

รายการคำนวณโครงสร้าง
DESIGN CALCULATION

ปรับปรุงต่อเติม เพิ่มสำนักงาน ชั้น 2
อาคารพิพิธภัณฑ์เทคโนโลยีสารสนเทศ
ขนาด 8.00 x 10.00 เมตร



เจ้าของโครงการ

องค์การพิพิธภัณฑ์วิทยาศาสตร์แห่งชาติ

วิศวกรโครงสร้าง

- | | | |
|----|-----------------------|----------|
| 1. | นายลือนาท คล้ายสมบัติ | สย.9662 |
| 2. | นายธรรมบุญ มงคลละ | ภย.24570 |

DESIGN CRITERIA

PROJECT : ปรับปรุงต่อเติม เพิ่มสำนักงาน ชั้น 2

LOCATION : อาคารพิพิธภัณฑ์เทคโนโลยีสารสนเทศ

F_c'		=	173 Ksc.	(Cylinder strengt at 28 day)
$F_c =$	$0.375 \cdot F_c'$	=	65 Ksc.	
E_c		=	$1.90 \cdot 10^5$ Ksc.	
(SR.24)	$F_y =$	2,400 Ksc.	$, F_s =$	$0.5 F_y =$ 1,200 Ksc.
(SD 30)	$F_y =$	3,000 Ksc.	$, F_s =$	$0.5 F_y =$ 1,500 Ksc.
n		=	10	
K		=	0.302	
j		=	0.899	
R		=	8.830	
V_c	$0.29 \cdot F_c'^{0.5}$	=	3.810 Ksc.	(Beam Shear)
V_c	$0.53 \cdot F_c'^{0.5}$	=	6.970 Ksc.	(Punching Shear)
Live Load	(Second floor)	=	300 Ksm.	
Live Load	(Roof)	=	30 Ksm.	
Concrete		=	2,400 Kg./cu.m.	
Structural steel Fe 24, F_y		=	2,400 Ksc.	
E_s		=	$2.10 \cdot 10^6$ Ksc.	

STRUCTURAL ENGINEER :

1 นายลือนาท คล้ายสมบัติ

สย.9662

2 นายธรรมบุญ มงคลละ

ภย.24570



DESIGN STEEL COLUMN

CS2

1 DESIGN CRITERIA

(Fe.24),	Fy	=	2,400 ksc.
Elastic modulus,	Es	=	2,100,000 ksc.
Axial load,	Pmax	=	19,750 kg.
Column hight,	L	=	3.50 m.
Length eff.,	K	=	1

2 TRIAL AREA OF CROSS SECTION

Assumed,	Fa	=	1,320 ksc.
Area (approximate)	A	=	14.96 sq.cm.

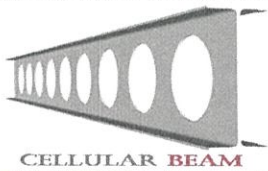
3 SELECTED STEEL SHAPE

Selected	WF	200X200mm.
	wt.	= 49.90 kg./m.
Area,	A	= 63.53 sq.cm.
	d	= 20 cm.
	b	= 20 cm.
	rx	= 8.62 cm.
	ry	= 5.02 cm.

4 ALLOWABLE COMPRESSSION STRESS

$Cc = (2 \cdot 3.14159^2 \cdot xE/Fy)^{0.5}$	=	131.42		
KL/r	=	69.72	<	Cc OK. #
$Fa = [(1 - 0.5(KL/r)^2)Fy] / [(5/3 + 3/8(KL/r)/Cc - 1/8(KL/r)/Cc)^3]$				
	Fa	=	1,116.58 ksc.	
Load resisting,	P _{resist}	=	70,937 kg. > Pmax :	19,750 OK. #





CELLULAR BEAM

Calculationsheet

PROJECT : ปรับปรุงสำนักงาน เพิ่มขึ้น 2 Owner : องค์การพิพิธภัณฑ์วิทยาศาสตร์แห่งชาติ
Location : พิพิธภัณฑ์เทคโนโลยีสารสนเทศ Engineer :
Beam No : B1

Design For Cellular Beam

[I.Data For Design]

1.1.Overall Load	0	kg
1.1.1.End Moment(M_1)	0.00	kg.-m.
1.2.Middle Moment	31,938.00	kg.-m.
1.3.End Moment(M_2)	0.00	kg.-m.
1.4.Max. Shear(V)	12,775.00	kg.
1.6.Max. Length(L)	10.00	m.
1.7.Lateral Support(L_b)	5.00	m.
1.8.Coefficient of C_b	1.00	

[III.Result Of Calculate]

3.1.Required (S_{x-x})	2,217.92	cm. ³
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- ☒ H-Beam
☐ I-Beam

485x348x10x16x20

3.2.Size Of Section H	485	mm.
3.3.Size Of Section bf	348	mm.
3.4.Thick. Web(t_w)	10	mm.
3.5.Thick. Flange(t_f)	16	mm.
3.6.Section Area(A_s)	126	cm. ²
3.7.Weight Of Section	112	kg./m.
3.8.Sect. Modulus(S_{x-x})	2773	cm. ³
3.9.M. Of In.(I_x)	67308	cm. ⁴
3.9.M. Of In.(I_y)	11243	
3.10.Rad. Of Gyr.($r_{min.}$)	23	cm.
3.11.Diameter Cellular	344	mm.
3.12.Space Hole	516	mm.

[II.Properties Of Steel For Design]

2.1.Use Steel Grade	Fe-24	
2.2.Modulus Of Elastic.	2,100,000	ksc.
2.3.Yield Strength	2,400	ksc.
2.4.Ultimate Strength	4,100	ksc.
2.5.All. Bend. Stress	1,440	ksc.
2.6.All. Shear Stress	960	ksc.

[IV.Check Laterally Supported]

4.1.Use Laterally Sup.	5.00	m.
4.2. $L_c = 637.2*b/(F_y^{1/2})$	4.53	m.(min.)
4.3. $L_u = 1406000*Af/(d*F_y)$	13.44	m.(max.)

<< Not Enough Laterally Supported >>

[V.Allowable Bending Stress(F_b)]

5.1.Laterally Supported Is Sufficiently		
$bf/2t_f$	=	*****
$437.7/F_y^{1/2}$	=	*****
$796.5/F_y^{1/2}$	=	*****
All.Bending Stress(F_b)	*****	ksc.

Partially Compact Section

5.2.Laterally Supported Is Non-Sufficiently		
L/r_t	=	106.06
$(717*10^4*C_b/F_y)^{1/2}$	=	55.47
$(3585*10^4*C_b/F_y)^{1/2}$	=	124.05
All.Bending Stress(F_b)	1,440.00	ksc.

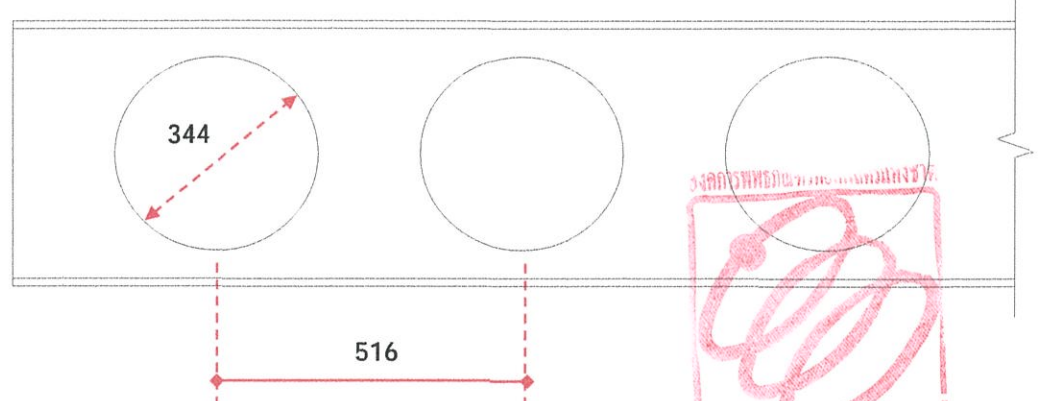
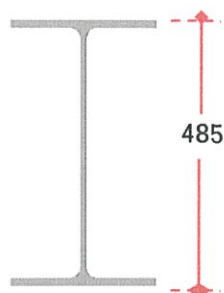
[VI.Allowable Deflexion(Δ all.) $L/360$]

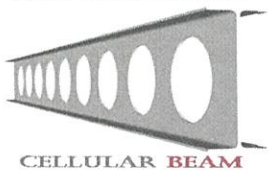
6.1.Max. Allowable	2.78	cm.
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[Recheck Allowable Stress On Section]

1.Actual Bending Stress	1,152	ksc	ksc. OK.!
2.Actual Shear Stress	101.64	ksc	ksc. OK.!
3.Actual Deflexion	0.00	cm.	OK.!($L/360$)

CELULAR BEAM (H-BEAM)485x348x10x16x20 SECTION CAN BE USE





CELLULAR BEAM

Calculationsheet

PROJECT : ปรับปรุงสำนักงาน เพิ่มขึ้น 2 Owner : องค์การพิพิธภัณฑ์วิทยาศาสตร์แห่งชาติ
Location : พิพิธภัณฑ์เทคโนโลยีสารสนเทศ Engineer :
Beam No : B2

Design For Cellular Beam

[I.Data For Design]

1.1.Overall Load	0	kg
1.1.End Moment(M_1)	0.00	kg.-m.
1.2.Middle Moment	15,641.00	kg.-m.
1.3.End Moment(M_2)	0.00	kg.-m.
1.4.Max. Shear(V)	12,513.00	kg.
1.6.Max. Length(L)	5.00	m.
1.7.Lateral Support(L_b)	0.00	m.
1.8.Coefficient of C_b	1.00	

[III.Result Of Calculate]

3.1.Required (S_{x-x})	1,086.18	cm. ³
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☒ H-Beam

☐ I-Beam

485x348x10x16x20

3.2.Size Of Section H	485	mm.
3.3.Size Of Section bf	348	mm.
3.4.Thick. Web(t_w)	10	mm.
3.5.Thick. Flange(t_f)	16	mm.
3.6.Section Area(A_s)	126	cm. ²
3.7.Weight Of Section	112	kg./m.
3.8.Sect. Modulus(S_{x-x})	2773	cm. ³
3.9.M. Of In. (I_x)	67308	cm. ⁴
3.9.M. Of In. (I_y)	11243	
3.10.Rad. Of Gyr. ($r_{min.}$)	23	cm.
3.11.Dimeter Cellular	344	mm.
3.12.Space Hole	516	mm.

[II.Properties Of Steel For Design]

2.1.Use Steel Grade	Fe-24	
2.2.Modulus Of Elastic.	2,100,000	ksc.
2.3.Yield Strength	2,400	ksc.
2.4.Ultimate Strength	4,100	ksc.
2.5.All. Bend. Stress	1,440	ksc.
2.6.All. Shear Stress	960	ksc.

[IV.Check Laterally Supported]

4.1.Use Laterally Sup.	0.00	m.
4.2. $L_c = 637.2*b/(F_y^{1/2})$	4.53	m.(min.)
4.3. $L_u = 1406000*Af/(d*F_y)$	13.44	m.(max.)

<< Enough Laterally Supported >>

[V.Allowable Bending Stress(F_b)]

5.1.Laterally Supported Is Sufficiently		
$bf/2t_f$	=	10.88
$437.7/F_y^{1/2}$	=	11.24
$796.5/F_y^{1/2}$	=	16.57
All.Bending Stress(F_b)	1,584.00	ksc.

Compact Section

5.2.Laterally Supported Is Non-Sufficiently		
L/r_t	=	*****
$(717*10^4*C_b/F_y)^{1/2}$	=	*****
$(3585*10^4*C_b/F_y)^{1/2}$	=	*****
All.Bending Stress(F_b)	*****	ksc.

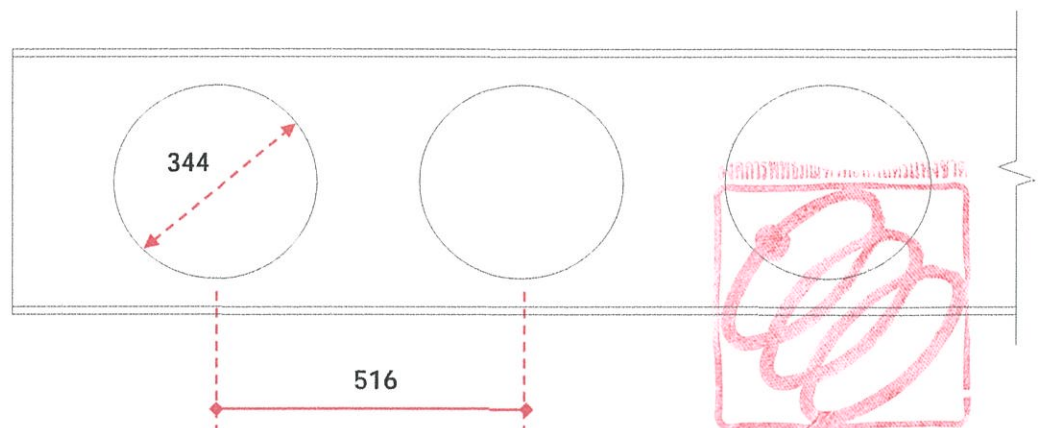
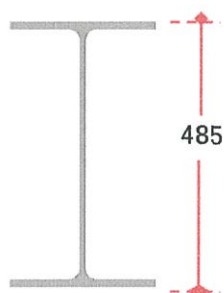
[VI.Allowable Deflexion(Δ all.) $L/360$]

6.1.Max. Allowable	1.39	cm.
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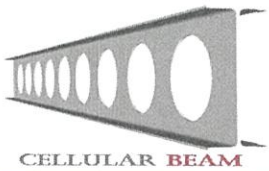
[Recheck Allowable Stress On Section]

1.Actual Bending Stress	564	ksc	ksc. OK.!
2.Actual Shear Stress	99.55	ksc	ksc. OK.!
3.Actual Deflexion	0.00	cm.	OK.!(L/360)

CELULAR BEAM (H-BEAM)485x348x10x16x20 SECTION CAN BE USE



NATIONAL SCIENCE MUSEUM



CELLULAR BEAM

Calculationsheet

PROJECT : ปรับปรุงสำนักงาน เพิ่มขึ้น 2 Owner : องค์การพิพิธภัณฑ์วิทยาศาสตร์แห่งชาติ
Location : พิพิธภัณฑ์เทคโนโลยีสารสนเทศ Engineer :
Beam No : B3

Design For Cellular Beam

[I.Data For Design]

1.1.Overall Load	0	kg
1.1.End Moment(M_1)	0.00	kg.-m.
1.2.Middle Moment	863.00	kg.-m.
1.3.End Moment(M_2)	0.00	kg.-m.
1.4.Max. Shear(V)	1,725.00	kg.
1.6.Max. Length(L)	2.00	m.
1.7.Lateral Support(L_b)	0.00	m.
1.8.Coefficient of C_b	1.00	

[III.Result Of Calculate]

3.1.Required (S_{x-x})	59.93	cm. ³
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- ☒ H-Beam
☐ I-Beam

175x125x6.5x9x10

3.2.Size Of Section H	175	mm.
3.3.Size Of Section bf	125	mm.
3.4.Thick. Web(t_w)	7	mm.
3.5.Thick. Flange(t_f)	9	mm.
3.6.Section Area(A_s)	25	cm. ²
3.7.Weight Of Section	23	kg./m.
3.8.Sect. Modulus(S_{x-x})	195	cm. ³
3.9.M. Of In. (I_x)	1705	cm. ⁴
3.9.M. Of In. (I_y)	293	
3.10.Rad. Of Gyr. ($r_{min.}$)	8	cm.
3.11.Dimeter Cellular	125	mm.
3.12.Space Hole	188	mm.

[II.Properties Of Steel For Design]

2.1.Use Steel Grade	Fe-24	
2.2.Modulus Of Elastic.	2,100,000	ksc.
2.3.Yield Strength	2,400	ksc.
2.4.Ultimate Strength	4,100	ksc.
2.5.All. Bend. Stress	1,440	ksc.
2.6.All. Shear Stress	960	ksc.

[IV.Check Laterally Supported]

4.1.Use Laterally Sup.	0.00	m.
4.2. $L_c = 637.2 * b / (F_y^{1/2})$	1.63	m.(min.)
4.3. $L_u = 1406000 * A_f / (d * F_y)$	7.55	m.(max.)

<< Enough Laterally Supported >>

[V.Allowable Bending Stress(F_b)]

5.1.Laterally Supported Is Sufficiently		
$bf/2t_f$	=	6.94
$437.7 / F_y^{1/2}$	=	11.24
$796.5 / F_y^{1/2}$	=	16.57
All.Bending Stress(F_b)	1,584.00	ksc.

Compact Section

5.2.Laterally Supported Is Non-Sufficiently		
L/r_t	=	*****
$(717 * 10^4 * C_b / F_y)^{1/2}$	=	*****
$(3585 * 10^4 * C_b / F_y)^{1/2}$	=	*****
All.Bending Stress(F_b)	*****	ksc.

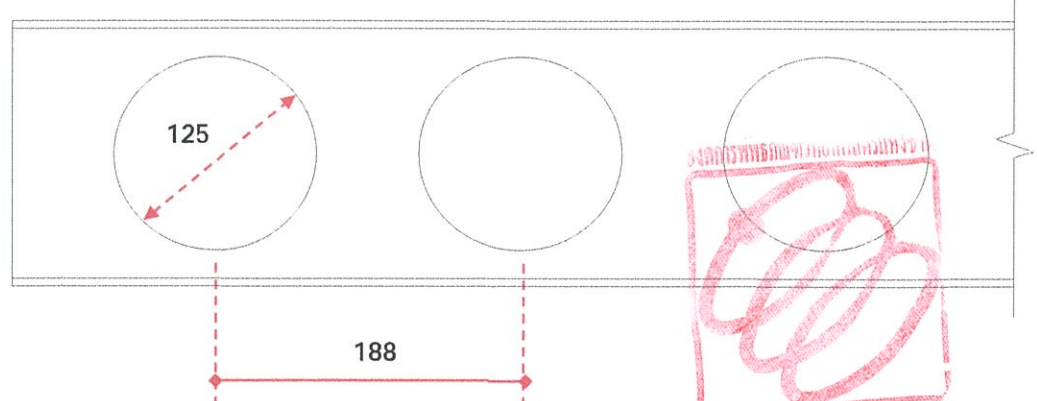
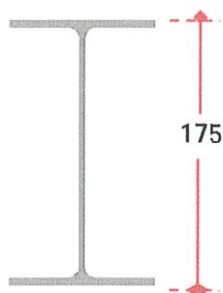
[VI.Allowable Deflexion(Δ all.) L/360]

6.1.Max. Allowable	0.56	cm.
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[Recheck Allowable Stress On Section]

1.Actual Bending Stress	442	ksc	ksc. OK.!
2.Actual Shear Stress	67.83	ksc	ksc. OK.!
3.Actual Deflexion	0.00	cm.	OK.!(L/360)

CELULAR BEAM (H-BEAM)175x125x6.5x9x10 SECTION CAN BE USE



NATIONAL SCIENCE MUSEUM



CELLULAR BEAM

Calculationsheet

PROJECT : ปรับปรุงสำนักงาน เพิ่มขึ้น 2
Location : พิพิธภัณฑ์เทคโนโลยีสารสนเทศ
Beam No : B4

Owner : องค์การพิพิธภัณฑ์วิทยาศาสตร์แห่งชาติ
Engineer :

Design For Cellular Beam

[I.Data For Design]

1.1.Overall Load	0	kg
1.1.End Moment(M_1)	0.00	kg.-m.
1.2.Middle Moment	18,163.00	kg.-m.
1.3.End Moment(M_2)	0.00	kg.-m.
1.4.Max. Shear(V)	7,265.00	kg.
1.6.Max. Length(L)	10.00	m.
1.7.Lateral Support(L_b)	2.50	m.
1.8.Coefficient of C_b	1.00	

[III.Result Of Calculate]

3.1.Required (S_{x-x})	1,261.32	cm. ³
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☒ H-Beam

☐ I-Beam

420x299x9x14x18

3.2.Size Of Section H	420	mm.
3.3.Size Of Section bf	299	mm.
3.4.Thick. Web(t_w)	9	mm.
3.5.Thick. Flange(t_f)	14	mm.
3.6.Section Area(A_s)	95	cm. ²
3.7.Weight Of Section	85	kg./m.
3.8.Sect. Modulus(S_{x-x})	1812	cm. ³
3.9.M. Of In. (I_x)	38072	cm. ⁴
3.9.M. Of In. (I_y)	6240	
3.10.Rad. Of Gyr. ($r_{min.}$)	20	cm.
3.11.Dimeter Cellular	298	mm.
3.12.Space Hole	447	mm.

[II.Properties Of Steel For Design]

2.1.Use Steel Grade	Fe-24	
2.2.Modulus Of Elastic.	2,100,000	ksc.
2.3.Yield Strength	2,400	ksc.
2.4.Ultimate Strength	4,100	ksc.
2.5.All. Bend. Stress	1,440	ksc.
2.6.All. Shear Stress	960	ksc.

[IV.Check Laterally Supported]

4.1.Use Laterally Sup.	2.50	m.
4.2. $L_c = 637.2 * b / (F_y)^{1/2}$	3.89	m.(min.)
4.3. $L_u = 1406000 * A_f / (d * F_y)$	11.67	m.(max.)

<< Enough Laterally Supported >>

[V.Allowable Bending Stress(F_b)]

5.1.Laterally Supported Is Sufficiently		
$b_f / 2t_f$	=	10.68
$437.7 / F_y^{1/2}$	=	11.24
$796.5 / F_y^{1/2}$	=	16.57
All.Bending Stress(F_b)	1,584.00	ksc.

Compact Section

5.2.Laterally Supported Is Non-Sufficiently		
L / r_t	=	*****
$(717 * 10^4 * C_b / F_y)^{1/2}$	=	*****
$(3585 * 10^4 * C_b / F_y)^{1/2}$	=	*****
All.Bending Stress(F_b)	*****	ksc.

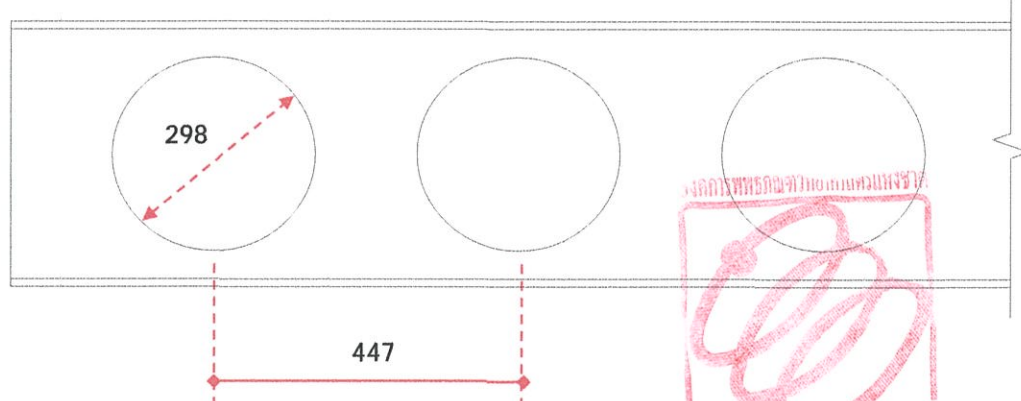
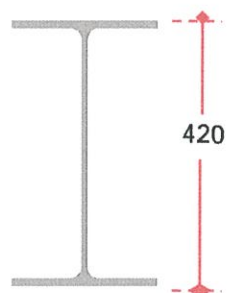
[VI.Allowable Deflexion(Δ all.) $L/360$]

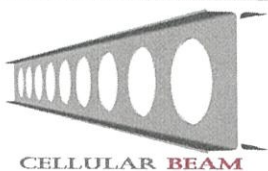
6.1.Max. Allowable	2.78	cm.
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[Recheck Allowable Stress On Section]

1.Actual Bending Stress	1,002	ksc	ksc. OK.!
2.Actual Shear Stress	76.51	ksc	ksc. OK.!
3.Actual Deflexion	0.00	cm.	OK.!($L/360$)

CELULAR BEAM (H-BEAM)420x299x9x14x18 SECTION CAN BE USE





Calculationsheet

PROJECT : ปรับปรุงสำนักงาน เพิ่มขึ้น 2 Owner : องค์การพิพิธภัณฑ์วิทยาศาสตร์แห่งชาติ
Location : พิพิธภัณฑ์เทคโนโลยีสารสนเทศ Engineer :
Beam No : B5

Design For Cellular Beam

[I.Data For Design]

1.1.Overall Load	0	kg
1.1.End Moment(M_1)	0.00	kg.-m.
1.2.Middle Moment	7,831.00	kg.-m.
1.3.End Moment(M_2)	0.00	kg.-m.
1.4.Max. Shear(V)	3,125.00	kg.
1.6.Max. Length(L)	10.00	m.
1.7.Lateral Support(L_b)	5.00	m.
1.8.Coefficient of C_b	1.00	

[III.Result Of Calculate]

3.1.Required (S_{x-x})	543.82	cm. ³
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☒ H-Beam

☐ I-Beam

281x100x5.5x8x11

3.2.Size Of Section H	281	mm.
3.3.Size Of Section bf	100	mm.
3.4.Thick. Web(t_w)	6	mm.
3.5.Thick. Flange(t_f)	8	mm.
3.6.Section Area(A_s)	57	cm. ²
3.7.Weight Of Section	49	kg./m.
3.8.Sect. Modulus(S_{x-x})	711	cm. ³
3.9.M. Of In. (I_x)	9989	cm. ⁴
3.9.M. Of In. (I_y)	1700	
3.10.Rad. Of Gyr. ($r_{min.}$)	13	cm.
3.11.Dimeter Cellular	200	mm.
3.12.Space Hole	300	mm.

[II.Properties Of Steel For Design]

2.1.Use Steel Grade	Fe-24	
2.2.Modulus Of Elastic.	2,100,000	ksc.
2.3.Yield Strength	2,400	ksc.
2.4.Ultimate Strength	4,100	ksc.
2.5.All. Bend. Stress	1,440	ksc.
2.6.All. Shear Stress	960	ksc.

[IV.Check Laterally Supported]

4.1.Use Laterally Sup.	5.00	m.
4.2. $L_c = 637.2*b/(F_y)^{1/2}$	1.30	m.(min.)
4.3. $L_u = 1406000*Af/(d*F_y)$	3.34	m.(max.)

<< Not Enough Laterally Supported >>

[V.Allowable Bending Stress(F_b)]

5.1.Laterally Supported Is Sufficiently		
$bf/2t_f$	=	*****
$437.7/F_y^{1/2}$	=	*****
$796.5/F_y^{1/2}$	=	*****
All.Bending Stress(F_b)	*****	ksc.

Partially Compact Section

5.2.Laterally Supported Is Non-Sufficiently		
L/r_t	=	110.77
$(717*10^4*C_b/F_y)^{1/2}$	=	55.47
$(3585*10^4*C_b/F_y)^{1/2}$	=	124.05
All.Bending Stress(F_b)	1,440.00	ksc.

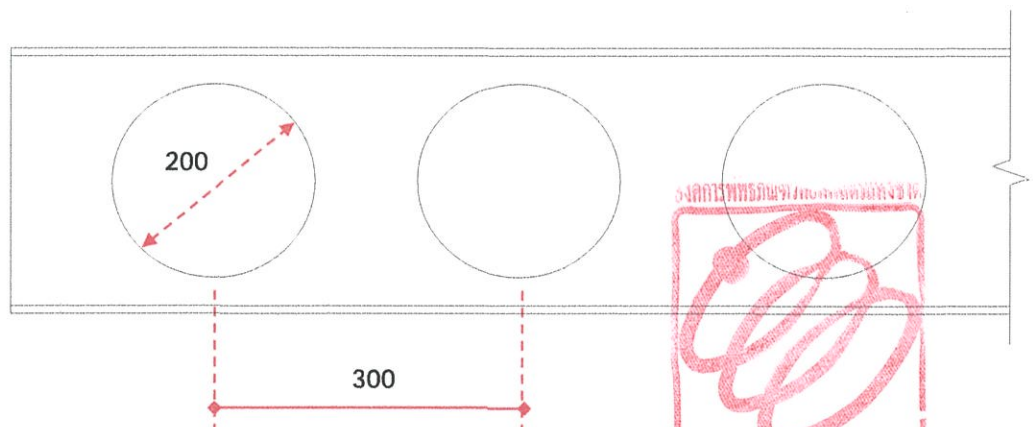
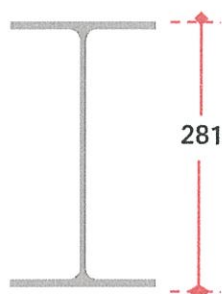
[VI.Allowable Deflexion(Δ all.) L/360]

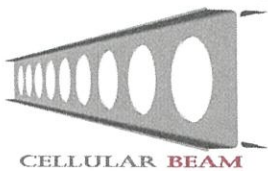
6.1.Max. Allowable	2.78	cm.
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[Recheck Allowable Stress On Section]

1.Actual Bending Stress	1,101	ksc	ksc. OK.!
2.Actual Shear Stress	54.59	ksc	ksc. OK.!
3.Actual Deflexion	0.00	cm.	OK.!(L/360)

CELULAR BEAM (H-BEAM)281x100x5.5x8x11 SECTION CAN BE USE





CELLULAR BEAM

Calculationsheet

PROJECT : ปรับปรุงสำนักงาน เพิ่มขึ้น 2 Owner : องค์การพิพิธภัณฑ์วิทยาศาสตร์แห่งชาติ
Location : พิพิธภัณฑ์เทคโนโลยีสารสนเทศ Engineer :
Beam No : B6

Design For Cellular Beam

[I.Data For Design]

1.1.Overall Load	0	kg
1.1.End Moment(M_1)	0.00	kg.-m.
1.2.Middle Moment	3,594.00	kg.-m.
1.3.End Moment(M_2)	0.00	kg.-m.
1.4.Max. Shear(V)	2,875.00	kg.
1.6.Max. Length(L)	5.00	m.
1.7.Lateral Support(L_b)	0.60	m.
1.8.Coefficient of C_b	1.00	

[III.Result Of Calculate]

3.1.Required (S_{x-x})	249.58	cm. ³
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☒ H-Beam

☐ I-Beam

281x100x5.5x8x11

3.2.Size Of Section H	281	mm.
3.3.Size Of Section bf	100	mm.
3.4.Thick. Web(t_w)	6	mm.
3.5.Thick. Flange(t_f)	8	mm.
3.6.Section Area(A_s)	57	cm. ²
3.7.Weight Of Section	49	kg./m.
3.8.Sect. Modulus(S_{x-x})	711	cm. ³
3.9.M. Of In. (I_x)	9989	cm. ⁴
3.9.M. Of In. (I_y)	1700	
3.10.Rad. Of Gyr. ($r_{min.}$)	13	cm.
3.11.Diameter Cellular	200	mm.
3.12.Space Hole	300	mm.

[II.Properties Of Steel For Design]

2.1.Use Steel Grade	Fe-24	
2.2.Modulus Of Elastic.	2,100,000	ksc.
2.3.Yield Strength	2,400	ksc.
2.4.Ultimate Strength	4,100	ksc.
2.5.All. Bend. Stress	1,440	ksc.
2.6.All. Shear Stress	960	ksc.

[IV.Check Laterally Supported]

4.1.Use Laterally Sup.	0.60	m.
4.2. $L_c = 637.2*b/(F_y)^{1/2}$	1.30	m.(min.)
4.3. $L_u = 1406000*Af/(d*F_y)$	3.34	m.(max.)

<< Enough Laterally Supported >>

[V.Allowable Bending Stress(F_b)]

5.1.Laterally Supported Is Sufficiently		
$bf/2t_f$	=	6.25
$437.7/F_y^{1/2}$	=	11.24
$796.5/F_y^{1/2}$	=	16.57
All.Bending Stress(F_b)	1,584.00	ksc.

Compact Section

5.2.Laterally Supported Is Non-Sufficiently		
L/r_t	=	*****
$(717*10^4*C_b/F_y)^{1/2}$	=	*****
$(3585*10^4*C_b/F_y)^{1/2}$	=	*****
All.Bending Stress(F_b)	*****	ksc.

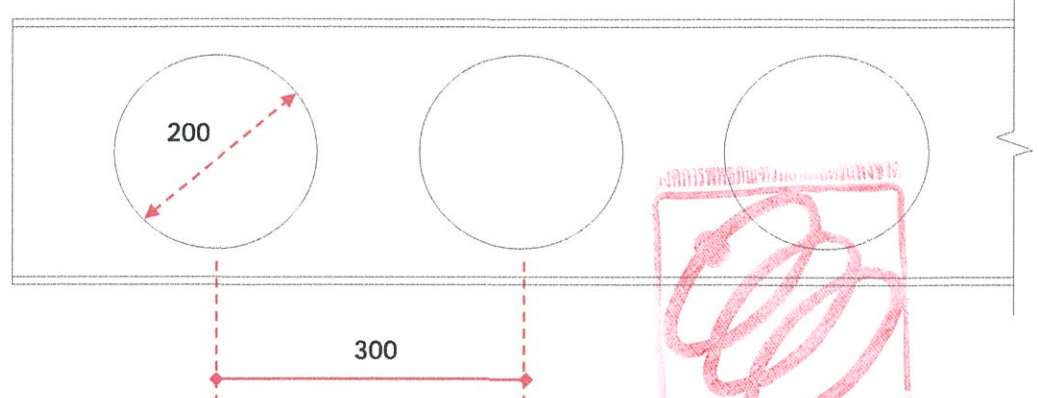
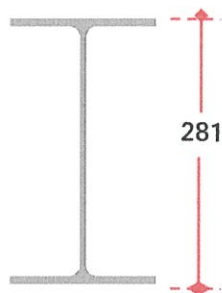
[VI.Allowable Deflexion(Δ all.) $L/360$]

6.1.Max. Allowable	1.39	cm.
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[Recheck Allowable Stress On Section]

1.Actual Bending Stress	506	ksc	ksc. OK.!
2.Actual Shear Stress	50.22	ksc	ksc. OK.!
3.Actual Deflexion	0.00	cm.	OK.!($L/360$)

CELULAR BEAM (H-BEAM)281x100x5.5x8x11 SECTION CAN BE USE



ตารางออกแบบน้ำหนักบรรทุกทุก รุ่น D-50W

ความหนา 0.80 mm.

Total Slab Thickness mm.	Beam support	Allowable Live Load (kg m ⁻²)															
		Span (m)															
		1.00	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75	4.00	4.25	4.50	4.75
100	Single	4.170	2.669	1.853	1.361	1.043	824	667	551	463	395	340	297	261	231	206	185
	Double	4.170	2.669	1.853	1.361	1.043	824	667	551	463	395	340	297	261	231	206	185
125	Single	4.717	3.019	2.096	1.540	1.179	932	755	624	524	447	385	335	295	261	233	209
	Double	4.717	3.019	2.096	1.540	1.179	932	755	624	524	447	385	335	295	261	233	209
150	Single	5.264	3.369	2.339	1.718	1.316	1,040	842	696	585	498	430	374	329	291	260	233
	Double	5.264	3.369	2.339	1.718	1.316	1,040	842	696	585	498	430	374	329	291	260	233
175	Single	5.810	3.719	2.582	1.897	1.453	1,148	930	768	646	550	474	413	363	322	287	258
	Double	5.810	3.719	2.582	1.897	1.453	1,148	930	768	646	550	474	413	363	322	287	258
200	Single	6.357	4.068	2.825	2.076	1.589	1,256	1,017	841	706	602	519	452	397	352	314	282
	Double	6.357	4.068	2.825	2.076	1.589	1,256	1,017	841	706	602	519	452	397	352	314	282
225	Single	6.904	4.418	3.068	2.254	1.726	1,364	1,105	913	767	654	564	491	431	382	341	306
	Double	6.904	4.418	3.068	2.254	1.726	1,364	1,105	913	767	654	564	491	431	382	341	306
250	Single	7.450	4.768	3.311	2.433	1.863	1,472	1,192	985	828	705	608	530	466	412	368	330
	Double	7.450	4.768	3.311	2.433	1.863	1,472	1,192	985	828	705	608	530	466	412	368	330
275	Single	7.997	5.118	3.554	2.611	1.999	1,580	1,280	1,057	889	757	653	569	500	442	395	354
	Double	7.997	5.118	3.554	2.611	1.999	1,580	1,280	1,057	889	757	653	569	500	442	395	354

In shaded areas to the right of the heavy line, mid-span deck shoring required during construction.

