

ภาคผนวก ก

ตัวอย่างไฟล์การนำเข้าข้อมูลไฟไนต์เอลิเมนต์โปรแกรม SACS
และผลจากการวิเคราะห์

ตัวอย่างไฟล์การนำเข้าข้อมูลไฟไนต์เอลิเมนต์ในการวิเคราะห์แบบกึ่งสถิตยศาสตร์(Linear quasi-static analysis) สำหรับโครงสร้างแท่นผลิตปิโตรเลียมแบบเสาเดี่ยวที่มีค้ำยันที่ตำแหน่งหนึ่งในสามของความลึกน้ำทะเล มุมในการค้ำยัน 20 องศา ความหนาของชิ้นส่วนโครงสร้างหลัก 25 มิลลิเมตร และมีขนาดเส้นผ่านศูนย์กลางท่อโครงสร้างหลักเท่ากับ 1.00 เมตร

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LDOPT  NF+Z1.0300007.850000  20.00GLOBMN
*****BRACED MONOPOD WATER DEPTH = 20 M,BRACED AT 2D/3*****
OPTIONS  MN  SDUC  1 1BM DC  APTPTPTPTPTPT  PTPTPT
LCSEL ST  101 102 103 104 105 106 107 108 109 110 111 112
LCSEL ST  113 114 115 116 117 118 119 120 121 122 123 124
UCPART  0.8000.8001.0001.000999.0
GRUP
GRUP BRC  50.000 2.500 20.008.00024.80 1  1.001.00  0.500N7.8500
GRUP CAS  100.00 2.500 20.008.00024.80 1  1.001.00  0.500F7.8500
MEMBER
MEMBER12  1  BRC
MEMBER OFFSETS  50.000
MEMBER 2  5  BRC
MEMBER13  1  BRC
MEMBER OFFSETS  50.000
MEMBER 3  5  BRC
MEMBER14  1  BRC
MEMBER OFFSETS  50.000
MEMBER 4  5  BRC
MEMBER 1  5  CAS  1.001.00
MEMBER 5  6  CAS  2.002.00
JOINT
JOINT 1  0.000 0.000 2.000
JOINT 2  -2.430 0.000 0.000  PILEHD
JOINT 3  1.210 -2.100 0.000  PILEHD
JOINT 4  1.210 2.100 0.000  PILEHD
JOINT 5  0.000 0.000 6.670
JOINT 6  0.000 0.000 28.000
CDM
    
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CDM 100.00 1.050 1.200 1.050 1.200
MGROV
MGROV 0.000 6.400 1.300 2.5400-4
MGROV 6.400 11.700 1.300 2.5400-4
MGROV 11.700 20.000 1.300 2.5400-4
LOAD
* *****
LOADCN 1
LOADLB1 *****JACKET DL & BOUYANCY*****
DEAD
DEAD -Z 20.000 M
*****
LOADCN 2
LOADLB2 *****TOTAL TOPSIDE WEIGHT*****
LOAD 6 -2.00+3 GLOB JOIN DECK
*****
LOADCN 3
LOADLB3 *****WAVE & CURRENT&WIND FORM NE (OPER) 0 DEG*****
WAVE
WAVE.880STRE 8.51 8.57 0.00 D 15.00 20MM10 1 1 3
CURR
CURR 0.150 0.000 NL
CURR 0.001 0.150
CURR 12.900 0.790
CURR 20.000 0.940
LOAD 6 -44.600 GLOB JOIN DECK
* *****
LOADCN 4
LOADLB4 *****WAVE & CURRENT&WIND FORM NE (OPER) 15DEG*****
WAVE
WAVE.880STRE 8.51 8.57 D 15.00 15.00 20MM10 1 1 3
CURR
CURR 0.150 15.000 NL
CURR 0.001 0.150 15.000
CURR 12.900 0.790 15.000
CURR 20.000 0.940 15.000

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LOAD 6   -44.600                GLOB JOIN  DECK
*****
LOADCN 5
LOADLB5 *****WAVE & CURRENT&WIND FORM NE (OPER) 30DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 30.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 30.000          NL
CURR  0.001 0.150 30.000
CURR  12.900 0.790 30.000
CURR  20.000 0.940 30.000
LOAD 6   -44.600                GLOB JOIN  DECK
*****
LOADCN 6
LOADLB6 *****WAVE & CURRENT&WIND FORM NE (OPER) 45DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 45.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 45.000          NL
CURR  0.001 0.150 45.000
CURR  12.900 0.790 45.000
CURR  20.000 0.940 45.000
LOAD 6   -44.600                GLOB JOIN  DECK
*****
LOADCN 7
LOADLB7 *****WAVE & CURRENT&WIND FORM NE (OPER) 60DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 60.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 60.000          NL
CURR  0.001 0.150 60.000
CURR  12.900 0.790 60.000
CURR  20.000 0.940 60.000
LOAD 6                1248.80 GLOB JOIN  DECK
*****
LOADCN 8

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LOADLB8 *****WAVE & CURRENT&WIND FORM NE (OPER) 75DEG*****

WAVE

WAVE.880STRE 8.51 8.57 D 75.00 15.00 20MM10 1 1 3

CURR

CURR 0.150 75.000 NL

CURR 0.001 0.150 75.000

CURR 12.900 0.790 75.000

CURR 20.000 0.940 75.000

LOAD 6 -44.600 GLOB JOIN DECK

LOADCN 9

LOADLB9 *****WAVE & CURRENT&WIND FORM NE (OPER) 90DEG*****

WAVE

WAVE.880STRE 8.51 8.57 D 90.00 15.00 20MM10 1 1 3

CURR

CURR 0.150 90.000 NL

CURR 0.001 0.150 90.000

CURR 12.900 0.790 90.000

CURR 20.000 0.940 90.000

LOAD 6 -44.600 GLOB JOIN DECK

LOADCN 10

LOADLB10 *****WAVE & CURRENT&WIND FORM NE (OPER)105DEG*****

WAVE

WAVE.880STRE 8.51 8.57 D 105.00 15.00 20MM10 1 1 3

CURR

CURR 0.150 105.000 NL

CURR 0.001 0.150 105.000

CURR 12.900 0.790 105.000

CURR 20.000 0.940 105.000

LOAD 6 -44.600 GLOB JOIN DECK

LOADCN 11

LOADLB11 *****WAVE & CURRENT&WIND FORM NE (OPER)120DEG*****

WAVE

WAVE.880STRE 8.51 8.57 D 120.00 15.00 20MM10 1 1 3

CURR

CURR 0.150 120.000 NL

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CURR  0.001  0.150 120.000
CURR  12.900  0.790 120.000
CURR  20.000  0.940 120.000
LOAD  6      -44.600          GLOB JOIN  DECK
LOADCN 12
LOADLB12 *****WAVE & CURRENT&WIND FORM NE (OPER)135DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 135.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 135.000          NL
CURR  0.001  0.150 135.000
CURR  12.900  0.790 135.000
CURR  20.000  0.940 135.000
LOAD  6      -44.600          GLOB JOIN  DECK
LOADCN 13
LOADLB13 *****WAVE & CURRENT&WIND FORM NE (OPER)150DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 150.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 150.000          NL
CURR  0.001  0.150 150.000
CURR  12.900  0.790 150.000
CURR  20.000  0.940 150.000
LOAD  6      44.6000         GLOB JOIN  DECK
LOADCN 14
LOADLB14 *****WAVE & CURRENT&WIND FORM NE (OPER)165DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 165.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 165.000          NL
CURR  0.001  0.150 165.000
CURR  12.900  0.790 165.000
CURR  20.000  0.940 165.000
LOAD  6      44.6000         GLOB JOIN  DECK
LOADCN 15
LOADLB15 *****WAVE & CURRENT&WIND FORM NE (OPER)180DEG*****

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WAVE
WAVE.880STRE 8.51    8.57          D 180.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 180.000          NL
CURR    0.001 0.150 180.000
CURR   12.900 0.790 180.000
CURR   20.000 0.940 180.000
LOAD 6      44.6000          GLOB JOIN  DECK
LOADCN 16
LOADLB16 *****WAVE & CURRENT&WIND FORM NE (OPER)195DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 195.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 195.000          NL
CURR    0.001 0.150 195.000
CURR   12.900 0.790 195.000
CURR   20.000 0.940 195.000
LOAD 6      44.6000          GLOB JOIN  DECK
LOADCN 17
LOADLB17 *****WAVE & CURRENT&WIND FORM NE (OPER)210DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 210.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 210.000          NL
CURR    0.001 0.150 210.000
CURR   12.900 0.790 210.000
CURR   20.000 0.940 210.000
LOAD 6      44.6000          GLOB JOIN  DECK
LOADCN 18
LOADLB18 *****WAVE & CURRENT&WIND FORM NE (OPER)225DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 225.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 225.000          NL
CURR    0.001 0.150 225.000
CURR   12.900 0.790 225.000

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CURR  20.000  0.940 225.000
LOAD  6    44.6000                GLOB JOIN  DECK
LOADCN 19
LOADLB19 *****WAVE & CURRENT&WIND FORM NE (OPER)240DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 240.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 240.000          NL
CURR  0.001  0.150 240.000
CURR  12.900  0.790 240.000
CURR  20.000  0.940 240.000
LOAD  6    44.6000                GLOB JOIN  DECK
LOADCN 20
LOADLB20 *****WAVE & CURRENT&WIND FORM NE (OPER)255DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 255.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 255.000          NL
CURR  0.001  0.150 255.000
CURR  12.900  0.790 255.000
CURR  20.000  0.940 255.000
LOAD  6    44.6000                GLOB JOIN  DECK
LOADCN 21
LOADLB21 *****WAVE & CURRENT&WIND FORM NE (OPER)270DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 240.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 240.000          NL
CURR  0.001  0.150 240.000
CURR  12.900  0.790 240.000
CURR  20.000  0.940 240.000
LOAD  6    44.6000                GLOB JOIN  DECK
LOADCN 22
LOADLB22 *****WAVE & CURRENT&WIND FORM NE (OPER)285DEG*****
WAVE
WAVE.880STRE 8.51    8.57          D 285.00 15.00 20MM10 1 1 3

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CURR
CURR      0.150 285.000      NL
CURR    0.001 0.150 285.000
CURR   12.900 0.790 285.000
CURR   20.000 0.940 285.000
LOAD 6      44.6000      GLOB JOIN DECK
LOADCN 23
LOADLB23 *****WAVE & CURRENT&WIND FORM NE (OPER)300DEG*****
WAVE
WAVE.880STRE 8.51      8.57      D 300.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 300.000      NL
CURR    0.001 0.150 300.000
CURR   12.900 0.790 300.000
CURR   20.000 0.940 300.000
LOAD 6      44.6000      GLOB JOIN DECK
LOADCN 24
LOADLB24 *****WAVE & CURRENT&WIND FORM NE (OPER)315DEG*****
WAVE
WAVE.880STRE 8.51      8.57      D 315.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 315.000      NL
CURR    0.001 0.150 315.000
CURR   12.900 0.790 315.000
CURR   20.000 0.940 315.000
LOAD 6      44.6000      GLOB JOIN DECK
LOADCN 25
LOADLB25 *****WAVE & CURRENT&WIND FORM NE (OPER)330DEG*****
WAVE
WAVE.880STRE 8.51      8.57      D 330.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 330.000      NL
CURR    0.001 0.150 330.000
CURR   12.900 0.790 330.000
CURR   20.000 0.940 330.000
LOAD 6      44.6000      GLOB JOIN DECK

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LOADCN 26
LOADLB26 *****WAVE & CURRENT&WIND FORM NE (OPER)345DEG*****
WAVE
WAVE.880STRE 8.51      8.57          D 345.00 15.00 20MM10 1 1 3
CURR
CURR      0.150 345.000          NL
CURR  0.001 0.150 345.000
CURR  12.900 0.790 345.000
CURR  20.000 0.940 345.000
LOAD 6    -44.600          GLOB JOIN DECK
LCOMB
*****
*****LOAD COMBINATION*****
LCOMB 101 1 1.05002 1.00003 1.0000
LCOMB 102 1 1.05002 1.00004 1.0000
LCOMB 103 1 1.05002 1.00005 1.0000
LCOMB 104 1 1.05002 1.00006 1.0000
LCOMB 105 1 1.05002 1.00007 1.0000
LCOMB 106 1 1.05002 1.00008 1.0000
LCOMB 107 1 1.05002 1.00009 1.0000
LCOMB 108 1 1.05002 1.00010 1.0000
LCOMB 109 1 1.05002 1.00011 1.0000
LCOMB 110 1 1.05002 1.00012 1.0000
LCOMB 111 1 1.05002 1.00013 1.0000
LCOMB 112 1 1.05002 1.00014 1.0000
LCOMB 113 1 1.05002 1.00015 1.0000
LCOMB 114 1 1.05002 1.00016 1.0000
LCOMB 115 1 1.05002 1.00017 1.0000
LCOMB 116 1 1.05002 1.00018 1.0000
LCOMB 117 1 1.05002 1.00019 1.0000
LCOMB 118 1 1.05002 1.00020 1.0000
LCOMB 119 1 1.05002 1.00021 1.0000
LCOMB 120 1 1.05002 1.00022 1.0000
LCOMB 121 1 1.05002 1.00023 1.0000
LCOMB 122 1 1.05002 1.00024 1.0000
LCOMB 123 1 1.05002 1.00025 1.0000

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```
LCOB 124 1 1.05002 1.000026 1.0000
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```
END
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```
***SPMB** 1 2 1 2
```

```
**MSLF** Uc:\program files\sacs53\aisc13th.sec
```

```
**JNCV** 0 0 0 0 1 1
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END
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ตารางที่ ค.1 ตัวอย่างผลการวิเคราะห์แบบกึ่งสถิตยศาสตร์ (Linear quasi-static analysis) สำหรับ โครงสร้างแท่นผลิตปิโตรเลียมแบบเสาเดี่ยวที่มีค้ำยันที่ตำแหน่งหนึ่งในสามของความลึกน้ำทะเล มุมในการค้ำยัน 20 องศา ความหนาของชิ้นส่วน โครงสร้างหลัก 25 มิลลิเมตร และมีขนาดเส้นผ่านศูนย์กลางท่อ โครงสร้างหลัก เท่ากับ 1.00 เมตร

SACS-IV SYSTEM ELEMENT STRESS REPORT AT MAXIMUM UNITY CHECK

| MEMBER | GRP | MAXIMUM UNITY CHECK | CRITICAL COND. | LOAD CASE NO. | DIST FROM END M | *** APPLIED STRESSES *** | | | | | * CM VALUES * | | * NEXT TWO HIGHEST CASES * | | | |
|--------|-----|---------------------------|-------------------|---------------------|--------------------------|--------------------------|---------------|--------------|--------------|------------|---------------|------|----------------------------|--------------|----------------|--------------|
| | | | | | | AXIAL N/MM2 | ** BENDING ** | | *** SHEAR*** | | Y | Z | UNITY CHECK | LOAD COND | UNITY CHECK | LOAD COND |
| | | | | | | | Y-Y N/MM2 | Z-Z N/MM2 | Y N/MM2 | Z N/MM2 | | | | | | |
| 2-1 | BRC | 0.501 | C<.15 | 105 | 3.49 | -14.6 | -7.07 | 73.61 | 6.98 | 8.03 | 1.00 | 1.00 | 0.17 | 118 | 0.16 | 117 |
| 2-5 | BRC | 0.373 | TN+BN | 105 | 7.10 | 10.3 | -30.73 | 47.33 | 2.64 | 11.62 | 1.00 | 1.00 | 0.34 | 118 | 0.31 | 117 |
| 3-1 | BRC | 0.401 | C<.15 | 105 | 3.48 | -8.29 | 7.09 | 63.39 | 5.87 | 8.81 | 1.00 | 1.00 | 0.13 | 123 | 0.13 | 122 |
| 3-5 | BRC | 0.452 | C>.15A | 118 | 7.10 | -30.86 | 26.43 | -30.34 | 1.71 | 1.63 | 1.00 | 1.00 | 0.43 | 117 | 0.40 | 116 |
| 4-1 | BRC | 0.476 | C<.15 | 105 | 3.48 | -6.78 | 10.44 | 78.91 | 7.64 | 7.67 | 1.00 | 1.00 | 0.12 | 118 | 0.12 | 107 |
| 4-5 | BRC | 0.575 | C>.15A | 105 | 7.10 | -27.85 | 21.22 | 63.96 | 3.13 | 10.72 | 1.00 | 1.00 | 0.47 | 123 | 0.45 | 122 |
| 1-5 | CAS | 0.527 | C<.15 | 118 | 4.67 | -10.25 | -10.62 | 84.14 | 8.88 | 0 | 1.00 | 1.00 | 0.5 | 117 | 0.49 | 123 |
| 5-6 | CAS | 1.017 | C>.15A | 118 | 0.00 | -27.7 | -14.15 | 111.67 | 3.47 | 0 | 1.00 | 1.00 | 0.98 | 117 | 0.96 | 123 |