

บทที่ 2

การสร้างตารางเหล็กมาตรฐาน JIS เพิ่มเติม

ตารางเหล็กมาตรฐานที่ให้มากับโปรแกรม QUICK STEEL มีตารางเหล็กมาตรฐาน British Standard (BS) และ Din European Standard (DINEURO) เท่านั้น แต่ในประเทศไทยนิยมใช้เหล็กที่ผลิตตามมาตรฐานของประเทศญี่ปุ่น Japanese Industrial Standard (JIS) ฉะนั้นเราจึงต้องสร้างตารางเหล็กมาตรฐาน JIS ที่นิยมใช้ในประเทศไทย(ตามมาตรฐาน มอก.) ขึ้นมาใหม่ซึ่งมีขั้นตอนดังต่อไปนี้

เนื่องด้วยตารางเหล็กมาตรฐานทั้งหมดจะถูกเก็บเป็น ASCII TEXT FILE เราเพียงแต่ใช้โปรแกรมที่สามารถ EDIT ข้อมูลใน FILE ได้ในการแก้ไขเพิ่มเติมข้อมูล ซึ่งคำอธิบายความหมายของตารางเหล็กมาตรฐานจะถูกเก็บไว้ที่แฟ้มข้อมูล STANDARD. CFG ในสารบัญแฟ้มข้อมูลที่ชื่อ QSDAT ซึ่งภายในแฟ้มข้อมูลดังกล่าวนี้จะบรรจุชื่อมาตรฐานตารางเหล็กต่างๆ ไว้ ถ้าเราต้องการกำหนดตารางเหล็กมาตรฐาน JIS ลงไปให้ใส่หมายเลข, ชื่อ (ไม่เกิน 8 ตัวอักษร) และคำบรรยาย จากนั้นไปสร้างสารบัญแฟ้มข้อมูลดังกล่าวในสารบัญแฟ้มข้อมูลที่ชื่อ QSTAB และเมื่อเราใช้โปรแกรม QUICK STEEL ในเมนู SETUP ให้เลือกตารางเหล็กมาตรฐาน JIS ในคำสั่ง STEEL STANDARD.

2.1 แฟ้มข้อมูลเหล็กโครงสร้าง (STEEL DATA FILES)

แฟ้มข้อมูลเหล็กโครงสร้างจะเก็บข้อมูลคุณสมบัติ รูปร่างตามแต่ละชนิดของเหล็กโครงสร้าง เช่น ความลึก ความกว้าง และความหนาเป็นต้น โดยข้อมูลดังกล่าวถูกแยกเก็บตามชนิดในส่วนขยายแฟ้มข้อมูล TXT ในตารางเหล็กมาตรฐาน JIS ที่เรากำหนดขึ้นมาใหม่นี้ เรามีข้อมูลแยกตามชนิด ของเหล็กโครงสร้างที่นิยมใช้กันในการก่อสร้างโครงสร้างเหล็กทั้งหมด 14 ชนิด เช่น H-BEAM, CHANNELS, LIGHT LIP CHANNEL, EQUAL ANGLE เป็นต้น

2.2 การกำหนด STEEL CONFIGURATION

เราใส่ข้อมูลหมายเลขชนิดเหล็กโครงสร้าง คำบรรยาย ข้อความก่อนและหลังขนาดในแบบ และแฟ้มข้อมูลตามชนิดของเหล็กในแฟ้มข้อมูล STL CFG.INX ของตารางเหล็กมาตรฐาน JIS ในสารบัญแฟ้มข้อมูลที่ชื่อ QSTAB

2.3 การกำหนด STEEL PROFILE

เรากำหนดรูปร่างของเหล็กโครงสร้างขึ้นมาก่อน แล้วเลือกชนิดของเหล็กโครงสร้างลงไปตามรูปร่างที่กำหนด ซึ่งมีทั้งหมด 7 รูปร่างดังนี้

Shape 1: Square/Rectangular Hollow Section/Square/Rectangular Shaped

Shape 2: Circular Hollow Section/Circular Shaped

Shape 3: I Shaped

Shape 4: T Shaped

Shape 5: L Shaped

Shape 6: Channel Section/C Shaped

Shape 7: RC.

เราใส่ข้อมูลรูปร่าง, หมายเลขชนิดของเหล็กโครงสร้าง ตามลำดับในแฟ้มข้อมูล profile.inx ในตารางเหล็กมาตรฐาน JIS

2.4 การกำหนด STEEL TYPE

เรากำหนดชนิดของเหล็กโครงสร้างให้เหมาะกับแต่ละองค์อาคาร โครงสร้างในแฟ้มข้อมูล Steel.typ ในตารางเหล็กมาตรฐาน JIS ซึ่งแก้ไขได้เฉพาะชนิดของเหล็กโครงสร้างเท่านั้น

ตารางที่ 2.1 แฟ้มข้อมูลที่สร้างในตารางเหล็กมาตรฐาน JIS

ชื่อแฟ้มข้อมูล	ส่วนขยายข้อมูล	รายละเอียดข้อมูล
PROFILE	INX	ข้อมูลการกำหนด Steel Profile
STLCFG	INX	ข้อมูลการกำหนด Steel Configuration
C	TXT	แฟ้มข้อมูลเหล็ก Channel
CHS	TXT	แฟ้มข้อมูลเหล็ก Circular Tube
EA	TXT	แฟ้มข้อมูลเหล็ก Equal Angle
J	TXT	แฟ้มข้อมูลเหล็ก Joist
LC	TXT	แฟ้มข้อมูลเหล็ก Light Lip Channel
RC	TXT	แฟ้มข้อมูลเสาคอนกรีตเสริมเหล็ก
RHS	TXT	แฟ้มข้อมูลเหล็ก Rectangular Tube
SHS	TXT	แฟ้มข้อมูลเหล็ก Square Tube
TB	TXT	แฟ้มข้อมูลเหล็ก T Beam
TC	TXT	แฟ้มข้อมูลเหล็ก T Column
TJ	TXT	แฟ้มข้อมูลเหล็ก T Joist

UA	TXT	เพิ่มข้อมูลเหล็ก Unequal Angle
UB	TXT	เพิ่มข้อมูลเหล็ก I Beam
UC	TXT	เพิ่มข้อมูลเหล็ก H Beam
STEEL	TYP	ข้อมูลการกำหนด Steel Type

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# This file store the profile/shape and steel property relationship.
# Each profile can consist of several steel property.
# Eg Shape I can have P2 and P3 as its related property
# Currently there are 6 shapes defined
#
# The sequence of the data place in this file is
# Steel Standard, Number of distinct shape/profile
# Profile Number, property 1, property2, .... property N
#
@JIS,7
S1,T1,T2
S2,T3
S3,T4,T5,T6
S4,T7,T8,T9
S5,T10,T11
S6,T12,T13
S7,T14
# Shape 1 : Square / Rectangular Hollow Section / Rectangular / Square Shaped
# Shape 2 : Circular Hollow Section / Circular Shaped
# Shape 3 : I Shaped
# Shape 4 : T Shaped
# Shape 5 : L Shaped
# Shape 6 : Channel Section / C Shaped
# Shape 7 : RC

```

ข้อมูลในการกำหนด Steel Profile ในแฟ้มข้อมูล PROFILE.INX

```

# This file store the steel type and its filename relationship.
# Each steel type has its own filename. The file must be an ASCII text file
#
# The sequence of the data place in this file is
# Steel Standard, Number of files
# Type Number, Filename, Steel Description, Prefix, Suffix
#
JIS,14
T1,SHS.TXT,SHS,Square Tube,ST-,mm.
T2,RHS.TXT,RHS,Rectangular Tube,RT-,mm.
T3,CHS.TXT,CHS,Circular Tube,CT-,mm.
T4,UB.TXT,UB,I Beam,IB-,mm.
T5,UC.TXT,UC,H Beam,HB-,mm.
T6,J.TXT,J,Joist,KG/M.JOIST,
T7,TB.TXT,TB,T Beam,CUT FROM-,KG/M.UB
T8,TC.TXT,TC,T Column,CUT FROM-,KG/M.UC
T9,TJ.TXT,TJ,T Joist,CUT FROM-,KG/M.JOIST
T10,EA.TXT,EA,Equal Angle,EA-,mm.
T11,UA.TXT,UA,Unequale Angle,UA-,mm.
T12,C.TXT,C,Channel,Channel-,KG/M.
T13,LC.TXT,LC,Lip Channel,L Channel,mm.
T14,RC.TXT,RC,Reinforced Concrete,RC Column,mm.

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ข้อมูลในการกำหนด Steel Configuration ในแฟ้มข้อมูล STEELCFG.INX

Steel Description : Channel,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tr,d,C,N,n

50x25x3.86,50,25,3.86,0,8.1,6,5,6,3,25,7,0,1

75x40x6.92,75,40,6.92,0,12.8,7,5,8,4,44,7,0,1

100x50x9.36,100,50,9.36,0,15.4,7,5,5,8,4,68,7,0,1

125x65x13.4,125,65,13.4,0,12.0,8,6,8,4,92,8,0,1

150x75x18.6,150,75,18.6,0,22.8,10,6,5,10,5,108,11,0,1

150x75x24.0,150,75,24.0,0,23.1,12.5,9,15,7,5,92,11,0,1

180x75x21.4,180,75,21.4,0,21.3,10.5,7,11,5,5,135,9,0,1

200x80x24.6,200,80,24.6,0,22.1,11,7,5,12,6,152,9,5,0,1

200x90x30.3,200,90,30.3,0,27.4,13.5,8,14,7,141,10,0,1

250x90x34.6,250,90,34.6,0,24.0,13,9,14,7,193,11,0,1

250x90x40.2,200,90,40.2,0,24.0,14.5,11,17,8,5,183,13,0,1

300x90x38.1,300,90,38.1,0,22.2,13,9,14,7,243,11,0,1

300x90x43.8,300,90,43.8,0,23.4,15.5,10,19,9,5,226,12,0,1

300x90x48.6,300,90,48.6,0,22.8,16,12,19,9,5,225,14,0,1

380x100x54.5,380,100,54.5,0,24.1,16,10,5,18,9,307,12.5,0,1

380x100x62.0,380,100,62.0,0,23.3,16.5,13,18,9,306,15,0,1

380x100x67.3,380,100,67.3,0,25.4,20,13,24,12,284,15,0,1

ข้อมูลเหล็ก Channel ในแฟ้มข้อมูล C.TXT

Steel Description : Circular Tube,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tr,d,C,N,n

21.7x2.0,21.7,0,0.972,0,0,2.0,0,0,0,0,0,0

27.2x2.0,27.2,0,1.24,0,0,2.0,0,0,0,0,0,0

27.2x2.3,27.2,0,1.41,0,0,2.3,0,0,0,0,0,0

34.0x2.3,34.0,0,1.80,0,0,2.3,0,0,0,0,0,0

42.7x2.3,42.7,0,2.29,0,0,2.3,0,0,0,0,0,0

42.7x2.8,42.7,0,2.76,0,0,2.8,0,0,0,0,0,0

48.6x2.3,48.6,0,2.63,0,0,2.3,0,0,0,0,0,0

48.6x2.8,48.6,0,3.16,0,0,2.8,0,0,0,0,0,0

48.6x3.2,48.6,0,3.58,0,0,3.2,0,0,0,0,0,0

60.5x2.3,60.5,0,3.30,0,0,2.3,0,0,0,0,0,0

60.5x3.2,60.5,0,4.52,0,0,3.2,0,0,0,0,0,0

60.5x4.0,60.5,0,5.57,0,0,4.0,0,0,0,0,0,0

76.3x2.8,76.3,0,5.08,0,0,2.8,0,0,0,0,0,0

76.3x3.2,76.3,0,5.77,0,0,3.2,0,0,0,0,0,0

76.3x4.0,76.3,0,7.13,0,0,4.0,0,0,0,0,0,0

89.1x2.8,89.1,0,5.96,0,0,2.8,0,0,0,0,0,0

89.1x3.2,89.1,0,6.78,0,0,3.2,0,0,0,0,0,0

89.1x4.0,89.1,0,8.39,0,0,4.0,0,0,0,0,0,0

101.6x3.2,101.6,0,7.76,0,0,3.2,0,0,0,0,0,0

101.6x4.0,101.6,0,9.63,0,0,4.0,0,0,0,0,0,0

101.6x5.0,101.6,0,11.9,0,0,5.0,0,0,0,0,0,0

114.3x3.2,114.3,0,8.77,0,0,3.2,0,0,0,0,0,0

114.3x4.5,114.3,0,9.83,0,0,4.5,0,0,0,0,0,0

114.3x5.6,114.3,0,15.0,0,0,5.6,0,0,0,0,0,0

139.8x3.6,139.8,0,12.1,0,0,3.6,0,0,0,0,0,0

139.8x4.0,139.8,0,13.4,0,0,4.0,0,0,0,0,0,0

139.8x4.5,139.8,0,15.0,0,0,4.5,0,0,0,0,0,0

139.8x6.0,139.8,0,19.8,0,0,6.0,0,0,0,0,0,0

165.2x4.5,165.2,0,17.8,0,0,4.5,0,0,0,0,0,0

165.2x5.0,165.2,0,19.8,0,0,5.0,0,0,0,0,0,0

165.2x6.0,165.2,0,23.6,0,0,6.0,0,0,0,0,0,0

165.2x7.0,165.2,0,27.3,0,0,6.0,0,0,0,0,0,0,0
 190.7x4.5,190.7,0,20.7,0,0,4.5,0,0,0,0,0,0,0
 190.7x5.0,190.7,0,22.9,0,0,5.0,0,0,0,0,0,0,0
 190.7x6.0,190.7,0,27.3,0,0,6.0,0,0,0,0,0,0,0
 190.7x7.0,190.7,0,31.7,0,0,7.0,0,0,0,0,0,0,0
 216.3x4.5,216.3,0,23.5,0,0,4.5,0,0,0,0,0,0,0
 216.3x6.0,216.3,0,31.1,0,0,6.0,0,0,0,0,0,0,0
 216.3x7.0,216.3,0,36.1,0,0,7.0,0,0,0,0,0,0,0
 216.3x8.0,216.3,0,41.1,0,0,8.0,0,0,0,0,0,0,0
 267.4x6.0,267.4,0,38.7,0,0,6.0,0,0,0,0,0,0,0
 267.4x7.0,267.4,0,45.0,0,0,7.0,0,0,0,0,0,0,0
 267.4x8.0,267.4,0,51.2,0,0,8.0,0,0,0,0,0,0,0
 267.4x9.0,267.4,0,57.4,0,0,9.0,0,0,0,0,0,0,0
 318.5x6.0,318.5,0,46.2,0,0,6.0,0,0,0,0,0,0,0
 318.5x7.0,318.5,0,53.8,0,0,7.0,0,0,0,0,0,0,0
 318.5x8.0,318.5,0,61.3,0,0,8.0,0,0,0,0,0,0,0
 318.5x9.0,318.5,0,68.7,0,0,9.0,0,0,0,0,0,0,0
 355.6x6.3,355.6,0,54.3,0,0,6.3,0,0,0,0,0,0,0
 355.6x8.0,355.6,0,68.6,0,0,8.0,0,0,0,0,0,0,0
 355.6x9.0,355.6,0,76.9,0,0,9.0,0,0,0,0,0,0,0
 355.6x12.0,355.6,0,102.0,0,0,12.0,0,0,0,0,0,0,0
 406.4x9.0,406.4,0,88.2,0,0,9.0,0,0,0,0,0,0,0
 406.4x12.0,406.4,0,117.0,0,0,12.0,0,0,0,0,0,0,0
 406.4x16.0,406.4,0,154.0,0,0,16.0,0,0,0,0,0,0,0
 406.4x19.0,406.4,0,182.0,0,0,19.0,0,0,0,0,0,0,0
 457.2x9.0,457.2,0,99.5,0,0,9.0,0,0,0,0,0,0,0
 457.2x12.0,457.2,0,132.0,0,0,12.0,0,0,0,0,0,0,0
 457.2x16.0,457.2,0,174.0,0,0,16.0,0,0,0,0,0,0,0
 457.2x19.0,457.2,0,205.0,0,0,19.0,0,0,0,0,0,0,0

ข้อมูลหลัก Circular Tube ในแฟ้มข้อมูล CHS.TXT

Steel Description : Equal Angle,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tr,d,C,N,n

25x25x3,25,25,1.12,7.19,0,3,0,4,2,0,0,0,0

25x25x5,25,25,1.77,8.0,0,5,0,3.5,2.4,0,0,0,0

30x30x3,30,30,1.36,8.44,0,3,0,4,2,0,0,0,0

30x30x5,30,30,2.18,9.2,0,5,0,5,2.4,0,0,0,0

40x40x3,40,40,1.83,10.9,0,3,0,4.5,2,0,0,0,0

40x40x4,40,40,2.42,11.2,0,4,0,6,2.4,0,0,0,0

40x40x5,40,40,2.95,11.7,0,5,0,4.5,3,0,0,0,0

40x40x6,40,40,3.52,12.0,0,6,0,6,2.4,0,0,0,0

45x45x4,45,45,2.74,12.4,0,4,0,6.5,3,0,0,0,0

45x45x5,45,45,3.38,12.8,0,5,0,6.5,3,0,0,0,0

50x50x3,50,50,1.3,23.3,0,3,0,7,2.4,0,0,0,0

50x50x4,50,50,3.06,13.7,0,4,6.5,3,0,0,0,0

50x50x5,50,50,3.77,14.1,0,5,0,6.5,3,0,0,0,0

50x50x6,50,50,5.644,44.3,0,6,0,6.5,4.5,0,0,0,0

60x60x4,60,60,3.68,16.1,0,4,0,6.5,3,0,0,0,0

60x60x5,60,60,4.55,16.6,0,5,0,6.5,3,0,0,0,0

65x65x5,65,65,5.00,17.7,0,5,0,8.5,3,0,0,0,0

65x65x6,65,65,5.91,18.1,0,6,0,8.5,4,0,0,0,0

65x65x8,65,65,7.66,18.8,0,8,0,8.5,6,0,0,0,0

70x70x6,70,70,6.38,19.3,0,6,0,8.5,4,0,0,0,0

75x75x6,75,75,6.85,20.6,0,6,0,8.5,4,0,0,0,0

75x75x9,75,75,9.96,21.7,0,9,0,8.5,6,0,0,0,0

75x75x12,75,75,13.0,22.9,0,12,0,8.5,6,0,0,0,0

80x80x6,80,80,7.32,21.8,0,6,0,8.5,4,0,0,0,0

90x90x6,90,90,8.28,24.2,0,6,0,10,5,0,0,0,0

90x90x7,90,90,9.59,24.6,0,7,0,10,5,0,0,0,0

90x90x10,90,90,13.3,25.7,0,10,0,10,7,0,0,0,0

90x90x12,90,90,15.9,26.6,0,12,0,11,4.8,0,0,0,0

90x90x13,90,90,17.0,26.9,0,13,0,10,7,0,0,0,0

100x100x7,100,100,10.7,27.1,0,7,0,10,5,0,0,0,0

100x100x10,100,100,14.9,28.2,0,10,0,10,7,0,0,0,0

100x100x12,100,100,17.8,29.0,0,12,0,12,4.8,0,0,0,0
 100x100x13,100,100,19.1,29.4,0,13,0,10,7,0,0,0,0
 120x120x8,120,120,14.7,32.4,0,8,0,12,5,0,0,0,0
 130x130x9,130,130,17.9,35.3,0,9,0,12,6,0,0,0,0
 130x130x12,130,130,23.4,36.4,0,12,0,12,8.5,0,0,0,0
 130x130x15,130,130,28.8,37.6,0,15,0,12,8.5,0,0,0,0
 150x150x12,150,150,27.3,41.4,0,12,0,14,7,0,0,0,0
 150x150x15,150,150,33.6,42.4,0,15,0,14,10,0,0,0,0
 150x150x19,150,150,41.9,44.0,0,19,0,14,10,0,0,0,0
 175x175x12,175,175,31.8,47.3,0,12,0,15,11,0,0,0,0
 175x175x15,175,175,39.4,48.5,0,15,0,15,11,0,0,0,0
 200x200x15,200,200,45.3,54.6,0,15,0,17,12,0,0,0,0
 200x200x20,200,200,59.7,56.7,0,20,0,17,12,0,0,0,0
 200x200x25,200,200,73.6,58.6,0,25,0,17,12,0,0,0,0
 250x250x25,250,250,93.7,71.0,0,25,0,24,12,0,0,0,0
 250x250x35,250,250,128.0,74.5,0,35,0,24,18,0,0,0,0

ข้อมูลหลัก Equal Angle ในแฟ้มข้อมูล EA.TXT

Steel Description : Joist,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tr,d,C,N,n

254x203x81.85,254,203.2,81.85,0,0,19.9,10.2,19.6,9.7,166.6,7.1,104,45

254x114x37.20,254,114.3,37.2,0,0,12.8,7.6,12.4,6.1,199.1,5.8,60,30

203x152x52.09,203.2,152.4,52.09,0,0,16.5,8.9,15.5,7.6,133.4,6.5,80,40

152x127x37.20,152.4,127.3,37.2,0,0,13.2,10.4,13.5,6.6,94.5,7.2,66,35

127x114x29.76,127,114.3,29.76,0,0,11.5,10.2,12.4,4.8,71.9,7.1,60,30

127x114x26.79,127,114.3,26.79,0,0,11.4,7.4,9.9,5.7,79.2,5.7,60,25

127x76x16.73,127,76.2,16.73,0,0,9.6,5.6,9.4,4.6,86.4,4.8,40,25

114x114x26.79,114.3,114.3,26.79,0,0,10.7,9.5,14.2,3.2,61.1,6.8,60,30

102x102x23.07,101.6,101.6,23.07,0,0,10.3,9.5,11.1,3.2,54.6,8.5,46,25

89x89x19.35,88.9,88.9,19.35,0,0,9.9,9.5,11.1,3.2,45.2,6.8,46,25

76x76x12.65,76.2,76.2,12.65,0,0,8.4,5.1,9.4,4.6,38.1,4.6,40,20

ข้อมูลเหล็ก Joist ในแฟ้มข้อมูล J.TXT

Steel Description : Lipped Channel,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tr,d,C,N,n

60x30x10x2.3,60,30,2.25,0,10.6,2.3,10,0,0,55.4,4.3,2.25,0
 75x35x15x2.3,75,35,2.89,0,12.9,2.3,15,0,0,70.4,4.3,2.89,0
 75x45x15x2.3,75,45,3.25,0,17.2,2.3,15,0,0,70.4,4.3,3.25,0
 90x45x20x3.2,90,45,5.0,0,17.2,3.2,20,0,0,83.6,5.2,5.0,0
 90x45x20x2.3,90,45,3.7,0,17.3,2.3,20,0,0,83.6,4.3,3.7,0
 100x50x20x4.5,100,50,7.43,0,18.6,4.5,20,0,0,91.0,6.5,7.43,0
 100x50x20x4.0,100,50,6.71,0,18.6,4.0,20,0,0,92.0,6.0,6.71,0
 100x50x20x3.2,100,50,5.50,0,18.6,3.2,20,0,0,93.6,5.2,5.50,0
 100x50x20x2.3,100,50,4.06,0,18.6,2.3,20,0,0,95.4,4.3,4.06,0
 120x40x20x3.2,120,40,5.50,0,13.2,3.2,20,0,0,113.6,5.2,5.50,0
 120x60x20x3.2,120,60,6.51,0,21.2,3.2,20,0,0,113.6,5.2,6.51,0
 120x60x25x4.5,120,60,9.20,0,22.5,4.5,25,0,0,111.0,6.5,9.20,0
 125x50x20x4.5,125,50,8.32,0,16.8,4.5,20,0,0,116.0,6.5,8.32,0
 125x50x20x4.0,125,50,7.50,0,16.8,4.0,20,0,0,117.0,6.0,7.50,0
 125x50x20x3.2,125,50,6.13,0,16.8,3.2,20,0,0,118.6,5.2,6.13,0
 150x50x20x4.5,150,50,9.20,0,15.4,4.5,20,0,0,141.0,6.5,9.20,0
 150x50x20x3.2,150,50,6.76,0,15.4,3.2,20,0,0,143.6,5.2,6.76,0
 150x65x20x4.0,150,65,9.22,0,21.1,4.0,20,0,0,142.0,6.0,9.22,0
 150x65x20x3.2,150,65,7.51,0,21.1,3.2,20,0,0,143.6,5.2,7.51,0
 150x75x20x4.5,150,75,11.0,0,25.0,4.5,20,0,0,141.0,6.5,11.0,0
 150x75x20x4.0,150,75,9.85,0,25.1,4.0,20,0,0,142.0,6.0,9.85,0
 150x75x20x3.2,150,75,8.01,0,25.1,3.2,20,0,0,143.6,5.2,8.01,0
 150x75x25x4.5,150,75,11.3,0,26.5,4.5,25,0,0,141.0,6.5,11.3,0
 150x75x25x4.0,150,75,10.2,0,26.5,4.0,25,0,0,142.0,6.0,10.2,0
 150x75x25x3.2,150,75,8.27,0,26.6,3.2,25,0,0,143.6,5.2,8.27,0
 200x75x20x4.5,200,75,12.7,0,21.9,4.5,20,0,0,191.0,6.5,12.7,0
 200x75x20x4.0,200,75,11.4,0,21.9,4.0,20,0,0,192.0,6.0,11.4,0
 200x75x20x3.2,200,75,9.27,0,21.9,3.2,20,0,0,193.6,5.2,9.27,0
 200x75x25x4.5,200,75,13.1,0,23.2,4.5,25,0,0,191.0,6.5,13.1,0
 200x75x25x4.0,200,75,11.7,0,23.2,4.0,25,0,0,192.0,6.0,11.7,0
 200x75x25x3.2,200,75,9.52,0,23.3,3.2,25,0,0,193.6,5.2,9.52,0
 250x75x25x4.5,250,75,14.9,0,20.7,4.5,25,0,0,241.0,6.5,14.9,0

ข้อมูลเหล็ก Light Lip Channel ในแฟ้มข้อมูล LC.TXT

Steel Description : Reinforced Concrete,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tt,d,C,N,n

100x100,100,100,0,0,0,0,0,0,0,0,0,0,0

150x150,150,150,0,0,0,0,0,0,0,0,0,0,0

200x200,200,200,0,0,0,0,0,0,0,0,0,0,0

250x250,250,250,0,0,0,0,0,0,0,0,0,0,0

300x300,300,300,0,0,0,0,0,0,0,0,0,0,0

400X400,400,400,0,0,0,0,0,0,0,0,0,0,0

200x300,300,200,0,0,0,0,0,0,0,0,0,0,0

200x400,400,200,0,0,0,0,0,0,0,0,0,0,0

200x500,500,200,0,0,0,0,0,0,0,0,0,0,0

200X600,600,200,0,0,0,0,0,0,0,0,0,0,0

250x300,300,250,0,0,0,0,0,0,0,0,0,0,0

250x400,400,250,0,0,0,0,0,0,0,0,0,0,0

250x500,500,250,0,0,0,0,0,0,0,0,0,0,0

250x600,600,250,0,0,0,0,0,0,0,0,0,0,0

250x700,700,250,0,0,0,0,0,0,0,0,0,0,0

250x800,800,250,0,0,0,0,0,0,0,0,0,0,0

300x400,400,300,0,0,0,0,0,0,0,0,0,0,0

300x500,500,300,0,0,0,0,0,0,0,0,0,0,0

300X600,600,300,0,0,0,0,0,0,0,0,0,0,0

300X700,700,300,0,0,0,0,0,0,0,0,0,0,0

300x800,800,300,0,0,0,0,0,0,0,0,0,0,0

400x500,500,400,0,0,0,0,0,0,0,0,0,0,0

400x600,600,400,0,0,0,0,0,0,0,0,0,0,0

400x700,700,400,0,0,0,0,0,0,0,0,0,0,0

400X800,800,400,0,0,0,0,0,0,0,0,0,0,0

ข้อมูลเสาคอนกรีตเสริมเหล็กในแฟ้มข้อมูล RC.TXT

Steel Description : Rectangular Tube,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tr,d,C,N,n

75x45x2.3,75,45,4.06,0,0,2.3,0,0,0,0,0,0

75x45x3.2,75,45,5.50,0,0,3.2,0,0,0,0,0,0

100x50x2.3,100,50,5.14,0,0,2.3,0,0,0,0,0,0

100x50x3.2,100,50,7.01,0,0,3.2,0,0,0,0,0,0

125x75x2.3,125,75,6.95,0,0,2.3,0,0,0,0,0,0

125x75x3.2,125,75,9.52,0,0,3.2,0,0,0,0,0,0

150x75x3.2,150,75,10.8,0,0,3.2,0,0,0,0,0,0

150x75x4.5,150,75,14.9,0,0,4.5,0,0,0,0,0,0

150x100x3.2,150,100,12.0,0,0,3.2,0,0,0,0,0,0

150x100x4.5,150,100,16.6,0,0,4.5,0,0,0,0,0,0

150x100x6.0,150,100,21.7,0,0,6.0,0,0,0,0,0,0

200x100x4.5,200,100,20.2,0,0,4.5,0,0,0,0,0,0

200x100x6.0,200,100,26.4,0,0,6.0,0,0,0,0,0,0

ข้อมูลเหล็ก Rectangular Tube ในแฟ้มข้อมูล RHS.TXT

Steel Description : Square Tube,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tt,d,C,N,n

50x50x1.6,50,50,2.38,0,0,1.6,0,0,0,0,0,0,0

50x50x2.3,50,50,3.34,0,0,2.3,0,0,0,0,0,0,0

60x60x1.6,60,60,2.88,0,0,1.6,0,0,0,0,0,0,0

60x60x2.3,60,60,4.06,0,0,2.3,0,0,0,0,0,0,0

75x75x2.3,75,75,5.14,0,0,2.3,0,0,0,0,0,0,0

75x75x3.2,75,75,7.01,0,0,3.2,0,0,0,0,0,0,0

75x75x4.5,75,75,9.55,0,0,4.5,0,0,0,0,0,0,0

100x100x2.3,100,100,6.95,0,0,2.3,0,0,0,0,0,0,0

100x100x3.2,100,100,9.52,0,0,3.2,0,0,0,0,0,0,0

100x100x4.5,100,100,13.1,0,0,4.5,0,0,0,0,0,0,0

100x100x6.0,100,100,17.0,0,0,6.0,0,0,0,0,0,0,0

125x125x3.2,125,125,12.0,0,0,3.2,0,0,0,0,0,0,0

125x125x4.5,125,125,16.6,0,0,4.5,0,0,0,0,0,0,0

125x125x6.0,125,125,21.7,0,0,6.0,0,0,0,0,0,0,0

150x150x4.5,150,150,20.2,0,0,4.5,0,0,0,0,0,0,0

150x150x6.0,150,150,26.4,0,0,6.0,0,0,0,0,0,0,0

ข้อมูล Square Tube ในแฟ้มข้อมูล SHS.TXT

Steel Description : T Beam,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tr,d,C,N,n

50x100x8.60,50,100,8.60,10,0,8,6,10,0,0,0,0,1

62.5x125x11.9,62.5,125,11.9,11.9,0,9,6,5,10,0,0,0,0,1

75x100x10.5,74,100,10.5,15.5,0,9,6,11,0,0,0,0,1

75x150x15.8,75,150,15.8,13.7,0,10,7,11,0,0,0,0,1

87.5x175x20.1,87.5,175,20.1,15.5,0,11,7.5,12,0,0,0,0,1

100x100x10.7,100,100,10.7,22.9,0,8,5.5,11,0,0,0,0,1

100x150x15.3,100,150,15.3,17.9,0,9,6,13,0,0,0,0,1

100x200x24.9,100,200,24.9,17.3,0,12,8,13,0,0,0,0,1

125x125x14.8,125,125,14.8,27.8,0,9,6,12,0,0,0,0,1

125x175x22.1,125,175,22.1,22.7,0,11,7,16,0,0,0,0,1

125x250x36.2,125,250,36.2,20.8,0,14,9,16,0,0,0,0,1

150x150x18.4,150,150,18.4,34.1,0,9,6.5,13,0,0,0,0,1

150x200x28.4,147,200,28.4,28.3,0,12,8,18,0,0,0,0,1

175x175x24.8,175,175,24.8,37.5,0,11,7,14,0,0,0,0,1

175x250x34.6,168,249,34.6,30.2,0,12,8,20,0,0,0,0,1

175x350x68.2,175,350,68.2,28.6,0,19,12,20,0,0,0,0,1

200x200x33.0,200,200,33.0,42.3,0,13,8,16,0,0,0,0,1

200x300x53.4,195,300,53.4,34.1,0,16,10,22,0,0,0,0,1

250x200x44.8,250,200,44.8,59.6,0,16,10,20,0,0,0,0,1

250x300x64.2,244,300,64.2,46.6,0,18,11,26,0,0,0,0,1

300x200x52.8,300,200,52.8,78.4,0,17,11,22,0,0,0,0,1

300x300x75.6,294,300,75.6,60.8,0,20,12,28,0,0,0,0,1

ข้อมูลเหล็ก T Beam ในแฟ้มข้อมูล TB.TXT

Steel Description : T Column,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tr,d,C,N,n

50x100x8.60,50,100,8.60,10,0,8.6,10,0,0,0,0,1

62.5x125x11.9,62.5,125,11.9,11.9,0,9.6,5,10,0,0,0,0,1

75x100x10.5,74,100,10.5,15.5,0,9.6,11,0,0,0,0,1

75x150x15.8,75,150,15.8,13.7,0,10,7,11,0,0,0,0,1

87.5x175x20.1,87.5,175,20.1,15.5,0,11,7.5,12,0,0,0,0,1

100x100x10.7,100,100,10.7,22.9,0,8.5,5,11,0,0,0,0,1

100x150x15.3,100,150,15.3,17.9,0,9.6,13,0,0,0,0,1

100x200x24.9,100,200,24.9,17.3,0,12.8,13,0,0,0,0,1

125x125x14.8,125,125,14.8,27.8,0,9.6,12,0,0,0,0,1

125x175x22.1,125,175,22.1,22.7,0,11,7,16,0,0,0,0,1

125x250x36.2,125,250,36.2,20.8,0,14.9,16,0,0,0,0,1

150x150x18.4,150,150,18.4,34.1,0,9.6,5,13,0,0,0,0,1

150x200x28.4,147,200,28.4,28.3,0,12.8,18,0,0,0,0,1

175x175x24.8,175,175,24.8,37.5,0,11,7,14,0,0,0,0,1

175x250x34.6,168,249,34.6,30.2,0,12.8,20,0,0,0,0,1

175x350x68.2,175,350,68.2,28.6,0,19,12,20,0,0,0,0,1

200x200x33.0,200,200,33.0,42.3,0,13.8,16,0,0,0,0,1

200x300x53.4,195,300,53.4,34.1,0,16,10,22,0,0,0,0,1

250x200x44.8,250,200,44.8,59.6,0,16,10,20,0,0,0,0,1

250x300x64.2,244,300,64.2,46.6,0,18,11,26,0,0,0,0,1

300x200x52.8,300,200,52.8,78.4,0,17,11,22,0,0,0,0,1

300x300x75.6,294,300,75.6,60.8,0,20,12,28,0,0,0,0,1

ข้อมูลเหล็ก T Column ในแฟ้มข้อมูล TC.TXT

Steel Description : T Joist,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tr,d,C,N,n

102x102x12.66,101.6,101.6,12.66,21.87,0,10.4,5.8,9.4,3.2,80.5,0,0,0

89x102x10.72,88.9,101.6,10.72,18.35,0,9.5,3.9,4,3.2,69.2,0,0,0

76x127x18.64,76.2,127,18.64,17.87,0,13.2,10.4,13.5,6.6,47.2,0,0,0

76x89x8.56,76.2,88.9,8.56,15.77,0,8.3,4.9,7.9,2.4,58.8,0,0,0

76x76x8.94,76.2,76.2,8.94,17.75,0,9.6,5.8,9.4,4.6,56,0,0,0

ข้อมูลเหล็ก T Joist ในแฟ้มข้อมูล TJ.TXT

Steel Description : Unequal Angle,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tr,d,C,N,n

90x75x9,90,75,11.0,27.5,20.0,9.0,8.5,6.0,0.0,0

100x75x7,100,75,9.32,30.6,18.3,7.0,10.5,0.0,0.0

100x75x10,100,75,13.0,31.7,19.4,10.0,10.7,0.0,0.0

125x75x7,125,75,10.7,41.0,16.4,7.0,10.5,0.0,0.0

125x75x10,125,75,14.9,42.2,17.5,10.0,10.7,0.0,0.0

125x75x13,125,75,19.1,43.5,18.7,13.0,10.7,0.0,0.0

125x90x10,125,90,16.1,39.5,22.2,10.0,10.7,0.0,0.0

125x90x13,125,90,20.6,40.7,23.4,13.0,10.7,0.0,0.0

150x90x9,150,90,16.4,49.5,19.9,9.0,12.6,0.0,0.0

150x90x12,150,90,21.5,50.7,21.0,12.0,12.8,5.0,0.0,0

150x100x9,150,100,17.1,47.6,23.0,9.0,12.6,0.0,0.0

150x100x12,150,100,22.4,48.8,24.1,12.0,12.8,5.0,0.0,0

150x100x15,150,100,27.7,50.0,25.3,15.0,12.8,5.0,0.0,0

ข้อมูลเหล็ก Unequal Angle ในแฟ้มข้อมูล UA.TXT

Steel Description : I Beam,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tr,d,C,N,n

100x75x12.9,100,75,12.9,0,0,8.5,7,3.5,0,0,0,0

125x75x16.1,125,75,16.1,0,0,9.5,5.5,9.4,5,0,0,0,0

150x75x17.1,150,75,17.1,0,0,9.5,5.5,9.4,5,0,0,0,0

150x125x36.2,150,125,36.2,0,0,14.8,5,13.6,5,0,0,0,0

180x100x23.6,180,100,23.6,0,0,10.6,10,5,0,0,0,0

200x100x26.0,200,100,26.0,0,0,10.7,10,5,0,0,0,0

200x150x50.4,200,150,50.4,0,0,16.9,15,7.5,0,0,0,0

250x125x38.3,250,125,38.3,0,0,12.5,7.5,12.6,0,0,0,0

250x125x55.5,250,125,55.5,0,0,19,10,21,10.5,0,0,0,0

300x150x48.3,300,150,48.3,0,0,13.8,12,6,0,0,0,0

300x150x65.5,300,150,65.5,0,0,18.5,10,19.9,5,0,0,0,0

300x150x76.8,300,150,76.8,0,0,22,11.5,23,11.5,0,0,0,0

350x150x58.5,350,150,58.5,0,0,15.9,13,6.5,0,0,0,0

350x150x87.2,350,150,87.2,0,0,24,12,25,12.5,0,0,0,0

400x150x72.0,400,150,72.0,0,0,18,10,17.8,5,0,0,0,0

400x150x95.8,400,150,95.8,0,0,25,12.5,27,13.5,0,0,0,0

450x175x91.7,450,175,91.7,0,0,20,11,19.9,5,0,0,0,0

450x175x115.0,450,175,115.0,0,0,26,13,27,13.5,0,0,0,0

600x190x133.0,600,190,133.0,0,0,25,13,25,12.5,0,0,0,0

600x190x176.0,600,190,176.0,0,0,35,16,38,19,0,0,0,0

ข้อมูลเหล็ก I Beam ในแฟ้มข้อมูล UB.TXT



Steel Description : H Beam,,,,,,,,,,,,,

Designation,Depth D,Width W,Mass,Cx,Cy,Flanget,Webt,Rr,Tr,d,C,N,n

100x50x9.30,100,50,9.30,0,0,7.5,8,0,0,0,0,0

100x100x17.2,100,100,17.2,0,0,8.6,10,0,0,0,0,0

๑๖

125x60x13.2,125,60,13.2,0,0,8.6,9,0,0,0,0,0

๓๔

125x125x23.8,125,125,23.8,0,0,9.6,5,10,0,0,0,0

๑๖ ๓๙

150x75x14.0,150,75,14.0,0,0,7.5,8,0,0,0,0,0

150x150x31.5,150,150,31.5,0,0,10.7,11,0,0,0,0,0

175x90x18.1,175,90,18.1,0,0,8.5,9,0,0,0,0,0

175x175x40.2,175,175,40.2,0,0,11.7,5,12,0,0,0,0

200x100x21.3,200,100,21.3,0,0,8.5,5,11,0,0,0,0

200x200x49.9,200,200,49.9,0,0,12.8,13,0,0,0,0,0

250x125x29.6,250,125,29.6,0,0,9.6,12,0,0,0,0,0

250x250x72.4,250,250,72.4,0,0,14.9,16,0,0,0,0,0

300x150x36.7,300,150,36.7,0,0,9.6,5,13,0,0,0,0

300x300x94.0,300,300,94.0,0,0,15.1,10,18,0,0,0,0

350x175x49.6,350,175,49.6,0,0,11.7,14,0,0,0,0,0

350x350x137.0,350,350,137.0,0,0,19.1,12,20,0,0,0,0

400x200x66.0,400,200,66.0,0,0,13.8,16,0,0,0,0,0

400x400x172.0,400,400,172.0,0,0,21.1,13,22,0,0,0,0

459x200x76.0,459,200,76.0,0,0,14.9,18,0,0,0,0,0

500x200x89.6,500,200,89.6,0,0,16.1,10,20,0,0,0,0

600x200x106.0,600,200,106.0,0,0,17.1,11,22,0,0,0,0

700x300x185.0,700,300,185.0,0,0,24.1,13,28,0,0,0,0

800x300x210.0,800,300,210.0,0,0,26.1,14,28,0,0,0,0

900x300x243.0,900,300,243.0,0,0,28.1,16,28,0,0,0,0

ข้อมูลเหล็ก H Beam ในแฟ้มข้อมูล UC.TXT

```
# QuickSteel Version 1.3
# File Name      : portal.rdb
# Date   : 2nd July 1992
# This file contains the allowable steel types for a particular member.
# WARNING:
# Any changes in this file would affect STEEL.RDB
# Do not amend this file !
# Do not leave any blank line !
# ***BS - British Standard, three asterisks for standards group.
# **PORTAL - two asterisks for member group.
# *STANCHION - one asterisk for the member type.

***BS
**PORTAL
*STANCHION
4, 5, 6, 2, 1
*RAFTER
4, 5, 6
*PRAFTER
4, 5, 6, 2, 1
*PURLIN
1,2,3,10,11,12,13
*HAUNCH
4, 5, 6
**TRUSS
*TOP CHORD
3, 8, 9, 4, 5, 11, 10, 2, 1, 7
*BOT CHORD
3, 8, 9, 4, 5, 11, 10, 2, 1, 7
*TRAFTER
4, 5, 6, 2, 1, 3
*DIAGONAL
7, 8, 9, 11, 10, 4, 5, 2, 1, 3
*COLUMN
```

14, 4, 5, 6, 2, 1

27

***CISC

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ข้อมูลการกำหนด Steel Type ในแฟ้มข้อมูล STEEL.TYP