.57	1.877	28.59	93.80	573.51	129.24	0.00	0.00	0.00	0.00

Fuente: Elaboración Propia.

3.5.3.4. Cálculo de momentos y cortantes con SAP2000 - FIN

Tabla 62 Cortantes y momentos combinación resistencia 1-1 – FIN

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	Kips-ft
1	0	E-RESIST1-1	Combination	Max	-36.14	-8.14	0.00	0.00
1	0.572	E-RESIST1-1	Combination	Max	-17.35	-3.91	291.29	214.97
1	0	E-RESIST1-1	Combination	Min	-569.14	-128.26	0.00	0.00
1	0.572	E-RESIST1-1	Combination	Min	-451.73	-101.80	15.30	11.29
2	0	E-RESIST1-1	Combination	Max	-17.35	-3.91	291.29	214.97
2	0.572	E-RESIST1-1	Combination	Max	25.71	5.79	516.45	381.14
2	0	E-RESIST1-1	Combination	Min	-451.73	-101.80	15.30	11.29
2	0.572	E-RESIST1-1	Combination	Min	-385.82	-86.94	19.85	14.65
3	0	E-RESIST1-1	Combination	Max	25.71	5.79	516.45	381.14
3	0.572	E-RESIST1-1	Combination	Max	75.99	17.12	677.85	500.26
3	0	E-RESIST1-1	Combination	Min	-385.82	-86.94	19.85	14.65
3	0.572	E-RESIST1-1	Combination	Min	-321.76	-72.51	13.66	10.08
4	0	E-RESIST1-1	Combination	Max	75.99	17.12	677.85	500.26
4	0.572	E-RESIST1-1	Combination	Max	124.20	27.99	778.84	574.79
4	0	E-RESIST1-1	Combination	Min	-321.76	-72.51	13.66	10.08
4	0.572	E-RESIST1-1	Combination	Min	-259.83	-58.55	-3.29	-2.42
5	0	E-RESIST1-1	Combination	Max	124.20	27.99	778.84	574.79
5	0.572	E-RESIST1-1	Combination	Max	170.35	38.39	823.38	607.65
5	0	E-RESIST1-1	Combination	Min	-259.83	-58.55	-3.29	-2.42
5	0.572	E-RESIST1-1	Combination	Min	-200.30	-45.14	-30.97	-22.86
6	0	E-RESIST1-1	Combination	Max	170.35	38.39	823.38	607.65
6	0.572	E-RESIST1-1	Combination	Max	214.48	48.33	816.06	602.25
6	0	E-RESIST1-1	Combination	Min	-200.30	-45.14	-30.97	-22.86
6	0.572	E-RESIST1-1	Combination	Min	-143.45	-32.33	-69.41	-51.23
7	0	E-RESIST1-1	Combination	Max	214.48	48.33	816.06	602.25
7	0.572	E-RESIST1-1	Combination	Max	257.60	58.05	762.12	562.44
7	0	E-RESIST1-1	Combination	Min	-143.45	-32.33	-69.41	-51.23
7	0.572	E-RESIST1-1	Combination	Min	-95.09	-21.43	-118.59	-87.52
8	0	E-RESIST1-1	Combination	Max	257.60	58.05	762.12	562.44
8	0.572	E-RESIST1-1	Combination	Max	299.76	67.55	723.98	534.30
8	0	E-RESIST1-1	Combination	Min	-95.09	-21.43	-118.59	-87.52
8	0.572	E-RESIST1-1	Combination	Min	-54.03	-12.18	-178.53	-131.75

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	Kips-ft
9	0	E-RESIST1-1	Combination	Max	299.76	67.55	723.98	534.30
9	0.572	E-RESIST1-1	Combination	Max	345.61	77.88	689.90	509.14
9	0	E-RESIST1-1	Combination	Min	-54.03	-12.18	-178.53	-131.75
9	0.572	E-RESIST1-1	Combination	Min	-14.21	-3.20	-249.20	-183.91
10	0	E-RESIST1-1	Combination	Max	345.61	77.88	689.90	509.14
10	0.572	E-RESIST1-1	Combination	Max	408.84	92.13	596.75	440.40
10	0	E-RESIST1-1	Combination	Min	-14.21	-3.20	-249.20	-183.91
10	0.572	E-RESIST1-1	Combination	Min	23.28	5.25	-330.63	-244.00
11	0	E-RESIST1-1	Combination	Max	408.84	92.13	596.75	440.40
11	0.572	E-RESIST1-1	Combination	Max	475.44	107.14	448.75	331.18
11	0	E-RESIST1-1	Combination	Min	23.28	5.25	-330.63	-244.00
11	0.572	E-RESIST1-1	Combination	Min	58.99	13.29	-422.80	-312.03
12	0	E-RESIST1-1	Combination	Max	475.44	107.14	448.75	331.18
12	0.572	E-RESIST1-1	Combination	Max	539.65	121.61	263.25	194.28
12	0	E-RESIST1-1	Combination	Min	58.99	13.29	-422.80	-312.03
12	0.572	E-RESIST1-1	Combination	Min	93.48	21.07	-525.72	-387.98
13	0	E-RESIST1-1	Combination	Max	539.65	121.61	263.25	194.28
13	0.572	E-RESIST1-1	Combination	Max	601.24	135.49	73.03	53.90
13	0	E-RESIST1-1	Combination	Min	93.48	21.07	-525.72	-387.98
13	0.572	E-RESIST1-1	Combination	Min	126.57	28.52	-639.39	-471.87
14	0	E-RESIST1-1	Combination	Max	601.24	135.49	73.03	53.90
14	0.572	E-RESIST1-1	Combination	Max	659.96	148.72	-111.08	-81.98
14	0	E-RESIST1-1	Combination	Min	126.57	28.52	-639.39	-471.87
14	0.572	E-RESIST1-1	Combination	Min	149.33	33.65	-770.01	-568.27
15	0	E-RESIST1-1	Combination	Max	659.96	148.72	-111.08	-81.98
15	0.572	E-RESIST1-1	Combination	Max	715.57	161.25	-233.38	-172.24
15	0	E-RESIST1-1	Combination	Min	149.33	33.65	-770.01	-568.27
15	0.572	E-RESIST1-1	Combination	Min	168.12	37.89	-977.24	-721.20
16	0	E-RESIST1-1	Combination	Max	-146.04	-32.91	-233.38	-172.24
16	0.5715	E-RESIST1-1	Combination	Max	-127.26	-28.68	-133.28	-98.36
16	0	E-RESIST1-1	Combination	Min	-716.20	-161.40	-977.24	-721.20
16	0.5715	E-RESIST1-1	Combination	Min	-661.09	-148.98	-724.41	-534.62
17	0	E-RESIST1-1	Combination	Max	-127.26	-28.68	-133.28	-98.36
17	0.5715	E-RESIST1-1	Combination	Max	-108.49	-24.45	47.61	35.13
17	0	E-RESIST1-1	Combination	Min	-661.09	-148.98	-724.41	-534.62
17	0.5715	E-RESIST1-1	Combination	Min	-605.49	-136.45	-509.42	-375.95

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	Kips-ft
18	0	E-RESIST1-1	Combination	Max	-108.49	-24.45	47.61	35.13
18	0.5715	E-RESIST1-1	Combination	Max	-86.38	-19.47	215.19	158.81
18	0	E-RESIST1-1	Combination	Min	-605.49	-136.45	-509.42	-375.95
18	0.5715	E-RESIST1-1	Combination	Min	-550.56	-124.07	-364.82	-269.24
19	0	E-RESIST1-1	Combination	Max	-86.38	-19.47	215.19	158.81
19	0.5715	E-RESIST1-1	Combination	Max	-51.93	-11.70	395.41	291.82
19	0	E-RESIST1-1	Combination	Min	-550.56	-124.07	-364.82	-269.24
19	0.5715	E-RESIST1-1	Combination	Min	-494.37	-111.41	-271.26	-200.19
20	0	E-RESIST1-1	Combination	Max	-51.93	-11.70	395.41	291.82
20	0.5715	E-RESIST1-1	Combination	Max	-8.06	-1.82	583.04	430.28
20	0	E-RESIST1-1	Combination	Min	-494.37	-111.41	-271.26	-200.19
20	0.5715	E-RESIST1-1	Combination	Min	-437.27	-98.54	-188.43	-139.06
21	0	E-RESIST1-1	Combination	Max	-8.06	-1.82	583.04	430.28
21	0.5715	E-RESIST1-1	Combination	Max	35.03	7.89	732.19	540.36
21	0	E-RESIST1-1	Combination	Min	-437.27	-98.54	-188.43	-139.06
21	0.5715	E-RESIST1-1	Combination	Min	-379.62	-85.55	-116.33	-85.85
22	0	E-RESIST1-1	Combination	Max	35.03	7.89	732.19	540.36
22	0.5715	E-RESIST1-1	Combination	Max	77.02	17.36	841.35	620.92
22	0	E-RESIST1-1	Combination	Min	-379.62	-85.55	-116.33	-85.85
22	0.5715	E-RESIST1-1	Combination	Min	-323.11	-72.81	-69.55	-51.33
23	0	E-RESIST1-1	Combination	Max	77.02	17.36	841.35	620.92
23	0.5715	E-RESIST1-1	Combination	Max	117.86	26.56	915.51	675.65
23	0	E-RESIST1-1	Combination	Min	-323.11	-72.81	-69.55	-51.33
23	0.5715	E-RESIST1-1	Combination	Min	-268.46	-60.50	-35.32	-26.07
24	0	E-RESIST1-1	Combination	Max	117.86	26.56	915.51	675.65
24	0.5715	E-RESIST1-1	Combination	Max	158.77	35.78	954.13	704.14
24	0	E-RESIST1-1	Combination	Min	-268.46	-60.50	-35.32	-26.07
24	0.5715	E-RESIST1-1	Combination	Min	-220.63	-49.72	-11.82	-8.72
25	0	E-RESIST1-1	Combination	Max	158.77	35.78	954.13	704.14
25	0.5715	E-RESIST1-1	Combination	Max	201.77	45.47	951.83	702.45
25	0	E-RESIST1-1	Combination	Min	-220.63	-49.72	-11.82	-8.72
25	0.5715	E-RESIST1-1	Combination	Min	-177.63	-40.03	0.95	0.70
26	0	E-RESIST1-1	Combination	Max	201.77	45.47	951.83	702.45
26	0.5715	E-RESIST1-1	Combination	Max	249.56	56.24	954.03	704.07
26	0	E-RESIST1-1	Combination	Min	-177.63	-40.03	0.95	0.70
26	0.5715	E-RESIST1-1	Combination	Min	-136.71	-30.81	-11.82	-8.72

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	Kips-ft
27	0	E-RESIST1-1	Combination	Max	249.56	56.24	954.03	704.07
27	0.5715	E-RESIST1-1	Combination	Max	304.21	68.55	915.44	675.60
27	0	E-RESIST1-1	Combination	Min	-136.71	-30.81	-11.82	-8.72
27	0.5715	E-RESIST1-1	Combination	Min	-95.87	-21.60	-35.32	-26.07
28	0	E-RESIST1-1	Combination	Max	304.21	68.55	915.44	675.60
28	0.5715	E-RESIST1-1	Combination	Max	360.72	81.29	841.28	620.86
28	0	E-RESIST1-1	Combination	Min	-95.87	-21.60	-35.32	-26.07
28	0.5715	E-RESIST1-1	Combination	Min	-53.89	-12.14	-69.56	-51.33
29	0	E-RESIST1-1	Combination	Max	360.72	81.29	841.28	620.86
29	0.5715	E-RESIST1-1	Combination	Max	418.36	94.28	732.15	540.33
29	0	E-RESIST1-1	Combination	Min	-53.89	-12.14	-69.56	-51.33
29	0.5715	E-RESIST1-1	Combination	Min	-10.80	-2.43	-116.33	-85.85
30	0	E-RESIST1-1	Combination	Max	418.36	94.28	732.15	540.33
30	0.5715	E-RESIST1-1	Combination	Max	475.46	107.15	583.02	430.27
30	0	E-RESIST1-1	Combination	Min	-10.80	-2.43	-116.33	-85.85
30	0.5715	E-RESIST1-1	Combination	Min	33.10	7.46	-188.43	-139.06
31	0	E-RESIST1-1	Combination	Max	475.46	107.15	583.02	430.27
31	0.5715	E-RESIST1-1	Combination	Max	531.66	119.81	395.42	291.82
31	0	E-RESIST1-1	Combination	Min	33.10	7.46	-188.43	-139.06
31	0.5715	E-RESIST1-1	Combination	Min	67.55	15.22	-271.26	-200.19
32	0	E-RESIST1-1	Combination	Max	531.66	119.81	395.42	291.82
32	0.5715	E-RESIST1-1	Combination	Max	586.60	132.19	215.24	158.85
32	0	E-RESIST1-1	Combination	Min	67.55	15.22	-271.26	-200.19
32	0.5715	E-RESIST1-1	Combination	Min	89.72	20.22	-364.82	-269.24
33	0	E-RESIST1-1	Combination	Max	586.60	132.19	215.24	158.85
33	0.5715	E-RESIST1-1	Combination	Max	642.18	144.72	47.65	35.16
33	0	E-RESIST1-1	Combination	Min	89.72	20.22	-364.82	-269.24
33	0.5715	E-RESIST1-1	Combination	Min	108.49	24.45	-509.40	-375.94
34	0	E-RESIST1-1	Combination	Max	642.18	144.72	47.65	35.16
34	0.5715	E-RESIST1-1	Combination	Max	697.30	157.14	-133.27	-98.35
34	0	E-RESIST1-1	Combination	Min	108.49	24.45	-509.40	-375.94
34	0.5715	E-RESIST1-1	Combination	Min	127.26	28.68	-724.40	-534.61
35	0	E-RESIST1-1	Combination	Max	697.30	157.14	-133.27	-98.35
35	0.5715	E-RESIST1-1	Combination	Max	750.65	169.16	-233.39	-172.24
35	0	E-RESIST1-1	Combination	Min	127.26	28.68	-724.40	-534.61
35	0.5715	E-RESIST1-1	Combination	Min	146.04	32.91	-977.21	-721.18

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	Kips-ft
36	0	E-RESIST1-1	Combination	Max	-168.12	-37.89	-233.39	-172.24
36	0.572	E-RESIST1-1	Combination	Max	-145.40	-32.77	-111.17	-82.04
36	0	E-RESIST1-1	Combination	Min	-678.88	-152.99	-977.21	-721.18
36	0.572	E-RESIST1-1	Combination	Min	-620.17	-139.76	-770.01	-568.27
37	0	E-RESIST1-1	Combination	Max	-145.40	-32.77	-111.17	-82.04
37	0.572	E-RESIST1-1	Combination	Max	-112.32	-25.31	72.94	53.83
37	0	E-RESIST1-1	Combination	Min	-620.17	-139.76	-770.01	-568.27
37	0.572	E-RESIST1-1	Combination	Min	-558.60	-125.88	-639.40	-471.88
38	0	E-RESIST1-1	Combination	Max	-112.32	-25.31	72.94	53.83
38	0.572	E-RESIST1-1	Combination	Max	-77.84	-17.54	263.19	194.24
38	0	E-RESIST1-1	Combination	Min	-558.60	-125.88	-639.40	-471.88
38	0.572	E-RESIST1-1	Combination	Min	-494.39	-111.41	-525.73	-387.99
39	0	E-RESIST1-1	Combination	Max	-77.84	-17.54	263.19	194.24
39	0.572	E-RESIST1-1	Combination	Max	-42.13	-9.49	448.75	331.18
39	0	E-RESIST1-1	Combination	Min	-494.39	-111.41	-525.73	-387.99
39	0.572	E-RESIST1-1	Combination	Min	-427.80	-96.41	-422.81	-312.04
40	0	E-RESIST1-1	Combination	Max	-42.13	-9.49	448.75	331.18
40	0.572	E-RESIST1-1	Combination	Max	-4.66	-1.05	596.81	440.44
40	0	E-RESIST1-1	Combination	Min	-427.80	-96.41	-422.81	-312.04
40	0.572	E-RESIST1-1	Combination	Min	-364.50	-82.14	-330.64	-244.01
41	0	E-RESIST1-1	Combination	Max	-4.66	-1.05	596.81	440.44
41	0.572	E-RESIST1-1	Combination	Max	35.17	7.92	690.01	509.23
41	0	E-RESIST1-1	Combination	Min	-364.50	-82.14	-330.64	-244.01
41	0.572	E-RESIST1-1	Combination	Min	-318.63	-71.80	-249.21	-183.92
42	0	E-RESIST1-1	Combination	Max	35.17	7.92	690.01	509.23
42	0.572	E-RESIST1-1	Combination	Max	76.22	17.18	724.18	534.44
42	0	E-RESIST1-1	Combination	Min	-318.63	-71.80	-249.21	-183.92
42	0.572	E-RESIST1-1	Combination	Min	-276.47	-62.30	-178.54	-131.76
43	0	E-RESIST1-1	Combination	Max	76.22	17.18	724.18	534.44
43	0.572	E-RESIST1-1	Combination	Max	124.53	28.06	761.93	562.30
43	0	E-RESIST1-1	Combination	Min	-276.47	-62.30	-178.54	-131.76
43	0.572	E-RESIST1-1	Combination	Min	-233.36	-52.59	-118.60	-87.53
44	0	E-RESIST1-1	Combination	Max	124.53	28.06	761.93	562.30
44	0.572	E-RESIST1-1	Combination	Max	181.37	40.87	815.92	602.15
44	0	E-RESIST1-1	Combination	Min	-233.36	-52.59	-118.60	-87.53
44	0.572	E-RESIST1-1	Combination	Min	-189.23	-42.64	-69.42	-51.23

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	Kips-ft
45	0	E-RESIST1-1	Combination	Max	181.37	40.87	815.92	602.15
45	0.572	E-RESIST1-1	Combination	Max	240.89	54.29	823.29	607.59
45	0	E-RESIST1-1	Combination	Min	-189.23	-42.64	-69.42	-51.23
45	0.572	E-RESIST1-1	Combination	Min	-143.08	-32.24	-30.98	-22.86
46	0	E-RESIST1-1	Combination	Max	240.89	54.29	823.29	607.59
46	0.572	E-RESIST1-1	Combination	Max	302.82	68.24	778.82	574.77
46	0	E-RESIST1-1	Combination	Min	-143.08	-32.24	-30.98	-22.86
46	0.572	E-RESIST1-1	Combination	Min	-94.89	-21.38	-3.29	-2.43
47	0	E-RESIST1-1	Combination	Max	302.82	68.24	778.82	574.77
47	0.572	E-RESIST1-1	Combination	Max	366.87	82.67	677.91	500.30
47	0	E-RESIST1-1	Combination	Min	-94.89	-21.38	-3.29	-2.43
47	0.572	E-RESIST1-1	Combination	Min	-44.61	-10.05	13.65	10.08
48	0	E-RESIST1-1	Combination	Max	366.87	82.67	677.91	500.30
48	0.572	E-RESIST1-1	Combination	Max	432.77	97.53	516.59	381.24
48	0	E-RESIST1-1	Combination	Min	-44.61	-10.05	13.65	10.08
48	0.572	E-RESIST1-1	Combination	Min	-1.44	-0.32	19.85	14.65
49	0	E-RESIST1-1	Combination	Max	432.77	97.53	516.59	381.24
49	0.572	E-RESIST1-1	Combination	Max	500.26	112.73	291.52	215.14
49	0	E-RESIST1-1	Combination	Min	-1.44	-0.32	19.85	14.65
49	0.572	E-RESIST1-1	Combination	Min	17.35	3.91	15.30	11.29
50	0	E-RESIST1-1	Combination	Max	500.26	112.73	291.52	215.14
50	0.572	E-RESIST1-1	Combination	Max	569.14	128.26	0.00	0.00
50	0	E-RESIST1-1	Combination	Min	17.35	3.91	15.30	11.29
50	0.572	E-RESIST1-1	Combination	Min	36.14	8.14	0.00	0.00

Fuente: Elaboración Propia.

Tabla 63 Cortantes y momentos combinación resistencia 1-2 – FIN

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	kips - ft
1	0	E-RESIST1-2	Combination	Max	-40.7	-9.2	0.0	0.0
1	0.572	E-RESIST1-2	Combination	Max	-8.8	-2.0	298.3	220.2
1	0	E-RESIST1-2	Combination	Min	-573.4	-129.2	0.0	0.0
1	0.572	E-RESIST1-2	Combination	Min	-470.9	-106.1	17.9	13.2
2	0	E-RESIST1-2	Combination	Max	-8.8	-2.0	298.3	220.2

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	kips - ft
2	0.572	E-RESIST1-2	Combination	Max	29.0	6.5	538.5	397.4
2	0	E-RESIST1-2	Combination	Min	-470.9	-106.1	17.9	13.2
2	0.572	E-RESIST1-2	Combination	Min	-411.1	-92.7	25.0	18.5
3	0	E-RESIST1-2	Combination	Max	29.0	6.5	538.5	397.4
3	0.572	E-RESIST1-2	Combination	Max	83.2	18.7	721.4	532.4
3	0	E-RESIST1-2	Combination	Min	-411.1	-92.7	25.0	18.5
3	0.572	E-RESIST1-2	Combination	Min	-352.2	-79.4	21.4	15.8
4	0	E-RESIST1-2	Combination	Max	83.2	18.7	721.4	532.4
4	0.572	E-RESIST1-2	Combination	Max	139.6	31.5	848.6	626.3
4	0	E-RESIST1-2	Combination	Min	-352.2	-79.4	21.4	15.8
4	0.572	E-RESIST1-2	Combination	Min	-294.4	-66.3	7.1	5.2
5	0	E-RESIST1-2	Combination	Max	139.6	31.5	848.6	626.3
5	0.572	E-RESIST1-2	Combination	Max	195.4	44.0	922.3	680.6
5	0	E-RESIST1-2	Combination	Min	-294.4	-66.3	7.1	5.2
5	0.572	E-RESIST1-2	Combination	Min	-237.8	-53.6	-18.0	-13.3
6	0	E-RESIST1-2	Combination	Max	195.4	44.0	922.3	680.6
6	0.572	E-RESIST1-2	Combination	Max	250.5	56.4	944.9	697.4
6	0	E-RESIST1-2	Combination	Min	-237.8	-53.6	-18.0	-13.3
6	0.572	E-RESIST1-2	Combination	Min	-182.8	-41.2	-53.9	-39.8
7	0	E-RESIST1-2	Combination	Max	250.5	56.4	944.9	697.4
7	0.572	E-RESIST1-2	Combination	Max	304.6	68.6	920.7	679.5
7	0	E-RESIST1-2	Combination	Min	-182.8	-41.2	-53.9	-39.8
7	0.572	E-RESIST1-2	Combination	Min	-129.5	-29.2	-100.5	-74.2
8	0	E-RESIST1-2	Combination	Max	304.6	68.6	920.7	679.5
8	0.572	E-RESIST1-2	Combination	Max	357.5	80.6	880.8	650.0
8	0	E-RESIST1-2	Combination	Min	-129.5	-29.2	-100.5	-74.2
8	0.572	E-RESIST1-2	Combination	Min	-78.1	-17.6	-157.8	-116.5
9	0	E-RESIST1-2	Combination	Max	357.5	80.6	880.8	650.0
9	0.572	E-RESIST1-2	Combination	Max	407.8	91.9	794.3	586.2
9	0	E-RESIST1-2	Combination	Min	-78.1	-17.6	-157.8	-116.5
9	0.572	E-RESIST1-2	Combination	Min	-28.9	-6.5	-225.9	-166.7
10	0	E-RESIST1-2	Combination	Max	407.8	91.9	794.3	586.2
10	0.572	E-RESIST1-2	Combination	Max	455.4	102.6	665.2	490.9
10	0	E-RESIST1-2	Combination	Min	-28.9	-6.5	-225.9	-166.7
10	0.572	E-RESIST1-2	Combination	Min	17.9	4.0	-304.8	-224.9
11	0	E-RESIST1-2	Combination	Max	455.4	102.6	665.2	490.9

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	kips - ft
11	0.572	E-RESIST1-2	Combination	Max	500.3	112.7	497.5	367.2
11	0	E-RESIST1-2	Combination	Min	17.9	4.0	-304.8	-224.9
11	0.572	E-RESIST1-2	Combination	Min	62.2	14.0	-394.3	-291.0
12	0	E-RESIST1-2	Combination	Max	500.3	112.7	497.5	367.2
12	0.572	E-RESIST1-2	Combination	Max	542.4	122.2	296.1	218.5
12	0	E-RESIST1-2	Combination	Min	62.2	14.0	-394.3	-291.0
12	0.572	E-RESIST1-2	Combination	Min	98.0	22.1	-494.7	-365.1
13	0	E-RESIST1-2	Combination	Max	542.4	122.2	296.1	218.5
13	0.572	E-RESIST1-2	Combination	Max	587.9	132.5	66.2	48.9
13	0	E-RESIST1-2	Combination	Min	98.0	22.1	-494.7	-365.1
13	0.572	E-RESIST1-2	Combination	Min	125.0	28.2	-618.1	-456.2
14	0	E-RESIST1-2	Combination	Max	587.9	132.5	66.2	48.9
14	0.572	E-RESIST1-2	Combination	Max	632.5	142.5	-98.4	-72.6
14	0	E-RESIST1-2	Combination	Min	125.0	28.2	-618.1	-456.2
14	0.572	E-RESIST1-2	Combination	Min	148.8	33.5	-865.2	-638.5
15	0	E-RESIST1-2	Combination	Max	632.5	142.5	-98.4	-72.6
15	0.572	E-RESIST1-2	Combination	Max	674.4	152.0	-228.7	-168.8
15	0	E-RESIST1-2	Combination	Min	148.8	33.5	-865.2	-638.5
15	0.572	E-RESIST1-2	Combination	Min	167.6	37.8	-1143.8	-844.1
16	0	E-RESIST1-2	Combination	Max	-144.2	-32.5	-228.7	-168.8
16	0.5715	E-RESIST1-2	Combination	Max	-123.3	-27.8	-98.7	-72.8
16	0	E-RESIST1-2	Combination	Min	-665.2	-149.9	-1143.8	-844.1
16	0.5715	E-RESIST1-2	Combination	Min	-624.1	-140.6	-871.8	-643.4
17	0	E-RESIST1-2	Combination	Max	-123.3	-27.8	-98.7	-72.8
17	0.5715	E-RESIST1-2	Combination	Max	-94.4	-21.3	63.3	46.7
17	0	E-RESIST1-2	Combination	Min	-624.1	-140.6	-871.8	-643.4
17	0.5715	E-RESIST1-2	Combination	Min	-580.9	-130.9	-623.8	-460.4
18	0	E-RESIST1-2	Combination	Max	-94.4	-21.3	63.3	46.7
18	0.5715	E-RESIST1-2	Combination	Max	-60.4	-13.6	253.5	187.1
18	0	E-RESIST1-2	Combination	Min	-580.9	-130.9	-623.8	-460.4
18	0.5715	E-RESIST1-2	Combination	Min	-535.9	-120.8	-417.0	-307.8
19	0	E-RESIST1-2	Combination	Max	-60.4	-13.6	253.5	187.1
19	0.5715	E-RESIST1-2	Combination	Max	-20.4	-4.6	457.7	337.8
19	0	E-RESIST1-2	Combination	Min	-535.9	-120.8	-417.0	-307.8
19	0.5715	E-RESIST1-2	Combination	Min	-489.4	-110.3	-283.5	-209.3
20	0	E-RESIST1-2	Combination	Max	-20.4	-4.6	457.7	337.8

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	kips - ft
20	0.5715	E-RESIST1-2	Combination	Max	20.2	4.5	635.8	469.2
20	0	E-RESIST1-2	Combination	Min	-489.4	-110.3	-283.5	-209.3
20	0.5715	E-RESIST1-2	Combination	Min	-441.6	-99.5	-199.6	-147.3
21	0	E-RESIST1-2	Combination	Max	20.2	4.5	635.8	469.2
21	0.5715	E-RESIST1-2	Combination	Max	62.4	14.1	784.1	578.6
21	0	E-RESIST1-2	Combination	Min	-441.6	-99.5	-199.6	-147.3
21	0.5715	E-RESIST1-2	Combination	Min	-398.7	-89.8	-126.5	-93.3
22	0	E-RESIST1-2	Combination	Max	62.4	14.1	784.1	578.6
22	0.5715	E-RESIST1-2	Combination	Max	106.0	23.9	899.9	664.1
22	0	E-RESIST1-2	Combination	Min	-398.7	-89.8	-126.5	-93.3
22	0.5715	E-RESIST1-2	Combination	Min	-354.2	-79.8	-64.0	-47.3
23	0	E-RESIST1-2	Combination	Max	106.0	23.9	899.9	664.1
23	0.5715	E-RESIST1-2	Combination	Max	150.7	34.0	981.3	724.2
23	0	E-RESIST1-2	Combination	Min	-354.2	-79.8	-64.0	-47.3
23	0.5715	E-RESIST1-2	Combination	Min	-307.9	-69.4	-12.3	-9.1
24	0	E-RESIST1-2	Combination	Max	150.7	34.0	981.3	724.2
24	0.5715	E-RESIST1-2	Combination	Max	196.4	44.2	1027.2	758.0
24	0	E-RESIST1-2	Combination	Min	-307.9	-69.4	-12.3	-9.1
24	0.5715	E-RESIST1-2	Combination	Min	-261.4	-58.9	28.6	21.1
25	0	E-RESIST1-2	Combination	Max	196.4	44.2	1027.2	758.0
25	0.5715	E-RESIST1-2	Combination	Max	242.5	54.7	1036.9	765.3
25	0	E-RESIST1-2	Combination	Min	-261.4	-58.9	28.6	21.1
25	0.5715	E-RESIST1-2	Combination	Min	-215.2	-48.5	58.9	43.5
26	0	E-RESIST1-2	Combination	Max	242.5	54.7	1036.9	765.3
26	0.5715	E-RESIST1-2	Combination	Max	289.0	65.1	1027.0	757.9
26	0	E-RESIST1-2	Combination	Min	-215.2	-48.5	58.9	43.5
26	0.5715	E-RESIST1-2	Combination	Min	-169.6	-38.2	28.6	21.1
27	0	E-RESIST1-2	Combination	Max	289.0	65.1	1027.0	757.9
27	0.5715	E-RESIST1-2	Combination	Max	335.3	75.6	981.1	724.1
27	0	E-RESIST1-2	Combination	Min	-169.6	-38.2	28.6	21.1
27	0.5715	E-RESIST1-2	Combination	Min	-124.8	-28.1	-12.3	-9.1
28	0	E-RESIST1-2	Combination	Max	335.3	75.6	981.1	724.1
28	0.5715	E-RESIST1-2	Combination	Max	379.8	85.6	899.7	664.0
28	0	E-RESIST1-2	Combination	Min	-124.8	-28.1	-12.3	-9.1
28	0.5715	E-RESIST1-2	Combination	Min	-81.2	-18.3	-64.0	-47.3
29	0	E-RESIST1-2	Combination	Max	379.8	85.6	899.7	664.0

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	kips - ft
29	0.5715	E-RESIST1-2	Combination	Max	422.7	95.3	783.9	578.5
29	0	E-RESIST1-2	Combination	Min	-81.2	-18.3	-64.0	-47.3
29	0.5715	E-RESIST1-2	Combination	Min	-39.0	-8.8	-126.5	-93.3
30	0	E-RESIST1-2	Combination	Max	422.7	95.3	783.9	578.5
30	0.5715	E-RESIST1-2	Combination	Max	470.5	106.0	635.7	469.1
30	0	E-RESIST1-2	Combination	Min	-39.0	-8.8	-126.5	-93.3
30	0.5715	E-RESIST1-2	Combination	Min	1.5	0.3	-199.6	-147.3
31	0	E-RESIST1-2	Combination	Max	470.5	106.0	635.7	469.1
31	0.5715	E-RESIST1-2	Combination	Max	517.1	116.5	457.6	337.7
31	0	E-RESIST1-2	Combination	Min	1.5	0.3	-199.6	-147.3
31	0.5715	E-RESIST1-2	Combination	Min	41.5	9.4	-283.5	-209.2
32	0	E-RESIST1-2	Combination	Max	517.1	116.5	457.6	337.7
32	0.5715	E-RESIST1-2	Combination	Max	562.1	126.7	253.4	187.0
32	0	E-RESIST1-2	Combination	Min	41.5	9.4	-283.5	-209.2
32	0.5715	E-RESIST1-2	Combination	Min	75.6	17.0	-417.0	-307.8
33	0	E-RESIST1-2	Combination	Max	562.1	126.7	253.4	187.0
33	0.5715	E-RESIST1-2	Combination	Max	605.3	136.4	63.2	46.6
33	0	E-RESIST1-2	Combination	Min	75.6	17.0	-417.0	-307.8
33	0.5715	E-RESIST1-2	Combination	Min	104.5	23.5	-623.8	-460.3
34	0	E-RESIST1-2	Combination	Max	605.3	136.4	63.2	46.6
34	0.5715	E-RESIST1-2	Combination	Max	646.3	145.6	-98.7	-72.8
34	0	E-RESIST1-2	Combination	Min	104.5	23.5	-623.8	-460.3
34	0.5715	E-RESIST1-2	Combination	Min	125.4	28.3	-871.8	-643.4
35	0	E-RESIST1-2	Combination	Max	646.3	145.6	-98.7	-72.8
35	0.5715	E-RESIST1-2	Combination	Max	686.0	154.6	-228.7	-168.8
35	0	E-RESIST1-2	Combination	Min	125.4	28.3	-871.8	-643.4
35	0.5715	E-RESIST1-2	Combination	Min	144.2	32.5	-1143.8	-844.1
36	0	E-RESIST1-2	Combination	Max	-167.6	-37.8	-228.7	-168.8
36	0.572	E-RESIST1-2	Combination	Max	-143.8	-32.4	-98.4	-72.6
36	0	E-RESIST1-2	Combination	Min	-651.4	-146.8	-1143.8	-844.1
36	0.572	E-RESIST1-2	Combination	Min	-606.8	-136.7	-865.2	-638.5
37	0	E-RESIST1-2	Combination	Max	-143.8	-32.4	-98.4	-72.6
37	0.572	E-RESIST1-2	Combination	Max	-116.8	-26.3	66.3	48.9
37	0	E-RESIST1-2	Combination	Min	-606.8	-136.7	-865.2	-638.5
37	0.572	E-RESIST1-2	Combination	Min	-561.3	-126.5	-618.1	-456.2
38	0	E-RESIST1-2	Combination	Max	-116.8	-26.3	66.3	48.9

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	kips - ft
38	0.572	E-RESIST1-2	Combination	Max	-81.1	-18.3	296.2	218.6
38	0	E-RESIST1-2	Combination	Min	-561.3	-126.5	-618.1	-456.2
38	0.572	E-RESIST1-2	Combination	Min	-519.2	-117.0	-494.7	-365.1
39	0	E-RESIST1-2	Combination	Max	-81.1	-18.3	296.2	218.6
39	0.572	E-RESIST1-2	Combination	Max	-36.8	-8.3	497.6	367.2
39	0	E-RESIST1-2	Combination	Min	-519.2	-117.0	-494.7	-365.1
39	0.572	E-RESIST1-2	Combination	Min	-474.3	-106.9	-394.3	-291.0
40	0	E-RESIST1-2	Combination	Max	-36.8	-8.3	497.6	367.2
40	0.572	E-RESIST1-2	Combination	Max	10.0	2.3	665.3	491.0
40	0	E-RESIST1-2	Combination	Min	-474.3	-106.9	-394.3	-291.0
40	0.572	E-RESIST1-2	Combination	Min	-426.7	-96.2	-304.7	-224.9
41	0	E-RESIST1-2	Combination	Max	10.0	2.3	665.3	491.0
41	0.572	E-RESIST1-2	Combination	Max	59.2	13.3	794.5	586.3
41	0	E-RESIST1-2	Combination	Min	-426.7	-96.2	-304.7	-224.9
41	0.572	E-RESIST1-2	Combination	Min	-376.4	-84.8	-225.9	-166.7
42	0	E-RESIST1-2	Combination	Max	59.2	13.3	794.5	586.3
42	0.572	E-RESIST1-2	Combination	Max	110.6	24.9	881.0	650.2
42	0	E-RESIST1-2	Combination	Min	-376.4	-84.8	-225.9	-166.7
42	0.572	E-RESIST1-2	Combination	Min	-323.5	-72.9	-157.8	-116.5
43	0	E-RESIST1-2	Combination	Max	110.6	24.9	881.0	650.2
43	0.572	E-RESIST1-2	Combination	Max	163.9	36.9	921.0	679.7
43	0	E-RESIST1-2	Combination	Min	-323.5	-72.9	-157.8	-116.5
43	0.572	E-RESIST1-2	Combination	Min	-269.4	-60.7	-100.5	-74.1
44	0	E-RESIST1-2	Combination	Max	163.9	36.9	921.0	679.7
44	0.572	E-RESIST1-2	Combination	Max	218.9	49.3	944.8	697.2
44	0	E-RESIST1-2	Combination	Min	-269.4	-60.7	-100.5	-74.1
44	0.572	E-RESIST1-2	Combination	Min	-214.3	-48.3	-53.9	-39.8
45	0	E-RESIST1-2	Combination	Max	218.9	49.3	944.8	697.2
45	0.572	E-RESIST1-2	Combination	Max	275.5	62.1	922.1	680.5
45	0	E-RESIST1-2	Combination	Min	-214.3	-48.3	-53.9	-39.8
45	0.572	E-RESIST1-2	Combination	Min	-158.5	-35.7	-18.0	-13.3
46	0	E-RESIST1-2	Combination	Max	275.5	62.1	922.1	680.5
46	0.572	E-RESIST1-2	Combination	Max	333.3	75.1	848.6	626.2
46	0	E-RESIST1-2	Combination	Min	-158.5	-35.7	-18.0	-13.3
46	0.572	E-RESIST1-2	Combination	Min	-102.1	-23.0	7.1	5.2
47	0	E-RESIST1-2	Combination	Max	333.3	75.1	848.6	626.2

TABLE: Element Forces - Frames								
Frame	Station	OutputCase	CaseType	StepType	V2		M3	
Text	m	Text	Text	Text	KN	kips	KN-m	kips - ft
47	0.572	E-RESIST1-2	Combination	Max	392.2	88.4	721.4	532.4
47	0	E-RESIST1-2	Combination	Min	-102.1	-23.0	7.1	5.2
47	0.572	E-RESIST1-2	Combination	Min	-47.9	-10.8	21.4	15.8
48	0	E-RESIST1-2	Combination	Max	392.2	88.4	721.4	532.4
48	0.572	E-RESIST1-2	Combination	Max	452.0	101.9	538.6	397.5
48	0	E-RESIST1-2	Combination	Min	-47.9	-10.8	21.4	15.8
48	0.572	E-RESIST1-2	Combination	Min	-10.0	-2.3	25.0	18.5
49	0	E-RESIST1-2	Combination	Max	452.0	101.9	538.6	397.5
49	0.572	E-RESIST1-2	Combination	Max	512.5	115.5	298.5	220.3
49	0	E-RESIST1-2	Combination	Min	-10.0	-2.3	25.0	18.5
49	0.572	E-RESIST1-2	Combination	Min	21.9	4.9	17.9	13.2
50	0	E-RESIST1-2	Combination	Max	512.5	115.5	298.5	220.3
50	0.572	E-RESIST1-2	Combination	Max	573.4	129.2	0.0	0.0
50	0	E-RESIST1-2	Combination	Min	21.9	4.9	17.9	13.2
50	0.572	E-RESIST1-2	Combination	Min	40.7	9.2	0.0	0.0

Fuente: Elaboración Propia.

3.5.3.5. Comparación resultados obtenidos con Líneas Vs SAP2000 –FIN

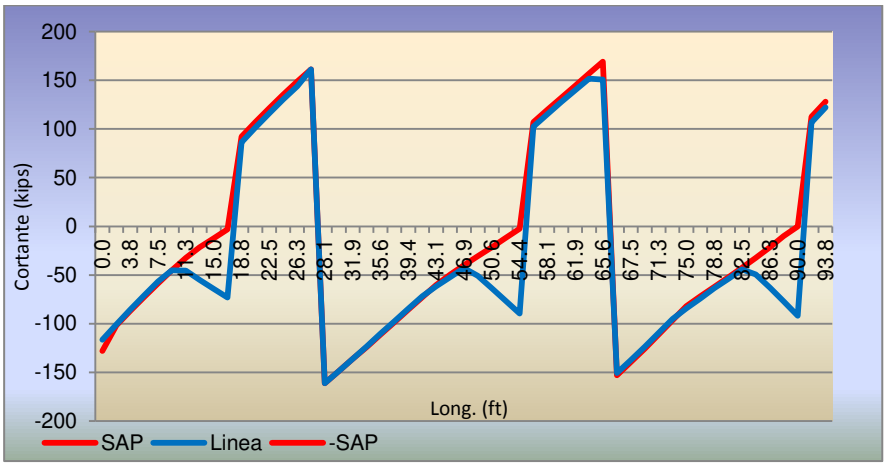


Figura 99 Diagrama de cortante combinación resistencia 1-1 Línea vs SAP2000

Fuente: Elaboración Propia.

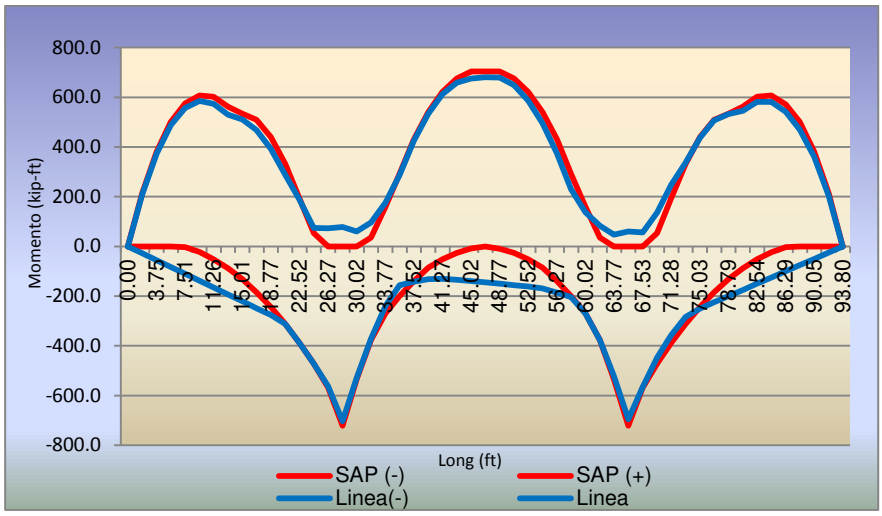


Figura 100 Diagrama de momentos combinación resistencia 1-1 Línea vs SAP2000

Fuente: Elaboración Propia.

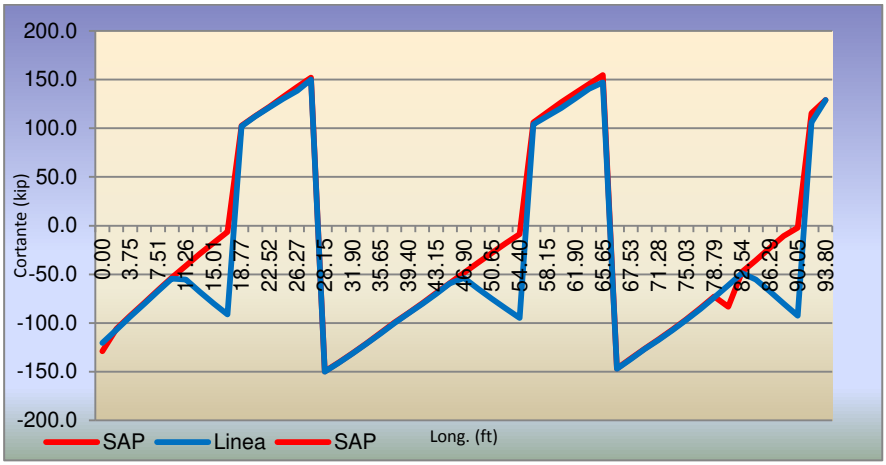


Figura 101 Diagrama de cortante combinación resistencia 1-2 Línea vs SAP2000

Fuente: Elaboración Propia.

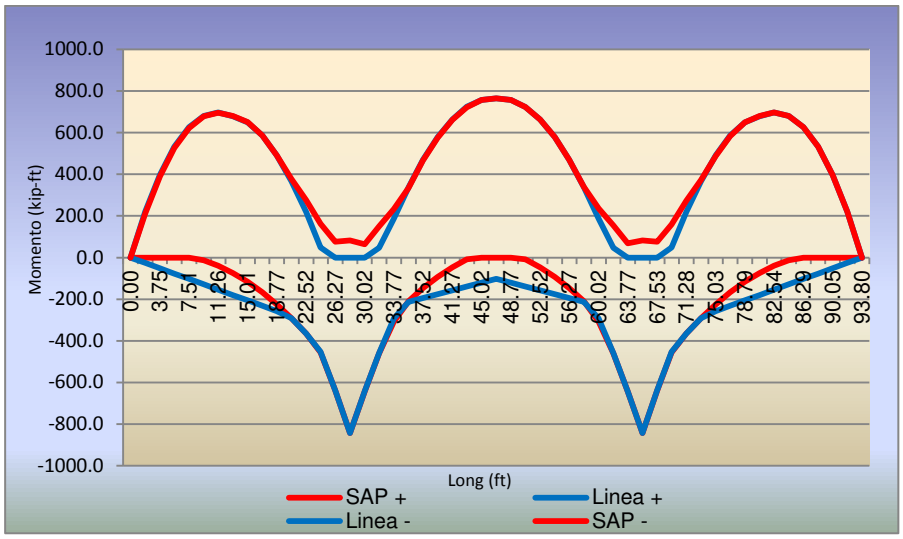


Figura 102 Diagrama de momentos combinación resistencia 1-2 Línea vs SAP2000

Fuente: Elaboración Propia.

3.5.3.6. Refuerzo suministrado a franja interna – FIN

En la Figura 103 a Figura 109 se presenta el refuerzo suministrado a la franja interna, de acuerdo con los planos de diseño y los cortes que se indican en la Figura 71.

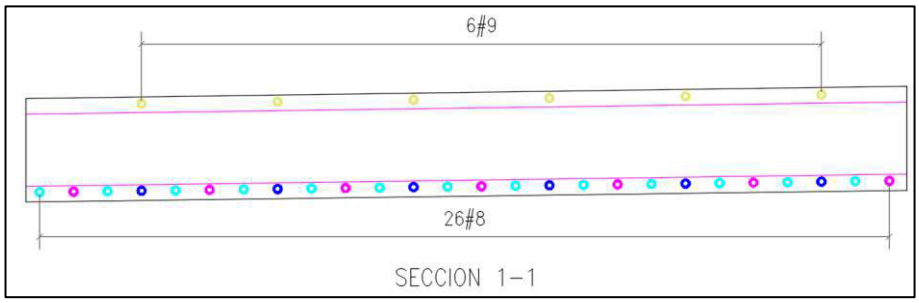


Figura 103 Refuerzo suministrado corte 1-1 – FIN

Fuente: Elaboración Propia.

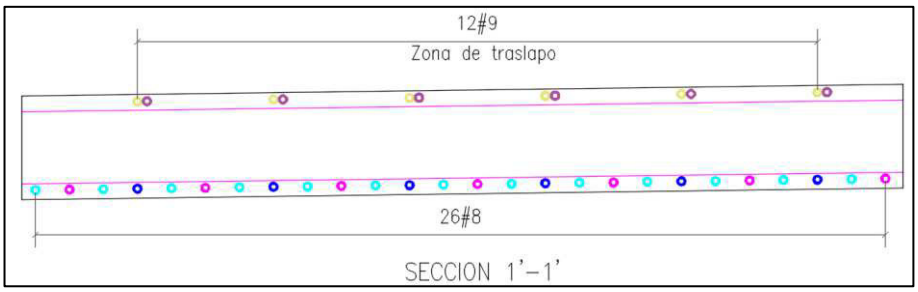


Figura 104 Refuerzo suministrado corte 1'-1' – FIN
Fuente: Elaboración Propia.

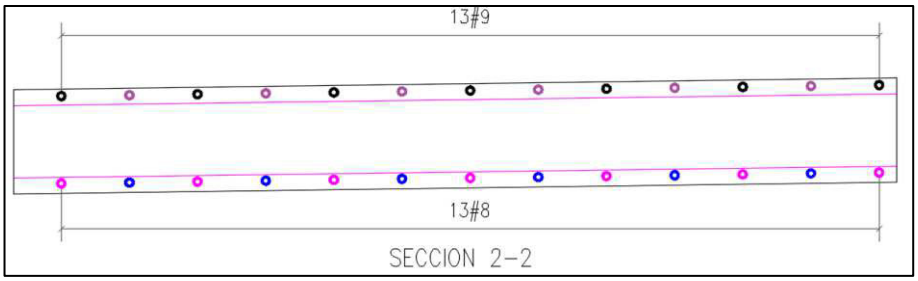


Figura 105 Refuerzo suministrado corte 2-2 – FIN
Fuente: Elaboración Propia.

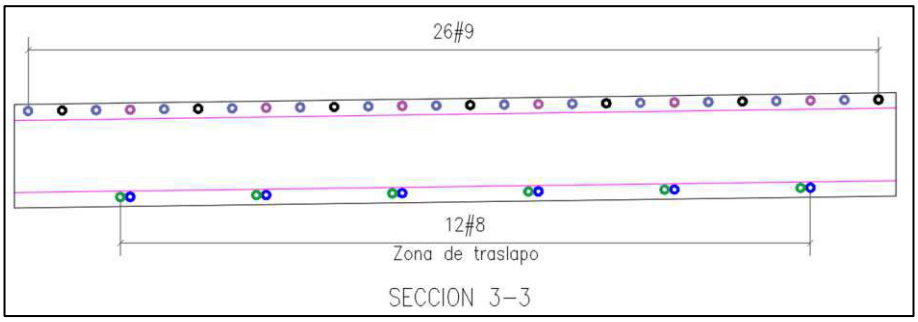


Figura 106 Refuerzo suministrado corte 3-3 – FIN
Fuente: Elaboración Propia.

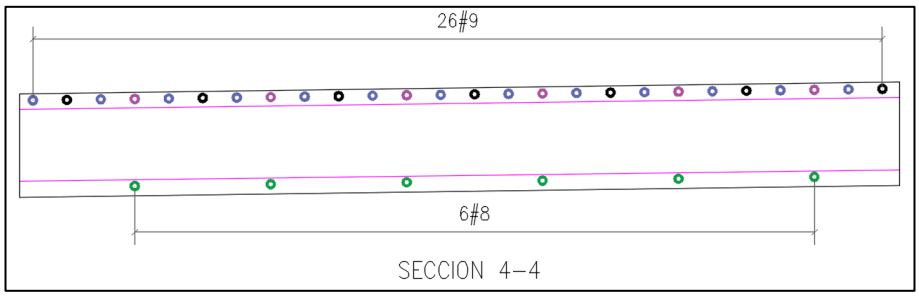


Figura 107 Refuerzo suministrado corte 4-4 – FIN
Fuente: Elaboración Propia.

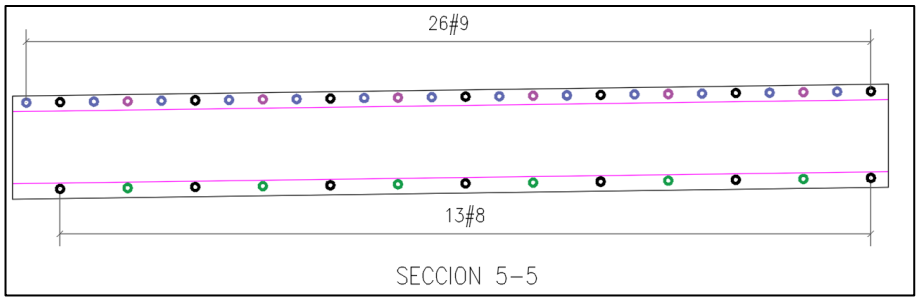


Figura 108 Refuerzo suministrado corte 5-5 – FIN
Fuente: Elaboración Propia.

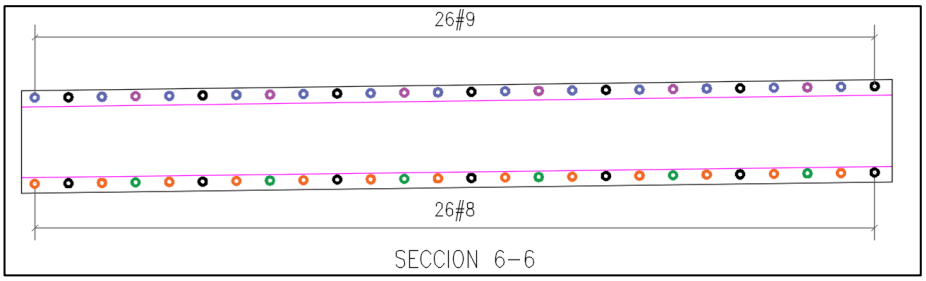


Figura 109 Refuerzo suministrado corte 6-6 – FIN
Fuente: Elaboración Propia.

3.5.3.7. Momento "Mn" y cortante resistente "Vn" -FIN

Los momentos y cortantes resistentes se calcularon de acuerdo a la geometría de la franja interior, especificaciones de materiales y refuerzo

suministrado, empleando las ecuaciones que se presentan en los numerales 1.6.8 y 1.6.9 de este documento.

Los momentos resistentes de la franja interior se calcularon en los cortes que se presentan en la Figura 71, esto para tener en cuenta traslapos y distribución de refuerzo.

Dado que el corte 1-1 se localiza en la zona del apoyo, se debe afectar el valor de la resistencia a fluencia del acero de refuerzo, en la zona donde se desarrolla la longitud de anclaje de las barras de acero. A continuación se presentan los cálculos.

Resistencia nominal a flexión Mn + corte 1-1 -FIN

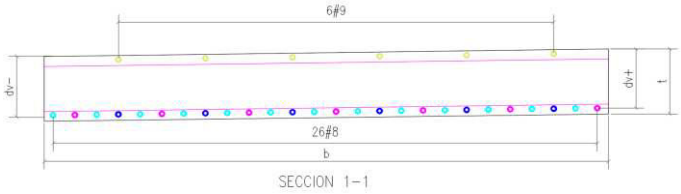
Lon-d= 0.67m = 2.8 ft Longitud de desarrollo barras

Materiales

f'c= 14 Mpa
fy= 420 Mpa
fy= 367.9 Mpa Afectada
Es= 2E+07 Mpa

Geometría viga

b 3.90m
t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 8 Diámetro de refuerzo para flexión
As = 5.1cm2
No Barr= 26
As= 133cm2 Área total de refuerzo para flexión
ρ = 0.0085 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 11 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 1526 kN-m/m = 2067.15 kips -ft/ft



Resistencia nominal a flexión - momento negativo

Geometría viga

t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 9 Diámetro de refuerzo para flexión
As = 6.3cm2
No Barr= 6
As= 38cm2 Área total de refuerzo para flexión
ρ = 0.00243 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 3 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 484 kN-m/m = 656.001 kips -ft/ft

Resistencia nominal a flexión Mn + corte 1a-1a -FIN

Materiales

f'c= 14 Mpa
fy= 420 Mpa
Es= 2E+07 Mpa

SECCION 1'–1'

Geometría viga

b 1.80m
t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 8 Diámetro de refuerzo para flexión
As = 5.1cm2
No Barr= 26
As= 133cm2 Área total de refuerzo para flexión
ρ = 0.01842 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 26 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 1353 kN-m/m = 1833.76 kips -ft/ft

Resistencia nominal a flexión - momento negativo

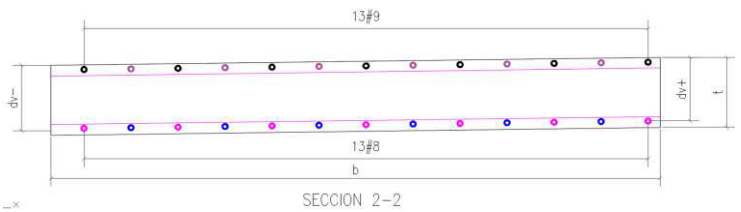
Geometría viga

t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 9 Diámetro de refuerzo para flexión
As = 6.3cm2
No Barr= 12
As= 76cm2 Área total de refuerzo para flexión
ρ = 0.01055 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 15 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 935 kN-m/m = 1266.52 kips -ft/ft

Resistencia nominal a flexión Mn + corte 2-2 -FIN

Materiales

f'c= 14 Mpa
fy= 420 Mpa
Es= 2E+07 Mpa



SECCION 2-2

Geometría viga

b 1.80m
t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 8 Diámetro de refuerzo para flexión
As = 5.1cm2
No Barr= 13
As= 66cm2 Área total de refuerzo para flexión
ρ = 0.00921 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 13 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 840 kN-m/m = 1137.61 kips -ft/ft

Resistencia nominal a flexión - momento negativo

Geometría viga

t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 9 Diámetro de refuerzo para flexión
As = 6.3cm2
No Barr= 13
As= 82cm2 Área total de refuerzo para flexión
ρ = 0.01143 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 16 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 993 kN-m/m = 1345.9 kips -ft/ft

Resistencia nominal a flexión Mn + corte 3-3 -FIN

Materiales

f'c= 14 Mpa
fy= 420 Mpa
Es= 2E+07 Mpa

Geometría viga

b 1.80m
t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 8 Diámetro de refuerzo para flexión
As = 5.1cm2
No Barr= 12
As= 61cm2 Área total de refuerzo para flexión
ρ = 0.0085 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 12 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 787 kN-m/m = 1065.78 kips -ft/ft

Resistencia nominal a flexión - momento negativo

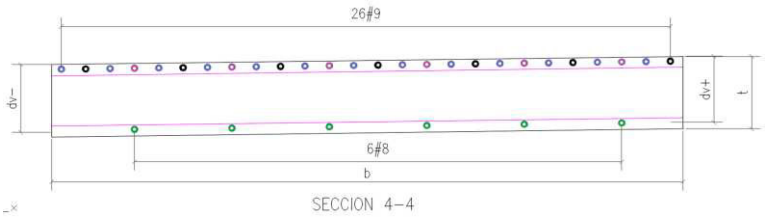
Geometría viga

t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 9 Diámetro de refuerzo para flexión
As = 6.3cm2
No Barr= 26
As= 165cm2 Área total de refuerzo para flexión
ρ = 0.02286 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 32 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 1485 kN-m/m = 2011.72 kips -ft/ft

Resistencia nominal a flexión Mn + corte 4-4 -FIN

Materiales

f'c= 14 Mpa
fy= 420 Mpa
Es= 2E+07 Mpa



SECCION 4-4

Geometría viga

b 1.80m
t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 8 Diámetro de refuerzo para flexión
As = 5.1cm2
No Barr= 6
As= 31cm2 Área total de refuerzo para flexión
ρ = 0.00425 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 6 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 428 kN-m/m = 579.907 kips -ft/ft

Resistencia nominal a flexión - momento negativo

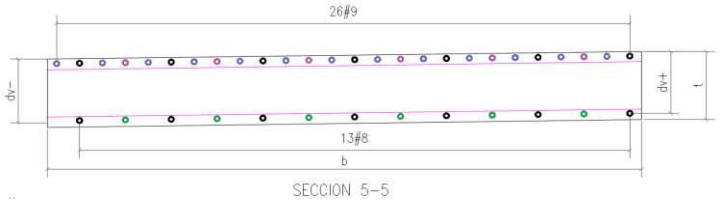
Geometría viga

t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 9 Diámetro de refuerzo para flexión
As = 6.3cm2
No Barr= 26
As= 165cm2 Área total de refuerzo para flexión
ρ = 0.02286 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 32 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 1485 kN-m/m = 2011.72 kips -ft/ft

Resistencia nominal a flexión Mn + corte 5-5-FIN

Materiales

f'c= 14 Mpa
fy= 420 Mpa
Es= 2E+07 Mpa



SECCION 5–5

Geometría viga

b 1.80m
t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 8 Diámetro de refuerzo para flexión
As = 5.1cm2
No Barr= 13
As= 66cm2 Área total de refuerzo para flexión
ρ = 0.00921 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 13 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 840 kN-m/m = 1137.61 kips -ft/ft

Resistencia nominal a flexión - momento negativo

Geometría viga

t= 0.46m = 1.5 ft
rec= 0.06
d+= 0.40m = 1.3 ft
Ref-prin= # 9 Diámetro de refuerzo para flexión
As = 6.3cm2
No Barr= 26
As= 165cm2 Área total de refuerzo para flexión
ρ = 0.02286 Cuantía de refuerzo a flexión
a= ρ*d*fy / .85 * f'c
a= 32 cm
Mn= ϕ*As*fy*(d-a/2) 5.7.3.2 AASTHO - Resistencia a flexión ϕ = 0.9 5.5.4.2 AASTHO
Mn= 1485 kN-m/m = 2011.72 kips -ft/ft

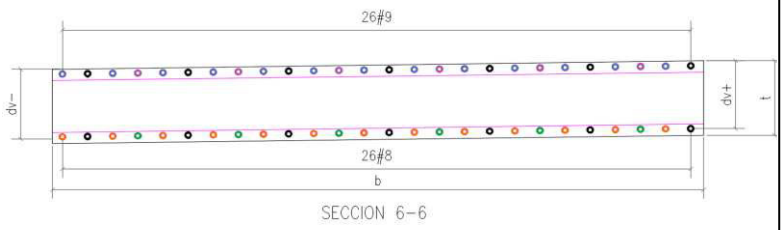
Resistencia nominal a flexión Mn + corte 6-6-FIN

Materiales

f'c=	14	Mpa	
fy=	420	Mpa	
Es=	2E+07	Mpa	

Geometría viga

b	1.80m		
t=	0.46m	= 1.5 ft	
rec=	0.06		
d+=	0.40m	= 1.3 ft	
Ref-prin=	# 8		Diámetro de refuerzo para flexión
As =	5.1cm2		
No Barr=	26		
As=	133cm2		Área total de refuerzo para flexión
ρ =	0.01842		Cuantía de refuerzo a flexión
a=	ρ*d*fy / .85 * f'c		
a=	26 cm		
Mn=	ϕ*As*fy*(d-a/2)		5.7.3.2 AASTHO - Resistencia a flexión
Mn=	1353	kN-m/m =	1833.76 kips -ft/ft



SECCION 6-6

ϕ = 0.9 5.5.4.2 AASTHO

Resistencia nominal a flexión - momento negativo

Geometría viga

t=	0.46m	= 1.5 ft	
rec=	0.06		
d+=	0.40m	= 1.3 ft	
Ref-prin=	# 9		Diámetro de refuerzo para flexión
As =	6.3cm2		
No Barr=	26		
As=	165cm2		Área total de refuerzo para flexión
ρ =	0.02286		Cuantía de refuerzo a flexión
a=	ρ*d*fy / .85 * f'c		
a=	32 cm		
Mn=	ϕ*As*fy*(d-a/2)		5.7.3.2 AASTHO - Resistencia a flexión
Mn=	1485	kN-m/m =	2011.72 kips -ft/ft

ϕ = 0.9 5.5.4.2 AASTHO

Según la norma, la resistencia a cortante de la sección se debe calcular con el momento y cortante actuante en el punto en estudio, por tal razón a continuación se presenta los cálculos para los punto 1 el cálculo en los demás puntos se presentan en se presentan en el Anexo 5

CAPACIDAD A CORTANTE SECCION φVn - FIN COMBINACION SERVICIO 1-1 PTO -1

Materiales

f'c=	14 Mpa =	292.6	kips/ft²	
fy=	420 Mpa =	60.9	kips/ft²	
Es=	200000 Mpa =	367.543	kips/ft²	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft²	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	0		Diámetro de estribos
Cant=	0		
Asv=	0.00 cm2	= 0.00 ft²	Área de acero transversal- Estribos
As-corte =	0.0 cm2	= 0.00 ft²	Área total de refuerzo a flexión - Punto en estudio
S=	0.00m	= 0.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.03 cm2 = 0.00 ft² **No cumple efuerzo minimo**

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	569 kN	= 127.95	kips	Cortante ultimo actuante en punto de estudio
Mu=	0 kN-m	= 0.00	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\; b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

Es = 0.00021

θ (29+3500Es) 29.8°

β = 4.1°

Vc=	1803 KN	= 406.25	kips	
Vs=	0 KN	= 0.00	kips	
ϕVn1=	1622 KN	= 365.62	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv =	4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1622 KN	= 365.62	kips	Mínimo entre Vn1 y Vn2

3.5.3.8. Índices de sobre esfuerzo por momentos y cortantes – FIN

La franja interna presenta el mismo espesor que la franja externa, por lo tato cumple con lo que el espesor mínimo recomendado en la norma.

Los índices de sobre esfuerzo de la franja interna se presentan de la misma forma que la franja externa; en tablas y representación gráfica.

Tabla 64 Índices de sobre esfuerzo por corte combinación servicio 1-1 Franja –FIN

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-1 V							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	-269.34	-60.70	1750.30	394.43	15%
2	0.57	1.88	-214.30	-48.29	1628.98	367.09	13%
3	1.14	3.75	-181.38	-40.87	1532.16	345.27	12%
4	1.72	5.63	-149.26	-33.64	1472.09	331.74	10%
5	2.29	7.51	-118.06	-26.60	1440.04	324.51	8%
6	2.86	9.38	-87.89	-19.81	1431.12	322.50	6%
7	3.43	11.26	-58.86	-13.26	1442.77	325.13	4%
8	4.00	13.14	-33.49	-7.55	1473.23	331.99	2%
9	4.58	15.01	-11.25	-2.54	1500.15	338.06	1%
10	5.15	16.89	165.05	37.19	1708.43	384.99	10%
11	5.72	18.77	196.82	44.35	1642.88	370.22	12%
12	6.29	20.64	230.03	51.84	1574.33	354.77	15%
13	6.86	22.52	262.21	59.09	1504.96	339.14	17%
14	7.44	24.40	293.27	66.09	1154.70	260.21	25%
15	8.01	26.27	323.10	72.81	1066.97	240.44	30%
16	8.58	28.15	351.59	79.23	927.15	208.93	38%
16	8.58	28.15	-353.65	-79.70	927.15	208.93	38%
17	9.15	30.02	-325.37	-73.32	727.01	163.83	45%
18	9.72	31.90	-296.89	-66.90	862.26	194.31	34%
19	10.29	33.77	-268.70	-60.55	1341.08	302.21	20%
20	10.87	35.65	-239.96	-54.07	1447.80	326.26	17%
21	11.44	37.52	-210.84	-47.51	1713.09	386.04	12%
22	12.01	39.40	-181.48	-40.90	1444.80	325.59	13%
23	12.58	41.27	-152.60	-34.39	1407.02	317.07	11%
24	13.15	43.15	-124.53	-28.06	1384.59	312.02	9%
25	13.72	45.02	-99.39	-22.40	1375.71	310.02	7%
26	14.3	46.90	-76.32	-17.20	1381.87	311.40	6%
27	14.87	48.77	-54.11	-12.19	1375.71	310.02	4%
28	15.44	50.65	139.99	31.55	1384.59	312.02	10%
29	16.01	52.52	168.76	38.03	1407.02	317.07	12%
30	16.58	54.40	198.12	44.65	1444.80	325.59	14%
31	17.15	56.27	227.25	51.21	1713.09	386.04	13%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-1 V							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
32	17.72	58.15	255.99	57.69	1447.80	326.26	18%
33	18.3	60.02	284.18	64.04	1341.08	302.21	21%
34	18.87	61.90	312.66	70.46	862.26	194.31	36%
35	19.44	63.77	340.93	76.83	727.01	163.83	47%
36	20.01	65.65	368.45	83.03	927.15	208.93	40%
37	20.01	65.65	-335.82	-75.68	927.15	208.93	36%
37	20.58	67.53	-306.00	-68.96	1066.97	240.44	29%
38	21.15	69.40	-274.95	-61.96	1154.70	260.21	24%
39	21.73	71.28	-242.77	-54.71	1504.96	339.14	16%
40	22.3	73.16	-209.77	-47.27	1574.33	354.77	13%
41	22.87	75.03	-177.76	-40.06	1642.88	370.22	11%
42	23.44	76.91	-153.46	-34.58	1708.43	384.99	9%
43	24.01	78.79	-130.75	-29.46	1500.15	338.06	9%
44	24.59	80.66	-107.63	-24.25	1473.23	331.99	7%
45	25.16	82.54	-84.07	-18.95	1442.77	325.13	6%
46	25.73	84.42	-59.66	-13.44	1431.12	322.50	4%
47	26.3	86.29	-34.34	-7.74	1440.04	324.51	2%
48	26.87	88.17	-8.15	-1.84	1472.09	331.74	1%
49	27.45	90.05	201.56	45.42	1532.16	345.27	13%
50	28.02	91.92	235.15	52.99	1628.98	367.09	14%
51	28.59	93.80	269.34	60.70	1750.30	394.43	15%

Fuente: Elaboración Propia.

Tabla 65 Índices de sobre esfuerzo por corte combinación servicio 1-2 Franja –FIN

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-2							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	-271.19	-61.11	1750.30	394.43	15%
2	0.57	1.88	-222.56	-50.15	1628.98	367.09	14%
3	1.14	3.75	-192.27	-43.33	1532.16	345.27	13%
4	1.72	5.63	-162.35	-36.59	1472.09	331.74	11%
5	2.29	7.51	-132.90	-29.95	1440.04	324.51	9%
6	2.86	9.38	-104.01	-23.44	1431.12	322.50	7%
7	3.43	11.26	-75.77	-17.07	1442.77	325.13	5%
8	4.00	13.14	-48.27	-10.88	1473.23	331.99	3%
9	4.58	15.01	-21.60	-4.87	1500.15	338.06	1%
10	5.15	16.89	191.79	43.22	1708.43	384.99	11%
11	5.72	18.77	216.83	48.86	1642.88	370.22	13%
12	6.29	20.64	240.70	54.24	1574.33	354.77	15%
13	6.86	22.52	263.39	59.35	1504.96	339.14	18%
14	7.44	24.40	287.54	64.80	1154.70	260.21	25%
15	8.01	26.27	311.30	70.15	1066.97	240.44	29%
16	8.58	28.15	333.88	75.24	927.15	208.93	36%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - SERVICIO 1-2							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
16	8.58	28.15	-331.72	-74.75	927.15	208.93	36%
17	9.15	30.02	-309.49	-69.74	727.01	163.83	43%
18	9.72	31.90	-286.35	-64.53	862.26	194.31	33%
19	10.29	33.77	-262.41	-59.13	1341.08	302.21	20%
20	10.87	35.65	-237.82	-53.59	1447.80	326.26	16%
21	11.44	37.52	-212.70	-47.93	1713.09	386.04	12%
22	12.01	39.40	-189.67	-42.74	1444.80	325.59	13%
23	12.58	41.27	-165.94	-37.39	1407.02	317.07	12%
24	13.15	43.15	-141.47	-31.88	1384.59	312.02	10%
25	13.72	45.02	-116.91	-26.35	1375.71	310.02	8%
26	14.3	46.90	-92.47	-20.84	1381.87	311.40	7%
27	14.87	48.77	-68.46	-15.43	1375.71	310.02	5%
28	15.44	50.65	-44.46	-10.02	1384.59	312.02	3%
29	16.01	52.52	-21.12	-4.76	1407.02	317.07	2%
30	16.58	54.40	200.00	45.07	1444.80	325.59	14%
31	17.15	56.27	255.12	57.49	1713.09	386.04	15%
32	17.72	58.15	249.71	56.27	1447.80	326.26	17%
33	18.3	60.02	273.65	61.67	1341.08	302.21	20%
34	18.87	61.90	296.80	66.88	862.26	194.31	34%
35	19.44	63.77	319.03	71.89	727.01	163.83	44%
36	20.01	65.65	340.70	76.78	927.15	208.93	37%
37	20.01	65.65	-324.01	-73.02	927.15	208.93	35%
37	20.58	67.53	-300.25	-67.66	1066.97	240.44	28%
38	21.15	69.40	-276.09	-62.22	1154.70	260.21	24%
39	21.73	71.28	-253.41	-57.11	1504.96	339.14	17%
40	22.3	73.16	-229.54	-51.73	1574.33	354.77	15%
41	22.87	75.03	-204.50	-46.08	1642.88	370.22	12%
42	23.44	76.91	-178.28	-40.18	1708.43	384.99	10%
43	24.01	78.79	-150.95	-34.02	1500.15	338.06	10%
44	24.59	80.66	-123.11	-27.74	1473.23	331.99	8%
45	25.16	82.54	-94.85	-21.37	1442.77	325.13	7%
46	25.73	84.42	-66.27	-14.93	1431.12	322.50	5%
47	26.3	86.29	-37.45	-8.44	1440.04	324.51	3%
48	26.87	88.17	-9.54	-2.15	1472.09	331.74	1%
49	27.45	90.05	209.83	47.29	1532.16	345.27	14%
50	28.02	91.92	240.40	54.17	1628.98	367.09	15%
51	28.59	93.80	271.19	61.11	1750.30	394.43	15%

Fuente: Elaboración Propia.

Tabla 66 Índices de sobre esfuerzo por momento combinación servicio 1-1

Franja –FIN

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-1												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
1	0.00	0.00	0.00	0.00	0.00	0.00	-550.00	-405.90	1704.00	1257.55	0%	0%
2	0.57	1.88	0.00	0.00	138.03	101.87	-550.00	-405.90	1704.00	1257.55	0%	8%
3	1.14	3.75	0.00	0.00	245.02	180.82	-550.00	-405.90	1704.00	1257.55	0%	14%
4	1.72	5.63	0.00	0.00	321.98	237.62	-550.00	-405.90	1704.00	1257.55	0%	19%
5	2.29	7.51	0.00	0.00	370.36	273.33	-550.00	-405.90	1704.00	1257.55	0%	22%
6	2.86	9.38	0.00	0.00	391.86	289.19	-550.00	-405.90	1704.00	1257.55	0%	23%
7	3.43	11.26	0.00	0.00	388.45	286.68	-935.00	-690.03	1704.00	1257.55	0%	23%
8	4.00	13.14	-16.02	-11.82	362.37	267.43	-935.00	-690.03	1704.00	1257.55	2%	21%
9	4.58	15.01	-47.30	-34.91	340.46	251.26	-550.00	-405.90	1704.00	1257.55	9%	20%
10	5.15	16.89	-85.83	-63.34	317.65	234.43	-550.00	-405.90	1704.00	1257.55	16%	19%
11	5.72	18.77	-131.60	-97.12	266.85	196.94	-550.00	-405.90	1704.00	1257.55	24%	16%
12	6.29	20.64	-184.62	-136.25	189.84	140.10	-993.00	-732.83	1704.00	1257.55	19%	11%
13	6.86	22.52	-244.88	-180.72	94.09	69.44	-1485.00	-1095.93	1704.00	1257.55	16%	6%
14	7.44	24.40	-312.40	-230.55	0.00	0.00	-1485.00	-1095.93	840.00	619.92	21%	0%
15	8.01	26.27	-389.82	-287.69	0.00	0.00	-1485.00	-1095.93	840.00	619.92	26%	0%
16	8.58	28.15	-502.79	-371.06	0.00	0.00	-1485.00	-1095.93	787.00	580.81	34%	0%
17	9.15	30.02	-369.23	-272.49	0.00	0.00	-1485.00	-1095.93	428.00	315.86	25%	0%
18	9.72	31.90	-254.55	-187.86	0.00	0.00	-1485.00	-1095.93	428.00	315.86	17%	0%
19	10.29	33.77	-172.73	-127.47	76.46	56.43	-1485.00	-1095.93	840.00	619.92	12%	9%
20	10.866	35.65	-115.47	-85.22	170.96	126.17	-1485.00	-1095.93	840.00	619.92	8%	20%
21	11.4375	37.52	-65.45	-48.30	266.01	196.32	-1485.00	-1095.93	1353.00	998.51	4%	20%
22	12.009	39.40	-22.66	-16.72	341.91	252.33	-1485.00	-1095.93	1353.00	998.51	2%	25%
23	12.5805	41.27	0.00	0.00	398.00	293.72	-1485.00	-1095.93	1353.00	998.51	0%	29%
24	13.152	43.15	0.00	0.00	436.42	322.08	-1485.00	-1095.93	1353.00	998.51	0%	32%
25	13.7235	45.02	0.00	0.00	456.95	337.23	-1485.00	-1095.93	1353.00	998.51	0%	34%
26	14.295	46.90	0.00	0.00	457.28	337.47	-1485.00	-1095.93	1353.00	998.51	0%	34%
27	14.8665	48.77	0.00	0.00	456.91	337.20	-1485.00	-1095.93	1353.00	998.51	0%	34%
28	15.438	50.65	0.00	0.00	436.39	322.06	-1485.00	-1095.93	1353.00	998.51	0%	32%
29	16.0095	52.52	0.00	0.00	397.96	293.69	-1485.00	-1095.93	1353.00	998.51	0%	29%
30	16.581	54.40	-27.66	-20.41	341.89	252.31	-1485.00	-1095.93	1353.00	998.51	2%	25%
31	17.1525	56.27	-65.45	-48.30	266.00	196.31	-1485.00	-1095.93	1353.00	998.51	4%	20%
32	17.724	58.15	-115.47	-85.22	170.96	126.17	-1485.00	-1095.93	840.00	619.92	8%	20%
33	18.2955	60.02	-172.73	-127.47	76.49	56.45	-1485.00	-1095.93	840.00	619.92	12%	9%
34	18.867	61.90	-254.54	-187.85	0.00	0.00	-1485.00	-1095.93	428.00	315.86	17%	0%
35	19.4385	63.77	-369.23	-272.49	0.00	0.00	-1485.00	-1095.93	428.00	315.86	25%	0%
36	20.01	65.65	-502.78	-371.05	0.00	0.00	-1485.00	-1095.93	787.00	580.81	34%	0%
37	20.582	67.53	-389.82	-287.69	0.00	0.00	-1485.00	-1095.93	840.00	619.92	26%	0%
38	21.154	69.40	-312.40	-230.55	0.00	0.00	-1485.00	-1095.93	840.00	619.92	21%	0%
39	21.726	71.28	-244.89	-180.73	94.07	69.42	-1485.00	-1095.93	1704.00	1257.55	16%	6%
40	22.298	73.16	-184.02	-135.81	189.84	140.10	-993.00	-732.83	1704.00	1257.55	19%	11%
41	22.87	75.03	-131.60	-97.12	266.87	196.95	-550.00	-405.90	1704.00	1257.55	24%	16%
42	23.442	76.91	-85.83	-63.34	317.70	234.46	-550.00	-405.90	1704.00	1257.55	16%	19%
43	24.014	78.79	-47.30	-34.91	340.54	251.32	-550.00	-405.90	1704.00	1257.55	9%	20%
44	24.586	80.66	-16.03	-11.83	362.29	267.37	-935.00	-690.03	1704.00	1257.55	2%	21%

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-1												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
45	25.158	82.54	0.00	0.00	388.39	286.63	-935.00	-690.03	1704.00	1257.55	0%	23%
46	25.73	84.42	0.00	0.00	391.82	289.16	-550.00	-405.90	1704.00	1257.55	0%	23%
47	26.302	86.29	0.00	0.00	370.35	273.32	-550.00	-405.90	1704.00	1257.55	0%	22%
48	26.874	88.17	0.00	0.00	322.01	237.64	-550.00	-405.90	1704.00	1257.55	0%	19%
49	27.446	90.05	0.00	0.00	245.08	180.87	-550.00	-405.90	1704.00	1257.55	0%	14%
50	28.018	91.92	0.00	0.00	138.13	101.94	-550.00	-405.90	1704.00	1257.55	0%	8%
51	28.59	93.80	0.00	0.00	0.00	0.00	-550.00	-405.90	1704.00	1257.55	0%	0%

Fuente: Elaboración Propia.

Tabla 67 Índices de sobre esfuerzo por momento combinación servicio 1-2 Franja –FIN

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-2												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
1	0.00	0.00	0.00	0.00	0.00	0.00	-550.00	-405.90	1704.00	1257.55	0%	0%
2	0.57	1.88	0.00	0.00	141.06	104.10	-550.00	-405.90	1704.00	1257.55	0%	8%
3	1.14	3.75	0.00	0.00	254.50	187.82	-550.00	-405.90	1704.00	1257.55	0%	15%
4	1.72	5.63	0.00	0.00	340.69	251.43	-550.00	-405.90	1704.00	1257.55	0%	20%
5	2.29	7.51	0.00	0.00	400.34	295.45	-550.00	-405.90	1704.00	1257.55	0%	23%
6	2.86	9.38	0.00	0.00	434.34	320.54	-550.00	-405.90	1704.00	1257.55	0%	25%
7	3.43	11.26	0.00	0.00	443.82	327.54	-935.00	-690.03	1704.00	1257.55	0%	26%
8	4.00	13.14	-8.24	-6.08	430.52	317.72	-935.00	-690.03	1704.00	1257.55	1%	25%
9	4.58	15.01	-38.41	-28.35	407.83	300.98	-550.00	-405.90	1704.00	1257.55	7%	24%
10	5.15	16.89	-75.82	-55.96	362.53	267.55	-550.00	-405.90	1704.00	1257.55	14%	21%
11	5.72	18.77	-120.48	-88.91	296.24	218.63	-550.00	-405.90	1704.00	1257.55	22%	17%
12	6.29	20.64	-172.39	-127.22	210.79	155.56	-993.00	-732.83	1704.00	1257.55	17%	12%
13	6.86	22.52	-231.54	-170.88	108.21	79.86	-1485.00	-1095.93	1704.00	1257.55	16%	6%
14	7.44	24.40	-303.27	-223.81	0.00	0.00	-1485.00	-1095.93	840.00	619.92	20%	0%
15	8.01	26.27	-430.72	-317.87	0.00	0.00	-1485.00	-1095.93	840.00	619.92	29%	0%
16	8.58	28.15	-574.36	-423.88	0.00	0.00	-1485.00	-1095.93	787.00	580.81	39%	0%
17	9.15	30.02	-432.54	-319.21	0.00	0.00	-1485.00	-1095.93	428.00	315.86	29%	0%
18	9.72	31.90	-303.68	-224.12	0.00	0.00	-1485.00	-1095.93	428.00	315.86	20%	0%
19	10.29	33.77	-195.17	-144.04	92.92	68.57	-1485.00	-1095.93	840.00	619.92	13%	11%
20	10.866	35.65	-120.75	-89.11	197.71	145.91	-1485.00	-1095.93	840.00	619.92	8%	24%
21	11.4375	37.52	-70.27	-51.86	288.69	213.05	-1485.00	-1095.93	1353.00	998.51	5%	21%
22	12.009	39.40	-27.02	-19.94	364.19	268.77	-1485.00	-1095.93	1353.00	998.51	2%	27%
23	12.5805	41.27	0.00	0.00	423.14	312.28	-1485.00	-1095.93	1353.00	998.51	0%	31%
24	13.152	43.15	0.00	0.00	464.69	342.94	-1485.00	-1095.93	1353.00	998.51	0%	34%
25	13.7235	45.02	0.00	0.00	448.33	330.87	-1485.00	-1095.93	1353.00	998.51	0%	33%
26	14.295	46.90	0.00	0.00	493.84	364.45	-1485.00	-1095.93	1353.00	998.51	0%	36%
27	14.8665	48.77	0.00	0.00	488.24	360.32	-1485.00	-1095.93	1353.00	998.51	0%	36%
28	15.438	50.65	0.00	0.00	464.61	342.88	-1485.00	-1095.93	1353.00	998.51	0%	34%
29	16.0095	52.52	0.00	0.00	423.08	312.23	-1485.00	-1095.93	1353.00	998.51	0%	31%
30	16.581	54.40	-27.01	-19.93	364.14	268.74	-1485.00	-1095.93	1353.00	998.51	2%	27%
31	17.1525	56.27	-70.26	-51.85	288.63	213.01	-1485.00	-1095.93	1353.00	998.51	5%	21%

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - SERVICIO 1-2												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
32	17.724	58.15	-120.74	-89.11	197.66	145.87	-1485.00	-1095.93	840.00	619.92	8%	24%
33	18.2955	60.02	-195.16	-144.03	92.88	68.55	-1485.00	-1095.93	840.00	619.92	13%	11%
34	18.867	61.90	-303.67	-224.11	0.00	0.00	-1485.00	-1095.93	428.00	315.86	20%	0%
35	19.4385	63.77	-432.55	-319.22	0.00	0.00	-1485.00	-1095.93	428.00	315.86	29%	0%
36	20.01	65.65	-575.35	-424.61	0.00	0.00	-1485.00	-1095.93	787.00	580.81	39%	0%
37	20.582	67.53	-430.35	-317.60	0.00	0.00	-1485.00	-1095.93	840.00	619.92	29%	0%
38	21.154	69.40	-303.26	-223.81	0.00	0.00	-1485.00	-1095.93	840.00	619.92	20%	0%
39	21.726	71.28	-231.54	-170.88	106.24	78.41	-1485.00	-1095.93	1704.00	1257.55	16%	6%
40	22.298	73.16	-172.38	-127.22	210.82	155.59	-993.00	-732.83	1704.00	1257.55	17%	12%
41	22.87	75.03	-120.47	-88.91	296.28	218.65	-550.00	-405.90	1704.00	1257.55	22%	17%
42	23.442	76.91	-75.82	-55.96	362.59	267.59	-550.00	-405.90	1704.00	1257.55	14%	21%
43	24.014	78.79	-38.40	-28.34	407.98	301.09	-550.00	-405.90	1704.00	1257.55	7%	24%
44	24.586	80.66	-8.24	-6.08	430.62	317.80	-935.00	-690.03	1704.00	1257.55	1%	25%
45	25.158	82.54	0.00	0.00	443.74	327.48	-935.00	-690.03	1704.00	1257.55	0%	26%
46	25.73	84.42	0.00	0.00	434.29	320.51	-550.00	-405.90	1704.00	1257.55	0%	25%
47	26.302	86.29	0.00	0.00	400.31	295.43	-550.00	-405.90	1704.00	1257.55	0%	23%
48	26.874	88.17	0.00	0.00	340.70	251.44	-550.00	-405.90	1704.00	1257.55	0%	20%
49	27.446	90.05	0.00	0.00	254.54	187.85	-550.00	-405.90	1704.00	1257.55	0%	15%
50	28.018	91.92	0.00	0.00	141.13	104.15	-550.00	-405.90	1704.00	1257.55	0%	8%
51	28.59	93.80	0.00	0.00	0.00	0.00	-550.00	-405.90	1704.00	1257.55	0%	0%

Fuente: Elaboración Propia.

Tabla 68 Índices de sobre esfuerzo por corte combinación resistencia 1-1 Franja –FIN

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-1							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	-569.14	-128.26	1622.47	365.62	35%
2	0.57	1.88	-451.73	-101.80	1406.23	316.89	32%
3	1.14	3.75	-385.82	-86.94	1261.19	284.21	31%
4	1.72	5.63	-321.76	-72.51	1177.95	265.45	27%
5	2.29	7.51	-259.83	-58.55	1135.39	255.86	23%
6	2.86	9.38	-200.30	-45.14	1123.48	253.18	18%
7	3.43	11.26	-143.45	-32.33	1137.83	256.41	13%
8	4.00	13.14	-95.09	-21.43	1176.45	265.11	8%
9	4.58	15.01	-54.03	-12.18	1206.87	271.97	4%
10	5.15	16.89	-14.20	-3.20	1587.70	357.79	1%
11	5.72	18.77	408.84	92.13	1387.28	312.62	29%
12	6.29	20.64	475.44	107.14	1302.07	293.42	37%
13	6.86	22.52	539.65	121.61	1220.85	275.12	44%
14	7.44	24.40	601.24	135.49	821.10	185.03	73%
15	8.01	26.27	659.96	148.72	746.94	168.32	88%
16	8.58	28.15	715.57	161.25	624.99	140.84	114%
16	8.58	28.15	-716.20	-161.40	624.99	140.84	115%
17	9.15	30.02	-661.09	-148.98	458.22	103.26	144%
18	9.72	31.90	-605.49	-136.45	559.59	126.10	108%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-1							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
19	10.29	33.77	-550.56	-124.07	1017.21	229.23	54%
20	10.87	35.65	-494.37	-111.41	1121.96	252.83	44%
21	11.44	37.52	-437.27	-98.54	1498.92	337.78	29%
22	12.01	39.40	-379.62	-85.55	1137.23	256.28	33%
23	12.58	41.27	-323.11	-72.81	1092.66	246.23	30%
24	13.15	43.15	-268.46	-60.50	1067.03	240.45	25%
25	13.72	45.02	-220.60	-49.71	1057.29	238.26	21%
26	14.3	46.90	-177.63	-40.03	1064.30	239.84	17%
27	14.87	48.77	-136.71	-30.81	1057.29	238.26	13%
28	15.44	50.65	-95.87	-21.60	1067.03	240.45	9%
29	16.01	52.52	-53.89	-12.14	1092.66	246.23	5%
30	16.58	54.40	-10.80	-2.43	1137.23	256.28	1%
31	17.15	56.27	475.46	107.14	1498.92	337.78	32%
32	17.72	58.15	531.66	119.81	1121.96	252.83	47%
33	18.3	60.02	586.60	132.19	1017.21	229.23	58%
34	18.87	61.90	642.18	144.72	559.59	126.10	115%
35	19.44	63.77	697.30	157.14	458.22	103.26	152%
36	20.01	65.65	750.65	169.16	624.99	140.84	120%
37	20.01	65.65	-678.88	-152.99	624.99	140.84	109%
37	20.58	67.53	-620.17	-139.76	746.94	168.32	83%
38	21.15	69.40	-558.60	-125.88	821.10	185.03	68%
39	21.73	71.28	-494.39	-111.41	1220.85	275.12	40%
40	22.3	73.16	-427.80	-96.40	1302.07	293.42	33%
41	22.87	75.03	-364.50	-82.14	1387.28	312.62	26%
42	23.44	76.91	-318.63	-71.80	1587.70	357.79	20%
43	24.01	78.79	-276.47	-62.30	1206.87	271.97	23%
44	24.59	80.66	-233.36	-52.59	1176.45	265.11	20%
45	25.16	82.54	-189.23	-42.64	1137.83	256.41	17%
46	25.73	84.42	-143.08	-32.24	1123.48	253.18	13%
47	26.3	86.29	-94.89	-21.38	1135.39	255.86	8%
48	26.87	88.17	-44.61	-10.05	1177.95	265.45	4%
49	27.45	90.05	-1.41	-0.32	1261.19	284.21	0%
50	28.02	91.92	500.26	112.73	1406.23	316.89	36%
51	28.59	93.80	569.14	128.26	1622.47	365.62	35%

Fuente: Elaboración Propia.

Tabla 69 Índices de sobre esfuerzo por corte combinación resistencia 1-2 Franja –FIN

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-2							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
1	0.00	0.00	-573.44	-129.22	1620.77	365.24	35%
2	0.57	1.88	-470.95	-106.13	1400.69	315.65	34%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-2							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
3	1.14	3.75	-411.15	-92.65	1255.33	282.89	33%
4	1.72	5.63	-352.22	-79.37	1171.83	264.07	30%
5	2.29	7.51	-294.38	-66.34	1128.95	254.41	26%
6	2.86	9.38	-237.83	-53.59	1116.63	251.63	21%
7	3.43	11.26	-182.80	-41.19	1130.47	254.75	16%
8	4.00	13.14	-129.49	-29.18	1169.56	263.56	11%
9	4.58	15.01	-78.12	-17.60	1201.77	270.82	7%
10	5.15	16.89	-28.92	-6.52	1582.27	356.56	2%
11	5.72	18.77	455.43	102.63	1374.28	309.69	33%
12	6.29	20.64	500.29	112.74	1295.95	292.04	39%
13	6.86	22.52	542.38	122.23	1220.26	274.98	44%
14	7.44	24.40	587.90	132.48	823.69	185.62	71%
15	8.01	26.27	632.51	142.54	751.35	169.32	84%
16	8.58	28.15	674.35	151.96	629.98	141.97	107%
16	8.58	28.15	-665.17	-149.90	629.98	141.97	106%
17	9.15	30.02	-624.13	-140.65	462.94	104.32	135%
18	9.72	31.90	-580.94	-130.91	564.32	127.17	103%
19	10.29	33.77	-535.92	-120.77	1021.62	230.22	52%
20	10.87	35.65	-489.38	-110.28	1123.79	253.25	44%
21	11.44	37.52	-441.61	-99.52	1497.49	337.46	29%
22	12.01	39.40	-398.69	-89.84	1133.65	255.47	35%
23	12.58	41.27	-354.16	-79.81	1087.30	245.02	33%
24	13.15	43.15	-307.89	-69.38	1060.55	238.99	29%
25	13.72	45.02	-261.41	-58.91	1050.72	236.78	25%
26	14.3	46.90	-215.22	-48.50	1058.16	238.46	20%
27	14.87	48.77	-169.61	-38.22	1050.72	236.78	16%
28	15.44	50.65	-124.85	-28.13	1060.55	238.99	12%
29	16.01	52.52	-81.22	-18.30	1087.30	245.02	7%
30	16.58	54.40	-39.01	-8.79	1133.65	255.47	3%
31	17.15	56.27	470.50	106.03	1497.49	337.46	31%
32	17.72	58.15	517.05	116.52	1123.79	253.25	46%
33	18.3	60.02	562.08	126.66	1021.62	230.22	55%
34	18.87	61.90	605.27	136.40	564.32	127.17	107%
35	19.44	63.77	646.32	145.65	462.94	104.32	140%
36	20.01	65.65	686.00	154.59	629.98	141.97	109%
37	20.01	65.65	-651.38	-146.79	629.98	141.97	103%
37	20.58	67.53	-606.78	-136.74	751.35	169.32	81%
38	21.15	69.40	-561.25	-126.48	823.69	185.62	68%
39	21.73	71.28	-519.16	-116.99	1220.26	274.98	43%
40	22.3	73.16	-474.32	-106.89	1295.95	292.04	37%
41	22.87	75.03	-426.73	-96.16	1374.28	309.69	31%
42	23.44	76.91	-376.40	-84.82	1582.27	356.56	24%
43	24.01	78.79	-323.49	-72.90	1201.77	270.82	27%
44	24.59	80.66	-369.39	-83.24	1169.56	263.56	32%
45	25.16	82.54	-211.33	-47.62	1130.47	254.75	19%
46	25.73	84.42	-158.51	-35.72	1116.63	251.63	14%
47	26.3	86.29	-102.12	-23.01	1128.95	254.41	9%

ÍNDICES DE SOBRE RESISTENCIA POR CORTE - RESISTENCIA 1-2							
PUNTO	DIST (0)		CORTANTE - SAP200		ϕ Vn (Vc + Vs)		ÍNDICE
	m	ft	KN	kip	KN	kip	%
48	26.87	88.17	-47.87	-10.79	1171.83	264.07	4%
49	27.45	90.05	-10.05	-2.26	1255.33	282.89	1%
50	28.02	91.92	-512.47	-115.49	1400.69	315.65	37%
51	28.59	93.80	-573.40	-129.22	1620.77	365.24	35%

Fuente: Elaboración Propia.

Tabla 70 Índices de sobre esfuerzo por momento combinación resistencia 1-1 Franja –FIN

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-1												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
1	0.00	0.00	0.00	0.00	0.00	0.00	-550.00	-405.90	1704.00	1257.55	0%	0%
2	0.57	1.88	0.00	0.00	291.29	214.97	-550.00	-405.90	1704.00	1257.55	0%	17%
3	1.14	3.75	0.00	0.00	516.45	381.14	-550.00	-405.90	1704.00	1257.55	0%	30%
4	1.72	5.63	0.00	0.00	677.85	500.25	-550.00	-405.90	1704.00	1257.55	0%	40%
5	2.29	7.51	-3.29	-2.43	778.84	574.78	-550.00	-405.90	1704.00	1257.55	1%	46%
6	2.86	9.38	-30.97	-22.86	823.38	607.65	-550.00	-405.90	1704.00	1257.55	6%	48%
7	3.43	11.26	-69.41	-51.22	816.06	602.25	-935.00	-690.03	1704.00	1257.55	7%	48%
8	4.00	13.14	-118.59	-87.52	762.12	562.44	-935.00	-690.03	1704.00	1257.55	13%	45%
9	4.58	15.01	-178.53	-131.76	723.98	534.30	-550.00	-405.90	1704.00	1257.55	32%	42%
10	5.15	16.89	-249.20	-183.91	689.90	509.15	-550.00	-405.90	1704.00	1257.55	45%	40%
11	5.72	18.77	-330.63	-244.00	596.75	440.40	-550.00	-405.90	1704.00	1257.55	60%	35%
12	6.29	20.64	-422.80	-312.03	448.75	331.18	-993.00	-732.83	1704.00	1257.55	43%	26%
13	6.86	22.52	-525.72	-387.98	263.25	194.28	-1485.00	-1095.93	1704.00	1257.55	35%	15%
14	7.44	24.40	-639.39	-471.87	73.03	53.90	-1485.00	-1095.93	840.00	619.92	43%	9%
15	8.01	26.27	-770.01	-568.27	0.00	0.00	-1485.00	-1095.93	840.00	619.92	52%	0%
16	8.58	28.15	-977.24	-721.20	0.00	0.00	-1485.00	-1095.93	787.00	580.81	66%	0%
17	9.15	30.02	-724.41	-534.61	0.00	0.00	-1485.00	-1095.93	428.00	315.86	49%	0%
18	9.72	31.90	-509.42	-375.95	47.61	35.14	-1485.00	-1095.93	428.00	315.86	34%	11%
19	10.29	33.77	-364.82	-269.24	215.19	158.81	-1485.00	-1095.93	840.00	619.92	25%	26%
20	10.866	35.65	-271.26	-200.19	395.41	291.81	-1485.00	-1095.93	840.00	619.92	18%	47%
21	11.4375	37.52	-188.43	-139.06	583.04	430.28	-1485.00	-1095.93	1353.00	998.51	13%	43%
22	12.009	39.40	-116.33	-85.85	732.19	540.36	-1485.00	-1095.93	1353.00	998.51	8%	54%
23	12.5805	41.27	-69.55	-51.33	841.35	620.92	-1485.00	-1095.93	1353.00	998.51	5%	62%
24	13.152	43.15	-35.32	-26.07	915.51	675.65	-1485.00	-1095.93	1353.00	998.51	2%	68%
25	13.7235	45.02	-11.02	-8.13	954.13	704.15	-1485.00	-1095.93	1353.00	998.51	1%	71%
26	14.295	46.90	0.00	0.00	954.15	704.16	-1485.00	-1095.93	1353.00	998.51	0%	71%
27	14.8665	48.77	-11.82	-8.72	954.03	704.07	-1485.00	-1095.93	1353.00	998.51	1%	71%
28	15.438	50.65	-35.32	-26.07	915.44	675.59	-1485.00	-1095.93	1353.00	998.51	2%	68%
29	16.0095	52.52	-69.56	-51.34	841.28	620.86	-1485.00	-1095.93	1353.00	998.51	5%	62%
30	16.581	54.40	-116.33	-85.85	732.15	540.33	-1485.00	-1095.93	1353.00	998.51	8%	54%
31	17.1525	56.27	-188.43	-139.06	583.02	430.27	-1485.00	-1095.93	1353.00	998.51	13%	43%
32	17.724	58.15	-271.26	-200.19	395.42	291.82	-1485.00	-1095.93	840.00	619.92	18%	47%
33	18.2955	60.02	-364.82	-269.24	215.24	158.85	-1485.00	-1095.93	840.00	619.92	25%	26%
34	18.867	61.90	-509.40	-375.94	47.65	35.17	-1485.00	-1095.93	428.00	315.86	34%	11%

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-1												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
35	19.4385	63.77	-724.40	-534.61	0.00	0.00	-1485.00	-1095.93	428.00	315.86	49%	0%
36	20.01	65.65	-977.21	-721.18	0.00	0.00	-1485.00	-1095.93	787.00	580.81	66%	0%
37	20.582	67.53	-770.01	-568.27	0.00	0.00	-1485.00	-1095.93	840.00	619.92	52%	0%
38	21.154	69.40	-639.40	-471.88	72.94	53.83	-1485.00	-1095.93	840.00	619.92	43%	9%
39	21.726	71.28	-525.73	-387.99	263.19	194.23	-1485.00	-1095.93	1704.00	1257.55	35%	15%
40	22.298	73.16	-422.81	-312.03	448.75	331.18	-993.00	-732.83	1704.00	1257.55	43%	26%
41	22.87	75.03	-330.64	-244.01	596.80	440.44	-550.00	-405.90	1704.00	1257.55	60%	35%
42	23.442	76.91	-249.21	-183.92	690.01	509.23	-550.00	-405.90	1704.00	1257.55	45%	40%
43	24.014	78.79	-178.54	-131.76	724.18	534.44	-550.00	-405.90	1704.00	1257.55	32%	42%
44	24.586	80.66	-118.60	-87.53	761.93	562.30	-935.00	-690.03	1704.00	1257.55	13%	45%
45	25.158	82.54	-69.42	-51.23	815.92	602.15	-935.00	-690.03	1704.00	1257.55	7%	48%
46	25.73	84.42	-30.98	-22.86	823.29	607.59	-550.00	-405.90	1704.00	1257.55	6%	48%
47	26.302	86.29	-3.29	-2.43	773.82	571.08	-550.00	-405.90	1704.00	1257.55	1%	45%
48	26.874	88.17	0.00	0.00	677.91	500.30	-550.00	-405.90	1704.00	1257.55	0%	40%
49	27.446	90.05	0.00	0.00	516.59	381.24	-550.00	-405.90	1704.00	1257.55	0%	30%
50	28.018	91.92	0.00	0.00	291.52	215.14	-550.00	-405.90	1704.00	1257.55	0%	17%
51	28.59	93.80	0.00	0.00	0.00	0.00	-550.00	-405.90	1704.00	1257.55	0%	0%

Fuente: Elaboración Propia.

Tabla 71 Índices de sobre esfuerzo por momento combinación resistencia 1-2 Franja –FIN

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-2												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
1	0.00	0.00	0.00	0.00	0.00	0.00	-550.00	-405.90	1704.00	1257.55	0%	0%
2	0.57	1.88	0.00	0.00	298.33	220.17	-550.00	-405.90	1704.00	1257.55	0%	18%
3	1.14	3.75	0.00	0.00	538.51	397.42	-550.00	-405.90	1704.00	1257.55	0%	32%
4	1.72	5.63	0.00	0.00	721.39	532.39	-550.00	-405.90	1704.00	1257.55	0%	42%
5	2.29	7.51	0.00	0.00	848.61	626.27	-550.00	-405.90	1704.00	1257.55	0%	50%
6	2.86	9.38	-18.04	-13.31	922.26	680.63	-550.00	-405.90	1704.00	1257.55	3%	54%
7	3.43	11.26	-52.88	-39.03	944.94	697.37	-935.00	-690.03	1704.00	1257.55	6%	55%
8	4.00	13.14	-100.48	-74.15	920.73	679.50	-935.00	-690.03	1704.00	1257.55	11%	54%
9	4.58	15.01	-157.82	-116.47	880.80	650.03	-550.00	-405.90	1704.00	1257.55	29%	52%
10	5.15	16.89	-225.91	-166.72	794.35	586.23	-550.00	-405.90	1704.00	1257.55	41%	47%
11	5.72	18.77	-304.75	-224.91	665.16	490.89	-550.00	-405.90	1704.00	1257.55	55%	39%
12	6.29	20.64	-394.34	-291.02	497.50	367.16	-993.00	-732.83	1704.00	1257.55	40%	29%
13	6.86	22.52	-494.67	-365.07	296.11	218.53	-1485.00	-1095.93	1704.00	1257.55	33%	17%
14	7.44	24.40	-618.15	-456.19	66.24	48.89	-1485.00	-1095.93	840.00	619.92	42%	8%
15	8.01	26.27	-865.19	-638.51	0.00	0.00	-1485.00	-1095.93	840.00	619.92	58%	0%
16	8.58	28.15	-1143.80	-844.12	0.00	0.00	-1485.00	-1095.93	787.00	580.81	77%	0%
17	9.15	30.02	-871.76	-643.36	0.00	0.00	-1485.00	-1095.93	428.00	315.86	59%	0%
18	9.72	31.90	-623.78	-460.35	63.30	46.72	-1485.00	-1095.93	428.00	315.86	42%	15%
19	10.29	33.77	-417.04	-307.78	253.49	187.08	-1485.00	-1095.93	840.00	619.92	28%	30%
20	10.866	35.65	-283.54	-209.25	457.67	337.76	-1485.00	-1095.93	840.00	619.92	19%	54%
21	11.4375	37.52	-199.65	-147.34	635.79	469.21	-1485.00	-1095.93	1353.00	998.51	13%	47%

ÍNDICES DE SOBRE RESISTENCIA POR MOMENTOS - RESISTENCIA 1-2												
PUNTO	DIST (0)		MT (-) SAP200		MT (+) SAP200		ϕ Mn -		ϕ Mn +		ÍNDICE	
	m	ft	KN -m	kip-ft	KN -m	kip-ft	KN-m	kip-ft	KN-m	kip-ft	% (-)	% (+)
22	12.009	39.40	-126.48	-93.34	784.06	578.64	-1485.00	-1095.93	1353.00	998.51	9%	58%
23	12.5805	41.27	-64.05	-47.27	899.87	664.10	-1485.00	-1095.93	1353.00	998.51	4%	67%
24	13.152	43.15	-12.34	-9.11	981.80	724.57	-1485.00	-1095.93	1353.00	998.51	1%	73%
25	13.7235	45.02	0.00	0.00	1027.16	758.04	-1485.00	-1095.93	1353.00	998.51	0%	76%
26	14.295	46.90	0.00	0.00	1036.94	765.26	-1485.00	-1095.93	1353.00	998.51	0%	77%
27	14.8665	48.77	0.00	0.00	1026.96	757.90	-1485.00	-1095.93	1353.00	998.51	0%	76%
28	15.438	50.65	-12.13	-8.95	981.13	724.07	-1485.00	-1095.93	1353.00	998.51	1%	73%
29	16.0095	52.52	-64.04	-47.26	899.73	664.00	-1485.00	-1095.93	1353.00	998.51	4%	66%
30	16.581	54.40	-126.47	-93.33	783.94	578.55	-1485.00	-1095.93	1353.00	998.51	9%	58%
31	17.1525	56.27	-199.63	-147.33	635.68	469.13	-1485.00	-1095.93	1353.00	998.51	13%	47%
32	17.724	58.15	-283.52	-209.24	457.56	337.68	-1485.00	-1095.93	840.00	619.92	19%	54%
33	18.2955	60.02	-417.03	-307.77	253.39	187.00	-1485.00	-1095.93	840.00	619.92	28%	30%
34	18.867	61.90	-623.76	-460.33	63.19	46.63	-1485.00	-1095.93	428.00	315.86	42%	15%
35	19.4385	63.77	-871.78	-643.37	0.00	0.00	-1485.00	-1095.93	428.00	315.86	59%	0%
36	20.01	65.65	-1143.79	-844.12	0.00	0.00	-1485.00	-1095.93	787.00	580.81	77%	0%
37	20.582	67.53	-865.18	-638.50	0.00	0.00	-1485.00	-1095.93	840.00	619.92	58%	0%
38	21.154	69.40	-618.13	-456.18	66.31	48.94	-1485.00	-1095.93	840.00	619.92	42%	8%
39	21.726	71.28	-494.66	-365.06	296.17	218.57	-1485.00	-1095.93	1704.00	1257.55	33%	17%
40	22.298	73.16	-394.74	-291.32	497.57	367.21	-993.00	-732.83	1704.00	1257.55	40%	29%
41	22.87	75.03	-304.74	-224.90	665.26	490.96	-550.00	-405.90	1704.00	1257.55	55%	39%
42	23.442	76.91	-225.91	-166.72	794.48	586.33	-550.00	-405.90	1704.00	1257.55	41%	47%
43	24.014	78.79	-157.82	-116.47	880.98	650.16	-550.00	-405.90	1704.00	1257.55	29%	52%
44	24.586	80.66	-100.47	-74.15	920.97	679.68	-935.00	-690.03	1704.00	1257.55	11%	54%
45	25.158	82.54	-53.88	-39.76	944.75	697.23	-935.00	-690.03	1704.00	1257.55	6%	55%
46	25.73	84.42	-18.03	-13.31	922.18	680.57	-550.00	-405.90	1704.00	1257.55	3%	54%
47	26.302	86.29	0.00	0.00	848.55	626.23	-550.00	-405.90	1704.00	1257.55	0%	50%
48	26.874	88.17	0.00	0.00	721.41	532.40	-550.00	-405.90	1704.00	1257.55	0%	42%
49	27.446	90.05	0.00	0.00	538.60	397.49	-550.00	-405.90	1704.00	1257.55	0%	32%
50	28.018	91.92	0.00	0.00	298.51	220.30	-550.00	-405.90	1704.00	1257.55	0%	18%
51	28.59	93.80	0.00	0.00	0.00	0.00	-550.00	-405.90	1704.00	1257.55	0%	0%

Fuente: Elaboración Propia.

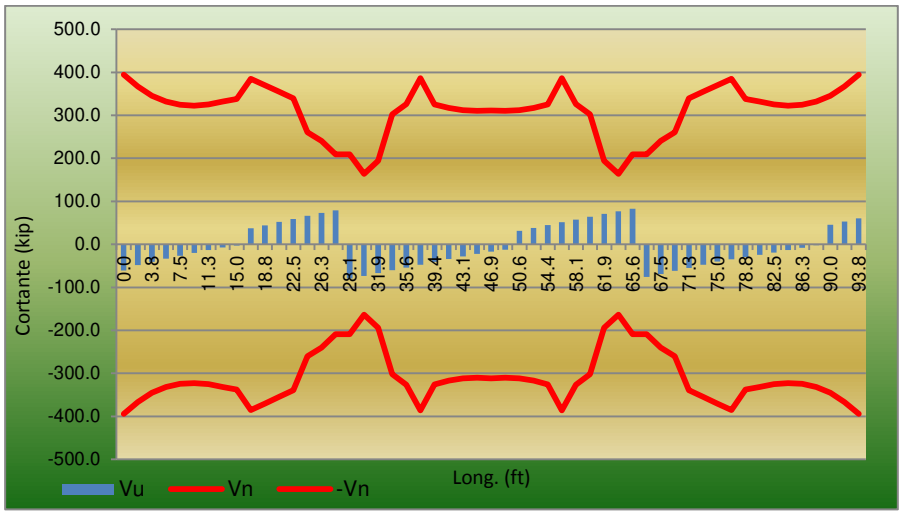


Figura 110 Representacion gráfica índices por corte combinacion servicio 1-1 – FIN

Fuente: Elaboración Propia.

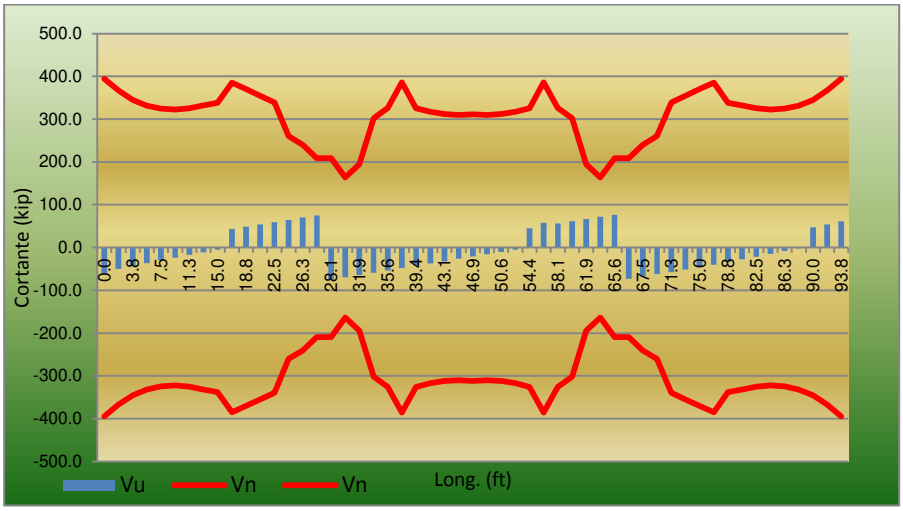


Figura 111 Representacion gráfica índices por corte combinacion servicio 1-2 – FIN

Fuente: Elaboración Propia.

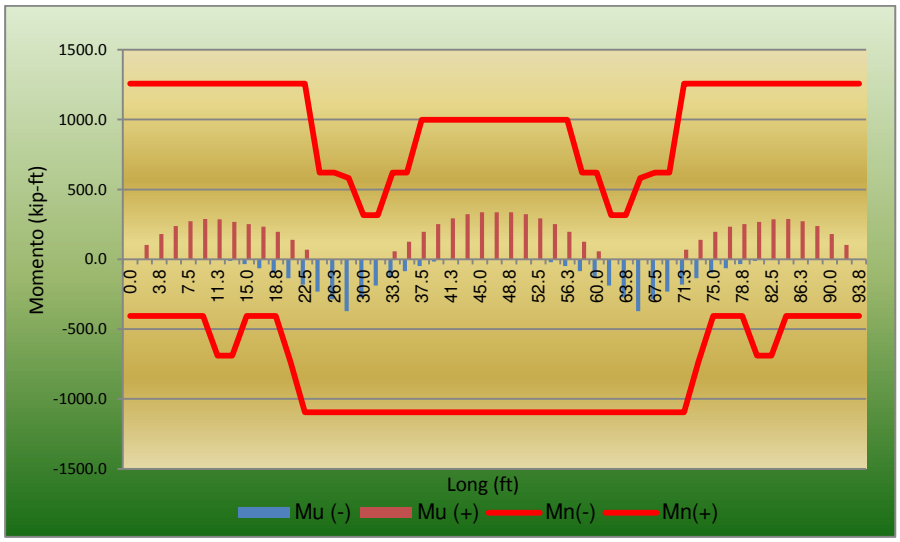


Figura 112 Representacion gráfica índices por momento combinacion servicio 1-1 – FIN

Fuente: Elaboración Propia.

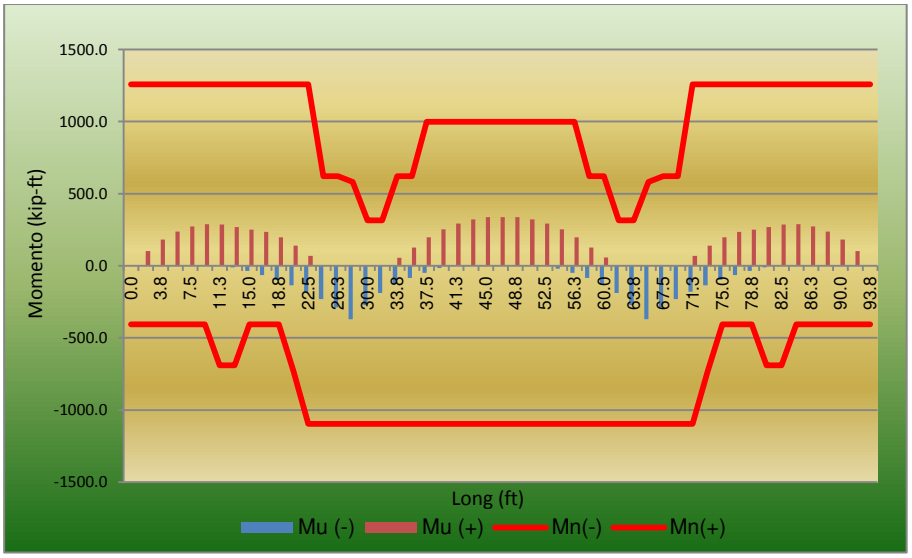


Figura 113 Representacion gráfica índices por momento combinacion servicio 1-2 – FIN

Fuente: Elaboración Propia.

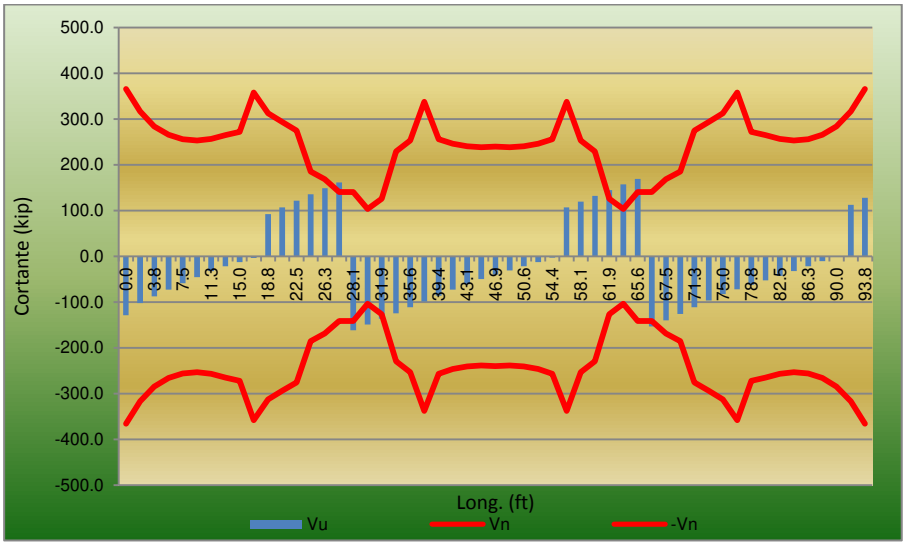


Figura 114 Representacion gráfica índices por corte combinacion resistencia 1-1 – FIN

Fuente: Elaboración Propia.

Figura 115 Representacion gráfica índices por corte combinacion resistencia 1-2 – FIN

Fuente: Elaboración Propia.

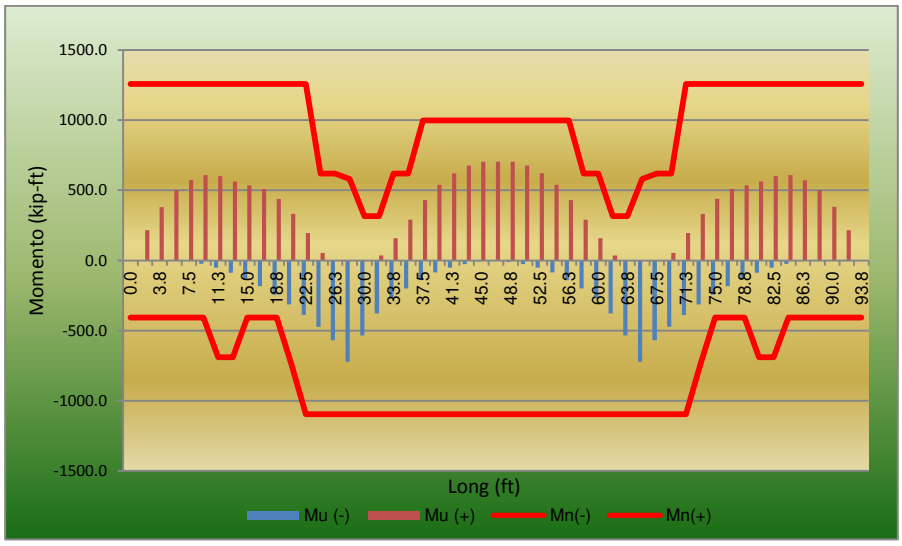


Figura 116 Representacion gráfica índices por momento combinacion resistencia 1-1 – FIN

Fuente: Elaboración Propia.

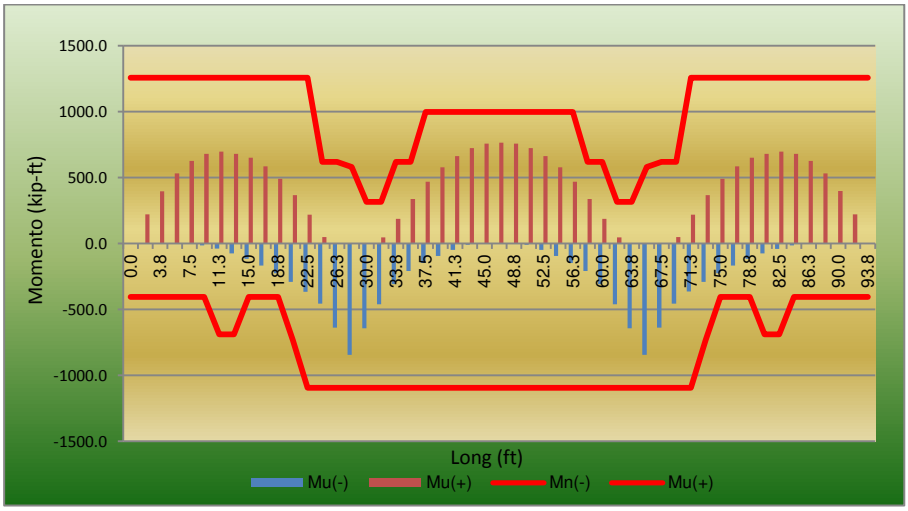


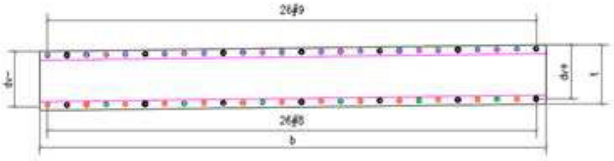
Figura 117 Representacion gráfica índices por momento combinacion resistencia 1-2 – FIN

Fuente: Elaboración Propia.

Dado que los índices de sobre esfuerzo por cortante, sobrepasan el 100 % cerca a los apoyos intermedios, se decide realizar una verificación de la capacidad a cortante de la placa, por el método del puntal tensor. A

continuación se presenta los cálculos y la representación gráfica de los resultados.

Revisión a corte por el método del Puntal-Tensor
Elemento : Franja Interna Punto - 17



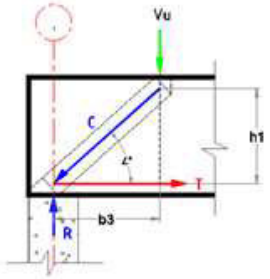
Geometría

h=	0.46m	= 1.5 ft	b1=	3.9	= 12.8 ft Ancho de apoyo
Rec =	0.06m	= 0.2 ft			
d=	0.40m	= 1.3 ft			

Materiales

f'c=	14 Mpa =	2000	PSI	
fy=	420 Mpa =	59997	PSI	

Esquema puntal - tensor



h1 =	0.34	
b3 =	0.57	
Angulo	30.82 °	Mayor a 22° - cumple,"Nocumple
Vu=	751 kN	= 168.8 kips
C=	699 kN	= 157.1 kips
T=	590 kN	= 132.6 kips

Cuantía de refuerzo suministrado

Ref-prin=	26 # 8"			Diámetro de refuerzo para flexión
Ash=	133cm2	= 20.55 ft²		Área de refuerzo a dv
Ld=	0.00m	= 2.8 ft		Longitud de desarrollo barras
fy=	420 Mpa =	59997	PSI	fy-Afectado por Ld

Resistencia del tensor (T)

$$P_u = \phi P_n = \phi f_y A_{st}$$

ϕ = 1.00

ϕPn = 5569 kN = 1252 kips Refuerzo cumple > T

Índice = 11%

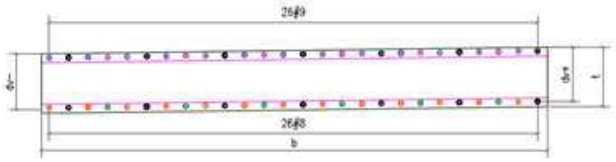
Resistencia del puntal de compresión sin refuerzo (C)

$$P_n = f_{cu} A_{cs} \quad \text{Donde ;} \quad f_{cu} = \frac{f_c'}{0.8 + 170\varepsilon_1} \le 0.85 f_c' \qquad \varepsilon_1 = \varepsilon_s + (\varepsilon_s + 0.002)\cot^2 \alpha_s$$

αs =	30.82 °	=	0.54 Rad	Menor Angulo entre el puntal de compresión y el tensores adyacentes de tracción
cot (αs)^2 =	2.812			
εs =	0.002	Deformación unitaria de tracción en el concreto		
ε1 =	0.01325			
fcu =	4.6 MPa	Cumple		
.85*fc =	11.9 MPa	Limite		
Barra #	1" =	25 mm	Refuerzo para calculo Acs	
6dba=	0.15m			
b-Franja =	1.80m			
Acs =	0.55m2			
ϕ =	0.80			
ϕPn =	2013 kN			

Índice = 35%

Revisión a corte por el método del Puntal-Tensor
Elemento : Franja interna punto 18



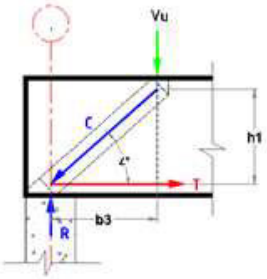
Geometría

h=	0.46m	= 1.5 ft	b1=	3.9	= 12.8 ft Ancho de apoyo
Rec =	0.06m	= 0.2 ft			
d=	0.41m	= 1.3 ft			

Materiales

f'c=	14 Mpa =	2000	PSI	
fy=	420 Mpa =	59997	PSI	

Esquema puntal - tensor



h1 =	0.35	
b3 =	0.865	
Angulo	22 °	Mayor a 22° - cumple
Vu=	564 kN	= 126.8 kips
C=	735 kN	= 165.2 kips
T=	679 kN	= 152.6 kips

Cuantía de refuerzo suministrado

Ref-prin=	26 # 8"			Diámetro de refuerzo para flexión
Ash=	133cm2	= 20.55 ft²		Área de refuerzo a dv
Ld=	0.00m	= 2.8 ft		Longitud de desarrollo barras
fy=	420 Mpa =	59997	PSI	fy-Afectado por Ld

Resistencia del tensor (T)

$$P_u = \phi P_n = \phi f_y A_{st}$$

ϕ = 1.00

ϕPn = 5569 kN = 1252 kips Refuerzo cumple > T Índice = 12%

Resistencia del puntal de compresión sin refuerzo (C)

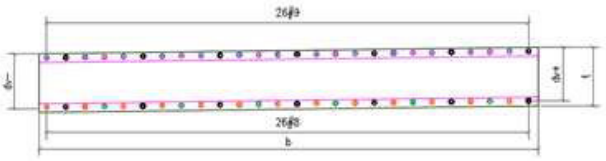
$$P_n = f_{cu} A_{cs} \quad \text{Donde :} \quad f_{cu} = \frac{f'_c}{0.8 + 170\varepsilon_1} \le 0.85 f'_c \qquad \varepsilon_1 = \varepsilon_s + (\varepsilon_s + 0.002)\cot^2 \alpha_s$$

αs =	22.03 °	=	0.38 Rad	Menor Angulo entre el puntal de compresión y el tensores adyacentes de tracción
cot (αs)^2 =	6.111			
εs =	0.002	Deformación unitaria de tracción en el concreto		
ε1 =	0.02644			
fcu =	2.6 MPa	Cumple		
.85*f'c =	11.9 MPa	Limite		
Barra #	1" =	25 mm	Refuerzo para calculo Acs	
6dba=	0.15m			
b-Franja =	1.80m			
Acs =	0.55m2			

ϕ = 0.80

ϕPn = 1160 kN Índice = 63%

Revisión a corte por el método del Puntal-Tensor
Elemento : Franja interna punto 35



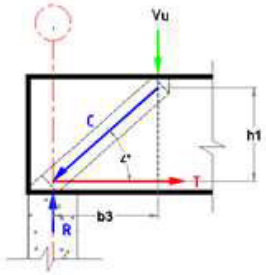
Geometría

h=	0.46m	= 1.5 ft	b1=	3.9	= 12.8 ft Ancho de apoyo
Rec =	0.06m	= 0.2 ft			
d=	0.41m	= 1.3 ft			

Materiales

f'c=	14 Mpa =	2000	PSI	
fy=	420 Mpa =	59997	PSI	

Esquema puntal - tensor



h1 =	0.35	
b3 =	0.865	
Angulo	22 °	Mayor a 22° - cumple
Vu=	462 kN	= 103.9 kips
C=	590 kN	= 132.6 kips
T=	1470 kN	= 330.5 kips

Cuantía de refuerzo suministrado

Ref-prin=	26 # 8"			Diámetro de refuerzo para flexión
Ash=	133cm2	= 20.55 ft²		Área de refuerzo a dv
Ld=	0.00m	= 2.8 ft		Longitud de desarrollo barras
fy=	420 Mpa =	59997	PSI	fy-Afectado por Ld

Resistencia del tensor (T)

$$P_u = \phi P_n = \phi f_y A_{st}$$

ϕ = 1.00

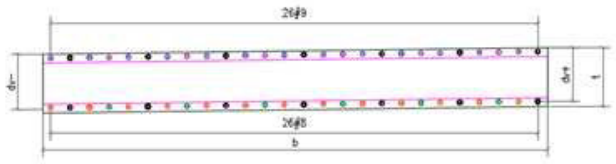
ϕPn = 5569 kN = 1252 kips Refuerzo cumple > T Índice = 26%

Resistencia del puntal de compresión sin refuerzo (C)

$$P_n = f_{cu} A_{cs} \quad \text{Donde :} \quad f_{cu} = \frac{f'_c}{0.8 + 170\varepsilon_1} \le 0.85 f'_c \qquad \varepsilon_1 = \varepsilon_s + (\varepsilon_s + 0.002)\cot^2 \alpha_s$$

αs =	22.03 °	=	0.38 Rad Menor Angulo entre el puntal de compresión y el tensores adyacentes de tracción
cot (αs)^2 =	6.111		
εs =	0.002	Deformación unitaria de tracción en el concreto	
ε1 =	0.02644		
fcu =	2.6 MPa	Cumple	
.85*f'c =	11.9 MPa	Limite	
Barra #	1" =	25 mm	Refuerzo para calculo Acs
6dba=	0.15m		
b-Franja =	1.80m		
Acs =	0.55m2		
ϕ =	0.80		
ϕPn =	1160 kN		Índice = 51%

Revisión a corte por el método del Puntal-Tensor
Elemento : Franja interna punto 36



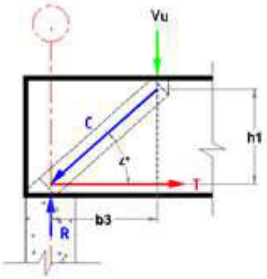
Geometría

h=	0.46m	= 1.5 ft	b1=	3.9	= 12.8 ft Ancho de apoyo
Rec =	0.06m	= 0.2 ft			
d=	0.41m	= 1.3 ft			

Materiales

f'c=	14 Mpa =	2000	PSI	
fy=	420 Mpa =	59997	PSI	

Esquema puntal - tensor



h1 =	0.34	
b3 =	0.57	
Angulo	31 °	Mayor a 22° - cumple
Vu=	823 kN	= 185.0 kips
C=	766 kN	= 172.2 kips
T=	647 kN	= 145.5 kips

Cuantía de refuerzo suministrado

Ref-prin=	26 # 8"			Diámetro de refuerzo para flexión
Ash=	133cm2	= 20.55 ft²		Área de refuerzo a dv
Ld=	0.00m	= 2.8 ft		Longitud de desarrollo barras
fy=	420 Mpa =	59997	PSI	fy-Afectado por Ld

Resistencia del tensor (T)

$$P_u = \phi P_n = \phi f_y A_{st}$$

ϕ = 1.00

ϕPn = 5569 kN = 1252 kips Refuerzo cumple > T Índice = 12%

Resistencia del puntal de compresión sin refuerzo (C)

$$P_n = f_{cu} A_{cs} \quad \text{Donde :} \quad f_{cu} = \frac{f'_c}{0.8 + 170\varepsilon_1} \le 0.85 f'_c \qquad \varepsilon_1 = \varepsilon_s + (\varepsilon_s + 0.002)\cot^2 \alpha_s$$

αs =	30.82 °	=	0.54 Rad	Menor Angulo entre el puntal de compresión y el tensores adyacentes de tracción
cot (αs)^2 =	2.812			
εs =	0.002	Deformación unitaria de tracción en el concreto		
ε1 =	0.01325			
fcu =	4.6 MPa	Cumple		
.85*f'c =	11.9 MPa	Limite		
Barra #	1" =	25 mm	Refuerzo para cálculo Acs	
6dba=	0.15m			
b-Franja =	1.80m			
Acs =	0.55m2			
ϕ =	0.80			
ϕPn =	2013 kN			Índice = 38%

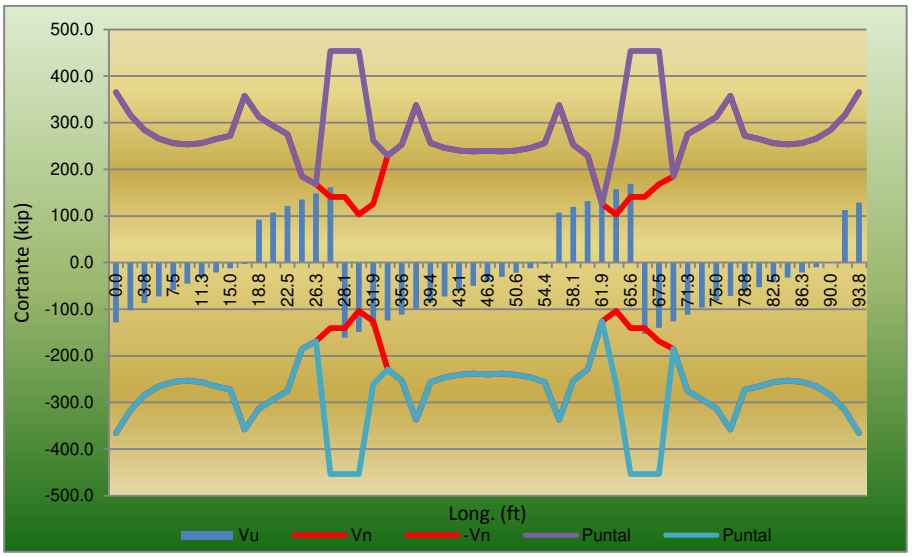


Figura 118 Representacion gráfica revision cortante por el metodo del puntal tensor combinacion resistencia 1-1 – FIN

Fuente: Elaboración Propia.

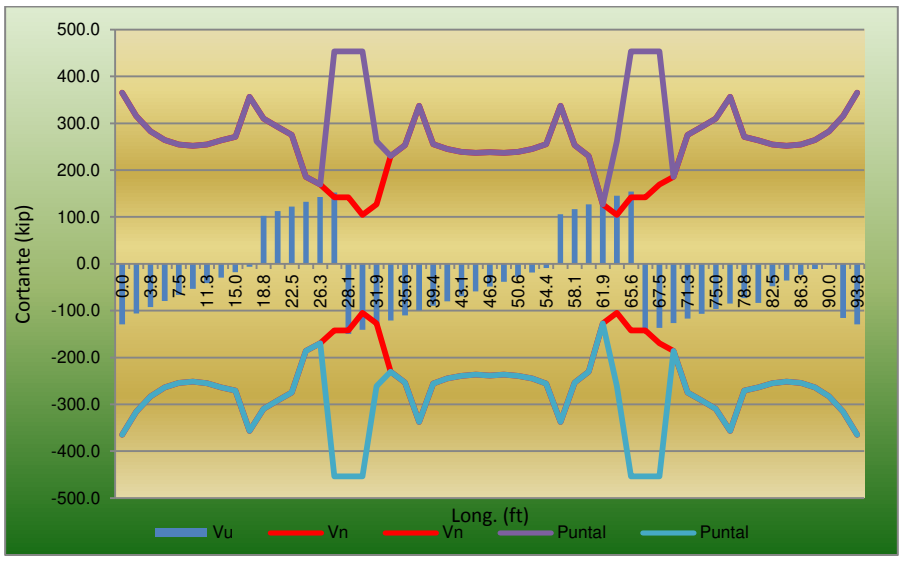


Figura 119 Representacion gráfica revision cortante por el metodo del puntal tensor combinacion resistencia 1-2 – FIN

Fuente: Elaboración Propia.

3.5.3.9. Chequeo de deformaciones

El chequeo de deformaciones se realizó con el momento de inercia efectivo del elemento, tal como se recomienda en la norma. A continuación se presentan los cálculos.

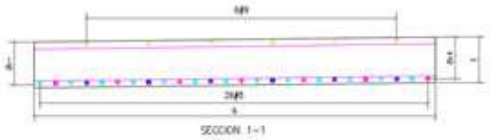
Momento de inercia efectivo corte 1-1

Materiales

f'c=	14 Mpa =	292.6	kips/ft²	
fy=	420 Mpa =	60.9	kips/ft²	
Es=	200000 Mpa =	367.543	kips/ft²	

Geometría viga

bfs=	3.90 m	= 12.8 ft	
e=	0.46 m	= 1.5 ft	
bv=	0.00 m	= 0.0 ft	
h=	0.00 m	= 0.0 ft	
dv=	0.40 m	= 1.3 ft	
Rec =	0.06 m	= 0.2 ft	



Propiedades

Barras = 26

# =	8		
As =	0.013 m2	= 0.14 ft 2	Área de refuerzo suministrado en punto de estudio
n=	11.14		Relación modular
n*As =	0.148	= 1.59 ft 2	
X=	0.20 m	= 0.7 ft	Distancia del eje centroidal

Momento de inercia efectivo

$$I_e = \left(\frac{M_{cr}}{M_a}\right)^3 I_g + \left[1 - \left(\frac{M_{cr}}{M_a}\right)^3\right] I_{cr} \leq I_g$$

Ig=	0.032 m4	= 3.7 ft 4	
yt =	0.23 m4	= 26.6 ft 4	Distancia dese el eje neutro a la fibra extrema a tracción
fr =	2320 kN/m2		Modulo de rotura del concreto
Mcr =	319 kN-m	= 235 kips-ft	Momento de fisuracion
Ma=	266 kN-m	= 196 kips-ft	Momento en el concreto para la cual se calcula la deformación
Icr=	0.016 m4	= 1.9 ft 4	Momento de inercia de la sección transformada
Ie =	0.0428 m4	= 5.0 ft 4	Momento de inercia efectivo

Deflexión máxima por cargas permanentes

$$\delta = 5 * W * l^4/384*E*Ie$$

W=	22 kN-m
L=	14.00 m
E=	17959955 kN/m2
δ =	0.014 m

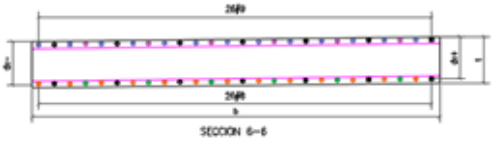
Momento de inercia efectivo corte 6-6

Materiales

f'c=	14	Mpa =	292.6	kips/ft²
fy=	420	Mpa =	60.9	kips/ft²
Es=	200000	Mpa =	367.543	kips/ft²

Geometría viga

bfs=	3.90 m	= 12.8 ft
e=	0.46 m	= 1.5 ft
bv=	0.00 m	= 0.0 ft
h=	0.00 m	= 0.0 ft
dv=	0.40 m	= 1.3 ft
Rec =	0.06 m	= 0.2 ft



Propiedades

Barras = 26

# =	8		
As =	0.013 m2	= 0.14 ft 2	Área de refuerzo suministrado en punto de estudio
n=	11.14		Relación modular
n*As =	0.148	= 1.59 ft 2	
X=	0.20 m	= 0.7 ft	Distancia del eje centroidal

Momento de inercia efectivo

$$I_e = \left(\frac{M_{cr}}{M_a}\right)^3 I_g + \left[1 - \left(\frac{M_{cr}}{M_a}\right)^3\right] I_{cr} \leq I_g$$

Ig=	0.032 m4	= 3.7 ft 4	
yt =	0.23 m4	= 26.6 ft 4	Distancia dese el eje neutro a la fibra extrema a tracción
fr =	2320 kN/m2		Modulo de rotura del concreto
Mcr =	319 kN-m	= 235 kips-ft	Momento de fisuracion
Ma=	327 kN-m	= 241 kips-ft	Momento en el concreto para la cual se calcula la deformación
Icr=	0.016 m4	= 1.9 ft 4	Momento de inercia de la sección transformada
Ie =	0.0305 m4	= 3.5 ft 4	Momento de inercia efectivo

Deflexión máxima por cargas permanentes

$$\delta = 5 * W * l^4/384*E*Ie$$

W=	22 kN-m
L=	14.00 m
E=	17959955 kN/m2
δ =	0.0197 m

Tabla 72 Revisión deflexiones franja FIN

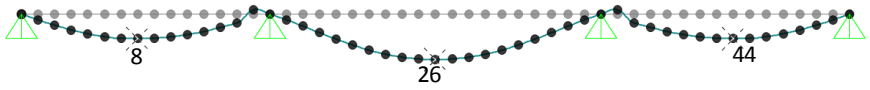


TABLE: Joint Displacements								
Joint	OutputCase	CaseType	StepType	U3		Δmax = L/800		Cumple
Text	Text	Text	Text	mm	in	mm	in	
8	HL93 +	LinMoving	Max	2.07	0.08	10.5	0.41	Cumple
8	HL93 +	LinMoving	Min	-3.56	-0.14	10.5	0.41	Cumple
8	DFL1	Combination	Max	0.07	0.00	10.5	0.41	Cumple
8	DFL1	Combination	Min	-1.34	-0.05	10.5	0.41	Cumple
8	DFL2	Combination	Max	0.03	0.00	10.5	0.41	Cumple
8	DFL2	Combination	Min	-1.47	-0.06	10.5	0.41	Cumple
8	DFL3	Combination		-0.59	-0.02	10.5	0.41	Cumple
26	HL93 +	LinMoving	Max	1.79	0.07	14.3	0.56	Cumple
26	HL93 +	LinMoving	Min	-6.60	-0.26	14.3	0.56	Cumple
26	DFL1	Combination	Max	-0.55	-0.02	14.3	0.56	Cumple
26	DFL1	Combination	Min	-2.65	-0.10	14.3	0.56	Cumple
26	DFL2	Combination	Max	-0.53	-0.02	14.3	0.56	Cumple
26	DFL2	Combination	Min	-2.64	-0.10	14.3	0.56	Cumple
26	DFL3	Combination		-1.32	-0.05	14.3	0.56	Cumple
44	HL93 +	LinMoving	Max	2.07	0.08	10.5	0.41	Cumple
44	HL93 +	LinMoving	Min	-3.56	-0.14	10.5	0.41	Cumple
44	DFL1	Combination	Max	0.07	0.00	10.5	0.41	Cumple
44	DFL1	Combination	Min	-1.34	-0.05	10.5	0.41	Cumple
44	DFL2	Combination	Max	0.03	0.00	10.5	0.41	Cumple
44	DFL2	Combination	Min	-1.47	-0.06	10.5	0.41	Cumple
44	DFL3	Combination		-0.59	-0.02	10.5	0.41	Cumple

Fuente: Elaboración Propia.

Capitulo IV
CONCLUSIONES

- Dado que el presente trabajo realizado fue netamente académico, no se realizaron trabajos de campo ni programación de ensayos en los puentes, necesarios para establecer las condiciones reales de conservación de cualquier estructura.
- Los resultados que se presentan en este informe, se calcularon con base en la información suministrada por la universidad de Purdue; la cual constaba de una copia de los planos originales de diseño y reparaciones realizadas a los puentes. Información que era poco legible y que debió ser confirmada con trabajos de campo, pero por tratarse un de trabajo académico no se realizó esta labor.
- Según las imágenes que se obtuvieron de los puentes, con la ayuda del programa Google Earth, los puentes siguen en servicio y a simple vista no se observan daños importantes en la superestructura de los mismos.
- De acuerdo a los resultados obtenidos, los índices de sobre esfuerzo por cortante y flexión del puente No 1, calculados con las combinaciones de servicio, no superan la capacidad de los elementos, aun cuando en estas combinaciones se está multiplicado la carga viva por 1.33% para tenar en cuenta efectos dinámicos, tal como lo indica la norma.
- Los índices de sobre esfuerzo por flexión del puente No 1, con combinaciones de resistencia son superados hasta un máximo del 16% de la capacidad de las vigas en centro luz del puente.
- Si bien los índices por flexión son superados en el puente No – 1, además de no cumplir con los límites de deformaciones establecidos en la norma, esto no quiere decir que se deba reforzar el puente de manera inmediata, ya que el puente ha venido soportando las cargas de diseño sin mayorar, atravez de los años y a simple vista no se observan daños que puedan comprometer la integridad del sus componentes.
- Los índices de sobre esfuerzo por flexión y corte, con combinaciones de servicio y para el puente No 2, no superan la resistencia de los elementos.
- Los índices de sobre esfuerzo por flexión, con combinaciones de resistencia para el puente No 2, no superan la resistencia de los elementos.

- Los índices de sobre esfuerzo por corte, con combinaciones de resistencia para el puente No 2, superan hasta un 54% de la capacidad del elemento en zonas “D” cercanas a los apoyos intermedios, por tal razón se realizó un chequeo adicional a cortante empleando el método del puntal tensor, método que es permitido por la AASTHO 2012 para analizar las regiones “D” que tienen estados de esfuerzos muy complejos en los que no aplica la teoría de vigas.

  Una vez realizado el chequeo por el método del puntal tensor, se observa que los elementos presentan una mayor capacidad de resistencia a cortante en las zonas cercanas a los apoyos que la calculada con la teoría de vigas, por lo tanto el puente No-2 cumple con los requerimientos de capacidad establecidos en la norma.
- Las deformaciones verticales del puente No- 2 no superan los límites establecidos en la norma.
- Si bien los puentes fueron diseñados y construidos hace ya casi 69 años el más antiguo, y estando cercanos a cumplir su vida útil es de admirar a los ingenieros estructurales que proyectaron estas estructuras, ya los puentes aún siguen en servicio, aun cuando con el paso de los años, las cargas vivas (Camión) han tenido grandes avance, tanto en su tecnología como en capacidad de carga.
- Si bien en el país se cuenta con la Norma Colombiana de Diseño de Puentes – LRFD – CCP14 y el manual para inspección visual de puentes y pontones del Instituto Nacional de Vías – INVIAS, no se cuenta con normativa para evaluación y reforzamiento de estructuras viales, por lo tanto es necesario que las entidades competentes revisen el tema, y dicten los lineamientos para desarrollar este tipo de trabajos en el país.

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ANEXOS

Anexo 1 Información suministrada por la universidad de Purdue

Anexo 2 Cálculo de cortante resistente en vigas del puente No 1

Anexo 3 Fuerzas en vigas del puente No 1

Anexo 4 Deflexiones en vigas del puente No 1

Anexo 5 Cálculo de cortante resistente en franjas del puente No 2

Anexo 6 Fuerzas en franjas del puente No 2

Anexo 7 Deflexiones en franjas del puente No 2

ANEXO 1

BRIDGE CONTRACT No. 3388

INDEX

PROJECT NO.	STRUCTURE NO.	TYPE	SPAN	OVER	STATION	CONTRACT NO.
F-18(9)	31-0-3570	R.C. GIRDER	1@36', 5K.30°R.	MUD CREEK	60+43	3388

SHEET NO.	SHEET DESIGNATION	SUBJECT
1		INDEX & TITLE SHEET
2	C1 (STRUCTURE 31-0-3570)	LAYOUT
3	C2	GENERAL PLAN
4	C3	SUBSTRUCTURE DETAILS
5	C4	FOOTING PLAN, BILLS OF MATERIALS & BENDING DIAGRAMS
6	C5	SUPERSTRUCTURE DETAILS
7	ONE SHEET	SUMMARY
8	BRIDGE STD. C	STANDARD MISCELLANEOUS DETAILS (REV. 5-14-45)
9	ROAD STD. SHEET MB	MISCELLANEOUS STANDARDS (REV. 3-23-50)
10	BRIDGE STD. G2	STANDARD THICKENED PAVEMENT DETAILS (JULY 15, 1947)
11	BRIDGE STD. M1	MISCELLANEOUS APPROACH DETAILS (REV. 8-31-48)
12	BRIDGE STD. M2	MISCELLANEOUS APPROACH DETAILS (AUG. 1, 1945)
13	BRIDGE STD. S2	TYPICAL DETAILS FOR PLACING SPECIAL FILLING MATERIAL (JUNE 15, 1939)
14	BRIDGE STD. T SHEET A	STANDARD TEMPORARY BRIDGE (REV. 3-26-43)
15	BRIDGE STD. T SHEET B	STANDARD TEMPORARY BRIDGE (REV. 11-13-39)
16	SHEET 1 DETOURS	STANDARD DETOUR SIGNS (APRIL 1, 1950)
17	SHEET 2 DETOURS	STANDARD DETOUR SIGNS (APRIL 1, 1950)

STATE OF INDIANA

STATE HIGHWAY COMMISSION

BRIDGE PLANS

FOR SPANS OVER 20 FEET ON STATE ROAD NO. 31 SECTION 0

F.A. PROJECT NO. F-18(9)

WESTFIELD-KOKOMO ROAD

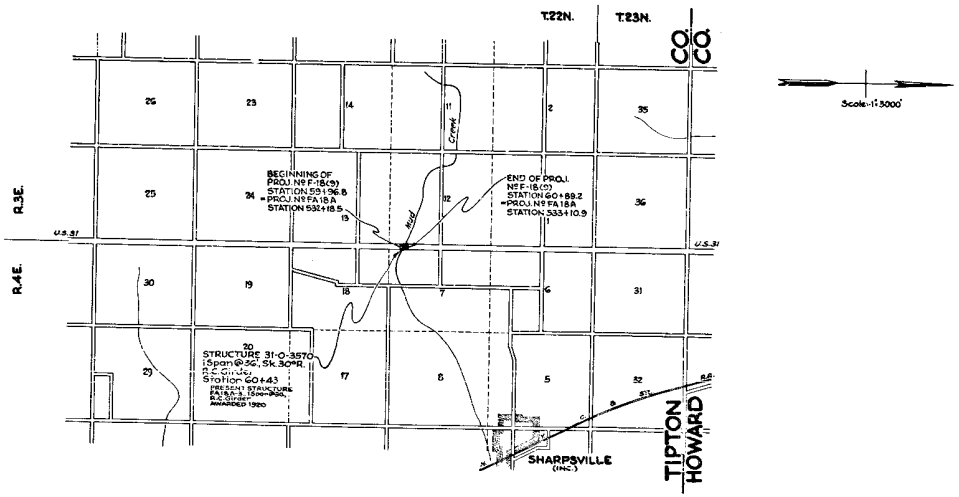
BEGINNING AT A POINT ON U.S. 31 APPROX. 696.8' NORTH OF THE CORNER COMMON TO SECTIONS 13, 12, 18 & 7 AND EXTENDING NORTH A DISTANCE OF APPROX. 92.4' TO A POINT ON U.S. 31 APPROX. 789.2' NORTH OF THE CORNER COMMON TO SECTIONS 13, 12, 18 & 7, ALL IN SECTIONS 12 & 7 - T.22N.-R3. & R4E., TIPTON COUNTY.

ROADWAY LENGTH = 0.010MI.
BRIDGE LENGTH = 0.007MI.
TOTAL LENGTH = 0.017MI.

MAX. GRADE = -0.47%

BRIDGES OVER 20' SPAN

PUB. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	IND.	F-18(9)	1951	1	17



APPROVED AND ADOPTED BY STATE HIGHWAY COMMISSION OF INDIANA DATE 5/3/51

Samuel T. Haddon
CHAIRMAN, STATE HIGHWAY COMMISSION OF INDIANA

APPROVED DATE April 7, 51

CHIEF ENGINEER, STATE HIGHWAY COMMISSION OF INDIANA

RECOMMENDED FOR APPROVAL DATE

DISTRICT ENGINEER
BUREAU OF PUBLIC ROADS
DEPARTMENT OF COMMERCE

APPROVED DATE

DIVISION ENGINEER
BUREAU OF PUBLIC ROADS
DEPARTMENT OF COMMERCE

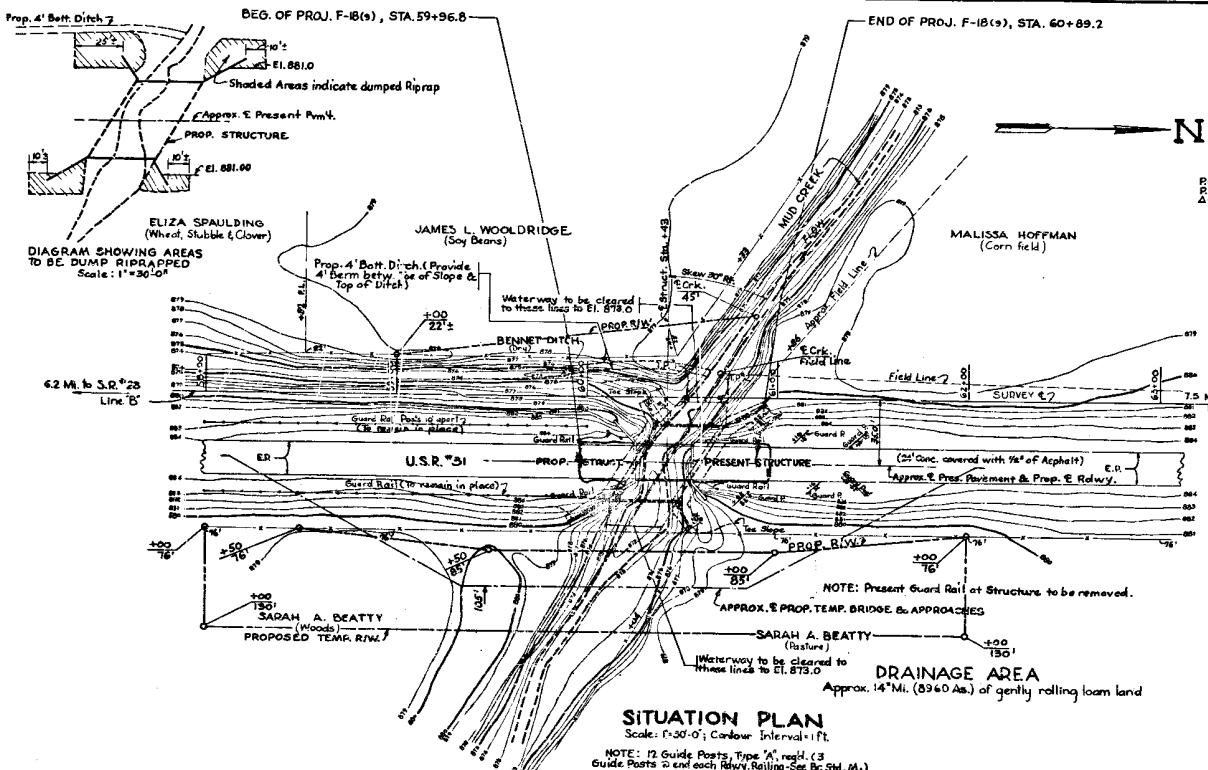
RECOMMENDED FOR APPROVAL DATE 4-16-51

ENGINEER OF BRIDGE DESIGN, STATE HIGHWAY COMMISSION OF INDIANA

STATE HIGHWAY COMMISSION OF INDIANA
1946 STANDARD ROAD AND BRIDGE SPECIFICATIONS
TO BE USED WITH THESE PLANS

BRIDGE FILE: 31-0-3570

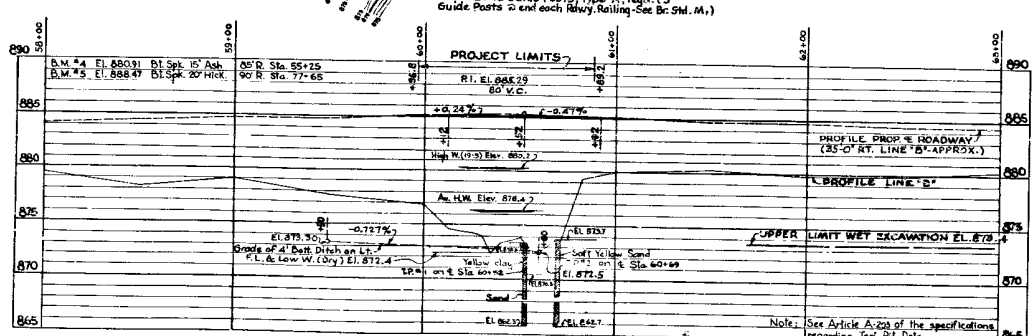
BRIDGES OVER 20' SPAN					
PUB ROAD DIV NO	STATE	PROJECT NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
4	IND.	F-18(9)	1951	2	17



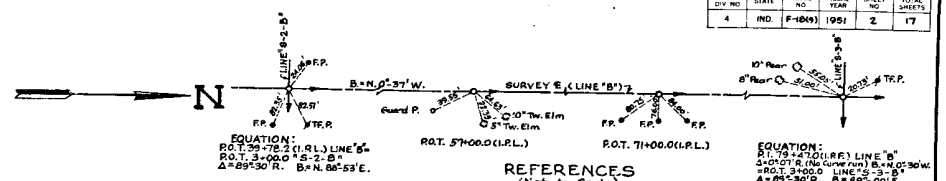
DRAINAGE AREA
Approx. 14" Mi. (8960 As.) of gently rolling loam land

SITUATION PLAN
Scale: 1"=30'-0"; Contour Interval = 1 ft.

NOTE: 12 Guide Posts, Type "A", req'd. (3 Guide Posts @ end each Rdwy. Railing - See Br. Std. M.)



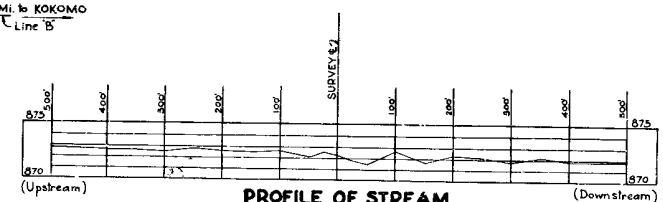
PROFILES
Scales; Hor. 1"=30'-0" Vert. 1"=5'-0"



REFERENCES
(Not to Scale)

The PRESENT STRUCTURE, a 30' Clear Span, R.C. Girder with 19'-4" Clear Rdwy., built in 1920 by the Ind. State Highway Commission as F.A. 18-A-3. Plans on file in Bridge Design Office.

NOTE: R/W. LINES SHOWN ARE TO BE MEASURED FROM SURVEY ℄ (LINE "B").



PROFILE OF STREAM
Scales; Hor. 1"=100'-0" Vert. 1"=5'-0"

FILL + 20%	=	290 CU. YDS.
SURPLUS EXCAVATION	=	805 " "
COMMON EXCAVATION	=	150 " "
WASTE	=	665 " "

LAYOUT
REINFORCED CONCRETE GIRDER BRIDGE
1 SPAN @ 36'-0" SKEW 30° RT. 41'-0" ROADWAY
OVER MUD CREEK ON STATE ROAD:- 31-0

STATE HIGHWAY COMMISSION OF INDIANA
TIPTON COUNTY

SCALE:- AS NOTED MARCH 21, 1951
RECOMMENDED FOR APPROVAL:-
PROJECT:- F-18(9) STATION:- 60+43
DRAWING:- C1 OF 5
BRIDGE CONTRACT NO. 3388
BRIDGE FILE:- 31-0-3570

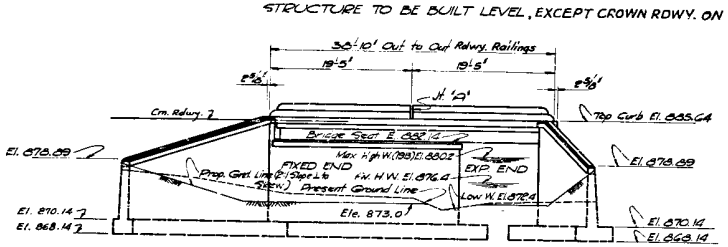
NOTE; SEE FIELD NOTES BR. Book No. 782 Pages 29 to 54

DESIGNED
DRAWN L.S. 3-31-44 C.K.D. M.J.R. 4-21-44
TRACED G.D.B. 4-27-54 C.K.D. C.L.M. 10-30-50

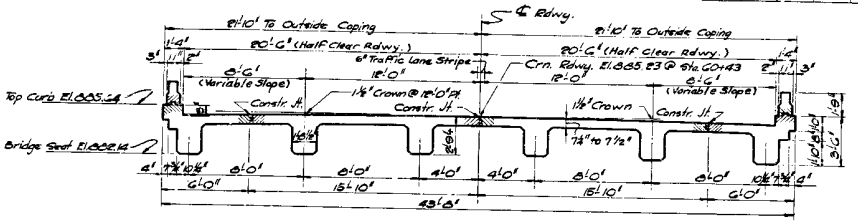
BRIDGES OVER 20' SPAN

PUR. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	IND.	F-15(9)	1951	3	17

STRUCTURE TO BE BUILT LEVEL, EXCEPT CROWN RDWY. ON 80' V.C.

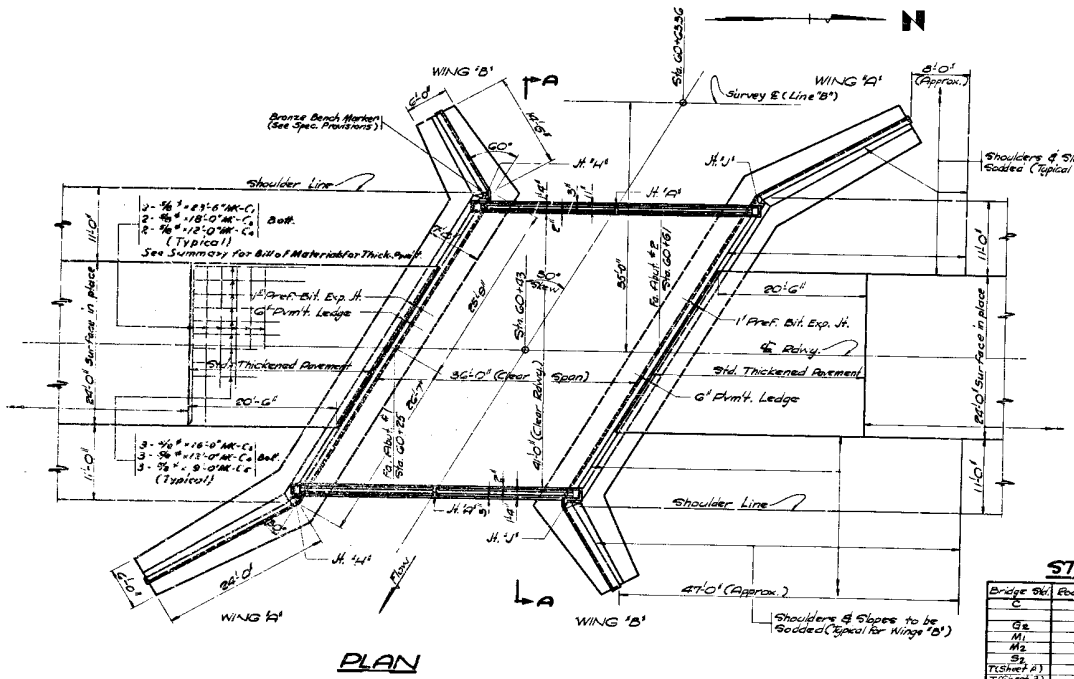


ELEVATION



SECTION A-A

Scale :- ½" = 1'-0"



PLAN

GENERAL NOTES

Depth of footings to be extended if found necessary. See Art. 802.3.2 of Specifications.
Reinforcing Steel covering shall be 1" in Floor Slabs, 3" in Footings, except bottom steel which shall be 4", and 2" in all other parts unless noted.
All Dimensions on Details and Bending Diagrams for Reinforcing Bars are measured on centerlines of bars.
Concrete in Footings, wingwalls, and Abutments to be Class "E".
Concrete in superstructure including Rdwy. Railing, to be Class "F".
Continuous concrete pours shall be required between Construction Jts. as shown on Detail Plans.
Waterproof abutments and wingwalls in accordance with Specifications.
Bevel Brgs. ½ inch under Copings; and chamfer exposed edges 1 inch unless noted.
Dumped Riprap to be placed around wing spills.
Outlet ends of Drains thru Structure to project 5". Cut or burn off inlet ends flush with concrete.
See Special Provisions for items included in this Contract.

DESIGN DATA

Designed for H 20-S 16-44 loading in accordance with 1949 A.A.S.H.O. Specifications.

JOINT LEGEND

Joint "A" indicates a vertical ⅝" open joint in handrail only.
Joint "H" indicates ½" preformed, bituminous expansion joints on vertical faces of keyways next to Girders #2 at Fixed End of Structure, and 1" preformed bituminous expansion joints extending down from top of Coping to top of Bridge Seat.
Joint "J" indicates one horizontal layer of roofing felt, medium weight, under entire superstructure bearing area at Expansion End of Structure, with ½" preformed bituminous expansion joints on vertical faces of keyways next to Girders #2, and one layer of roofing felt on vertical faces of keyways next to Girders #3, also 1" preformed, bituminous expansion joints extending down from top of Coping to top of Bridge Seat.

TYPICAL CROSS SECTION

NOTE: THICKENED PAVEMENT ONLY TO BE CONSTRUCTED. 24'-0" SURFACE, 1'-0" SHOULDERS SLOPED AT 1" PER FT., AND SIDE SLOPES AT 2:1.
MATCH PRESENT SHOULDERS AND SLOPES AT 25' BEYOND PROJECT LIMITS.

STANDARD DRAWINGS

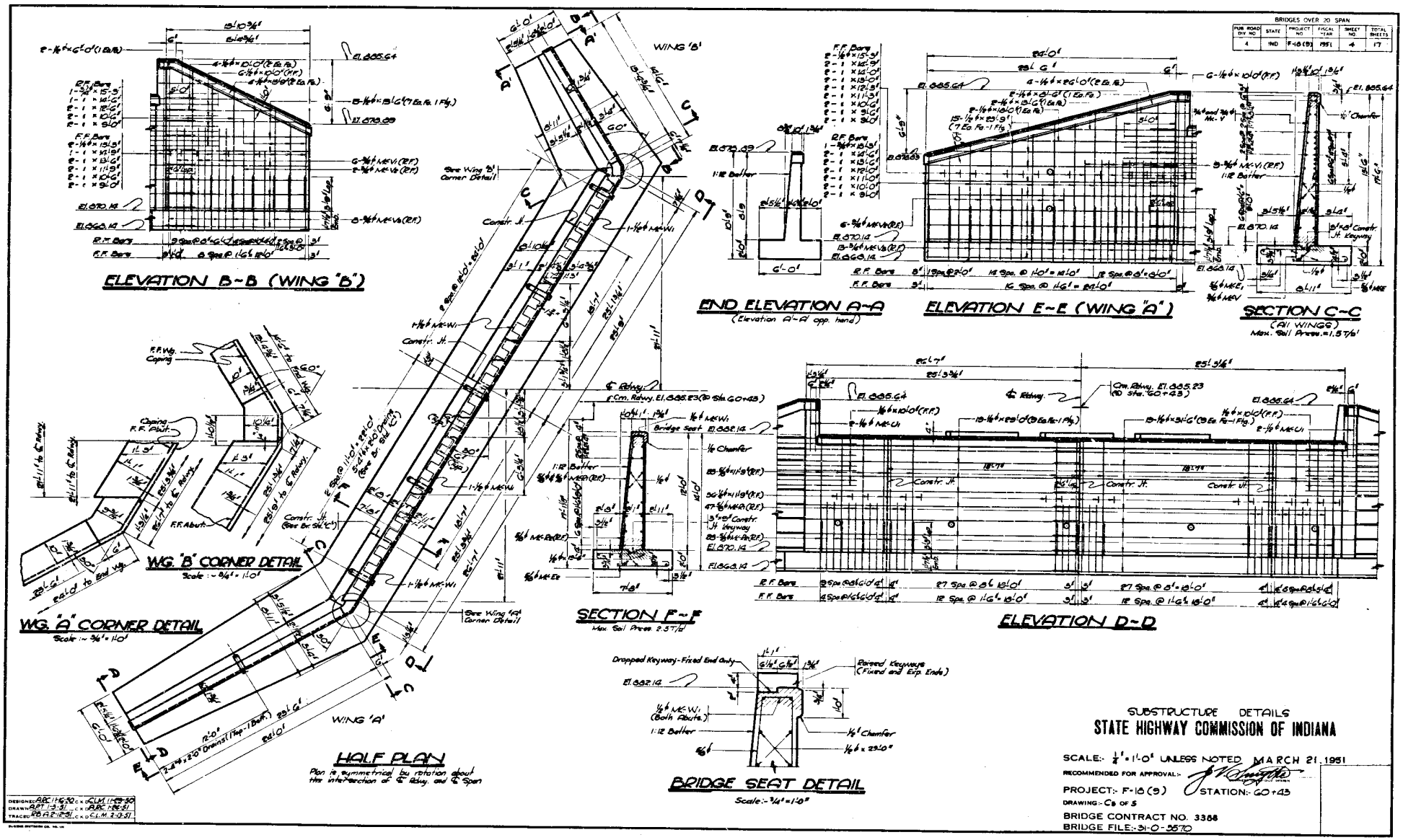
Bridge Std.	Road Std.	Purpose	Date
C		Waterproofing; Constructn. & Drain Defls. and Test Bar Samples.	Rev. 5-14-49
G_2		Standard Thickened Pavement Details	4-15-47
M_1		Guide Post Details	Rev. 8-31-48
M_2		Paved Temporary Run-a-round Details	8-1-49
S_2		Typ. Details for placing Spec. Filling Mat'l.	6-15-39
T (Sheet 1)		Standard Temporary Bridge Details	Rev. 3-26-43
T (Sheet 2)		" " "	" 11-13-39
	M B	R/W Marker Details	" 3-29-50
	Detours (Sh. 1)	Standard Detour Signs - Details	4-1-50
	" (Sh. 2)	" " " "	4-1-50

NOTE :-
Crown of thickened pavement to be adjusted to match Bridge Floor and Present Pavement at Project Limits.
Elevations of Present Pavement to be checked before Proposed Structure is built.

GENERAL PLAN
REINFORCED CONCRETE GIRDER BRIDGE
1 SPAN @ 36'-0" SKEW 30° RT. 41'-0" ROADWAY
OVER MUD CREEK ON STATE ROAD :- 31-0
STATE HIGHWAY COMMISSION OF INDIANA
TIPTON COUNTY

SCALE:- ½" = 1'-0" UNLESS NOTED MARCH 21, 1951
RECOMMENDED FOR APPROVAL:-
PROJECT:- F-15(9) STATION:- 60+43
DRAWING:- C2 OF 5
BRIDGE CONTRACT NO. 3388
BRIDGE FILE:- 31-0-5570

DESIGNED GEM 4-50 CKD.
DRAWN GEM 4-11-51 CKD. GLM 4-11-51
TRACED GEM 4-13-51 CKD. GEM 4-11-51



BRIDGES OVER 20 SPAN					
PUB ROAD DIV NO	STATE	PROJECT NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
4	IND	F-18 (9)	1951	4	17

SUBSTRUCTURE DETAILS

STATE HIGHWAY COMMISSION OF INDIANA

SCALE:- 1/4" = 1'-0" UNLESS NOTED MARCH 21, 1951

RECOMMENDED FOR APPROVAL:-

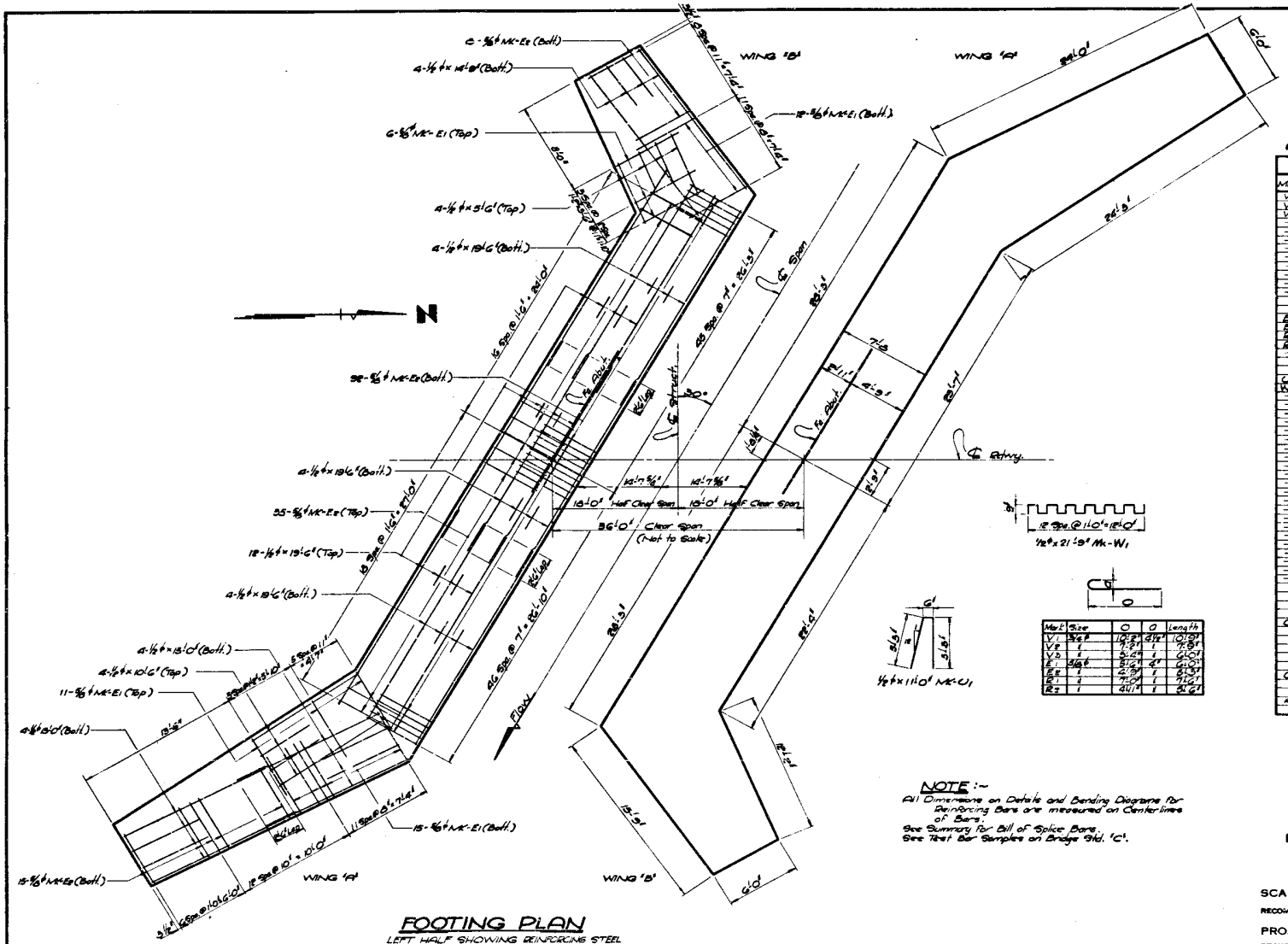
PROJECT:- F-18 (9) STATION:- 60+43

DRAWING:- C9 OF 5

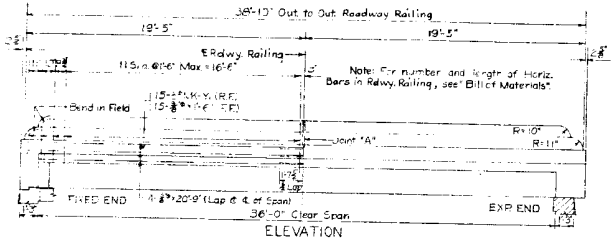
BRIDGE CONTRACT NO. 3368

BRIDGE FILE:- 31-0-5570

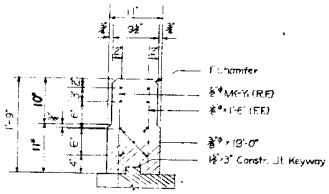
DESIGNED	ABC 11-6-50	CK'D	CLM 11-9-50
DRAWN	RPT 1-3-51	CK'D	ABC 1-16-51
TRACED	RBA 2-15-51	CK'D	CLM 2-20-51


WING 'B'
WING 'A'
WING 'A'
WING 'B'
N
36'-0" Clear Span (Not to Scale)
18'-0" Half Clear Span
18'-0" Half Clear Span
Retwy.
Fa. Abut.
Fa. Abut.
Fa. Struct.
30°
12 Spa. @ 1'-0" = 12'-0"
1/2"ø x 21'-9" Mk-W1
1/2"ø x 11'-0" Mk-U1
6'-0"
3'-0"
6'-0"
6'-0"
6

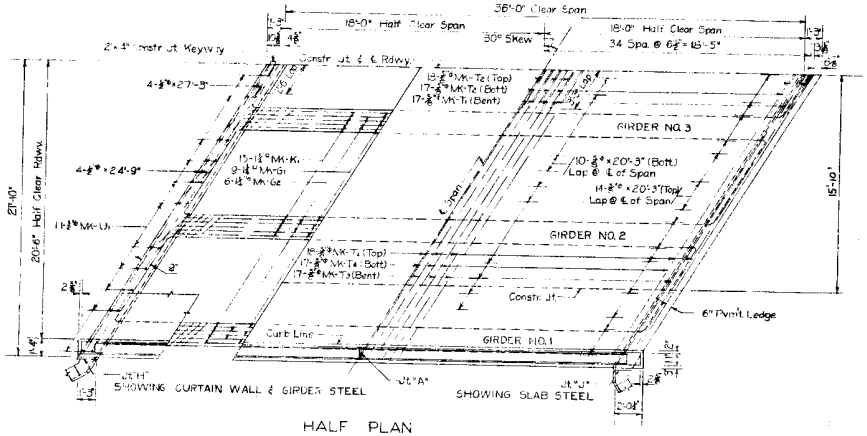
BRIDGES OVER 20 SPAN					
Fr. Alphab. Sec. No.	STATE	Proj. No.	TOTAL SHEETS	SHEET NO.	TOTAL SHEETS
4	IND.	F-18(9)	1851	G	1-7



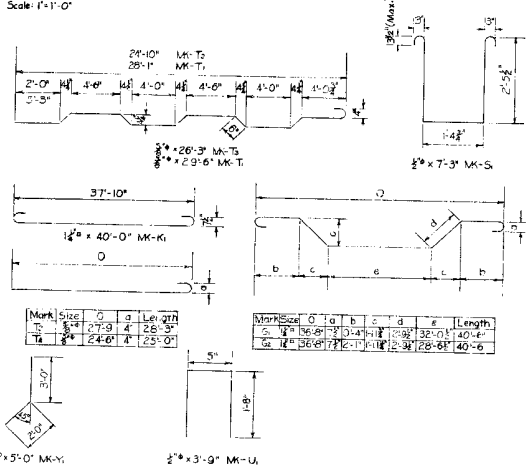
ELEVATION

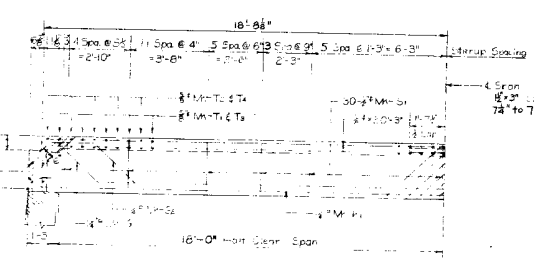


ROADWAY RAILING SECTION
Scale: 1"=1'-0"

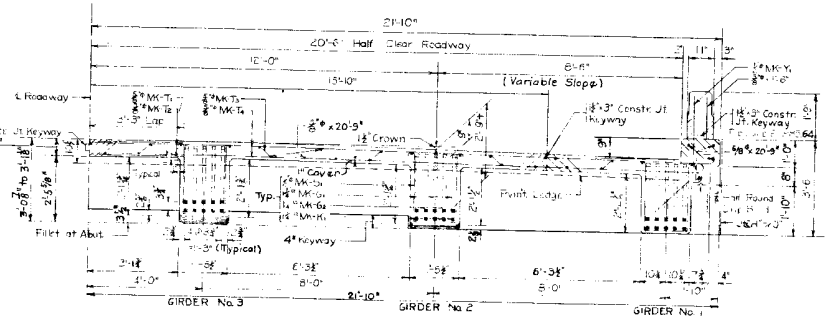


HALF PLAN
SYMMETRICAL ABOUT ℄ ROADWAY





HALF GIRDER SECTION
(TYPICAL FOR ALL GIRDERS)
Scale: ½"=1'-0"



HALF SECTION PERPENDICULAR TO ℄ ROADWAY
Scale: ½"=1'-0"

BILL OF MATERIALS

SUPERSTRUCTURE

REINFORCING STEEL

MARK	NO. PCS.	SIZE	LENGTH	LOCATION	TOTAL LENGTH	WEIGHT
S	154	⅝"	45'-6"	Longit. Girders	7,009'-0"	
S1	10		20'-6"		205'-0"	
K1	30		40'-0"		1,200'-0"	
				Total ⅝"	8,414'-0"	12,831#
T5	44	⅝"	69'-6"	Trans. Slab	3,058'-0"	
T4	56		28'-3"		1,582'-0"	
T3	34		26'-3"		892'-6"	
T2	66		25'-0"		1,650'-0"	
T1	16		22'-9"		364'-0"	
G1	14		20'-3"	Longit. Slab	283'-6"	
				Total ⅝"	17,552'-0"	6085#
S	354	⅜"	7'-3"	Girder Stirrups	2,566'-6"	
V	50		35'-0"	Vert. R.F. Roadway Railing	1,302'-0"	
V1	44		3'-9"	Vert. Curtain Wall	165'-0"	
	8		27'-3"	Horiz. Curtain Wall	214'-0"	
	8		24'-0"		192'-0"	
				Total ⅜"	3447'-6"	2305#
	32	½"	19'-0"	Horiz. Roadway Railing	608'-0"	
	60		1'-6"	Vert. R.F. " "	90'-0"	
				Total ½"	698'-0"	262#
				TOTAL STEEL		23481#

CONCRETE

Class "F" — Constr. Jt. to Outer Constr. Jt.	
2 Pours @ 25.5 Cu Yds Ea.	= 51.0 Cu Yds
Outer Constr. Jt. to Coping	
2 Pours @ 12.7 Cu Yds. Ea.	= 25.4 "
Total Class "F" (Next Sheet R.R.)	= 76.4 Cu Yds
Class "F" Rdwy. Railing (4.2 Cu Yds)	= 777.7 Lin Ft

NOTE: See Summary Sheet for Bill of Splice Bars
See Test Bar Samples on Br. Std. "C"

DESIGN DATA

Unit Stresses — fs = 20,000 #/□", fc = 1,000 #/□"

Live Load — Hs-Sie-44 with impact with distribution of load in accordance with 1949 A.A.S.H.O. Specifications.

Dead Load — Increased 15 #/sq. ft. of roadway for future wearing surface.
Slab designed with ½" wearing surface.
Max. Dead Load Deflection = ½"

NOTE:
For Joint Legend See Drwg. "C2"
Dimensions on Details & Bending Diagrams for Reinforcing Bars are measured on Centerlines of Bars

SUPERSTRUCTURE DETAILS

STATE HIGHWAY COMMISSION OF INDIANA

SCALE: ½"=1'-0" UNLESS NOTED — MARCH 21, 1951

RECOMMENDED FOR APPROVAL: _____ CHIEF ENGINEER

PROJECT: F-18(9) — STATION: 60+43

DRAWING: 6 OF 5

BRIDGE CONTRACT NO. 3388

BRIDGE FILE: 31-0-3570

REMODELED	ARC 10-26-50	622 2-60
DRAWN	MK-K 12-51	2-7-51
TRACED		
CHECKED		

BRIDGES OVER 20' SPAN

FED. ROAD PROJ. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	IND.	F-18(9)	1951	17	17

STRUCTURE QUANTITIES

ITEM	CONCRETE: CL. A F (CU. YDS.)	CL. D (CU. YDS.)	CL. E ABOVE FTG (CU. YDS.)	CL. E FTG. (CU. YDS.)	ROADWAY RAILING: CL. F CONCRETE (CU. YDS.)	(LIN. FT.)	REINFORCING STEEL (1934 STD. WTS.): 1¼" (LBS.)	1⅛" (LBS.)	1" (LBS.)	⅞" (LBS.)	¾" (LBS.)	⅝" (LBS.)	½" (LBS.)	⅜" (LBS.)	¼" (LBS.)	TOTALS (LBS.)	STRUCTURAL STEEL (LBS.)	CAST IRON (LBS.)	PILES: Nº	LIN. FT.
ABUTMENT Nº 1			60.3	50.1								899	1964	2492		5355		88		
SUPERSTRUCTURE	76.4				4.8	77.7	12851								268	2543				
ABUTMENT Nº 2			60.3	50.1								885	1968	2492		5345		88		
SPLICE BARS							82					47	30	16		175				
Reinf. Steel from "Approach Structs" column																				
Reinf. Steel for Thickened Pavement													5127			5127				
Reinf. Steel for Lip Gutter, Pymt. Rock & etc.																				
TOTALS	76.4		120.6	100.2	4.8	77.7	12913					1845	15178	7503	268	37501		176		

BILL OF SPLICE BARS

REINFORCING STEEL

Bar / Stirrup	Mark	Nº Pcs.	Size	Length	Location	Total Length	Weight
		1	1¼"	15'-6"	Splice with 1¼" out for test	15'-6"	32 #
		5	⅝"	10'-6"	1 1 5@ 1 1 1	52'-6"	47 #
		5	⅝"	9'-6"	1 1 5@ 1 1 1	47'-6"	30 #
		3	½"	8'-0"	1 1 3@ 1 1 1	24'-0"	16 #
					TOTAL		1175 #

BILL OF MATERIALS FOR THICKENED PAVEMENT

REINFORCING STEEL

Bar / Stirrup	Mark	Nº Pcs.	Size	Length	Location	Total Length	Weight
	A	96	⅝"	20'-0"	Longit. Slab	1920'-0"	
	B	22	1	27'-0"	Transv. "	594'-0"	
	C1	4	1	24'-0"	" "	96'-0"	
	C2	4	1	18'-0"	" "	72'-0"	
	C3	6	1	16'-0"	Longit. "	96'-0"	
	C4	10	1	12'-0"	Transv. & Longit. Slab	120'-0"	
	D	6	1	81'-0"	Longit. Slab	243'-0"	
					TOTAL (Two Slabs)	2958'-0"	5127 #

BARRICADES, BARRIERS, TRAFFIC SIGNS, & LIGHTS

ITEM	UNIT	QUANTITY	ASSEMBLY	31-0-3570
PRE-WARNING SIGNS	Each	12	Signs 130 - R	4
			" 125 - R	
			" 126 - R	4
			" 115 - R	4
			Torches	4
STD. BARRICADES TYPE A	Each	2	Barricades (Type A)	2
			Signs 115 - R	2
			" W11-R	2
			" 117	
			Lanterns	4
STD. 3'-0" x 4'-8" SIGNS	Each		Signs X-13	
			Lanterns or Torches	
BRIDGE (SUITABLE) BARRIERS	Each		Bridge (Suitable) Barriers	
			Lanterns or Torches	

APPROACH STRUCTURES

STRUCT. Nº	LOCATION	DESCRIPTION: SIZE	KIND	LENGTH	CL. D CONC. IN STRUCTS. CU. YDS.	REINF. STEEL LBS.	CAST IRON LBS.	REMARKS
				TOTALS				Total of Reinf. Steel carried to "Structure Quantities"

SUMMARIZED: C.L.M. 3-9-51 ; CK'D: A.P.T. 3-8-51
TRACED: E.B.A. 3-17-51 ; CK'D: A.P.T. 3-19-51

SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY: 31-0-3570
1	Class F Concrete	Cu. Yds.	76.4
2	Class D Concrete	Cu. Yds.	
3	Class E Concrete above Footings	Cu. Yds.	120.6
4	Class E Concrete in Footings	Cu. Yds.	100.2
5	ROADWAY RAILING	Lin. Ft.	77.7
6	Reinforcing Steel	Lbs.	37501
7	Structural Steel	Lbs.	—
8	Cast Iron	Lbs.	176
9	Untreated Timber Piles Furnished	Lin. Ft.	—
10	Untreated Timber Piles Driven	Lin. Ft.	—
11	Furnishing Equipment for Driving Piles	Lump Sum	—
12	Wet Excavation	Cu. Yds.	389
13	Waterway Excavation	Cu. Yds.	210
14	Common Excavation	Cu. Yds.	150
15	Special Borrow	Cu. Yds.	—
16	Special Filling Material	Cu. Yds.	495
17	Sodding	Sq. Yds.	465
18	Mulched Seeding	Sq. Yds.	410
19	Cement Concrete Pavement	Sq. Yds.	—
20	Reinforced Cement Concrete Pavement	Sq. Yds.	—
21	Thickened Reinf. Cement Concrete Pavement	Sq. Yds.	126
22	Compacted Aggregate Surface	Sq. Yds.	—
23	Removal Present Structure (3570)	Lump Sum	1
24	Temporary Bridge and Approaches (3570)	Lump Sum	1
25	Prewarning Signs	Each	12
26	Std. Barricades (Type A)	Each	2
27	Class D Concrete in Structures	Cu. Yds.	—
28	Temp. 6" Plain Cement Conc. Pavmt.	Sq. Yds.	797
29			
30	1" Pref. Bitum. Expansion Joints	Lin. Ft.	56
31	Guide Posts (Type A)	Each	12
32			
33	Pavement Removal	Sq. Yds.	160
34			
35	R/W Markers	Each	6
36			
37			
38			
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59			
60			

SUMMARY

STATE HIGHWAY COMMISSION OF INDIANA

MARCH 21, 1951

RECOMMENDED FOR APPROVAL:- _____ DIRECTOR OF BRIDGE DESIGN

PROJECT:- F-18(9)

BRIDGE CONTRACT Nº 3388

BRIDGE FILE:- 31-0-3570

BRIDGE CONTRACT No. 5105

INDEX

PROJECT	STRUCTURE	TYPE	SPAN	OVER	STATION	CONTRACT NO.
F-18(15)	31-0-3570 J	CONTINUOUS R.C. SLAB	3 SPANS 28-1½, 37-6, 28-1½ SKEW 30° RT.	MUD CREEK	℄ S.B. LANE STRUCTURE STA. 60+84.57	5105

SHEET NO.	SHEET DESIGNATION	SUBJECT
1		INDEX & TITLE SHEET
2	RD. STD. E-11-1R	STANDARD PAVEMENT SECTION (AD'P'T'D JULY 1953)
3	RD. PLAN SHEET № 3	TYPICAL CROSS-SECTION ROAD PROJ. F-18(15)
4	RD. PLAN SHEET № 7	ROAD PLAN & PROFILE, ROAD PROJ. F-18(15) STA 48+00 TO STA. 80+00
5-7	RD. PLAN SHEETS № 47 №48 & № 49	CROSS SECTIONS, ROAD PROJ. F-18(15)
8	(USTR. № 31-0-3570 J)	LAYOUT
9	C_2	GENERAL PLAN
10	C_3	BENTS № 1 & № 4 DETAILS & BILL OF MATERIALS
11	C_4	PIERS № 2 & № 3 DETAILS & BILL OF MATERIALS
12	C_5	SUPERSTRUCTURE DETAILS
13	C_6	SUPERSTRUCTURE DETAILS & BILL OF MATERIALS
14	ONE SHEET	SUMMARY
15	BR. STD. C	STANDARD MISCELLANEOUS DETAILS (REV. 12-2-58)
16	RD. STD. A	STANDARD PAVEMENT JOINTS (APRIL, 1957)
17	RD. STD. M_6	MISCELLANEOUS STANDARDS (REV. 4-1-59)
18	RD. STD. M_0	MISCELLANEOUS STANDARDS (REV. 5-26-59)
19	RD. STD. M_8	MISCELLANEOUS STANDARDS (REV. 11-17-58)
20	RD. STD. M_4	MISCELLANEOUS STANDARDS (REV. 1-23-58)
21	RD. STD. M_9	MISCELLANEOUS STANDARDS (REV. 3-11-59)
22	RD. STD. GR	STEEL BEAM GUARD RAIL (REV. 1-10-57)
23	BR. STD. M_1	MISCELLANEOUS APPROACH DETAILS (REV. 5-15-59)
24	BR. STD. M_2	MISCELLANEOUS APPROACH DETAILS (REV. 6-3-57)
25	BR. STD. M_3	MISCELLANEOUS APPROACH DETAILS (REV. 1-15-59)
26	BR. STD. R_1	ALUMINUM RAILING DETAILS (REV. 3-3-59)
27	BR. STD. S_2	TYPICAL DETAILS FOR PLACING SPECIAL FILLING MATERIAL (REV. 7-20-52)
28	SHEET 1 DETOURS	STANDARD DETOUR SIGNS (REV. 2-11-54)
29	SHEET 2 DETOURS	STANDARD DETOUR SIGNS (REV. 11-12-58)

NOTE: ALL BRIDGE STDS. APPROVED BY B.P.R. 1-18-60, EXCEPT M2 & S2.
ALL ROAD STDS. APPROVED BY B.P.R. 1-26-60.

STATE OF INDIANA
STATE HIGHWAY DEPARTMENT

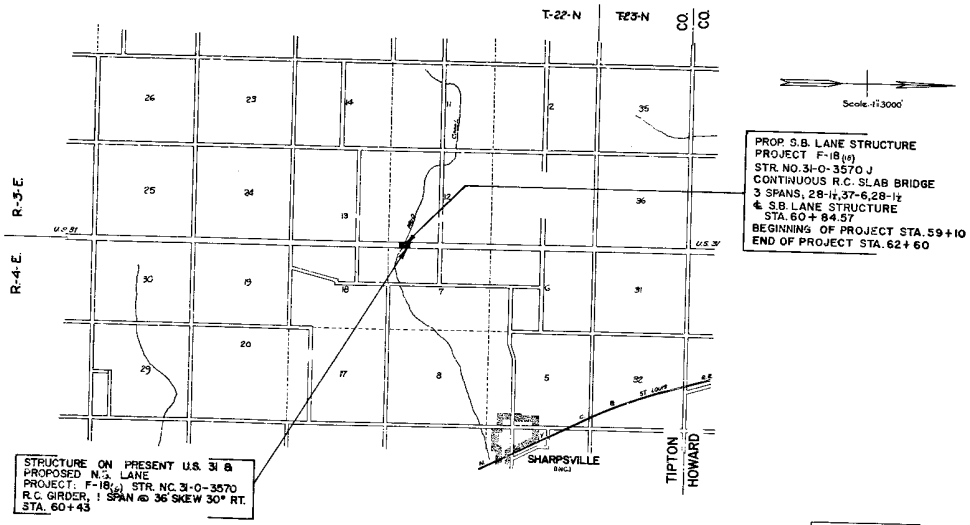
BRIDGE PLANS
FOR SPANS OVER 20 FEET
ON
STATE ROAD NO. 31 SECTION 0
F.A. PROJECT NO. F-18(15)

BEGINNING AT A POINT ON SURVEY ℄ APPROXIMATELY 600.0 Ft. NORTH OF THE CORNER COMMON TO SECTIONS 13, 12, 18 & 7 AND EXTEND NORTH A DISTANCE OF APPROXIMATELY 3500 Ft TO A POINT ON SURVEY ℄ APPROXIMATELY 960.0 Ft. NORTH OF THE CORNER COMMON TO SECTIONS 13, 12, 18 & 7; ALL IN SECTIONS 12, & 7, T-22-N, R-3 & R-4-E, TIPTON, COUNTY.

REV. 5-9-60 SHEETS № 13, 12, 13 & 14

ROADWAY LENGTH = 0.048 MI.
BRIDGE LENGTH = 0.018 MI.
TOTAL LENGTH = 0.066 MI.

MAXIMUM GRADE = +0.357 %



BRIDGES OVER 20' SPAN					
PUB. ROAD REG. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	IND.	F-18(15)	1959	1	29

PREPARED AND DESIGNED BY
SORRELL & MATTIS ASSOCIATES INC.
ENGINEERS, INDIANAPOLIS, INDIANA
James D. Mattis 12-5-58

SUBMITTED BY
FLECK, QUEBE & REID ASSOCIATES INC.
ENGINEERS, INDIANAPOLIS, INDIANA
William F. Quebe 12-5-58

TRAFFIC COUNT
ADT. 1958 = 5525
ADT. 1978 = 8875
TRUCKS = 21%
DESIGN SPEED = 70 MPH
ACCESS CONTROL = NONE

APPROVED AND ADOPTED BY STATE HIGHWAY DEPARTMENT OF INDIANA — DATE 1-13-59
CHAIRMAN, STATE HIGHWAY DEPARTMENT OF INDIANA

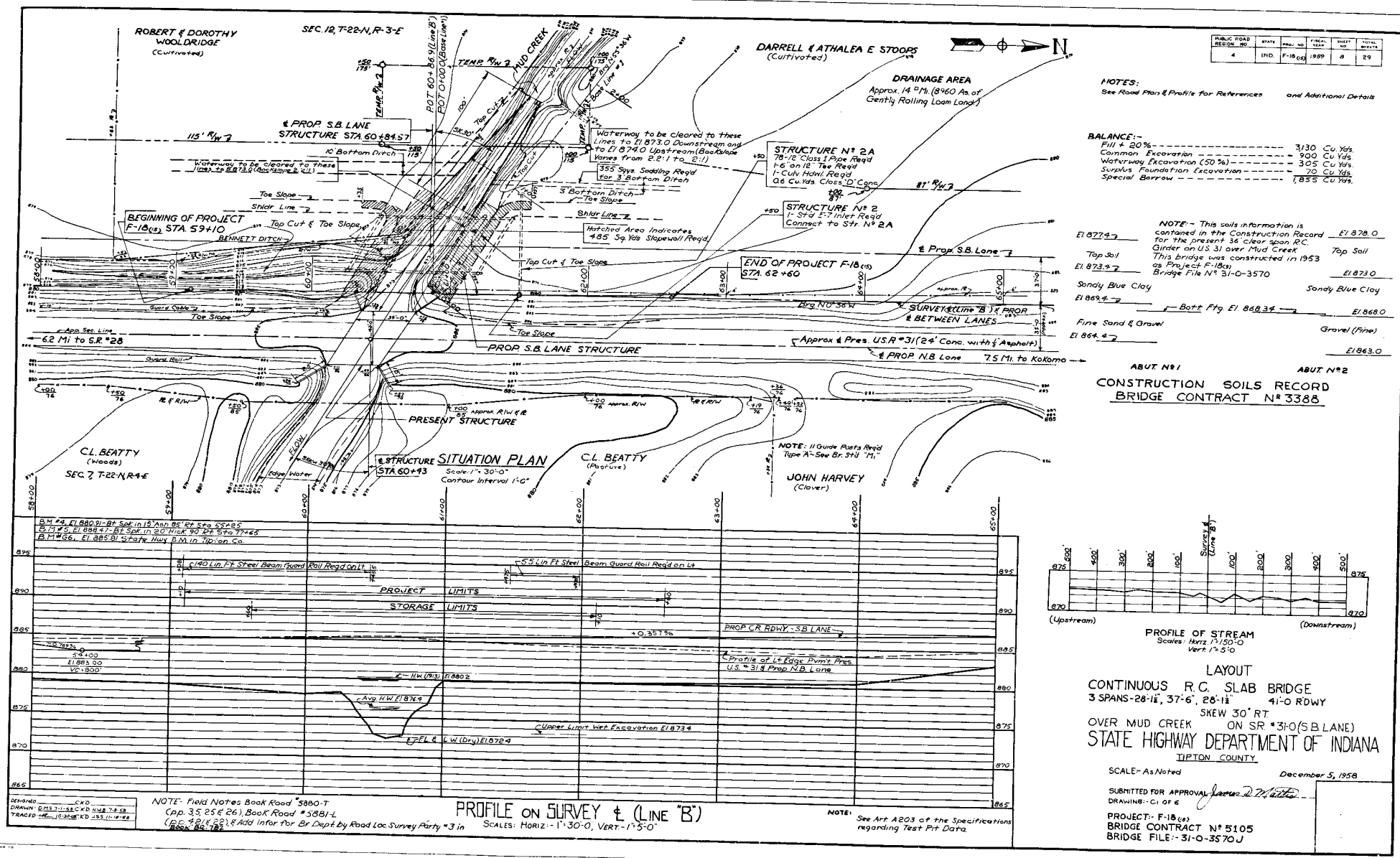
APPROVED — DATE 1-12-59
CHIEF ENGINEER, STATE HIGHWAY DEPARTMENT OF INDIANA

RECOMMENDED FOR APPROVAL DATE 1-9-59
ENGINEER OF BRIDGE DESIGN, STATE HIGHWAY DEPARTMENT OF INDIANA

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
APPROVED:
DIVISION ENGINEER

BRIDGE FILE: 31-0-3570 J

STATE HIGHWAY DEPARTMENT OF INDIANA
1957 STANDARD ROAD AND BRIDGE SPECIFICATIONS
TO BE USED WITH THESE PLANS



PUBLIC ROAD REGION NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	IND.	F-18 (15)	1959	8	29

NOTES:
See Road Plan & Profile for References and Additional Details

BALANCE:-

Fill + 20%	3130 Cu. Yds.
Common Excavation	900 Cu. Yds.
Waterway Excavation (50%)	305 Cu. Yds.
Surplus Foundation Excavation	70 Cu. Yds.
Special Borrow	1,855 Cu. Yds.

NOTE:- This soils information is contained in the Construction Record for the present 36' clear span R.C. Girder on U.S. 31 over Mud Creek. This bridge was constructed in 1953 as Project F-18(8). Bridge File No. 31-0-3570

ABUT. No. 1		ABUT. No. 2
El. 877.4		El. 878.0
Top Soil		Top Soil
El. 873.9		El. 873.0
Sandy Blue Clay		Sandy Blue Clay
El. 869.4	Bott. Ftg. El. 868.34	El. 868.0
Fine Sand & Gravel		Gravel (Fine)
El. 864.4		El. 863.0

CONSTRUCTION SOILS RECORD
BRIDGE CONTRACT No. 3388

LAYOUT
CONTINUOUS R.C. SLAB BRIDGE
3 SPANS - 28-1½", 37'-6", 28-1½" 41'-0 RDWY
SKEW 30° RT.
OVER MUD CREEK ON SR. No. 31-0 (S.B. LANE)
STATE HIGHWAY DEPARTMENT OF INDIANA
TIPTON COUNTY

SCALE - As Noted December 5, 1958

SUBMITTED FOR APPROVAL James D. Martin
DRAWING:- C1 OF 6

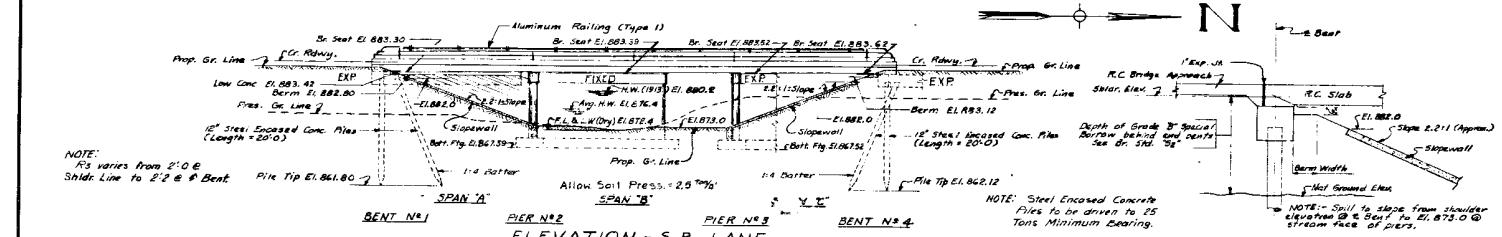
PROJECT:- F-18 (8)
BRIDGE CONTRACT No. 5105
BRIDGE FILE:- 31-0-3570J

DESIGNED CKD
DRAWN D.M.S. 7-11-58 CKD. H.W.B. 7-8-58
TRACED HF 10-30-58 CKD. J.S.S. 11-19-58

NOTE- Field Notes Book Road "5880-T (pp. 35, 25 & 26), Book Road "5881-L (pp. 42 & 22) & Add Infor. for Br. Dept. by Road Loc. Survey Party "3 in Book "BC-782"

NOTE: See Art. A203 of the Specifications regarding Test Pit Data.

NOTE:- STRUCTURE TO BE BUILT TO A +0.357% GRADE



NOTE:- Rs varies from 2'-0 ℄ Shldr. Line to 2'-2 ℄ @ Bent.

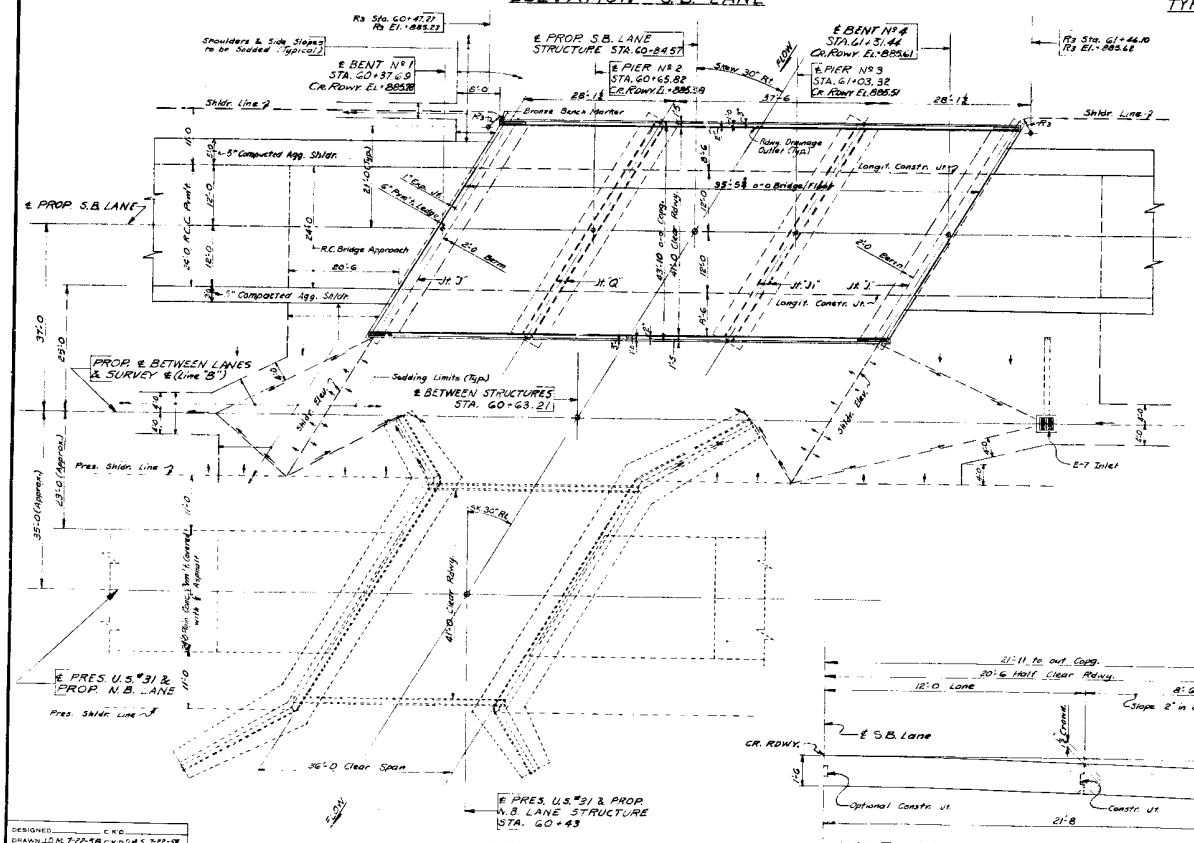
NOTE:- Steel Encased Concrete Piles to be driven to 25 Tons Minimum Bearing.

ELEVATION - S.B. LANE

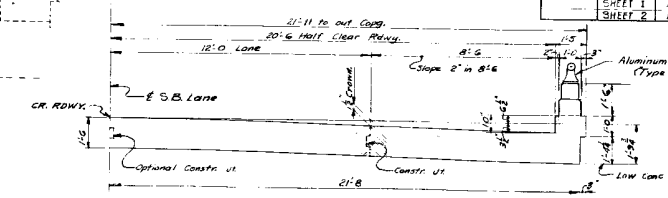
NOTE:- Spill to slope from shoulder elevation @ ℄ Bent to El. 875.0 @ stream face of piers.

TYPICAL DETAIL FOR SPILL @ END BENTS

Scale:- 1/4" = 1'-0



PLAN



HALF SECTION 1 TO ℄ S.B. LANE

Scale:- 1/4" = 1'-0

Traffic Stripe, Parapet Wall & Revision Dates.

REV. 5-9-'60

DESIGN DATA:-

Designed for H-20-S16-44 Loading in accordance with 1957 AASHO Specifications.

TYPICAL CROSS-SECTION:-

For Typical Cross-Section see Sheet No. 3.

For Typical 9" R.C. Pavement reinforcing see Sheet No. 2, Road Std. E-11-1R (adopted July 1953).

JOINT LEGEND:-

Joint "J" indicates ½" preformed joint filler under front 6" of slab bearing area and one layer of medium weight roofing felt under remainder of bearing area.

Joint "Q" indicates ½" preformed joint filler placed longitudinally on each of the outer 3" portions of the pier bearing area with concrete to concrete bearing under the remaining portion.

Joint "J1" indicates ½" preformed joint filler placed longitudinally on each of the outer 3" portions of the pier bearing area and one layer of medium weight roofing felt under remainder of bearing area.

1" Exp. Jt. see Br. Std. "C1".

GENERAL NOTES:-

No present structure at proposed S.B. Lane bridge site.

Depth of footings to be extended if found necessary. See Art. B 403.2 (a) of the Specifications.

Piles shall have minimum bearing value shown on detail drawings. Determine pile lengths by Art. 502.5 of Specifications.

For details of steel encased concrete piles see Br. Std. "C1", the special provisions, and applicable articles in the Specifications.

Piles shall be driven to refusal, shown on plans or below, if necessary, to obtain desired bearing.

Reinforcing steel covering shall be 1¾" in floor slabs, 3" in footings except bottom steel which shall be 4" and 2" in all other parts, unless noted.

Concrete in footings and pier stems to bottom of coping to be class "E".

Concrete in superstructure, including railing, bent caps, top of piers above bottom of coping to be class "F".

Concrete in structure not noted above, in steel encased concrete piles, concrete slopewall, inlets & hdwls. to be class "D".

Continuous concrete pours shall be required between const. jts. as shown on detail plans.

Bevel forms ¾" under copings; chamfer exposed edges 1" unless noted.

2 roadway drainage outlets to be placed as shown on this drawing.

Construct slopewall at locations as shown on Layout.

Tolerance in position of pile head maximum 2".

3" expansion joint to be placed in approach pavement approximately 40' from each end of bridge floor.

All railings to be constructed perpendicular to grade.

Railing & Posts are Aluminum. See Br. Std. "R1".

STANDARD DRAWINGS

See special provisions for items included in this contract.

BR. STD	RD. STD	DATE	PURPOSE
	MN	Rev. 1-25-38	Subsurface Drains
C1		Rev. 12-2-58	Reinf. Bar Notes, Test Bar Samples, Bar Bending Details, Splicing Pile Shells in Field, 1" Exp. Jt., Roadway Drainage Outlet Details.
M1		Rev. 5-15-59	Pvmt. Offsets, Location of Guide Posts at Structure, Guide Posts (Type "A"), R/W Markers.
M2		Rev. 6-3-57	Slopewall, 3" Exp. Jt.
M3		Rev. 1-15-59	R.C. Bridge Approach Details.
R1		Rev. 9-2-59	Aluminum Railing & Post Details.
S2		Rev. 9-20-52	Typical Details for Placing Special Filling Material.
	E-11-1R	7-53	Reinforcing for 9" R.C. Pavement.
	A	4-57	D-1 Constr. Jt., Longit. Jt., Keyway Constr. Jt., Pvmt. Jt. Seals.
	MC	Rev. 4-1-59	Type 7 Casting.
	MD	Rev. 5-26-59	Pipe E. Inlet.
	ME	Rev. 11-17-58	Pipe Culvert Headwalls.
	MP	Rev. 9-11-59	Surface & Subsurface Drainage Pipes
	GR	Rev. 1-10-57	Steel Beam Guard Rail.
	SHEET 1	Rev. 2-11-54	Standard Detour Signs
	SHEET 2	Rev. 11-12-58	Standard Detour Signs

BRIDGES OVER 20' SPAN

FUR. ROAD REG. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	IND.	F-18(15)	1959	3	29

GENERAL PLAN

CONTINUOUS R.C. SLAB BRIDGE

3 SPANS:- 28'-1½", 37'-6, 28'-1½"; SKEW 30° RT.; 41'-0 RDWY.

OVER MUD CREEK ON S.R. 31-0 (S.B. LANE)

STATE HIGHWAY DEPARTMENT OF INDIANA

TIPTON COUNTY

SCALE:- 3/32" = 1'-0 UNLESS NOTED DECEMBER 5, 1958

SUBMITTED FOR APPROVAL: James D. Matlo

DRAWING:- C 2 OF 6

PROJECT:- F-18(15)

BRIDGE CONTRACT NO. 5105

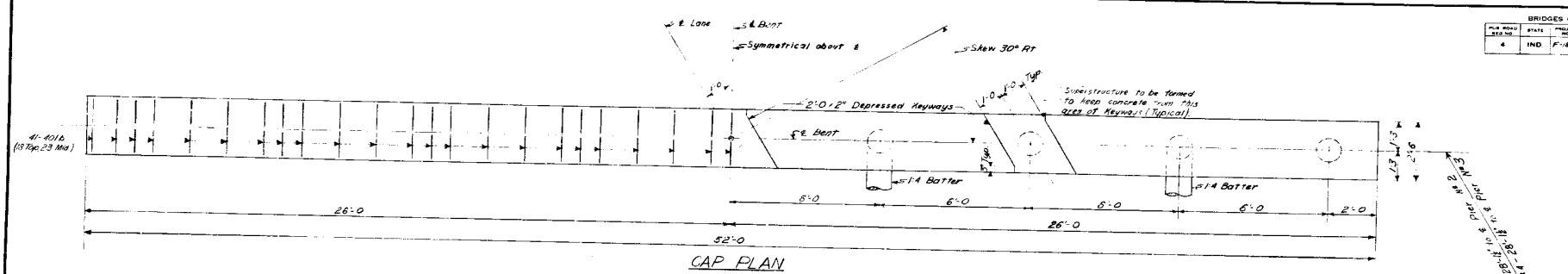
BRIDGE FILE.- 31-0-3570 J

DESIGNED ____ CKD ____

DRAWN J.D.M. 7-22-58 CKD D.M.S. 7-22-58

TRACED ____ CKD ____

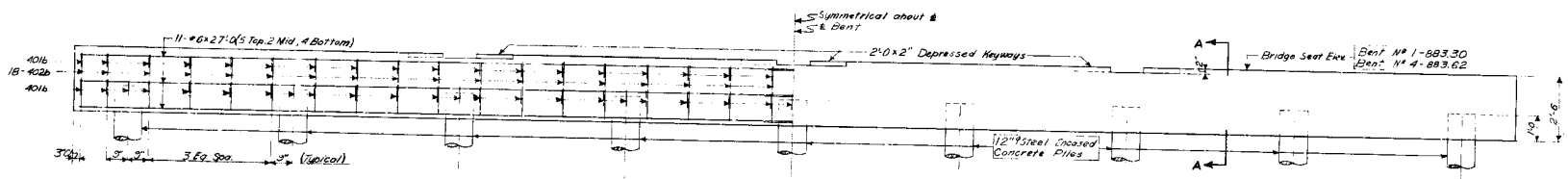
BRIDGES OVER 20' SPAN					
PUB. ROAD REG. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	IND.	F-18(15)	1959	10	20



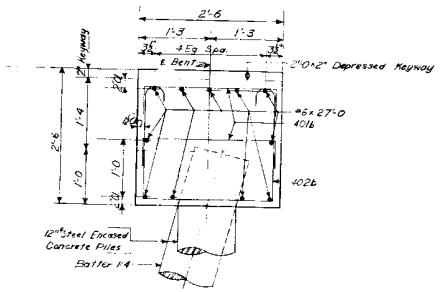
CAP PLAN

SHOWING REINFORCING STEEL

SHOWING CONCRETE DIMENSIONS



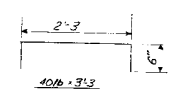
ELEVATION

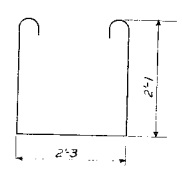


SECTION A-A

Scale 1"=1'-0"

NOTES:
For Reinforcing Bar Notes See Br. Std. "C1".
The Bent Cap is not to be poured until after the fill has been completed to approximately the bottom of the Cap.
9 Steel Encased Concrete piles each Bent to be driven to 25 Ton Minimum Bearing.





BILL OF MATERIALS
BENT No 1
BENT No 4 SAME

REINFORCING STEEL			
SIZE & MARK	No. of BARS	LENGTH	WEIGHT
#6	22	27'-0	892#
401b	81	3'-3	
402b	36	7'-5	
		Total No 4 =	354#
		TOTAL STEEL =	1,246#
CONCRETE			
Class "F" in Cap			12.0 Cyds.
MISCELLANEOUS			
9 - 2" ⌀ Steel Encased Conc. Piles, Length = 20'-0" (Ea.)			180 Lin Ft.

BENTS No 1 & No 4 DETAILS AND BILL OF MATERIALS

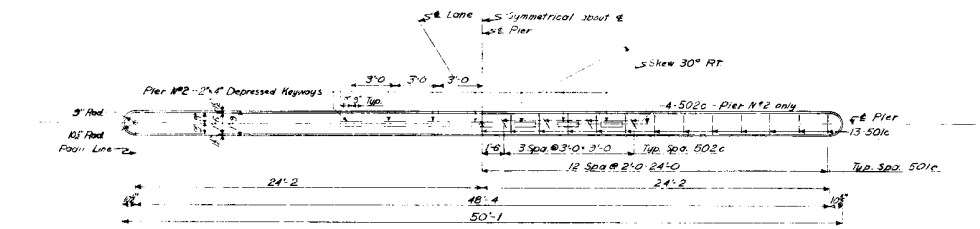
STATE HIGHWAY DEPARTMENT OF INDIANA

SCALE:- ½" = 1'-0" UNLESS NOTED DECEMBER 5, 1958

SUBMITTED FOR APPROVAL:- James D. Mattis

DRAWING:- C 3 OF 6
PROJECT:- F-18(15)
BRIDGE CONTRACT NO. 5105
BRIDGE FILE:- 31-0-3570 J

DESIGNED J.S.S. 11-2-58 CKD D.M.S. 10-3-58
DRAWN G.M.S. 10-14-58 CKD J.S.S. 11-20-58
TRACED ____ CKD ____

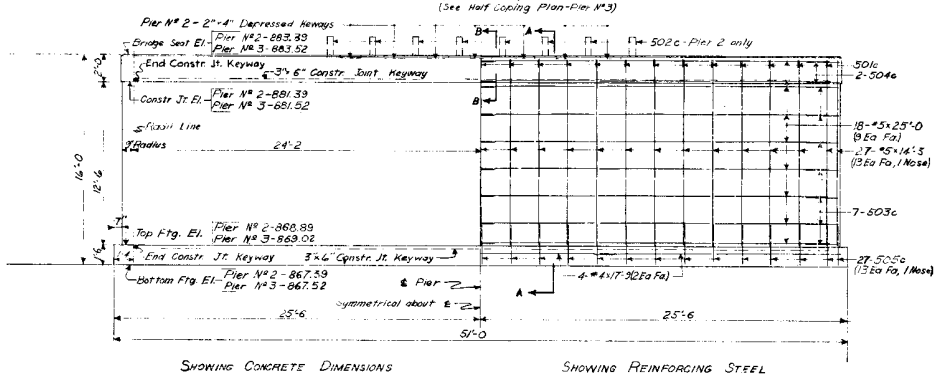


SHOWING CONCRETE DIMENSIONS — SHOWING REINFORCING STEEL (501c & 502c)

COPING PLAN

PIER N°2

Pier N° 3 same except as Noted. (See Half Coping Plan-Pier N°3)

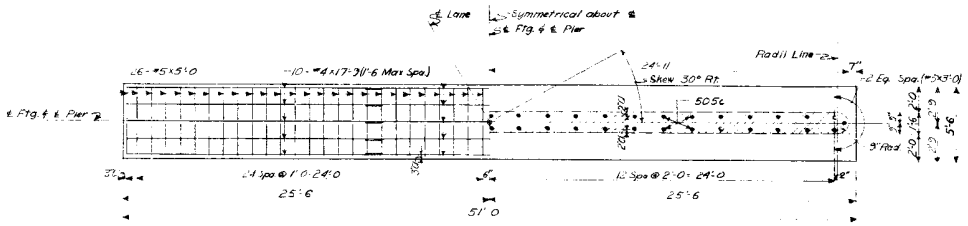


SHOWING CONCRETE DIMENSIONS — SHOWING REINFORCING STEEL

ELEVATION - PIER N° 2

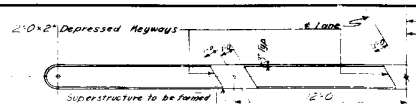
Pier N°3 same except as noted (See Part Elevation-Pier N° 3)

NOTE: See Br. Std. "C" for Reinforcing Bar Notes.



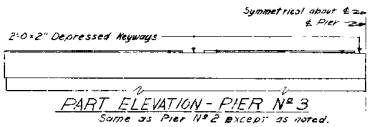
SHOWING REINFORCING STEEL — SHOWING NEAT LINES AND VERTICAL STEEL EXTENDING INTO FOOTING

FOOTING PLAN



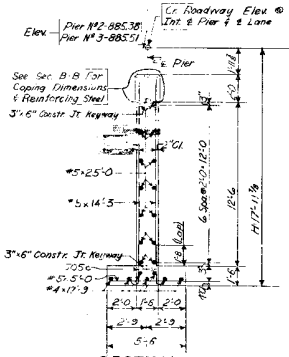
HALF COPING PLAN - PIER N° 3

Same as Pier N° 2 except as Noted.



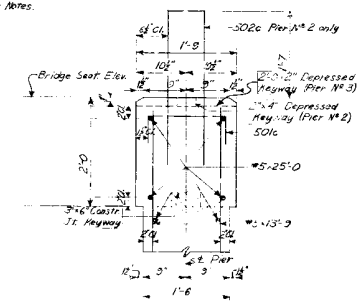
PART ELEVATION - PIER N° 3

Same as Pier N° 2 except as noted.



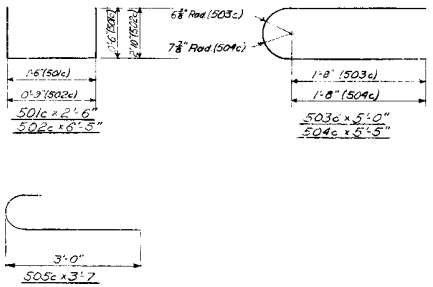
SECTION A-A

Max. Allow. Soil Pressure = 2.5 Tons/sq.ft.



SECTION B-B

Scale 1"=1'-0



BRIDGES OVER 20' SPAN

PUB. ROAD ASS'N. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	IND.	F-118(15)	1959	11	29

BILL OF MATERIALS PIER N° 3

REINFORCING STEEL

SIZE & MARK	N° OF BARS	LENGTH	WEIGHT
501c	25	5'-6	
503c	14	5'-0	
504c	4	5'-5	
505c	52	3'-7	
#5	36	25'-0	
#5	52	14'-3	
#5	52	7'-0	
		Total #5	2338#
#4	21	17'-3	249#
		TOTAL STEEL	2,587#

CONCRETE

Class 'E' Above Ftg.	
Pier Cap	6.4 Cys.
Pier Stem	34.3 Cys.
TOTAL Class 'E' Above Ftg.	40.7 Cys.
Class 'E' in Ftg.	15.6 Cys.

BILL OF MATERIALS PIER N° 2

REINFORCING STEEL

SIZE & MARK	N° OF BARS	LENGTH	WEIGHT
501c	25	5'-6	
502c	8	6'-8	
503c	4	5'-0	
504c	4	5'-5	
505c	52	3'-7	
#5	36	25'-0	
#5	52	14'-3	
#5	52	7'-0	
		Total #5	2,331#
#4	21	17'-3	249#
		TOTAL STEEL	2,640#

CONCRETE

Class 'E' Above Ftg.	
Pier Cap	6.4 Cys.
Pier Stem	34.3 Cys.
TOTAL Class 'E' Above Ftg.	40.7 Cys.
Class 'E' in Ftg.	15.6 Cys.

PIERS N°2 & N° 3 DETAILS AND BILL OF MATERIALS

STATE HIGHWAY DEPARTMENT OF INDIANA

SCALE:- 1/4" = 1'-0" UNLESS NOTED — DECEMBER 5, 1958

SUBMITTED FOR APPROVAL:- James D. Matlin

DRAWING C4 OF 6

PROJECT:- F-(18)15)

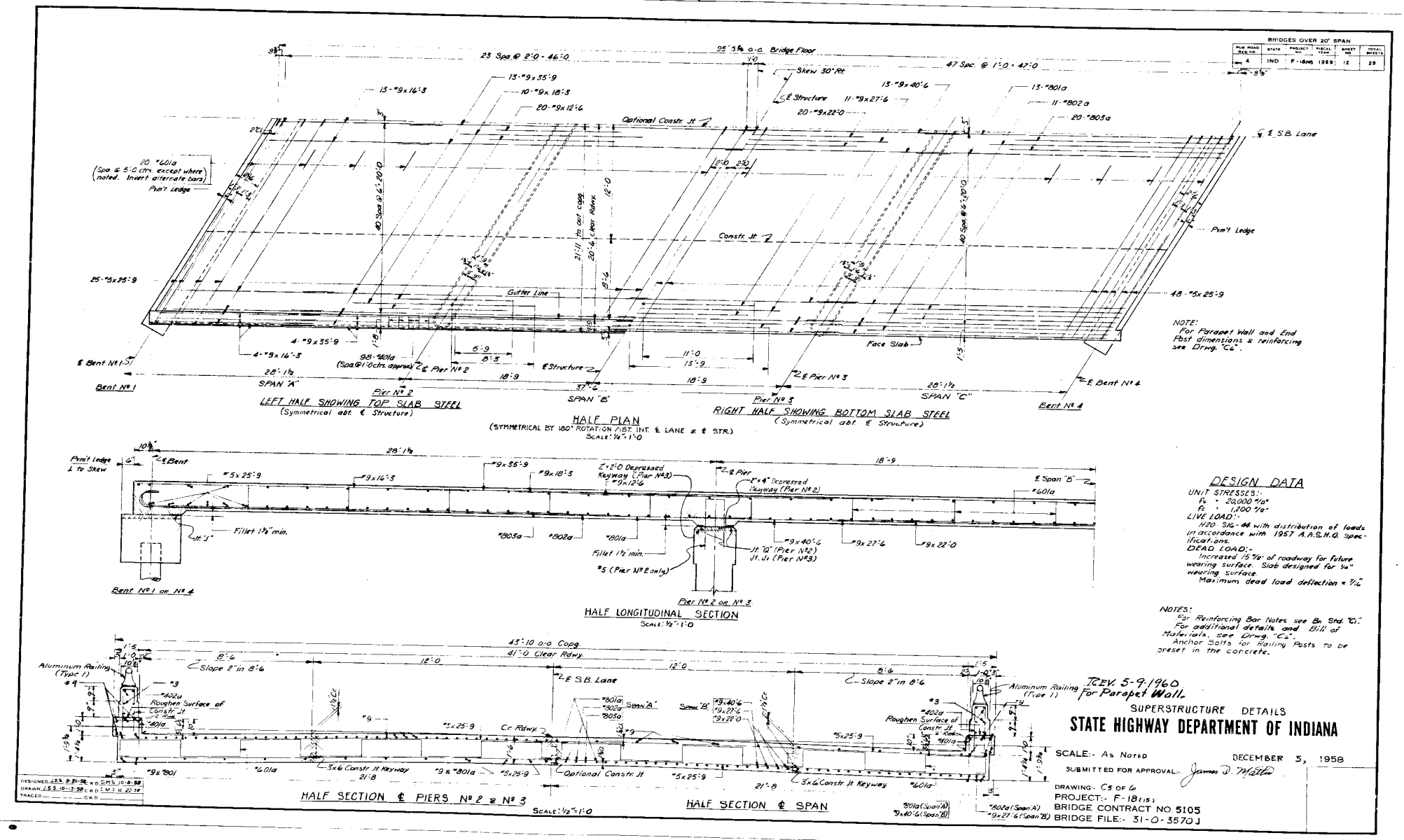
BRIDGE CONTRACT NO. 5105

BRIDGE FILE:- 31-0-3570J

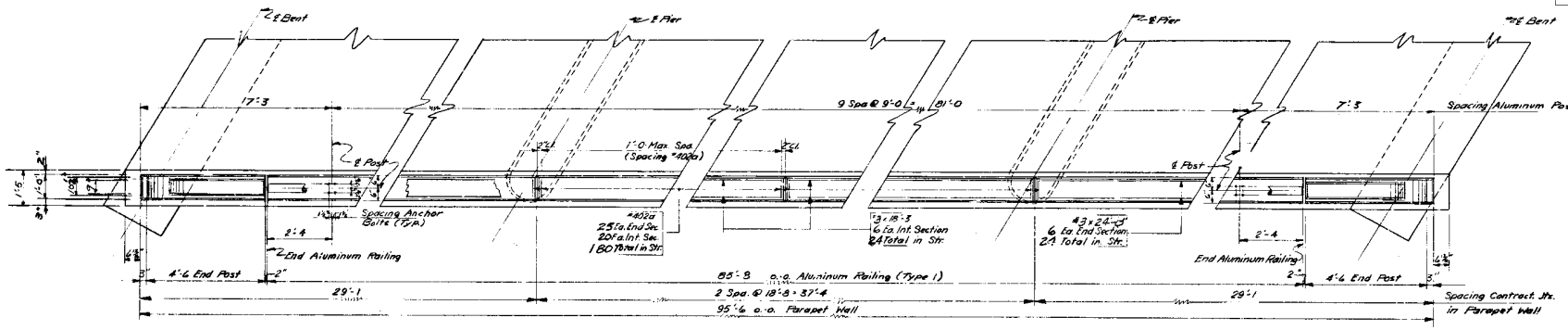
DESIGNED J.S. 10-8-58 C.W.D. D.M.S. 10-9-58

DRAWN D.M.S. 10-9-58 C.W.D. J.S.S. 10-20-58

TRACED ____ C.W.D. ____

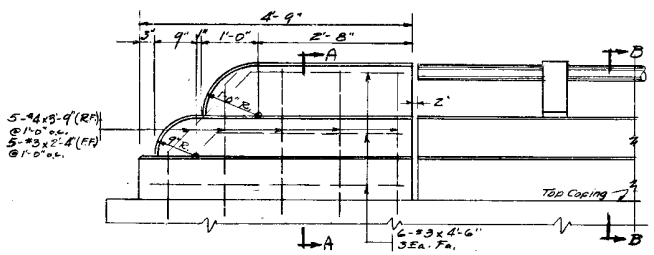

BRIDGES OVER 20' SPAN
PUB ROAD REG NO 4
STATE IND
PROJECT NO F-18(15)
FISCAL YEAR 1959
SHEET NO 12
TOTAL SHEETS 29
23 Spa. @ 2'-0 = 46'-0
95'-5¾ o.o. Bridge Floor
47 Spa. @ 1'-0 = 47'-0
Skew 30° Rt.
℄ Structure
Optional Constr. Jt.
℄ S.B. Lane
Pvm't Ledge
Constr. Jt.
Gutter Line
Face Slab
℄ Bent No 1
Bent No 1
℄ Pier No 2
Pier No 2
℄ Pier No 3
Pier No 3
℄ Bent No 4
Bent No 4
SPAN "A"
SPAN "B"
SPAN "C"
LEFT HALF SHOWING TOP SLAB STEEL
(Symmetrical abt. ℄ Structure)
RIGHT HALF SHOWING BOTTOM SLAB STEEL
(Symmetrical abt. ℄ Structure)
HALF PLAN
(SYMMETRICAL BY 180° ROTATION ABT. INT. ℄ LANE & ℄ STR.)
SCALE: ¼" = 1'-0
NOTE:
For Parapet Wall and End Post dimensions & reinforcing see Drwg. "C6".
Pvm't Ledge ⊥ to Skew
Fillet 1½" min.
Bent No 1 or No 4
Pier No 2 or No 3
HALF LONGITUDINAL SECTION
SCALE: ½" = 1'-0
43'-10 o.o. Copg.
41'-0 Clear Rdwy.
Aluminum Railing (Type 1)
Slope 2" in 8'-6
Roughen Surface of Constr. Jt.
Cr. Rdwy.
3x6 Constr. Jt. Keyway
Optional Constr. Jt.
HALF SECTION ℄ PIERS No 2 & No 3
SCALE: ½" = 1'-0
HALF SECTION ℄ SPAN
DESIGN DATA
UNIT STRESSES:-
fs = 20,000 #/□"
fc = 1,200 #/□"
LIVE LOAD:-
H20-S16-44 with distribution of loads in accordance with 1957 A.A.S.H.O. specifications.
DEAD LOAD:-
Increased 15 #/□' of roadway for future wearing surface. Slab designed for ¼" wearing surface.
Maximum dead load deflection = 7/16"
NOTES:
For Reinforcing Bar Notes see Br. Std. "C1".
For additional details and Bill of Materials, see Drwg. "C6".
Anchor Bolts for Railing Posts to be preset in the concrete.
REV. 5-9-1960
For Parapet Wall.
SUPERSTRUCTURE DETAILS
STATE HIGHWAY DEPARTMENT OF INDIANA
SCALE:- As Noted
DECEMBER 5, 1958
SUBMITTED FOR APPROVAL:- James D. Mattis
DRAWING:- C5 OF 6
PROJECT:- F-18(15)
BRIDGE CONTRACT NO. 5105
BRIDGE FILE:- 31-0-3570 J
DESIGNED J.S.S. 9-30-58 CKD CMS 10-8-58
DRAWN J.S.S. 10-13-58 CKD CMS 10-20-58
TRACED CKD

BRIDGES OVER 20' SPAN					
PUB. ROAD REG. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	IND.	F-18(15)	1959	15	29

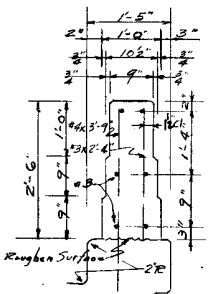


PART PLAN

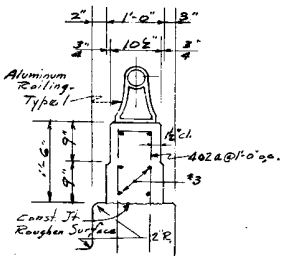
SHOWING PARAPET WALL & END POSTS
(SYMMETRICAL BY 180° ROTATION ABT. INT. ℄ LANE & ℄ STR.)
SCALE: ⅛" = 1'-0



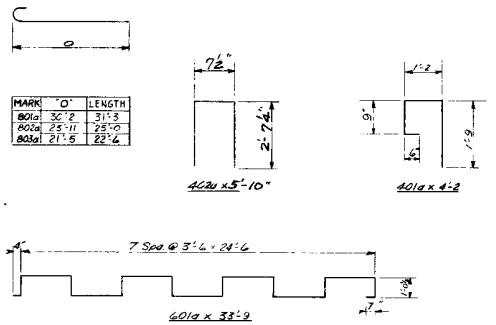
END POST DETAILS
SCALE: 1" = 1'-0

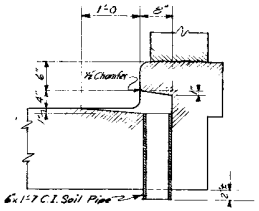


SECTION "A-A"



SECTION "B-B"





See Br. Std. 'C' for Additional Details

ROADWAY DRAIN

SCALE: 1" = 1'-0
(See Dwg. 'C2' for location)

NOTES:
For additional details and notes concerning this drawing, see Dwg. 'C5'.

REV-5-9-1960
For Parapet Wall.

BILL OF MATERIALS
SUPERSTRUCTURE

REINFORCING STEEL				
SIZE & MARK	No. BARS	LENGTH	WEIGHT	
#9	24	40'-6		
#9	68	35'-9		
#9	72	27'-6		
#9	40	22'-0		
#9	40	18'-3		
#9	68	14'-3		
#9	80	12'-6		
		Total #9	24,334#	
801a	72	31'-3		
802a	44	25'-0		
803a	80	22'-6		
		Total #8	12,082#	
601a	40	33'-9	2,028#	
#5	290	25'-9	7,789#	
401a	196	4'-2		
402a	180	5'-10		
#4	20	3'-9½		
	Total #4		1297	#
#3	24	4'-6		
#3	24	24'-0		
#3	24	18'-3		
#3	20	2'-4		
	Total #3		439	#
TOTAL STEEL			50164	#

CONCRETE - Cu. Yds.	
Class F (Except Railing Conc.)	
Drwy. Constr. Jts. (2 @ 65 Cu. Yds.)	130.2
Outside Constr. Jts. (2 @ 56.5 Cu. Yds.)	113.0
Total	243.2
Class 'F' Railing Concrete	10.1
MISCELLANEOUS	
1-Ft. 6" C.I. Soil Pipe	
(1-3'-2 lgth. cuts 2)	57#
Aluminum Railing (Type 1) 171.3 Lin. Ft.	

SUPERSTRUCTURE DETAILS & BILL OF MATERIALS

STATE HIGHWAY DEPARTMENT OF INDIANA

SCALE:- As Noted
DECEMBER 5, 1958
SUBMITTED FOR APPROVAL: James D. Wallis
DRAWING:- C4 OF 6
PROJECT:- F-18(15)
BRIDGE CONTRACT NO. 5105
BRIDGE FILE:- 31-0-3570J

DESIGNED	J.S.S. 9-30-58	K.D.	D.M.S. 10-8-58
DRAWN	J.S.S. 10-14-58	K.D.	D.M.S. 10-22-58
TRACED			C.W.D.

BRIDGES OVER 20' SPAN					
PLAN SHEET NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	IND	F-18(68)	1959	14	29

STRUCTURE QUANTITIES

ITEM	CONCRETE CLASS F (CU. YDS.)	CONCRETE CLASS D (CU. YDS.)	CONCRETE CLASS E ABOVE FTG (CU. YDS.)	CONCRETE CLASS E FTG. (CU. YDS.)	RAILING CONCRETE CLASS F (CU. YDS.)	RAILING CONCRETE CLASS F (LIN. FT.)	REINFORCING STEEL (1934 STD. WTS) #11(1 3/8") (LBS.)	#10(1 1/8") (LBS.)	#9(1") (LBS.)	#8(1") (LBS.)	#7(7/8") (LBS.)	#6(3/4") (LBS.)	#5(5/8") I.BS.	#4(1/2") (LBS.)	#3(3/8") (LBS.)	#2(1/4") (LBS.)	TOTALS (LBS.)	STRUCTURAL STEEL (LBS.)	CAST IRON (LBS.)	STEEL ENCASED COMP. 'C' PILES (No.)	STEEL ENCASED COMP. 'C' PILES (LIN. FT.)	ALUMINUM RAILING (LIN. FT.)
SUBSTRUCTURE																						
Bent No 1	12.0												892		354		1,246			9	180	
Pier No 2			40.7	15.6									2,391		249		2,640					
Pier No 3			40.7	15.6									2,338		249		2,587					
Bent No 4	12.0												892		354		1,246			9	180	
SUPERSTRUCTURE	243.2				10.1				26,534	18,082			2,028	7,789	1,207	439	50,169		57			171.3
Reinf. Steel for R.C. Br. Approach																						
Splice Bars														2,672			2,672					
									65	23			34	21	12		155					
Reinf. Steel from Approach Shoulder Column																						
Reinf. Steel for Thickened Pavement																						
Reinf. Steel for Curb, Gutter, Curb Type, etc.																						
TOTALS	267.2		81.4	31.2	10.1				26,599	12,105			3,846	15211	2,515	439	60,715		57	18	360	171.3

BILL OF SPLICE BARS

REINFORCING STEEL

Size	No Pcs	Length	Location	Weight	Total Weight
#9	2	9'-3			
#8	1	8'-9	Splice with #8 cut for Test	6.5 #	
#6	3	7'-6	" " #8 " " "	2.3 #	
#5	3	6'-9	" " #6 " " "	3.4 #	
#4	3	6'-0	" " #5 " " "	2.1 #	
			" " #4 " " "	1.2 #	
					155 #

Note:- For Test bar Samples see Br. Std. "C."

BILL OF MATERIALS FOR R.C. BRIDGE APPROACH

REINFORCING STEEL

Size	No Pcs	Length	Location	Weight	Total Weight
591	96	20'-6	Longitudinal	2,050 #	
# 5	22	27'-0	Transverse	820 #	
			TOTAL		2,672 #

BARRICADES, BARRIERS, TRAFFIC SIGNS, & LIGHTS

ITEM	UNIT	QUANTITY	ASSEMBLY	
WARNING SIGNS	Each	8	Signs 130 R	4
			" 123 R	2
			" 124 R	
			" 116 R	2
			Torches	8
STD. BARRICADES (TYPE A)	Each		Barricades (Type A)	
			Signs 113 R	
			" W11 R	
			" 117	
			Lanterns	
STD. 8'-0" x 4'-0" SIGNS	Each		Signs 113	
BARRIER (SUITABLE) BARRIERS	Each	2 *	Suitable Barriers	2
		*	Lanterns or Torches	4
STD. BARRICADES (TYPE B)	Each		Barricades (Type B)	
			Signs 113	
			Lanterns or Torches	
TYPICAL SIGN STANDARDS	Each		Signs 113 R	
			" W11 R	
			" 117	
			Lanterns	

*Not a pay item.

APPROACH STRUCTURES

STRUCT. No	LOCATION	DESCRIPTION SIZE	DESCRIPTION KIND	DESCRIPTION LENGTH	CL. D CONC. IN STRUCTS. CU. YDS.	REINF. STEEL LBS.	CAST IRON LBS.	REMARKS
2	61+50 (℄)		E-7 Inlet					
2A	61+50 (Lt)	12"	Class 1 Pipe	78'-0	0.6			Connect to Str. No 2A
	59+10 to 60+44.4 (Lt)	6"	Class 7 Pipe	134'-0				1-Culv. Hdwl. Reqd, 1-6 on 12 Tee Reqd
	61+42 to 62+60 (Lt)	6"	Class 7 Pipe	122'-0				1-6 on 6" Tee Reqd. Includes 4 Lin Ft for Connection to Str. No 2A
				TOTALS	0.6			

Total of Reinf. Steel carried to "Bill of Bars Quantities"

SUMMARY

ITEM	DESCRIPTION	UNIT	QUANTITY
1	Class F Concrete	Cu Yds	267.2
2	Class D Concrete	Cu Yds	
3	Class E Concrete above Footings	Cu Yds	81.4
4	Class E Concrete in Footings	Cu Yds	31.2
5	Railing Concrete	Lin Ft	
6	Reinforcing Steel	Lbs	60715
7	Structural Steel	Lbs	
8	Cast Iron	Lbs	57
9	Untreated Timber Piles Furnished	Lin Ft	
10	Untreated Timber Piles Driven	Lin Ft	
11	Furnishing Equipment for Driving Piles	Lump Sum	1
12	Wet Excavation	Cu Yds	190
13	Waterway Excavation	Cu Yds	610
14	Common Excavation	Cu Yds	900
15	Special Borrow	Cu Yds	1855
16	Grade B Special Borrow	Cu Yds	565
17	Sodding	Sq Yds	930
18	Mulched Seeding	Sq Yds	1,190
19	Cement Concrete Pavement	Sq Yds	
20	Reinforced Cement Concrete Pavement (9")	Sq Yds	680
21	Thickened Reinf. Cement Concrete Pavement	Sq Yds	
22	Aggregate for Compacted Aggregate Base	Tons	
23	Removal Present Structure	Lump Sum	
24	Temporary Bridge and Approaches	Lump Sum	
25	Warning Signs	Each	8
26	Std. Barricades (Type A)	Each	
27	Class D Concrete in Structures	Cu Yds	0.6
28	R/W Markers	Each	1
29	Steel Pile Shells Furnished	Lin Ft	360
30	Steel Pile Shells Driven	Lin Ft	360
31	Contraction Joint (Type D-1)	Lin Ft	48
32	3" Expansion Joint	Lin Ft	48
33	1" Expansion Joint	Lin Ft	56
34	Subbase (Type I or II)	Cu Yds	140
35	Compacted Aggregate Shoulder	Tons	63
36	Steel Beam Guard Rail	Lin Ft	195
37	Guide Posts (Type "A")	Each	22
38	Slopewall	Sq Yds	485
39	Calcium Chloride	Tons	0.1
40	18" Pipe (Class 1)	Lin Ft	80
41	6" Pipe (Class 7)	Lin Ft	258
42	Inlet (Type E-7)	Each	1
43	Aggregate for Subsurface Drains	Cu Yds	15
44	Railing Concrete	Cu Yds	10.1
45	Aluminum Railing (Type 1)	Lin Ft	171.3
46			
47			
48			
49			
50			
51			
52			
53			
54			
55			
56			
57			
58			
59			
60			

SUMMARY

STATE HIGHWAY DEPARTMENT OF INDIANA

DECEMBER 5, 1958

SUBMITTED FOR APPROVAL:- James D. Wallis

PROJECT:- F-18 (68)

BRIDGE CONTRACT No 5105

BRIDGE FILE:- 31-0-3570 J

Rev. 5-9-60
For Parapet Wall

CONTRACT No. B-20135

FEDERAL REGION NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
5	IND.	ACNH-153-2(024)	1992	1	30

INDEX

PROJECT	STRUCTURE	TYPE	SPAN	OVER	STATION
ACNH-153-2(024)	31-80-3570 A	BRIDGE DECK RECONSTRUCTION	1 SPAN 36'-0	MUD CREEK	
	31-80-3570 JA		3 SPANS 28'-1.37'-6.28'-1		

SHEET NO	SHEET DESIGNATION	SUBJECT	F.H.W.A. APPROVAL
1		TITLE SHEET	
2		TRAFFIC MAINTENANCE DETAILS (3570JA)	
3	R1	GENERAL PLAN (3570A)	
4	R2	GENERAL PLAN (3570JA)	
5	R3	CONCRETE RAILING DETAILS (3570A)	
6	R4	R.C. APPROACH SLAB DETAILS (3570JA)	
7	R5	CONCRETE RAILING DETAILS (3570JA)	
8		BRIDGE SUMMARY	

INDIANA DEPARTMENT OF TRANSPORTATION

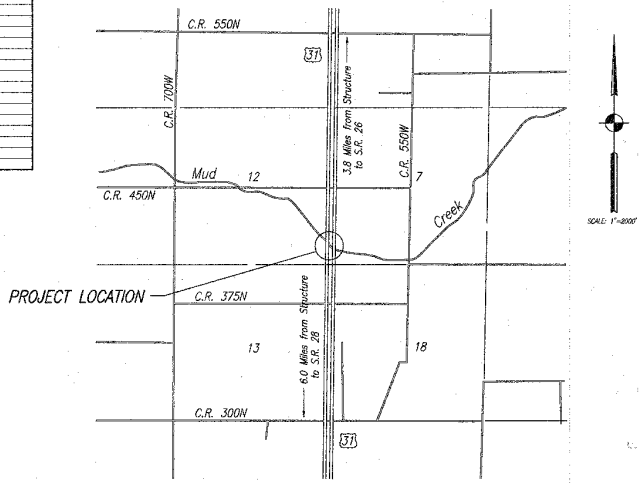
BRIDGE PLANS

FOR SPANS OVER 20 FEET ON U.S. ROUTE 31

PROJECT ACNH-153-2(024)

DECK RECONSTRUCTION AND REPAIRS, TO STRUCTURES NO. 31-80-3570 A AND 31-80-3570 JA, BOTH OVER MUD CREEK, IN SECTION 12, T-22-N, R-3-E AND SECTION 7, T-22-N, R-4-E, PRAIRIE TOWNSHIP, TIPTON COUNTY, INDIANA.

US 31 AT: RP 154+25



SCALE: 1"=2000'

TRAFFIC DATA		
A.D.T. (1991)		23,960 V.P.D.
A.D.T. (2011 PROJECTED)		34,850 V.P.D.
D.H.V. (2011 PROJECTED)		3,140 V.P.H.
TRUCKS		D.H.V. A.D.T.
DESIGN SPEED		55 M.P.H.
ACCESS CONTROL		PARTIAL
FUNCTIONAL CLASSIFICATION		RURAL PRINCIPAL ARTERIAL

NOTE:
WHENEVER NH-153-2(024)
APPEARS ON THESE PLANS OR CONTRACT DOCUMENTS
IT SHALL BE INTERPRETED AS ACNH-153-2(024)

TIPTON COUNTY

B-20135

PREPARED BY:
UNITED CONSULTING ENGINEERS & ARCHITECTS
1625 N. POST ROAD, INDIANAPOLIS, INDIANA 46219
(317) 895-2585
CERTIFIED BY Jerry D. Ritchie DATE 9/30/92

JERRY D. RITCHIE REGISTERED No. 12868 STATE OF INDIANA PROFESSIONAL ENGINEER

INDEX CONTINUED
STANDARD DRAWINGS

SHEET NO.	SHEET DESIGNATION	SUBJECT	F.H.W.A. APPROVAL	ADOPTED "A" REVISION "R"
	BRIDGE STD. BR-1	CONCRETE BRIDGE RAILING TRANSITION TYPE TGR		
9	BRIDGE STD. BR-1A	CONCRETE BRIDGE RAILING TRANSITION TYPE TGR	PENDING	A AUG. 1992
	BRIDGE STD. BR-2	CONCRETE BRIDGE RAILING TRANSITION TYPE WGB		
	BRIDGE STD. BR-2A	CONCRETE BRIDGE RAILING TRANSITION TYPE WGB		
	BRIDGE STD. BNS	RAILING CONNECTION DETAILS		
	BRIDGE STD.			
10	BRIDGE STD. C1	MISCELLANEOUS DETAILS	11-22-91	R 10-1-91
	BRIDGE STD. C2	MISCELLANEOUS DETAILS		
11	BRIDGE STD. C3	MISCELLANEOUS DETAILS	1-26-88	R 11-2-87
	BRIDGE STD. C4	MISCELLANEOUS DETAILS		
	BRIDGE STD. D	CASTING DETAILS ROADWAY DRAINS		
	BRIDGE STD. DJ	ADJUSTING RINGS DETAILS FOR ROADWAY DRAINS		
	BRIDGE STD.			
	BRIDGE STD. PB	PRESTRESSED CONCRETE TYPE I-BEAMS		
	BRIDGE STD. PB	PRESTRESSED CONCRETE TYPE I-BEAMS		
	BRIDGE STD. PBB	PRESTRESSED BOX BEAMS		
	BRIDGE STD. PB	PRESTRESSED COMPOSITE BOX BEAMS WIDE		
	BRIDGE STD. PB	PRESTRESSED COMPOSITE BOX BEAMS WIDE		
	BRIDGE STD. PB10	TOLERANCES FOR FABRICATION OF PRESTRESSED BEAMS		
	BRIDGE STD. PB11	ELASTOMERIC BEARING PAD DETAILS		
	BRIDGE STD.			
	BRIDGE STD.			
	BRIDGE STD. RSA	TYPICAL LIGHTING DETAILS		
	BRIDGE STD. RZB	BRIDGE LIGHTING DETAILS		
	BRIDGE STD. S1	MISCELLANEOUS DETAILS		
	BRIDGE STD. SH1	STEEL SHOE DETAILS		
	BRIDGE STD. T SHEET A	STANDARD TEMPORARY BRIDGE		
	BRIDGE STD. T SHEET B	STANDARD TEMPORARY BRIDGE		
	BRIDGE STD.			
	BRIDGE STD.			
	BRIDGE STD.			
	BRIDGE STD.			
	BRIDGE STD.			
12	ROAD STD. SHEET A	STANDARD PAVEMENT JOINTS	*	R 3-1-90
13	ROAD STD. SHEET B	STANDARD PAVEMENT JOINTS	5-1-90	R 4-1-82
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
14	ROAD STD. SHEET MT3	MISCELLANEOUS STANDARDS	8-5-88	R 8-1-88
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
15	ROAD STD. SHEET MT1B	MISCELLANEOUS STANDARDS	1-6-88	A NOV. 1987
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
16	ROAD STD. SHEET MT19	MISCELLANEOUS STANDARDS	1-6-88	A NOV. 1987
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
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	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
	ROAD STD. SHEET	MISCELLANEOUS STANDARDS		
17	ROAD STD. SHEET G-1	W-BEAM GUARDRAIL COMPONENTS	*	A DEC. 1991
18	ROAD STD. SHEET G-2	THRIE-BEAM GUARDRAIL COMPONENTS	*	A DEC. 1991
19	ROAD STD. SHEET G-3	W-BEAM GUARDRAIL ASSEMBLIES	*	A DEC. 1991
20	ROAD STD. SHEET T-1	GUARDRAIL TRANSITION TYPE SB	*	A DEC. 1991
	ROAD STD. SHEET T-2	GUARDRAIL TRANSITION TYPE GP		
	ROAD STD. SHEET T-3	GUARDRAIL TRANSITION TYPE W1		
	ROAD STD. SHEET T-4	PIER CONNECTION DETAILS		
	ROAD STD. SHEET E-1	GUARDRAIL END TREATMENT TYPE I		
21	ROAD STD. SHEET E-2	GUARDRAIL END TREATMENT TYPE OS	*	A DEC. 1991
22	ROAD STD. SHEET E-3	GUARDRAIL END TREATMENT TYPE MS	*	A DEC. 1991
23	ROAD STD. SHEET B-1	TYPICAL BRIDGE APPROACH GUARDRAIL	*	A DEC. 1991
	ROAD STD. SHEET			
24	ROAD STD. SHEET C82	TEMPORARY CONCRETE BARRIER	1-11-89	R 9-1-88
25	ROAD STD. SHEET 1 DETOURS	STANDARD DETOUR SIGNS	*	A SEP. 1988
	ROAD STD. SHEET 1A DETOURS	STANDARD DETOUR SIGNS		
	ROAD STD. SHEET 1B DETOURS	STANDARD DETOUR SIGNS		
	ROAD STD. SHEET 2 DETOURS	STANDARD DETOUR SIGNS		
26	ROAD STD. SHEET 2A DETOURS	STANDARD DETOUR SIGNS	*	A SEP. 1988
27	ROAD STD. SHEET 3 DETOURS	STANDARD DETOUR SIGNS	*	R 9-1-88
28	ROAD STD. SHEET 3A DETOURS	STANDARD DETOUR SIGNS	*	R 9-1-88
29	ROAD STD. SHEET 4 DETOURS	STANDARD DETOUR SIGNS	7-11-89	R 9-1-88
30	ROAD STD. SHEET 5 DETOURS	STANDARD DETOUR SIGNS	*	R 9-1-88
	ROAD STD. SHEET 5A DETOURS	STANDARD DETOUR SIGNS		

* F.H.W.A. APPROVAL PENDING

RECOMMENDED FOR APPROVAL 10-7-92
BRIDGE ENGINEER

JAMES C. KARR REGISTERED No. 16000 STATE OF INDIANA PROFESSIONAL ENGINEER

APPROVED 10-9-92
CHIEF, DIVISION OF DESIGN

RECOMMENDED FOR APPROVAL 10-9-92
DESIGN CONSULTANT SERVICES MANAGER, INDOT

DAVID M. PLUCKEBAUM REGISTERED No. 20674 STATE OF INDIANA PROFESSIONAL ENGINEER

FEDERAL HIGHWAY ADMINISTRATION
DEPARTMENT OF TRANSPORTATION
APPROVED:
DIVISION ADMINISTRATOR DATE

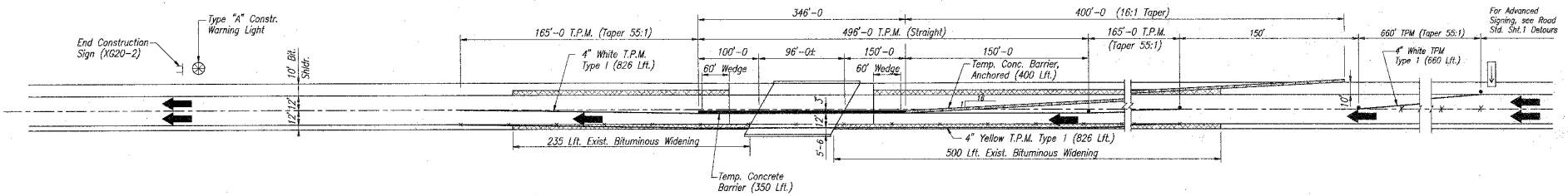
BRIDGE FILE: 31-80-3570 A & 31-80-3570 JA

INDIANA DEPARTMENT OF HIGHWAYS
STANDARD SPECIFICATIONS DATED 1988
TO BE USED WITH THESE PLANS.

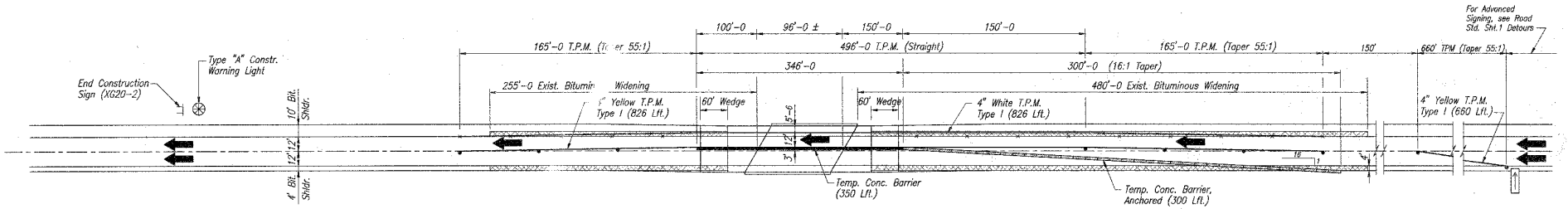
DES. NO. 9715405

REVISIONS	
DATE	SHEET NO.
11-18-92	Delete Sheet 9

REVISIONS	
DATE	SHEET NO.



PHASE I

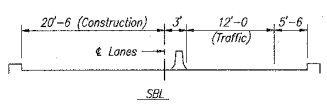


PHASE II

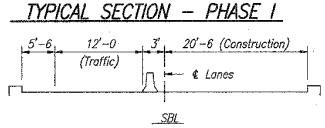
NOTE:
Traffic to be restricted during daylight hours only on Structure 3570A. (Northbound) See Road Std. Sheet 1 Detours.

Bituminous Widening at southbound structure was placed in Contract R19523. (U.S. 31 Reconstruction, Letting July, 1991)

2 Signs Type XG20-5 to be placed as directed by the Engineer.



TYPICAL SECTION – PHASE I



TYPICAL SECTION – PHASE II

LEGEND

- 4'-0 Bituminous Widening (Exist.)
- Temporary Concrete Barrier, Anchored
- Temporary Concrete Barrier
- Flashing Arrow Sign
- Drum or Barricade Type II with Type "C" Steady Burning Light (not a pay item)
- Existing Line Removal

TRAFFIC MAINTENANCE DETAILS (3570JA)

INDIANA DEPARTMENT OF TRANSPORTATION

TIPTON COUNTY

SCALE: NO SCALE

DATE: September 30, 1992

Jerry D. Ritchie

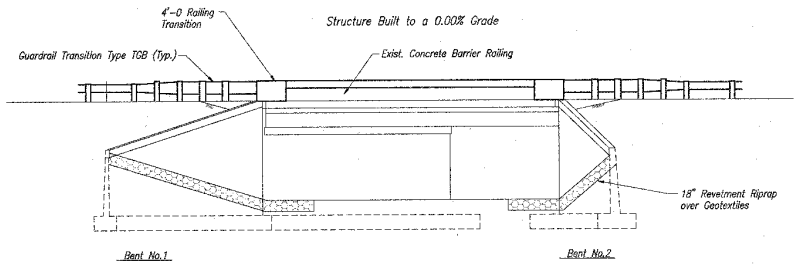
SHEET: 2 OF 30

PROJECT: NH-153-2(024)
BRIDGE CONTRACT NO. B-20135
BRIDGE FILE: 31-80-3570A

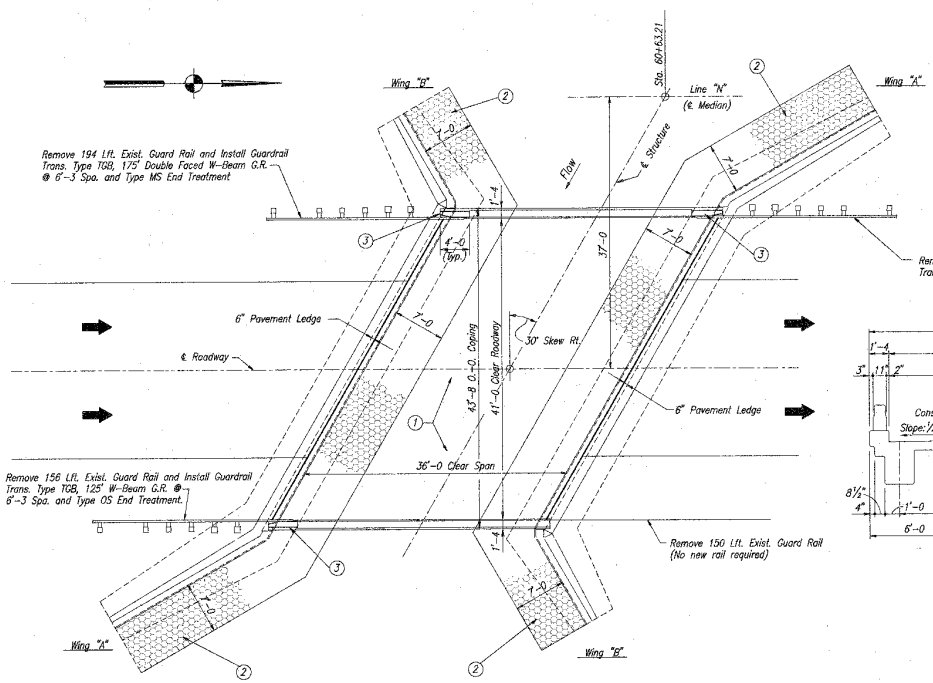
JERRY D. RITCHIE REGISTERED No. 12868 STATE OF INDIANA PROFESSIONAL ENGINEER

9120505\TM\1=480

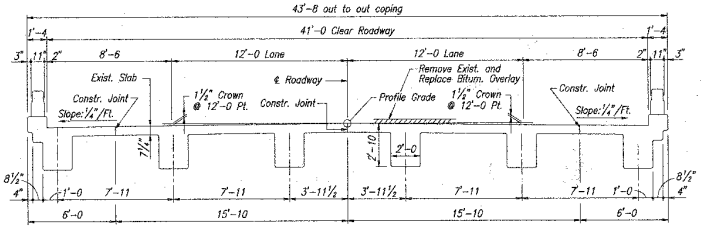
DESIGNED: CKD:
DRAWN: WLV/CAD (11-91) CKD: JDR
TRACED: CKD:



ELEVATION
Scale: 1/8"=1'-0



PLAN
Scale: 1/8"=1'-0



TYPICAL SECTION
Scale: 1/4"=1'-0

LEGEND

1. Remove existing bituminous surface on bridge and resurface. Match existing profile.
2. Place revetment riprap over geotextiles as shown. (Estimated quantity = 113 Tons Revetment Riprap & 139 Sys. Geotextiles).
3. Remove railing end section and construct new concrete railing transition. See Drawing R3.

Indicates limits of Revetment Riprap

GENERAL NOTES

Plans for these structures are on file in the Central Office, INDOT as Bridge File Nos. 31-80-3570 and 31-80-3570J and are available upon request.

Where new work is to be fitted to old work, the contractor shall check all dimensions and conditions in the field and report any errors or discrepancies to the engineer and assume responsibility for their correctness and the fit of the new part to the old.

The hand chipping and cleaning of deteriorated concrete areas shall be as directed by the Engineer. It is the intent of these plans that all such deteriorated concrete be removed and should there be any doubt as to the quality of the concrete, removal shall continue until PERFECTLY SOUND CONCRETE is exposed. All existing non-full depth patches shall be removed.

Concrete in patches for deteriorated concrete areas, up to the milled surface, is to be Bridge Deck Patching Concrete bonded with an epoxy bonding compound or Modified Portland Cement Concrete.

All bituminous material required in this contract is to be included in the pay item "Bituminous Mixture For Approaches, HV" except tack coat which is to be paid for as "Bituminous Material For Tack Coat" in Sys.

The length and quantity of bituminous wedge and leveling shown is based on the use of Modified Portland Cement Concrete Overlay. See the "Special Provisions".

Reinforcing steel covering shall be 1" in the top and 1" minimum in the bottom of the floor slab and 2" in all other parts, unless noted.

Concrete in railing is to be Class "C".

All exposed edges shall be chamfered 1" unless noted.

Surface Seal curbs, all faces of concrete railings, and face of copings for Structure 3570JA only. Est. Quantity = 1,980 Sft.

All Guard Rail removed to remain the property of the contractor (Typ. both Structures)

MATERIAL NOTES

BITUMINOUS WEDGE: 3570JA

110#/Syd. H.A.C. Type II HV on variable depth Bituminous Binder, Hv.

BRIDGE DECK RESURFACE: 3570A

110#/Syd. HAC Type II HV over Variable Depth Bituminous Binder, Hv. Match exist. profile.

BRIDGE DECK OVERLAY: 3570JA

1¾" Modified Portland Cement Concrete or 2¼" Dense Portland Cement Concrete (1½" or 2¼" above exist. surface)

GENERAL PLAN (3570A)

REPAIRS TO REINFORCED CONCRETE GIRDER BRIDGE
1 SPAN @ 36'-0 SKEW 30° RT.
US 31 N.B. OVER MUD CREEK

INDIANA DEPARTMENT OF TRANSPORTATION

TIPTON COUNTY

SCALE: As Noted DATE: September 30, 1992

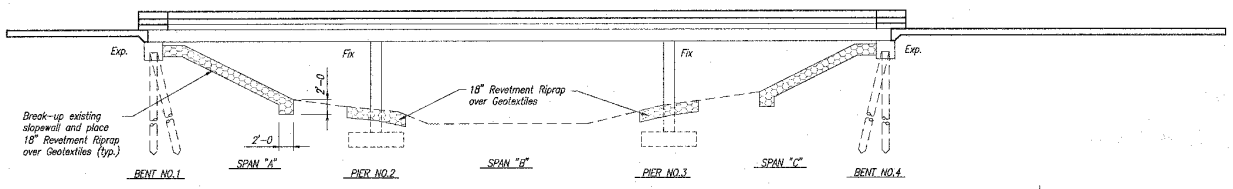
Jerry D. Ritchie

DRAWING: R1 OF R5 SHEET: 3 OF 30
PROJECT: NH-153-2(024)
BRIDGE CONTRACT NO. B-20135
BRIDGE FILE: 31-80-3570A

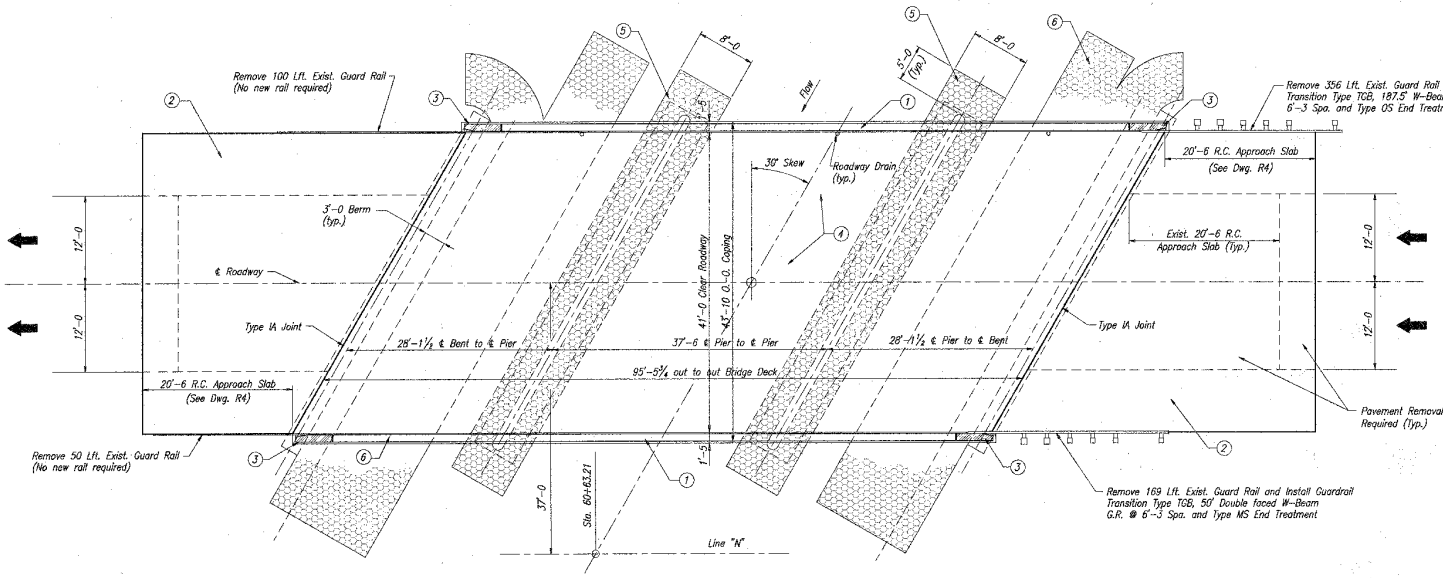
JERRY D. RITCHIE REGISTERED No. 12868 STATE OF INDIANA PROFESSIONAL ENGINEER

DESIGNED	J.D.R.	CHK'D.
DRAWN	D.W.B.	CHK'D. J.D.R.
TRACED		CHK'D.

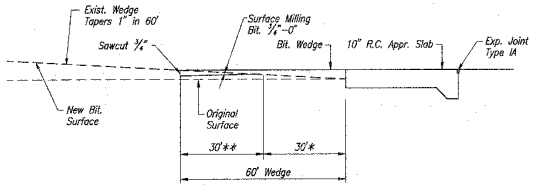
Structure built to a +0.357% Grade



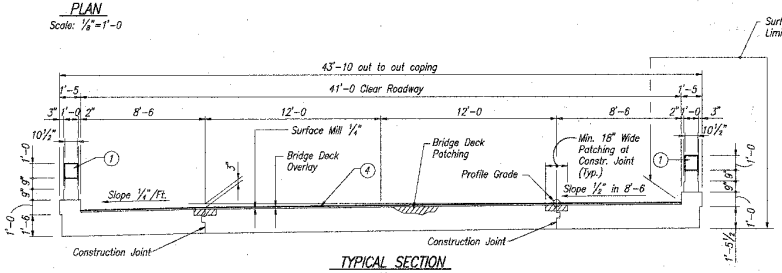
ELEVATION
Scale: 1/8"=1'-0



PLAN
Scale: 1/8"=1'-0



LONGITUDINAL SECTION – S.B.
No Scale



TYPICAL SECTION
Scale: 1/4"=1'-0

*– Top of Wedge to be a Continuation of the Bridge Deck Profile.
**– Taper Top of Wedge Uniformly to Meet Existing Roadway Surface.
Note: Seal all Joints and Cracks in the Approach Pavement with a Sealer before Placing the Bituminous Wedging. Cost to be Included in the Cost of Other Items.

LEGEND

1. Remove aluminum tube from concrete parapet and raise height of parapet to 2'-6. See Dwg. R5.
2. Remove existing approach slabs and construct new 10" R.C. slabs. New slabs to be tied to bridge deck. See Dwg. R4.
3. Remove 4'-9 at ends of existing parapet and reconstruct to provide standard rail connection. See Dwg. R5.
4. Surface mill, patch and overlay deck with a modified or dense portland cement concrete overlay to a level 1 1/2" or 2 1/4" above original deck surface. (Est. Patching 1,370 Sft.)
5. Place revetment riprap as shown to provide erosion protection at Pier No.2 and Pier No.3
6. Break up existing concrete slopewalls and place revetment riprap as shown.

Indicates Parapet Removal (To be paid for as "Structure Removal, Portions")

Indicates limits of Revetment Riprap over Geotextiles (est. 266 Tons Revetment Riprap & 328 Sys. Geotextiles)

STANDARD DRAWINGS

BRIDGE	ROAD	PURPOSE
BR-1A		Attachment Details
C1		Reinforcing Bar Notes
C3		Type "A" Constr.
	Sht. A	Wire Fabric
	Sht. B	R.C. Bridge Approach
	MT3	Traffic Sign Details
	MT18	Snowplowable Pavement Markings
	MT19	Snowplowable Pavement Markings
	CB2	Temporary Concrete Barrier
	Sht. 1	Standard Detour Signs
	Sht. 2A	Standard Detour Signs
	Sht. 3	Standard Detour Signs
	Sht. 3A	Standard Detour Signs
	Sht. 4	Standard Detour Signs
	Sht. 5	Standard Detour Signs
	G1	Guard Rail Standards
	G2	Guard Rail Standards
	G3	Guard Rail Standards
	B1	Guard Rail Standards
	E2	Guard Rail Standards
	E3	Guard Rail Standards
	T1	Guard Rail Standards

NOTES:
For General Notes and Material Notes, see Dwg. R1.
Bridge rail and posts to remain the property of the State.

GENERAL PLAN (3570JA)

REPAIRS TO REINFORCED CONCRETE SLAB BRIDGE
3 SPAN @ 28'-1 1/2, 37'-6, 28'-1 1/2 SKEW 30° RT.
US 31 S.B. OVER MUD CREEK

INDIANA DEPARTMENT OF TRANSPORTATION

TIPTON COUNTY

SCALE: As Noted
DATE: September 30, 1992

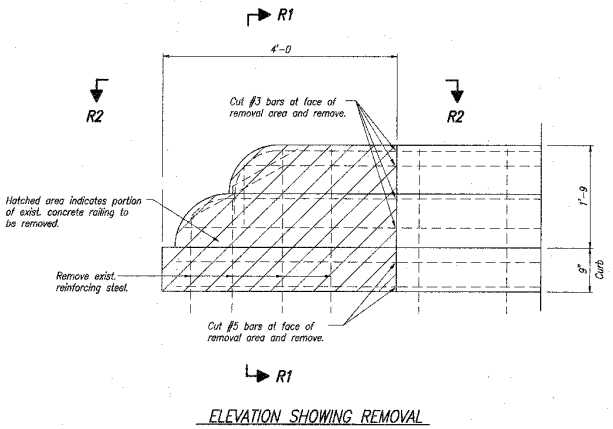
Jerry D. Ritchie

DRAWING: R2 OF R5 SHEET: 4 OF 30
PROJECT: NH-153-2(024)
BRIDGE CONTRACT NO. B-20135
BRIDGE FILE: 31-80-3570JA

JERRY D. RITCHIE REGISTERED No. 12868 STATE OF INDIANA PROFESSIONAL ENGINEER

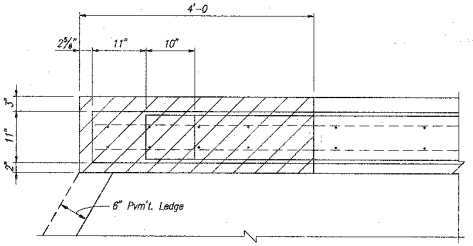
DESIGNED	J.D.R.	CKD.	
DRAWN	D.W.B.	CKD.	J.D.R.
TRACED		CKD.	

DGN: 1251100000-R2



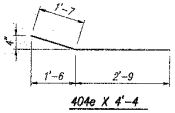
ELEVATION SHOWING REMOVAL

Scale: 1" = 1'-0



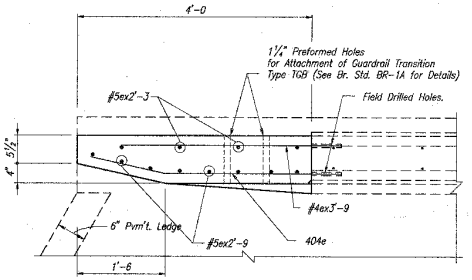
EXIST. SECTION R2-R2

Scale: 1" = 1'-0



BAR BENDING DETAILS

No Scale



PROPOSED SECTION R2-R2

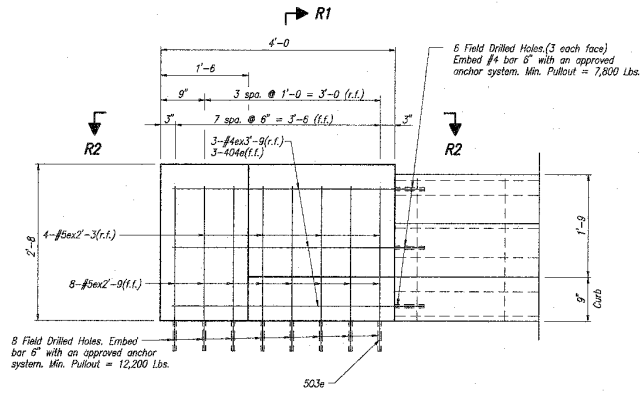
Scale: 1" = 1'-0

BILL OF MATERIALS
CONCRETE RAILING
(THREE CORNERS)

EPOXY COATED REINFORCING STEEL

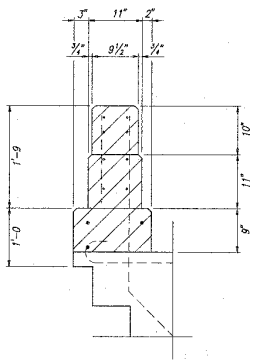
Size or Mark	No. of Bars	Length	Weight (lbs.)
#5e	24	2'-9	
#5e	12	2'-3	
		Total #5	97
404e	9	4'-4	
#4e	9	3'-9	
		Total #4e	49
Total Epoxy Coated Reinforcing			146
CONCRETE CLASS "C"			
Class "C" in Railing			0.9 cys.
MISCELLANEOUS			
Field Drilled Holes in Concrete			42 each

For reinforcing bar notes, see Bridge Std.C1.
For General Notes, see Dwg. R1
e-Indicates Epoxy Coated Reinforcing Steel



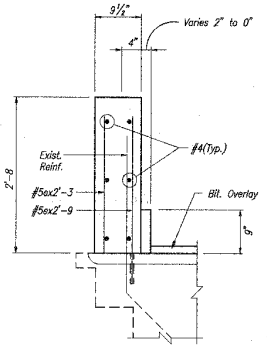
PROPOSED ELEVATION

Scale: 1" = 1'-0



EXIST. SECTION R1-R1

Scale: 1" = 1'-0



PROPOSED SECTION R1-R1

Scale: 1" = 1'-0

CONCRETE RAILING DETAILS (3570A)

INDIANA DEPARTMENT OF TRANSPORTATION

TIPTON COUNTY

SCALE: As Noted

DATE: September 30, 1992

Jerry D. Ritchie

DRAWING: R3 OF R5 SHEET: 5 OF 30

PROJECT: NH-153-2(024)

BRIDGE CONTRACT NO. B-20135

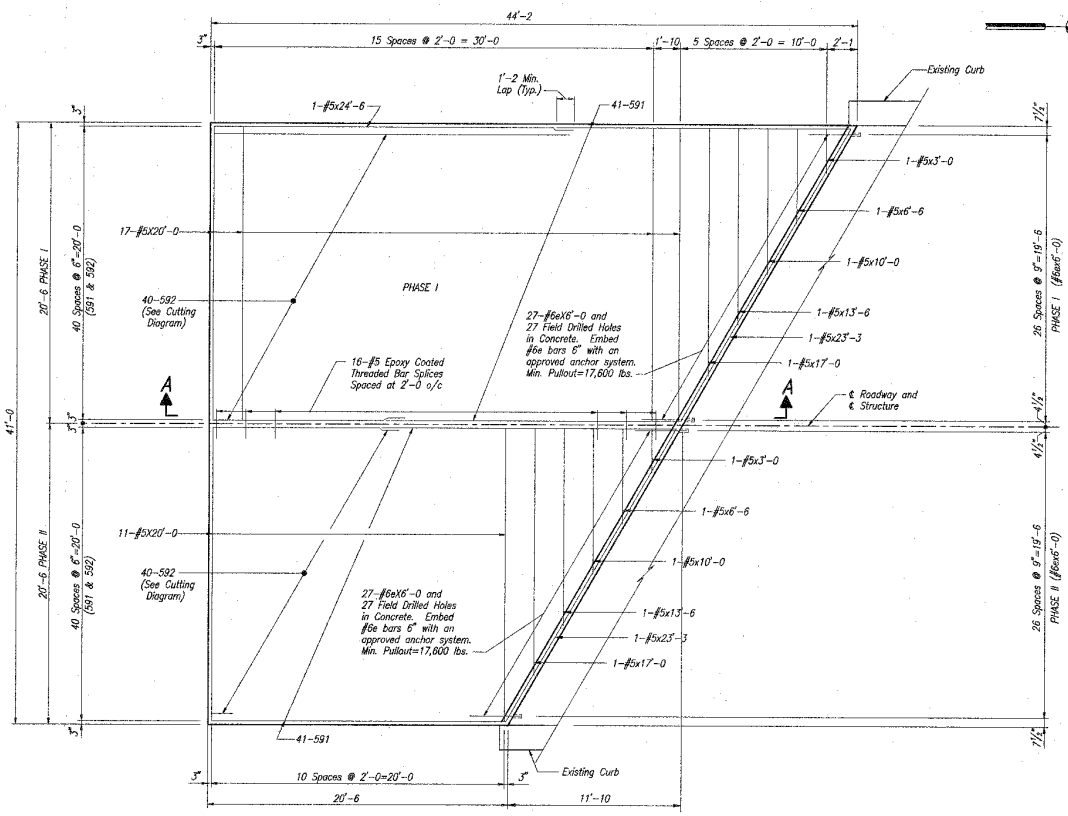
BRIDGE FILE: 31-80-3570A

JERRY D. RITCHIE REGISTERED No. 12868 STATE OF INDIANA PROFESSIONAL ENGINEER

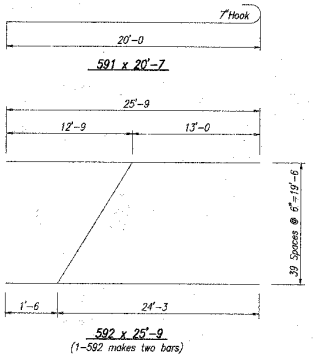
DESIGNED J.D.R. CVD.

DRAWN T.E.B. CVD.

TRACED CVD.



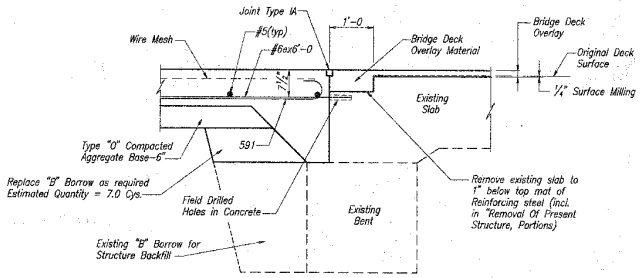
PLAN
Scale: 1/4"=1'-0



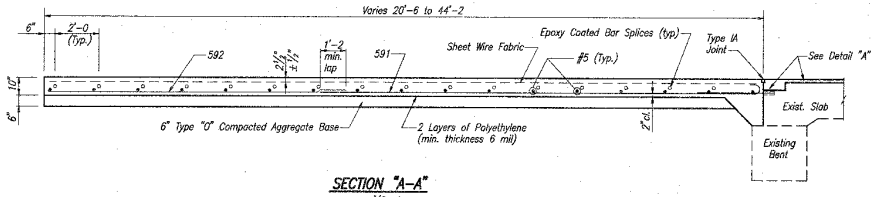
BILL OF MATERIALS
R.C. APPROACH SLAB

Size or Mark	No. of Bars	Length	Weight (lbs.)
EPOXY COATED REINFORCING STEEL			
#6e	54	6'-0	487
REINFORCING STEEL			
591	82	20'-7	
592	40	25'-9	
#5	1	24'-6	
#5	2	23'-3	
#5	28	20'-0	
#5	2	17'-0	
#5	2	13'-6	
#5	2	10'-0	
#5	2	6'-6	
#5	2	3'-0	
		Total #5	3597
Total Reinforcing Steel			3597
CONCRETE			
R.C. Concrete Pavement-10"			147.3 sys.
MISCELLANEOUS			
E.C. Thr'ded. Splice Bars			16 each
Field Drilled Holes in Concrete			54 each
Type "O" Compacted Aggregate			49 tons
B-Borrow for Struc. Backfill			7 cys.

NOTE: Bill of Materials for one Approach Slab



DETAIL "A"
Scale: 1/4"=1'-0



SECTION "A-A"
Scale: 1/8"=1'-0

NOTES:
For reinforcing bar notes, see Bridge Std.C1
For R.C. Approach Details, see Road Std. Sht.A, Joints and Sht.B, Joints.
For General Notes, see Dwg.R1

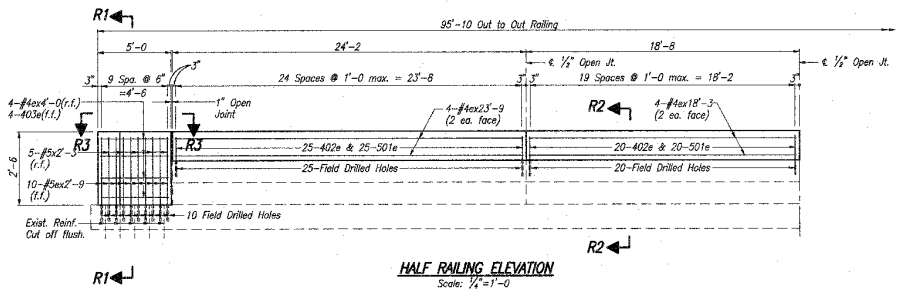
R.C. APPROACH SLAB DETAILS (3570JA)
INDIANA DEPARTMENT OF TRANSPORTATION
TIPTON COUNTY

SCALE: As Noted
DATE: September 30, 1992
Jerry D. Ritchie

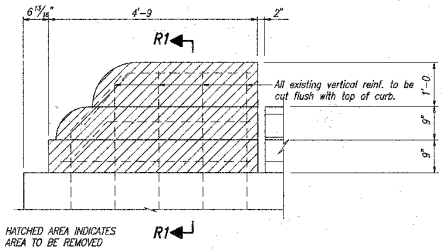
DRAWING: R4 OF R5 SHEET: 6 OF 30
PROJECT: NH-153-2(024)
BRIDGE CONTRACT NO. B-20185
BRIDGE FILE: 31-80-3570JA

JERRY D. RITCHIE REGISTERED No. 12868 STATE OF INDIANA PROFESSIONAL ENGINEER

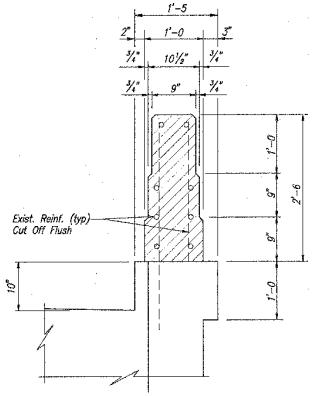
DESIGNED J.D.R. CK'D.
DRAWN W.L.V. CK'D. J.D.R.
TRACED CK'D.



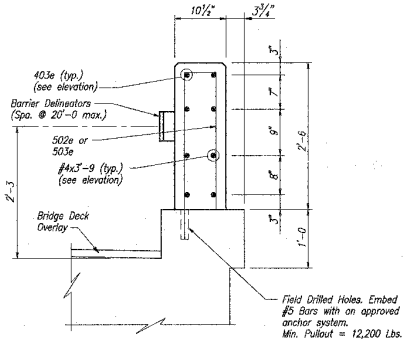
HALF RAILING ELEVATION
Scale: 1/4"=1'-0



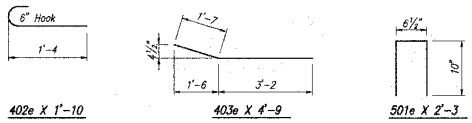
REMOVAL DETAILS
Scale: 3/4"=1'-0



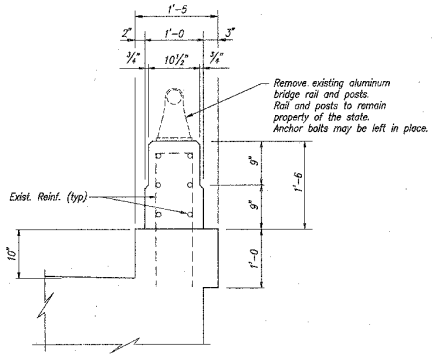
EXISTING SECTION R1-R1
Scale: 1"=1'-0



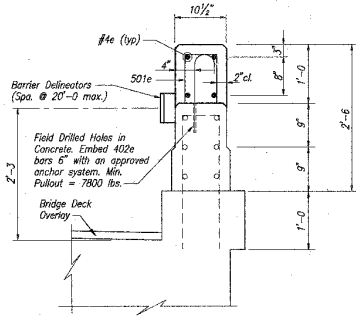
PROPOSED SECTION R1-R1
Scale: 1"=1'-0



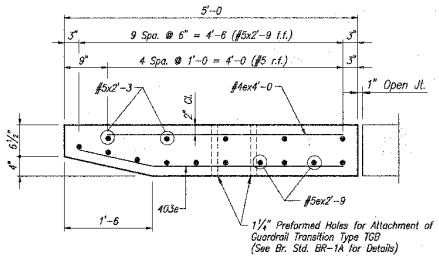
BAR BENDING DETAILS
No Scale



EXISTING SECTION R2-R2
Scale: 1"=1'-0



PROPOSED SECTION R2-R2
Scale: 1"=1'-0



PLAN R3-R3
Scale: 1"=1'-0

NOTES:
For reinforcing bar notes, see Bridge Std.C1.
For General Notes, see Dwg.R1
e-Indicates Epoxy Coated Reinforcing Steel

BILL OF MATERIALS
CONCRETE RAILING (FOUR CORNERS)

EPOXY COATED REINFORCING STEEL			
Size or Mark	No. of Bars	Length	Weight (lbs.)
501e	180	2'-3	
#5e	20	2'-3	
#5e	40	2'-9	
		Total #5e	584
402e	180	1'-10	
403e	16	4'-9	
#4e	16	23'-9	
#4e	16	18'-3	
#4e	16	4'-0	
		Total #4e	763
Total Epoxy Coated Reinforcing			1,347
CONCRETE CLASS "C"			
Class "C" in Railing			7.1 Cys.
MISCELLANEOUS			
Field Drilled Holes in Concrete			220 Each
Barrier Delineators			10 Each

CONCRETE RAILING DETAILS (3570JA)
INDIANA DEPARTMENT OF TRANSPORTATION
TIPTON COUNTY

SCALE: As Noted
DATE: September 30, 1992

DESIGNED J.D.R. CHK'D
DRAWN T.E.B. CHK'D J.D.R.
TRACED CHK'D

DRAWING: R5 OF R5 SHEET: 7 OF 30
PROJECT: NH-153-2(024)
BRIDGE CONTRACT NO. B-20135
BRIDGE FILE: 31-80-3570JA

JERRY D. RITCHIE REGISTERED No. 12868 STATE OF INDIANA PROFESSIONAL ENGINEER

BRIDGE FILE

ITEM	CONCRETE CLASS C SUPERSTR CU. YDS.	CONCRETE CLASS A SUBSTR CU. YDS.	CONCRETE CLASS B ABOVE FOOTING CU. YDS.	CONCRETE CLASS B IN FOOTING CU. YDS.			CONCRETE RAILING CLASS C CU. YDS.	CONCRETE RAILING CLASS C LIN. FT.	REINF. STEEL TOTAL LBS.	STRUCT. STEEL *** LBS.	EPOXY COATED REINF. STEEL LBS.	ANCHOR PLATES MK-AP EACH	STRUCTURE PILES EPOXY COATED SHELLS NO.	EPOXY COATED SHELLS LIN. FT.	TREATED TIMBER NO.	TREATED TIMBER LIN. FT.	STEEL ENCASED CONC. NO.	STEEL ENCASED CONC. LIN. FT.	STEEL H BEARING NO.	STEEL H BEARING LIN. FT.	QUANTITIES E.C. Thr'ded Splice Bars LBS.	CAST IRON GRATES, BASINS, & FITTINGS LBS.	CONC. PVMT. REINF. 10 INCH SYS.	EXP. JOINT TYPE LFT.	EXP. JOINT CLASS LFT.	CONC. STR. MEMBERS BOX BEAMS TYPE SQ. FT.	CONC. STR. MEMBERS I-BEAM TYPE LIN. FT.	MASONRY COATING SQ. FT.	Type "D" Comp. Agg. TONS	B-BORROW FOR STR. BACKFILL CU. YDS.	BRIDGE DECK SURFACE SQ. YDS.	BARRIER DELINEATORS EACH	SURFACE SEAL SQ. FT.	FIELD DRILLED HOLES IN CONCRETE
3570 A																																		
Concrete Railing							0.9				146																							42
3570 JA																																		
Concrete Railing							7.1				1347																						10		220
South Approach Slab									3597		487										16		147.3						49	7				54
North Approach Slab									3597		487										16		147.3						49	7				54
GRAND TOTALS							8.0		7194		2467										32		294.6						98	14		10		370

REVISIONS	
DATE	ITEM

BRIDGE SUMMARY

INDIANA DEPARTMENT OF TRANSPORTATION

TIPTON COUNTY

SCALE: NONE

DATE: September 30, 1992

Jerry D. Ritchie

SHEET: 9 OF 30

PROJECT: NH-153-2(024)

BRIDGE CONTRACT NO. B-20135

BRIDGE FILE: 31-80-3570 A & JA

JERRY D. RITCHIE REGISTERED No. 12868 STATE OF INDIANA PROFESSIONAL ENGINEER

SUMMARIED T.E.B. CKD. J.D.R.

TRACED T.E.B. CKD. J.D.R.

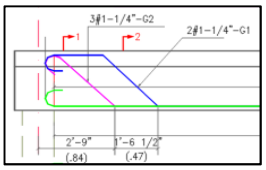
9120005.TSM/1=1

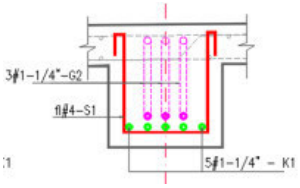
ANEXO 2

Capacidad a cortante Vn puntos 1 y 2 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	





Geometría viga

b=	0.52m	= 1.7 ft	
h=	0.71m	= 2.3 ft	
dv=	0.59m	= 1.9 ft	
Ref-prin=	1-1/4"		Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043 ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2" + 1-1/4"		Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003 ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft	Separación entre estribos
Asv=	23.7 cm2	= 0.026 ft^2	Área de acero inclinado
α =	37.3°		Angulo de inclinación del acero

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	502 kN	= 112.78	kips	Cortante actuante en punto de estudio
Mu=	0 kN-m	= 0.00	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0006

θ (29+3500εs) = 31.2°

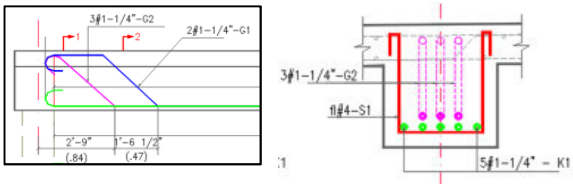
β = 3.3°

Vc=	310 KN	= 69.92	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vs2=	740 KN	= 166.73	kips	Resistencia refuerzo inclinado
Vn2=	1381 KN	= 311.31	kips	Resistencia a cortante 2
Vnd =	1074 KN	= 241.98	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 3 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft	
h=	0.71m	= 2.3 ft	
dv=	0.59m	= 1.9 ft	
Ref-prin=	1-1/4"		Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043 ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2" + 1-1/4"		Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003 ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft	Separación entre estribos
Asv=	15.8 cm2	= 0.017 ft^2	Área de acero inclinado
α =	37.3°		Angulo de inclinación del acero

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	461 kN	= 103.75	kips	Cortante actuante en punto de estudio
Mu=	279 kN-m	= 205.75	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0012

θ (29+3500εs) = 33.1°

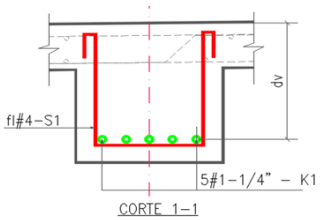
β = 2.6°

Vc=	243 KN	= 54.75	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vs2=	493 KN	= 111.15	kips	Resistencia refuerzo inclinado
Vn2=	1067 KN	= 240.56	kips	Resistencia a cortante 2
Vnd =	1067 KN	= 240.56	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 4 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"			Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	381 kN	= 85.68	kips	Cortante actuante en punto de estudio
Mu=	727 kN-m	= 536.68	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

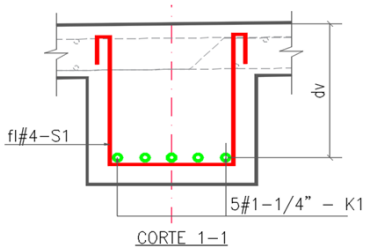
$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs =	0.0020			
θ (29+3500εs) =	36.1°			
β =	1.9°			
Vc=	181 KN	= 40.83	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	512 KN	= 115.48	kips	Resistencia a cortante 2
Vnd =	512 KN	= 115.48	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 5 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"			Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	341 kN	= 76.64	kips	Cortante actuante en punto de estudio
Mu=	897 kN-m	= 661.86	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0023

θ (29+3500εs) = 37.2°

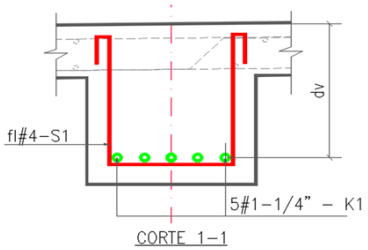
β = 1.7°

Vc=	166 KN	= 37.37	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	497 KN	= 112.02	kips	Resistencia a cortante 2
Vnd =	497 KN	= 112.02	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 6 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"			Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	0.73 cm2	= 0.001	ft^2	Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	301 kN	= 67.61	kips	Cortante actuante en punto de estudio
Mu=	1034 kN-m	= 763.09	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

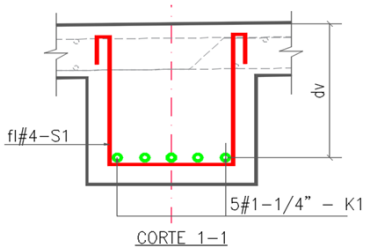
$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs =	0.0026			
θ (29+3500εs) =	38.1°			
β =	1.6°			
Vc=	156 KN	= 35.06	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	487 KN	= 109.71	kips	Resistencia a cortante 2
Vnd =	487 KN	= 109.71	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 7 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft	
h=	0.71m	= 2.3 ft	
dv=	0.59m	= 1.9 ft	
Ref-prin=	1-1/4"		Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043 ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"		Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003 ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft	Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	263 kN	= 59.11	kips	Cortante actuante en punto de estudio
Mu=	1143 kN-m	= 843.84	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0028

θ (29+3500εs) = 38.7°

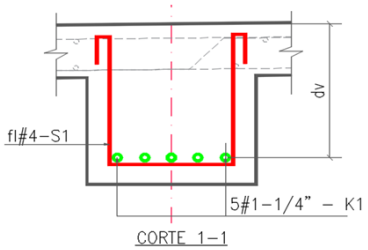
β = 1.6°

Vc=	149 KN	= 33.47	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	480 KN	= 108.12	kips	Resistencia a cortante 2
Vnd =	480 KN	= 108.12	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 8 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft	
h=	0.71m	= 2.3 ft	
dv=	0.59m	= 1.9 ft	
Ref-prin=	1-1/4"		Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043 ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"		Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003 ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft	Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	225 kN	= 50.60	kips	Cortante actuante en punto de estudio
Mu=	1226 kN-m	= 904.96	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0029

θ (29+3500εs) = 39.2°

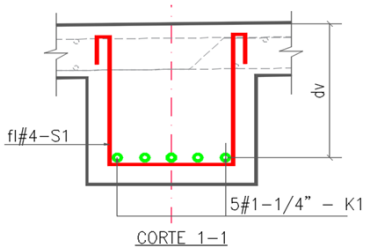
β = 1.5°

Vc=	144 KN	= 32.45	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	475 KN	= 107.10	kips	Resistencia a cortante 2
Vnd =	475 KN	= 107.10	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 9 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft	
h=	0.71m	= 2.3 ft	
dv=	0.59m	= 1.9 ft	
Ref-prin=	1-1/4"		Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043 ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"		Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003 ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft	Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	187 kN	= 42.10	kips	Cortante actuante en punto de estudio
Mu=	1275 kN-m	= 941.27	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0030

θ (29+3500εs) = 39.4°

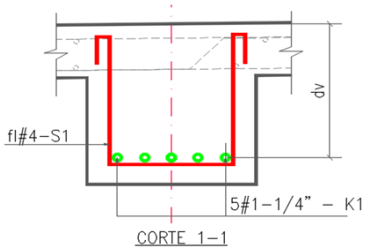
β = 1.5°

Vc=	142 KN	= 32.02	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	473 KN	= 106.67	kips	Resistencia a cortante 2
Vnd =	473 KN	= 106.67	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 10 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft	
h=	0.71m	= 2.3 ft	
dv=	0.59m	= 1.9 ft	
Ref-prin=	1-1/4"		Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043 ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"		Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003 ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft	Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	149 kN	= 33.59	kips	Cortante actuante en punto de estudio
Mu=	1291 kN-m	= 952.79	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0029

θ (29+3500εs) = 39.3°

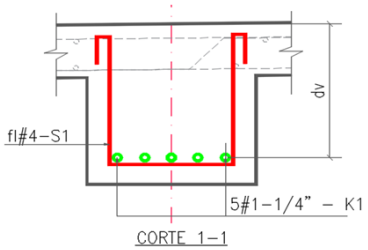
β = 1.5°

Vc=	143 KN	= 32.13	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	474 KN	= 106.78	kips	Resistencia a cortante 2
Vnd =	474 KN	= 106.78	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 11 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft	
h=	0.71m	= 2.3 ft	
dv=	0.59m	= 1.9 ft	
Ref-prin=	1-1/4"		Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043 ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"		Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003 ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft	Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	112 kN	= 25.09	kips	Cortante actuante en punto de estudio
Mu=	1301 kN-m	= 960.14	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0029

θ (29+3500εs) = 39.2°

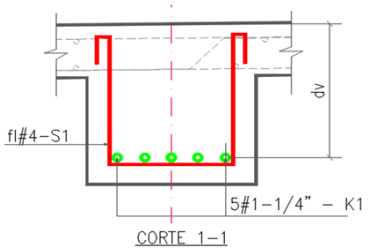
β = 1.5°

Vc=	143 KN	= 32.32	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	475 KN	= 106.98	kips	Resistencia a cortante 2
Vnd =	475 KN	= 106.98	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 12 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"			Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	0.73 cm2	= 0.001	ft^2	Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	149 kN	= 33.42	kips	Cortante actuante en punto de estudio
Mu=	1304 kN-m	= 962.40	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

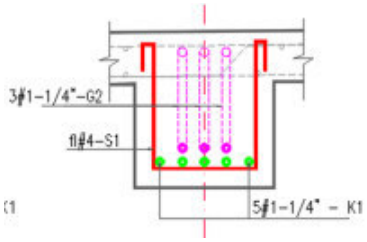
$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs =	0.0030			
θ (29+3500εs) =	39.4°			
β =	1.5°			
Vc=	142 KN	= 31.92	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	473 KN	= 106.58	kips	Resistencia a cortante 2
Vnd =	473 KN	= 106.58	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 13 VGE

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"			Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	0.73 cm2	= 0.001	ft^2	Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	189 kN	= 42.46	kips	Cortante actuante en punto de estudio
Mu=	1280 kN-m	= 944.93	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

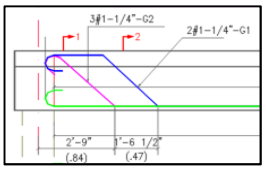
$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

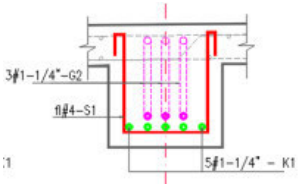
εs =	0.0030			
θ (29+3500εs) =	39.4°			
β =	1.5°			
Vc=	142 KN	= 31.92	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	473 KN	= 106.58	kips	Resistencia a cortante 2
Vnd =	473 KN	= 106.58	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn puntos 1 y 2 VGI

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	





Geometría viga

b=	0.52m	= 1.7 ft	
h=	0.71m	= 2.3 ft	
dv=	0.59m	= 1.9 ft	
Ref-prin=	1-1/4"		Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043 ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2" + 1-1/4"		Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003 ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft	Separación entre estribos
Asv=	23.7 cm2	= 0.026 ft^2	Área de acero inclinado
α =	37.3°		Angulo de inclinación del acero

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	726 kN	= 163.11	kips	Cortante actuante en punto de estudio
Mu=	0 kN-m	= 0.00	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0009

θ (29+3500εs) = 32.2°

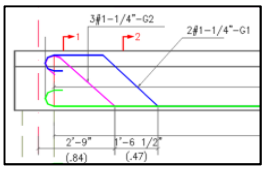
β = 2.8°

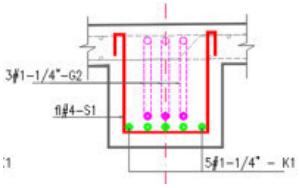
Vc=	271 KN	= 61.15	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vs2=	740 KN	= 166.73	kips	Resistencia refuerzo inclinado
Vn2=	1343 KN	= 302.53	kips	Resistencia a cortante 2
Vnd =	1074 KN	= 241.98	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 3 VGI

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	





Geometría viga

b=	0.52m	= 1.7 ft	
h=	0.71m	= 2.3 ft	
dv=	0.59m	= 1.9 ft	
Ref-prin=	1-1/4"		Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043 ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2" + 1-1/4"		Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003 ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft	Separación entre estribos
Asv=	15.8 cm2	= 0.017 ft^2	Área de acero inclinado
α =	37.3°		Angulo de inclinación del acero

Refuerzo mínimo transversal

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	638 kN	= 143.44	kips	Cortante actuante en punto de estudio
Mu=	353 kN-m	= 260.67	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0016

θ (29+3500εs) = 34.5°

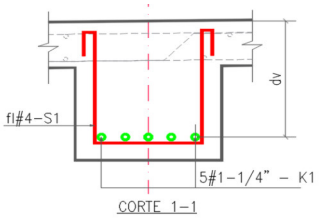
β = 2.2°

Vc=	211 KN	= 47.53	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vs2=	493 KN	= 111.15	kips	Resistencia refuerzo inclinado
Vn2=	1035 KN	= 233.34	kips	Resistencia a cortante 2
Vnd =	1035 KN	= 233.34	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 4 VGI

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft	
h=	0.71m	= 2.3 ft	
dv=	0.59m	= 1.9 ft	
Ref-prin=	1-1/4"		Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043 ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"		Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003 ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft	Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	525 kN	= 117.98	kips	Cortante actuante en punto de estudio
Mu=	926 kN-m	= 683.29	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\; b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0026

θ (29+3500εs) = 38.2°

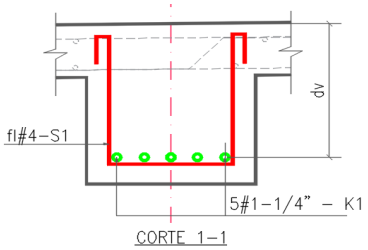
β = 1.6°

Vc=	154 KN	= 34.61	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	485 KN	= 109.26	kips	Resistencia a cortante 2
Vnd =	485 KN	= 109.26	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 5 VGI

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"			Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	468 kN	= 105.25	kips	Cortante actuante en punto de estudio
Mu=	1145 kN-m	= 845.08	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\; b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0030

θ (29+3500εs) = 39.6°

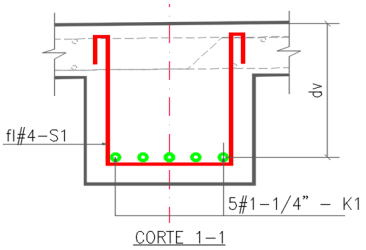
β = 1.5°

Vc=	140 KN	= 31.46	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	471 KN	= 106.12	kips	Resistencia a cortante 2
Vnd =	471 KN	= 106.12	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 5 VGI

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft	
h=	0.71m	= 2.3 ft	
dv=	0.59m	= 1.9 ft	
Ref-prin=	1-1/4"		Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043 ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"		Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003 ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft	Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316 \sqrt{f_c'} \frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	413 kN	= 92.94	kips	Cortante actuante en punto de estudio
Mu=	1320 kN-m	= 973.86	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f_c'}\, b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0033

θ (29+3500εs) = 40.7°

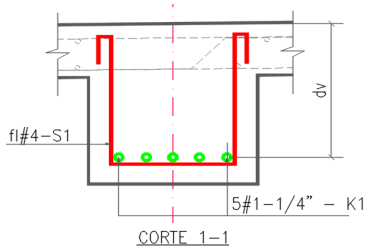
β = 1.4°

Vc=	131 KN	= 29.42	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	462 KN	= 104.07	kips	Resistencia a cortante 2
Vnd =	462 KN	= 104.07	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 7 VGI

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"			Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	0.73 cm2	= 0.001	ft^2	Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	360 kN	= 80.98	kips	Cortante actuante en punto de estudio
Mu=	1455 kN-m	= 1073.54	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\; b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0036

θ (29+3500εs) = 41.5°

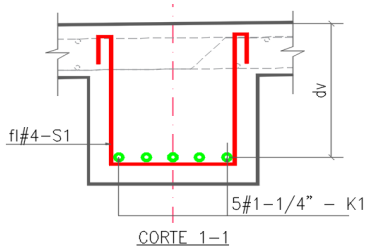
β = 1.3°

Vc=	125 KN	= 28.09	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	456 KN	= 102.74	kips	Resistencia a cortante 2
Vnd =	456 KN	= 102.74	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 8 VGI

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"			Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	307 kN	= 69.02	kips	Cortante actuante en punto de estudio
Mu=	1552 kN-m	= 1145.42	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\; b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0037

θ (29+3500εs) = 41.9°

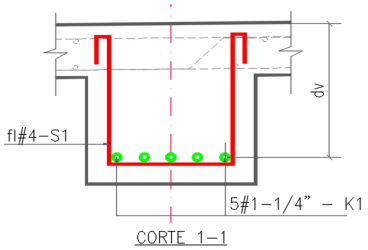
β = 1.3°

Vc=	121 KN	= 27.30	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	452 KN	= 101.95	kips	Resistencia a cortante 2
Vnd =	452 KN	= 101.95	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 9 VGI

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft	
h=	0.71m	= 2.3 ft	
dv=	0.59m	= 1.9 ft	
Ref-prin=	1-1/4"		Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043 ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"		Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003 ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft	Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	254 kN	= 57.07	kips	Cortante actuante en punto de estudio
Mu=	1622 kN-m	= 1197.31	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\; b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0038

θ (29+3500εs) = 42.2°

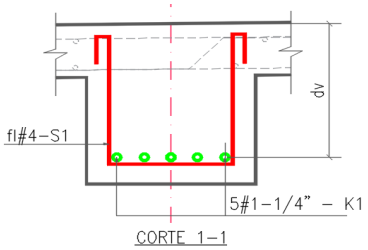
β = 1.3°

Vc=	119 KN	= 26.86	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	450 KN	= 101.51	kips	Resistencia a cortante 2
Vnd =	450 KN	= 101.51	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 10 VGI

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"			Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	201 kN	= 45.11	kips	Cortante actuante en punto de estudio
Mu=	1654 kN-m	= 1220.49	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\; b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0038

θ (29+3500εs) = 42.2°

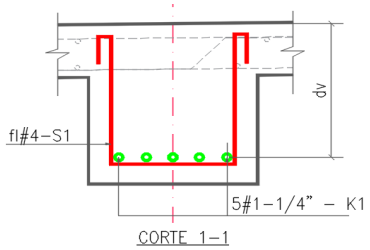
β = 1.3°

Vc=	119 KN	= 26.86	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	450 KN	= 101.51	kips	Resistencia a cortante 2
Vnd =	450 KN	= 101.51	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 11 VGI

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"			Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	0.73 cm2	= 0.001	ft^2	Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	147 kN	= 33.15	kips	Cortante actuante en punto de estudio
Mu=	1654 kN-m	= 1220.50	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0037

θ (29+3500εs) = 42.0°

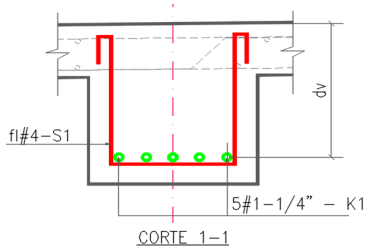
β = 1.3°

Vc=	121 KN	= 27.21	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	452 KN	= 101.87	kips	Resistencia a cortante 2
Vnd =	452 KN	= 101.87	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 12 VGI

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"			Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	94 kN	= 21.20	kips	Cortante actuante en punto de estudio
Mu=	1654 kN-m	= 1220.49	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\; b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0036

θ (29+3500εs) = 41.8°

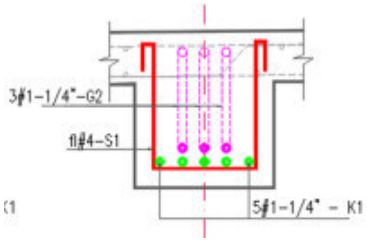
β = 1.3°

Vc=	122 KN	= 27.58	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	454 KN	= 102.23	kips	Resistencia a cortante 2
Vnd =	454 KN	= 102.23	kips	Mínimo entre Vn1 y Vn2

Capacidad a cortante Vn punto 13 VGI

Materiales

f'c=	14 Mpa =	292.396	kips/ft^2	
fy=	420 Mpa =	8771.88	kips/ft^2	
Es=	200000 Mpa =	4177087	kips/ft^2	



Geometría viga

b=	0.52m	= 1.7 ft		
h=	0.71m	= 2.3 ft		
dv=	0.59m	= 1.9 ft		
Ref-prin=	1-1/4"			Diámetro de refuerzo Horizontal
Ash=	39.7cm2	= 0.043	ft^2	Área total de refuerzo Horizontal en el apoyo
Estribos=	1/2"			Diámetro de estribos + Refuerzo inclinado
Asv=	2.5 cm2	= 0.003	ft^2	Área de acero transversal- Estribos
S=	0.19m	= 0.6 ft		Separación entre estribos

Refuerzo mínimo transversal

$$A_v \geq 0.0316 \sqrt{f_c'} \frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.73 cm2 = 0.001 ft^2 Asv>Av-Cumple- Se puede aplicar procedimiento general para cortatnte

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	281 kN	= 63.23	kips	Cortante actuante en punto de estudio
Mu=	1623 kN-m	= 1197.63	kips	Momento actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

Vn= Menor valor entre :

Vn = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0

Vn1 = 0.25*f'c*bv*dv = 1074 kN = 241.4 kips 5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f_c'}\, b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

εs = 0.0038

θ (29+3500εs) = 42.4°

β = 1.2°

Vc=	118 KN	= 26.67	kips	
Vs1=	331 KN	= 74.65	kips	Resistencia estribos
Vn2=	450 KN	= 101.33	kips	Resistencia a cortante 2
Vnd =	450 KN	= 101.33	kips	Mínimo entre Vn1 y Vn2

ANEXO 3

ANEXO 3A- FUERZAS EN VIGA EXTERNA

TABLE: Element Forces - Frames

Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	T	M2	M3	FrameElem	ElemStation
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m	Text	m
1	0	SERV1-1	Combination	Max	0	-188,807	10,58	0	-301,408	3,411E-13	1-1	0
1	0,5915	SERV1-1	Combination	Max	0	-162,823	10,58	0	-301,408	239,9949	1-1	0,5915
1	0	SERV1-1	Combination	Min	0	-431,403	-10,579	0	-622,3652	3,411E-13	1-1	0
1	0,5915	SERV1-1	Combination	Min	0	-380,53	-10,579	0	-619,0448	106,0953	1-1	0,5915
1	0	SERV1-2	Combination	Max	0	-188,807	15,708	0	-301,408	3,411E-13	1-1	0
1	0,5915	SERV1-2	Combination	Max	0	-164,376	15,708	0	-301,408	224,1841	1-1	0,5915
1	0	SERV1-2	Combination	Min	0	-399,739	-15,706	0	-607,8599	3,411E-13	1-1	0
1	0,5915	SERV1-2	Combination	Min	0	-358,637	-15,706	0	-601,1559	106,0953	1-1	0,5915
1	0	RESIST 1-1 M	Combination	Max	0	-266,959	15,834	0	-426,1684	5,684E-13	1-1	0
1	0,5915	RESIST 1-1 M	Combination	Max	0	-229,633	15,834	0	-426,1684	350,4049	1-1	0,5915
1	0	RESIST 1-1 M	Combination	Min	0	-630,029	-15,833	0	-906,513	5,684E-13	1-1	0
1	0,5915	RESIST 1-1 M	Combination	Min	0	-555,452	-15,833	0	-901,5437	150,0108	1-1	0,5915
1	0	RESIST 1-2 M	Combination	Max	0	-266,959	23,508	0	-426,1684	5,684E-13	1-1	0
1	0,5915	RESIST 1-2 M	Combination	Max	0	-231,956	23,508	0	-426,1684	326,7425	1-1	0,5915
1	0	RESIST 1-2 M	Combination	Min	0	-582,64	-23,506	0	-884,8043	5,684E-13	1-1	0
1	0,5915	RESIST 1-2 M	Combination	Min	0	-522,688	-23,506	0	-874,7712	150,0108	1-1	0,5915
1	0	RESIST 1-1 V	Combination	Max	0	-266,959	15,612	0	-426,1684	5,684E-13	1-1	0
1	0,5915	RESIST 1-1 V	Combination	Max	0	-229,782	15,612	0	-426,1684	347,593	1-1	0,5915
1	0	RESIST 1-1 V	Combination	Min	0	-624,934	-15,611	0	-899,7729	5,684E-13	1-1	0
1	0,5915	RESIST 1-1 V	Combination	Min	0	-551,029	-15,611	0	-894,8733	150,0108	1-1	0,5915
1	0	RESIST 1-2 V	Combination	Max	0	-266,959	23,178	0	-426,1684	5,684E-13	1-1	0
1	0,5915	RESIST 1-2 V	Combination	Max	0	-232,072	23,178	0	-426,1684	324,2627	1-1	0,5915
1	0	RESIST 1-2 V	Combination	Min	0	-578,21	-23,176	0	-878,3689	5,684E-13	1-1	0
1	0,5915	RESIST 1-2 V	Combination	Min	0	-518,725	-23,176	0	-868,4765	150,0108	1-1	0,5915
2	0	SERV1-1	Combination	Max	0	-162,823	10,58	0	-301,408	239,9949	2-1	0
2	0,5915	SERV1-1	Combination	Max	0	-136,827	10,58	0	-301,408	450,0243	2-1	0,5915
2	0	SERV1-1	Combination	Min	0	-380,53	-10,579	0	-619,0448	106,0953	2-1	0
2	0,5915	SERV1-1	Combination	Min	0	-345,639	-10,579	0	-615,7244	201,0226	2-1	0,5915
2	0	SERV1-2	Combination	Max	0	-164,376	15,708	0	-301,408	224,1841	2-1	0
2	0,5915	SERV1-2	Combination	Max	0	-139,935	15,708	0	-301,408	424,1565	2-1	0,5915
2	0	SERV1-2	Combination	Min	0	-358,637	-15,706	0	-601,1559	106,0953	2-1	0
2	0,5915	SERV1-2	Combination	Min	0	-328,636	-15,706	0	-594,5031	201,0226	2-1	0,5915
2	0	RESIST 1-1 M	Combination	Max	0	-229,633	15,834	0	-426,1684	350,4049	2-1	0
2	0,5915	RESIST 1-1 M	Combination	Max	0	-192,288	15,834	0	-426,1684	656,8869	2-1	0,5915
2	0	RESIST 1-1 M	Combination	Min	0	-555,452	-15,833	0	-901,5437	150,0108	2-1	0
2	0,5915	RESIST 1-1 M	Combination	Min	0	-504,796	-15,833	0	-896,5743	284,231	2-1	0,5915
2	0	RESIST 1-2 M	Combination	Max	0	-231,956	23,508	0	-426,1684	326,7425	2-1	0
2	0,5915	RESIST 1-2 M	Combination	Max	0	-196,939	23,508	0	-426,1684	618,1732	2-1	0,5915
2	0	RESIST 1-2 M	Combination	Min	0	-522,688	-23,506	0	-874,7712	150,0108	2-1	0
2	0,5915	RESIST 1-2 M	Combination	Min	0	-479,35	-23,506	0	-864,8145	284,231	2-1	0,5915
2	0	RESIST 1-1 V	Combination	Max	0	-229,782	15,612	0	-426,1684	347,593	2-1	0
2	0,5915	RESIST 1-1 V	Combination	Max	0	-192,587	15,612	0	-426,1684	651,6578	2-1	0,5915
2	0	RESIST 1-1 V	Combination	Min	0	-551,029	-15,611	0	-894,8733	150,0108	2-1	0
2	0,5915	RESIST 1-1 V	Combination	Min	0	-500,709	-15,611	0	-889,9737	284,231	2-1	0,5915
2	0	RESIST 1-2 V	Combination	Max	0	-232,072	23,178	0	-426,1684	324,2627	2-1	0
2	0,5915	RESIST 1-2 V	Combination	Max	0	-197,172	23,178	0	-426,1684	613,4874	2-1	0,5915
2	0	RESIST 1-2 V	Combination	Min	0	-518,725	-23,176	0	-868,4765	150,0108	2-1	0
2	0,5915	RESIST 1-2 V	Combination	Min	0	-475,62	-23,176	0	-858,6595	284,231	2-1	0,5915
3	0	SERV1-1	Combination	Max	0	-136,827	10,58	0	-301,408	450,0243	3-1	0
3	0,5915	SERV1-1	Combination	Max	0	-110,832	10,58	0	-301,408	629,9459	3-1	0,5915
3	0	SERV1-1	Combination	Min	0	-345,639	-10,579	0	-615,7244	201,0226	3-1	0
3	0,5915	SERV1-1	Combination	Min	0	-310,748	-10,579	0	-612,4039	284,782	3-1	0,5915
3	0	SERV1-2	Combination	Max	0	-139,935	15,708	0	-301,408	424,1565	3-1	0
3	0,5915	SERV1-2	Combination	Max	0	-110,291	15,708	0	-301,408	599,8061	3-1	0,5915
3	0	SERV1-2	Combination	Min	0	-328,636	-15,706	0	-594,5031	201,0226	3-1	0
3	0,5915	SERV1-2	Combination	Min	0	-298,636	-15,706	0	-587,8502	284,782	3-1	0,5915
3	0	RESIST 1-1 M	Combination	Max	0	-192,288	15,834	0	-426,1684	656,8869	3-1	0
3	0,5915	RESIST 1-1 M	Combination	Max	0	-154,944	15,834	0	-426,1684	919,2328	3-1	0,5915
3	0	RESIST 1-1 M	Combination	Min	0	-504,796	-15,833	0	-896,5743	284,231	3-1	0
3	0,5915	RESIST 1-1 M	Combination	Min	0	-454,139	-15,833	0	-891,605	402,6605	3-1	0,5915
3	0	RESIST 1-2 M	Combination	Max	0	-196,939	23,508	0	-426,1684	618,1732	3-1	0
3	0,5915	RESIST 1-2 M	Combination	Max	0	-154,135	23,508	0	-426,1684	874,1255	3-1	0,5915
3	0	RESIST 1-2 M	Combination	Min	0	-479,35	-23,506	0	-864,8145	284,231	3-1	0
3	0,5915	RESIST 1-2 M	Combination	Min	0	-436,012	-23,506	0	-854,8578	402,6605	3-1	0,5915

3	0	RESIST 1-1 V	Combination	Max	0	-192,587	15,612	0	-426,1684	651,6578	3-1	0
3	0,5915	RESIST 1-1 V	Combination	Max	0	-155,392	15,612	0	-426,1684	911,9844	3-1	0,5915
3	0	RESIST 1-1 V	Combination	Min	0	-500,709	-15,611	0	-889,9737	284,231	3-1	0
3	0,5915	RESIST 1-1 V	Combination	Min	0	-450,389	-15,611	0	-885,0741	402,6605	3-1	0,5915
3	0	RESIST 1-2 V	Combination	Max	0	-197,172	23,178	0	-426,1684	613,4874	3-1	0
3	0,5915	RESIST 1-2 V	Combination	Max	0	-154,595	23,178	0	-426,1684	867,51	3-1	0,5915
3	0	RESIST 1-2 V	Combination	Min	0	-475,62	-23,176	0	-858,6595	284,231	3-1	0
3	0,5915	RESIST 1-2 V	Combination	Min	0	-432,516	-23,176	0	-848,8426	402,6605	3-1	0,5915
4	0	SERV1-1	Combination	Max	0	-110,832	10,58	0	-301,408	629,9459	4-1	0
4	0,5915	SERV1-1	Combination	Max	0	-84,836	10,58	0	-301,408	779,7598	4-1	0,5915
4	0	SERV1-1	Combination	Min	0	-310,748	-10,579	0	-612,4039	284,782	4-1	0
4	0,5915	SERV1-1	Combination	Min	0	-275,858	-10,579	0	-609,0835	357,3735	4-1	0,5915
4	0	SERV1-2	Combination	Max	0	-110,291	15,708	0	-301,408	599,8061	4-1	0
4	0,5915	SERV1-2	Combination	Max	0	-80,291	15,708	0	-301,408	751,1327	4-1	0,5915
4	0	SERV1-2	Combination	Min	0	-298,636	-15,706	0	-587,8502	284,782	4-1	0
4	0,5915	SERV1-2	Combination	Min	0	-268,635	-15,706	0	-582,5163	357,3735	4-1	0,5915
4	0	RESIST 1-1 M	Combination	Max	0	-154,944	15,834	0	-426,1684	919,2328	4-1	0
4	0,5915	RESIST 1-1 M	Combination	Max	0	-117,6	15,834	0	-426,1684	1137,4428	4-1	0,5915
4	0	RESIST 1-1 M	Combination	Min	0	-454,139	-15,833	0	-891,605	402,6605	4-1	0
4	0,5915	RESIST 1-1 M	Combination	Min	0	-403,483	-15,833	0	-886,6356	505,2995	4-1	0,5915
4	0	RESIST 1-2 M	Combination	Max	0	-154,135	23,508	0	-426,1684	874,1255	4-1	0
4	0,5915	RESIST 1-2 M	Combination	Max	0	-110,797	23,508	0	-426,1684	1094,5995	4-1	0,5915
4	0	RESIST 1-2 M	Combination	Min	0	-436,012	-23,506	0	-854,8578	402,6605	4-1	0
4	0,5915	RESIST 1-2 M	Combination	Min	0	-392,674	-23,506	0	-846,8752	505,2995	4-1	0,5915
4	0	RESIST 1-1 V	Combination	Max	0	-155,392	15,612	0	-426,1684	911,9844	4-1	0
4	0,5915	RESIST 1-1 V	Combination	Max	0	-118,197	15,612	0	-426,1684	1128,5727	4-1	0,5915
4	0	RESIST 1-1 V	Combination	Min	0	-450,389	-15,611	0	-885,0741	402,6605	4-1	0
4	0,5915	RESIST 1-1 V	Combination	Min	0	-400,069	-15,611	0	-880,1744	505,2995	4-1	0,5915
4	0	RESIST 1-2 V	Combination	Max	0	-154,595	23,178	0	-426,1684	867,51	4-1	0
4	0,5915	RESIST 1-2 V	Combination	Max	0	-111,49	23,178	0	-426,1684	1086,3306	4-1	0,5915
4	0	RESIST 1-2 V	Combination	Min	0	-432,516	-23,176	0	-848,8426	402,6605	4-1	0
4	0,5915	RESIST 1-2 V	Combination	Min	0	-389,411	-23,176	0	-840,9719	505,2995	4-1	0,5915
5	0	SERV1-1	Combination	Max	0	-84,836	10,58	0	-301,408	779,7598	5-1	0
5	0,5915	SERV1-1	Combination	Max	0	-58,84	10,58	0	-301,408	899,466	5-1	0,5915
5	0	SERV1-1	Combination	Min	0	-275,858	-10,579	0	-609,0835	357,3735	5-1	0
5	0,5915	SERV1-1	Combination	Min	0	-241,924	-10,579	0	-606,175	418,7971	5-1	0,5915
5	0	SERV1-2	Combination	Max	0	-80,291	15,708	0	-301,408	751,1327	5-1	0
5	0,5915	SERV1-2	Combination	Max	0	-50,29	15,708	0	-301,408	878,1365	5-1	0,5915
5	0	SERV1-2	Combination	Min	0	-268,635	-15,706	0	-582,5163	357,3735	5-1	0
5	0,5915	SERV1-2	Combination	Min	0	-238,634	-15,706	0	-577,7469	418,7971	5-1	0,5915
5	0	RESIST 1-1 M	Combination	Max	0	-117,6	15,834	0	-426,1684	1137,4428	5-1	0
5	0,5915	RESIST 1-1 M	Combination	Max	0	-80,256	15,834	0	-426,1684	1311,5169	5-1	0,5915
5	0	RESIST 1-1 M	Combination	Min	0	-403,483	-15,833	0	-886,6356	505,2995	5-1	0
5	0,5915	RESIST 1-1 M	Combination	Min	0	-354,259	-15,833	0	-882,2828	592,1478	5-1	0,5915
5	0	RESIST 1-2 M	Combination	Max	0	-110,797	23,508	0	-426,1684	1094,5995	5-1	0
5	0,5915	RESIST 1-2 M	Combination	Max	0	-67,459	23,508	0	-426,1684	1279,5952	5-1	0,5915
5	0	RESIST 1-2 M	Combination	Min	0	-392,674	-23,506	0	-846,8752	505,2995	5-1	0
5	0,5915	RESIST 1-2 M	Combination	Min	0	-349,335	-23,506	0	-839,7373	592,1478	5-1	0,5915
5	0	RESIST 1-1 V	Combination	Max	0	-118,197	15,612	0	-426,1684	1128,5727	5-1	0
5	0,5915	RESIST 1-1 V	Combination	Max	0	-81,003	15,612	0	-426,1684	1301,4228	5-1	0,5915
5	0	RESIST 1-1 V	Combination	Min	0	-400,069	-15,611	0	-880,1744	505,2995	5-1	0
5	0,5915	RESIST 1-1 V	Combination	Min	0	-351,161	-15,611	0	-875,8827	592,1478	5-1	0,5915
5	0	RESIST 1-2 V	Combination	Max	0	-111,49	23,178	0	-426,1684	1086,3306	5-1	0
5	0,5915	RESIST 1-2 V	Combination	Max	0	-68,386	23,178	0	-426,1684	1269,9491	5-1	0,5915
5	0	RESIST 1-2 V	Combination	Min	0	-389,411	-23,176	0	-840,9719	505,2995	5-1	0
5	0,5915	RESIST 1-2 V	Combination	Min	0	-346,307	-23,176	0	-833,9342	592,1478	5-1	0,5915
6	0	SERV1-1	Combination	Max	0	-58,84	10,58	0	-301,408	899,466	6-1	0
6	0,5915	SERV1-1	Combination	Max	0	-32,845	10,58	0	-301,408	992,4606	6-1	0,5915
6	0	SERV1-1	Combination	Min	0	-241,924	-10,579	0	-606,175	418,7971	6-1	0
6	0,5915	SERV1-1	Combination	Min	0	-208,813	-10,579	0	-603,6606	469,0527	6-1	0,5915
6	0	SERV1-2	Combination	Max	0	-50,29	15,708	0	-301,408	878,1365	6-1	0
6	0,5915	SERV1-2	Combination	Max	0	-20,289	15,708	0	-301,408	980,8174	6-1	0,5915
6	0	SERV1-2	Combination	Min	0	-238,634	-15,706	0	-577,7469	418,7971	6-1	0
6	0,5915	SERV1-2	Combination	Min	0	-208,634	-15,706	0	-573,0848	469,0527	6-1	0,5915
6	0	RESIST 1-1 M	Combination	Max	0	-80,256	15,834	0	-426,1684	1311,5169	6-1	0
6	0,5915	RESIST 1-1 M	Combination	Max	0	-42,912	15,834	0	-426,1684	1446,5378	6-1	0,5915
6	0	RESIST 1-1 M	Combination	Min	0	-354,259	-15,833	0	-882,2828	592,1478	6-1	0
6	0,5915	RESIST 1-1 M	Combination	Min	0	-306,266	-15,833	0	-878,5197	663,2056	6-1	0,5915

6	0	RESIST 1-2 M	Combination	Max	0	-67,459	23,508	0	-426,1684	1279,5952	6-1	0
6	0,5915	RESIST 1-2 M	Combination	Max	0	-24,121	23,508	0	-426,1684	1429,1126	6-1	0,5915
6	0	RESIST 1-2 M	Combination	Min	0	-349,335	-23,506	0	-839,7373	592,1478	6-1	0
6	0,5915	RESIST 1-2 M	Combination	Min	0	-305,997	-23,506	0	-832,76	663,2056	6-1	0,5915
6	0	RESIST 1-1 V	Combination	Max	0	-81,003	15,612	0	-426,1684	1301,4228	6-1	0
6	0,5915	RESIST 1-1 V	Combination	Max	0	-43,808	15,612	0	-426,1684	1435,5462	6-1	0,5915
6	0	RESIST 1-1 V	Combination	Min	0	-351,161	-15,611	0	-875,8827	592,1478	6-1	0
6	0,5915	RESIST 1-1 V	Combination	Min	0	-303,467	-15,611	0	-872,1724	663,2056	6-1	0,5915
6	0	RESIST 1-2 V	Combination	Max	0	-68,386	23,178	0	-426,1684	1269,9491	6-1	0
6	0,5915	RESIST 1-2 V	Combination	Max	0	-25,281	23,178	0	-426,1684	1418,3655	6-1	0,5915
6	0	RESIST 1-2 V	Combination	Min	0	-346,307	-23,176	0	-833,9342	592,1478	6-1	0
6	0,5915	RESIST 1-2 V	Combination	Min	0	-303,202	-23,176	0	-827,0548	663,2056	6-1	0,5915
7	0	SERV1-1	Combination	Max	0	-32,845	10,58	0	-301,408	992,4606	7-1	0
7	0,5915	SERV1-1	Combination	Max	0	-6,849	10,58	0	-301,408	1059,8874	7-1	0,5915
7	0	SERV1-1	Combination	Min	0	-208,813	-10,579	0	-603,6606	469,0527	7-1	0
7	0,5915	SERV1-1	Combination	Min	0	-175,703	-10,579	0	-601,1462	508,1405	7-1	0,5915
7	0	SERV1-2	Combination	Max	0	-20,289	15,708	0	-301,408	980,8174	7-1	0
7	0,5915	SERV1-2	Combination	Max	0	9,711	15,708	0	-301,408	1059,1754	7-1	0,5915
7	0	SERV1-2	Combination	Min	0	-208,634	-15,706	0	-573,0848	469,0527	7-1	0
7	0,5915	SERV1-2	Combination	Min	0	-178,633	-15,706	0	-569,4743	508,1405	7-1	0,5915
7	0	RESIST 1-1 M	Combination	Max	0	-42,912	15,834	0	-426,1684	1446,5378	7-1	0
7	0,5915	RESIST 1-1 M	Combination	Max	0	-5,567	15,834	0	-426,1684	1544,2171	7-1	0,5915
7	0	RESIST 1-1 M	Combination	Min	0	-306,266	-15,833	0	-878,5197	663,2056	7-1	0
7	0,5915	RESIST 1-1 M	Combination	Min	0	-258,274	-15,833	0	-874,7566	718,4727	7-1	0,5915
7	0	RESIST 1-2 M	Combination	Max	0	-24,121	23,508	0	-426,1684	1429,1126	7-1	0
7	0,5915	RESIST 1-2 M	Combination	Max	0	19,217	23,508	0	-426,1684	1543,1516	7-1	0,5915
7	0	RESIST 1-2 M	Combination	Min	0	-305,997	-23,506	0	-832,76	663,2056	7-1	0
7	0,5915	RESIST 1-2 M	Combination	Min	0	-262,659	-23,506	0	-827,3564	718,4727	7-1	0,5915
7	0	RESIST 1-1 V	Combination	Max	0	-43,808	15,612	0	-426,1684	1435,5462	7-1	0
7	0,5915	RESIST 1-1 V	Combination	Max	0	-6,613	15,612	0	-426,1684	1532,6305	7-1	0,5915
7	0	RESIST 1-1 V	Combination	Min	0	-303,467	-15,611	0	-872,1724	663,2056	7-1	0
7	0,5915	RESIST 1-1 V	Combination	Min	0	-255,773	-15,611	0	-868,4621	718,4727	7-1	0,5915
7	0	RESIST 1-2 V	Combination	Max	0	-25,281	23,178	0	-426,1684	1418,3655	7-1	0
7	0,5915	RESIST 1-2 V	Combination	Max	0	17,823	23,178	0	-426,1684	1531,5799	7-1	0,5915
7	0	RESIST 1-2 V	Combination	Min	0	-303,202	-23,176	0	-827,0548	663,2056	7-1	0
7	0,5915	RESIST 1-2 V	Combination	Min	0	-260,098	-23,176	0	-821,727	718,4727	7-1	0,5915
8	0	SERV1-1	Combination	Max	0	-6,849	10,58	0	-301,408	1059,8874	8-1	0
8	0,5915	SERV1-1	Combination	Max	0	24,331	10,58	0	-301,408	1108,5183	8-1	0,5915
8	0	SERV1-1	Combination	Min	0	-175,703	-10,579	0	-601,1462	508,1405	8-1	0
8	0,5915	SERV1-1	Combination	Min	0	-142,592	-10,579	0	-598,7929	536,0603	8-1	0,5915
8	0	SERV1-2	Combination	Max	0	9,711	15,708	0	-301,408	1059,1754	8-1	0
8	0,5915	SERV1-2	Combination	Max	0	39,712	15,708	0	-301,408	1113,2105	8-1	0,5915
8	0	SERV1-2	Combination	Min	0	-178,633	-15,706	0	-569,4743	508,1405	8-1	0
8	0,5915	SERV1-2	Combination	Min	0	-148,632	-15,706	0	-567,0076	536,0603	8-1	0,5915
8	0	RESIST 1-1 M	Combination	Max	0	-5,567	15,834	0	-426,1684	1544,2171	8-1	0
8	0,5915	RESIST 1-1 M	Combination	Max	0	39,536	15,834	0	-426,1684	1614,6899	8-1	0,5915
8	0	RESIST 1-1 M	Combination	Min	0	-258,274	-15,833	0	-874,7566	718,4727	8-1	0
8	0,5915	RESIST 1-1 M	Combination	Min	0	-210,281	-15,833	0	-871,2347	757,9492	8-1	0,5915
8	0	RESIST 1-2 M	Combination	Max	0	19,217	23,508	0	-426,1684	1543,1516	8-1	0
8	0,5915	RESIST 1-2 M	Combination	Max	0	62,555	23,508	0	-426,1684	1621,7123	8-1	0,5915
8	0	RESIST 1-2 M	Combination	Min	0	-262,659	-23,506	0	-827,3564	718,4727	8-1	0
8	0,5915	RESIST 1-2 M	Combination	Min	0	-219,321	-23,506	0	-823,6648	757,9492	8-1	0,5915
8	0	RESIST 1-1 V	Combination	Max	0	-6,613	15,612	0	-426,1684	1532,6305	8-1	0
8	0,5915	RESIST 1-1 V	Combination	Max	0	38,232	15,612	0	-426,1684	1602,6683	8-1	0,5915
8	0	RESIST 1-1 V	Combination	Min	0	-255,773	-15,611	0	-868,4621	718,4727	8-1	0
8	0,5915	RESIST 1-1 V	Combination	Min	0	-208,08	-15,611	0	-864,9896	757,9492	8-1	0,5915
8	0	RESIST 1-2 V	Combination	Max	0	17,823	23,178	0	-426,1684	1531,5799	8-1	0
8	0,5915	RESIST 1-2 V	Combination	Max	0	60,928	23,178	0	-426,1684	1609,5921	8-1	0,5915
8	0	RESIST 1-2 V	Combination	Min	0	-260,098	-23,176	0	-821,727	718,4727	8-1	0
8	0,5915	RESIST 1-2 V	Combination	Min	0	-216,993	-23,176	0	-818,0872	757,9492	8-1	0,5915
9	0	SERV1-1	Combination	Max	0	24,331	10,58	0	-301,408	1108,5183	9-1	0
9	0,5915	SERV1-1	Combination	Max	0	57,442	10,58	0	-301,408	1130,7554	9-1	0,5915
9	0	SERV1-1	Combination	Min	0	-142,592	-10,579	0	-598,7929	536,0603	9-1	0
9	0,5915	SERV1-1	Combination	Min	0	-109,481	-10,579	0	-597,0954	552,8121	9-1	0,5915
9	0	SERV1-2	Combination	Max	0	39,712	15,708	0	-301,408	1113,2105	9-1	0
9	0,5915	SERV1-2	Combination	Max	0	69,713	15,708	0	-301,408	1142,9227	9-1	0,5915
9	0	SERV1-2	Combination	Min	0	-148,632	-15,706	0	-567,0076	536,0603	9-1	0
9	0,5915	SERV1-2	Combination	Min	0	-118,632	-15,706	0	-564,85	552,8121	9-1	0,5915

9	0	RESIST 1-1 M	Combination	Max	0	39,536	15,834	0	-426,1684	1614,6899	9-1	0
9	0,5915	RESIST 1-1 M	Combination	Max	0	87,528	15,834	0	-426,1684	1646,5851	9-1	0,5915
9	0	RESIST 1-1 M	Combination	Min	0	-210,281	-15,833	0	-871,2347	757,9492	9-1	0
9	0,5915	RESIST 1-1 M	Combination	Min	0	-162,289	-15,833	0	-868,6942	781,6352	9-1	0,5915
9	0	RESIST 1-2 M	Combination	Max	0	62,555	23,508	0	-426,1684	1621,7123	9-1	0
9	0,5915	RESIST 1-2 M	Combination	Max	0	105,893	23,508	0	-426,1684	1664,7947	9-1	0,5915
9	0	RESIST 1-2 M	Combination	Min	0	-219,321	-23,506	0	-823,6648	757,9492	9-1	0
9	0,5915	RESIST 1-2 M	Combination	Min	0	-175,983	-23,506	0	-820,4357	781,6352	9-1	0,5915
9	0	RESIST 1-1 V	Combination	Max	0	38,232	15,612	0	-426,1684	1602,6683	9-1	0
9	0,5915	RESIST 1-1 V	Combination	Max	0	85,925	15,612	0	-426,1684	1634,4483	9-1	0,5915
9	0	RESIST 1-1 V	Combination	Min	0	-208,08	-15,611	0	-864,9896	757,9492	9-1	0
9	0,5915	RESIST 1-1 V	Combination	Min	0	-160,386	-15,611	0	-862,4847	781,6352	9-1	0,5915
9	0	RESIST 1-2 V	Combination	Max	0	60,928	23,178	0	-426,1684	1609,5921	9-1	0
9	0,5915	RESIST 1-2 V	Combination	Max	0	104,033	23,178	0	-426,1684	1652,4024	9-1	0,5915
9	0	RESIST 1-2 V	Combination	Min	0	-216,993	-23,176	0	-818,0872	757,9492	9-1	0
9	0,5915	RESIST 1-2 V	Combination	Min	0	-173,888	-23,176	0	-814,9034	781,6352	9-1	0,5915
10	0	SERV1-1	Combination	Max	0	57,442	10,58	0	-301,408	1130,7554	10-1	0
10	0,5915	SERV1-1	Combination	Max	0	90,552	10,58	0	-301,408	1122,8848	10-1	0,5915
10	0	SERV1-1	Combination	Min	0	-109,481	-10,579	0	-597,0954	552,8121	10-1	0
10	0,5915	SERV1-1	Combination	Min	0	-76,37	-10,579	0	-596,3507	558,3961	10-1	0,5915
10	0	SERV1-2	Combination	Max	0	69,713	15,708	0	-301,408	1142,9227	10-1	0
10	0,5915	SERV1-2	Combination	Max	0	99,713	15,708	0	-301,408	1148,3121	10-1	0,5915
10	0	SERV1-2	Combination	Min	0	-118,632	-15,706	0	-564,85	552,8121	10-1	0
10	0,5915	SERV1-2	Combination	Min	0	-88,631	-15,706	0	-564,7723	558,3961	10-1	0,5915
10	0	RESIST 1-1 M	Combination	Max	0	87,528	15,834	0	-426,1684	1646,5851	10-1	0
10	0,5915	RESIST 1-1 M	Combination	Max	0	135,521	15,834	0	-426,1684	1634,3443	10-1	0,5915
10	0	RESIST 1-1 M	Combination	Min	0	-162,289	-15,833	0	-868,6942	781,6352	10-1	0
10	0,5915	RESIST 1-1 M	Combination	Min	0	-114,296	-15,833	0	-867,5796	789,5305	10-1	0,5915
10	0	RESIST 1-2 M	Combination	Max	0	105,893	23,508	0	-426,1684	1664,7947	10-1	0
10	0,5915	RESIST 1-2 M	Combination	Max	0	149,231	23,508	0	-426,1684	1672,3988	10-1	0,5915
10	0	RESIST 1-2 M	Combination	Min	0	-175,983	-23,506	0	-820,4357	781,6352	10-1	0
10	0,5915	RESIST 1-2 M	Combination	Min	0	-132,645	-23,506	0	-820,3195	789,5305	10-1	0,5915
10	0	RESIST 1-1 V	Combination	Max	0	85,925	15,612	0	-426,1684	1634,4483	10-1	0
10	0,5915	RESIST 1-1 V	Combination	Max	0	133,619	15,612	0	-426,1684	1622,49	10-1	0,5915
10	0	RESIST 1-1 V	Combination	Min	0	-160,386	-15,611	0	-862,4847	781,6352	10-1	0
10	0,5915	RESIST 1-1 V	Combination	Min	0	-112,692	-15,611	0	-861,3859	789,5305	10-1	0,5915
10	0	RESIST 1-2 V	Combination	Max	0	104,033	23,178	0	-426,1684	1652,4024	10-1	0
10	0,5915	RESIST 1-2 V	Combination	Max	0	147,137	23,178	0	-426,1684	1660,0105	10-1	0,5915
10	0	RESIST 1-2 V	Combination	Min	0	-173,888	-23,176	0	-814,9034	781,6352	10-1	0
10	0,5915	RESIST 1-2 V	Combination	Min	0	-130,784	-23,176	0	-814,7888	789,5305	10-1	0,5915
11	0	SERV1-1	Combination	Max	0	90,552	10,58	0	-301,408	1122,8848	11-1	0
11	0,5915	SERV1-1	Combination	Max	0	123,663	10,58	0	-301,408	1130,6807	11-1	0,5915
11	0	SERV1-1	Combination	Min	0	-76,37	-10,579	0	-596,3507	558,3961	11-1	0
11	0,5915	SERV1-1	Combination	Min	0	-43,26	-10,579	0	-597,0972	552,8121	11-1	0,5915
11	0	SERV1-2	Combination	Max	0	99,713	15,708	0	-301,408	1148,3121	11-1	0
11	0,5915	SERV1-2	Combination	Max	0	129,714	15,708	0	-301,408	1142,8338	11-1	0,5915
11	0	SERV1-2	Combination	Min	0	-88,631	-15,706	0	-564,7723	558,3961	11-1	0
11	0,5915	SERV1-2	Combination	Min	0	-58,63	-15,706	0	-564,8422	552,8121	11-1	0,5915
11	0	RESIST 1-1 M	Combination	Max	0	135,521	15,834	0	-426,1684	1634,3443	11-1	0
11	0,5915	RESIST 1-1 M	Combination	Max	0	183,513	15,834	0	-426,1684	1646,4733	11-1	0,5915
11	0	RESIST 1-1 M	Combination	Min	0	-114,296	-15,833	0	-867,5796	789,5305	11-1	0
11	0,5915	RESIST 1-1 M	Combination	Min	0	-66,304	-15,833	0	-868,6969	781,6352	11-1	0,5915
11	0	RESIST 1-2 M	Combination	Max	0	149,231	23,508	0	-426,1684	1672,3988	11-1	0
11	0,5915	RESIST 1-2 M	Combination	Max	0	192,569	23,508	0	-426,1684	1664,6615	11-1	0,5915
11	0	RESIST 1-2 M	Combination	Min	0	-132,645	-23,506	0	-820,3195	789,5305	11-1	0
11	0,5915	RESIST 1-2 M	Combination	Min	0	-89,307	-23,506	0	-820,4241	781,6352	11-1	0,5915
11	0	RESIST 1-1 V	Combination	Max	0	133,619	15,612	0	-426,1684	1622,49	11-1	0
11	0,5915	RESIST 1-1 V	Combination	Max	0	181,313	15,612	0	-426,1684	1634,3381	11-1	0,5915
11	0	RESIST 1-1 V	Combination	Min	0	-112,692	-15,611	0	-861,3859	789,5305	11-1	0
11	0,5915	RESIST 1-1 V	Combination	Min	0	-64,999	-15,611	0	-862,4874	781,6352	11-1	0,5915
11	0	RESIST 1-2 V	Combination	Max	0	147,137	23,178	0	-426,1684	1660,0105	11-1	0
11	0,5915	RESIST 1-2 V	Combination	Max	0	190,242	23,178	0	-426,1684	1652,2711	11-1	0,5915
11	0	RESIST 1-2 V	Combination	Min	0	-130,784	-23,176	0	-814,7888	789,5305	11-1	0
11	0,5915	RESIST 1-2 V	Combination	Min	0	-87,679	-23,176	0	-814,892	781,6352	11-1	0,5915
12	0	SERV1-1	Combination	Max	0	123,663	10,58	0	-301,408	1130,6807	12-1	0
12	0,5915	SERV1-1	Combination	Max	0	156,774	10,58	0	-301,408	1108,4756	12-1	0,5915
12	0	SERV1-1	Combination	Min	0	-43,26	-10,579	0	-597,0972	552,8121	12-1	0
12	0,5915	SERV1-1	Combination	Min	0	-12,056	-10,579	0	-598,79	536,0603	12-1	0,5915

12	0	SERV1-2	Combination	Max	0	129,714	15,708	0	-301,408	1142,8338	12-1	0
12	0,5915	SERV1-2	Combination	Max	0	159,715	15,708	0	-301,408	1113,1438	12-1	0,5915
12	0	SERV1-2	Combination	Min	0	-58,63	-15,706	0	-564,8422	552,8121	12-1	0
12	0,5915	SERV1-2	Combination	Min	0	-28,63	-15,706	0	-567,0089	536,0603	12-1	0,5915
12	0	RESIST 1-1 M	Combination	Max	0	183,513	15,834	0	-426,1684	1646,4733	12-1	0
12	0,5915	RESIST 1-1 M	Combination	Max	0	231,506	15,834	0	-426,1684	1614,6261	12-1	0,5915
12	0	RESIST 1-1 M	Combination	Min	0	-66,304	-15,833	0	-868,6969	781,6352	12-1	0
12	0,5915	RESIST 1-1 M	Combination	Min	0	-21,164	-15,833	0	-871,2304	757,9492	12-1	0,5915
12	0	RESIST 1-2 M	Combination	Max	0	192,569	23,508	0	-426,1684	1664,6615	12-1	0
12	0,5915	RESIST 1-2 M	Combination	Max	0	235,907	23,508	0	-426,1684	1621,6124	12-1	0,5915
12	0	RESIST 1-2 M	Combination	Min	0	-89,307	-23,506	0	-820,4241	781,6352	12-1	0
12	0,5915	RESIST 1-2 M	Combination	Min	0	-45,969	-23,506	0	-823,6667	757,9492	12-1	0,5915
12	0	RESIST 1-1 V	Combination	Max	0	181,313	15,612	0	-426,1684	1634,3381	12-1	0
12	0,5915	RESIST 1-1 V	Combination	Max	0	229,006	15,612	0	-426,1684	1602,6054	12-1	0,5915
12	0	RESIST 1-1 V	Combination	Min	0	-64,999	-15,611	0	-862,4874	781,6352	12-1	0
12	0,5915	RESIST 1-1 V	Combination	Min	0	-20,118	-15,611	0	-864,9853	757,9492	12-1	0,5915
12	0	RESIST 1-2 V	Combination	Max	0	190,242	23,178	0	-426,1684	1652,2711	12-1	0
12	0,5915	RESIST 1-2 V	Combination	Max	0	233,346	23,178	0	-426,1684	1609,4937	12-1	0,5915
12	0	RESIST 1-2 V	Combination	Min	0	-87,679	-23,176	0	-814,892	781,6352	12-1	0
12	0,5915	RESIST 1-2 V	Combination	Min	0	-44,575	-23,176	0	-818,0891	757,9492	12-1	0,5915
13	0	SERV1-1	Combination	Max	0	156,774	10,58	0	-301,408	1108,4756	13-1	0
13	0,5915	SERV1-1	Combination	Max	0	189,884	10,58	0	-301,408	1059,8304	13-1	0,5915
13	0	SERV1-1	Combination	Min	0	-12,056	-10,579	0	-598,79	536,0603	13-1	0
13	0,5915	SERV1-1	Combination	Min	0	13,94	-10,579	0	-601,1465	508,1405	13-1	0,5915
13	0	SERV1-2	Combination	Max	0	159,715	15,708	0	-301,408	1113,1438	13-1	0
13	0,5915	SERV1-2	Combination	Max	0	189,715	15,708	0	-301,408	1059,1309	13-1	0,5915
13	0	SERV1-2	Combination	Min	0	-28,63	-15,706	0	-567,0089	536,0603	13-1	0
13	0,5915	SERV1-2	Combination	Min	0	1,371	-15,706	0	-569,4687	508,1405	13-1	0,5915
13	0	RESIST 1-1 M	Combination	Max	0	231,506	15,834	0	-426,1684	1614,6261	13-1	0
13	0,5915	RESIST 1-1 M	Combination	Max	0	279,498	15,834	0	-426,1684	1544,132	13-1	0,5915
13	0	RESIST 1-1 M	Combination	Min	0	-21,164	-15,833	0	-871,2304	757,9492	13-1	0
13	0,5915	RESIST 1-1 M	Combination	Min	0	16,18	-15,833	0	-874,7571	718,4727	13-1	0,5915
13	0	RESIST 1-2 M	Combination	Max	0	235,907	23,508	0	-426,1684	1621,6124	13-1	0
13	0,5915	RESIST 1-2 M	Combination	Max	0	279,245	23,508	0	-426,1684	1543,085	13-1	0,5915
13	0	RESIST 1-2 M	Combination	Min	0	-45,969	-23,506	0	-823,6667	757,9492	13-1	0
13	0,5915	RESIST 1-2 M	Combination	Min	0	-2,631	-23,506	0	-827,348	718,4727	13-1	0,5915
13	0	RESIST 1-1 V	Combination	Max	0	229,006	15,612	0	-426,1684	1602,6054	13-1	0
13	0,5915	RESIST 1-1 V	Combination	Max	0	276,7	15,612	0	-426,1684	1532,5465	13-1	0,5915
13	0	RESIST 1-1 V	Combination	Min	0	-20,118	-15,611	0	-864,9853	757,9492	13-1	0
13	0,5915	RESIST 1-1 V	Combination	Min	0	17,077	-15,611	0	-868,4626	718,4727	13-1	0,5915
13	0	RESIST 1-2 V	Combination	Max	0	233,346	23,178	0	-426,1684	1609,4937	13-1	0
13	0,5915	RESIST 1-2 V	Combination	Max	0	276,451	23,178	0	-426,1684	1531,5142	13-1	0,5915
13	0	RESIST 1-2 V	Combination	Min	0	-44,575	-23,176	0	-818,0891	757,9492	13-1	0
13	0,5915	RESIST 1-2 V	Combination	Min	0	-1,47	-23,176	0	-821,7188	718,4727	13-1	0,5915
14	0	SERV1-1	Combination	Max	0	189,884	10,58	0	-301,408	1059,8304	14-1	0
14	0,5915	SERV1-1	Combination	Max	0	222,995	10,58	0	-301,408	992,4321	14-1	0,5915
14	0	SERV1-1	Combination	Min	0	13,94	-10,579	0	-601,1465	508,1405	14-1	0
14	0,5915	SERV1-1	Combination	Min	0	39,936	-10,579	0	-603,6573	469,0527	14-1	0,5915
14	0	SERV1-2	Combination	Max	0	189,715	15,708	0	-301,408	1059,1309	14-1	0
14	0,5915	SERV1-2	Combination	Max	0	219,716	15,708	0	-301,408	980,7951	14-1	0,5915
14	0	SERV1-2	Combination	Min	0	1,371	-15,706	0	-569,4687	508,1405	14-1	0
14	0,5915	SERV1-2	Combination	Min	0	31,372	-15,706	0	-573,091	469,0527	14-1	0,5915
14	0	RESIST 1-1 M	Combination	Max	0	279,498	15,834	0	-426,1684	1544,132	14-1	0
14	0,5915	RESIST 1-1 M	Combination	Max	0	327,491	15,834	0	-426,1684	1446,4952	14-1	0,5915
14	0	RESIST 1-1 M	Combination	Min	0	16,18	-15,833	0	-874,7571	718,4727	14-1	0
14	0,5915	RESIST 1-1 M	Combination	Min	0	53,524	-15,833	0	-878,5147	663,2056	14-1	0,5915
14	0	RESIST 1-2 M	Combination	Max	0	279,245	23,508	0	-426,1684	1543,085	14-1	0
14	0,5915	RESIST 1-2 M	Combination	Max	0	322,583	23,508	0	-426,1684	1429,0793	14-1	0,5915
14	0	RESIST 1-2 M	Combination	Min	0	-2,631	-23,506	0	-827,348	718,4727	14-1	0
14	0,5915	RESIST 1-2 M	Combination	Min	0	40,707	-23,506	0	-832,7692	663,2056	14-1	0,5915
14	0	RESIST 1-1 V	Combination	Max	0	276,7	15,612	0	-426,1684	1532,5465	14-1	0
14	0,5915	RESIST 1-1 V	Combination	Max	0	324,394	15,612	0	-426,1684	1435,5042	14-1	0,5915
14	0	RESIST 1-1 V	Combination	Min	0	17,077	-15,611	0	-868,4626	718,4727	14-1	0
14	0,5915	RESIST 1-1 V	Combination	Min	0	54,271	-15,611	0	-872,1675	663,2056	14-1	0,5915
14	0	RESIST 1-2 V	Combination	Max	0	276,451	23,178	0	-426,1684	1531,5142	14-1	0
14	0,5915	RESIST 1-2 V	Combination	Max	0	319,555	23,178	0	-426,1684	1418,3327	14-1	0,5915
14	0	RESIST 1-2 V	Combination	Min	0	-1,47	-23,176	0	-821,7188	718,4727	14-1	0
14	0,5915	RESIST 1-2 V	Combination	Min	0	41,634	-23,176	0	-827,0638	663,2056	14-1	0,5915

15	0	SERV1-1	Combination	Max	0	222,995	10,58	0	-301,408	992,4321	15-1	0
15	0,5915	SERV1-1	Combination	Max	0	256,923	10,58	0	-301,408	899,4482	15-1	0,5915
15	0	SERV1-1	Combination	Min	0	39,936	-10,579	0	-603,6573	469,0527	15-1	0
15	0,5915	SERV1-1	Combination	Min	0	65,931	-10,579	0	-606,1681	418,7971	15-1	0,5915
15	0	SERV1-2	Combination	Max	0	219,716	15,708	0	-301,408	980,7951	15-1	0
15	0,5915	SERV1-2	Combination	Max	0	249,717	15,708	0	-301,408	878,1365	15-1	0,5915
15	0	SERV1-2	Combination	Min	0	31,372	-15,706	0	-573,091	469,0527	15-1	0
15	0,5915	SERV1-2	Combination	Min	0	61,372	-15,706	0	-577,7457	418,7971	15-1	0,5915
15	0	RESIST 1-1 M	Combination	Max	0	327,491	15,834	0	-426,1684	1446,4952	15-1	0
15	0,5915	RESIST 1-1 M	Combination	Max	0	376,706	15,834	0	-426,1684	1311,4902	15-1	0,5915
15	0	RESIST 1-1 M	Combination	Min	0	53,524	-15,833	0	-878,5147	663,2056	15-1	0
15	0,5915	RESIST 1-1 M	Combination	Min	0	90,868	-15,833	0	-882,2724	592,1478	15-1	0,5915
15	0	RESIST 1-2 M	Combination	Max	0	322,583	23,508	0	-426,1684	1429,0793	15-1	0
15	0,5915	RESIST 1-2 M	Combination	Max	0	365,921	23,508	0	-426,1684	1279,5952	15-1	0,5915
15	0	RESIST 1-2 M	Combination	Min	0	40,707	-23,506	0	-832,7692	663,2056	15-1	0
15	0,5915	RESIST 1-2 M	Combination	Min	0	84,045	-23,506	0	-839,7355	592,1478	15-1	0,5915
15	0	RESIST 1-1 V	Combination	Max	0	324,394	15,612	0	-426,1684	1435,5042	15-1	0
15	0,5915	RESIST 1-1 V	Combination	Max	0	373,293	15,612	0	-426,1684	1301,3966	15-1	0,5915
15	0	RESIST 1-1 V	Combination	Min	0	54,271	-15,611	0	-872,1675	663,2056	15-1	0
15	0,5915	RESIST 1-1 V	Combination	Min	0	91,466	-15,611	0	-875,8724	592,1478	15-1	0,5915
15	0	RESIST 1-2 V	Combination	Max	0	319,555	23,178	0	-426,1684	1418,3327	15-1	0
15	0,5915	RESIST 1-2 V	Combination	Max	0	362,66	23,178	0	-426,1684	1269,9491	15-1	0,5915
15	0	RESIST 1-2 V	Combination	Min	0	41,634	-23,176	0	-827,0638	663,2056	15-1	0
15	0,5915	RESIST 1-2 V	Combination	Min	0	84,739	-23,176	0	-833,9324	592,1478	15-1	0,5915
16	0	SERV1-1	Combination	Max	0	256,923	10,58	0	-301,408	899,4482	16-1	0
16	0,5915	SERV1-1	Combination	Max	0	291,813	10,58	0	-301,408	779,774	16-1	0,5915
16	0	SERV1-1	Combination	Min	0	65,931	-10,579	0	-606,1681	418,7971	16-1	0
16	0,5915	SERV1-1	Combination	Min	0	91,927	-10,579	0	-609,0947	357,3735	16-1	0,5915
16	0	SERV1-2	Combination	Max	0	249,717	15,708	0	-301,408	878,1365	16-1	0
16	0,5915	SERV1-2	Combination	Max	0	279,717	15,708	0	-301,408	751,155	16-1	0,5915
16	0	SERV1-2	Combination	Min	0	61,372	-15,706	0	-577,7457	418,7971	16-1	0
16	0,5915	SERV1-2	Combination	Min	0	91,373	-15,706	0	-582,5093	357,3735	16-1	0,5915
16	0	RESIST 1-1 M	Combination	Max	0	376,706	15,834	0	-426,1684	1311,4902	16-1	0
16	0,5915	RESIST 1-1 M	Combination	Max	0	427,362	15,834	0	-426,1684	1137,4641	16-1	0,5915
16	0	RESIST 1-1 M	Combination	Min	0	90,868	-15,833	0	-882,2724	592,1478	16-1	0
16	0,5915	RESIST 1-1 M	Combination	Min	0	128,212	-15,833	0	-886,6523	505,2995	16-1	0,5915
16	0	RESIST 1-2 M	Combination	Max	0	365,921	23,508	0	-426,1684	1279,5952	16-1	0
16	0,5915	RESIST 1-2 M	Combination	Max	0	409,259	23,508	0	-426,1684	1094,6328	16-1	0,5915
16	0	RESIST 1-2 M	Combination	Min	0	84,045	-23,506	0	-839,7355	592,1478	16-1	0
16	0,5915	RESIST 1-2 M	Combination	Min	0	127,383	-23,506	0	-846,8647	505,2995	16-1	0,5915
16	0	RESIST 1-1 V	Combination	Max	0	373,293	15,612	0	-426,1684	1301,3966	16-1	0
16	0,5915	RESIST 1-1 V	Combination	Max	0	423,613	15,612	0	-426,1684	1128,5937	16-1	0,5915
16	0	RESIST 1-1 V	Combination	Min	0	91,466	-15,611	0	-875,8724	592,1478	16-1	0
16	0,5915	RESIST 1-1 V	Combination	Min	0	128,661	-15,611	0	-880,1909	505,2995	16-1	0,5915
16	0	RESIST 1-2 V	Combination	Max	0	362,66	23,178	0	-426,1684	1269,9491	16-1	0
16	0,5915	RESIST 1-2 V	Combination	Max	0	405,764	23,178	0	-426,1684	1086,3634	16-1	0,5915
16	0	RESIST 1-2 V	Combination	Min	0	84,739	-23,176	0	-833,9324	592,1478	16-1	0
16	0,5915	RESIST 1-2 V	Combination	Min	0	127,843	-23,176	0	-840,9616	505,2995	16-1	0,5915
17	0	SERV1-1	Combination	Max	0	291,813	10,58	0	-301,408	779,774	17-1	0
17	0,5915	SERV1-1	Combination	Max	0	326,704	10,58	0	-301,408	629,9922	17-1	0,5915
17	0	SERV1-1	Combination	Min	0	91,927	-10,579	0	-609,0947	357,3735	17-1	0
17	0,5915	SERV1-1	Combination	Min	0	117,923	-10,579	0	-612,412	284,782	17-1	0,5915
17	0	SERV1-2	Combination	Max	0	279,717	15,708	0	-301,408	751,155	17-1	0
17	0,5915	SERV1-2	Combination	Max	0	309,718	15,708	0	-301,408	599,8505	17-1	0,5915
17	0	SERV1-2	Combination	Min	0	91,373	-15,706	0	-582,5093	357,3735	17-1	0
17	0,5915	SERV1-2	Combination	Min	0	121,035	-15,706	0	-587,8613	284,782	17-1	0,5915
17	0	RESIST 1-1 M	Combination	Max	0	427,362	15,834	0	-426,1684	1137,4641	17-1	0
17	0,5915	RESIST 1-1 M	Combination	Max	0	478,019	15,834	0	-426,1684	919,302	17-1	0,5915
17	0	RESIST 1-1 M	Combination	Min	0	128,212	-15,833	0	-886,6523	505,2995	17-1	0
17	0,5915	RESIST 1-1 M	Combination	Min	0	165,556	-15,833	0	-891,617	402,6605	17-1	0,5915
17	0	RESIST 1-2 M	Combination	Max	0	409,259	23,508	0	-426,1684	1094,6328	17-1	0
17	0,5915	RESIST 1-2 M	Combination	Max	0	452,598	23,508	0	-426,1684	874,1921	17-1	0,5915
17	0	RESIST 1-2 M	Combination	Min	0	127,383	-23,506	0	-846,8647	505,2995	17-1	0
17	0,5915	RESIST 1-2 M	Combination	Min	0	170,215	-23,506	0	-854,8744	402,6605	17-1	0,5915
17	0	RESIST 1-1 V	Combination	Max	0	423,613	15,612	0	-426,1684	1128,5937	17-1	0
17	0,5915	RESIST 1-1 V	Combination	Max	0	473,933	15,612	0	-426,1684	912,0526	17-1	0,5915
17	0	RESIST 1-1 V	Combination	Min	0	128,661	-15,611	0	-880,1909	505,2995	17-1	0
17	0,5915	RESIST 1-1 V	Combination	Min	0	165,856	-15,611	0	-885,0859	402,6605	17-1	0,5915

17	0	RESIST 1-2 V	Combination	Max	0	405,764	23,178	0	-426,1684	1086,3634	17-1	0
17	0,5915	RESIST 1-2 V	Combination	Max	0	448,869	23,178	0	-426,1684	867,5756	17-1	0,5915
17	0	RESIST 1-2 V	Combination	Min	0	127,843	-23,176	0	-840,9616	505,2995	17-1	0
17	0,5915	RESIST 1-2 V	Combination	Min	0	170,449	-23,176	0	-848,8589	402,6605	17-1	0,5915
18	0	SERV1-1	Combination	Max	0	326,704	10,58	0	-301,408	629,9922	18-1	0
18	0,5915	SERV1-1	Combination	Max	0	361,595	10,58	0	-301,408	450,1025	18-1	0,5915
18	0	SERV1-1	Combination	Min	0	117,923	-10,579	0	-612,412	284,782	18-1	0
18	0,5915	SERV1-1	Combination	Min	0	143,918	-10,579	0	-615,7293	201,0226	18-1	0,5915
18	0	SERV1-2	Combination	Max	0	309,718	15,708	0	-301,408	599,8505	18-1	0
18	0,5915	SERV1-2	Combination	Max	0	339,719	15,708	0	-301,408	424,2232	18-1	0,5915
18	0	SERV1-2	Combination	Min	0	121,035	-15,706	0	-587,8613	284,782	18-1	0
18	0,5915	SERV1-2	Combination	Min	0	145,476	-15,706	0	-594,5081	201,0226	18-1	0,5915
18	0	RESIST 1-1 M	Combination	Max	0	478,019	15,834	0	-426,1684	919,302	18-1	0
18	0,5915	RESIST 1-1 M	Combination	Max	0	528,675	15,834	0	-426,1684	657,004	18-1	0,5915
18	0	RESIST 1-1 M	Combination	Min	0	165,556	-15,833	0	-891,617	402,6605	18-1	0
18	0,5915	RESIST 1-1 M	Combination	Min	0	202,901	-15,833	0	-896,5817	284,231	18-1	0,5915
18	0	RESIST 1-2 M	Combination	Max	0	452,598	23,508	0	-426,1684	874,1921	18-1	0
18	0,5915	RESIST 1-2 M	Combination	Max	0	495,936	23,508	0	-426,1684	618,273	18-1	0,5915
18	0	RESIST 1-2 M	Combination	Min	0	170,215	-23,506	0	-854,8744	402,6605	18-1	0
18	0,5915	RESIST 1-2 M	Combination	Min	0	205,232	-23,506	0	-864,8221	284,231	18-1	0,5915
18	0	RESIST 1-1 V	Combination	Max	0	473,933	15,612	0	-426,1684	912,0526	18-1	0
18	0,5915	RESIST 1-1 V	Combination	Max	0	524,254	15,612	0	-426,1684	651,7733	18-1	0,5915
18	0	RESIST 1-1 V	Combination	Min	0	165,856	-15,611	0	-885,0859	402,6605	18-1	0
18	0,5915	RESIST 1-1 V	Combination	Min	0	203,05	-15,611	0	-889,9809	284,231	18-1	0,5915
18	0	RESIST 1-2 V	Combination	Max	0	448,869	23,178	0	-426,1684	867,5756	18-1	0
18	0,5915	RESIST 1-2 V	Combination	Max	0	491,973	23,178	0	-426,1684	613,5858	18-1	0,5915
18	0	RESIST 1-2 V	Combination	Min	0	170,449	-23,176	0	-848,8589	402,6605	18-1	0
18	0,5915	RESIST 1-2 V	Combination	Min	0	205,349	-23,176	0	-858,667	284,231	18-1	0,5915
19	0	SERV1-1	Combination	Max	0	361,595	10,58	0	-301,408	450,1025	19-1	0
19	0,5915	SERV1-1	Combination	Max	0	396,486	10,58	0	-301,408	240,1051	19-1	0,5915
19	0	SERV1-1	Combination	Min	0	143,918	-10,579	0	-615,7293	201,0226	19-1	0
19	0,5915	SERV1-1	Combination	Min	0	169,926	-10,579	0	-619,0466	106,0953	19-1	0,5915
19	0	SERV1-2	Combination	Max	0	339,719	15,708	0	-301,408	424,2232	19-1	0
19	0,5915	SERV1-2	Combination	Max	0	369,72	15,708	0	-301,408	224,2731	19-1	0,5915
19	0	SERV1-2	Combination	Min	0	145,476	-15,706	0	-594,5081	201,0226	19-1	0
19	0,5915	SERV1-2	Combination	Min	0	169,926	-15,706	0	-601,1549	106,0953	19-1	0,5915
19	0	RESIST 1-1 M	Combination	Max	0	528,675	15,834	0	-426,1684	657,004	19-1	0
19	0,5915	RESIST 1-1 M	Combination	Max	0	579,332	15,834	0	-426,1684	350,57	19-1	0,5915
19	0	RESIST 1-1 M	Combination	Min	0	202,901	-15,833	0	-896,5817	284,231	19-1	0
19	0,5915	RESIST 1-1 M	Combination	Min	0	240,263	-15,833	0	-901,5463	150,0108	19-1	0,5915
19	0	RESIST 1-2 M	Combination	Max	0	495,936	23,508	0	-426,1684	618,273	19-1	0
19	0,5915	RESIST 1-2 M	Combination	Max	0	539,274	23,508	0	-426,1684	326,8757	19-1	0,5915
19	0	RESIST 1-2 M	Combination	Min	0	205,232	-23,506	0	-864,8221	284,231	19-1	0
19	0,5915	RESIST 1-2 M	Combination	Min	0	240,263	-23,506	0	-874,7697	150,0108	19-1	0,5915
19	0	RESIST 1-1 V	Combination	Max	0	524,254	15,612	0	-426,1684	651,7733	19-1	0
19	0,5915	RESIST 1-1 V	Combination	Max	0	574,574	15,612	0	-426,1684	347,7558	19-1	0,5915
19	0	RESIST 1-1 V	Combination	Min	0	203,05	-15,611	0	-889,9809	284,231	19-1	0
19	0,5915	RESIST 1-1 V	Combination	Min	0	240,263	-15,611	0	-894,8759	150,0108	19-1	0,5915
19	0	RESIST 1-2 V	Combination	Max	0	491,973	23,178	0	-426,1684	613,5858	19-1	0
19	0,5915	RESIST 1-2 V	Combination	Max	0	535,078	23,178	0	-426,1684	324,394	19-1	0,5915
19	0	RESIST 1-2 V	Combination	Min	0	205,349	-23,176	0	-858,667	284,231	19-1	0
19	0,5915	RESIST 1-2 V	Combination	Min	0	240,263	-23,176	0	-868,475	150,0108	19-1	0,5915
20	0	SERV1-1	Combination	Max	0	396,486	10,58	0	-301,408	240,1051	20-1	0
20	0,5915	SERV1-1	Combination	Max	0	431,403	10,58	0	-301,408	-8,853E-13	20-1	0,5915
20	0	SERV1-1	Combination	Min	0	169,926	-10,579	0	-619,0466	106,0953	20-1	0
20	0,5915	SERV1-1	Combination	Min	0	188,807	-10,579	0	-622,3639	-8,853E-13	20-1	0,5915
20	0	SERV1-2	Combination	Max	0	369,72	15,708	0	-301,408	224,2731	20-1	0
20	0,5915	SERV1-2	Combination	Max	0	399,739	15,708	0	-301,408	-8,853E-13	20-1	0,5915
20	0	SERV1-2	Combination	Min	0	169,926	-15,706	0	-601,1549	106,0953	20-1	0
20	0,5915	SERV1-2	Combination	Min	0	188,807	-15,706	0	-607,8549	-8,853E-13	20-1	0,5915
20	0	RESIST 1-1 M	Combination	Max	0	579,332	15,834	0	-426,1684	350,57	20-1	0
20	0,5915	RESIST 1-1 M	Combination	Max	0	630,029	15,834	0	-426,1684	-1,416E-12	20-1	0,5915
20	0	RESIST 1-1 M	Combination	Min	0	240,263	-15,833	0	-901,5463	150,0108	20-1	0
20	0,5915	RESIST 1-1 M	Combination	Min	0	266,959	-15,833	0	-906,511	-1,416E-12	20-1	0,5915
20	0	RESIST 1-2 M	Combination	Max	0	539,274	23,508	0	-426,1684	326,8757	20-1	0
20	0,5915	RESIST 1-2 M	Combination	Max	0	582,64	23,508	0	-426,1684	-1,416E-12	20-1	0,5915
20	0	RESIST 1-2 M	Combination	Min	0	240,263	-23,506	0	-874,7697	150,0108	20-1	0
20	0,5915	RESIST 1-2 M	Combination	Min	0	266,959	-23,506	0	-884,7969	-1,416E-12	20-1	0,5915

20	0	RESIST 1-1 V	Combination	Max	0	574,574	15,612	0	-426,1684	347,7558	20-1	0
20	0,5915	RESIST 1-1 V	Combination	Max	0	624,934	15,612	0	-426,1684	-1,416E-12	20-1	0,5915
20	0	RESIST 1-1 V	Combination	Min	0	240,263	-15,611	0	-894,8759	150,0108	20-1	0
20	0,5915	RESIST 1-1 V	Combination	Min	0	266,959	-15,611	0	-899,7709	-1,416E-12	20-1	0,5915
20	0	RESIST 1-2 V	Combination	Max	0	535,078	23,178	0	-426,1684	324,394	20-1	0
20	0,5915	RESIST 1-2 V	Combination	Max	0	578,21	23,178	0	-426,1684	-1,416E-12	20-1	0,5915
20	0	RESIST 1-2 V	Combination	Min	0	240,263	-23,176	0	-868,475	150,0108	20-1	0
20	0,5915	RESIST 1-2 V	Combination	Min	0	266,959	-23,176	0	-878,3615	-1,416E-12	20-1	0,5915

ANEXO 3B - FUERZAS EN VIGA INTERNA

TABLE: Element Forces - Frames

Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	T	M2	M3	FrameElem	ElemStation
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m	Text	m
1	0	SERV1-1	Combination	Max	0	-179,047	0	0	0	2,274E-13	1-1	0
1	0,5905	SERV1-1	Combination	Max	0	-154,07	0	0	0	234,2651	1-1	0,5905
1	0,5905	SERV1-1	Combination	Max	0	-154,07	0	0	0	234,2651	1-1	0,5905
1	0,5915	SERV1-1	Combination	Max	0	-154,039	0	0	0	234,5106	1-1	0,5915
1	0	SERV1-1	Combination	Min	0	-421,643	0	0	0	2,274E-13	1-1	0
1	0,5905	SERV1-1	Combination	Min	0	-387,786	0	0	0	100,4499	1-1	0,5905
1	0,5905	SERV1-1	Combination	Min	0	-387,786	0	0	0	100,4499	1-1	0,5905
1	0,5915	SERV1-1	Combination	Min	0	-371,746	0	0	0	100,611	1-1	0,5915
1	0	SERV1-2	Combination	Max	0	-179,047	0	0	0	2,274E-13	1-1	0
1	0,5905	SERV1-2	Combination	Max	0	-155,622	0	0	0	218,4501	1-1	0,5905
1	0,5905	SERV1-2	Combination	Max	0	-155,622	0	0	0	218,4501	1-1	0,5905
1	0,5915	SERV1-2	Combination	Max	0	-155,592	0	0	0	218,6999	1-1	0,5915
1	0	SERV1-2	Combination	Min	0	-389,979	0	0	0	2,274E-13	1-1	0
1	0,5905	SERV1-2	Combination	Min	0	-361,004	0	0	0	100,4499	1-1	0,5905
1	0,5905	SERV1-2	Combination	Min	0	-361,004	0	0	0	100,4499	1-1	0,5905
1	0,5915	SERV1-2	Combination	Min	0	-349,853	0	0	0	100,611	1-1	0,5915
1	0	RESIST 1-1 M	Combination	Max	0	-257,081	0	0	0	3,411E-13	1-1	0
1	0,5905	RESIST 1-1 M	Combination	Max	0	-220,343	0	0	0	352,8467	1-1	0,5905
1	0,5905	RESIST 1-1 M	Combination	Max	0	-220,343	0	0	0	352,8467	1-1	0,5905
1	0,5915	RESIST 1-1 M	Combination	Max	0	-220,299	0	0	0	353,2095	1-1	0,5915
1	0	RESIST 1-1 M	Combination	Min	0	-635,289	0	0	0	3,411E-13	1-1	0
1	0,5905	RESIST 1-1 M	Combination	Min	0	-584,707	0	0	0	144,2287	1-1	0,5905
1	0,5905	RESIST 1-1 M	Combination	Min	0	-584,707	0	0	0	144,2287	1-1	0,5905
1	0,5915	RESIST 1-1 M	Combination	Min	0	-559,704	0	0	0	144,4601	1-1	0,5915
1	0	RESIST 1-2 M	Combination	Max	0	-257,081	0	0	0	3,411E-13	1-1	0
1	0,5905	RESIST 1-2 M	Combination	Max	0	-222,763	0	0	0	328,191	1-1	0,5905
1	0,5905	RESIST 1-2 M	Combination	Max	0	-222,763	0	0	0	328,191	1-1	0,5905
1	0,5915	RESIST 1-2 M	Combination	Max	0	-222,719	0	0	0	328,5606	1-1	0,5915
1	0	RESIST 1-2 M	Combination	Min	0	-585,924	0	0	0	3,411E-13	1-1	0
1	0,5905	RESIST 1-2 M	Combination	Min	0	-542,953	0	0	0	144,2287	1-1	0,5905
1	0,5905	RESIST 1-2 M	Combination	Min	0	-542,953	0	0	0	144,2287	1-1	0,5905
1	0,5915	RESIST 1-2 M	Combination	Min	0	-525,573	0	0	0	144,4601	1-1	0,5915
1	0	RESIST 1-1 V	Combination	Max	0	-257,081	0	0	0	3,411E-13	1-1	0
1	0,5905	RESIST 1-1 V	Combination	Max	0	-217,7	0	0	0	402,626	1-1	0,5905
1	0,5905	RESIST 1-1 V	Combination	Max	0	-217,7	0	0	0	402,626	1-1	0,5905
1	0,5915	RESIST 1-1 V	Combination	Max	0	-217,657	0	0	0	403,0202	1-1	0,5915
1	0	RESIST 1-1 V	Combination	Min	0	-725,534	0	0	0	3,411E-13	1-1	0
1	0,5905	RESIST 1-1 V	Combination	Min	0	-669,007	0	0	0	144,2287	1-1	0,5905
1	0,5905	RESIST 1-1 V	Combination	Min	0	-669,007	0	0	0	144,2287	1-1	0,5905
1	0,5915	RESIST 1-1 V	Combination	Min	0	-638,048	0	0	0	144,4601	1-1	0,5915
1	0	RESIST 1-2 V	Combination	Max	0	-257,081	0	0	0	3,411E-13	1-1	0
1	0,5905	RESIST 1-2 V	Combination	Max	0	-220,698	0	0	0	372,0871	1-1	0,5905
1	0,5905	RESIST 1-2 V	Combination	Max	0	-220,698	0	0	0	372,0871	1-1	0,5905
1	0,5915	RESIST 1-2 V	Combination	Max	0	-220,654	0	0	0	372,4896	1-1	0,5915
1	0	RESIST 1-2 V	Combination	Min	0	-664,391	0	0	0	3,411E-13	1-1	0
1	0,5905	RESIST 1-2 V	Combination	Min	0	-617,29	0	0	0	144,2287	1-1	0,5905
1	0,5905	RESIST 1-2 V	Combination	Min	0	-617,29	0	0	0	144,2287	1-1	0,5905
1	0,5915	RESIST 1-2 V	Combination	Min	0	-595,774	0	0	0	144,4601	1-1	0,5915
2	0	SERV1-1	Combination	Max	0	-154,039	0	0	0	234,5106	2-1	0
2	0,5905	SERV1-1	Combination	Max	0	-129,05	0	0	0	439,4215	2-1	0,5905
2	0,5905	SERV1-1	Combination	Max	0	-129,05	0	0	0	439,4215	2-1	0,5905
2	0,5915	SERV1-1	Combination	Max	0	-129,02	0	0	0	439,6331	2-1	0,5915
2	0	SERV1-1	Combination	Min	0	-371,746	0	0	0	100,611	2-1	0
2	0,5905	SERV1-1	Combination	Min	0	-353,871	0	0	0	190,4881	2-1	0,5905
2	0,5905	SERV1-1	Combination	Min	0	-353,871	0	0	0	190,4881	2-1	0,5905
2	0,5915	SERV1-1	Combination	Min	0	-337,831	0	0	0	190,6314	2-1	0,5915
2	0	SERV1-2	Combination	Max	0	-155,592	0	0	0	218,6999	2-1	0
2	0,5905	SERV1-2	Combination	Max	0	-132,157	0	0	0	413,5446	2-1	0,5905
2	0,5905	SERV1-2	Combination	Max	0	-132,157	0	0	0	413,5446	2-1	0,5905
2	0,5915	SERV1-2	Combination	Max	0	-132,127	0	0	0	413,7653	2-1	0,5915
2	0	SERV1-2	Combination	Min	0	-349,853	0	0	0	100,611	2-1	0
2	0,5905	SERV1-2	Combination	Min	0	-331,979	0	0	0	190,4881	2-1	0,5905
2	0,5905	SERV1-2	Combination	Min	0	-331,979	0	0	0	190,4881	2-1	0,5905
2	0,5915	SERV1-2	Combination	Min	0	-320,829	0	0	0	190,6314	2-1	0,5915

2	0	RESIST 1-1 M	Combination	Max	0	-220,299	0	0	0	353,2095	2-1	0
2	0,5905	RESIST 1-1 M	Combination	Max	0	-183,542	0	0	0	661,5952	2-1	0,5905
2	0,5905	RESIST 1-1 M	Combination	Max	0	-183,542	0	0	0	661,5952	2-1	0,5905
2	0,5915	RESIST 1-1 M	Combination	Max	0	-183,499	0	0	0	661,9074	2-1	0,5915
2	0	RESIST 1-1 M	Combination	Min	0	-559,704	0	0	0	144,4601	2-1	0
2	0,5905	RESIST 1-1 M	Combination	Min	0	-534,039	0	0	0	273,5081	2-1	0,5905
2	0,5905	RESIST 1-1 M	Combination	Min	0	-534,039	0	0	0	273,5081	2-1	0,5905
2	0,5915	RESIST 1-1 M	Combination	Min	0	-509,036	0	0	0	273,7138	2-1	0,5915
2	0	RESIST 1-2 M	Combination	Max	0	-222,719	0	0	0	328,5606	2-1	0
2	0,5905	RESIST 1-2 M	Combination	Max	0	-188,387	0	0	0	621,2531	2-1	0,5905
2	0,5905	RESIST 1-2 M	Combination	Max	0	-188,387	0	0	0	621,2531	2-1	0,5905
2	0,5915	RESIST 1-2 M	Combination	Max	0	-188,343	0	0	0	621,5796	2-1	0,5915
2	0	RESIST 1-2 M	Combination	Min	0	-525,573	0	0	0	144,4601	2-1	0
2	0,5905	RESIST 1-2 M	Combination	Min	0	-499,908	0	0	0	273,5081	2-1	0,5905
2	0,5905	RESIST 1-2 M	Combination	Min	0	-499,908	0	0	0	273,5081	2-1	0,5905
2	0,5915	RESIST 1-2 M	Combination	Min	0	-482,529	0	0	0	273,7138	2-1	0,5915
2	0	RESIST 1-1 V	Combination	Max	0	-217,657	0	0	0	403,0202	2-1	0
2	0,5905	RESIST 1-1 V	Combination	Max	0	-178,253	0	0	0	754,1984	2-1	0,5905
2	0,5905	RESIST 1-1 V	Combination	Max	0	-178,253	0	0	0	754,1984	2-1	0,5905
2	0,5915	RESIST 1-1 V	Combination	Max	0	-178,21	0	0	0	754,536	2-1	0,5915
2	0	RESIST 1-1 V	Combination	Min	0	-638,048	0	0	0	144,4601	2-1	0
2	0,5905	RESIST 1-1 V	Combination	Min	0	-612,383	0	0	0	273,5081	2-1	0,5905
2	0,5905	RESIST 1-1 V	Combination	Min	0	-612,383	0	0	0	273,5081	2-1	0,5905
2	0,5915	RESIST 1-1 V	Combination	Min	0	-581,425	0	0	0	273,7138	2-1	0,5915
2	0	RESIST 1-2 V	Combination	Max	0	-220,654	0	0	0	372,4896	2-1	0
2	0,5905	RESIST 1-2 V	Combination	Max	0	-184,253	0	0	0	704,23	2-1	0,5905
2	0,5905	RESIST 1-2 V	Combination	Max	0	-184,253	0	0	0	704,23	2-1	0,5905
2	0,5915	RESIST 1-2 V	Combination	Max	0	-184,21	0	0	0	704,5854	2-1	0,5915
2	0	RESIST 1-2 V	Combination	Min	0	-595,774	0	0	0	144,4601	2-1	0
2	0,5905	RESIST 1-2 V	Combination	Min	0	-570,109	0	0	0	273,5081	2-1	0,5905
2	0,5905	RESIST 1-2 V	Combination	Min	0	-570,109	0	0	0	273,5081	2-1	0,5905
2	0,5915	RESIST 1-2 V	Combination	Min	0	-548,593	0	0	0	273,7138	2-1	0,5915
3	0	SERV1-1	Combination	Max	0	-129,02	0	0	0	439,6331	3-1	0
3	0,5905	SERV1-1	Combination	Max	0	-104,03	0	0	0	615,0474	3-1	0,5905
3	0,5905	SERV1-1	Combination	Max	0	-104,03	0	0	0	615,0474	3-1	0,5905
3	0,5915	SERV1-1	Combination	Max	0	-104	0	0	0	615,225	3-1	0,5915
3	0	SERV1-1	Combination	Min	0	-337,831	0	0	0	190,6314	3-1	0
3	0,5905	SERV1-1	Combination	Min	0	-319,957	0	0	0	269,9358	3-1	0,5905
3	0,5905	SERV1-1	Combination	Min	0	-319,957	0	0	0	269,9358	3-1	0,5905
3	0,5915	SERV1-1	Combination	Min	0	-303,916	0	0	0	270,0611	3-1	0,5915
3	0	SERV1-2	Combination	Max	0	-132,127	0	0	0	413,7653	3-1	0
3	0,5905	SERV1-2	Combination	Max	0	-103,49	0	0	0	584,8934	3-1	0,5905
3	0,5905	SERV1-2	Combination	Max	0	-103,49	0	0	0	584,8934	3-1	0,5905
3	0,5915	SERV1-2	Combination	Max	0	-103,46	0	0	0	585,0852	3-1	0,5915
3	0	SERV1-2	Combination	Min	0	-320,829	0	0	0	190,6314	3-1	0
3	0,5905	SERV1-2	Combination	Min	0	-302,954	0	0	0	269,9358	3-1	0,5905
3	0,5905	SERV1-2	Combination	Min	0	-302,954	0	0	0	269,9358	3-1	0,5905
3	0,5915	SERV1-2	Combination	Min	0	-291,804	0	0	0	270,0611	3-1	0,5915
3	0	RESIST 1-1 M	Combination	Max	0	-183,499	0	0	0	661,9074	3-1	0
3	0,5905	RESIST 1-1 M	Combination	Max	0	-146,742	0	0	0	925,6102	3-1	0,5905
3	0,5905	RESIST 1-1 M	Combination	Max	0	-146,742	0	0	0	925,6102	3-1	0,5905
3	0,5915	RESIST 1-1 M	Combination	Max	0	-146,698	0	0	0	925,8717	3-1	0,5915
3	0	RESIST 1-1 M	Combination	Min	0	-509,036	0	0	0	273,7138	3-1	0
3	0,5905	RESIST 1-1 M	Combination	Min	0	-483,371	0	0	0	387,5812	3-1	0,5905
3	0,5905	RESIST 1-1 M	Combination	Min	0	-483,371	0	0	0	387,5812	3-1	0,5905
3	0,5915	RESIST 1-1 M	Combination	Min	0	-458,368	0	0	0	387,7612	3-1	0,5915
3	0	RESIST 1-2 M	Combination	Max	0	-188,343	0	0	0	621,5796	3-1	0
3	0,5905	RESIST 1-2 M	Combination	Max	0	-145,899	0	0	0	878,6002	3-1	0,5905
3	0,5905	RESIST 1-2 M	Combination	Max	0	-145,899	0	0	0	878,6002	3-1	0,5905
3	0,5915	RESIST 1-2 M	Combination	Max	0	-145,856	0	0	0	878,8837	3-1	0,5915
3	0	RESIST 1-2 M	Combination	Min	0	-482,529	0	0	0	273,7138	3-1	0
3	0,5905	RESIST 1-2 M	Combination	Min	0	-456,864	0	0	0	387,5812	3-1	0,5905
3	0,5905	RESIST 1-2 M	Combination	Min	0	-456,864	0	0	0	387,5812	3-1	0,5905
3	0,5915	RESIST 1-2 M	Combination	Min	0	-439,485	0	0	0	387,7612	3-1	0,5915
3	0	RESIST 1-1 V	Combination	Max	0	-178,21	0	0	0	754,536	3-1	0
3	0,5905	RESIST 1-1 V	Combination	Max	0	-138,806	0	0	0	1053,9918	3-1	0,5905
3	0,5905	RESIST 1-1 V	Combination	Max	0	-138,806	0	0	0	1053,9918	3-1	0,5905
3	0,5915	RESIST 1-1 V	Combination	Max	0	-138,763	0	0	0	1054,2727	3-1	0,5915

3	0	RESIST 1-1 V	Combination	Min	0	-581,425	0	0	0	273,7138	3-1	0
3	0,5905	RESIST 1-1 V	Combination	Min	0	-555,76	0	0	0	387,5812	3-1	0,5905
3	0,5905	RESIST 1-1 V	Combination	Min	0	-555,76	0	0	0	387,5812	3-1	0,5905
3	0,5915	RESIST 1-1 V	Combination	Min	0	-524,801	0	0	0	387,7612	3-1	0,5915
3	0	RESIST 1-2 V	Combination	Max	0	-184,21	0	0	0	704,5854	3-1	0
3	0,5905	RESIST 1-2 V	Combination	Max	0	-137,762	0	0	0	995,7645	3-1	0,5905
3	0,5905	RESIST 1-2 V	Combination	Max	0	-137,762	0	0	0	995,7645	3-1	0,5905
3	0,5915	RESIST 1-2 V	Combination	Max	0	-137,719	0	0	0	996,0726	3-1	0,5915
3	0	RESIST 1-2 V	Combination	Min	0	-548,593	0	0	0	273,7138	3-1	0
3	0,5905	RESIST 1-2 V	Combination	Min	0	-522,928	0	0	0	387,5812	3-1	0,5905
3	0,5905	RESIST 1-2 V	Combination	Min	0	-522,928	0	0	0	387,5812	3-1	0,5905
3	0,5915	RESIST 1-2 V	Combination	Min	0	-501,412	0	0	0	387,7612	3-1	0,5915
4	0	SERV1-1	Combination	Max	0	-104	0	0	0	615,225	4-1	0
4	0,5905	SERV1-1	Combination	Max	0	-79,011	0	0	0	761,1428	4-1	0,5905
4	0,5905	SERV1-1	Combination	Max	0	-79,011	0	0	0	761,1428	4-1	0,5905
4	0,5915	SERV1-1	Combination	Max	0	-78,98	0	0	0	761,2866	4-1	0,5915
4	0	SERV1-1	Combination	Min	0	-303,916	0	0	0	270,0611	4-1	0
4	0,5905	SERV1-1	Combination	Min	0	-286,042	0	0	0	338,7928	4-1	0,5905
4	0,5905	SERV1-1	Combination	Min	0	-286,042	0	0	0	338,7928	4-1	0,5905
4	0,5915	SERV1-1	Combination	Min	0	-270,002	0	0	0	338,9003	4-1	0,5915
4	0	SERV1-2	Combination	Max	0	-103,46	0	0	0	585,0852	4-1	0
4	0,5905	SERV1-2	Combination	Max	0	-74,465	0	0	0	732,4967	4-1	0,5905
4	0,5905	SERV1-2	Combination	Max	0	-74,465	0	0	0	732,4967	4-1	0,5905
4	0,5915	SERV1-2	Combination	Max	0	-74,435	0	0	0	732,6595	4-1	0,5915
4	0	SERV1-2	Combination	Min	0	-291,804	0	0	0	270,0611	4-1	0
4	0,5905	SERV1-2	Combination	Min	0	-273,93	0	0	0	338,7928	4-1	0,5905
4	0,5905	SERV1-2	Combination	Min	0	-273,93	0	0	0	338,7928	4-1	0,5905
4	0,5915	SERV1-2	Combination	Min	0	-262,779	0	0	0	338,9003	4-1	0,5915
4	0	RESIST 1-1 M	Combination	Max	0	-146,698	0	0	0	925,8717	4-1	0
4	0,5905	RESIST 1-1 M	Combination	Max	0	-109,941	0	0	0	1144,8917	4-1	0,5905
4	0,5905	RESIST 1-1 M	Combination	Max	0	-109,941	0	0	0	1144,8917	4-1	0,5905
4	0,5915	RESIST 1-1 M	Combination	Max	0	-109,898	0	0	0	1145,1026	4-1	0,5915
4	0	RESIST 1-1 M	Combination	Min	0	-458,368	0	0	0	387,7612	4-1	0
4	0,5905	RESIST 1-1 M	Combination	Min	0	-432,704	0	0	0	486,4481	4-1	0,5905
4	0,5905	RESIST 1-1 M	Combination	Min	0	-432,704	0	0	0	486,4481	4-1	0,5905
4	0,5915	RESIST 1-1 M	Combination	Min	0	-407,701	0	0	0	486,6023	4-1	0,5915
4	0	RESIST 1-2 M	Combination	Max	0	-145,856	0	0	0	878,8837	4-1	0
4	0,5905	RESIST 1-2 M	Combination	Max	0	-102,855	0	0	0	1100,2325	4-1	0,5905
4	0,5905	RESIST 1-2 M	Combination	Max	0	-102,855	0	0	0	1100,2325	4-1	0,5905
4	0,5915	RESIST 1-2 M	Combination	Max	0	-102,812	0	0	0	1100,4729	4-1	0,5915
4	0	RESIST 1-2 M	Combination	Min	0	-439,485	0	0	0	387,7612	4-1	0
4	0,5905	RESIST 1-2 M	Combination	Min	0	-413,82	0	0	0	486,4481	4-1	0,5905
4	0,5905	RESIST 1-2 M	Combination	Min	0	-413,82	0	0	0	486,4481	4-1	0,5905
4	0,5915	RESIST 1-2 M	Combination	Min	0	-396,441	0	0	0	486,6023	4-1	0,5915
4	0	RESIST 1-1 V	Combination	Max	0	-138,763	0	0	0	1054,2727	4-1	0
4	0,5905	RESIST 1-1 V	Combination	Max	0	-99,359	0	0	0	1302,0059	4-1	0,5905
4	0,5905	RESIST 1-1 V	Combination	Max	0	-99,359	0	0	0	1302,0059	4-1	0,5905
4	0,5915	RESIST 1-1 V	Combination	Max	0	-99,315	0	0	0	1302,2303	4-1	0,5915
4	0	RESIST 1-1 V	Combination	Min	0	-524,801	0	0	0	387,7612	4-1	0
4	0,5905	RESIST 1-1 V	Combination	Min	0	-499,137	0	0	0	486,4481	4-1	0,5905
4	0,5905	RESIST 1-1 V	Combination	Min	0	-499,137	0	0	0	486,4481	4-1	0,5905
4	0,5915	RESIST 1-1 V	Combination	Min	0	-468,178	0	0	0	486,6023	4-1	0,5915
4	0	RESIST 1-2 V	Combination	Max	0	-137,719	0	0	0	996,0726	4-1	0
4	0,5905	RESIST 1-2 V	Combination	Max	0	-90,582	0	0	0	1246,6903	4-1	0,5905
4	0,5905	RESIST 1-2 V	Combination	Max	0	-90,582	0	0	0	1246,6903	4-1	0,5905
4	0,5915	RESIST 1-2 V	Combination	Max	0	-90,538	0	0	0	1246,9513	4-1	0,5915
4	0	RESIST 1-2 V	Combination	Min	0	-501,412	0	0	0	387,7612	4-1	0
4	0,5905	RESIST 1-2 V	Combination	Min	0	-475,747	0	0	0	486,4481	4-1	0,5905
4	0,5905	RESIST 1-2 V	Combination	Min	0	-475,747	0	0	0	486,4481	4-1	0,5905
4	0,5915	RESIST 1-2 V	Combination	Min	0	-454,231	0	0	0	486,6023	4-1	0,5915
5	0	SERV1-1	Combination	Max	0	-78,98	0	0	0	761,2866	5-1	0
5	0,5905	SERV1-1	Combination	Max	0	-53,991	0	0	0	877,7078	5-1	0,5905
5	0,5905	SERV1-1	Combination	Max	0	-53,991	0	0	0	877,7078	5-1	0,5905
5	0,5915	SERV1-1	Combination	Max	0	-53,961	0	0	0	877,8176	5-1	0,5915
5	0	SERV1-1	Combination	Min	0	-270,002	0	0	0	338,9003	5-1	0
5	0,5905	SERV1-1	Combination	Min	0	-252,127	0	0	0	397,0592	5-1	0,5905
5	0,5905	SERV1-1	Combination	Min	0	-252,127	0	0	0	397,0592	5-1	0,5905
5	0,5915	SERV1-1	Combination	Min	0	-237,044	0	0	0	397,1487	5-1	0,5915

3	0	RESIST 1-1 V	Combination	Min	0	-581,425	0	0	0	273,7138	3-1	0
3	0,5905	RESIST 1-1 V	Combination	Min	0	-555,76	0	0	0	387,5812	3-1	0,5905
3	0,5905	RESIST 1-1 V	Combination	Min	0	-555,76	0	0	0	387,5812	3-1	0,5905
3	0,5915	RESIST 1-1 V	Combination	Min	0	-524,801	0	0	0	387,7612	3-1	0,5915
3	0	RESIST 1-2 V	Combination	Max	0	-184,21	0	0	0	704,5854	3-1	0
3	0,5905	RESIST 1-2 V	Combination	Max	0	-137,762	0	0	0	995,7645	3-1	0,5905
3	0,5905	RESIST 1-2 V	Combination	Max	0	-137,762	0	0	0	995,7645	3-1	0,5905
3	0,5915	RESIST 1-2 V	Combination	Max	0	-137,719	0	0	0	996,0726	3-1	0,5915
3	0	RESIST 1-2 V	Combination	Min	0	-548,593	0	0	0	273,7138	3-1	0
3	0,5905	RESIST 1-2 V	Combination	Min	0	-522,928	0	0	0	387,5812	3-1	0,5905
3	0,5905	RESIST 1-2 V	Combination	Min	0	-522,928	0	0	0	387,5812	3-1	0,5905
3	0,5915	RESIST 1-2 V	Combination	Min	0	-501,412	0	0	0	387,7612	3-1	0,5915
4	0	SERV1-1	Combination	Max	0	-104	0	0	0	615,225	4-1	0
4	0,5905	SERV1-1	Combination	Max	0	-79,011	0	0	0	761,1428	4-1	0,5905
4	0,5905	SERV1-1	Combination	Max	0	-79,011	0	0	0	761,1428	4-1	0,5905
4	0,5915	SERV1-1	Combination	Max	0	-78,98	0	0	0	761,2866	4-1	0,5915
4	0	SERV1-1	Combination	Min	0	-303,916	0	0	0	270,0611	4-1	0
4	0,5905	SERV1-1	Combination	Min	0	-286,042	0	0	0	338,7928	4-1	0,5905
4	0,5905	SERV1-1	Combination	Min	0	-286,042	0	0	0	338,7928	4-1	0,5905
4	0,5915	SERV1-1	Combination	Min	0	-270,002	0	0	0	338,9003	4-1	0,5915
4	0	SERV1-2	Combination	Max	0	-103,46	0	0	0	585,0852	4-1	0
4	0,5905	SERV1-2	Combination	Max	0	-74,465	0	0	0	732,4967	4-1	0,5905
4	0,5905	SERV1-2	Combination	Max	0	-74,465	0	0	0	732,4967	4-1	0,5905
4	0,5915	SERV1-2	Combination	Max	0	-74,435	0	0	0	732,6595	4-1	0,5915
4	0	SERV1-2	Combination	Min	0	-291,804	0	0	0	270,0611	4-1	0
4	0,5905	SERV1-2	Combination	Min	0	-273,93	0	0	0	338,7928	4-1	0,5905
4	0,5905	SERV1-2	Combination	Min	0	-273,93	0	0	0	338,7928	4-1	0,5905
4	0,5915	SERV1-2	Combination	Min	0	-262,779	0	0	0	338,9003	4-1	0,5915
4	0	RESIST 1-1 M	Combination	Max	0	-146,698	0	0	0	925,8717	4-1	0
4	0,5905	RESIST 1-1 M	Combination	Max	0	-109,941	0	0	0	1144,8917	4-1	0,5905
4	0,5905	RESIST 1-1 M	Combination	Max	0	-109,941	0	0	0	1144,8917	4-1	0,5905
4	0,5915	RESIST 1-1 M	Combination	Max	0	-109,898	0	0	0	1145,1026	4-1	0,5915
4	0	RESIST 1-1 M	Combination	Min	0	-458,368	0	0	0	387,7612	4-1	0
4	0,5905	RESIST 1-1 M	Combination	Min	0	-432,704	0	0	0	486,4481	4-1	0,5905
4	0,5905	RESIST 1-1 M	Combination	Min	0	-432,704	0	0	0	486,4481	4-1	0,5905
4	0,5915	RESIST 1-1 M	Combination	Min	0	-407,701	0	0	0	486,6023	4-1	0,5915
4	0	RESIST 1-2 M	Combination	Max	0	-145,856	0	0	0	878,8837	4-1	0
4	0,5905	RESIST 1-2 M	Combination	Max	0	-102,855	0	0	0	1100,2325	4-1	0,5905
4	0,5905	RESIST 1-2 M	Combination	Max	0	-102,855	0	0	0	1100,2325	4-1	0,5905
4	0,5915	RESIST 1-2 M	Combination	Max	0	-102,812	0	0	0	1100,4729	4-1	0,5915
4	0	RESIST 1-2 M	Combination	Min	0	-439,485	0	0	0	387,7612	4-1	0
4	0,5905	RESIST 1-2 M	Combination	Min	0	-413,82	0	0	0	486,4481	4-1	0,5905
4	0,5905	RESIST 1-2 M	Combination	Min	0	-413,82	0	0	0	486,4481	4-1	0,5905
4	0,5915	RESIST 1-2 M	Combination	Min	0	-396,441	0	0	0	486,6023	4-1	0,5915
4	0	RESIST 1-1 V	Combination	Max	0	-138,763	0	0	0	1054,2727	4-1	0
4	0,5905	RESIST 1-1 V	Combination	Max	0	-99,359	0	0	0	1302,0059	4-1	0,5905
4	0,5905	RESIST 1-1 V	Combination	Max	0	-99,359	0	0	0	1302,0059	4-1	0,5905
4	0,5915	RESIST 1-1 V	Combination	Max	0	-99,315	0	0	0	1302,2303	4-1	0,5915
4	0	RESIST 1-1 V	Combination	Min	0	-524,801	0	0	0	387,7612	4-1	0
4	0,5905	RESIST 1-1 V	Combination	Min	0	-499,137	0	0	0	486,4481	4-1	0,5905
4	0,5905	RESIST 1-1 V	Combination	Min	0	-499,137	0	0	0	486,4481	4-1	0,5905
4	0,5915	RESIST 1-1 V	Combination	Min	0	-468,178	0	0	0	486,6023	4-1	0,5915
4	0	RESIST 1-2 V	Combination	Max	0	-137,719	0	0	0	996,0726	4-1	0
4	0,5905	RESIST 1-2 V	Combination	Max	0	-90,582	0	0	0	1246,6903	4-1	0,5905
4	0,5905	RESIST 1-2 V	Combination	Max	0	-90,582	0	0	0	1246,6903	4-1	0,5905
4	0,5915	RESIST 1-2 V	Combination	Max	0	-90,538	0	0	0	1246,9513	4-1	0,5915
4	0	RESIST 1-2 V	Combination	Min	0	-501,412	0	0	0	387,7612	4-1	0
4	0,5905	RESIST 1-2 V	Combination	Min	0	-475,747	0	0	0	486,4481	4-1	0,5905
4	0,5905	RESIST 1-2 V	Combination	Min	0	-475,747	0	0	0	486,4481	4-1	0,5905
4	0,5915	RESIST 1-2 V	Combination	Min	0	-454,231	0	0	0	486,6023	4-1	0,5915
5	0	SERV1-1	Combination	Max	0	-78,98	0	0	0	761,2866	5-1	0
5	0,5905	SERV1-1	Combination	Max	0	-53,991	0	0	0	877,7078	5-1	0,5905
5	0,5905	SERV1-1	Combination	Max	0	-53,991	0	0	0	877,7078	5-1	0,5905
5	0,5915	SERV1-1	Combination	Max	0	-53,961	0	0	0	877,8176	5-1	0,5915
5	0	SERV1-1	Combination	Min	0	-270,002	0	0	0	338,9003	5-1	0
5	0,5905	SERV1-1	Combination	Min	0	-252,127	0	0	0	397,0592	5-1	0,5905
5	0,5905	SERV1-1	Combination	Min	0	-252,127	0	0	0	397,0592	5-1	0,5905
5	0,5915	SERV1-1	Combination	Min	0	-237,044	0	0	0	397,1487	5-1	0,5915

5	0	SERV1-2	Combination	Max	0	-74,435	0	0	0	732,6595	5-1	0
5	0,5905	SERV1-2	Combination	Max	0	-45,44	0	0	0	856,3544	5-1	0,5905
5	0,5905	SERV1-2	Combination	Max	0	-45,44	0	0	0	856,3544	5-1	0,5905
5	0,5915	SERV1-2	Combination	Max	0	-45,41	0	0	0	856,4881	5-1	0,5915
5	0	SERV1-2	Combination	Min	0	-262,779	0	0	0	338,9003	5-1	0
5	0,5905	SERV1-2	Combination	Min	0	-244,905	0	0	0	397,0592	5-1	0,5905
5	0,5905	SERV1-2	Combination	Min	0	-244,905	0	0	0	397,0592	5-1	0,5905
5	0,5915	SERV1-2	Combination	Min	0	-233,755	0	0	0	397,1487	5-1	0,5915
5	0	RESIST 1-1 M	Combination	Max	0	-109,898	0	0	0	1145,1026	5-1	0
5	0,5905	RESIST 1-1 M	Combination	Max	0	-73,141	0	0	0	1319,4397	5-1	0,5905
5	0,5905	RESIST 1-1 M	Combination	Max	0	-73,141	0	0	0	1319,4397	5-1	0,5905
5	0,5915	RESIST 1-1 M	Combination	Max	0	-73,098	0	0	0	1319,5999	5-1	0,5915
5	0	RESIST 1-1 M	Combination	Min	0	-407,701	0	0	0	486,6023	5-1	0
5	0,5905	RESIST 1-1 M	Combination	Min	0	-382,036	0	0	0	570,1085	5-1	0,5905
5	0,5905	RESIST 1-1 M	Combination	Min	0	-382,036	0	0	0	570,1085	5-1	0,5905
5	0,5915	RESIST 1-1 M	Combination	Min	0	-358,525	0	0	0	570,2371	5-1	0,5915
5	0	RESIST 1-2 M	Combination	Max	0	-102,812	0	0	0	1100,4729	5-1	0
5	0,5905	RESIST 1-2 M	Combination	Max	0	-59,811	0	0	0	1286,1498	5-1	0,5905
5	0,5905	RESIST 1-2 M	Combination	Max	0	-59,811	0	0	0	1286,1498	5-1	0,5905
5	0,5915	RESIST 1-2 M	Combination	Max	0	-59,768	0	0	0	1286,3472	5-1	0,5915
5	0	RESIST 1-2 M	Combination	Min	0	-396,441	0	0	0	486,6023	5-1	0
5	0,5905	RESIST 1-2 M	Combination	Min	0	-370,776	0	0	0	570,1085	5-1	0,5905
5	0,5905	RESIST 1-2 M	Combination	Min	0	-370,776	0	0	0	570,1085	5-1	0,5905
5	0,5915	RESIST 1-2 M	Combination	Min	0	-353,396	0	0	0	570,2371	5-1	0,5915
5	0	RESIST 1-1 V	Combination	Max	0	-99,315	0	0	0	1302,2303	5-1	0
5	0,5905	RESIST 1-1 V	Combination	Max	0	-59,912	0	0	0	1498,241	5-1	0,5905
5	0,5905	RESIST 1-1 V	Combination	Max	0	-59,912	0	0	0	1498,241	5-1	0,5905
5	0,5915	RESIST 1-1 V	Combination	Max	0	-59,868	0	0	0	1498,4087	5-1	0,5915
5	0	RESIST 1-1 V	Combination	Min	0	-468,178	0	0	0	486,6023	5-1	0
5	0,5905	RESIST 1-1 V	Combination	Min	0	-442,513	0	0	0	570,1085	5-1	0,5905
5	0,5905	RESIST 1-1 V	Combination	Min	0	-442,513	0	0	0	570,1085	5-1	0,5905
5	0,5915	RESIST 1-1 V	Combination	Min	0	-413,402	0	0	0	570,2371	5-1	0,5915
5	0	RESIST 1-2 V	Combination	Max	0	-90,538	0	0	0	1246,9513	5-1	0
5	0,5905	RESIST 1-2 V	Combination	Max	0	-43,401	0	0	0	1457,0077	5-1	0,5905
5	0,5905	RESIST 1-2 V	Combination	Max	0	-43,401	0	0	0	1457,0077	5-1	0,5905
5	0,5915	RESIST 1-2 V	Combination	Max	0	-43,357	0	0	0	1457,2215	5-1	0,5915
5	0	RESIST 1-2 V	Combination	Min	0	-454,231	0	0	0	486,6023	5-1	0
5	0,5905	RESIST 1-2 V	Combination	Min	0	-428,567	0	0	0	570,1085	5-1	0,5905
5	0,5905	RESIST 1-2 V	Combination	Min	0	-428,567	0	0	0	570,1085	5-1	0,5905
5	0,5915	RESIST 1-2 V	Combination	Min	0	-407,05	0	0	0	570,2371	5-1	0,5915
6	0	SERV1-1	Combination	Max	0	-53,961	0	0	0	877,8176	6-1	0
6	0,5905	SERV1-1	Combination	Max	0	-28,971	0	0	0	968,1376	6-1	0,5905
6	0,5905	SERV1-1	Combination	Max	0	-28,971	0	0	0	968,1376	6-1	0,5905
6	0,5915	SERV1-1	Combination	Max	0	-28,941	0	0	0	968,2144	6-1	0,5915
6	0	SERV1-1	Combination	Min	0	-237,044	0	0	0	397,1487	6-1	0
6	0,5905	SERV1-1	Combination	Min	0	-219,17	0	0	0	444,735	6-1	0,5905
6	0,5905	SERV1-1	Combination	Min	0	-219,17	0	0	0	444,735	6-1	0,5905
6	0,5915	SERV1-1	Combination	Min	0	-204,909	0	0	0	444,8066	6-1	0,5915
6	0	SERV1-2	Combination	Max	0	-45,41	0	0	0	856,4881	6-1	0
6	0,5905	SERV1-2	Combination	Max	0	-16,416	0	0	0	956,4666	6-1	0,5905
6	0,5905	SERV1-2	Combination	Max	0	-16,416	0	0	0	956,4666	6-1	0,5905
6	0,5915	SERV1-2	Combination	Max	0	-16,385	0	0	0	956,5712	6-1	0,5915
6	0	SERV1-2	Combination	Min	0	-233,755	0	0	0	397,1487	6-1	0
6	0,5905	SERV1-2	Combination	Min	0	-215,88	0	0	0	444,735	6-1	0,5905
6	0,5905	SERV1-2	Combination	Min	0	-215,88	0	0	0	444,735	6-1	0,5905
6	0,5915	SERV1-2	Combination	Min	0	-204,73	0	0	0	444,8066	6-1	0,5915
6	0	RESIST 1-1 M	Combination	Max	0	-73,098	0	0	0	1319,5999	6-1	0
6	0,5905	RESIST 1-1 M	Combination	Max	0	-36,341	0	0	0	1454,5474	6-1	0,5905
6	0,5905	RESIST 1-1 M	Combination	Max	0	-36,341	0	0	0	1454,5474	6-1	0,5905
6	0,5915	RESIST 1-1 M	Combination	Max	0	-36,297	0	0	0	1454,6584	6-1	0,5915
6	0	RESIST 1-1 M	Combination	Min	0	-358,525	0	0	0	570,2371	6-1	0
6	0,5905	RESIST 1-1 M	Combination	Min	0	-332,86	0	0	0	638,5627	6-1	0,5905
6	0,5905	RESIST 1-1 M	Combination	Min	0	-332,86	0	0	0	638,5627	6-1	0,5905
6	0,5915	RESIST 1-1 M	Combination	Min	0	-310,632	0	0	0	638,6656	6-1	0,5915
6	0	RESIST 1-2 M	Combination	Max	0	-59,768	0	0	0	1286,3472	6-1	0
6	0,5905	RESIST 1-2 M	Combination	Max	0	-16,767	0	0	0	1436,3523	6-1	0,5905
6	0,5905	RESIST 1-2 M	Combination	Max	0	-16,767	0	0	0	1436,3523	6-1	0,5905
6	0,5915	RESIST 1-2 M	Combination	Max	0	-16,723	0	0	0	1436,5066	6-1	0,5915

6	0	RESIST 1-2 M	Combination	Min	0	-353,396	0	0	0	570,2371 6-1	0
6	0,5905	RESIST 1-2 M	Combination	Min	0	-327,732	0	0	0	638,5627 6-1	0,5905
6	0,5905	RESIST 1-2 M	Combination	Min	0	-327,732	0	0	0	638,5627 6-1	0,5905
6	0,5915	RESIST 1-2 M	Combination	Min	0	-310,352	0	0	0	638,6656 6-1	0,5915
6	0	RESIST 1-1 V	Combination	Max	0	-59,868	0	0	0	1498,4087 6-1	0
6	0,5905	RESIST 1-1 V	Combination	Max	0	-20,465	0	0	0	1649,2532 6-1	0,5905
6	0,5905	RESIST 1-1 V	Combination	Max	0	-20,465	0	0	0	1649,2532 6-1	0,5905
6	0,5915	RESIST 1-1 V	Combination	Max	0	-20,421	0	0	0	1649,3661 6-1	0,5915
6	0	RESIST 1-1 V	Combination	Min	0	-413,402	0	0	0	570,2371 6-1	0
6	0,5905	RESIST 1-1 V	Combination	Min	0	-387,738	0	0	0	638,5627 6-1	0,5905
6	0,5905	RESIST 1-1 V	Combination	Min	0	-387,738	0	0	0	638,5627 6-1	0,5905
6	0,5915	RESIST 1-1 V	Combination	Min	0	-360,216	0	0	0	638,6656 6-1	0,5915
6	0	RESIST 1-2 V	Combination	Max	0	-43,357	0	0	0	1457,2215 6-1	0
6	0,5905	RESIST 1-2 V	Combination	Max	0	3,78	0	0	0	1626,7164 6-1	0,5905
6	0,5905	RESIST 1-2 V	Combination	Max	0	3,78	0	0	0	1626,7164 6-1	0,5905
6	0,5915	RESIST 1-2 V	Combination	Max	0	3,823	0	0	0	1626,8831 6-1	0,5915
6	0	RESIST 1-2 V	Combination	Min	0	-407,05	0	0	0	570,2371 6-1	0
6	0,5905	RESIST 1-2 V	Combination	Min	0	-381,386	0	0	0	638,5627 6-1	0,5905
6	0,5905	RESIST 1-2 V	Combination	Min	0	-381,386	0	0	0	638,5627 6-1	0,5905
6	0,5915	RESIST 1-2 V	Combination	Min	0	-359,87	0	0	0	638,6656 6-1	0,5915
7	0	SERV1-1	Combination	Max	0	-28,941	0	0	0	968,2144 7-1	0
7	0,5905	SERV1-1	Combination	Max	0	-3,951	0	0	0	1033,576 7-1	0,5905
7	0,5905	SERV1-1	Combination	Max	0	-3,951	0	0	0	1033,576 7-1	0,5905
7	0,5915	SERV1-1	Combination	Max	0	-3,921	0	0	0	1033,6207 7-1	0,5915
7	0	SERV1-1	Combination	Min	0	-204,909	0	0	0	444,8066 7-1	0
7	0,5905	SERV1-1	Combination	Min	0	-187,035	0	0	0	481,8201 7-1	0,5905
7	0,5905	SERV1-1	Combination	Min	0	-187,035	0	0	0	481,8201 7-1	0,5905
7	0,5915	SERV1-1	Combination	Min	0	-172,775	0	0	0	481,8738 7-1	0,5915
7	0	SERV1-2	Combination	Max	0	-16,385	0	0	0	956,5712 7-1	0
7	0,5905	SERV1-2	Combination	Max	0	12,609	0	0	0	1032,8331 7-1	0,5905
7	0,5905	SERV1-2	Combination	Max	0	12,609	0	0	0	1032,8331 7-1	0,5905
7	0,5915	SERV1-2	Combination	Max	0	12,639	0	0	0	1032,9087 7-1	0,5915
7	0	SERV1-2	Combination	Min	0	-204,73	0	0	0	444,8066 7-1	0
7	0,5905	SERV1-2	Combination	Min	0	-186,855	0	0	0	481,8201 7-1	0,5905
7	0,5905	SERV1-2	Combination	Min	0	-186,855	0	0	0	481,8201 7-1	0,5905
7	0,5915	SERV1-2	Combination	Min	0	-175,705	0	0	0	481,8738 7-1	0,5915
7	0	RESIST 1-1 M	Combination	Max	0	-36,297	0	0	0	1454,6584 7-1	0
7	0,5905	RESIST 1-1 M	Combination	Max	0	0,46	0	0	0	1551,998 7-1	0,5905
7	0,5905	RESIST 1-1 M	Combination	Max	0	0,46	0	0	0	1551,998 7-1	0,5905
7	0,5915	RESIST 1-1 M	Combination	Max	0	0,503	0	0	0	1552,0611 7-1	0,5915
7	0	RESIST 1-1 M	Combination	Min	0	-310,632	0	0	0	638,6656 7-1	0
7	0,5905	RESIST 1-1 M	Combination	Min	0	-284,968	0	0	0	691,8105 7-1	0,5905
7	0,5905	RESIST 1-1 M	Combination	Min	0	-284,968	0	0	0	691,8105 7-1	0,5905
7	0,5915	RESIST 1-1 M	Combination	Min	0	-262,739	0	0	0	691,8877 7-1	0,5915
7	0	RESIST 1-2 M	Combination	Max	0	-16,723	0	0	0	1436,5066 7-1	0
7	0,5905	RESIST 1-2 M	Combination	Max	0	26,277	0	0	0	1550,8398 7-1	0,5905
7	0,5905	RESIST 1-2 M	Combination	Max	0	26,277	0	0	0	1550,8398 7-1	0,5905
7	0,5915	RESIST 1-2 M	Combination	Max	0	26,321	0	0	0	1550,9511 7-1	0,5915
7	0	RESIST 1-2 M	Combination	Min	0	-310,352	0	0	0	638,6656 7-1	0
7	0,5905	RESIST 1-2 M	Combination	Min	0	-284,688	0	0	0	691,8105 7-1	0,5905
7	0,5905	RESIST 1-2 M	Combination	Min	0	-284,688	0	0	0	691,8105 7-1	0,5905
7	0,5915	RESIST 1-2 M	Combination	Min	0	-267,308	0	0	0	691,8877 7-1	0,5915
7	0	RESIST 1-1 V	Combination	Max	0	-20,421	0	0	0	1649,3661 7-1	0
7	0,5905	RESIST 1-1 V	Combination	Max	0	18,983	0	0	0	1757,2512 7-1	0,5905
7	0,5905	RESIST 1-1 V	Combination	Max	0	18,983	0	0	0	1757,2512 7-1	0,5905
7	0,5915	RESIST 1-1 V	Combination	Max	0	19,026	0	0	0	1757,311 7-1	0,5915
7	0	RESIST 1-1 V	Combination	Min	0	-360,216	0	0	0	638,6656 7-1	0
7	0,5905	RESIST 1-1 V	Combination	Min	0	-334,552	0	0	0	691,8105 7-1	0,5905
7	0,5905	RESIST 1-1 V	Combination	Min	0	-334,552	0	0	0	691,8105 7-1	0,5905
7	0,5915	RESIST 1-1 V	Combination	Min	0	-307,03	0	0	0	691,8877 7-1	0,5915
7	0	RESIST 1-2 V	Combination	Max	0	3,823	0	0	0	1626,8831 7-1	0
7	0,5905	RESIST 1-2 V	Combination	Max	0	50,961	0	0	0	1755,8167 7-1	0,5905
7	0,5905	RESIST 1-2 V	Combination	Max	0	50,961	0	0	0	1755,8167 7-1	0,5905
7	0,5915	RESIST 1-2 V	Combination	Max	0	51,004	0	0	0	1755,9361 7-1	0,5915
7	0	RESIST 1-2 V	Combination	Min	0	-359,87	0	0	0	638,6656 7-1	0
7	0,5905	RESIST 1-2 V	Combination	Min	0	-334,205	0	0	0	691,8105 7-1	0,5905
7	0,5905	RESIST 1-2 V	Combination	Min	0	-334,205	0	0	0	691,8105 7-1	0,5905
7	0,5915	RESIST 1-2 V	Combination	Min	0	-312,689	0	0	0	691,8877 7-1	0,5915

8	0	SERV1-1	Combination	Max	0	-3,921	0	0	0	1033,6207	8-1	0
8	0,5905	SERV1-1	Combination	Max	0	26,253	0	0	0	1080,7971	8-1	0,5905
8	0,5905	SERV1-1	Combination	Max	0	26,253	0	0	0	1080,7971	8-1	0,5905
8	0,5915	SERV1-1	Combination	Max	0	26,283	0	0	0	1080,8084	8-1	0,5915
8	0	SERV1-1	Combination	Min	0	-172,775	0	0	0	481,8738	8-1	0
8	0,5905	SERV1-1	Combination	Min	0	-154,9	0	0	0	508,3146	8-1	0,5905
8	0,5905	SERV1-1	Combination	Min	0	-154,9	0	0	0	508,3146	8-1	0,5905
8	0,5915	SERV1-1	Combination	Min	0	-140,64	0	0	0	508,3504	8-1	0,5915
8	0	SERV1-2	Combination	Max	0	12,639	0	0	0	1032,9087	8-1	0
8	0,5905	SERV1-2	Combination	Max	0	41,634	0	0	0	1085,454	8-1	0,5905
8	0,5905	SERV1-2	Combination	Max	0	41,634	0	0	0	1085,454	8-1	0,5905
8	0,5915	SERV1-2	Combination	Max	0	41,664	0	0	0	1085,5006	8-1	0,5915
8	0	SERV1-2	Combination	Min	0	-175,705	0	0	0	481,8738	8-1	0
8	0,5905	SERV1-2	Combination	Min	0	-157,831	0	0	0	508,3146	8-1	0,5905
8	0,5905	SERV1-2	Combination	Min	0	-157,831	0	0	0	508,3146	8-1	0,5905
8	0,5915	SERV1-2	Combination	Min	0	-146,68	0	0	0	508,3504	8-1	0,5915
8	0	RESIST 1-1 M	Combination	Max	0	0,503	0	0	0	1552,0611	8-1	0
8	0,5905	RESIST 1-1 M	Combination	Max	0	45,342	0	0	0	1622,3524	8-1	0,5905
8	0,5905	RESIST 1-1 M	Combination	Max	0	45,342	0	0	0	1622,3524	8-1	0,5905
8	0,5915	RESIST 1-1 M	Combination	Max	0	45,386	0	0	0	1622,3655	8-1	0,5915
8	0	RESIST 1-1 M	Combination	Min	0	-262,739	0	0	0	691,8877	8-1	0
8	0,5905	RESIST 1-1 M	Combination	Min	0	-237,075	0	0	0	729,8521	8-1	0,5905
8	0,5905	RESIST 1-1 M	Combination	Min	0	-237,075	0	0	0	729,8521	8-1	0,5905
8	0,5915	RESIST 1-1 M	Combination	Min	0	-214,847	0	0	0	729,9035	8-1	0,5915
8	0	RESIST 1-2 M	Combination	Max	0	26,321	0	0	0	1550,9511	8-1	0
8	0,5905	RESIST 1-2 M	Combination	Max	0	69,321	0	0	0	1629,6125	8-1	0,5905
8	0,5905	RESIST 1-2 M	Combination	Max	0	69,321	0	0	0	1629,6125	8-1	0,5905
8	0,5915	RESIST 1-2 M	Combination	Max	0	69,365	0	0	0	1629,6807	8-1	0,5915
8	0	RESIST 1-2 M	Combination	Min	0	-267,308	0	0	0	691,8877	8-1	0
8	0,5905	RESIST 1-2 M	Combination	Min	0	-241,644	0	0	0	729,8521	8-1	0,5905
8	0,5905	RESIST 1-2 M	Combination	Min	0	-241,644	0	0	0	729,8521	8-1	0,5905
8	0,5915	RESIST 1-2 M	Combination	Min	0	-224,264	0	0	0	729,9035	8-1	0,5915
8	0	RESIST 1-1 V	Combination	Max	0	19,026	0	0	0	1757,311	8-1	0
8	0,5905	RESIST 1-1 V	Combination	Max	0	68,441	0	0	0	1835,3159	8-1	0,5905
8	0,5905	RESIST 1-1 V	Combination	Max	0	68,441	0	0	0	1835,3159	8-1	0,5905
8	0,5915	RESIST 1-1 V	Combination	Max	0	68,484	0	0	0	1835,3199	8-1	0,5915
8	0	RESIST 1-1 V	Combination	Min	0	-307,03	0	0	0	691,8877	8-1	0
8	0,5905	RESIST 1-1 V	Combination	Min	0	-281,365	0	0	0	729,8521	8-1	0,5905
8	0,5905	RESIST 1-1 V	Combination	Min	0	-281,365	0	0	0	729,8521	8-1	0,5905
8	0,5915	RESIST 1-1 V	Combination	Min	0	-253,844	0	0	0	729,9035	8-1	0,5915
8	0	RESIST 1-2 V	Combination	Max	0	51,004	0	0	0	1755,9361	8-1	0
8	0,5905	RESIST 1-2 V	Combination	Max	0	98,142	0	0	0	1844,3083	8-1	0,5905
8	0,5905	RESIST 1-2 V	Combination	Max	0	98,142	0	0	0	1844,3083	8-1	0,5905
8	0,5915	RESIST 1-2 V	Combination	Max	0	98,185	0	0	0	1844,3806	8-1	0,5915
8	0	RESIST 1-2 V	Combination	Min	0	-312,689	0	0	0	691,8877	8-1	0
8	0,5905	RESIST 1-2 V	Combination	Min	0	-287,024	0	0	0	729,8521	8-1	0,5905
8	0,5905	RESIST 1-2 V	Combination	Min	0	-287,024	0	0	0	729,8521	8-1	0,5905
8	0,5915	RESIST 1-2 V	Combination	Min	0	-265,508	0	0	0	729,9035	8-1	0,5915
9	0	SERV1-1	Combination	Max	0	26,283	0	0	0	1080,8084	9-1	0
9	0,5905	SERV1-1	Combination	Max	0	58,387	0	0	0	1102,2022	9-1	0,5905
9	0,5905	SERV1-1	Combination	Max	0	58,387	0	0	0	1102,2022	9-1	0,5905
9	0,5915	SERV1-1	Combination	Max	0	58,418	0	0	0	1102,1796	9-1	0,5915
9	0	SERV1-1	Combination	Min	0	-140,64	0	0	0	508,3504	9-1	0
9	0,5905	SERV1-1	Combination	Min	0	-122,765	0	0	0	524,2184	9-1	0,5905
9	0,5905	SERV1-1	Combination	Min	0	-122,765	0	0	0	524,2184	9-1	0,5905
9	0,5915	SERV1-1	Combination	Min	0	-108,505	0	0	0	524,2363	9-1	0,5915
9	0	SERV1-2	Combination	Max	0	41,664	0	0	0	1085,5006	9-1	0
9	0,5905	SERV1-2	Combination	Max	0	70,658	0	0	0	1114,3293	9-1	0,5905
9	0,5905	SERV1-2	Combination	Max	0	70,658	0	0	0	1114,3293	9-1	0,5905
9	0,5915	SERV1-2	Combination	Max	0	70,689	0	0	0	1114,3469	9-1	0,5915
9	0	SERV1-2	Combination	Min	0	-146,68	0	0	0	508,3504	9-1	0
9	0,5905	SERV1-2	Combination	Min	0	-128,806	0	0	0	524,2184	9-1	0,5905
9	0,5905	SERV1-2	Combination	Min	0	-128,806	0	0	0	524,2184	9-1	0,5905
9	0,5915	SERV1-2	Combination	Min	0	-117,656	0	0	0	524,2363	9-1	0,5915
9	0	RESIST 1-1 M	Combination	Max	0	45,386	0	0	0	1622,3655	9-1	0
9	0,5905	RESIST 1-1 M	Combination	Max	0	93,235	0	0	0	1653,764	9-1	0,5905
9	0,5905	RESIST 1-1 M	Combination	Max	0	93,235	0	0	0	1653,764	9-1	0,5905
9	0,5915	RESIST 1-1 M	Combination	Max	0	93,278	0	0	0	1653,7265	9-1	0,5915

9	0	RESIST 1-1 M	Combination	Min	0	-214,847	0	0	0	729,9035	9-1	0
9	0,5905	RESIST 1-1 M	Combination	Min	0	-189,182	0	0	0	752,6872	9-1	0,5905
9	0,5905	RESIST 1-1 M	Combination	Min	0	-189,182	0	0	0	752,6872	9-1	0,5905
9	0,5915	RESIST 1-1 M	Combination	Min	0	-166,954	0	0	0	752,713	9-1	0,5915
9	0	RESIST 1-2 M	Combination	Max	0	69,365	0	0	0	1629,6807	9-1	0
9	0,5905	RESIST 1-2 M	Combination	Max	0	112,366	0	0	0	1672,6702	9-1	0,5905
9	0,5905	RESIST 1-2 M	Combination	Max	0	112,366	0	0	0	1672,6702	9-1	0,5905
9	0,5915	RESIST 1-2 M	Combination	Max	0	112,409	0	0	0	1672,6954	9-1	0,5915
9	0	RESIST 1-2 M	Combination	Min	0	-224,264	0	0	0	729,9035	9-1	0
9	0,5905	RESIST 1-2 M	Combination	Min	0	-198,599	0	0	0	752,6872	9-1	0,5905
9	0,5905	RESIST 1-2 M	Combination	Min	0	-198,599	0	0	0	752,6872	9-1	0,5905
9	0,5915	RESIST 1-2 M	Combination	Min	0	-181,22	0	0	0	752,713	9-1	0,5915
9	0	RESIST 1-1 V	Combination	Max	0	68,484	0	0	0	1835,3199	9-1	0
9	0,5905	RESIST 1-1 V	Combination	Max	0	121,627	0	0	0	1868,774	9-1	0,5905
9	0,5905	RESIST 1-1 V	Combination	Max	0	121,627	0	0	0	1868,774	9-1	0,5905
9	0,5915	RESIST 1-1 V	Combination	Max	0	121,67	0	0	0	1868,7214	9-1	0,5915
9	0	RESIST 1-1 V	Combination	Min	0	-253,844	0	0	0	729,9035	9-1	0
9	0,5905	RESIST 1-1 V	Combination	Min	0	-228,179	0	0	0	752,6872	9-1	0,5905
9	0,5905	RESIST 1-1 V	Combination	Min	0	-228,179	0	0	0	752,6872	9-1	0,5905
9	0,5915	RESIST 1-1 V	Combination	Min	0	-200,658	0	0	0	752,713	9-1	0,5915
9	0	RESIST 1-2 V	Combination	Max	0	98,185	0	0	0	1844,3806	9-1	0
9	0,5905	RESIST 1-2 V	Combination	Max	0	145,322	0	0	0	1892,1914	9-1	0,5905
9	0,5905	RESIST 1-2 V	Combination	Max	0	145,322	0	0	0	1892,1914	9-1	0,5905
9	0,5915	RESIST 1-2 V	Combination	Max	0	145,366	0	0	0	1892,2165	9-1	0,5915
9	0	RESIST 1-2 V	Combination	Min	0	-265,508	0	0	0	729,9035	9-1	0
9	0,5905	RESIST 1-2 V	Combination	Min	0	-239,843	0	0	0	752,6872	9-1	0,5905
9	0,5905	RESIST 1-2 V	Combination	Min	0	-239,843	0	0	0	752,6872	9-1	0,5905
9	0,5915	RESIST 1-2 V	Combination	Min	0	-218,327	0	0	0	752,713	9-1	0,5915
10	0	SERV1-1	Combination	Max	0	58,418	0	0	0	1102,1796	10-1	0
10	0,5905	SERV1-1	Combination	Max	0	90,522	0	0	0	1094,0769	10-1	0,5905
10	0,5905	SERV1-1	Combination	Max	0	90,522	0	0	0	1094,0769	10-1	0,5905
10	0,5915	SERV1-1	Combination	Max	0	90,552	0	0	0	1094,0204	10-1	0,5915
10	0	SERV1-1	Combination	Min	0	-108,505	0	0	0	524,2363	10-1	0
10	0,5905	SERV1-1	Combination	Min	0	-90,631	0	0	0	529,5316	10-1	0,5905
10	0,5905	SERV1-1	Combination	Min	0	-90,631	0	0	0	529,5316	10-1	0,5905
10	0,5915	SERV1-1	Combination	Min	0	-76,37	0	0	0	529,5317	10-1	0,5915
10	0	SERV1-2	Combination	Max	0	70,689	0	0	0	1114,3469	10-1	0
10	0,5905	SERV1-2	Combination	Max	0	99,683	0	0	0	1119,4591	10-1	0,5905
10	0,5905	SERV1-2	Combination	Max	0	99,683	0	0	0	1119,4591	10-1	0,5905
10	0,5915	SERV1-2	Combination	Max	0	99,713	0	0	0	1119,4477	10-1	0,5915
10	0	SERV1-2	Combination	Min	0	-117,656	0	0	0	524,2363	10-1	0
10	0,5905	SERV1-2	Combination	Min	0	-99,781	0	0	0	529,5316	10-1	0,5905
10	0,5905	SERV1-2	Combination	Min	0	-99,781	0	0	0	529,5316	10-1	0,5905
10	0,5915	SERV1-2	Combination	Min	0	-88,631	0	0	0	529,5317	10-1	0,5915
10	0	RESIST 1-1 M	Combination	Max	0	93,278	0	0	0	1653,7265	10-1	0
10	0,5905	RESIST 1-1 M	Combination	Max	0	141,128	0	0	0	1640,4422	10-1	0,5905
10	0,5905	RESIST 1-1 M	Combination	Max	0	141,128	0	0	0	1640,4422	10-1	0,5905
10	0,5915	RESIST 1-1 M	Combination	Max	0	141,171	0	0	0	1640,354	10-1	0,5915
10	0	RESIST 1-1 M	Combination	Min	0	-166,954	0	0	0	752,713	10-1	0
10	0,5905	RESIST 1-1 M	Combination	Min	0	-141,29	0	0	0	760,3161	10-1	0,5905
10	0,5905	RESIST 1-1 M	Combination	Min	0	-141,29	0	0	0	760,3161	10-1	0,5905
10	0,5915	RESIST 1-1 M	Combination	Min	0	-119,062	0	0	0	760,3161	10-1	0,5915
10	0	RESIST 1-2 M	Combination	Max	0	112,409	0	0	0	1672,6954	10-1	0
10	0,5905	RESIST 1-2 M	Combination	Max	0	155,41	0	0	0	1680,013	10-1	0,5905
10	0,5905	RESIST 1-2 M	Combination	Max	0	155,41	0	0	0	1680,013	10-1	0,5905
10	0,5915	RESIST 1-2 M	Combination	Max	0	155,453	0	0	0	1679,9952	10-1	0,5915
10	0	RESIST 1-2 M	Combination	Min	0	-181,22	0	0	0	752,713	10-1	0
10	0,5905	RESIST 1-2 M	Combination	Min	0	-155,555	0	0	0	760,3161	10-1	0,5905
10	0,5905	RESIST 1-2 M	Combination	Min	0	-155,555	0	0	0	760,3161	10-1	0,5905
10	0,5915	RESIST 1-2 M	Combination	Min	0	-138,176	0	0	0	760,3161	10-1	0,5915
10	0	RESIST 1-1 V	Combination	Max	0	121,67	0	0	0	1868,7214	10-1	0
10	0,5905	RESIST 1-1 V	Combination	Max	0	174,813	0	0	0	1850,453	10-1	0,5905
10	0,5905	RESIST 1-1 V	Combination	Max	0	174,813	0	0	0	1850,453	10-1	0,5905
10	0,5915	RESIST 1-1 V	Combination	Max	0	174,857	0	0	0	1850,3438	10-1	0,5915
10	0	RESIST 1-1 V	Combination	Min	0	-200,658	0	0	0	752,713	10-1	0
10	0,5905	RESIST 1-1 V	Combination	Min	0	-174,993	0	0	0	760,3161	10-1	0,5905
10	0,5905	RESIST 1-1 V	Combination	Min	0	-174,993	0	0	0	760,3161	10-1	0,5905
10	0,5915	RESIST 1-1 V	Combination	Min	0	-147,471	0	0	0	760,3161	10-1	0,5915

10	0	RESIST 1-2 V	Combination	Max	0	145,366	0	0	0	1892,2165	10-1	0
10	0,5905	RESIST 1-2 V	Combination	Max	0	192,503	0	0	0	1899,466	10-1	0,5905
10	0,5905	RESIST 1-2 V	Combination	Max	0	192,503	0	0	0	1899,466	10-1	0,5905
10	0,5915	RESIST 1-2 V	Combination	Max	0	192,547	0	0	0	1899,4439	10-1	0,5915
10	0	RESIST 1-2 V	Combination	Min	0	-218,327	0	0	0	752,713	10-1	0
10	0,5905	RESIST 1-2 V	Combination	Min	0	-192,663	0	0	0	760,3161	10-1	0,5905
10	0,5905	RESIST 1-2 V	Combination	Min	0	-192,663	0	0	0	760,3161	10-1	0,5905
10	0,5915	RESIST 1-2 V	Combination	Min	0	-171,146	0	0	0	760,3161	10-1	0,5915
11	0	SERV1-1	Combination	Max	0	90,552	0	0	0	1094,0204	11-1	0
11	0,5905	SERV1-1	Combination	Max	0	122,657	0	0	0	1102,2245	11-1	0,5905
11	0,5905	SERV1-1	Combination	Max	0	122,657	0	0	0	1102,2245	11-1	0,5905
11	0,5915	SERV1-1	Combination	Max	0	122,687	0	0	0	1102,1049	11-1	0,5915
11	0	SERV1-1	Combination	Min	0	-76,37	0	0	0	529,5317	11-1	0
11	0,5905	SERV1-1	Combination	Min	0	-58,496	0	0	0	524,2542	11-1	0,5905
11	0,5905	SERV1-1	Combination	Min	0	-58,496	0	0	0	524,2542	11-1	0,5905
11	0,5915	SERV1-1	Combination	Min	0	-44,236	0	0	0	524,2363	11-1	0,5915
11	0	SERV1-2	Combination	Max	0	99,713	0	0	0	1119,4477	11-1	0
11	0,5905	SERV1-2	Combination	Max	0	128,708	0	0	0	1114,3867	11-1	0,5905
11	0,5905	SERV1-2	Combination	Max	0	128,708	0	0	0	1114,3867	11-1	0,5905
11	0,5915	SERV1-2	Combination	Max	0	128,738	0	0	0	1114,258	11-1	0,5915
11	0	SERV1-2	Combination	Min	0	-88,631	0	0	0	529,5317	11-1	0
11	0,5905	SERV1-2	Combination	Min	0	-70,757	0	0	0	524,2542	11-1	0,5905
11	0,5905	SERV1-2	Combination	Min	0	-70,757	0	0	0	524,2542	11-1	0,5905
11	0,5915	SERV1-2	Combination	Min	0	-59,606	0	0	0	524,2363	11-1	0,5915
11	0	RESIST 1-1 M	Combination	Max	0	141,171	0	0	0	1640,354	11-1	0
11	0,5905	RESIST 1-1 M	Combination	Max	0	189,02	0	0	0	1653,7943	11-1	0,5905
11	0,5905	RESIST 1-1 M	Combination	Max	0	189,02	0	0	0	1653,7943	11-1	0,5905
11	0,5915	RESIST 1-1 M	Combination	Max	0	189,064	0	0	0	1653,6101	11-1	0,5915
11	0	RESIST 1-1 M	Combination	Min	0	-119,062	0	0	0	760,3161	11-1	0
11	0,5905	RESIST 1-1 M	Combination	Min	0	-93,397	0	0	0	752,7387	11-1	0,5905
11	0,5905	RESIST 1-1 M	Combination	Min	0	-93,397	0	0	0	752,7387	11-1	0,5905
11	0,5915	RESIST 1-1 M	Combination	Min	0	-71,169	0	0	0	752,713	11-1	0,5915
11	0	RESIST 1-2 M	Combination	Max	0	155,453	0	0	0	1679,9952	11-1	0
11	0,5905	RESIST 1-2 M	Combination	Max	0	198,454	0	0	0	1672,7552	11-1	0,5905
11	0,5905	RESIST 1-2 M	Combination	Max	0	198,454	0	0	0	1672,7552	11-1	0,5905
11	0,5915	RESIST 1-2 M	Combination	Max	0	198,497	0	0	0	1672,5567	11-1	0,5915
11	0	RESIST 1-2 M	Combination	Min	0	-138,176	0	0	0	760,3161	11-1	0
11	0,5905	RESIST 1-2 M	Combination	Min	0	-112,511	0	0	0	752,7387	11-1	0,5905
11	0,5905	RESIST 1-2 M	Combination	Min	0	-112,511	0	0	0	752,7387	11-1	0,5905
11	0,5915	RESIST 1-2 M	Combination	Min	0	-95,132	0	0	0	752,713	11-1	0,5915
11	0	RESIST 1-1 V	Combination	Max	0	174,857	0	0	0	1850,3438	11-1	0
11	0,5905	RESIST 1-1 V	Combination	Max	0	227,999	0	0	0	1868,7993	11-1	0,5905
11	0,5905	RESIST 1-1 V	Combination	Max	0	227,999	0	0	0	1868,7993	11-1	0,5905
11	0,5915	RESIST 1-1 V	Combination	Max	0	228,043	0	0	0	1868,5772	11-1	0,5915
11	0	RESIST 1-1 V	Combination	Min	0	-147,471	0	0	0	760,3161	11-1	0
11	0,5905	RESIST 1-1 V	Combination	Min	0	-121,807	0	0	0	752,7387	11-1	0,5905
11	0,5905	RESIST 1-1 V	Combination	Min	0	-121,807	0	0	0	752,7387	11-1	0,5905
11	0,5915	RESIST 1-1 V	Combination	Min	0	-94,285	0	0	0	752,713	11-1	0,5915
11	0	RESIST 1-2 V	Combination	Max	0	192,547	0	0	0	1899,4439	11-1	0
11	0,5905	RESIST 1-2 V	Combination	Max	0	239,684	0	0	0	1892,2845	11-1	0,5905
11	0,5905	RESIST 1-2 V	Combination	Max	0	239,684	0	0	0	1892,2845	11-1	0,5905
11	0,5915	RESIST 1-2 V	Combination	Max	0	239,727	0	0	0	1892,0448	11-1	0,5915
11	0	RESIST 1-2 V	Combination	Min	0	-171,146	0	0	0	760,3161	11-1	0
11	0,5905	RESIST 1-2 V	Combination	Min	0	-145,482	0	0	0	752,7387	11-1	0,5905
11	0,5905	RESIST 1-2 V	Combination	Min	0	-145,482	0	0	0	752,7387	11-1	0,5905
11	0,5915	RESIST 1-2 V	Combination	Min	0	-123,966	0	0	0	752,713	11-1	0,5915
12	0	SERV1-1	Combination	Max	0	122,687	0	0	0	1102,1049	12-1	0
12	0,5905	SERV1-1	Combination	Max	0	154,791	0	0	0	1080,9192	12-1	0,5905
12	0,5905	SERV1-1	Combination	Max	0	154,791	0	0	0	1080,9192	12-1	0,5905
12	0,5915	SERV1-1	Combination	Max	0	154,822	0	0	0	1080,7657	12-1	0,5915
12	0	SERV1-1	Combination	Min	0	-44,236	0	0	0	524,2363	12-1	0
12	0,5905	SERV1-1	Combination	Min	0	-26,361	0	0	0	508,3862	12-1	0,5905
12	0,5905	SERV1-1	Combination	Min	0	-26,361	0	0	0	508,3862	12-1	0,5905
12	0,5915	SERV1-1	Combination	Min	0	-14,008	0	0	0	508,3504	12-1	0,5915
12	0	SERV1-2	Combination	Max	0	128,738	0	0	0	1114,258	12-1	0
12	0,5905	SERV1-2	Combination	Max	0	157,733	0	0	0	1085,5917	12-1	0,5905
12	0,5905	SERV1-2	Combination	Max	0	157,733	0	0	0	1085,5917	12-1	0,5905
12	0,5915	SERV1-2	Combination	Max	0	157,763	0	0	0	1085,4339	12-1	0,5915

12	0	SERV1-2	Combination	Min	0	-59,606	0	0	0	524,2363	12-1	0
12	0,5905	SERV1-2	Combination	Min	0	-41,732	0	0	0	508,3862	12-1	0,5905
12	0,5905	SERV1-2	Combination	Min	0	-41,732	0	0	0	508,3862	12-1	0,5905
12	0,5915	SERV1-2	Combination	Min	0	-30,582	0	0	0	508,3504	12-1	0,5915
12	0	RESIST 1-1 M	Combination	Max	0	189,064	0	0	0	1653,6101	12-1	0
12	0,5905	RESIST 1-1 M	Combination	Max	0	236,913	0	0	0	1622,5339	12-1	0,5905
12	0,5905	RESIST 1-1 M	Combination	Max	0	236,913	0	0	0	1622,5339	12-1	0,5905
12	0,5915	RESIST 1-1 M	Combination	Max	0	236,956	0	0	0	1622,299	12-1	0,5915
12	0	RESIST 1-1 M	Combination	Min	0	-71,169	0	0	0	752,713	12-1	0
12	0,5905	RESIST 1-1 M	Combination	Min	0	-45,504	0	0	0	729,9549	12-1	0,5905
12	0,5905	RESIST 1-1 M	Combination	Min	0	-45,504	0	0	0	729,9549	12-1	0,5905
12	0,5915	RESIST 1-1 M	Combination	Min	0	-26,249	0	0	0	729,9035	12-1	0,5915
12	0	RESIST 1-2 M	Combination	Max	0	198,497	0	0	0	1672,5567	12-1	0
12	0,5905	RESIST 1-2 M	Combination	Max	0	241,498	0	0	0	1629,8182	12-1	0,5905
12	0,5905	RESIST 1-2 M	Combination	Max	0	241,498	0	0	0	1629,8182	12-1	0,5905
12	0,5915	RESIST 1-2 M	Combination	Max	0	241,541	0	0	0	1629,5767	12-1	0,5915
12	0	RESIST 1-2 M	Combination	Min	0	-95,132	0	0	0	752,713	12-1	0
12	0,5905	RESIST 1-2 M	Combination	Min	0	-69,467	0	0	0	729,9549	12-1	0,5905
12	0,5905	RESIST 1-2 M	Combination	Min	0	-69,467	0	0	0	729,9549	12-1	0,5905
12	0,5915	RESIST 1-2 M	Combination	Min	0	-52,087	0	0	0	729,9035	12-1	0,5915
12	0	RESIST 1-1 V	Combination	Max	0	228,043	0	0	0	1868,5772	12-1	0
12	0,5905	RESIST 1-1 V	Combination	Max	0	281,186	0	0	0	1835,5162	12-1	0,5905
12	0,5905	RESIST 1-1 V	Combination	Max	0	281,186	0	0	0	1835,5162	12-1	0,5905
12	0,5915	RESIST 1-1 V	Combination	Max	0	281,229	0	0	0	1835,2375	12-1	0,5915
12	0	RESIST 1-1 V	Combination	Min	0	-94,285	0	0	0	752,713	12-1	0
12	0,5905	RESIST 1-1 V	Combination	Min	0	-68,621	0	0	0	729,9549	12-1	0,5905
12	0,5905	RESIST 1-1 V	Combination	Min	0	-68,621	0	0	0	729,9549	12-1	0,5905
12	0,5915	RESIST 1-1 V	Combination	Min	0	-44,781	0	0	0	729,9035	12-1	0,5915
12	0	RESIST 1-2 V	Combination	Max	0	239,727	0	0	0	1892,0448	12-1	0
12	0,5905	RESIST 1-2 V	Combination	Max	0	286,865	0	0	0	1844,5387	12-1	0,5905
12	0,5905	RESIST 1-2 V	Combination	Max	0	286,865	0	0	0	1844,5387	12-1	0,5905
12	0,5915	RESIST 1-2 V	Combination	Max	0	286,908	0	0	0	1844,2518	12-1	0,5915
12	0	RESIST 1-2 V	Combination	Min	0	-123,966	0	0	0	752,713	12-1	0
12	0,5905	RESIST 1-2 V	Combination	Min	0	-98,301	0	0	0	729,9549	12-1	0,5905
12	0,5905	RESIST 1-2 V	Combination	Min	0	-98,301	0	0	0	729,9549	12-1	0,5905
12	0,5915	RESIST 1-2 V	Combination	Min	0	-76,785	0	0	0	729,9035	12-1	0,5915
13	0	SERV1-1	Combination	Max	0	154,822	0	0	0	1080,7657	13-1	0
13	0,5905	SERV1-1	Combination	Max	0	186,926	0	0	0	1033,7507	13-1	0,5905
13	0,5905	SERV1-1	Combination	Max	0	186,926	0	0	0	1033,7507	13-1	0,5905
13	0,5915	SERV1-1	Combination	Max	0	186,956	0	0	0	1033,5638	13-1	0,5915
13	0	SERV1-1	Combination	Min	0	-14,008	0	0	0	508,3504	13-1	0
13	0,5905	SERV1-1	Combination	Min	0	3,867	0	0	0	481,9275	13-1	0,5905
13	0,5905	SERV1-1	Combination	Min	0	3,867	0	0	0	481,9275	13-1	0,5905
13	0,5915	SERV1-1	Combination	Min	0	11,012	0	0	0	481,8738	13-1	0,5915
13	0	SERV1-2	Combination	Max	0	157,763	0	0	0	1085,4339	13-1	0
13	0,5905	SERV1-2	Combination	Max	0	186,757	0	0	0	1033,051	13-1	0,5905
13	0,5905	SERV1-2	Combination	Max	0	186,757	0	0	0	1033,051	13-1	0,5905
13	0,5915	SERV1-2	Combination	Max	0	186,788	0	0	0	1032,8642	13-1	0,5915
13	0	SERV1-2	Combination	Min	0	-30,582	0	0	0	508,3504	13-1	0
13	0,5905	SERV1-2	Combination	Min	0	-12,707	0	0	0	481,9275	13-1	0,5905
13	0,5905	SERV1-2	Combination	Min	0	-12,707	0	0	0	481,9275	13-1	0,5905
13	0,5915	SERV1-2	Combination	Min	0	-1,557	0	0	0	481,8738	13-1	0,5915
13	0	RESIST 1-1 M	Combination	Max	0	236,956	0	0	0	1622,299	13-1	0
13	0,5905	RESIST 1-1 M	Combination	Max	0	284,806	0	0	0	1552,2572	13-1	0,5905
13	0,5905	RESIST 1-1 M	Combination	Max	0	284,806	0	0	0	1552,2572	13-1	0,5905
13	0,5915	RESIST 1-1 M	Combination	Max	0	284,849	0	0	0	1551,9724	13-1	0,5915
13	0	RESIST 1-1 M	Combination	Min	0	-26,249	0	0	0	729,9035	13-1	0
13	0,5905	RESIST 1-1 M	Combination	Min	0	-0,584	0	0	0	691,9648	13-1	0,5905
13	0,5905	RESIST 1-1 M	Combination	Min	0	-0,584	0	0	0	691,9648	13-1	0,5905
13	0,5915	RESIST 1-1 M	Combination	Min	0	10,552	0	0	0	691,8877	13-1	0,5915
13	0	RESIST 1-2 M	Combination	Max	0	241,541	0	0	0	1629,5767	13-1	0
13	0,5905	RESIST 1-2 M	Combination	Max	0	284,542	0	0	0	1551,1663	13-1	0,5905
13	0,5905	RESIST 1-2 M	Combination	Max	0	284,542	0	0	0	1551,1663	13-1	0,5905
13	0,5915	RESIST 1-2 M	Combination	Max	0	284,586	0	0	0	1550,8818	13-1	0,5915
13	0	RESIST 1-2 M	Combination	Min	0	-52,087	0	0	0	729,9035	13-1	0
13	0,5905	RESIST 1-2 M	Combination	Min	0	-26,423	0	0	0	691,9648	13-1	0,5905
13	0,5905	RESIST 1-2 M	Combination	Min	0	-26,423	0	0	0	691,9648	13-1	0,5905
13	0,5915	RESIST 1-2 M	Combination	Min	0	-9,043	0	0	0	691,8877	13-1	0,5915

13	0	RESIST 1-1 V	Combination	Max	0	281,229	0	0	0	1835,2375	13-1	0
13	0,5905	RESIST 1-1 V	Combination	Max	0	334,372	0	0	0	1757,5354	13-1	0,5905
13	0,5905	RESIST 1-1 V	Combination	Max	0	334,372	0	0	0	1757,5354	13-1	0,5905
13	0,5915	RESIST 1-1 V	Combination	Max	0	334,415	0	0	0	1757,201	13-1	0,5915
13	0	RESIST 1-1 V	Combination	Min	0	-44,781	0	0	0	729,9035	13-1	0
13	0,5905	RESIST 1-1 V	Combination	Min	0	-19,116	0	0	0	691,9648	13-1	0,5905
13	0,5905	RESIST 1-1 V	Combination	Min	0	-19,116	0	0	0	691,9648	13-1	0,5905
13	0,5915	RESIST 1-1 V	Combination	Min	0	-5,333	0	0	0	691,8877	13-1	0,5915
13	0	RESIST 1-2 V	Combination	Max	0	286,908	0	0	0	1844,2518	13-1	0
13	0,5905	RESIST 1-2 V	Combination	Max	0	334,045	0	0	0	1756,1843	13-1	0,5905
13	0,5905	RESIST 1-2 V	Combination	Max	0	334,045	0	0	0	1756,1843	13-1	0,5905
13	0,5915	RESIST 1-2 V	Combination	Max	0	334,089	0	0	0	1755,8502	13-1	0,5915
13	0	RESIST 1-2 V	Combination	Min	0	-76,785	0	0	0	729,9035	13-1	0
13	0,5905	RESIST 1-2 V	Combination	Min	0	-51,12	0	0	0	691,9648	13-1	0,5905
13	0,5905	RESIST 1-2 V	Combination	Min	0	-51,12	0	0	0	691,9648	13-1	0,5905
13	0,5915	RESIST 1-2 V	Combination	Min	0	-29,604	0	0	0	691,8877	13-1	0,5915
14	0	SERV1-1	Combination	Max	0	186,956	0	0	0	1033,5638	14-1	0
14	0,5905	SERV1-1	Combination	Max	0	219,061	0	0	0	968,4051	14-1	0,5905
14	0,5905	SERV1-1	Combination	Max	0	219,061	0	0	0	968,4051	14-1	0,5905
14	0,5915	SERV1-1	Combination	Max	0	219,091	0	0	0	968,186	14-1	0,5915
14	0	SERV1-1	Combination	Min	0	11,012	0	0	0	481,8738	14-1	0
14	0,5905	SERV1-1	Combination	Min	0	28,887	0	0	0	444,8782	14-1	0,5905
14	0,5905	SERV1-1	Combination	Min	0	28,887	0	0	0	444,8782	14-1	0,5905
14	0,5915	SERV1-1	Combination	Min	0	36,032	0	0	0	444,8066	14-1	0,5915
14	0	SERV1-2	Combination	Max	0	186,788	0	0	0	1032,8642	14-1	0
14	0,5905	SERV1-2	Combination	Max	0	215,782	0	0	0	956,7648	14-1	0,5905
14	0,5905	SERV1-2	Combination	Max	0	215,782	0	0	0	956,7648	14-1	0,5905
14	0,5915	SERV1-2	Combination	Max	0	215,812	0	0	0	956,549	14-1	0,5915
14	0	SERV1-2	Combination	Min	0	-1,557	0	0	0	481,8738	14-1	0
14	0,5905	SERV1-2	Combination	Min	0	16,318	0	0	0	444,8782	14-1	0,5905
14	0,5905	SERV1-2	Combination	Min	0	16,318	0	0	0	444,8782	14-1	0,5905
14	0,5915	SERV1-2	Combination	Min	0	27,468	0	0	0	444,8066	14-1	0,5915
14	0	RESIST 1-1 M	Combination	Max	0	284,849	0	0	0	1551,9724	14-1	0
14	0,5905	RESIST 1-1 M	Combination	Max	0	332,698	0	0	0	1454,9468	14-1	0,5905
14	0,5905	RESIST 1-1 M	Combination	Max	0	332,698	0	0	0	1454,9468	14-1	0,5905
14	0,5915	RESIST 1-1 M	Combination	Max	0	332,742	0	0	0	1454,614	14-1	0,5915
14	0	RESIST 1-1 M	Combination	Min	0	10,552	0	0	0	691,8877	14-1	0
14	0,5905	RESIST 1-1 M	Combination	Min	0	36,216	0	0	0	638,7684	14-1	0,5905
14	0,5905	RESIST 1-1 M	Combination	Min	0	36,216	0	0	0	638,7684	14-1	0,5905
14	0,5915	RESIST 1-1 M	Combination	Min	0	47,352	0	0	0	638,6656	14-1	0,5915
14	0	RESIST 1-2 M	Combination	Max	0	284,586	0	0	0	1550,8818	14-1	0
14	0,5905	RESIST 1-2 M	Combination	Max	0	327,586	0	0	0	1436,7996	14-1	0,5905
14	0,5905	RESIST 1-2 M	Combination	Max	0	327,586	0	0	0	1436,7996	14-1	0,5905
14	0,5915	RESIST 1-2 M	Combination	Max	0	327,63	0	0	0	1436,472	14-1	0,5915
14	0	RESIST 1-2 M	Combination	Min	0	-9,043	0	0	0	691,8877	14-1	0
14	0,5905	RESIST 1-2 M	Combination	Min	0	16,621	0	0	0	638,7684	14-1	0,5905
14	0,5905	RESIST 1-2 M	Combination	Min	0	16,621	0	0	0	638,7684	14-1	0,5905
14	0,5915	RESIST 1-2 M	Combination	Min	0	34,001	0	0	0	638,6656	14-1	0,5915
14	0	RESIST 1-1 V	Combination	Max	0	334,415	0	0	0	1757,201	14-1	0
14	0,5905	RESIST 1-1 V	Combination	Max	0	387,558	0	0	0	1649,6988	14-1	0,5905
14	0,5905	RESIST 1-1 V	Combination	Max	0	387,558	0	0	0	1649,6988	14-1	0,5905
14	0,5915	RESIST 1-1 V	Combination	Max	0	387,601	0	0	0	1649,3112	14-1	0,5915
14	0	RESIST 1-1 V	Combination	Min	0	-5,333	0	0	0	691,8877	14-1	0
14	0,5905	RESIST 1-1 V	Combination	Min	0	20,331	0	0	0	638,7684	14-1	0,5905
14	0,5905	RESIST 1-1 V	Combination	Min	0	20,331	0	0	0	638,7684	14-1	0,5905
14	0,5915	RESIST 1-1 V	Combination	Min	0	34,114	0	0	0	638,6656	14-1	0,5915
14	0	RESIST 1-2 V	Combination	Max	0	334,089	0	0	0	1755,8502	14-1	0
14	0,5905	RESIST 1-2 V	Combination	Max	0	381,226	0	0	0	1627,2214	14-1	0,5905
14	0,5905	RESIST 1-2 V	Combination	Max	0	381,226	0	0	0	1627,2214	14-1	0,5905
14	0,5915	RESIST 1-2 V	Combination	Max	0	381,27	0	0	0	1626,8401	14-1	0,5915
14	0	RESIST 1-2 V	Combination	Min	0	-29,604	0	0	0	691,8877	14-1	0
14	0,5905	RESIST 1-2 V	Combination	Min	0	-3,939	0	0	0	638,7684	14-1	0,5905
14	0,5905	RESIST 1-2 V	Combination	Min	0	-3,939	0	0	0	638,7684	14-1	0,5905
14	0,5915	RESIST 1-2 V	Combination	Min	0	17,577	0	0	0	638,6656	14-1	0,5915
15	0	SERV1-1	Combination	Max	0	219,091	0	0	0	968,186	15-1	0
15	0,5905	SERV1-1	Combination	Max	0	252,013	0	0	0	878,0518	15-1	0,5905
15	0,5905	SERV1-1	Combination	Max	0	252,013	0	0	0	878,0518	15-1	0,5905
15	0,5915	SERV1-1	Combination	Max	0	252,043	0	0	0	877,7998	15-1	0,5915

15	0	SERV1-1	Combination	Min	0	36,032	0	0	0	444,8066	15-1	0
15	0,5905	SERV1-1	Combination	Min	0	53,906	0	0	0	397,2382	15-1	0,5905
15	0,5905	SERV1-1	Combination	Min	0	53,906	0	0	0	397,2382	15-1	0,5905
15	0,5915	SERV1-1	Combination	Min	0	61,051	0	0	0	397,1487	15-1	0,5915
15	0	SERV1-2	Combination	Max	0	215,812	0	0	0	956,549	15-1	0
15	0,5905	SERV1-2	Combination	Max	0	244,807	0	0	0	856,733	15-1	0,5905
15	0,5905	SERV1-2	Combination	Max	0	244,807	0	0	0	856,733	15-1	0,5905
15	0,5915	SERV1-2	Combination	Max	0	244,837	0	0	0	856,4881	15-1	0,5915
15	0	SERV1-2	Combination	Min	0	27,468	0	0	0	444,8066	15-1	0
15	0,5905	SERV1-2	Combination	Min	0	45,342	0	0	0	397,2382	15-1	0,5905
15	0,5905	SERV1-2	Combination	Min	0	45,342	0	0	0	397,2382	15-1	0,5905
15	0,5915	SERV1-2	Combination	Min	0	56,493	0	0	0	397,1487	15-1	0,5915
15	0	RESIST 1-1 M	Combination	Max	0	332,742	0	0	0	1454,614	15-1	0
15	0,5905	RESIST 1-1 M	Combination	Max	0	381,865	0	0	0	1319,954	15-1	0,5905
15	0,5905	RESIST 1-1 M	Combination	Max	0	381,865	0	0	0	1319,954	15-1	0,5905
15	0,5915	RESIST 1-1 M	Combination	Max	0	381,908	0	0	0	1319,5721	15-1	0,5915
15	0	RESIST 1-1 M	Combination	Min	0	47,352	0	0	0	638,6656	15-1	0
15	0,5905	RESIST 1-1 M	Combination	Min	0	73,017	0	0	0	570,3656	15-1	0,5905
15	0,5905	RESIST 1-1 M	Combination	Min	0	73,017	0	0	0	570,3656	15-1	0,5905
15	0,5915	RESIST 1-1 M	Combination	Min	0	84,152	0	0	0	570,2371	15-1	0,5915
15	0	RESIST 1-2 M	Combination	Max	0	327,63	0	0	0	1436,472	15-1	0
15	0,5905	RESIST 1-2 M	Combination	Max	0	370,63	0	0	0	1286,7179	15-1	0,5905
15	0,5905	RESIST 1-2 M	Combination	Max	0	370,63	0	0	0	1286,7179	15-1	0,5905
15	0,5915	RESIST 1-2 M	Combination	Max	0	370,674	0	0	0	1286,3472	15-1	0,5915
15	0	RESIST 1-2 M	Combination	Min	0	34,001	0	0	0	638,6656	15-1	0
15	0,5905	RESIST 1-2 M	Combination	Min	0	59,665	0	0	0	570,3656	15-1	0,5905
15	0,5905	RESIST 1-2 M	Combination	Min	0	59,665	0	0	0	570,3656	15-1	0,5905
15	0,5915	RESIST 1-2 M	Combination	Min	0	77,045	0	0	0	570,2371	15-1	0,5915
15	0	RESIST 1-1 V	Combination	Max	0	387,601	0	0	0	1649,3112	15-1	0
15	0,5905	RESIST 1-1 V	Combination	Max	0	442,322	0	0	0	1498,8167	15-1	0,5905
15	0,5905	RESIST 1-1 V	Combination	Max	0	442,322	0	0	0	1498,8167	15-1	0,5905
15	0,5915	RESIST 1-1 V	Combination	Max	0	442,365	0	0	0	1498,3743	15-1	0,5915
15	0	RESIST 1-1 V	Combination	Min	0	34,114	0	0	0	638,6656	15-1	0
15	0,5905	RESIST 1-1 V	Combination	Min	0	59,778	0	0	0	570,3656	15-1	0,5905
15	0,5905	RESIST 1-1 V	Combination	Min	0	59,778	0	0	0	570,3656	15-1	0,5905
15	0,5915	RESIST 1-1 V	Combination	Min	0	73,561	0	0	0	570,2371	15-1	0,5915
15	0	RESIST 1-2 V	Combination	Max	0	381,27	0	0	0	1626,8401	15-1	0
15	0,5905	RESIST 1-2 V	Combination	Max	0	428,407	0	0	0	1457,6499	15-1	0,5905
15	0,5905	RESIST 1-2 V	Combination	Max	0	428,407	0	0	0	1457,6499	15-1	0,5905
15	0,5915	RESIST 1-2 V	Combination	Max	0	428,451	0	0	0	1457,2215	15-1	0,5915
15	0	RESIST 1-2 V	Combination	Min	0	17,577	0	0	0	638,6656	15-1	0
15	0,5905	RESIST 1-2 V	Combination	Min	0	43,241	0	0	0	570,3656	15-1	0,5905
15	0,5905	RESIST 1-2 V	Combination	Min	0	43,241	0	0	0	570,3656	15-1	0,5905
15	0,5915	RESIST 1-2 V	Combination	Min	0	64,757	0	0	0	570,2371	15-1	0,5915
16	0	SERV1-1	Combination	Max	0	252,043	0	0	0	877,7998	16-1	0
16	0,5905	SERV1-1	Combination	Max	0	285,927	0	0	0	761,5867	16-1	0,5905
16	0,5905	SERV1-1	Combination	Max	0	285,927	0	0	0	761,5867	16-1	0,5905
16	0,5915	SERV1-1	Combination	Max	0	285,958	0	0	0	761,3008	16-1	0,5915
16	0	SERV1-1	Combination	Min	0	61,051	0	0	0	397,1487	16-1	0
16	0,5905	SERV1-1	Combination	Min	0	78,926	0	0	0	339,0077	16-1	0,5905
16	0,5905	SERV1-1	Combination	Min	0	78,926	0	0	0	339,0077	16-1	0,5905
16	0,5915	SERV1-1	Combination	Min	0	86,071	0	0	0	338,9003	16-1	0,5915
16	0	SERV1-2	Combination	Max	0	244,837	0	0	0	856,4881	16-1	0
16	0,5905	SERV1-2	Combination	Max	0	273,831	0	0	0	732,9555	16-1	0,5905
16	0,5905	SERV1-2	Combination	Max	0	273,831	0	0	0	732,9555	16-1	0,5905
16	0,5915	SERV1-2	Combination	Max	0	273,862	0	0	0	732,6817	16-1	0,5915
16	0	SERV1-2	Combination	Min	0	56,493	0	0	0	397,1487	16-1	0
16	0,5905	SERV1-2	Combination	Min	0	74,367	0	0	0	339,0077	16-1	0,5905
16	0,5905	SERV1-2	Combination	Min	0	74,367	0	0	0	339,0077	16-1	0,5905
16	0,5915	SERV1-2	Combination	Min	0	85,517	0	0	0	338,9003	16-1	0,5915
16	0	RESIST 1-1 M	Combination	Max	0	381,908	0	0	0	1319,5721	16-1	0
16	0,5905	RESIST 1-1 M	Combination	Max	0	432,532	0	0	0	1145,5573	16-1	0,5905
16	0,5905	RESIST 1-1 M	Combination	Max	0	432,532	0	0	0	1145,5573	16-1	0,5905
16	0,5915	RESIST 1-1 M	Combination	Max	0	432,576	0	0	0	1145,1247	16-1	0,5915
16	0	RESIST 1-1 M	Combination	Min	0	84,152	0	0	0	570,2371	16-1	0
16	0,5905	RESIST 1-1 M	Combination	Min	0	109,817	0	0	0	486,7566	16-1	0,5905
16	0,5905	RESIST 1-1 M	Combination	Min	0	109,817	0	0	0	486,7566	16-1	0,5905
16	0,5915	RESIST 1-1 M	Combination	Min	0	120,953	0	0	0	486,6023	16-1	0,5915

17	0	RESIST 1-2 V	Combination	Min	0	111,938	0	0	0	486,6023	17-1	0
17	0,5905	RESIST 1-2 V	Combination	Min	0	137,603	0	0	0	387,9412	17-1	0,5905
17	0,5905	RESIST 1-2 V	Combination	Min	0	137,603	0	0	0	387,9412	17-1	0,5905
17	0,5915	RESIST 1-2 V	Combination	Min	0	158,466	0	0	0	387,7612	17-1	0,5915
18	0	SERV1-1	Combination	Max	0	319,872	0	0	0	615,2713	18-1	0
18	0,5905	SERV1-1	Combination	Max	0	353,757	0	0	0	440,0651	18-1	0,5905
18	0,5905	SERV1-1	Combination	Max	0	353,757	0	0	0	440,0651	18-1	0,5905
18	0,5915	SERV1-1	Combination	Max	0	353,787	0	0	0	439,7113	18-1	0,5915
18	0	SERV1-1	Combination	Min	0	111,091	0	0	0	270,0611	18-1	0
18	0,5905	SERV1-1	Combination	Min	0	128,965	0	0	0	190,7746	18-1	0,5905
18	0,5905	SERV1-1	Combination	Min	0	128,965	0	0	0	190,7746	18-1	0,5905
18	0,5915	SERV1-1	Combination	Min	0	136,111	0	0	0	190,6314	18-1	0,5915
18	0	SERV1-2	Combination	Max	0	302,886	0	0	0	585,1297	18-1	0
18	0,5905	SERV1-2	Combination	Max	0	331,881	0	0	0	414,1639	18-1	0,5905
18	0,5905	SERV1-2	Combination	Max	0	331,881	0	0	0	414,1639	18-1	0,5905
18	0,5915	SERV1-2	Combination	Max	0	331,911	0	0	0	413,832	18-1	0,5915
18	0	SERV1-2	Combination	Min	0	114,204	0	0	0	270,0611	18-1	0
18	0,5905	SERV1-2	Combination	Min	0	132,078	0	0	0	190,7746	18-1	0,5905
18	0,5905	SERV1-2	Combination	Min	0	132,078	0	0	0	190,7746	18-1	0,5905
18	0,5915	SERV1-2	Combination	Min	0	137,668	0	0	0	190,6314	18-1	0,5915
18	0	RESIST 1-1 M	Combination	Max	0	483,243	0	0	0	925,9438	18-1	0
18	0,5905	RESIST 1-1 M	Combination	Max	0	533,868	0	0	0	662,5633	18-1	0,5905
18	0,5905	RESIST 1-1 M	Combination	Max	0	533,868	0	0	0	662,5633	18-1	0,5905
18	0,5915	RESIST 1-1 M	Combination	Max	0	533,911	0	0	0	662,0294	18-1	0,5915
18	0	RESIST 1-1 M	Combination	Min	0	157,753	0	0	0	387,7612	18-1	0
18	0,5905	RESIST 1-1 M	Combination	Min	0	183,418	0	0	0	273,9195	18-1	0,5905
18	0,5905	RESIST 1-1 M	Combination	Min	0	183,418	0	0	0	273,9195	18-1	0,5905
18	0,5915	RESIST 1-1 M	Combination	Min	0	194,554	0	0	0	273,7138	18-1	0,5915
18	0	RESIST 1-2 M	Combination	Max	0	456,762	0	0	0	878,9531	18-1	0
18	0,5905	RESIST 1-2 M	Combination	Max	0	499,763	0	0	0	622,1834	18-1	0,5905
18	0,5905	RESIST 1-2 M	Combination	Max	0	499,763	0	0	0	622,1834	18-1	0,5905
18	0,5915	RESIST 1-2 M	Combination	Max	0	499,806	0	0	0	621,6836	18-1	0,5915
18	0	RESIST 1-2 M	Combination	Min	0	162,606	0	0	0	387,7612	18-1	0
18	0,5905	RESIST 1-2 M	Combination	Min	0	188,27	0	0	0	273,9195	18-1	0,5905
18	0,5905	RESIST 1-2 M	Combination	Min	0	188,27	0	0	0	273,9195	18-1	0,5905
18	0,5915	RESIST 1-2 M	Combination	Min	0	196,982	0	0	0	273,7138	18-1	0,5915
18	0	RESIST 1-1 V	Combination	Max	0	555,612	0	0	0	1054,362	18-1	0
18	0,5905	RESIST 1-1 V	Combination	Max	0	612,192	0	0	0	755,2993	18-1	0,5905
18	0,5905	RESIST 1-1 V	Combination	Max	0	612,192	0	0	0	755,2993	18-1	0,5905
18	0,5915	RESIST 1-1 V	Combination	Max	0	612,235	0	0	0	754,6871	18-1	0,5915
18	0	RESIST 1-1 V	Combination	Min	0	152,455	0	0	0	387,7612	18-1	0
18	0,5905	RESIST 1-1 V	Combination	Min	0	178,12	0	0	0	273,9195	18-1	0,5905
18	0,5905	RESIST 1-1 V	Combination	Min	0	178,12	0	0	0	273,9195	18-1	0,5905
18	0,5915	RESIST 1-1 V	Combination	Min	0	191,902	0	0	0	273,7138	18-1	0,5915
18	0	RESIST 1-2 V	Combination	Max	0	522,812	0	0	0	996,1585	18-1	0
18	0,5905	RESIST 1-2 V	Combination	Max	0	569,949	0	0	0	705,2842	18-1	0,5905
18	0,5905	RESIST 1-2 V	Combination	Max	0	569,949	0	0	0	705,2842	18-1	0,5905
18	0,5915	RESIST 1-2 V	Combination	Max	0	569,993	0	0	0	704,7142	18-1	0,5915
18	0	RESIST 1-2 V	Combination	Min	0	158,466	0	0	0	387,7612	18-1	0
18	0,5905	RESIST 1-2 V	Combination	Min	0	184,13	0	0	0	273,9195	18-1	0,5905
18	0,5905	RESIST 1-2 V	Combination	Min	0	184,13	0	0	0	273,9195	18-1	0,5905
18	0,5915	RESIST 1-2 V	Combination	Min	0	194,91	0	0	0	273,7138	18-1	0,5915
19	0	SERV1-1	Combination	Max	0	353,787	0	0	0	439,7113	19-1	0
19	0,5905	SERV1-1	Combination	Max	0	387,671	0	0	0	235,0086	19-1	0,5905
19	0,5905	SERV1-1	Combination	Max	0	387,671	0	0	0	235,0086	19-1	0,5905
19	0,5915	SERV1-1	Combination	Max	0	387,702	0	0	0	234,6209	19-1	0,5915
19	0	SERV1-1	Combination	Min	0	136,111	0	0	0	190,6314	19-1	0
19	0,5905	SERV1-1	Combination	Min	0	153,985	0	0	0	100,7721	19-1	0,5905
19	0,5905	SERV1-1	Combination	Min	0	153,985	0	0	0	100,7721	19-1	0,5905
19	0,5915	SERV1-1	Combination	Min	0	161,142	0	0	0	100,611	19-1	0,5915
19	0	SERV1-2	Combination	Max	0	331,911	0	0	0	413,832	19-1	0
19	0,5905	SERV1-2	Combination	Max	0	360,905	0	0	0	219,1497	19-1	0,5905
19	0,5905	SERV1-2	Combination	Max	0	360,905	0	0	0	219,1497	19-1	0,5905
19	0,5915	SERV1-2	Combination	Max	0	360,936	0	0	0	218,7888	19-1	0,5915
19	0	SERV1-2	Combination	Min	0	137,668	0	0	0	190,6314	19-1	0
19	0,5905	SERV1-2	Combination	Min	0	155,543	0	0	0	100,7721	19-1	0,5905
19	0,5905	SERV1-2	Combination	Min	0	155,543	0	0	0	100,7721	19-1	0,5905
19	0,5915	SERV1-2	Combination	Min	0	161,142	0	0	0	100,611	19-1	0,5915

19	0	RESIST 1-1 M	Combination	Max	0	533,911	0	0	0	662,0294	19-1	0
19	0,5905	RESIST 1-1 M	Combination	Max	0	584,535	0	0	0	353,966	19-1	0,5905
19	0,5905	RESIST 1-1 M	Combination	Max	0	584,535	0	0	0	353,966	19-1	0,5905
19	0,5915	RESIST 1-1 M	Combination	Max	0	584,579	0	0	0	353,3815	19-1	0,5915
19	0	RESIST 1-1 M	Combination	Min	0	194,554	0	0	0	273,7138	19-1	0
19	0,5905	RESIST 1-1 M	Combination	Min	0	220,218	0	0	0	144,6914	19-1	0,5905
19	0,5905	RESIST 1-1 M	Combination	Min	0	220,218	0	0	0	144,6914	19-1	0,5905
19	0,5915	RESIST 1-1 M	Combination	Min	0	231,373	0	0	0	144,4601	19-1	0,5915
19	0	RESIST 1-2 M	Combination	Max	0	499,806	0	0	0	621,6836	19-1	0
19	0,5905	RESIST 1-2 M	Combination	Max	0	542,807	0	0	0	329,2421	19-1	0,5905
19	0,5905	RESIST 1-2 M	Combination	Max	0	542,807	0	0	0	329,2421	19-1	0,5905
19	0,5915	RESIST 1-2 M	Combination	Max	0	542,851	0	0	0	328,6993	19-1	0,5915
19	0	RESIST 1-2 M	Combination	Min	0	196,982	0	0	0	273,7138	19-1	0
19	0,5905	RESIST 1-2 M	Combination	Min	0	222,646	0	0	0	144,6914	19-1	0,5905
19	0,5905	RESIST 1-2 M	Combination	Min	0	222,646	0	0	0	144,6914	19-1	0,5905
19	0,5915	RESIST 1-2 M	Combination	Min	0	231,373	0	0	0	144,4601	19-1	0,5915
19	0	RESIST 1-1 V	Combination	Max	0	612,235	0	0	0	754,6871	19-1	0
19	0,5905	RESIST 1-1 V	Combination	Max	0	668,815	0	0	0	403,902	19-1	0,5905
19	0,5905	RESIST 1-1 V	Combination	Max	0	668,815	0	0	0	403,902	19-1	0,5905
19	0,5915	RESIST 1-1 V	Combination	Max	0	668,859	0	0	0	403,2331	19-1	0,5915
19	0	RESIST 1-1 V	Combination	Min	0	191,902	0	0	0	273,7138	19-1	0
19	0,5905	RESIST 1-1 V	Combination	Min	0	217,567	0	0	0	144,6914	19-1	0,5905
19	0,5905	RESIST 1-1 V	Combination	Min	0	217,567	0	0	0	144,6914	19-1	0,5905
19	0,5915	RESIST 1-1 V	Combination	Min	0	231,373	0	0	0	144,4601	19-1	0,5915
19	0	RESIST 1-2 V	Combination	Max	0	569,993	0	0	0	704,7142	19-1	0
19	0,5905	RESIST 1-2 V	Combination	Max	0	617,13	0	0	0	373,2785	19-1	0,5905
19	0,5905	RESIST 1-2 V	Combination	Max	0	617,13	0	0	0	373,2785	19-1	0,5905
19	0,5915	RESIST 1-2 V	Combination	Max	0	617,174	0	0	0	372,6614	19-1	0,5915
19	0	RESIST 1-2 V	Combination	Min	0	194,91	0	0	0	273,7138	19-1	0
19	0,5905	RESIST 1-2 V	Combination	Min	0	220,575	0	0	0	144,6914	19-1	0,5905
19	0,5905	RESIST 1-2 V	Combination	Min	0	220,575	0	0	0	144,6914	19-1	0,5905
19	0,5915	RESIST 1-2 V	Combination	Min	0	231,373	0	0	0	144,4601	19-1	0,5915
20	0	SERV1-1	Combination	Max	0	387,702	0	0	0	234,6209	20-1	0
20	0,5915	SERV1-1	Combination	Max	0	421,643	0	0	0	1,114E-12	20-1	0,5915
20	0	SERV1-1	Combination	Min	0	161,142	0	0	0	100,611	20-1	0
20	0,5915	SERV1-1	Combination	Min	0	179,047	0	0	0	1,114E-12	20-1	0,5915
20	0	SERV1-2	Combination	Max	0	360,936	0	0	0	218,7888	20-1	0
20	0,5915	SERV1-2	Combination	Max	0	389,979	0	0	0	1,114E-12	20-1	0,5915
20	0	SERV1-2	Combination	Min	0	161,142	0	0	0	100,611	20-1	0
20	0,5915	SERV1-2	Combination	Min	0	179,047	0	0	0	1,114E-12	20-1	0,5915
20	0	RESIST 1-1 M	Combination	Max	0	584,579	0	0	0	353,3815	20-1	0
20	0,5915	RESIST 1-1 M	Combination	Max	0	635,289	0	0	0	1,648E-12	20-1	0,5915
20	0	RESIST 1-1 M	Combination	Min	0	231,373	0	0	0	144,4601	20-1	0
20	0,5915	RESIST 1-1 M	Combination	Min	0	257,081	0	0	0	1,648E-12	20-1	0,5915
20	0	RESIST 1-2 M	Combination	Max	0	542,851	0	0	0	328,6993	20-1	0
20	0,5915	RESIST 1-2 M	Combination	Max	0	585,924	0	0	0	1,648E-12	20-1	0,5915
20	0	RESIST 1-2 M	Combination	Min	0	231,373	0	0	0	144,4601	20-1	0
20	0,5915	RESIST 1-2 M	Combination	Min	0	257,081	0	0	0	1,648E-12	20-1	0,5915
20	0	RESIST 1-1 V	Combination	Max	0	668,859	0	0	0	403,2331	20-1	0
20	0,5915	RESIST 1-1 V	Combination	Max	0	725,534	0	0	0	1,648E-12	20-1	0,5915
20	0	RESIST 1-1 V	Combination	Min	0	231,373	0	0	0	144,4601	20-1	0
20	0,5915	RESIST 1-1 V	Combination	Min	0	257,081	0	0	0	1,648E-12	20-1	0,5915
20	0	RESIST 1-2 V	Combination	Max	0	617,174	0	0	0	372,6614	20-1	0
20	0,5915	RESIST 1-2 V	Combination	Max	0	664,391	0	0	0	1,648E-12	20-1	0,5915
20	0	RESIST 1-2 V	Combination	Min	0	231,373	0	0	0	144,4601	20-1	0
20	0,5915	RESIST 1-2 V	Combination	Min	0	257,081	0	0	0	1,648E-12	20-1	0,5915

ANEXO 4

ANEXO 4A - DEFLEXIONES VIGA EXTERNA

TABLE: Joint Displacements

Joint	OutputCase	CaseType	StepType	U1	U2	U3	R1	R2	R3
Text	Text	Text	Text	m	m	m	Radians	Radians	Radians
11	HL93	LinMoving	Max	0	0,001022	0	0	0,00055	0,000059
11	HL93	LinMoving	Min	0	0	-0,026687	0	-0,00055	-0,000059
11	DFL1	Combination	Max	0	0,00054	-0,007851	0	0,000138	0,000015
11	DFL1	Combination	Min	0	0,000284	-0,014523	0	-0,000138	-0,000015
11	DFL2	Combination	Max	0	0,000562	-0,007851	0	0,000204	0,000022
11	DFL2	Combination	Min	0	0,000284	-0,014122	0	-0,000204	-0,000022
11	DFL3	Combination		0	0,000687	-0,018981	0	-2,923E-16	-2,614E-17

ANEXO 4B - DEFLEXIONES VIGA INTERNA

TABLE: Joint Displacements

Joint	OutputCase	CaseType	StepType	U1	U2	U3	R1	R2	R3
Text	Text	Text	Text	m	m	m	Radians	Radians	Radians
11	HL93	LinMoving	Max	0	0	0	0	0,000487	0
11	HL93	LinMoving	Min	0	0	-0,02493	0	-0,000487	0
11	DFL1	Combination	Max	0	0	-0,007347	0	0,000122	0
11	DFL1	Combination	Min	0	0	-0,013579	0	-0,000122	0
11	DFL2	Combination	Max	0	0	-0,007347	0	0,000181	0
11	DFL2	Combination	Min	0	0	-0,013175	0	-0,000181	0
11	DFL3	Combination		0	0	-0,016463	0	3,041E-17	0

ANEXO 5

CAPACIDAD A CORTANTE SECCION φVn - FEX COMBINACION RESISTENCIA 1-1 PTO -1

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	0		Diámetro de estribos
Cant=	0		
Asv=	0.00 cm2	= 0.00 ft^2	Área de acero transversal- Estribos
As-corte =	0.0 cm2	= 0.00 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	0.00m	= 0.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.01 cm2 = 0.00 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	324 kN	= 72.88	kips	Cortante ultimo actuante en punto de estudio
Mu=	0 kN-m	= 0.00	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\, b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x \frac{1.38}{a_g + 0.63}$$

εs =	0.00026			
θ (29+3500εs) =	29.9°			
β =	4.0°			
Vc=	806 KN	= 181.60	kips	
Vs=	0 KN	= 0.00	kips	
ϕVn1=	725 KN	= 163.44	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv =	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	725 KN	= 163.44	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -2**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	20.23 cm2	= 3.14 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	258 kN	= 58.03	kips	Cortante ultimo actuante en punto de estudio
Mu=	166 kN-m	= 122.66	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00059					
θ (29+3500εs) =	31.1°					
β =	3.3°					
Vc=	670 KN	= 151.06	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	621 KN	= 139.94	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	621 KN	= 139.94	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -3**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"	Diámetro de refuerzo Horizontal
Asv=	5.1 cm2	Área de barra
Cant=	12	
As- flexión =	61.2 cm2 = 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	218 kN	= 48.98	kips	Cortante ultimo actuante en punto de estudio
Mu=	295 kN-m	= 217.81	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\, b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x \frac{1.38}{a_g + 0.63}$$

εs =	0.00085			
θ (29+3500εs) =	32.0°			
β =	2.9°			
Vc=	591 KN	= 133.07	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	549 KN	= 123.76	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv =	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	549 KN	= 123.76	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -4**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	20.23 cm2	= 3.14 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	179 kN	= 40.14	kips	Cortante ultimo actuante en punto de estudio
Mu=	388 kN-m	= 286.33	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00103			
θ (29+3500εs) =	32.6°			
β =	2.7°			
Vc=	546 KN	= 123.00	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	509 KN	= 114.69	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	509 KN	= 114.69	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX COMBINACION RESISTENCIA 1-1 PTO -5

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	14 kN	= 3.21	kips	Cortante ultimo actuante en punto de estudio
Mu=	446 kN-m	= 329.47	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00102					
θ (29+3500εs) =	32.6°					
β =	2.7°					
Vc=	546 KN	= 123.08	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	509 KN	= 114.77	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	= 2041 KN	= 458.9	kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	509 KN	= 114.77	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -6**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	103 kN	= 23.20	kips	Cortante ultimo actuante en punto de estudio
Mu=	472 kN-m	= 348.68	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00116			
θ (29+3500εs) =	33.0°			
β =	2.6°			
Vc=	517 KN	= 116.57	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	483 KN	= 108.91	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	483 KN	= 108.91	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -7**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	20.23 cm2	= 3.14 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	67 kN	= 15.17	kips	Cortante ultimo actuante en punto de estudio
Mu=	468 kN-m	= 345.66	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00112			
θ (29+3500εs) =	32.9°			
β =	2.6°			
Vc=	525 KN	= 118.40	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	491 KN	= 110.55	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv =	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	491 KN	= 110.55	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -8**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"	Diámetro de refuerzo Horizontal
Asv=	5.1 cm2	Área de barra
Cant=	12	
As- flexión =	61.2 cm2 = 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	36 kN	= 8.11	kips	Cortante ultimo actuante en punto de estudio
Mu=	437 kN-m	= 322.34	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00102					
θ (29+3500εs) =	32.6°					
β =	2.7°					
Vc=	547 KN	= 123.29	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	510 KN	= 114.96	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	= 2041 KN	= 458.9	kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	510 KN	= 114.96	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FEX COMBINACION RESISTENCIA 1-1 PTO -9

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	8 kN	= 1.85	kips	Cortante ultimo actuante en punto de estudio	
Mu=	409 kN-m	= 301.82	kips	Momento ultimo actuante en punto de estudio	
Vr = ϕ Vn	5.8.2.1-2 AASTHO			φ =	0.9
ϕVn=	Menor valor entre :				
ϕVn1 =	Vc+Vs	5.8.3.3-1 AASTHO ; Vp=0		Resistencia a cortante 1	
Vc=	$0.0316\beta\sqrt{f'_c}\,b_v d_v$,			5.8.3.3-3 AASTHO ; Vp=0	

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\frac{1.38}{a_g+0.63}$$

εs =	0.00093				
θ (29+3500εs) =	32.3°				
β =	2.8°				
Vc=	568 KN	= 127.96	kips		
Vs=	20 KN	= 4.44	kips		
ϕVn1=	529 KN	= 119.16	kips	Resistencia a cortante 2	
ϕVn2=	0.25*f'c*bv*dv =	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	529 KN	= 119.16	kips	Mínimo entre Vn1 y Vn2	

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -10**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	199 kN	= 44.78	kips	Cortante ultimo actuante en punto de estudio
Mu=	91 kN-m	= 67.42	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00037			
θ (29+3500εs) =	30.3°			
β =	3.8°			
Vc=	756 KN	= 170.39	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	698 KN	= 157.34	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	698 KN	= 157.34	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -11**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	239 kN	= 53.67	kips	Cortante ultimo actuante en punto de estudio
Mu=	149 kN-m	= 110.07	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00053					
θ (29+3500εs) =	30.9°					
β =	3.4°					
Vc=	690 KN	= 155.47	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	639 KN	= 143.92	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	639 KN	= 143.92	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -12**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	279 kN	= 62.66	kips	Cortante ultimo actuante en punto de estudio
Mu=	216 kN-m	= 159.74	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00072					
θ (29+3500εs) =	31.5°					
β =	3.1°					
Vc=	628 KN	= 141.42	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	583 KN	= 131.28	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	583 KN	= 131.28	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -13**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	318 kN	= 71.52	kips	Cortante ultimo actuante en punto de estudio
Mu=	293 kN-m	= 216.44	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00093			
θ (29+3500εs) =	32.2°			
β =	2.8°			
Vc=	570 KN	= 128.49	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	531 KN	= 119.64	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	531 KN	= 119.64	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -14**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"	Diámetro de refuerzo Horizontal
Asv=	5.1 cm2	Área de barra
Cant=	8	
As- flexión =	40.8 cm2 = 6.32 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	356 kN	= 80.08	kips	Cortante ultimo actuante en punto de estudio
Mu=	380 kN-m	= 280.17	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00173					
θ (29+3500εs) =	35.1°					
β =	2.1°					
Vc=	421 KN	= 94.78	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	396 KN	= 89.30	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv =	2041 KN	= 458.9	kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	396 KN	= 89.30	kips	Mínimo entre Vn1 y Vn2		

PTO -16 **COMBINACION RESISTENCIA 1-1** **PTO -16**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	10		
As- flexión =	51.0 cm2	= 7.91 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	20.23 cm2	= 3.14 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	428 kN	= 96.21	kips	Cortante ultimo actuante en punto de estudio
Mu=	620 kN-m	= 457.64	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\; b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x \frac{1.38}{a_g + 0.63}$$

εs =	0.00211			
θ (29+3500εs) =	36.4°			
β =	1.9°			
Vc=	374 KN	= 84.33	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	355 KN	= 79.89	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	355 KN	= 79.89	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -15**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"	Diámetro de refuerzo Horizontal
Asv=	5.1 cm2	Área de barra
Cant=	8	
As- flexión =	40.8 cm2 = 6.32 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"	Diámetro de estribos	
Cant=	2		
Asv=	1.98 cm2 = 0.31 ft^2	Área de acero transversal- Estribos	
As-corte =	4.0 cm2 = 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio	
S=	1.52m = 5.0 ft	Separación entre estribos	

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	393 kN	= 88.32	kips	Cortante ultimo actuante en punto de estudio
Mu=	479 kN-m	= 353.23	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x \frac{1.38}{a_g + 0.63}$$

εs = 0.00211

θ (29+3500εs) = 36.4°

β = 1.9°

Vc=	374 KN	= 84.27	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	354 KN	= 79.84	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv = 2041 KN	= 458.9	kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	354 KN	= 79.84	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -18**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	5		
As- flexión =	25.5 cm2	= 3.95 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	361 kN	= 81.20	kips	Cortante ultimo actuante en punto de estudio
Mu=	311 kN-m	= 229.78	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00240					
θ (29+3500εs) =	37.4°					
β =	1.7°					
Vc=	345 KN	= 77.66	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	328 KN	= 73.89	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	328 KN	= 73.89	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -17**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	5		
As- flexión =	25.5 cm2	= 3.95 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	396 kN	= 89.08	kips	Cortante ultimo actuante en punto de estudio
Mu=	454 kN-m	= 335.19	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00325			
θ (29+3500εs) =	40.4°			
β =	1.4°			
Vc=	281 KN	= 63.31	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	271 KN	= 60.98	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv =	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	271 KN	= 60.98	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -19**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"	Diámetro de refuerzo Horizontal
Asv=	5.1 cm2	Área de barra
Cant=	10	
As- flexión =	51.0 cm2 = 7.91 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	326 kN	= 73.38	kips	Cortante ultimo actuante en punto de estudio
Mu=	208 kN-m	= 153.45	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\, b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x \frac{1.38}{a_g + 0.63}$$

εs =	0.00089			
θ (29+3500εs) =	32.1°			
β =	2.9°			
Vc=	580 KN	= 130.76	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	540 KN	= 121.68	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv =	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	540 KN	= 121.68	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -20**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	291 kN	= 65.43	kips	Cortante ultimo actuante en punto de estudio
Mu=	134 kN-m	= 99.03	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00054					
θ (29+3500εs) =	30.9°					
β =	3.4°					
Vc=	687 KN	= 154.74	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	636 KN	= 143.26	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	636 KN	= 143.26	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -21**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	256 kN	= 57.44	kips	Cortante ultimo actuante en punto de estudio
Mu=	70 kN-m	= 51.62	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00037					
θ (29+3500εs) =	30.3°					
β =	3.8°					
Vc=	757 KN	= 170.64	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	699 KN	= 157.57	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	699 KN	= 157.57	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -22**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	219 kN	= 49.26	kips	Cortante ultimo actuante en punto de estudio
Mu=	410 kN-m	= 302.44	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00111					
θ (29+3500εs) =	32.9°					
β =	2.6°					
Vc=	527 KN	= 118.83	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	492 KN	= 110.95	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	492 KN	= 110.95	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -23**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	20000000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	184 kN	= 41.27	kips	Cortante ultimo actuante en punto de estudio
Mu=	479 kN-m	= 353.47	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.0012						
θ (29+3500εs) =	33.3°						
β =	2.5°						
Vc=	501 KN	= 112.92	kips				
Vs=	20 KN	= 4.44	kips				
ϕVn1=	469 KN	= 105.62	kips	Resistencia a cortante 2			
ϕVn2=	0.25*f'c*bv*dv	=	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2	
ϕVnd =	469 KN	= 105.62	kips	Mínimo entre Vn1 y Vn2			

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -24**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	20000000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 20.23 cm2 = 3.14 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	149 kN	= 33.49	kips	Cortante ultimo actuante en punto de estudio
Mu=	526 kN-m	= 388.51	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.0013			
θ (29+3500εs) =	33.6°			
β =	2.4°			
Vc=	486 KN	= 109.53	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	455 KN	= 102.58	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv =	2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	455 KN	= 102.58	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -25**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	20000000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	20.23 cm2	= 3.14 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	118 kN	= 26.47	kips	Cortante ultimo actuante en punto de estudio
Mu=	552 kN-m	= 407.36	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.0013			
θ (29+3500εs) =	33.7°			
β =	2.4°			
Vc=	480 KN	= 108.21	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	450 KN	= 101.38	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	450 KN	= 101.38	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FEX **COMBINACION RESISTENCIA 1-1** **PTO -26**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	20000000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	1.80m	= 5.9 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	20.23 cm2	= 3.14 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	89 kN	= 20.00	kips	Cortante ultimo actuante en punto de estudio
Mu=	553 kN-m	= 408.03	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.0013			
θ (29+3500εs) =	33.6°			
β =	2.4°			
Vc=	484 KN	= 109.08	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	453 KN	= 102.17	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 2041 KN	= 458.9 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	453 KN	= 102.17	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -1**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	0		Diámetro de estribos
Cant=	0		
Asv=	0.00 cm2	= 0.00 ft^2	Área de acero transversal- Estribos
As-corte =	0.0 cm2	= 0.00 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	0.00m	= 0.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316 \sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 0.03 cm2 = 0.00 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	569 kN	= 127.95	kips	Cortante ultimo actuante en punto de estudio
Mu=	0 kN-m	= 0.00	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\, b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x \frac{1.38}{a_g + 0.63}$$

εs =	0.00021			
θ (29+3500εs) =	29.8°			
β =	4.1°			
Vc=	1803 KN	= 406.25	kips	
Vs=	0 KN	= 0.00	kips	
ϕVn1=	1622 KN	= 365.62	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv =	4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1622 KN	= 365.62	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -2**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	452 kN	= 101.55 kips	Cortante ultimo actuante en punto de estudio
Mu=	291 kN-m	= 214.97 kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00048				
θ (29+3500εs) =	30.7°				
β =	3.5°				
Vc=	1543 KN	= 347.67	kips		
Vs=	20 KN	= 4.44	kips		
ϕVn1=	1406 KN	= 316.89	kips	Resistencia a cortante 2	
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	1406 KN	= 316.89	kips	Mínimo entre Vn1 y Vn2	

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -3**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 43.83 cm2 = 6.79 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	386 kN	= 86.74	kips	Cortante ultimo actuante en punto de estudio
Mu=	516 kN-m	= 381.14	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00069					
θ (29+3500εs) =	31.4°					
β =	3.2°					
Vc=	1382 KN	= 311.35	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	1261 KN	= 284.21	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	1261 KN	= 284.21	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -4**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	322 kN	= 72.33	kips	Cortante ultimo actuante en punto de estudio
Mu=	678 kN-m	= 500.25	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00083			
θ (29+3500εs) =	31.9°			
β =	3.0°			
Vc=	1289 KN	= 290.51	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	1178 KN	= 265.45	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1178 KN	= 265.45	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -5**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	260 kN	= 58.41 kips	Cortante ultimo actuante en punto de estudio
Mu=	779 kN-m	= 574.78 kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00091				
θ (29+3500εs) =	32.2°				
β =	2.8°				
Vc=	1242 KN	= 279.85	kips		
Vs=	20 KN	= 4.44	kips		
ϕVn1=	1135 KN	= 255.86	kips	Resistencia a cortante 2	
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	1135 KN	= 255.86	kips	Mínimo entre Vn1 y Vn2	

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -6**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 43.83 cm2 = 6.79 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	200 kN	= 45.03	kips	Cortante ultimo actuante en punto de estudio
Mu=	823 kN-m	= 607.65	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00094			
θ (29+3500εs) =	32.3°			
β =	2.8°			
Vc=	1229 KN	= 276.87	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	1123 KN	= 253.18	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1123 KN	= 253.18	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -7**

Materiales

f'c=	14	Mpa =	292.6	kips/ft^2
fy=	420	Mpa =	60.9	kips/ft^2
Es=	200000	Mpa =	367.543	kips/ft^2

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v\, s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	143 kN	= 32.25 kips	Cortante ultimo actuante en punto de estudio
Mu=	816 kN-m	= 602.25 kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00091				
θ (29+3500εs) =	32.2°				
β =	2.9°				
Vc=	1245 KN	= 280.46	kips		
Vs=	20 KN	= 4.44	kips		
ϕVn1=	1138 KN	= 256.41	kips	Resistencia a cortante 2	
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	1138 KN	= 256.41	kips	Mínimo entre Vn1 y Vn2	

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -8**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	95 kN	= 21.38 kips	Cortante ultimo actuante en punto de estudio
Mu=	762 kN-m	= 562.44 kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00083				
θ (29+3500εs) =	31.9°				
β =	3.0°				
Vc=	1287 KN	= 290.13	kips		
Vs=	20 KN	= 4.44	kips		
ϕVn1=	1176 KN	= 265.11	kips	Resistencia a cortante 2	
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	1176 KN	= 265.11	kips	Mínimo entre Vn1 y Vn2	

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -9**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	54 kN	= 12.15 kips	Cortante ultimo actuante en punto de estudio
Mu=	724 kN-m	= 534.30 kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00078				
θ (29+3500εs) =	31.7°				
β =	3.0°				
Vc=	1321 KN	= 297.75	kips		
Vs=	20 KN	= 4.44	kips		
ϕVn1=	1207 KN	= 271.97	kips	Resistencia a cortante 2	
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	1207 KN	= 271.97	kips	Mínimo entre Vn1 y Vn2	

CAPACIDAD A CORTANTE SECCION φVn - FIN COMBINACION RESISTENCIA 1-1 PTO -10

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"	Diámetro de refuerzo Horizontal
Asv=	5.1 cm2	Área de barra
Cant=	26	
As- flexión =	132.6 cm2 = 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"	Diámetro de estribos	
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 43.83 cm2 = 6.79 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	14 kN	= 3.19	kips	Cortante ultimo actuante en punto de estudio
Mu=	249 kN-m	= 183.91	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\frac{1.38}{a_g+0.63}$$

εs =	0.00027			
θ (29+3500εs) =	29.9°			
β =	4.0°			
Vc=	1744 KN	= 393.10	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	1588 KN	= 357.79	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv =	4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1588 KN	= 357.79	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -11**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 43.83 cm2 = 6.79 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	409 kN	= 91.91	kips	Cortante ultimo actuante en punto de estudio
Mu=	331 kN-m	= 244.00	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00050					
θ (29+3500εs) =	30.8°					
β =	3.5°					
Vc=	1522 KN	= 342.92	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	1387 KN	= 312.62	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	1387 KN	= 312.62	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -12**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 43.83 cm2 = 6.79 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	475 kN	= 106.88	kips	Cortante ultimo actuante en punto de estudio
Mu=	423 kN-m	= 312.03	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00062					
θ (29+3500εs) =	31.2°					
β =	3.3°					
Vc=	1427 KN	= 321.59	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	1302 KN	= 293.42	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	1302 KN	= 293.42	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -13**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	540 kN	= 121.32	kips	Cortante ultimo actuante en punto de estudio
Mu=	526 kN-m	= 387.98	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00075			
θ (29+3500εs) =	31.6°			
β =	3.1°			
Vc=	1337 KN	= 301.25	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	1221 KN	= 275.12	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1221 KN	= 275.12	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -14**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	13		
As- flexión =	66.3 cm2	= 10.28 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 43.83 cm2 = 6.79 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	601 kN	= 135.16	kips	Cortante ultimo actuante en punto de estudio
Mu=	639 kN-m	= 471.87	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00179					
θ (29+3500εs) =	35.3°					
β =	2.0°					
Vc=	893 KN	= 201.16	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	821 KN	= 185.03	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	821 KN	= 185.03	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -15**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	13		
As- flexión =	66.3 cm2	= 10.28 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	660 kN	= 148.36	kips	Cortante ultimo actuante en punto de estudio
Mu=	770 kN-m	= 568.27	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00211			
θ (29+3500εs) =	36.4°			
β =	1.9°			
Vc=	810 KN	= 182.59	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	747 KN	= 168.32	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	747 KN	= 168.32	kips	Mínimo entre Vn1 y Vn2

PTO -16 **COMBINACION RESISTENCIA 1-1** **PTO -16**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	12		
As- flexión =	61.2 cm2	= 9.49 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	716 kN	= 160.87	kips	Cortante ultimo actuante en punto de estudio
Mu=	977 kN-m	= 721.20	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00280					
θ (29+3500εs) =	38.8°					
β =	1.5°					
Vc=	675 KN	= 152.05	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	625 KN	= 140.84	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	625 KN	= 140.84	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -17**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	6		
As- flexión =	30.6 cm2	= 4.74 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 43.83 cm2 = 6.79 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	661 kN	= 148.62	kips	Cortante ultimo actuante en punto de estudio
Mu=	724 kN-m	= 534.61	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00437						
θ (29+3500εs) =	44.3°						
β =	1.1°						
Vc=	489 KN	= 110.29	kips				
Vs=	20 KN	= 4.44	kips				
ϕVn1=	458 KN	= 103.26	kips	Resistencia a cortante 2			
ϕVn2=	0.25*f'c*bv*dv	=	4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2	
ϕVnd =	458 KN	= 103.26	kips	Mínimo entre Vn1 y Vn2			

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -18**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	6		
As- flexión =	30.6 cm2	= 4.74 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	605 kN	= 136.12 kips	Cortante ultimo actuante en punto de estudio
Mu=	509 kN-m	= 375.95 kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00330					
θ (29+3500εs) =	40.6°					
β =	1.4°					
Vc=	602 KN	= 135.68	kips			
Vs=	20 KN	= 4.44	kips			
ϕVn1=	560 KN	= 126.10	kips	Resistencia a cortante 2		
ϕVn2=	0.25*f'c*bv*dv	=	4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	560 KN	= 126.10	kips	Mínimo entre Vn1 y Vn2		

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -19**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	13		
As- flexión =	66.3 cm2	= 10.28 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	551 kN	= 123.77 kips	Cortante ultimo actuante en punto de estudio
Mu=	365 kN-m	= 269.24 kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00118				
θ (29+3500εs) =	33.1°				
β =	2.5°				
Vc=	1111 KN	= 250.26	kips		
Vs=	20 KN	= 4.44	kips		
ϕVn1=	1017 KN	= 229.23	kips	Resistencia a cortante 2	
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0	Resistencia a cortante 2
ϕVnd =	1017 KN	= 229.23	kips	Mínimo entre Vn1 y Vn2	

CAPACIDAD A CORTANTE SECCION φVn - FIN COMBINACION RESISTENCIA 1-1 PTO -20

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	13		
As- flexión =	66.3 cm2	= 10.28 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 43.83 cm2 = 6.79 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	494 kN	= 111.14	kips	Cortante ultimo actuante en punto de estudio
Mu=	271 kN-m	= 200.19	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00094			
θ (29+3500εs) =	32.3°			
β =	2.8°			
Vc=	1227 KN	= 276.49	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	1122 KN	= 252.83	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1122 KN	= 252.83	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -21**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	437 kN	= 98.30	kips	Cortante ultimo actuante en punto de estudio
Mu=	188 kN-m	= 139.06	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00036			
θ (29+3500εs) =	30.3°			
β =	3.8°			
Vc=	1646 KN	= 370.88	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	1499 KN	= 337.78	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1499 KN	= 337.78	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -22**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 43.83 cm2 = 6.79 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	380 kN	= 85.34	kips	Cortante ultimo actuante en punto de estudio
Mu=	732 kN-m	= 540.36	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.00091			
θ (29+3500εs) =	32.2°			
β =	2.9°			
Vc=	1244 KN	= 280.31	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	1137 KN	= 256.28	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1137 KN	= 256.28	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -23**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 43.83 cm2 = 6.79 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	323 kN	= 72.64	kips	Cortante ultimo actuante en punto de estudio
Mu=	841 kN-m	= 620.92	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.0010			
θ (29+3500εs) =	32.5°			
β =	2.7°			
Vc=	1194 KN	= 269.15	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	1093 KN	= 246.23	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1093 KN	= 246.23	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -24**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 43.83 cm2 = 6.79 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	268 kN	= 60.35	kips	Cortante ultimo actuante en punto de estudio
Mu=	916 kN-m	= 675.65	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.0011			
θ (29+3500εs) =	32.7°			
β =	2.7°			
Vc=	1166 KN	= 262.73	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	1067 KN	= 240.45	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1067 KN	= 240.45	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -25**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av= 43.83 cm2 = 6.79 ft^2 No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	221 kN	= 49.59	kips	Cortante ultimo actuante en punto de estudio
Mu=	954 kN-m	= 704.15	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.0011			
θ (29+3500εs) =	32.8°			
β =	2.6°			
Vc=	1155 KN	= 260.30	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	1057 KN	= 238.26	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1057 KN	= 238.26	kips	Mínimo entre Vn1 y Vn2

CAPACIDAD A CORTANTE SECCION φVn - FIN **COMBINACION RESISTENCIA 1-1** **PTO -26**

Materiales

f'c=	14 Mpa =	292.6	kips/ft^2	
fy=	420 Mpa =	60.9	kips/ft^2	
Es=	200000 Mpa =	367.543	kips/ft^2	

Geometría viga

h=	0.46m	= 1.5 ft	Altura del elemento
b=	3.90m	= 12.8 ft	Base del elemento
de=	0.40m	= 1.3 ft	Altura efectiva -cetro de refuerzo
.90*de=	0.36m		
0.72*h=	0.33m		
dv=	0.36m	= 1.2 ft	Profundidad efectiva de cortante

Refuerzo a flexión

Var #=	1"		Diámetro de refuerzo Horizontal
Asv=	5.1 cm2		Área de barra
Cant=	26		
As- flexión =	132.6 cm2	= 20.55 ft^2	Área total de refuerzo a flexión - Punto en estudio

Refuerzo a cortante

Estribos=	5/8"		Diámetro de estribos
Cant=	2		
Asv=	1.98 cm2	= 0.31 ft^2	Área de acero transversal- Estribos
As-corte =	4.0 cm2	= 0.61 ft^2	Área total de refuerzo a flexión - Punto en estudio
S=	1.52m	= 5.0 ft	Separación entre estribos

Chequeo refuerzo mínimo a corte

$$A_v \geq 0.0316\sqrt{f'_c}\,\frac{b_v s}{f_y}$$ 5.8.2.5-1 AASTHO

Av=	43.83 cm2	= 6.79 ft^2	No cumple efuerzo minimo

Resistencia a cortante -procedimiento general 5.8.3.4.2 AASTHO

Vu=	178 kN	= 39.93	kips	Cortante ultimo actuante en punto de estudio
Mu=	954 kN-m	= 704.16	kips	Momento ultimo actuante en punto de estudio

Vr = ϕ Vn 5.8.2.1-2 AASTHO φ = 0.9

ϕVn= Menor valor entre :

ϕVn1 = Vc+Vs 5.8.3.3-1 AASTHO ; Vp=0 Resistencia a cortante 1

Vc= $0.0316\beta\sqrt{f'_c}\,b_v d_v$, 5.8.3.3-3 AASTHO ; Vp=0

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}$$ Si cumple refuerzo mínimo

$$\varepsilon_s = \frac{\left(\frac{|M_u|}{d_v} + 0.5N_u + |V_u - V_p| - A_{ps}f_{po}\right)}{E_s A_s + E_p A_{ps}}$$

$$\beta = \frac{4.8}{(1+750\varepsilon_s)}\,\frac{51}{(39+s_{xe})}$$ Si no cumple refuerzo mínimo

$$s_{xe} = s_x\,\frac{1.38}{a_g + 0.63}$$

εs =	0.0011			
θ (29+3500εs) =	32.7°			
β =	2.7°			
Vc=	1163 KN	= 262.05	kips	
Vs=	20 KN	= 4.44	kips	
ϕVn1=	1064 KN	= 239.84	kips	Resistencia a cortante 2
ϕVn2=	0.25*f'c*bv*dv	= 4423 KN	= 994.2 kips	5.8.3.3-2 AASTHO ; Vp=0 Resistencia a cortante 2
ϕVnd =	1064 KN	= 239.84	kips	Mínimo entre Vn1 y Vn2

ANEXO 6

ANEXO 6B - FUERZAS EN FRANJA INTERNA

TABLE: Element Forces - Frames

Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	T	M2	M3	FrameElem	ElemStation
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m	Text	m
1	0	LINEA	LinStatic		0	-29,423	0	0	0	-5,684E-14	1-1	0
1	0,572	LINEA	LinStatic		0	-23,972	0	0	0	15,2708	1-1	0,572
1	0	HL93 +	LinMoving	Max	0	28,046	0	0	0	0	1-1	0
1	0,572	HL93 +	LinMoving	Max	0	28,046	0	0	0	102,5358	1-1	0,572
1	0	HL93 +	LinMoving	Min	0	-200,956	0	0	0	0	1-1	0
1	0,572	HL93 +	LinMoving	Min	0	-158,582	0	0	0	-16,0422	1-1	0,572
1	0	TAMDEM +	LinMoving	Max	0	26,102	0	0	0	0	1-1	0
1	0,572	TAMDEM +	LinMoving	Max	0	26,102	0	0	0	105,5616	1-1	0,572
1	0	TAMDEM +	LinMoving	Min	0	-202,803	0	0	0	0	1-1	0
1	0,572	TAMDEM +	LinMoving	Min	0	-166,84	0	0	0	-14,9305	1-1	0,572
1	0	HL93 -	LinMoving	Max	0	25,241	0	0	0	0	1-1	0
1	0,572	HL93 -	LinMoving	Max	0	25,241	0	0	0	94,18	1-1	0,572
1	0	HL93 -	LinMoving	Min	0	-184,786	0	0	0	0	1-1	0
1	0,572	HL93 -	LinMoving	Min	0	-145,949	0	0	0	-14,438	1-1	0,572
1	0	TAMDEM -	LinMoving	Max	0	23,513	0	0	0	0	1-1	0
1	0,572	TAMDEM -	LinMoving	Max	0	31,718	0	0	0	95,0909	1-1	0,572
1	0	TAMDEM -	LinMoving	Min	0	-182,687	0	0	0	0	1-1	0
1	0,572	TAMDEM -	LinMoving	Min	0	-150,291	0	0	0	-13,4495	1-1	0,572
1	0	SERV1-1 H+	Combination	Max	0	-40,34	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-1 H+	Combination	Max	0	-27,67	0	0	0	138,0288	1-1	0,572
1	0	SERV1-1 H+	Combination	Min	0	-269,341	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-1 H+	Combination	Min	0	-214,298	0	0	0	19,4508	1-1	0,572
1	0	SERV1-2 T+	Combination	Max	0	-42,283	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-2 T+	Combination	Max	0	-29,614	0	0	0	141,0546	1-1	0,572
1	0	SERV1-2 T+	Combination	Min	0	-271,189	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-2 T+	Combination	Min	0	-222,556	0	0	0	20,5625	1-1	0,572
1	0	RESIST1-2 T+	Combination	Max	0	-40,66	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST1-2 T+	Combination	Max	0	-21,871	0	0	0	298,3292	1-1	0,572
1	0	RESIST1-2 T+	Combination	Min	0	-573,438	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST1-2 T+	Combination	Min	0	-470,944	0	0	0	17,8839	1-1	0,572
1	0	SERV1-1 H-	Combination	Max	0	-43,144	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-1 H-	Combination	Max	0	-30,475	0	0	0	129,673	1-1	0,572
1	0	SERV1-1 H-	Combination	Min	0	-253,172	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-1 H-	Combination	Min	0	-201,665	0	0	0	21,055	1-1	0,572
1	0	SERV1-2 T-	Combination	Max	0	-44,872	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-2 T-	Combination	Max	0	-23,998	0	0	0	130,584	1-1	0,572
1	0	SERV1-2 T-	Combination	Min	0	-251,073	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-2 T-	Combination	Min	0	-206,007	0	0	0	22,0435	1-1	0,572
1	0	RESIST 1-1 H+	Combination	Max	0	-36,136	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST 1-1 H+	Combination	Max	0	-17,347	0	0	0	291,2867	1-1	0,572
1	0	RESIST 1-1 H+	Combination	Min	0	-569,137	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST 1-1 H+	Combination	Min	0	-451,723	0	0	0	15,2963	1-1	0,572
1	0	RESIST1-1 H-	Combination	Max	0	-42,664	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST1-1 H-	Combination	Max	0	-23,875	0	0	0	271,8386	1-1	0,572
1	0	RESIST1-1 H-	Combination	Min	0	-531,503	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST1-1 H-	Combination	Min	0	-422,321	0	0	0	19,0302	1-1	0,572
1	0	RESIST1-2 T-	Combination	Max	0	-46,686	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST1-2 T-	Combination	Max	0	-8,8	0	0	0	273,9588	1-1	0,572
1	0	RESIST1-2 T-	Combination	Min	0	-526,618	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST1-2 T-	Combination	Min	0	-432,427	0	0	0	21,3308	1-1	0,572
1	0	E-SERV1-1	Combination	Max	0	-40,34	0	0	0	-1,137E-13	1-1	0
1	0,572	E-SERV1-1	Combination	Max	0	-27,67	0	0	0	138,0288	1-1	0,572
1	0	E-SERV1-1	Combination	Min	0	-269,341	0	0	0	-1,137E-13	1-1	0
1	0,572	E-SERV1-1	Combination	Min	0	-214,298	0	0	0	19,4508	1-1	0,572
1	0	E-SERV1-2	Combination	Max	0	-42,283	0	0	0	-1,137E-13	1-1	0
1	0,572	E-SERV1-2	Combination	Max	0	-23,998	0	0	0	141,0546	1-1	0,572
1	0	E-SERV1-2	Combination	Min	0	-271,189	0	0	0	-1,137E-13	1-1	0
1	0,572	E-SERV1-2	Combination	Min	0	-222,556	0	0	0	20,5625	1-1	0,572
1	0	E-RESIST1-1	Combination	Max	0	-36,136	0	0	0	-1,705E-13	1-1	0
1	0,572	E-RESIST1-1	Combination	Max	0	-17,347	0	0	0	291,2867	1-1	0,572
1	0	E-RESIST1-1	Combination	Min	0	-569,137	0	0	0	-1,705E-13	1-1	0
1	0,572	E-RESIST1-1	Combination	Min	0	-451,723	0	0	0	15,2963	1-1	0,572
1	0	E-RESIST1-2	Combination	Max	0	-40,66	0	0	0	-1,705E-13	1-1	0
1	0,572	E-RESIST1-2	Combination	Max	0	-8,8	0	0	0	298,3292	1-1	0,572

1	0	E-RESIST1-2	Combination	Min	0	-573,438	0	0	0	-1,705E-13	1-1	0
1	0,572	E-RESIST1-2	Combination	Min	0	-470,944	0	0	0	17,8839	1-1	0,572
2	0	LINEA	LinStatic		0	-23,972	0	0	0	15,2708	2-1	0
2	0,572	LINEA	LinStatic		0	-18,52	0	0	0	27,4236	2-1	0,572
2	0	HL93 +	LinMoving	Max	0	28,046	0	0	0	102,5358	2-1	0
2	0,572	HL93 +	LinMoving	Max	0	38,476	0	0	0	181,2752	2-1	0,572
2	0	HL93 +	LinMoving	Min	0	-158,582	0	0	0	-16,0422	2-1	0
2	0,572	HL93 +	LinMoving	Min	0	-138,335	0	0	0	-32,0845	2-1	0,572
2	0	TAMDEM +	LinMoving	Max	0	26,102	0	0	0	105,5616	2-1	0
2	0,572	TAMDEM +	LinMoving	Max	0	26,102	0	0	0	190,7537	2-1	0,572
2	0	TAMDEM +	LinMoving	Min	0	-166,84	0	0	0	-14,9305	2-1	0
2	0,572	TAMDEM +	LinMoving	Min	0	-149,219	0	0	0	-29,861	2-1	0,572
2	0	HL93 -	LinMoving	Max	0	25,241	0	0	0	94,18	2-1	0
2	0,572	HL93 -	LinMoving	Max	0	25,241	0	0	0	166,8379	2-1	0,572
2	0	HL93 -	LinMoving	Min	0	-145,949	0	0	0	-14,438	2-1	0
2	0,572	HL93 -	LinMoving	Min	0	-127,671	0	0	0	-28,876	2-1	0,572
2	0	TAMDEM -	LinMoving	Max	0	31,718	0	0	0	95,0909	2-1	0
2	0,572	TAMDEM -	LinMoving	Max	0	39,896	0	0	0	171,8329	2-1	0,572
2	0	TAMDEM -	LinMoving	Min	0	-150,291	0	0	0	-13,4495	2-1	0
2	0,572	TAMDEM -	LinMoving	Min	0	-134,418	0	0	0	-26,8991	2-1	0,572
2	0	SERV1-1 H+	Combination	Max	0	-27,67	0	0	0	138,0288	2-1	0
2	0,572	SERV1-1 H+	Combination	Max	0	-4,57	0	0	0	245,0141	2-1	0,572
2	0	SERV1-1 H+	Combination	Min	0	-214,298	0	0	0	19,4508	2-1	0
2	0,572	SERV1-1 H+	Combination	Min	0	-181,381	0	0	0	31,6544	2-1	0,572
2	0	SERV1-2 T+	Combination	Max	0	-29,614	0	0	0	141,0546	2-1	0
2	0,572	SERV1-2 T+	Combination	Max	0	-16,944	0	0	0	254,4926	2-1	0,572
2	0	SERV1-2 T+	Combination	Min	0	-222,556	0	0	0	20,5625	2-1	0
2	0,572	SERV1-2 T+	Combination	Min	0	-192,265	0	0	0	33,8779	2-1	0,572
2	0	RESIST1-2 T+	Combination	Max	0	-21,871	0	0	0	298,3292	2-1	0
2	0,572	RESIST1-2 T+	Combination	Max	0	-3,082	0	0	0	538,5013	2-1	0,572
2	0	RESIST1-2 T+	Combination	Min	0	-470,944	0	0	0	17,8839	2-1	0
2	0,572	RESIST1-2 T+	Combination	Min	0	-411,143	0	0	0	25,0207	2-1	0,572
2	0	SERV1-1 H-	Combination	Max	0	-30,475	0	0	0	129,673	2-1	0
2	0,572	SERV1-1 H-	Combination	Max	0	-17,805	0	0	0	230,5768	2-1	0,572
2	0	SERV1-1 H-	Combination	Min	0	-201,665	0	0	0	21,055	2-1	0
2	0,572	SERV1-1 H-	Combination	Min	0	-170,717	0	0	0	34,8629	2-1	0,572
2	0	SERV1-2 T-	Combination	Max	0	-23,998	0	0	0	130,584	2-1	0
2	0,572	SERV1-2 T-	Combination	Max	0	-3,15	0	0	0	235,5718	2-1	0,572
2	0	SERV1-2 T-	Combination	Min	0	-206,007	0	0	0	22,0435	2-1	0
2	0,572	SERV1-2 T-	Combination	Min	0	-177,464	0	0	0	36,8399	2-1	0,572
2	0	RESIST 1-1 H+	Combination	Max	0	-17,347	0	0	0	291,2867	2-1	0
2	0,572	RESIST 1-1 H+	Combination	Max	0	25,717	0	0	0	516,44	2-1	0,572
2	0	RESIST 1-1 H+	Combination	Min	0	-451,723	0	0	0	15,2963	2-1	0
2	0,572	RESIST 1-1 H+	Combination	Min	0	-385,81	0	0	0	19,8455	2-1	0,572
2	0	RESIST1-1 H-	Combination	Max	0	-23,875	0	0	0	271,8386	2-1	0
2	0,572	RESIST1-1 H-	Combination	Max	0	-5,086	0	0	0	482,8374	2-1	0,572
2	0	RESIST1-1 H-	Combination	Min	0	-422,321	0	0	0	19,0302	2-1	0
2	0,572	RESIST1-1 H-	Combination	Min	0	-360,99	0	0	0	27,3131	2-1	0,572
2	0	RESIST1-2 T-	Combination	Max	0	-8,8	0	0	0	273,9588	2-1	0
2	0,572	RESIST1-2 T-	Combination	Max	0	29,023	0	0	0	494,463	2-1	0,572
2	0	RESIST1-2 T-	Combination	Min	0	-432,427	0	0	0	21,3308	2-1	0
2	0,572	RESIST1-2 T-	Combination	Min	0	-376,694	0	0	0	31,9145	2-1	0,572
2	0	E-SERV1-1	Combination	Max	0	-27,67	0	0	0	138,0288	2-1	0
2	0,572	E-SERV1-1	Combination	Max	0	-4,57	0	0	0	245,0141	2-1	0,572
2	0	E-SERV1-1	Combination	Min	0	-214,298	0	0	0	19,4508	2-1	0
2	0,572	E-SERV1-1	Combination	Min	0	-181,381	0	0	0	31,6544	2-1	0,572
2	0	E-SERV1-2	Combination	Max	0	-23,998	0	0	0	141,0546	2-1	0
2	0,572	E-SERV1-2	Combination	Max	0	-3,15	0	0	0	254,4926	2-1	0,572
2	0	E-SERV1-2	Combination	Min	0	-222,556	0	0	0	20,5625	2-1	0
2	0,572	E-SERV1-2	Combination	Min	0	-192,265	0	0	0	33,8779	2-1	0,572
2	0	E-RESIST1-1	Combination	Max	0	-17,347	0	0	0	291,2867	2-1	0
2	0,572	E-RESIST1-1	Combination	Max	0	25,717	0	0	0	516,44	2-1	0,572
2	0	E-RESIST1-1	Combination	Min	0	-451,723	0	0	0	15,2963	2-1	0
2	0,572	E-RESIST1-1	Combination	Min	0	-385,81	0	0	0	19,8455	2-1	0,572
2	0	E-RESIST1-2	Combination	Max	0	-8,8	0	0	0	298,3292	2-1	0
2	0,572	E-RESIST1-2	Combination	Max	0	29,023	0	0	0	538,5013	2-1	0,572
2	0	E-RESIST1-2	Combination	Min	0	-470,944	0	0	0	17,8839	2-1	0
2	0,572	E-RESIST1-2	Combination	Min	0	-411,143	0	0	0	25,0207	2-1	0,572

3	0	LINEA	LinStatic		0	-18,52	0	0	0	27,4236	3-1	0
3	0,572	LINEA	LinStatic		0	-13,069	0	0	0	36,4582	3-1	0,572
3	0	HL93 +	LinMoving	Max	0	38,476	0	0	0	181,2752	3-1	0
3	0,572	HL93 +	LinMoving	Max	0	52,007	0	0	0	237,2403	3-1	0,572
3	0	HL93 +	LinMoving	Min	0	-138,335	0	0	0	-32,0845	3-1	0
3	0,572	HL93 +	LinMoving	Min	0	-118,885	0	0	0	-48,1267	3-1	0,572
3	0	TAMDEM +	LinMoving	Max	0	26,102	0	0	0	190,7537	3-1	0
3	0,572	TAMDEM +	LinMoving	Max	0	35,07	0	0	0	255,9492	3-1	0,572
3	0	TAMDEM +	LinMoving	Min	0	-149,219	0	0	0	-29,861	3-1	0
3	0,572	TAMDEM +	LinMoving	Min	0	-131,973	0	0	0	-44,7914	3-1	0,572
3	0	HL93 -	LinMoving	Max	0	25,241	0	0	0	166,8379	3-1	0
3	0,572	HL93 -	LinMoving	Max	0	33,923	0	0	0	218,9555	3-1	0,572
3	0	HL93 -	LinMoving	Min	0	-127,671	0	0	0	-28,876	3-1	0
3	0,572	HL93 -	LinMoving	Min	0	-109,974	0	0	0	-43,314	3-1	0,572
3	0	TAMDEM -	LinMoving	Max	0	39,896	0	0	0	171,8329	3-1	0
3	0,572	TAMDEM -	LinMoving	Max	0	55,104	0	0	0	230,5616	3-1	0,572
3	0	TAMDEM -	LinMoving	Min	0	-134,418	0	0	0	-26,8991	3-1	0
3	0,572	TAMDEM -	LinMoving	Min	0	-118,882	0	0	0	-40,3486	3-1	0,572
3	0	SERV1-1 H+	Combination	Max	0	-4,57	0	0	0	245,0141	3-1	0
3	0,572	SERV1-1 H+	Combination	Max	0	21,63	0	0	0	321,978	3-1	0,572
3	0	SERV1-1 H+	Combination	Min	0	-181,381	0	0	0	31,6544	3-1	0
3	0,572	SERV1-1 H+	Combination	Min	0	-149,261	0	0	0	36,611	3-1	0,572
3	0	SERV1-2 T+	Combination	Max	0	-16,944	0	0	0	254,4926	3-1	0
3	0,572	SERV1-2 T+	Combination	Max	0	4,693	0	0	0	340,6868	3-1	0,572
3	0	SERV1-2 T+	Combination	Min	0	-192,265	0	0	0	33,8779	3-1	0
3	0,572	SERV1-2 T+	Combination	Min	0	-162,349	0	0	0	39,9462	3-1	0,572
3	0	RESIST1-2 T+	Combination	Max	0	-3,082	0	0	0	538,5013	3-1	0
3	0,572	RESIST1-2 T+	Combination	Max	0	36,578	0	0	0	721,384	3-1	0,572
3	0	RESIST1-2 T+	Combination	Min	0	-411,143	0	0	0	25,0207	3-1	0
3	0,572	RESIST1-2 T+	Combination	Min	0	-352,213	0	0	0	21,4103	3-1	0,572
3	0	SERV1-1 H-	Combination	Max	0	-17,805	0	0	0	230,5768	3-1	0
3	0,572	SERV1-1 H-	Combination	Max	0	3,547	0	0	0	303,6932	3-1	0,572
3	0	SERV1-1 H-	Combination	Min	0	-170,717	0	0	0	34,8629	3-1	0
3	0,572	SERV1-1 H-	Combination	Min	0	-140,35	0	0	0	41,4236	3-1	0,572
3	0	SERV1-2 T-	Combination	Max	0	-3,15	0	0	0	235,5718	3-1	0
3	0,572	SERV1-2 T-	Combination	Max	0	24,728	0	0	0	315,2993	3-1	0,572
3	0	SERV1-2 T-	Combination	Min	0	-177,464	0	0	0	36,8399	3-1	0
3	0,572	SERV1-2 T-	Combination	Min	0	-149,259	0	0	0	44,3891	3-1	0,572
3	0	RESIST 1-1 H+	Combination	Max	0	25,717	0	0	0	516,44	3-1	0
3	0,572	RESIST 1-1 H+	Combination	Max	0	75,999	0	0	0	677,8392	3-1	0,572
3	0	RESIST 1-1 H+	Combination	Min	0	-385,81	0	0	0	19,8455	3-1	0
3	0,572	RESIST 1-1 H+	Combination	Min	0	-321,751	0	0	0	13,6474	3-1	0,572
3	0	RESIST1-1 H-	Combination	Max	0	-5,086	0	0	0	482,8374	3-1	0
3	0,572	RESIST1-1 H-	Combination	Max	0	33,909	0	0	0	635,2813	3-1	0,572
3	0	RESIST1-1 H-	Combination	Min	0	-360,99	0	0	0	27,3131	3-1	0
3	0,572	RESIST1-1 H-	Combination	Min	0	-301,01	0	0	0	24,8489	3-1	0,572
3	0	RESIST1-2 T-	Combination	Max	0	29,023	0	0	0	494,463	3-1	0
3	0,572	RESIST1-2 T-	Combination	Max	0	83,208	0	0	0	662,2944	3-1	0,572
3	0	RESIST1-2 T-	Combination	Min	0	-376,694	0	0	0	31,9145	3-1	0
3	0,572	RESIST1-2 T-	Combination	Min	0	-321,745	0	0	0	31,751	3-1	0,572
3	0	E-SERV1-1	Combination	Max	0	-4,57	0	0	0	245,0141	3-1	0
3	0,572	E-SERV1-1	Combination	Max	0	21,63	0	0	0	321,978	3-1	0,572
3	0	E-SERV1-1	Combination	Min	0	-181,381	0	0	0	31,6544	3-1	0
3	0,572	E-SERV1-1	Combination	Min	0	-149,261	0	0	0	36,611	3-1	0,572
3	0	E-SERV1-2	Combination	Max	0	-3,15	0	0	0	254,4926	3-1	0
3	0,572	E-SERV1-2	Combination	Max	0	24,728	0	0	0	340,6868	3-1	0,572
3	0	E-SERV1-2	Combination	Min	0	-192,265	0	0	0	33,8779	3-1	0
3	0,572	E-SERV1-2	Combination	Min	0	-162,349	0	0	0	39,9462	3-1	0,572
3	0	E-RESIST1-1	Combination	Max	0	25,717	0	0	0	516,44	3-1	0
3	0,572	E-RESIST1-1	Combination	Max	0	75,999	0	0	0	677,8392	3-1	0,572
3	0	E-RESIST1-1	Combination	Min	0	-385,81	0	0	0	19,8455	3-1	0
3	0,572	E-RESIST1-1	Combination	Min	0	-321,751	0	0	0	13,6474	3-1	0,572
3	0	E-RESIST1-2	Combination	Max	0	29,023	0	0	0	538,5013	3-1	0
3	0,572	E-RESIST1-2	Combination	Max	0	83,208	0	0	0	721,384	3-1	0,572
3	0	E-RESIST1-2	Combination	Min	0	-411,143	0	0	0	25,0207	3-1	0
3	0,572	E-RESIST1-2	Combination	Min	0	-352,213	0	0	0	21,4103	3-1	0,572
4	0	LINEA	LinStatic		0	-13,069	0	0	0	36,4582	4-1	0
4	0,572	LINEA	LinStatic		0	-7,618	0	0	0	42,3749	4-1	0,572

4	0	HL93 +	LinMoving	Max	0	52,007	0	0	0	237,2403	4-1	0
4	0,572	HL93 +	LinMoving	Max	0	64,645	0	0	0	271,8658	4-1	0,572
4	0	HL93 +	LinMoving	Min	0	-118,885	0	0	0	-48,1267	4-1	0
4	0,572	HL93 +	LinMoving	Min	0	-100,349	0	0	0	-64,1689	4-1	0,572
4	0	TAMDEM +	LinMoving	Max	0	35,07	0	0	0	255,9492	4-1	0
4	0,572	TAMDEM +	LinMoving	Max	0	53,003	0	0	0	301,8424	4-1	0,572
4	0	TAMDEM +	LinMoving	Min	0	-131,973	0	0	0	-44,7914	4-1	0
4	0,572	TAMDEM +	LinMoving	Min	0	-115,192	0	0	0	-59,7219	4-1	0,572
4	0	HL93 -	LinMoving	Max	0	33,923	0	0	0	218,9555	4-1	0
4	0,572	HL93 -	LinMoving	Max	0	44,64	0	0	0	251,4913	4-1	0,572
4	0	HL93 -	LinMoving	Min	0	-109,974	0	0	0	-43,314	4-1	0
4	0,572	HL93 -	LinMoving	Min	0	-92,981	0	0	0	-57,752	4-1	0,572
4	0	TAMDEM -	LinMoving	Max	0	55,104	0	0	0	230,5616	4-1	0
4	0,572	TAMDEM -	LinMoving	Max	0	71,258	0	0	0	271,9027	4-1	0,572
4	0	TAMDEM -	LinMoving	Min	0	-118,882	0	0	0	-40,3486	4-1	0
4	0,572	TAMDEM -	LinMoving	Min	0	-103,766	0	0	0	-53,7981	4-1	0,572
4	0	SERV1-1 H+	Combination	Max	0	21,63	0	0	0	321,978	4-1	0
4	0,572	SERV1-1 H+	Combination	Max	0	46,938	0	0	0	370,3551	4-1	0,572
4	0	SERV1-1 H+	Combination	Min	0	-149,261	0	0	0	36,611	4-1	0
4	0,572	SERV1-1 H+	Combination	Min	0	-118,055	0	0	0	34,3204	4-1	0,572
4	0	SERV1-2 T+	Combination	Max	0	4,693	0	0	0	340,6868	4-1	0
4	0,572	SERV1-2 T+	Combination	Max	0	35,296	0	0	0	400,3318	4-1	0,572
4	0	SERV1-2 T+	Combination	Min	0	-162,349	0	0	0	39,9462	4-1	0
4	0,572	SERV1-2 T+	Combination	Min	0	-132,899	0	0	0	38,7674	4-1	0,572
4	0	RESIST1-2 T+	Combination	Max	0	36,578	0	0	0	721,384	4-1	0
4	0,572	RESIST1-2 T+	Combination	Max	0	97,106	0	0	0	848,5937	4-1	0,572
4	0	RESIST1-2 T+	Combination	Min	0	-352,213	0	0	0	21,4103	4-1	0
4	0,572	RESIST1-2 T+	Combination	Min	0	-294,368	0	0	0	7,0527	4-1	0,572
4	0	SERV1-1 H-	Combination	Max	0	3,547	0	0	0	303,6932	4-1	0
4	0,572	SERV1-1 H-	Combination	Max	0	26,934	0	0	0	349,9806	4-1	0,572
4	0	SERV1-1 H-	Combination	Min	0	-140,35	0	0	0	41,4236	4-1	0
4	0,572	SERV1-1 H-	Combination	Min	0	-110,688	0	0	0	40,7373	4-1	0,572
4	0	SERV1-2 T-	Combination	Max	0	24,728	0	0	0	315,2993	4-1	0
4	0,572	SERV1-2 T-	Combination	Max	0	53,552	0	0	0	370,392	4-1	0,572
4	0	SERV1-2 T-	Combination	Min	0	-149,259	0	0	0	44,3891	4-1	0
4	0,572	SERV1-2 T-	Combination	Min	0	-121,473	0	0	0	44,6912	4-1	0,572
4	0	RESIST 1-1 H+	Combination	Max	0	75,999	0	0	0	677,8392	4-1	0
4	0,572	RESIST 1-1 H+	Combination	Max	0	124,203	0	0	0	778,823	4-1	0,572
4	0	RESIST 1-1 H+	Combination	Min	0	-321,751	0	0	0	13,6474	4-1	0
4	0,572	RESIST 1-1 H+	Combination	Min	0	-259,82	0	0	0	-3,2978	4-1	0,572
4	0	RESIST1-1 H-	Combination	Max	0	33,909	0	0	0	635,2813	4-1	0
4	0,572	RESIST1-1 H-	Combination	Max	0	77,643	0	0	0	731,4013	4-1	0,572
4	0	RESIST1-1 H-	Combination	Min	0	-301,01	0	0	0	24,8489	4-1	0
4	0,572	RESIST1-1 H-	Combination	Min	0	-242,672	0	0	0	11,6376	4-1	0,572
4	0	RESIST1-2 T-	Combination	Max	0	83,208	0	0	0	662,2944	4-1	0
4	0,572	RESIST1-2 T-	Combination	Max	0	139,596	0	0	0	778,909	4-1	0,572
4	0	RESIST1-2 T-	Combination	Min	0	-321,745	0	0	0	31,751	4-1	0
4	0,572	RESIST1-2 T-	Combination	Min	0	-267,774	0	0	0	20,8403	4-1	0,572
4	0	E-SERV1-1	Combination	Max	0	21,63	0	0	0	321,978	4-1	0
4	0,572	E-SERV1-1	Combination	Max	0	46,938	0	0	0	370,3551	4-1	0,572
4	0	E-SERV1-1	Combination	Min	0	-149,261	0	0	0	36,611	4-1	0
4	0,572	E-SERV1-1	Combination	Min	0	-118,055	0	0	0	34,3204	4-1	0,572
4	0	E-SERV1-2	Combination	Max	0	24,728	0	0	0	340,6868	4-1	0
4	0,572	E-SERV1-2	Combination	Max	0	53,552	0	0	0	400,3318	4-1	0,572
4	0	E-SERV1-2	Combination	Min	0	-162,349	0	0	0	39,9462	4-1	0
4	0,572	E-SERV1-2	Combination	Min	0	-132,899	0	0	0	38,7674	4-1	0,572
4	0	E-RESIST1-1	Combination	Max	0	75,999	0	0	0	677,8392	4-1	0
4	0,572	E-RESIST1-1	Combination	Max	0	124,203	0	0	0	778,823	4-1	0,572
4	0	E-RESIST1-1	Combination	Min	0	-321,751	0	0	0	13,6474	4-1	0
4	0,572	E-RESIST1-1	Combination	Min	0	-259,82	0	0	0	-3,2978	4-1	0,572
4	0	E-RESIST1-2	Combination	Max	0	83,208	0	0	0	721,384	4-1	0
4	0,572	E-RESIST1-2	Combination	Max	0	139,596	0	0	0	848,5937	4-1	0,572
4	0	E-RESIST1-2	Combination	Min	0	-352,213	0	0	0	21,4103	4-1	0
4	0,572	E-RESIST1-2	Combination	Min	0	-294,368	0	0	0	7,0527	4-1	0,572
5	0	LINEA	LinStatic		0	-7,618	0	0	0	42,3749	5-1	0
5	0,572	LINEA	LinStatic		0	-2,167	0	0	0	45,1734	5-1	0,572
5	0	HL93 +	LinMoving	Max	0	64,645	0	0	0	271,8658	5-1	0
5	0,572	HL93 +	LinMoving	Max	0	76,402	0	0	0	286,8556	5-1	0,572

5	0	HL93 +	LinMoving	Min	0	-100,349	0	0	0	-64,1689	5-1	0
5	0,572	HL93 +	LinMoving	Min	0	-82,846	0	0	0	-80,2112	5-1	0,572
5	0	TAMDEM +	LinMoving	Max	0	53,003	0	0	0	301,8424	5-1	0
5	0,572	TAMDEM +	LinMoving	Max	0	70,666	0	0	0	329,3386	5-1	0,572
5	0	TAMDEM +	LinMoving	Min	0	-115,192	0	0	0	-59,7219	5-1	0
5	0,572	TAMDEM +	LinMoving	Min	0	-98,97	0	0	0	-74,6524	5-1	0,572
5	0	HL93 -	LinMoving	Max	0	44,64	0	0	0	251,4913	5-1	0
5	0,572	HL93 -	LinMoving	Max	0	54,998	0	0	0	265,7986	5-1	0,572
5	0	HL93 -	LinMoving	Min	0	-92,981	0	0	0	-57,752	5-1	0
5	0,572	HL93 -	LinMoving	Min	0	-76,82	0	0	0	-72,19	5-1	0,572
5	0	TAMDEM -	LinMoving	Max	0	71,258	0	0	0	271,9027	5-1	0
5	0,572	TAMDEM -	LinMoving	Max	0	87,17	0	0	0	296,6715	5-1	0,572
5	0	TAMDEM -	LinMoving	Min	0	-103,766	0	0	0	-53,7981	5-1	0
5	0,572	TAMDEM -	LinMoving	Min	0	-89,153	0	0	0	-67,2476	5-1	0,572
5	0	SERV1-1 H+	Combination	Max	0	46,938	0	0	0	370,3551	5-1	0
5	0,572	SERV1-1 H+	Combination	Max	0	71,366	0	0	0	391,8495	5-1	0,572
5	0	SERV1-1 H+	Combination	Min	0	-118,055	0	0	0	34,3204	5-1	0
5	0,572	SERV1-1 H+	Combination	Min	0	-87,882	0	0	0	24,7827	5-1	0,572
5	0	SERV1-2 T+	Combination	Max	0	35,296	0	0	0	400,3318	5-1	0
5	0,572	SERV1-2 T+	Combination	Max	0	65,629	0	0	0	434,3324	5-1	0,572
5	0	SERV1-2 T+	Combination	Min	0	-132,899	0	0	0	38,7674	5-1	0
5	0,572	SERV1-2 T+	Combination	Min	0	-104,006	0	0	0	30,3414	5-1	0,572
5	0	RESIST1-2 T+	Combination	Max	0	97,106	0	0	0	848,5937	5-1	0
5	0,572	RESIST1-2 T+	Combination	Max	0	157,006	0	0	0	922,2368	5-1	0,572
5	0	RESIST1-2 T+	Combination	Min	0	-294,368	0	0	0	7,0527	5-1	0
5	0,572	RESIST1-2 T+	Combination	Min	0	-237,821	0	0	0	-18,0521	5-1	0,572
5	0	SERV1-1 H-	Combination	Max	0	26,934	0	0	0	349,9806	5-1	0
5	0,572	SERV1-1 H-	Combination	Max	0	49,962	0	0	0	370,7924	5-1	0,572
5	0	SERV1-1 H-	Combination	Min	0	-110,688	0	0	0	40,7373	5-1	0
5	0,572	SERV1-1 H-	Combination	Min	0	-81,856	0	0	0	32,8038	5-1	0,572
5	0	SERV1-2 T-	Combination	Max	0	53,552	0	0	0	370,392	5-1	0
5	0,572	SERV1-2 T-	Combination	Max	0	82,133	0	0	0	401,6653	5-1	0,572
5	0	SERV1-2 T-	Combination	Min	0	-121,473	0	0	0	44,6912	5-1	0
5	0,572	SERV1-2 T-	Combination	Min	0	-94,19	0	0	0	37,7462	5-1	0,572
5	0	RESIST 1-1 H+	Combination	Max	0	124,203	0	0	0	778,823	5-1	0
5	0,572	RESIST 1-1 H+	Combination	Max	0	170,357	0	0	0	823,3579	5-1	0,572
5	0	RESIST 1-1 H+	Combination	Min	0	-259,82	0	0	0	-3,2978	5-1	0
5	0,572	RESIST 1-1 H+	Combination	Min	0	-200,292	0	0	0	-30,9901	5-1	0,572
5	0	RESIST1-1 H-	Combination	Max	0	77,643	0	0	0	731,4013	5-1	0
5	0,572	RESIST1-1 H-	Combination	Max	0	120,539	0	0	0	774,3476	5-1	0,572
5	0	RESIST1-1 H-	Combination	Min	0	-242,672	0	0	0	11,6376	5-1	0
5	0,572	RESIST1-1 H-	Combination	Min	0	-186,267	0	0	0	-12,321	5-1	0,572
5	0	RESIST1-2 T-	Combination	Max	0	139,596	0	0	0	778,909	5-1	0
5	0,572	RESIST1-2 T-	Combination	Max	0	195,419	0	0	0	846,2042	5-1	0,572
5	0	RESIST1-2 T-	Combination	Min	0	-267,774	0	0	0	20,8403	5-1	0
5	0,572	RESIST1-2 T-	Combination	Min	0	-214,973	0	0	0	-0,8175	5-1	0,572
5	0	E-SERV1-1	Combination	Max	0	46,938	0	0	0	370,3551	5-1	0
5	0,572	E-SERV1-1	Combination	Max	0	71,366	0	0	0	391,8495	5-1	0,572
5	0	E-SERV1-1	Combination	Min	0	-118,055	0	0	0	34,3204	5-1	0
5	0,572	E-SERV1-1	Combination	Min	0	-87,882	0	0	0	24,7827	5-1	0,572
5	0	E-SERV1-2	Combination	Max	0	53,552	0	0	0	400,3318	5-1	0
5	0,572	E-SERV1-2	Combination	Max	0	82,133	0	0	0	434,3324	5-1	0,572
5	0	E-SERV1-2	Combination	Min	0	-132,899	0	0	0	38,7674	5-1	0
5	0,572	E-SERV1-2	Combination	Min	0	-104,006	0	0	0	30,3414	5-1	0,572
5	0	E-RESIST1-1	Combination	Max	0	124,203	0	0	0	778,823	5-1	0
5	0,572	E-RESIST1-1	Combination	Max	0	170,357	0	0	0	823,3579	5-1	0,572
5	0	E-RESIST1-1	Combination	Min	0	-259,82	0	0	0	-3,2978	5-1	0
5	0,572	E-RESIST1-1	Combination	Min	0	-200,292	0	0	0	-30,9901	5-1	0,572
5	0	E-RESIST1-2	Combination	Max	0	139,596	0	0	0	848,5937	5-1	0
5	0,572	E-RESIST1-2	Combination	Max	0	195,419	0	0	0	922,2368	5-1	0,572
5	0	E-RESIST1-2	Combination	Min	0	-294,368	0	0	0	7,0527	5-1	0
5	0,572	E-RESIST1-2	Combination	Min	0	-237,821	0	0	0	-18,0521	5-1	0,572
6	0	LINEA	LinStatic		0	-2,167	0	0	0	45,1734	6-1	0
6	0,572	LINEA	LinStatic		0	3,284	0	0	0	44,8539	6-1	0,572
6	0	HL93 +	LinMoving	Max	0	76,402	0	0	0	286,8556	6-1	0
6	0,572	HL93 +	LinMoving	Max	0	87,291	0	0	0	284,1838	6-1	0,572
6	0	HL93 +	LinMoving	Min	0	-82,846	0	0	0	-80,2112	6-1	0
6	0,572	HL93 +	LinMoving	Min	0	-66,493	0	0	0	-96,2534	6-1	0,572

6	0	TAMDEM +	LinMoving	Max	0	70,666	0	0	0	329,3386	6-1	0
6	0,572	TAMDEM +	LinMoving	Max	0	87,968	0	0	0	339,553	6-1	0,572
6	0	TAMDEM +	LinMoving	Min	0	-98,97	0	0	0	-74,6524	6-1	0
6	0,572	TAMDEM +	LinMoving	Min	0	-83,397	0	0	0	-89,5829	6-1	0,572
6	0	HL93 -	LinMoving	Max	0	54,998	0	0	0	265,7986	6-1	0
6	0,572	HL93 -	LinMoving	Max	0	64,956	0	0	0	263,5171	6-1	0,572
6	0	HL93 -	LinMoving	Min	0	-76,82	0	0	0	-72,19	6-1	0
6	0,572	HL93 -	LinMoving	Min	0	-62,24	0	0	0	-86,628	6-1	0,572
6	0	TAMDEM -	LinMoving	Max	0	87,17	0	0	0	296,6715	6-1	0
6	0,572	TAMDEM -	LinMoving	Max	0	102,755	0	0	0	305,8728	6-1	0,572
6	0	TAMDEM -	LinMoving	Min	0	-89,153	0	0	0	-67,2476	6-1	0
6	0,572	TAMDEM -	LinMoving	Min	0	-75,125	0	0	0	-80,6972	6-1	0,572
6	0	SERV1-1 H+	Combination	Max	0	71,366	0	0	0	391,8495	6-1	0
6	0,572	SERV1-1 H+	Combination	Max	0	94,925	0	0	0	388,435	6-1	0,572
6	0	SERV1-1 H+	Combination	Min	0	-87,882	0	0	0	24,7827	6-1	0
6	0,572	SERV1-1 H+	Combination	Min	0	-58,86	0	0	0	7,9978	6-1	0,572
6	0	SERV1-2 T+	Combination	Max	0	65,629	0	0	0	434,3324	6-1	0
6	0,572	SERV1-2 T+	Combination	Max	0	95,601	0	0	0	443,8042	6-1	0,572
6	0	SERV1-2 T+	Combination	Min	0	-104,006	0	0	0	30,3414	6-1	0
6	0,572	SERV1-2 T+	Combination	Min	0	-75,764	0	0	0	14,6683	6-1	0,572
6	0	RESIST1-2 T+	Combination	Max	0	157,006	0	0	0	922,2368	6-1	0
6	0,572	RESIST1-2 T+	Combination	Max	0	216,064	0	0	0	944,9097	6-1	0,572
6	0	RESIST1-2 T+	Combination	Min	0	-237,821	0	0	0	-18,0521	6-1	0
6	0,572	RESIST1-2 T+	Combination	Min	0	-182,788	0	0	0	-53,9041	6-1	0,572
6	0	SERV1-1 H-	Combination	Max	0	49,962	0	0	0	370,7924	6-1	0
6	0,572	SERV1-1 H-	Combination	Max	0	72,59	0	0	0	367,7683	6-1	0,572
6	0	SERV1-1 H-	Combination	Min	0	-81,856	0	0	0	32,8038	6-1	0
6	0,572	SERV1-1 H-	Combination	Min	0	-54,607	0	0	0	17,6232	6-1	0,572
6	0	SERV1-2 T-	Combination	Max	0	82,133	0	0	0	401,6653	6-1	0
6	0,572	SERV1-2 T-	Combination	Max	0	110,388	0	0	0	410,124	6-1	0,572
6	0	SERV1-2 T-	Combination	Min	0	-94,19	0	0	0	37,7462	6-1	0
6	0,572	SERV1-2 T-	Combination	Min	0	-67,492	0	0	0	23,5541	6-1	0,572
6	0	RESIST 1-1 H+	Combination	Max	0	170,357	0	0	0	823,3579	6-1	0
6	0,572	RESIST 1-1 H+	Combination	Max	0	214,491	0	0	0	816,0379	6-1	0,572
6	0	RESIST 1-1 H+	Combination	Min	0	-200,292	0	0	0	-30,9901	6-1	0
6	0,572	RESIST 1-1 H+	Combination	Min	0	-143,444	0	0	0	-69,4297	6-1	0,572
6	0	RESIST1-1 H-	Combination	Max	0	120,539	0	0	0	774,3476	6-1	0
6	0,572	RESIST1-1 H-	Combination	Max	0	162,506	0	0	0	767,9362	6-1	0,572
6	0	RESIST1-1 H-	Combination	Min	0	-186,267	0	0	0	-12,321	6-1	0
6	0,572	RESIST1-1 H-	Combination	Min	0	-133,545	0	0	0	-47,0267	6-1	0,572
6	0	RESIST1-2 T-	Combination	Max	0	195,419	0	0	0	846,2042	6-1	0
6	0,572	RESIST1-2 T-	Combination	Max	0	250,483	0	0	0	866,519	6-1	0,572
6	0	RESIST1-2 T-	Combination	Min	0	-214,973	0	0	0	-0,8175	6-1	0
6	0,572	RESIST1-2 T-	Combination	Min	0	-163,534	0	0	0	-33,2225	6-1	0,572
6	0	E-SERV1-1	Combination	Max	0	71,366	0	0	0	391,8495	6-1	0
6	0,572	E-SERV1-1	Combination	Max	0	94,925	0	0	0	388,435	6-1	0,572
6	0	E-SERV1-1	Combination	Min	0	-87,882	0	0	0	24,7827	6-1	0
6	0,572	E-SERV1-1	Combination	Min	0	-58,86	0	0	0	7,9978	6-1	0,572
6	0	E-SERV1-2	Combination	Max	0	82,133	0	0	0	434,3324	6-1	0
6	0,572	E-SERV1-2	Combination	Max	0	110,388	0	0	0	443,8042	6-1	0,572
6	0	E-SERV1-2	Combination	Min	0	-104,006	0	0	0	30,3414	6-1	0
6	0,572	E-SERV1-2	Combination	Min	0	-75,764	0	0	0	14,6683	6-1	0,572
6	0	E-RESIST1-1	Combination	Max	0	170,357	0	0	0	823,3579	6-1	0
6	0,572	E-RESIST1-1	Combination	Max	0	214,491	0	0	0	816,0379	6-1	0,572
6	0	E-RESIST1-1	Combination	Min	0	-200,292	0	0	0	-30,9901	6-1	0
6	0,572	E-RESIST1-1	Combination	Min	0	-143,444	0	0	0	-69,4297	6-1	0,572
6	0	E-RESIST1-2	Combination	Max	0	195,419	0	0	0	922,2368	6-1	0
6	0,572	E-RESIST1-2	Combination	Max	0	250,483	0	0	0	944,9097	6-1	0,572
6	0	E-RESIST1-2	Combination	Min	0	-237,821	0	0	0	-18,0521	6-1	0
6	0,572	E-RESIST1-2	Combination	Min	0	-182,788	0	0	0	-53,9041	6-1	0,572
7	0	LINEA	LinStatic		0	3,284	0	0	0	44,8539	7-1	0
7	0,572	LINEA	LinStatic		0	8,735	0	0	0	41,4163	7-1	0,572
7	0	HL93 +	LinMoving	Max	0	87,291	0	0	0	284,1838	7-1	0
7	0,572	HL93 +	LinMoving	Max	0	97,745	0	0	0	266,0974	7-1	0,572
7	0	HL93 +	LinMoving	Min	0	-66,493	0	0	0	-96,2534	7-1	0
7	0,572	HL93 +	LinMoving	Min	0	-53,789	0	0	0	-112,2956	7-1	0,572
7	0	TAMDEM +	LinMoving	Max	0	87,968	0	0	0	339,553	7-1	0
7	0,572	TAMDEM +	LinMoving	Max	0	104,815	0	0	0	334,244	7-1	0,572

7	0	TAMDEM +	LinMoving	Min	0	-83,397	0	0	0	-89,5829	7-1	0
7	0,572	TAMDEM +	LinMoving	Min	0	-68,567	0	0	0	-104,5133	7-1	0,572
7	0	HL93 -	LinMoving	Max	0	64,956	0	0	0	263,5171	7-1	0
7	0,572	HL93 -	LinMoving	Max	0	74,475	0	0	0	249,0819	7-1	0,572
7	0	HL93 -	LinMoving	Min	0	-62,24	0	0	0	-86,628	7-1	0
7	0,572	HL93 -	LinMoving	Min	0	-52,064	0	0	0	-101,0661	7-1	0,572
7	0	TAMDEM -	LinMoving	Max	0	102,755	0	0	0	305,8728	7-1	0
7	0,572	TAMDEM -	LinMoving	Max	0	117,932	0	0	0	301,0904	7-1	0,572
7	0	TAMDEM -	LinMoving	Min	0	-75,125	0	0	0	-80,6972	7-1	0
7	0,572	TAMDEM -	LinMoving	Min	0	-61,766	0	0	0	-94,1467	7-1	0,572
7	0	SERV1-1 H+	Combination	Max	0	94,925	0	0	0	388,435	7-1	0
7	0,572	SERV1-1 H+	Combination	Max	0	118,048	0	0	0	362,3589	7-1	0,572
7	0	SERV1-1 H+	Combination	Min	0	-58,86	0	0	0	7,9978	7-1	0
7	0,572	SERV1-1 H+	Combination	Min	0	-33,486	0	0	0	-16,0342	7-1	0,572
7	0	SERV1-2 T+	Combination	Max	0	95,601	0	0	0	443,8042	7-1	0
7	0,572	SERV1-2 T+	Combination	Max	0	125,118	0	0	0	430,5055	7-1	0,572
7	0	SERV1-2 T+	Combination	Min	0	-75,764	0	0	0	14,6683	7-1	0
7	0,572	SERV1-2 T+	Combination	Min	0	-48,264	0	0	0	-8,2519	7-1	0,572
7	0	RESIST1-2 T+	Combination	Max	0	216,064	0	0	0	944,9097	7-1	0
7	0,572	RESIST1-2 T+	Combination	Max	0	274,066	0	0	0	920,7046	7-1	0,572
7	0	RESIST1-2 T+	Combination	Min	0	-182,788	0	0	0	-53,9041	7-1	0
7	0,572	RESIST1-2 T+	Combination	Min	0	-129,482	0	0	0	-100,5032	7-1	0,572
7	0	SERV1-1 H-	Combination	Max	0	72,59	0	0	0	367,7683	7-1	0
7	0,572	SERV1-1 H-	Combination	Max	0	94,778	0	0	0	345,3434	7-1	0,572
7	0	SERV1-1 H-	Combination	Min	0	-54,607	0	0	0	17,6232	7-1	0
7	0,572	SERV1-1 H-	Combination	Min	0	-31,761	0	0	0	-4,8046	7-1	0,572
7	0	SERV1-2 T-	Combination	Max	0	110,388	0	0	0	410,124	7-1	0
7	0,572	SERV1-2 T-	Combination	Max	0	138,235	0	0	0	397,3518	7-1	0,572
7	0	SERV1-2 T-	Combination	Min	0	-67,492	0	0	0	23,5541	7-1	0
7	0,572	SERV1-2 T-	Combination	Min	0	-41,463	0	0	0	2,1148	7-1	0,572
7	0	RESIST 1-1 H+	Combination	Max	0	214,491	0	0	0	816,0379	7-1	0
7	0,572	RESIST 1-1 H+	Combination	Max	0	257,61	0	0	0	762,0933	7-1	0,572
7	0	RESIST 1-1 H+	Combination	Min	0	-143,444	0	0	0	-69,4297	7-1	0
7	0,572	RESIST 1-1 H+	Combination	Min	0	-95,084	0	0	0	-118,6164	7-1	0,572
7	0	RESIST1-1 H-	Combination	Max	0	162,506	0	0	0	767,9362	7-1	0
7	0,572	RESIST1-1 H-	Combination	Max	0	203,448	0	0	0	722,4897	7-1	0,572
7	0	RESIST1-1 H-	Combination	Min	0	-133,545	0	0	0	-47,0267	7-1	0
7	0,572	RESIST1-1 H-	Combination	Min	0	-91,072	0	0	0	-92,4796	7-1	0,572
7	0	RESIST1-2 T-	Combination	Max	0	250,483	0	0	0	866,519	7-1	0
7	0,572	RESIST1-2 T-	Combination	Max	0	304,595	0	0	0	843,5395	7-1	0,572
7	0	RESIST1-2 T-	Combination	Min	0	-163,534	0	0	0	-33,2225	7-1	0
7	0,572	RESIST1-2 T-	Combination	Min	0	-113,652	0	0	0	-76,3748	7-1	0,572
7	0	E-SERV1-1	Combination	Max	0	94,925	0	0	0	388,435	7-1	0
7	0,572	E-SERV1-1	Combination	Max	0	118,048	0	0	0	362,3589	7-1	0,572
7	0	E-SERV1-1	Combination	Min	0	-58,86	0	0	0	7,9978	7-1	0
7	0,572	E-SERV1-1	Combination	Min	0	-33,486	0	0	0	-16,0342	7-1	0,572
7	0	E-SERV1-2	Combination	Max	0	110,388	0	0	0	443,8042	7-1	0
7	0,572	E-SERV1-2	Combination	Max	0	138,235	0	0	0	430,5055	7-1	0,572
7	0	E-SERV1-2	Combination	Min	0	-75,764	0	0	0	14,6683	7-1	0
7	0,572	E-SERV1-2	Combination	Min	0	-48,264	0	0	0	-8,2519	7-1	0,572
7	0	E-RESIST1-1	Combination	Max	0	214,491	0	0	0	816,0379	7-1	0
7	0,572	E-RESIST1-1	Combination	Max	0	257,61	0	0	0	762,0933	7-1	0,572
7	0	E-RESIST1-1	Combination	Min	0	-143,444	0	0	0	-69,4297	7-1	0
7	0,572	E-RESIST1-1	Combination	Min	0	-95,084	0	0	0	-118,6164	7-1	0,572
7	0	E-RESIST1-2	Combination	Max	0	250,483	0	0	0	944,9097	7-1	0
7	0,572	E-RESIST1-2	Combination	Max	0	304,595	0	0	0	920,7046	7-1	0,572
7	0	E-RESIST1-2	Combination	Min	0	-182,788	0	0	0	-53,9041	7-1	0
7	0,572	E-RESIST1-2	Combination	Min	0	-129,482	0	0	0	-100,5032	7-1	0,572
8	0	LINEA	LinStatic		0	8,735	0	0	0	41,4163	8-1	0
8	0,572	LINEA	LinStatic		0	14,186	0	0	0	34,8607	8-1	0,572
8	0	HL93 +	LinMoving	Max	0	97,745	0	0	0	266,0974	8-1	0
8	0,572	HL93 +	LinMoving	Max	0	107,785	0	0	0	259,4196	8-1	0,572
8	0	HL93 +	LinMoving	Min	0	-53,789	0	0	0	-112,2956	8-1	0
8	0,572	HL93 +	LinMoving	Min	0	-44,22	0	0	0	-128,3378	8-1	0,572
8	0	TAMDEM +	LinMoving	Max	0	104,815	0	0	0	334,244	8-1	0
8	0,572	TAMDEM +	LinMoving	Max	0	121,117	0	0	0	326,7905	8-1	0,572
8	0	TAMDEM +	LinMoving	Min	0	-68,567	0	0	0	-104,5133	8-1	0
8	0,572	TAMDEM +	LinMoving	Min	0	-54,571	0	0	0	-119,4438	8-1	0,572

8	0	HL93 -	LinMoving	Max	0	74,475	0	0	0	249,0819	8-1	0
8	0,572	HL93 -	LinMoving	Max	0	85,656	0	0	0	250,2016	8-1	0,572
8	0	HL93 -	LinMoving	Min	0	-52,064	0	0	0	-101,0661	8-1	0
8	0,572	HL93 -	LinMoving	Min	0	-42,994	0	0	0	-115,5041	8-1	0,572
8	0	TAMDEM -	LinMoving	Max	0	117,932	0	0	0	301,0904	8-1	0
8	0,572	TAMDEM -	LinMoving	Max	0	132,593	0	0	0	294,3762	8-1	0,572
8	0	TAMDEM -	LinMoving	Min	0	-61,766	0	0	0	-94,1467	8-1	0
8	0,572	TAMDEM -	LinMoving	Min	0	-49,158	0	0	0	-107,5962	8-1	0,572
8	0	SERV1-1 H+	Combination	Max	0	118,048	0	0	0	362,3589	8-1	0
8	0,572	SERV1-1 H+	Combination	Max	0	140,758	0	0	0	340,4442	8-1	0,572
8	0	SERV1-1 H+	Combination	Min	0	-33,486	0	0	0	-16,0342	8-1	0
8	0,572	SERV1-1 H+	Combination	Min	0	-11,247	0	0	0	-47,3132	8-1	0,572
8	0	SERV1-2 T+	Combination	Max	0	125,118	0	0	0	430,5055	8-1	0
8	0,572	SERV1-2 T+	Combination	Max	0	154,09	0	0	0	407,8151	8-1	0,572
8	0	SERV1-2 T+	Combination	Min	0	-48,264	0	0	0	-8,2519	8-1	0
8	0,572	SERV1-2 T+	Combination	Min	0	-21,598	0	0	0	-38,4192	8-1	0,572
8	0	RESIST1-2 T+	Combination	Max	0	274,066	0	0	0	920,7046	8-1	0
8	0,572	RESIST1-2 T+	Combination	Max	0	330,798	0	0	0	880,761	8-1	0,572
8	0	RESIST1-2 T+	Combination	Min	0	-129,482	0	0	0	-100,5032	8-1	0
8	0,572	RESIST1-2 T+	Combination	Min	0	-78,117	0	0	0	-157,8495	8-1	0,572
8	0	SERV1-1 H-	Combination	Max	0	94,778	0	0	0	345,3434	8-1	0
8	0,572	SERV1-1 H-	Combination	Max	0	118,629	0	0	0	331,2262	8-1	0,572
8	0	SERV1-1 H-	Combination	Min	0	-31,761	0	0	0	-4,8046	8-1	0
8	0,572	SERV1-1 H-	Combination	Min	0	-10,021	0	0	0	-34,4795	8-1	0,572
8	0	SERV1-2 T-	Combination	Max	0	138,235	0	0	0	397,3518	8-1	0
8	0,572	SERV1-2 T-	Combination	Max	0	165,566	0	0	0	375,4008	8-1	0,572
8	0	SERV1-2 T-	Combination	Min	0	-41,463	0	0	0	2,1148	8-1	0
8	0,572	SERV1-2 T-	Combination	Min	0	-16,185	0	0	0	-26,5716	8-1	0,572
8	0	RESIST 1-1 H+	Combination	Max	0	257,61	0	0	0	762,0933	8-1	0
8	0,572	RESIST 1-1 H+	Combination	Max	0	299,768	0	0	0	723,9551	8-1	0,572
8	0	RESIST 1-1 H+	Combination	Min	0	-95,084	0	0	0	-118,6164	8-1	0
8	0,572	RESIST 1-1 H+	Combination	Min	0	-54,024	0	0	0	-178,5503	8-1	0,572
8	0	RESIST1-1 H-	Combination	Max	0	203,448	0	0	0	722,4897	8-1	0
8	0,572	RESIST1-1 H-	Combination	Max	0	248,262	0	0	0	702,5003	8-1	0,572
8	0	RESIST1-1 H-	Combination	Min	0	-91,072	0	0	0	-92,4796	8-1	0
8	0,572	RESIST1-1 H-	Combination	Min	0	-51,17	0	0	0	-148,6797	8-1	0,572
8	0	RESIST1-2 T-	Combination	Max	0	304,595	0	0	0	843,5395	8-1	0
8	0,572	RESIST1-2 T-	Combination	Max	0	357,507	0	0	0	805,3167	8-1	0,572
8	0	RESIST1-2 T-	Combination	Min	0	-113,652	0	0	0	-76,3748	8-1	0
8	0,572	RESIST1-2 T-	Combination	Min	0	-65,518	0	0	0	-130,2741	8-1	0,572
8	0	E-SERV1-1	Combination	Max	0	118,048	0	0	0	362,3589	8-1	0
8	0,572	E-SERV1-1	Combination	Max	0	140,758	0	0	0	340,4442	8-1	0,572
8	0	E-SERV1-1	Combination	Min	0	-33,486	0	0	0	-16,0342	8-1	0
8	0,572	E-SERV1-1	Combination	Min	0	-11,247	0	0	0	-47,3132	8-1	0,572
8	0	E-SERV1-2	Combination	Max	0	138,235	0	0	0	430,5055	8-1	0
8	0,572	E-SERV1-2	Combination	Max	0	165,566	0	0	0	407,8151	8-1	0,572
8	0	E-SERV1-2	Combination	Min	0	-48,264	0	0	0	-8,2519	8-1	0
8	0,572	E-SERV1-2	Combination	Min	0	-21,598	0	0	0	-38,4192	8-1	0,572
8	0	E-RESIST1-1	Combination	Max	0	257,61	0	0	0	762,0933	8-1	0
8	0,572	E-RESIST1-1	Combination	Max	0	299,768	0	0	0	723,9551	8-1	0,572
8	0	E-RESIST1-1	Combination	Min	0	-95,084	0	0	0	-118,6164	8-1	0
8	0,572	E-RESIST1-1	Combination	Min	0	-54,024	0	0	0	-178,5503	8-1	0,572
8	0	E-RESIST1-2	Combination	Max	0	304,595	0	0	0	920,7046	8-1	0
8	0,572	E-RESIST1-2	Combination	Max	0	357,507	0	0	0	880,761	8-1	0,572
8	0	E-RESIST1-2	Combination	Min	0	-129,482	0	0	0	-100,5032	8-1	0
8	0,572	E-RESIST1-2	Combination	Min	0	-78,117	0	0	0	-157,8495	8-1	0,572
9	0	LINEA	LinStatic		0	14,186	0	0	0	34,8607	9-1	0
9	0,572	LINEA	LinStatic		0	19,638	0	0	0	25,187	9-1	0,572
9	0	HL93 +	LinMoving	Max	0	107,785	0	0	0	259,4196	9-1	0
9	0,572	HL93 +	LinMoving	Max	0	119,412	0	0	0	259,0959	9-1	0,572
9	0	HL93 +	LinMoving	Min	0	-44,22	0	0	0	-128,3378	9-1	0
9	0,572	HL93 +	LinMoving	Min	0	-35,181	0	0	0	-144,3801	9-1	0,572
9	0	TAMDEM +	LinMoving	Max	0	121,117	0	0	0	326,7905	9-1	0
9	0,572	TAMDEM +	LinMoving	Max	0	136,781	0	0	0	303,9714	9-1	0,572
9	0	TAMDEM +	LinMoving	Min	0	-54,571	0	0	0	-119,4438	9-1	0
9	0,572	TAMDEM +	LinMoving	Min	0	-41,501	0	0	0	-134,3743	9-1	0,572
9	0	HL93 -	LinMoving	Max	0	85,656	0	0	0	250,2016	9-1	0
9	0,572	HL93 -	LinMoving	Max	0	105,342	0	0	0	249,6382	9-1	0,572

9	0	HL93 -	LinMoving	Min	0	-42,994	0	0	0	-115,5041	9-1	0
9	0,572	HL93 -	LinMoving	Min	0	-34,881	0	0	0	-129,9421	9-1	0,572
9	0	TAMDEM -	LinMoving	Max	0	132,593	0	0	0	294,3762	9-1	0
9	0,572	TAMDEM -	LinMoving	Max	0	146,148	0	0	0	273,8205	9-1	0,572
9	0	TAMDEM -	LinMoving	Min	0	-49,158	0	0	0	-107,5962	9-1	0
9	0,572	TAMDEM -	LinMoving	Min	0	-37,593	0	0	0	-121,0457	9-1	0,572
9	0	SERV1-1 H+	Combination	Max	0	140,758	0	0	0	340,4442	9-1	0
9	0,572	SERV1-1 H+	Combination	Max	0	165,055	0	0	0	317,6365	9-1	0,572
9	0	SERV1-1 H+	Combination	Min	0	-11,247	0	0	0	-47,3132	9-1	0
9	0,572	SERV1-1 H+	Combination	Min	0	10,461	0	0	0	-85,8395	9-1	0,572
9	0	SERV1-2 T+	Combination	Max	0	154,09	0	0	0	407,8151	9-1	0
9	0,572	SERV1-2 T+	Combination	Max	0	182,424	0	0	0	362,512	9-1	0,572
9	0	SERV1-2 T+	Combination	Min	0	-21,598	0	0	0	-38,4192	9-1	0
9	0,572	SERV1-2 T+	Combination	Min	0	4,142	0	0	0	-75,8337	9-1	0,572
9	0	RESIST1-2 T+	Combination	Max	0	330,798	0	0	0	880,761	9-1	0
9	0,572	RESIST1-2 T+	Combination	Max	0	386,044	0	0	0	794,3067	9-1	0,572
9	0	RESIST1-2 T+	Combination	Min	0	-78,117	0	0	0	-157,8495	9-1	0
9	0,572	RESIST1-2 T+	Combination	Min	0	-28,908	0	0	0	-225,943	9-1	0,572
9	0	SERV1-1 H-	Combination	Max	0	118,629	0	0	0	331,2262	9-1	0
9	0,572	SERV1-1 H-	Combination	Max	0	150,984	0	0	0	308,1788	9-1	0,572
9	0	SERV1-1 H-	Combination	Min	0	-10,021	0	0	0	-34,4795	9-1	0
9	0,572	SERV1-1 H-	Combination	Min	0	10,762	0	0	0	-71,4015	9-1	0,572
9	0	SERV1-2 T-	Combination	Max	0	165,566	0	0	0	375,4008	9-1	0
9	0,572	SERV1-2 T-	Combination	Max	0	191,791	0	0	0	332,3611	9-1	0,572
9	0	SERV1-2 T-	Combination	Min	0	-16,185	0	0	0	-26,5716	9-1	0
9	0,572	SERV1-2 T-	Combination	Min	0	8,049	0	0	0	-62,5051	9-1	0,572
9	0	RESIST 1-1 H+	Combination	Max	0	299,768	0	0	0	723,9551	9-1	0
9	0,572	RESIST 1-1 H+	Combination	Max	0	345,619	0	0	0	689,8589	9-1	0,572
9	0	RESIST 1-1 H+	Combination	Min	0	-54,024	0	0	0	-178,5503	9-1	0
9	0,572	RESIST 1-1 H+	Combination	Min	0	-14,199	0	0	0	-249,2314	9-1	0,572
9	0	RESIST1-1 H-	Combination	Max	0	248,262	0	0	0	702,5003	9-1	0
9	0,572	RESIST1-1 H-	Combination	Max	0	312,869	0	0	0	667,8461	9-1	0,572
9	0	RESIST1-1 H-	Combination	Min	0	-51,17	0	0	0	-148,6797	9-1	0
9	0,572	RESIST1-1 H-	Combination	Min	0	-13,499	0	0	0	-215,627	9-1	0,572
9	0	RESIST1-2 T-	Combination	Max	0	357,507	0	0	0	805,3167	9-1	0
9	0,572	RESIST1-2 T-	Combination	Max	0	407,846	0	0	0	724,1304	9-1	0,572
9	0	RESIST1-2 T-	Combination	Min	0	-65,518	0	0	0	-130,2741	9-1	0
9	0,572	RESIST1-2 T-	Combination	Min	0	-19,813	0	0	0	-194,9207	9-1	0,572
9	0	E-SERV1-1	Combination	Max	0	140,758	0	0	0	340,4442	9-1	0
9	0,572	E-SERV1-1	Combination	Max	0	165,055	0	0	0	317,6365	9-1	0,572
9	0	E-SERV1-1	Combination	Min	0	-11,247	0	0	0	-47,3132	9-1	0
9	0,572	E-SERV1-1	Combination	Min	0	10,461	0	0	0	-85,8395	9-1	0,572
9	0	E-SERV1-2	Combination	Max	0	165,566	0	0	0	407,8151	9-1	0
9	0,572	E-SERV1-2	Combination	Max	0	191,791	0	0	0	362,512	9-1	0,572
9	0	E-SERV1-2	Combination	Min	0	-21,598	0	0	0	-38,4192	9-1	0
9	0,572	E-SERV1-2	Combination	Min	0	4,142	0	0	0	-75,8337	9-1	0,572
9	0	E-RESIST1-1	Combination	Max	0	299,768	0	0	0	723,9551	9-1	0
9	0,572	E-RESIST1-1	Combination	Max	0	345,619	0	0	0	689,8589	9-1	0,572
9	0	E-RESIST1-1	Combination	Min	0	-54,024	0	0	0	-178,5503	9-1	0
9	0,572	E-RESIST1-1	Combination	Min	0	-14,199	0	0	0	-249,2314	9-1	0,572
9	0	E-RESIST1-2	Combination	Max	0	357,507	0	0	0	880,761	9-1	0
9	0,572	E-RESIST1-2	Combination	Max	0	407,846	0	0	0	794,3067	9-1	0,572
9	0	E-RESIST1-2	Combination	Min	0	-78,117	0	0	0	-157,8495	9-1	0
9	0,572	E-RESIST1-2	Combination	Min	0	-28,908	0	0	0	-225,943	9-1	0,572
10	0	LINEA	LinStatic		0	19,638	0	0	0	25,187	10-1	0
10	0,572	LINEA	LinStatic		0	25,089	0	0	0	12,3952	10-1	0,572
10	0	HL93 +	LinMoving	Max	0	119,412	0	0	0	259,0959	10-1	0
10	0,572	HL93 +	LinMoving	Max	0	138,508	0	0	0	238,0178	10-1	0,572
10	0	HL93 +	LinMoving	Min	0	-35,181	0	0	0	-144,3801	10-1	0
10	0,572	HL93 +	LinMoving	Min	0	-26,732	0	0	0	-160,4223	10-1	0,572
10	0	TAMDEM +	LinMoving	Max	0	136,781	0	0	0	303,9714	10-1	0
10	0,572	TAMDEM +	LinMoving	Max	0	151,715	0	0	0	267,4075	10-1	0,572
10	0	TAMDEM +	LinMoving	Min	0	-41,501	0	0	0	-134,3743	10-1	0
10	0,572	TAMDEM +	LinMoving	Min	0	-29,449	0	0	0	-149,3048	10-1	0,572
10	0	HL93 -	LinMoving	Max	0	105,342	0	0	0	249,6382	10-1	0
10	0,572	HL93 -	LinMoving	Max	0	124,657	0	0	0	232,6192	10-1	0,572
10	0	HL93 -	LinMoving	Min	0	-34,881	0	0	0	-129,9421	10-1	0
10	0,572	HL93 -	LinMoving	Min	0	-27,152	0	0	0	-144,3801	10-1	0,572

10	0	TAMDEM -	LinMoving	Max	0	146,148	0	0	0	273,8205	10-1	0
10	0,572	TAMDEM -	LinMoving	Max	0	158,526	0	0	0	240,8834	10-1	0,572
10	0	TAMDEM -	LinMoving	Min	0	-37,593	0	0	0	-121,0457	10-1	0
10	0,572	TAMDEM -	LinMoving	Min	0	-27,491	0	0	0	-134,4953	10-1	0,572
10	0	SERV1-1 H+	Combination	Max	0	165,055	0	0	0	317,6365	10-1	0
10	0,572	SERV1-1 H+	Combination	Max	0	196,82	0	0	0	266,8273	10-1	0,572
10	0	SERV1-1 H+	Combination	Min	0	10,461	0	0	0	-85,8395	10-1	0
10	0,572	SERV1-1 H+	Combination	Min	0	31,58	0	0	0	-131,6128	10-1	0,572
10	0	SERV1-2 T+	Combination	Max	0	182,424	0	0	0	362,512	10-1	0
10	0,572	SERV1-2 T+	Combination	Max	0	210,028	0	0	0	296,217	10-1	0,572
10	0	SERV1-2 T+	Combination	Min	0	4,142	0	0	0	-75,8337	10-1	0
10	0,572	SERV1-2 T+	Combination	Min	0	28,863	0	0	0	-120,4953	10-1	0,572
10	0	RESIST1-2 T+	Combination	Max	0	386,044	0	0	0	794,3067	10-1	0
10	0,572	RESIST1-2 T+	Combination	Max	0	439,592	0	0	0	665,1142	10-1	0,572
10	0	RESIST1-2 T+	Combination	Min	0	-28,908	0	0	0	-225,943	10-1	0
10	0,572	RESIST1-2 T+	Combination	Min	0	17,932	0	0	0	-304,7836	10-1	0,572
10	0	SERV1-1 H-	Combination	Max	0	150,984	0	0	0	308,1788	10-1	0
10	0,572	SERV1-1 H-	Combination	Max	0	182,97	0	0	0	261,4287	10-1	0,572
10	0	SERV1-1 H-	Combination	Min	0	10,762	0	0	0	-71,4015	10-1	0
10	0,572	SERV1-1 H-	Combination	Min	0	31,16	0	0	0	-115,5706	10-1	0,572
10	0	SERV1-2 T-	Combination	Max	0	191,791	0	0	0	332,3611	10-1	0
10	0,572	SERV1-2 T-	Combination	Max	0	216,839	0	0	0	269,6929	10-1	0,572
10	0	SERV1-2 T-	Combination	Min	0	8,049	0	0	0	-62,5051	10-1	0
10	0,572	SERV1-2 T-	Combination	Min	0	30,821	0	0	0	-105,6858	10-1	0,572
10	0	RESIST 1-1 H+	Combination	Max	0	345,619	0	0	0	689,8589	10-1	0
10	0,572	RESIST 1-1 H+	Combination	Max	0	408,852	0	0	0	596,7097	10-1	0,572
10	0	RESIST 1-1 H+	Combination	Min	0	-14,199	0	0	0	-249,2314	10-1	0
10	0,572	RESIST 1-1 H+	Combination	Min	0	24,255	0	0	0	-330,6597	10-1	0,572
10	0	RESIST1-1 H-	Combination	Max	0	312,869	0	0	0	667,8461	10-1	0
10	0,572	RESIST1-1 H-	Combination	Max	0	376,615	0	0	0	584,1444	10-1	0,572
10	0	RESIST1-1 H-	Combination	Min	0	-13,499	0	0	0	-215,627	10-1	0
10	0,572	RESIST1-1 H-	Combination	Min	0	23,278	0	0	0	-293,3214	10-1	0,572
10	0	RESIST1-2 T-	Combination	Max	0	407,846	0	0	0	724,1304	10-1	0
10	0,572	RESIST1-2 T-	Combination	Max	0	455,445	0	0	0	603,3793	10-1	0,572
10	0	RESIST1-2 T-	Combination	Min	0	-19,813	0	0	0	-194,9207	10-1	0
10	0,572	RESIST1-2 T-	Combination	Min	0	22,49	0	0	0	-270,3144	10-1	0,572
10	0	E-SERV1-1	Combination	Max	0	165,055	0	0	0	317,6365	10-1	0
10	0,572	E-SERV1-1	Combination	Max	0	196,82	0	0	0	266,8273	10-1	0,572
10	0	E-SERV1-1	Combination	Min	0	10,461	0	0	0	-85,8395	10-1	0
10	0,572	E-SERV1-1	Combination	Min	0	31,16	0	0	0	-131,6128	10-1	0,572
10	0	E-SERV1-2	Combination	Max	0	191,791	0	0	0	362,512	10-1	0
10	0,572	E-SERV1-2	Combination	Max	0	216,839	0	0	0	296,217	10-1	0,572
10	0	E-SERV1-2	Combination	Min	0	4,142	0	0	0	-75,8337	10-1	0
10	0,572	E-SERV1-2	Combination	Min	0	28,863	0	0	0	-120,4953	10-1	0,572
10	0	E-RESIST1-1	Combination	Max	0	345,619	0	0	0	689,8589	10-1	0
10	0,572	E-RESIST1-1	Combination	Max	0	408,852	0	0	0	596,7097	10-1	0,572
10	0	E-RESIST1-1	Combination	Min	0	-14,199	0	0	0	-249,2314	10-1	0
10	0,572	E-RESIST1-1	Combination	Min	0	23,278	0	0	0	-330,6597	10-1	0,572
10	0	E-RESIST1-2	Combination	Max	0	407,846	0	0	0	794,3067	10-1	0
10	0,572	E-RESIST1-2	Combination	Max	0	455,445	0	0	0	665,1142	10-1	0,572
10	0	E-RESIST1-2	Combination	Min	0	-28,908	0	0	0	-225,943	10-1	0
10	0,572	E-RESIST1-2	Combination	Min	0	17,932	0	0	0	-304,7836	10-1	0,572
11	0	LINEA	LinStatic		0	25,089	0	0	0	12,3952	11-1	0
11	0,572	LINEA	LinStatic		0	30,54	0	0	0	-3,5146	11-1	0,572
11	0	HL93 +	LinMoving	Max	0	138,508	0	0	0	238,0178	11-1	0
11	0,572	HL93 +	LinMoving	Max	0	159,049	0	0	0	197,9871	11-1	0,572
11	0	HL93 +	LinMoving	Min	0	-26,732	0	0	0	-160,4223	11-1	0
11	0,572	HL93 +	LinMoving	Min	0	-19,077	0	0	0	-176,4645	11-1	0,572
11	0	TAMDEM +	LinMoving	Max	0	151,715	0	0	0	267,4075	11-1	0
11	0,572	TAMDEM +	LinMoving	Max	0	165,828	0	0	0	218,9303	11-1	0,572
11	0	TAMDEM +	LinMoving	Min	0	-29,449	0	0	0	-149,3048	11-1	0
11	0,572	TAMDEM +	LinMoving	Min	0	-18,507	0	0	0	-164,2353	11-1	0,572
11	0	HL93 -	LinMoving	Max	0	124,657	0	0	0	232,6192	11-1	0
11	0,572	HL93 -	LinMoving	Max	0	143,144	0	0	0	197,6499	11-1	0,572
11	0	HL93 -	LinMoving	Min	0	-27,152	0	0	0	-144,3801	11-1	0
11	0,572	HL93 -	LinMoving	Min	0	-19,88	0	0	0	-158,8181	11-1	0,572
11	0	TAMDEM -	LinMoving	Max	0	158,526	0	0	0	240,8834	11-1	0
11	0,572	TAMDEM -	LinMoving	Max	0	169,724	0	0	0	197,2146	11-1	0,572

11	0	TAMDEM -	LinMoving	Min	0	-27,491	0	0	0	-134,4953	11-1	0
11	0,572	TAMDEM -	LinMoving	Min	0	-18,33	0	0	0	-147,9448	11-1	0,572
11	0	SERV1-1 H+	Combination	Max	0	196,82	0	0	0	266,8273	11-1	0
11	0,572	SERV1-1 H+	Combination	Max	0	230,031	0	0	0	189,8183	11-1	0,572
11	0	SERV1-1 H+	Combination	Min	0	31,58	0	0	0	-131,6128	11-1	0
11	0,572	SERV1-1 H+	Combination	Min	0	51,905	0	0	0	-184,6333	11-1	0,572
11	0	SERV1-2 T+	Combination	Max	0	210,028	0	0	0	296,217	11-1	0
11	0,572	SERV1-2 T+	Combination	Max	0	236,81	0	0	0	210,7615	11-1	0,572
11	0	SERV1-2 T+	Combination	Min	0	28,863	0	0	0	-120,4953	11-1	0
11	0,572	SERV1-2 T+	Combination	Min	0	52,476	0	0	0	-172,404	11-1	0,572
11	0	RESIST1-2 T+	Combination	Max	0	439,592	0	0	0	665,1142	11-1	0
11	0,572	RESIST1-2 T+	Combination	Max	0	491,228	0	0	0	497,4463	11-1	0,572
11	0	RESIST1-2 T+	Combination	Min	0	17,932	0	0	0	-304,7836	11-1	0
11	0,572	RESIST1-2 T+	Combination	Min	0	62,19	0	0	0	-394,3715	11-1	0,572
11	0	SERV1-1 H-	Combination	Max	0	182,97	0	0	0	261,4287	11-1	0
11	0,572	SERV1-1 H-	Combination	Max	0	214,126	0	0	0	189,4811	11-1	0,572
11	0	SERV1-1 H-	Combination	Min	0	31,16	0	0	0	-115,5706	11-1	0
11	0,572	SERV1-1 H-	Combination	Min	0	51,102	0	0	0	-166,9868	11-1	0,572
11	0	SERV1-2 T-	Combination	Max	0	216,839	0	0	0	269,6929	11-1	0
11	0,572	SERV1-2 T-	Combination	Max	0	240,706	0	0	0	189,0459	11-1	0,572
11	0	SERV1-2 T-	Combination	Min	0	30,821	0	0	0	-105,6858	11-1	0
11	0,572	SERV1-2 T-	Combination	Min	0	52,652	0	0	0	-156,1135	11-1	0,572
11	0	RESIST 1-1 H+	Combination	Max	0	408,852	0	0	0	596,7097	11-1	0
11	0,572	RESIST 1-1 H+	Combination	Max	0	475,45	0	0	0	448,701	11-1	0,572
11	0	RESIST 1-1 H+	Combination	Min	0	24,255	0	0	0	-330,6597	11-1	0
11	0,572	RESIST 1-1 H+	Combination	Min	0	60,861	0	0	0	-422,8351	11-1	0,572
11	0	RESIST1-1 H-	Combination	Max	0	376,615	0	0	0	584,1444	11-1	0
11	0,572	RESIST1-1 H-	Combination	Max	0	438,431	0	0	0	447,9162	11-1	0,572
11	0	RESIST1-1 H-	Combination	Min	0	23,278	0	0	0	-293,3214	11-1	0
11	0,572	RESIST1-1 H-	Combination	Min	0	58,993	0	0	0	-381,763	11-1	0,572
11	0	RESIST1-2 T-	Combination	Max	0	455,445	0	0	0	603,3793	11-1	0
11	0,572	RESIST1-2 T-	Combination	Max	0	500,296	0	0	0	446,9031	11-1	0,572
11	0	RESIST1-2 T-	Combination	Min	0	22,49	0	0	0	-270,3144	11-1	0
11	0,572	RESIST1-2 T-	Combination	Min	0	62,601	0	0	0	-356,4554	11-1	0,572
11	0	E-SERV1-1	Combination	Max	0	196,82	0	0	0	266,8273	11-1	0
11	0,572	E-SERV1-1	Combination	Max	0	230,031	0	0	0	189,8183	11-1	0,572
11	0	E-SERV1-1	Combination	Min	0	31,16	0	0	0	-131,6128	11-1	0
11	0,572	E-SERV1-1	Combination	Min	0	51,102	0	0	0	-184,6333	11-1	0,572
11	0	E-SERV1-2	Combination	Max	0	216,839	0	0	0	296,217	11-1	0
11	0,572	E-SERV1-2	Combination	Max	0	240,706	0	0	0	210,7615	11-1	0,572
11	0	E-SERV1-2	Combination	Min	0	28,863	0	0	0	-120,4953	11-1	0
11	0,572	E-SERV1-2	Combination	Min	0	52,476	0	0	0	-172,404	11-1	0,572
11	0	E-RESIST1-1	Combination	Max	0	408,852	0	0	0	596,7097	11-1	0
11	0,572	E-RESIST1-1	Combination	Max	0	475,45	0	0	0	448,701	11-1	0,572
11	0	E-RESIST1-1	Combination	Min	0	23,278	0	0	0	-330,6597	11-1	0
11	0,572	E-RESIST1-1	Combination	Min	0	58,993	0	0	0	-422,8351	11-1	0,572
11	0	E-RESIST1-2	Combination	Max	0	455,445	0	0	0	665,1142	11-1	0
11	0,572	E-RESIST1-2	Combination	Max	0	500,296	0	0	0	497,4463	11-1	0,572
11	0	E-RESIST1-2	Combination	Min	0	17,932	0	0	0	-304,7836	11-1	0
11	0,572	E-RESIST1-2	Combination	Min	0	62,19	0	0	0	-394,3715	11-1	0,572
12	0	LINEA	LinStatic		0	30,54	0	0	0	-3,5146	12-1	0
12	0,572	LINEA	LinStatic		0	35,991	0	0	0	-22,5425	12-1	0,572
12	0	HL93 +	LinMoving	Max	0	159,049	0	0	0	197,9871	12-1	0
12	0,572	HL93 +	LinMoving	Max	0	178,565	0	0	0	141,0752	12-1	0,572
12	0	HL93 +	LinMoving	Min	0	-19,077	0	0	0	-176,4645	12-1	0
12	0,572	HL93 +	LinMoving	Min	0	-12,237	0	0	0	-192,507	12-1	0,572
12	0	TAMDEM +	LinMoving	Max	0	165,828	0	0	0	218,9303	12-1	0
12	0,572	TAMDEM +	LinMoving	Max	0	179,026	0	0	0	160,5817	12-1	0,572
12	0	TAMDEM +	LinMoving	Min	0	-18,507	0	0	0	-164,2353	12-1	0
12	0,572	TAMDEM +	LinMoving	Min	0	-9,24	0	0	0	-179,1657	12-1	0,572
12	0	HL93 -	LinMoving	Max	0	143,144	0	0	0	197,6499	12-1	0
12	0,572	HL93 -	LinMoving	Max	0	160,708	0	0	0	146,4713	12-1	0,572
12	0	HL93 -	LinMoving	Min	0	-19,88	0	0	0	-158,8181	12-1	0
12	0,572	HL93 -	LinMoving	Min	0	-13,136	0	0	0	-173,2563	12-1	0,572
12	0	TAMDEM -	LinMoving	Max	0	169,724	0	0	0	197,2146	12-1	0
12	0,572	TAMDEM -	LinMoving	Max	0	179,738	0	0	0	145,3519	12-1	0,572
12	0	TAMDEM -	LinMoving	Min	0	-18,33	0	0	0	-147,9448	12-1	0
12	0,572	TAMDEM -	LinMoving	Min	0	-11,201	0	0	0	-161,3943	12-1	0,572

12	0	SERV1-1 H+	Combination	Max	0	230,031	0	0	0	189,8183	12-1	0
12	0,572	SERV1-1 H+	Combination	Max	0	262,217	0	0	0	88,6811	12-1	0,572
12	0	SERV1-1 H+	Combination	Min	0	51,905	0	0	0	-184,6333	12-1	0
12	0,572	SERV1-1 H+	Combination	Min	0	71,415	0	0	0	-244,9011	12-1	0,572
12	0	SERV1-2 T+	Combination	Max	0	236,81	0	0	0	210,7615	12-1	0
12	0,572	SERV1-2 T+	Combination	Max	0	262,678	0	0	0	108,1876	12-1	0,572
12	0	SERV1-2 T+	Combination	Min	0	52,476	0	0	0	-172,404	12-1	0
12	0,572	SERV1-2 T+	Combination	Min	0	74,412	0	0	0	-231,5598	12-1	0,572
12	0	RESIST1-2 T+	Combination	Max	0	491,228	0	0	0	497,4463	12-1	0
12	0,572	RESIST1-2 T+	Combination	Max	0	540,735	0	0	0	296,0558	12-1	0,572
12	0	RESIST1-2 T+	Combination	Min	0	62,19	0	0	0	-394,3715	12-1	0
12	0,572	RESIST1-2 T+	Combination	Min	0	102,546	0	0	0	-494,7065	12-1	0,572
12	0	SERV1-1 H-	Combination	Max	0	214,126	0	0	0	189,4811	12-1	0
12	0,572	SERV1-1 H-	Combination	Max	0	244,36	0	0	0	94,0772	12-1	0,572
12	0	SERV1-1 H-	Combination	Min	0	51,102	0	0	0	-166,9868	12-1	0
12	0,572	SERV1-1 H-	Combination	Min	0	70,516	0	0	0	-225,6504	12-1	0,572
12	0	SERV1-2 T-	Combination	Max	0	240,706	0	0	0	189,0459	12-1	0
12	0,572	SERV1-2 T-	Combination	Max	0	263,39	0	0	0	92,9578	12-1	0,572
12	0	SERV1-2 T-	Combination	Min	0	52,652	0	0	0	-156,1135	12-1	0
12	0,572	SERV1-2 T-	Combination	Min	0	72,451	0	0	0	-213,7884	12-1	0,572
12	0	RESIST 1-1 H+	Combination	Max	0	475,45	0	0	0	448,701	12-1	0
12	0,572	RESIST 1-1 H+	Combination	Max	0	539,662	0	0	0	250,6544	12-1	0,572
12	0	RESIST 1-1 H+	Combination	Min	0	60,861	0	0	0	-422,8351	12-1	0
12	0,572	RESIST 1-1 H+	Combination	Min	0	95,57	0	0	0	-525,7583	12-1	0,572
12	0	RESIST1-1 H-	Combination	Max	0	438,431	0	0	0	447,9162	12-1	0
12	0,572	RESIST1-1 H-	Combination	Max	0	498,101	0	0	0	263,2138	12-1	0,572
12	0	RESIST1-1 H-	Combination	Min	0	58,993	0	0	0	-381,763	12-1	0
12	0,572	RESIST1-1 H-	Combination	Min	0	93,479	0	0	0	-480,9523	12-1	0,572
12	0	RESIST1-2 T-	Combination	Max	0	500,296	0	0	0	446,9031	12-1	0
12	0,572	RESIST1-2 T-	Combination	Max	0	542,392	0	0	0	260,6084	12-1	0,572
12	0	RESIST1-2 T-	Combination	Min	0	62,601	0	0	0	-356,4554	12-1	0
12	0,572	RESIST1-2 T-	Combination	Min	0	97,982	0	0	0	-453,3434	12-1	0,572
12	0	E-SERV1-1	Combination	Max	0	230,031	0	0	0	189,8183	12-1	0
12	0,572	E-SERV1-1	Combination	Max	0	262,217	0	0	0	94,0772	12-1	0,572
12	0	E-SERV1-1	Combination	Min	0	51,102	0	0	0	-184,6333	12-1	0
12	0,572	E-SERV1-1	Combination	Min	0	70,516	0	0	0	-244,9011	12-1	0,572
12	0	E-SERV1-2	Combination	Max	0	240,706	0	0	0	210,7615	12-1	0
12	0,572	E-SERV1-2	Combination	Max	0	263,39	0	0	0	108,1876	12-1	0,572
12	0	E-SERV1-2	Combination	Min	0	52,476	0	0	0	-172,404	12-1	0
12	0,572	E-SERV1-2	Combination	Min	0	72,451	0	0	0	-231,5598	12-1	0,572
12	0	E-RESIST1-1	Combination	Max	0	475,45	0	0	0	448,701	12-1	0
12	0,572	E-RESIST1-1	Combination	Max	0	539,662	0	0	0	263,2138	12-1	0,572
12	0	E-RESIST1-1	Combination	Min	0	58,993	0	0	0	-422,8351	12-1	0
12	0,572	E-RESIST1-1	Combination	Min	0	93,479	0	0	0	-525,7583	12-1	0,572
12	0	E-RESIST1-2	Combination	Max	0	500,296	0	0	0	497,4463	12-1	0
12	0,572	E-RESIST1-2	Combination	Max	0	542,392	0	0	0	296,0558	12-1	0,572
12	0	E-RESIST1-2	Combination	Min	0	62,19	0	0	0	-394,3715	12-1	0
12	0,572	E-RESIST1-2	Combination	Min	0	97,982	0	0	0	-494,7065	12-1	0,572
13	0	LINEA	LinStatic		0	35,991	0	0	0	-22,5425	13-1	0
13	0,572	LINEA	LinStatic		0	41,442	0	0	0	-44,6884	13-1	0,572
13	0	HL93 +	LinMoving	Max	0	178,565	0	0	0	141,0752	13-1	0
13	0,572	HL93 +	LinMoving	Max	0	196,953	0	0	0	90,8551	13-1	0,572
13	0	HL93 +	LinMoving	Min	0	-12,237	0	0	0	-192,507	13-1	0
13	0,572	HL93 +	LinMoving	Min	0	-6,107	0	0	0	-208,5492	13-1	0,572
13	0	TAMDEM +	LinMoving	Max	0	179,026	0	0	0	160,5817	13-1	0
13	0,572	TAMDEM +	LinMoving	Max	0	191,218	0	0	0	94,6144	13-1	0,572
13	0	TAMDEM +	LinMoving	Min	0	-9,24	0	0	0	-179,1657	13-1	0
13	0,572	TAMDEM +	LinMoving	Min	0	-5,522	0	0	0	-194,0962	13-1	0,572
13	0	HL93 -	LinMoving	Max	0	160,708	0	0	0	146,4713	13-1	0
13	0,572	HL93 -	LinMoving	Max	0	177,257	0	0	0	97,5492	13-1	0,572
13	0	HL93 -	LinMoving	Min	0	-13,136	0	0	0	-173,2563	13-1	0
13	0,572	HL93 -	LinMoving	Min	0	-6,992	0	0	0	-187,6943	13-1	0,572
13	0	TAMDEM -	LinMoving	Max	0	179,738	0	0	0	145,3519	13-1	0
13	0,572	TAMDEM -	LinMoving	Max	0	188,566	0	0	0	91,7641	13-1	0,572
13	0	TAMDEM -	LinMoving	Min	0	-11,201	0	0	0	-161,3943	13-1	0
13	0,572	TAMDEM -	LinMoving	Min	0	-7,67	0	0	0	-199,4367	13-1	0,572
13	0	SERV1-1 H+	Combination	Max	0	262,217	0	0	0	88,6811	13-1	0
13	0,572	SERV1-1 H+	Combination	Max	0	293,274	0	0	0	-13,0115	13-1	0,572

13	0	SERV1-1 H+	Combination	Min	0	71,415	0	0	0	-244,9011	13-1	0
13	0,572	SERV1-1 H+	Combination	Min	0	90,214	0	0	0	-312,4158	13-1	0,572
13	0	SERV1-2 T+	Combination	Max	0	262,678	0	0	0	108,1876	13-1	0
13	0,572	SERV1-2 T+	Combination	Max	0	287,54	0	0	0	-9,2522	13-1	0,572
13	0	SERV1-2 T+	Combination	Min	0	74,412	0	0	0	-231,5598	13-1	0
13	0,572	SERV1-2 T+	Combination	Min	0	90,8	0	0	0	-297,9628	13-1	0,572
13	0	RESIST1-2 T+	Combination	Max	0	540,735	0	0	0	296,0558	13-1	0
13	0,572	RESIST1-2 T+	Combination	Max	0	587,902	0	0	0	66,1853	13-1	0,572
13	0	RESIST1-2 T+	Combination	Min	0	102,546	0	0	0	-494,7065	13-1	0
13	0,572	RESIST1-2 T+	Combination	Min	0	129,989	0	0	0	-605,7886	13-1	0,572
13	0	SERV1-1 H-	Combination	Max	0	244,36	0	0	0	94,0772	13-1	0
13	0,572	SERV1-1 H-	Combination	Max	0	273,579	0	0	0	-6,3174	13-1	0,572
13	0	SERV1-1 H-	Combination	Min	0	70,516	0	0	0	-225,6504	13-1	0
13	0,572	SERV1-1 H-	Combination	Min	0	89,33	0	0	0	-291,5609	13-1	0,572
13	0	SERV1-2 T-	Combination	Max	0	263,39	0	0	0	92,9578	13-1	0
13	0,572	SERV1-2 T-	Combination	Max	0	284,888	0	0	0	-12,1026	13-1	0,572
13	0	SERV1-2 T-	Combination	Min	0	72,451	0	0	0	-213,7884	13-1	0
13	0,572	SERV1-2 T-	Combination	Min	0	88,652	0	0	0	-303,3033	13-1	0,572
13	0	RESIST 1-1 H+	Combination	Max	0	539,662	0	0	0	250,6544	13-1	0
13	0,572	RESIST 1-1 H+	Combination	Max	0	601,248	0	0	0	57,4356	13-1	0,572
13	0	RESIST 1-1 H+	Combination	Min	0	95,57	0	0	0	-525,7583	13-1	0
13	0,572	RESIST 1-1 H+	Combination	Min	0	128,626	0	0	0	-639,4281	13-1	0,572
13	0	RESIST1-1 H-	Combination	Max	0	498,101	0	0	0	263,2138	13-1	0
13	0,572	RESIST1-1 H-	Combination	Max	0	555,407	0	0	0	73,0162	13-1	0,572
13	0	RESIST1-1 H-	Combination	Min	0	93,479	0	0	0	-480,9523	13-1	0
13	0,572	RESIST1-1 H-	Combination	Min	0	126,568	0	0	0	-590,8883	13-1	0,572
13	0	RESIST1-2 T-	Combination	Max	0	542,392	0	0	0	260,6084	13-1	0
13	0,572	RESIST1-2 T-	Combination	Max	0	581,728	0	0	0	59,5511	13-1	0,572
13	0	RESIST1-2 T-	Combination	Min	0	97,982	0	0	0	-453,3434	13-1	0
13	0,572	RESIST1-2 T-	Combination	Min	0	124,989	0	0	0	-618,2185	13-1	0,572
13	0	E-SERV1-1	Combination	Max	0	262,217	0	0	0	94,0772	13-1	0
13	0,572	E-SERV1-1	Combination	Max	0	293,274	0	0	0	-6,3174	13-1	0,572
13	0	E-SERV1-1	Combination	Min	0	70,516	0	0	0	-244,9011	13-1	0
13	0,572	E-SERV1-1	Combination	Min	0	89,33	0	0	0	-312,4158	13-1	0,572
13	0	E-SERV1-2	Combination	Max	0	263,39	0	0	0	108,1876	13-1	0
13	0,572	E-SERV1-2	Combination	Max	0	287,54	0	0	0	-9,2522	13-1	0,572
13	0	E-SERV1-2	Combination	Min	0	72,451	0	0	0	-231,5598	13-1	0
13	0,572	E-SERV1-2	Combination	Min	0	88,652	0	0	0	-303,3033	13-1	0,572
13	0	E-RESIST1-1	Combination	Max	0	539,662	0	0	0	263,2138	13-1	0
13	0,572	E-RESIST1-1	Combination	Max	0	601,248	0	0	0	73,0162	13-1	0,572
13	0	E-RESIST1-1	Combination	Min	0	93,479	0	0	0	-525,7583	13-1	0
13	0,572	E-RESIST1-1	Combination	Min	0	126,568	0	0	0	-639,4281	13-1	0,572
13	0	E-RESIST1-2	Combination	Max	0	542,392	0	0	0	296,0558	13-1	0
13	0,572	E-RESIST1-2	Combination	Max	0	587,902	0	0	0	66,1853	13-1	0,572
13	0	E-RESIST1-2	Combination	Min	0	97,982	0	0	0	-494,7065	13-1	0
13	0,572	E-RESIST1-2	Combination	Min	0	124,989	0	0	0	-618,2185	13-1	0,572
14	0	LINEA	LinStatic		0	41,442	0	0	0	-44,6884	14-1	0
14	0,572	LINEA	LinStatic		0	46,893	0	0	0	-69,9524	14-1	0,572
14	0	HL93 +	LinMoving	Max	0	196,953	0	0	0	90,8551	14-1	0
14	0,572	HL93 +	LinMoving	Max	0	214,108	0	0	0	48,7657	14-1	0,572
14	0	HL93 +	LinMoving	Min	0	-6,107	0	0	0	-208,5492	14-1	0
14	0,572	HL93 +	LinMoving	Min	0	-5,287	0	0	0	-227,2622	14-1	0,572
14	0	TAMDEM +	LinMoving	Max	0	191,218	0	0	0	94,6144	14-1	0
14	0,572	TAMDEM +	LinMoving	Max	0	202,313	0	0	0	44,2199	14-1	0,572
14	0	TAMDEM +	LinMoving	Min	0	-5,522	0	0	0	-194,0962	14-1	0
14	0,572	TAMDEM +	LinMoving	Min	0	-5,522	0	0	0	-209,0267	14-1	0,572
14	0	HL93 -	LinMoving	Max	0	177,257	0	0	0	97,5492	14-1	0
14	0,572	HL93 -	LinMoving	Max	0	192,697	0	0	0	55,8602	14-1	0,572
14	0	HL93 -	LinMoving	Min	0	-6,992	0	0	0	-187,6943	14-1	0
14	0,572	HL93 -	LinMoving	Min	0	-4,758	0	0	0	-204,536	14-1	0,572
14	0	TAMDEM -	LinMoving	Max	0	188,566	0	0	0	91,7641	14-1	0
14	0,572	TAMDEM -	LinMoving	Max	0	196,205	0	0	0	61,3208	14-1	0,572
14	0	TAMDEM -	LinMoving	Min	0	-7,67	0	0	0	-199,4367	14-1	0
14	0,572	TAMDEM -	LinMoving	Min	0	-4,974	0	0	0	-268,1706	14-1	0,572
14	0	SERV1-1 H+	Combination	Max	0	293,274	0	0	0	-13,0115	14-1	0
14	0,572	SERV1-1 H+	Combination	Max	0	323,1	0	0	0	-113,8205	14-1	0,572
14	0	SERV1-1 H+	Combination	Min	0	90,214	0	0	0	-312,4158	14-1	0
14	0,572	SERV1-1 H+	Combination	Min	0	103,705	0	0	0	-389,8484	14-1	0,572

14	0	SERV1-2 T+	Combination	Max	0	287,54	0	0	0	-9,2522	14-1	0
14	0,572	SERV1-2 T+	Combination	Max	0	311,305	0	0	0	-118,3663	14-1	0,572
14	0	SERV1-2 T+	Combination	Min	0	90,8	0	0	0	-297,9628	14-1	0
14	0,572	SERV1-2 T+	Combination	Min	0	103,47	0	0	0	-371,6129	14-1	0,572
14	0	RESIST1-2 T+	Combination	Max	0	587,902	0	0	0	66,1853	14-1	0
14	0,572	RESIST1-2 T+	Combination	Max	0	632,513	0	0	0	-138,1866	14-1	0,572
14	0	RESIST1-2 T+	Combination	Min	0	129,989	0	0	0	-605,7886	14-1	0
14	0,572	RESIST1-2 T+	Combination	Min	0	148,777	0	0	0	-727,618	14-1	0,572
14	0	SERV1-1 H-	Combination	Max	0	273,579	0	0	0	-6,3174	14-1	0
14	0,572	SERV1-1 H-	Combination	Max	0	301,689	0	0	0	-106,726	14-1	0,572
14	0	SERV1-1 H-	Combination	Min	0	89,33	0	0	0	-291,5609	14-1	0
14	0,572	SERV1-1 H-	Combination	Min	0	104,233	0	0	0	-367,1222	14-1	0,572
14	0	SERV1-2 T-	Combination	Max	0	284,888	0	0	0	-12,1026	14-1	0
14	0,572	SERV1-2 T-	Combination	Max	0	305,197	0	0	0	-101,2654	14-1	0,572
14	0	SERV1-2 T-	Combination	Min	0	88,652	0	0	0	-303,3033	14-1	0
14	0,572	SERV1-2 T-	Combination	Min	0	104,017	0	0	0	-430,7568	14-1	0,572
14	0	RESIST 1-1 H+	Combination	Max	0	601,248	0	0	0	57,4356	14-1	0
14	0,572	RESIST 1-1 H+	Combination	Max	0	659,967	0	0	0	-127,6063	14-1	0,572
14	0	RESIST 1-1 H+	Combination	Min	0	128,626	0	0	0	-639,4281	14-1	0
14	0,572	RESIST 1-1 H+	Combination	Min	0	149,325	0	0	0	-770,0611	14-1	0,572
14	0	RESIST1-1 H-	Combination	Max	0	555,407	0	0	0	73,0162	14-1	0
14	0,572	RESIST1-1 H-	Combination	Max	0	610,133	0	0	0	-111,0938	14-1	0,572
14	0	RESIST1-1 H-	Combination	Min	0	126,568	0	0	0	-590,8883	14-1	0
14	0,572	RESIST1-1 H-	Combination	Min	0	150,555	0	0	0	-717,1658	14-1	0,572
14	0	RESIST1-2 T-	Combination	Max	0	581,728	0	0	0	59,5511	14-1	0
14	0,572	RESIST1-2 T-	Combination	Max	0	618,298	0	0	0	-98,3841	14-1	0,572
14	0	RESIST1-2 T-	Combination	Min	0	124,989	0	0	0	-618,2185	14-1	0
14	0,572	RESIST1-2 T-	Combination	Min	0	150,052	0	0	0	-865,2755	14-1	0,572
14	0	E-SERV1-1	Combination	Max	0	293,274	0	0	0	-6,3174	14-1	0
14	0,572	E-SERV1-1	Combination	Max	0	323,1	0	0	0	-106,726	14-1	0,572
14	0	E-SERV1-1	Combination	Min	0	89,33	0	0	0	-312,4158	14-1	0
14	0,572	E-SERV1-1	Combination	Min	0	103,705	0	0	0	-389,8484	14-1	0,572
14	0	E-SERV1-2	Combination	Max	0	287,54	0	0	0	-9,2522	14-1	0
14	0,572	E-SERV1-2	Combination	Max	0	311,305	0	0	0	-101,2654	14-1	0,572
14	0	E-SERV1-2	Combination	Min	0	88,652	0	0	0	-303,3033	14-1	0
14	0,572	E-SERV1-2	Combination	Min	0	103,47	0	0	0	-430,7568	14-1	0,572
14	0	E-RESIST1-1	Combination	Max	0	601,248	0	0	0	73,0162	14-1	0
14	0,572	E-RESIST1-1	Combination	Max	0	659,967	0	0	0	-111,0938	14-1	0,572
14	0	E-RESIST1-1	Combination	Min	0	126,568	0	0	0	-639,4281	14-1	0
14	0,572	E-RESIST1-1	Combination	Min	0	149,325	0	0	0	-770,0611	14-1	0,572
14	0	E-RESIST1-2	Combination	Max	0	587,902	0	0	0	66,1853	14-1	0
14	0,572	E-RESIST1-2	Combination	Max	0	632,513	0	0	0	-98,3841	14-1	0,572
14	0	E-RESIST1-2	Combination	Min	0	124,989	0	0	0	-618,2185	14-1	0
14	0,572	E-RESIST1-2	Combination	Min	0	148,777	0	0	0	-865,2755	14-1	0,572
15	0	LINEA	LinStatic		0	46,893	0	0	0	-69,9524	15-1	0
15	0,572	LINEA	LinStatic		0	52,345	0	0	0	-98,3345	15-1	0,572
15	0	HL93 +	LinMoving	Max	0	214,108	0	0	0	48,7657	15-1	0
15	0,572	HL93 +	LinMoving	Max	0	229,928	0	0	0	45,3607	15-1	0,572
15	0	HL93 +	LinMoving	Min	0	-5,287	0	0	0	-227,2622	15-1	0
15	0,572	HL93 +	LinMoving	Min	0	-5,287	0	0	0	-274,2756	15-1	0,572
15	0	TAMDEM +	LinMoving	Max	0	202,313	0	0	0	44,2199	15-1	0
15	0,572	TAMDEM +	LinMoving	Max	0	212,217	0	0	0	47,3785	15-1	0,572
15	0	TAMDEM +	LinMoving	Min	0	-5,522	0	0	0	-209,0267	15-1	0
15	0,572	TAMDEM +	LinMoving	Min	0	-5,522	0	0	0	-223,9572	15-1	0,572
15	0	HL93 -	LinMoving	Max	0	192,697	0	0	0	55,8602	15-1	0
15	0,572	HL93 -	LinMoving	Max	0	206,935	0	0	0	40,8246	15-1	0,572
15	0	HL93 -	LinMoving	Min	0	-4,758	0	0	0	-204,536	15-1	0
15	0,572	HL93 -	LinMoving	Min	0	-4,758	0	0	0	-234,1701	15-1	0,572
15	0	TAMDEM -	LinMoving	Max	0	196,205	0	0	0	61,3208	15-1	0
15	0,572	TAMDEM -	LinMoving	Max	0	202,658	0	0	0	42,679	15-1	0,572
15	0	TAMDEM -	LinMoving	Min	0	-4,974	0	0	0	-268,1706	15-1	0
15	0,572	TAMDEM -	LinMoving	Min	0	-4,974	0	0	0	-345,8473	15-1	0,572
15	0	SERV1-1 H+	Combination	Max	0	323,1	0	0	0	-113,8205	15-1	0
15	0,572	SERV1-1 H+	Combination	Max	0	351,59	0	0	0	-183,1923	15-1	0,572
15	0	SERV1-1 H+	Combination	Min	0	103,705	0	0	0	-389,8484	15-1	0
15	0,572	SERV1-1 H+	Combination	Min	0	116,375	0	0	0	-502,8286	15-1	0,572
15	0	SERV1-2 T+	Combination	Max	0	311,305	0	0	0	-118,3663	15-1	0
15	0,572	SERV1-2 T+	Combination	Max	0	333,879	0	0	0	-181,1745	15-1	0,572

15	0	SERV1-2 T+	Combination	Min	0	103,47	0	0	0	-371,6129	15-1	0
15	0,572	SERV1-2 T+	Combination	Min	0	116,139	0	0	0	-452,5101	15-1	0,572
15	0	RESIST1-2 T+	Combination	Max	0	632,513	0	0	0	-138,1866	15-1	0
15	0,572	RESIST1-2 T+	Combination	Max	0	674,355	0	0	0	-228,6609	15-1	0,572
15	0	RESIST1-2 T+	Combination	Min	0	148,777	0	0	0	-727,618	15-1	0
15	0,572	RESIST1-2 T+	Combination	Min	0	167,566	0	0	0	-860,1946	15-1	0,572
15	0	SERV1-1 H-	Combination	Max	0	301,689	0	0	0	-106,726	15-1	0
15	0,572	SERV1-1 H-	Combination	Max	0	328,597	0	0	0	-187,7284	15-1	0,572
15	0	SERV1-1 H-	Combination	Min	0	104,233	0	0	0	-367,1222	15-1	0
15	0,572	SERV1-1 H-	Combination	Min	0	116,903	0	0	0	-462,7231	15-1	0,572
15	0	SERV1-2 T-	Combination	Max	0	305,197	0	0	0	-101,2654	15-1	0
15	0,572	SERV1-2 T-	Combination	Max	0	324,319	0	0	0	-185,874	15-1	0,572
15	0	SERV1-2 T-	Combination	Min	0	104,017	0	0	0	-430,7568	15-1	0
15	0,572	SERV1-2 T-	Combination	Min	0	116,687	0	0	0	-574,4002	15-1	0,572
15	0	RESIST 1-1 H+	Combination	Max	0	659,967	0	0	0	-127,6063	15-1	0
15	0,572	RESIST 1-1 H+	Combination	Max	0	715,577	0	0	0	-233,3573	15-1	0,572
15	0	RESIST 1-1 H+	Combination	Min	0	149,325	0	0	0	-770,0611	15-1	0
15	0,572	RESIST 1-1 H+	Combination	Min	0	168,114	0	0	0	-977,3107	15-1	0,572
15	0	RESIST1-1 H-	Combination	Max	0	610,133	0	0	0	-111,0938	15-1	0
15	0,572	RESIST1-1 H-	Combination	Max	0	662,061	0	0	0	-243,915	15-1	0,572
15	0	RESIST1-1 H-	Combination	Min	0	150,555	0	0	0	-717,1658	15-1	0
15	0,572	RESIST1-1 H-	Combination	Min	0	169,344	0	0	0	-883,9652	15-1	0,572
15	0	RESIST1-2 T-	Combination	Max	0	618,298	0	0	0	-98,3841	15-1	0
15	0,572	RESIST1-2 T-	Combination	Max	0	652,105	0	0	0	-239,5989	15-1	0,572
15	0	RESIST1-2 T-	Combination	Min	0	150,052	0	0	0	-865,2755	15-1	0
15	0,572	RESIST1-2 T-	Combination	Min	0	168,841	0	0	0	-1143,8938	15-1	0,572
15	0	E-SERV1-1	Combination	Max	0	323,1	0	0	0	-106,726	15-1	0
15	0,572	E-SERV1-1	Combination	Max	0	351,59	0	0	0	-183,1923	15-1	0,572
15	0	E-SERV1-1	Combination	Min	0	103,705	0	0	0	-389,8484	15-1	0
15	0,572	E-SERV1-1	Combination	Min	0	116,375	0	0	0	-502,8286	15-1	0,572
15	0	E-SERV1-2	Combination	Max	0	311,305	0	0	0	-101,2654	15-1	0
15	0,572	E-SERV1-2	Combination	Max	0	333,879	0	0	0	-181,1745	15-1	0,572
15	0	E-SERV1-2	Combination	Min	0	103,47	0	0	0	-430,7568	15-1	0
15	0,572	E-SERV1-2	Combination	Min	0	116,139	0	0	0	-574,4002	15-1	0,572
15	0	E-RESIST1-1	Combination	Max	0	659,967	0	0	0	-111,0938	15-1	0
15	0,572	E-RESIST1-1	Combination	Max	0	715,577	0	0	0	-233,3573	15-1	0,572
15	0	E-RESIST1-1	Combination	Min	0	149,325	0	0	0	-770,0611	15-1	0
15	0,572	E-RESIST1-1	Combination	Min	0	168,114	0	0	0	-977,3107	15-1	0,572
15	0	E-RESIST1-2	Combination	Max	0	632,513	0	0	0	-98,3841	15-1	0
15	0,572	E-RESIST1-2	Combination	Max	0	674,355	0	0	0	-228,6609	15-1	0,572
15	0	E-RESIST1-2	Combination	Min	0	148,777	0	0	0	-865,2755	15-1	0
15	0,572	E-RESIST1-2	Combination	Min	0	167,566	0	0	0	-1143,8938	15-1	0,572
16	0	LINEA	LinStatic		0	-54,464	0	0	0	-98,3345	16-1	0
16	0,5715	LINEA	LinStatic		0	-49,018	0	0	0	-68,7647	16-1	0,5715
16	0	HL93 +	LinMoving	Max	0	17,914	0	0	0	45,3607	16-1	0
16	0,5715	HL93 +	LinMoving	Max	0	17,914	0	0	0	44,5593	16-1	0,5715
16	0	HL93 +	LinMoving	Min	0	-227,058	0	0	0	-274,2756	16-1	0
16	0,5715	HL93 +	LinMoving	Min	0	-211,444	0	0	0	-209,4373	16-1	0,5715
16	0	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	47,3785	16-1	0
16	0,5715	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	36,685	16-1	0,5715
16	0	TAMDEM +	LinMoving	Min	0	-205,134	0	0	0	-223,9572	16-1	0
16	0,5715	TAMDEM +	LinMoving	Min	0	-195,566	0	0	0	-155,8047	16-1	0,5715
16	0	HL93 -	LinMoving	Max	0	16,123	0	0	0	40,8246	16-1	0
16	0,5715	HL93 -	LinMoving	Max	0	16,123	0	0	0	41,336	16-1	0,5715
16	0	HL93 -	LinMoving	Min	0	-204,353	0	0	0	-234,1701	16-1	0
16	0,5715	HL93 -	LinMoving	Min	0	-190,3	0	0	0	-147,4033	16-1	0,5715
16	0	TAMDEM -	LinMoving	Max	0	16,855	0	0	0	42,679	16-1	0
16	0,5715	TAMDEM -	LinMoving	Max	0	19,62	0	0	0	59,4283	16-1	0,5715
16	0	TAMDEM -	LinMoving	Min	0	-198,092	0	0	0	-345,8473	16-1	0
16	0,5715	TAMDEM -	LinMoving	Min	0	-182,8	0	0	0	-272,7537	16-1	0,5715
16	0	SERV1-1 H+	Combination	Max	0	-108,673	0	0	0	-183,1923	16-1	0
16	0,5715	SERV1-1 H+	Combination	Max	0	-96,014	0	0	0	-115,2663	16-1	0,5715
16	0	SERV1-1 H+	Combination	Min	0	-353,646	0	0	0	-502,8286	16-1	0
16	0,5715	SERV1-1 H+	Combination	Min	0	-325,373	0	0	0	-369,2629	16-1	0,5715
16	0	SERV1-2 T+	Combination	Max	0	-107,876	0	0	0	-181,1745	16-1	0
16	0,5715	SERV1-2 T+	Combination	Max	0	-95,217	0	0	0	-123,1406	16-1	0,5715
16	0	SERV1-2 T+	Combination	Min	0	-331,721	0	0	0	-452,5101	16-1	0
16	0,5715	SERV1-2 T+	Combination	Min	0	-309,495	0	0	0	-315,6303	16-1	0,5715

16	0	RESIST1-2 T+	Combination	Max	0	-144,173	0	0	0	-228,6609	16-1	0
16	0,5715	RESIST1-2 T+	Combination	Max	0	-125,401	0	0	0	-151,6301	16-1	0,5715
16	0	RESIST1-2 T+	Combination	Min	0	-665,172	0	0	0	-860,1946	16-1	0
16	0,5715	RESIST1-2 T+	Combination	Min	0	-624,131	0	0	0	-599,6499	16-1	0,5715
16	0	SERV1-1 H-	Combination	Max	0	-110,464	0	0	0	-187,7284	16-1	0
16	0,5715	SERV1-1 H-	Combination	Max	0	-97,806	0	0	0	-118,4896	16-1	0,5715
16	0	SERV1-1 H-	Combination	Min	0	-330,94	0	0	0	-462,7231	16-1	0
16	0,5715	SERV1-1 H-	Combination	Min	0	-304,229	0	0	0	-307,2289	16-1	0,5715
16	0	SERV1-2 T-	Combination	Max	0	-109,732	0	0	0	-185,874	16-1	0
16	0,5715	SERV1-2 T-	Combination	Max	0	-94,309	0	0	0	-100,3973	16-1	0,5715
16	0	SERV1-2 T-	Combination	Min	0	-324,679	0	0	0	-574,4002	16-1	0
16	0,5715	SERV1-2 T-	Combination	Min	0	-296,729	0	0	0	-432,5793	16-1	0,5715
16	0	RESIST 1-1 H+	Combination	Max	0	-146,028	0	0	0	-233,3573	16-1	0
16	0,5715	RESIST 1-1 H+	Combination	Max	0	-127,256	0	0	0	-133,3027	16-1	0,5715
16	0	RESIST 1-1 H+	Combination	Min	0	-716,202	0	0	0	-977,3107	16-1	0
16	0,5715	RESIST 1-1 H+	Combination	Min	0	-661,088	0	0	0	-724,4799	16-1	0,5715
16	0	RESIST1-1 H-	Combination	Max	0	-150,197	0	0	0	-243,915	16-1	0
16	0,5715	RESIST1-1 H-	Combination	Max	0	-131,425	0	0	0	-140,8049	16-1	0,5715
16	0	RESIST1-1 H-	Combination	Min	0	-663,354	0	0	0	-883,9652	16-1	0
16	0,5715	RESIST1-1 H-	Combination	Min	0	-611,874	0	0	0	-580,0956	16-1	0,5715
16	0	RESIST1-2 T-	Combination	Max	0	-148,493	0	0	0	-239,5989	16-1	0
16	0,5715	RESIST1-2 T-	Combination	Max	0	-123,286	0	0	0	-98,6952	16-1	0,5715
16	0	RESIST1-2 T-	Combination	Min	0	-648,782	0	0	0	-1143,8938	16-1	0
16	0,5715	RESIST1-2 T-	Combination	Min	0	-594,419	0	0	0	-871,8487	16-1	0,5715
16	0	E-SERV1-1	Combination	Max	0	-108,673	0	0	0	-183,1923	16-1	0
16	0,5715	E-SERV1-1	Combination	Max	0	-96,014	0	0	0	-115,2663	16-1	0,5715
16	0	E-SERV1-1	Combination	Min	0	-353,646	0	0	0	-502,8286	16-1	0
16	0,5715	E-SERV1-1	Combination	Min	0	-325,373	0	0	0	-369,2629	16-1	0,5715
16	0	E-SERV1-2	Combination	Max	0	-107,876	0	0	0	-181,1745	16-1	0
16	0,5715	E-SERV1-2	Combination	Max	0	-94,309	0	0	0	-100,3973	16-1	0,5715
16	0	E-SERV1-2	Combination	Min	0	-331,721	0	0	0	-574,4002	16-1	0
16	0,5715	E-SERV1-2	Combination	Min	0	-309,495	0	0	0	-432,5793	16-1	0,5715
16	0	E-RESIST1-1	Combination	Max	0	-146,028	0	0	0	-233,3573	16-1	0
16	0,5715	E-RESIST1-1	Combination	Max	0	-127,256	0	0	0	-133,3027	16-1	0,5715
16	0	E-RESIST1-1	Combination	Min	0	-716,202	0	0	0	-977,3107	16-1	0
16	0,5715	E-RESIST1-1	Combination	Min	0	-661,088	0	0	0	-724,4799	16-1	0,5715
16	0	E-RESIST1-2	Combination	Max	0	-144,173	0	0	0	-228,6609	16-1	0
16	0,5715	E-RESIST1-2	Combination	Max	0	-123,286	0	0	0	-98,6952	16-1	0,5715
16	0	E-RESIST1-2	Combination	Min	0	-665,172	0	0	0	-1143,8938	16-1	0
16	0,5715	E-RESIST1-2	Combination	Min	0	-624,131	0	0	0	-871,8487	16-1	0,5715
17	0	LINEA	LinStatic		0	-49,018	0	0	0	-68,7647	17-1	0
17	0,5715	LINEA	LinStatic		0	-43,571	0	0	0	-42,3075	17-1	0,5715
17	0	HL93 +	LinMoving	Max	0	17,914	0	0	0	44,5593	17-1	0
17	0,5715	HL93 +	LinMoving	Max	0	17,914	0	0	0	83,0957	17-1	0,5715
17	0	HL93 +	LinMoving	Min	0	-211,444	0	0	0	-209,4373	17-1	0
17	0,5715	HL93 +	LinMoving	Min	0	-195,625	0	0	0	-156,2445	17-1	0,5715
17	0	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	36,685	17-1	0
17	0,5715	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	73,7471	17-1	0,5715
17	0	TAMDEM +	LinMoving	Min	0	-195,566	0	0	0	-155,8047	17-1	0
17	0,5715	TAMDEM +	LinMoving	Min	0	-185,077	0	0	0	-145,1107	17-1	0,5715
17	0	HL93 -	LinMoving	Max	0	16,123	0	0	0	41,336	17-1	0
17	0,5715	HL93 -	LinMoving	Max	0	16,123	0	0	0	74,5942	17-1	0,5715
17	0	HL93 -	LinMoving	Min	0	-190,3	0	0	0	-147,4033	17-1	0
17	0,5715	HL93 -	LinMoving	Min	0	-176,063	0	0	0	-125,0306	17-1	0,5715
17	0	TAMDEM -	LinMoving	Max	0	19,62	0	0	0	59,4283	17-1	0
17	0,5715	TAMDEM -	LinMoving	Max	0	23,984	0	0	0	89,8456	17-1	0,5715
17	0	TAMDEM -	LinMoving	Min	0	-182,8	0	0	0	-272,7537	17-1	0
17	0,5715	TAMDEM -	LinMoving	Min	0	-175,063	0	0	0	-205,3846	17-1	0,5715
17	0	SERV1-1 H+	Combination	Max	0	-96,014	0	0	0	-115,2663	17-1	0
17	0,5715	SERV1-1 H+	Combination	Max	0	-83,356	0	0	0	-15,2369	17-1	0,5715
17	0	SERV1-1 H+	Combination	Min	0	-325,373	0	0	0	-369,2629	17-1	0
17	0,5715	SERV1-1 H+	Combination	Min	0	-296,895	0	0	0	-254,5772	17-1	0,5715
17	0	SERV1-2 T+	Combination	Max	0	-95,217	0	0	0	-123,1406	17-1	0
17	0,5715	SERV1-2 T+	Combination	Max	0	-82,559	0	0	0	-24,5856	17-1	0,5715
17	0	SERV1-2 T+	Combination	Min	0	-309,495	0	0	0	-315,6303	17-1	0
17	0,5715	SERV1-2 T+	Combination	Min	0	-286,347	0	0	0	-243,4434	17-1	0,5715
17	0	RESIST1-2 T+	Combination	Max	0	-125,401	0	0	0	-151,6301	17-1	0
17	0,5715	RESIST1-2 T+	Combination	Max	0	-106,628	0	0	0	25,8232	17-1	0,5715

17	0	RESIST1-2 T+	Combination	Min	0	-624,131	0	0	0	-599,6499	17-1	0
17	0,5715	RESIST1-2 T+	Combination	Min	0	-580,946	0	0	0	-483,5683	17-1	0,5715
17	0	SERV1-1 H-	Combination	Max	0	-97,806	0	0	0	-118,4896	17-1	0
17	0,5715	SERV1-1 H-	Combination	Max	0	-85,147	0	0	0	-23,7385	17-1	0,5715
17	0	SERV1-1 H-	Combination	Min	0	-304,229	0	0	0	-307,2289	17-1	0
17	0,5715	SERV1-1 H-	Combination	Min	0	-277,333	0	0	0	-223,3632	17-1	0,5715
17	0	SERV1-2 T-	Combination	Max	0	-94,309	0	0	0	-100,3973	17-1	0
17	0,5715	SERV1-2 T-	Combination	Max	0	-77,286	0	0	0	-8,4871	17-1	0,5715
17	0	SERV1-2 T-	Combination	Min	0	-296,729	0	0	0	-432,5793	17-1	0
17	0,5715	SERV1-2 T-	Combination	Min	0	-276,333	0	0	0	-303,7173	17-1	0,5715
17	0	RESIST 1-1 H+	Combination	Max	0	-127,256	0	0	0	-133,3027	17-1	0
17	0,5715	RESIST 1-1 H+	Combination	Max	0	-108,483	0	0	0	47,5822	17-1	0,5715
17	0	RESIST 1-1 H+	Combination	Min	0	-661,088	0	0	0	-724,4799	17-1	0
17	0,5715	RESIST 1-1 H+	Combination	Min	0	-605,497	0	0	0	-509,4823	17-1	0,5715
17	0	RESIST1-1 H-	Combination	Max	0	-131,425	0	0	0	-140,8049	17-1	0
17	0,5715	RESIST1-1 H-	Combination	Max	0	-112,653	0	0	0	27,7949	17-1	0,5715
17	0	RESIST1-1 H-	Combination	Min	0	-611,874	0	0	0	-580,0956	17-1	0
17	0,5715	RESIST1-1 H-	Combination	Min	0	-559,965	0	0	0	-436,8317	17-1	0,5715
17	0	RESIST1-2 T-	Combination	Max	0	-123,286	0	0	0	-98,6952	17-1	0
17	0,5715	RESIST1-2 T-	Combination	Max	0	-94,357	0	0	0	63,2925	17-1	0,5715
17	0	RESIST1-2 T-	Combination	Min	0	-594,419	0	0	0	-871,8487	17-1	0
17	0,5715	RESIST1-2 T-	Combination	Min	0	-557,639	0	0	0	-623,8559	17-1	0,5715
17	0	E-SERV1-1	Combination	Max	0	-96,014	0	0	0	-115,2663	17-1	0
17	0,5715	E-SERV1-1	Combination	Max	0	-83,356	0	0	0	-15,2369	17-1	0,5715
17	0	E-SERV1-1	Combination	Min	0	-325,373	0	0	0	-369,2629	17-1	0
17	0,5715	E-SERV1-1	Combination	Min	0	-296,895	0	0	0	-254,5772	17-1	0,5715
17	0	E-SERV1-2	Combination	Max	0	-94,309	0	0	0	-100,3973	17-1	0
17	0,5715	E-SERV1-2	Combination	Max	0	-77,286	0	0	0	-8,4871	17-1	0,5715
17	0	E-SERV1-2	Combination	Min	0	-309,495	0	0	0	-432,5793	17-1	0
17	0,5715	E-SERV1-2	Combination	Min	0	-286,347	0	0	0	-303,7173	17-1	0,5715
17	0	E-RESIST1-1	Combination	Max	0	-127,256	0	0	0	-133,3027	17-1	0
17	0,5715	E-RESIST1-1	Combination	Max	0	-108,483	0	0	0	47,5822	17-1	0,5715
17	0	E-RESIST1-1	Combination	Min	0	-661,088	0	0	0	-724,4799	17-1	0
17	0,5715	E-RESIST1-1	Combination	Min	0	-605,497	0	0	0	-509,4823	17-1	0,5715
17	0	E-RESIST1-2	Combination	Max	0	-123,286	0	0	0	-98,6952	17-1	0
17	0,5715	E-RESIST1-2	Combination	Max	0	-94,357	0	0	0	63,2925	17-1	0,5715
17	0	E-RESIST1-2	Combination	Min	0	-624,131	0	0	0	-871,8487	17-1	0
17	0,5715	E-RESIST1-2	Combination	Min	0	-580,946	0	0	0	-623,8559	17-1	0,5715
18	0	LINEA	LinStatic		0	-43,571	0	0	0	-42,3075	18-1	0
18	0,5715	LINEA	LinStatic		0	-38,125	0	0	0	-18,9628	18-1	0,5715
18	0	HL93 +	LinMoving	Max	0	17,914	0	0	0	83,0957	18-1	0
18	0,5715	HL93 +	LinMoving	Max	0	19,346	0	0	0	120,5233	18-1	0,5715
18	0	HL93 +	LinMoving	Min	0	-195,625	0	0	0	-156,2445	18-1	0
18	0,5715	HL93 +	LinMoving	Min	0	-180,09	0	0	0	-128,6849	18-1	0,5715
18	0	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	73,7471	18-1	0
18	0,5715	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	136,7698	18-1	0,5715
18	0	TAMDEM +	LinMoving	Min	0	-185,077	0	0	0	-145,1107	18-1	0
18	0,5715	TAMDEM +	LinMoving	Min	0	-173,8	0	0	0	-134,4167	18-1	0,5715
18	0	HL93 -	LinMoving	Max	0	16,123	0	0	0	74,5942	18-1	0
18	0,5715	HL93 -	LinMoving	Max	0	16,998	0	0	0	108,1332	18-1	0,5715
18	0	HL93 -	LinMoving	Min	0	-176,063	0	0	0	-125,0306	18-1	0
18	0,5715	HL93 -	LinMoving	Min	0	-162,081	0	0	0	-115,8164	18-1	0,5715
18	0	TAMDEM -	LinMoving	Max	0	23,984	0	0	0	89,8456	18-1	0
18	0,5715	TAMDEM -	LinMoving	Max	0	30,529	0	0	0	136,9843	18-1	0,5715
18	0	TAMDEM -	LinMoving	Min	0	-175,063	0	0	0	-205,3846	18-1	0
18	0,5715	TAMDEM -	LinMoving	Min	0	-167,375	0	0	0	-151,1236	18-1	0,5715
18	0	SERV1-1 H+	Combination	Max	0	-83,356	0	0	0	-15,2369	18-1	0
18	0,5715	SERV1-1 H+	Combination	Max	0	-69,265	0	0	0	76,4491	18-1	0,5715
18	0	SERV1-1 H+	Combination	Min	0	-296,895	0	0	0	-254,5772	18-1	0
18	0,5715	SERV1-1 H+	Combination	Min	0	-268,701	0	0	0	-172,7591	18-1	0,5715
18	0	SERV1-2 T+	Combination	Max	0	-82,559	0	0	0	-24,5856	18-1	0
18	0,5715	SERV1-2 T+	Combination	Max	0	-69,9	0	0	0	92,6956	18-1	0,5715
18	0	SERV1-2 T+	Combination	Min	0	-286,347	0	0	0	-243,4434	18-1	0
18	0,5715	SERV1-2 T+	Combination	Min	0	-262,411	0	0	0	-178,4909	18-1	0,5715
18	0	RESIST1-2 T+	Combination	Max	0	-106,628	0	0	0	25,8232	18-1	0
18	0,5715	RESIST1-2 T+	Combination	Max	0	-87,856	0	0	0	252,9715	18-1	0,5715
18	0	RESIST1-2 T+	Combination	Min	0	-580,946	0	0	0	-483,5683	18-1	0
18	0,5715	RESIST1-2 T+	Combination	Min	0	-535,925	0	0	0	-378,2151	18-1	0,5715

18	0	SERV1-1 H-	Combination	Max	0	-85,147	0	0	0	-23,7385	18-1	0
18	0,5715	SERV1-1 H-	Combination	Max	0	-71,613	0	0	0	64,059	18-1	0,5715
18	0	SERV1-1 H-	Combination	Min	0	-277,333	0	0	0	-223,3632	18-1	0
18	0,5715	SERV1-1 H-	Combination	Min	0	-250,692	0	0	0	-159,8906	18-1	0,5715
18	0	SERV1-2 T-	Combination	Max	0	-77,286	0	0	0	-8,4871	18-1	0
18	0,5715	SERV1-2 T-	Combination	Max	0	-58,082	0	0	0	92,9101	18-1	0,5715
18	0	SERV1-2 T-	Combination	Min	0	-276,333	0	0	0	-303,7173	18-1	0
18	0,5715	SERV1-2 T-	Combination	Min	0	-255,986	0	0	0	-195,1978	18-1	0,5715
18	0	RESIST 1-1 H+	Combination	Max	0	-108,483	0	0	0	47,5822	18-1	0
18	0,5715	RESIST 1-1 H+	Combination	Max	0	-86,378	0	0	0	215,1578	18-1	0,5715
18	0	RESIST 1-1 H+	Combination	Min	0	-605,497	0	0	0	-509,4823	18-1	0
18	0,5715	RESIST 1-1 H+	Combination	Min	0	-550,565	0	0	0	-364,8742	18-1	0,5715
18	0	RESIST1-1 H-	Combination	Max	0	-112,653	0	0	0	27,7949	18-1	0
18	0,5715	RESIST1-1 H-	Combination	Max	0	-91,843	0	0	0	186,3199	18-1	0,5715
18	0	RESIST1-1 H-	Combination	Min	0	-559,965	0	0	0	-436,8317	18-1	0
18	0,5715	RESIST1-1 H-	Combination	Min	0	-508,649	0	0	0	-334,9228	18-1	0,5715
18	0	RESIST1-2 T-	Combination	Max	0	-94,357	0	0	0	63,2925	18-1	0
18	0,5715	RESIST1-2 T-	Combination	Max	0	-60,35	0	0	0	253,4708	18-1	0,5715
18	0	RESIST1-2 T-	Combination	Min	0	-557,639	0	0	0	-623,8559	18-1	0
18	0,5715	RESIST1-2 T-	Combination	Min	0	-520,972	0	0	0	-417,1003	18-1	0,5715
18	0	E-SERV1-1	Combination	Max	0	-83,356	0	0	0	-15,2369	18-1	0
18	0,5715	E-SERV1-1	Combination	Max	0	-69,265	0	0	0	76,4491	18-1	0,5715
18	0	E-SERV1-1	Combination	Min	0	-296,895	0	0	0	-254,5772	18-1	0
18	0,5715	E-SERV1-1	Combination	Min	0	-268,701	0	0	0	-172,7591	18-1	0,5715
18	0	E-SERV1-2	Combination	Max	0	-77,286	0	0	0	-8,4871	18-1	0
18	0,5715	E-SERV1-2	Combination	Max	0	-58,082	0	0	0	92,9101	18-1	0,5715
18	0	E-SERV1-2	Combination	Min	0	-286,347	0	0	0	-303,7173	18-1	0
18	0,5715	E-SERV1-2	Combination	Min	0	-262,411	0	0	0	-195,1978	18-1	0,5715
18	0	E-RESIST1-1	Combination	Max	0	-108,483	0	0	0	47,5822	18-1	0
18	0,5715	E-RESIST1-1	Combination	Max	0	-86,378	0	0	0	215,1578	18-1	0,5715
18	0	E-RESIST1-1	Combination	Min	0	-605,497	0	0	0	-509,4823	18-1	0
18	0,5715	E-RESIST1-1	Combination	Min	0	-550,565	0	0	0	-364,8742	18-1	0,5715
18	0	E-RESIST1-2	Combination	Max	0	-94,357	0	0	0	63,2925	18-1	0
18	0,5715	E-RESIST1-2	Combination	Max	0	-60,35	0	0	0	253,4708	18-1	0,5715
18	0	E-RESIST1-2	Combination	Min	0	-580,946	0	0	0	-623,8559	18-1	0
18	0,5715	E-RESIST1-2	Combination	Min	0	-535,925	0	0	0	-417,1003	18-1	0,5715
19	0	LINEA	LinStatic		0	-38,125	0	0	0	-18,9628	19-1	0
19	0,5715	LINEA	LinStatic		0	-32,678	0	0	0	1,2691	19-1	0,5715
19	0	HL93 +	LinMoving	Max	0	19,346	0	0	0	120,5233	19-1	0
19	0,5715	HL93 +	LinMoving	Max	0	26,079	0	0	0	167,9897	19-1	0,5715
19	0	HL93 +	LinMoving	Min	0	-180,09	0	0	0	-128,6849	19-1	0
19	0,5715	HL93 +	LinMoving	Min	0	-164,01	0	0	0	-118,4469	19-1	0,5715
19	0	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	136,7698	19-1	0
19	0,5715	TAMDEM +	LinMoving	Max	0	25,298	0	0	0	194,7362	19-1	0,5715
19	0	TAMDEM +	LinMoving	Min	0	-173,8	0	0	0	-134,4167	19-1	0
19	0,5715	TAMDEM +	LinMoving	Min	0	-161,867	0	0	0	-123,7228	19-1	0,5715
19	0	HL93 -	LinMoving	Max	0	16,998	0	0	0	108,1332	19-1	0
19	0,5715	HL93 -	LinMoving	Max	0	22,758	0	0	0	151,1907	19-1	0,5715
19	0	HL93 -	LinMoving	Min	0	-162,081	0	0	0	-115,8164	19-1	0
19	0,5715	HL93 -	LinMoving	Min	0	-147,609	0	0	0	-106,6022	19-1	0,5715
19	0	TAMDEM -	LinMoving	Max	0	30,529	0	0	0	136,9843	19-1	0
19	0,5715	TAMDEM -	LinMoving	Max	0	39,642	0	0	0	179,5683	19-1	0,5715
19	0	TAMDEM -	LinMoving	Min	0	-167,375	0	0	0	-151,1236	19-1	0
19	0,5715	TAMDEM -	LinMoving	Min	0	-158,782	0	0	0	-114,9825	19-1	0,5715
19	0	SERV1-1 H+	Combination	Max	0	-69,265	0	0	0	76,4491	19-1	0
19	0,5715	SERV1-1 H+	Combination	Max	0	-49,873	0	0	0	170,9395	19-1	0,5715
19	0	SERV1-1 H+	Combination	Min	0	-268,701	0	0	0	-172,7591	19-1	0
19	0,5715	SERV1-1 H+	Combination	Min	0	-239,963	0	0	0	-115,4971	19-1	0,5715
19	0	SERV1-2 T+	Combination	Max	0	-69,9	0	0	0	92,6956	19-1	0
19	0,5715	SERV1-2 T+	Combination	Max	0	-50,654	0	0	0	197,686	19-1	0,5715
19	0	SERV1-2 T+	Combination	Min	0	-262,411	0	0	0	-178,4909	19-1	0
19	0,5715	SERV1-2 T+	Combination	Min	0	-237,819	0	0	0	-120,773	19-1	0,5715
19	0	RESIST1-2 T+	Combination	Max	0	-87,856	0	0	0	252,9715	19-1	0
19	0,5715	RESIST1-2 T+	Combination	Max	0	-53,752	0	0	0	457,623	19-1	0,5715
19	0	RESIST1-2 T+	Combination	Min	0	-535,925	0	0	0	-378,2151	19-1	0
19	0,5715	RESIST1-2 T+	Combination	Min	0	-489,379	0	0	0	-283,5903	19-1	0,5715
19	0	SERV1-1 H-	Combination	Max	0	-71,613	0	0	0	64,059	19-1	0
19	0,5715	SERV1-1 H-	Combination	Max	0	-53,195	0	0	0	154,1405	19-1	0,5715

19	0	SERV1-1 H-	Combination	Min	0	-250,692	0	0	0	-159,8906	19-1	0
19	0,5715	SERV1-1 H-	Combination	Min	0	-223,561	0	0	0	-103,6524	19-1	0,5715
19	0	SERV1-2 T-	Combination	Max	0	-58,082	0	0	0	92,9101	19-1	0
19	0,5715	SERV1-2 T-	Combination	Max	0	-36,31	0	0	0	182,5181	19-1	0,5715
19	0	SERV1-2 T-	Combination	Min	0	-255,986	0	0	0	-195,1978	19-1	0
19	0,5715	SERV1-2 T-	Combination	Min	0	-234,734	0	0	0	-112,0327	19-1	0,5715
19	0	RESIST 1-1 H+	Combination	Max	0	-86,378	0	0	0	215,1578	19-1	0
19	0,5715	RESIST 1-1 H+	Combination	Max	0	-51,935	0	0	0	395,3704	19-1	0,5715
19	0	RESIST 1-1 H+	Combination	Min	0	-550,565	0	0	0	-364,8742	19-1	0
19	0,5715	RESIST 1-1 H+	Combination	Min	0	-494,368	0	0	0	-271,3108	19-1	0,5715
19	0	RESIST1-1 H-	Combination	Max	0	-91,843	0	0	0	186,3199	19-1	0
19	0,5715	RESIST1-1 H-	Combination	Max	0	-59,666	0	0	0	356,2708	19-1	0,5715
19	0	RESIST1-1 H-	Combination	Min	0	-508,649	0	0	0	-334,9228	19-1	0
19	0,5715	RESIST1-1 H-	Combination	Min	0	-456,194	0	0	0	-243,7423	19-1	0,5715
19	0	RESIST1-2 T-	Combination	Max	0	-60,35	0	0	0	253,4708	19-1	0
19	0,5715	RESIST1-2 T-	Combination	Max	0	-20,368	0	0	0	422,3197	19-1	0,5715
19	0	RESIST1-2 T-	Combination	Min	0	-520,972	0	0	0	-417,1003	19-1	0
19	0,5715	RESIST1-2 T-	Combination	Min	0	-482,198	0	0	0	-263,2474	19-1	0,5715
19	0	E-SERV1-1	Combination	Max	0	-69,265	0	0	0	76,4491	19-1	0
19	0,5715	E-SERV1-1	Combination	Max	0	-49,873	0	0	0	170,9395	19-1	0,5715
19	0	E-SERV1-1	Combination	Min	0	-268,701	0	0	0	-172,7591	19-1	0
19	0,5715	E-SERV1-1	Combination	Min	0	-239,963	0	0	0	-115,4971	19-1	0,5715
19	0	E-SERV1-2	Combination	Max	0	-58,082	0	0	0	92,9101	19-1	0
19	0,5715	E-SERV1-2	Combination	Max	0	-36,31	0	0	0	197,686	19-1	0,5715
19	0	E-SERV1-2	Combination	Min	0	-262,411	0	0	0	-195,1978	19-1	0
19	0,5715	E-SERV1-2	Combination	Min	0	-237,819	0	0	0	-120,773	19-1	0,5715
19	0	E-RESIST1-1	Combination	Max	0	-86,378	0	0	0	215,1578	19-1	0
19	0,5715	E-RESIST1-1	Combination	Max	0	-51,935	0	0	0	395,3704	19-1	0,5715
19	0	E-RESIST1-1	Combination	Min	0	-550,565	0	0	0	-364,8742	19-1	0
19	0,5715	E-RESIST1-1	Combination	Min	0	-494,368	0	0	0	-271,3108	19-1	0,5715
19	0	E-RESIST1-2	Combination	Max	0	-60,35	0	0	0	253,4708	19-1	0
19	0,5715	E-RESIST1-2	Combination	Max	0	-20,368	0	0	0	457,623	19-1	0,5715
19	0	E-RESIST1-2	Combination	Min	0	-535,925	0	0	0	-417,1003	19-1	0
19	0,5715	E-RESIST1-2	Combination	Min	0	-489,379	0	0	0	-283,5903	19-1	0,5715
20	0	LINEA	LinStatic		0	-32,678	0	0	0	1,2691	20-1	0
20	0,5715	LINEA	LinStatic		0	-27,232	0	0	0	18,3885	20-1	0,5715
20	0	HL93 +	LinMoving	Max	0	26,079	0	0	0	167,9897	20-1	0
20	0,5715	HL93 +	LinMoving	Max	0	36,864	0	0	0	223,2516	20-1	0,5715
20	0	HL93 +	LinMoving	Min	0	-164,01	0	0	0	-118,4469	20-1	0
20	0,5715	HL93 +	LinMoving	Min	0	-147,542	0	0	0	-108,209	20-1	0,5715
20	0	TAMDEM +	LinMoving	Max	0	25,298	0	0	0	194,7362	20-1	0
20	0,5715	TAMDEM +	LinMoving	Max	0	35,671	0	0	0	245,9149	20-1	0,5715
20	0	TAMDEM +	LinMoving	Min	0	-161,867	0	0	0	-123,7228	20-1	0
20	0,5715	TAMDEM +	LinMoving	Min	0	-149,411	0	0	0	-113,0288	20-1	0,5715
20	0	HL93 -	LinMoving	Max	0	22,758	0	0	0	151,1907	20-1	0
20	0,5715	HL93 -	LinMoving	Max	0	28,916	0	0	0	200,9265	20-1	0,5715
20	0	HL93 -	LinMoving	Min	0	-147,609	0	0	0	-106,6022	20-1	0
20	0,5715	HL93 -	LinMoving	Min	0	-132,788	0	0	0	-100,671	20-1	0,5715
20	0	TAMDEM -	LinMoving	Max	0	39,642	0	0	0	179,5683	20-1	0
20	0,5715	TAMDEM -	LinMoving	Max	0	48,988	0	0	0	221,5227	20-1	0,5715
20	0	TAMDEM -	LinMoving	Min	0	-158,782	0	0	0	-114,9825	20-1	0
20	0,5715	TAMDEM -	LinMoving	Min	0	-149,323	0	0	0	-101,8175	20-1	0,5715
20	0	SERV1-1 H+	Combination	Max	0	-49,873	0	0	0	170,9395	20-1	0
20	0,5715	SERV1-1 H+	Combination	Max	0	-26,43	0	0	0	265,991	20-1	0,5715
20	0	SERV1-1 H+	Combination	Min	0	-239,963	0	0	0	-115,4971	20-1	0
20	0,5715	SERV1-1 H+	Combination	Min	0	-210,836	0	0	0	-65,4696	20-1	0,5715
20	0	SERV1-2 T+	Combination	Max	0	-50,654	0	0	0	197,686	20-1	0
20	0,5715	SERV1-2 T+	Combination	Max	0	-27,623	0	0	0	288,6543	20-1	0,5715
20	0	SERV1-2 T+	Combination	Min	0	-237,819	0	0	0	-120,773	20-1	0
20	0,5715	SERV1-2 T+	Combination	Min	0	-212,705	0	0	0	-70,2895	20-1	0,5715
20	0	RESIST1-2 T+	Combination	Max	0	-53,752	0	0	0	457,623	20-1	0
20	0,5715	RESIST1-2 T+	Combination	Max	0	-10,838	0	0	0	635,7476	20-1	0,5715
20	0	RESIST1-2 T+	Combination	Min	0	-489,379	0	0	0	-283,5903	20-1	0
20	0,5715	RESIST1-2 T+	Combination	Min	0	-441,616	0	0	0	-199,6939	20-1	0,5715
20	0	SERV1-1 H-	Combination	Max	0	-53,195	0	0	0	154,1405	20-1	0
20	0,5715	SERV1-1 H-	Combination	Max	0	-34,378	0	0	0	243,6658	20-1	0,5715
20	0	SERV1-1 H-	Combination	Min	0	-223,561	0	0	0	-103,6524	20-1	0
20	0,5715	SERV1-1 H-	Combination	Min	0	-196,082	0	0	0	-57,9316	20-1	0,5715

20	0	SERV1-2 T-	Combination	Max	0	-36,31	0	0	0	182,5181	20-1	0
20	0,5715	SERV1-2 T-	Combination	Max	0	-14,306	0	0	0	264,262	20-1	0,5715
20	0	SERV1-2 T-	Combination	Min	0	-234,734	0	0	0	-112,0327	20-1	0
20	0,5715	SERV1-2 T-	Combination	Min	0	-212,617	0	0	0	-59,0781	20-1	0,5715
20	0	RESIST 1-1 H+	Combination	Max	0	-51,935	0	0	0	395,3704	20-1	0
20	0,5715	RESIST 1-1 H+	Combination	Max	0	-8,062	0	0	0	582,9988	20-1	0,5715
20	0	RESIST 1-1 H+	Combination	Min	0	-494,368	0	0	0	-271,3108	20-1	0
20	0,5715	RESIST 1-1 H+	Combination	Min	0	-437,267	0	0	0	-188,4758	20-1	0,5715
20	0	RESIST1-1 H-	Combination	Max	0	-59,666	0	0	0	356,2708	20-1	0
20	0,5715	RESIST1-1 H-	Combination	Max	0	-26,561	0	0	0	531,037	20-1	0,5715
20	0	RESIST1-1 H-	Combination	Min	0	-456,194	0	0	0	-243,7423	20-1	0
20	0,5715	RESIST1-1 H-	Combination	Min	0	-402,926	0	0	0	-170,931	20-1	0,5715
20	0	RESIST1-2 T-	Combination	Max	0	-20,368	0	0	0	422,3197	20-1	0
20	0,5715	RESIST1-2 T-	Combination	Max	0	20,158	0	0	0	578,9746	20-1	0,5715
20	0	RESIST1-2 T-	Combination	Min	0	-482,198	0	0	0	-263,2474	20-1	0
20	0,5715	RESIST1-2 T-	Combination	Min	0	-441,411	0	0	0	-173,5996	20-1	0,5715
20	0	E-SERV1-1	Combination	Max	0	-49,873	0	0	0	170,9395	20-1	0
20	0,5715	E-SERV1-1	Combination	Max	0	-26,43	0	0	0	265,991	20-1	0,5715
20	0	E-SERV1-1	Combination	Min	0	-239,963	0	0	0	-115,4971	20-1	0
20	0,5715	E-SERV1-1	Combination	Min	0	-210,836	0	0	0	-65,4696	20-1	0,5715
20	0	E-SERV1-2	Combination	Max	0	-36,31	0	0	0	197,686	20-1	0
20	0,5715	E-SERV1-2	Combination	Max	0	-14,306	0	0	0	288,6543	20-1	0,5715
20	0	E-SERV1-2	Combination	Min	0	-237,819	0	0	0	-120,773	20-1	0
20	0,5715	E-SERV1-2	Combination	Min	0	-212,705	0	0	0	-70,2895	20-1	0,5715
20	0	E-RESIST1-1	Combination	Max	0	-51,935	0	0	0	395,3704	20-1	0
20	0,5715	E-RESIST1-1	Combination	Max	0	-8,062	0	0	0	582,9988	20-1	0,5715
20	0	E-RESIST1-1	Combination	Min	0	-494,368	0	0	0	-271,3108	20-1	0
20	0,5715	E-RESIST1-1	Combination	Min	0	-437,267	0	0	0	-188,4758	20-1	0,5715
20	0	E-RESIST1-2	Combination	Max	0	-20,368	0	0	0	457,623	20-1	0
20	0,5715	E-RESIST1-2	Combination	Max	0	20,158	0	0	0	635,7476	20-1	0,5715
20	0	E-RESIST1-2	Combination	Min	0	-489,379	0	0	0	-283,5903	20-1	0
20	0,5715	E-RESIST1-2	Combination	Min	0	-441,616	0	0	0	-199,6939	20-1	0,5715
21	0	LINEA	LinStatic		0	-27,232	0	0	0	18,3885	21-1	0
21	0,5715	LINEA	LinStatic		0	-21,786	0	0	0	32,3953	21-1	0,5715
21	0	HL93 +	LinMoving	Max	0	36,864	0	0	0	223,2516	21-1	0
21	0,5715	HL93 +	LinMoving	Max	0	47,313	0	0	0	266,5933	21-1	0,5715
21	0	HL93 +	LinMoving	Min	0	-147,542	0	0	0	-108,209	21-1	0
21	0,5715	HL93 +	LinMoving	Min	0	-130,842	0	0	0	-97,971	21-1	0,5715
21	0	TAMDEM +	LinMoving	Max	0	35,671	0	0	0	245,9149	21-1	0
21	0,5715	TAMDEM +	LinMoving	Max	0	46,85	0	0	0	288,8782	21-1	0,5715
21	0	TAMDEM +	LinMoving	Min	0	-149,411	0	0	0	-113,0288	21-1	0
21	0,5715	TAMDEM +	LinMoving	Min	0	-136,565	0	0	0	-102,3348	21-1	0,5715
21	0	HL93 -	LinMoving	Max	0	28,916	0	0	0	200,9265	21-1	0
21	0,5715	HL93 -	LinMoving	Max	0	35,409	0	0	0	239,934	21-1	0,5715
21	0	HL93 -	LinMoving	Min	0	-132,788	0	0	0	-100,671	21-1	0
21	0,5715	HL93 -	LinMoving	Min	0	-117,758	0	0	0	-97,2317	21-1	0,5715
21	0	TAMDEM -	LinMoving	Max	0	48,988	0	0	0	221,5227	21-1	0
21	0,5715	TAMDEM -	LinMoving	Max	0	59,058	0	0	0	260,2244	21-1	0,5715
21	0	TAMDEM -	LinMoving	Min	0	-149,323	0	0	0	-101,8175	21-1	0
21	0,5715	TAMDEM -	LinMoving	Min	0	-139,039	0	0	0	-92,1842	21-1	0,5715
21	0	SERV1-1 H+	Combination	Max	0	-26,43	0	0	0	265,991	21-1	0
21	0,5715	SERV1-1 H+	Combination	Max	0	-3,322	0	0	0	341,8878	21-1	0,5715
21	0	SERV1-1 H+	Combination	Min	0	-210,836	0	0	0	-65,4696	21-1	0
21	0,5715	SERV1-1 H+	Combination	Min	0	-181,477	0	0	0	-22,6766	21-1	0,5715
21	0	SERV1-2 T+	Combination	Max	0	-27,623	0	0	0	288,6543	21-1	0
21	0,5715	SERV1-2 T+	Combination	Max	0	-3,785	0	0	0	364,1726	21-1	0,5715
21	0	SERV1-2 T+	Combination	Min	0	-212,705	0	0	0	-70,2895	21-1	0
21	0,5715	SERV1-2 T+	Combination	Min	0	-187,2	0	0	0	-27,0404	21-1	0,5715
21	0	RESIST1-2 T+	Combination	Max	0	-10,838	0	0	0	635,7476	21-1	0
21	0,5715	RESIST1-2 T+	Combination	Max	0	33,953	0	0	0	784,0223	21-1	0,5715
21	0	RESIST1-2 T+	Combination	Min	0	-441,616	0	0	0	-199,6939	21-1	0
21	0,5715	RESIST1-2 T+	Combination	Min	0	-392,945	0	0	0	-126,5259	21-1	0,5715
21	0	SERV1-1 H-	Combination	Max	0	-34,378	0	0	0	243,6658	21-1	0
21	0,5715	SERV1-1 H-	Combination	Max	0	-15,226	0	0	0	315,2284	21-1	0,5715
21	0	SERV1-1 H-	Combination	Min	0	-196,082	0	0	0	-57,9316	21-1	0
21	0,5715	SERV1-1 H-	Combination	Min	0	-168,393	0	0	0	-21,9372	21-1	0,5715
21	0	SERV1-2 T-	Combination	Max	0	-14,306	0	0	0	264,262	21-1	0
21	0,5715	SERV1-2 T-	Combination	Max	0	8,423	0	0	0	335,5188	21-1	0,5715

21	0	SERV1-2 T-	Combination	Min	0	-212,617	0	0	0	-59,0781	21-1	0
21	0,5715	SERV1-2 T-	Combination	Min	0	-189,674	0	0	0	-16,8898	21-1	0,5715
21	0	RESIST 1-1 H+	Combination	Max	0	-8,062	0	0	0	582,9988	21-1	0
21	0,5715	RESIST 1-1 H+	Combination	Max	0	35,032	0	0	0	732,1544	21-1	0,5715
21	0	RESIST 1-1 H+	Combination	Min	0	-437,267	0	0	0	-188,4758	21-1	0
21	0,5715	RESIST 1-1 H+	Combination	Min	0	-379,624	0	0	0	-116,3691	21-1	0,5715
21	0	RESIST1-1 H-	Combination	Max	0	-26,561	0	0	0	531,037	21-1	0
21	0,5715	RESIST1-1 H-	Combination	Max	0	7,324	0	0	0	670,1048	21-1	0,5715
21	0	RESIST1-1 H-	Combination	Min	0	-402,926	0	0	0	-170,931	21-1	0
21	0,5715	RESIST1-1 H-	Combination	Min	0	-349,17	0	0	0	-114,6483	21-1	0,5715
21	0	RESIST1-2 T-	Combination	Max	0	20,158	0	0	0	578,9746	21-1	0
21	0,5715	RESIST1-2 T-	Combination	Max	0	62,368	0	0	0	717,3306	21-1	0,5715
21	0	RESIST1-2 T-	Combination	Min	0	-441,411	0	0	0	-173,5996	21-1	0
21	0,5715	RESIST1-2 T-	Combination	Min	0	-398,703	0	0	0	-102,9004	21-1	0,5715
21	0	E-SERV1-1	Combination	Max	0	-26,43	0	0	0	265,991	21-1	0
21	0,5715	E-SERV1-1	Combination	Max	0	-3,322	0	0	0	341,8878	21-1	0,5715
21	0	E-SERV1-1	Combination	Min	0	-210,836	0	0	0	-65,4696	21-1	0
21	0,5715	E-SERV1-1	Combination	Min	0	-181,477	0	0	0	-22,6766	21-1	0,5715
21	0	E-SERV1-2	Combination	Max	0	-14,306	0	0	0	288,6543	21-1	0
21	0,5715	E-SERV1-2	Combination	Max	0	8,423	0	0	0	364,1726	21-1	0,5715
21	0	E-SERV1-2	Combination	Min	0	-212,705	0	0	0	-70,2895	21-1	0
21	0,5715	E-SERV1-2	Combination	Min	0	-189,674	0	0	0	-27,0404	21-1	0,5715
21	0	E-RESIST1-1	Combination	Max	0	-8,062	0	0	0	582,9988	21-1	0
21	0,5715	E-RESIST1-1	Combination	Max	0	35,032	0	0	0	732,1544	21-1	0,5715
21	0	E-RESIST1-1	Combination	Min	0	-437,267	0	0	0	-188,4758	21-1	0
21	0,5715	E-RESIST1-1	Combination	Min	0	-379,624	0	0	0	-116,3691	21-1	0,5715
21	0	E-RESIST1-2	Combination	Max	0	20,158	0	0	0	635,7476	21-1	0
21	0,5715	E-RESIST1-2	Combination	Max	0	62,368	0	0	0	784,0223	21-1	0,5715
21	0	E-RESIST1-2	Combination	Min	0	-441,616	0	0	0	-199,6939	21-1	0
21	0,5715	E-RESIST1-2	Combination	Min	0	-398,703	0	0	0	-126,5259	21-1	0,5715
22	0	LINEA	LinStatic		0	-21,786	0	0	0	32,3953	22-1	0
22	0,5715	LINEA	LinStatic		0	-16,339	0	0	0	43,2894	22-1	0,5715
22	0	HL93 +	LinMoving	Max	0	47,313	0	0	0	266,5933	22-1	0
22	0,5715	HL93 +	LinMoving	Max	0	57,287	0	0	0	297,3612	22-1	0,5715
22	0	HL93 +	LinMoving	Min	0	-130,842	0	0	0	-97,971	22-1	0
22	0,5715	HL93 +	LinMoving	Min	0	-114,624	0	0	0	-87,7331	22-1	0,5715
22	0	TAMDEM +	LinMoving	Max	0	46,85	0	0	0	288,8782	22-1	0
22	0,5715	TAMDEM +	LinMoving	Max	0	58,702	0	0	0	322,5019	22-1	0,5715
22	0	TAMDEM +	LinMoving	Min	0	-136,565	0	0	0	-102,3348	22-1	0
22	0,5715	TAMDEM +	LinMoving	Min	0	-123,463	0	0	0	-91,6408	22-1	0,5715
22	0	HL93 -	LinMoving	Max	0	35,409	0	0	0	239,934	22-1	0
22	0,5715	HL93 -	LinMoving	Max	0	42,914	0	0	0	267,625	22-1	0,5715
22	0	HL93 -	LinMoving	Min	0	-117,758	0	0	0	-97,2317	22-1	0
22	0,5715	HL93 -	LinMoving	Min	0	-103,161	0	0	0	-94,0007	22-1	0,5715
22	0	TAMDEM -	LinMoving	Max	0	59,058	0	0	0	260,2244	22-1	0
22	0,5715	TAMDEM -	LinMoving	Max	0	69,735	0	0	0	290,5129	22-1	0,5715
22	0	TAMDEM -	LinMoving	Min	0	-139,039	0	0	0	-92,1842	22-1	0
22	0,5715	TAMDEM -	LinMoving	Min	0	-127,97	0	0	0	-82,551	22-1	0,5715
22	0	SERV1-1 H+	Combination	Max	0	-3,322	0	0	0	341,8878	22-1	0
22	0,5715	SERV1-1 H+	Combination	Max	0	19,311	0	0	0	397,9762	22-1	0,5715
22	0	SERV1-1 H+	Combination	Min	0	-181,477	0	0	0	-22,6766	22-1	0
22	0,5715	SERV1-1 H+	Combination	Min	0	-152,6	0	0	0	12,882	22-1	0,5715
22	0	SERV1-2 T+	Combination	Max	0	-3,785	0	0	0	364,1726	22-1	0
22	0,5715	SERV1-2 T+	Combination	Max	0	20,726	0	0	0	423,1169	22-1	0,5715
22	0	SERV1-2 T+	Combination	Min	0	-187,2	0	0	0	-27,0404	22-1	0
22	0,5715	SERV1-2 T+	Combination	Min	0	-161,439	0	0	0	8,9742	22-1	0,5715
22	0	RESIST1-2 T+	Combination	Max	0	33,953	0	0	0	784,0223	22-1	0
22	0,5715	RESIST1-2 T+	Combination	Max	0	80,312	0	0	0	899,8308	22-1	0,5715
22	0	RESIST1-2 T+	Combination	Min	0	-392,945	0	0	0	-126,5259	22-1	0
22	0,5715	RESIST1-2 T+	Combination	Min	0	-343,677	0	0	0	-64,0863	22-1	0,5715
22	0	SERV1-1 H-	Combination	Max	0	-15,226	0	0	0	315,2284	22-1	0
22	0,5715	SERV1-1 H-	Combination	Max	0	4,938	0	0	0	368,2401	22-1	0,5715
22	0	SERV1-1 H-	Combination	Min	0	-168,393	0	0	0	-21,9372	22-1	0
22	0,5715	SERV1-1 H-	Combination	Min	0	-141,138	0	0	0	6,6143	22-1	0,5715
22	0	SERV1-2 T-	Combination	Max	0	8,423	0	0	0	335,5188	22-1	0
22	0,5715	SERV1-2 T-	Combination	Max	0	31,759	0	0	0	391,128	22-1	0,5715
22	0	SERV1-2 T-	Combination	Min	0	-189,674	0	0	0	-16,8898	22-1	0
22	0,5715	SERV1-2 T-	Combination	Min	0	-165,946	0	0	0	18,064	22-1	0,5715

22	0	RESIST 1-1 H+	Combination	Max	0	35,032	0	0	0	732,1544	22-1	0
22	0,5715	RESIST 1-1 H+	Combination	Max	0	77,019	0	0	0	841,3159	22-1	0,5715
22	0	RESIST 1-1 H+	Combination	Min	0	-379,624	0	0	0	-116,3691	22-1	0
22	0,5715	RESIST 1-1 H+	Combination	Min	0	-323,104	0	0	0	-54,9909	22-1	0,5715
22	0	RESIST1-1 H-	Combination	Max	0	7,324	0	0	0	670,1048	22-1	0
22	0,5715	RESIST1-1 H-	Combination	Max	0	43,566	0	0	0	772,1051	22-1	0,5715
22	0	RESIST1-1 H-	Combination	Min	0	-349,17	0	0	0	-114,6483	22-1	0
22	0,5715	RESIST1-1 H-	Combination	Min	0	-296,425	0	0	0	-69,5789	22-1	0,5715
22	0	RESIST1-2 T-	Combination	Max	0	62,368	0	0	0	717,3306	22-1	0
22	0,5715	RESIST1-2 T-	Combination	Max	0	105,991	0	0	0	825,3766	22-1	0,5715
22	0	RESIST1-2 T-	Combination	Min	0	-398,703	0	0	0	-102,9004	22-1	0
22	0,5715	RESIST1-2 T-	Combination	Min	0	-354,167	0	0	0	-42,9297	22-1	0,5715
22	0	E-SERV1-1	Combination	Max	0	-3,322	0	0	0	341,8878	22-1	0
22	0,5715	E-SERV1-1	Combination	Max	0	19,311	0	0	0	397,9762	22-1	0,5715
22	0	E-SERV1-1	Combination	Min	0	-181,477	0	0	0	-22,6766	22-1	0
22	0,5715	E-SERV1-1	Combination	Min	0	-152,6	0	0	0	6,6143	22-1	0,5715
22	0	E-SERV1-2	Combination	Max	0	8,423	0	0	0	364,1726	22-1	0
22	0,5715	E-SERV1-2	Combination	Max	0	31,759	0	0	0	423,1169	22-1	0,5715
22	0	E-SERV1-2	Combination	Min	0	-189,674	0	0	0	-27,0404	22-1	0
22	0,5715	E-SERV1-2	Combination	Min	0	-165,946	0	0	0	8,9742	22-1	0,5715
22	0	E-RESIST1-1	Combination	Max	0	35,032	0	0	0	732,1544	22-1	0
22	0,5715	E-RESIST1-1	Combination	Max	0	77,019	0	0	0	841,3159	22-1	0,5715
22	0	E-RESIST1-1	Combination	Min	0	-379,624	0	0	0	-116,3691	22-1	0
22	0,5715	E-RESIST1-1	Combination	Min	0	-323,104	0	0	0	-69,5789	22-1	0,5715
22	0	E-RESIST1-2	Combination	Max	0	62,368	0	0	0	784,0223	22-1	0
22	0,5715	E-RESIST1-2	Combination	Max	0	105,991	0	0	0	899,8308	22-1	0,5715
22	0	E-RESIST1-2	Combination	Min	0	-398,703	0	0	0	-126,5259	22-1	0
22	0,5715	E-RESIST1-2	Combination	Min	0	-354,167	0	0	0	-64,0863	22-1	0,5715
23	0	LINEA	LinStatic		0	-16,339	0	0	0	43,2894	23-1	0
23	0,5715	LINEA	LinStatic		0	-10,893	0	0	0	51,071	23-1	0,5715
23	0	HL93 +	LinMoving	Max	0	57,287	0	0	0	297,3612	23-1	0
23	0,5715	HL93 +	LinMoving	Max	0	66,772	0	0	0	317,6982	23-1	0,5715
23	0	HL93 +	LinMoving	Min	0	-114,624	0	0	0	-87,7331	23-1	0
23	0,5715	HL93 +	LinMoving	Min	0	-99,21	0	0	0	-77,4951	23-1	0,5715
23	0	TAMDEM +	LinMoving	Max	0	58,702	0	0	0	322,5019	23-1	0
23	0,5715	TAMDEM +	LinMoving	Max	0	71,095	0	0	0	345,9657	23-1	0,5715
23	0	TAMDEM +	LinMoving	Min	0	-123,463	0	0	0	-91,6408	23-1	0
23	0,5715	TAMDEM +	LinMoving	Min	0	-110,236	0	0	0	-80,9469	23-1	0,5715
23	0	HL93 -	LinMoving	Max	0	42,914	0	0	0	267,625	23-1	0
23	0,5715	HL93 -	LinMoving	Max	0	51,15	0	0	0	285,9283	23-1	0,5715
23	0	HL93 -	LinMoving	Min	0	-103,161	0	0	0	-94,0007	23-1	0
23	0,5715	HL93 -	LinMoving	Min	0	-89,289	0	0	0	-90,8171	23-1	0,5715
23	0	TAMDEM -	LinMoving	Max	0	69,735	0	0	0	290,5129	23-1	0
23	0,5715	TAMDEM -	LinMoving	Max	0	80,899	0	0	0	311,6494	23-1	0,5715
23	0	TAMDEM -	LinMoving	Min	0	-127,97	0	0	0	-82,551	23-1	0
23	0,5715	TAMDEM -	LinMoving	Min	0	-116,158	0	0	0	-72,9178	23-1	0,5715
23	0	SERV1-1 H+	Combination	Max	0	19,311	0	0	0	397,9762	23-1	0
23	0,5715	SERV1-1 H+	Combination	Max	0	41,454	0	0	0	436,3993	23-1	0,5715
23	0	SERV1-1 H+	Combination	Min	0	-152,6	0	0	0	12,882	23-1	0
23	0,5715	SERV1-1 H+	Combination	Min	0	-124,527	0	0	0	41,2061	23-1	0,5715
23	0	SERV1-2 T+	Combination	Max	0	20,726	0	0	0	423,1169	23-1	0
23	0,5715	SERV1-2 T+	Combination	Max	0	45,778	0	0	0	464,6669	23-1	0,5715
23	0	SERV1-2 T+	Combination	Min	0	-161,439	0	0	0	8,9742	23-1	0
23	0,5715	SERV1-2 T+	Combination	Min	0	-135,553	0	0	0	37,7543	23-1	0,5715
23	0	RESIST1-2 T+	Combination	Max	0	80,312	0	0	0	899,8308	23-1	0
23	0,5715	RESIST1-2 T+	Combination	Max	0	127,93	0	0	0	981,264	23-1	0,5715
23	0	RESIST1-2 T+	Combination	Min	0	-343,677	0	0	0	-64,0863	23-1	0
23	0,5715	RESIST1-2 T+	Combination	Min	0	-294,119	0	0	0	-12,3751	23-1	0,5715
23	0	SERV1-1 H-	Combination	Max	0	4,938	0	0	0	368,2401	23-1	0
23	0,5715	SERV1-1 H-	Combination	Max	0	25,833	0	0	0	404,6295	23-1	0,5715
23	0	SERV1-1 H-	Combination	Min	0	-141,138	0	0	0	6,6143	23-1	0
23	0,5715	SERV1-1 H-	Combination	Min	0	-114,606	0	0	0	27,8841	23-1	0,5715
23	0	SERV1-2 T-	Combination	Max	0	31,759	0	0	0	391,128	23-1	0
23	0,5715	SERV1-2 T-	Combination	Max	0	55,581	0	0	0	430,3506	23-1	0,5715
23	0	SERV1-2 T-	Combination	Min	0	-165,946	0	0	0	18,064	23-1	0
23	0,5715	SERV1-2 T-	Combination	Min	0	-141,475	0	0	0	45,7834	23-1	0,5715
23	0	RESIST 1-1 H+	Combination	Max	0	77,019	0	0	0	841,3159	23-1	0
23	0,5715	RESIST 1-1 H+	Combination	Max	0	117,867	0	0	0	915,4712	23-1	0,5715

23	0	RESIST 1-1 H+	Combination	Min	0	-323,104	0	0	0	-54,9909	23-1	0
23	0,5715	RESIST 1-1 H+	Combination	Min	0	-268,455	0	0	0	-4,3411	23-1	0,5715
23	0	RESIST1-1 H-	Combination	Max	0	43,566	0	0	0	772,1051	23-1	0
23	0,5715	RESIST1-1 H-	Combination	Max	0	81,508	0	0	0	841,527	23-1	0,5715
23	0	RESIST1-1 H-	Combination	Min	0	-296,425	0	0	0	-69,5789	23-1	0
23	0,5715	RESIST1-1 H-	Combination	Min	0	-245,364	0	0	0	-35,348	23-1	0,5715
23	0	RESIST1-2 T-	Combination	Max	0	105,991	0	0	0	825,3766	23-1	0
23	0,5715	RESIST1-2 T-	Combination	Max	0	150,747	0	0	0	901,3927	23-1	0,5715
23	0	RESIST1-2 T-	Combination	Min	0	-354,167	0	0	0	-42,9297	23-1	0
23	0,5715	RESIST1-2 T-	Combination	Min	0	-307,902	0	0	0	6,3127	23-1	0,5715
23	0	E-SERV1-1	Combination	Max	0	19,311	0	0	0	397,9762	23-1	0
23	0,5715	E-SERV1-1	Combination	Max	0	41,454	0	0	0	436,3993	23-1	0,5715
23	0	E-SERV1-1	Combination	Min	0	-152,6	0	0	0	6,6143	23-1	0
23	0,5715	E-SERV1-1	Combination	Min	0	-124,527	0	0	0	27,8841	23-1	0,5715
23	0	E-SERV1-2	Combination	Max	0	31,759	0	0	0	423,1169	23-1	0
23	0,5715	E-SERV1-2	Combination	Max	0	55,581	0	0	0	464,6669	23-1	0,5715
23	0	E-SERV1-2	Combination	Min	0	-165,946	0	0	0	8,9742	23-1	0
23	0,5715	E-SERV1-2	Combination	Min	0	-141,475	0	0	0	37,7543	23-1	0,5715
23	0	E-RESIST1-1	Combination	Max	0	77,019	0	0	0	841,3159	23-1	0
23	0,5715	E-RESIST1-1	Combination	Max	0	117,867	0	0	0	915,4712	23-1	0,5715
23	0	E-RESIST1-1	Combination	Min	0	-323,104	0	0	0	-69,5789	23-1	0
23	0,5715	E-RESIST1-1	Combination	Min	0	-268,455	0	0	0	-35,348	23-1	0,5715
23	0	E-RESIST1-2	Combination	Max	0	105,991	0	0	0	899,8308	23-1	0
23	0,5715	E-RESIST1-2	Combination	Max	0	150,747	0	0	0	981,264	23-1	0,5715
23	0	E-RESIST1-2	Combination	Min	0	-354,167	0	0	0	-64,0863	23-1	0
23	0,5715	E-RESIST1-2	Combination	Min	0	-307,902	0	0	0	-12,3751	23-1	0,5715
24	0	LINEA	LinStatic		0	-10,893	0	0	0	51,071	24-1	0
24	0,5715	LINEA	LinStatic		0	-5,446	0	0	0	55,7399	24-1	0,5715
24	0	HL93 +	LinMoving	Max	0	66,772	0	0	0	317,6982	24-1	0
24	0,5715	HL93 +	LinMoving	Max	0	76,284	0	0	0	327,3755	24-1	0,5715
24	0	HL93 +	LinMoving	Min	0	-99,21	0	0	0	-77,4951	24-1	0
24	0,5715	HL93 +	LinMoving	Min	0	-86,729	0	0	0	-67,2571	24-1	0,5715
24	0	TAMDEM +	LinMoving	Max	0	71,095	0	0	0	345,9657	24-1	0
24	0,5715	TAMDEM +	LinMoving	Max	0	83,896	0	0	0	358,7532	24-1	0,5715
24	0	TAMDEM +	LinMoving	Min	0	-110,236	0	0	0	-80,9469	24-1	0
24	0,5715	TAMDEM +	LinMoving	Min	0	-97,018	0	0	0	-70,2529	24-1	0,5715
24	0	HL93 -	LinMoving	Max	0	51,15	0	0	0	285,9283	24-1	0
24	0,5715	HL93 -	LinMoving	Max	0	62,922	0	0	0	294,638	24-1	0,5715
24	0	HL93 -	LinMoving	Min	0	-89,289	0	0	0	-90,8171	24-1	0
24	0,5715	HL93 -	LinMoving	Min	0	-75,839	0	0	0	-87,6335	24-1	0,5715
24	0	TAMDEM -	LinMoving	Max	0	80,899	0	0	0	311,6494	24-1	0
24	0,5715	TAMDEM -	LinMoving	Max	0	92,43	0	0	0	323,1685	24-1	0,5715
24	0	TAMDEM -	LinMoving	Min	0	-116,158	0	0	0	-72,9178	24-1	0
24	0,5715	TAMDEM -	LinMoving	Min	0	-104,251	0	0	0	-63,2845	24-1	0,5715
24	0	SERV1-1 H+	Combination	Max	0	41,454	0	0	0	436,3993	24-1	0
24	0,5715	SERV1-1 H+	Combination	Max	0	63,625	0	0	0	456,9284	24-1	0,5715
24	0	SERV1-1 H+	Combination	Min	0	-124,527	0	0	0	41,2061	24-1	0
24	0,5715	SERV1-1 H+	Combination	Min	0	-99,388	0	0	0	62,2957	24-1	0,5715
24	0	SERV1-2 T+	Combination	Max	0	45,778	0	0	0	464,6669	24-1	0
24	0,5715	SERV1-2 T+	Combination	Max	0	71,237	0	0	0	488,306	24-1	0,5715
24	0	SERV1-2 T+	Combination	Min	0	-135,553	0	0	0	37,7543	24-1	0
24	0,5715	SERV1-2 T+	Combination	Min	0	-109,677	0	0	0	59,3	24-1	0,5715
24	0	RESIST1-2 T+	Combination	Max	0	127,93	0	0	0	981,264	24-1	0
24	0,5715	RESIST1-2 T+	Combination	Max	0	176,496	0	0	0	1027,1193	24-1	0,5715
24	0	RESIST1-2 T+	Combination	Min	0	-294,119	0	0	0	-12,3751	24-1	0
24	0,5715	RESIST1-2 T+	Combination	Min	0	-244,582	0	0	0	28,6077	24-1	0,5715
24	0	SERV1-1 H-	Combination	Max	0	25,833	0	0	0	404,6295	24-1	0
24	0,5715	SERV1-1 H-	Combination	Max	0	50,263	0	0	0	424,1909	24-1	0,5715
24	0	SERV1-1 H-	Combination	Min	0	-114,606	0	0	0	27,8841	24-1	0
24	0,5715	SERV1-1 H-	Combination	Min	0	-88,498	0	0	0	41,9194	24-1	0,5715
24	0	SERV1-2 T-	Combination	Max	0	55,581	0	0	0	430,3506	24-1	0
24	0,5715	SERV1-2 T-	Combination	Max	0	79,771	0	0	0	452,7213	24-1	0,5715
24	0	SERV1-2 T-	Combination	Min	0	-141,475	0	0	0	45,7834	24-1	0
24	0,5715	SERV1-2 T-	Combination	Min	0	-116,91	0	0	0	66,2684	24-1	0,5715
24	0	RESIST 1-1 H+	Combination	Max	0	117,867	0	0	0	915,4712	24-1	0
24	0,5715	RESIST 1-1 H+	Combination	Max	0	158,778	0	0	0	954,0879	24-1	0,5715
24	0	RESIST 1-1 H+	Combination	Min	0	-268,455	0	0	0	-4,3411	24-1	0
24	0,5715	RESIST 1-1 H+	Combination	Min	0	-220,634	0	0	0	35,5804	24-1	0,5715

24	0	RESIST1-1 H-	Combination	Max	0	81,508	0	0	0	841,527	24-1	0
24	0,5715	RESIST1-1 H-	Combination	Max	0	127,678	0	0	0	877,8913	24-1	0,5715
24	0	RESIST1-1 H-	Combination	Min	0	-245,364	0	0	0	-35,348	24-1	0
24	0,5715	RESIST1-1 H-	Combination	Min	0	-195,288	0	0	0	-11,8455	24-1	0,5715
24	0	RESIST1-2 T-	Combination	Max	0	150,747	0	0	0	901,3927	24-1	0
24	0,5715	RESIST1-2 T-	Combination	Max	0	196,358	0	0	0	944,296	24-1	0,5715
24	0	RESIST1-2 T-	Combination	Min	0	-307,902	0	0	0	6,3127	24-1	0
24	0,5715	RESIST1-2 T-	Combination	Min	0	-261,416	0	0	0	44,8266	24-1	0,5715
24	0	E-SERV1-1	Combination	Max	0	41,454	0	0	0	436,3993	24-1	0
24	0,5715	E-SERV1-1	Combination	Max	0	63,625	0	0	0	456,9284	24-1	0,5715
24	0	E-SERV1-1	Combination	Min	0	-124,527	0	0	0	27,8841	24-1	0
24	0,5715	E-SERV1-1	Combination	Min	0	-99,388	0	0	0	41,9194	24-1	0,5715
24	0	E-SERV1-2	Combination	Max	0	55,581	0	0	0	464,6669	24-1	0
24	0,5715	E-SERV1-2	Combination	Max	0	79,771	0	0	0	488,306	24-1	0,5715
24	0	E-SERV1-2	Combination	Min	0	-141,475	0	0	0	37,7543	24-1	0
24	0,5715	E-SERV1-2	Combination	Min	0	-116,91	0	0	0	59,3	24-1	0,5715
24	0	E-RESIST1-1	Combination	Max	0	117,867	0	0	0	915,4712	24-1	0
24	0,5715	E-RESIST1-1	Combination	Max	0	158,778	0	0	0	954,0879	24-1	0,5715
24	0	E-RESIST1-1	Combination	Min	0	-268,455	0	0	0	-35,348	24-1	0
24	0,5715	E-RESIST1-1	Combination	Min	0	-220,634	0	0	0	-11,8455	24-1	0,5715
24	0	E-RESIST1-2	Combination	Max	0	150,747	0	0	0	981,264	24-1	0
24	0,5715	E-RESIST1-2	Combination	Max	0	196,358	0	0	0	1027,1193	24-1	0,5715
24	0	E-RESIST1-2	Combination	Min	0	-307,902	0	0	0	-12,3751	24-1	0
24	0,5715	E-RESIST1-2	Combination	Min	0	-261,416	0	0	0	28,6077	24-1	0,5715
25	0	LINEA	LinStatic		0	-5,446	0	0	0	55,7399	25-1	0
25	0,5715	LINEA	LinStatic		0	9,734E-13	0	0	0	57,2962	25-1	0,5715
25	0	HL93 +	LinMoving	Max	0	76,284	0	0	0	327,3755	25-1	0
25	0,5715	HL93 +	LinMoving	Max	0	86,693	0	0	0	324,0855	25-1	0,5715
25	0	HL93 +	LinMoving	Min	0	-86,729	0	0	0	-67,2571	25-1	0
25	0,5715	HL93 +	LinMoving	Min	0	-76,32	0	0	0	-57,0195	25-1	0,5715
25	0	TAMDEM +	LinMoving	Max	0	83,896	0	0	0	358,7532	25-1	0
25	0,5715	TAMDEM +	LinMoving	Max	0	96,972	0	0	0	360,6513	25-1	0,5715
25	0	TAMDEM +	LinMoving	Min	0	-97,018	0	0	0	-70,2529	25-1	0
25	0,5715	TAMDEM +	LinMoving	Min	0	-83,941	0	0	0	-59,5589	25-1	0,5715
25	0	HL93 -	LinMoving	Max	0	62,922	0	0	0	294,638	25-1	0
25	0,5715	HL93 -	LinMoving	Max	0	75,793	0	0	0	291,6769	25-1	0,5715
25	0	HL93 -	LinMoving	Min	0	-75,839	0	0	0	-87,6335	25-1	0
25	0,5715	HL93 -	LinMoving	Min	0	-62,966	0	0	0	-84,4498	25-1	0,5715
25	0	TAMDEM -	LinMoving	Max	0	92,43	0	0	0	323,1685	25-1	0
25	0,5715	TAMDEM -	LinMoving	Max	0	104,208	0	0	0	324,8784	25-1	0,5715
25	0	TAMDEM -	LinMoving	Min	0	-104,251	0	0	0	-63,2845	25-1	0
25	0,5715	TAMDEM -	LinMoving	Min	0	-92,471	0	0	0	-53,6513	25-1	0,5715
25	0	SERV1-1 H+	Combination	Max	0	63,625	0	0	0	456,9284	25-1	0
25	0,5715	SERV1-1 H+	Combination	Max	0	86,693	0	0	0	457,2556	25-1	0,5715
25	0	SERV1-1 H+	Combination	Min	0	-99,388	0	0	0	62,2957	25-1	0
25	0,5715	SERV1-1 H+	Combination	Min	0	-76,32	0	0	0	76,1506	25-1	0,5715
25	0	SERV1-2 T+	Combination	Max	0	71,237	0	0	0	488,306	25-1	0
25	0,5715	SERV1-2 T+	Combination	Max	0	96,972	0	0	0	493,8215	25-1	0,5715
25	0	SERV1-2 T+	Combination	Min	0	-109,677	0	0	0	59,3	25-1	0
25	0,5715	SERV1-2 T+	Combination	Min	0	-83,941	0	0	0	73,6112	25-1	0,5715
25	0	RESIST1-2 T+	Combination	Max	0	176,496	0	0	0	1027,1193	25-1	0
25	0,5715	RESIST1-2 T+	Combination	Max	0	225,702	0	0	0	1036,9016	25-1	0,5715
25	0	RESIST1-2 T+	Combination	Min	0	-244,582	0	0	0	28,6077	25-1	0
25	0,5715	RESIST1-2 T+	Combination	Min	0	-195,374	0	0	0	58,8622	25-1	0,5715
25	0	SERV1-1 H-	Combination	Max	0	50,263	0	0	0	424,1909	25-1	0
25	0,5715	SERV1-1 H-	Combination	Max	0	75,793	0	0	0	424,847	25-1	0,5715
25	0	SERV1-1 H-	Combination	Min	0	-88,498	0	0	0	41,9194	25-1	0
25	0,5715	SERV1-1 H-	Combination	Min	0	-62,966	0	0	0	48,7203	25-1	0,5715
25	0	SERV1-2 T-	Combination	Max	0	79,771	0	0	0	452,7213	25-1	0
25	0,5715	SERV1-2 T-	Combination	Max	0	104,208	0	0	0	458,0485	25-1	0,5715
25	0	SERV1-2 T-	Combination	Min	0	-116,91	0	0	0	66,2684	25-1	0
25	0,5715	SERV1-2 T-	Combination	Min	0	-92,471	0	0	0	79,5188	25-1	0,5715
25	0	RESIST 1-1 H+	Combination	Max	0	158,778	0	0	0	954,0879	25-1	0
25	0,5715	RESIST 1-1 H+	Combination	Max	0	201,778	0	0	0	951,7945	25-1	0,5715
25	0	RESIST 1-1 H+	Combination	Min	0	-220,634	0	0	0	35,5804	25-1	0
25	0,5715	RESIST 1-1 H+	Combination	Min	0	-177,636	0	0	0	64,7726	25-1	0,5715
25	0	RESIST1-1 H-	Combination	Max	0	127,678	0	0	0	877,8913	25-1	0
25	0,5715	RESIST1-1 H-	Combination	Max	0	176,408	0	0	0	876,3636	25-1	0,5715

25	0	RESIST1-1 H-	Combination	Min	0	-195,288	0	0	0	-11,8455	25-1	0
25	0,5715	RESIST1-1 H-	Combination	Min	0	-146,552	0	0	0	0,9286	25-1	0,5715
25	0	RESIST1-2 T-	Combination	Max	0	196,358	0	0	0	944,296	25-1	0
25	0,5715	RESIST1-2 T-	Combination	Max	0	242,545	0	0	0	953,64	25-1	0,5715
25	0	RESIST1-2 T-	Combination	Min	0	-261,416	0	0	0	44,8266	25-1	0
25	0,5715	RESIST1-2 T-	Combination	Min	0	-215,227	0	0	0	72,6122	25-1	0,5715
25	0	E-SERV1-1	Combination	Max	0	63,625	0	0	0	456,9284	25-1	0
25	0,5715	E-SERV1-1	Combination	Max	0	86,693	0	0	0	457,2556	25-1	0,5715
25	0	E-SERV1-1	Combination	Min	0	-99,388	0	0	0	41,9194	25-1	0
25	0,5715	E-SERV1-1	Combination	Min	0	-76,32	0	0	0	48,7203	25-1	0,5715
25	0	E-SERV1-2	Combination	Max	0	79,771	0	0	0	488,306	25-1	0
25	0,5715	E-SERV1-2	Combination	Max	0	104,208	0	0	0	493,8215	25-1	0,5715
25	0	E-SERV1-2	Combination	Min	0	-116,91	0	0	0	59,3	25-1	0
25	0,5715	E-SERV1-2	Combination	Min	0	-92,471	0	0	0	73,6112	25-1	0,5715
25	0	E-RESIST1-1	Combination	Max	0	158,778	0	0	0	954,0879	25-1	0
25	0,5715	E-RESIST1-1	Combination	Max	0	201,778	0	0	0	951,7945	25-1	0,5715
25	0	E-RESIST1-1	Combination	Min	0	-220,634	0	0	0	-11,8455	25-1	0
25	0,5715	E-RESIST1-1	Combination	Min	0	-177,636	0	0	0	0,9286	25-1	0,5715
25	0	E-RESIST1-2	Combination	Max	0	196,358	0	0	0	1027,1193	25-1	0
25	0,5715	E-RESIST1-2	Combination	Max	0	242,545	0	0	0	1036,9016	25-1	0,5715
25	0	E-RESIST1-2	Combination	Min	0	-261,416	0	0	0	28,6077	25-1	0
25	0,5715	E-RESIST1-2	Combination	Min	0	-215,227	0	0	0	58,8622	25-1	0,5715
26	0	LINEA	LinStatic		0	3,638E-12	0	0	0	57,2962	26-1	0
26	0,5715	LINEA	LinStatic		0	5,446	0	0	0	55,7399	26-1	0,5715
26	0	HL93 +	LinMoving	Max	0	86,693	0	0	0	324,0855	26-1	0
26	0,5715	HL93 +	LinMoving	Max	0	99,157	0	0	0	327,3341	26-1	0,5715
26	0	HL93 +	LinMoving	Min	0	-76,32	0	0	0	-57,0195	26-1	0
26	0,5715	HL93 +	LinMoving	Min	0	-66,804	0	0	0	-67,2575	26-1	0,5715
26	0	TAMDEM +	LinMoving	Max	0	96,972	0	0	0	360,6513	26-1	0
26	0,5715	TAMDEM +	LinMoving	Max	0	110,19	0	0	0	358,6695	26-1	0,5715
26	0	TAMDEM +	LinMoving	Min	0	-83,941	0	0	0	-59,5589	26-1	0
26	0,5715	TAMDEM +	LinMoving	Min	0	-71,139	0	0	0	-70,2494	26-1	0,5715
26	0	HL93 -	LinMoving	Max	0	75,793	0	0	0	291,6769	26-1	0
26	0,5715	HL93 -	LinMoving	Max	0	89,241	0	0	0	294,6007	26-1	0,5715
26	0	HL93 -	LinMoving	Min	0	-62,966	0	0	0	-84,4498	26-1	0
26	0,5715	HL93 -	LinMoving	Min	0	-51,183	0	0	0	-87,6331	26-1	0,5715
26	0	TAMDEM -	LinMoving	Max	0	104,208	0	0	0	324,8784	26-1	0
26	0,5715	TAMDEM -	LinMoving	Max	0	116,115	0	0	0	323,0931	26-1	0,5715
26	0	TAMDEM -	LinMoving	Min	0	-92,471	0	0	0	-53,6513	26-1	0
26	0,5715	TAMDEM -	LinMoving	Min	0	-80,939	0	0	0	-63,2814	26-1	0,5715
26	0	SERV1-1 H+	Combination	Max	0	86,693	0	0	0	457,2556	26-1	0
26	0,5715	SERV1-1 H+	Combination	Max	0	111,815	0	0	0	456,887	26-1	0,5715
26	0	SERV1-1 H+	Combination	Min	0	-76,32	0	0	0	76,1506	26-1	0
26	0,5715	SERV1-1 H+	Combination	Min	0	-54,145	0	0	0	62,2953	26-1	0,5715
26	0	SERV1-2 T+	Combination	Max	0	96,972	0	0	0	493,8215	26-1	0
26	0,5715	SERV1-2 T+	Combination	Max	0	122,848	0	0	0	488,2224	26-1	0,5715
26	0	SERV1-2 T+	Combination	Min	0	-83,941	0	0	0	73,6112	26-1	0
26	0,5715	SERV1-2 T+	Combination	Min	0	-58,481	0	0	0	59,3035	26-1	0,5715
26	0	RESIST1-2 T+	Combination	Max	0	225,702	0	0	0	1036,9016	26-1	0
26	0,5715	RESIST1-2 T+	Combination	Max	0	275,239	0	0	0	1026,9247	26-1	0,5715
26	0	RESIST1-2 T+	Combination	Min	0	-195,374	0	0	0	58,8622	26-1	0
26	0,5715	RESIST1-2 T+	Combination	Min	0	-146,805	0	0	0	28,6159	26-1	0,5715
26	0	SERV1-1 H-	Combination	Max	0	75,793	0	0	0	424,847	26-1	0
26	0,5715	SERV1-1 H-	Combination	Max	0	101,9	0	0	0	424,1536	26-1	0,5715
26	0	SERV1-1 H-	Combination	Min	0	-62,966	0	0	0	48,7203	26-1	0
26	0,5715	SERV1-1 H-	Combination	Min	0	-38,524	0	0	0	41,9198	26-1	0,5715
26	0	SERV1-2 T-	Combination	Max	0	104,208	0	0	0	458,0485	26-1	0
26	0,5715	SERV1-2 T-	Combination	Max	0	128,774	0	0	0	452,646	26-1	0,5715
26	0	SERV1-2 T-	Combination	Min	0	-92,471	0	0	0	79,5188	26-1	0
26	0,5715	SERV1-2 T-	Combination	Min	0	-68,28	0	0	0	66,2715	26-1	0,5715
26	0	RESIST 1-1 H+	Combination	Max	0	201,778	0	0	0	951,7945	26-1	0
26	0,5715	RESIST 1-1 H+	Combination	Max	0	249,559	0	0	0	953,9915	26-1	0,5715
26	0	RESIST 1-1 H+	Combination	Min	0	-177,636	0	0	0	64,7726	26-1	0
26	0,5715	RESIST 1-1 H+	Combination	Min	0	-136,714	0	0	0	35,5794	26-1	0,5715
26	0	RESIST1-1 H-	Combination	Max	0	176,408	0	0	0	876,3636	26-1	0
26	0,5715	RESIST1-1 H-	Combination	Max	0	226,481	0	0	0	877,8044	26-1	0,5715
26	0	RESIST1-1 H-	Combination	Min	0	-146,552	0	0	0	0,9286	26-1	0
26	0,5715	RESIST1-1 H-	Combination	Min	0	-100,355	0	0	0	-11,8447	26-1	0,5715

26	0	RESIST1-2 T-	Combination	Max	0	242,545	0	0	0	953,64	26-1	0
26	0,5715	RESIST1-2 T-	Combination	Max	0	289,03	0	0	0	944,1206	26-1	0,5715
26	0	RESIST1-2 T-	Combination	Min	0	-215,227	0	0	0	72,6122	26-1	0
26	0,5715	RESIST1-2 T-	Combination	Min	0	-169,614	0	0	0	44,834	26-1	0,5715
26	0	E-SERV1-1	Combination	Max	0	86,693	0	0	0	457,2556	26-1	0
26	0,5715	E-SERV1-1	Combination	Max	0	111,815	0	0	0	456,887	26-1	0,5715
26	0	E-SERV1-1	Combination	Min	0	-76,32	0	0	0	48,7203	26-1	0
26	0,5715	E-SERV1-1	Combination	Min	0	-54,145	0	0	0	41,9198	26-1	0,5715
26	0	E-SERV1-2	Combination	Max	0	104,208	0	0	0	493,8215	26-1	0
26	0,5715	E-SERV1-2	Combination	Max	0	128,774	0	0	0	488,2224	26-1	0,5715
26	0	E-SERV1-2	Combination	Min	0	-92,471	0	0	0	73,6112	26-1	0
26	0,5715	E-SERV1-2	Combination	Min	0	-68,28	0	0	0	59,3035	26-1	0,5715
26	0	E-RESIST1-1	Combination	Max	0	201,778	0	0	0	951,7945	26-1	0
26	0,5715	E-RESIST1-1	Combination	Max	0	249,559	0	0	0	953,9915	26-1	0,5715
26	0	E-RESIST1-1	Combination	Min	0	-177,636	0	0	0	0,9286	26-1	0
26	0,5715	E-RESIST1-1	Combination	Min	0	-136,714	0	0	0	-11,8447	26-1	0,5715
26	0	E-RESIST1-2	Combination	Max	0	242,545	0	0	0	1036,9016	26-1	0
26	0,5715	E-RESIST1-2	Combination	Max	0	289,03	0	0	0	1026,9247	26-1	0,5715
26	0	E-RESIST1-2	Combination	Min	0	-215,227	0	0	0	58,8622	26-1	0
26	0,5715	E-RESIST1-2	Combination	Min	0	-169,614	0	0	0	28,6159	26-1	0,5715
27	0	LINEA	LinStatic		0	5,446	0	0	0	55,7399	27-1	0
27	0,5715	LINEA	LinStatic		0	10,893	0	0	0	51,071	27-1	0,5715
27	0	HL93 +	LinMoving	Max	0	99,157	0	0	0	327,3341	27-1	0
27	0,5715	HL93 +	LinMoving	Max	0	114,569	0	0	0	317,6702	27-1	0,5715
27	0	HL93 +	LinMoving	Min	0	-66,804	0	0	0	-67,2575	27-1	0
27	0,5715	HL93 +	LinMoving	Min	0	-57,321	0	0	0	-77,4956	27-1	0,5715
27	0	TAMDEM +	LinMoving	Max	0	110,19	0	0	0	358,6695	27-1	0
27	0,5715	TAMDEM +	LinMoving	Max	0	123,417	0	0	0	345,8936	27-1	0,5715
27	0	TAMDEM +	LinMoving	Min	0	-71,139	0	0	0	-70,2494	27-1	0
27	0,5715	TAMDEM +	LinMoving	Min	0	-58,745	0	0	0	-80,9428	27-1	0,5715
27	0	HL93 -	LinMoving	Max	0	89,241	0	0	0	294,6007	27-1	0
27	0,5715	HL93 -	LinMoving	Max	0	103,112	0	0	0	285,9032	27-1	0,5715
27	0	HL93 -	LinMoving	Min	0	-51,183	0	0	0	-87,6331	27-1	0
27	0,5715	HL93 -	LinMoving	Min	0	-42,942	0	0	0	-90,8189	27-1	0,5715
27	0	TAMDEM -	LinMoving	Max	0	116,115	0	0	0	323,0931	27-1	0
27	0,5715	TAMDEM -	LinMoving	Max	0	127,93	0	0	0	311,5844	27-1	0,5715
27	0	TAMDEM -	LinMoving	Min	0	-80,939	0	0	0	-63,2814	27-1	0
27	0,5715	TAMDEM -	LinMoving	Min	0	-69,774	0	0	0	-72,9141	27-1	0,5715
27	0	SERV1-1 H+	Combination	Max	0	111,815	0	0	0	456,887	27-1	0
27	0,5715	SERV1-1 H+	Combination	Max	0	139,887	0	0	0	436,3714	27-1	0,5715
27	0	SERV1-1 H+	Combination	Min	0	-54,145	0	0	0	62,2953	27-1	0
27	0,5715	SERV1-1 H+	Combination	Min	0	-32,004	0	0	0	41,2056	27-1	0,5715
27	0	SERV1-2 T+	Combination	Max	0	122,848	0	0	0	488,2224	27-1	0
27	0,5715	SERV1-2 T+	Combination	Max	0	148,734	0	0	0	464,5947	27-1	0,5715
27	0	SERV1-2 T+	Combination	Min	0	-58,481	0	0	0	59,3035	27-1	0
27	0,5715	SERV1-2 T+	Combination	Min	0	-33,427	0	0	0	37,7583	27-1	0,5715
27	0	RESIST1-2 T+	Combination	Max	0	275,239	0	0	0	1026,9247	27-1	0
27	0,5715	RESIST1-2 T+	Combination	Max	0	324,797	0	0	0	981,096	27-1	0,5715
27	0	RESIST1-2 T+	Combination	Min	0	-146,805	0	0	0	28,6159	27-1	0
27	0,5715	RESIST1-2 T+	Combination	Min	0	-99,184	0	0	0	-12,3657	27-1	0,5715
27	0	SERV1-1 H-	Combination	Max	0	101,9	0	0	0	424,1536	27-1	0
27	0,5715	SERV1-1 H-	Combination	Max	0	128,43	0	0	0	404,6044	27-1	0,5715
27	0	SERV1-1 H-	Combination	Min	0	-38,524	0	0	0	41,9198	27-1	0
27	0,5715	SERV1-1 H-	Combination	Min	0	-17,625	0	0	0	27,8823	27-1	0,5715
27	0	SERV1-2 T-	Combination	Max	0	128,774	0	0	0	452,646	27-1	0
27	0,5715	SERV1-2 T-	Combination	Max	0	153,247	0	0	0	430,2856	27-1	0,5715
27	0	SERV1-2 T-	Combination	Min	0	-68,28	0	0	0	66,2715	27-1	0
27	0,5715	SERV1-2 T-	Combination	Min	0	-44,456	0	0	0	45,7871	27-1	0,5715
27	0	RESIST 1-1 H+	Combination	Max	0	249,559	0	0	0	953,9915	27-1	0
27	0,5715	RESIST 1-1 H+	Combination	Max	0	304,204	0	0	0	915,4061	27-1	0,5715
27	0	RESIST 1-1 H+	Combination	Min	0	-136,714	0	0	0	35,5794	27-1	0
27	0,5715	RESIST 1-1 H+	Combination	Min	0	-95,871	0	0	0	-4,3422	27-1	0,5715
27	0	RESIST1-1 H-	Combination	Max	0	226,481	0	0	0	877,8044	27-1	0
27	0,5715	RESIST1-1 H-	Combination	Max	0	277,538	0	0	0	841,4684	27-1	0,5715
27	0	RESIST1-1 H-	Combination	Min	0	-100,355	0	0	0	-11,8447	27-1	0
27	0,5715	RESIST1-1 H-	Combination	Min	0	-62,403	0	0	0	-35,3522	27-1	0,5715
27	0	RESIST1-2 T-	Combination	Max	0	289,03	0	0	0	944,1206	27-1	0
27	0,5715	RESIST1-2 T-	Combination	Max	0	335,302	0	0	0	901,2415	27-1	0,5715

27	0	RESIST1-2 T-	Combination	Min	0	-169,614	0	0	0	44,834	27-1	0
27	0,5715	RESIST1-2 T-	Combination	Min	0	-124,854	0	0	0	6,3211	27-1	0,5715
27	0	E-SERV1-1	Combination	Max	0	111,815	0	0	0	456,887	27-1	0
27	0,5715	E-SERV1-1	Combination	Max	0	139,887	0	0	0	436,3714	27-1	0,5715
27	0	E-SERV1-1	Combination	Min	0	-54,145	0	0	0	41,9198	27-1	0
27	0,5715	E-SERV1-1	Combination	Min	0	-32,004	0	0	0	27,8823	27-1	0,5715
27	0	E-SERV1-2	Combination	Max	0	128,774	0	0	0	488,2224	27-1	0
27	0,5715	E-SERV1-2	Combination	Max	0	153,247	0	0	0	464,5947	27-1	0,5715
27	0	E-SERV1-2	Combination	Min	0	-68,28	0	0	0	59,3035	27-1	0
27	0,5715	E-SERV1-2	Combination	Min	0	-44,456	0	0	0	37,7583	27-1	0,5715
27	0	E-RESIST1-1	Combination	Max	0	249,559	0	0	0	953,9915	27-1	0
27	0,5715	E-RESIST1-1	Combination	Max	0	304,204	0	0	0	915,4061	27-1	0,5715
27	0	E-RESIST1-1	Combination	Min	0	-136,714	0	0	0	-11,8447	27-1	0
27	0,5715	E-RESIST1-1	Combination	Min	0	-95,871	0	0	0	-35,3522	27-1	0,5715
27	0	E-RESIST1-2	Combination	Max	0	289,03	0	0	0	1026,9247	27-1	0
27	0,5715	E-RESIST1-2	Combination	Max	0	335,302	0	0	0	981,096	27-1	0,5715
27	0	E-RESIST1-2	Combination	Min	0	-169,614	0	0	0	28,6159	27-1	0
27	0,5715	E-RESIST1-2	Combination	Min	0	-124,854	0	0	0	-12,3657	27-1	0,5715
28	0	LINEA	LinStatic		0	10,893	0	0	0	51,071	28-1	0
28	0,5715	LINEA	LinStatic		0	16,339	0	0	0	43,2894	28-1	0,5715
28	0	HL93 +	LinMoving	Max	0	114,569	0	0	0	317,6702	28-1	0
28	0,5715	HL93 +	LinMoving	Max	0	130,785	0	0	0	297,3281	28-1	0,5715
28	0	HL93 +	LinMoving	Min	0	-57,321	0	0	0	-77,4956	28-1	0
28	0,5715	HL93 +	LinMoving	Min	0	-47,349	0	0	0	-87,7336	28-1	0,5715
28	0	TAMDEM +	LinMoving	Max	0	123,417	0	0	0	345,8936	28-1	0
28	0,5715	TAMDEM +	LinMoving	Max	0	136,52	0	0	0	322,4401	28-1	0,5715
28	0	TAMDEM +	LinMoving	Min	0	-58,745	0	0	0	-80,9428	28-1	0
28	0,5715	TAMDEM +	LinMoving	Min	0	-46,89	0	0	0	-91,6363	28-1	0,5715
28	0	HL93 -	LinMoving	Max	0	103,112	0	0	0	285,9032	28-1	0
28	0,5715	HL93 -	LinMoving	Max	0	117,706	0	0	0	267,5953	28-1	0,5715
28	0	HL93 -	LinMoving	Min	0	-42,942	0	0	0	-90,8189	28-1	0
28	0,5715	HL93 -	LinMoving	Min	0	-35,432	0	0	0	-94,0047	28-1	0,5715
28	0	TAMDEM -	LinMoving	Max	0	127,93	0	0	0	311,5844	28-1	0
28	0,5715	TAMDEM -	LinMoving	Max	0	139,002	0	0	0	290,4573	28-1	0,5715
28	0	TAMDEM -	LinMoving	Min	0	-69,774	0	0	0	-72,9141	28-1	0
28	0,5715	TAMDEM -	LinMoving	Min	0	-59,095	0	0	0	-82,5469	28-1	0,5715
28	0	SERV1-1 H+	Combination	Max	0	139,887	0	0	0	436,3714	28-1	0
28	0,5715	SERV1-1 H+	Combination	Max	0	168,761	0	0	0	397,9431	28-1	0,5715
28	0	SERV1-1 H+	Combination	Min	0	-32,004	0	0	0	41,2056	28-1	0
28	0,5715	SERV1-1 H+	Combination	Min	0	-9,373	0	0	0	12,8814	28-1	0,5715
28	0	SERV1-2 T+	Combination	Max	0	148,734	0	0	0	464,5947	28-1	0
28	0,5715	SERV1-2 T+	Combination	Max	0	174,496	0	0	0	423,0552	28-1	0,5715
28	0	SERV1-2 T+	Combination	Min	0	-33,427	0	0	0	37,7583	28-1	0
28	0,5715	SERV1-2 T+	Combination	Min	0	-8,914	0	0	0	8,9787	28-1	0,5715
28	0	RESIST1-2 T+	Combination	Max	0	324,797	0	0	0	981,096	28-1	0
28	0,5715	RESIST1-2 T+	Combination	Max	0	374,067	0	0	0	899,6872	28-1	0,5715
28	0	RESIST1-2 T+	Combination	Min	0	-99,184	0	0	0	-12,3657	28-1	0
28	0,5715	RESIST1-2 T+	Combination	Min	0	-52,82	0	0	0	-64,0757	28-1	0,5715
28	0	SERV1-1 H-	Combination	Max	0	128,43	0	0	0	404,6044	28-1	0
28	0,5715	SERV1-1 H-	Combination	Max	0	155,683	0	0	0	368,2103	28-1	0,5715
28	0	SERV1-1 H-	Combination	Min	0	-17,625	0	0	0	27,8823	28-1	0
28	0,5715	SERV1-1 H-	Combination	Min	0	2,544	0	0	0	6,6104	28-1	0,5715
28	0	SERV1-2 T-	Combination	Max	0	153,247	0	0	0	430,2856	28-1	0
28	0,5715	SERV1-2 T-	Combination	Max	0	176,978	0	0	0	391,0724	28-1	0,5715
28	0	SERV1-2 T-	Combination	Min	0	-44,456	0	0	0	45,7871	28-1	0
28	0,5715	SERV1-2 T-	Combination	Min	0	-21,119	0	0	0	18,0681	28-1	0,5715
28	0	RESIST 1-1 H+	Combination	Max	0	304,204	0	0	0	915,4061	28-1	0
28	0,5715	RESIST 1-1 H+	Combination	Max	0	360,719	0	0	0	841,239	28-1	0,5715
28	0	RESIST 1-1 H+	Combination	Min	0	-95,871	0	0	0	-4,3422	28-1	0
28	0,5715	RESIST 1-1 H+	Combination	Min	0	-53,888	0	0	0	-54,9921	28-1	0,5715
28	0	RESIST1-1 H-	Combination	Max	0	277,538	0	0	0	841,4684	28-1	0
28	0,5715	RESIST1-1 H-	Combination	Max	0	330,279	0	0	0	772,0358	28-1	0,5715
28	0	RESIST1-1 H-	Combination	Min	0	-62,403	0	0	0	-35,3522	28-1	0
28	0,5715	RESIST1-1 H-	Combination	Min	0	-26,151	0	0	0	-69,5881	28-1	0,5715
28	0	RESIST1-2 T-	Combination	Max	0	335,302	0	0	0	901,2415	28-1	0
28	0,5715	RESIST1-2 T-	Combination	Max	0	379,844	0	0	0	825,2472	28-1	0,5715
28	0	RESIST1-2 T-	Combination	Min	0	-124,854	0	0	0	6,3211	28-1	0
28	0,5715	RESIST1-2 T-	Combination	Min	0	-81,227	0	0	0	-42,9201	28-1	0,5715

28	0	E-SERV1-1	Combination	Max	0	139,887	0	0	0	436,3714	28-1	0
28	0,5715	E-SERV1-1	Combination	Max	0	168,761	0	0	0	397,9431	28-1	0,5715
28	0	E-SERV1-1	Combination	Min	0	-32,004	0	0	0	27,8823	28-1	0
28	0,5715	E-SERV1-1	Combination	Min	0	-9,373	0	0	0	6,6104	28-1	0,5715
28	0	E-SERV1-2	Combination	Max	0	153,247	0	0	0	464,5947	28-1	0
28	0,5715	E-SERV1-2	Combination	Max	0	176,978	0	0	0	423,0552	28-1	0,5715
28	0	E-SERV1-2	Combination	Min	0	-44,456	0	0	0	37,7583	28-1	0
28	0,5715	E-SERV1-2	Combination	Min	0	-21,119	0	0	0	8,9787	28-1	0,5715
28	0	E-RESIST1-1	Combination	Max	0	304,204	0	0	0	915,4061	28-1	0
28	0,5715	E-RESIST1-1	Combination	Max	0	360,719	0	0	0	841,239	28-1	0,5715
28	0	E-RESIST1-1	Combination	Min	0	-95,871	0	0	0	-35,3522	28-1	0
28	0,5715	E-RESIST1-1	Combination	Min	0	-53,888	0	0	0	-69,5881	28-1	0,5715
28	0	E-RESIST1-2	Combination	Max	0	335,302	0	0	0	981,096	28-1	0
28	0,5715	E-RESIST1-2	Combination	Max	0	379,844	0	0	0	899,6872	28-1	0,5715
28	0	E-RESIST1-2	Combination	Min	0	-124,854	0	0	0	-12,3657	28-1	0
28	0,5715	E-RESIST1-2	Combination	Min	0	-81,227	0	0	0	-64,0757	28-1	0,5715
29	0	LINEA	LinStatic		0	16,339	0	0	0	43,2894	29-1	0
29	0,5715	LINEA	LinStatic		0	21,786	0	0	0	32,3953	29-1	0,5715
29	0	HL93 +	LinMoving	Max	0	130,785	0	0	0	297,3281	29-1	0
29	0,5715	HL93 +	LinMoving	Max	0	147,484	0	0	0	266,5733	29-1	0,5715
29	0	HL93 +	LinMoving	Min	0	-47,349	0	0	0	-87,7336	29-1	0
29	0,5715	HL93 +	LinMoving	Min	0	-36,901	0	0	0	-97,9716	29-1	0,5715
29	0	TAMDEM +	LinMoving	Max	0	136,52	0	0	0	322,4401	29-1	0
29	0,5715	TAMDEM +	LinMoving	Max	0	149,367	0	0	0	288,8251	29-1	0,5715
29	0	TAMDEM +	LinMoving	Min	0	-46,89	0	0	0	-91,6363	29-1	0
29	0,5715	TAMDEM +	LinMoving	Min	0	-35,709	0	0	0	-102,3297	29-1	0,5715
29	0	HL93 -	LinMoving	Max	0	117,706	0	0	0	267,5953	29-1	0
29	0,5715	HL93 -	LinMoving	Max	0	132,736	0	0	0	239,916	29-1	0,5715
29	0	HL93 -	LinMoving	Min	0	-35,432	0	0	0	-94,0047	29-1	0
29	0,5715	HL93 -	LinMoving	Min	0	-28,938	0	0	0	-97,2339	29-1	0,5715
29	0	TAMDEM -	LinMoving	Max	0	139,002	0	0	0	290,4573	29-1	0
29	0,5715	TAMDEM -	LinMoving	Max	0	149,288	0	0	0	260,1765	29-1	0,5715
29	0	TAMDEM -	LinMoving	Min	0	-59,095	0	0	0	-82,5469	29-1	0
29	0,5715	TAMDEM -	LinMoving	Min	0	-49,023	0	0	0	-92,1796	29-1	0,5715
29	0	SERV1-1 H+	Combination	Max	0	168,761	0	0	0	397,9431	29-1	0
29	0,5715	SERV1-1 H+	Combination	Max	0	198,119	0	0	0	341,8677	29-1	0,5715
29	0	SERV1-1 H+	Combination	Min	0	-9,373	0	0	0	12,8814	29-1	0
29	0,5715	SERV1-1 H+	Combination	Min	0	13,734	0	0	0	-22,6772	29-1	0,5715
29	0	SERV1-2 T+	Combination	Max	0	174,496	0	0	0	423,0552	29-1	0
29	0,5715	SERV1-2 T+	Combination	Max	0	200,002	0	0	0	364,1195	29-1	0,5715
29	0	SERV1-2 T+	Combination	Min	0	-8,914	0	0	0	8,9787	29-1	0
29	0,5715	SERV1-2 T+	Combination	Min	0	14,926	0	0	0	-27,0353	29-1	0,5715
29	0	RESIST1-2 T+	Combination	Max	0	374,067	0	0	0	899,6872	29-1	0
29	0,5715	RESIST1-2 T+	Combination	Max	0	422,74	0	0	0	783,8987	29-1	0,5715
29	0	RESIST1-2 T+	Combination	Min	0	-52,82	0	0	0	-64,0757	29-1	0
29	0,5715	RESIST1-2 T+	Combination	Min	0	-8,023	0	0	0	-126,514	29-1	0,5715
29	0	SERV1-1 H-	Combination	Max	0	155,683	0	0	0	368,2103	29-1	0
29	0,5715	SERV1-1 H-	Combination	Max	0	183,371	0	0	0	315,2104	29-1	0,5715
29	0	SERV1-1 H-	Combination	Min	0	2,544	0	0	0	6,6104	29-1	0
29	0,5715	SERV1-1 H-	Combination	Min	0	21,697	0	0	0	-21,9395	29-1	0,5715
29	0	SERV1-2 T-	Combination	Max	0	176,978	0	0	0	391,0724	29-1	0
29	0,5715	SERV1-2 T-	Combination	Max	0	199,923	0	0	0	335,4709	29-1	0,5715
29	0	SERV1-2 T-	Combination	Min	0	-21,119	0	0	0	18,0681	29-1	0
29	0,5715	SERV1-2 T-	Combination	Min	0	1,612	0	0	0	-16,8852	29-1	0,5715
29	0	RESIST 1-1 H+	Combination	Max	0	360,719	0	0	0	841,239	29-1	0
29	0,5715	RESIST 1-1 H+	Combination	Max	0	418,359	0	0	0	732,1077	29-1	0,5715
29	0	RESIST 1-1 H+	Combination	Min	0	-53,888	0	0	0	-54,9921	29-1	0
29	0,5715	RESIST 1-1 H+	Combination	Min	0	-10,797	0	0	0	-116,3705	29-1	0,5715
29	0	RESIST1-1 H-	Combination	Max	0	330,279	0	0	0	772,0358	29-1	0
29	0,5715	RESIST1-1 H-	Combination	Max	0	384,032	0	0	0	670,0628	29-1	0,5715
29	0	RESIST1-1 H-	Combination	Min	0	-26,151	0	0	0	-69,5881	29-1	0
29	0,5715	RESIST1-1 H-	Combination	Min	0	7,737	0	0	0	-114,6535	29-1	0,5715
29	0	RESIST1-2 T-	Combination	Max	0	379,844	0	0	0	825,2472	29-1	0
29	0,5715	RESIST1-2 T-	Combination	Max	0	422,558	0	0	0	717,2192	29-1	0,5715
29	0	RESIST1-2 T-	Combination	Min	0	-81,227	0	0	0	-42,9201	29-1	0
29	0,5715	RESIST1-2 T-	Combination	Min	0	-39,011	0	0	0	-102,8897	29-1	0,5715
29	0	E-SERV1-1	Combination	Max	0	168,761	0	0	0	397,9431	29-1	0
29	0,5715	E-SERV1-1	Combination	Max	0	198,119	0	0	0	341,8677	29-1	0,5715

29	0	E-SERV1-1	Combination	Min	0	-9,373	0	0	0	6,6104	29-1	0
29	0,5715	E-SERV1-1	Combination	Min	0	13,734	0	0	0	-22,6772	29-1	0,5715
29	0	E-SERV1-2	Combination	Max	0	176,978	0	0	0	423,0552	29-1	0
29	0,5715	E-SERV1-2	Combination	Max	0	200,002	0	0	0	364,1195	29-1	0,5715
29	0	E-SERV1-2	Combination	Min	0	-21,119	0	0	0	8,9787	29-1	0
29	0,5715	E-SERV1-2	Combination	Min	0	1,612	0	0	0	-27,0353	29-1	0,5715
29	0	E-RESIST1-1	Combination	Max	0	360,719	0	0	0	841,239	29-1	0
29	0,5715	E-RESIST1-1	Combination	Max	0	418,359	0	0	0	732,1077	29-1	0,5715
29	0	E-RESIST1-1	Combination	Min	0	-53,888	0	0	0	-69,5881	29-1	0
29	0,5715	E-RESIST1-1	Combination	Min	0	-10,797	0	0	0	-116,3705	29-1	0,5715
29	0	E-RESIST1-2	Combination	Max	0	379,844	0	0	0	899,6872	29-1	0
29	0,5715	E-RESIST1-2	Combination	Max	0	422,74	0	0	0	783,8987	29-1	0,5715
29	0	E-RESIST1-2	Combination	Min	0	-81,227	0	0	0	-64,0757	29-1	0
29	0,5715	E-RESIST1-2	Combination	Min	0	-39,011	0	0	0	-126,514	29-1	0,5715
30	0	LINEA	LinStatic		0	21,786	0	0	0	32,3953	30-1	0
30	0,5715	LINEA	LinStatic		0	27,232	0	0	0	18,3885	30-1	0,5715
30	0	HL93 +	LinMoving	Max	0	147,484	0	0	0	266,5733	30-1	0
30	0,5715	HL93 +	LinMoving	Max	0	163,953	0	0	0	223,2431	30-1	0,5715
30	0	HL93 +	LinMoving	Min	0	-36,901	0	0	0	-97,9716	30-1	0
30	0,5715	HL93 +	LinMoving	Min	0	-26,104	0	0	0	-108,2096	30-1	0,5715
30	0	TAMDEM +	LinMoving	Max	0	149,367	0	0	0	288,8251	30-1	0
30	0,5715	TAMDEM +	LinMoving	Max	0	161,824	0	0	0	245,8678	30-1	0,5715
30	0	TAMDEM +	LinMoving	Min	0	-35,709	0	0	0	-102,3297	30-1	0
30	0,5715	TAMDEM +	LinMoving	Min	0	-25,333	0	0	0	-113,0232	30-1	0,5715
30	0	HL93 -	LinMoving	Max	0	132,736	0	0	0	239,916	30-1	0
30	0,5715	HL93 -	LinMoving	Max	0	147,558	0	0	0	200,9188	30-1	0,5715
30	0	HL93 -	LinMoving	Min	0	-28,938	0	0	0	-97,2339	30-1	0
30	0,5715	HL93 -	LinMoving	Min	0	-22,778	0	0	0	-100,6706	30-1	0,5715
30	0	TAMDEM -	LinMoving	Max	0	149,288	0	0	0	260,1765	30-1	0
30	0,5715	TAMDEM -	LinMoving	Max	0	158,75	0	0	0	221,4802	30-1	0,5715
30	0	TAMDEM -	LinMoving	Min	0	-49,023	0	0	0	-92,1796	30-1	0
30	0,5715	TAMDEM -	LinMoving	Min	0	-39,674	0	0	0	-101,8124	30-1	0,5715
30	0	SERV1-1 H+	Combination	Max	0	198,119	0	0	0	341,8677	30-1	0
30	0,5715	SERV1-1 H+	Combination	Max	0	227,247	0	0	0	265,9824	30-1	0,5715
30	0	SERV1-1 H+	Combination	Min	0	13,734	0	0	0	-22,6772	30-1	0
30	0,5715	SERV1-1 H+	Combination	Min	0	37,19	0	0	0	-65,4703	30-1	0,5715
30	0	SERV1-2 T+	Combination	Max	0	200,002	0	0	0	364,1195	30-1	0
30	0,5715	SERV1-2 T+	Combination	Max	0	225,118	0	0	0	288,6072	30-1	0,5715
30	0	SERV1-2 T+	Combination	Min	0	14,926	0	0	0	-27,0353	30-1	0
30	0,5715	SERV1-2 T+	Combination	Min	0	37,961	0	0	0	-70,2838	30-1	0,5715
30	0	RESIST1-2 T+	Combination	Max	0	422,74	0	0	0	783,8987	30-1	0
30	0,5715	RESIST1-2 T+	Combination	Max	0	470,507	0	0	0	635,638	30-1	0,5715
30	0	RESIST1-2 T+	Combination	Min	0	-8,023	0	0	0	-126,514	30-1	0
30	0,5715	RESIST1-2 T+	Combination	Min	0	34,899	0	0	0	-199,6808	30-1	0,5715
30	0	SERV1-1 H-	Combination	Max	0	183,371	0	0	0	315,2104	30-1	0
30	0,5715	SERV1-1 H-	Combination	Max	0	210,851	0	0	0	243,6581	30-1	0,5715
30	0	SERV1-1 H-	Combination	Min	0	21,697	0	0	0	-21,9395	30-1	0
30	0,5715	SERV1-1 H-	Combination	Min	0	40,515	0	0	0	-57,9312	30-1	0,5715
30	0	SERV1-2 T-	Combination	Max	0	199,923	0	0	0	335,4709	30-1	0
30	0,5715	SERV1-2 T-	Combination	Max	0	222,044	0	0	0	264,2196	30-1	0,5715
30	0	SERV1-2 T-	Combination	Min	0	1,612	0	0	0	-16,8852	30-1	0
30	0,5715	SERV1-2 T-	Combination	Min	0	23,62	0	0	0	-59,0731	30-1	0,5715
30	0	RESIST 1-1 H+	Combination	Max	0	418,359	0	0	0	732,1077	30-1	0
30	0,5715	RESIST 1-1 H+	Combination	Max	0	475,463	0	0	0	582,9788	30-1	0,5715
30	0	RESIST 1-1 H+	Combination	Min	0	-10,797	0	0	0	-116,3705	30-1	0
30	0,5715	RESIST 1-1 H+	Combination	Min	0	33,105	0	0	0	-188,4773	30-1	0,5715
30	0	RESIST1-1 H-	Combination	Max	0	384,032	0	0	0	670,0628	30-1	0
30	0,5715	RESIST1-1 H-	Combination	Max	0	437,303	0	0	0	531,019	30-1	0,5715
30	0	RESIST1-1 H-	Combination	Min	0	7,737	0	0	0	-114,6535	30-1	0
30	0,5715	RESIST1-1 H-	Combination	Min	0	40,845	0	0	0	-170,9301	30-1	0,5715
30	0	RESIST1-2 T-	Combination	Max	0	422,558	0	0	0	717,2192	30-1	0
30	0,5715	RESIST1-2 T-	Combination	Max	0	463,352	0	0	0	578,8758	30-1	0,5715
30	0	RESIST1-2 T-	Combination	Min	0	-39,011	0	0	0	-102,8897	30-1	0
30	0,5715	RESIST1-2 T-	Combination	Min	0	1,52	0	0	0	-173,5878	30-1	0,5715
30	0	E-SERV1-1	Combination	Max	0	198,119	0	0	0	341,8677	30-1	0
30	0,5715	E-SERV1-1	Combination	Max	0	227,247	0	0	0	265,9824	30-1	0,5715
30	0	E-SERV1-1	Combination	Min	0	13,734	0	0	0	-22,6772	30-1	0
30	0,5715	E-SERV1-1	Combination	Min	0	37,19	0	0	0	-65,4703	30-1	0,5715

30	0	E-SERV1-2	Combination	Max	0	200,002	0	0	0	364,1195	30-1	0
30	0,5715	E-SERV1-2	Combination	Max	0	225,118	0	0	0	288,6072	30-1	0,5715
30	0	E-SERV1-2	Combination	Min	0	1,612	0	0	0	-27,0353	30-1	0
30	0,5715	E-SERV1-2	Combination	Min	0	23,62	0	0	0	-70,2838	30-1	0,5715
30	0	E-RESIST1-1	Combination	Max	0	418,359	0	0	0	732,1077	30-1	0
30	0,5715	E-RESIST1-1	Combination	Max	0	475,463	0	0	0	582,9788	30-1	0,5715
30	0	E-RESIST1-1	Combination	Min	0	-10,797	0	0	0	-116,3705	30-1	0
30	0,5715	E-RESIST1-1	Combination	Min	0	33,105	0	0	0	-188,4773	30-1	0,5715
30	0	E-RESIST1-2	Combination	Max	0	422,74	0	0	0	783,8987	30-1	0
30	0,5715	E-RESIST1-2	Combination	Max	0	470,507	0	0	0	635,638	30-1	0,5715
30	0	E-RESIST1-2	Combination	Min	0	-39,011	0	0	0	-126,514	30-1	0
30	0,5715	E-RESIST1-2	Combination	Min	0	1,52	0	0	0	-199,6808	30-1	0,5715
31	0	LINEA	LinStatic		0	27,232	0	0	0	18,3885	31-1	0
31	0,5715	LINEA	LinStatic		0	32,678	0	0	0	1,2691	31-1	0,5715
31	0	HL93 +	LinMoving	Max	0	163,953	0	0	0	223,2431	31-1	0
31	0,5715	HL93 +	LinMoving	Max	0	180,034	0	0	0	167,9901	31-1	0,5715
31	0	HL93 +	LinMoving	Min	0	-26,104	0	0	0	-108,2096	31-1	0
31	0,5715	HL93 +	LinMoving	Min	0	-19,369	0	0	0	-118,4476	31-1	0,5715
31	0	TAMDEM +	LinMoving	Max	0	161,824	0	0	0	245,8678	31-1	0
31	0,5715	TAMDEM +	LinMoving	Max	0	173,759	0	0	0	194,6917	31-1	0,5715
31	0	TAMDEM +	LinMoving	Min	0	-25,333	0	0	0	-113,0232	31-1	0
31	0,5715	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-123,7166	31-1	0,5715
31	0	HL93 -	LinMoving	Max	0	147,558	0	0	0	200,9188	31-1	0
31	0,5715	HL93 -	LinMoving	Max	0	162,031	0	0	0	151,1911	31-1	0,5715
31	0	HL93 -	LinMoving	Min	0	-22,778	0	0	0	-100,6706	31-1	0
31	0,5715	HL93 -	LinMoving	Min	0	-17,018	0	0	0	-106,6029	31-1	0,5715
31	0	TAMDEM -	LinMoving	Max	0	158,75	0	0	0	221,4802	31-1	0
31	0,5715	TAMDEM -	LinMoving	Max	0	167,347	0	0	0	179,5284	31-1	0,5715
31	0	TAMDEM -	LinMoving	Min	0	-39,674	0	0	0	-101,8124	31-1	0
31	0,5715	TAMDEM -	LinMoving	Min	0	-30,559	0	0	0	-114,976	31-1	0,5715
31	0	SERV1-1 H+	Combination	Max	0	227,247	0	0	0	265,9824	31-1	0
31	0,5715	SERV1-1 H+	Combination	Max	0	255,987	0	0	0	170,9399	31-1	0,5715
31	0	SERV1-1 H+	Combination	Min	0	37,19	0	0	0	-65,4703	31-1	0
31	0,5715	SERV1-1 H+	Combination	Min	0	56,583	0	0	0	-115,4978	31-1	0,5715
31	0	SERV1-2 T+	Combination	Max	0	225,118	0	0	0	288,6072	31-1	0
31	0,5715	SERV1-2 T+	Combination	Max	0	249,711	0	0	0	197,6415	31-1	0,5715
31	0	SERV1-2 T+	Combination	Min	0	37,961	0	0	0	-70,2838	31-1	0
31	0,5715	SERV1-2 T+	Combination	Min	0	57,24	0	0	0	-120,7668	31-1	0,5715
31	0	RESIST1-2 T+	Combination	Max	0	470,507	0	0	0	635,638	31-1	0
31	0,5715	RESIST1-2 T+	Combination	Max	0	517,058	0	0	0	457,5193	31-1	0,5715
31	0	RESIST1-2 T+	Combination	Min	0	34,899	0	0	0	-199,6808	31-1	0
31	0,5715	RESIST1-2 T+	Combination	Min	0	69,082	0	0	0	-283,576	31-1	0,5715
31	0	SERV1-1 H-	Combination	Max	0	210,851	0	0	0	243,6581	31-1	0
31	0,5715	SERV1-1 H-	Combination	Max	0	237,983	0	0	0	154,1409	31-1	0,5715
31	0	SERV1-1 H-	Combination	Min	0	40,515	0	0	0	-57,9312	31-1	0
31	0,5715	SERV1-1 H-	Combination	Min	0	58,935	0	0	0	-103,6531	31-1	0,5715
31	0	SERV1-2 T-	Combination	Max	0	222,044	0	0	0	264,2196	31-1	0
31	0,5715	SERV1-2 T-	Combination	Max	0	243,299	0	0	0	182,4782	31-1	0,5715
31	0	SERV1-2 T-	Combination	Min	0	23,62	0	0	0	-59,0731	31-1	0
31	0,5715	SERV1-2 T-	Combination	Min	0	45,393	0	0	0	-112,0262	31-1	0,5715
31	0	RESIST 1-1 H+	Combination	Max	0	475,463	0	0	0	582,9788	31-1	0
31	0,5715	RESIST 1-1 H+	Combination	Max	0	531,664	0	0	0	395,3713	31-1	0,5715
31	0	RESIST 1-1 H+	Combination	Min	0	33,105	0	0	0	-188,4773	31-1	0
31	0,5715	RESIST 1-1 H+	Combination	Min	0	67,553	0	0	0	-271,3125	31-1	0,5715
31	0	RESIST1-1 H-	Combination	Max	0	437,303	0	0	0	531,019	31-1	0
31	0,5715	RESIST1-1 H-	Combination	Max	0	489,761	0	0	0	356,2716	31-1	0,5715
31	0	RESIST1-1 H-	Combination	Min	0	40,845	0	0	0	-170,9301	31-1	0
31	0,5715	RESIST1-1 H-	Combination	Min	0	73,025	0	0	0	-243,7438	31-1	0,5715
31	0	RESIST1-2 T-	Combination	Max	0	463,352	0	0	0	578,8758	31-1	0
31	0,5715	RESIST1-2 T-	Combination	Max	0	502,133	0	0	0	422,2267	31-1	0,5715
31	0	RESIST1-2 T-	Combination	Min	0	1,52	0	0	0	-173,5878	31-1	0
31	0,5715	RESIST1-2 T-	Combination	Min	0	41,508	0	0	0	-263,2323	31-1	0,5715
31	0	E-SERV1-1	Combination	Max	0	227,247	0	0	0	265,9824	31-1	0
31	0,5715	E-SERV1-1	Combination	Max	0	255,987	0	0	0	170,9399	31-1	0,5715
31	0	E-SERV1-1	Combination	Min	0	37,19	0	0	0	-65,4703	31-1	0
31	0,5715	E-SERV1-1	Combination	Min	0	56,583	0	0	0	-115,4978	31-1	0,5715
31	0	E-SERV1-2	Combination	Max	0	225,118	0	0	0	288,6072	31-1	0
31	0,5715	E-SERV1-2	Combination	Max	0	249,711	0	0	0	197,6415	31-1	0,5715

31	0	E-SERV1-2	Combination	Min	0	23,62	0	0	0	-70,2838	31-1	0
31	0,5715	E-SERV1-2	Combination	Min	0	45,393	0	0	0	-120,7668	31-1	0,5715
31	0	E-RESIST1-1	Combination	Max	0	475,463	0	0	0	582,9788	31-1	0
31	0,5715	E-RESIST1-1	Combination	Max	0	531,664	0	0	0	395,3713	31-1	0,5715
31	0	E-RESIST1-1	Combination	Min	0	33,105	0	0	0	-188,4773	31-1	0
31	0,5715	E-RESIST1-1	Combination	Min	0	67,553	0	0	0	-271,3125	31-1	0,5715
31	0	E-RESIST1-2	Combination	Max	0	470,507	0	0	0	635,638	31-1	0
31	0,5715	E-RESIST1-2	Combination	Max	0	517,058	0	0	0	457,5193	31-1	0,5715
31	0	E-RESIST1-2	Combination	Min	0	1,52	0	0	0	-199,6808	31-1	0
31	0,5715	E-RESIST1-2	Combination	Min	0	41,508	0	0	0	-283,576	31-1	0,5715
32	0	LINEA	LinStatic		0	32,678	0	0	0	1,2691	32-1	0
32	0,5715	LINEA	LinStatic		0	38,125	0	0	0	-18,9628	32-1	0,5715
32	0	HL93 +	LinMoving	Max	0	180,034	0	0	0	167,9901	32-1	0
32	0,5715	HL93 +	LinMoving	Max	0	195,572	0	0	0	120,5474	32-1	0,5715
32	0	HL93 +	LinMoving	Min	0	-19,369	0	0	0	-118,4476	32-1	0
32	0,5715	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-128,6857	32-1	0,5715
32	0	TAMDEM +	LinMoving	Max	0	173,759	0	0	0	194,6917	32-1	0
32	0,5715	TAMDEM +	LinMoving	Max	0	185,039	0	0	0	136,7236	32-1	0,5715
32	0	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-123,7166	32-1	0
32	0,5715	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-134,4101	32-1	0,5715
32	0	HL93 -	LinMoving	Max	0	162,031	0	0	0	151,1911	32-1	0
32	0,5715	HL93 -	LinMoving	Max	0	176,015	0	0	0	108,154	32-1	0,5715
32	0	HL93 -	LinMoving	Min	0	-17,018	0	0	0	-106,6029	32-1	0
32	0,5715	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-115,8171	32-1	0,5715
32	0	TAMDEM -	LinMoving	Max	0	167,347	0	0	0	179,5284	32-1	0
32	0,5715	TAMDEM -	LinMoving	Max	0	175,038	0	0	0	136,9434	32-1	0,5715
32	0	TAMDEM -	LinMoving	Min	0	-30,559	0	0	0	-114,976	32-1	0
32	0,5715	TAMDEM -	LinMoving	Min	0	-23,999	0	0	0	-151,1177	32-1	0,5715
32	0	SERV1-1 H+	Combination	Max	0	255,987	0	0	0	170,9399	32-1	0
32	0,5715	SERV1-1 H+	Combination	Max	0	284,183	0	0	0	76,4732	32-1	0,5715
32	0	SERV1-1 H+	Combination	Min	0	56,583	0	0	0	-115,4978	32-1	0
32	0,5715	SERV1-1 H+	Combination	Min	0	70,697	0	0	0	-172,7599	32-1	0,5715
32	0	SERV1-2 T+	Combination	Max	0	249,711	0	0	0	197,6415	32-1	0
32	0,5715	SERV1-2 T+	Combination	Max	0	273,65	0	0	0	92,6494	32-1	0,5715
32	0	SERV1-2 T+	Combination	Min	0	57,24	0	0	0	-120,7668	32-1	0
32	0,5715	SERV1-2 T+	Combination	Min	0	69,899	0	0	0	-178,4843	32-1	0,5715
32	0	RESIST1-2 T+	Combination	Max	0	517,058	0	0	0	457,5193	32-1	0
32	0,5715	RESIST1-2 T+	Combination	Max	0	562,085	0	0	0	252,864	32-1	0,5715
32	0	RESIST1-2 T+	Combination	Min	0	69,082	0	0	0	-283,576	32-1	0
32	0,5715	RESIST1-2 T+	Combination	Min	0	87,854	0	0	0	-378,1995	32-1	0,5715
32	0	SERV1-1 H-	Combination	Max	0	237,983	0	0	0	154,1409	32-1	0
32	0,5715	SERV1-1 H-	Combination	Max	0	264,626	0	0	0	64,0798	32-1	0,5715
32	0	SERV1-1 H-	Combination	Min	0	58,935	0	0	0	-103,6531	32-1	0
32	0,5715	SERV1-1 H-	Combination	Min	0	72,488	0	0	0	-159,8913	32-1	0,5715
32	0	SERV1-2 T-	Combination	Max	0	243,299	0	0	0	182,4782	32-1	0
32	0,5715	SERV1-2 T-	Combination	Max	0	263,649	0	0	0	92,8692	32-1	0,5715
32	0	SERV1-2 T-	Combination	Min	0	45,393	0	0	0	-112,0262	32-1	0
32	0,5715	SERV1-2 T-	Combination	Min	0	64,612	0	0	0	-195,1919	32-1	0,5715
32	0	RESIST 1-1 H+	Combination	Max	0	531,664	0	0	0	395,3713	32-1	0
32	0,5715	RESIST 1-1 H+	Combination	Max	0	586,6	0	0	0	215,2139	32-1	0,5715
32	0	RESIST 1-1 H+	Combination	Min	0	67,553	0	0	0	-271,3125	32-1	0
32	0,5715	RESIST 1-1 H+	Combination	Min	0	89,711	0	0	0	-364,876	32-1	0,5715
32	0	RESIST1-1 H-	Combination	Max	0	489,761	0	0	0	356,2716	32-1	0
32	0,5715	RESIST1-1 H-	Combination	Max	0	541,081	0	0	0	186,3683	32-1	0,5715
32	0	RESIST1-1 H-	Combination	Min	0	73,025	0	0	0	-243,7438	32-1	0
32	0,5715	RESIST1-1 H-	Combination	Min	0	93,881	0	0	0	-334,9244	32-1	0,5715
32	0	RESIST1-2 T-	Combination	Max	0	502,133	0	0	0	422,2267	32-1	0
32	0,5715	RESIST1-2 T-	Combination	Max	0	538,808	0	0	0	253,3756	32-1	0,5715
32	0	RESIST1-2 T-	Combination	Min	0	41,508	0	0	0	-263,2323	32-1	0
32	0,5715	RESIST1-2 T-	Combination	Min	0	75,549	0	0	0	-417,0866	32-1	0,5715
32	0	E-SERV1-1	Combination	Max	0	255,987	0	0	0	170,9399	32-1	0
32	0,5715	E-SERV1-1	Combination	Max	0	284,183	0	0	0	76,4732	32-1	0,5715
32	0	E-SERV1-1	Combination	Min	0	56,583	0	0	0	-115,4978	32-1	0
32	0,5715	E-SERV1-1	Combination	Min	0	70,697	0	0	0	-172,7599	32-1	0,5715
32	0	E-SERV1-2	Combination	Max	0	249,711	0	0	0	197,6415	32-1	0
32	0,5715	E-SERV1-2	Combination	Max	0	273,65	0	0	0	92,8692	32-1	0,5715
32	0	E-SERV1-2	Combination	Min	0	45,393	0	0	0	-120,7668	32-1	0
32	0,5715	E-SERV1-2	Combination	Min	0	64,612	0	0	0	-195,1919	32-1	0,5715

32	0	E-RESIST1-1	Combination	Max	0	531,664	0	0	0	395,3713	32-1	0
32	0,5715	E-RESIST1-1	Combination	Max	0	586,6	0	0	0	215,2139	32-1	0,5715
32	0	E-RESIST1-1	Combination	Min	0	67,553	0	0	0	-271,3125	32-1	0
32	0,5715	E-RESIST1-1	Combination	Min	0	89,711	0	0	0	-364,876	32-1	0,5715
32	0	E-RESIST1-2	Combination	Max	0	517,058	0	0	0	457,5193	32-1	0
32	0,5715	E-RESIST1-2	Combination	Max	0	562,085	0	0	0	253,3756	32-1	0,5715
32	0	E-RESIST1-2	Combination	Min	0	41,508	0	0	0	-283,576	32-1	0
32	0,5715	E-RESIST1-2	Combination	Min	0	75,549	0	0	0	-417,0866	32-1	0,5715
33	0	LINEA	LinStatic		0	38,125	0	0	0	-18,9628	33-1	0
33	0,5715	LINEA	LinStatic		0	43,571	0	0	0	-42,3075	33-1	0,5715
33	0	HL93 +	LinMoving	Max	0	195,572	0	0	0	120,5474	33-1	0
33	0,5715	HL93 +	LinMoving	Max	0	211,389	0	0	0	83,1134	33-1	0,5715
33	0	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-128,6857	33-1	0
33	0,5715	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-156,2356	33-1	0,5715
33	0	TAMDEM +	LinMoving	Max	0	185,039	0	0	0	136,7236	33-1	0
33	0,5715	TAMDEM +	LinMoving	Max	0	195,531	0	0	0	73,6942	33-1	0,5715
33	0	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-134,4101	33-1	0
33	0,5715	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-145,1035	33-1	0,5715
33	0	HL93 -	LinMoving	Max	0	176,015	0	0	0	108,154	33-1	0
33	0,5715	HL93 -	LinMoving	Max	0	190,25	0	0	0	74,6087	33-1	0,5715
33	0	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-115,8171	33-1	0
33	0,5715	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-125,0313	33-1	0,5715
33	0	TAMDEM -	LinMoving	Max	0	175,038	0	0	0	136,9434	33-1	0
33	0,5715	TAMDEM -	LinMoving	Max	0	182,754	0	0	0	89,7991	33-1	0,5715
33	0	TAMDEM -	LinMoving	Min	0	-23,999	0	0	0	-151,1177	33-1	0
33	0,5715	TAMDEM -	LinMoving	Min	0	-19,636	0	0	0	-205,3758	33-1	0,5715
33	0	SERV1-1 H+	Combination	Max	0	284,183	0	0	0	76,4732	33-1	0
33	0,5715	SERV1-1 H+	Combination	Max	0	312,659	0	0	0	-15,2193	33-1	0,5715
33	0	SERV1-1 H+	Combination	Min	0	70,697	0	0	0	-172,7599	33-1	0
33	0,5715	SERV1-1 H+	Combination	Min	0	83,356	0	0	0	-254,5682	33-1	0,5715
33	0	SERV1-2 T+	Combination	Max	0	273,65	0	0	0	92,6494	33-1	0
33	0,5715	SERV1-2 T+	Combination	Max	0	296,801	0	0	0	-24,6384	33-1	0,5715
33	0	SERV1-2 T+	Combination	Min	0	69,899	0	0	0	-178,4843	33-1	0
33	0,5715	SERV1-2 T+	Combination	Min	0	82,558	0	0	0	-243,4362	33-1	0,5715
33	0	RESIST1-2 T+	Combination	Max	0	562,085	0	0	0	252,864	33-1	0
33	0,5715	RESIST1-2 T+	Combination	Max	0	605,277	0	0	0	25,7002	33-1	0,5715
33	0	RESIST1-2 T+	Combination	Min	0	87,854	0	0	0	-378,1995	33-1	0
33	0,5715	RESIST1-2 T+	Combination	Min	0	106,626	0	0	0	-483,5515	33-1	0,5715
33	0	SERV1-1 H-	Combination	Max	0	264,626	0	0	0	64,0798	33-1	0
33	0,5715	SERV1-1 H-	Combination	Max	0	291,52	0	0	0	-23,7239	33-1	0,5715
33	0	SERV1-1 H-	Combination	Min	0	72,488	0	0	0	-159,8913	33-1	0
33	0,5715	SERV1-1 H-	Combination	Min	0	85,147	0	0	0	-223,364	33-1	0,5715
33	0	SERV1-2 T-	Combination	Max	0	263,649	0	0	0	92,8692	33-1	0
33	0,5715	SERV1-2 T-	Combination	Max	0	284,024	0	0	0	-8,5335	33-1	0,5715
33	0	SERV1-2 T-	Combination	Min	0	64,612	0	0	0	-195,1919	33-1	0
33	0,5715	SERV1-2 T-	Combination	Min	0	81,634	0	0	0	-303,7085	33-1	0,5715
33	0	RESIST 1-1 H+	Combination	Max	0	586,6	0	0	0	215,2139	33-1	0
33	0,5715	RESIST 1-1 H+	Combination	Max	0	642,186	0	0	0	47,6233	33-1	0,5715
33	0	RESIST 1-1 H+	Combination	Min	0	89,711	0	0	0	-364,876	33-1	0
33	0,5715	RESIST 1-1 H+	Combination	Min	0	108,484	0	0	0	-509,4614	33-1	0,5715
33	0	RESIST1-1 H-	Combination	Max	0	541,081	0	0	0	186,3683	33-1	0
33	0,5715	RESIST1-1 H-	Combination	Max	0	592,985	0	0	0	27,8287	33-1	0,5715
33	0	RESIST1-1 H-	Combination	Min	0	93,881	0	0	0	-334,9244	33-1	0
33	0,5715	RESIST1-1 H-	Combination	Min	0	112,653	0	0	0	-436,8335	33-1	0,5715
33	0	RESIST1-2 T-	Combination	Max	0	538,808	0	0	0	253,3756	33-1	0
33	0,5715	RESIST1-2 T-	Combination	Max	0	575,54	0	0	0	63,1844	33-1	0,5715
33	0	RESIST1-2 T-	Combination	Min	0	75,549	0	0	0	-417,0866	33-1	0
33	0,5715	RESIST1-2 T-	Combination	Min	0	104,477	0	0	0	-623,8353	33-1	0,5715
33	0	E-SERV1-1	Combination	Max	0	284,183	0	0	0	76,4732	33-1	0
33	0,5715	E-SERV1-1	Combination	Max	0	312,659	0	0	0	-15,2193	33-1	0,5715
33	0	E-SERV1-1	Combination	Min	0	70,697	0	0	0	-172,7599	33-1	0
33	0,5715	E-SERV1-1	Combination	Min	0	83,356	0	0	0	-254,5682	33-1	0,5715
33	0	E-SERV1-2	Combination	Max	0	273,65	0	0	0	92,8692	33-1	0
33	0,5715	E-SERV1-2	Combination	Max	0	296,801	0	0	0	-8,5335	33-1	0,5715
33	0	E-SERV1-2	Combination	Min	0	64,612	0	0	0	-195,1919	33-1	0
33	0,5715	E-SERV1-2	Combination	Min	0	81,634	0	0	0	-303,7085	33-1	0,5715
33	0	E-RESIST1-1	Combination	Max	0	586,6	0	0	0	215,2139	33-1	0
33	0,5715	E-RESIST1-1	Combination	Max	0	642,186	0	0	0	47,6233	33-1	0,5715

33	0	E-RESIST1-1	Combination	Min	0	89,711	0	0	0	-364,876	33-1	0
33	0,5715	E-RESIST1-1	Combination	Min	0	108,484	0	0	0	-509,4614	33-1	0,5715
33	0	E-RESIST1-2	Combination	Max	0	562,085	0	0	0	253,3756	33-1	0
33	0,5715	E-RESIST1-2	Combination	Max	0	605,277	0	0	0	63,1844	33-1	0,5715
33	0	E-RESIST1-2	Combination	Min	0	75,549	0	0	0	-417,0866	33-1	0
33	0,5715	E-RESIST1-2	Combination	Min	0	104,477	0	0	0	-623,8353	33-1	0,5715
34	0	LINEA	LinStatic		0	43,571	0	0	0	-42,3075	34-1	0
34	0,5715	LINEA	LinStatic		0	49,018	0	0	0	-68,7647	34-1	0,5715
34	0	HL93 +	LinMoving	Max	0	211,389	0	0	0	83,1134	34-1	0
34	0,5715	HL93 +	LinMoving	Max	0	227,005	0	0	0	44,5673	34-1	0,5715
34	0	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-156,2356	34-1	0
34	0,5715	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-209,4331	34-1	0,5715
34	0	TAMDEM +	LinMoving	Max	0	195,531	0	0	0	73,6942	34-1	0
34	0,5715	TAMDEM +	LinMoving	Max	0	205,102	0	0	0	36,6868	34-1	0,5715
34	0	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-145,1035	34-1	0
34	0,5715	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-155,7969	34-1	0,5715
34	0	HL93 -	LinMoving	Max	0	190,25	0	0	0	74,6087	34-1	0
34	0,5715	HL93 -	LinMoving	Max	0	204,305	0	0	0	41,3279	34-1	0,5715
34	0	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-125,0313	34-1	0
34	0,5715	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-147,4102	34-1	0,5715
34	0	TAMDEM -	LinMoving	Max	0	182,754	0	0	0	89,7991	34-1	0
34	0,5715	TAMDEM -	LinMoving	Max	0	198,038	0	0	0	59,4388	34-1	0,5715
34	0	TAMDEM -	LinMoving	Min	0	-19,636	0	0	0	-205,3758	34-1	0
34	0,5715	TAMDEM -	LinMoving	Min	0	-16,856	0	0	0	-272,7608	34-1	0,5715
34	0	SERV1-1 H+	Combination	Max	0	312,659	0	0	0	-15,2193	34-1	0
34	0,5715	SERV1-1 H+	Combination	Max	0	340,934	0	0	0	-115,2583	34-1	0,5715
34	0	SERV1-1 H+	Combination	Min	0	83,356	0	0	0	-254,5682	34-1	0
34	0,5715	SERV1-1 H+	Combination	Min	0	96,014	0	0	0	-369,2586	34-1	0,5715
34	0	SERV1-2 T+	Combination	Max	0	296,801	0	0	0	-24,6384	34-1	0
34	0,5715	SERV1-2 T+	Combination	Max	0	319,031	0	0	0	-123,1387	34-1	0,5715
34	0	SERV1-2 T+	Combination	Min	0	82,558	0	0	0	-243,4362	34-1	0
34	0,5715	SERV1-2 T+	Combination	Min	0	95,216	0	0	0	-315,6225	34-1	0,5715
34	0	RESIST1-2 T+	Combination	Max	0	605,277	0	0	0	25,7002	34-1	0
34	0,5715	RESIST1-2 T+	Combination	Max	0	646,326	0	0	0	-151,6258	34-1	0,5715
34	0	RESIST1-2 T+	Combination	Min	0	106,626	0	0	0	-483,5515	34-1	0
34	0,5715	RESIST1-2 T+	Combination	Min	0	125,399	0	0	0	-599,6319	34-1	0,5715
34	0	SERV1-1 H-	Combination	Max	0	291,52	0	0	0	-23,7239	34-1	0
34	0,5715	SERV1-1 H-	Combination	Max	0	318,233	0	0	0	-118,4976	34-1	0,5715
34	0	SERV1-1 H-	Combination	Min	0	85,147	0	0	0	-223,364	34-1	0
34	0,5715	SERV1-1 H-	Combination	Min	0	97,806	0	0	0	-307,2358	34-1	0,5715
34	0	SERV1-2 T-	Combination	Max	0	284,024	0	0	0	-8,5335	34-1	0
34	0,5715	SERV1-2 T-	Combination	Max	0	311,967	0	0	0	-100,3868	34-1	0,5715
34	0	SERV1-2 T-	Combination	Min	0	81,634	0	0	0	-303,7085	34-1	0
34	0,5715	SERV1-2 T-	Combination	Min	0	97,072	0	0	0	-432,5864	34-1	0,5715
34	0	RESIST 1-1 H+	Combination	Max	0	642,186	0	0	0	47,6233	34-1	0
34	0,5715	RESIST 1-1 H+	Combination	Max	0	697,305	0	0	0	-133,2841	34-1	0,5715
34	0	RESIST 1-1 H+	Combination	Min	0	108,484	0	0	0	-509,4614	34-1	0
34	0,5715	RESIST 1-1 H+	Combination	Min	0	127,256	0	0	0	-724,4699	34-1	0,5715
34	0	RESIST1-1 H-	Combination	Max	0	592,985	0	0	0	27,8287	34-1	0
34	0,5715	RESIST1-1 H-	Combination	Max	0	644,47	0	0	0	-140,8237	34-1	0,5715
34	0	RESIST1-1 H-	Combination	Min	0	112,653	0	0	0	-436,8335	34-1	0
34	0,5715	RESIST1-1 H-	Combination	Min	0	131,425	0	0	0	-580,1117	34-1	0,5715
34	0	RESIST1-2 T-	Combination	Max	0	575,54	0	0	0	63,1844	34-1	0
34	0,5715	RESIST1-2 T-	Combination	Max	0	629,885	0	0	0	-98,6707	34-1	0,5715
34	0	RESIST1-2 T-	Combination	Min	0	104,477	0	0	0	-623,8353	34-1	0
34	0,5715	RESIST1-2 T-	Combination	Min	0	129,719	0	0	0	-871,8652	34-1	0,5715
34	0	E-SERV1-1	Combination	Max	0	312,659	0	0	0	-15,2193	34-1	0
34	0,5715	E-SERV1-1	Combination	Max	0	340,934	0	0	0	-115,2583	34-1	0,5715
34	0	E-SERV1-1	Combination	Min	0	83,356	0	0	0	-254,5682	34-1	0
34	0,5715	E-SERV1-1	Combination	Min	0	96,014	0	0	0	-369,2586	34-1	0,5715
34	0	E-SERV1-2	Combination	Max	0	296,801	0	0	0	-8,5335	34-1	0
34	0,5715	E-SERV1-2	Combination	Max	0	319,031	0	0	0	-100,3868	34-1	0,5715
34	0	E-SERV1-2	Combination	Min	0	81,634	0	0	0	-303,7085	34-1	0
34	0,5715	E-SERV1-2	Combination	Min	0	95,216	0	0	0	-432,5864	34-1	0,5715
34	0	E-RESIST1-1	Combination	Max	0	642,186	0	0	0	47,6233	34-1	0
34	0,5715	E-RESIST1-1	Combination	Max	0	697,305	0	0	0	-133,2841	34-1	0,5715
34	0	E-RESIST1-1	Combination	Min	0	108,484	0	0	0	-509,4614	34-1	0
34	0,5715	E-RESIST1-1	Combination	Min	0	127,256	0	0	0	-724,4699	34-1	0,5715

34	0	E-RESIST1-2	Combination	Max	0	605,277	0	0	0	63,1844	34-1	0
34	0,5715	E-RESIST1-2	Combination	Max	0	646,326	0	0	0	-98,6707	34-1	0,5715
34	0	E-RESIST1-2	Combination	Min	0	104,477	0	0	0	-623,8353	34-1	0
34	0,5715	E-RESIST1-2	Combination	Min	0	125,399	0	0	0	-871,8652	34-1	0,5715
35	0	LINEA	LinStatic		0	49,018	0	0	0	-68,7647	35-1	0
35	0,5715	LINEA	LinStatic		0	54,464	0	0	0	-98,3345	35-1	0,5715
35	0	HL93 +	LinMoving	Max	0	227,005	0	0	0	44,5673	35-1	0
35	0,5715	HL93 +	LinMoving	Max	0	241,859	0	0	0	45,3604	35-1	0,5715
35	0	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-209,4331	35-1	0
35	0,5715	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-274,2646	35-1	0,5715
35	0	TAMDEM +	LinMoving	Max	0	205,102	0	0	0	36,6868	35-1	0
35	0,5715	TAMDEM +	LinMoving	Max	0	213,619	0	0	0	47,3808	35-1	0,5715
35	0	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-155,7969	35-1	0
35	0,5715	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-223,9507	35-1	0,5715
35	0	HL93 -	LinMoving	Max	0	204,305	0	0	0	41,3279	35-1	0
35	0,5715	HL93 -	LinMoving	Max	0	217,673	0	0	0	40,8243	35-1	0,5715
35	0	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-147,4102	35-1	0
35	0,5715	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-234,1755	35-1	0,5715
35	0	TAMDEM -	LinMoving	Max	0	198,038	0	0	0	59,4388	35-1	0
35	0,5715	TAMDEM -	LinMoving	Max	0	214,08	0	0	0	42,6811	35-1	0,5715
35	0	TAMDEM -	LinMoving	Min	0	-16,856	0	0	0	-272,7608	35-1	0
35	0,5715	TAMDEM -	LinMoving	Min	0	-16,856	0	0	0	-345,8403	35-1	0,5715
35	0	SERV1-1 H+	Combination	Max	0	340,934	0	0	0	-115,2583	35-1	0
35	0,5715	SERV1-1 H+	Combination	Max	0	368,446	0	0	0	-183,1926	35-1	0,5715
35	0	SERV1-1 H+	Combination	Min	0	96,014	0	0	0	-369,2586	35-1	0
35	0,5715	SERV1-1 H+	Combination	Min	0	108,673	0	0	0	-502,8176	35-1	0,5715
35	0	SERV1-2 T+	Combination	Max	0	319,031	0	0	0	-123,1387	35-1	0
35	0,5715	SERV1-2 T+	Combination	Max	0	340,207	0	0	0	-181,1721	35-1	0,5715
35	0	SERV1-2 T+	Combination	Min	0	95,216	0	0	0	-315,6225	35-1	0
35	0,5715	SERV1-2 T+	Combination	Min	0	107,875	0	0	0	-452,5037	35-1	0,5715
35	0	RESIST1-2 T+	Combination	Max	0	646,326	0	0	0	-151,6258	35-1	0
35	0,5715	RESIST1-2 T+	Combination	Max	0	684,922	0	0	0	-228,6554	35-1	0,5715
35	0	RESIST1-2 T+	Combination	Min	0	125,399	0	0	0	-599,6319	35-1	0
35	0,5715	RESIST1-2 T+	Combination	Min	0	144,171	0	0	0	-860,1796	35-1	0,5715
35	0	SERV1-1 H-	Combination	Max	0	318,233	0	0	0	-118,4976	35-1	0
35	0,5715	SERV1-1 H-	Combination	Max	0	344,26	0	0	0	-187,7286	35-1	0,5715
35	0	SERV1-1 H-	Combination	Min	0	97,806	0	0	0	-307,2358	35-1	0
35	0,5715	SERV1-1 H-	Combination	Min	0	110,464	0	0	0	-462,7284	35-1	0,5715
35	0	SERV1-2 T-	Combination	Max	0	311,967	0	0	0	-100,3868	35-1	0
35	0,5715	SERV1-2 T-	Combination	Max	0	340,667	0	0	0	-185,8718	35-1	0,5715
35	0	SERV1-2 T-	Combination	Min	0	97,072	0	0	0	-432,5864	35-1	0
35	0,5715	SERV1-2 T-	Combination	Min	0	109,731	0	0	0	-574,3933	35-1	0,5715
35	0	RESIST 1-1 H+	Combination	Max	0	697,305	0	0	0	-133,2841	35-1	0
35	0,5715	RESIST 1-1 H+	Combination	Max	0	750,65	0	0	0	-233,3579	35-1	0,5715
35	0	RESIST 1-1 H+	Combination	Min	0	127,256	0	0	0	-724,4699	35-1	0
35	0,5715	RESIST 1-1 H+	Combination	Min	0	146,028	0	0	0	-977,2851	35-1	0,5715
35	0	RESIST1-1 H-	Combination	Max	0	644,47	0	0	0	-140,8237	35-1	0
35	0,5715	RESIST1-1 H-	Combination	Max	0	694,357	0	0	0	-243,9156	35-1	0,5715
35	0	RESIST1-1 H-	Combination	Min	0	131,425	0	0	0	-580,1117	35-1	0
35	0,5715	RESIST1-1 H-	Combination	Min	0	150,198	0	0	0	-883,9776	35-1	0,5715
35	0	RESIST1-2 T-	Combination	Max	0	629,885	0	0	0	-98,6707	35-1	0
35	0,5715	RESIST1-2 T-	Combination	Max	0	685,994	0	0	0	-239,5939	35-1	0,5715
35	0	RESIST1-2 T-	Combination	Min	0	129,719	0	0	0	-871,8652	35-1	0
35	0,5715	RESIST1-2 T-	Combination	Min	0	148,491	0	0	0	-1143,8775	35-1	0,5715
35	0	E-SERV1-1	Combination	Max	0	340,934	0	0	0	-115,2583	35-1	0
35	0,5715	E-SERV1-1	Combination	Max	0	368,446	0	0	0	-183,1926	35-1	0,5715
35	0	E-SERV1-1	Combination	Min	0	96,014	0	0	0	-369,2586	35-1	0
35	0,5715	E-SERV1-1	Combination	Min	0	108,673	0	0	0	-502,8176	35-1	0,5715
35	0	E-SERV1-2	Combination	Max	0	319,031	0	0	0	-100,3868	35-1	0
35	0,5715	E-SERV1-2	Combination	Max	0	340,667	0	0	0	-181,1721	35-1	0,5715
35	0	E-SERV1-2	Combination	Min	0	95,216	0	0	0	-432,5864	35-1	0
35	0,5715	E-SERV1-2	Combination	Min	0	107,875	0	0	0	-574,3933	35-1	0,5715
35	0	E-RESIST1-1	Combination	Max	0	697,305	0	0	0	-133,2841	35-1	0
35	0,5715	E-RESIST1-1	Combination	Max	0	750,65	0	0	0	-233,3579	35-1	0,5715
35	0	E-RESIST1-1	Combination	Min	0	127,256	0	0	0	-724,4699	35-1	0
35	0,5715	E-RESIST1-1	Combination	Min	0	146,028	0	0	0	-977,2851	35-1	0,5715
35	0	E-RESIST1-2	Combination	Max	0	646,326	0	0	0	-98,6707	35-1	0
35	0,5715	E-RESIST1-2	Combination	Max	0	685,994	0	0	0	-228,6554	35-1	0,5715

35	0	E-RESIST1-2	Combination	Min	0	125,399	0	0	0	-871,8652	35-1	0
35	0,5715	E-RESIST1-2	Combination	Min	0	144,171	0	0	0	-1143,8775	35-1	0,5715
36	0	LINEA	LinStatic		0	-52,345	0	0	0	-98,3345	36-1	0
36	0,572	LINEA	LinStatic		0	-46,893	0	0	0	-69,9524	36-1	0,572
36	0	HL93 +	LinMoving	Max	0	5,287	0	0	0	45,3604	36-1	0
36	0,572	HL93 +	LinMoving	Max	0	6,087	0	0	0	48,7469	36-1	0,572
36	0	HL93 +	LinMoving	Min	0	-214,166	0	0	0	-274,2646	36-1	0
36	0,572	HL93 +	LinMoving	Min	0	-197,015	0	0	0	-227,2629	36-1	0,572
36	0	TAMDEM +	LinMoving	Max	0	5,522	0	0	0	47,3808	36-1	0
36	0,572	TAMDEM +	LinMoving	Max	0	5,522	0	0	0	44,2221	36-1	0,572
36	0	TAMDEM +	LinMoving	Min	0	-202,35	0	0	0	-223,9507	36-1	0
36	0,572	TAMDEM +	LinMoving	Min	0	-191,259	0	0	0	-209,0207	36-1	0,572
36	0	HL93 -	LinMoving	Max	0	4,758	0	0	0	40,8243	36-1	0
36	0,572	HL93 -	LinMoving	Max	0	6,971	0	0	0	55,8254	36-1	0,572
36	0	HL93 -	LinMoving	Min	0	-192,749	0	0	0	-234,1755	36-1	0
36	0,572	HL93 -	LinMoving	Min	0	-177,313	0	0	0	-204,5367	36-1	0,572
36	0	TAMDEM -	LinMoving	Max	0	4,974	0	0	0	42,6811	36-1	0
36	0,572	TAMDEM -	LinMoving	Max	0	7,658	0	0	0	61,326	36-1	0,572
36	0	TAMDEM -	LinMoving	Min	0	-196,221	0	0	0	-345,8403	36-1	0
36	0,572	TAMDEM -	LinMoving	Min	0	-188,595	0	0	0	-268,1662	36-1	0,572
36	0	SERV1-1 H+	Combination	Max	0	-116,375	0	0	0	-183,1926	36-1	0
36	0,572	SERV1-1 H+	Combination	Max	0	-102,904	0	0	0	-113,8393	36-1	0,572
36	0	SERV1-1 H+	Combination	Min	0	-335,827	0	0	0	-502,8176	36-1	0
36	0,572	SERV1-1 H+	Combination	Min	0	-306,006	0	0	0	-389,8492	36-1	0,572
36	0	SERV1-2 T+	Combination	Max	0	-116,139	0	0	0	-181,1721	36-1	0
36	0,572	SERV1-2 T+	Combination	Max	0	-103,469	0	0	0	-118,3641	36-1	0,572
36	0	SERV1-2 T+	Combination	Min	0	-324,011	0	0	0	-452,5037	36-1	0
36	0,572	SERV1-2 T+	Combination	Min	0	-300,251	0	0	0	-371,6069	36-1	0,572
36	0	RESIST1-2 T+	Combination	Max	0	-167,566	0	0	0	-228,6554	36-1	0
36	0,572	RESIST1-2 T+	Combination	Max	0	-148,777	0	0	0	-138,1814	36-1	0,572
36	0	RESIST1-2 T+	Combination	Min	0	-651,388	0	0	0	-860,1796	36-1	0
36	0,572	RESIST1-2 T+	Combination	Min	0	-606,786	0	0	0	-727,6041	36-1	0,572
36	0	SERV1-1 H-	Combination	Max	0	-116,903	0	0	0	-187,7286	36-1	0
36	0,572	SERV1-1 H-	Combination	Max	0	-102,02	0	0	0	-106,7608	36-1	0,572
36	0	SERV1-1 H-	Combination	Min	0	-314,411	0	0	0	-462,7284	36-1	0
36	0,572	SERV1-1 H-	Combination	Min	0	-286,305	0	0	0	-367,1229	36-1	0,572
36	0	SERV1-2 T-	Combination	Max	0	-116,687	0	0	0	-185,8718	36-1	0
36	0,572	SERV1-2 T-	Combination	Max	0	-101,333	0	0	0	-101,2602	36-1	0,572
36	0	SERV1-2 T-	Combination	Min	0	-317,883	0	0	0	-574,3933	36-1	0
36	0,572	SERV1-2 T-	Combination	Min	0	-297,586	0	0	0	-430,7525	36-1	0,572
36	0	RESIST 1-1 H+	Combination	Max	0	-168,114	0	0	0	-233,3579	36-1	0
36	0,572	RESIST 1-1 H+	Combination	Max	0	-147,462	0	0	0	-127,6499	36-1	0,572
36	0	RESIST 1-1 H+	Combination	Min	0	-678,89	0	0	0	-977,2851	36-1	0
36	0,572	RESIST 1-1 H+	Combination	Min	0	-620,182	0	0	0	-770,0629	36-1	0,572
36	0	RESIST1-1 H-	Combination	Max	0	-169,344	0	0	0	-243,9156	36-1	0
36	0,572	RESIST1-1 H-	Combination	Max	0	-145,404	0	0	0	-111,1748	36-1	0,572
36	0	RESIST1-1 H-	Combination	Min	0	-629,043	0	0	0	-883,9776	36-1	0
36	0,572	RESIST1-1 H-	Combination	Min	0	-574,326	0	0	0	-717,1674	36-1	0,572
36	0	RESIST1-2 T-	Combination	Max	0	-168,84	0	0	0	-239,5939	36-1	0
36	0,572	RESIST1-2 T-	Combination	Max	0	-143,806	0	0	0	-98,3722	36-1	0,572
36	0	RESIST1-2 T-	Combination	Min	0	-637,124	0	0	0	-1143,8775	36-1	0
36	0,572	RESIST1-2 T-	Combination	Min	0	-600,584	0	0	0	-865,2653	36-1	0,572
36	0	E-SERV1-1	Combination	Max	0	-116,375	0	0	0	-183,1926	36-1	0
36	0,572	E-SERV1-1	Combination	Max	0	-102,02	0	0	0	-106,7608	36-1	0,572
36	0	E-SERV1-1	Combination	Min	0	-335,827	0	0	0	-502,8176	36-1	0
36	0,572	E-SERV1-1	Combination	Min	0	-306,006	0	0	0	-389,8492	36-1	0,572
36	0	E-SERV1-2	Combination	Max	0	-116,139	0	0	0	-181,1721	36-1	0
36	0,572	E-SERV1-2	Combination	Max	0	-101,333	0	0	0	-101,2602	36-1	0,572
36	0	E-SERV1-2	Combination	Min	0	-324,011	0	0	0	-574,3933	36-1	0
36	0,572	E-SERV1-2	Combination	Min	0	-300,251	0	0	0	-430,7525	36-1	0,572
36	0	E-RESIST1-1	Combination	Max	0	-168,114	0	0	0	-233,3579	36-1	0
36	0,572	E-RESIST1-1	Combination	Max	0	-145,404	0	0	0	-111,1748	36-1	0,572
36	0	E-RESIST1-1	Combination	Min	0	-678,89	0	0	0	-977,2851	36-1	0
36	0,572	E-RESIST1-1	Combination	Min	0	-620,182	0	0	0	-770,0629	36-1	0,572
36	0	E-RESIST1-2	Combination	Max	0	-167,566	0	0	0	-228,6554	36-1	0
36	0,572	E-RESIST1-2	Combination	Max	0	-143,806	0	0	0	-98,3722	36-1	0,572
36	0	E-RESIST1-2	Combination	Min	0	-651,388	0	0	0	-1143,8775	36-1	0
36	0,572	E-RESIST1-2	Combination	Min	0	-606,786	0	0	0	-865,2653	36-1	0,572

37	0	LINEA	LinStatic		0	-46,893	0	0	0	-69,9524	37-1	0
37	0,572	LINEA	LinStatic		0	-41,442	0	0	0	-44,6884	37-1	0,572
37	0	HL93 +	LinMoving	Max	0	6,087	0	0	0	48,7469	37-1	0
37	0,572	HL93 +	LinMoving	Max	0	12,215	0	0	0	90,8286	37-1	0,572
37	0	HL93 +	LinMoving	Min	0	-197,015	0	0	0	-227,2629	37-1	0
37	0,572	HL93 +	LinMoving	Min	0	-178,631	0	0	0	-208,5556	37-1	0,572
37	0	TAMDEM +	LinMoving	Max	0	5,522	0	0	0	44,2221	37-1	0
37	0,572	TAMDEM +	LinMoving	Max	0	9,222	0	0	0	94,6446	37-1	0,572
37	0	TAMDEM +	LinMoving	Min	0	-191,259	0	0	0	-209,0207	37-1	0
37	0,572	TAMDEM +	LinMoving	Min	0	-179,07	0	0	0	-194,0906	37-1	0,572
37	0	HL93 -	LinMoving	Max	0	6,971	0	0	0	55,8254	37-1	0
37	0,572	HL93 -	LinMoving	Max	0	13,113	0	0	0	97,5095	37-1	0,572
37	0	HL93 -	LinMoving	Min	0	-177,313	0	0	0	-204,5367	37-1	0
37	0,572	HL93 -	LinMoving	Min	0	-160,768	0	0	0	-187,7001	37-1	0,572
37	0	TAMDEM -	LinMoving	Max	0	7,658	0	0	0	61,326	37-1	0
37	0,572	TAMDEM -	LinMoving	Max	0	11,188	0	0	0	91,8093	37-1	0,572
37	0	TAMDEM -	LinMoving	Min	0	-188,595	0	0	0	-268,1662	37-1	0
37	0,572	TAMDEM -	LinMoving	Min	0	-179,771	0	0	0	-199,4316	37-1	0,572
37	0	SERV1-1 H+	Combination	Max	0	-102,904	0	0	0	-113,8393	37-1	0
37	0,572	SERV1-1 H+	Combination	Max	0	-84,107	0	0	0	-13,038	37-1	0,572
37	0	SERV1-1 H+	Combination	Min	0	-306,006	0	0	0	-389,8492	37-1	0
37	0,572	SERV1-1 H+	Combination	Min	0	-274,953	0	0	0	-312,4222	37-1	0,572
37	0	SERV1-2 T+	Combination	Max	0	-103,469	0	0	0	-118,3641	37-1	0
37	0,572	SERV1-2 T+	Combination	Max	0	-87,1	0	0	0	-9,222	37-1	0,572
37	0	SERV1-2 T+	Combination	Min	0	-300,251	0	0	0	-371,6069	37-1	0
37	0,572	SERV1-2 T+	Combination	Min	0	-275,392	0	0	0	-297,9572	37-1	0,572
37	0	RESIST1-2 T+	Combination	Max	0	-148,777	0	0	0	-138,1814	37-1	0
37	0,572	RESIST1-2 T+	Combination	Max	0	-121,378	0	0	0	66,2557	37-1	0,572
37	0	RESIST1-2 T+	Combination	Min	0	-606,786	0	0	0	-727,6041	37-1	0
37	0,572	RESIST1-2 T+	Combination	Min	0	-559,628	0	0	0	-605,7757	37-1	0,572
37	0	SERV1-1 H-	Combination	Max	0	-102,02	0	0	0	-106,7608	37-1	0
37	0,572	SERV1-1 H-	Combination	Max	0	-83,209	0	0	0	-6,3571	37-1	0,572
37	0	SERV1-1 H-	Combination	Min	0	-286,305	0	0	0	-367,1229	37-1	0
37	0,572	SERV1-1 H-	Combination	Min	0	-257,09	0	0	0	-291,5667	37-1	0,572
37	0	SERV1-2 T-	Combination	Max	0	-101,333	0	0	0	-101,2602	37-1	0
37	0,572	SERV1-2 T-	Combination	Max	0	-85,134	0	0	0	-12,0573	37-1	0,572
37	0	SERV1-2 T-	Combination	Min	0	-297,586	0	0	0	-430,7525	37-1	0
37	0,572	SERV1-2 T-	Combination	Min	0	-276,093	0	0	0	-303,2982	37-1	0,572
37	0	RESIST 1-1 H+	Combination	Max	0	-147,462	0	0	0	-127,6499	37-1	0
37	0,572	RESIST 1-1 H+	Combination	Max	0	-114,411	0	0	0	57,3739	37-1	0,572
37	0	RESIST 1-1 H+	Combination	Min	0	-620,182	0	0	0	-770,0629	37-1	0
37	0,572	RESIST 1-1 H+	Combination	Min	0	-558,605	0	0	0	-639,4429	37-1	0,572
37	0	RESIST1-1 H-	Combination	Max	0	-145,404	0	0	0	-111,1748	37-1	0
37	0,572	RESIST1-1 H-	Combination	Max	0	-112,32	0	0	0	72,9237	37-1	0,572
37	0	RESIST1-1 H-	Combination	Min	0	-574,326	0	0	0	-717,1674	37-1	0
37	0,572	RESIST1-1 H-	Combination	Min	0	-517,029	0	0	0	-590,9016	37-1	0,572
37	0	RESIST1-2 T-	Combination	Max	0	-143,806	0	0	0	-98,3722	37-1	0
37	0,572	RESIST1-2 T-	Combination	Max	0	-116,801	0	0	0	59,6564	37-1	0,572
37	0	RESIST1-2 T-	Combination	Min	0	-600,584	0	0	0	-865,2653	37-1	0
37	0,572	RESIST1-2 T-	Combination	Min	0	-561,258	0	0	0	-618,2067	37-1	0,572
37	0	E-SERV1-1	Combination	Max	0	-102,02	0	0	0	-106,7608	37-1	0
37	0,572	E-SERV1-1	Combination	Max	0	-83,209	0	0	0	-6,3571	37-1	0,572
37	0	E-SERV1-1	Combination	Min	0	-306,006	0	0	0	-389,8492	37-1	0
37	0,572	E-SERV1-1	Combination	Min	0	-274,953	0	0	0	-312,4222	37-1	0,572
37	0	E-SERV1-2	Combination	Max	0	-101,333	0	0	0	-101,2602	37-1	0
37	0,572	E-SERV1-2	Combination	Max	0	-85,134	0	0	0	-9,222	37-1	0,572
37	0	E-SERV1-2	Combination	Min	0	-300,251	0	0	0	-430,7525	37-1	0
37	0,572	E-SERV1-2	Combination	Min	0	-276,093	0	0	0	-303,2982	37-1	0,572
37	0	E-RESIST1-1	Combination	Max	0	-145,404	0	0	0	-111,1748	37-1	0
37	0,572	E-RESIST1-1	Combination	Max	0	-112,32	0	0	0	72,9237	37-1	0,572
37	0	E-RESIST1-1	Combination	Min	0	-620,182	0	0	0	-770,0629	37-1	0
37	0,572	E-RESIST1-1	Combination	Min	0	-558,605	0	0	0	-639,4429	37-1	0,572
37	0	E-RESIST1-2	Combination	Max	0	-143,806	0	0	0	-98,3722	37-1	0
37	0,572	E-RESIST1-2	Combination	Max	0	-116,801	0	0	0	66,2557	37-1	0,572
37	0	E-RESIST1-2	Combination	Min	0	-606,786	0	0	0	-865,2653	37-1	0
37	0,572	E-RESIST1-2	Combination	Min	0	-561,258	0	0	0	-618,2067	37-1	0,572
38	0	LINEA	LinStatic		0	-41,442	0	0	0	-44,6884	38-1	0
38	0,572	LINEA	LinStatic		0	-35,991	0	0	0	-22,5425	38-1	0,572

38	0	HL93 +	LinMoving	Max	0	12,215	0	0	0	90,8286	38-1	0
38	0,572	HL93 +	LinMoving	Max	0	19,052	0	0	0	141,0569	38-1	0,572
38	0	HL93 +	LinMoving	Min	0	-178,631	0	0	0	-208,5556	38-1	0
38	0,572	HL93 +	LinMoving	Min	0	-159,119	0	0	0	-192,5129	38-1	0,572
38	0	TAMDEM +	LinMoving	Max	0	9,222	0	0	0	94,6446	38-1	0
38	0,572	TAMDEM +	LinMoving	Max	0	18,472	0	0	0	160,61	38-1	0,572
38	0	TAMDEM +	LinMoving	Min	0	-179,07	0	0	0	-194,0906	38-1	0
38	0,572	TAMDEM +	LinMoving	Min	0	-165,876	0	0	0	-179,1606	38-1	0,572
38	0	HL93 -	LinMoving	Max	0	13,113	0	0	0	97,5095	38-1	0
38	0,572	HL93 -	LinMoving	Max	0	19,855	0	0	0	146,4474	38-1	0,572
38	0	HL93 -	LinMoving	Min	0	-160,768	0	0	0	-187,7001	38-1	0
38	0,572	HL93 -	LinMoving	Min	0	-143,207	0	0	0	-173,2616	38-1	0,572
38	0	TAMDEM -	LinMoving	Max	0	11,188	0	0	0	91,8093	38-1	0
38	0,572	TAMDEM -	LinMoving	Max	0	18,301	0	0	0	145,3965	38-1	0,572
38	0	TAMDEM -	LinMoving	Min	0	-179,771	0	0	0	-199,4316	38-1	0
38	0,572	TAMDEM -	LinMoving	Min	0	-169,761	0	0	0	-161,3897	38-1	0,572
38	0	SERV1-1 H+	Combination	Max	0	-84,107	0	0	0	-13,038	38-1	0
38	0,572	SERV1-1 H+	Combination	Max	0	-64,6	0	0	0	88,6628	38-1	0,572
38	0	SERV1-1 H+	Combination	Min	0	-274,953	0	0	0	-312,4222	38-1	0
38	0,572	SERV1-1 H+	Combination	Min	0	-242,771	0	0	0	-244,907	38-1	0,572
38	0	SERV1-2 T+	Combination	Max	0	-87,1	0	0	0	-9,222	38-1	0
38	0,572	SERV1-2 T+	Combination	Max	0	-65,18	0	0	0	108,2159	38-1	0,572
38	0	SERV1-2 T+	Combination	Min	0	-275,392	0	0	0	-297,9572	38-1	0
38	0,572	SERV1-2 T+	Combination	Min	0	-249,527	0	0	0	-231,5547	38-1	0,572
38	0	RESIST1-2 T+	Combination	Max	0	-121,378	0	0	0	66,2557	38-1	0
38	0,572	RESIST1-2 T+	Combination	Max	0	-81,058	0	0	0	296,1216	38-1	0,572
38	0	RESIST1-2 T+	Combination	Min	0	-559,628	0	0	0	-605,7757	38-1	0
38	0,572	RESIST1-2 T+	Combination	Min	0	-510,128	0	0	0	-494,6945	38-1	0,572
38	0	SERV1-1 H-	Combination	Max	0	-83,209	0	0	0	-6,3571	38-1	0
38	0,572	SERV1-1 H-	Combination	Max	0	-63,797	0	0	0	94,0533	38-1	0,572
38	0	SERV1-1 H-	Combination	Min	0	-257,09	0	0	0	-291,5667	38-1	0
38	0,572	SERV1-1 H-	Combination	Min	0	-226,859	0	0	0	-225,6557	38-1	0,572
38	0	SERV1-2 T-	Combination	Max	0	-85,134	0	0	0	-12,0573	38-1	0
38	0,572	SERV1-2 T-	Combination	Max	0	-65,351	0	0	0	93,0024	38-1	0,572
38	0	SERV1-2 T-	Combination	Min	0	-276,093	0	0	0	-303,2982	38-1	0
38	0,572	SERV1-2 T-	Combination	Min	0	-253,413	0	0	0	-213,7838	38-1	0,572
38	0	RESIST 1-1 H+	Combination	Max	0	-114,411	0	0	0	57,3739	38-1	0
38	0,572	RESIST 1-1 H+	Combination	Max	0	-79,709	0	0	0	250,6117	38-1	0,572
38	0	RESIST 1-1 H+	Combination	Min	0	-558,605	0	0	0	-639,4429	38-1	0
38	0,572	RESIST 1-1 H+	Combination	Min	0	-494,401	0	0	0	-525,772	38-1	0,572
38	0	RESIST1-1 H-	Combination	Max	0	-112,32	0	0	0	72,9237	38-1	0
38	0,572	RESIST1-1 H-	Combination	Max	0	-77,839	0	0	0	263,1581	38-1	0,572
38	0	RESIST1-1 H-	Combination	Min	0	-517,029	0	0	0	-590,9016	38-1	0
38	0,572	RESIST1-1 H-	Combination	Min	0	-457,367	0	0	0	-480,9646	38-1	0,572
38	0	RESIST1-2 T-	Combination	Max	0	-116,801	0	0	0	59,6564	38-1	0
38	0,572	RESIST1-2 T-	Combination	Max	0	-81,457	0	0	0	260,7121	38-1	0,572
38	0	RESIST1-2 T-	Combination	Min	0	-561,258	0	0	0	-618,2067	38-1	0
38	0,572	RESIST1-2 T-	Combination	Min	0	-519,171	0	0	0	-453,3327	38-1	0,572
38	0	E-SERV1-1	Combination	Max	0	-83,209	0	0	0	-6,3571	38-1	0
38	0,572	E-SERV1-1	Combination	Max	0	-63,797	0	0	0	94,0533	38-1	0,572
38	0	E-SERV1-1	Combination	Min	0	-274,953	0	0	0	-312,4222	38-1	0
38	0,572	E-SERV1-1	Combination	Min	0	-242,771	0	0	0	-244,907	38-1	0,572
38	0	E-SERV1-2	Combination	Max	0	-85,134	0	0	0	-9,222	38-1	0
38	0,572	E-SERV1-2	Combination	Max	0	-65,18	0	0	0	108,2159	38-1	0,572
38	0	E-SERV1-2	Combination	Min	0	-276,093	0	0	0	-303,2982	38-1	0
38	0,572	E-SERV1-2	Combination	Min	0	-253,413	0	0	0	-231,5547	38-1	0,572
38	0	E-RESIST1-1	Combination	Max	0	-112,32	0	0	0	72,9237	38-1	0
38	0,572	E-RESIST1-1	Combination	Max	0	-77,839	0	0	0	263,1581	38-1	0,572
38	0	E-RESIST1-1	Combination	Min	0	-558,605	0	0	0	-639,4429	38-1	0
38	0,572	E-RESIST1-1	Combination	Min	0	-494,401	0	0	0	-525,772	38-1	0,572
38	0	E-RESIST1-2	Combination	Max	0	-116,801	0	0	0	66,2557	38-1	0
38	0,572	E-RESIST1-2	Combination	Max	0	-81,058	0	0	0	296,1216	38-1	0,572
38	0	E-RESIST1-2	Combination	Min	0	-561,258	0	0	0	-618,2067	38-1	0
38	0,572	E-RESIST1-2	Combination	Min	0	-519,171	0	0	0	-494,6945	38-1	0,572
39	0	LINEA	LinStatic		0	-35,991	0	0	0	-22,5425	39-1	0
39	0,572	LINEA	LinStatic		0	-30,54	0	0	0	-3,5146	39-1	0,572
39	0	HL93 +	LinMoving	Max	0	19,052	0	0	0	141,0569	39-1	0
39	0,572	HL93 +	LinMoving	Max	0	26,704	0	0	0	197,9858	39-1	0,572

39	0	HL93 +	LinMoving	Min	0	-159,119	0	0	0	-192,5129	39-1	0
39	0,572	HL93 +	LinMoving	Min	0	-138,582	0	0	0	-176,4703	39-1	0,572
39	0	TAMDEM +	LinMoving	Max	0	18,472	0	0	0	160,61	39-1	0
39	0,572	TAMDEM +	LinMoving	Max	0	29,409	0	0	0	218,9629	39-1	0,572
39	0	TAMDEM +	LinMoving	Min	0	-165,876	0	0	0	-179,1606	39-1	0
39	0,572	TAMDEM +	LinMoving	Min	0	-151,766	0	0	0	-164,2305	39-1	0,572
39	0	HL93 -	LinMoving	Max	0	19,855	0	0	0	146,4474	39-1	0
39	0,572	HL93 -	LinMoving	Max	0	27,126	0	0	0	197,6445	39-1	0,572
39	0	HL93 -	LinMoving	Min	0	-143,207	0	0	0	-173,2616	39-1	0
39	0,572	HL93 -	LinMoving	Min	0	-124,723	0	0	0	-158,8233	39-1	0,572
39	0	TAMDEM -	LinMoving	Max	0	18,301	0	0	0	145,3965	39-1	0
39	0,572	TAMDEM -	LinMoving	Max	0	27,457	0	0	0	197,2439	39-1	0,572
39	0	TAMDEM -	LinMoving	Min	0	-169,761	0	0	0	-161,3897	39-1	0
39	0,572	TAMDEM -	LinMoving	Min	0	-158,568	0	0	0	-147,9405	39-1	0,572
39	0	SERV1-1 H+	Combination	Max	0	-64,6	0	0	0	88,6628	39-1	0
39	0,572	SERV1-1 H+	Combination	Max	0	-44,278	0	0	0	189,817	39-1	0,572
39	0	SERV1-1 H+	Combination	Min	0	-242,771	0	0	0	-244,907	39-1	0
39	0,572	SERV1-1 H+	Combination	Min	0	-209,564	0	0	0	-184,6391	39-1	0,572
39	0	SERV1-2 T+	Combination	Max	0	-65,18	0	0	0	108,2159	39-1	0
39	0,572	SERV1-2 T+	Combination	Max	0	-41,573	0	0	0	210,7941	39-1	0,572
39	0	SERV1-2 T+	Combination	Min	0	-249,527	0	0	0	-231,5547	39-1	0
39	0,572	SERV1-2 T+	Combination	Min	0	-222,748	0	0	0	-172,3993	39-1	0,572
39	0	RESIST1-2 T+	Combination	Max	0	-81,058	0	0	0	296,1216	39-1	0
39	0,572	RESIST1-2 T+	Combination	Max	0	-36,814	0	0	0	497,5221	39-1	0,572
39	0	RESIST1-2 T+	Combination	Min	0	-510,128	0	0	0	-494,6945	39-1	0
39	0,572	RESIST1-2 T+	Combination	Min	0	-458,5	0	0	0	-394,3605	39-1	0,572
39	0	SERV1-1 H-	Combination	Max	0	-63,797	0	0	0	94,0533	39-1	0
39	0,572	SERV1-1 H-	Combination	Max	0	-43,856	0	0	0	189,4757	39-1	0,572
39	0	SERV1-1 H-	Combination	Min	0	-226,859	0	0	0	-225,6557	39-1	0
39	0,572	SERV1-1 H-	Combination	Min	0	-195,706	0	0	0	-166,992	39-1	0,572
39	0	SERV1-2 T-	Combination	Max	0	-65,351	0	0	0	93,0024	39-1	0
39	0,572	SERV1-2 T-	Combination	Max	0	-43,525	0	0	0	189,0752	39-1	0,572
39	0	SERV1-2 T-	Combination	Min	0	-253,413	0	0	0	-213,7838	39-1	0
39	0,572	SERV1-2 T-	Combination	Min	0	-229,55	0	0	0	-156,1093	39-1	0,572
39	0	RESIST 1-1 H+	Combination	Max	0	-79,709	0	0	0	250,6117	39-1	0
39	0,572	RESIST 1-1 H+	Combination	Max	0	-43,11	0	0	0	448,698	39-1	0,572
39	0	RESIST 1-1 H+	Combination	Min	0	-494,401	0	0	0	-525,772	39-1	0
39	0,572	RESIST 1-1 H+	Combination	Min	0	-427,812	0	0	0	-422,8485	39-1	0,572
39	0	RESIST1-1 H-	Combination	Max	0	-77,839	0	0	0	263,1581	39-1	0
39	0,572	RESIST1-1 H-	Combination	Max	0	-42,128	0	0	0	447,9037	39-1	0,572
39	0	RESIST1-1 H-	Combination	Min	0	-457,367	0	0	0	-480,9646	39-1	0
39	0,572	RESIST1-1 H-	Combination	Min	0	-395,557	0	0	0	-381,7751	39-1	0,572
39	0	RESIST1-2 T-	Combination	Max	0	-81,457	0	0	0	260,7121	39-1	0
39	0,572	RESIST1-2 T-	Combination	Max	0	-41,357	0	0	0	446,9714	39-1	0,572
39	0	RESIST1-2 T-	Combination	Min	0	-519,171	0	0	0	-453,3327	39-1	0
39	0,572	RESIST1-2 T-	Combination	Min	0	-474,329	0	0	0	-356,4455	39-1	0,572
39	0	E-SERV1-1	Combination	Max	0	-63,797	0	0	0	94,0533	39-1	0
39	0,572	E-SERV1-1	Combination	Max	0	-43,856	0	0	0	189,817	39-1	0,572
39	0	E-SERV1-1	Combination	Min	0	-242,771	0	0	0	-244,907	39-1	0
39	0,572	E-SERV1-1	Combination	Min	0	-209,564	0	0	0	-184,6391	39-1	0,572
39	0	E-SERV1-2	Combination	Max	0	-65,18	0	0	0	108,2159	39-1	0
39	0,572	E-SERV1-2	Combination	Max	0	-41,573	0	0	0	210,7941	39-1	0,572
39	0	E-SERV1-2	Combination	Min	0	-253,413	0	0	0	-231,5547	39-1	0
39	0,572	E-SERV1-2	Combination	Min	0	-229,55	0	0	0	-172,3993	39-1	0,572
39	0	E-RESIST1-1	Combination	Max	0	-77,839	0	0	0	263,1581	39-1	0
39	0,572	E-RESIST1-1	Combination	Max	0	-42,128	0	0	0	448,698	39-1	0,572
39	0	E-RESIST1-1	Combination	Min	0	-494,401	0	0	0	-525,772	39-1	0
39	0,572	E-RESIST1-1	Combination	Min	0	-427,812	0	0	0	-422,8485	39-1	0,572
39	0	E-RESIST1-2	Combination	Max	0	-81,058	0	0	0	296,1216	39-1	0
39	0,572	E-RESIST1-2	Combination	Max	0	-36,814	0	0	0	497,5221	39-1	0,572
39	0	E-RESIST1-2	Combination	Min	0	-519,171	0	0	0	-494,6945	39-1	0
39	0,572	E-RESIST1-2	Combination	Min	0	-474,329	0	0	0	-394,3605	39-1	0,572
40	0	LINEA	LinStatic		0	-30,54	0	0	0	-3,5146	40-1	0
40	0,572	LINEA	LinStatic		0	-25,089	0	0	0	12,3952	40-1	0,572
40	0	HL93 +	LinMoving	Max	0	26,704	0	0	0	197,9858	40-1	0
40	0,572	HL93 +	LinMoving	Max	0	35,151	0	0	0	238,0396	40-1	0,572
40	0	HL93 +	LinMoving	Min	0	-138,582	0	0	0	-176,4703	40-1	0
40	0,572	HL93 +	LinMoving	Min	0	-119,455	0	0	0	-160,4276	40-1	0,572

40	0	TAMDEM +	LinMoving	Max	0	29,409	0	0	0	218,9629	40-1	0
40	0,572	TAMDEM +	LinMoving	Max	0	41,457	0	0	0	267,45	40-1	0,572
40	0	TAMDEM +	LinMoving	Min	0	-151,766	0	0	0	-164,2305	40-1	0
40	0,572	TAMDEM +	LinMoving	Min	0	-136,835	0	0	0	-149,3005	40-1	0,572
40	0	HL93 -	LinMoving	Max	0	27,126	0	0	0	197,6445	40-1	0
40	0,572	HL93 -	LinMoving	Max	0	34,853	0	0	0	232,6377	40-1	0,572
40	0	HL93 -	LinMoving	Min	0	-124,723	0	0	0	-158,8233	40-1	0
40	0,572	HL93 -	LinMoving	Min	0	-105,411	0	0	0	-144,3848	40-1	0,572
40	0	TAMDEM -	LinMoving	Max	0	27,457	0	0	0	197,2439	40-1	0
40	0,572	TAMDEM -	LinMoving	Max	0	37,555	0	0	0	240,9217	40-1	0,572
40	0	TAMDEM -	LinMoving	Min	0	-158,568	0	0	0	-147,9405	40-1	0
40	0,572	TAMDEM -	LinMoving	Min	0	-146,194	0	0	0	-134,4914	40-1	0,572
40	0	SERV1-1 H+	Combination	Max	0	-44,278	0	0	0	189,817	40-1	0
40	0,572	SERV1-1 H+	Combination	Max	0	-23,162	0	0	0	266,8491	40-1	0,572
40	0	SERV1-1 H+	Combination	Min	0	-209,564	0	0	0	-184,6391	40-1	0
40	0,572	SERV1-1 H+	Combination	Min	0	-177,767	0	0	0	-131,6181	40-1	0,572
40	0	SERV1-2 T+	Combination	Max	0	-41,573	0	0	0	210,7941	40-1	0
40	0,572	SERV1-2 T+	Combination	Max	0	-16,855	0	0	0	296,2595	40-1	0,572
40	0	SERV1-2 T+	Combination	Min	0	-222,748	0	0	0	-172,3993	40-1	0
40	0,572	SERV1-2 T+	Combination	Min	0	-195,147	0	0	0	-120,491	40-1	0,572
40	0	RESIST1-2 T+	Combination	Max	0	-36,814	0	0	0	497,5221	40-1	0
40	0,572	RESIST1-2 T+	Combination	Max	0	10,016	0	0	0	665,2132	40-1	0,572
40	0	RESIST1-2 T+	Combination	Min	0	-458,5	0	0	0	-394,3605	40-1	0
40	0,572	RESIST1-2 T+	Combination	Min	0	-404,958	0	0	0	-304,7737	40-1	0,572
40	0	SERV1-1 H-	Combination	Max	0	-43,856	0	0	0	189,4757	40-1	0
40	0,572	SERV1-1 H-	Combination	Max	0	-23,46	0	0	0	261,4472	40-1	0,572
40	0	SERV1-1 H-	Combination	Min	0	-195,706	0	0	0	-166,992	40-1	0
40	0,572	SERV1-1 H-	Combination	Min	0	-163,723	0	0	0	-115,5753	40-1	0,572
40	0	SERV1-2 T-	Combination	Max	0	-43,525	0	0	0	189,0752	40-1	0
40	0,572	SERV1-2 T-	Combination	Max	0	-20,758	0	0	0	269,7312	40-1	0,572
40	0	SERV1-2 T-	Combination	Min	0	-229,55	0	0	0	-156,1093	40-1	0
40	0,572	SERV1-2 T-	Combination	Min	0	-204,506	0	0	0	-105,6819	40-1	0,572
40	0	RESIST 1-1 H+	Combination	Max	0	-43,11	0	0	0	448,698	40-1	0
40	0,572	RESIST 1-1 H+	Combination	Max	0	-4,661	0	0	0	596,7603	40-1	0,572
40	0	RESIST 1-1 H+	Combination	Min	0	-427,812	0	0	0	-422,8485	40-1	0
40	0,572	RESIST 1-1 H+	Combination	Min	0	-364,505	0	0	0	-330,6719	40-1	0,572
40	0	RESIST1-1 H-	Combination	Max	0	-42,128	0	0	0	447,9037	40-1	0
40	0,572	RESIST1-1 H-	Combination	Max	0	-5,355	0	0	0	584,1874	40-1	0,572
40	0	RESIST1-1 H-	Combination	Min	0	-395,557	0	0	0	-381,7751	40-1	0
40	0,572	RESIST1-1 H-	Combination	Min	0	-331,818	0	0	0	-293,3324	40-1	0,572
40	0	RESIST1-2 T-	Combination	Max	0	-41,357	0	0	0	446,9714	40-1	0
40	0,572	RESIST1-2 T-	Combination	Max	0	0,933	0	0	0	603,4685	40-1	0,572
40	0	RESIST1-2 T-	Combination	Min	0	-474,329	0	0	0	-356,4455	40-1	0
40	0,572	RESIST1-2 T-	Combination	Min	0	-426,741	0	0	0	-270,3055	40-1	0,572
40	0	E-SERV1-1	Combination	Max	0	-43,856	0	0	0	189,817	40-1	0
40	0,572	E-SERV1-1	Combination	Max	0	-23,162	0	0	0	266,8491	40-1	0,572
40	0	E-SERV1-1	Combination	Min	0	-209,564	0	0	0	-184,6391	40-1	0
40	0,572	E-SERV1-1	Combination	Min	0	-177,767	0	0	0	-131,6181	40-1	0,572
40	0	E-SERV1-2	Combination	Max	0	-41,573	0	0	0	210,7941	40-1	0
40	0,572	E-SERV1-2	Combination	Max	0	-16,855	0	0	0	296,2595	40-1	0,572
40	0	E-SERV1-2	Combination	Min	0	-229,55	0	0	0	-172,3993	40-1	0
40	0,572	E-SERV1-2	Combination	Min	0	-204,506	0	0	0	-120,491	40-1	0,572
40	0	E-RESIST1-1	Combination	Max	0	-42,128	0	0	0	448,698	40-1	0
40	0,572	E-RESIST1-1	Combination	Max	0	-4,661	0	0	0	596,7603	40-1	0,572
40	0	E-RESIST1-1	Combination	Min	0	-427,812	0	0	0	-422,8485	40-1	0
40	0,572	E-RESIST1-1	Combination	Min	0	-364,505	0	0	0	-330,6719	40-1	0,572
40	0	E-RESIST1-2	Combination	Max	0	-36,814	0	0	0	497,5221	40-1	0
40	0,572	E-RESIST1-2	Combination	Max	0	10,016	0	0	0	665,2132	40-1	0,572
40	0	E-RESIST1-2	Combination	Min	0	-474,329	0	0	0	-394,3605	40-1	0
40	0,572	E-RESIST1-2	Combination	Min	0	-426,741	0	0	0	-304,7737	40-1	0,572
41	0	LINEA	LinStatic		0	-25,089	0	0	0	12,3952	41-1	0
41	0,572	LINEA	LinStatic		0	-19,638	0	0	0	25,187	41-1	0,572
41	0	HL93 +	LinMoving	Max	0	35,151	0	0	0	238,0396	41-1	0
41	0,572	HL93 +	LinMoving	Max	0	44,187	0	0	0	259,146	41-1	0,572
41	0	HL93 +	LinMoving	Min	0	-119,455	0	0	0	-160,4276	41-1	0
41	0,572	HL93 +	LinMoving	Min	0	-107,819	0	0	0	-144,3848	41-1	0,572
41	0	TAMDEM +	LinMoving	Max	0	41,457	0	0	0	267,45	41-1	0
41	0,572	TAMDEM +	LinMoving	Max	0	54,524	0	0	0	304,0291	41-1	0,572

41	0	TAMDEM +	LinMoving	Min	0	-136,835	0	0	0	-149,3005	41-1	0
41	0,572	TAMDEM +	LinMoving	Min	0	-121,173	0	0	0	-134,3704	41-1	0,572
41	0	HL93 -	LinMoving	Max	0	34,853	0	0	0	232,6377	41-1	0
41	0,572	HL93 -	LinMoving	Max	0	42,964	0	0	0	249,6812	41-1	0,572
41	0	HL93 -	LinMoving	Min	0	-105,411	0	0	0	-144,3848	41-1	0
41	0,572	HL93 -	LinMoving	Min	0	-85,698	0	0	0	-129,9463	41-1	0,572
41	0	TAMDEM -	LinMoving	Max	0	37,555	0	0	0	240,9217	41-1	0
41	0,572	TAMDEM -	LinMoving	Max	0	49,115	0	0	0	273,8724	41-1	0,572
41	0	TAMDEM -	LinMoving	Min	0	-146,194	0	0	0	-134,4914	41-1	0
41	0,572	TAMDEM -	LinMoving	Min	0	-132,642	0	0	0	-121,0423	41-1	0,572
41	0	SERV1-1 H+	Combination	Max	0	-23,162	0	0	0	266,8491	41-1	0
41	0,572	SERV1-1 H+	Combination	Max	0	-1,455	0	0	0	317,6866	41-1	0,572
41	0	SERV1-1 H+	Combination	Min	0	-177,767	0	0	0	-131,6181	41-1	0
41	0,572	SERV1-1 H+	Combination	Min	0	-153,462	0	0	0	-85,8442	41-1	0,572
41	0	SERV1-2 T+	Combination	Max	0	-16,855	0	0	0	296,2595	41-1	0
41	0,572	SERV1-2 T+	Combination	Max	0	8,881	0	0	0	362,5697	41-1	0,572
41	0	SERV1-2 T+	Combination	Min	0	-195,147	0	0	0	-120,491	41-1	0
41	0,572	SERV1-2 T+	Combination	Min	0	-166,816	0	0	0	-75,8298	41-1	0,572
41	0	RESIST1-2 T+	Combination	Max	0	10,016	0	0	0	665,2132	41-1	0
41	0,572	RESIST1-2 T+	Combination	Max	0	59,218	0	0	0	794,4409	41-1	0,572
41	0	RESIST1-2 T+	Combination	Min	0	-404,958	0	0	0	-304,7737	41-1	0
41	0,572	RESIST1-2 T+	Combination	Min	0	-349,717	0	0	0	-225,934	41-1	0,572
41	0	SERV1-1 H-	Combination	Max	0	-23,46	0	0	0	261,4472	41-1	0
41	0,572	SERV1-1 H-	Combination	Max	0	-2,679	0	0	0	308,2218	41-1	0,572
41	0	SERV1-1 H-	Combination	Min	0	-163,723	0	0	0	-115,5753	41-1	0
41	0,572	SERV1-1 H-	Combination	Min	0	-131,34	0	0	0	-71,4057	41-1	0,572
41	0	SERV1-2 T-	Combination	Max	0	-20,758	0	0	0	269,7312	41-1	0
41	0,572	SERV1-2 T-	Combination	Max	0	3,473	0	0	0	332,4131	41-1	0,572
41	0	SERV1-2 T-	Combination	Min	0	-204,506	0	0	0	-105,6819	41-1	0
41	0,572	SERV1-2 T-	Combination	Min	0	-178,285	0	0	0	-62,5016	41-1	0,572
41	0	RESIST 1-1 H+	Combination	Max	0	-4,661	0	0	0	596,7603	41-1	0
41	0,572	RESIST 1-1 H+	Combination	Max	0	35,16	0	0	0	689,9755	41-1	0,572
41	0	RESIST 1-1 H+	Combination	Min	0	-364,505	0	0	0	-330,6719	41-1	0
41	0,572	RESIST 1-1 H+	Combination	Min	0	-318,635	0	0	0	-249,2424	41-1	0,572
41	0	RESIST1-1 H-	Combination	Max	0	-5,355	0	0	0	584,1874	41-1	0
41	0,572	RESIST1-1 H-	Combination	Max	0	32,312	0	0	0	667,9463	41-1	0,572
41	0	RESIST1-1 H-	Combination	Min	0	-331,818	0	0	0	-293,3324	41-1	0
41	0,572	RESIST1-1 H-	Combination	Min	0	-267,148	0	0	0	-215,6368	41-1	0,572
41	0	RESIST1-2 T-	Combination	Max	0	0,933	0	0	0	603,4685	41-1	0
41	0,572	RESIST1-2 T-	Combination	Max	0	46,63	0	0	0	724,2513	41-1	0,572
41	0	RESIST1-2 T-	Combination	Min	0	-426,741	0	0	0	-270,3055	41-1	0
41	0,572	RESIST1-2 T-	Combination	Min	0	-376,411	0	0	0	-194,9126	41-1	0,572
41	0	E-SERV1-1	Combination	Max	0	-23,162	0	0	0	266,8491	41-1	0
41	0,572	E-SERV1-1	Combination	Max	0	-1,455	0	0	0	317,6866	41-1	0,572
41	0	E-SERV1-1	Combination	Min	0	-177,767	0	0	0	-131,6181	41-1	0
41	0,572	E-SERV1-1	Combination	Min	0	-153,462	0	0	0	-85,8442	41-1	0,572
41	0	E-SERV1-2	Combination	Max	0	-16,855	0	0	0	296,2595	41-1	0
41	0,572	E-SERV1-2	Combination	Max	0	8,881	0	0	0	362,5697	41-1	0,572
41	0	E-SERV1-2	Combination	Min	0	-204,506	0	0	0	-120,491	41-1	0
41	0,572	E-SERV1-2	Combination	Min	0	-178,285	0	0	0	-75,8298	41-1	0,572
41	0	E-RESIST1-1	Combination	Max	0	-4,661	0	0	0	596,7603	41-1	0
41	0,572	E-RESIST1-1	Combination	Max	0	35,16	0	0	0	689,9755	41-1	0,572
41	0	E-RESIST1-1	Combination	Min	0	-364,505	0	0	0	-330,6719	41-1	0
41	0,572	E-RESIST1-1	Combination	Min	0	-318,635	0	0	0	-249,2424	41-1	0,572
41	0	E-RESIST1-2	Combination	Max	0	10,016	0	0	0	665,2132	41-1	0
41	0,572	E-RESIST1-2	Combination	Max	0	59,218	0	0	0	794,4409	41-1	0,572
41	0	E-RESIST1-2	Combination	Min	0	-426,741	0	0	0	-304,7737	41-1	0
41	0,572	E-RESIST1-2	Combination	Min	0	-376,411	0	0	0	-225,934	41-1	0,572
42	0	LINEA	LinStatic		0	-19,638	0	0	0	25,187	42-1	0
42	0,572	LINEA	LinStatic		0	-14,186	0	0	0	34,8607	42-1	0,572
42	0	HL93 +	LinMoving	Max	0	44,187	0	0	0	259,146	42-1	0
42	0,572	HL93 +	LinMoving	Max	0	53,754	0	0	0	259,5027	42-1	0,572
42	0	HL93 +	LinMoving	Min	0	-107,819	0	0	0	-144,3848	42-1	0
42	0,572	HL93 +	LinMoving	Min	0	-97,78	0	0	0	-128,342	42-1	0,572
42	0	TAMDEM +	LinMoving	Max	0	54,524	0	0	0	304,0291	42-1	0
42	0,572	TAMDEM +	LinMoving	Max	0	68,517	0	0	0	326,8679	42-1	0,572
42	0	TAMDEM +	LinMoving	Min	0	-121,173	0	0	0	-134,3704	42-1	0
42	0,572	TAMDEM +	LinMoving	Min	0	-104,873	0	0	0	-119,4404	42-1	0,572

42	0	HL93 -	LinMoving	Max	0	42,964	0	0	0	249,6812	42-1	0
42	0,572	HL93 -	LinMoving	Max	0	52,031	0	0	0	250,2666	42-1	0,572
42	0	HL93 -	LinMoving	Min	0	-85,698	0	0	0	-129,9463	42-1	0
42	0,572	HL93 -	LinMoving	Min	0	-74,507	0	0	0	-115,5078	42-1	0,572
42	0	TAMDEM -	LinMoving	Max	0	49,115	0	0	0	273,8724	42-1	0
42	0,572	TAMDEM -	LinMoving	Max	0	61,721	0	0	0	294,4459	42-1	0,572
42	0	TAMDEM -	LinMoving	Min	0	-132,642	0	0	0	-121,0423	42-1	0
42	0,572	TAMDEM -	LinMoving	Min	0	-117,983	0	0	0	-107,5931	42-1	0,572
42	0	SERV1-1 H+	Combination	Max	0	-1,455	0	0	0	317,6866	42-1	0
42	0,572	SERV1-1 H+	Combination	Max	0	20,781	0	0	0	340,5273	42-1	0,572
42	0	SERV1-1 H+	Combination	Min	0	-153,462	0	0	0	-85,8442	42-1	0
42	0,572	SERV1-1 H+	Combination	Min	0	-130,753	0	0	0	-47,3174	42-1	0,572
42	0	SERV1-2 T+	Combination	Max	0	8,881	0	0	0	362,5697	42-1	0
42	0,572	SERV1-2 T+	Combination	Max	0	35,544	0	0	0	407,8925	42-1	0,572
42	0	SERV1-2 T+	Combination	Min	0	-166,816	0	0	0	-75,8298	42-1	0
42	0,572	SERV1-2 T+	Combination	Min	0	-137,846	0	0	0	-38,4158	42-1	0,572
42	0	RESIST1-2 T+	Combination	Max	0	59,218	0	0	0	794,4409	42-1	0
42	0,572	RESIST1-2 T+	Combination	Max	0	110,575	0	0	0	880,941	42-1	0,572
42	0	RESIST1-2 T+	Combination	Min	0	-349,717	0	0	0	-225,934	42-1	0
42	0,572	RESIST1-2 T+	Combination	Min	0	-292,99	0	0	0	-157,8415	42-1	0,572
42	0	SERV1-1 H-	Combination	Max	0	-2,679	0	0	0	308,2218	42-1	0
42	0,572	SERV1-1 H-	Combination	Max	0	19,059	0	0	0	331,2912	42-1	0,572
42	0	SERV1-1 H-	Combination	Min	0	-131,34	0	0	0	-71,4057	42-1	0
42	0,572	SERV1-1 H-	Combination	Min	0	-107,48	0	0	0	-34,4832	42-1	0,572
42	0	SERV1-2 T-	Combination	Max	0	3,473	0	0	0	332,4131	42-1	0
42	0,572	SERV1-2 T-	Combination	Max	0	28,748	0	0	0	375,4705	42-1	0,572
42	0	SERV1-2 T-	Combination	Min	0	-178,285	0	0	0	-62,5016	42-1	0
42	0,572	SERV1-2 T-	Combination	Min	0	-150,956	0	0	0	-26,5685	42-1	0,572
42	0	RESIST 1-1 H+	Combination	Max	0	35,16	0	0	0	689,9755	42-1	0
42	0,572	RESIST 1-1 H+	Combination	Max	0	76,216	0	0	0	724,1485	42-1	0,572
42	0	RESIST 1-1 H+	Combination	Min	0	-318,635	0	0	0	-249,2424	42-1	0
42	0,572	RESIST 1-1 H+	Combination	Min	0	-276,481	0	0	0	-178,5601	42-1	0,572
42	0	RESIST1-1 H-	Combination	Max	0	32,312	0	0	0	667,9463	42-1	0
42	0,572	RESIST1-1 H-	Combination	Max	0	72,206	0	0	0	702,6516	42-1	0,572
42	0	RESIST1-1 H-	Combination	Min	0	-267,148	0	0	0	-215,6368	42-1	0
42	0,572	RESIST1-1 H-	Combination	Min	0	-222,312	0	0	0	-148,6885	42-1	0,572
42	0	RESIST1-2 T-	Combination	Max	0	46,63	0	0	0	724,2513	42-1	0
42	0,572	RESIST1-2 T-	Combination	Max	0	94,757	0	0	0	805,4788	42-1	0,572
42	0	RESIST1-2 T-	Combination	Min	0	-376,411	0	0	0	-194,9126	42-1	0
42	0,572	RESIST1-2 T-	Combination	Min	0	-323,504	0	0	0	-130,267	42-1	0,572
42	0	E-SERV1-1	Combination	Max	0	-1,455	0	0	0	317,6866	42-1	0
42	0,572	E-SERV1-1	Combination	Max	0	20,781	0	0	0	340,5273	42-1	0,572
42	0	E-SERV1-1	Combination	Min	0	-153,462	0	0	0	-85,8442	42-1	0
42	0,572	E-SERV1-1	Combination	Min	0	-130,753	0	0	0	-47,3174	42-1	0,572
42	0	E-SERV1-2	Combination	Max	0	8,881	0	0	0	362,5697	42-1	0
42	0,572	E-SERV1-2	Combination	Max	0	35,544	0	0	0	407,8925	42-1	0,572
42	0	E-SERV1-2	Combination	Min	0	-178,285	0	0	0	-75,8298	42-1	0
42	0,572	E-SERV1-2	Combination	Min	0	-150,956	0	0	0	-38,4158	42-1	0,572
42	0	E-RESIST1-1	Combination	Max	0	35,16	0	0	0	689,9755	42-1	0
42	0,572	E-RESIST1-1	Combination	Max	0	76,216	0	0	0	724,1485	42-1	0,572
42	0	E-RESIST1-1	Combination	Min	0	-318,635	0	0	0	-249,2424	42-1	0
42	0,572	E-RESIST1-1	Combination	Min	0	-276,481	0	0	0	-178,5601	42-1	0,572
42	0	E-RESIST1-2	Combination	Max	0	59,218	0	0	0	794,4409	42-1	0
42	0,572	E-RESIST1-2	Combination	Max	0	110,575	0	0	0	880,941	42-1	0,572
42	0	E-RESIST1-2	Combination	Min	0	-376,411	0	0	0	-225,934	42-1	0
42	0,572	E-RESIST1-2	Combination	Min	0	-323,504	0	0	0	-157,8415	42-1	0,572
43	0	LINEA	LinStatic		0	-14,186	0	0	0	34,8607	43-1	0
43	0,572	LINEA	LinStatic		0	-8,735	0	0	0	41,4163	43-1	0,572
43	0	HL93 +	LinMoving	Max	0	53,754	0	0	0	259,5027	43-1	0
43	0,572	HL93 +	LinMoving	Max	0	66,438	0	0	0	266,016	43-1	0,572
43	0	HL93 +	LinMoving	Min	0	-97,78	0	0	0	-128,342	43-1	0
43	0,572	HL93 +	LinMoving	Min	0	-87,328	0	0	0	-112,2993	43-1	0,572
43	0	TAMDEM +	LinMoving	Max	0	68,517	0	0	0	326,8679	43-1	0
43	0,572	TAMDEM +	LinMoving	Max	0	83,344	0	0	0	334,3451	43-1	0,572
43	0	TAMDEM +	LinMoving	Min	0	-104,873	0	0	0	-119,4404	43-1	0
43	0,572	TAMDEM +	LinMoving	Min	0	-88,027	0	0	0	-104,5103	43-1	0,572
43	0	HL93 -	LinMoving	Max	0	52,031	0	0	0	250,2666	43-1	0
43	0,572	HL93 -	LinMoving	Max	0	62,202	0	0	0	249,0563	43-1	0,572

43	0	HL93 -	LinMoving	Min	0	-74,507	0	0	0	-115,5078	43-1	0
43	0,572	HL93 -	LinMoving	Min	0	-64,991	0	0	0	-101,0694	43-1	0,572
43	0	TAMDEM -	LinMoving	Max	0	61,721	0	0	0	294,4459	43-1	0
43	0,572	TAMDEM -	LinMoving	Max	0	75,077	0	0	0	301,1814	43-1	0,572
43	0	TAMDEM -	LinMoving	Min	0	-117,983	0	0	0	-107,5931	43-1	0
43	0,572	TAMDEM -	LinMoving	Min	0	-102,808	0	0	0	-94,144	43-1	0,572
43	0	SERV1-1 H+	Combination	Max	0	20,781	0	0	0	340,5273	43-1	0
43	0,572	SERV1-1 H+	Combination	Max	0	46,135	0	0	0	362,2775	43-1	0,572
43	0	SERV1-1 H+	Combination	Min	0	-130,753	0	0	0	-47,3174	43-1	0
43	0,572	SERV1-1 H+	Combination	Min	0	-107,631	0	0	0	-16,0378	43-1	0,572
43	0	SERV1-2 T+	Combination	Max	0	35,544	0	0	0	407,8925	43-1	0
43	0,572	SERV1-2 T+	Combination	Max	0	63,041	0	0	0	430,6065	43-1	0,572
43	0	SERV1-2 T+	Combination	Min	0	-137,846	0	0	0	-38,4158	43-1	0
43	0,572	SERV1-2 T+	Combination	Min	0	-108,33	0	0	0	-8,2489	43-1	0,572
43	0	RESIST1-2 T+	Combination	Max	0	110,575	0	0	0	880,941	43-1	0
43	0,572	RESIST1-2 T+	Combination	Max	0	163,875	0	0	0	920,9398	43-1	0,572
43	0	RESIST1-2 T+	Combination	Min	0	-292,99	0	0	0	-157,8415	43-1	0
43	0,572	RESIST1-2 T+	Combination	Min	0	-234,992	0	0	0	-100,4962	43-1	0,572
43	0	SERV1-1 H-	Combination	Max	0	19,059	0	0	0	331,2912	43-1	0
43	0,572	SERV1-1 H-	Combination	Max	0	41,899	0	0	0	345,3177	43-1	0,572
43	0	SERV1-1 H-	Combination	Min	0	-107,48	0	0	0	-34,4832	43-1	0
43	0,572	SERV1-1 H-	Combination	Min	0	-85,293	0	0	0	-4,8079	43-1	0,572
43	0	SERV1-2 T-	Combination	Max	0	28,748	0	0	0	375,4705	43-1	0
43	0,572	SERV1-2 T-	Combination	Max	0	54,774	0	0	0	397,4429	43-1	0,572
43	0	SERV1-2 T-	Combination	Min	0	-150,956	0	0	0	-26,5685	43-1	0
43	0,572	SERV1-2 T-	Combination	Min	0	-123,111	0	0	0	2,1175	43-1	0,572
43	0	RESIST 1-1 H+	Combination	Max	0	76,216	0	0	0	724,1485	43-1	0
43	0,572	RESIST 1-1 H+	Combination	Max	0	124,525	0	0	0	761,9039	43-1	0,572
43	0	RESIST 1-1 H+	Combination	Min	0	-276,481	0	0	0	-178,5601	43-1	0
43	0,572	RESIST 1-1 H+	Combination	Min	0	-233,364	0	0	0	-118,625	43-1	0,572
43	0	RESIST1-1 H-	Combination	Max	0	72,206	0	0	0	702,6516	43-1	0
43	0,572	RESIST1-1 H-	Combination	Max	0	114,666	0	0	0	722,4301	43-1	0,572
43	0	RESIST1-1 H-	Combination	Min	0	-222,312	0	0	0	-148,6885	43-1	0
43	0,572	RESIST1-1 H-	Combination	Min	0	-181,374	0	0	0	-92,4873	43-1	0,572
43	0	RESIST1-2 T-	Combination	Max	0	94,757	0	0	0	805,4788	43-1	0
43	0,572	RESIST1-2 T-	Combination	Max	0	144,634	0	0	0	843,7513	43-1	0,572
43	0	RESIST1-2 T-	Combination	Min	0	-323,504	0	0	0	-130,267	43-1	0
43	0,572	RESIST1-2 T-	Combination	Min	0	-269,395	0	0	0	-76,3685	43-1	0,572
43	0	E-SERV1-1	Combination	Max	0	20,781	0	0	0	340,5273	43-1	0
43	0,572	E-SERV1-1	Combination	Max	0	46,135	0	0	0	362,2775	43-1	0,572
43	0	E-SERV1-1	Combination	Min	0	-130,753	0	0	0	-47,3174	43-1	0
43	0,572	E-SERV1-1	Combination	Min	0	-107,631	0	0	0	-16,0378	43-1	0,572
43	0	E-SERV1-2	Combination	Max	0	35,544	0	0	0	407,8925	43-1	0
43	0,572	E-SERV1-2	Combination	Max	0	63,041	0	0	0	430,6065	43-1	0,572
43	0	E-SERV1-2	Combination	Min	0	-150,956	0	0	0	-38,4158	43-1	0
43	0,572	E-SERV1-2	Combination	Min	0	-123,111	0	0	0	-8,2489	43-1	0,572
43	0	E-RESIST1-1	Combination	Max	0	76,216	0	0	0	724,1485	43-1	0
43	0,572	E-RESIST1-1	Combination	Max	0	124,525	0	0	0	761,9039	43-1	0,572
43	0	E-RESIST1-1	Combination	Min	0	-276,481	0	0	0	-178,5601	43-1	0
43	0,572	E-RESIST1-1	Combination	Min	0	-233,364	0	0	0	-118,625	43-1	0,572
43	0	E-RESIST1-2	Combination	Max	0	110,575	0	0	0	880,941	43-1	0
43	0,572	E-RESIST1-2	Combination	Max	0	163,875	0	0	0	920,9398	43-1	0,572
43	0	E-RESIST1-2	Combination	Min	0	-323,504	0	0	0	-157,8415	43-1	0
43	0,572	E-RESIST1-2	Combination	Min	0	-269,395	0	0	0	-100,4962	43-1	0,572
44	0	LINEA	LinStatic		0	-8,735	0	0	0	41,4163	44-1	0
44	0,572	LINEA	LinStatic		0	-3,284	0	0	0	44,8539	44-1	0,572
44	0	HL93 +	LinMoving	Max	0	66,438	0	0	0	266,016	44-1	0
44	0,572	HL93 +	LinMoving	Max	0	82,786	0	0	0	284,1228	44-1	0,572
44	0	HL93 +	LinMoving	Min	0	-87,328	0	0	0	-112,2993	44-1	0
44	0,572	HL93 +	LinMoving	Min	0	-76,442	0	0	0	-96,2565	44-1	0,572
44	0	TAMDEM +	LinMoving	Max	0	83,344	0	0	0	334,3451	44-1	0
44	0,572	TAMDEM +	LinMoving	Max	0	98,914	0	0	0	339,4732	44-1	0,572
44	0	TAMDEM +	LinMoving	Min	0	-88,027	0	0	0	-104,5103	44-1	0
44	0,572	TAMDEM +	LinMoving	Min	0	-70,727	0	0	0	-89,5803	44-1	0,572
44	0	HL93 -	LinMoving	Max	0	62,202	0	0	0	249,0563	44-1	0
44	0,572	HL93 -	LinMoving	Max	0	76,765	0	0	0	263,4568	44-1	0,572
44	0	HL93 -	LinMoving	Min	0	-64,991	0	0	0	-101,0694	44-1	0
44	0,572	HL93 -	LinMoving	Min	0	-55,034	0	0	0	-86,6309	44-1	0,572

44	0	TAMDEM -	LinMoving	Max	0	75,077	0	0	0	301,1814	44-1	0
44	0,572	TAMDEM -	LinMoving	Max	0	89,103	0	0	0	305,8009	44-1	0,572
44	0	TAMDEM -	LinMoving	Min	0	-102,808	0	0	0	-94,144	44-1	0
44	0,572	TAMDEM -	LinMoving	Min	0	-87,224	0	0	0	-80,6948	44-1	0,572
44	0	SERV1-1 H+	Combination	Max	0	46,135	0	0	0	362,2775	44-1	0
44	0,572	SERV1-1 H+	Combination	Max	0	75,153	0	0	0	388,374	44-1	0,572
44	0	SERV1-1 H+	Combination	Min	0	-107,631	0	0	0	-16,0378	44-1	0
44	0,572	SERV1-1 H+	Combination	Min	0	-84,075	0	0	0	7,9947	44-1	0,572
44	0	SERV1-2 T+	Combination	Max	0	63,041	0	0	0	430,6065	44-1	0
44	0,572	SERV1-2 T+	Combination	Max	0	91,281	0	0	0	443,7244	44-1	0,572
44	0	SERV1-2 T+	Combination	Min	0	-108,33	0	0	0	-8,2489	44-1	0
44	0,572	SERV1-2 T+	Combination	Min	0	-78,36	0	0	0	14,6709	44-1	0,572
44	0	RESIST1-2 T+	Combination	Max	0	163,875	0	0	0	920,9398	44-1	0
44	0,572	RESIST1-2 T+	Combination	Max	0	218,903	0	0	0	944,7239	44-1	0,572
44	0	RESIST1-2 T+	Combination	Min	0	-234,992	0	0	0	-100,4962	44-1	0
44	0,572	RESIST1-2 T+	Combination	Min	0	-175,937	0	0	0	-53,8981	44-1	0,572
44	0	SERV1-1 H-	Combination	Max	0	41,899	0	0	0	345,3177	44-1	0
44	0,572	SERV1-1 H-	Combination	Max	0	69,132	0	0	0	367,708	44-1	0,572
44	0	SERV1-1 H-	Combination	Min	0	-85,293	0	0	0	-4,8079	44-1	0
44	0,572	SERV1-1 H-	Combination	Min	0	-62,667	0	0	0	17,6203	44-1	0,572
44	0	SERV1-2 T-	Combination	Max	0	54,774	0	0	0	397,4429	44-1	0
44	0,572	SERV1-2 T-	Combination	Max	0	81,47	0	0	0	410,0521	44-1	0,572
44	0	SERV1-2 T-	Combination	Min	0	-123,111	0	0	0	2,1175	44-1	0
44	0,572	SERV1-2 T-	Combination	Min	0	-94,857	0	0	0	23,5564	44-1	0,572
44	0	RESIST 1-1 H+	Combination	Max	0	124,525	0	0	0	761,9039	44-1	0
44	0,572	RESIST 1-1 H+	Combination	Max	0	181,366	0	0	0	815,8959	44-1	0,572
44	0	RESIST 1-1 H+	Combination	Min	0	-233,364	0	0	0	-118,625	44-1	0
44	0,572	RESIST 1-1 H+	Combination	Min	0	-189,238	0	0	0	-69,437	44-1	0,572
44	0	RESIST1-1 H-	Combination	Max	0	114,666	0	0	0	722,4301	44-1	0
44	0,572	RESIST1-1 H-	Combination	Max	0	167,35	0	0	0	767,7957	44-1	0,572
44	0	RESIST1-1 H-	Combination	Min	0	-181,374	0	0	0	-92,4873	44-1	0
44	0,572	RESIST1-1 H-	Combination	Min	0	-139,411	0	0	0	-47,0333	44-1	0,572
44	0	RESIST1-2 T-	Combination	Max	0	144,634	0	0	0	843,7513	44-1	0
44	0,572	RESIST1-2 T-	Combination	Max	0	196,067	0	0	0	866,3516	44-1	0,572
44	0	RESIST1-2 T-	Combination	Min	0	-269,395	0	0	0	-76,3685	44-1	0
44	0,572	RESIST1-2 T-	Combination	Min	0	-214,334	0	0	0	-33,2172	44-1	0,572
44	0	E-SERV1-1	Combination	Max	0	46,135	0	0	0	362,2775	44-1	0
44	0,572	E-SERV1-1	Combination	Max	0	75,153	0	0	0	388,374	44-1	0,572
44	0	E-SERV1-1	Combination	Min	0	-107,631	0	0	0	-16,0378	44-1	0
44	0,572	E-SERV1-1	Combination	Min	0	-84,075	0	0	0	7,9947	44-1	0,572
44	0	E-SERV1-2	Combination	Max	0	63,041	0	0	0	430,6065	44-1	0
44	0,572	E-SERV1-2	Combination	Max	0	91,281	0	0	0	443,7244	44-1	0,572
44	0	E-SERV1-2	Combination	Min	0	-123,111	0	0	0	-8,2489	44-1	0
44	0,572	E-SERV1-2	Combination	Min	0	-94,857	0	0	0	14,6709	44-1	0,572
44	0	E-RESIST1-1	Combination	Max	0	124,525	0	0	0	761,9039	44-1	0
44	0,572	E-RESIST1-1	Combination	Max	0	181,366	0	0	0	815,8959	44-1	0,572
44	0	E-RESIST1-1	Combination	Min	0	-233,364	0	0	0	-118,625	44-1	0
44	0,572	E-RESIST1-1	Combination	Min	0	-189,238	0	0	0	-69,437	44-1	0,572
44	0	E-RESIST1-2	Combination	Max	0	163,875	0	0	0	920,9398	44-1	0
44	0,572	E-RESIST1-2	Combination	Max	0	218,903	0	0	0	944,7239	44-1	0,572
44	0	E-RESIST1-2	Combination	Min	0	-269,395	0	0	0	-100,4962	44-1	0
44	0,572	E-RESIST1-2	Combination	Min	0	-214,334	0	0	0	-53,8981	44-1	0,572
45	0	LINEA	LinStatic		0	-3,284	0	0	0	44,8539	45-1	0
45	0,572	LINEA	LinStatic		0	2,167	0	0	0	45,1734	45-1	0,572
45	0	HL93 +	LinMoving	Max	0	82,786	0	0	0	284,1228	45-1	0
45	0,572	HL93 +	LinMoving	Max	0	100,286	0	0	0	286,8176	45-1	0,572
45	0	HL93 +	LinMoving	Min	0	-76,442	0	0	0	-96,2565	45-1	0
45	0,572	HL93 +	LinMoving	Min	0	-64,687	0	0	0	-80,2138	45-1	0,572
45	0	TAMDEM +	LinMoving	Max	0	98,914	0	0	0	339,4732	45-1	0
45	0,572	TAMDEM +	LinMoving	Max	0	115,134	0	0	0	329,2845	45-1	0,572
45	0	TAMDEM +	LinMoving	Min	0	-70,727	0	0	0	-89,5803	45-1	0
45	0,572	TAMDEM +	LinMoving	Min	0	-53,065	0	0	0	-74,6502	45-1	0,572
45	0	HL93 -	LinMoving	Max	0	76,765	0	0	0	263,4568	45-1	0
45	0,572	HL93 -	LinMoving	Max	0	92,923	0	0	0	265,7608	45-1	0,572
45	0	HL93 -	LinMoving	Min	0	-55,034	0	0	0	-86,6309	45-1	0
45	0,572	HL93 -	LinMoving	Min	0	-44,677	0	0	0	-72,1924	45-1	0,572
45	0	TAMDEM -	LinMoving	Max	0	89,103	0	0	0	305,8009	45-1	0
45	0,572	TAMDEM -	LinMoving	Max	0	103,714	0	0	0	296,6228	45-1	0,572

45	0	TAMDEM -	LinMoving	Min	0	-87,224	0	0	0	-80,6948	45-1	0
45	0,572	TAMDEM -	LinMoving	Min	0	-71,314	0	0	0	-67,2457	45-1	0,572
45	0	SERV1-1 H+	Combination	Max	0	75,153	0	0	0	388,374	45-1	0
45	0,572	SERV1-1 H+	Combination	Max	0	105,323	0	0	0	391,8114	45-1	0,572
45	0	SERV1-1 H+	Combination	Min	0	-84,075	0	0	0	7,9947	45-1	0
45	0,572	SERV1-1 H+	Combination	Min	0	-59,651	0	0	0	24,78	45-1	0,572
45	0	SERV1-2 T+	Combination	Max	0	91,281	0	0	0	443,7244	45-1	0
45	0,572	SERV1-2 T+	Combination	Max	0	120,171	0	0	0	434,2783	45-1	0,572
45	0	SERV1-2 T+	Combination	Min	0	-78,36	0	0	0	14,6709	45-1	0
45	0,572	SERV1-2 T+	Combination	Min	0	-48,028	0	0	0	30,3436	45-1	0,572
45	0	RESIST1-2 T+	Combination	Max	0	218,903	0	0	0	944,7239	45-1	0
45	0,572	RESIST1-2 T+	Combination	Max	0	275,445	0	0	0	922,111	45-1	0,572
45	0	RESIST1-2 T+	Combination	Min	0	-175,937	0	0	0	-53,8981	45-1	0
45	0,572	RESIST1-2 T+	Combination	Min	0	-116,04	0	0	0	-18,0471	45-1	0,572
45	0	SERV1-1 H-	Combination	Max	0	69,132	0	0	0	367,708	45-1	0
45	0,572	SERV1-1 H-	Combination	Max	0	97,96	0	0	0	370,7546	45-1	0,572
45	0	SERV1-1 H-	Combination	Min	0	-62,667	0	0	0	17,6203	45-1	0
45	0,572	SERV1-1 H-	Combination	Min	0	-39,641	0	0	0	32,8014	45-1	0,572
45	0	SERV1-2 T-	Combination	Max	0	81,47	0	0	0	410,0521	45-1	0
45	0,572	SERV1-2 T-	Combination	Max	0	108,751	0	0	0	401,6166	45-1	0,572
45	0	SERV1-2 T-	Combination	Min	0	-94,857	0	0	0	23,5564	45-1	0
45	0,572	SERV1-2 T-	Combination	Min	0	-66,277	0	0	0	37,7481	45-1	0,572
45	0	RESIST 1-1 H+	Combination	Max	0	181,366	0	0	0	815,8959	45-1	0
45	0,572	RESIST 1-1 H+	Combination	Max	0	240,884	0	0	0	823,2693	45-1	0,572
45	0	RESIST 1-1 H+	Combination	Min	0	-189,238	0	0	0	-69,437	45-1	0
45	0,572	RESIST 1-1 H+	Combination	Min	0	-143,091	0	0	0	-30,9962	45-1	0,572
45	0	RESIST1-1 H-	Combination	Max	0	167,35	0	0	0	767,7957	45-1	0
45	0,572	RESIST1-1 H-	Combination	Max	0	223,748	0	0	0	774,2595	45-1	0,572
45	0	RESIST1-1 H-	Combination	Min	0	-139,411	0	0	0	-47,0333	45-1	0
45	0,572	RESIST1-1 H-	Combination	Min	0	-96,517	0	0	0	-12,3265	45-1	0,572
45	0	RESIST1-2 T-	Combination	Max	0	196,067	0	0	0	866,3516	45-1	0
45	0,572	RESIST1-2 T-	Combination	Max	0	248,864	0	0	0	846,0909	45-1	0,572
45	0	RESIST1-2 T-	Combination	Min	0	-214,334	0	0	0	-33,2172	45-1	0
45	0,572	RESIST1-2 T-	Combination	Min	0	-158,514	0	0	0	-0,813	45-1	0,572
45	0	E-SERV1-1	Combination	Max	0	75,153	0	0	0	388,374	45-1	0
45	0,572	E-SERV1-1	Combination	Max	0	105,323	0	0	0	391,8114	45-1	0,572
45	0	E-SERV1-1	Combination	Min	0	-84,075	0	0	0	7,9947	45-1	0
45	0,572	E-SERV1-1	Combination	Min	0	-59,651	0	0	0	24,78	45-1	0,572
45	0	E-SERV1-2	Combination	Max	0	91,281	0	0	0	443,7244	45-1	0
45	0,572	E-SERV1-2	Combination	Max	0	120,171	0	0	0	434,2783	45-1	0,572
45	0	E-SERV1-2	Combination	Min	0	-94,857	0	0	0	14,6709	45-1	0
45	0,572	E-SERV1-2	Combination	Min	0	-66,277	0	0	0	30,3436	45-1	0,572
45	0	E-RESIST1-1	Combination	Max	0	181,366	0	0	0	815,8959	45-1	0
45	0,572	E-RESIST1-1	Combination	Max	0	240,884	0	0	0	823,2693	45-1	0,572
45	0	E-RESIST1-1	Combination	Min	0	-189,238	0	0	0	-69,437	45-1	0
45	0,572	E-RESIST1-1	Combination	Min	0	-143,091	0	0	0	-30,9962	45-1	0,572
45	0	E-RESIST1-2	Combination	Max	0	218,903	0	0	0	944,7239	45-1	0
45	0,572	E-RESIST1-2	Combination	Max	0	275,445	0	0	0	922,111	45-1	0,572
45	0	E-RESIST1-2	Combination	Min	0	-214,334	0	0	0	-53,8981	45-1	0
45	0,572	E-RESIST1-2	Combination	Min	0	-158,514	0	0	0	-18,0471	45-1	0,572
46	0	LINEA	LinStatic		0	2,167	0	0	0	45,1734	46-1	0
46	0,572	LINEA	LinStatic		0	7,618	0	0	0	42,3749	46-1	0,572
46	0	HL93 +	LinMoving	Max	0	100,286	0	0	0	286,8176	46-1	0
46	0,572	HL93 +	LinMoving	Max	0	118,818	0	0	0	271,856	46-1	0,572
46	0	HL93 +	LinMoving	Min	0	-64,687	0	0	0	-80,2138	46-1	0
46	0,572	HL93 +	LinMoving	Min	0	-52,052	0	0	0	-64,171	46-1	0,572
46	0	TAMDEM +	LinMoving	Max	0	115,134	0	0	0	329,2845	46-1	0
46	0,572	TAMDEM +	LinMoving	Max	0	131,913	0	0	0	301,8173	46-1	0,572
46	0	TAMDEM +	LinMoving	Min	0	-53,065	0	0	0	-74,6502	46-1	0
46	0,572	TAMDEM +	LinMoving	Min	0	-35,133	0	0	0	-59,7202	46-1	0,572
46	0	HL93 -	LinMoving	Max	0	92,923	0	0	0	265,7608	46-1	0
46	0,572	HL93 -	LinMoving	Max	0	109,913	0	0	0	251,4805	46-1	0,572
46	0	HL93 -	LinMoving	Min	0	-44,677	0	0	0	-72,1924	46-1	0
46	0,572	HL93 -	LinMoving	Min	0	-33,961	0	0	0	-57,7539	46-1	0,572
46	0	TAMDEM -	LinMoving	Max	0	103,714	0	0	0	296,6228	46-1	0
46	0,572	TAMDEM -	LinMoving	Max	0	118,829	0	0	0	271,8801	46-1	0,572
46	0	TAMDEM -	LinMoving	Min	0	-71,314	0	0	0	-67,2457	46-1	0
46	0,572	TAMDEM -	LinMoving	Min	0	-55,16	0	0	0	-53,7966	46-1	0,572

46	0	SERV1-1 H+	Combination	Max	0	105,323	0	0	0	391,8114	46-1	0
46	0,572	SERV1-1 H+	Combination	Max	0	136,525	0	0	0	370,3453	46-1	0,572
46	0	SERV1-1 H+	Combination	Min	0	-59,651	0	0	0	24,78	46-1	0
46	0,572	SERV1-1 H+	Combination	Min	0	-34,346	0	0	0	34,3183	46-1	0,572
46	0	SERV1-2 T+	Combination	Max	0	120,171	0	0	0	434,2783	46-1	0
46	0,572	SERV1-2 T+	Combination	Max	0	149,62	0	0	0	400,3066	46-1	0,572
46	0	SERV1-2 T+	Combination	Min	0	-48,028	0	0	0	30,3436	46-1	0
46	0,572	SERV1-2 T+	Combination	Min	0	-17,426	0	0	0	38,7691	46-1	0,572
46	0	RESIST1-2 T+	Combination	Max	0	275,445	0	0	0	922,111	46-1	0
46	0,572	RESIST1-2 T+	Combination	Max	0	333,286	0	0	0	848,5352	46-1	0,572
46	0	RESIST1-2 T+	Combination	Min	0	-116,04	0	0	0	-18,0471	46-1	0
46	0,572	RESIST1-2 T+	Combination	Min	0	-55,513	0	0	0	7,0567	46-1	0,572
46	0	SERV1-1 H-	Combination	Max	0	97,96	0	0	0	370,7546	46-1	0
46	0,572	SERV1-1 H-	Combination	Max	0	127,619	0	0	0	349,9698	46-1	0,572
46	0	SERV1-1 H-	Combination	Min	0	-39,641	0	0	0	32,8014	46-1	0
46	0,572	SERV1-1 H-	Combination	Min	0	-16,255	0	0	0	40,7354	46-1	0,572
46	0	SERV1-2 T-	Combination	Max	0	108,751	0	0	0	401,6166	46-1	0
46	0,572	SERV1-2 T-	Combination	Max	0	136,535	0	0	0	370,3694	46-1	0,572
46	0	SERV1-2 T-	Combination	Min	0	-66,277	0	0	0	37,7481	46-1	0
46	0,572	SERV1-2 T-	Combination	Min	0	-37,454	0	0	0	44,6927	46-1	0,572
46	0	RESIST 1-1 H+	Combination	Max	0	240,884	0	0	0	823,2693	46-1	0
46	0,572	RESIST 1-1 H+	Combination	Max	0	302,807	0	0	0	778,8004	46-1	0,572
46	0	RESIST 1-1 H+	Combination	Min	0	-143,091	0	0	0	-30,9962	46-1	0
46	0,572	RESIST 1-1 H+	Combination	Min	0	-94,894	0	0	0	-3,3026	46-1	0,572
46	0	RESIST1-1 H-	Combination	Max	0	223,748	0	0	0	774,2595	46-1	0
46	0,572	RESIST1-1 H-	Combination	Max	0	282,08	0	0	0	731,3762	46-1	0,572
46	0	RESIST1-1 H-	Combination	Min	0	-96,517	0	0	0	-12,3265	46-1	0
46	0,572	RESIST1-1 H-	Combination	Min	0	-52,786	0	0	0	11,6332	46-1	0,572
46	0	RESIST1-2 T-	Combination	Max	0	248,864	0	0	0	846,0909	46-1	0
46	0,572	RESIST1-2 T-	Combination	Max	0	302,832	0	0	0	778,8563	46-1	0,572
46	0	RESIST1-2 T-	Combination	Min	0	-158,514	0	0	0	-0,813	46-1	0
46	0,572	RESIST1-2 T-	Combination	Min	0	-102,128	0	0	0	20,8439	46-1	0,572
46	0	E-SERV1-1	Combination	Max	0	105,323	0	0	0	391,8114	46-1	0
46	0,572	E-SERV1-1	Combination	Max	0	136,525	0	0	0	370,3453	46-1	0,572
46	0	E-SERV1-1	Combination	Min	0	-59,651	0	0	0	24,78	46-1	0
46	0,572	E-SERV1-1	Combination	Min	0	-34,346	0	0	0	34,3183	46-1	0,572
46	0	E-SERV1-2	Combination	Max	0	120,171	0	0	0	434,2783	46-1	0
46	0,572	E-SERV1-2	Combination	Max	0	149,62	0	0	0	400,3066	46-1	0,572
46	0	E-SERV1-2	Combination	Min	0	-66,277	0	0	0	30,3436	46-1	0
46	0,572	E-SERV1-2	Combination	Min	0	-37,454	0	0	0	38,7691	46-1	0,572
46	0	E-RESIST1-1	Combination	Max	0	240,884	0	0	0	823,2693	46-1	0
46	0,572	E-RESIST1-1	Combination	Max	0	302,807	0	0	0	778,8004	46-1	0,572
46	0	E-RESIST1-1	Combination	Min	0	-143,091	0	0	0	-30,9962	46-1	0
46	0,572	E-RESIST1-1	Combination	Min	0	-94,894	0	0	0	-3,3026	46-1	0,572
46	0	E-RESIST1-2	Combination	Max	0	275,445	0	0	0	922,111	46-1	0
46	0,572	E-RESIST1-2	Combination	Max	0	333,286	0	0	0	848,5352	46-1	0,572
46	0	E-RESIST1-2	Combination	Min	0	-158,514	0	0	0	-18,0471	46-1	0
46	0,572	E-RESIST1-2	Combination	Min	0	-102,128	0	0	0	7,0567	46-1	0,572
47	0	LINEA	LinStatic		0	7,618	0	0	0	42,3749	47-1	0
47	0,572	LINEA	LinStatic		0	13,069	0	0	0	36,4582	47-1	0,572
47	0	HL93 +	LinMoving	Max	0	118,818	0	0	0	271,856	47-1	0
47	0,572	HL93 +	LinMoving	Max	0	138,265	0	0	0	237,2635	47-1	0,572
47	0	HL93 +	LinMoving	Min	0	-52,052	0	0	0	-64,171	47-1	0
47	0,572	HL93 +	LinMoving	Min	0	-38,525	0	0	0	-48,1283	47-1	0,572
47	0	TAMDEM +	LinMoving	Max	0	131,913	0	0	0	301,8173	47-1	0
47	0,572	TAMDEM +	LinMoving	Max	0	149,158	0	0	0	255,9556	47-1	0,572
47	0	TAMDEM +	LinMoving	Min	0	-35,133	0	0	0	-59,7202	47-1	0
47	0,572	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	-44,7901	47-1	0,572
47	0	HL93 -	LinMoving	Max	0	109,913	0	0	0	251,4805	47-1	0
47	0,572	HL93 -	LinMoving	Max	0	127,608	0	0	0	218,9756	47-1	0,572
47	0	HL93 -	LinMoving	Min	0	-33,961	0	0	0	-57,7539	47-1	0
47	0,572	HL93 -	LinMoving	Min	0	-25,242	0	0	0	-43,3154	47-1	0,572
47	0	TAMDEM -	LinMoving	Max	0	118,829	0	0	0	271,8801	47-1	0
47	0,572	TAMDEM -	LinMoving	Max	0	134,363	0	0	0	230,5674	47-1	0,572
47	0	TAMDEM -	LinMoving	Min	0	-55,16	0	0	0	-53,7966	47-1	0
47	0,572	TAMDEM -	LinMoving	Min	0	-39,924	0	0	0	-40,3474	47-1	0,572
47	0	SERV1-1 H+	Combination	Max	0	136,525	0	0	0	370,3453	47-1	0
47	0,572	SERV1-1 H+	Combination	Max	0	168,642	0	0	0	322,0012	47-1	0,572

47	0	SERV1-1 H+	Combination	Min	0	-34,346	0	0	0	34,3183	47-1	0
47	0,572	SERV1-1 H+	Combination	Min	0	-8,148	0	0	0	36,6094	47-1	0,572
47	0	SERV1-2 T+	Combination	Max	0	149,62	0	0	0	400,3066	47-1	0
47	0,572	SERV1-2 T+	Combination	Max	0	179,534	0	0	0	340,6932	47-1	0,572
47	0	SERV1-2 T+	Combination	Min	0	-17,426	0	0	0	38,7691	47-1	0
47	0,572	SERV1-2 T+	Combination	Min	0	4,275	0	0	0	39,9475	47-1	0,572
47	0	RESIST1-2 T+	Combination	Max	0	333,286	0	0	0	848,5352	47-1	0
47	0,572	RESIST1-2 T+	Combination	Max	0	392,212	0	0	0	721,3989	47-1	0,572
47	0	RESIST1-2 T+	Combination	Min	0	-55,513	0	0	0	7,0567	47-1	0
47	0,572	RESIST1-2 T+	Combination	Min	0	-15,705	0	0	0	21,4133	47-1	0,572
47	0	SERV1-1 H-	Combination	Max	0	127,619	0	0	0	349,9698	47-1	0
47	0,572	SERV1-1 H-	Combination	Max	0	157,984	0	0	0	303,7132	47-1	0,572
47	0	SERV1-1 H-	Combination	Min	0	-16,255	0	0	0	40,7354	47-1	0
47	0,572	SERV1-1 H-	Combination	Min	0	5,134	0	0	0	41,4222	47-1	0,572
47	0	SERV1-2 T-	Combination	Max	0	136,535	0	0	0	370,3694	47-1	0
47	0,572	SERV1-2 T-	Combination	Max	0	164,739	0	0	0	315,305	47-1	0,572
47	0	SERV1-2 T-	Combination	Min	0	-37,454	0	0	0	44,6927	47-1	0
47	0,572	SERV1-2 T-	Combination	Min	0	-9,548	0	0	0	44,3903	47-1	0,572
47	0	RESIST 1-1 H+	Combination	Max	0	302,807	0	0	0	778,8004	47-1	0
47	0,572	RESIST 1-1 H+	Combination	Max	0	366,859	0	0	0	677,8931	47-1	0,572
47	0	RESIST 1-1 H+	Combination	Min	0	-94,894	0	0	0	-3,3026	47-1	0
47	0,572	RESIST 1-1 H+	Combination	Min	0	-44,62	0	0	0	13,6438	47-1	0,572
47	0	RESIST1-1 H-	Combination	Max	0	282,08	0	0	0	731,3762	47-1	0
47	0,572	RESIST1-1 H-	Combination	Max	0	342,055	0	0	0	635,328	47-1	0,572
47	0	RESIST1-1 H-	Combination	Min	0	-52,786	0	0	0	11,6332	47-1	0
47	0,572	RESIST1-1 H-	Combination	Min	0	-13,704	0	0	0	24,8456	47-1	0,572
47	0	RESIST1-2 T-	Combination	Max	0	302,832	0	0	0	778,8563	47-1	0
47	0,572	RESIST1-2 T-	Combination	Max	0	357,777	0	0	0	662,3079	47-1	0,572
47	0	RESIST1-2 T-	Combination	Min	0	-102,128	0	0	0	20,8439	47-1	0
47	0,572	RESIST1-2 T-	Combination	Min	0	-47,876	0	0	0	31,7537	47-1	0,572
47	0	E-SERV1-1	Combination	Max	0	136,525	0	0	0	370,3453	47-1	0
47	0,572	E-SERV1-1	Combination	Max	0	168,642	0	0	0	322,0012	47-1	0,572
47	0	E-SERV1-1	Combination	Min	0	-34,346	0	0	0	34,3183	47-1	0
47	0,572	E-SERV1-1	Combination	Min	0	-8,148	0	0	0	36,6094	47-1	0,572
47	0	E-SERV1-2	Combination	Max	0	149,62	0	0	0	400,3066	47-1	0
47	0,572	E-SERV1-2	Combination	Max	0	179,534	0	0	0	340,6932	47-1	0,572
47	0	E-SERV1-2	Combination	Min	0	-37,454	0	0	0	38,7691	47-1	0
47	0,572	E-SERV1-2	Combination	Min	0	-9,548	0	0	0	39,9475	47-1	0,572
47	0	E-RESIST1-1	Combination	Max	0	302,807	0	0	0	778,8004	47-1	0
47	0,572	E-RESIST1-1	Combination	Max	0	366,859	0	0	0	677,8931	47-1	0,572
47	0	E-RESIST1-1	Combination	Min	0	-94,894	0	0	0	-3,3026	47-1	0
47	0,572	E-RESIST1-1	Combination	Min	0	-44,62	0	0	0	13,6438	47-1	0,572
47	0	E-RESIST1-2	Combination	Max	0	333,286	0	0	0	848,5352	47-1	0
47	0,572	E-RESIST1-2	Combination	Max	0	392,212	0	0	0	721,3989	47-1	0,572
47	0	E-RESIST1-2	Combination	Min	0	-102,128	0	0	0	7,0567	47-1	0
47	0,572	E-RESIST1-2	Combination	Min	0	-47,876	0	0	0	21,4133	47-1	0,572
48	0	LINEA	LinStatic		0	13,069	0	0	0	36,4582	48-1	0
48	0,572	LINEA	LinStatic		0	18,52	0	0	0	27,4236	48-1	0,572
48	0	HL93 +	LinMoving	Max	0	138,265	0	0	0	237,2635	48-1	0
48	0,572	HL93 +	LinMoving	Max	0	158,51	0	0	0	181,3351	48-1	0,572
48	0	HL93 +	LinMoving	Min	0	-38,525	0	0	0	-48,1283	48-1	0
48	0,572	HL93 +	LinMoving	Min	0	-28,047	0	0	0	-32,0855	48-1	0,572
48	0	TAMDEM +	LinMoving	Max	0	149,158	0	0	0	255,9556	48-1	0
48	0,572	TAMDEM +	LinMoving	Max	0	166,778	0	0	0	190,7937	48-1	0,572
48	0	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	-44,7901	48-1	0
48	0,572	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	-29,8601	48-1	0,572
48	0	HL93 -	LinMoving	Max	0	127,608	0	0	0	218,9756	48-1	0
48	0,572	HL93 -	LinMoving	Max	0	145,884	0	0	0	166,8917	48-1	0,572
48	0	HL93 -	LinMoving	Min	0	-25,242	0	0	0	-43,3154	48-1	0
48	0,572	HL93 -	LinMoving	Min	0	-25,242	0	0	0	-28,877	48-1	0,572
48	0	TAMDEM -	LinMoving	Max	0	134,363	0	0	0	230,5674	48-1	0
48	0,572	TAMDEM -	LinMoving	Max	0	150,235	0	0	0	171,8689	48-1	0,572
48	0	TAMDEM -	LinMoving	Min	0	-39,924	0	0	0	-40,3474	48-1	0
48	0,572	TAMDEM -	LinMoving	Min	0	-31,746	0	0	0	-26,8983	48-1	0,572
48	0	SERV1-1 H+	Combination	Max	0	168,642	0	0	0	322,0012	48-1	0
48	0,572	SERV1-1 H+	Combination	Max	0	201,556	0	0	0	245,074	48-1	0,572
48	0	SERV1-1 H+	Combination	Min	0	-8,148	0	0	0	36,6094	48-1	0
48	0,572	SERV1-1 H+	Combination	Min	0	14,999	0	0	0	31,6534	48-1	0,572

48	0	SERV1-2 T+	Combination	Max	0	179,534	0	0	0	340,6932	48-1	0
48	0,572	SERV1-2 T+	Combination	Max	0	209,824	0	0	0	254,5326	48-1	0,572
48	0	SERV1-2 T+	Combination	Min	0	4,275	0	0	0	39,9475	48-1	0
48	0,572	SERV1-2 T+	Combination	Min	0	16,945	0	0	0	33,8788	48-1	0,572
48	0	RESIST1-2 T+	Combination	Max	0	392,212	0	0	0	721,3989	48-1	0
48	0,572	RESIST1-2 T+	Combination	Max	0	452,011	0	0	0	538,5944	48-1	0,572
48	0	RESIST1-2 T+	Combination	Min	0	-15,705	0	0	0	21,4133	48-1	0
48	0,572	RESIST1-2 T+	Combination	Min	0	3,084	0	0	0	25,0227	48-1	0,572
48	0	SERV1-1 H-	Combination	Max	0	157,984	0	0	0	303,7132	48-1	0
48	0,572	SERV1-1 H-	Combination	Max	0	188,93	0	0	0	230,6306	48-1	0,572
48	0	SERV1-1 H-	Combination	Min	0	5,134	0	0	0	41,4222	48-1	0
48	0,572	SERV1-1 H-	Combination	Min	0	17,804	0	0	0	34,8619	48-1	0,572
48	0	SERV1-2 T-	Combination	Max	0	164,739	0	0	0	315,305	48-1	0
48	0,572	SERV1-2 T-	Combination	Max	0	193,281	0	0	0	235,6078	48-1	0,572
48	0	SERV1-2 T-	Combination	Min	0	-9,548	0	0	0	44,3903	48-1	0
48	0,572	SERV1-2 T-	Combination	Min	0	11,3	0	0	0	36,8406	48-1	0,572
48	0	RESIST 1-1 H+	Combination	Max	0	366,859	0	0	0	677,8931	48-1	0
48	0,572	RESIST 1-1 H+	Combination	Max	0	432,767	0	0	0	516,5795	48-1	0,572
48	0	RESIST 1-1 H+	Combination	Min	0	-44,62	0	0	0	13,6438	48-1	0
48	0,572	RESIST 1-1 H+	Combination	Min	0	-1,443	0	0	0	19,843	48-1	0,572
48	0	RESIST1-1 H-	Combination	Max	0	342,055	0	0	0	635,328	48-1	0
48	0,572	RESIST1-1 H-	Combination	Max	0	403,381	0	0	0	482,9624	48-1	0,572
48	0	RESIST1-1 H-	Combination	Min	0	-13,704	0	0	0	24,8456	48-1	0
48	0,572	RESIST1-1 H-	Combination	Min	0	5,084	0	0	0	27,3109	48-1	0,572
48	0	RESIST1-2 T-	Combination	Max	0	357,777	0	0	0	662,3079	48-1	0
48	0,572	RESIST1-2 T-	Combination	Max	0	413,507	0	0	0	494,5469	48-1	0,572
48	0	RESIST1-2 T-	Combination	Min	0	-47,876	0	0	0	31,7537	48-1	0
48	0,572	RESIST1-2 T-	Combination	Min	0	-10,054	0	0	0	31,9163	48-1	0,572
48	0	E-SERV1-1	Combination	Max	0	168,642	0	0	0	322,0012	48-1	0
48	0,572	E-SERV1-1	Combination	Max	0	201,556	0	0	0	245,074	48-1	0,572
48	0	E-SERV1-1	Combination	Min	0	-8,148	0	0	0	36,6094	48-1	0
48	0,572	E-SERV1-1	Combination	Min	0	14,999	0	0	0	31,6534	48-1	0,572
48	0	E-SERV1-2	Combination	Max	0	179,534	0	0	0	340,6932	48-1	0
48	0,572	E-SERV1-2	Combination	Max	0	209,824	0	0	0	254,5326	48-1	0,572
48	0	E-SERV1-2	Combination	Min	0	-9,548	0	0	0	39,9475	48-1	0
48	0,572	E-SERV1-2	Combination	Min	0	11,3	0	0	0	33,8788	48-1	0,572
48	0	E-RESIST1-1	Combination	Max	0	366,859	0	0	0	677,8931	48-1	0
48	0,572	E-RESIST1-1	Combination	Max	0	432,767	0	0	0	516,5795	48-1	0,572
48	0	E-RESIST1-1	Combination	Min	0	-44,62	0	0	0	13,6438	48-1	0
48	0,572	E-RESIST1-1	Combination	Min	0	-1,443	0	0	0	19,843	48-1	0,572
48	0	E-RESIST1-2	Combination	Max	0	392,212	0	0	0	721,3989	48-1	0
48	0,572	E-RESIST1-2	Combination	Max	0	452,011	0	0	0	538,5944	48-1	0,572
48	0	E-RESIST1-2	Combination	Min	0	-47,876	0	0	0	21,4133	48-1	0
48	0,572	E-RESIST1-2	Combination	Min	0	-10,054	0	0	0	25,0227	48-1	0,572
49	0	LINEA	LinStatic		0	18,52	0	0	0	27,4236	49-1	0
49	0,572	LINEA	LinStatic		0	23,972	0	0	0	15,2708	49-1	0,572
49	0	HL93 +	LinMoving	Max	0	158,51	0	0	0	181,3351	49-1	0
49	0,572	HL93 +	LinMoving	Max	0	179,433	0	0	0	102,6357	49-1	0,572
49	0	HL93 +	LinMoving	Min	0	-28,047	0	0	0	-32,0855	49-1	0
49	0,572	HL93 +	LinMoving	Min	0	-28,047	0	0	0	-16,0428	49-1	0,572
49	0	TAMDEM +	LinMoving	Max	0	166,778	0	0	0	190,7937	49-1	0
49	0,572	TAMDEM +	LinMoving	Max	0	184,679	0	0	0	105,6367	49-1	0,572
49	0	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	-29,8601	49-1	0
49	0,572	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	-14,93	49-1	0,572
49	0	HL93 -	LinMoving	Max	0	145,884	0	0	0	166,8917	49-1	0
49	0,572	HL93 -	LinMoving	Max	0	164,805	0	0	0	94,2686	49-1	0,572
49	0	HL93 -	LinMoving	Min	0	-25,242	0	0	0	-28,877	49-1	0
49	0,572	HL93 -	LinMoving	Min	0	-25,242	0	0	0	-14,4385	49-1	0,572
49	0	TAMDEM -	LinMoving	Max	0	150,235	0	0	0	171,8689	49-1	0
49	0,572	TAMDEM -	LinMoving	Max	0	166,361	0	0	0	95,1586	49-1	0,572
49	0	TAMDEM -	LinMoving	Min	0	-31,746	0	0	0	-26,8983	49-1	0
49	0,572	TAMDEM -	LinMoving	Min	0	-23,512	0	0	0	-13,4491	49-1	0,572
49	0	SERV1-1 H+	Combination	Max	0	201,556	0	0	0	245,074	49-1	0
49	0,572	SERV1-1 H+	Combination	Max	0	235,149	0	0	0	138,1287	49-1	0,572
49	0	SERV1-1 H+	Combination	Min	0	14,999	0	0	0	31,6534	49-1	0
49	0,572	SERV1-1 H+	Combination	Min	0	27,669	0	0	0	19,4503	49-1	0,572
49	0	SERV1-2 T+	Combination	Max	0	209,824	0	0	0	254,5326	49-1	0
49	0,572	SERV1-2 T+	Combination	Max	0	240,395	0	0	0	141,1297	49-1	0,572

49	0	SERV1-2 T+	Combination	Min	0	16,945	0	0	0	33,8788	49-1	0
49	0,572	SERV1-2 T+	Combination	Min	0	29,614	0	0	0	20,563	49-1	0,572
49	0	RESIST1-2 T+	Combination	Max	0	452,011	0	0	0	538,5944	49-1	0
49	0,572	RESIST1-2 T+	Combination	Max	0	512,466	0	0	0	298,504	49-1	0,572
49	0	RESIST1-2 T+	Combination	Min	0	3,084	0	0	0	25,0227	49-1	0
49	0,572	RESIST1-2 T+	Combination	Min	0	21,873	0	0	0	17,8849	49-1	0,572
49	0	SERV1-1 H-	Combination	Max	0	188,93	0	0	0	230,6306	49-1	0
49	0,572	SERV1-1 H-	Combination	Max	0	220,521	0	0	0	129,7616	49-1	0,572
49	0	SERV1-1 H-	Combination	Min	0	17,804	0	0	0	34,8619	49-1	0
49	0,572	SERV1-1 H-	Combination	Min	0	30,474	0	0	0	21,0545	49-1	0,572
49	0	SERV1-2 T-	Combination	Max	0	193,281	0	0	0	235,6078	49-1	0
49	0,572	SERV1-2 T-	Combination	Max	0	222,077	0	0	0	130,6516	49-1	0,572
49	0	SERV1-2 T-	Combination	Min	0	11,3	0	0	0	36,8406	49-1	0
49	0,572	SERV1-2 T-	Combination	Min	0	32,203	0	0	0	22,0439	49-1	0,572
49	0	RESIST 1-1 H+	Combination	Max	0	432,767	0	0	0	516,5795	49-1	0
49	0,572	RESIST 1-1 H+	Combination	Max	0	500,255	0	0	0	291,5192	49-1	0,572
49	0	RESIST 1-1 H+	Combination	Min	0	-1,443	0	0	0	19,843	49-1	0
49	0,572	RESIST 1-1 H+	Combination	Min	0	17,345	0	0	0	15,2951	49-1	0,572
49	0	RESIST1-1 H-	Combination	Max	0	403,381	0	0	0	482,9624	49-1	0
49	0,572	RESIST1-1 H-	Combination	Max	0	466,208	0	0	0	272,0448	49-1	0,572
49	0	RESIST1-1 H-	Combination	Min	0	5,084	0	0	0	27,3109	49-1	0
49	0,572	RESIST1-1 H-	Combination	Min	0	23,873	0	0	0	19,0291	49-1	0,572
49	0	RESIST1-2 T-	Combination	Max	0	413,507	0	0	0	494,5469	49-1	0
49	0,572	RESIST1-2 T-	Combination	Max	0	469,83	0	0	0	274,1162	49-1	0,572
49	0	RESIST1-2 T-	Combination	Min	0	-10,054	0	0	0	31,9163	49-1	0
49	0,572	RESIST1-2 T-	Combination	Min	0	27,899	0	0	0	21,3317	49-1	0,572
49	0	E-SERV1-1	Combination	Max	0	201,556	0	0	0	245,074	49-1	0
49	0,572	E-SERV1-1	Combination	Max	0	235,149	0	0	0	138,1287	49-1	0,572
49	0	E-SERV1-1	Combination	Min	0	14,999	0	0	0	31,6534	49-1	0
49	0,572	E-SERV1-1	Combination	Min	0	27,669	0	0	0	19,4503	49-1	0,572
49	0	E-SERV1-2	Combination	Max	0	209,824	0	0	0	254,5326	49-1	0
49	0,572	E-SERV1-2	Combination	Max	0	240,395	0	0	0	141,1297	49-1	0,572
49	0	E-SERV1-2	Combination	Min	0	11,3	0	0	0	33,8788	49-1	0
49	0,572	E-SERV1-2	Combination	Min	0	29,614	0	0	0	20,563	49-1	0,572
49	0	E-RESIST1-1	Combination	Max	0	432,767	0	0	0	516,5795	49-1	0
49	0,572	E-RESIST1-1	Combination	Max	0	500,255	0	0	0	291,5192	49-1	0,572
49	0	E-RESIST1-1	Combination	Min	0	-1,443	0	0	0	19,843	49-1	0
49	0,572	E-RESIST1-1	Combination	Min	0	17,345	0	0	0	15,2951	49-1	0,572
49	0	E-RESIST1-2	Combination	Max	0	452,011	0	0	0	538,5944	49-1	0
49	0,572	E-RESIST1-2	Combination	Max	0	512,466	0	0	0	298,504	49-1	0,572
49	0	E-RESIST1-2	Combination	Min	0	-10,054	0	0	0	25,0227	49-1	0
49	0,572	E-RESIST1-2	Combination	Min	0	21,873	0	0	0	17,8849	49-1	0,572
50	0	LINEA	LinStatic		0	23,972	0	0	0	15,2708	50-1	0
50	0,572	LINEA	LinStatic		0	29,423	0	0	0	4,441E-15	50-1	0,572
50	0	HL93 +	LinMoving	Max	0	179,433	0	0	0	102,6357	50-1	0
50	0,572	HL93 +	LinMoving	Max	0	200,956	0	0	0	0	50-1	0,572
50	0	HL93 +	LinMoving	Min	0	-28,047	0	0	0	-16,0428	50-1	0
50	0,572	HL93 +	LinMoving	Min	0	-28,047	0	0	0	0	50-1	0,572
50	0	TAMDEM +	LinMoving	Max	0	184,679	0	0	0	105,6367	50-1	0
50	0,572	TAMDEM +	LinMoving	Max	0	202,803	0	0	0	0	50-1	0,572
50	0	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	-14,93	50-1	0
50	0,572	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	0	50-1	0,572
50	0	HL93 -	LinMoving	Max	0	164,805	0	0	0	94,2686	50-1	0
50	0,572	HL93 -	LinMoving	Max	0	184,786	0	0	0	0	50-1	0,572
50	0	HL93 -	LinMoving	Min	0	-25,242	0	0	0	-14,4385	50-1	0
50	0,572	HL93 -	LinMoving	Min	0	-25,242	0	0	0	0	50-1	0,572
50	0	TAMDEM -	LinMoving	Max	0	166,361	0	0	0	95,1586	50-1	0
50	0,572	TAMDEM -	LinMoving	Max	0	182,687	0	0	0	0	50-1	0,572
50	0	TAMDEM -	LinMoving	Min	0	-23,512	0	0	0	-13,4491	50-1	0
50	0,572	TAMDEM -	LinMoving	Min	0	-23,512	0	0	0	0	50-1	0,572
50	0	SERV1-1 H+	Combination	Max	0	235,149	0	0	0	138,1287	50-1	0
50	0,572	SERV1-1 H+	Combination	Max	0	269,341	0	0	0	-4,563E-14	50-1	0,572
50	0	SERV1-1 H+	Combination	Min	0	27,669	0	0	0	19,4503	50-1	0
50	0,572	SERV1-1 H+	Combination	Min	0	40,339	0	0	0	-4,563E-14	50-1	0,572
50	0	SERV1-2 T+	Combination	Max	0	240,395	0	0	0	141,1297	50-1	0
50	0,572	SERV1-2 T+	Combination	Max	0	271,189	0	0	0	-4,563E-14	50-1	0,572
50	0	SERV1-2 T+	Combination	Min	0	29,614	0	0	0	20,563	50-1	0
50	0,572	SERV1-2 T+	Combination	Min	0	42,284	0	0	0	-4,563E-14	50-1	0,572

50	0	RESIST1-2 T+	Combination	Max	0	512,466	0	0	0	298,504	50-1	0
50	0,572	RESIST1-2 T+	Combination	Max	0	573,438	0	0	0	-5,712E-14	50-1	0,572
50	0	RESIST1-2 T+	Combination	Min	0	21,873	0	0	0	17,8849	50-1	0
50	0,572	RESIST1-2 T+	Combination	Min	0	40,662	0	0	0	-5,712E-14	50-1	0,572
50	0	SERV1-1 H-	Combination	Max	0	220,521	0	0	0	129,7616	50-1	0
50	0,572	SERV1-1 H-	Combination	Max	0	253,172	0	0	0	-4,563E-14	50-1	0,572
50	0	SERV1-1 H-	Combination	Min	0	30,474	0	0	0	21,0545	50-1	0
50	0,572	SERV1-1 H-	Combination	Min	0	43,144	0	0	0	-4,563E-14	50-1	0,572
50	0	SERV1-2 T-	Combination	Max	0	222,077	0	0	0	130,6516	50-1	0
50	0,572	SERV1-2 T-	Combination	Max	0	251,073	0	0	0	-4,563E-14	50-1	0,572
50	0	SERV1-2 T-	Combination	Min	0	32,203	0	0	0	22,0439	50-1	0
50	0,572	SERV1-2 T-	Combination	Min	0	44,873	0	0	0	-4,563E-14	50-1	0,572
50	0	RESIST 1-1 H+	Combination	Max	0	500,255	0	0	0	291,5192	50-1	0
50	0,572	RESIST 1-1 H+	Combination	Max	0	569,137	0	0	0	-5,712E-14	50-1	0,572
50	0	RESIST 1-1 H+	Combination	Min	0	17,345	0	0	0	15,2951	50-1	0
50	0,572	RESIST 1-1 H+	Combination	Min	0	36,134	0	0	0	-5,712E-14	50-1	0,572
50	0	RESIST1-1 H-	Combination	Max	0	466,208	0	0	0	272,0448	50-1	0
50	0,572	RESIST1-1 H-	Combination	Max	0	531,503	0	0	0	-5,712E-14	50-1	0,572
50	0	RESIST1-1 H-	Combination	Min	0	23,873	0	0	0	19,0291	50-1	0
50	0,572	RESIST1-1 H-	Combination	Min	0	42,662	0	0	0	-5,712E-14	50-1	0,572
50	0	RESIST1-2 T-	Combination	Max	0	469,83	0	0	0	274,1162	50-1	0
50	0,572	RESIST1-2 T-	Combination	Max	0	526,617	0	0	0	-5,712E-14	50-1	0,572
50	0	RESIST1-2 T-	Combination	Min	0	27,899	0	0	0	21,3317	50-1	0
50	0,572	RESIST1-2 T-	Combination	Min	0	46,688	0	0	0	-5,712E-14	50-1	0,572
50	0	E-SERV1-1	Combination	Max	0	235,149	0	0	0	138,1287	50-1	0
50	0,572	E-SERV1-1	Combination	Max	0	269,341	0	0	0	-4,563E-14	50-1	0,572
50	0	E-SERV1-1	Combination	Min	0	27,669	0	0	0	19,4503	50-1	0
50	0,572	E-SERV1-1	Combination	Min	0	40,339	0	0	0	-4,563E-14	50-1	0,572
50	0	E-SERV1-2	Combination	Max	0	240,395	0	0	0	141,1297	50-1	0
50	0,572	E-SERV1-2	Combination	Max	0	271,189	0	0	0	-4,563E-14	50-1	0,572
50	0	E-SERV1-2	Combination	Min	0	29,614	0	0	0	20,563	50-1	0
50	0,572	E-SERV1-2	Combination	Min	0	42,284	0	0	0	-4,563E-14	50-1	0,572
50	0	E-RESIST1-1	Combination	Max	0	500,255	0	0	0	291,5192	50-1	0
50	0,572	E-RESIST1-1	Combination	Max	0	569,137	0	0	0	-5,712E-14	50-1	0,572
50	0	E-RESIST1-1	Combination	Min	0	17,345	0	0	0	15,2951	50-1	0
50	0,572	E-RESIST1-1	Combination	Min	0	36,134	0	0	0	-5,712E-14	50-1	0,572
50	0	E-RESIST1-2	Combination	Max	0	512,466	0	0	0	298,504	50-1	0
50	0,572	E-RESIST1-2	Combination	Max	0	573,438	0	0	0	-5,712E-14	50-1	0,572
50	0	E-RESIST1-2	Combination	Min	0	21,873	0	0	0	17,8849	50-1	0
50	0,572	E-RESIST1-2	Combination	Min	0	40,662	0	0	0	-5,712E-14	50-1	0,572

4	0	HL93 +	LinMoving	Max	0	52,007	0	0	0	237,2403	4-1	0
4	0,572	HL93 +	LinMoving	Max	0	64,645	0	0	0	271,8658	4-1	0,572
4	0	HL93 +	LinMoving	Min	0	-118,885	0	0	0	-48,1267	4-1	0
4	0,572	HL93 +	LinMoving	Min	0	-100,349	0	0	0	-64,1689	4-1	0,572
4	0	TAMDEM +	LinMoving	Max	0	35,07	0	0	0	255,9492	4-1	0
4	0,572	TAMDEM +	LinMoving	Max	0	53,003	0	0	0	301,8424	4-1	0,572
4	0	TAMDEM +	LinMoving	Min	0	-131,973	0	0	0	-44,7914	4-1	0
4	0,572	TAMDEM +	LinMoving	Min	0	-115,192	0	0	0	-59,7219	4-1	0,572
4	0	HL93 -	LinMoving	Max	0	33,923	0	0	0	218,9555	4-1	0
4	0,572	HL93 -	LinMoving	Max	0	44,64	0	0	0	251,4913	4-1	0,572
4	0	HL93 -	LinMoving	Min	0	-109,974	0	0	0	-43,314	4-1	0
4	0,572	HL93 -	LinMoving	Min	0	-92,981	0	0	0	-57,752	4-1	0,572
4	0	TAMDEM -	LinMoving	Max	0	55,104	0	0	0	230,5616	4-1	0
4	0,572	TAMDEM -	LinMoving	Max	0	71,258	0	0	0	271,9027	4-1	0,572
4	0	TAMDEM -	LinMoving	Min	0	-118,882	0	0	0	-40,3486	4-1	0
4	0,572	TAMDEM -	LinMoving	Min	0	-103,766	0	0	0	-53,7981	4-1	0,572
4	0	SERV1-1 H+	Combination	Max	0	21,63	0	0	0	321,978	4-1	0
4	0,572	SERV1-1 H+	Combination	Max	0	46,938	0	0	0	370,3551	4-1	0,572
4	0	SERV1-1 H+	Combination	Min	0	-149,261	0	0	0	36,611	4-1	0
4	0,572	SERV1-1 H+	Combination	Min	0	-118,055	0	0	0	34,3204	4-1	0,572
4	0	SERV1-2 T+	Combination	Max	0	4,693	0	0	0	340,6868	4-1	0
4	0,572	SERV1-2 T+	Combination	Max	0	35,296	0	0	0	400,3318	4-1	0,572
4	0	SERV1-2 T+	Combination	Min	0	-162,349	0	0	0	39,9462	4-1	0
4	0,572	SERV1-2 T+	Combination	Min	0	-132,899	0	0	0	38,7674	4-1	0,572
4	0	RESIST1-2 T+	Combination	Max	0	36,578	0	0	0	721,384	4-1	0
4	0,572	RESIST1-2 T+	Combination	Max	0	97,106	0	0	0	848,5937	4-1	0,572
4	0	RESIST1-2 T+	Combination	Min	0	-352,213	0	0	0	21,4103	4-1	0
4	0,572	RESIST1-2 T+	Combination	Min	0	-294,368	0	0	0	7,0527	4-1	0,572
4	0	SERV1-1 H-	Combination	Max	0	3,547	0	0	0	303,6932	4-1	0
4	0,572	SERV1-1 H-	Combination	Max	0	26,934	0	0	0	349,9806	4-1	0,572
4	0	SERV1-1 H-	Combination	Min	0	-140,35	0	0	0	41,4236	4-1	0
4	0,572	SERV1-1 H-	Combination	Min	0	-110,688	0	0	0	40,7373	4-1	0,572
4	0	SERV1-2 T-	Combination	Max	0	24,728	0	0	0	315,2993	4-1	0
4	0,572	SERV1-2 T-	Combination	Max	0	53,552	0	0	0	370,392	4-1	0,572
4	0	SERV1-2 T-	Combination	Min	0	-149,259	0	0	0	44,3891	4-1	0
4	0,572	SERV1-2 T-	Combination	Min	0	-121,473	0	0	0	44,6912	4-1	0,572
4	0	RESIST 1-1 H+	Combination	Max	0	75,999	0	0	0	677,8392	4-1	0
4	0,572	RESIST 1-1 H+	Combination	Max	0	124,203	0	0	0	778,823	4-1	0,572
4	0	RESIST 1-1 H+	Combination	Min	0	-321,751	0	0	0	13,6474	4-1	0
4	0,572	RESIST 1-1 H+	Combination	Min	0	-259,82	0	0	0	-3,2978	4-1	0,572
4	0	RESIST1-1 H-	Combination	Max	0	33,909	0	0	0	635,2813	4-1	0
4	0,572	RESIST1-1 H-	Combination	Max	0	77,643	0	0	0	731,4013	4-1	0,572
4	0	RESIST1-1 H-	Combination	Min	0	-301,01	0	0	0	24,8489	4-1	0
4	0,572	RESIST1-1 H-	Combination	Min	0	-242,672	0	0	0	11,6376	4-1	0,572
4	0	RESIST1-2 T-	Combination	Max	0	83,208	0	0	0	662,2944	4-1	0
4	0,572	RESIST1-2 T-	Combination	Max	0	139,596	0	0	0	778,909	4-1	0,572
4	0	RESIST1-2 T-	Combination	Min	0	-321,745	0	0	0	31,751	4-1	0
4	0,572	RESIST1-2 T-	Combination	Min	0	-267,774	0	0	0	20,8403	4-1	0,572
4	0	E-SERV1-1	Combination	Max	0	21,63	0	0	0	321,978	4-1	0
4	0,572	E-SERV1-1	Combination	Max	0	46,938	0	0	0	370,3551	4-1	0,572
4	0	E-SERV1-1	Combination	Min	0	-149,261	0	0	0	36,611	4-1	0
4	0,572	E-SERV1-1	Combination	Min	0	-118,055	0	0	0	34,3204	4-1	0,572
4	0	E-SERV1-2	Combination	Max	0	24,728	0	0	0	340,6868	4-1	0
4	0,572	E-SERV1-2	Combination	Max	0	53,552	0	0	0	400,3318	4-1	0,572
4	0	E-SERV1-2	Combination	Min	0	-162,349	0	0	0	39,9462	4-1	0
4	0,572	E-SERV1-2	Combination	Min	0	-132,899	0	0	0	38,7674	4-1	0,572
4	0	E-RESIST1-1	Combination	Max	0	75,999	0	0	0	677,8392	4-1	0
4	0,572	E-RESIST1-1	Combination	Max	0	124,203	0	0	0	778,823	4-1	0,572
4	0	E-RESIST1-1	Combination	Min	0	-321,751	0	0	0	13,6474	4-1	0
4	0,572	E-RESIST1-1	Combination	Min	0	-259,82	0	0	0	-3,2978	4-1	0,572
4	0	E-RESIST1-2	Combination	Max	0	83,208	0	0	0	721,384	4-1	0
4	0,572	E-RESIST1-2	Combination	Max	0	139,596	0	0	0	848,5937	4-1	0,572
4	0	E-RESIST1-2	Combination	Min	0	-352,213	0	0	0	21,4103	4-1	0
4	0,572	E-RESIST1-2	Combination	Min	0	-294,368	0	0	0	7,0527	4-1	0,572
5	0	LINEA	LinStatic		0	-7,618	0	0	0	42,3749	5-1	0
5	0,572	LINEA	LinStatic		0	-2,167	0	0	0	45,1734	5-1	0,572
5	0	HL93 +	LinMoving	Max	0	64,645	0	0	0	271,8658	5-1	0
5	0,572	HL93 +	LinMoving	Max	0	76,402	0	0	0	286,8556	5-1	0,572

3	0	LINEA	LinStatic		0	-18,52	0	0	0	27,4236	3-1	0
3	0,572	LINEA	LinStatic		0	-13,069	0	0	0	36,4582	3-1	0,572
3	0	HL93 +	LinMoving	Max	0	38,476	0	0	0	181,2752	3-1	0
3	0,572	HL93 +	LinMoving	Max	0	52,007	0	0	0	237,2403	3-1	0,572
3	0	HL93 +	LinMoving	Min	0	-138,335	0	0	0	-32,0845	3-1	0
3	0,572	HL93 +	LinMoving	Min	0	-118,885	0	0	0	-48,1267	3-1	0,572
3	0	TAMDEM +	LinMoving	Max	0	26,102	0	0	0	190,7537	3-1	0
3	0,572	TAMDEM +	LinMoving	Max	0	35,07	0	0	0	255,9492	3-1	0,572
3	0	TAMDEM +	LinMoving	Min	0	-149,219	0	0	0	-29,861	3-1	0
3	0,572	TAMDEM +	LinMoving	Min	0	-131,973	0	0	0	-44,7914	3-1	0,572
3	0	HL93 -	LinMoving	Max	0	25,241	0	0	0	166,8379	3-1	0
3	0,572	HL93 -	LinMoving	Max	0	33,923	0	0	0	218,9555	3-1	0,572
3	0	HL93 -	LinMoving	Min	0	-127,671	0	0	0	-28,876	3-1	0
3	0,572	HL93 -	LinMoving	Min	0	-109,974	0	0	0	-43,314	3-1	0,572
3	0	TAMDEM -	LinMoving	Max	0	39,896	0	0	0	171,8329	3-1	0
3	0,572	TAMDEM -	LinMoving	Max	0	55,104	0	0	0	230,5616	3-1	0,572
3	0	TAMDEM -	LinMoving	Min	0	-134,418	0	0	0	-26,8991	3-1	0
3	0,572	TAMDEM -	LinMoving	Min	0	-118,882	0	0	0	-40,3486	3-1	0,572
3	0	SERV1-1 H+	Combination	Max	0	-4,57	0	0	0	245,0141	3-1	0
3	0,572	SERV1-1 H+	Combination	Max	0	21,63	0	0	0	321,978	3-1	0,572
3	0	SERV1-1 H+	Combination	Min	0	-181,381	0	0	0	31,6544	3-1	0
3	0,572	SERV1-1 H+	Combination	Min	0	-149,261	0	0	0	36,611	3-1	0,572
3	0	SERV1-2 T+	Combination	Max	0	-16,944	0	0	0	254,4926	3-1	0
3	0,572	SERV1-2 T+	Combination	Max	0	4,693	0	0	0	340,6868	3-1	0,572
3	0	SERV1-2 T+	Combination	Min	0	-192,265	0	0	0	33,8779	3-1	0
3	0,572	SERV1-2 T+	Combination	Min	0	-162,349	0	0	0	39,9462	3-1	0,572
3	0	RESIST1-2 T+	Combination	Max	0	-3,082	0	0	0	538,5013	3-1	0
3	0,572	RESIST1-2 T+	Combination	Max	0	36,578	0	0	0	721,384	3-1	0,572
3	0	RESIST1-2 T+	Combination	Min	0	-411,143	0	0	0	25,0207	3-1	0
3	0,572	RESIST1-2 T+	Combination	Min	0	-352,213	0	0	0	21,4103	3-1	0,572
3	0	SERV1-1 H-	Combination	Max	0	-17,805	0	0	0	230,5768	3-1	0
3	0,572	SERV1-1 H-	Combination	Max	0	3,547	0	0	0	303,6932	3-1	0,572
3	0	SERV1-1 H-	Combination	Min	0	-170,717	0	0	0	34,8629	3-1	0
3	0,572	SERV1-1 H-	Combination	Min	0	-140,35	0	0	0	41,4236	3-1	0,572
3	0	SERV1-2 T-	Combination	Max	0	-3,15	0	0	0	235,5718	3-1	0
3	0,572	SERV1-2 T-	Combination	Max	0	24,728	0	0	0	315,2993	3-1	0,572
3	0	SERV1-2 T-	Combination	Min	0	-177,464	0	0	0	36,8399	3-1	0
3	0,572	SERV1-2 T-	Combination	Min	0	-149,259	0	0	0	44,3891	3-1	0,572
3	0	RESIST 1-1 H+	Combination	Max	0	25,717	0	0	0	516,44	3-1	0
3	0,572	RESIST 1-1 H+	Combination	Max	0	75,999	0	0	0	677,8392	3-1	0,572
3	0	RESIST 1-1 H+	Combination	Min	0	-385,81	0	0	0	19,8455	3-1	0
3	0,572	RESIST 1-1 H+	Combination	Min	0	-321,751	0	0	0	13,6474	3-1	0,572
3	0	RESIST1-1 H-	Combination	Max	0	-5,086	0	0	0	482,8374	3-1	0
3	0,572	RESIST1-1 H-	Combination	Max	0	33,909	0	0	0	635,2813	3-1	0,572
3	0	RESIST1-1 H-	Combination	Min	0	-360,99	0	0	0	27,3131	3-1	0
3	0,572	RESIST1-1 H-	Combination	Min	0	-301,01	0	0	0	24,8489	3-1	0,572
3	0	RESIST1-2 T-	Combination	Max	0	29,023	0	0	0	494,463	3-1	0
3	0,572	RESIST1-2 T-	Combination	Max	0	83,208	0	0	0	662,2944	3-1	0,572
3	0	RESIST1-2 T-	Combination	Min	0	-376,694	0	0	0	31,9145	3-1	0
3	0,572	RESIST1-2 T-	Combination	Min	0	-321,745	0	0	0	31,751	3-1	0,572
3	0	E-SERV1-1	Combination	Max	0	-4,57	0	0	0	245,0141	3-1	0
3	0,572	E-SERV1-1	Combination	Max	0	21,63	0	0	0	321,978	3-1	0,572
3	0	E-SERV1-1	Combination	Min	0	-181,381	0	0	0	31,6544	3-1	0
3	0,572	E-SERV1-1	Combination	Min	0	-149,261	0	0	0	36,611	3-1	0,572
3	0	E-SERV1-2	Combination	Max	0	-3,15	0	0	0	254,4926	3-1	0
3	0,572	E-SERV1-2	Combination	Max	0	24,728	0	0	0	340,6868	3-1	0,572
3	0	E-SERV1-2	Combination	Min	0	-192,265	0	0	0	33,8779	3-1	0
3	0,572	E-SERV1-2	Combination	Min	0	-162,349	0	0	0	39,9462	3-1	0,572
3	0	E-RESIST1-1	Combination	Max	0	25,717	0	0	0	516,44	3-1	0
3	0,572	E-RESIST1-1	Combination	Max	0	75,999	0	0	0	677,8392	3-1	0,572
3	0	E-RESIST1-1	Combination	Min	0	-385,81	0	0	0	19,8455	3-1	0
3	0,572	E-RESIST1-1	Combination	Min	0	-321,751	0	0	0	13,6474	3-1	0,572
3	0	E-RESIST1-2	Combination	Max	0	29,023	0	0	0	538,5013	3-1	0
3	0,572	E-RESIST1-2	Combination	Max	0	83,208	0	0	0	721,384	3-1	0,572
3	0	E-RESIST1-2	Combination	Min	0	-411,143	0	0	0	25,0207	3-1	0
3	0,572	E-RESIST1-2	Combination	Min	0	-352,213	0	0	0	21,4103	3-1	0,572
4	0	LINEA	LinStatic		0	-13,069	0	0	0	36,4582	4-1	0
4	0,572	LINEA	LinStatic		0	-7,618	0	0	0	42,3749	4-1	0,572

1	0	E-RESIST1-2	Combination	Min	0	-573,438	0	0	0	-1,705E-13	1-1	0
1	0,572	E-RESIST1-2	Combination	Min	0	-470,944	0	0	0	17,8839	1-1	0,572
2	0	LINEA	LinStatic		0	-23,972	0	0	0	15,2708	2-1	0
2	0,572	LINEA	LinStatic		0	-18,52	0	0	0	27,4236	2-1	0,572
2	0	HL93 +	LinMoving	Max	0	28,046	0	0	0	102,5358	2-1	0
2	0,572	HL93 +	LinMoving	Max	0	38,476	0	0	0	181,2752	2-1	0,572
2	0	HL93 +	LinMoving	Min	0	-158,582	0	0	0	-16,0422	2-1	0
2	0,572	HL93 +	LinMoving	Min	0	-138,335	0	0	0	-32,0845	2-1	0,572
2	0	TAMDEM +	LinMoving	Max	0	26,102	0	0	0	105,5616	2-1	0
2	0,572	TAMDEM +	LinMoving	Max	0	26,102	0	0	0	190,7537	2-1	0,572
2	0	TAMDEM +	LinMoving	Min	0	-166,84	0	0	0	-14,9305	2-1	0
2	0,572	TAMDEM +	LinMoving	Min	0	-149,219	0	0	0	-29,861	2-1	0,572
2	0	HL93 -	LinMoving	Max	0	25,241	0	0	0	94,18	2-1	0
2	0,572	HL93 -	LinMoving	Max	0	25,241	0	0	0	166,8379	2-1	0,572
2	0	HL93 -	LinMoving	Min	0	-145,949	0	0	0	-14,438	2-1	0
2	0,572	HL93 -	LinMoving	Min	0	-127,671	0	0	0	-28,876	2-1	0,572
2	0	TAMDEM -	LinMoving	Max	0	31,718	0	0	0	95,0909	2-1	0
2	0,572	TAMDEM -	LinMoving	Max	0	39,896	0	0	0	171,8329	2-1	0,572
2	0	TAMDEM -	LinMoving	Min	0	-150,291	0	0	0	-13,4495	2-1	0
2	0,572	TAMDEM -	LinMoving	Min	0	-134,418	0	0	0	-26,8991	2-1	0,572
2	0	SERV1-1 H+	Combination	Max	0	-27,67	0	0	0	138,0288	2-1	0
2	0,572	SERV1-1 H+	Combination	Max	0	-4,57	0	0	0	245,0141	2-1	0,572
2	0	SERV1-1 H+	Combination	Min	0	-214,298	0	0	0	19,4508	2-1	0
2	0,572	SERV1-1 H+	Combination	Min	0	-181,381	0	0	0	31,6544	2-1	0,572
2	0	SERV1-2 T+	Combination	Max	0	-29,614	0	0	0	141,0546	2-1	0
2	0,572	SERV1-2 T+	Combination	Max	0	-16,944	0	0	0	254,4926	2-1	0,572
2	0	SERV1-2 T+	Combination	Min	0	-222,556	0	0	0	20,5625	2-1	0
2	0,572	SERV1-2 T+	Combination	Min	0	-192,265	0	0	0	33,8779	2-1	0,572
2	0	RESIST1-2 T+	Combination	Max	0	-21,871	0	0	0	298,3292	2-1	0
2	0,572	RESIST1-2 T+	Combination	Max	0	-3,082	0	0	0	538,5013	2-1	0,572
2	0	RESIST1-2 T+	Combination	Min	0	-470,944	0	0	0	17,8839	2-1	0
2	0,572	RESIST1-2 T+	Combination	Min	0	-411,143	0	0	0	25,0207	2-1	0,572
2	0	SERV1-1 H-	Combination	Max	0	-30,475	0	0	0	129,673	2-1	0
2	0,572	SERV1-1 H-	Combination	Max	0	-17,805	0	0	0	230,5768	2-1	0,572
2	0	SERV1-1 H-	Combination	Min	0	-201,665	0	0	0	21,055	2-1	0
2	0,572	SERV1-1 H-	Combination	Min	0	-170,717	0	0	0	34,8629	2-1	0,572
2	0	SERV1-2 T-	Combination	Max	0	-23,998	0	0	0	130,584	2-1	0
2	0,572	SERV1-2 T-	Combination	Max	0	-3,15	0	0	0	235,5718	2-1	0,572
2	0	SERV1-2 T-	Combination	Min	0	-206,007	0	0	0	22,0435	2-1	0
2	0,572	SERV1-2 T-	Combination	Min	0	-177,464	0	0	0	36,8399	2-1	0,572
2	0	RESIST 1-1 H+	Combination	Max	0	-17,347	0	0	0	291,2867	2-1	0
2	0,572	RESIST 1-1 H+	Combination	Max	0	25,717	0	0	0	516,44	2-1	0,572
2	0	RESIST 1-1 H+	Combination	Min	0	-451,723	0	0	0	15,2963	2-1	0
2	0,572	RESIST 1-1 H+	Combination	Min	0	-385,81	0	0	0	19,8455	2-1	0,572
2	0	RESIST1-1 H-	Combination	Max	0	-23,875	0	0	0	271,8386	2-1	0
2	0,572	RESIST1-1 H-	Combination	Max	0	-5,086	0	0	0	482,8374	2-1	0,572
2	0	RESIST1-1 H-	Combination	Min	0	-422,321	0	0	0	19,0302	2-1	0
2	0,572	RESIST1-1 H-	Combination	Min	0	-360,99	0	0	0	27,3131	2-1	0,572
2	0	RESIST1-2 T-	Combination	Max	0	-8,8	0	0	0	273,9588	2-1	0
2	0,572	RESIST1-2 T-	Combination	Max	0	29,023	0	0	0	494,463	2-1	0,572
2	0	RESIST1-2 T-	Combination	Min	0	-432,427	0	0	0	21,3308	2-1	0
2	0,572	RESIST1-2 T-	Combination	Min	0	-376,694	0	0	0	31,9145	2-1	0,572
2	0	E-SERV1-1	Combination	Max	0	-27,67	0	0	0	138,0288	2-1	0
2	0,572	E-SERV1-1	Combination	Max	0	-4,57	0	0	0	245,0141	2-1	0,572
2	0	E-SERV1-1	Combination	Min	0	-214,298	0	0	0	19,4508	2-1	0
2	0,572	E-SERV1-1	Combination	Min	0	-181,381	0	0	0	31,6544	2-1	0,572
2	0	E-SERV1-2	Combination	Max	0	-23,998	0	0	0	141,0546	2-1	0
2	0,572	E-SERV1-2	Combination	Max	0	-3,15	0	0	0	254,4926	2-1	0,572
2	0	E-SERV1-2	Combination	Min	0	-222,556	0	0	0	20,5625	2-1	0
2	0,572	E-SERV1-2	Combination	Min	0	-192,265	0	0	0	33,8779	2-1	0,572
2	0	E-RESIST1-1	Combination	Max	0	-17,347	0	0	0	291,2867	2-1	0
2	0,572	E-RESIST1-1	Combination	Max	0	25,717	0	0	0	516,44	2-1	0,572
2	0	E-RESIST1-1	Combination	Min	0	-451,723	0	0	0	15,2963	2-1	0
2	0,572	E-RESIST1-1	Combination	Min	0	-385,81	0	0	0	19,8455	2-1	0,572
2	0	E-RESIST1-2	Combination	Max	0	-8,8	0	0	0	298,3292	2-1	0
2	0,572	E-RESIST1-2	Combination	Max	0	29,023	0	0	0	538,5013	2-1	0,572
2	0	E-RESIST1-2	Combination	Min	0	-470,944	0	0	0	17,8839	2-1	0
2	0,572	E-RESIST1-2	Combination	Min	0	-411,143	0	0	0	25,0207	2-1	0,572

ANEXO 6B - FUERZAS EN FRANJA INTERNA

TABLE: Element Forces - Frames

Frame	Station	OutputCase	CaseType	StepType	P	V2	V3	T	M2	M3	FrameElem	ElemStation
Text	m	Text	Text	Text	KN	KN	KN	KN-m	KN-m	KN-m	Text	m
1	0	LINEA	LinStatic		0	-29,423	0	0	0	-5,684E-14	1-1	0
1	0,572	LINEA	LinStatic		0	-23,972	0	0	0	15,2708	1-1	0,572
1	0	HL93 +	LinMoving	Max	0	28,046	0	0	0	0	1-1	0
1	0,572	HL93 +	LinMoving	Max	0	28,046	0	0	0	102,5358	1-1	0,572
1	0	HL93 +	LinMoving	Min	0	-200,956	0	0	0	0	1-1	0
1	0,572	HL93 +	LinMoving	Min	0	-158,582	0	0	0	-16,0422	1-1	0,572
1	0	TAMDEM +	LinMoving	Max	0	26,102	0	0	0	0	1-1	0
1	0,572	TAMDEM +	LinMoving	Max	0	26,102	0	0	0	105,5616	1-1	0,572
1	0	TAMDEM +	LinMoving	Min	0	-202,803	0	0	0	0	1-1	0
1	0,572	TAMDEM +	LinMoving	Min	0	-166,84	0	0	0	-14,9305	1-1	0,572
1	0	HL93 -	LinMoving	Max	0	25,241	0	0	0	0	1-1	0
1	0,572	HL93 -	LinMoving	Max	0	25,241	0	0	0	94,18	1-1	0,572
1	0	HL93 -	LinMoving	Min	0	-184,786	0	0	0	0	1-1	0
1	0,572	HL93 -	LinMoving	Min	0	-145,949	0	0	0	-14,438	1-1	0,572
1	0	TAMDEM -	LinMoving	Max	0	23,513	0	0	0	0	1-1	0
1	0,572	TAMDEM -	LinMoving	Max	0	31,718	0	0	0	95,0909	1-1	0,572
1	0	TAMDEM -	LinMoving	Min	0	-182,687	0	0	0	0	1-1	0
1	0,572	TAMDEM -	LinMoving	Min	0	-150,291	0	0	0	-13,4495	1-1	0,572
1	0	SERV1-1 H+	Combination	Max	0	-40,34	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-1 H+	Combination	Max	0	-27,67	0	0	0	138,0288	1-1	0,572
1	0	SERV1-1 H+	Combination	Min	0	-269,341	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-1 H+	Combination	Min	0	-214,298	0	0	0	19,4508	1-1	0,572
1	0	SERV1-2 T+	Combination	Max	0	-42,283	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-2 T+	Combination	Max	0	-29,614	0	0	0	141,0546	1-1	0,572
1	0	SERV1-2 T+	Combination	Min	0	-271,189	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-2 T+	Combination	Min	0	-222,556	0	0	0	20,5625	1-1	0,572
1	0	RESIST1-2 T+	Combination	Max	0	-40,66	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST1-2 T+	Combination	Max	0	-21,871	0	0	0	298,3292	1-1	0,572
1	0	RESIST1-2 T+	Combination	Min	0	-573,438	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST1-2 T+	Combination	Min	0	-470,944	0	0	0	17,8839	1-1	0,572
1	0	SERV1-1 H-	Combination	Max	0	-43,144	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-1 H-	Combination	Max	0	-30,475	0	0	0	129,673	1-1	0,572
1	0	SERV1-1 H-	Combination	Min	0	-253,172	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-1 H-	Combination	Min	0	-201,665	0	0	0	21,055	1-1	0,572
1	0	SERV1-2 T-	Combination	Max	0	-44,872	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-2 T-	Combination	Max	0	-23,998	0	0	0	130,584	1-1	0,572
1	0	SERV1-2 T-	Combination	Min	0	-251,073	0	0	0	-1,137E-13	1-1	0
1	0,572	SERV1-2 T-	Combination	Min	0	-206,007	0	0	0	22,0435	1-1	0,572
1	0	RESIST 1-1 H+	Combination	Max	0	-36,136	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST 1-1 H+	Combination	Max	0	-17,347	0	0	0	291,2867	1-1	0,572
1	0	RESIST 1-1 H+	Combination	Min	0	-569,137	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST 1-1 H+	Combination	Min	0	-451,723	0	0	0	15,2963	1-1	0,572
1	0	RESIST1-1 H-	Combination	Max	0	-42,664	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST1-1 H-	Combination	Max	0	-23,875	0	0	0	271,8386	1-1	0,572
1	0	RESIST1-1 H-	Combination	Min	0	-531,503	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST1-1 H-	Combination	Min	0	-422,321	0	0	0	19,0302	1-1	0,572
1	0	RESIST1-2 T-	Combination	Max	0	-46,686	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST1-2 T-	Combination	Max	0	-8,8	0	0	0	273,9588	1-1	0,572
1	0	RESIST1-2 T-	Combination	Min	0	-526,618	0	0	0	-1,705E-13	1-1	0
1	0,572	RESIST1-2 T-	Combination	Min	0	-432,427	0	0	0	21,3308	1-1	0,572
1	0	E-SERV1-1	Combination	Max	0	-40,34	0	0	0	-1,137E-13	1-1	0
1	0,572	E-SERV1-1	Combination	Max	0	-27,67	0	0	0	138,0288	1-1	0,572
1	0	E-SERV1-1	Combination	Min	0	-269,341	0	0	0	-1,137E-13	1-1	0
1	0,572	E-SERV1-1	Combination	Min	0	-214,298	0	0	0	19,4508	1-1	0,572
1	0	E-SERV1-2	Combination	Max	0	-42,283	0	0	0	-1,137E-13	1-1	0
1	0,572	E-SERV1-2	Combination	Max	0	-23,998	0	0	0	141,0546	1-1	0,572
1	0	E-SERV1-2	Combination	Min	0	-271,189	0	0	0	-1,137E-13	1-1	0
1	0,572	E-SERV1-2	Combination	Min	0	-222,556	0	0	0	20,5625	1-1	0,572
1	0	E-RESIST1-1	Combination	Max	0	-36,136	0	0	0	-1,705E-13	1-1	0
1	0,572	E-RESIST1-1	Combination	Max	0	-17,347	0	0	0	291,2867	1-1	0,572
1	0	E-RESIST1-1	Combination	Min	0	-569,137	0	0	0	-1,705E-13	1-1	0
1	0,572	E-RESIST1-1	Combination	Min	0	-451,723	0	0	0	15,2963	1-1	0,572
1	0	E-RESIST1-2	Combination	Max	0	-40,66	0	0	0	-1,705E-13	1-1	0
1	0,572	E-RESIST1-2	Combination	Max	0	-8,8	0	0	0	298,3292	1-1	0,572

6	0	TAMDEM +	LinMoving	Max	0	70,666	0	0	0	329,3386	6-1	0
6	0,572	TAMDEM +	LinMoving	Max	0	87,968	0	0	0	339,553	6-1	0,572
6	0	TAMDEM +	LinMoving	Min	0	-98,97	0	0	0	-74,6524	6-1	0
6	0,572	TAMDEM +	LinMoving	Min	0	-83,397	0	0	0	-89,5829	6-1	0,572
6	0	HL93 -	LinMoving	Max	0	54,998	0	0	0	265,7986	6-1	0
6	0,572	HL93 -	LinMoving	Max	0	64,956	0	0	0	263,5171	6-1	0,572
6	0	HL93 -	LinMoving	Min	0	-76,82	0	0	0	-72,19	6-1	0
6	0,572	HL93 -	LinMoving	Min	0	-62,24	0	0	0	-86,628	6-1	0,572
6	0	TAMDEM -	LinMoving	Max	0	87,17	0	0	0	296,6715	6-1	0
6	0,572	TAMDEM -	LinMoving	Max	0	102,755	0	0	0	305,8728	6-1	0,572
6	0	TAMDEM -	LinMoving	Min	0	-89,153	0	0	0	-67,2476	6-1	0
6	0,572	TAMDEM -	LinMoving	Min	0	-75,125	0	0	0	-80,6972	6-1	0,572
6	0	SERV1-1 H+	Combination	Max	0	71,366	0	0	0	391,8495	6-1	0
6	0,572	SERV1-1 H+	Combination	Max	0	94,925	0	0	0	388,435	6-1	0,572
6	0	SERV1-1 H+	Combination	Min	0	-87,882	0	0	0	24,7827	6-1	0
6	0,572	SERV1-1 H+	Combination	Min	0	-58,86	0	0	0	7,9978	6-1	0,572
6	0	SERV1-2 T+	Combination	Max	0	65,629	0	0	0	434,3324	6-1	0
6	0,572	SERV1-2 T+	Combination	Max	0	95,601	0	0	0	443,8042	6-1	0,572
6	0	SERV1-2 T+	Combination	Min	0	-104,006	0	0	0	30,3414	6-1	0
6	0,572	SERV1-2 T+	Combination	Min	0	-75,764	0	0	0	14,6683	6-1	0,572
6	0	RESIST1-2 T+	Combination	Max	0	157,006	0	0	0	922,2368	6-1	0
6	0,572	RESIST1-2 T+	Combination	Max	0	216,064	0	0	0	944,9097	6-1	0,572
6	0	RESIST1-2 T+	Combination	Min	0	-237,821	0	0	0	-18,0521	6-1	0
6	0,572	RESIST1-2 T+	Combination	Min	0	-182,788	0	0	0	-53,9041	6-1	0,572
6	0	SERV1-1 H-	Combination	Max	0	49,962	0	0	0	370,7924	6-1	0
6	0,572	SERV1-1 H-	Combination	Max	0	72,59	0	0	0	367,7683	6-1	0,572
6	0	SERV1-1 H-	Combination	Min	0	-81,856	0	0	0	32,8038	6-1	0
6	0,572	SERV1-1 H-	Combination	Min	0	-54,607	0	0	0	17,6232	6-1	0,572
6	0	SERV1-2 T-	Combination	Max	0	82,133	0	0	0	401,6653	6-1	0
6	0,572	SERV1-2 T-	Combination	Max	0	110,388	0	0	0	410,124	6-1	0,572
6	0	SERV1-2 T-	Combination	Min	0	-94,19	0	0	0	37,7462	6-1	0
6	0,572	SERV1-2 T-	Combination	Min	0	-67,492	0	0	0	23,5541	6-1	0,572
6	0	RESIST 1-1 H+	Combination	Max	0	170,357	0	0	0	823,3579	6-1	0
6	0,572	RESIST 1-1 H+	Combination	Max	0	214,491	0	0	0	816,0379	6-1	0,572
6	0	RESIST 1-1 H+	Combination	Min	0	-200,292	0	0	0	-30,9901	6-1	0
6	0,572	RESIST 1-1 H+	Combination	Min	0	-143,444	0	0	0	-69,4297	6-1	0,572
6	0	RESIST1-1 H-	Combination	Max	0	120,539	0	0	0	774,3476	6-1	0
6	0,572	RESIST1-1 H-	Combination	Max	0	162,506	0	0	0	767,9362	6-1	0,572
6	0	RESIST1-1 H-	Combination	Min	0	-186,267	0	0	0	-12,321	6-1	0
6	0,572	RESIST1-1 H-	Combination	Min	0	-133,545	0	0	0	-47,0267	6-1	0,572
6	0	RESIST1-2 T-	Combination	Max	0	195,419	0	0	0	846,2042	6-1	0
6	0,572	RESIST1-2 T-	Combination	Max	0	250,483	0	0	0	866,519	6-1	0,572
6	0	RESIST1-2 T-	Combination	Min	0	-214,973	0	0	0	-0,8175	6-1	0
6	0,572	RESIST1-2 T-	Combination	Min	0	-163,534	0	0	0	-33,2225	6-1	0,572
6	0	E-SERV1-1	Combination	Max	0	71,366	0	0	0	391,8495	6-1	0
6	0,572	E-SERV1-1	Combination	Max	0	94,925	0	0	0	388,435	6-1	0,572
6	0	E-SERV1-1	Combination	Min	0	-87,882	0	0	0	24,7827	6-1	0
6	0,572	E-SERV1-1	Combination	Min	0	-58,86	0	0	0	7,9978	6-1	0,572
6	0	E-SERV1-2	Combination	Max	0	82,133	0	0	0	434,3324	6-1	0
6	0,572	E-SERV1-2	Combination	Max	0	110,388	0	0	0	443,8042	6-1	0,572
6	0	E-SERV1-2	Combination	Min	0	-104,006	0	0	0	30,3414	6-1	0
6	0,572	E-SERV1-2	Combination	Min	0	-75,764	0	0	0	14,6683	6-1	0,572
6	0	E-RESIST1-1	Combination	Max	0	170,357	0	0	0	823,3579	6-1	0
6	0,572	E-RESIST1-1	Combination	Max	0	214,491	0	0	0	816,0379	6-1	0,572
6	0	E-RESIST1-1	Combination	Min	0	-200,292	0	0	0	-30,9901	6-1	0
6	0,572	E-RESIST1-1	Combination	Min	0	-143,444	0	0	0	-69,4297	6-1	0,572
6	0	E-RESIST1-2	Combination	Max	0	195,419	0	0	0	922,2368	6-1	0
6	0,572	E-RESIST1-2	Combination	Max	0	250,483	0	0	0	944,9097	6-1	0,572
6	0	E-RESIST1-2	Combination	Min	0	-237,821	0	0	0	-18,0521	6-1	0
6	0,572	E-RESIST1-2	Combination	Min	0	-182,788	0	0	0	-53,9041	6-1	0,572
7	0	LINEA	LinStatic		0	3,284	0	0	0	44,8539	7-1	0
7	0,572	LINEA	LinStatic		0	8,735	0	0	0	41,4163	7-1	0,572
7	0	HL93 +	LinMoving	Max	0	87,291	0	0	0	284,1838	7-1	0
7	0,572	HL93 +	LinMoving	Max	0	97,745	0	0	0	266,0974	7-1	0,572
7	0	HL93 +	LinMoving	Min	0	-66,493	0	0	0	-96,2534	7-1	0
7	0,572	HL93 +	LinMoving	Min	0	-53,789	0	0	0	-112,2956	7-1	0,572
7	0	TAMDEM +	LinMoving	Max	0	87,968	0	0	0	339,553	7-1	0
7	0,572	TAMDEM +	LinMoving	Max	0	104,815	0	0	0	334,244	7-1	0,572

7	0	TAMDEM +	LinMoving	Min	0	-83,397	0	0	0	-89,5829	7-1	0
7	0,572	TAMDEM +	LinMoving	Min	0	-68,567	0	0	0	-104,5133	7-1	0,572
7	0	HL93 -	LinMoving	Max	0	64,956	0	0	0	263,5171	7-1	0
7	0,572	HL93 -	LinMoving	Max	0	74,475	0	0	0	249,0819	7-1	0,572
7	0	HL93 -	LinMoving	Min	0	-62,24	0	0	0	-86,628	7-1	0
7	0,572	HL93 -	LinMoving	Min	0	-52,064	0	0	0	-101,0661	7-1	0,572
7	0	TAMDEM -	LinMoving	Max	0	102,755	0	0	0	305,8728	7-1	0
7	0,572	TAMDEM -	LinMoving	Max	0	117,932	0	0	0	301,0904	7-1	0,572
7	0	TAMDEM -	LinMoving	Min	0	-75,125	0	0	0	-80,6972	7-1	0
7	0,572	TAMDEM -	LinMoving	Min	0	-61,766	0	0	0	-94,1467	7-1	0,572
7	0	SERV1-1 H+	Combination	Max	0	94,925	0	0	0	388,435	7-1	0
7	0,572	SERV1-1 H+	Combination	Max	0	118,048	0	0	0	362,3589	7-1	0,572
7	0	SERV1-1 H+	Combination	Min	0	-58,86	0	0	0	7,9978	7-1	0
7	0,572	SERV1-1 H+	Combination	Min	0	-33,486	0	0	0	-16,0342	7-1	0,572
7	0	SERV1-2 T+	Combination	Max	0	95,601	0	0	0	443,8042	7-1	0
7	0,572	SERV1-2 T+	Combination	Max	0	125,118	0	0	0	430,5055	7-1	0,572
7	0	SERV1-2 T+	Combination	Min	0	-75,764	0	0	0	14,6683	7-1	0
7	0,572	SERV1-2 T+	Combination	Min	0	-48,264	0	0	0	-8,2519	7-1	0,572
7	0	RESIST1-2 T+	Combination	Max	0	216,064	0	0	0	944,9097	7-1	0
7	0,572	RESIST1-2 T+	Combination	Max	0	274,066	0	0	0	920,7046	7-1	0,572
7	0	RESIST1-2 T+	Combination	Min	0	-182,788	0	0	0	-53,9041	7-1	0
7	0,572	RESIST1-2 T+	Combination	Min	0	-129,482	0	0	0	-100,5032	7-1	0,572
7	0	SERV1-1 H-	Combination	Max	0	72,59	0	0	0	367,7683	7-1	0
7	0,572	SERV1-1 H-	Combination	Max	0	94,778	0	0	0	345,3434	7-1	0,572
7	0	SERV1-1 H-	Combination	Min	0	-54,607	0	0	0	17,6232	7-1	0
7	0,572	SERV1-1 H-	Combination	Min	0	-31,761	0	0	0	-4,8046	7-1	0,572
7	0	SERV1-2 T-	Combination	Max	0	110,388	0	0	0	410,124	7-1	0
7	0,572	SERV1-2 T-	Combination	Max	0	138,235	0	0	0	397,3518	7-1	0,572
7	0	SERV1-2 T-	Combination	Min	0	-67,492	0	0	0	23,5541	7-1	0
7	0,572	SERV1-2 T-	Combination	Min	0	-41,463	0	0	0	2,1148	7-1	0,572
7	0	RESIST 1-1 H+	Combination	Max	0	214,491	0	0	0	816,0379	7-1	0
7	0,572	RESIST 1-1 H+	Combination	Max	0	257,61	0	0	0	762,0933	7-1	0,572
7	0	RESIST 1-1 H+	Combination	Min	0	-143,444	0	0	0	-69,4297	7-1	0
7	0,572	RESIST 1-1 H+	Combination	Min	0	-95,084	0	0	0	-118,6164	7-1	0,572
7	0	RESIST1-1 H-	Combination	Max	0	162,506	0	0	0	767,9362	7-1	0
7	0,572	RESIST1-1 H-	Combination	Max	0	203,448	0	0	0	722,4897	7-1	0,572
7	0	RESIST1-1 H-	Combination	Min	0	-133,545	0	0	0	-47,0267	7-1	0
7	0,572	RESIST1-1 H-	Combination	Min	0	-91,072	0	0	0	-92,4796	7-1	0,572
7	0	RESIST1-2 T-	Combination	Max	0	250,483	0	0	0	866,519	7-1	0
7	0,572	RESIST1-2 T-	Combination	Max	0	304,595	0	0	0	843,5395	7-1	0,572
7	0	RESIST1-2 T-	Combination	Min	0	-163,534	0	0	0	-33,2225	7-1	0
7	0,572	RESIST1-2 T-	Combination	Min	0	-113,652	0	0	0	-76,3748	7-1	0,572
7	0	E-SERV1-1	Combination	Max	0	94,925	0	0	0	388,435	7-1	0
7	0,572	E-SERV1-1	Combination	Max	0	118,048	0	0	0	362,3589	7-1	0,572
7	0	E-SERV1-1	Combination	Min	0	-58,86	0	0	0	7,9978	7-1	0
7	0,572	E-SERV1-1	Combination	Min	0	-33,486	0	0	0	-16,0342	7-1	0,572
7	0	E-SERV1-2	Combination	Max	0	110,388	0	0	0	443,8042	7-1	0
7	0,572	E-SERV1-2	Combination	Max	0	138,235	0	0	0	430,5055	7-1	0,572
7	0	E-SERV1-2	Combination	Min	0	-75,764	0	0	0	14,6683	7-1	0
7	0,572	E-SERV1-2	Combination	Min	0	-48,264	0	0	0	-8,2519	7-1	0,572
7	0	E-RESIST1-1	Combination	Max	0	214,491	0	0	0	816,0379	7-1	0
7	0,572	E-RESIST1-1	Combination	Max	0	257,61	0	0	0	762,0933	7-1	0,572
7	0	E-RESIST1-1	Combination	Min	0	-143,444	0	0	0	-69,4297	7-1	0
7	0,572	E-RESIST1-1	Combination	Min	0	-95,084	0	0	0	-118,6164	7-1	0,572
7	0	E-RESIST1-2	Combination	Max	0	250,483	0	0	0	944,9097	7-1	0
7	0,572	E-RESIST1-2	Combination	Max	0	304,595	0	0	0	920,7046	7-1	0,572
7	0	E-RESIST1-2	Combination	Min	0	-182,788	0	0	0	-53,9041	7-1	0
7	0,572	E-RESIST1-2	Combination	Min	0	-129,482	0	0	0	-100,5032	7-1	0,572
8	0	LINEA	LinStatic		0	8,735	0	0	0	41,4163	8-1	0
8	0,572	LINEA	LinStatic		0	14,186	0	0	0	34,8607	8-1	0,572
8	0	HL93 +	LinMoving	Max	0	97,745	0	0	0	266,0974	8-1	0
8	0,572	HL93 +	LinMoving	Max	0	107,785	0	0	0	259,4196	8-1	0,572
8	0	HL93 +	LinMoving	Min	0	-53,789	0	0	0	-112,2956	8-1	0
8	0,572	HL93 +	LinMoving	Min	0	-44,22	0	0	0	-128,3378	8-1	0,572
8	0	TAMDEM +	LinMoving	Max	0	104,815	0	0	0	334,244	8-1	0
8	0,572	TAMDEM +	LinMoving	Max	0	121,117	0	0	0	326,7905	8-1	0,572
8	0	TAMDEM +	LinMoving	Min	0	-68,567	0	0	0	-104,5133	8-1	0
8	0,572	TAMDEM +	LinMoving	Min	0	-54,571	0	0	0	-119,4438	8-1	0,572

8	0	HL93 -	LinMoving	Max	0	74,475	0	0	0	249,0819	8-1	0
8	0,572	HL93 -	LinMoving	Max	0	85,656	0	0	0	250,2016	8-1	0,572
8	0	HL93 -	LinMoving	Min	0	-52,064	0	0	0	-101,0661	8-1	0
8	0,572	HL93 -	LinMoving	Min	0	-42,994	0	0	0	-115,5041	8-1	0,572
8	0	TAMDEM -	LinMoving	Max	0	117,932	0	0	0	301,0904	8-1	0
8	0,572	TAMDEM -	LinMoving	Max	0	132,593	0	0	0	294,3762	8-1	0,572
8	0	TAMDEM -	LinMoving	Min	0	-61,766	0	0	0	-94,1467	8-1	0
8	0,572	TAMDEM -	LinMoving	Min	0	-49,158	0	0	0	-107,5962	8-1	0,572
8	0	SERV1-1 H+	Combination	Max	0	118,048	0	0	0	362,3589	8-1	0
8	0,572	SERV1-1 H+	Combination	Max	0	140,758	0	0	0	340,4442	8-1	0,572
8	0	SERV1-1 H+	Combination	Min	0	-33,486	0	0	0	-16,0342	8-1	0
8	0,572	SERV1-1 H+	Combination	Min	0	-11,247	0	0	0	-47,3132	8-1	0,572
8	0	SERV1-2 T+	Combination	Max	0	125,118	0	0	0	430,5055	8-1	0
8	0,572	SERV1-2 T+	Combination	Max	0	154,09	0	0	0	407,8151	8-1	0,572
8	0	SERV1-2 T+	Combination	Min	0	-48,264	0	0	0	-8,2519	8-1	0
8	0,572	SERV1-2 T+	Combination	Min	0	-21,598	0	0	0	-38,4192	8-1	0,572
8	0	RESIST1-2 T+	Combination	Max	0	274,066	0	0	0	920,7046	8-1	0
8	0,572	RESIST1-2 T+	Combination	Max	0	330,798	0	0	0	880,761	8-1	0,572
8	0	RESIST1-2 T+	Combination	Min	0	-129,482	0	0	0	-100,5032	8-1	0
8	0,572	RESIST1-2 T+	Combination	Min	0	-78,117	0	0	0	-157,8495	8-1	0,572
8	0	SERV1-1 H-	Combination	Max	0	94,778	0	0	0	345,3434	8-1	0
8	0,572	SERV1-1 H-	Combination	Max	0	118,629	0	0	0	331,2262	8-1	0,572
8	0	SERV1-1 H-	Combination	Min	0	-31,761	0	0	0	-4,8046	8-1	0
8	0,572	SERV1-1 H-	Combination	Min	0	-10,021	0	0	0	-34,4795	8-1	0,572
8	0	SERV1-2 T-	Combination	Max	0	138,235	0	0	0	397,3518	8-1	0
8	0,572	SERV1-2 T-	Combination	Max	0	165,566	0	0	0	375,4008	8-1	0,572
8	0	SERV1-2 T-	Combination	Min	0	-41,463	0	0	0	2,1148	8-1	0
8	0,572	SERV1-2 T-	Combination	Min	0	-16,185	0	0	0	-26,5716	8-1	0,572
8	0	RESIST 1-1 H+	Combination	Max	0	257,61	0	0	0	762,0933	8-1	0
8	0,572	RESIST 1-1 H+	Combination	Max	0	299,768	0	0	0	723,9551	8-1	0,572
8	0	RESIST 1-1 H+	Combination	Min	0	-95,084	0	0	0	-118,6164	8-1	0
8	0,572	RESIST 1-1 H+	Combination	Min	0	-54,024	0	0	0	-178,5503	8-1	0,572
8	0	RESIST1-1 H-	Combination	Max	0	203,448	0	0	0	722,4897	8-1	0
8	0,572	RESIST1-1 H-	Combination	Max	0	248,262	0	0	0	702,5003	8-1	0,572
8	0	RESIST1-1 H-	Combination	Min	0	-91,072	0	0	0	-92,4796	8-1	0
8	0,572	RESIST1-1 H-	Combination	Min	0	-51,17	0	0	0	-148,6797	8-1	0,572
8	0	RESIST1-2 T-	Combination	Max	0	304,595	0	0	0	843,5395	8-1	0
8	0,572	RESIST1-2 T-	Combination	Max	0	357,507	0	0	0	805,3167	8-1	0,572
8	0	RESIST1-2 T-	Combination	Min	0	-113,652	0	0	0	-76,3748	8-1	0
8	0,572	RESIST1-2 T-	Combination	Min	0	-65,518	0	0	0	-130,2741	8-1	0,572
8	0	E-SERV1-1	Combination	Max	0	118,048	0	0	0	362,3589	8-1	0
8	0,572	E-SERV1-1	Combination	Max	0	140,758	0	0	0	340,4442	8-1	0,572
8	0	E-SERV1-1	Combination	Min	0	-33,486	0	0	0	-16,0342	8-1	0
8	0,572	E-SERV1-1	Combination	Min	0	-11,247	0	0	0	-47,3132	8-1	0,572
8	0	E-SERV1-2	Combination	Max	0	138,235	0	0	0	430,5055	8-1	0
8	0,572	E-SERV1-2	Combination	Max	0	165,566	0	0	0	407,8151	8-1	0,572
8	0	E-SERV1-2	Combination	Min	0	-48,264	0	0	0	-8,2519	8-1	0
8	0,572	E-SERV1-2	Combination	Min	0	-21,598	0	0	0	-38,4192	8-1	0,572
8	0	E-RESIST1-1	Combination	Max	0	257,61	0	0	0	762,0933	8-1	0
8	0,572	E-RESIST1-1	Combination	Max	0	299,768	0	0	0	723,9551	8-1	0,572
8	0	E-RESIST1-1	Combination	Min	0	-95,084	0	0	0	-118,6164	8-1	0
8	0,572	E-RESIST1-1	Combination	Min	0	-54,024	0	0	0	-178,5503	8-1	0,572
8	0	E-RESIST1-2	Combination	Max	0	304,595	0	0	0	920,7046	8-1	0
8	0,572	E-RESIST1-2	Combination	Max	0	357,507	0	0	0	880,761	8-1	0,572
8	0	E-RESIST1-2	Combination	Min	0	-129,482	0	0	0	-100,5032	8-1	0
8	0,572	E-RESIST1-2	Combination	Min	0	-78,117	0	0	0	-157,8495	8-1	0,572
9	0	LINEA	LinStatic		0	14,186	0	0	0	34,8607	9-1	0
9	0,572	LINEA	LinStatic		0	19,638	0	0	0	25,187	9-1	0,572
9	0	HL93 +	LinMoving	Max	0	107,785	0	0	0	259,4196	9-1	0
9	0,572	HL93 +	LinMoving	Max	0	119,412	0	0	0	259,0959	9-1	0,572
9	0	HL93 +	LinMoving	Min	0	-44,22	0	0	0	-128,3378	9-1	0
9	0,572	HL93 +	LinMoving	Min	0	-35,181	0	0	0	-144,3801	9-1	0,572
9	0	TAMDEM +	LinMoving	Max	0	121,117	0	0	0	326,7905	9-1	0
9	0,572	TAMDEM +	LinMoving	Max	0	136,781	0	0	0	303,9714	9-1	0,572
9	0	TAMDEM +	LinMoving	Min	0	-54,571	0	0	0	-119,4438	9-1	0
9	0,572	TAMDEM +	LinMoving	Min	0	-41,501	0	0	0	-134,3743	9-1	0,572
9	0	HL93 -	LinMoving	Max	0	85,656	0	0	0	250,2016	9-1	0
9	0,572	HL93 -	LinMoving	Max	0	105,342	0	0	0	249,6382	9-1	0,572

9	0	HL93 -	LinMoving	Min	0	-42,994	0	0	0	-115,5041	9-1	0
9	0,572	HL93 -	LinMoving	Min	0	-34,881	0	0	0	-129,9421	9-1	0,572
9	0	TAMDEM -	LinMoving	Max	0	132,593	0	0	0	294,3762	9-1	0
9	0,572	TAMDEM -	LinMoving	Max	0	146,148	0	0	0	273,8205	9-1	0,572
9	0	TAMDEM -	LinMoving	Min	0	-49,158	0	0	0	-107,5962	9-1	0
9	0,572	TAMDEM -	LinMoving	Min	0	-37,593	0	0	0	-121,0457	9-1	0,572
9	0	SERV1-1 H+	Combination	Max	0	140,758	0	0	0	340,4442	9-1	0
9	0,572	SERV1-1 H+	Combination	Max	0	165,055	0	0	0	317,6365	9-1	0,572
9	0	SERV1-1 H+	Combination	Min	0	-11,247	0	0	0	-47,3132	9-1	0
9	0,572	SERV1-1 H+	Combination	Min	0	10,461	0	0	0	-85,8395	9-1	0,572
9	0	SERV1-2 T+	Combination	Max	0	154,09	0	0	0	407,8151	9-1	0
9	0,572	SERV1-2 T+	Combination	Max	0	182,424	0	0	0	362,512	9-1	0,572
9	0	SERV1-2 T+	Combination	Min	0	-21,598	0	0	0	-38,4192	9-1	0
9	0,572	SERV1-2 T+	Combination	Min	0	4,142	0	0	0	-75,8337	9-1	0,572
9	0	RESIST1-2 T+	Combination	Max	0	330,798	0	0	0	880,761	9-1	0
9	0,572	RESIST1-2 T+	Combination	Max	0	386,044	0	0	0	794,3067	9-1	0,572
9	0	RESIST1-2 T+	Combination	Min	0	-78,117	0	0	0	-157,8495	9-1	0
9	0,572	RESIST1-2 T+	Combination	Min	0	-28,908	0	0	0	-225,943	9-1	0,572
9	0	SERV1-1 H-	Combination	Max	0	118,629	0	0	0	331,2262	9-1	0
9	0,572	SERV1-1 H-	Combination	Max	0	150,984	0	0	0	308,1788	9-1	0,572
9	0	SERV1-1 H-	Combination	Min	0	-10,021	0	0	0	-34,4795	9-1	0
9	0,572	SERV1-1 H-	Combination	Min	0	10,762	0	0	0	-71,4015	9-1	0,572
9	0	SERV1-2 T-	Combination	Max	0	165,566	0	0	0	375,4008	9-1	0
9	0,572	SERV1-2 T-	Combination	Max	0	191,791	0	0	0	332,3611	9-1	0,572
9	0	SERV1-2 T-	Combination	Min	0	-16,185	0	0	0	-26,5716	9-1	0
9	0,572	SERV1-2 T-	Combination	Min	0	8,049	0	0	0	-62,5051	9-1	0,572
9	0	RESIST 1-1 H+	Combination	Max	0	299,768	0	0	0	723,9551	9-1	0
9	0,572	RESIST 1-1 H+	Combination	Max	0	345,619	0	0	0	689,8589	9-1	0,572
9	0	RESIST 1-1 H+	Combination	Min	0	-54,024	0	0	0	-178,5503	9-1	0
9	0,572	RESIST 1-1 H+	Combination	Min	0	-14,199	0	0	0	-249,2314	9-1	0,572
9	0	RESIST1-1 H-	Combination	Max	0	248,262	0	0	0	702,5003	9-1	0
9	0,572	RESIST1-1 H-	Combination	Max	0	312,869	0	0	0	667,8461	9-1	0,572
9	0	RESIST1-1 H-	Combination	Min	0	-51,17	0	0	0	-148,6797	9-1	0
9	0,572	RESIST1-1 H-	Combination	Min	0	-13,499	0	0	0	-215,627	9-1	0,572
9	0	RESIST1-2 T-	Combination	Max	0	357,507	0	0	0	805,3167	9-1	0
9	0,572	RESIST1-2 T-	Combination	Max	0	407,846	0	0	0	724,1304	9-1	0,572
9	0	RESIST1-2 T-	Combination	Min	0	-65,518	0	0	0	-130,2741	9-1	0
9	0,572	RESIST1-2 T-	Combination	Min	0	-19,813	0	0	0	-194,9207	9-1	0,572
9	0	E-SERV1-1	Combination	Max	0	140,758	0	0	0	340,4442	9-1	0
9	0,572	E-SERV1-1	Combination	Max	0	165,055	0	0	0	317,6365	9-1	0,572
9	0	E-SERV1-1	Combination	Min	0	-11,247	0	0	0	-47,3132	9-1	0
9	0,572	E-SERV1-1	Combination	Min	0	10,461	0	0	0	-85,8395	9-1	0,572
9	0	E-SERV1-2	Combination	Max	0	165,566	0	0	0	407,8151	9-1	0
9	0,572	E-SERV1-2	Combination	Max	0	191,791	0	0	0	362,512	9-1	0,572
9	0	E-SERV1-2	Combination	Min	0	-21,598	0	0	0	-38,4192	9-1	0
9	0,572	E-SERV1-2	Combination	Min	0	4,142	0	0	0	-75,8337	9-1	0,572
9	0	E-RESIST1-1	Combination	Max	0	299,768	0	0	0	723,9551	9-1	0
9	0,572	E-RESIST1-1	Combination	Max	0	345,619	0	0	0	689,8589	9-1	0,572
9	0	E-RESIST1-1	Combination	Min	0	-54,024	0	0	0	-178,5503	9-1	0
9	0,572	E-RESIST1-1	Combination	Min	0	-14,199	0	0	0	-249,2314	9-1	0,572
9	0	E-RESIST1-2	Combination	Max	0	357,507	0	0	0	880,761	9-1	0
9	0,572	E-RESIST1-2	Combination	Max	0	407,846	0	0	0	794,3067	9-1	0,572
9	0	E-RESIST1-2	Combination	Min	0	-78,117	0	0	0	-157,8495	9-1	0
9	0,572	E-RESIST1-2	Combination	Min	0	-28,908	0	0	0	-225,943	9-1	0,572
10	0	LINEA	LinStatic		0	19,638	0	0	0	25,187	10-1	0
10	0,572	LINEA	LinStatic		0	25,089	0	0	0	12,3952	10-1	0,572
10	0	HL93 +	LinMoving	Max	0	119,412	0	0	0	259,0959	10-1	0
10	0,572	HL93 +	LinMoving	Max	0	138,508	0	0	0	238,0178	10-1	0,572
10	0	HL93 +	LinMoving	Min	0	-35,181	0	0	0	-144,3801	10-1	0
10	0,572	HL93 +	LinMoving	Min	0	-26,732	0	0	0	-160,4223	10-1	0,572
10	0	TAMDEM +	LinMoving	Max	0	136,781	0	0	0	303,9714	10-1	0
10	0,572	TAMDEM +	LinMoving	Max	0	151,715	0	0	0	267,4075	10-1	0,572
10	0	TAMDEM +	LinMoving	Min	0	-41,501	0	0	0	-134,3743	10-1	0
10	0,572	TAMDEM +	LinMoving	Min	0	-29,449	0	0	0	-149,3048	10-1	0,572
10	0	HL93 -	LinMoving	Max	0	105,342	0	0	0	249,6382	10-1	0
10	0,572	HL93 -	LinMoving	Max	0	124,657	0	0	0	232,6192	10-1	0,572
10	0	HL93 -	LinMoving	Min	0	-34,881	0	0	0	-129,9421	10-1	0
10	0,572	HL93 -	LinMoving	Min	0	-27,152	0	0	0	-144,3801	10-1	0,572

10	0	TAMDEM -	LinMoving	Max	0	146,148	0	0	0	273,8205	10-1	0
10	0,572	TAMDEM -	LinMoving	Max	0	158,526	0	0	0	240,8834	10-1	0,572
10	0	TAMDEM -	LinMoving	Min	0	-37,593	0	0	0	-121,0457	10-1	0
10	0,572	TAMDEM -	LinMoving	Min	0	-27,491	0	0	0	-134,4953	10-1	0,572
10	0	SERV1-1 H+	Combination	Max	0	165,055	0	0	0	317,6365	10-1	0
10	0,572	SERV1-1 H+	Combination	Max	0	196,82	0	0	0	266,8273	10-1	0,572
10	0	SERV1-1 H+	Combination	Min	0	10,461	0	0	0	-85,8395	10-1	0
10	0,572	SERV1-1 H+	Combination	Min	0	31,58	0	0	0	-131,6128	10-1	0,572
10	0	SERV1-2 T+	Combination	Max	0	182,424	0	0	0	362,512	10-1	0
10	0,572	SERV1-2 T+	Combination	Max	0	210,028	0	0	0	296,217	10-1	0,572
10	0	SERV1-2 T+	Combination	Min	0	4,142	0	0	0	-75,8337	10-1	0
10	0,572	SERV1-2 T+	Combination	Min	0	28,863	0	0	0	-120,4953	10-1	0,572
10	0	RESIST1-2 T+	Combination	Max	0	386,044	0	0	0	794,3067	10-1	0
10	0,572	RESIST1-2 T+	Combination	Max	0	439,592	0	0	0	665,1142	10-1	0,572
10	0	RESIST1-2 T+	Combination	Min	0	-28,908	0	0	0	-225,943	10-1	0
10	0,572	RESIST1-2 T+	Combination	Min	0	17,932	0	0	0	-304,7836	10-1	0,572
10	0	SERV1-1 H-	Combination	Max	0	150,984	0	0	0	308,1788	10-1	0
10	0,572	SERV1-1 H-	Combination	Max	0	182,97	0	0	0	261,4287	10-1	0,572
10	0	SERV1-1 H-	Combination	Min	0	10,762	0	0	0	-71,4015	10-1	0
10	0,572	SERV1-1 H-	Combination	Min	0	31,16	0	0	0	-115,5706	10-1	0,572
10	0	SERV1-2 T-	Combination	Max	0	191,791	0	0	0	332,3611	10-1	0
10	0,572	SERV1-2 T-	Combination	Max	0	216,839	0	0	0	269,6929	10-1	0,572
10	0	SERV1-2 T-	Combination	Min	0	8,049	0	0	0	-62,5051	10-1	0
10	0,572	SERV1-2 T-	Combination	Min	0	30,821	0	0	0	-105,6858	10-1	0,572
10	0	RESIST 1-1 H+	Combination	Max	0	345,619	0	0	0	689,8589	10-1	0
10	0,572	RESIST 1-1 H+	Combination	Max	0	408,852	0	0	0	596,7097	10-1	0,572
10	0	RESIST 1-1 H+	Combination	Min	0	-14,199	0	0	0	-249,2314	10-1	0
10	0,572	RESIST 1-1 H+	Combination	Min	0	24,255	0	0	0	-330,6597	10-1	0,572
10	0	RESIST1-1 H-	Combination	Max	0	312,869	0	0	0	667,8461	10-1	0
10	0,572	RESIST1-1 H-	Combination	Max	0	376,615	0	0	0	584,1444	10-1	0,572
10	0	RESIST1-1 H-	Combination	Min	0	-13,499	0	0	0	-215,627	10-1	0
10	0,572	RESIST1-1 H-	Combination	Min	0	23,278	0	0	0	-293,3214	10-1	0,572
10	0	RESIST1-2 T-	Combination	Max	0	407,846	0	0	0	724,1304	10-1	0
10	0,572	RESIST1-2 T-	Combination	Max	0	455,445	0	0	0	603,3793	10-1	0,572
10	0	RESIST1-2 T-	Combination	Min	0	-19,813	0	0	0	-194,9207	10-1	0
10	0,572	RESIST1-2 T-	Combination	Min	0	22,49	0	0	0	-270,3144	10-1	0,572
10	0	E-SERV1-1	Combination	Max	0	165,055	0	0	0	317,6365	10-1	0
10	0,572	E-SERV1-1	Combination	Max	0	196,82	0	0	0	266,8273	10-1	0,572
10	0	E-SERV1-1	Combination	Min	0	10,461	0	0	0	-85,8395	10-1	0
10	0,572	E-SERV1-1	Combination	Min	0	31,16	0	0	0	-131,6128	10-1	0,572
10	0	E-SERV1-2	Combination	Max	0	191,791	0	0	0	362,512	10-1	0
10	0,572	E-SERV1-2	Combination	Max	0	216,839	0	0	0	296,217	10-1	0,572
10	0	E-SERV1-2	Combination	Min	0	4,142	0	0	0	-75,8337	10-1	0
10	0,572	E-SERV1-2	Combination	Min	0	28,863	0	0	0	-120,4953	10-1	0,572
10	0	E-RESIST1-1	Combination	Max	0	345,619	0	0	0	689,8589	10-1	0
10	0,572	E-RESIST1-1	Combination	Max	0	408,852	0	0	0	596,7097	10-1	0,572
10	0	E-RESIST1-1	Combination	Min	0	-14,199	0	0	0	-249,2314	10-1	0
10	0,572	E-RESIST1-1	Combination	Min	0	23,278	0	0	0	-330,6597	10-1	0,572
10	0	E-RESIST1-2	Combination	Max	0	407,846	0	0	0	794,3067	10-1	0
10	0,572	E-RESIST1-2	Combination	Max	0	455,445	0	0	0	665,1142	10-1	0,572
10	0	E-RESIST1-2	Combination	Min	0	-28,908	0	0	0	-225,943	10-1	0
10	0,572	E-RESIST1-2	Combination	Min	0	17,932	0	0	0	-304,7836	10-1	0,572
11	0	LINEA	LinStatic		0	25,089	0	0	0	12,3952	11-1	0
11	0,572	LINEA	LinStatic		0	30,54	0	0	0	-3,5146	11-1	0,572
11	0	HL93 +	LinMoving	Max	0	138,508	0	0	0	238,0178	11-1	0
11	0,572	HL93 +	LinMoving	Max	0	159,049	0	0	0	197,9871	11-1	0,572
11	0	HL93 +	LinMoving	Min	0	-26,732	0	0	0	-160,4223	11-1	0
11	0,572	HL93 +	LinMoving	Min	0	-19,077	0	0	0	-176,4645	11-1	0,572
11	0	TAMDEM +	LinMoving	Max	0	151,715	0	0	0	267,4075	11-1	0
11	0,572	TAMDEM +	LinMoving	Max	0	165,828	0	0	0	218,9303	11-1	0,572
11	0	TAMDEM +	LinMoving	Min	0	-29,449	0	0	0	-149,3048	11-1	0
11	0,572	TAMDEM +	LinMoving	Min	0	-18,507	0	0	0	-164,2353	11-1	0,572
11	0	HL93 -	LinMoving	Max	0	124,657	0	0	0	232,6192	11-1	0
11	0,572	HL93 -	LinMoving	Max	0	143,144	0	0	0	197,6499	11-1	0,572
11	0	HL93 -	LinMoving	Min	0	-27,152	0	0	0	-144,3801	11-1	0
11	0,572	HL93 -	LinMoving	Min	0	-19,88	0	0	0	-158,8181	11-1	0,572
11	0	TAMDEM -	LinMoving	Max	0	158,526	0	0	0	240,8834	11-1	0
11	0,572	TAMDEM -	LinMoving	Max	0	169,724	0	0	0	197,2146	11-1	0,572

11	0	TAMDEM -	LinMoving	Min	0	-27,491	0	0	0	-134,4953	11-1	0
11	0,572	TAMDEM -	LinMoving	Min	0	-18,33	0	0	0	-147,9448	11-1	0,572
11	0	SERV1-1 H+	Combination	Max	0	196,82	0	0	0	266,8273	11-1	0
11	0,572	SERV1-1 H+	Combination	Max	0	230,031	0	0	0	189,8183	11-1	0,572
11	0	SERV1-1 H+	Combination	Min	0	31,58	0	0	0	-131,6128	11-1	0
11	0,572	SERV1-1 H+	Combination	Min	0	51,905	0	0	0	-184,6333	11-1	0,572
11	0	SERV1-2 T+	Combination	Max	0	210,028	0	0	0	296,217	11-1	0
11	0,572	SERV1-2 T+	Combination	Max	0	236,81	0	0	0	210,7615	11-1	0,572
11	0	SERV1-2 T+	Combination	Min	0	28,863	0	0	0	-120,4953	11-1	0
11	0,572	SERV1-2 T+	Combination	Min	0	52,476	0	0	0	-172,404	11-1	0,572
11	0	RESIST1-2 T+	Combination	Max	0	439,592	0	0	0	665,1142	11-1	0
11	0,572	RESIST1-2 T+	Combination	Max	0	491,228	0	0	0	497,4463	11-1	0,572
11	0	RESIST1-2 T+	Combination	Min	0	17,932	0	0	0	-304,7836	11-1	0
11	0,572	RESIST1-2 T+	Combination	Min	0	62,19	0	0	0	-394,3715	11-1	0,572
11	0	SERV1-1 H-	Combination	Max	0	182,97	0	0	0	261,4287	11-1	0
11	0,572	SERV1-1 H-	Combination	Max	0	214,126	0	0	0	189,4811	11-1	0,572
11	0	SERV1-1 H-	Combination	Min	0	31,16	0	0	0	-115,5706	11-1	0
11	0,572	SERV1-1 H-	Combination	Min	0	51,102	0	0	0	-166,9868	11-1	0,572
11	0	SERV1-2 T-	Combination	Max	0	216,839	0	0	0	269,6929	11-1	0
11	0,572	SERV1-2 T-	Combination	Max	0	240,706	0	0	0	189,0459	11-1	0,572
11	0	SERV1-2 T-	Combination	Min	0	30,821	0	0	0	-105,6858	11-1	0
11	0,572	SERV1-2 T-	Combination	Min	0	52,652	0	0	0	-156,1135	11-1	0,572
11	0	RESIST 1-1 H+	Combination	Max	0	408,852	0	0	0	596,7097	11-1	0
11	0,572	RESIST 1-1 H+	Combination	Max	0	475,45	0	0	0	448,701	11-1	0,572
11	0	RESIST 1-1 H+	Combination	Min	0	24,255	0	0	0	-330,6597	11-1	0
11	0,572	RESIST 1-1 H+	Combination	Min	0	60,861	0	0	0	-422,8351	11-1	0,572
11	0	RESIST1-1 H-	Combination	Max	0	376,615	0	0	0	584,1444	11-1	0
11	0,572	RESIST1-1 H-	Combination	Max	0	438,431	0	0	0	447,9162	11-1	0,572
11	0	RESIST1-1 H-	Combination	Min	0	23,278	0	0	0	-293,3214	11-1	0
11	0,572	RESIST1-1 H-	Combination	Min	0	58,993	0	0	0	-381,763	11-1	0,572
11	0	RESIST1-2 T-	Combination	Max	0	455,445	0	0	0	603,3793	11-1	0
11	0,572	RESIST1-2 T-	Combination	Max	0	500,296	0	0	0	446,9031	11-1	0,572
11	0	RESIST1-2 T-	Combination	Min	0	22,49	0	0	0	-270,3144	11-1	0
11	0,572	RESIST1-2 T-	Combination	Min	0	62,601	0	0	0	-356,4554	11-1	0,572
11	0	E-SERV1-1	Combination	Max	0	196,82	0	0	0	266,8273	11-1	0
11	0,572	E-SERV1-1	Combination	Max	0	230,031	0	0	0	189,8183	11-1	0,572
11	0	E-SERV1-1	Combination	Min	0	31,16	0	0	0	-131,6128	11-1	0
11	0,572	E-SERV1-1	Combination	Min	0	51,102	0	0	0	-184,6333	11-1	0,572
11	0	E-SERV1-2	Combination	Max	0	216,839	0	0	0	296,217	11-1	0
11	0,572	E-SERV1-2	Combination	Max	0	240,706	0	0	0	210,7615	11-1	0,572
11	0	E-SERV1-2	Combination	Min	0	28,863	0	0	0	-120,4953	11-1	0
11	0,572	E-SERV1-2	Combination	Min	0	52,476	0	0	0	-172,404	11-1	0,572
11	0	E-RESIST1-1	Combination	Max	0	408,852	0	0	0	596,7097	11-1	0
11	0,572	E-RESIST1-1	Combination	Max	0	475,45	0	0	0	448,701	11-1	0,572
11	0	E-RESIST1-1	Combination	Min	0	23,278	0	0	0	-330,6597	11-1	0
11	0,572	E-RESIST1-1	Combination	Min	0	58,993	0	0	0	-422,8351	11-1	0,572
11	0	E-RESIST1-2	Combination	Max	0	455,445	0	0	0	665,1142	11-1	0
11	0,572	E-RESIST1-2	Combination	Max	0	500,296	0	0	0	497,4463	11-1	0,572
11	0	E-RESIST1-2	Combination	Min	0	17,932	0	0	0	-304,7836	11-1	0
11	0,572	E-RESIST1-2	Combination	Min	0	62,19	0	0	0	-394,3715	11-1	0,572
12	0	LINEA	LinStatic		0	30,54	0	0	0	-3,5146	12-1	0
12	0,572	LINEA	LinStatic		0	35,991	0	0	0	-22,5425	12-1	0,572
12	0	HL93 +	LinMoving	Max	0	159,049	0	0	0	197,9871	12-1	0
12	0,572	HL93 +	LinMoving	Max	0	178,565	0	0	0	141,0752	12-1	0,572
12	0	HL93 +	LinMoving	Min	0	-19,077	0	0	0	-176,4645	12-1	0
12	0,572	HL93 +	LinMoving	Min	0	-12,237	0	0	0	-192,507	12-1	0,572
12	0	TAMDEM +	LinMoving	Max	0	165,828	0	0	0	218,9303	12-1	0
12	0,572	TAMDEM +	LinMoving	Max	0	179,026	0	0	0	160,5817	12-1	0,572
12	0	TAMDEM +	LinMoving	Min	0	-18,507	0	0	0	-164,2353	12-1	0
12	0,572	TAMDEM +	LinMoving	Min	0	-9,24	0	0	0	-179,1657	12-1	0,572
12	0	HL93 -	LinMoving	Max	0	143,144	0	0	0	197,6499	12-1	0
12	0,572	HL93 -	LinMoving	Max	0	160,708	0	0	0	146,4713	12-1	0,572
12	0	HL93 -	LinMoving	Min	0	-19,88	0	0	0	-158,8181	12-1	0
12	0,572	HL93 -	LinMoving	Min	0	-13,136	0	0	0	-173,2563	12-1	0,572
12	0	TAMDEM -	LinMoving	Max	0	169,724	0	0	0	197,2146	12-1	0
12	0,572	TAMDEM -	LinMoving	Max	0	179,738	0	0	0	145,3519	12-1	0,572
12	0	TAMDEM -	LinMoving	Min	0	-18,33	0	0	0	-147,9448	12-1	0
12	0,572	TAMDEM -	LinMoving	Min	0	-11,201	0	0	0	-161,3943	12-1	0,572

12	0	SERV1-1 H+	Combination	Max	0	230,031	0	0	0	189,8183	12-1	0
12	0,572	SERV1-1 H+	Combination	Max	0	262,217	0	0	0	88,6811	12-1	0,572
12	0	SERV1-1 H+	Combination	Min	0	51,905	0	0	0	-184,6333	12-1	0
12	0,572	SERV1-1 H+	Combination	Min	0	71,415	0	0	0	-244,9011	12-1	0,572
12	0	SERV1-2 T+	Combination	Max	0	236,81	0	0	0	210,7615	12-1	0
12	0,572	SERV1-2 T+	Combination	Max	0	262,678	0	0	0	108,1876	12-1	0,572
12	0	SERV1-2 T+	Combination	Min	0	52,476	0	0	0	-172,404	12-1	0
12	0,572	SERV1-2 T+	Combination	Min	0	74,412	0	0	0	-231,5598	12-1	0,572
12	0	RESIST1-2 T+	Combination	Max	0	491,228	0	0	0	497,4463	12-1	0
12	0,572	RESIST1-2 T+	Combination	Max	0	540,735	0	0	0	296,0558	12-1	0,572
12	0	RESIST1-2 T+	Combination	Min	0	62,19	0	0	0	-394,3715	12-1	0
12	0,572	RESIST1-2 T+	Combination	Min	0	102,546	0	0	0	-494,7065	12-1	0,572
12	0	SERV1-1 H-	Combination	Max	0	214,126	0	0	0	189,4811	12-1	0
12	0,572	SERV1-1 H-	Combination	Max	0	244,36	0	0	0	94,0772	12-1	0,572
12	0	SERV1-1 H-	Combination	Min	0	51,102	0	0	0	-166,9868	12-1	0
12	0,572	SERV1-1 H-	Combination	Min	0	70,516	0	0	0	-225,6504	12-1	0,572
12	0	SERV1-2 T-	Combination	Max	0	240,706	0	0	0	189,0459	12-1	0
12	0,572	SERV1-2 T-	Combination	Max	0	263,39	0	0	0	92,9578	12-1	0,572
12	0	SERV1-2 T-	Combination	Min	0	52,652	0	0	0	-156,1135	12-1	0
12	0,572	SERV1-2 T-	Combination	Min	0	72,451	0	0	0	-213,7884	12-1	0,572
12	0	RESIST 1-1 H+	Combination	Max	0	475,45	0	0	0	448,701	12-1	0
12	0,572	RESIST 1-1 H+	Combination	Max	0	539,662	0	0	0	250,6544	12-1	0,572
12	0	RESIST 1-1 H+	Combination	Min	0	60,861	0	0	0	-422,8351	12-1	0
12	0,572	RESIST 1-1 H+	Combination	Min	0	95,57	0	0	0	-525,7583	12-1	0,572
12	0	RESIST1-1 H-	Combination	Max	0	438,431	0	0	0	447,9162	12-1	0
12	0,572	RESIST1-1 H-	Combination	Max	0	498,101	0	0	0	263,2138	12-1	0,572
12	0	RESIST1-1 H-	Combination	Min	0	58,993	0	0	0	-381,763	12-1	0
12	0,572	RESIST1-1 H-	Combination	Min	0	93,479	0	0	0	-480,9523	12-1	0,572
12	0	RESIST1-2 T-	Combination	Max	0	500,296	0	0	0	446,9031	12-1	0
12	0,572	RESIST1-2 T-	Combination	Max	0	542,392	0	0	0	260,6084	12-1	0,572
12	0	RESIST1-2 T-	Combination	Min	0	62,601	0	0	0	-356,4554	12-1	0
12	0,572	RESIST1-2 T-	Combination	Min	0	97,982	0	0	0	-453,3434	12-1	0,572
12	0	E-SERV1-1	Combination	Max	0	230,031	0	0	0	189,8183	12-1	0
12	0,572	E-SERV1-1	Combination	Max	0	262,217	0	0	0	94,0772	12-1	0,572
12	0	E-SERV1-1	Combination	Min	0	51,102	0	0	0	-184,6333	12-1	0
12	0,572	E-SERV1-1	Combination	Min	0	70,516	0	0	0	-244,9011	12-1	0,572
12	0	E-SERV1-2	Combination	Max	0	240,706	0	0	0	210,7615	12-1	0
12	0,572	E-SERV1-2	Combination	Max	0	263,39	0	0	0	108,1876	12-1	0,572
12	0	E-SERV1-2	Combination	Min	0	52,476	0	0	0	-172,404	12-1	0
12	0,572	E-SERV1-2	Combination	Min	0	72,451	0	0	0	-231,5598	12-1	0,572
12	0	E-RESIST1-1	Combination	Max	0	475,45	0	0	0	448,701	12-1	0
12	0,572	E-RESIST1-1	Combination	Max	0	539,662	0	0	0	263,2138	12-1	0,572
12	0	E-RESIST1-1	Combination	Min	0	58,993	0	0	0	-422,8351	12-1	0
12	0,572	E-RESIST1-1	Combination	Min	0	93,479	0	0	0	-525,7583	12-1	0,572
12	0	E-RESIST1-2	Combination	Max	0	500,296	0	0	0	497,4463	12-1	0
12	0,572	E-RESIST1-2	Combination	Max	0	542,392	0	0	0	296,0558	12-1	0,572
12	0	E-RESIST1-2	Combination	Min	0	62,19	0	0	0	-394,3715	12-1	0
12	0,572	E-RESIST1-2	Combination	Min	0	97,982	0	0	0	-494,7065	12-1	0,572
13	0	LINEA	LinStatic		0	35,991	0	0	0	-22,5425	13-1	0
13	0,572	LINEA	LinStatic		0	41,442	0	0	0	-44,6884	13-1	0,572
13	0	HL93 +	LinMoving	Max	0	178,565	0	0	0	141,0752	13-1	0
13	0,572	HL93 +	LinMoving	Max	0	196,953	0	0	0	90,8551	13-1	0,572
13	0	HL93 +	LinMoving	Min	0	-12,237	0	0	0	-192,507	13-1	0
13	0,572	HL93 +	LinMoving	Min	0	-6,107	0	0	0	-208,5492	13-1	0,572
13	0	TAMDEM +	LinMoving	Max	0	179,026	0	0	0	160,5817	13-1	0
13	0,572	TAMDEM +	LinMoving	Max	0	191,218	0	0	0	94,6144	13-1	0,572
13	0	TAMDEM +	LinMoving	Min	0	-9,24	0	0	0	-179,1657	13-1	0
13	0,572	TAMDEM +	LinMoving	Min	0	-5,522	0	0	0	-194,0962	13-1	0,572
13	0	HL93 -	LinMoving	Max	0	160,708	0	0	0	146,4713	13-1	0
13	0,572	HL93 -	LinMoving	Max	0	177,257	0	0	0	97,5492	13-1	0,572
13	0	HL93 -	LinMoving	Min	0	-13,136	0	0	0	-173,2563	13-1	0
13	0,572	HL93 -	LinMoving	Min	0	-6,992	0	0	0	-187,6943	13-1	0,572
13	0	TAMDEM -	LinMoving	Max	0	179,738	0	0	0	145,3519	13-1	0
13	0,572	TAMDEM -	LinMoving	Max	0	188,566	0	0	0	91,7641	13-1	0,572
13	0	TAMDEM -	LinMoving	Min	0	-11,201	0	0	0	-161,3943	13-1	0
13	0,572	TAMDEM -	LinMoving	Min	0	-7,67	0	0	0	-199,4367	13-1	0,572
13	0	SERV1-1 H+	Combination	Max	0	262,217	0	0	0	88,6811	13-1	0
13	0,572	SERV1-1 H+	Combination	Max	0	293,274	0	0	0	-13,0115	13-1	0,572

13	0	SERV1-1 H+	Combination	Min	0	71,415	0	0	0	-244,9011	13-1	0
13	0,572	SERV1-1 H+	Combination	Min	0	90,214	0	0	0	-312,4158	13-1	0,572
13	0	SERV1-2 T+	Combination	Max	0	262,678	0	0	0	108,1876	13-1	0
13	0,572	SERV1-2 T+	Combination	Max	0	287,54	0	0	0	-9,2522	13-1	0,572
13	0	SERV1-2 T+	Combination	Min	0	74,412	0	0	0	-231,5598	13-1	0
13	0,572	SERV1-2 T+	Combination	Min	0	90,8	0	0	0	-297,9628	13-1	0,572
13	0	RESIST1-2 T+	Combination	Max	0	540,735	0	0	0	296,0558	13-1	0
13	0,572	RESIST1-2 T+	Combination	Max	0	587,902	0	0	0	66,1853	13-1	0,572
13	0	RESIST1-2 T+	Combination	Min	0	102,546	0	0	0	-494,7065	13-1	0
13	0,572	RESIST1-2 T+	Combination	Min	0	129,989	0	0	0	-605,7886	13-1	0,572
13	0	SERV1-1 H-	Combination	Max	0	244,36	0	0	0	94,0772	13-1	0
13	0,572	SERV1-1 H-	Combination	Max	0	273,579	0	0	0	-6,3174	13-1	0,572
13	0	SERV1-1 H-	Combination	Min	0	70,516	0	0	0	-225,6504	13-1	0
13	0,572	SERV1-1 H-	Combination	Min	0	89,33	0	0	0	-291,5609	13-1	0,572
13	0	SERV1-2 T-	Combination	Max	0	263,39	0	0	0	92,9578	13-1	0
13	0,572	SERV1-2 T-	Combination	Max	0	284,888	0	0	0	-12,1026	13-1	0,572
13	0	SERV1-2 T-	Combination	Min	0	72,451	0	0	0	-213,7884	13-1	0
13	0,572	SERV1-2 T-	Combination	Min	0	88,652	0	0	0	-303,3033	13-1	0,572
13	0	RESIST 1-1 H+	Combination	Max	0	539,662	0	0	0	250,6544	13-1	0
13	0,572	RESIST 1-1 H+	Combination	Max	0	601,248	0	0	0	57,4356	13-1	0,572
13	0	RESIST 1-1 H+	Combination	Min	0	95,57	0	0	0	-525,7583	13-1	0
13	0,572	RESIST 1-1 H+	Combination	Min	0	128,626	0	0	0	-639,4281	13-1	0,572
13	0	RESIST1-1 H-	Combination	Max	0	498,101	0	0	0	263,2138	13-1	0
13	0,572	RESIST1-1 H-	Combination	Max	0	555,407	0	0	0	73,0162	13-1	0,572
13	0	RESIST1-1 H-	Combination	Min	0	93,479	0	0	0	-480,9523	13-1	0
13	0,572	RESIST1-1 H-	Combination	Min	0	126,568	0	0	0	-590,8883	13-1	0,572
13	0	RESIST1-2 T-	Combination	Max	0	542,392	0	0	0	260,6084	13-1	0
13	0,572	RESIST1-2 T-	Combination	Max	0	581,728	0	0	0	59,5511	13-1	0,572
13	0	RESIST1-2 T-	Combination	Min	0	97,982	0	0	0	-453,3434	13-1	0
13	0,572	RESIST1-2 T-	Combination	Min	0	124,989	0	0	0	-618,2185	13-1	0,572
13	0	E-SERV1-1	Combination	Max	0	262,217	0	0	0	94,0772	13-1	0
13	0,572	E-SERV1-1	Combination	Max	0	293,274	0	0	0	-6,3174	13-1	0,572
13	0	E-SERV1-1	Combination	Min	0	70,516	0	0	0	-244,9011	13-1	0
13	0,572	E-SERV1-1	Combination	Min	0	89,33	0	0	0	-312,4158	13-1	0,572
13	0	E-SERV1-2	Combination	Max	0	263,39	0	0	0	108,1876	13-1	0
13	0,572	E-SERV1-2	Combination	Max	0	287,54	0	0	0	-9,2522	13-1	0,572
13	0	E-SERV1-2	Combination	Min	0	72,451	0	0	0	-231,5598	13-1	0
13	0,572	E-SERV1-2	Combination	Min	0	88,652	0	0	0	-303,3033	13-1	0,572
13	0	E-RESIST1-1	Combination	Max	0	539,662	0	0	0	263,2138	13-1	0
13	0,572	E-RESIST1-1	Combination	Max	0	601,248	0	0	0	73,0162	13-1	0,572
13	0	E-RESIST1-1	Combination	Min	0	93,479	0	0	0	-525,7583	13-1	0
13	0,572	E-RESIST1-1	Combination	Min	0	126,568	0	0	0	-639,4281	13-1	0,572
13	0	E-RESIST1-2	Combination	Max	0	542,392	0	0	0	296,0558	13-1	0
13	0,572	E-RESIST1-2	Combination	Max	0	587,902	0	0	0	66,1853	13-1	0,572
13	0	E-RESIST1-2	Combination	Min	0	97,982	0	0	0	-494,7065	13-1	0
13	0,572	E-RESIST1-2	Combination	Min	0	124,989	0	0	0	-618,2185	13-1	0,572
14	0	LINEA	LinStatic		0	41,442	0	0	0	-44,6884	14-1	0
14	0,572	LINEA	LinStatic		0	46,893	0	0	0	-69,9524	14-1	0,572
14	0	HL93 +	LinMoving	Max	0	196,953	0	0	0	90,8551	14-1	0
14	0,572	HL93 +	LinMoving	Max	0	214,108	0	0	0	48,7657	14-1	0,572
14	0	HL93 +	LinMoving	Min	0	-6,107	0	0	0	-208,5492	14-1	0
14	0,572	HL93 +	LinMoving	Min	0	-5,287	0	0	0	-227,2622	14-1	0,572
14	0	TAMDEM +	LinMoving	Max	0	191,218	0	0	0	94,6144	14-1	0
14	0,572	TAMDEM +	LinMoving	Max	0	202,313	0	0	0	44,2199	14-1	0,572
14	0	TAMDEM +	LinMoving	Min	0	-5,522	0	0	0	-194,0962	14-1	0
14	0,572	TAMDEM +	LinMoving	Min	0	-5,522	0	0	0	-209,0267	14-1	0,572
14	0	HL93 -	LinMoving	Max	0	177,257	0	0	0	97,5492	14-1	0
14	0,572	HL93 -	LinMoving	Max	0	192,697	0	0	0	55,8602	14-1	0,572
14	0	HL93 -	LinMoving	Min	0	-6,992	0	0	0	-187,6943	14-1	0
14	0,572	HL93 -	LinMoving	Min	0	-4,758	0	0	0	-204,536	14-1	0,572
14	0	TAMDEM -	LinMoving	Max	0	188,566	0	0	0	91,7641	14-1	0
14	0,572	TAMDEM -	LinMoving	Max	0	196,205	0	0	0	61,3208	14-1	0,572
14	0	TAMDEM -	LinMoving	Min	0	-7,67	0	0	0	-199,4367	14-1	0
14	0,572	TAMDEM -	LinMoving	Min	0	-4,974	0	0	0	-268,1706	14-1	0,572
14	0	SERV1-1 H+	Combination	Max	0	293,274	0	0	0	-13,0115	14-1	0
14	0,572	SERV1-1 H+	Combination	Max	0	323,1	0	0	0	-113,8205	14-1	0,572
14	0	SERV1-1 H+	Combination	Min	0	90,214	0	0	0	-312,4158	14-1	0
14	0,572	SERV1-1 H+	Combination	Min	0	103,705	0	0	0	-389,8484	14-1	0,572

14	0	SERV1-2 T+	Combination	Max	0	287,54	0	0	0	-9,2522	14-1	0
14	0,572	SERV1-2 T+	Combination	Max	0	311,305	0	0	0	-118,3663	14-1	0,572
14	0	SERV1-2 T+	Combination	Min	0	90,8	0	0	0	-297,9628	14-1	0
14	0,572	SERV1-2 T+	Combination	Min	0	103,47	0	0	0	-371,6129	14-1	0,572
14	0	RESIST1-2 T+	Combination	Max	0	587,902	0	0	0	66,1853	14-1	0
14	0,572	RESIST1-2 T+	Combination	Max	0	632,513	0	0	0	-138,1866	14-1	0,572
14	0	RESIST1-2 T+	Combination	Min	0	129,989	0	0	0	-605,7886	14-1	0
14	0,572	RESIST1-2 T+	Combination	Min	0	148,777	0	0	0	-727,618	14-1	0,572
14	0	SERV1-1 H-	Combination	Max	0	273,579	0	0	0	-6,3174	14-1	0
14	0,572	SERV1-1 H-	Combination	Max	0	301,689	0	0	0	-106,726	14-1	0,572
14	0	SERV1-1 H-	Combination	Min	0	89,33	0	0	0	-291,5609	14-1	0
14	0,572	SERV1-1 H-	Combination	Min	0	104,233	0	0	0	-367,1222	14-1	0,572
14	0	SERV1-2 T-	Combination	Max	0	284,888	0	0	0	-12,1026	14-1	0
14	0,572	SERV1-2 T-	Combination	Max	0	305,197	0	0	0	-101,2654	14-1	0,572
14	0	SERV1-2 T-	Combination	Min	0	88,652	0	0	0	-303,3033	14-1	0
14	0,572	SERV1-2 T-	Combination	Min	0	104,017	0	0	0	-430,7568	14-1	0,572
14	0	RESIST 1-1 H+	Combination	Max	0	601,248	0	0	0	57,4356	14-1	0
14	0,572	RESIST 1-1 H+	Combination	Max	0	659,967	0	0	0	-127,6063	14-1	0,572
14	0	RESIST 1-1 H+	Combination	Min	0	128,626	0	0	0	-639,4281	14-1	0
14	0,572	RESIST 1-1 H+	Combination	Min	0	149,325	0	0	0	-770,0611	14-1	0,572
14	0	RESIST1-1 H-	Combination	Max	0	555,407	0	0	0	73,0162	14-1	0
14	0,572	RESIST1-1 H-	Combination	Max	0	610,133	0	0	0	-111,0938	14-1	0,572
14	0	RESIST1-1 H-	Combination	Min	0	126,568	0	0	0	-590,8883	14-1	0
14	0,572	RESIST1-1 H-	Combination	Min	0	150,555	0	0	0	-717,1658	14-1	0,572
14	0	RESIST1-2 T-	Combination	Max	0	581,728	0	0	0	59,5511	14-1	0
14	0,572	RESIST1-2 T-	Combination	Max	0	618,298	0	0	0	-98,3841	14-1	0,572
14	0	RESIST1-2 T-	Combination	Min	0	124,989	0	0	0	-618,2185	14-1	0
14	0,572	RESIST1-2 T-	Combination	Min	0	150,052	0	0	0	-865,2755	14-1	0,572
14	0	E-SERV1-1	Combination	Max	0	293,274	0	0	0	-6,3174	14-1	0
14	0,572	E-SERV1-1	Combination	Max	0	323,1	0	0	0	-106,726	14-1	0,572
14	0	E-SERV1-1	Combination	Min	0	89,33	0	0	0	-312,4158	14-1	0
14	0,572	E-SERV1-1	Combination	Min	0	103,705	0	0	0	-389,8484	14-1	0,572
14	0	E-SERV1-2	Combination	Max	0	287,54	0	0	0	-9,2522	14-1	0
14	0,572	E-SERV1-2	Combination	Max	0	311,305	0	0	0	-101,2654	14-1	0,572
14	0	E-SERV1-2	Combination	Min	0	88,652	0	0	0	-303,3033	14-1	0
14	0,572	E-SERV1-2	Combination	Min	0	103,47	0	0	0	-430,7568	14-1	0,572
14	0	E-RESIST1-1	Combination	Max	0	601,248	0	0	0	73,0162	14-1	0
14	0,572	E-RESIST1-1	Combination	Max	0	659,967	0	0	0	-111,0938	14-1	0,572
14	0	E-RESIST1-1	Combination	Min	0	126,568	0	0	0	-639,4281	14-1	0
14	0,572	E-RESIST1-1	Combination	Min	0	149,325	0	0	0	-770,0611	14-1	0,572
14	0	E-RESIST1-2	Combination	Max	0	587,902	0	0	0	66,1853	14-1	0
14	0,572	E-RESIST1-2	Combination	Max	0	632,513	0	0	0	-98,3841	14-1	0,572
14	0	E-RESIST1-2	Combination	Min	0	124,989	0	0	0	-618,2185	14-1	0
14	0,572	E-RESIST1-2	Combination	Min	0	148,777	0	0	0	-865,2755	14-1	0,572
15	0	LINEA	LinStatic		0	46,893	0	0	0	-69,9524	15-1	0
15	0,572	LINEA	LinStatic		0	52,345	0	0	0	-98,3345	15-1	0,572
15	0	HL93 +	LinMoving	Max	0	214,108	0	0	0	48,7657	15-1	0
15	0,572	HL93 +	LinMoving	Max	0	229,928	0	0	0	45,3607	15-1	0,572
15	0	HL93 +	LinMoving	Min	0	-5,287	0	0	0	-227,2622	15-1	0
15	0,572	HL93 +	LinMoving	Min	0	-5,287	0	0	0	-274,2756	15-1	0,572
15	0	TAMDEM +	LinMoving	Max	0	202,313	0	0	0	44,2199	15-1	0
15	0,572	TAMDEM +	LinMoving	Max	0	212,217	0	0	0	47,3785	15-1	0,572
15	0	TAMDEM +	LinMoving	Min	0	-5,522	0	0	0	-209,0267	15-1	0
15	0,572	TAMDEM +	LinMoving	Min	0	-5,522	0	0	0	-223,9572	15-1	0,572
15	0	HL93 -	LinMoving	Max	0	192,697	0	0	0	55,8602	15-1	0
15	0,572	HL93 -	LinMoving	Max	0	206,935	0	0	0	40,8246	15-1	0,572
15	0	HL93 -	LinMoving	Min	0	-4,758	0	0	0	-204,536	15-1	0
15	0,572	HL93 -	LinMoving	Min	0	-4,758	0	0	0	-234,1701	15-1	0,572
15	0	TAMDEM -	LinMoving	Max	0	196,205	0	0	0	61,3208	15-1	0
15	0,572	TAMDEM -	LinMoving	Max	0	202,658	0	0	0	42,679	15-1	0,572
15	0	TAMDEM -	LinMoving	Min	0	-4,974	0	0	0	-268,1706	15-1	0
15	0,572	TAMDEM -	LinMoving	Min	0	-4,974	0	0	0	-345,8473	15-1	0,572
15	0	SERV1-1 H+	Combination	Max	0	323,1	0	0	0	-113,8205	15-1	0
15	0,572	SERV1-1 H+	Combination	Max	0	351,59	0	0	0	-183,1923	15-1	0,572
15	0	SERV1-1 H+	Combination	Min	0	103,705	0	0	0	-389,8484	15-1	0
15	0,572	SERV1-1 H+	Combination	Min	0	116,375	0	0	0	-502,8286	15-1	0,572
15	0	SERV1-2 T+	Combination	Max	0	311,305	0	0	0	-118,3663	15-1	0
15	0,572	SERV1-2 T+	Combination	Max	0	333,879	0	0	0	-181,1745	15-1	0,572

15	0	SERV1-2 T+	Combination	Min	0	103,47	0	0	0	-371,6129	15-1	0
15	0,572	SERV1-2 T+	Combination	Min	0	116,139	0	0	0	-452,5101	15-1	0,572
15	0	RESIST1-2 T+	Combination	Max	0	632,513	0	0	0	-138,1866	15-1	0
15	0,572	RESIST1-2 T+	Combination	Max	0	674,355	0	0	0	-228,6609	15-1	0,572
15	0	RESIST1-2 T+	Combination	Min	0	148,777	0	0	0	-727,618	15-1	0
15	0,572	RESIST1-2 T+	Combination	Min	0	167,566	0	0	0	-860,1946	15-1	0,572
15	0	SERV1-1 H-	Combination	Max	0	301,689	0	0	0	-106,726	15-1	0
15	0,572	SERV1-1 H-	Combination	Max	0	328,597	0	0	0	-187,7284	15-1	0,572
15	0	SERV1-1 H-	Combination	Min	0	104,233	0	0	0	-367,1222	15-1	0
15	0,572	SERV1-1 H-	Combination	Min	0	116,903	0	0	0	-462,7231	15-1	0,572
15	0	SERV1-2 T-	Combination	Max	0	305,197	0	0	0	-101,2654	15-1	0
15	0,572	SERV1-2 T-	Combination	Max	0	324,319	0	0	0	-185,874	15-1	0,572
15	0	SERV1-2 T-	Combination	Min	0	104,017	0	0	0	-430,7568	15-1	0
15	0,572	SERV1-2 T-	Combination	Min	0	116,687	0	0	0	-574,4002	15-1	0,572
15	0	RESIST 1-1 H+	Combination	Max	0	659,967	0	0	0	-127,6063	15-1	0
15	0,572	RESIST 1-1 H+	Combination	Max	0	715,577	0	0	0	-233,3573	15-1	0,572
15	0	RESIST 1-1 H+	Combination	Min	0	149,325	0	0	0	-770,0611	15-1	0
15	0,572	RESIST 1-1 H+	Combination	Min	0	168,114	0	0	0	-977,3107	15-1	0,572
15	0	RESIST1-1 H-	Combination	Max	0	610,133	0	0	0	-111,0938	15-1	0
15	0,572	RESIST1-1 H-	Combination	Max	0	662,061	0	0	0	-243,915	15-1	0,572
15	0	RESIST1-1 H-	Combination	Min	0	150,555	0	0	0	-717,1658	15-1	0
15	0,572	RESIST1-1 H-	Combination	Min	0	169,344	0	0	0	-883,9652	15-1	0,572
15	0	RESIST1-2 T-	Combination	Max	0	618,298	0	0	0	-98,3841	15-1	0
15	0,572	RESIST1-2 T-	Combination	Max	0	652,105	0	0	0	-239,5989	15-1	0,572
15	0	RESIST1-2 T-	Combination	Min	0	150,052	0	0	0	-865,2755	15-1	0
15	0,572	RESIST1-2 T-	Combination	Min	0	168,841	0	0	0	-1143,8938	15-1	0,572
15	0	E-SERV1-1	Combination	Max	0	323,1	0	0	0	-106,726	15-1	0
15	0,572	E-SERV1-1	Combination	Max	0	351,59	0	0	0	-183,1923	15-1	0,572
15	0	E-SERV1-1	Combination	Min	0	103,705	0	0	0	-389,8484	15-1	0
15	0,572	E-SERV1-1	Combination	Min	0	116,375	0	0	0	-502,8286	15-1	0,572
15	0	E-SERV1-2	Combination	Max	0	311,305	0	0	0	-101,2654	15-1	0
15	0,572	E-SERV1-2	Combination	Max	0	333,879	0	0	0	-181,1745	15-1	0,572
15	0	E-SERV1-2	Combination	Min	0	103,47	0	0	0	-430,7568	15-1	0
15	0,572	E-SERV1-2	Combination	Min	0	116,139	0	0	0	-574,4002	15-1	0,572
15	0	E-RESIST1-1	Combination	Max	0	659,967	0	0	0	-111,0938	15-1	0
15	0,572	E-RESIST1-1	Combination	Max	0	715,577	0	0	0	-233,3573	15-1	0,572
15	0	E-RESIST1-1	Combination	Min	0	149,325	0	0	0	-770,0611	15-1	0
15	0,572	E-RESIST1-1	Combination	Min	0	168,114	0	0	0	-977,3107	15-1	0,572
15	0	E-RESIST1-2	Combination	Max	0	632,513	0	0	0	-98,3841	15-1	0
15	0,572	E-RESIST1-2	Combination	Max	0	674,355	0	0	0	-228,6609	15-1	0,572
15	0	E-RESIST1-2	Combination	Min	0	148,777	0	0	0	-865,2755	15-1	0
15	0,572	E-RESIST1-2	Combination	Min	0	167,566	0	0	0	-1143,8938	15-1	0,572
16	0	LINEA	LinStatic		0	-54,464	0	0	0	-98,3345	16-1	0
16	0,5715	LINEA	LinStatic		0	-49,018	0	0	0	-68,7647	16-1	0,5715
16	0	HL93 +	LinMoving	Max	0	17,914	0	0	0	45,3607	16-1	0
16	0,5715	HL93 +	LinMoving	Max	0	17,914	0	0	0	44,5593	16-1	0,5715
16	0	HL93 +	LinMoving	Min	0	-227,058	0	0	0	-274,2756	16-1	0
16	0,5715	HL93 +	LinMoving	Min	0	-211,444	0	0	0	-209,4373	16-1	0,5715
16	0	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	47,3785	16-1	0
16	0,5715	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	36,685	16-1	0,5715
16	0	TAMDEM +	LinMoving	Min	0	-205,134	0	0	0	-223,9572	16-1	0
16	0,5715	TAMDEM +	LinMoving	Min	0	-195,566	0	0	0	-155,8047	16-1	0,5715
16	0	HL93 -	LinMoving	Max	0	16,123	0	0	0	40,8246	16-1	0
16	0,5715	HL93 -	LinMoving	Max	0	16,123	0	0	0	41,336	16-1	0,5715
16	0	HL93 -	LinMoving	Min	0	-204,353	0	0	0	-234,1701	16-1	0
16	0,5715	HL93 -	LinMoving	Min	0	-190,3	0	0	0	-147,4033	16-1	0,5715
16	0	TAMDEM -	LinMoving	Max	0	16,855	0	0	0	42,679	16-1	0
16	0,5715	TAMDEM -	LinMoving	Max	0	19,62	0	0	0	59,4283	16-1	0,5715
16	0	TAMDEM -	LinMoving	Min	0	-198,092	0	0	0	-345,8473	16-1	0
16	0,5715	TAMDEM -	LinMoving	Min	0	-182,8	0	0	0	-272,7537	16-1	0,5715
16	0	SERV1-1 H+	Combination	Max	0	-108,673	0	0	0	-183,1923	16-1	0
16	0,5715	SERV1-1 H+	Combination	Max	0	-96,014	0	0	0	-115,2663	16-1	0,5715
16	0	SERV1-1 H+	Combination	Min	0	-353,646	0	0	0	-502,8286	16-1	0
16	0,5715	SERV1-1 H+	Combination	Min	0	-325,373	0	0	0	-369,2629	16-1	0,5715
16	0	SERV1-2 T+	Combination	Max	0	-107,876	0	0	0	-181,1745	16-1	0
16	0,5715	SERV1-2 T+	Combination	Max	0	-95,217	0	0	0	-123,1406	16-1	0,5715
16	0	SERV1-2 T+	Combination	Min	0	-331,721	0	0	0	-452,5101	16-1	0
16	0,5715	SERV1-2 T+	Combination	Min	0	-309,495	0	0	0	-315,6303	16-1	0,5715

16	0	RESIST1-2 T+	Combination	Max	0	-144,173	0	0	0	-228,6609	16-1	0
16	0,5715	RESIST1-2 T+	Combination	Max	0	-125,401	0	0	0	-151,6301	16-1	0,5715
16	0	RESIST1-2 T+	Combination	Min	0	-665,172	0	0	0	-860,1946	16-1	0
16	0,5715	RESIST1-2 T+	Combination	Min	0	-624,131	0	0	0	-599,6499	16-1	0,5715
16	0	SERV1-1 H-	Combination	Max	0	-110,464	0	0	0	-187,7284	16-1	0
16	0,5715	SERV1-1 H-	Combination	Max	0	-97,806	0	0	0	-118,4896	16-1	0,5715
16	0	SERV1-1 H-	Combination	Min	0	-330,94	0	0	0	-462,7231	16-1	0
16	0,5715	SERV1-1 H-	Combination	Min	0	-304,229	0	0	0	-307,2289	16-1	0,5715
16	0	SERV1-2 T-	Combination	Max	0	-109,732	0	0	0	-185,874	16-1	0
16	0,5715	SERV1-2 T-	Combination	Max	0	-94,309	0	0	0	-100,3973	16-1	0,5715
16	0	SERV1-2 T-	Combination	Min	0	-324,679	0	0	0	-574,4002	16-1	0
16	0,5715	SERV1-2 T-	Combination	Min	0	-296,729	0	0	0	-432,5793	16-1	0,5715
16	0	RESIST 1-1 H+	Combination	Max	0	-146,028	0	0	0	-233,3573	16-1	0
16	0,5715	RESIST 1-1 H+	Combination	Max	0	-127,256	0	0	0	-133,3027	16-1	0,5715
16	0	RESIST 1-1 H+	Combination	Min	0	-716,202	0	0	0	-977,3107	16-1	0
16	0,5715	RESIST 1-1 H+	Combination	Min	0	-661,088	0	0	0	-724,4799	16-1	0,5715
16	0	RESIST1-1 H-	Combination	Max	0	-150,197	0	0	0	-243,915	16-1	0
16	0,5715	RESIST1-1 H-	Combination	Max	0	-131,425	0	0	0	-140,8049	16-1	0,5715
16	0	RESIST1-1 H-	Combination	Min	0	-663,354	0	0	0	-883,9652	16-1	0
16	0,5715	RESIST1-1 H-	Combination	Min	0	-611,874	0	0	0	-580,0956	16-1	0,5715
16	0	RESIST1-2 T-	Combination	Max	0	-148,493	0	0	0	-239,5989	16-1	0
16	0,5715	RESIST1-2 T-	Combination	Max	0	-123,286	0	0	0	-98,6952	16-1	0,5715
16	0	RESIST1-2 T-	Combination	Min	0	-648,782	0	0	0	-1143,8938	16-1	0
16	0,5715	RESIST1-2 T-	Combination	Min	0	-594,419	0	0	0	-871,8487	16-1	0,5715
16	0	E-SERV1-1	Combination	Max	0	-108,673	0	0	0	-183,1923	16-1	0
16	0,5715	E-SERV1-1	Combination	Max	0	-96,014	0	0	0	-115,2663	16-1	0,5715
16	0	E-SERV1-1	Combination	Min	0	-353,646	0	0	0	-502,8286	16-1	0
16	0,5715	E-SERV1-1	Combination	Min	0	-325,373	0	0	0	-369,2629	16-1	0,5715
16	0	E-SERV1-2	Combination	Max	0	-107,876	0	0	0	-181,1745	16-1	0
16	0,5715	E-SERV1-2	Combination	Max	0	-94,309	0	0	0	-100,3973	16-1	0,5715
16	0	E-SERV1-2	Combination	Min	0	-331,721	0	0	0	-574,4002	16-1	0
16	0,5715	E-SERV1-2	Combination	Min	0	-309,495	0	0	0	-432,5793	16-1	0,5715
16	0	E-RESIST1-1	Combination	Max	0	-146,028	0	0	0	-233,3573	16-1	0
16	0,5715	E-RESIST1-1	Combination	Max	0	-127,256	0	0	0	-133,3027	16-1	0,5715
16	0	E-RESIST1-1	Combination	Min	0	-716,202	0	0	0	-977,3107	16-1	0
16	0,5715	E-RESIST1-1	Combination	Min	0	-661,088	0	0	0	-724,4799	16-1	0,5715
16	0	E-RESIST1-2	Combination	Max	0	-144,173	0	0	0	-228,6609	16-1	0
16	0,5715	E-RESIST1-2	Combination	Max	0	-123,286	0	0	0	-98,6952	16-1	0,5715
16	0	E-RESIST1-2	Combination	Min	0	-665,172	0	0	0	-1143,8938	16-1	0
16	0,5715	E-RESIST1-2	Combination	Min	0	-624,131	0	0	0	-871,8487	16-1	0,5715
17	0	LINEA	LinStatic		0	-49,018	0	0	0	-68,7647	17-1	0
17	0,5715	LINEA	LinStatic		0	-43,571	0	0	0	-42,3075	17-1	0,5715
17	0	HL93 +	LinMoving	Max	0	17,914	0	0	0	44,5593	17-1	0
17	0,5715	HL93 +	LinMoving	Max	0	17,914	0	0	0	83,0957	17-1	0,5715
17	0	HL93 +	LinMoving	Min	0	-211,444	0	0	0	-209,4373	17-1	0
17	0,5715	HL93 +	LinMoving	Min	0	-195,625	0	0	0	-156,2445	17-1	0,5715
17	0	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	36,685	17-1	0
17	0,5715	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	73,7471	17-1	0,5715
17	0	TAMDEM +	LinMoving	Min	0	-195,566	0	0	0	-155,8047	17-1	0
17	0,5715	TAMDEM +	LinMoving	Min	0	-185,077	0	0	0	-145,1107	17-1	0,5715
17	0	HL93 -	LinMoving	Max	0	16,123	0	0	0	41,336	17-1	0
17	0,5715	HL93 -	LinMoving	Max	0	16,123	0	0	0	74,5942	17-1	0,5715
17	0	HL93 -	LinMoving	Min	0	-190,3	0	0	0	-147,4033	17-1	0
17	0,5715	HL93 -	LinMoving	Min	0	-176,063	0	0	0	-125,0306	17-1	0,5715
17	0	TAMDEM -	LinMoving	Max	0	19,62	0	0	0	59,4283	17-1	0
17	0,5715	TAMDEM -	LinMoving	Max	0	23,984	0	0	0	89,8456	17-1	0,5715
17	0	TAMDEM -	LinMoving	Min	0	-182,8	0	0	0	-272,7537	17-1	0
17	0,5715	TAMDEM -	LinMoving	Min	0	-175,063	0	0	0	-205,3846	17-1	0,5715
17	0	SERV1-1 H+	Combination	Max	0	-96,014	0	0	0	-115,2663	17-1	0
17	0,5715	SERV1-1 H+	Combination	Max	0	-83,356	0	0	0	-15,2369	17-1	0,5715
17	0	SERV1-1 H+	Combination	Min	0	-325,373	0	0	0	-369,2629	17-1	0
17	0,5715	SERV1-1 H+	Combination	Min	0	-296,895	0	0	0	-254,5772	17-1	0,5715
17	0	SERV1-2 T+	Combination	Max	0	-95,217	0	0	0	-123,1406	17-1	0
17	0,5715	SERV1-2 T+	Combination	Max	0	-82,559	0	0	0	-24,5856	17-1	0,5715
17	0	SERV1-2 T+	Combination	Min	0	-309,495	0	0	0	-315,6303	17-1	0
17	0,5715	SERV1-2 T+	Combination	Min	0	-286,347	0	0	0	-243,4434	17-1	0,5715
17	0	RESIST1-2 T+	Combination	Max	0	-125,401	0	0	0	-151,6301	17-1	0
17	0,5715	RESIST1-2 T+	Combination	Max	0	-106,628	0	0	0	25,8232	17-1	0,5715

17	0	RESIST1-2 T+	Combination	Min	0	-624,131	0	0	0	-599,6499	17-1	0
17	0,5715	RESIST1-2 T+	Combination	Min	0	-580,946	0	0	0	-483,5683	17-1	0,5715
17	0	SERV1-1 H-	Combination	Max	0	-97,806	0	0	0	-118,4896	17-1	0
17	0,5715	SERV1-1 H-	Combination	Max	0	-85,147	0	0	0	-23,7385	17-1	0,5715
17	0	SERV1-1 H-	Combination	Min	0	-304,229	0	0	0	-307,2289	17-1	0
17	0,5715	SERV1-1 H-	Combination	Min	0	-277,333	0	0	0	-223,3632	17-1	0,5715
17	0	SERV1-2 T-	Combination	Max	0	-94,309	0	0	0	-100,3973	17-1	0
17	0,5715	SERV1-2 T-	Combination	Max	0	-77,286	0	0	0	-8,4871	17-1	0,5715
17	0	SERV1-2 T-	Combination	Min	0	-296,729	0	0	0	-432,5793	17-1	0
17	0,5715	SERV1-2 T-	Combination	Min	0	-276,333	0	0	0	-303,7173	17-1	0,5715
17	0	RESIST 1-1 H+	Combination	Max	0	-127,256	0	0	0	-133,3027	17-1	0
17	0,5715	RESIST 1-1 H+	Combination	Max	0	-108,483	0	0	0	47,5822	17-1	0,5715
17	0	RESIST 1-1 H+	Combination	Min	0	-661,088	0	0	0	-724,4799	17-1	0
17	0,5715	RESIST 1-1 H+	Combination	Min	0	-605,497	0	0	0	-509,4823	17-1	0,5715
17	0	RESIST1-1 H-	Combination	Max	0	-131,425	0	0	0	-140,8049	17-1	0
17	0,5715	RESIST1-1 H-	Combination	Max	0	-112,653	0	0	0	27,7949	17-1	0,5715
17	0	RESIST1-1 H-	Combination	Min	0	-611,874	0	0	0	-580,0956	17-1	0
17	0,5715	RESIST1-1 H-	Combination	Min	0	-559,965	0	0	0	-436,8317	17-1	0,5715
17	0	RESIST1-2 T-	Combination	Max	0	-123,286	0	0	0	-98,6952	17-1	0
17	0,5715	RESIST1-2 T-	Combination	Max	0	-94,357	0	0	0	63,2925	17-1	0,5715
17	0	RESIST1-2 T-	Combination	Min	0	-594,419	0	0	0	-871,8487	17-1	0
17	0,5715	RESIST1-2 T-	Combination	Min	0	-557,639	0	0	0	-623,8559	17-1	0,5715
17	0	E-SERV1-1	Combination	Max	0	-96,014	0	0	0	-115,2663	17-1	0
17	0,5715	E-SERV1-1	Combination	Max	0	-83,356	0	0	0	-15,2369	17-1	0,5715
17	0	E-SERV1-1	Combination	Min	0	-325,373	0	0	0	-369,2629	17-1	0
17	0,5715	E-SERV1-1	Combination	Min	0	-296,895	0	0	0	-254,5772	17-1	0,5715
17	0	E-SERV1-2	Combination	Max	0	-94,309	0	0	0	-100,3973	17-1	0
17	0,5715	E-SERV1-2	Combination	Max	0	-77,286	0	0	0	-8,4871	17-1	0,5715
17	0	E-SERV1-2	Combination	Min	0	-309,495	0	0	0	-432,5793	17-1	0
17	0,5715	E-SERV1-2	Combination	Min	0	-286,347	0	0	0	-303,7173	17-1	0,5715
17	0	E-RESIST1-1	Combination	Max	0	-127,256	0	0	0	-133,3027	17-1	0
17	0,5715	E-RESIST1-1	Combination	Max	0	-108,483	0	0	0	47,5822	17-1	0,5715
17	0	E-RESIST1-1	Combination	Min	0	-661,088	0	0	0	-724,4799	17-1	0
17	0,5715	E-RESIST1-1	Combination	Min	0	-605,497	0	0	0	-509,4823	17-1	0,5715
17	0	E-RESIST1-2	Combination	Max	0	-123,286	0	0	0	-98,6952	17-1	0
17	0,5715	E-RESIST1-2	Combination	Max	0	-94,357	0	0	0	63,2925	17-1	0,5715
17	0	E-RESIST1-2	Combination	Min	0	-624,131	0	0	0	-871,8487	17-1	0
17	0,5715	E-RESIST1-2	Combination	Min	0	-580,946	0	0	0	-623,8559	17-1	0,5715
18	0	LINEA	LinStatic		0	-43,571	0	0	0	-42,3075	18-1	0
18	0,5715	LINEA	LinStatic		0	-38,125	0	0	0	-18,9628	18-1	0,5715
18	0	HL93 +	LinMoving	Max	0	17,914	0	0	0	83,0957	18-1	0
18	0,5715	HL93 +	LinMoving	Max	0	19,346	0	0	0	120,5233	18-1	0,5715
18	0	HL93 +	LinMoving	Min	0	-195,625	0	0	0	-156,2445	18-1	0
18	0,5715	HL93 +	LinMoving	Min	0	-180,09	0	0	0	-128,6849	18-1	0,5715
18	0	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	73,7471	18-1	0
18	0,5715	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	136,7698	18-1	0,5715
18	0	TAMDEM +	LinMoving	Min	0	-185,077	0	0	0	-145,1107	18-1	0
18	0,5715	TAMDEM +	LinMoving	Min	0	-173,8	0	0	0	-134,4167	18-1	0,5715
18	0	HL93 -	LinMoving	Max	0	16,123	0	0	0	74,5942	18-1	0
18	0,5715	HL93 -	LinMoving	Max	0	16,998	0	0	0	108,1332	18-1	0,5715
18	0	HL93 -	LinMoving	Min	0	-176,063	0	0	0	-125,0306	18-1	0
18	0,5715	HL93 -	LinMoving	Min	0	-162,081	0	0	0	-115,8164	18-1	0,5715
18	0	TAMDEM -	LinMoving	Max	0	23,984	0	0	0	89,8456	18-1	0
18	0,5715	TAMDEM -	LinMoving	Max	0	30,529	0	0	0	136,9843	18-1	0,5715
18	0	TAMDEM -	LinMoving	Min	0	-175,063	0	0	0	-205,3846	18-1	0
18	0,5715	TAMDEM -	LinMoving	Min	0	-167,375	0	0	0	-151,1236	18-1	0,5715
18	0	SERV1-1 H+	Combination	Max	0	-83,356	0	0	0	-15,2369	18-1	0
18	0,5715	SERV1-1 H+	Combination	Max	0	-69,265	0	0	0	76,4491	18-1	0,5715
18	0	SERV1-1 H+	Combination	Min	0	-296,895	0	0	0	-254,5772	18-1	0
18	0,5715	SERV1-1 H+	Combination	Min	0	-268,701	0	0	0	-172,7591	18-1	0,5715
18	0	SERV1-2 T+	Combination	Max	0	-82,559	0	0	0	-24,5856	18-1	0
18	0,5715	SERV1-2 T+	Combination	Max	0	-69,9	0	0	0	92,6956	18-1	0,5715
18	0	SERV1-2 T+	Combination	Min	0	-286,347	0	0	0	-243,4434	18-1	0
18	0,5715	SERV1-2 T+	Combination	Min	0	-262,411	0	0	0	-178,4909	18-1	0,5715
18	0	RESIST1-2 T+	Combination	Max	0	-106,628	0	0	0	25,8232	18-1	0
18	0,5715	RESIST1-2 T+	Combination	Max	0	-87,856	0	0	0	252,9715	18-1	0,5715
18	0	RESIST1-2 T+	Combination	Min	0	-580,946	0	0	0	-483,5683	18-1	0
18	0,5715	RESIST1-2 T+	Combination	Min	0	-535,925	0	0	0	-378,2151	18-1	0,5715

18	0	SERV1-1 H-	Combination	Max	0	-85,147	0	0	0	-23,7385	18-1	0
18	0,5715	SERV1-1 H-	Combination	Max	0	-71,613	0	0	0	64,059	18-1	0,5715
18	0	SERV1-1 H-	Combination	Min	0	-277,333	0	0	0	-223,3632	18-1	0
18	0,5715	SERV1-1 H-	Combination	Min	0	-250,692	0	0	0	-159,8906	18-1	0,5715
18	0	SERV1-2 T-	Combination	Max	0	-77,286	0	0	0	-8,4871	18-1	0
18	0,5715	SERV1-2 T-	Combination	Max	0	-58,082	0	0	0	92,9101	18-1	0,5715
18	0	SERV1-2 T-	Combination	Min	0	-276,333	0	0	0	-303,7173	18-1	0
18	0,5715	SERV1-2 T-	Combination	Min	0	-255,986	0	0	0	-195,1978	18-1	0,5715
18	0	RESIST 1-1 H+	Combination	Max	0	-108,483	0	0	0	47,5822	18-1	0
18	0,5715	RESIST 1-1 H+	Combination	Max	0	-86,378	0	0	0	215,1578	18-1	0,5715
18	0	RESIST 1-1 H+	Combination	Min	0	-605,497	0	0	0	-509,4823	18-1	0
18	0,5715	RESIST 1-1 H+	Combination	Min	0	-550,565	0	0	0	-364,8742	18-1	0,5715
18	0	RESIST1-1 H-	Combination	Max	0	-112,653	0	0	0	27,7949	18-1	0
18	0,5715	RESIST1-1 H-	Combination	Max	0	-91,843	0	0	0	186,3199	18-1	0,5715
18	0	RESIST1-1 H-	Combination	Min	0	-559,965	0	0	0	-436,8317	18-1	0
18	0,5715	RESIST1-1 H-	Combination	Min	0	-508,649	0	0	0	-334,9228	18-1	0,5715
18	0	RESIST1-2 T-	Combination	Max	0	-94,357	0	0	0	63,2925	18-1	0
18	0,5715	RESIST1-2 T-	Combination	Max	0	-60,35	0	0	0	253,4708	18-1	0,5715
18	0	RESIST1-2 T-	Combination	Min	0	-557,639	0	0	0	-623,8559	18-1	0
18	0,5715	RESIST1-2 T-	Combination	Min	0	-520,972	0	0	0	-417,1003	18-1	0,5715
18	0	E-SERV1-1	Combination	Max	0	-83,356	0	0	0	-15,2369	18-1	0
18	0,5715	E-SERV1-1	Combination	Max	0	-69,265	0	0	0	76,4491	18-1	0,5715
18	0	E-SERV1-1	Combination	Min	0	-296,895	0	0	0	-254,5772	18-1	0
18	0,5715	E-SERV1-1	Combination	Min	0	-268,701	0	0	0	-172,7591	18-1	0,5715
18	0	E-SERV1-2	Combination	Max	0	-77,286	0	0	0	-8,4871	18-1	0
18	0,5715	E-SERV1-2	Combination	Max	0	-58,082	0	0	0	92,9101	18-1	0,5715
18	0	E-SERV1-2	Combination	Min	0	-286,347	0	0	0	-303,7173	18-1	0
18	0,5715	E-SERV1-2	Combination	Min	0	-262,411	0	0	0	-195,1978	18-1	0,5715
18	0	E-RESIST1-1	Combination	Max	0	-108,483	0	0	0	47,5822	18-1	0
18	0,5715	E-RESIST1-1	Combination	Max	0	-86,378	0	0	0	215,1578	18-1	0,5715
18	0	E-RESIST1-1	Combination	Min	0	-605,497	0	0	0	-509,4823	18-1	0
18	0,5715	E-RESIST1-1	Combination	Min	0	-550,565	0	0	0	-364,8742	18-1	0,5715
18	0	E-RESIST1-2	Combination	Max	0	-94,357	0	0	0	63,2925	18-1	0
18	0,5715	E-RESIST1-2	Combination	Max	0	-60,35	0	0	0	253,4708	18-1	0,5715
18	0	E-RESIST1-2	Combination	Min	0	-580,946	0	0	0	-623,8559	18-1	0
18	0,5715	E-RESIST1-2	Combination	Min	0	-535,925	0	0	0	-417,1003	18-1	0,5715
19	0	LINEA	LinStatic		0	-38,125	0	0	0	-18,9628	19-1	0
19	0,5715	LINEA	LinStatic		0	-32,678	0	0	0	1,2691	19-1	0,5715
19	0	HL93 +	LinMoving	Max	0	19,346	0	0	0	120,5233	19-1	0
19	0,5715	HL93 +	LinMoving	Max	0	26,079	0	0	0	167,9897	19-1	0,5715
19	0	HL93 +	LinMoving	Min	0	-180,09	0	0	0	-128,6849	19-1	0
19	0,5715	HL93 +	LinMoving	Min	0	-164,01	0	0	0	-118,4469	19-1	0,5715
19	0	TAMDEM +	LinMoving	Max	0	18,711	0	0	0	136,7698	19-1	0
19	0,5715	TAMDEM +	LinMoving	Max	0	25,298	0	0	0	194,7362	19-1	0,5715
19	0	TAMDEM +	LinMoving	Min	0	-173,8	0	0	0	-134,4167	19-1	0
19	0,5715	TAMDEM +	LinMoving	Min	0	-161,867	0	0	0	-123,7228	19-1	0,5715
19	0	HL93 -	LinMoving	Max	0	16,998	0	0	0	108,1332	19-1	0
19	0,5715	HL93 -	LinMoving	Max	0	22,758	0	0	0	151,1907	19-1	0,5715
19	0	HL93 -	LinMoving	Min	0	-162,081	0	0	0	-115,8164	19-1	0
19	0,5715	HL93 -	LinMoving	Min	0	-147,609	0	0	0	-106,6022	19-1	0,5715
19	0	TAMDEM -	LinMoving	Max	0	30,529	0	0	0	136,9843	19-1	0
19	0,5715	TAMDEM -	LinMoving	Max	0	39,642	0	0	0	179,5683	19-1	0,5715
19	0	TAMDEM -	LinMoving	Min	0	-167,375	0	0	0	-151,1236	19-1	0
19	0,5715	TAMDEM -	LinMoving	Min	0	-158,782	0	0	0	-114,9825	19-1	0,5715
19	0	SERV1-1 H+	Combination	Max	0	-69,265	0	0	0	76,4491	19-1	0
19	0,5715	SERV1-1 H+	Combination	Max	0	-49,873	0	0	0	170,9395	19-1	0,5715
19	0	SERV1-1 H+	Combination	Min	0	-268,701	0	0	0	-172,7591	19-1	0
19	0,5715	SERV1-1 H+	Combination	Min	0	-239,963	0	0	0	-115,4971	19-1	0,5715
19	0	SERV1-2 T+	Combination	Max	0	-69,9	0	0	0	92,6956	19-1	0
19	0,5715	SERV1-2 T+	Combination	Max	0	-50,654	0	0	0	197,686	19-1	0,5715
19	0	SERV1-2 T+	Combination	Min	0	-262,411	0	0	0	-178,4909	19-1	0
19	0,5715	SERV1-2 T+	Combination	Min	0	-237,819	0	0	0	-120,773	19-1	0,5715
19	0	RESIST1-2 T+	Combination	Max	0	-87,856	0	0	0	252,9715	19-1	0
19	0,5715	RESIST1-2 T+	Combination	Max	0	-53,752	0	0	0	457,623	19-1	0,5715
19	0	RESIST1-2 T+	Combination	Min	0	-535,925	0	0	0	-378,2151	19-1	0
19	0,5715	RESIST1-2 T+	Combination	Min	0	-489,379	0	0	0	-283,5903	19-1	0,5715
19	0	SERV1-1 H-	Combination	Max	0	-71,613	0	0	0	64,059	19-1	0
19	0,5715	SERV1-1 H-	Combination	Max	0	-53,195	0	0	0	154,1405	19-1	0,5715

19	0	SERV1-1 H-	Combination	Min	0	-250,692	0	0	0	-159,8906	19-1	0
19	0,5715	SERV1-1 H-	Combination	Min	0	-223,561	0	0	0	-103,6524	19-1	0,5715
19	0	SERV1-2 T-	Combination	Max	0	-58,082	0	0	0	92,9101	19-1	0
19	0,5715	SERV1-2 T-	Combination	Max	0	-36,31	0	0	0	182,5181	19-1	0,5715
19	0	SERV1-2 T-	Combination	Min	0	-255,986	0	0	0	-195,1978	19-1	0
19	0,5715	SERV1-2 T-	Combination	Min	0	-234,734	0	0	0	-112,0327	19-1	0,5715
19	0	RESIST 1-1 H+	Combination	Max	0	-86,378	0	0	0	215,1578	19-1	0
19	0,5715	RESIST 1-1 H+	Combination	Max	0	-51,935	0	0	0	395,3704	19-1	0,5715
19	0	RESIST 1-1 H+	Combination	Min	0	-550,565	0	0	0	-364,8742	19-1	0
19	0,5715	RESIST 1-1 H+	Combination	Min	0	-494,368	0	0	0	-271,3108	19-1	0,5715
19	0	RESIST1-1 H-	Combination	Max	0	-91,843	0	0	0	186,3199	19-1	0
19	0,5715	RESIST1-1 H-	Combination	Max	0	-59,666	0	0	0	356,2708	19-1	0,5715
19	0	RESIST1-1 H-	Combination	Min	0	-508,649	0	0	0	-334,9228	19-1	0
19	0,5715	RESIST1-1 H-	Combination	Min	0	-456,194	0	0	0	-243,7423	19-1	0,5715
19	0	RESIST1-2 T-	Combination	Max	0	-60,35	0	0	0	253,4708	19-1	0
19	0,5715	RESIST1-2 T-	Combination	Max	0	-20,368	0	0	0	422,3197	19-1	0,5715
19	0	RESIST1-2 T-	Combination	Min	0	-520,972	0	0	0	-417,1003	19-1	0
19	0,5715	RESIST1-2 T-	Combination	Min	0	-482,198	0	0	0	-263,2474	19-1	0,5715
19	0	E-SERV1-1	Combination	Max	0	-69,265	0	0	0	76,4491	19-1	0
19	0,5715	E-SERV1-1	Combination	Max	0	-49,873	0	0	0	170,9395	19-1	0,5715
19	0	E-SERV1-1	Combination	Min	0	-268,701	0	0	0	-172,7591	19-1	0
19	0,5715	E-SERV1-1	Combination	Min	0	-239,963	0	0	0	-115,4971	19-1	0,5715
19	0	E-SERV1-2	Combination	Max	0	-58,082	0	0	0	92,9101	19-1	0
19	0,5715	E-SERV1-2	Combination	Max	0	-36,31	0	0	0	197,686	19-1	0,5715
19	0	E-SERV1-2	Combination	Min	0	-262,411	0	0	0	-195,1978	19-1	0
19	0,5715	E-SERV1-2	Combination	Min	0	-237,819	0	0	0	-120,773	19-1	0,5715
19	0	E-RESIST1-1	Combination	Max	0	-86,378	0	0	0	215,1578	19-1	0
19	0,5715	E-RESIST1-1	Combination	Max	0	-51,935	0	0	0	395,3704	19-1	0,5715
19	0	E-RESIST1-1	Combination	Min	0	-550,565	0	0	0	-364,8742	19-1	0
19	0,5715	E-RESIST1-1	Combination	Min	0	-494,368	0	0	0	-271,3108	19-1	0,5715
19	0	E-RESIST1-2	Combination	Max	0	-60,35	0	0	0	253,4708	19-1	0
19	0,5715	E-RESIST1-2	Combination	Max	0	-20,368	0	0	0	457,623	19-1	0,5715
19	0	E-RESIST1-2	Combination	Min	0	-535,925	0	0	0	-417,1003	19-1	0
19	0,5715	E-RESIST1-2	Combination	Min	0	-489,379	0	0	0	-283,5903	19-1	0,5715
20	0	LINEA	LinStatic		0	-32,678	0	0	0	1,2691	20-1	0
20	0,5715	LINEA	LinStatic		0	-27,232	0	0	0	18,3885	20-1	0,5715
20	0	HL93 +	LinMoving	Max	0	26,079	0	0	0	167,9897	20-1	0
20	0,5715	HL93 +	LinMoving	Max	0	36,864	0	0	0	223,2516	20-1	0,5715
20	0	HL93 +	LinMoving	Min	0	-164,01	0	0	0	-118,4469	20-1	0
20	0,5715	HL93 +	LinMoving	Min	0	-147,542	0	0	0	-108,209	20-1	0,5715
20	0	TAMDEM +	LinMoving	Max	0	25,298	0	0	0	194,7362	20-1	0
20	0,5715	TAMDEM +	LinMoving	Max	0	35,671	0	0	0	245,9149	20-1	0,5715
20	0	TAMDEM +	LinMoving	Min	0	-161,867	0	0	0	-123,7228	20-1	0
20	0,5715	TAMDEM +	LinMoving	Min	0	-149,411	0	0	0	-113,0288	20-1	0,5715
20	0	HL93 -	LinMoving	Max	0	22,758	0	0	0	151,1907	20-1	0
20	0,5715	HL93 -	LinMoving	Max	0	28,916	0	0	0	200,9265	20-1	0,5715
20	0	HL93 -	LinMoving	Min	0	-147,609	0	0	0	-106,6022	20-1	0
20	0,5715	HL93 -	LinMoving	Min	0	-132,788	0	0	0	-100,671	20-1	0,5715
20	0	TAMDEM -	LinMoving	Max	0	39,642	0	0	0	179,5683	20-1	0
20	0,5715	TAMDEM -	LinMoving	Max	0	48,988	0	0	0	221,5227	20-1	0,5715
20	0	TAMDEM -	LinMoving	Min	0	-158,782	0	0	0	-114,9825	20-1	0
20	0,5715	TAMDEM -	LinMoving	Min	0	-149,323	0	0	0	-101,8175	20-1	0,5715
20	0	SERV1-1 H+	Combination	Max	0	-49,873	0	0	0	170,9395	20-1	0
20	0,5715	SERV1-1 H+	Combination	Max	0	-26,43	0	0	0	265,991	20-1	0,5715
20	0	SERV1-1 H+	Combination	Min	0	-239,963	0	0	0	-115,4971	20-1	0
20	0,5715	SERV1-1 H+	Combination	Min	0	-210,836	0	0	0	-65,4696	20-1	0,5715
20	0	SERV1-2 T+	Combination	Max	0	-50,654	0	0	0	197,686	20-1	0
20	0,5715	SERV1-2 T+	Combination	Max	0	-27,623	0	0	0	288,6543	20-1	0,5715
20	0	SERV1-2 T+	Combination	Min	0	-237,819	0	0	0	-120,773	20-1	0
20	0,5715	SERV1-2 T+	Combination	Min	0	-212,705	0	0	0	-70,2895	20-1	0,5715
20	0	RESIST1-2 T+	Combination	Max	0	-53,752	0	0	0	457,623	20-1	0
20	0,5715	RESIST1-2 T+	Combination	Max	0	-10,838	0	0	0	635,7476	20-1	0,5715
20	0	RESIST1-2 T+	Combination	Min	0	-489,379	0	0	0	-283,5903	20-1	0
20	0,5715	RESIST1-2 T+	Combination	Min	0	-441,616	0	0	0	-199,6939	20-1	0,5715
20	0	SERV1-1 H-	Combination	Max	0	-53,195	0	0	0	154,1405	20-1	0
20	0,5715	SERV1-1 H-	Combination	Max	0	-34,378	0	0	0	243,6658	20-1	0,5715
20	0	SERV1-1 H-	Combination	Min	0	-223,561	0	0	0	-103,6524	20-1	0
20	0,5715	SERV1-1 H-	Combination	Min	0	-196,082	0	0	0	-57,9316	20-1	0,5715

20	0	SERV1-2 T-	Combination	Max	0	-36,31	0	0	0	182,5181	20-1	0
20	0,5715	SERV1-2 T-	Combination	Max	0	-14,306	0	0	0	264,262	20-1	0,5715
20	0	SERV1-2 T-	Combination	Min	0	-234,734	0	0	0	-112,0327	20-1	0
20	0,5715	SERV1-2 T-	Combination	Min	0	-212,617	0	0	0	-59,0781	20-1	0,5715
20	0	RESIST 1-1 H+	Combination	Max	0	-51,935	0	0	0	395,3704	20-1	0
20	0,5715	RESIST 1-1 H+	Combination	Max	0	-8,062	0	0	0	582,9988	20-1	0,5715
20	0	RESIST 1-1 H+	Combination	Min	0	-494,368	0	0	0	-271,3108	20-1	0
20	0,5715	RESIST 1-1 H+	Combination	Min	0	-437,267	0	0	0	-188,4758	20-1	0,5715
20	0	RESIST1-1 H-	Combination	Max	0	-59,666	0	0	0	356,2708	20-1	0
20	0,5715	RESIST1-1 H-	Combination	Max	0	-26,561	0	0	0	531,037	20-1	0,5715
20	0	RESIST1-1 H-	Combination	Min	0	-456,194	0	0	0	-243,7423	20-1	0
20	0,5715	RESIST1-1 H-	Combination	Min	0	-402,926	0	0	0	-170,931	20-1	0,5715
20	0	RESIST1-2 T-	Combination	Max	0	-20,368	0	0	0	422,3197	20-1	0
20	0,5715	RESIST1-2 T-	Combination	Max	0	20,158	0	0	0	578,9746	20-1	0,5715
20	0	RESIST1-2 T-	Combination	Min	0	-482,198	0	0	0	-263,2474	20-1	0
20	0,5715	RESIST1-2 T-	Combination	Min	0	-441,411	0	0	0	-173,5996	20-1	0,5715
20	0	E-SERV1-1	Combination	Max	0	-49,873	0	0	0	170,9395	20-1	0
20	0,5715	E-SERV1-1	Combination	Max	0	-26,43	0	0	0	265,991	20-1	0,5715
20	0	E-SERV1-1	Combination	Min	0	-239,963	0	0	0	-115,4971	20-1	0
20	0,5715	E-SERV1-1	Combination	Min	0	-210,836	0	0	0	-65,4696	20-1	0,5715
20	0	E-SERV1-2	Combination	Max	0	-36,31	0	0	0	197,686	20-1	0
20	0,5715	E-SERV1-2	Combination	Max	0	-14,306	0	0	0	288,6543	20-1	0,5715
20	0	E-SERV1-2	Combination	Min	0	-237,819	0	0	0	-120,773	20-1	0
20	0,5715	E-SERV1-2	Combination	Min	0	-212,705	0	0	0	-70,2895	20-1	0,5715
20	0	E-RESIST1-1	Combination	Max	0	-51,935	0	0	0	395,3704	20-1	0
20	0,5715	E-RESIST1-1	Combination	Max	0	-8,062	0	0	0	582,9988	20-1	0,5715
20	0	E-RESIST1-1	Combination	Min	0	-494,368	0	0	0	-271,3108	20-1	0
20	0,5715	E-RESIST1-1	Combination	Min	0	-437,267	0	0	0	-188,4758	20-1	0,5715
20	0	E-RESIST1-2	Combination	Max	0	-20,368	0	0	0	457,623	20-1	0
20	0,5715	E-RESIST1-2	Combination	Max	0	20,158	0	0	0	635,7476	20-1	0,5715
20	0	E-RESIST1-2	Combination	Min	0	-489,379	0	0	0	-283,5903	20-1	0
20	0,5715	E-RESIST1-2	Combination	Min	0	-441,616	0	0	0	-199,6939	20-1	0,5715
21	0	LINEA	LinStatic		0	-27,232	0	0	0	18,3885	21-1	0
21	0,5715	LINEA	LinStatic		0	-21,786	0	0	0	32,3953	21-1	0,5715
21	0	HL93 +	LinMoving	Max	0	36,864	0	0	0	223,2516	21-1	0
21	0,5715	HL93 +	LinMoving	Max	0	47,313	0	0	0	266,5933	21-1	0,5715
21	0	HL93 +	LinMoving	Min	0	-147,542	0	0	0	-108,209	21-1	0
21	0,5715	HL93 +	LinMoving	Min	0	-130,842	0	0	0	-97,971	21-1	0,5715
21	0	TAMDEM +	LinMoving	Max	0	35,671	0	0	0	245,9149	21-1	0
21	0,5715	TAMDEM +	LinMoving	Max	0	46,85	0	0	0	288,8782	21-1	0,5715
21	0	TAMDEM +	LinMoving	Min	0	-149,411	0	0	0	-113,0288	21-1	0
21	0,5715	TAMDEM +	LinMoving	Min	0	-136,565	0	0	0	-102,3348	21-1	0,5715
21	0	HL93 -	LinMoving	Max	0	28,916	0	0	0	200,9265	21-1	0
21	0,5715	HL93 -	LinMoving	Max	0	35,409	0	0	0	239,934	21-1	0,5715
21	0	HL93 -	LinMoving	Min	0	-132,788	0	0	0	-100,671	21-1	0
21	0,5715	HL93 -	LinMoving	Min	0	-117,758	0	0	0	-97,2317	21-1	0,5715
21	0	TAMDEM -	LinMoving	Max	0	48,988	0	0	0	221,5227	21-1	0
21	0,5715	TAMDEM -	LinMoving	Max	0	59,058	0	0	0	260,2244	21-1	0,5715
21	0	TAMDEM -	LinMoving	Min	0	-149,323	0	0	0	-101,8175	21-1	0
21	0,5715	TAMDEM -	LinMoving	Min	0	-139,039	0	0	0	-92,1842	21-1	0,5715
21	0	SERV1-1 H+	Combination	Max	0	-26,43	0	0	0	265,991	21-1	0
21	0,5715	SERV1-1 H+	Combination	Max	0	-3,322	0	0	0	341,8878	21-1	0,5715
21	0	SERV1-1 H+	Combination	Min	0	-210,836	0	0	0	-65,4696	21-1	0
21	0,5715	SERV1-1 H+	Combination	Min	0	-181,477	0	0	0	-22,6766	21-1	0,5715
21	0	SERV1-2 T+	Combination	Max	0	-27,623	0	0	0	288,6543	21-1	0
21	0,5715	SERV1-2 T+	Combination	Max	0	-3,785	0	0	0	364,1726	21-1	0,5715
21	0	SERV1-2 T+	Combination	Min	0	-212,705	0	0	0	-70,2895	21-1	0
21	0,5715	SERV1-2 T+	Combination	Min	0	-187,2	0	0	0	-27,0404	21-1	0,5715
21	0	RESIST1-2 T+	Combination	Max	0	-10,838	0	0	0	635,7476	21-1	0
21	0,5715	RESIST1-2 T+	Combination	Max	0	33,953	0	0	0	784,0223	21-1	0,5715
21	0	RESIST1-2 T+	Combination	Min	0	-441,616	0	0	0	-199,6939	21-1	0
21	0,5715	RESIST1-2 T+	Combination	Min	0	-392,945	0	0	0	-126,5259	21-1	0,5715
21	0	SERV1-1 H-	Combination	Max	0	-34,378	0	0	0	243,6658	21-1	0
21	0,5715	SERV1-1 H-	Combination	Max	0	-15,226	0	0	0	315,2284	21-1	0,5715
21	0	SERV1-1 H-	Combination	Min	0	-196,082	0	0	0	-57,9316	21-1	0
21	0,5715	SERV1-1 H-	Combination	Min	0	-168,393	0	0	0	-21,9372	21-1	0,5715
21	0	SERV1-2 T-	Combination	Max	0	-14,306	0	0	0	264,262	21-1	0
21	0,5715	SERV1-2 T-	Combination	Max	0	8,423	0	0	0	335,5188	21-1	0,5715

21	0	SERV1-2 T-	Combination	Min	0	-212,617	0	0	0	-59,0781	21-1	0
21	0,5715	SERV1-2 T-	Combination	Min	0	-189,674	0	0	0	-16,8898	21-1	0,5715
21	0	RESIST 1-1 H+	Combination	Max	0	-8,062	0	0	0	582,9988	21-1	0
21	0,5715	RESIST 1-1 H+	Combination	Max	0	35,032	0	0	0	732,1544	21-1	0,5715
21	0	RESIST 1-1 H+	Combination	Min	0	-437,267	0	0	0	-188,4758	21-1	0
21	0,5715	RESIST 1-1 H+	Combination	Min	0	-379,624	0	0	0	-116,3691	21-1	0,5715
21	0	RESIST1-1 H-	Combination	Max	0	-26,561	0	0	0	531,037	21-1	0
21	0,5715	RESIST1-1 H-	Combination	Max	0	7,324	0	0	0	670,1048	21-1	0,5715
21	0	RESIST1-1 H-	Combination	Min	0	-402,926	0	0	0	-170,931	21-1	0
21	0,5715	RESIST1-1 H-	Combination	Min	0	-349,17	0	0	0	-114,6483	21-1	0,5715
21	0	RESIST1-2 T-	Combination	Max	0	20,158	0	0	0	578,9746	21-1	0
21	0,5715	RESIST1-2 T-	Combination	Max	0	62,368	0	0	0	717,3306	21-1	0,5715
21	0	RESIST1-2 T-	Combination	Min	0	-441,411	0	0	0	-173,5996	21-1	0
21	0,5715	RESIST1-2 T-	Combination	Min	0	-398,703	0	0	0	-102,9004	21-1	0,5715
21	0	E-SERV1-1	Combination	Max	0	-26,43	0	0	0	265,991	21-1	0
21	0,5715	E-SERV1-1	Combination	Max	0	-3,322	0	0	0	341,8878	21-1	0,5715
21	0	E-SERV1-1	Combination	Min	0	-210,836	0	0	0	-65,4696	21-1	0
21	0,5715	E-SERV1-1	Combination	Min	0	-181,477	0	0	0	-22,6766	21-1	0,5715
21	0	E-SERV1-2	Combination	Max	0	-14,306	0	0	0	288,6543	21-1	0
21	0,5715	E-SERV1-2	Combination	Max	0	8,423	0	0	0	364,1726	21-1	0,5715
21	0	E-SERV1-2	Combination	Min	0	-212,705	0	0	0	-70,2895	21-1	0
21	0,5715	E-SERV1-2	Combination	Min	0	-189,674	0	0	0	-27,0404	21-1	0,5715
21	0	E-RESIST1-1	Combination	Max	0	-8,062	0	0	0	582,9988	21-1	0
21	0,5715	E-RESIST1-1	Combination	Max	0	35,032	0	0	0	732,1544	21-1	0,5715
21	0	E-RESIST1-1	Combination	Min	0	-437,267	0	0	0	-188,4758	21-1	0
21	0,5715	E-RESIST1-1	Combination	Min	0	-379,624	0	0	0	-116,3691	21-1	0,5715
21	0	E-RESIST1-2	Combination	Max	0	20,158	0	0	0	635,7476	21-1	0
21	0,5715	E-RESIST1-2	Combination	Max	0	62,368	0	0	0	784,0223	21-1	0,5715
21	0	E-RESIST1-2	Combination	Min	0	-441,616	0	0	0	-199,6939	21-1	0
21	0,5715	E-RESIST1-2	Combination	Min	0	-398,703	0	0	0	-126,5259	21-1	0,5715
22	0	LINEA	LinStatic		0	-21,786	0	0	0	32,3953	22-1	0
22	0,5715	LINEA	LinStatic		0	-16,339	0	0	0	43,2894	22-1	0,5715
22	0	HL93 +	LinMoving	Max	0	47,313	0	0	0	266,5933	22-1	0
22	0,5715	HL93 +	LinMoving	Max	0	57,287	0	0	0	297,3612	22-1	0,5715
22	0	HL93 +	LinMoving	Min	0	-130,842	0	0	0	-97,971	22-1	0
22	0,5715	HL93 +	LinMoving	Min	0	-114,624	0	0	0	-87,7331	22-1	0,5715
22	0	TAMDEM +	LinMoving	Max	0	46,85	0	0	0	288,8782	22-1	0
22	0,5715	TAMDEM +	LinMoving	Max	0	58,702	0	0	0	322,5019	22-1	0,5715
22	0	TAMDEM +	LinMoving	Min	0	-136,565	0	0	0	-102,3348	22-1	0
22	0,5715	TAMDEM +	LinMoving	Min	0	-123,463	0	0	0	-91,6408	22-1	0,5715
22	0	HL93 -	LinMoving	Max	0	35,409	0	0	0	239,934	22-1	0
22	0,5715	HL93 -	LinMoving	Max	0	42,914	0	0	0	267,625	22-1	0,5715
22	0	HL93 -	LinMoving	Min	0	-117,758	0	0	0	-97,2317	22-1	0
22	0,5715	HL93 -	LinMoving	Min	0	-103,161	0	0	0	-94,0007	22-1	0,5715
22	0	TAMDEM -	LinMoving	Max	0	59,058	0	0	0	260,2244	22-1	0
22	0,5715	TAMDEM -	LinMoving	Max	0	69,735	0	0	0	290,5129	22-1	0,5715
22	0	TAMDEM -	LinMoving	Min	0	-139,039	0	0	0	-92,1842	22-1	0
22	0,5715	TAMDEM -	LinMoving	Min	0	-127,97	0	0	0	-82,551	22-1	0,5715
22	0	SERV1-1 H+	Combination	Max	0	-3,322	0	0	0	341,8878	22-1	0
22	0,5715	SERV1-1 H+	Combination	Max	0	19,311	0	0	0	397,9762	22-1	0,5715
22	0	SERV1-1 H+	Combination	Min	0	-181,477	0	0	0	-22,6766	22-1	0
22	0,5715	SERV1-1 H+	Combination	Min	0	-152,6	0	0	0	12,882	22-1	0,5715
22	0	SERV1-2 T+	Combination	Max	0	-3,785	0	0	0	364,1726	22-1	0
22	0,5715	SERV1-2 T+	Combination	Max	0	20,726	0	0	0	423,1169	22-1	0,5715
22	0	SERV1-2 T+	Combination	Min	0	-187,2	0	0	0	-27,0404	22-1	0
22	0,5715	SERV1-2 T+	Combination	Min	0	-161,439	0	0	0	8,9742	22-1	0,5715
22	0	RESIST1-2 T+	Combination	Max	0	33,953	0	0	0	784,0223	22-1	0
22	0,5715	RESIST1-2 T+	Combination	Max	0	80,312	0	0	0	899,8308	22-1	0,5715
22	0	RESIST1-2 T+	Combination	Min	0	-392,945	0	0	0	-126,5259	22-1	0
22	0,5715	RESIST1-2 T+	Combination	Min	0	-343,677	0	0	0	-64,0863	22-1	0,5715
22	0	SERV1-1 H-	Combination	Max	0	-15,226	0	0	0	315,2284	22-1	0
22	0,5715	SERV1-1 H-	Combination	Max	0	4,938	0	0	0	368,2401	22-1	0,5715
22	0	SERV1-1 H-	Combination	Min	0	-168,393	0	0	0	-21,9372	22-1	0
22	0,5715	SERV1-1 H-	Combination	Min	0	-141,138	0	0	0	6,6143	22-1	0,5715
22	0	SERV1-2 T-	Combination	Max	0	8,423	0	0	0	335,5188	22-1	0
22	0,5715	SERV1-2 T-	Combination	Max	0	31,759	0	0	0	391,128	22-1	0,5715
22	0	SERV1-2 T-	Combination	Min	0	-189,674	0	0	0	-16,8898	22-1	0
22	0,5715	SERV1-2 T-	Combination	Min	0	-165,946	0	0	0	18,064	22-1	0,5715

22	0	RESIST 1-1 H+	Combination	Max	0	35,032	0	0	0	732,1544	22-1	0
22	0,5715	RESIST 1-1 H+	Combination	Max	0	77,019	0	0	0	841,3159	22-1	0,5715
22	0	RESIST 1-1 H+	Combination	Min	0	-379,624	0	0	0	-116,3691	22-1	0
22	0,5715	RESIST 1-1 H+	Combination	Min	0	-323,104	0	0	0	-54,9909	22-1	0,5715
22	0	RESIST1-1 H-	Combination	Max	0	7,324	0	0	0	670,1048	22-1	0
22	0,5715	RESIST1-1 H-	Combination	Max	0	43,566	0	0	0	772,1051	22-1	0,5715
22	0	RESIST1-1 H-	Combination	Min	0	-349,17	0	0	0	-114,6483	22-1	0
22	0,5715	RESIST1-1 H-	Combination	Min	0	-296,425	0	0	0	-69,5789	22-1	0,5715
22	0	RESIST1-2 T-	Combination	Max	0	62,368	0	0	0	717,3306	22-1	0
22	0,5715	RESIST1-2 T-	Combination	Max	0	105,991	0	0	0	825,3766	22-1	0,5715
22	0	RESIST1-2 T-	Combination	Min	0	-398,703	0	0	0	-102,9004	22-1	0
22	0,5715	RESIST1-2 T-	Combination	Min	0	-354,167	0	0	0	-42,9297	22-1	0,5715
22	0	E-SERV1-1	Combination	Max	0	-3,322	0	0	0	341,8878	22-1	0
22	0,5715	E-SERV1-1	Combination	Max	0	19,311	0	0	0	397,9762	22-1	0,5715
22	0	E-SERV1-1	Combination	Min	0	-181,477	0	0	0	-22,6766	22-1	0
22	0,5715	E-SERV1-1	Combination	Min	0	-152,6	0	0	0	6,6143	22-1	0,5715
22	0	E-SERV1-2	Combination	Max	0	8,423	0	0	0	364,1726	22-1	0
22	0,5715	E-SERV1-2	Combination	Max	0	31,759	0	0	0	423,1169	22-1	0,5715
22	0	E-SERV1-2	Combination	Min	0	-189,674	0	0	0	-27,0404	22-1	0
22	0,5715	E-SERV1-2	Combination	Min	0	-165,946	0	0	0	8,9742	22-1	0,5715
22	0	E-RESIST1-1	Combination	Max	0	35,032	0	0	0	732,1544	22-1	0
22	0,5715	E-RESIST1-1	Combination	Max	0	77,019	0	0	0	841,3159	22-1	0,5715
22	0	E-RESIST1-1	Combination	Min	0	-379,624	0	0	0	-116,3691	22-1	0
22	0,5715	E-RESIST1-1	Combination	Min	0	-323,104	0	0	0	-69,5789	22-1	0,5715
22	0	E-RESIST1-2	Combination	Max	0	62,368	0	0	0	784,0223	22-1	0
22	0,5715	E-RESIST1-2	Combination	Max	0	105,991	0	0	0	899,8308	22-1	0,5715
22	0	E-RESIST1-2	Combination	Min	0	-398,703	0	0	0	-126,5259	22-1	0
22	0,5715	E-RESIST1-2	Combination	Min	0	-354,167	0	0	0	-64,0863	22-1	0,5715
23	0	LINEA	LinStatic		0	-16,339	0	0	0	43,2894	23-1	0
23	0,5715	LINEA	LinStatic		0	-10,893	0	0	0	51,071	23-1	0,5715
23	0	HL93 +	LinMoving	Max	0	57,287	0	0	0	297,3612	23-1	0
23	0,5715	HL93 +	LinMoving	Max	0	66,772	0	0	0	317,6982	23-1	0,5715
23	0	HL93 +	LinMoving	Min	0	-114,624	0	0	0	-87,7331	23-1	0
23	0,5715	HL93 +	LinMoving	Min	0	-99,21	0	0	0	-77,4951	23-1	0,5715
23	0	TAMDEM +	LinMoving	Max	0	58,702	0	0	0	322,5019	23-1	0
23	0,5715	TAMDEM +	LinMoving	Max	0	71,095	0	0	0	345,9657	23-1	0,5715
23	0	TAMDEM +	LinMoving	Min	0	-123,463	0	0	0	-91,6408	23-1	0
23	0,5715	TAMDEM +	LinMoving	Min	0	-110,236	0	0	0	-80,9469	23-1	0,5715
23	0	HL93 -	LinMoving	Max	0	42,914	0	0	0	267,625	23-1	0
23	0,5715	HL93 -	LinMoving	Max	0	51,15	0	0	0	285,9283	23-1	0,5715
23	0	HL93 -	LinMoving	Min	0	-103,161	0	0	0	-94,0007	23-1	0
23	0,5715	HL93 -	LinMoving	Min	0	-89,289	0	0	0	-90,8171	23-1	0,5715
23	0	TAMDEM -	LinMoving	Max	0	69,735	0	0	0	290,5129	23-1	0
23	0,5715	TAMDEM -	LinMoving	Max	0	80,899	0	0	0	311,6494	23-1	0,5715
23	0	TAMDEM -	LinMoving	Min	0	-127,97	0	0	0	-82,551	23-1	0
23	0,5715	TAMDEM -	LinMoving	Min	0	-116,158	0	0	0	-72,9178	23-1	0,5715
23	0	SERV1-1 H+	Combination	Max	0	19,311	0	0	0	397,9762	23-1	0
23	0,5715	SERV1-1 H+	Combination	Max	0	41,454	0	0	0	436,3993	23-1	0,5715
23	0	SERV1-1 H+	Combination	Min	0	-152,6	0	0	0	12,882	23-1	0
23	0,5715	SERV1-1 H+	Combination	Min	0	-124,527	0	0	0	41,2061	23-1	0,5715
23	0	SERV1-2 T+	Combination	Max	0	20,726	0	0	0	423,1169	23-1	0
23	0,5715	SERV1-2 T+	Combination	Max	0	45,778	0	0	0	464,6669	23-1	0,5715
23	0	SERV1-2 T+	Combination	Min	0	-161,439	0	0	0	8,9742	23-1	0
23	0,5715	SERV1-2 T+	Combination	Min	0	-135,553	0	0	0	37,7543	23-1	0,5715
23	0	RESIST1-2 T+	Combination	Max	0	80,312	0	0	0	899,8308	23-1	0
23	0,5715	RESIST1-2 T+	Combination	Max	0	127,93	0	0	0	981,264	23-1	0,5715
23	0	RESIST1-2 T+	Combination	Min	0	-343,677	0	0	0	-64,0863	23-1	0
23	0,5715	RESIST1-2 T+	Combination	Min	0	-294,119	0	0	0	-12,3751	23-1	0,5715
23	0	SERV1-1 H-	Combination	Max	0	4,938	0	0	0	368,2401	23-1	0
23	0,5715	SERV1-1 H-	Combination	Max	0	25,833	0	0	0	404,6295	23-1	0,5715
23	0	SERV1-1 H-	Combination	Min	0	-141,138	0	0	0	6,6143	23-1	0
23	0,5715	SERV1-1 H-	Combination	Min	0	-114,606	0	0	0	27,8841	23-1	0,5715
23	0	SERV1-2 T-	Combination	Max	0	31,759	0	0	0	391,128	23-1	0
23	0,5715	SERV1-2 T-	Combination	Max	0	55,581	0	0	0	430,3506	23-1	0,5715
23	0	SERV1-2 T-	Combination	Min	0	-165,946	0	0	0	18,064	23-1	0
23	0,5715	SERV1-2 T-	Combination	Min	0	-141,475	0	0	0	45,7834	23-1	0,5715
23	0	RESIST 1-1 H+	Combination	Max	0	77,019	0	0	0	841,3159	23-1	0
23	0,5715	RESIST 1-1 H+	Combination	Max	0	117,867	0	0	0	915,4712	23-1	0,5715

25	0	RESIST1-1 H-	Combination	Min	0	-195,288	0	0	0	-11,8455	25-1	0
25	0,5715	RESIST1-1 H-	Combination	Min	0	-146,552	0	0	0	0,9286	25-1	0,5715
25	0	RESIST1-2 T-	Combination	Max	0	196,358	0	0	0	944,296	25-1	0
25	0,5715	RESIST1-2 T-	Combination	Max	0	242,545	0	0	0	953,64	25-1	0,5715
25	0	RESIST1-2 T-	Combination	Min	0	-261,416	0	0	0	44,8266	25-1	0
25	0,5715	RESIST1-2 T-	Combination	Min	0	-215,227	0	0	0	72,6122	25-1	0,5715
25	0	E-SERV1-1	Combination	Max	0	63,625	0	0	0	456,9284	25-1	0
25	0,5715	E-SERV1-1	Combination	Max	0	86,693	0	0	0	457,2556	25-1	0,5715
25	0	E-SERV1-1	Combination	Min	0	-99,388	0	0	0	41,9194	25-1	0
25	0,5715	E-SERV1-1	Combination	Min	0	-76,32	0	0	0	48,7203	25-1	0,5715
25	0	E-SERV1-2	Combination	Max	0	79,771	0	0	0	488,306	25-1	0
25	0,5715	E-SERV1-2	Combination	Max	0	104,208	0	0	0	493,8215	25-1	0,5715
25	0	E-SERV1-2	Combination	Min	0	-116,91	0	0	0	59,3	25-1	0
25	0,5715	E-SERV1-2	Combination	Min	0	-92,471	0	0	0	73,6112	25-1	0,5715
25	0	E-RESIST1-1	Combination	Max	0	158,778	0	0	0	954,0879	25-1	0
25	0,5715	E-RESIST1-1	Combination	Max	0	201,778	0	0	0	951,7945	25-1	0,5715
25	0	E-RESIST1-1	Combination	Min	0	-220,634	0	0	0	-11,8455	25-1	0
25	0,5715	E-RESIST1-1	Combination	Min	0	-177,636	0	0	0	0,9286	25-1	0,5715
25	0	E-RESIST1-2	Combination	Max	0	196,358	0	0	0	1027,1193	25-1	0
25	0,5715	E-RESIST1-2	Combination	Max	0	242,545	0	0	0	1036,9016	25-1	0,5715
25	0	E-RESIST1-2	Combination	Min	0	-261,416	0	0	0	28,6077	25-1	0
25	0,5715	E-RESIST1-2	Combination	Min	0	-215,227	0	0	0	58,8622	25-1	0,5715
26	0	LINEA	LinStatic		0	3,638E-12	0	0	0	57,2962	26-1	0
26	0,5715	LINEA	LinStatic		0	5,446	0	0	0	55,7399	26-1	0,5715
26	0	HL93 +	LinMoving	Max	0	86,693	0	0	0	324,0855	26-1	0
26	0,5715	HL93 +	LinMoving	Max	0	99,157	0	0	0	327,3341	26-1	0,5715
26	0	HL93 +	LinMoving	Min	0	-76,32	0	0	0	-57,0195	26-1	0
26	0,5715	HL93 +	LinMoving	Min	0	-66,804	0	0	0	-67,2575	26-1	0,5715
26	0	TAMDEM +	LinMoving	Max	0	96,972	0	0	0	360,6513	26-1	0
26	0,5715	TAMDEM +	LinMoving	Max	0	110,19	0	0	0	358,6695	26-1	0,5715
26	0	TAMDEM +	LinMoving	Min	0	-83,941	0	0	0	-59,5589	26-1	0
26	0,5715	TAMDEM +	LinMoving	Min	0	-71,139	0	0	0	-70,2494	26-1	0,5715
26	0	HL93 -	LinMoving	Max	0	75,793	0	0	0	291,6769	26-1	0
26	0,5715	HL93 -	LinMoving	Max	0	89,241	0	0	0	294,6007	26-1	0,5715
26	0	HL93 -	LinMoving	Min	0	-62,966	0	0	0	-84,4498	26-1	0
26	0,5715	HL93 -	LinMoving	Min	0	-51,183	0	0	0	-87,6331	26-1	0,5715
26	0	TAMDEM -	LinMoving	Max	0	104,208	0	0	0	324,8784	26-1	0
26	0,5715	TAMDEM -	LinMoving	Max	0	116,115	0	0	0	323,0931	26-1	0,5715
26	0	TAMDEM -	LinMoving	Min	0	-92,471	0	0	0	-53,6513	26-1	0
26	0,5715	TAMDEM -	LinMoving	Min	0	-80,939	0	0	0	-63,2814	26-1	0,5715
26	0	SERV1-1 H+	Combination	Max	0	86,693	0	0	0	457,2556	26-1	0
26	0,5715	SERV1-1 H+	Combination	Max	0	111,815	0	0	0	456,887	26-1	0,5715
26	0	SERV1-1 H+	Combination	Min	0	-76,32	0	0	0	76,1506	26-1	0
26	0,5715	SERV1-1 H+	Combination	Min	0	-54,145	0	0	0	62,2953	26-1	0,5715
26	0	SERV1-2 T+	Combination	Max	0	96,972	0	0	0	493,8215	26-1	0
26	0,5715	SERV1-2 T+	Combination	Max	0	122,848	0	0	0	488,2224	26-1	0,5715
26	0	SERV1-2 T+	Combination	Min	0	-83,941	0	0	0	73,6112	26-1	0
26	0,5715	SERV1-2 T+	Combination	Min	0	-58,481	0	0	0	59,3035	26-1	0,5715
26	0	RESIST1-2 T+	Combination	Max	0	225,702	0	0	0	1036,9016	26-1	0
26	0,5715	RESIST1-2 T+	Combination	Max	0	275,239	0	0	0	1026,9247	26-1	0,5715
26	0	RESIST1-2 T+	Combination	Min	0	-195,374	0	0	0	58,8622	26-1	0
26	0,5715	RESIST1-2 T+	Combination	Min	0	-146,805	0	0	0	28,6159	26-1	0,5715
26	0	SERV1-1 H-	Combination	Max	0	75,793	0	0	0	424,847	26-1	0
26	0,5715	SERV1-1 H-	Combination	Max	0	101,9	0	0	0	424,1536	26-1	0,5715
26	0	SERV1-1 H-	Combination	Min	0	-62,966	0	0	0	48,7203	26-1	0
26	0,5715	SERV1-1 H-	Combination	Min	0	-38,524	0	0	0	41,9198	26-1	0,5715
26	0	SERV1-2 T-	Combination	Max	0	104,208	0	0	0	458,0485	26-1	0
26	0,5715	SERV1-2 T-	Combination	Max	0	128,774	0	0	0	452,646	26-1	0,5715
26	0	SERV1-2 T-	Combination	Min	0	-92,471	0	0	0	79,5188	26-1	0
26	0,5715	SERV1-2 T-	Combination	Min	0	-68,28	0	0	0	66,2715	26-1	0,5715
26	0	RESIST 1-1 H+	Combination	Max	0	201,778	0	0	0	951,7945	26-1	0
26	0,5715	RESIST 1-1 H+	Combination	Max	0	249,559	0	0	0	953,9915	26-1	0,5715
26	0	RESIST 1-1 H+	Combination	Min	0	-177,636	0	0	0	64,7726	26-1	0
26	0,5715	RESIST 1-1 H+	Combination	Min	0	-136,714	0	0	0	35,5794	26-1	0,5715
26	0	RESIST1-1 H-	Combination	Max	0	176,408	0	0	0	876,3636	26-1	0
26	0,5715	RESIST1-1 H-	Combination	Max	0	226,481	0	0	0	877,8044	26-1	0,5715
26	0	RESIST1-1 H-	Combination	Min	0	-146,552	0	0	0	0,9286	26-1	0
26	0,5715	RESIST1-1 H-	Combination	Min	0	-100,355	0	0	0	-11,8447	26-1	0,5715

24	0	RESIST1-1 H-	Combination	Max	0	81,508	0	0	0	841,527	24-1	0
24	0,5715	RESIST1-1 H-	Combination	Max	0	127,678	0	0	0	877,8913	24-1	0,5715
24	0	RESIST1-1 H-	Combination	Min	0	-245,364	0	0	0	-35,348	24-1	0
24	0,5715	RESIST1-1 H-	Combination	Min	0	-195,288	0	0	0	-11,8455	24-1	0,5715
24	0	RESIST1-2 T-	Combination	Max	0	150,747	0	0	0	901,3927	24-1	0
24	0,5715	RESIST1-2 T-	Combination	Max	0	196,358	0	0	0	944,296	24-1	0,5715
24	0	RESIST1-2 T-	Combination	Min	0	-307,902	0	0	0	6,3127	24-1	0
24	0,5715	RESIST1-2 T-	Combination	Min	0	-261,416	0	0	0	44,8266	24-1	0,5715
24	0	E-SERV1-1	Combination	Max	0	41,454	0	0	0	436,3993	24-1	0
24	0,5715	E-SERV1-1	Combination	Max	0	63,625	0	0	0	456,9284	24-1	0,5715
24	0	E-SERV1-1	Combination	Min	0	-124,527	0	0	0	27,8841	24-1	0
24	0,5715	E-SERV1-1	Combination	Min	0	-99,388	0	0	0	41,9194	24-1	0,5715
24	0	E-SERV1-2	Combination	Max	0	55,581	0	0	0	464,6669	24-1	0
24	0,5715	E-SERV1-2	Combination	Max	0	79,771	0	0	0	488,306	24-1	0,5715
24	0	E-SERV1-2	Combination	Min	0	-141,475	0	0	0	37,7543	24-1	0
24	0,5715	E-SERV1-2	Combination	Min	0	-116,91	0	0	0	59,3	24-1	0,5715
24	0	E-RESIST1-1	Combination	Max	0	117,867	0	0	0	915,4712	24-1	0
24	0,5715	E-RESIST1-1	Combination	Max	0	158,778	0	0	0	954,0879	24-1	0,5715
24	0	E-RESIST1-1	Combination	Min	0	-268,455	0	0	0	-35,348	24-1	0
24	0,5715	E-RESIST1-1	Combination	Min	0	-220,634	0	0	0	-11,8455	24-1	0,5715
24	0	E-RESIST1-2	Combination	Max	0	150,747	0	0	0	981,264	24-1	0
24	0,5715	E-RESIST1-2	Combination	Max	0	196,358	0	0	0	1027,1193	24-1	0,5715
24	0	E-RESIST1-2	Combination	Min	0	-307,902	0	0	0	-12,3751	24-1	0
24	0,5715	E-RESIST1-2	Combination	Min	0	-261,416	0	0	0	28,6077	24-1	0,5715
25	0	LINEA	LinStatic		0	-5,446	0	0	0	55,7399	25-1	0
25	0,5715	LINEA	LinStatic		0	9,734E-13	0	0	0	57,2962	25-1	0,5715
25	0	HL93 +	LinMoving	Max	0	76,284	0	0	0	327,3755	25-1	0
25	0,5715	HL93 +	LinMoving	Max	0	86,693	0	0	0	324,0855	25-1	0,5715
25	0	HL93 +	LinMoving	Min	0	-86,729	0	0	0	-67,2571	25-1	0
25	0,5715	HL93 +	LinMoving	Min	0	-76,32	0	0	0	-57,0195	25-1	0,5715
25	0	TAMDEM +	LinMoving	Max	0	83,896	0	0	0	358,7532	25-1	0
25	0,5715	TAMDEM +	LinMoving	Max	0	96,972	0	0	0	360,6513	25-1	0,5715
25	0	TAMDEM +	LinMoving	Min	0	-97,018	0	0	0	-70,2529	25-1	0
25	0,5715	TAMDEM +	LinMoving	Min	0	-83,941	0	0	0	-59,5589	25-1	0,5715
25	0	HL93 -	LinMoving	Max	0	62,922	0	0	0	294,638	25-1	0
25	0,5715	HL93 -	LinMoving	Max	0	75,793	0	0	0	291,6769	25-1	0,5715
25	0	HL93 -	LinMoving	Min	0	-75,839	0	0	0	-87,6335	25-1	0
25	0,5715	HL93 -	LinMoving	Min	0	-62,966	0	0	0	-84,4498	25-1	0,5715
25	0	TAMDEM -	LinMoving	Max	0	92,43	0	0	0	323,1685	25-1	0
25	0,5715	TAMDEM -	LinMoving	Max	0	104,208	0	0	0	324,8784	25-1	0,5715
25	0	TAMDEM -	LinMoving	Min	0	-104,251	0	0	0	-63,2845	25-1	0
25	0,5715	TAMDEM -	LinMoving	Min	0	-92,471	0	0	0	-53,6513	25-1	0,5715
25	0	SERV1-1 H+	Combination	Max	0	63,625	0	0	0	456,9284	25-1	0
25	0,5715	SERV1-1 H+	Combination	Max	0	86,693	0	0	0	457,2556	25-1	0,5715
25	0	SERV1-1 H+	Combination	Min	0	-99,388	0	0	0	62,2957	25-1	0
25	0,5715	SERV1-1 H+	Combination	Min	0	-76,32	0	0	0	76,1506	25-1	0,5715
25	0	SERV1-2 T+	Combination	Max	0	71,237	0	0	0	488,306	25-1	0
25	0,5715	SERV1-2 T+	Combination	Max	0	96,972	0	0	0	493,8215	25-1	0,5715
25	0	SERV1-2 T+	Combination	Min	0	-109,677	0	0	0	59,3	25-1	0
25	0,5715	SERV1-2 T+	Combination	Min	0	-83,941	0	0	0	73,6112	25-1	0,5715
25	0	RESIST1-2 T+	Combination	Max	0	176,496	0	0	0	1027,1193	25-1	0
25	0,5715	RESIST1-2 T+	Combination	Max	0	225,702	0	0	0	1036,9016	25-1	0,5715
25	0	RESIST1-2 T+	Combination	Min	0	-244,582	0	0	0	28,6077	25-1	0
25	0,5715	RESIST1-2 T+	Combination	Min	0	-195,374	0	0	0	58,8622	25-1	0,5715
25	0	SERV1-1 H-	Combination	Max	0	50,263	0	0	0	424,1909	25-1	0
25	0,5715	SERV1-1 H-	Combination	Max	0	75,793	0	0	0	424,847	25-1	0,5715
25	0	SERV1-1 H-	Combination	Min	0	-88,498	0	0	0	41,9194	25-1	0
25	0,5715	SERV1-1 H-	Combination	Min	0	-62,966	0	0	0	48,7203	25-1	0,5715
25	0	SERV1-2 T-	Combination	Max	0	79,771	0	0	0	452,7213	25-1	0
25	0,5715	SERV1-2 T-	Combination	Max	0	104,208	0	0	0	458,0485	25-1	0,5715
25	0	SERV1-2 T-	Combination	Min	0	-116,91	0	0	0	66,2684	25-1	0
25	0,5715	SERV1-2 T-	Combination	Min	0	-92,471	0	0	0	79,5188	25-1	0,5715
25	0	RESIST 1-1 H+	Combination	Max	0	158,778	0	0	0	954,0879	25-1	0
25	0,5715	RESIST 1-1 H+	Combination	Max	0	201,778	0	0	0	951,7945	25-1	0,5715
25	0	RESIST 1-1 H+	Combination	Min	0	-220,634	0	0	0	35,5804	25-1	0
25	0,5715	RESIST 1-1 H+	Combination	Min	0	-177,636	0	0	0	64,7726	25-1	0,5715
25	0	RESIST1-1 H-	Combination	Max	0	127,678	0	0	0	877,8913	25-1	0
25	0,5715	RESIST1-1 H-	Combination	Max	0	176,408	0	0	0	876,3636	25-1	0,5715

26	0	RESIST1-2 T-	Combination	Max	0	242,545	0	0	0	953,64	26-1	0
26	0,5715	RESIST1-2 T-	Combination	Max	0	289,03	0	0	0	944,1206	26-1	0,5715
26	0	RESIST1-2 T-	Combination	Min	0	-215,227	0	0	0	72,6122	26-1	0
26	0,5715	RESIST1-2 T-	Combination	Min	0	-169,614	0	0	0	44,834	26-1	0,5715
26	0	E-SERV1-1	Combination	Max	0	86,693	0	0	0	457,2556	26-1	0
26	0,5715	E-SERV1-1	Combination	Max	0	111,815	0	0	0	456,887	26-1	0,5715
26	0	E-SERV1-1	Combination	Min	0	-76,32	0	0	0	48,7203	26-1	0
26	0,5715	E-SERV1-1	Combination	Min	0	-54,145	0	0	0	41,9198	26-1	0,5715
26	0	E-SERV1-2	Combination	Max	0	104,208	0	0	0	493,8215	26-1	0
26	0,5715	E-SERV1-2	Combination	Max	0	128,774	0	0	0	488,2224	26-1	0,5715
26	0	E-SERV1-2	Combination	Min	0	-92,471	0	0	0	73,6112	26-1	0
26	0,5715	E-SERV1-2	Combination	Min	0	-68,28	0	0	0	59,3035	26-1	0,5715
26	0	E-RESIST1-1	Combination	Max	0	201,778	0	0	0	951,7945	26-1	0
26	0,5715	E-RESIST1-1	Combination	Max	0	249,559	0	0	0	953,9915	26-1	0,5715
26	0	E-RESIST1-1	Combination	Min	0	-177,636	0	0	0	0,9286	26-1	0
26	0,5715	E-RESIST1-1	Combination	Min	0	-136,714	0	0	0	-11,8447	26-1	0,5715
26	0	E-RESIST1-2	Combination	Max	0	242,545	0	0	0	1036,9016	26-1	0
26	0,5715	E-RESIST1-2	Combination	Max	0	289,03	0	0	0	1026,9247	26-1	0,5715
26	0	E-RESIST1-2	Combination	Min	0	-215,227	0	0	0	58,8622	26-1	0
26	0,5715	E-RESIST1-2	Combination	Min	0	-169,614	0	0	0	28,6159	26-1	0,5715
27	0	LINEA	LinStatic		0	5,446	0	0	0	55,7399	27-1	0
27	0,5715	LINEA	LinStatic		0	10,893	0	0	0	51,071	27-1	0,5715
27	0	HL93 +	LinMoving	Max	0	99,157	0	0	0	327,3341	27-1	0
27	0,5715	HL93 +	LinMoving	Max	0	114,569	0	0	0	317,6702	27-1	0,5715
27	0	HL93 +	LinMoving	Min	0	-66,804	0	0	0	-67,2575	27-1	0
27	0,5715	HL93 +	LinMoving	Min	0	-57,321	0	0	0	-77,4956	27-1	0,5715
27	0	TAMDEM +	LinMoving	Max	0	110,19	0	0	0	358,6695	27-1	0
27	0,5715	TAMDEM +	LinMoving	Max	0	123,417	0	0	0	345,8936	27-1	0,5715
27	0	TAMDEM +	LinMoving	Min	0	-71,139	0	0	0	-70,2494	27-1	0
27	0,5715	TAMDEM +	LinMoving	Min	0	-58,745	0	0	0	-80,9428	27-1	0,5715
27	0	HL93 -	LinMoving	Max	0	89,241	0	0	0	294,6007	27-1	0
27	0,5715	HL93 -	LinMoving	Max	0	103,112	0	0	0	285,9032	27-1	0,5715
27	0	HL93 -	LinMoving	Min	0	-51,183	0	0	0	-87,6331	27-1	0
27	0,5715	HL93 -	LinMoving	Min	0	-42,942	0	0	0	-90,8189	27-1	0,5715
27	0	TAMDEM -	LinMoving	Max	0	116,115	0	0	0	323,0931	27-1	0
27	0,5715	TAMDEM -	LinMoving	Max	0	127,93	0	0	0	311,5844	27-1	0,5715
27	0	TAMDEM -	LinMoving	Min	0	-80,939	0	0	0	-63,2814	27-1	0
27	0,5715	TAMDEM -	LinMoving	Min	0	-69,774	0	0	0	-72,9141	27-1	0,5715
27	0	SERV1-1 H+	Combination	Max	0	111,815	0	0	0	456,887	27-1	0
27	0,5715	SERV1-1 H+	Combination	Max	0	139,887	0	0	0	436,3714	27-1	0,5715
27	0	SERV1-1 H+	Combination	Min	0	-54,145	0	0	0	62,2953	27-1	0
27	0,5715	SERV1-1 H+	Combination	Min	0	-32,004	0	0	0	41,2056	27-1	0,5715
27	0	SERV1-2 T+	Combination	Max	0	122,848	0	0	0	488,2224	27-1	0
27	0,5715	SERV1-2 T+	Combination	Max	0	148,734	0	0	0	464,5947	27-1	0,5715
27	0	SERV1-2 T+	Combination	Min	0	-58,481	0	0	0	59,3035	27-1	0
27	0,5715	SERV1-2 T+	Combination	Min	0	-33,427	0	0	0	37,7583	27-1	0,5715
27	0	RESIST1-2 T+	Combination	Max	0	275,239	0	0	0	1026,9247	27-1	0
27	0,5715	RESIST1-2 T+	Combination	Max	0	324,797	0	0	0	981,096	27-1	0,5715
27	0	RESIST1-2 T+	Combination	Min	0	-146,805	0	0	0	28,6159	27-1	0
27	0,5715	RESIST1-2 T+	Combination	Min	0	-99,184	0	0	0	-12,3657	27-1	0,5715
27	0	SERV1-1 H-	Combination	Max	0	101,9	0	0	0	424,1536	27-1	0
27	0,5715	SERV1-1 H-	Combination	Max	0	128,43	0	0	0	404,6044	27-1	0,5715
27	0	SERV1-1 H-	Combination	Min	0	-38,524	0	0	0	41,9198	27-1	0
27	0,5715	SERV1-1 H-	Combination	Min	0	-17,625	0	0	0	27,8823	27-1	0,5715
27	0	SERV1-2 T-	Combination	Max	0	128,774	0	0	0	452,646	27-1	0
27	0,5715	SERV1-2 T-	Combination	Max	0	153,247	0	0	0	430,2856	27-1	0,5715
27	0	SERV1-2 T-	Combination	Min	0	-68,28	0	0	0	66,2715	27-1	0
27	0,5715	SERV1-2 T-	Combination	Min	0	-44,456	0	0	0	45,7871	27-1	0,5715
27	0	RESIST 1-1 H+	Combination	Max	0	249,559	0	0	0	953,9915	27-1	0
27	0,5715	RESIST 1-1 H+	Combination	Max	0	304,204	0	0	0	915,4061	27-1	0,5715
27	0	RESIST 1-1 H+	Combination	Min	0	-136,714	0	0	0	35,5794	27-1	0
27	0,5715	RESIST 1-1 H+	Combination	Min	0	-95,871	0	0	0	-4,3422	27-1	0,5715
27	0	RESIST1-1 H-	Combination	Max	0	226,481	0	0	0	877,8044	27-1	0
27	0,5715	RESIST1-1 H-	Combination	Max	0	277,538	0	0	0	841,4684	27-1	0,5715
27	0	RESIST1-1 H-	Combination	Min	0	-100,355	0	0	0	-11,8447	27-1	0
27	0,5715	RESIST1-1 H-	Combination	Min	0	-62,403	0	0	0	-35,3522	27-1	0,5715
27	0	RESIST1-2 T-	Combination	Max	0	289,03	0	0	0	944,1206	27-1	0
27	0,5715	RESIST1-2 T-	Combination	Max	0	335,302	0	0	0	901,2415	27-1	0,5715

27	0	RESIST1-2 T-	Combination	Min	0	-169,614	0	0	0	44,834	27-1	0
27	0,5715	RESIST1-2 T-	Combination	Min	0	-124,854	0	0	0	6,3211	27-1	0,5715
27	0	E-SERV1-1	Combination	Max	0	111,815	0	0	0	456,887	27-1	0
27	0,5715	E-SERV1-1	Combination	Max	0	139,887	0	0	0	436,3714	27-1	0,5715
27	0	E-SERV1-1	Combination	Min	0	-54,145	0	0	0	41,9198	27-1	0
27	0,5715	E-SERV1-1	Combination	Min	0	-32,004	0	0	0	27,8823	27-1	0,5715
27	0	E-SERV1-2	Combination	Max	0	128,774	0	0	0	488,2224	27-1	0
27	0,5715	E-SERV1-2	Combination	Max	0	153,247	0	0	0	464,5947	27-1	0,5715
27	0	E-SERV1-2	Combination	Min	0	-68,28	0	0	0	59,3035	27-1	0
27	0,5715	E-SERV1-2	Combination	Min	0	-44,456	0	0	0	37,7583	27-1	0,5715
27	0	E-RESIST1-1	Combination	Max	0	249,559	0	0	0	953,9915	27-1	0
27	0,5715	E-RESIST1-1	Combination	Max	0	304,204	0	0	0	915,4061	27-1	0,5715
27	0	E-RESIST1-1	Combination	Min	0	-136,714	0	0	0	-11,8447	27-1	0
27	0,5715	E-RESIST1-1	Combination	Min	0	-95,871	0	0	0	-35,3522	27-1	0,5715
27	0	E-RESIST1-2	Combination	Max	0	289,03	0	0	0	1026,9247	27-1	0
27	0,5715	E-RESIST1-2	Combination	Max	0	335,302	0	0	0	981,096	27-1	0,5715
27	0	E-RESIST1-2	Combination	Min	0	-169,614	0	0	0	28,6159	27-1	0
27	0,5715	E-RESIST1-2	Combination	Min	0	-124,854	0	0	0	-12,3657	27-1	0,5715
28	0	LINEA	LinStatic		0	10,893	0	0	0	51,071	28-1	0
28	0,5715	LINEA	LinStatic		0	16,339	0	0	0	43,2894	28-1	0,5715
28	0	HL93 +	LinMoving	Max	0	114,569	0	0	0	317,6702	28-1	0
28	0,5715	HL93 +	LinMoving	Max	0	130,785	0	0	0	297,3281	28-1	0,5715
28	0	HL93 +	LinMoving	Min	0	-57,321	0	0	0	-77,4956	28-1	0
28	0,5715	HL93 +	LinMoving	Min	0	-47,349	0	0	0	-87,7336	28-1	0,5715
28	0	TAMDEM +	LinMoving	Max	0	123,417	0	0	0	345,8936	28-1	0
28	0,5715	TAMDEM +	LinMoving	Max	0	136,52	0	0	0	322,4401	28-1	0,5715
28	0	TAMDEM +	LinMoving	Min	0	-58,745	0	0	0	-80,9428	28-1	0
28	0,5715	TAMDEM +	LinMoving	Min	0	-46,89	0	0	0	-91,6363	28-1	0,5715
28	0	HL93 -	LinMoving	Max	0	103,112	0	0	0	285,9032	28-1	0
28	0,5715	HL93 -	LinMoving	Max	0	117,706	0	0	0	267,5953	28-1	0,5715
28	0	HL93 -	LinMoving	Min	0	-42,942	0	0	0	-90,8189	28-1	0
28	0,5715	HL93 -	LinMoving	Min	0	-35,432	0	0	0	-94,0047	28-1	0,5715
28	0	TAMDEM -	LinMoving	Max	0	127,93	0	0	0	311,5844	28-1	0
28	0,5715	TAMDEM -	LinMoving	Max	0	139,002	0	0	0	290,4573	28-1	0,5715
28	0	TAMDEM -	LinMoving	Min	0	-69,774	0	0	0	-72,9141	28-1	0
28	0,5715	TAMDEM -	LinMoving	Min	0	-59,095	0	0	0	-82,5469	28-1	0,5715
28	0	SERV1-1 H+	Combination	Max	0	139,887	0	0	0	436,3714	28-1	0
28	0,5715	SERV1-1 H+	Combination	Max	0	168,761	0	0	0	397,9431	28-1	0,5715
28	0	SERV1-1 H+	Combination	Min	0	-32,004	0	0	0	41,2056	28-1	0
28	0,5715	SERV1-1 H+	Combination	Min	0	-9,373	0	0	0	12,8814	28-1	0,5715
28	0	SERV1-2 T+	Combination	Max	0	148,734	0	0	0	464,5947	28-1	0
28	0,5715	SERV1-2 T+	Combination	Max	0	174,496	0	0	0	423,0552	28-1	0,5715
28	0	SERV1-2 T+	Combination	Min	0	-33,427	0	0	0	37,7583	28-1	0
28	0,5715	SERV1-2 T+	Combination	Min	0	-8,914	0	0	0	8,9787	28-1	0,5715
28	0	RESIST1-2 T+	Combination	Max	0	324,797	0	0	0	981,096	28-1	0
28	0,5715	RESIST1-2 T+	Combination	Max	0	374,067	0	0	0	899,6872	28-1	0,5715
28	0	RESIST1-2 T+	Combination	Min	0	-99,184	0	0	0	-12,3657	28-1	0
28	0,5715	RESIST1-2 T+	Combination	Min	0	-52,82	0	0	0	-64,0757	28-1	0,5715
28	0	SERV1-1 H-	Combination	Max	0	128,43	0	0	0	404,6044	28-1	0
28	0,5715	SERV1-1 H-	Combination	Max	0	155,683	0	0	0	368,2103	28-1	0,5715
28	0	SERV1-1 H-	Combination	Min	0	-17,625	0	0	0	27,8823	28-1	0
28	0,5715	SERV1-1 H-	Combination	Min	0	2,544	0	0	0	6,6104	28-1	0,5715
28	0	SERV1-2 T-	Combination	Max	0	153,247	0	0	0	430,2856	28-1	0
28	0,5715	SERV1-2 T-	Combination	Max	0	176,978	0	0	0	391,0724	28-1	0,5715
28	0	SERV1-2 T-	Combination	Min	0	-44,456	0	0	0	45,7871	28-1	0
28	0,5715	SERV1-2 T-	Combination	Min	0	-21,119	0	0	0	18,0681	28-1	0,5715
28	0	RESIST 1-1 H+	Combination	Max	0	304,204	0	0	0	915,4061	28-1	0
28	0,5715	RESIST 1-1 H+	Combination	Max	0	360,719	0	0	0	841,239	28-1	0,5715
28	0	RESIST 1-1 H+	Combination	Min	0	-95,871	0	0	0	-4,3422	28-1	0
28	0,5715	RESIST 1-1 H+	Combination	Min	0	-53,888	0	0	0	-54,9921	28-1	0,5715
28	0	RESIST1-1 H-	Combination	Max	0	277,538	0	0	0	841,4684	28-1	0
28	0,5715	RESIST1-1 H-	Combination	Max	0	330,279	0	0	0	772,0358	28-1	0,5715
28	0	RESIST1-1 H-	Combination	Min	0	-62,403	0	0	0	-35,3522	28-1	0
28	0,5715	RESIST1-1 H-	Combination	Min	0	-26,151	0	0	0	-69,5881	28-1	0,5715
28	0	RESIST1-2 T-	Combination	Max	0	335,302	0	0	0	901,2415	28-1	0
28	0,5715	RESIST1-2 T-	Combination	Max	0	379,844	0	0	0	825,2472	28-1	0,5715
28	0	RESIST1-2 T-	Combination	Min	0	-124,854	0	0	0	6,3211	28-1	0
28	0,5715	RESIST1-2 T-	Combination	Min	0	-81,227	0	0	0	-42,9201	28-1	0,5715

29	0	E-SERV1-1	Combination	Min	0	-9,373	0	0	0	6,6104	29-1	0
29	0,5715	E-SERV1-1	Combination	Min	0	13,734	0	0	0	-22,6772	29-1	0,5715
29	0	E-SERV1-2	Combination	Max	0	176,978	0	0	0	423,0552	29-1	0
29	0,5715	E-SERV1-2	Combination	Max	0	200,002	0	0	0	364,1195	29-1	0,5715
29	0	E-SERV1-2	Combination	Min	0	-21,119	0	0	0	8,9787	29-1	0
29	0,5715	E-SERV1-2	Combination	Min	0	1,612	0	0	0	-27,0353	29-1	0,5715
29	0	E-RESIST1-1	Combination	Max	0	360,719	0	0	0	841,239	29-1	0
29	0,5715	E-RESIST1-1	Combination	Max	0	418,359	0	0	0	732,1077	29-1	0,5715
29	0	E-RESIST1-1	Combination	Min	0	-53,888	0	0	0	-69,5881	29-1	0
29	0,5715	E-RESIST1-1	Combination	Min	0	-10,797	0	0	0	-116,3705	29-1	0,5715
29	0	E-RESIST1-2	Combination	Max	0	379,844	0	0	0	899,6872	29-1	0
29	0,5715	E-RESIST1-2	Combination	Max	0	422,74	0	0	0	783,8987	29-1	0,5715
29	0	E-RESIST1-2	Combination	Min	0	-81,227	0	0	0	-64,0757	29-1	0
29	0,5715	E-RESIST1-2	Combination	Min	0	-39,011	0	0	0	-126,514	29-1	0,5715
30	0	LINEA	LinStatic		0	21,786	0	0	0	32,3953	30-1	0
30	0,5715	LINEA	LinStatic		0	27,232	0	0	0	18,3885	30-1	0,5715
30	0	HL93 +	LinMoving	Max	0	147,484	0	0	0	266,5733	30-1	0
30	0,5715	HL93 +	LinMoving	Max	0	163,953	0	0	0	223,2431	30-1	0,5715
30	0	HL93 +	LinMoving	Min	0	-36,901	0	0	0	-97,9716	30-1	0
30	0,5715	HL93 +	LinMoving	Min	0	-26,104	0	0	0	-108,2096	30-1	0,5715
30	0	TAMDEM +	LinMoving	Max	0	149,367	0	0	0	288,8251	30-1	0
30	0,5715	TAMDEM +	LinMoving	Max	0	161,824	0	0	0	245,8678	30-1	0,5715
30	0	TAMDEM +	LinMoving	Min	0	-35,709	0	0	0	-102,3297	30-1	0
30	0,5715	TAMDEM +	LinMoving	Min	0	-25,333	0	0	0	-113,0232	30-1	0,5715
30	0	HL93 -	LinMoving	Max	0	132,736	0	0	0	239,916	30-1	0
30	0,5715	HL93 -	LinMoving	Max	0	147,558	0	0	0	200,9188	30-1	0,5715
30	0	HL93 -	LinMoving	Min	0	-28,938	0	0	0	-97,2339	30-1	0
30	0,5715	HL93 -	LinMoving	Min	0	-22,778	0	0	0	-100,6706	30-1	0,5715
30	0	TAMDEM -	LinMoving	Max	0	149,288	0	0	0	260,1765	30-1	0
30	0,5715	TAMDEM -	LinMoving	Max	0	158,75	0	0	0	221,4802	30-1	0,5715
30	0	TAMDEM -	LinMoving	Min	0	-49,023	0	0	0	-92,1796	30-1	0
30	0,5715	TAMDEM -	LinMoving	Min	0	-39,674	0	0	0	-101,8124	30-1	0,5715
30	0	SERV1-1 H+	Combination	Max	0	198,119	0	0	0	341,8677	30-1	0
30	0,5715	SERV1-1 H+	Combination	Max	0	227,247	0	0	0	265,9824	30-1	0,5715
30	0	SERV1-1 H+	Combination	Min	0	13,734	0	0	0	-22,6772	30-1	0
30	0,5715	SERV1-1 H+	Combination	Min	0	37,19	0	0	0	-65,4703	30-1	0,5715
30	0	SERV1-2 T+	Combination	Max	0	200,002	0	0	0	364,1195	30-1	0
30	0,5715	SERV1-2 T+	Combination	Max	0	225,118	0	0	0	288,6072	30-1	0,5715
30	0	SERV1-2 T+	Combination	Min	0	14,926	0	0	0	-27,0353	30-1	0
30	0,5715	SERV1-2 T+	Combination	Min	0	37,961	0	0	0	-70,2838	30-1	0,5715
30	0	RESIST1-2 T+	Combination	Max	0	422,74	0	0	0	783,8987	30-1	0
30	0,5715	RESIST1-2 T+	Combination	Max	0	470,507	0	0	0	635,638	30-1	0,5715
30	0	RESIST1-2 T+	Combination	Min	0	-8,023	0	0	0	-126,514	30-1	0
30	0,5715	RESIST1-2 T+	Combination	Min	0	34,899	0	0	0	-199,6808	30-1	0,5715
30	0	SERV1-1 H-	Combination	Max	0	183,371	0	0	0	315,2104	30-1	0
30	0,5715	SERV1-1 H-	Combination	Max	0	210,851	0	0	0	243,6581	30-1	0,5715
30	0	SERV1-1 H-	Combination	Min	0	21,697	0	0	0	-21,9395	30-1	0
30	0,5715	SERV1-1 H-	Combination	Min	0	40,515	0	0	0	-57,9312	30-1	0,5715
30	0	SERV1-2 T-	Combination	Max	0	199,923	0	0	0	335,4709	30-1	0
30	0,5715	SERV1-2 T-	Combination	Max	0	222,044	0	0	0	264,2196	30-1	0,5715
30	0	SERV1-2 T-	Combination	Min	0	1,612	0	0	0	-16,8852	30-1	0
30	0,5715	SERV1-2 T-	Combination	Min	0	23,62	0	0	0	-59,0731	30-1	0,5715
30	0	RESIST 1-1 H+	Combination	Max	0	418,359	0	0	0	732,1077	30-1	0
30	0,5715	RESIST 1-1 H+	Combination	Max	0	475,463	0	0	0	582,9788	30-1	0,5715
30	0	RESIST 1-1 H+	Combination	Min	0	-10,797	0	0	0	-116,3705	30-1	0
30	0,5715	RESIST 1-1 H+	Combination	Min	0	33,105	0	0	0	-188,4773	30-1	0,5715
30	0	RESIST1-1 H-	Combination	Max	0	384,032	0	0	0	670,0628	30-1	0
30	0,5715	RESIST1-1 H-	Combination	Max	0	437,303	0	0	0	531,019	30-1	0,5715
30	0	RESIST1-1 H-	Combination	Min	0	7,737	0	0	0	-114,6535	30-1	0
30	0,5715	RESIST1-1 H-	Combination	Min	0	40,845	0	0	0	-170,9301	30-1	0,5715
30	0	RESIST1-2 T-	Combination	Max	0	422,558	0	0	0	717,2192	30-1	0
30	0,5715	RESIST1-2 T-	Combination	Max	0	463,352	0	0	0	578,8758	30-1	0,5715
30	0	RESIST1-2 T-	Combination	Min	0	-39,011	0	0	0	-102,8897	30-1	0
30	0,5715	RESIST1-2 T-	Combination	Min	0	1,52	0	0	0	-173,5878	30-1	0,5715
30	0	E-SERV1-1	Combination	Max	0	198,119	0	0	0	341,8677	30-1	0
30	0,5715	E-SERV1-1	Combination	Max	0	227,247	0	0	0	265,9824	30-1	0,5715
30	0	E-SERV1-1	Combination	Min	0	13,734	0	0	0	-22,6772	30-1	0
30	0,5715	E-SERV1-1	Combination	Min	0	37,19	0	0	0	-65,4703	30-1	0,5715

28	0	E-SERV1-1	Combination	Max	0	139,887	0	0	0	436,3714	28-1	0
28	0,5715	E-SERV1-1	Combination	Max	0	168,761	0	0	0	397,9431	28-1	0,5715
28	0	E-SERV1-1	Combination	Min	0	-32,004	0	0	0	27,8823	28-1	0
28	0,5715	E-SERV1-1	Combination	Min	0	-9,373	0	0	0	6,6104	28-1	0,5715
28	0	E-SERV1-2	Combination	Max	0	153,247	0	0	0	464,5947	28-1	0
28	0,5715	E-SERV1-2	Combination	Max	0	176,978	0	0	0	423,0552	28-1	0,5715
28	0	E-SERV1-2	Combination	Min	0	-44,456	0	0	0	37,7583	28-1	0
28	0,5715	E-SERV1-2	Combination	Min	0	-21,119	0	0	0	8,9787	28-1	0,5715
28	0	E-RESIST1-1	Combination	Max	0	304,204	0	0	0	915,4061	28-1	0
28	0,5715	E-RESIST1-1	Combination	Max	0	360,719	0	0	0	841,239	28-1	0,5715
28	0	E-RESIST1-1	Combination	Min	0	-95,871	0	0	0	-35,3522	28-1	0
28	0,5715	E-RESIST1-1	Combination	Min	0	-53,888	0	0	0	-69,5881	28-1	0,5715
28	0	E-RESIST1-2	Combination	Max	0	335,302	0	0	0	981,096	28-1	0
28	0,5715	E-RESIST1-2	Combination	Max	0	379,844	0	0	0	899,6872	28-1	0,5715
28	0	E-RESIST1-2	Combination	Min	0	-124,854	0	0	0	-12,3657	28-1	0
28	0,5715	E-RESIST1-2	Combination	Min	0	-81,227	0	0	0	-64,0757	28-1	0,5715
29	0	LINEA	LinStatic		0	16,339	0	0	0	43,2894	29-1	0
29	0,5715	LINEA	LinStatic		0	21,786	0	0	0	32,3953	29-1	0,5715
29	0	HL93 +	LinMoving	Max	0	130,785	0	0	0	297,3281	29-1	0
29	0,5715	HL93 +	LinMoving	Max	0	147,484	0	0	0	266,5733	29-1	0,5715
29	0	HL93 +	LinMoving	Min	0	-47,349	0	0	0	-87,7336	29-1	0
29	0,5715	HL93 +	LinMoving	Min	0	-36,901	0	0	0	-97,9716	29-1	0,5715
29	0	TAMDEM +	LinMoving	Max	0	136,52	0	0	0	322,4401	29-1	0
29	0,5715	TAMDEM +	LinMoving	Max	0	149,367	0	0	0	288,8251	29-1	0,5715
29	0	TAMDEM +	LinMoving	Min	0	-46,89	0	0	0	-91,6363	29-1	0
29	0,5715	TAMDEM +	LinMoving	Min	0	-35,709	0	0	0	-102,3297	29-1	0,5715
29	0	HL93 -	LinMoving	Max	0	117,706	0	0	0	267,5953	29-1	0
29	0,5715	HL93 -	LinMoving	Max	0	132,736	0	0	0	239,916	29-1	0,5715
29	0	HL93 -	LinMoving	Min	0	-35,432	0	0	0	-94,0047	29-1	0
29	0,5715	HL93 -	LinMoving	Min	0	-28,938	0	0	0	-97,2339	29-1	0,5715
29	0	TAMDEM -	LinMoving	Max	0	139,002	0	0	0	290,4573	29-1	0
29	0,5715	TAMDEM -	LinMoving	Max	0	149,288	0	0	0	260,1765	29-1	0,5715
29	0	TAMDEM -	LinMoving	Min	0	-59,095	0	0	0	-82,5469	29-1	0
29	0,5715	TAMDEM -	LinMoving	Min	0	-49,023	0	0	0	-92,1796	29-1	0,5715
29	0	SERV1-1 H+	Combination	Max	0	168,761	0	0	0	397,9431	29-1	0
29	0,5715	SERV1-1 H+	Combination	Max	0	198,119	0	0	0	341,8677	29-1	0,5715
29	0	SERV1-1 H+	Combination	Min	0	-9,373	0	0	0	12,8814	29-1	0
29	0,5715	SERV1-1 H+	Combination	Min	0	13,734	0	0	0	-22,6772	29-1	0,5715
29	0	SERV1-2 T+	Combination	Max	0	174,496	0	0	0	423,0552	29-1	0
29	0,5715	SERV1-2 T+	Combination	Max	0	200,002	0	0	0	364,1195	29-1	0,5715
29	0	SERV1-2 T+	Combination	Min	0	-8,914	0	0	0	8,9787	29-1	0
29	0,5715	SERV1-2 T+	Combination	Min	0	14,926	0	0	0	-27,0353	29-1	0,5715
29	0	RESIST1-2 T+	Combination	Max	0	374,067	0	0	0	899,6872	29-1	0
29	0,5715	RESIST1-2 T+	Combination	Max	0	422,74	0	0	0	783,8987	29-1	0,5715
29	0	RESIST1-2 T+	Combination	Min	0	-52,82	0	0	0	-64,0757	29-1	0
29	0,5715	RESIST1-2 T+	Combination	Min	0	-8,023	0	0	0	-126,514	29-1	0,5715
29	0	SERV1-1 H-	Combination	Max	0	155,683	0	0	0	368,2103	29-1	0
29	0,5715	SERV1-1 H-	Combination	Max	0	183,371	0	0	0	315,2104	29-1	0,5715
29	0	SERV1-1 H-	Combination	Min	0	2,544	0	0	0	6,6104	29-1	0
29	0,5715	SERV1-1 H-	Combination	Min	0	21,697	0	0	0	-21,9395	29-1	0,5715
29	0	SERV1-2 T-	Combination	Max	0	176,978	0	0	0	391,0724	29-1	0
29	0,5715	SERV1-2 T-	Combination	Max	0	199,923	0	0	0	335,4709	29-1	0,5715
29	0	SERV1-2 T-	Combination	Min	0	-21,119	0	0	0	18,0681	29-1	0
29	0,5715	SERV1-2 T-	Combination	Min	0	1,612	0	0	0	-16,8852	29-1	0,5715
29	0	RESIST 1-1 H+	Combination	Max	0	360,719	0	0	0	841,239	29-1	0
29	0,5715	RESIST 1-1 H+	Combination	Max	0	418,359	0	0	0	732,1077	29-1	0,5715
29	0	RESIST 1-1 H+	Combination	Min	0	-53,888	0	0	0	-54,9921	29-1	0
29	0,5715	RESIST 1-1 H+	Combination	Min	0	-10,797	0	0	0	-116,3705	29-1	0,5715
29	0	RESIST1-1 H-	Combination	Max	0	330,279	0	0	0	772,0358	29-1	0
29	0,5715	RESIST1-1 H-	Combination	Max	0	384,032	0	0	0	670,0628	29-1	0,5715
29	0	RESIST1-1 H-	Combination	Min	0	-26,151	0	0	0	-69,5881	29-1	0
29	0,5715	RESIST1-1 H-	Combination	Min	0	7,737	0	0	0	-114,6535	29-1	0,5715
29	0	RESIST1-2 T-	Combination	Max	0	379,844	0	0	0	825,2472	29-1	0
29	0,5715	RESIST1-2 T-	Combination	Max	0	422,558	0	0	0	717,2192	29-1	0,5715
29	0	RESIST1-2 T-	Combination	Min	0	-81,227	0	0	0	-42,9201	29-1	0
29	0,5715	RESIST1-2 T-	Combination	Min	0	-39,011	0	0	0	-102,8897	29-1	0,5715
29	0	E-SERV1-1	Combination	Max	0	168,761	0	0	0	397,9431	29-1	0
29	0,5715	E-SERV1-1	Combination	Max	0	198,119	0	0	0	341,8677	29-1	0,5715

30	0	E-SERV1-2	Combination	Max	0	200,002	0	0	0	364,1195	30-1	0
30	0,5715	E-SERV1-2	Combination	Max	0	225,118	0	0	0	288,6072	30-1	0,5715
30	0	E-SERV1-2	Combination	Min	0	1,612	0	0	0	-27,0353	30-1	0
30	0,5715	E-SERV1-2	Combination	Min	0	23,62	0	0	0	-70,2838	30-1	0,5715
30	0	E-RESIST1-1	Combination	Max	0	418,359	0	0	0	732,1077	30-1	0
30	0,5715	E-RESIST1-1	Combination	Max	0	475,463	0	0	0	582,9788	30-1	0,5715
30	0	E-RESIST1-1	Combination	Min	0	-10,797	0	0	0	-116,3705	30-1	0
30	0,5715	E-RESIST1-1	Combination	Min	0	33,105	0	0	0	-188,4773	30-1	0,5715
30	0	E-RESIST1-2	Combination	Max	0	422,74	0	0	0	783,8987	30-1	0
30	0,5715	E-RESIST1-2	Combination	Max	0	470,507	0	0	0	635,638	30-1	0,5715
30	0	E-RESIST1-2	Combination	Min	0	-39,011	0	0	0	-126,514	30-1	0
30	0,5715	E-RESIST1-2	Combination	Min	0	1,52	0	0	0	-199,6808	30-1	0,5715
31	0	LINEA	LinStatic		0	27,232	0	0	0	18,3885	31-1	0
31	0,5715	LINEA	LinStatic		0	32,678	0	0	0	1,2691	31-1	0,5715
31	0	HL93 +	LinMoving	Max	0	163,953	0	0	0	223,2431	31-1	0
31	0,5715	HL93 +	LinMoving	Max	0	180,034	0	0	0	167,9901	31-1	0,5715
31	0	HL93 +	LinMoving	Min	0	-26,104	0	0	0	-108,2096	31-1	0
31	0,5715	HL93 +	LinMoving	Min	0	-19,369	0	0	0	-118,4476	31-1	0,5715
31	0	TAMDEM +	LinMoving	Max	0	161,824	0	0	0	245,8678	31-1	0
31	0,5715	TAMDEM +	LinMoving	Max	0	173,759	0	0	0	194,6917	31-1	0,5715
31	0	TAMDEM +	LinMoving	Min	0	-25,333	0	0	0	-113,0232	31-1	0
31	0,5715	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-123,7166	31-1	0,5715
31	0	HL93 -	LinMoving	Max	0	147,558	0	0	0	200,9188	31-1	0
31	0,5715	HL93 -	LinMoving	Max	0	162,031	0	0	0	151,1911	31-1	0,5715
31	0	HL93 -	LinMoving	Min	0	-22,778	0	0	0	-100,6706	31-1	0
31	0,5715	HL93 -	LinMoving	Min	0	-17,018	0	0	0	-106,6029	31-1	0,5715
31	0	TAMDEM -	LinMoving	Max	0	158,75	0	0	0	221,4802	31-1	0
31	0,5715	TAMDEM -	LinMoving	Max	0	167,347	0	0	0	179,5284	31-1	0,5715
31	0	TAMDEM -	LinMoving	Min	0	-39,674	0	0	0	-101,8124	31-1	0
31	0,5715	TAMDEM -	LinMoving	Min	0	-30,559	0	0	0	-114,976	31-1	0,5715
31	0	SERV1-1 H+	Combination	Max	0	227,247	0	0	0	265,9824	31-1	0
31	0,5715	SERV1-1 H+	Combination	Max	0	255,987	0	0	0	170,9399	31-1	0,5715
31	0	SERV1-1 H+	Combination	Min	0	37,19	0	0	0	-65,4703	31-1	0
31	0,5715	SERV1-1 H+	Combination	Min	0	56,583	0	0	0	-115,4978	31-1	0,5715
31	0	SERV1-2 T+	Combination	Max	0	225,118	0	0	0	288,6072	31-1	0
31	0,5715	SERV1-2 T+	Combination	Max	0	249,711	0	0	0	197,6415	31-1	0,5715
31	0	SERV1-2 T+	Combination	Min	0	37,961	0	0	0	-70,2838	31-1	0
31	0,5715	SERV1-2 T+	Combination	Min	0	57,24	0	0	0	-120,7668	31-1	0,5715
31	0	RESIST1-2 T+	Combination	Max	0	470,507	0	0	0	635,638	31-1	0
31	0,5715	RESIST1-2 T+	Combination	Max	0	517,058	0	0	0	457,5193	31-1	0,5715
31	0	RESIST1-2 T+	Combination	Min	0	34,899	0	0	0	-199,6808	31-1	0
31	0,5715	RESIST1-2 T+	Combination	Min	0	69,082	0	0	0	-283,576	31-1	0,5715
31	0	SERV1-1 H-	Combination	Max	0	210,851	0	0	0	243,6581	31-1	0
31	0,5715	SERV1-1 H-	Combination	Max	0	237,983	0	0	0	154,1409	31-1	0,5715
31	0	SERV1-1 H-	Combination	Min	0	40,515	0	0	0	-57,9312	31-1	0
31	0,5715	SERV1-1 H-	Combination	Min	0	58,935	0	0	0	-103,6531	31-1	0,5715
31	0	SERV1-2 T-	Combination	Max	0	222,044	0	0	0	264,2196	31-1	0
31	0,5715	SERV1-2 T-	Combination	Max	0	243,299	0	0	0	182,4782	31-1	0,5715
31	0	SERV1-2 T-	Combination	Min	0	23,62	0	0	0	-59,0731	31-1	0
31	0,5715	SERV1-2 T-	Combination	Min	0	45,393	0	0	0	-112,0262	31-1	0,5715
31	0	RESIST 1-1 H+	Combination	Max	0	475,463	0	0	0	582,9788	31-1	0
31	0,5715	RESIST 1-1 H+	Combination	Max	0	531,664	0	0	0	395,3713	31-1	0,5715
31	0	RESIST 1-1 H+	Combination	Min	0	33,105	0	0	0	-188,4773	31-1	0
31	0,5715	RESIST 1-1 H+	Combination	Min	0	67,553	0	0	0	-271,3125	31-1	0,5715
31	0	RESIST1-1 H-	Combination	Max	0	437,303	0	0	0	531,019	31-1	0
31	0,5715	RESIST1-1 H-	Combination	Max	0	489,761	0	0	0	356,2716	31-1	0,5715
31	0	RESIST1-1 H-	Combination	Min	0	40,845	0	0	0	-170,9301	31-1	0
31	0,5715	RESIST1-1 H-	Combination	Min	0	73,025	0	0	0	-243,7438	31-1	0,5715
31	0	RESIST1-2 T-	Combination	Max	0	463,352	0	0	0	578,8758	31-1	0
31	0,5715	RESIST1-2 T-	Combination	Max	0	502,133	0	0	0	422,2267	31-1	0,5715
31	0	RESIST1-2 T-	Combination	Min	0	1,52	0	0	0	-173,5878	31-1	0
31	0,5715	RESIST1-2 T-	Combination	Min	0	41,508	0	0	0	-263,2323	31-1	0,5715
31	0	E-SERV1-1	Combination	Max	0	227,247	0	0	0	265,9824	31-1	0
31	0,5715	E-SERV1-1	Combination	Max	0	255,987	0	0	0	170,9399	31-1	0,5715
31	0	E-SERV1-1	Combination	Min	0	37,19	0	0	0	-65,4703	31-1	0
31	0,5715	E-SERV1-1	Combination	Min	0	56,583	0	0	0	-115,4978	31-1	0,5715
31	0	E-SERV1-2	Combination	Max	0	225,118	0	0	0	288,6072	31-1	0
31	0,5715	E-SERV1-2	Combination	Max	0	249,711	0	0	0	197,6415	31-1	0,5715

31	0	E-SERV1-2	Combination	Min	0	23,62	0	0	0	-70,2838	31-1	0
31	0,5715	E-SERV1-2	Combination	Min	0	45,393	0	0	0	-120,7668	31-1	0,5715
31	0	E-RESIST1-1	Combination	Max	0	475,463	0	0	0	582,9788	31-1	0
31	0,5715	E-RESIST1-1	Combination	Max	0	531,664	0	0	0	395,3713	31-1	0,5715
31	0	E-RESIST1-1	Combination	Min	0	33,105	0	0	0	-188,4773	31-1	0
31	0,5715	E-RESIST1-1	Combination	Min	0	67,553	0	0	0	-271,3125	31-1	0,5715
31	0	E-RESIST1-2	Combination	Max	0	470,507	0	0	0	635,638	31-1	0
31	0,5715	E-RESIST1-2	Combination	Max	0	517,058	0	0	0	457,5193	31-1	0,5715
31	0	E-RESIST1-2	Combination	Min	0	1,52	0	0	0	-199,6808	31-1	0
31	0,5715	E-RESIST1-2	Combination	Min	0	41,508	0	0	0	-283,576	31-1	0,5715
32	0	LINEA	LinStatic		0	32,678	0	0	0	1,2691	32-1	0
32	0,5715	LINEA	LinStatic		0	38,125	0	0	0	-18,9628	32-1	0,5715
32	0	HL93 +	LinMoving	Max	0	180,034	0	0	0	167,9901	32-1	0
32	0,5715	HL93 +	LinMoving	Max	0	195,572	0	0	0	120,5474	32-1	0,5715
32	0	HL93 +	LinMoving	Min	0	-19,369	0	0	0	-118,4476	32-1	0
32	0,5715	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-128,6857	32-1	0,5715
32	0	TAMDEM +	LinMoving	Max	0	173,759	0	0	0	194,6917	32-1	0
32	0,5715	TAMDEM +	LinMoving	Max	0	185,039	0	0	0	136,7236	32-1	0,5715
32	0	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-123,7166	32-1	0
32	0,5715	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-134,4101	32-1	0,5715
32	0	HL93 -	LinMoving	Max	0	162,031	0	0	0	151,1911	32-1	0
32	0,5715	HL93 -	LinMoving	Max	0	176,015	0	0	0	108,154	32-1	0,5715
32	0	HL93 -	LinMoving	Min	0	-17,018	0	0	0	-106,6029	32-1	0
32	0,5715	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-115,8171	32-1	0,5715
32	0	TAMDEM -	LinMoving	Max	0	167,347	0	0	0	179,5284	32-1	0
32	0,5715	TAMDEM -	LinMoving	Max	0	175,038	0	0	0	136,9434	32-1	0,5715
32	0	TAMDEM -	LinMoving	Min	0	-30,559	0	0	0	-114,976	32-1	0
32	0,5715	TAMDEM -	LinMoving	Min	0	-23,999	0	0	0	-151,1177	32-1	0,5715
32	0	SERV1-1 H+	Combination	Max	0	255,987	0	0	0	170,9399	32-1	0
32	0,5715	SERV1-1 H+	Combination	Max	0	284,183	0	0	0	76,4732	32-1	0,5715
32	0	SERV1-1 H+	Combination	Min	0	56,583	0	0	0	-115,4978	32-1	0
32	0,5715	SERV1-1 H+	Combination	Min	0	70,697	0	0	0	-172,7599	32-1	0,5715
32	0	SERV1-2 T+	Combination	Max	0	249,711	0	0	0	197,6415	32-1	0
32	0,5715	SERV1-2 T+	Combination	Max	0	273,65	0	0	0	92,6494	32-1	0,5715
32	0	SERV1-2 T+	Combination	Min	0	57,24	0	0	0	-120,7668	32-1	0
32	0,5715	SERV1-2 T+	Combination	Min	0	69,899	0	0	0	-178,4843	32-1	0,5715
32	0	RESIST1-2 T+	Combination	Max	0	517,058	0	0	0	457,5193	32-1	0
32	0,5715	RESIST1-2 T+	Combination	Max	0	562,085	0	0	0	252,864	32-1	0,5715
32	0	RESIST1-2 T+	Combination	Min	0	69,082	0	0	0	-283,576	32-1	0
32	0,5715	RESIST1-2 T+	Combination	Min	0	87,854	0	0	0	-378,1995	32-1	0,5715
32	0	SERV1-1 H-	Combination	Max	0	237,983	0	0	0	154,1409	32-1	0
32	0,5715	SERV1-1 H-	Combination	Max	0	264,626	0	0	0	64,0798	32-1	0,5715
32	0	SERV1-1 H-	Combination	Min	0	58,935	0	0	0	-103,6531	32-1	0
32	0,5715	SERV1-1 H-	Combination	Min	0	72,488	0	0	0	-159,8913	32-1	0,5715
32	0	SERV1-2 T-	Combination	Max	0	243,299	0	0	0	182,4782	32-1	0
32	0,5715	SERV1-2 T-	Combination	Max	0	263,649	0	0	0	92,8692	32-1	0,5715
32	0	SERV1-2 T-	Combination	Min	0	45,393	0	0	0	-112,0262	32-1	0
32	0,5715	SERV1-2 T-	Combination	Min	0	64,612	0	0	0	-195,1919	32-1	0,5715
32	0	RESIST 1-1 H+	Combination	Max	0	531,664	0	0	0	395,3713	32-1	0
32	0,5715	RESIST 1-1 H+	Combination	Max	0	586,6	0	0	0	215,2139	32-1	0,5715
32	0	RESIST 1-1 H+	Combination	Min	0	67,553	0	0	0	-271,3125	32-1	0
32	0,5715	RESIST 1-1 H+	Combination	Min	0	89,711	0	0	0	-364,876	32-1	0,5715
32	0	RESIST1-1 H-	Combination	Max	0	489,761	0	0	0	356,2716	32-1	0
32	0,5715	RESIST1-1 H-	Combination	Max	0	541,081	0	0	0	186,3683	32-1	0,5715
32	0	RESIST1-1 H-	Combination	Min	0	73,025	0	0	0	-243,7438	32-1	0
32	0,5715	RESIST1-1 H-	Combination	Min	0	93,881	0	0	0	-334,9244	32-1	0,5715
32	0	RESIST1-2 T-	Combination	Max	0	502,133	0	0	0	422,2267	32-1	0
32	0,5715	RESIST1-2 T-	Combination	Max	0	538,808	0	0	0	253,3756	32-1	0,5715
32	0	RESIST1-2 T-	Combination	Min	0	41,508	0	0	0	-263,2323	32-1	0
32	0,5715	RESIST1-2 T-	Combination	Min	0	75,549	0	0	0	-417,0866	32-1	0,5715
32	0	E-SERV1-1	Combination	Max	0	255,987	0	0	0	170,9399	32-1	0
32	0,5715	E-SERV1-1	Combination	Max	0	284,183	0	0	0	76,4732	32-1	0,5715
32	0	E-SERV1-1	Combination	Min	0	56,583	0	0	0	-115,4978	32-1	0
32	0,5715	E-SERV1-1	Combination	Min	0	70,697	0	0	0	-172,7599	32-1	0,5715
32	0	E-SERV1-2	Combination	Max	0	249,711	0	0	0	197,6415	32-1	0
32	0,5715	E-SERV1-2	Combination	Max	0	273,65	0	0	0	92,8692	32-1	0,5715
32	0	E-SERV1-2	Combination	Min	0	45,393	0	0	0	-120,7668	32-1	0
32	0,5715	E-SERV1-2	Combination	Min	0	64,612	0	0	0	-195,1919	32-1	0,5715

32	0	E-RESIST1-1	Combination	Max	0	531,664	0	0	0	395,3713	32-1	0
32	0,5715	E-RESIST1-1	Combination	Max	0	586,6	0	0	0	215,2139	32-1	0,5715
32	0	E-RESIST1-1	Combination	Min	0	67,553	0	0	0	-271,3125	32-1	0
32	0,5715	E-RESIST1-1	Combination	Min	0	89,711	0	0	0	-364,876	32-1	0,5715
32	0	E-RESIST1-2	Combination	Max	0	517,058	0	0	0	457,5193	32-1	0
32	0,5715	E-RESIST1-2	Combination	Max	0	562,085	0	0	0	253,3756	32-1	0,5715
32	0	E-RESIST1-2	Combination	Min	0	41,508	0	0	0	-283,576	32-1	0
32	0,5715	E-RESIST1-2	Combination	Min	0	75,549	0	0	0	-417,0866	32-1	0,5715
33	0	LINEA	LinStatic		0	38,125	0	0	0	-18,9628	33-1	0
33	0,5715	LINEA	LinStatic		0	43,571	0	0	0	-42,3075	33-1	0,5715
33	0	HL93 +	LinMoving	Max	0	195,572	0	0	0	120,5474	33-1	0
33	0,5715	HL93 +	LinMoving	Max	0	211,389	0	0	0	83,1134	33-1	0,5715
33	0	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-128,6857	33-1	0
33	0,5715	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-156,2356	33-1	0,5715
33	0	TAMDEM +	LinMoving	Max	0	185,039	0	0	0	136,7236	33-1	0
33	0,5715	TAMDEM +	LinMoving	Max	0	195,531	0	0	0	73,6942	33-1	0,5715
33	0	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-134,4101	33-1	0
33	0,5715	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-145,1035	33-1	0,5715
33	0	HL93 -	LinMoving	Max	0	176,015	0	0	0	108,154	33-1	0
33	0,5715	HL93 -	LinMoving	Max	0	190,25	0	0	0	74,6087	33-1	0,5715
33	0	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-115,8171	33-1	0
33	0,5715	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-125,0313	33-1	0,5715
33	0	TAMDEM -	LinMoving	Max	0	175,038	0	0	0	136,9434	33-1	0
33	0,5715	TAMDEM -	LinMoving	Max	0	182,754	0	0	0	89,7991	33-1	0,5715
33	0	TAMDEM -	LinMoving	Min	0	-23,999	0	0	0	-151,1177	33-1	0
33	0,5715	TAMDEM -	LinMoving	Min	0	-19,636	0	0	0	-205,3758	33-1	0,5715
33	0	SERV1-1 H+	Combination	Max	0	284,183	0	0	0	76,4732	33-1	0
33	0,5715	SERV1-1 H+	Combination	Max	0	312,659	0	0	0	-15,2193	33-1	0,5715
33	0	SERV1-1 H+	Combination	Min	0	70,697	0	0	0	-172,7599	33-1	0
33	0,5715	SERV1-1 H+	Combination	Min	0	83,356	0	0	0	-254,5682	33-1	0,5715
33	0	SERV1-2 T+	Combination	Max	0	273,65	0	0	0	92,6494	33-1	0
33	0,5715	SERV1-2 T+	Combination	Max	0	296,801	0	0	0	-24,6384	33-1	0,5715
33	0	SERV1-2 T+	Combination	Min	0	69,899	0	0	0	-178,4843	33-1	0
33	0,5715	SERV1-2 T+	Combination	Min	0	82,558	0	0	0	-243,4362	33-1	0,5715
33	0	RESIST1-2 T+	Combination	Max	0	562,085	0	0	0	252,864	33-1	0
33	0,5715	RESIST1-2 T+	Combination	Max	0	605,277	0	0	0	25,7002	33-1	0,5715
33	0	RESIST1-2 T+	Combination	Min	0	87,854	0	0	0	-378,1995	33-1	0
33	0,5715	RESIST1-2 T+	Combination	Min	0	106,626	0	0	0	-483,5515	33-1	0,5715
33	0	SERV1-1 H-	Combination	Max	0	264,626	0	0	0	64,0798	33-1	0
33	0,5715	SERV1-1 H-	Combination	Max	0	291,52	0	0	0	-23,7239	33-1	0,5715
33	0	SERV1-1 H-	Combination	Min	0	72,488	0	0	0	-159,8913	33-1	0
33	0,5715	SERV1-1 H-	Combination	Min	0	85,147	0	0	0	-223,364	33-1	0,5715
33	0	SERV1-2 T-	Combination	Max	0	263,649	0	0	0	92,8692	33-1	0
33	0,5715	SERV1-2 T-	Combination	Max	0	284,024	0	0	0	-8,5335	33-1	0,5715
33	0	SERV1-2 T-	Combination	Min	0	64,612	0	0	0	-195,1919	33-1	0
33	0,5715	SERV1-2 T-	Combination	Min	0	81,634	0	0	0	-303,7085	33-1	0,5715
33	0	RESIST 1-1 H+	Combination	Max	0	586,6	0	0	0	215,2139	33-1	0
33	0,5715	RESIST 1-1 H+	Combination	Max	0	642,186	0	0	0	47,6233	33-1	0,5715
33	0	RESIST 1-1 H+	Combination	Min	0	89,711	0	0	0	-364,876	33-1	0
33	0,5715	RESIST 1-1 H+	Combination	Min	0	108,484	0	0	0	-509,4614	33-1	0,5715
33	0	RESIST1-1 H-	Combination	Max	0	541,081	0	0	0	186,3683	33-1	0
33	0,5715	RESIST1-1 H-	Combination	Max	0	592,985	0	0	0	27,8287	33-1	0,5715
33	0	RESIST1-1 H-	Combination	Min	0	93,881	0	0	0	-334,9244	33-1	0
33	0,5715	RESIST1-1 H-	Combination	Min	0	112,653	0	0	0	-436,8335	33-1	0,5715
33	0	RESIST1-2 T-	Combination	Max	0	538,808	0	0	0	253,3756	33-1	0
33	0,5715	RESIST1-2 T-	Combination	Max	0	575,54	0	0	0	63,1844	33-1	0,5715
33	0	RESIST1-2 T-	Combination	Min	0	75,549	0	0	0	-417,0866	33-1	0
33	0,5715	RESIST1-2 T-	Combination	Min	0	104,477	0	0	0	-623,8353	33-1	0,5715
33	0	E-SERV1-1	Combination	Max	0	284,183	0	0	0	76,4732	33-1	0
33	0,5715	E-SERV1-1	Combination	Max	0	312,659	0	0	0	-15,2193	33-1	0,5715
33	0	E-SERV1-1	Combination	Min	0	70,697	0	0	0	-172,7599	33-1	0
33	0,5715	E-SERV1-1	Combination	Min	0	83,356	0	0	0	-254,5682	33-1	0,5715
33	0	E-SERV1-2	Combination	Max	0	273,65	0	0	0	92,8692	33-1	0
33	0,5715	E-SERV1-2	Combination	Max	0	296,801	0	0	0	-8,5335	33-1	0,5715
33	0	E-SERV1-2	Combination	Min	0	64,612	0	0	0	-195,1919	33-1	0
33	0,5715	E-SERV1-2	Combination	Min	0	81,634	0	0	0	-303,7085	33-1	0,5715
33	0	E-RESIST1-1	Combination	Max	0	586,6	0	0	0	215,2139	33-1	0
33	0,5715	E-RESIST1-1	Combination	Max	0	642,186	0	0	0	47,6233	33-1	0,5715

34	0	E-RESIST1-2	Combination	Max	0	605,277	0	0	0	63,1844	34-1	0
34	0,5715	E-RESIST1-2	Combination	Max	0	646,326	0	0	0	-98,6707	34-1	0,5715
34	0	E-RESIST1-2	Combination	Min	0	104,477	0	0	0	-623,8353	34-1	0
34	0,5715	E-RESIST1-2	Combination	Min	0	125,399	0	0	0	-871,8652	34-1	0,5715
35	0	LINEA	LinStatic		0	49,018	0	0	0	-68,7647	35-1	0
35	0,5715	LINEA	LinStatic		0	54,464	0	0	0	-98,3345	35-1	0,5715
35	0	HL93 +	LinMoving	Max	0	227,005	0	0	0	44,5673	35-1	0
35	0,5715	HL93 +	LinMoving	Max	0	241,859	0	0	0	45,3604	35-1	0,5715
35	0	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-209,4331	35-1	0
35	0,5715	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-274,2646	35-1	0,5715
35	0	TAMDEM +	LinMoving	Max	0	205,102	0	0	0	36,6868	35-1	0
35	0,5715	TAMDEM +	LinMoving	Max	0	213,619	0	0	0	47,3808	35-1	0,5715
35	0	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-155,7969	35-1	0
35	0,5715	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-223,9507	35-1	0,5715
35	0	HL93 -	LinMoving	Max	0	204,305	0	0	0	41,3279	35-1	0
35	0,5715	HL93 -	LinMoving	Max	0	217,673	0	0	0	40,8243	35-1	0,5715
35	0	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-147,4102	35-1	0
35	0,5715	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-234,1755	35-1	0,5715
35	0	TAMDEM -	LinMoving	Max	0	198,038	0	0	0	59,4388	35-1	0
35	0,5715	TAMDEM -	LinMoving	Max	0	214,08	0	0	0	42,6811	35-1	0,5715
35	0	TAMDEM -	LinMoving	Min	0	-16,856	0	0	0	-272,7608	35-1	0
35	0,5715	TAMDEM -	LinMoving	Min	0	-16,856	0	0	0	-345,8403	35-1	0,5715
35	0	SERV1-1 H+	Combination	Max	0	340,934	0	0	0	-115,2583	35-1	0
35	0,5715	SERV1-1 H+	Combination	Max	0	368,446	0	0	0	-183,1926	35-1	0,5715
35	0	SERV1-1 H+	Combination	Min	0	96,014	0	0	0	-369,2586	35-1	0
35	0,5715	SERV1-1 H+	Combination	Min	0	108,673	0	0	0	-502,8176	35-1	0,5715
35	0	SERV1-2 T+	Combination	Max	0	319,031	0	0	0	-123,1387	35-1	0
35	0,5715	SERV1-2 T+	Combination	Max	0	340,207	0	0	0	-181,1721	35-1	0,5715
35	0	SERV1-2 T+	Combination	Min	0	95,216	0	0	0	-315,6225	35-1	0
35	0,5715	SERV1-2 T+	Combination	Min	0	107,875	0	0	0	-452,5037	35-1	0,5715
35	0	RESIST1-2 T+	Combination	Max	0	646,326	0	0	0	-151,6258	35-1	0
35	0,5715	RESIST1-2 T+	Combination	Max	0	684,922	0	0	0	-228,6554	35-1	0,5715
35	0	RESIST1-2 T+	Combination	Min	0	125,399	0	0	0	-599,6319	35-1	0
35	0,5715	RESIST1-2 T+	Combination	Min	0	144,171	0	0	0	-860,1796	35-1	0,5715
35	0	SERV1-1 H-	Combination	Max	0	318,233	0	0	0	-118,4976	35-1	0
35	0,5715	SERV1-1 H-	Combination	Max	0	344,26	0	0	0	-187,7286	35-1	0,5715
35	0	SERV1-1 H-	Combination	Min	0	97,806	0	0	0	-307,2358	35-1	0
35	0,5715	SERV1-1 H-	Combination	Min	0	110,464	0	0	0	-462,7284	35-1	0,5715
35	0	SERV1-2 T-	Combination	Max	0	311,967	0	0	0	-100,3868	35-1	0
35	0,5715	SERV1-2 T-	Combination	Max	0	340,667	0	0	0	-185,8718	35-1	0,5715
35	0	SERV1-2 T-	Combination	Min	0	97,072	0	0	0	-432,5864	35-1	0
35	0,5715	SERV1-2 T-	Combination	Min	0	109,731	0	0	0	-574,3933	35-1	0,5715
35	0	RESIST 1-1 H+	Combination	Max	0	697,305	0	0	0	-133,2841	35-1	0
35	0,5715	RESIST 1-1 H+	Combination	Max	0	750,65	0	0	0	-233,3579	35-1	0,5715
35	0	RESIST 1-1 H+	Combination	Min	0	127,256	0	0	0	-724,4699	35-1	0
35	0,5715	RESIST 1-1 H+	Combination	Min	0	146,028	0	0	0	-977,2851	35-1	0,5715
35	0	RESIST1-1 H-	Combination	Max	0	644,47	0	0	0	-140,8237	35-1	0
35	0,5715	RESIST1-1 H-	Combination	Max	0	694,357	0	0	0	-243,9156	35-1	0,5715
35	0	RESIST1-1 H-	Combination	Min	0	131,425	0	0	0	-580,1117	35-1	0
35	0,5715	RESIST1-1 H-	Combination	Min	0	150,198	0	0	0	-883,9776	35-1	0,5715
35	0	RESIST1-2 T-	Combination	Max	0	629,885	0	0	0	-98,6707	35-1	0
35	0,5715	RESIST1-2 T-	Combination	Max	0	685,994	0	0	0	-239,5939	35-1	0,5715
35	0	RESIST1-2 T-	Combination	Min	0	129,719	0	0	0	-871,8652	35-1	0
35	0,5715	RESIST1-2 T-	Combination	Min	0	148,491	0	0	0	-1143,8775	35-1	0,5715
35	0	E-SERV1-1	Combination	Max	0	340,934	0	0	0	-115,2583	35-1	0
35	0,5715	E-SERV1-1	Combination	Max	0	368,446	0	0	0	-183,1926	35-1	0,5715
35	0	E-SERV1-1	Combination	Min	0	96,014	0	0	0	-369,2586	35-1	0
35	0,5715	E-SERV1-1	Combination	Min	0	108,673	0	0	0	-502,8176	35-1	0,5715
35	0	E-SERV1-2	Combination	Max	0	319,031	0	0	0	-100,3868	35-1	0
35	0,5715	E-SERV1-2	Combination	Max	0	340,667	0	0	0	-181,1721	35-1	0,5715
35	0	E-SERV1-2	Combination	Min	0	95,216	0	0	0	-432,5864	35-1	0
35	0,5715	E-SERV1-2	Combination	Min	0	107,875	0	0	0	-574,3933	35-1	0,5715
35	0	E-RESIST1-1	Combination	Max	0	697,305	0	0	0	-133,2841	35-1	0
35	0,5715	E-RESIST1-1	Combination	Max	0	750,65	0	0	0	-233,3579	35-1	0,5715
35	0	E-RESIST1-1	Combination	Min	0	127,256	0	0	0	-724,4699	35-1	0
35	0,5715	E-RESIST1-1	Combination	Min	0	146,028	0	0	0	-977,2851	35-1	0,5715
35	0	E-RESIST1-2	Combination	Max	0	646,326	0	0	0	-98,6707	35-1	0
35	0,5715	E-RESIST1-2	Combination	Max	0	685,994	0	0	0	-228,6554	35-1	0,5715

33	0	E-RESIST1-1	Combination	Min	0	89,711	0	0	0	-364,876	33-1	0
33	0,5715	E-RESIST1-1	Combination	Min	0	108,484	0	0	0	-509,4614	33-1	0,5715
33	0	E-RESIST1-2	Combination	Max	0	562,085	0	0	0	253,3756	33-1	0
33	0,5715	E-RESIST1-2	Combination	Max	0	605,277	0	0	0	63,1844	33-1	0,5715
33	0	E-RESIST1-2	Combination	Min	0	75,549	0	0	0	-417,0866	33-1	0
33	0,5715	E-RESIST1-2	Combination	Min	0	104,477	0	0	0	-623,8353	33-1	0,5715
34	0	LINEA	LinStatic		0	43,571	0	0	0	-42,3075	34-1	0
34	0,5715	LINEA	LinStatic		0	49,018	0	0	0	-68,7647	34-1	0,5715
34	0	HL93 +	LinMoving	Max	0	211,389	0	0	0	83,1134	34-1	0
34	0,5715	HL93 +	LinMoving	Max	0	227,005	0	0	0	44,5673	34-1	0,5715
34	0	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-156,2356	34-1	0
34	0,5715	HL93 +	LinMoving	Min	0	-17,914	0	0	0	-209,4331	34-1	0,5715
34	0	TAMDEM +	LinMoving	Max	0	195,531	0	0	0	73,6942	34-1	0
34	0,5715	TAMDEM +	LinMoving	Max	0	205,102	0	0	0	36,6868	34-1	0,5715
34	0	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-145,1035	34-1	0
34	0,5715	TAMDEM +	LinMoving	Min	0	-18,712	0	0	0	-155,7969	34-1	0,5715
34	0	HL93 -	LinMoving	Max	0	190,25	0	0	0	74,6087	34-1	0
34	0,5715	HL93 -	LinMoving	Max	0	204,305	0	0	0	41,3279	34-1	0,5715
34	0	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-125,0313	34-1	0
34	0,5715	HL93 -	LinMoving	Min	0	-16,123	0	0	0	-147,4102	34-1	0,5715
34	0	TAMDEM -	LinMoving	Max	0	182,754	0	0	0	89,7991	34-1	0
34	0,5715	TAMDEM -	LinMoving	Max	0	198,038	0	0	0	59,4388	34-1	0,5715
34	0	TAMDEM -	LinMoving	Min	0	-19,636	0	0	0	-205,3758	34-1	0
34	0,5715	TAMDEM -	LinMoving	Min	0	-16,856	0	0	0	-272,7608	34-1	0,5715
34	0	SERV1-1 H+	Combination	Max	0	312,659	0	0	0	-15,2193	34-1	0
34	0,5715	SERV1-1 H+	Combination	Max	0	340,934	0	0	0	-115,2583	34-1	0,5715
34	0	SERV1-1 H+	Combination	Min	0	83,356	0	0	0	-254,5682	34-1	0
34	0,5715	SERV1-1 H+	Combination	Min	0	96,014	0	0	0	-369,2586	34-1	0,5715
34	0	SERV1-2 T+	Combination	Max	0	296,801	0	0	0	-24,6384	34-1	0
34	0,5715	SERV1-2 T+	Combination	Max	0	319,031	0	0	0	-123,1387	34-1	0,5715
34	0	SERV1-2 T+	Combination	Min	0	82,558	0	0	0	-243,4362	34-1	0
34	0,5715	SERV1-2 T+	Combination	Min	0	95,216	0	0	0	-315,6225	34-1	0,5715
34	0	RESIST1-2 T+	Combination	Max	0	605,277	0	0	0	25,7002	34-1	0
34	0,5715	RESIST1-2 T+	Combination	Max	0	646,326	0	0	0	-151,6258	34-1	0,5715
34	0	RESIST1-2 T+	Combination	Min	0	106,626	0	0	0	-483,5515	34-1	0
34	0,5715	RESIST1-2 T+	Combination	Min	0	125,399	0	0	0	-599,6319	34-1	0,5715
34	0	SERV1-1 H-	Combination	Max	0	291,52	0	0	0	-23,7239	34-1	0
34	0,5715	SERV1-1 H-	Combination	Max	0	318,233	0	0	0	-118,4976	34-1	0,5715
34	0	SERV1-1 H-	Combination	Min	0	85,147	0	0	0	-223,364	34-1	0
34	0,5715	SERV1-1 H-	Combination	Min	0	97,806	0	0	0	-307,2358	34-1	0,5715
34	0	SERV1-2 T-	Combination	Max	0	284,024	0	0	0	-8,5335	34-1	0
34	0,5715	SERV1-2 T-	Combination	Max	0	311,967	0	0	0	-100,3868	34-1	0,5715
34	0	SERV1-2 T-	Combination	Min	0	81,634	0	0	0	-303,7085	34-1	0
34	0,5715	SERV1-2 T-	Combination	Min	0	97,072	0	0	0	-432,5864	34-1	0,5715
34	0	RESIST 1-1 H+	Combination	Max	0	642,186	0	0	0	47,6233	34-1	0
34	0,5715	RESIST 1-1 H+	Combination	Max	0	697,305	0	0	0	-133,2841	34-1	0,5715
34	0	RESIST 1-1 H+	Combination	Min	0	108,484	0	0	0	-509,4614	34-1	0
34	0,5715	RESIST 1-1 H+	Combination	Min	0	127,256	0	0	0	-724,4699	34-1	0,5715
34	0	RESIST1-1 H-	Combination	Max	0	592,985	0	0	0	27,8287	34-1	0
34	0,5715	RESIST1-1 H-	Combination	Max	0	644,47	0	0	0	-140,8237	34-1	0,5715
34	0	RESIST1-1 H-	Combination	Min	0	112,653	0	0	0	-436,8335	34-1	0
34	0,5715	RESIST1-1 H-	Combination	Min	0	131,425	0	0	0	-580,1117	34-1	0,5715
34	0	RESIST1-2 T-	Combination	Max	0	575,54	0	0	0	63,1844	34-1	0
34	0,5715	RESIST1-2 T-	Combination	Max	0	629,885	0	0	0	-98,6707	34-1	0,5715
34	0	RESIST1-2 T-	Combination	Min	0	104,477	0	0	0	-623,8353	34-1	0
34	0,5715	RESIST1-2 T-	Combination	Min	0	129,719	0	0	0	-871,8652	34-1	0,5715
34	0	E-SERV1-1	Combination	Max	0	312,659	0	0	0	-15,2193	34-1	0
34	0,5715	E-SERV1-1	Combination	Max	0	340,934	0	0	0	-115,2583	34-1	0,5715
34	0	E-SERV1-1	Combination	Min	0	83,356	0	0	0	-254,5682	34-1	0
34	0,5715	E-SERV1-1	Combination	Min	0	96,014	0	0	0	-369,2586	34-1	0,5715
34	0	E-SERV1-2	Combination	Max	0	296,801	0	0	0	-8,5335	34-1	0
34	0,5715	E-SERV1-2	Combination	Max	0	319,031	0	0	0	-100,3868	34-1	0,5715
34	0	E-SERV1-2	Combination	Min	0	81,634	0	0	0	-303,7085	34-1	0
34	0,5715	E-SERV1-2	Combination	Min	0	95,216	0	0	0	-432,5864	34-1	0,5715
34	0	E-RESIST1-1	Combination	Max	0	642,186	0	0	0	47,6233	34-1	0
34	0,5715	E-RESIST1-1	Combination	Max	0	697,305	0	0	0	-133,2841	34-1	0,5715
34	0	E-RESIST1-1	Combination	Min	0	108,484	0	0	0	-509,4614	34-1	0
34	0,5715	E-RESIST1-1	Combination	Min	0	127,256	0	0	0	-724,4699	34-1	0,5715

35	0	E-RESIST1-2	Combination	Min	0	125,399	0	0	0	-871,8652	35-1	0
35	0,5715	E-RESIST1-2	Combination	Min	0	144,171	0	0	0	-1143,8775	35-1	0,5715
36	0	LINEA	LinStatic		0	-52,345	0	0	0	-98,3345	36-1	0
36	0,572	LINEA	LinStatic		0	-46,893	0	0	0	-69,9524	36-1	0,572
36	0	HL93 +	LinMoving	Max	0	5,287	0	0	0	45,3604	36-1	0
36	0,572	HL93 +	LinMoving	Max	0	6,087	0	0	0	48,7469	36-1	0,572
36	0	HL93 +	LinMoving	Min	0	-214,166	0	0	0	-274,2646	36-1	0
36	0,572	HL93 +	LinMoving	Min	0	-197,015	0	0	0	-227,2629	36-1	0,572
36	0	TAMDEM +	LinMoving	Max	0	5,522	0	0	0	47,3808	36-1	0
36	0,572	TAMDEM +	LinMoving	Max	0	5,522	0	0	0	44,2221	36-1	0,572
36	0	TAMDEM +	LinMoving	Min	0	-202,35	0	0	0	-223,9507	36-1	0
36	0,572	TAMDEM +	LinMoving	Min	0	-191,259	0	0	0	-209,0207	36-1	0,572
36	0	HL93 -	LinMoving	Max	0	4,758	0	0	0	40,8243	36-1	0
36	0,572	HL93 -	LinMoving	Max	0	6,971	0	0	0	55,8254	36-1	0,572
36	0	HL93 -	LinMoving	Min	0	-192,749	0	0	0	-234,1755	36-1	0
36	0,572	HL93 -	LinMoving	Min	0	-177,313	0	0	0	-204,5367	36-1	0,572
36	0	TAMDEM -	LinMoving	Max	0	4,974	0	0	0	42,6811	36-1	0
36	0,572	TAMDEM -	LinMoving	Max	0	7,658	0	0	0	61,326	36-1	0,572
36	0	TAMDEM -	LinMoving	Min	0	-196,221	0	0	0	-345,8403	36-1	0
36	0,572	TAMDEM -	LinMoving	Min	0	-188,595	0	0	0	-268,1662	36-1	0,572
36	0	SERV1-1 H+	Combination	Max	0	-116,375	0	0	0	-183,1926	36-1	0
36	0,572	SERV1-1 H+	Combination	Max	0	-102,904	0	0	0	-113,8393	36-1	0,572
36	0	SERV1-1 H+	Combination	Min	0	-335,827	0	0	0	-502,8176	36-1	0
36	0,572	SERV1-1 H+	Combination	Min	0	-306,006	0	0	0	-389,8492	36-1	0,572
36	0	SERV1-2 T+	Combination	Max	0	-116,139	0	0	0	-181,1721	36-1	0
36	0,572	SERV1-2 T+	Combination	Max	0	-103,469	0	0	0	-118,3641	36-1	0,572
36	0	SERV1-2 T+	Combination	Min	0	-324,011	0	0	0	-452,5037	36-1	0
36	0,572	SERV1-2 T+	Combination	Min	0	-300,251	0	0	0	-371,6069	36-1	0,572
36	0	RESIST1-2 T+	Combination	Max	0	-167,566	0	0	0	-228,6554	36-1	0
36	0,572	RESIST1-2 T+	Combination	Max	0	-148,777	0	0	0	-138,1814	36-1	0,572
36	0	RESIST1-2 T+	Combination	Min	0	-651,388	0	0	0	-860,1796	36-1	0
36	0,572	RESIST1-2 T+	Combination	Min	0	-606,786	0	0	0	-727,6041	36-1	0,572
36	0	SERV1-1 H-	Combination	Max	0	-116,903	0	0	0	-187,7286	36-1	0
36	0,572	SERV1-1 H-	Combination	Max	0	-102,02	0	0	0	-106,7608	36-1	0,572
36	0	SERV1-1 H-	Combination	Min	0	-314,411	0	0	0	-462,7284	36-1	0
36	0,572	SERV1-1 H-	Combination	Min	0	-286,305	0	0	0	-367,1229	36-1	0,572
36	0	SERV1-2 T-	Combination	Max	0	-116,687	0	0	0	-185,8718	36-1	0
36	0,572	SERV1-2 T-	Combination	Max	0	-101,333	0	0	0	-101,2602	36-1	0,572
36	0	SERV1-2 T-	Combination	Min	0	-317,883	0	0	0	-574,3933	36-1	0
36	0,572	SERV1-2 T-	Combination	Min	0	-297,586	0	0	0	-430,7525	36-1	0,572
36	0	RESIST 1-1 H+	Combination	Max	0	-168,114	0	0	0	-233,3579	36-1	0
36	0,572	RESIST 1-1 H+	Combination	Max	0	-147,462	0	0	0	-127,6499	36-1	0,572
36	0	RESIST 1-1 H+	Combination	Min	0	-678,89	0	0	0	-977,2851	36-1	0
36	0,572	RESIST 1-1 H+	Combination	Min	0	-620,182	0	0	0	-770,0629	36-1	0,572
36	0	RESIST1-1 H-	Combination	Max	0	-169,344	0	0	0	-243,9156	36-1	0
36	0,572	RESIST1-1 H-	Combination	Max	0	-145,404	0	0	0	-111,1748	36-1	0,572
36	0	RESIST1-1 H-	Combination	Min	0	-629,043	0	0	0	-883,9776	36-1	0
36	0,572	RESIST1-1 H-	Combination	Min	0	-574,326	0	0	0	-717,1674	36-1	0,572
36	0	RESIST1-2 T-	Combination	Max	0	-168,84	0	0	0	-239,5939	36-1	0
36	0,572	RESIST1-2 T-	Combination	Max	0	-143,806	0	0	0	-98,3722	36-1	0,572
36	0	RESIST1-2 T-	Combination	Min	0	-637,124	0	0	0	-1143,8775	36-1	0
36	0,572	RESIST1-2 T-	Combination	Min	0	-600,584	0	0	0	-865,2653	36-1	0,572
36	0	E-SERV1-1	Combination	Max	0	-116,375	0	0	0	-183,1926	36-1	0
36	0,572	E-SERV1-1	Combination	Max	0	-102,02	0	0	0	-106,7608	36-1	0,572
36	0	E-SERV1-1	Combination	Min	0	-335,827	0	0	0	-502,8176	36-1	0
36	0,572	E-SERV1-1	Combination	Min	0	-306,006	0	0	0	-389,8492	36-1	0,572
36	0	E-SERV1-2	Combination	Max	0	-116,139	0	0	0	-181,1721	36-1	0
36	0,572	E-SERV1-2	Combination	Max	0	-101,333	0	0	0	-101,2602	36-1	0,572
36	0	E-SERV1-2	Combination	Min	0	-324,011	0	0	0	-574,3933	36-1	0
36	0,572	E-SERV1-2	Combination	Min	0	-300,251	0	0	0	-430,7525	36-1	0,572
36	0	E-RESIST1-1	Combination	Max	0	-168,114	0	0	0	-233,3579	36-1	0
36	0,572	E-RESIST1-1	Combination	Max	0	-145,404	0	0	0	-111,1748	36-1	0,572
36	0	E-RESIST1-1	Combination	Min	0	-678,89	0	0	0	-977,2851	36-1	0
36	0,572	E-RESIST1-1	Combination	Min	0	-620,182	0	0	0	-770,0629	36-1	0,572
36	0	E-RESIST1-2	Combination	Max	0	-167,566	0	0	0	-228,6554	36-1	0
36	0,572	E-RESIST1-2	Combination	Max	0	-143,806	0	0	0	-98,3722	36-1	0,572
36	0	E-RESIST1-2	Combination	Min	0	-651,388	0	0	0	-1143,8775	36-1	0
36	0,572	E-RESIST1-2	Combination	Min	0	-606,786	0	0	0	-865,2653	36-1	0,572

38	0	HL93 +	LinMoving	Max	0	12,215	0	0	0	90,8286	38-1	0
38	0,572	HL93 +	LinMoving	Max	0	19,052	0	0	0	141,0569	38-1	0,572
38	0	HL93 +	LinMoving	Min	0	-178,631	0	0	0	-208,5556	38-1	0
38	0,572	HL93 +	LinMoving	Min	0	-159,119	0	0	0	-192,5129	38-1	0,572
38	0	TAMDEM +	LinMoving	Max	0	9,222	0	0	0	94,6446	38-1	0
38	0,572	TAMDEM +	LinMoving	Max	0	18,472	0	0	0	160,61	38-1	0,572
38	0	TAMDEM +	LinMoving	Min	0	-179,07	0	0	0	-194,0906	38-1	0
38	0,572	TAMDEM +	LinMoving	Min	0	-165,876	0	0	0	-179,1606	38-1	0,572
38	0	HL93 -	LinMoving	Max	0	13,113	0	0	0	97,5095	38-1	0
38	0,572	HL93 -	LinMoving	Max	0	19,855	0	0	0	146,4474	38-1	0,572
38	0	HL93 -	LinMoving	Min	0	-160,768	0	0	0	-187,7001	38-1	0
38	0,572	HL93 -	LinMoving	Min	0	-143,207	0	0	0	-173,2616	38-1	0,572
38	0	TAMDEM -	LinMoving	Max	0	11,188	0	0	0	91,8093	38-1	0
38	0,572	TAMDEM -	LinMoving	Max	0	18,301	0	0	0	145,3965	38-1	0,572
38	0	TAMDEM -	LinMoving	Min	0	-179,771	0	0	0	-199,4316	38-1	0
38	0,572	TAMDEM -	LinMoving	Min	0	-169,761	0	0	0	-161,3897	38-1	0,572
38	0	SERV1-1 H+	Combination	Max	0	-84,107	0	0	0	-13,038	38-1	0
38	0,572	SERV1-1 H+	Combination	Max	0	-64,6	0	0	0	88,6628	38-1	0,572
38	0	SERV1-1 H+	Combination	Min	0	-274,953	0	0	0	-312,4222	38-1	0
38	0,572	SERV1-1 H+	Combination	Min	0	-242,771	0	0	0	-244,907	38-1	0,572
38	0	SERV1-2 T+	Combination	Max	0	-87,1	0	0	0	-9,222	38-1	0
38	0,572	SERV1-2 T+	Combination	Max	0	-65,18	0	0	0	108,2159	38-1	0,572
38	0	SERV1-2 T+	Combination	Min	0	-275,392	0	0	0	-297,9572	38-1	0
38	0,572	SERV1-2 T+	Combination	Min	0	-249,527	0	0	0	-231,5547	38-1	0,572
38	0	RESIST1-2 T+	Combination	Max	0	-121,378	0	0	0	66,2557	38-1	0
38	0,572	RESIST1-2 T+	Combination	Max	0	-81,058	0	0	0	296,1216	38-1	0,572
38	0	RESIST1-2 T+	Combination	Min	0	-559,628	0	0	0	-605,7757	38-1	0
38	0,572	RESIST1-2 T+	Combination	Min	0	-510,128	0	0	0	-494,6945	38-1	0,572
38	0	SERV1-1 H-	Combination	Max	0	-83,209	0	0	0	-6,3571	38-1	0
38	0,572	SERV1-1 H-	Combination	Max	0	-63,797	0	0	0	94,0533	38-1	0,572
38	0	SERV1-1 H-	Combination	Min	0	-257,09	0	0	0	-291,5667	38-1	0
38	0,572	SERV1-1 H-	Combination	Min	0	-226,859	0	0	0	-225,6557	38-1	0,572
38	0	SERV1-2 T-	Combination	Max	0	-85,134	0	0	0	-12,0573	38-1	0
38	0,572	SERV1-2 T-	Combination	Max	0	-65,351	0	0	0	93,0024	38-1	0,572
38	0	SERV1-2 T-	Combination	Min	0	-276,093	0	0	0	-303,2982	38-1	0
38	0,572	SERV1-2 T-	Combination	Min	0	-253,413	0	0	0	-213,7838	38-1	0,572
38	0	RESIST 1-1 H+	Combination	Max	0	-114,411	0	0	0	57,3739	38-1	0
38	0,572	RESIST 1-1 H+	Combination	Max	0	-79,709	0	0	0	250,6117	38-1	0,572
38	0	RESIST 1-1 H+	Combination	Min	0	-558,605	0	0	0	-639,4429	38-1	0
38	0,572	RESIST 1-1 H+	Combination	Min	0	-494,401	0	0	0	-525,772	38-1	0,572
38	0	RESIST1-1 H-	Combination	Max	0	-112,32	0	0	0	72,9237	38-1	0
38	0,572	RESIST1-1 H-	Combination	Max	0	-77,839	0	0	0	263,1581	38-1	0,572
38	0	RESIST1-1 H-	Combination	Min	0	-517,029	0	0	0	-590,9016	38-1	0
38	0,572	RESIST1-1 H-	Combination	Min	0	-457,367	0	0	0	-480,9646	38-1	0,572
38	0	RESIST1-2 T-	Combination	Max	0	-116,801	0	0	0	59,6564	38-1	0
38	0,572	RESIST1-2 T-	Combination	Max	0	-81,457	0	0	0	260,7121	38-1	0,572
38	0	RESIST1-2 T-	Combination	Min	0	-561,258	0	0	0	-618,2067	38-1	0
38	0,572	RESIST1-2 T-	Combination	Min	0	-519,171	0	0	0	-453,3327	38-1	0,572
38	0	E-SERV1-1	Combination	Max	0	-83,209	0	0	0	-6,3571	38-1	0
38	0,572	E-SERV1-1	Combination	Max	0	-63,797	0	0	0	94,0533	38-1	0,572
38	0	E-SERV1-1	Combination	Min	0	-274,953	0	0	0	-312,4222	38-1	0
38	0,572	E-SERV1-1	Combination	Min	0	-242,771	0	0	0	-244,907	38-1	0,572
38	0	E-SERV1-2	Combination	Max	0	-85,134	0	0	0	-9,222	38-1	0
38	0,572	E-SERV1-2	Combination	Max	0	-65,18	0	0	0	108,2159	38-1	0,572
38	0	E-SERV1-2	Combination	Min	0	-276,093	0	0	0	-303,2982	38-1	0
38	0,572	E-SERV1-2	Combination	Min	0	-253,413	0	0	0	-231,5547	38-1	0,572
38	0	E-RESIST1-1	Combination	Max	0	-112,32	0	0	0	72,9237	38-1	0
38	0,572	E-RESIST1-1	Combination	Max	0	-77,839	0	0	0	263,1581	38-1	0,572
38	0	E-RESIST1-1	Combination	Min	0	-558,605	0	0	0	-639,4429	38-1	0
38	0,572	E-RESIST1-1	Combination	Min	0	-494,401	0	0	0	-525,772	38-1	0,572
38	0	E-RESIST1-2	Combination	Max	0	-116,801	0	0	0	66,2557	38-1	0
38	0,572	E-RESIST1-2	Combination	Max	0	-81,058	0	0	0	296,1216	38-1	0,572
38	0	E-RESIST1-2	Combination	Min	0	-561,258	0	0	0	-618,2067	38-1	0
38	0,572	E-RESIST1-2	Combination	Min	0	-519,171	0	0	0	-494,6945	38-1	0,572
39	0	LINEA	LinStatic		0	-35,991	0	0	0	-22,5425	39-1	0
39	0,572	LINEA	LinStatic		0	-30,54	0	0	0	-3,5146	39-1	0,572
39	0	HL93 +	LinMoving	Max	0	19,052	0	0	0	141,0569	39-1	0
39	0,572	HL93 +	LinMoving	Max	0	26,704	0	0	0	197,9858	39-1	0,572

37	0	LINEA	LinStatic		0	-46,893	0	0	0	-69,9524	37-1	0
37	0,572	LINEA	LinStatic		0	-41,442	0	0	0	-44,6884	37-1	0,572
37	0	HL93 +	LinMoving	Max	0	6,087	0	0	0	48,7469	37-1	0
37	0,572	HL93 +	LinMoving	Max	0	12,215	0	0	0	90,8286	37-1	0,572
37	0	HL93 +	LinMoving	Min	0	-197,015	0	0	0	-227,2629	37-1	0
37	0,572	HL93 +	LinMoving	Min	0	-178,631	0	0	0	-208,5556	37-1	0,572
37	0	TAMDEM +	LinMoving	Max	0	5,522	0	0	0	44,2221	37-1	0
37	0,572	TAMDEM +	LinMoving	Max	0	9,222	0	0	0	94,6446	37-1	0,572
37	0	TAMDEM +	LinMoving	Min	0	-191,259	0	0	0	-209,0207	37-1	0
37	0,572	TAMDEM +	LinMoving	Min	0	-179,07	0	0	0	-194,0906	37-1	0,572
37	0	HL93 -	LinMoving	Max	0	6,971	0	0	0	55,8254	37-1	0
37	0,572	HL93 -	LinMoving	Max	0	13,113	0	0	0	97,5095	37-1	0,572
37	0	HL93 -	LinMoving	Min	0	-177,313	0	0	0	-204,5367	37-1	0
37	0,572	HL93 -	LinMoving	Min	0	-160,768	0	0	0	-187,7001	37-1	0,572
37	0	TAMDEM -	LinMoving	Max	0	7,658	0	0	0	61,326	37-1	0
37	0,572	TAMDEM -	LinMoving	Max	0	11,188	0	0	0	91,8093	37-1	0,572
37	0	TAMDEM -	LinMoving	Min	0	-188,595	0	0	0	-268,1662	37-1	0
37	0,572	TAMDEM -	LinMoving	Min	0	-179,771	0	0	0	-199,4316	37-1	0,572
37	0	SERV1-1 H+	Combination	Max	0	-102,904	0	0	0	-113,8393	37-1	0
37	0,572	SERV1-1 H+	Combination	Max	0	-84,107	0	0	0	-13,038	37-1	0,572
37	0	SERV1-1 H+	Combination	Min	0	-306,006	0	0	0	-389,8492	37-1	0
37	0,572	SERV1-1 H+	Combination	Min	0	-274,953	0	0	0	-312,4222	37-1	0,572
37	0	SERV1-2 T+	Combination	Max	0	-103,469	0	0	0	-118,3641	37-1	0
37	0,572	SERV1-2 T+	Combination	Max	0	-87,1	0	0	0	-9,222	37-1	0,572
37	0	SERV1-2 T+	Combination	Min	0	-300,251	0	0	0	-371,6069	37-1	0
37	0,572	SERV1-2 T+	Combination	Min	0	-275,392	0	0	0	-297,9572	37-1	0,572
37	0	RESIST1-2 T+	Combination	Max	0	-148,777	0	0	0	-138,1814	37-1	0
37	0,572	RESIST1-2 T+	Combination	Max	0	-121,378	0	0	0	66,2557	37-1	0,572
37	0	RESIST1-2 T+	Combination	Min	0	-606,786	0	0	0	-727,6041	37-1	0
37	0,572	RESIST1-2 T+	Combination	Min	0	-559,628	0	0	0	-605,7757	37-1	0,572
37	0	SERV1-1 H-	Combination	Max	0	-102,02	0	0	0	-106,7608	37-1	0
37	0,572	SERV1-1 H-	Combination	Max	0	-83,209	0	0	0	-6,3571	37-1	0,572
37	0	SERV1-1 H-	Combination	Min	0	-286,305	0	0	0	-367,1229	37-1	0
37	0,572	SERV1-1 H-	Combination	Min	0	-257,09	0	0	0	-291,5667	37-1	0,572
37	0	SERV1-2 T-	Combination	Max	0	-101,333	0	0	0	-101,2602	37-1	0
37	0,572	SERV1-2 T-	Combination	Max	0	-85,134	0	0	0	-12,0573	37-1	0,572
37	0	SERV1-2 T-	Combination	Min	0	-297,586	0	0	0	-430,7525	37-1	0
37	0,572	SERV1-2 T-	Combination	Min	0	-276,093	0	0	0	-303,2982	37-1	0,572
37	0	RESIST 1-1 H+	Combination	Max	0	-147,462	0	0	0	-127,6499	37-1	0
37	0,572	RESIST 1-1 H+	Combination	Max	0	-114,411	0	0	0	57,3739	37-1	0,572
37	0	RESIST 1-1 H+	Combination	Min	0	-620,182	0	0	0	-770,0629	37-1	0
37	0,572	RESIST 1-1 H+	Combination	Min	0	-558,605	0	0	0	-639,4429	37-1	0,572
37	0	RESIST1-1 H-	Combination	Max	0	-145,404	0	0	0	-111,1748	37-1	0
37	0,572	RESIST1-1 H-	Combination	Max	0	-112,32	0	0	0	72,9237	37-1	0,572
37	0	RESIST1-1 H-	Combination	Min	0	-574,326	0	0	0	-717,1674	37-1	0
37	0,572	RESIST1-1 H-	Combination	Min	0	-517,029	0	0	0	-590,9016	37-1	0,572
37	0	RESIST1-2 T-	Combination	Max	0	-143,806	0	0	0	-98,3722	37-1	0
37	0,572	RESIST1-2 T-	Combination	Max	0	-116,801	0	0	0	59,6564	37-1	0,572
37	0	RESIST1-2 T-	Combination	Min	0	-600,584	0	0	0	-865,2653	37-1	0
37	0,572	RESIST1-2 T-	Combination	Min	0	-561,258	0	0	0	-618,2067	37-1	0,572
37	0	E-SERV1-1	Combination	Max	0	-102,02	0	0	0	-106,7608	37-1	0
37	0,572	E-SERV1-1	Combination	Max	0	-83,209	0	0	0	-6,3571	37-1	0,572
37	0	E-SERV1-1	Combination	Min	0	-306,006	0	0	0	-389,8492	37-1	0
37	0,572	E-SERV1-1	Combination	Min	0	-274,953	0	0	0	-312,4222	37-1	0,572
37	0	E-SERV1-2	Combination	Max	0	-101,333	0	0	0	-101,2602	37-1	0
37	0,572	E-SERV1-2	Combination	Max	0	-85,134	0	0	0	-9,222	37-1	0,572
37	0	E-SERV1-2	Combination	Min	0	-300,251	0	0	0	-430,7525	37-1	0
37	0,572	E-SERV1-2	Combination	Min	0	-276,093	0	0	0	-303,2982	37-1	0,572
37	0	E-RESIST1-1	Combination	Max	0	-145,404	0	0	0	-111,1748	37-1	0
37	0,572	E-RESIST1-1	Combination	Max	0	-112,32	0	0	0	72,9237	37-1	0,572
37	0	E-RESIST1-1	Combination	Min	0	-620,182	0	0	0	-770,0629	37-1	0
37	0,572	E-RESIST1-1	Combination	Min	0	-558,605	0	0	0	-639,4429	37-1	0,572
37	0	E-RESIST1-2	Combination	Max	0	-143,806	0	0	0	-98,3722	37-1	0
37	0,572	E-RESIST1-2	Combination	Max	0	-116,801	0	0	0	66,2557	37-1	0,572
37	0	E-RESIST1-2	Combination	Min	0	-606,786	0	0	0	-865,2653	37-1	0
37	0,572	E-RESIST1-2	Combination	Min	0	-561,258	0	0	0	-618,2067	37-1	0,572
38	0	LINEA	LinStatic		0	-41,442	0	0	0	-44,6884	38-1	0
38	0,572	LINEA	LinStatic		0	-35,991	0	0	0	-22,5425	38-1	0,572

39	0	HL93 +	LinMoving	Min	0	-159,119	0	0	0	-192,5129	39-1	0
39	0,572	HL93 +	LinMoving	Min	0	-138,582	0	0	0	-176,4703	39-1	0,572
39	0	TAMDEM +	LinMoving	Max	0	18,472	0	0	0	160,61	39-1	0
39	0,572	TAMDEM +	LinMoving	Max	0	29,409	0	0	0	218,9629	39-1	0,572
39	0	TAMDEM +	LinMoving	Min	0	-165,876	0	0	0	-179,1606	39-1	0
39	0,572	TAMDEM +	LinMoving	Min	0	-151,766	0	0	0	-164,2305	39-1	0,572
39	0	HL93 -	LinMoving	Max	0	19,855	0	0	0	146,4474	39-1	0
39	0,572	HL93 -	LinMoving	Max	0	27,126	0	0	0	197,6445	39-1	0,572
39	0	HL93 -	LinMoving	Min	0	-143,207	0	0	0	-173,2616	39-1	0
39	0,572	HL93 -	LinMoving	Min	0	-124,723	0	0	0	-158,8233	39-1	0,572
39	0	TAMDEM -	LinMoving	Max	0	18,301	0	0	0	145,3965	39-1	0
39	0,572	TAMDEM -	LinMoving	Max	0	27,457	0	0	0	197,2439	39-1	0,572
39	0	TAMDEM -	LinMoving	Min	0	-169,761	0	0	0	-161,3897	39-1	0
39	0,572	TAMDEM -	LinMoving	Min	0	-158,568	0	0	0	-147,9405	39-1	0,572
39	0	SERV1-1 H+	Combination	Max	0	-64,6	0	0	0	88,6628	39-1	0
39	0,572	SERV1-1 H+	Combination	Max	0	-44,278	0	0	0	189,817	39-1	0,572
39	0	SERV1-1 H+	Combination	Min	0	-242,771	0	0	0	-244,907	39-1	0
39	0,572	SERV1-1 H+	Combination	Min	0	-209,564	0	0	0	-184,6391	39-1	0,572
39	0	SERV1-2 T+	Combination	Max	0	-65,18	0	0	0	108,2159	39-1	0
39	0,572	SERV1-2 T+	Combination	Max	0	-41,573	0	0	0	210,7941	39-1	0,572
39	0	SERV1-2 T+	Combination	Min	0	-249,527	0	0	0	-231,5547	39-1	0
39	0,572	SERV1-2 T+	Combination	Min	0	-222,748	0	0	0	-172,3993	39-1	0,572
39	0	RESIST1-2 T+	Combination	Max	0	-81,058	0	0	0	296,1216	39-1	0
39	0,572	RESIST1-2 T+	Combination	Max	0	-36,814	0	0	0	497,5221	39-1	0,572
39	0	RESIST1-2 T+	Combination	Min	0	-510,128	0	0	0	-494,6945	39-1	0
39	0,572	RESIST1-2 T+	Combination	Min	0	-458,5	0	0	0	-394,3605	39-1	0,572
39	0	SERV1-1 H-	Combination	Max	0	-63,797	0	0	0	94,0533	39-1	0
39	0,572	SERV1-1 H-	Combination	Max	0	-43,856	0	0	0	189,4757	39-1	0,572
39	0	SERV1-1 H-	Combination	Min	0	-226,859	0	0	0	-225,6557	39-1	0
39	0,572	SERV1-1 H-	Combination	Min	0	-195,706	0	0	0	-166,992	39-1	0,572
39	0	SERV1-2 T-	Combination	Max	0	-65,351	0	0	0	93,0024	39-1	0
39	0,572	SERV1-2 T-	Combination	Max	0	-43,525	0	0	0	189,0752	39-1	0,572
39	0	SERV1-2 T-	Combination	Min	0	-253,413	0	0	0	-213,7838	39-1	0
39	0,572	SERV1-2 T-	Combination	Min	0	-229,55	0	0	0	-156,1093	39-1	0,572
39	0	RESIST 1-1 H+	Combination	Max	0	-79,709	0	0	0	250,6117	39-1	0
39	0,572	RESIST 1-1 H+	Combination	Max	0	-43,11	0	0	0	448,698	39-1	0,572
39	0	RESIST 1-1 H+	Combination	Min	0	-494,401	0	0	0	-525,772	39-1	0
39	0,572	RESIST 1-1 H+	Combination	Min	0	-427,812	0	0	0	-422,8485	39-1	0,572
39	0	RESIST1-1 H-	Combination	Max	0	-77,839	0	0	0	263,1581	39-1	0
39	0,572	RESIST1-1 H-	Combination	Max	0	-42,128	0	0	0	447,9037	39-1	0,572
39	0	RESIST1-1 H-	Combination	Min	0	-457,367	0	0	0	-480,9646	39-1	0
39	0,572	RESIST1-1 H-	Combination	Min	0	-395,557	0	0	0	-381,7751	39-1	0,572
39	0	RESIST1-2 T-	Combination	Max	0	-81,457	0	0	0	260,7121	39-1	0
39	0,572	RESIST1-2 T-	Combination	Max	0	-41,357	0	0	0	446,9714	39-1	0,572
39	0	RESIST1-2 T-	Combination	Min	0	-519,171	0	0	0	-453,3327	39-1	0
39	0,572	RESIST1-2 T-	Combination	Min	0	-474,329	0	0	0	-356,4455	39-1	0,572
39	0	E-SERV1-1	Combination	Max	0	-63,797	0	0	0	94,0533	39-1	0
39	0,572	E-SERV1-1	Combination	Max	0	-43,856	0	0	0	189,817	39-1	0,572
39	0	E-SERV1-1	Combination	Min	0	-242,771	0	0	0	-244,907	39-1	0
39	0,572	E-SERV1-1	Combination	Min	0	-209,564	0	0	0	-184,6391	39-1	0,572
39	0	E-SERV1-2	Combination	Max	0	-65,18	0	0	0	108,2159	39-1	0
39	0,572	E-SERV1-2	Combination	Max	0	-41,573	0	0	0	210,7941	39-1	0,572
39	0	E-SERV1-2	Combination	Min	0	-253,413	0	0	0	-231,5547	39-1	0
39	0,572	E-SERV1-2	Combination	Min	0	-229,55	0	0	0	-172,3993	39-1	0,572
39	0	E-RESIST1-1	Combination	Max	0	-77,839	0	0	0	263,1581	39-1	0
39	0,572	E-RESIST1-1	Combination	Max	0	-42,128	0	0	0	448,698	39-1	0,572
39	0	E-RESIST1-1	Combination	Min	0	-494,401	0	0	0	-525,772	39-1	0
39	0,572	E-RESIST1-1	Combination	Min	0	-427,812	0	0	0	-422,8485	39-1	0,572
39	0	E-RESIST1-2	Combination	Max	0	-81,058	0	0	0	296,1216	39-1	0
39	0,572	E-RESIST1-2	Combination	Max	0	-36,814	0	0	0	497,5221	39-1	0,572
39	0	E-RESIST1-2	Combination	Min	0	-519,171	0	0	0	-494,6945	39-1	0
39	0,572	E-RESIST1-2	Combination	Min	0	-474,329	0	0	0	-394,3605	39-1	0,572
40	0	LINEA	LinStatic		0	-30,54	0	0	0	-3,5146	40-1	0
40	0,572	LINEA	LinStatic		0	-25,089	0	0	0	12,3952	40-1	0,572
40	0	HL93 +	LinMoving	Max	0	26,704	0	0	0	197,9858	40-1	0
40	0,572	HL93 +	LinMoving	Max	0	35,151	0	0	0	238,0396	40-1	0,572
40	0	HL93 +	LinMoving	Min	0	-138,582	0	0	0	-176,4703	40-1	0
40	0,572	HL93 +	LinMoving	Min	0	-119,455	0	0	0	-160,4276	40-1	0,572

40	0	TAMDEM +	LinMoving	Max	0	29,409	0	0	0	218,9629	40-1	0
40	0,572	TAMDEM +	LinMoving	Max	0	41,457	0	0	0	267,45	40-1	0,572
40	0	TAMDEM +	LinMoving	Min	0	-151,766	0	0	0	-164,2305	40-1	0
40	0,572	TAMDEM +	LinMoving	Min	0	-136,835	0	0	0	-149,3005	40-1	0,572
40	0	HL93 -	LinMoving	Max	0	27,126	0	0	0	197,6445	40-1	0
40	0,572	HL93 -	LinMoving	Max	0	34,853	0	0	0	232,6377	40-1	0,572
40	0	HL93 -	LinMoving	Min	0	-124,723	0	0	0	-158,8233	40-1	0
40	0,572	HL93 -	LinMoving	Min	0	-105,411	0	0	0	-144,3848	40-1	0,572
40	0	TAMDEM -	LinMoving	Max	0	27,457	0	0	0	197,2439	40-1	0
40	0,572	TAMDEM -	LinMoving	Max	0	37,555	0	0	0	240,9217	40-1	0,572
40	0	TAMDEM -	LinMoving	Min	0	-158,568	0	0	0	-147,9405	40-1	0
40	0,572	TAMDEM -	LinMoving	Min	0	-146,194	0	0	0	-134,4914	40-1	0,572
40	0	SERV1-1 H+	Combination	Max	0	-44,278	0	0	0	189,817	40-1	0
40	0,572	SERV1-1 H+	Combination	Max	0	-23,162	0	0	0	266,8491	40-1	0,572
40	0	SERV1-1 H+	Combination	Min	0	-209,564	0	0	0	-184,6391	40-1	0
40	0,572	SERV1-1 H+	Combination	Min	0	-177,767	0	0	0	-131,6181	40-1	0,572
40	0	SERV1-2 T+	Combination	Max	0	-41,573	0	0	0	210,7941	40-1	0
40	0,572	SERV1-2 T+	Combination	Max	0	-16,855	0	0	0	296,2595	40-1	0,572
40	0	SERV1-2 T+	Combination	Min	0	-222,748	0	0	0	-172,3993	40-1	0
40	0,572	SERV1-2 T+	Combination	Min	0	-195,147	0	0	0	-120,491	40-1	0,572
40	0	RESIST1-2 T+	Combination	Max	0	-36,814	0	0	0	497,5221	40-1	0
40	0,572	RESIST1-2 T+	Combination	Max	0	10,016	0	0	0	665,2132	40-1	0,572
40	0	RESIST1-2 T+	Combination	Min	0	-458,5	0	0	0	-394,3605	40-1	0
40	0,572	RESIST1-2 T+	Combination	Min	0	-404,958	0	0	0	-304,7737	40-1	0,572
40	0	SERV1-1 H-	Combination	Max	0	-43,856	0	0	0	189,4757	40-1	0
40	0,572	SERV1-1 H-	Combination	Max	0	-23,46	0	0	0	261,4472	40-1	0,572
40	0	SERV1-1 H-	Combination	Min	0	-195,706	0	0	0	-166,992	40-1	0
40	0,572	SERV1-1 H-	Combination	Min	0	-163,723	0	0	0	-115,5753	40-1	0,572
40	0	SERV1-2 T-	Combination	Max	0	-43,525	0	0	0	189,0752	40-1	0
40	0,572	SERV1-2 T-	Combination	Max	0	-20,758	0	0	0	269,7312	40-1	0,572
40	0	SERV1-2 T-	Combination	Min	0	-229,55	0	0	0	-156,1093	40-1	0
40	0,572	SERV1-2 T-	Combination	Min	0	-204,506	0	0	0	-105,6819	40-1	0,572
40	0	RESIST 1-1 H+	Combination	Max	0	-43,11	0	0	0	448,698	40-1	0
40	0,572	RESIST 1-1 H+	Combination	Max	0	-4,661	0	0	0	596,7603	40-1	0,572
40	0	RESIST 1-1 H+	Combination	Min	0	-427,812	0	0	0	-422,8485	40-1	0
40	0,572	RESIST 1-1 H+	Combination	Min	0	-364,505	0	0	0	-330,6719	40-1	0,572
40	0	RESIST1-1 H-	Combination	Max	0	-42,128	0	0	0	447,9037	40-1	0
40	0,572	RESIST1-1 H-	Combination	Max	0	-5,355	0	0	0	584,1874	40-1	0,572
40	0	RESIST1-1 H-	Combination	Min	0	-395,557	0	0	0	-381,7751	40-1	0
40	0,572	RESIST1-1 H-	Combination	Min	0	-331,818	0	0	0	-293,3324	40-1	0,572
40	0	RESIST1-2 T-	Combination	Max	0	-41,357	0	0	0	446,9714	40-1	0
40	0,572	RESIST1-2 T-	Combination	Max	0	0,933	0	0	0	603,4685	40-1	0,572
40	0	RESIST1-2 T-	Combination	Min	0	-474,329	0	0	0	-356,4455	40-1	0
40	0,572	RESIST1-2 T-	Combination	Min	0	-426,741	0	0	0	-270,3055	40-1	0,572
40	0	E-SERV1-1	Combination	Max	0	-43,856	0	0	0	189,817	40-1	0
40	0,572	E-SERV1-1	Combination	Max	0	-23,162	0	0	0	266,8491	40-1	0,572
40	0	E-SERV1-1	Combination	Min	0	-209,564	0	0	0	-184,6391	40-1	0
40	0,572	E-SERV1-1	Combination	Min	0	-177,767	0	0	0	-131,6181	40-1	0,572
40	0	E-SERV1-2	Combination	Max	0	-41,573	0	0	0	210,7941	40-1	0
40	0,572	E-SERV1-2	Combination	Max	0	-16,855	0	0	0	296,2595	40-1	0,572
40	0	E-SERV1-2	Combination	Min	0	-229,55	0	0	0	-172,3993	40-1	0
40	0,572	E-SERV1-2	Combination	Min	0	-204,506	0	0	0	-120,491	40-1	0,572
40	0	E-RESIST1-1	Combination	Max	0	-42,128	0	0	0	448,698	40-1	0
40	0,572	E-RESIST1-1	Combination	Max	0	-4,661	0	0	0	596,7603	40-1	0,572
40	0	E-RESIST1-1	Combination	Min	0	-427,812	0	0	0	-422,8485	40-1	0
40	0,572	E-RESIST1-1	Combination	Min	0	-364,505	0	0	0	-330,6719	40-1	0,572
40	0	E-RESIST1-2	Combination	Max	0	-36,814	0	0	0	497,5221	40-1	0
40	0,572	E-RESIST1-2	Combination	Max	0	10,016	0	0	0	665,2132	40-1	0,572
40	0	E-RESIST1-2	Combination	Min	0	-474,329	0	0	0	-394,3605	40-1	0
40	0,572	E-RESIST1-2	Combination	Min	0	-426,741	0	0	0	-304,7737	40-1	0,572
41	0	LINEA	LinStatic		0	-25,089	0	0	0	12,3952	41-1	0
41	0,572	LINEA	LinStatic		0	-19,638	0	0	0	25,187	41-1	0,572
41	0	HL93 +	LinMoving	Max	0	35,151	0	0	0	238,0396	41-1	0
41	0,572	HL93 +	LinMoving	Max	0	44,187	0	0	0	259,146	41-1	0,572
41	0	HL93 +	LinMoving	Min	0	-119,455	0	0	0	-160,4276	41-1	0
41	0,572	HL93 +	LinMoving	Min	0	-107,819	0	0	0	-144,3848	41-1	0,572
41	0	TAMDEM +	LinMoving	Max	0	41,457	0	0	0	267,45	41-1	0
41	0,572	TAMDEM +	LinMoving	Max	0	54,524	0	0	0	304,0291	41-1	0,572

42	0	HL93 -	LinMoving	Max	0	42,964	0	0	0	249,6812	42-1	0
42	0,572	HL93 -	LinMoving	Max	0	52,031	0	0	0	250,2666	42-1	0,572
42	0	HL93 -	LinMoving	Min	0	-85,698	0	0	0	-129,9463	42-1	0
42	0,572	HL93 -	LinMoving	Min	0	-74,507	0	0	0	-115,5078	42-1	0,572
42	0	TAMDEM -	LinMoving	Max	0	49,115	0	0	0	273,8724	42-1	0
42	0,572	TAMDEM -	LinMoving	Max	0	61,721	0	0	0	294,4459	42-1	0,572
42	0	TAMDEM -	LinMoving	Min	0	-132,642	0	0	0	-121,0423	42-1	0
42	0,572	TAMDEM -	LinMoving	Min	0	-117,983	0	0	0	-107,5931	42-1	0,572
42	0	SERV1-1 H+	Combination	Max	0	-1,455	0	0	0	317,6866	42-1	0
42	0,572	SERV1-1 H+	Combination	Max	0	20,781	0	0	0	340,5273	42-1	0,572
42	0	SERV1-1 H+	Combination	Min	0	-153,462	0	0	0	-85,8442	42-1	0
42	0,572	SERV1-1 H+	Combination	Min	0	-130,753	0	0	0	-47,3174	42-1	0,572
42	0	SERV1-2 T+	Combination	Max	0	8,881	0	0	0	362,5697	42-1	0
42	0,572	SERV1-2 T+	Combination	Max	0	35,544	0	0	0	407,8925	42-1	0,572
42	0	SERV1-2 T+	Combination	Min	0	-166,816	0	0	0	-75,8298	42-1	0
42	0,572	SERV1-2 T+	Combination	Min	0	-137,846	0	0	0	-38,4158	42-1	0,572
42	0	RESIST1-2 T+	Combination	Max	0	59,218	0	0	0	794,4409	42-1	0
42	0,572	RESIST1-2 T+	Combination	Max	0	110,575	0	0	0	880,941	42-1	0,572
42	0	RESIST1-2 T+	Combination	Min	0	-349,717	0	0	0	-225,934	42-1	0
42	0,572	RESIST1-2 T+	Combination	Min	0	-292,99	0	0	0	-157,8415	42-1	0,572
42	0	SERV1-1 H-	Combination	Max	0	-2,679	0	0	0	308,2218	42-1	0
42	0,572	SERV1-1 H-	Combination	Max	0	19,059	0	0	0	331,2912	42-1	0,572
42	0	SERV1-1 H-	Combination	Min	0	-131,34	0	0	0	-71,4057	42-1	0
42	0,572	SERV1-1 H-	Combination	Min	0	-107,48	0	0	0	-34,4832	42-1	0,572
42	0	SERV1-2 T-	Combination	Max	0	3,473	0	0	0	332,4131	42-1	0
42	0,572	SERV1-2 T-	Combination	Max	0	28,748	0	0	0	375,4705	42-1	0,572
42	0	SERV1-2 T-	Combination	Min	0	-178,285	0	0	0	-62,5016	42-1	0
42	0,572	SERV1-2 T-	Combination	Min	0	-150,956	0	0	0	-26,5685	42-1	0,572
42	0	RESIST 1-1 H+	Combination	Max	0	35,16	0	0	0	689,9755	42-1	0
42	0,572	RESIST 1-1 H+	Combination	Max	0	76,216	0	0	0	724,1485	42-1	0,572
42	0	RESIST 1-1 H+	Combination	Min	0	-318,635	0	0	0	-249,2424	42-1	0
42	0,572	RESIST 1-1 H+	Combination	Min	0	-276,481	0	0	0	-178,5601	42-1	0,572
42	0	RESIST1-1 H-	Combination	Max	0	32,312	0	0	0	667,9463	42-1	0
42	0,572	RESIST1-1 H-	Combination	Max	0	72,206	0	0	0	702,6516	42-1	0,572
42	0	RESIST1-1 H-	Combination	Min	0	-267,148	0	0	0	-215,6368	42-1	0
42	0,572	RESIST1-1 H-	Combination	Min	0	-222,312	0	0	0	-148,6885	42-1	0,572
42	0	RESIST1-2 T-	Combination	Max	0	46,63	0	0	0	724,2513	42-1	0
42	0,572	RESIST1-2 T-	Combination	Max	0	94,757	0	0	0	805,4788	42-1	0,572
42	0	RESIST1-2 T-	Combination	Min	0	-376,411	0	0	0	-194,9126	42-1	0
42	0,572	RESIST1-2 T-	Combination	Min	0	-323,504	0	0	0	-130,267	42-1	0,572
42	0	E-SERV1-1	Combination	Max	0	-1,455	0	0	0	317,6866	42-1	0
42	0,572	E-SERV1-1	Combination	Max	0	20,781	0	0	0	340,5273	42-1	0,572
42	0	E-SERV1-1	Combination	Min	0	-153,462	0	0	0	-85,8442	42-1	0
42	0,572	E-SERV1-1	Combination	Min	0	-130,753	0	0	0	-47,3174	42-1	0,572
42	0	E-SERV1-2	Combination	Max	0	8,881	0	0	0	362,5697	42-1	0
42	0,572	E-SERV1-2	Combination	Max	0	35,544	0	0	0	407,8925	42-1	0,572
42	0	E-SERV1-2	Combination	Min	0	-178,285	0	0	0	-75,8298	42-1	0
42	0,572	E-SERV1-2	Combination	Min	0	-150,956	0	0	0	-38,4158	42-1	0,572
42	0	E-RESIST1-1	Combination	Max	0	35,16	0	0	0	689,9755	42-1	0
42	0,572	E-RESIST1-1	Combination	Max	0	76,216	0	0	0	724,1485	42-1	0,572
42	0	E-RESIST1-1	Combination	Min	0	-318,635	0	0	0	-249,2424	42-1	0
42	0,572	E-RESIST1-1	Combination	Min	0	-276,481	0	0	0	-178,5601	42-1	0,572
42	0	E-RESIST1-2	Combination	Max	0	59,218	0	0	0	794,4409	42-1	0
42	0,572	E-RESIST1-2	Combination	Max	0	110,575	0	0	0	880,941	42-1	0,572
42	0	E-RESIST1-2	Combination	Min	0	-376,411	0	0	0	-225,934	42-1	0
42	0,572	E-RESIST1-2	Combination	Min	0	-323,504	0	0	0	-157,8415	42-1	0,572
43	0	LINEA	LinStatic		0	-14,186	0	0	0	34,8607	43-1	0
43	0,572	LINEA	LinStatic		0	-8,735	0	0	0	41,4163	43-1	0,572
43	0	HL93 +	LinMoving	Max	0	53,754	0	0	0	259,5027	43-1	0
43	0,572	HL93 +	LinMoving	Max	0	66,438	0	0	0	266,016	43-1	0,572
43	0	HL93 +	LinMoving	Min	0	-97,78	0	0	0	-128,342	43-1	0
43	0,572	HL93 +	LinMoving	Min	0	-87,328	0	0	0	-112,2993	43-1	0,572
43	0	TAMDEM +	LinMoving	Max	0	68,517	0	0	0	326,8679	43-1	0
43	0,572	TAMDEM +	LinMoving	Max	0	83,344	0	0	0	334,3451	43-1	0,572
43	0	TAMDEM +	LinMoving	Min	0	-104,873	0	0	0	-119,4404	43-1	0
43	0,572	TAMDEM +	LinMoving	Min	0	-88,027	0	0	0	-104,5103	43-1	0,572
43	0	HL93 -	LinMoving	Max	0	52,031	0	0	0	250,2666	43-1	0
43	0,572	HL93 -	LinMoving	Max	0	62,202	0	0	0	249,0563	43-1	0,572

41	0	TAMDEM +	LinMoving	Min	0	-136,835	0	0	0	-149,3005	41-1	0
41	0,572	TAMDEM +	LinMoving	Min	0	-121,173	0	0	0	-134,3704	41-1	0,572
41	0	HL93 -	LinMoving	Max	0	34,853	0	0	0	232,6377	41-1	0
41	0,572	HL93 -	LinMoving	Max	0	42,964	0	0	0	249,6812	41-1	0,572
41	0	HL93 -	LinMoving	Min	0	-105,411	0	0	0	-144,3848	41-1	0
41	0,572	HL93 -	LinMoving	Min	0	-85,698	0	0	0	-129,9463	41-1	0,572
41	0	TAMDEM -	LinMoving	Max	0	37,555	0	0	0	240,9217	41-1	0
41	0,572	TAMDEM -	LinMoving	Max	0	49,115	0	0	0	273,8724	41-1	0,572
41	0	TAMDEM -	LinMoving	Min	0	-146,194	0	0	0	-134,4914	41-1	0
41	0,572	TAMDEM -	LinMoving	Min	0	-132,642	0	0	0	-121,0423	41-1	0,572
41	0	SERV1-1 H+	Combination	Max	0	-23,162	0	0	0	266,8491	41-1	0
41	0,572	SERV1-1 H+	Combination	Max	0	-1,455	0	0	0	317,6866	41-1	0,572
41	0	SERV1-1 H+	Combination	Min	0	-177,767	0	0	0	-131,6181	41-1	0
41	0,572	SERV1-1 H+	Combination	Min	0	-153,462	0	0	0	-85,8442	41-1	0,572
41	0	SERV1-2 T+	Combination	Max	0	-16,855	0	0	0	296,2595	41-1	0
41	0,572	SERV1-2 T+	Combination	Max	0	8,881	0	0	0	362,5697	41-1	0,572
41	0	SERV1-2 T+	Combination	Min	0	-195,147	0	0	0	-120,491	41-1	0
41	0,572	SERV1-2 T+	Combination	Min	0	-166,816	0	0	0	-75,8298	41-1	0,572
41	0	RESIST1-2 T+	Combination	Max	0	10,016	0	0	0	665,2132	41-1	0
41	0,572	RESIST1-2 T+	Combination	Max	0	59,218	0	0	0	794,4409	41-1	0,572
41	0	RESIST1-2 T+	Combination	Min	0	-404,958	0	0	0	-304,7737	41-1	0
41	0,572	RESIST1-2 T+	Combination	Min	0	-349,717	0	0	0	-225,934	41-1	0,572
41	0	SERV1-1 H-	Combination	Max	0	-23,46	0	0	0	261,4472	41-1	0
41	0,572	SERV1-1 H-	Combination	Max	0	-2,679	0	0	0	308,2218	41-1	0,572
41	0	SERV1-1 H-	Combination	Min	0	-163,723	0	0	0	-115,5753	41-1	0
41	0,572	SERV1-1 H-	Combination	Min	0	-131,34	0	0	0	-71,4057	41-1	0,572
41	0	SERV1-2 T-	Combination	Max	0	-20,758	0	0	0	269,7312	41-1	0
41	0,572	SERV1-2 T-	Combination	Max	0	3,473	0	0	0	332,4131	41-1	0,572
41	0	SERV1-2 T-	Combination	Min	0	-204,506	0	0	0	-105,6819	41-1	0
41	0,572	SERV1-2 T-	Combination	Min	0	-178,285	0	0	0	-62,5016	41-1	0,572
41	0	RESIST 1-1 H+	Combination	Max	0	-4,661	0	0	0	596,7603	41-1	0
41	0,572	RESIST 1-1 H+	Combination	Max	0	35,16	0	0	0	689,9755	41-1	0,572
41	0	RESIST 1-1 H+	Combination	Min	0	-364,505	0	0	0	-330,6719	41-1	0
41	0,572	RESIST 1-1 H+	Combination	Min	0	-318,635	0	0	0	-249,2424	41-1	0,572
41	0	RESIST1-1 H-	Combination	Max	0	-5,355	0	0	0	584,1874	41-1	0
41	0,572	RESIST1-1 H-	Combination	Max	0	32,312	0	0	0	667,9463	41-1	0,572
41	0	RESIST1-1 H-	Combination	Min	0	-331,818	0	0	0	-293,3324	41-1	0
41	0,572	RESIST1-1 H-	Combination	Min	0	-267,148	0	0	0	-215,6368	41-1	0,572
41	0	RESIST1-2 T-	Combination	Max	0	0,933	0	0	0	603,4685	41-1	0
41	0,572	RESIST1-2 T-	Combination	Max	0	46,63	0	0	0	724,2513	41-1	0,572
41	0	RESIST1-2 T-	Combination	Min	0	-426,741	0	0	0	-270,3055	41-1	0
41	0,572	RESIST1-2 T-	Combination	Min	0	-376,411	0	0	0	-194,9126	41-1	0,572
41	0	E-SERV1-1	Combination	Max	0	-23,162	0	0	0	266,8491	41-1	0
41	0,572	E-SERV1-1	Combination	Max	0	-1,455	0	0	0	317,6866	41-1	0,572
41	0	E-SERV1-1	Combination	Min	0	-177,767	0	0	0	-131,6181	41-1	0
41	0,572	E-SERV1-1	Combination	Min	0	-153,462	0	0	0	-85,8442	41-1	0,572
41	0	E-SERV1-2	Combination	Max	0	-16,855	0	0	0	296,2595	41-1	0
41	0,572	E-SERV1-2	Combination	Max	0	8,881	0	0	0	362,5697	41-1	0,572
41	0	E-SERV1-2	Combination	Min	0	-204,506	0	0	0	-120,491	41-1	0
41	0,572	E-SERV1-2	Combination	Min	0	-178,285	0	0	0	-75,8298	41-1	0,572
41	0	E-RESIST1-1	Combination	Max	0	-4,661	0	0	0	596,7603	41-1	0
41	0,572	E-RESIST1-1	Combination	Max	0	35,16	0	0	0	689,9755	41-1	0,572
41	0	E-RESIST1-1	Combination	Min	0	-364,505	0	0	0	-330,6719	41-1	0
41	0,572	E-RESIST1-1	Combination	Min	0	-318,635	0	0	0	-249,2424	41-1	0,572
41	0	E-RESIST1-2	Combination	Max	0	10,016	0	0	0	665,2132	41-1	0
41	0,572	E-RESIST1-2	Combination	Max	0	59,218	0	0	0	794,4409	41-1	0,572
41	0	E-RESIST1-2	Combination	Min	0	-426,741	0	0	0	-304,7737	41-1	0
41	0,572	E-RESIST1-2	Combination	Min	0	-376,411	0	0	0	-225,934	41-1	0,572
42	0	LINEA	LinStatic		0	-19,638	0	0	0	25,187	42-1	0
42	0,572	LINEA	LinStatic		0	-14,186	0	0	0	34,8607	42-1	0,572
42	0	HL93 +	LinMoving	Max	0	44,187	0	0	0	259,146	42-1	0
42	0,572	HL93 +	LinMoving	Max	0	53,754	0	0	0	259,5027	42-1	0,572
42	0	HL93 +	LinMoving	Min	0	-107,819	0	0	0	-144,3848	42-1	0
42	0,572	HL93 +	LinMoving	Min	0	-97,78	0	0	0	-128,342	42-1	0,572
42	0	TAMDEM +	LinMoving	Max	0	54,524	0	0	0	304,0291	42-1	0
42	0,572	TAMDEM +	LinMoving	Max	0	68,517	0	0	0	326,8679	42-1	0,572
42	0	TAMDEM +	LinMoving	Min	0	-121,173	0	0	0	-134,3704	42-1	0
42	0,572	TAMDEM +	LinMoving	Min	0	-104,873	0	0	0	-119,4404	42-1	0,572

43	0	HL93 -	LinMoving	Min	0	-74,507	0	0	0	-115,5078	43-1	0
43	0,572	HL93 -	LinMoving	Min	0	-64,991	0	0	0	-101,0694	43-1	0,572
43	0	TAMDEM -	LinMoving	Max	0	61,721	0	0	0	294,4459	43-1	0
43	0,572	TAMDEM -	LinMoving	Max	0	75,077	0	0	0	301,1814	43-1	0,572
43	0	TAMDEM -	LinMoving	Min	0	-117,983	0	0	0	-107,5931	43-1	0
43	0,572	TAMDEM -	LinMoving	Min	0	-102,808	0	0	0	-94,144	43-1	0,572
43	0	SERV1-1 H+	Combination	Max	0	20,781	0	0	0	340,5273	43-1	0
43	0,572	SERV1-1 H+	Combination	Max	0	46,135	0	0	0	362,2775	43-1	0,572
43	0	SERV1-1 H+	Combination	Min	0	-130,753	0	0	0	-47,3174	43-1	0
43	0,572	SERV1-1 H+	Combination	Min	0	-107,631	0	0	0	-16,0378	43-1	0,572
43	0	SERV1-2 T+	Combination	Max	0	35,544	0	0	0	407,8925	43-1	0
43	0,572	SERV1-2 T+	Combination	Max	0	63,041	0	0	0	430,6065	43-1	0,572
43	0	SERV1-2 T+	Combination	Min	0	-137,846	0	0	0	-38,4158	43-1	0
43	0,572	SERV1-2 T+	Combination	Min	0	-108,33	0	0	0	-8,2489	43-1	0,572
43	0	RESIST1-2 T+	Combination	Max	0	110,575	0	0	0	880,941	43-1	0
43	0,572	RESIST1-2 T+	Combination	Max	0	163,875	0	0	0	920,9398	43-1	0,572
43	0	RESIST1-2 T+	Combination	Min	0	-292,99	0	0	0	-157,8415	43-1	0
43	0,572	RESIST1-2 T+	Combination	Min	0	-234,992	0	0	0	-100,4962	43-1	0,572
43	0	SERV1-1 H-	Combination	Max	0	19,059	0	0	0	331,2912	43-1	0
43	0,572	SERV1-1 H-	Combination	Max	0	41,899	0	0	0	345,3177	43-1	0,572
43	0	SERV1-1 H-	Combination	Min	0	-107,48	0	0	0	-34,4832	43-1	0
43	0,572	SERV1-1 H-	Combination	Min	0	-85,293	0	0	0	-4,8079	43-1	0,572
43	0	SERV1-2 T-	Combination	Max	0	28,748	0	0	0	375,4705	43-1	0
43	0,572	SERV1-2 T-	Combination	Max	0	54,774	0	0	0	397,4429	43-1	0,572
43	0	SERV1-2 T-	Combination	Min	0	-150,956	0	0	0	-26,5685	43-1	0
43	0,572	SERV1-2 T-	Combination	Min	0	-123,111	0	0	0	2,1175	43-1	0,572
43	0	RESIST 1-1 H+	Combination	Max	0	76,216	0	0	0	724,1485	43-1	0
43	0,572	RESIST 1-1 H+	Combination	Max	0	124,525	0	0	0	761,9039	43-1	0,572
43	0	RESIST 1-1 H+	Combination	Min	0	-276,481	0	0	0	-178,5601	43-1	0
43	0,572	RESIST 1-1 H+	Combination	Min	0	-233,364	0	0	0	-118,625	43-1	0,572
43	0	RESIST1-1 H-	Combination	Max	0	72,206	0	0	0	702,6516	43-1	0
43	0,572	RESIST1-1 H-	Combination	Max	0	114,666	0	0	0	722,4301	43-1	0,572
43	0	RESIST1-1 H-	Combination	Min	0	-222,312	0	0	0	-148,6885	43-1	0
43	0,572	RESIST1-1 H-	Combination	Min	0	-181,374	0	0	0	-92,4873	43-1	0,572
43	0	RESIST1-2 T-	Combination	Max	0	94,757	0	0	0	805,4788	43-1	0
43	0,572	RESIST1-2 T-	Combination	Max	0	144,634	0	0	0	843,7513	43-1	0,572
43	0	RESIST1-2 T-	Combination	Min	0	-323,504	0	0	0	-130,267	43-1	0
43	0,572	RESIST1-2 T-	Combination	Min	0	-269,395	0	0	0	-76,3685	43-1	0,572
43	0	E-SERV1-1	Combination	Max	0	20,781	0	0	0	340,5273	43-1	0
43	0,572	E-SERV1-1	Combination	Max	0	46,135	0	0	0	362,2775	43-1	0,572
43	0	E-SERV1-1	Combination	Min	0	-130,753	0	0	0	-47,3174	43-1	0
43	0,572	E-SERV1-1	Combination	Min	0	-107,631	0	0	0	-16,0378	43-1	0,572
43	0	E-SERV1-2	Combination	Max	0	35,544	0	0	0	407,8925	43-1	0
43	0,572	E-SERV1-2	Combination	Max	0	63,041	0	0	0	430,6065	43-1	0,572
43	0	E-SERV1-2	Combination	Min	0	-150,956	0	0	0	-38,4158	43-1	0
43	0,572	E-SERV1-2	Combination	Min	0	-123,111	0	0	0	-8,2489	43-1	0,572
43	0	E-RESIST1-1	Combination	Max	0	76,216	0	0	0	724,1485	43-1	0
43	0,572	E-RESIST1-1	Combination	Max	0	124,525	0	0	0	761,9039	43-1	0,572
43	0	E-RESIST1-1	Combination	Min	0	-276,481	0	0	0	-178,5601	43-1	0
43	0,572	E-RESIST1-1	Combination	Min	0	-233,364	0	0	0	-118,625	43-1	0,572
43	0	E-RESIST1-2	Combination	Max	0	110,575	0	0	0	880,941	43-1	0
43	0,572	E-RESIST1-2	Combination	Max	0	163,875	0	0	0	920,9398	43-1	0,572
43	0	E-RESIST1-2	Combination	Min	0	-323,504	0	0	0	-157,8415	43-1	0
43	0,572	E-RESIST1-2	Combination	Min	0	-269,395	0	0	0	-100,4962	43-1	0,572
44	0	LINEA	LinStatic		0	-8,735	0	0	0	41,4163	44-1	0
44	0,572	LINEA	LinStatic		0	-3,284	0	0	0	44,8539	44-1	0,572
44	0	HL93 +	LinMoving	Max	0	66,438	0	0	0	266,016	44-1	0
44	0,572	HL93 +	LinMoving	Max	0	82,786	0	0	0	284,1228	44-1	0,572
44	0	HL93 +	LinMoving	Min	0	-87,328	0	0	0	-112,2993	44-1	0
44	0,572	HL93 +	LinMoving	Min	0	-76,442	0	0	0	-96,2565	44-1	0,572
44	0	TAMDEM +	LinMoving	Max	0	83,344	0	0	0	334,3451	44-1	0
44	0,572	TAMDEM +	LinMoving	Max	0	98,914	0	0	0	339,4732	44-1	0,572
44	0	TAMDEM +	LinMoving	Min	0	-88,027	0	0	0	-104,5103	44-1	0
44	0,572	TAMDEM +	LinMoving	Min	0	-70,727	0	0	0	-89,5803	44-1	0,572
44	0	HL93 -	LinMoving	Max	0	62,202	0	0	0	249,0563	44-1	0
44	0,572	HL93 -	LinMoving	Max	0	76,765	0	0	0	263,4568	44-1	0,572
44	0	HL93 -	LinMoving	Min	0	-64,991	0	0	0	-101,0694	44-1	0
44	0,572	HL93 -	LinMoving	Min	0	-55,034	0	0	0	-86,6309	44-1	0,572

44	0	TAMDEM -	LinMoving	Max	0	75,077	0	0	0	301,1814	44-1	0
44	0,572	TAMDEM -	LinMoving	Max	0	89,103	0	0	0	305,8009	44-1	0,572
44	0	TAMDEM -	LinMoving	Min	0	-102,808	0	0	0	-94,144	44-1	0
44	0,572	TAMDEM -	LinMoving	Min	0	-87,224	0	0	0	-80,6948	44-1	0,572
44	0	SERV1-1 H+	Combination	Max	0	46,135	0	0	0	362,2775	44-1	0
44	0,572	SERV1-1 H+	Combination	Max	0	75,153	0	0	0	388,374	44-1	0,572
44	0	SERV1-1 H+	Combination	Min	0	-107,631	0	0	0	-16,0378	44-1	0
44	0,572	SERV1-1 H+	Combination	Min	0	-84,075	0	0	0	7,9947	44-1	0,572
44	0	SERV1-2 T+	Combination	Max	0	63,041	0	0	0	430,6065	44-1	0
44	0,572	SERV1-2 T+	Combination	Max	0	91,281	0	0	0	443,7244	44-1	0,572
44	0	SERV1-2 T+	Combination	Min	0	-108,33	0	0	0	-8,2489	44-1	0
44	0,572	SERV1-2 T+	Combination	Min	0	-78,36	0	0	0	14,6709	44-1	0,572
44	0	RESIST1-2 T+	Combination	Max	0	163,875	0	0	0	920,9398	44-1	0
44	0,572	RESIST1-2 T+	Combination	Max	0	218,903	0	0	0	944,7239	44-1	0,572
44	0	RESIST1-2 T+	Combination	Min	0	-234,992	0	0	0	-100,4962	44-1	0
44	0,572	RESIST1-2 T+	Combination	Min	0	-175,937	0	0	0	-53,8981	44-1	0,572
44	0	SERV1-1 H-	Combination	Max	0	41,899	0	0	0	345,3177	44-1	0
44	0,572	SERV1-1 H-	Combination	Max	0	69,132	0	0	0	367,708	44-1	0,572
44	0	SERV1-1 H-	Combination	Min	0	-85,293	0	0	0	-4,8079	44-1	0
44	0,572	SERV1-1 H-	Combination	Min	0	-62,667	0	0	0	17,6203	44-1	0,572
44	0	SERV1-2 T-	Combination	Max	0	54,774	0	0	0	397,4429	44-1	0
44	0,572	SERV1-2 T-	Combination	Max	0	81,47	0	0	0	410,0521	44-1	0,572
44	0	SERV1-2 T-	Combination	Min	0	-123,111	0	0	0	2,1175	44-1	0
44	0,572	SERV1-2 T-	Combination	Min	0	-94,857	0	0	0	23,5564	44-1	0,572
44	0	RESIST 1-1 H+	Combination	Max	0	124,525	0	0	0	761,9039	44-1	0
44	0,572	RESIST 1-1 H+	Combination	Max	0	181,366	0	0	0	815,8959	44-1	0,572
44	0	RESIST 1-1 H+	Combination	Min	0	-233,364	0	0	0	-118,625	44-1	0
44	0,572	RESIST 1-1 H+	Combination	Min	0	-189,238	0	0	0	-69,437	44-1	0,572
44	0	RESIST1-1 H-	Combination	Max	0	114,666	0	0	0	722,4301	44-1	0
44	0,572	RESIST1-1 H-	Combination	Max	0	167,35	0	0	0	767,7957	44-1	0,572
44	0	RESIST1-1 H-	Combination	Min	0	-181,374	0	0	0	-92,4873	44-1	0
44	0,572	RESIST1-1 H-	Combination	Min	0	-139,411	0	0	0	-47,0333	44-1	0,572
44	0	RESIST1-2 T-	Combination	Max	0	144,634	0	0	0	843,7513	44-1	0
44	0,572	RESIST1-2 T-	Combination	Max	0	196,067	0	0	0	866,3516	44-1	0,572
44	0	RESIST1-2 T-	Combination	Min	0	-269,395	0	0	0	-76,3685	44-1	0
44	0,572	RESIST1-2 T-	Combination	Min	0	-214,334	0	0	0	-33,2172	44-1	0,572
44	0	E-SERV1-1	Combination	Max	0	46,135	0	0	0	362,2775	44-1	0
44	0,572	E-SERV1-1	Combination	Max	0	75,153	0	0	0	388,374	44-1	0,572
44	0	E-SERV1-1	Combination	Min	0	-107,631	0	0	0	-16,0378	44-1	0
44	0,572	E-SERV1-1	Combination	Min	0	-84,075	0	0	0	7,9947	44-1	0,572
44	0	E-SERV1-2	Combination	Max	0	63,041	0	0	0	430,6065	44-1	0
44	0,572	E-SERV1-2	Combination	Max	0	91,281	0	0	0	443,7244	44-1	0,572
44	0	E-SERV1-2	Combination	Min	0	-123,111	0	0	0	-8,2489	44-1	0
44	0,572	E-SERV1-2	Combination	Min	0	-94,857	0	0	0	14,6709	44-1	0,572
44	0	E-RESIST1-1	Combination	Max	0	124,525	0	0	0	761,9039	44-1	0
44	0,572	E-RESIST1-1	Combination	Max	0	181,366	0	0	0	815,8959	44-1	0,572
44	0	E-RESIST1-1	Combination	Min	0	-233,364	0	0	0	-118,625	44-1	0
44	0,572	E-RESIST1-1	Combination	Min	0	-189,238	0	0	0	-69,437	44-1	0,572
44	0	E-RESIST1-2	Combination	Max	0	163,875	0	0	0	920,9398	44-1	0
44	0,572	E-RESIST1-2	Combination	Max	0	218,903	0	0	0	944,7239	44-1	0,572
44	0	E-RESIST1-2	Combination	Min	0	-269,395	0	0	0	-100,4962	44-1	0
44	0,572	E-RESIST1-2	Combination	Min	0	-214,334	0	0	0	-53,8981	44-1	0,572
45	0	LINEA	LinStatic		0	-3,284	0	0	0	44,8539	45-1	0
45	0,572	LINEA	LinStatic		0	2,167	0	0	0	45,1734	45-1	0,572
45	0	HL93 +	LinMoving	Max	0	82,786	0	0	0	284,1228	45-1	0
45	0,572	HL93 +	LinMoving	Max	0	100,286	0	0	0	286,8176	45-1	0,572
45	0	HL93 +	LinMoving	Min	0	-76,442	0	0	0	-96,2565	45-1	0
45	0,572	HL93 +	LinMoving	Min	0	-64,687	0	0	0	-80,2138	45-1	0,572
45	0	TAMDEM +	LinMoving	Max	0	98,914	0	0	0	339,4732	45-1	0
45	0,572	TAMDEM +	LinMoving	Max	0	115,134	0	0	0	329,2845	45-1	0,572
45	0	TAMDEM +	LinMoving	Min	0	-70,727	0	0	0	-89,5803	45-1	0
45	0,572	TAMDEM +	LinMoving	Min	0	-53,065	0	0	0	-74,6502	45-1	0,572
45	0	HL93 -	LinMoving	Max	0	76,765	0	0	0	263,4568	45-1	0
45	0,572	HL93 -	LinMoving	Max	0	92,923	0	0	0	265,7608	45-1	0,572
45	0	HL93 -	LinMoving	Min	0	-55,034	0	0	0	-86,6309	45-1	0
45	0,572	HL93 -	LinMoving	Min	0	-44,677	0	0	0	-72,1924	45-1	0,572
45	0	TAMDEM -	LinMoving	Max	0	89,103	0	0	0	305,8009	45-1	0
45	0,572	TAMDEM -	LinMoving	Max	0	103,714	0	0	0	296,6228	45-1	0,572

46	0	SERV1-1 H+	Combination	Max	0	105,323	0	0	0	391,8114	46-1	0
46	0,572	SERV1-1 H+	Combination	Max	0	136,525	0	0	0	370,3453	46-1	0,572
46	0	SERV1-1 H+	Combination	Min	0	-59,651	0	0	0	24,78	46-1	0
46	0,572	SERV1-1 H+	Combination	Min	0	-34,346	0	0	0	34,3183	46-1	0,572
46	0	SERV1-2 T+	Combination	Max	0	120,171	0	0	0	434,2783	46-1	0
46	0,572	SERV1-2 T+	Combination	Max	0	149,62	0	0	0	400,3066	46-1	0,572
46	0	SERV1-2 T+	Combination	Min	0	-48,028	0	0	0	30,3436	46-1	0
46	0,572	SERV1-2 T+	Combination	Min	0	-17,426	0	0	0	38,7691	46-1	0,572
46	0	RESIST1-2 T+	Combination	Max	0	275,445	0	0	0	922,111	46-1	0
46	0,572	RESIST1-2 T+	Combination	Max	0	333,286	0	0	0	848,5352	46-1	0,572
46	0	RESIST1-2 T+	Combination	Min	0	-116,04	0	0	0	-18,0471	46-1	0
46	0,572	RESIST1-2 T+	Combination	Min	0	-55,513	0	0	0	7,0567	46-1	0,572
46	0	SERV1-1 H-	Combination	Max	0	97,96	0	0	0	370,7546	46-1	0
46	0,572	SERV1-1 H-	Combination	Max	0	127,619	0	0	0	349,9698	46-1	0,572
46	0	SERV1-1 H-	Combination	Min	0	-39,641	0	0	0	32,8014	46-1	0
46	0,572	SERV1-1 H-	Combination	Min	0	-16,255	0	0	0	40,7354	46-1	0,572
46	0	SERV1-2 T-	Combination	Max	0	108,751	0	0	0	401,6166	46-1	0
46	0,572	SERV1-2 T-	Combination	Max	0	136,535	0	0	0	370,3694	46-1	0,572
46	0	SERV1-2 T-	Combination	Min	0	-66,277	0	0	0	37,7481	46-1	0
46	0,572	SERV1-2 T-	Combination	Min	0	-37,454	0	0	0	44,6927	46-1	0,572
46	0	RESIST 1-1 H+	Combination	Max	0	240,884	0	0	0	823,2693	46-1	0
46	0,572	RESIST 1-1 H+	Combination	Max	0	302,807	0	0	0	778,8004	46-1	0,572
46	0	RESIST 1-1 H+	Combination	Min	0	-143,091	0	0	0	-30,9962	46-1	0
46	0,572	RESIST 1-1 H+	Combination	Min	0	-94,894	0	0	0	-3,3026	46-1	0,572
46	0	RESIST1-1 H-	Combination	Max	0	223,748	0	0	0	774,2595	46-1	0
46	0,572	RESIST1-1 H-	Combination	Max	0	282,08	0	0	0	731,3762	46-1	0,572
46	0	RESIST1-1 H-	Combination	Min	0	-96,517	0	0	0	-12,3265	46-1	0
46	0,572	RESIST1-1 H-	Combination	Min	0	-52,786	0	0	0	11,6332	46-1	0,572
46	0	RESIST1-2 T-	Combination	Max	0	248,864	0	0	0	846,0909	46-1	0
46	0,572	RESIST1-2 T-	Combination	Max	0	302,832	0	0	0	778,8563	46-1	0,572
46	0	RESIST1-2 T-	Combination	Min	0	-158,514	0	0	0	-0,813	46-1	0
46	0,572	RESIST1-2 T-	Combination	Min	0	-102,128	0	0	0	20,8439	46-1	0,572
46	0	E-SERV1-1	Combination	Max	0	105,323	0	0	0	391,8114	46-1	0
46	0,572	E-SERV1-1	Combination	Max	0	136,525	0	0	0	370,3453	46-1	0,572
46	0	E-SERV1-1	Combination	Min	0	-59,651	0	0	0	24,78	46-1	0
46	0,572	E-SERV1-1	Combination	Min	0	-34,346	0	0	0	34,3183	46-1	0,572
46	0	E-SERV1-2	Combination	Max	0	120,171	0	0	0	434,2783	46-1	0
46	0,572	E-SERV1-2	Combination	Max	0	149,62	0	0	0	400,3066	46-1	0,572
46	0	E-SERV1-2	Combination	Min	0	-66,277	0	0	0	30,3436	46-1	0
46	0,572	E-SERV1-2	Combination	Min	0	-37,454	0	0	0	38,7691	46-1	0,572
46	0	E-RESIST1-1	Combination	Max	0	240,884	0	0	0	823,2693	46-1	0
46	0,572	E-RESIST1-1	Combination	Max	0	302,807	0	0	0	778,8004	46-1	0,572
46	0	E-RESIST1-1	Combination	Min	0	-143,091	0	0	0	-30,9962	46-1	0
46	0,572	E-RESIST1-1	Combination	Min	0	-94,894	0	0	0	-3,3026	46-1	0,572
46	0	E-RESIST1-2	Combination	Max	0	275,445	0	0	0	922,111	46-1	0
46	0,572	E-RESIST1-2	Combination	Max	0	333,286	0	0	0	848,5352	46-1	0,572
46	0	E-RESIST1-2	Combination	Min	0	-158,514	0	0	0	-18,0471	46-1	0
46	0,572	E-RESIST1-2	Combination	Min	0	-102,128	0	0	0	7,0567	46-1	0,572
47	0	LINEA	LinStatic		0	7,618	0	0	0	42,3749	47-1	0
47	0,572	LINEA	LinStatic		0	13,069	0	0	0	36,4582	47-1	0,572
47	0	HL93 +	LinMoving	Max	0	118,818	0	0	0	271,856	47-1	0
47	0,572	HL93 +	LinMoving	Max	0	138,265	0	0	0	237,2635	47-1	0,572
47	0	HL93 +	LinMoving	Min	0	-52,052	0	0	0	-64,171	47-1	0
47	0,572	HL93 +	LinMoving	Min	0	-38,525	0	0	0	-48,1283	47-1	0,572
47	0	TAMDEM +	LinMoving	Max	0	131,913	0	0	0	301,8173	47-1	0
47	0,572	TAMDEM +	LinMoving	Max	0	149,158	0	0	0	255,9556	47-1	0,572
47	0	TAMDEM +	LinMoving	Min	0	-35,133	0	0	0	-59,7202	47-1	0
47	0,572	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	-44,7901	47-1	0,572
47	0	HL93 -	LinMoving	Max	0	109,913	0	0	0	251,4805	47-1	0
47	0,572	HL93 -	LinMoving	Max	0	127,608	0	0	0	218,9756	47-1	0,572
47	0	HL93 -	LinMoving	Min	0	-33,961	0	0	0	-57,7539	47-1	0
47	0,572	HL93 -	LinMoving	Min	0	-25,242	0	0	0	-43,3154	47-1	0,572
47	0	TAMDEM -	LinMoving	Max	0	118,829	0	0	0	271,8801	47-1	0
47	0,572	TAMDEM -	LinMoving	Max	0	134,363	0	0	0	230,5674	47-1	0,572
47	0	TAMDEM -	LinMoving	Min	0	-55,16	0	0	0	-53,7966	47-1	0
47	0,572	TAMDEM -	LinMoving	Min	0	-39,924	0	0	0	-40,3474	47-1	0,572
47	0	SERV1-1 H+	Combination	Max	0	136,525	0	0	0	370,3453	47-1	0
47	0,572	SERV1-1 H+	Combination	Max	0	168,642	0	0	0	322,0012	47-1	0,572

45	0	TAMDEM -	LinMoving	Min	0	-87,224	0	0	0	-80,6948	45-1	0
45	0,572	TAMDEM -	LinMoving	Min	0	-71,314	0	0	0	-67,2457	45-1	0,572
45	0	SERV1-1 H+	Combination	Max	0	75,153	0	0	0	388,374	45-1	0
45	0,572	SERV1-1 H+	Combination	Max	0	105,323	0	0	0	391,8114	45-1	0,572
45	0	SERV1-1 H+	Combination	Min	0	-84,075	0	0	0	7,9947	45-1	0
45	0,572	SERV1-1 H+	Combination	Min	0	-59,651	0	0	0	24,78	45-1	0,572
45	0	SERV1-2 T+	Combination	Max	0	91,281	0	0	0	443,7244	45-1	0
45	0,572	SERV1-2 T+	Combination	Max	0	120,171	0	0	0	434,2783	45-1	0,572
45	0	SERV1-2 T+	Combination	Min	0	-78,36	0	0	0	14,6709	45-1	0
45	0,572	SERV1-2 T+	Combination	Min	0	-48,028	0	0	0	30,3436	45-1	0,572
45	0	RESIST1-2 T+	Combination	Max	0	218,903	0	0	0	944,7239	45-1	0
45	0,572	RESIST1-2 T+	Combination	Max	0	275,445	0	0	0	922,111	45-1	0,572
45	0	RESIST1-2 T+	Combination	Min	0	-175,937	0	0	0	-53,8981	45-1	0
45	0,572	RESIST1-2 T+	Combination	Min	0	-116,04	0	0	0	-18,0471	45-1	0,572
45	0	SERV1-1 H-	Combination	Max	0	69,132	0	0	0	367,708	45-1	0
45	0,572	SERV1-1 H-	Combination	Max	0	97,96	0	0	0	370,7546	45-1	0,572
45	0	SERV1-1 H-	Combination	Min	0	-62,667	0	0	0	17,6203	45-1	0
45	0,572	SERV1-1 H-	Combination	Min	0	-39,641	0	0	0	32,8014	45-1	0,572
45	0	SERV1-2 T-	Combination	Max	0	81,47	0	0	0	410,0521	45-1	0
45	0,572	SERV1-2 T-	Combination	Max	0	108,751	0	0	0	401,6166	45-1	0,572
45	0	SERV1-2 T-	Combination	Min	0	-94,857	0	0	0	23,5564	45-1	0
45	0,572	SERV1-2 T-	Combination	Min	0	-66,277	0	0	0	37,7481	45-1	0,572
45	0	RESIST 1-1 H+	Combination	Max	0	181,366	0	0	0	815,8959	45-1	0
45	0,572	RESIST 1-1 H+	Combination	Max	0	240,884	0	0	0	823,2693	45-1	0,572
45	0	RESIST 1-1 H+	Combination	Min	0	-189,238	0	0	0	-69,437	45-1	0
45	0,572	RESIST 1-1 H+	Combination	Min	0	-143,091	0	0	0	-30,9962	45-1	0,572
45	0	RESIST1-1 H-	Combination	Max	0	167,35	0	0	0	767,7957	45-1	0
45	0,572	RESIST1-1 H-	Combination	Max	0	223,748	0	0	0	774,2595	45-1	0,572
45	0	RESIST1-1 H-	Combination	Min	0	-139,411	0	0	0	-47,0333	45-1	0
45	0,572	RESIST1-1 H-	Combination	Min	0	-96,517	0	0	0	-12,3265	45-1	0,572
45	0	RESIST1-2 T-	Combination	Max	0	196,067	0	0	0	866,3516	45-1	0
45	0,572	RESIST1-2 T-	Combination	Max	0	248,864	0	0	0	846,0909	45-1	0,572
45	0	RESIST1-2 T-	Combination	Min	0	-214,334	0	0	0	-33,2172	45-1	0
45	0,572	RESIST1-2 T-	Combination	Min	0	-158,514	0	0	0	-0,813	45-1	0,572
45	0	E-SERV1-1	Combination	Max	0	75,153	0	0	0	388,374	45-1	0
45	0,572	E-SERV1-1	Combination	Max	0	105,323	0	0	0	391,8114	45-1	0,572
45	0	E-SERV1-1	Combination	Min	0	-84,075	0	0	0	7,9947	45-1	0
45	0,572	E-SERV1-1	Combination	Min	0	-59,651	0	0	0	24,78	45-1	0,572
45	0	E-SERV1-2	Combination	Max	0	91,281	0	0	0	443,7244	45-1	0
45	0,572	E-SERV1-2	Combination	Max	0	120,171	0	0	0	434,2783	45-1	0,572
45	0	E-SERV1-2	Combination	Min	0	-94,857	0	0	0	14,6709	45-1	0
45	0,572	E-SERV1-2	Combination	Min	0	-66,277	0	0	0	30,3436	45-1	0,572
45	0	E-RESIST1-1	Combination	Max	0	181,366	0	0	0	815,8959	45-1	0
45	0,572	E-RESIST1-1	Combination	Max	0	240,884	0	0	0	823,2693	45-1	0,572
45	0	E-RESIST1-1	Combination	Min	0	-189,238	0	0	0	-69,437	45-1	0
45	0,572	E-RESIST1-1	Combination	Min	0	-143,091	0	0	0	-30,9962	45-1	0,572
45	0	E-RESIST1-2	Combination	Max	0	218,903	0	0	0	944,7239	45-1	0
45	0,572	E-RESIST1-2	Combination	Max	0	275,445	0	0	0	922,111	45-1	0,572
45	0	E-RESIST1-2	Combination	Min	0	-214,334	0	0	0	-53,8981	45-1	0
45	0,572	E-RESIST1-2	Combination	Min	0	-158,514	0	0	0	-18,0471	45-1	0,572
46	0	LINEA	LinStatic		0	2,167	0	0	0	45,1734	46-1	0
46	0,572	LINEA	LinStatic		0	7,618	0	0	0	42,3749	46-1	0,572
46	0	HL93 +	LinMoving	Max	0	100,286	0	0	0	286,8176	46-1	0
46	0,572	HL93 +	LinMoving	Max	0	118,818	0	0	0	271,856	46-1	0,572
46	0	HL93 +	LinMoving	Min	0	-64,687	0	0	0	-80,2138	46-1	0
46	0,572	HL93 +	LinMoving	Min	0	-52,052	0	0	0	-64,171	46-1	0,572
46	0	TAMDEM +	LinMoving	Max	0	115,134	0	0	0	329,2845	46-1	0
46	0,572	TAMDEM +	LinMoving	Max	0	131,913	0	0	0	301,8173	46-1	0,572
46	0	TAMDEM +	LinMoving	Min	0	-53,065	0	0	0	-74,6502	46-1	0
46	0,572	TAMDEM +	LinMoving	Min	0	-35,133	0	0	0	-59,7202	46-1	0,572
46	0	HL93 -	LinMoving	Max	0	92,923	0	0	0	265,7608	46-1	0
46	0,572	HL93 -	LinMoving	Max	0	109,913	0	0	0	251,4805	46-1	0,572
46	0	HL93 -	LinMoving	Min	0	-44,677	0	0	0	-72,1924	46-1	0
46	0,572	HL93 -	LinMoving	Min	0	-33,961	0	0	0	-57,7539	46-1	0,572
46	0	TAMDEM -	LinMoving	Max	0	103,714	0	0	0	296,6228	46-1	0
46	0,572	TAMDEM -	LinMoving	Max	0	118,829	0	0	0	271,8801	46-1	0,572
46	0	TAMDEM -	LinMoving	Min	0	-71,314	0	0	0	-67,2457	46-1	0
46	0,572	TAMDEM -	LinMoving	Min	0	-55,16	0	0	0	-53,7966	46-1	0,572

47	0	SERV1-1 H+	Combination	Min	0	-34,346	0	0	0	34,3183	47-1	0
47	0,572	SERV1-1 H+	Combination	Min	0	-8,148	0	0	0	36,6094	47-1	0,572
47	0	SERV1-2 T+	Combination	Max	0	149,62	0	0	0	400,3066	47-1	0
47	0,572	SERV1-2 T+	Combination	Max	0	179,534	0	0	0	340,6932	47-1	0,572
47	0	SERV1-2 T+	Combination	Min	0	-17,426	0	0	0	38,7691	47-1	0
47	0,572	SERV1-2 T+	Combination	Min	0	4,275	0	0	0	39,9475	47-1	0,572
47	0	RESIST1-2 T+	Combination	Max	0	333,286	0	0	0	848,5352	47-1	0
47	0,572	RESIST1-2 T+	Combination	Max	0	392,212	0	0	0	721,3989	47-1	0,572
47	0	RESIST1-2 T+	Combination	Min	0	-55,513	0	0	0	7,0567	47-1	0
47	0,572	RESIST1-2 T+	Combination	Min	0	-15,705	0	0	0	21,4133	47-1	0,572
47	0	SERV1-1 H-	Combination	Max	0	127,619	0	0	0	349,9698	47-1	0
47	0,572	SERV1-1 H-	Combination	Max	0	157,984	0	0	0	303,7132	47-1	0,572
47	0	SERV1-1 H-	Combination	Min	0	-16,255	0	0	0	40,7354	47-1	0
47	0,572	SERV1-1 H-	Combination	Min	0	5,134	0	0	0	41,4222	47-1	0,572
47	0	SERV1-2 T-	Combination	Max	0	136,535	0	0	0	370,3694	47-1	0
47	0,572	SERV1-2 T-	Combination	Max	0	164,739	0	0	0	315,305	47-1	0,572
47	0	SERV1-2 T-	Combination	Min	0	-37,454	0	0	0	44,6927	47-1	0
47	0,572	SERV1-2 T-	Combination	Min	0	-9,548	0	0	0	44,3903	47-1	0,572
47	0	RESIST 1-1 H+	Combination	Max	0	302,807	0	0	0	778,8004	47-1	0
47	0,572	RESIST 1-1 H+	Combination	Max	0	366,859	0	0	0	677,8931	47-1	0,572
47	0	RESIST 1-1 H+	Combination	Min	0	-94,894	0	0	0	-3,3026	47-1	0
47	0,572	RESIST 1-1 H+	Combination	Min	0	-44,62	0	0	0	13,6438	47-1	0,572
47	0	RESIST1-1 H-	Combination	Max	0	282,08	0	0	0	731,3762	47-1	0
47	0,572	RESIST1-1 H-	Combination	Max	0	342,055	0	0	0	635,328	47-1	0,572
47	0	RESIST1-1 H-	Combination	Min	0	-52,786	0	0	0	11,6332	47-1	0
47	0,572	RESIST1-1 H-	Combination	Min	0	-13,704	0	0	0	24,8456	47-1	0,572
47	0	RESIST1-2 T-	Combination	Max	0	302,832	0	0	0	778,8563	47-1	0
47	0,572	RESIST1-2 T-	Combination	Max	0	357,777	0	0	0	662,3079	47-1	0,572
47	0	RESIST1-2 T-	Combination	Min	0	-102,128	0	0	0	20,8439	47-1	0
47	0,572	RESIST1-2 T-	Combination	Min	0	-47,876	0	0	0	31,7537	47-1	0,572
47	0	E-SERV1-1	Combination	Max	0	136,525	0	0	0	370,3453	47-1	0
47	0,572	E-SERV1-1	Combination	Max	0	168,642	0	0	0	322,0012	47-1	0,572
47	0	E-SERV1-1	Combination	Min	0	-34,346	0	0	0	34,3183	47-1	0
47	0,572	E-SERV1-1	Combination	Min	0	-8,148	0	0	0	36,6094	47-1	0,572
47	0	E-SERV1-2	Combination	Max	0	149,62	0	0	0	400,3066	47-1	0
47	0,572	E-SERV1-2	Combination	Max	0	179,534	0	0	0	340,6932	47-1	0,572
47	0	E-SERV1-2	Combination	Min	0	-37,454	0	0	0	38,7691	47-1	0
47	0,572	E-SERV1-2	Combination	Min	0	-9,548	0	0	0	39,9475	47-1	0,572
47	0	E-RESIST1-1	Combination	Max	0	302,807	0	0	0	778,8004	47-1	0
47	0,572	E-RESIST1-1	Combination	Max	0	366,859	0	0	0	677,8931	47-1	0,572
47	0	E-RESIST1-1	Combination	Min	0	-94,894	0	0	0	-3,3026	47-1	0
47	0,572	E-RESIST1-1	Combination	Min	0	-44,62	0	0	0	13,6438	47-1	0,572
47	0	E-RESIST1-2	Combination	Max	0	333,286	0	0	0	848,5352	47-1	0
47	0,572	E-RESIST1-2	Combination	Max	0	392,212	0	0	0	721,3989	47-1	0,572
47	0	E-RESIST1-2	Combination	Min	0	-102,128	0	0	0	7,0567	47-1	0
47	0,572	E-RESIST1-2	Combination	Min	0	-47,876	0	0	0	21,4133	47-1	0,572
48	0	LINEA	LinStatic		0	13,069	0	0	0	36,4582	48-1	0
48	0,572	LINEA	LinStatic		0	18,52	0	0	0	27,4236	48-1	0,572
48	0	HL93 +	LinMoving	Max	0	138,265	0	0	0	237,2635	48-1	0
48	0,572	HL93 +	LinMoving	Max	0	158,51	0	0	0	181,3351	48-1	0,572
48	0	HL93 +	LinMoving	Min	0	-38,525	0	0	0	-48,1283	48-1	0
48	0,572	HL93 +	LinMoving	Min	0	-28,047	0	0	0	-32,0855	48-1	0,572
48	0	TAMDEM +	LinMoving	Max	0	149,158	0	0	0	255,9556	48-1	0
48	0,572	TAMDEM +	LinMoving	Max	0	166,778	0	0	0	190,7937	48-1	0,572
48	0	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	-44,7901	48-1	0
48	0,572	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	-29,8601	48-1	0,572
48	0	HL93 -	LinMoving	Max	0	127,608	0	0	0	218,9756	48-1	0
48	0,572	HL93 -	LinMoving	Max	0	145,884	0	0	0	166,8917	48-1	0,572
48	0	HL93 -	LinMoving	Min	0	-25,242	0	0	0	-43,3154	48-1	0
48	0,572	HL93 -	LinMoving	Min	0	-25,242	0	0	0	-28,877	48-1	0,572
48	0	TAMDEM -	LinMoving	Max	0	134,363	0	0	0	230,5674	48-1	0
48	0,572	TAMDEM -	LinMoving	Max	0	150,235	0	0	0	171,8689	48-1	0,572
48	0	TAMDEM -	LinMoving	Min	0	-39,924	0	0	0	-40,3474	48-1	0
48	0,572	TAMDEM -	LinMoving	Min	0	-31,746	0	0	0	-26,8983	48-1	0,572
48	0	SERV1-1 H+	Combination	Max	0	168,642	0	0	0	322,0012	48-1	0
48	0,572	SERV1-1 H+	Combination	Max	0	201,556	0	0	0	245,074	48-1	0,572
48	0	SERV1-1 H+	Combination	Min	0	-8,148	0	0	0	36,6094	48-1	0
48	0,572	SERV1-1 H+	Combination	Min	0	14,999	0	0	0	31,6534	48-1	0,572

48	0	SERV1-2 T+	Combination	Max	0	179,534	0	0	0	340,6932	48-1	0
48	0,572	SERV1-2 T+	Combination	Max	0	209,824	0	0	0	254,5326	48-1	0,572
48	0	SERV1-2 T+	Combination	Min	0	4,275	0	0	0	39,9475	48-1	0
48	0,572	SERV1-2 T+	Combination	Min	0	16,945	0	0	0	33,8788	48-1	0,572
48	0	RESIST1-2 T+	Combination	Max	0	392,212	0	0	0	721,3989	48-1	0
48	0,572	RESIST1-2 T+	Combination	Max	0	452,011	0	0	0	538,5944	48-1	0,572
48	0	RESIST1-2 T+	Combination	Min	0	-15,705	0	0	0	21,4133	48-1	0
48	0,572	RESIST1-2 T+	Combination	Min	0	3,084	0	0	0	25,0227	48-1	0,572
48	0	SERV1-1 H-	Combination	Max	0	157,984	0	0	0	303,7132	48-1	0
48	0,572	SERV1-1 H-	Combination	Max	0	188,93	0	0	0	230,6306	48-1	0,572
48	0	SERV1-1 H-	Combination	Min	0	5,134	0	0	0	41,4222	48-1	0
48	0,572	SERV1-1 H-	Combination	Min	0	17,804	0	0	0	34,8619	48-1	0,572
48	0	SERV1-2 T-	Combination	Max	0	164,739	0	0	0	315,305	48-1	0
48	0,572	SERV1-2 T-	Combination	Max	0	193,281	0	0	0	235,6078	48-1	0,572
48	0	SERV1-2 T-	Combination	Min	0	-9,548	0	0	0	44,3903	48-1	0
48	0,572	SERV1-2 T-	Combination	Min	0	11,3	0	0	0	36,8406	48-1	0,572
48	0	RESIST 1-1 H+	Combination	Max	0	366,859	0	0	0	677,8931	48-1	0
48	0,572	RESIST 1-1 H+	Combination	Max	0	432,767	0	0	0	516,5795	48-1	0,572
48	0	RESIST 1-1 H+	Combination	Min	0	-44,62	0	0	0	13,6438	48-1	0
48	0,572	RESIST 1-1 H+	Combination	Min	0	-1,443	0	0	0	19,843	48-1	0,572
48	0	RESIST1-1 H-	Combination	Max	0	342,055	0	0	0	635,328	48-1	0
48	0,572	RESIST1-1 H-	Combination	Max	0	403,381	0	0	0	482,9624	48-1	0,572
48	0	RESIST1-1 H-	Combination	Min	0	-13,704	0	0	0	24,8456	48-1	0
48	0,572	RESIST1-1 H-	Combination	Min	0	5,084	0	0	0	27,3109	48-1	0,572
48	0	RESIST1-2 T-	Combination	Max	0	357,777	0	0	0	662,3079	48-1	0
48	0,572	RESIST1-2 T-	Combination	Max	0	413,507	0	0	0	494,5469	48-1	0,572
48	0	RESIST1-2 T-	Combination	Min	0	-47,876	0	0	0	31,7537	48-1	0
48	0,572	RESIST1-2 T-	Combination	Min	0	-10,054	0	0	0	31,9163	48-1	0,572
48	0	E-SERV1-1	Combination	Max	0	168,642	0	0	0	322,0012	48-1	0
48	0,572	E-SERV1-1	Combination	Max	0	201,556	0	0	0	245,074	48-1	0,572
48	0	E-SERV1-1	Combination	Min	0	-8,148	0	0	0	36,6094	48-1	0
48	0,572	E-SERV1-1	Combination	Min	0	14,999	0	0	0	31,6534	48-1	0,572
48	0	E-SERV1-2	Combination	Max	0	179,534	0	0	0	340,6932	48-1	0
48	0,572	E-SERV1-2	Combination	Max	0	209,824	0	0	0	254,5326	48-1	0,572
48	0	E-SERV1-2	Combination	Min	0	-9,548	0	0	0	39,9475	48-1	0
48	0,572	E-SERV1-2	Combination	Min	0	11,3	0	0	0	33,8788	48-1	0,572
48	0	E-RESIST1-1	Combination	Max	0	366,859	0	0	0	677,8931	48-1	0
48	0,572	E-RESIST1-1	Combination	Max	0	432,767	0	0	0	516,5795	48-1	0,572
48	0	E-RESIST1-1	Combination	Min	0	-44,62	0	0	0	13,6438	48-1	0
48	0,572	E-RESIST1-1	Combination	Min	0	-1,443	0	0	0	19,843	48-1	0,572
48	0	E-RESIST1-2	Combination	Max	0	392,212	0	0	0	721,3989	48-1	0
48	0,572	E-RESIST1-2	Combination	Max	0	452,011	0	0	0	538,5944	48-1	0,572
48	0	E-RESIST1-2	Combination	Min	0	-47,876	0	0	0	21,4133	48-1	0
48	0,572	E-RESIST1-2	Combination	Min	0	-10,054	0	0	0	25,0227	48-1	0,572
49	0	LINEA	LinStatic		0	18,52	0	0	0	27,4236	49-1	0
49	0,572	LINEA	LinStatic		0	23,972	0	0	0	15,2708	49-1	0,572
49	0	HL93 +	LinMoving	Max	0	158,51	0	0	0	181,3351	49-1	0
49	0,572	HL93 +	LinMoving	Max	0	179,433	0	0	0	102,6357	49-1	0,572
49	0	HL93 +	LinMoving	Min	0	-28,047	0	0	0	-32,0855	49-1	0
49	0,572	HL93 +	LinMoving	Min	0	-28,047	0	0	0	-16,0428	49-1	0,572
49	0	TAMDEM +	LinMoving	Max	0	166,778	0	0	0	190,7937	49-1	0
49	0,572	TAMDEM +	LinMoving	Max	0	184,679	0	0	0	105,6367	49-1	0,572
49	0	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	-29,8601	49-1	0
49	0,572	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	-14,93	49-1	0,572
49	0	HL93 -	LinMoving	Max	0	145,884	0	0	0	166,8917	49-1	0
49	0,572	HL93 -	LinMoving	Max	0	164,805	0	0	0	94,2686	49-1	0,572
49	0	HL93 -	LinMoving	Min	0	-25,242	0	0	0	-28,877	49-1	0
49	0,572	HL93 -	LinMoving	Min	0	-25,242	0	0	0	-14,4385	49-1	0,572
49	0	TAMDEM -	LinMoving	Max	0	150,235	0	0	0	171,8689	49-1	0
49	0,572	TAMDEM -	LinMoving	Max	0	166,361	0	0	0	95,1586	49-1	0,572
49	0	TAMDEM -	LinMoving	Min	0	-31,746	0	0	0	-26,8983	49-1	0
49	0,572	TAMDEM -	LinMoving	Min	0	-23,512	0	0	0	-13,4491	49-1	0,572
49	0	SERV1-1 H+	Combination	Max	0	201,556	0	0	0	245,074	49-1	0
49	0,572	SERV1-1 H+	Combination	Max	0	235,149	0	0	0	138,1287	49-1	0,572
49	0	SERV1-1 H+	Combination	Min	0	14,999	0	0	0	31,6534	49-1	0
49	0,572	SERV1-1 H+	Combination	Min	0	27,669	0	0	0	19,4503	49-1	0,572
49	0	SERV1-2 T+	Combination	Max	0	209,824	0	0	0	254,5326	49-1	0
49	0,572	SERV1-2 T+	Combination	Max	0	240,395	0	0	0	141,1297	49-1	0,572

49	0	SERV1-2 T+	Combination	Min	0	16,945	0	0	0	33,8788	49-1	0
49	0,572	SERV1-2 T+	Combination	Min	0	29,614	0	0	0	20,563	49-1	0,572
49	0	RESIST1-2 T+	Combination	Max	0	452,011	0	0	0	538,5944	49-1	0
49	0,572	RESIST1-2 T+	Combination	Max	0	512,466	0	0	0	298,504	49-1	0,572
49	0	RESIST1-2 T+	Combination	Min	0	3,084	0	0	0	25,0227	49-1	0
49	0,572	RESIST1-2 T+	Combination	Min	0	21,873	0	0	0	17,8849	49-1	0,572
49	0	SERV1-1 H-	Combination	Max	0	188,93	0	0	0	230,6306	49-1	0
49	0,572	SERV1-1 H-	Combination	Max	0	220,521	0	0	0	129,7616	49-1	0,572
49	0	SERV1-1 H-	Combination	Min	0	17,804	0	0	0	34,8619	49-1	0
49	0,572	SERV1-1 H-	Combination	Min	0	30,474	0	0	0	21,0545	49-1	0,572
49	0	SERV1-2 T-	Combination	Max	0	193,281	0	0	0	235,6078	49-1	0
49	0,572	SERV1-2 T-	Combination	Max	0	222,077	0	0	0	130,6516	49-1	0,572
49	0	SERV1-2 T-	Combination	Min	0	11,3	0	0	0	36,8406	49-1	0
49	0,572	SERV1-2 T-	Combination	Min	0	32,203	0	0	0	22,0439	49-1	0,572
49	0	RESIST 1-1 H+	Combination	Max	0	432,767	0	0	0	516,5795	49-1	0
49	0,572	RESIST 1-1 H+	Combination	Max	0	500,255	0	0	0	291,5192	49-1	0,572
49	0	RESIST 1-1 H+	Combination	Min	0	-1,443	0	0	0	19,843	49-1	0
49	0,572	RESIST 1-1 H+	Combination	Min	0	17,345	0	0	0	15,2951	49-1	0,572
49	0	RESIST1-1 H-	Combination	Max	0	403,381	0	0	0	482,9624	49-1	0
49	0,572	RESIST1-1 H-	Combination	Max	0	466,208	0	0	0	272,0448	49-1	0,572
49	0	RESIST1-1 H-	Combination	Min	0	5,084	0	0	0	27,3109	49-1	0
49	0,572	RESIST1-1 H-	Combination	Min	0	23,873	0	0	0	19,0291	49-1	0,572
49	0	RESIST1-2 T-	Combination	Max	0	413,507	0	0	0	494,5469	49-1	0
49	0,572	RESIST1-2 T-	Combination	Max	0	469,83	0	0	0	274,1162	49-1	0,572
49	0	RESIST1-2 T-	Combination	Min	0	-10,054	0	0	0	31,9163	49-1	0
49	0,572	RESIST1-2 T-	Combination	Min	0	27,899	0	0	0	21,3317	49-1	0,572
49	0	E-SERV1-1	Combination	Max	0	201,556	0	0	0	245,074	49-1	0
49	0,572	E-SERV1-1	Combination	Max	0	235,149	0	0	0	138,1287	49-1	0,572
49	0	E-SERV1-1	Combination	Min	0	14,999	0	0	0	31,6534	49-1	0
49	0,572	E-SERV1-1	Combination	Min	0	27,669	0	0	0	19,4503	49-1	0,572
49	0	E-SERV1-2	Combination	Max	0	209,824	0	0	0	254,5326	49-1	0
49	0,572	E-SERV1-2	Combination	Max	0	240,395	0	0	0	141,1297	49-1	0,572
49	0	E-SERV1-2	Combination	Min	0	11,3	0	0	0	33,8788	49-1	0
49	0,572	E-SERV1-2	Combination	Min	0	29,614	0	0	0	20,563	49-1	0,572
49	0	E-RESIST1-1	Combination	Max	0	432,767	0	0	0	516,5795	49-1	0
49	0,572	E-RESIST1-1	Combination	Max	0	500,255	0	0	0	291,5192	49-1	0,572
49	0	E-RESIST1-1	Combination	Min	0	-1,443	0	0	0	19,843	49-1	0
49	0,572	E-RESIST1-1	Combination	Min	0	17,345	0	0	0	15,2951	49-1	0,572
49	0	E-RESIST1-2	Combination	Max	0	452,011	0	0	0	538,5944	49-1	0
49	0,572	E-RESIST1-2	Combination	Max	0	512,466	0	0	0	298,504	49-1	0,572
49	0	E-RESIST1-2	Combination	Min	0	-10,054	0	0	0	25,0227	49-1	0
49	0,572	E-RESIST1-2	Combination	Min	0	21,873	0	0	0	17,8849	49-1	0,572
50	0	LINEA	LinStatic		0	23,972	0	0	0	15,2708	50-1	0
50	0,572	LINEA	LinStatic		0	29,423	0	0	0	4,441E-15	50-1	0,572
50	0	HL93 +	LinMoving	Max	0	179,433	0	0	0	102,6357	50-1	0
50	0,572	HL93 +	LinMoving	Max	0	200,956	0	0	0	0	50-1	0,572
50	0	HL93 +	LinMoving	Min	0	-28,047	0	0	0	-16,0428	50-1	0
50	0,572	HL93 +	LinMoving	Min	0	-28,047	0	0	0	0	50-1	0,572
50	0	TAMDEM +	LinMoving	Max	0	184,679	0	0	0	105,6367	50-1	0
50	0,572	TAMDEM +	LinMoving	Max	0	202,803	0	0	0	0	50-1	0,572
50	0	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	-14,93	50-1	0
50	0,572	TAMDEM +	LinMoving	Min	0	-26,101	0	0	0	0	50-1	0,572
50	0	HL93 -	LinMoving	Max	0	164,805	0	0	0	94,2686	50-1	0
50	0,572	HL93 -	LinMoving	Max	0	184,786	0	0	0	0	50-1	0,572
50	0	HL93 -	LinMoving	Min	0	-25,242	0	0	0	-14,4385	50-1	0
50	0,572	HL93 -	LinMoving	Min	0	-25,242	0	0	0	0	50-1	0,572
50	0	TAMDEM -	LinMoving	Max	0	166,361	0	0	0	95,1586	50-1	0
50	0,572	TAMDEM -	LinMoving	Max	0	182,687	0	0	0	0	50-1	0,572
50	0	TAMDEM -	LinMoving	Min	0	-23,512	0	0	0	-13,4491	50-1	0
50	0,572	TAMDEM -	LinMoving	Min	0	-23,512	0	0	0	0	50-1	0,572
50	0	SERV1-1 H+	Combination	Max	0	235,149	0	0	0	138,1287	50-1	0
50	0,572	SERV1-1 H+	Combination	Max	0	269,341	0	0	0	-4,563E-14	50-1	0,572
50	0	SERV1-1 H+	Combination	Min	0	27,669	0	0	0	19,4503	50-1	0
50	0,572	SERV1-1 H+	Combination	Min	0	40,339	0	0	0	-4,563E-14	50-1	0,572
50	0	SERV1-2 T+	Combination	Max	0	240,395	0	0	0	141,1297	50-1	0
50	0,572	SERV1-2 T+	Combination	Max	0	271,189	0	0	0	-4,563E-14	50-1	0,572
50	0	SERV1-2 T+	Combination	Min	0	29,614	0	0	0	20,563	50-1	0
50	0,572	SERV1-2 T+	Combination	Min	0	42,284	0	0	0	-4,563E-14	50-1	0,572

ANEXO 7

ANEXO 7A-DEFLEXIONES FRANJA EXTERNA

TABLE: Joint Displacements

Joint	OutputCase	CaseType	StepType	U1	U2	U3	R1	R2	R3
Text	Text	Text	Text	m	m	m	Radians	Radians	Radians
8	HL93 +	LinMoving	Max	0	0	0,002418	0	0,000192	0
8	HL93 +	LinMoving	Min	0	0	-0,00415	0	-0,000331	0
8	DFL1	Combination	Max	0	0	0,000095	0	-0,000003007	0
8	DFL1	Combination	Min	0	0	-0,001547	0	-0,000134	0
8	DFL2	Combination	Max	0	0	0,000052	0	0,000017	0
8	DFL2	Combination	Min	0	0	-0,001696	0	-0,000112	0
8	DFL3	Combination		0	0	-0,001801	0	-0,00018	0
26	HL93 +	LinMoving	Max	0	0	0,002089	0	0,000401	0
26	HL93 +	LinMoving	Min	0	0	-0,007693	0	-0,000401	0
26	DFL1	Combination	Max	0	0	-0,000617	0	0,0001	0
26	DFL1	Combination	Min	0	0	-0,003062	0	-0,0001	0
26	DFL2	Combination	Max	0	0	-0,000594	0	0,000101	0
26	DFL2	Combination	Min	0	0	-0,003048	0	-0,000101	0
26	DFL3	Combination		0	0	-0,004024	0	1,421E-17	0
44	HL93 +	LinMoving	Max	0	0	0,002418	0	0,000331	0
44	HL93 +	LinMoving	Min	0	0	-0,00415	0	-0,000192	0
44	DFL1	Combination	Max	0	0	0,000095	0	0,000134	0
44	DFL1	Combination	Min	0	0	-0,001547	0	0,000003004	0
44	DFL2	Combination	Max	0	0	0,000052	0	0,000112	0
44	DFL2	Combination	Min	0	0	-0,001696	0	-0,000017	0
44	DFL3	Combination		0	0	-0,001801	0	0,00018	0

ANEXO 7B - DEFLEXIONES FRANJA INTERNA

TABLE: Joint Displacements

Joint	OutputCase	CaseType	StepType	U1	U2	U3	R1	R2	R3
Text	Text	Text	Text	m	m	m	Radians	Radians	Radians
8	HL93 +	LinMoving	Max	0	0	0,002072	0	0,000164	0
8	HL93 +	LinMoving	Min	0	0	-0,003559	0	-0,000284	0
8	DFL1	Combination	Max	0	0	0,000071	0	-0,000003445	0
8	DFL1	Combination	Min	0	0	-0,001337	0	-0,000115	0
8	DFL2	Combination	Max	0	0	0,000035	0	0,000014	0
8	DFL2	Combination	Min	0	0	-0,001466	0	-0,000097	0
8	DFL3	Combination		0	0	-0,000592	0	-0,000059	0
26	HL93 +	LinMoving	Max	0	0	0,00179	0	0,000344	0
26	HL93 +	LinMoving	Min	0	0	-0,006596	0	-0,000344	0
26	DFL1	Combination	Max	0	0	-0,000551	0	0,000086	0
26	DFL1	Combination	Min	0	0	-0,002648	0	-0,000086	0
26	DFL2	Combination	Max	0	0	-0,000531	0	0,000087	0
26	DFL2	Combination	Min	0	0	-0,002637	0	-0,000087	0
26	DFL3	Combination		0	0	-0,001323	0	-1,254E-17	0
43	HL93 +	LinMoving	Max	0	0	0,002166	0	0,000361	0
43	HL93 +	LinMoving	Min	0	0	-0,003503	0	-0,00004	0
43	DFL1	Combination	Max	0	0	0,000133	0	0,000177	0
43	DFL1	Combination	Min	0	0	-0,001284	0	0,000077	0
43	DFL2	Combination	Max	0	0	0,000095	0	0,000195	0
43	DFL2	Combination	Min	0	0	-0,001405	0	0,000075	0
43	DFL3	Combination		0	0	-0,000541	0	0,000115	0