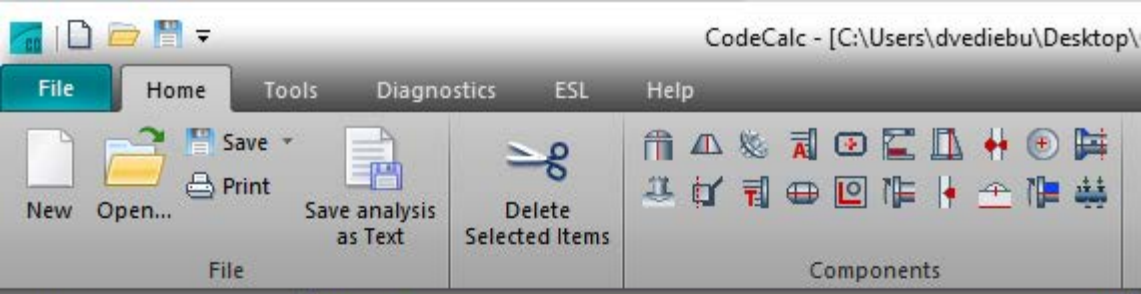


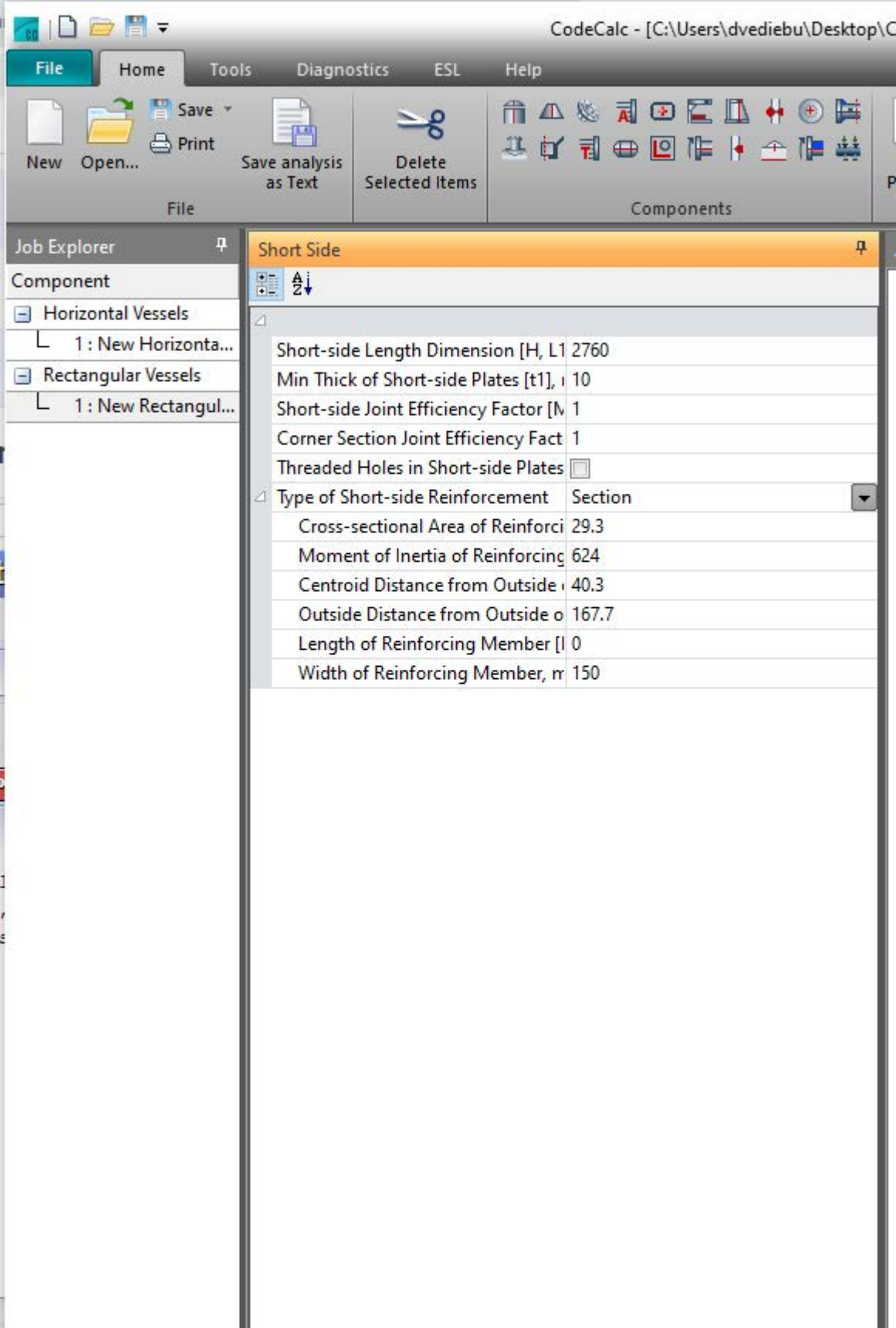
Job Explorer

Component

- Horizontal Vessels
  - 1 : New Horizonta...
- Rectangular Vessels
  - 1 : New Rectangul...

Vessel

Identification	
Item Number	1
Description	New Rectangular V
Vessel	
Design Internal Pressure, bars	1.246
Design Temperature, C	80
Vessel Corrosion Allowance, mm.	0
Shell Section Material	SA-240 316L
Figure Number for Type of Vessel	A4
Stay Plate/Reinforcement Material	SA-182 F316L
Pitch Distance Between Reinforcing Members, mm.	350
C-Factor [From UG-47]	2.1
Delta, $(N./mm^2)^{0.5}$	40.2654
Min Thick of End Closure Plate/Vessel Head [t5], mm.	0
C-Factor for End Closure Plate/Vessel Head [UG-34]	0.2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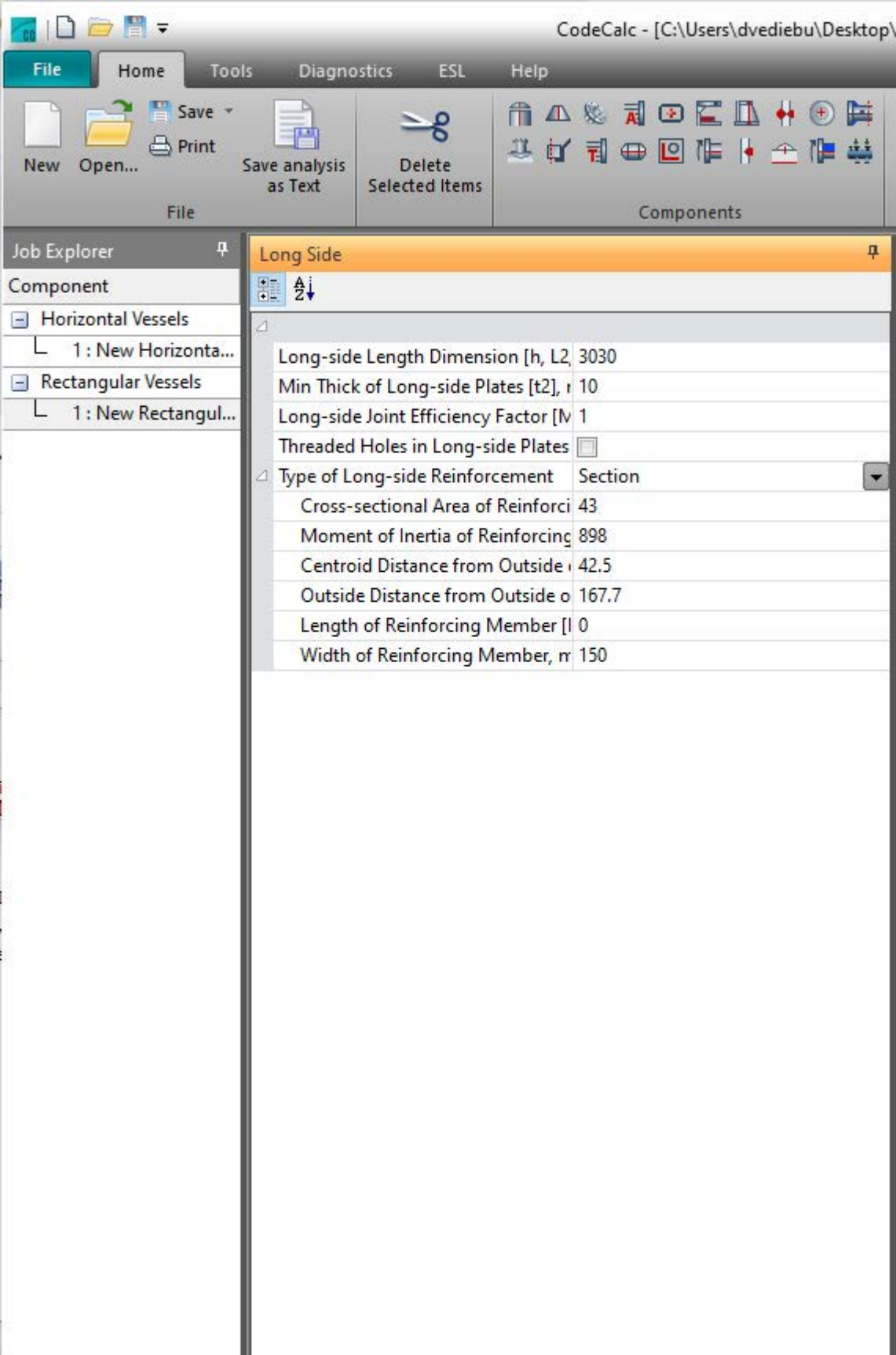
Diagnostics
ESL
Help
New
Open...
Save
Print
Save analysis as Text
File
Delete Selected Items
Components
Job Explorer
Component
Horizontal Vessels
1 : New Horizonta...
Rectangular Vessels
1 : New Rectangul...
Short Side
Short-side Length Dimension [H, L1 2760
Min Thick of Short-side Plates [t1], 10
Short-side Joint Efficiency Factor [M 1
Corner Section Joint Efficiency Fact 1
Threaded Holes in Short-side Plates
Type of Short-side Reinforcement Section
Cross-sectional Area of Reinforci 29.3
Moment of Inertia of Reinforcing 624
Centroid Distance from Outside 40.3
Outside Distance from Outside o 167.7
Length of Reinforcing Member [I 0
Width of Reinforcing Member, m 150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File
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Tools
Diagnostics
ESL
Help
New
Open...
Save
Print
Save analysis as Text
File
Delete Selected Items
Components
Job Explorer
Component
Horizontal Vessels
1 : New Horizonta...
Rectangular Vessels
1 : New Rectangul...
Long Side
Long-side Length Dimension [h, L2 3030
Min Thick of Long-side Plates [t2], r 10
Long-side Joint Efficiency Factor [M 1
Threaded Holes in Long-side Plates
Type of Long-side Reinforcement Section
Cross-sectional Area of Reinforci 43
Moment of Inertia of Reinforcing 898
Centroid Distance from Outside (42.5
Outside Distance from Outside o 167.7
Length of Reinforcing Member [l 0
Width of Reinforcing Member, m 150

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DESIGN CALCULATION

ASME Code Version : 2015

Analysis Performed by : SPLM user

Job File : C:\Users\dvediebu\Desktop\CodeCalc1.cc2

Date of Analysis : Aug 4,2020

PV Elite 2017, January 2017

Note:
PV Elite performs all calculations internally in U.S. Customary Units
to remain compliant with the ASME Code and any built in assumptions in
the ASME Code formulae. Finalized results are converted to the user set of
selected units using conversion constants with adequate significant digits.

Input Echo, Horizontal Vessel Item 1, Description: New Horizontal

Design Internal Pressure	6.89	bars
Design Temperature	37.78	C
Corrosion Allowance for Vessel	0.0000	mm.
Shell Material	SA-516 70	
Shell Material UNS Number	K02700	
Shell Operating Allowable Stress	137.90	N./mm^2
Shell Ambient Allowable Stress	137.90	N./mm^2
Head Material	SA-516 70	
Head Material UNS Number	K02700	
Head Operating Allowable Stress	137.90	N./mm^2
Head Ambient Allowable Stress	137.90	N./mm^2
Density of Shell and Head Material	0.0078	kg./cm^3
Density of Stored Liquid	0.0010	kg./cm^3
Liquid Height in Vessel	-19.0500	mm.

NOTE: Liquid Height was not entered, it has been set to the vessel ID.

Extra Weight	0.000	Kgf
Saddle Reaction Force Factor ftr	3.00	
Distance from Center of Vessel to Support B	0.00	mm.
Wind Loads Present	N	
Seismic Loads Present	N	
Diameter Basis for Vessel	OD	
Shell Diameter	0.000	mm.
Shell Length Tangent to Tangent	0.000	mm.
Thickness of Shell	9.5250	mm.
Shell Joint Efficiency	1.0000	
Head Type	Elliptical	
Head Thickness	9.5250	mm.
Head Joint Efficiency	1.0000	
Distance from Saddle to Vessel Tangent	0.000	mm.
Saddle Width	0.000	mm.
Saddle Bearing Angle	0.0000	degrees
Wear Pad Thickness	0.0000	mm.
Wear Pad Extension above Horn of Saddle	0.0000	mm.
Wear Pad Width	0.000	mm.
Stiffening Ring Present	N	

Error Messages for HORIZVES Analysis 1
ERROR - Shell Diameter, 0. , must be > 0.0.
ERROR - The shell length, 0. , must be > than 0.0 .
ERROR - The length dimension, 0. , (saddle to tangent) must be > 0 .
ERROR - The saddle width, 0. , must be > 0 .
ERROR - The bearing angle, 0. , must be > 80 and < = 180.
The analysis will not be possible until there are no errors.

Input Echo, COMPONENT 1, Description: New Rectangular

Figure Number Analyzed		A4	
Design Internal Pressure	P	1.2460	bars
Design External Pressure	Pext	10.1300	bars
Design Temperature	Temp	80.0000	C
VESSEL MATERIAL DATA:			
Material Specification		SA-240 316L	
Shell Allowable Stress at Design Temp	S	102.0484	N./mm^2
Shell Allowable Stress at Ambient	SA	115.1465	N./mm^2
Shell Yield Stress at Design Temperature	Sy	151.4996	N./mm^2
Length of Vessel	Lv	1.7900	mm.
SHORT-SIDE VESSEL DATA:			
Short-side Length Dimension	H	2760.0000	mm.
Minimum Thickness of Short-side Plates	t1	10.0000	mm.
Mid-side Joint Efficiency on Short-side	E	1.0000	
Corner Joint Efficiency on Short-side	EC	1.0000	
LONG-SIDE VESSEL DATA:			
Long-side Length Dimension	h	3030.0000	mm.
Minimum Thickness of Long-side Plates	t2	10.0000	mm.
Mid-side Joint Efficiency on Long-side	E	1.0000	
REINFORCEMENT MATERIAL DATA:			
Reinforcement Material Specification		SA-182 F316L	
Reinf Allowable Stress at Design Temp	Sr	102.0484	N./mm^2
Reinf Allowable Stress at Ambient	SA	115.1465	N./mm^2
Reinf Yield Stress at Design Temp	Sy	151.4996	N./mm^2
Pitch Distance for Reinforcement	p	350.0000	mm.
C-Factor for Reinforcement (from UG-47)		2.1000	
DELTA (Reinforcement Material Parameter)		40.2654	N./mm^2^0.5
SHORT-SIDE SECTIONAL DATA:			
Cross-sectional Area of Reinforcement		29.3000	cm^2
Moment of Inertia of Reinforcement		624.0000	cm**4
Outside Distance from Outside of Vessel		167.7000	mm.
Centroid Distance from Outside of Vessel		40.3000	mm.
Width of Reinforcing Member		150.0000	mm.
LONG-SIDE SECTIONAL DATA:			
Cross-sectional Area of Reinforcement		43.0000	cm^2
Moment of Inertia of Reinforcement		898.0000	cm**4
Outside Distance from Outside of Vessel		167.7000	mm.
Centroid Distance from Outside of Vessel		42.5000	mm.
Width of Reinforcing Member		150.0000	mm.

Rectangular Vessel Results, Item number 1, Desc: New Rectangular
ASME Code, Section VIII, Division 1, 2015 App. 13

Ligament Efficiency Calculations (Section 13-6, Equations (1)-(6)):

Short-side 1 Calculations

Membrane Ligament Efficiency [Em]:
= 1.000

Bending Ligament Efficiency [Eb]:
= 1.000

Dist from Neutral axis of c/s to inside surface of the vesssel [Ci]:

= t1 - CA / 2
= 10.000 - 0.000 / 2
= 5.000 mm.

Dist from Neutral axis of c/s to extreme outside surface of the section [Co]:
= -(t1 - CA) / 2
= -(10.000 - 0.000) / 2
= -5.000 mm.

Short-side 2 Calculations

Membrane Ligament Efficiency [Em]:
= 1.000

Bending Ligament Efficiency [Eb]:
= 1.000

Dist from Neutral axis of c/s to inside surface of the vesssel [Ci]:
= t1 - CA / 2
= 10.000 - 0.000 / 2
= 5.000 mm.

Dist from Neutral axis of c/s to extreme outside surface of the section [Co]:
= -(t1 - CA) / 2
= -(10.000 - 0.000) / 2
= -5.000 mm.

Long-side 1 Calculations

Membrane Ligament Efficiency [Em]:
= 1.000

Bending Ligament Efficiency [Eb]:
= 1.000

Dist from Neutral axis of c/s to inside surface of the vesssel [Ci]:
= t1 - CA / 2
= 10.000 - 0.000 / 2
= 5.000 mm.

Dist from Neutral axis of c/s to extreme outside surface of the section [Co]:
= -(t1 - CA) / 2
= -(10.000 - 0.000) / 2
= -5.000 mm.

Long-side 2 Calculations

Membrane Ligament Efficiency [Em]:
= 1.000

Bending Ligament Efficiency [Eb]:
= 1.000

Dist from Neutral axis of c/s to inside surface of the vesssel [Ci]:
= t1 - CA / 2
= 10.000 - 0.000 / 2
= 5.000 mm.

Dist from Neutral axis of c/s to extreme outside surface of the section [Co]:
= -(t1 - CA) / 2
= -(10.000 - 0.000) / 2
= -5.000 mm.

Ligament Efficiency Calculations (Section 13-6, Equations (1)-(6)):

		Em	Eb	Ci	Co
Short-side	1	1.000	1.000	5.000	-5.000
	2	1.000	1.000	5.000	-5.000

Long-side	1	1.000	1.000	5.000	-5.000
	2	1.000	1.000	5.000	-5.000

REINFORCEMENT CALCULATIONS:

Maximum Distance B/W Reinforcing Members (Eq.(1) of UG-47) [pmax]:
= 414.71 mm.

Beta and J Values:

Short-side BETA [Bs]:
= H / pmax
= 2760.00 / 414.71
= 6.66

Short-side J from Table 13-8(d) [Js]:
= 2.00

Long-side BETA [Bl]:
= h / pmax
= 3030.00 / 414.71
= 7.31

Long-side J from Table 13-8(d) [Jl]:
= 2.00

Max Pitch Values for Long and Short-sides based on Equations (1a)-(1d) from Section 13-8:

Short-side Pitch [p1]:
= t1 * sqrt(S * J / P)
= 10.00 * sqrt(102.05 * 2.00 / 1.25)
= 404.71 mm.

Long-side Pitch [p2]:
= t2 * sqrt(S * J / P)
= 10.00 * sqrt(102.05 * 2.00 / 1.25)
= 404.71 mm.

Maximum Pitch (Minimum of p, p1, and p2)
= Min(pmax, p1, p2)
= Min(414.71 , 404.71 , 404.71)
= 404.71 mm.

Effective Width of Shell Plate (Section 13-8, Eq. (2))

In Compression [w]:
= Min(Min(t1, t2) * Delta / sqrt(Sy), p)
= Min(Min(10.00 , 10.00) * 484.91 / sqrt(151.50), 350.00)
= 32.71 mm.

In Tension [w]:
= 350.00 mm.

Moment of Inertia of a Strip of the Vessel Wall:

Thickness t1, I1 = 0.0083 cm**4
Thickness t2, I2 = 0.0083 cm**4

Effective Area of Reinforcement on Shell (t * w):

Short-side Ap = 35.0000 cm^2
Long-side Ap = 35.0000 cm^2

Moment of Inertia of Effective Area of Reinforcement (w * t3 / 12):**

Short-side Is = 2.9167 cm**4

```
    Long-side  Il = 2.9167 cm**4
```

Moment of Inertia of Combined Reinforcement and Effective Width:

```
    In Compression I11 = 684.6611 cm**4
                   I21 = 966.8640 cm**4
    In Tension     I11 = 954.1976 cm**4
                   I21 = 1336.2567 cm**4
```

Distance from Neutral Axis of Cross Section of Composite Section to the Inside Surface of the Vessel (mm.):

		Ci	Co
Short-side,	in Compression	45.7502	-131.9498
	in Tension	25.6421	-152.0578
Long-side,	in Compression	49.1418	-128.5582
	in Tension	31.1859	-146.5141

Rectangular Vessel Reinforcement Parameters:

```
    Alpha1 =     H1 / h1      = 0.9161
    k(comp)= (I22/I11)*Alpha1 = 1.2937
    k(tens)= (I22/I11)*Alpha1 = 1.2829
```

Membrane Stress Calculations per Section 13-8

Membrane Stresses at Short-side 1

Membrane Stress at Short-side 1 [Sms]:

```
  = p * h * p / ( 2 * ( A1 + p * t1 ))
  = 1.25 * 3030.00 * 350.00 / ( 2 * ( 2930.000 + 350.00 * 10.00 ))
  = 10.28 N./mm^2
```

Membrane Stresses at Short-side 2

Membrane Stress at Short-side 2 [Sms]:

```
  = p * h * p / ( 2 * ( A1 + p * t1 ))
  = 1.25 * 3030.00 * 350.00 / ( 2 * ( 2930.000 + 350.00 * 10.00 ))
  = 10.28 N./mm^2
```

Membrane Stresses at Long-side 1

Membrane Stress at Long-side 1 at A[SmlA]:

```
  = p * H * p / ( 2 * ( A2 + p * t2 ))
  = 1.25 * 2760.00 * 350.00 / ( 2 * ( 43.000 + 350.00 * 10.00 ))
  = 7.72 N./mm^2
```

Membrane Stresses at Long-side 2

Membrane Stress at Long-side 2 at A[SmlA]:

```
  = p * H * p / ( 2 * ( A2 + p * t2 ))
  = 1.25 * 2760.00 * 350.00 / ( 2 * ( 43.000 + 350.00 * 10.00 ))
  = 7.72 N./mm^2
```

Membrane Stresses at Corner sections

Membrane Stress at Short side [Smsc]:

```
  = p * h * p / ( 2 * ( A1 + p * t1 ))
  = 1.25 * 3030.00 * 350.00 / ( 2 * ( 29.300 + 350.00 * 10.00 ))
  = 10.28 N./mm^2
```

Membrane Stress at Long side [Smlc]:

```
  = p * H * p / ( 2 * ( A2 + p * t2 ))
  = 1.25 * 2760.00 * 350.00 / ( 2 * ( 43.000 + 350.00 * 10.00 ))
  = 7.72 N./mm^2
```

MEMBRANE STRESSES: Membrane Stress Calculations per Section 13-8,

Equations (3) and (4). (N./mm^2) :

STRESS LOCATIONS	Actual	Allowable
Short-side 1	10.28	102.05
Short-side 2	10.28	102.05
Short-side Corner	10.28	102.05
Long-side 1 at A	7.72	102.05
Long-side 2 at A	7.72	102.05
Long-side Corner	7.72	102.05

Bending Stress Calculations per Section 13-8

Bending Stresses at Short-side 1

Bending Stress at Short-side 1 at N Inner[SbsNi]:

$= P * p * c / (24 * I11) * [-3 * H^2 + 2 * h^2 * ((1 + Alpha1^2 * k) / (1 + k))]$
$= 1.2 * 350.0 * 45.75 / (24 * 684.7) * [-3 * 2760.00^2 + 2 * 3030.00^2 * ((1 + 0.92^2 * 1.29) / (1 + 1.29))]$
$= -74.75$ N./mm^2

Bending Stress at Short-side 1 at N Outer[SbsNo]:

$= P * p * c / (24 * I11) * [-3 * H^2 + 2 * h^2 * ((1 + Alpha1^2 * k) / (1 + k))]$
$= 1.2 * 350.0 * -152.06 / (24 * 954.2) * [-3 * 2760.00^2 + 2 * 3030.00^2 * ((1 + 0.92^2 * 1.28) / (1 + 1.28))]$
$= 178.09$ N./mm^2

Bending Stress at Short-side 1 at Q Inner[SbsQi]:

$= P * h^2 * p * c / (12 * I11) * ((1 + Alpha1^2 * k) / (1 + k))$
$= 1.25 * 3030.00^2 * 350.00 * 25.64 / (12 * 954.20) * ((1 + 0.92^2 * 1.28) / (1 + 1.28))$
$= 81.57$ N./mm^2

Bending Stress at Short-side 1 at Q Outer[SbsQo]:

$= P * h^2 * p * c / (12 * I11) * ((1 + Alpha1^2 * k) / (1 + k))$
$= 1.25 * 3030.00^2 * 350.00 * -131.95 / (12 * 684.66) * ((1 + 0.92^2 * 1.29) / (1 + 1.29))$
$= -584.74$ N./mm^2

Bending Stresses at Short-side 2

Bending Stress at Short-side 2 at N Inner[SbsNi]:

$= P * p * c / (24 * I11) * [-3 * H^2 + 2 * h^2 * ((1 + Alpha1^2 * k) / (1 + k))]$
$= 1.2 * 350.0 * 45.75 / (24 * 684.7) * [-3 * 2760.00^2 + 2 * 3030.00^2 * ((1 + 0.92^2 * 1.29) / (1 + 1.29))]$
$= -74.75$ N./mm^2

Bending Stress at Short-side 2 at N Outer[SbsNo]:

$= P * p * c / (24 * I11) * [-3 * H^2 + 2 * h^2 * ((1 + Alpha1^2 * k) / (1 + k))]$
$= 1.2 * 350.0 * -152.06 / (24 * 954.2) * [-3 * 2760.00^2 + 2 * 3030.00^2 * ((1 + 0.92^2 * 1.28) / (1 + 1.28))]$
$= 178.09$ N./mm^2

Bending Stress at Short-side 2 at Q Inner[SbsQi]:

$= P * h^2 * p * c / (12 * I11) * ((1 + Alpha1^2 * k) / (1 + k))$
$= 1.25 * 3030.00^2 * 350.00 * 25.64 / (12 * 954.20) * ((1 + 0.92^2 * 1.28) / (1 + 1.28))$
$= 81.57$ N./mm^2

Bending Stress at Short-side 2 at Q Outer[SbsQo]:

$= P * h^2 * p * c / (12 * I11) * ((1 + Alpha1^2 * k) / (1 + k))$

```
  = 1.25 * 3030.00^2 * 350.00 * -131.95 / ( 12 * 684.66 ) *
    (( 1 + 0.92^2 * 1.29 ) / ( 1 + 1.29 ))
  = -584.74 N./mm^2
```

Bending Stresses at Long-side 1

Bending Stress at Long-side 1 at M Inner[SblMi]:
```
  = P * h^2 * p * c / ( 24 * I21 ) * [ -3 + 2 *
    (( 1 + Alpha1^2 * k ) / ( 1 + k ))]
  = 1.25 * 3030.00^2 * 350.00 * 49.14 / ( 24 * 966.86 ) * [ -3 + 2 *
    (( 1 + 0.92^2 * 1.29 ) / ( 1 + 1.29 ))]
  = -100.17 N./mm^2
```

Bending Stress at Long-side 1 at M Outer[SblMo]:
```
  = P * h^2 * p * c / ( 24 * I21 ) * [ -3 + 2 *
    (( 1 + Alpha1^2 * k ) / ( 1 + k ))]
  = 1.25 * 3030.00^2 * 350.00 * -146.51 / ( 24 * 966.86 ) * [ -3 + 2 *
    (( 1 + 0.92^2 * 1.28 ) / ( 1 + 1.28 ))]
  = 215.98 N./mm^2
```

Bending Stress at Long-side 1 at Q Inner[SblQi]:
```
  = P * h^2 * p * c / ( 12 * I21 ) *
    (( 1 + Alpha1^2 * k ) / ( 1 + k ))
  = 1.25 * 3030.00^2 * 350.00 * 31.19 / ( 24 * 1336.26 ) *
    (( 1 + 0.92^2 * 1.28 ) / ( 1 + 1.28 ))]
  = 70.84 N./mm^2
```

Bending Stress at Long-side 1 at Q Outer[SblQo]:
```
  = P * h^2 * p * c / ( 12 * I21 ) *
    (( 1 + Alpha1^2 * k ) / ( 1 + k ))
  = 1.25 * 3030.00^2 * 350.00 * -128.56 / ( 24 * 966.86 ) *
    (( 1 + 0.92^2 * 1.29 ) / ( 1 + 1.29 ))]
  = -403.43 N./mm^2
```

Bending Stresses at Long-side 2

Bending Stress at Long-side 2 at M Inner[SblMi]:
```
  = P * h^2 * p * c / ( 24 * I21 ) * [ -3 + 2 *
    (( 1 + Alpha1^2 * k ) / ( 1 + k ))]
  = 1.25 * 3030.00^2 * 350.00 * 49.14 / ( 24 * 966.86 ) * [ -3 + 2 *
    (( 1 + 0.92^2 * 1.29 ) / ( 1 + 1.29 ))]
  = -100.17 N./mm^2
```

Bending Stress at Long-side 2 at M Outer[SblMo]:
```
  = P * h^2 * p * c / ( 24 * I21 ) * [ -3 + 2 *
    (( 1 + Alpha1^2 * k ) / ( 1 + k ))]
  = 1.25 * 3030.00^2 * 350.00 * -146.51 / ( 24 * 966.86 ) * [ -3 + 2 *
    (( 1 + 0.92^2 * 1.28 ) / ( 1 + 1.28 ))]
  = 215.98 N./mm^2
```

Bending Stress at Long-side 2 at Q Inner[SblQi]:
```
  = P * h^2 * p * c / ( 12 * I21 ) *
    (( 1 + Alpha1^2 * k ) / ( 1 + k ))
  = 1.25 * 3030.00^2 * 350.00 * 31.19 / ( 24 * 1336.26 ) *
    (( 1 + 0.92^2 * 1.28 ) / ( 1 + 1.28 ))]
  = 70.84 N./mm^2
```

Bending Stress at Long-side 2 at Q Outer[SblQo]:
```
  = P * h^2 * p * c / ( 12 * I21 ) *
    (( 1 + Alpha1^2 * k ) / ( 1 + k ))
  = 1.25 * 3030.00^2 * 350.00 * -128.56 / ( 24 * 966.86 ) *
    (( 1 + 0.92^2 * 1.29 ) / ( 1 + 1.29 ))]
  = -403.43 N./mm^2
```

BENDING STRESSES: Bending Stress Calculations per Section 13-8, Equations (5-8). (N./mm^2) :

STRESS LOCATIONS	Inner	Outer	Allowable
Short-side 1 at N	-74.75	178.09	101.00
at Q	81.57	-584.74	101.00
Short-side 2 at N	-74.75	178.09	101.00
at Q	81.57	-584.74	101.00
Long-side 1 at M	-100.17	215.98	101.00
at Q	70.84	-403.43	101.00
Long-side 2 at M	-100.17	215.98	101.00
at Q	70.84	-403.43	101.00

Total Stress Calculations per Section 13-8

Total Stresses at Short-side 1

Total Stress at short side 1 at N inner [STS_Ni]:
```
= Sms + SbsNi
= 10.28 + -74.75
= -64.48 N./mm^2
```

Total Stress at short side 1 at N outer [STS_No]:
```
= Sms + SbsNo
= 10.28 + 178.09
= 188.37 N./mm^2
```

Total Stress at short side 1 at Q inner [STS_Qi]:
```
= Smsc + SbsQi
= 10.28 + 81.57
= 91.84 N./mm^2
```

Total Stress at short side 1 at Q outer [STS_Qo]:
```
= Smsc + SbsQo
= 10.28 + -584.74
= -574.46 N./mm^2
```

Total Stresses at Short-side 2

Total Stress at short side 2 at N inner [STS_Ni]:
```
= Sms + SbsNi
= 10.28 + -74.75
= -64.48 N./mm^2
```

Total Stress at short side 2 at N outer [STS_No]:
```
= Sms + SbsNo
= 10.28 + 178.09
= 188.37 N./mm^2
```

Total Stress at short side 2 at Q inner [STS_Qi]:
```
= Smsc + SbsQi
= 10.28 + 81.57
= 91.84 N./mm^2
```

Total Stress at short side 2 at Q outer [STS_Qo]:
```
= Smsc + SbsQo
= 10.28 + -584.74
= -574.46 N./mm^2
```

Total Stresses at Long-side 1

Total Stress at long side 1 at M inner [STL_Mi]:
```
= SmlA + SblMi
= 7.72 + -100.17
= -92.46 N./mm^2
```

Total Stress at long side 1 at M outer [STL_Mo]:
```
= SmlA + SblMo
= 7.72 + 215.98
= 223.70 N./mm^2
```

Total Stress at long side 1 at Q inner [STL_Qi]:
= Smlc + SblQi
= 7.72 + 70.84
= 78.55 N./mm^2

Total Stress at long side 1 at Q outer [STL_Qo]:
= Smlc + SblQo
= 7.72 + -403.43
= -395.71 N./mm^2

Total Stresses at Long-side 2

Total Stress at long side 2 at M inner [STL_Mi]:
= SmlA + SblMi
= 7.72 + -100.17
= -92.46 N./mm^2

Total Stress at long side 2 at M outer [STL_Mo]:
= SmlA + SblMo
= 7.72 + 215.98
= 223.70 N./mm^2

Total Stress at long side 2 at Q inner [STL_Qi]:
= Smlc + SblQi
= 7.72 + 70.84
= 78.55 N./mm^2

Total Stress at long side 2 at Q outer [STL_Qo]:
= Smlc + SblQo
= 7.72 + -403.43
= -395.71 N./mm^2

TOTAL STRESSES: Total Stress Calculations per Section 13-8, Equations (9-12). (N./mm^2) :

STRESS LOCATIONS	Inner	Outer	Allowable
Short-side 1 at N	-64.48	188.37	101.00
at Q	91.84	-574.46	101.00
Short-side 2 at N	-64.48	188.37	101.00
at Q	91.84	-574.46	101.00
Long-side 1 at M	-92.46	223.70	101.00
at Q	78.55	-395.71	101.00
Long-side 2 at M	-92.46	223.70	101.00
at Q	78.55	-395.71	101.00

SUMMARY OF RESULTS:

MEMBRANE STRESS SUMMARY,

High Stress (Highest % of Allowable)	10.28	N./mm^2
High Stress Percentage	10.07	%
M.A.W.P. for Membrane Stresses	12.37	bars

BENDING STRESS SUMMARY,

High Stress (Highest % of Allowable)	-584.74	N./mm^2
High Stress Percentage	*578.95*	*%*
M.A.W.P. for Bending Stresses	*0.22*	*bars*

TOTAL STRESS SUMMARY,

High Stress (Highest % of Allowable)	-574.46	N./mm^2
High Stress Percentage	*568.78*	*%*
M.A.W.P. for Total Stresses	*0.22*	*bars*

Horizontal Vessel Summary for Item 1 : New Horizontal

Shell Thk. + CA, Reqd. vs. Actual	0.000	0.000	mm.
Head Thk. + CA, Reqd. vs. Actual	0.000	0.000	mm.
Shell M.A.W.P. , Reqd. vs. Actual	0.00	0.00	bars
Head M.A.W.P. , Reqd. vs. Actual	0.00	0.00	bars

	Actual	Allowable	
The weight of the vessel filled is		0.000	Kgf
The weight of the vessel empty is		0.000	Kgf

Rectangular Vessel Results For Item 1 : A4

SUMMARY OF RESULTS:

MEMBRANE STRESS SUMMARY,

High Stress (Highest % of Allowable)	10.28	N./mm^2
High Stress Percentage	10.07	%
M.A.W.P. for Membrane Stresses	12.37	bars

BENDING STRESS SUMMARY,

High Stress (Highest % of Allowable)	-584.74	N./mm^2
High Stress Percentage	*578.95*	*%*
M.A.W.P. for Bending Stresses	*0.22*	*bars*

TOTAL STRESS SUMMARY,

High Stress (Highest % of Allowable)	-574.46	N./mm^2
High Stress Percentage	*568.78*	*%*
M.A.W.P. for Total Stresses	*0.22*	*bars*