

	บริษัท ดีเซนอ จำกัด Diseno company limited เลขที่ 26 ซ.ลาดพร้าววังหิน 55 ถนนลาดพร้าววังหิน แขวง ลาดพร้าว เขต ลาดพร้าว กรุงเทพมหานคร ทะเบียนเลขที่ 0105558040601 Tel & Fax : +66(0) 2 931 6980 , Mobile : +66(0)84 449 6777			
	Calculations Sheet		Made by	Date
	รายการคำนวณ		PAP	13 มิ.ย. 58
	Project			
	Owner			
	Location			
Note				

รายการคำนวณ

อาคารพักอาศัย ค.ส.ล. และโครงสร้างเหล็ก 3 ชั้น

 <p>บริษัท ดีเซนอ จำกัด Diseno company limited เลขที่ 26 ซ.ลาดพร้าววังหิน 55 ถนนลาดพร้าววังหิน แขวง ลาดพร้าว เขต ลาดพร้าว กรุงเทพมหานคร ทะเบียนเลขที่ 0105558040601 Tel & Fax : +66(0) 2 931 6980 , Mobile : +66(0)84 449 6777</p>	CRITERIA		
	Calculations Sheet	Made by	Date
	รายการคำนวณ	PAP	13 มิ.ย. 58
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ข้อกำหนดการออกแบบ

เหล็กโครงสร้าง	=	JIS G3101 OR SS-400 OR ASTM A-36		
fy	=	2,400	กก/ตร.ซม.	
Es	=	2.04E+06	กก/ตร.ซม.	
Cc	=	129.53		
คอนกรีตเสริมเหล็ก	=	EIT 1007-34		
fc'	=	210	กก/ตร.ซม.	k1 = 0.328 (ROUND BAR)
fc	=	78.75	กก/ตร.ซม.	k2 = 0.281 (DEFORMED BAR)
USE	=	65.00	กก/ตร.ซม.	R1 = 9.49 kg./sq.cm.
fs (RB)	=	1,200	กก/ตร.ซม.	R2 = 8.27 kg./sq.cm.
fs (DB)	=	1,500	กก/ตร.ซม.	j1 = 0.891 (ROUND BAR)
n	=	9		j2 = 0.906 (DEFORMED BAR)
Vc = 0.29SQRT(fc')	=	4.20	กก/ตร.ซม.	
Vcs = 0.53SQRT(fc')	=	7.68	กก/ตร.ซม.	
u = 2.29SQRT(fc')/D	=	27.65	กก/ตร.ซม. สำหรับเหล็กเสริมบน	
u = 3.23SQRT(fc')/D	=	39.01	กก/ตร.ซม. สำหรับเหล็กเสริมล่าง	

หน่วยน้ำหนักบรรทุก และ แรงลม สำหรับการคำนวณออกแบบ

ประเภทและส่วนต่างๆของอาคาร	หน่วยน้ำหนักบรรทุกจร	
1 พื้นที่ใช้พักอาศัย	200	กก/ตรม.
2 ส่วนร้านค้า โถงทางเดิน และบันได	300	กก/ตรม.
3 หลังคา METAL SHEET	30	กก/ตรม.
4 หลังคา คสล.	150	กก/ตรม.

น้ำหนักวัสดุต่างๆ	หน่วยน้ำหนักบรรทุกคงตัว	
1 โครงสร้างคอนกรีตเสริมเหล็ก	2,400	กก/ลบม.
2 เหล็กเสริมคอนกรีต	7,850	กก/ลบม.
3 เหล็กรูปพรรณ และ เหล็กโครงสร้างอื่นๆ	7,850	กก/ลบม.
4 หลังคา METAL SHEET	5	กก/ลบม.
5 ผนังก่ออิฐมวลเบาครึ่งแผ่น	110	กก/ม.

แรงลมในการออกแบบ

1 ส่วนของอาคารที่สูงไม่เกิน 10 เมตร	50	กก/ตรม.
2 ส่วนของอาคารที่สูงเกิน 10 เมตร แต่ไม่เกิน 20 เมตร	80	กก/ตรม.
3 ส่วนของอาคารที่สูงเกิน 20 เมตร แต่ไม่เกิน 40 เมตร	120	กก/ตรม.
4 ส่วนของอาคารที่สูงเกิน 40 เมตร	160	กก/ตรม.



ปณิธิ พรหมสาขา ณ สกลนคร สย 9187

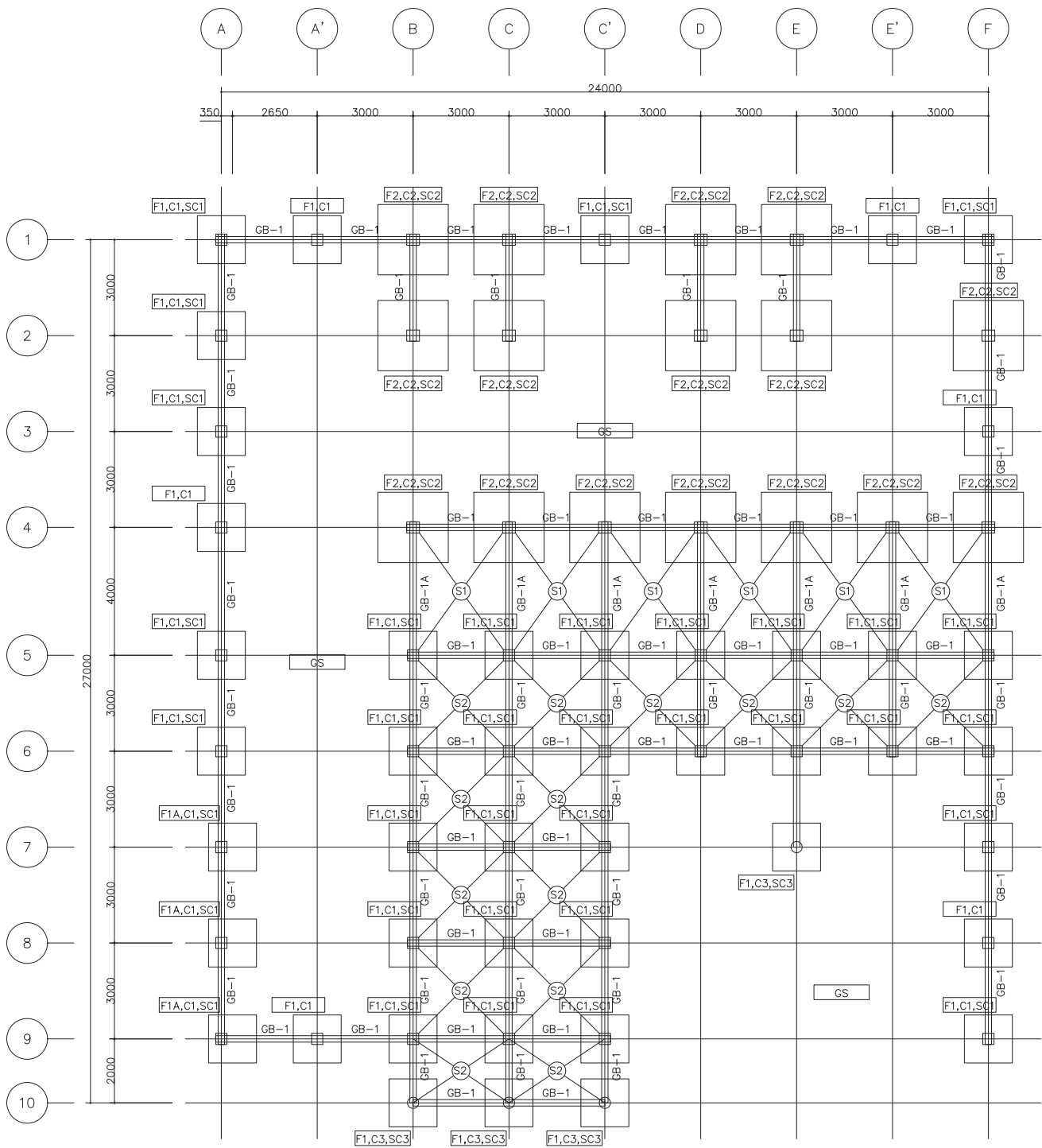
ฐานรากขุดวางบนชั้นดินเดิม หรือดินแข็ง รับ นน.บรรทุกปลอดภัย ได้ไม่น้อยกว่า 12 ตัน/ตรม. S.F.=2.5

 <p>บริษัท ดีเซนอ จำกัด Diseno company limited เลขที่ 26 ซ.ลาดพร้าววังหิน 55 ถนนลาดพร้าววังหิน แขวง ลาดพร้าว เขต ลาดพร้าว กรุงเทพมหานคร ทะเบียนเลขที่ 0105558040601 Tel & Fax : +66(0) 2 931 6980 , Mobile : +66(0)84 449 6777</p>	CRITERIA		
	Calculations Sheet	Made by	Date
	รายการคำนวณ	PAP	13 มิ.ย. 58
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Structural steel work

1 Allowable Stress	Yield strength	แรงดึง	แรงอัด	แรงเฉือน	แรงดัด	แรงกด
ชนิดวัสดุ	JIS	ASTM	กก/ตรซม	กก/ตรซม	กก/ตรซม	กก/ตรซม
เหล็กแผ่น	G 3101 SS 400	A-36	2,400	1,440	1,440	960
เหล็กรูปพรรณ	G 3192	A-36	2,400	1,440	1,440	960
ท่อเหล็ก	G 3444 ,STK 41	-	2,400	1,440	1,440	960
					1,440	1,800
2 Length of Buckling Coefficient	Supporting Condition	Length of Buckling Coefficient				
	Both Ends Pin	1.0				
	Both Ends Fixed	0.5				
	One End Pin ,Other Fixed	0.7				
	One End Free , Other Fixed	2.0				
3 Allowable Deflection	Allowable Deflection Due to LL	L/300-L/360				
	Allowable Deflection Due to WL	L/150-L/200				
4 Maximum slenderness ratio (KL/r ratio)	Tension member					
	Main member	KL/r	=	<240		
	Secondary member	KL/r	=	<300		
	Compression member					
	Main member	KL/r	=	<200		
	Secondary member	KL/r	=	<200		
	Lacing for compression member					
	Single lacing	KL/r	=	<140		
	Double lacing	KL/r	=	<200		
5 Compression stress for A-36	Cc =	126.91				
ตัวอย่าง	Cc<126.91	KL/r	Fc = (1-(KL/r) ² /2/(126.91 ²))*2500/(5/3+3*(KL/r)/8/(KL/r-1)-(KL/r) ³ /126.91 ³)			
		41.73	1,325			
		120.00	723			
	Cc>126.91	KL/r	Fc =10473944/C21 ²			
		149.46	469			
		126.91	650			
	Compression stress for steel pipe					
ตัวอย่าง	Cc<129.53	KL/r	Fc = (1-(KL/r) ² /2/(129.53 ²))*2400/(5/3+3*(KL/r)/8/129.53-(KL/r) ³ /129.53 ³)			
		41.73	1,276			
		120.00	716			
	Cc>129.53	KL/r	Fc =10473944/C21 ²			
		149.46	469			
		129.53	624			





ปณิ พรหมสาขา ณ สกลนคร สย 9187

VisStructure 4

(สแกนลิขสิทธิ์)

วิศวกร : ปณิธิ พรหมสาขา ณ สกลนคร

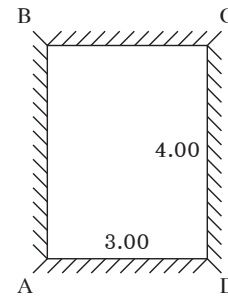
Two-way Slab

ชื่อโครงการ : ตลาดสุขุมวิท

ชื่อแผ่นพื้น : S1

Input Data

คอนกรีตหุ้มเหล็ก	=	1.50	ซม.
f_c	=	65	กก./ตร.ซม.
f_c'	=	210	กก./ตร.ซม.
f_s (ขนาด 6 มม. และ 9 มม.)	=	1,200	กก./ตร.ซม.
f_y (ขนาด 6 มม. และ 9 มม.)	=	2,400	กก./ตร.ซม.
f_s (ขนาดตั้งแต่ 12 มม.ขึ้นไป)	=	1,500	กก./ตร.ซม.
f_y (ขนาดตั้งแต่ 12 มม.ขึ้นไป)	=	3,000	กก./ตร.ซม.
น้ำหนักบรรทุกทุกจร	=	300	กก./ตร.ม.
น้ำหนักบรรทุกตายตัว	=	100	กก./ตร.ม.
ความยาวช่วง, L_x	=	3.00	ม.
ความยาวช่วง, L_y	=	4.00	ม.
ความหนาของแผ่นพื้น	=	10.00	ซม.

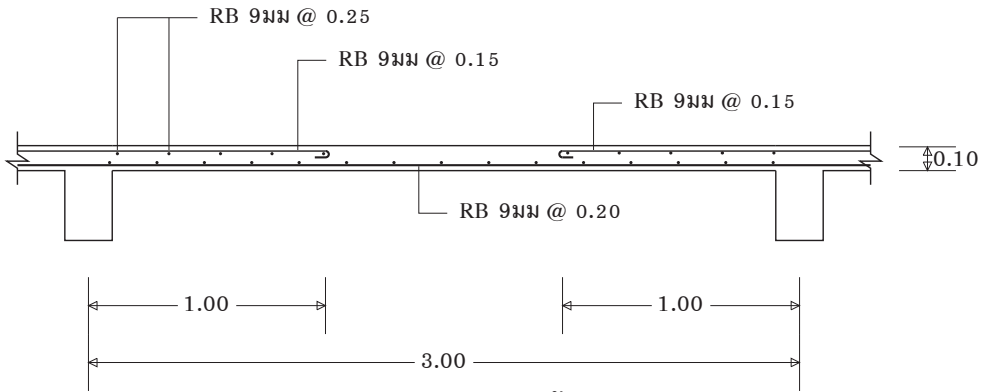


Result

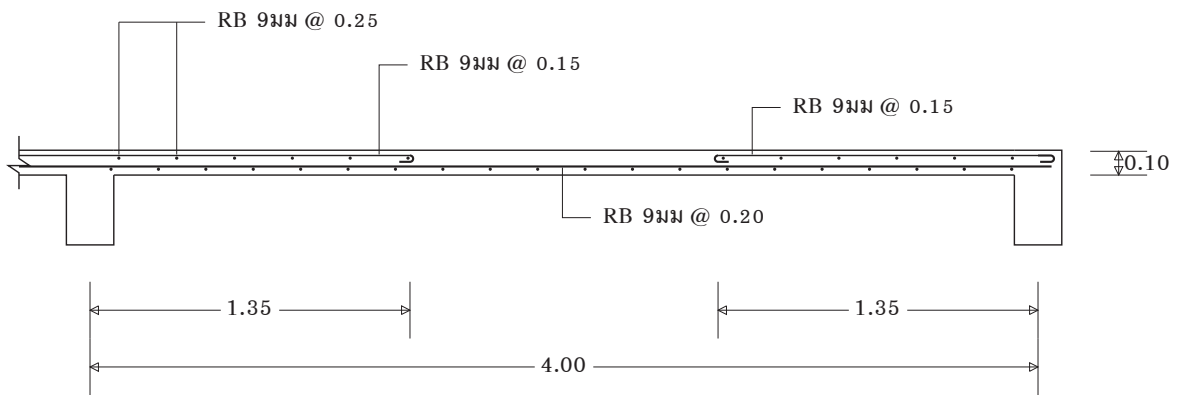
น้ำหนักที่ถ่ายจากแผ่นพื้นไปยังคานเพื่อการคำนวณหาโมเมนต์ดัดของคาน	=	DL + LL = น้ำหนักรวม
ถ่ายไปยังคานด้านสั้น	=	340 + 300 = 640 กก./ม.
ถ่ายไปยังคานด้านยาว	=	414 + 366 = 780 กก./ม.
น้ำหนักที่ถ่ายจากแผ่นพื้นไปยังคานเพื่อการคำนวณหาน้ำหนักที่ถ่ายเข้าเสา	=	DL + LL = น้ำหนักรวม
ถ่ายไปยังคานด้านสั้น	=	255 + 225 = 480 กก./ม.
ถ่ายไปยังคานด้านยาว	=	319 + 281 = 600 กก./ม.
เหล็กเสริมด้านการยึดเหนี่ยวในทิศทางด้านสั้น	=	2.50 ตร.ซม./ม. เลือกใช้ RB 9 มม @ 0.25
เหล็กเสริมด้านการยึดเหนี่ยวในทิศทางด้านยาว	=	2.50 ตร.ซม./ม. เลือกใช้ RB 9 มม @ 0.25

	สัมประสิทธิ์ โมเมนต์	R	j	d ซม.	Mc กก.-ม./ม.	M กก.-ม./ม.	As ตร.ซม./ม.	เหล็กเสริมทางสั้น ม.
ที่ขอบ AB	-0.0550	9.6787	0.8882	8.05	627	-317	3.69	RB 9 มม @ 0.15
ที่ขอบ CD	-0.0550	9.6787	0.8882	8.05	627	-317	3.69	RB 9 มม @ 0.15
กลางช่วง	+0.0410	9.6787	0.8882	8.05	627	+236	2.75	RB 9 มม @ 0.20

	สัมประสิทธิ์ โมเมนต์	R	j	d ซม.	Mc กก.-ม./ม.	M กก.-ม./ม.	As ตร.ซม./ม.	เหล็กเสริมทางยาว ม.
ที่ขอบ DA	-0.0330	9.6787	0.8882	8.05	627	-190	2.22	RB 9 มม @ 0.15
ที่ขอบ BC	-0.0330	9.6787	0.8882	8.05	627	-190	2.22	RB 9 มม @ 0.15
กลางช่วง	+0.0250	9.6787	0.8882	7.15	495	+144	1.89	RB 9 มม @ 0.20



S1 รูปตัดทางด้านสั้น



S1 รูปตัดทางด้านยาว

VisStructure 4

(สแกนลิขสิทธิ์)

วิศวกร : ปณิธิ พรหมสาขา ณ สกลนคร

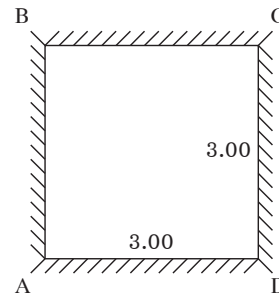
Two-way Slab

ชื่อโครงการ : ตลาดสุขุมมาก

ชื่อแผ่นพื้น : S2

Input Data

คอนกรีตหุ้มเหล็ก	=	1.50	ซม.
f_c	=	65	กก./ตร.ซม.
f_c'	=	210	กก./ตร.ซม.
f_s (ขนาด 6 มม. และ 9 มม.)	=	1,200	กก./ตร.ซม.
f_y (ขนาด 6 มม. และ 9 มม.)	=	2,400	กก./ตร.ซม.
f_s (ขนาดตั้งแต่ 12 มม.ขึ้นไป)	=	1,500	กก./ตร.ซม.
f_y (ขนาดตั้งแต่ 12 มม.ขึ้นไป)	=	3,000	กก./ตร.ซม.
น้ำหนักบรรทุกจร	=	300	กก./ตร.ม.
น้ำหนักบรรทุกตายตัว	=	100	กก./ตร.ม.
ความยาวช่วง, L_x	=	3.00	ม.
ความยาวช่วง, L_y	=	3.00	ม.
ความหนาของแผ่นพื้น	=	10.00	ซม.

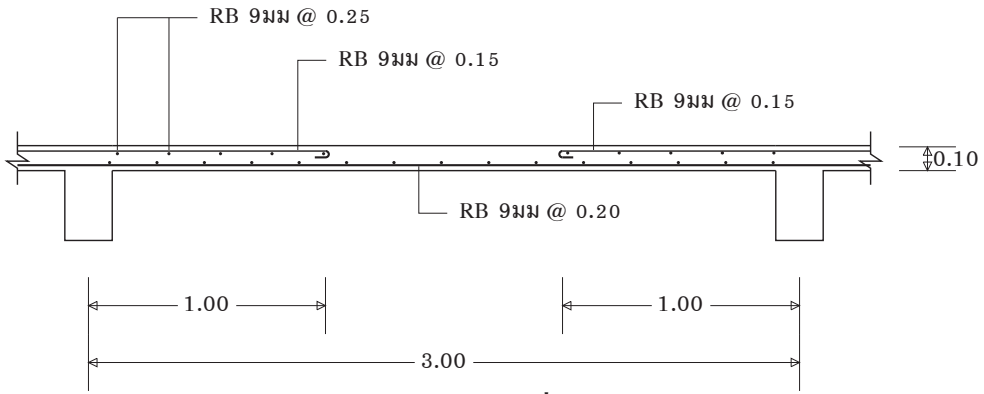


Result

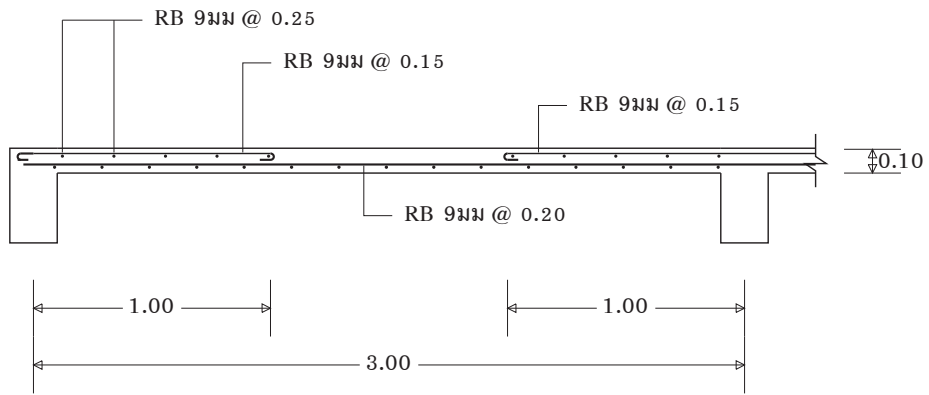
น้ำหนักที่ถ่ายจากแผ่นพื้นไปยังคานเพื่อการคำนวณหาโมเมนต์ดัดของคาน	=	DL + LL = น้ำหนักรวม
ถ่ายไปยังคานด้านสั้น	=	340 + 300 = 640 กก./ม.
ถ่ายไปยังคานด้านยาว	=	340 + 300 = 640 กก./ม.
น้ำหนักที่ถ่ายจากแผ่นพื้นไปยังคานเพื่อการคำนวณหาน้ำหนักที่ถ่ายเข้าเสา	=	DL + LL = น้ำหนักรวม
ถ่ายไปยังคานด้านสั้น	=	255 + 225 = 480 กก./ม.
ถ่ายไปยังคานด้านยาว	=	255 + 225 = 480 กก./ม.
เหล็กเสริมด้านการยึดเหนี่ยวในทิศทางด้านสั้น	=	2.50 ตร.ซม./ม. เลือกใช้ RB 9 มม @ 0.25
เหล็กเสริมด้านการยึดเหนี่ยวในทิศทางด้านยาว	=	2.50 ตร.ซม./ม. เลือกใช้ RB 9 มม @ 0.25

	สัมประสิทธิ์ โมเมนต์	R	j	d ซม.	M_c กก.-ม./ม.	M กก.-ม./ม.	A_s ตร.ซม./ม.	เหล็กเสริมทางสั้น ม.
ที่ขอบ AB	-0.0330	9.6787	0.8882	8.05	627	-190	2.22	RB 9 มม @ 0.15
ที่ขอบ CD	-0.0330	9.6787	0.8882	8.05	627	-190	2.22	RB 9 มม @ 0.15
กลางช่วง	+0.0250	9.6787	0.8882	7.15	495	+144	1.89	RB 9 มม @ 0.20

	สัมประสิทธิ์ โมเมนต์	R	j	d ซม.	M_c กก.-ม./ม.	M กก.-ม./ม.	A_s ตร.ซม./ม.	เหล็กเสริมทางยาว ม.
ที่ขอบ DA	-0.0330	9.6787	0.8882	8.05	627	-190	2.22	RB 9 มม @ 0.15
ที่ขอบ BC	-0.0330	9.6787	0.8882	8.05	627	-190	2.22	RB 9 มม @ 0.15
กลางช่วง	+0.0250	9.6787	0.8882	7.15	495	+144	1.89	RB 9 มม @ 0.20



S2 รูปตัดด้านหนึ่ง



S2 รูปตัดด้านสอง

VisStructure 4

(สแกนลิขสิทธิ์)

วิศวกร : ปณิธิ พรหมสาขา ณ สกลนคร

Beam

ชื่อโครงการ : ตลาดสุขมาก

ชื่อคาน : GB-1

Input Data

 $f_c = 65$ กก./ตร.ซม. $f_c' = 210$ กก./ตร.ซม. $f_s = 1500$ กก./ตร.ซม. $f_y = 3000$ กก./ตร.ซม. คอนกรีตหุ้มเหล็ก = 3 ซม.

คานช่วงที่ Span No.	ยาว (ม.)	กว้าง x ลึก (ซม. x ซม.)	ลดระดับ (ซม.)	Point Load		Uniform Load (กก./ ม.)
				น้ำหนัก (กก.)	ระยะห่าง (ม.)	
1	3.00	20 x 40	----	-----	-----	U = 2,250
2	3.00	20 x 40	----	-----	-----	U = 2,250
3	4.00	20 x 40	----	-----	-----	U = 2,250
4	3.00	20 x 40	----	-----	-----	U = 2,250
5	3.00	20 x 40	----	-----	-----	U = 2,250

Joint No.	Grid Line	ชนิดของ Joint	ความกว้างที่รองรับ(ซม.) เมื่อเป็น Hinged / Roller	เสาเหนือคาน (ซม. x ซม. x ม.)	เสาใต้คาน (ซม. x ซม. x ม.)
1	2	ColumnS (2)	----	35 x 35 x 3.00	35 x 35 x 3.00
2	3	ColumnS (2)	----	35 x 35 x 3.00	35 x 35 x 3.00
3	4	ColumnS (2)	----	35 x 35 x 3.00	35 x 35 x 3.00
4	5	ColumnS (2)	----	35 x 35 x 3.00	35 x 35 x 3.00
5	6	ColumnS (2)	----	35 x 35 x 3.00	35 x 35 x 3.00
6	7	ColumnS (2)	----	35 x 35 x 3.00	35 x 35 x 3.00

Result

n = 9.3117 , R = 8.4483 , j = 0.9042

คานช่วงที่ Span No.	แรงเฉือน (กก.)	แรงเฉือนที่ หน้าตัดวิกฤต	โมเมนต์ดัด (กก.- ม.)	โมเมนต์ดัดที่ ขอบของที่รองรับ	เหล็กบน (ตร.ซม.)	เหล็กล่าง (ตร.ซม.)	d (ซม.)	d' (ซม.)	ระยะที่ M=0 (ม.)	
1	L	+3,450	+2,149	-1,344	-777	2.14	0.75	35.80	4.20	0.47
	M	----	----	+1,094	----	0.00	3.02	35.80	4.20	----
	R	-3,876	-2,574	-1,982	-1,341	3.34	0.75	35.80	4.20	0.64
2	L	+3,521	+2,220	-1,744	-1,166	3.22	0.55	35.80	4.20	0.64
	M	----	----	+795	----	0.00	2.19	35.80	4.20	----
	R	-3,805	-2,503	-2,169	-1,541	3.34	0.55	35.80	4.20	0.75
3	L	+4,884	+3,619	-3,106	-2,289	4.93	1.42	34.32	4.20	0.79
	M	----	----	+1,778	----	0.00	3.66	35.80	4.20	----
	R	-4,884	-3,619	-3,106	-2,289	4.93	1.42	34.32	4.20	0.79
4	L	+3,805	+2,503	-2,169	-1,541	3.34	0.55	35.80	4.20	0.75
	M	----	----	+795	----	0.00	2.19	35.80	4.20	----
	R	-3,521	-2,220	-1,744	-1,166	3.22	0.55	35.80	4.20	0.64
5	L	+3,876	+2,574	-1,982	-1,341	3.34	0.75	35.80	4.20	0.64
	M	----	----	+1,094	----	0.00	3.02	35.80	4.20	----
	R	-3,450	-2,149	-1,344	-777	2.14	0.75	35.80	4.20	0.47

VisStructure 4

(สวอนลิขสิทธิ์)

วิศวกร : ปณิธิ พรหมสาขา ณ สกลนคร

Beam

ชื่อโครงการ : ตลาดสุขมาก

ชื่อคาน : GB-1

Joint No.	Grid Line	ชนิดของ Joint	เสาเหนือคานรับโมเมนต์ดัด		เสาใต้คานรับโมเมนต์ดัด		น้ำหนักที่ถ่ายเข้าที่รองรับ(กก.)	
			ที่หัวเสา	ที่โคนเสา	ที่หัวเสา	ที่โคนเสา	ไม่รวม/ไม่มี ตัวเสา	รวมน้ำหนักเสา
1	2	ColumnS (2)	-336	+672	-672	+336	3,450	4,332
2	3	ColumnS (2)	+59	-119	+119	-59	7,397	8,279
3	4	ColumnS (2)	-234	+468	-468	+234	8,689	9,571
4	5	ColumnS (2)	+234	-468	+468	-234	8,689	9,571
5	6	ColumnS (2)	-59	+119	-119	+59	7,397	8,279
6	7	ColumnS (2)	+336	-672	+672	-336	3,450	4,332



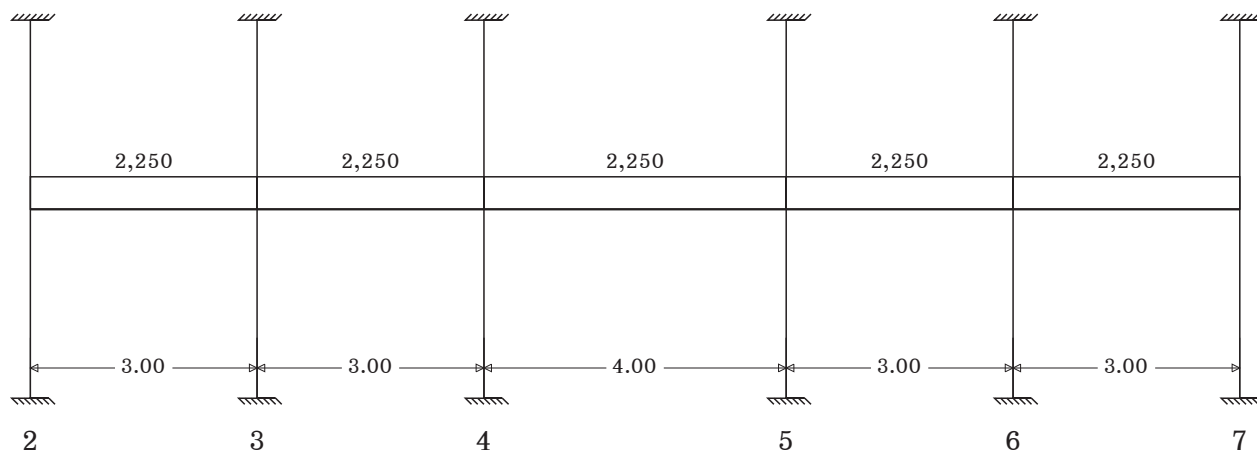
ปณิธิ พรหมสาขา ณ สกลนคร สย 9187

(สนวนลิขสิทธิ)

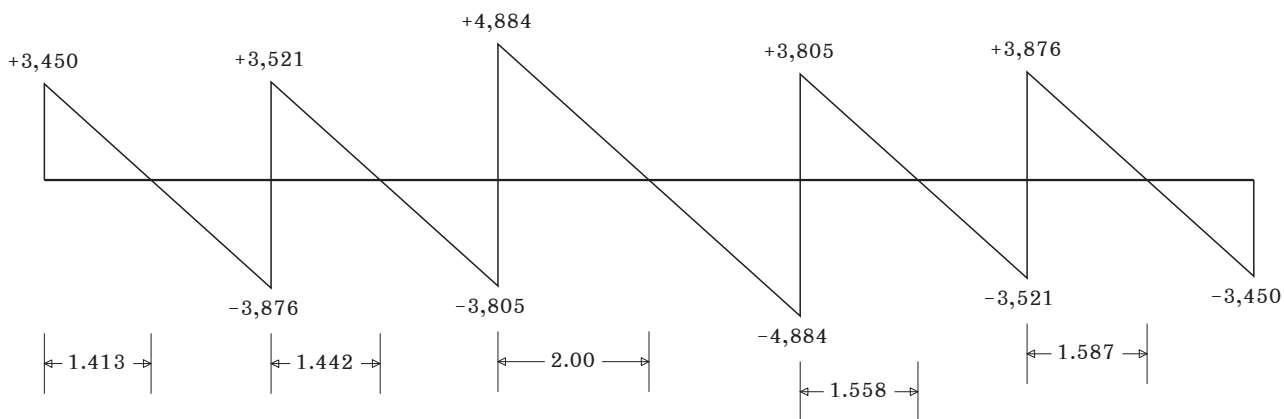
ชื่อโครงการ : ตลาดสุขุมวิท

วิศวกร : ปณิธิ พรหมสาขา ณ สกลนคร

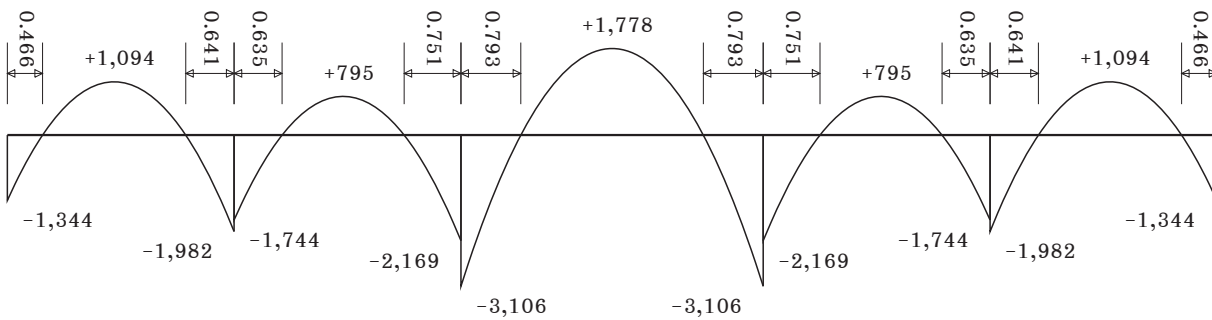
ชื่อคาน : GB-1



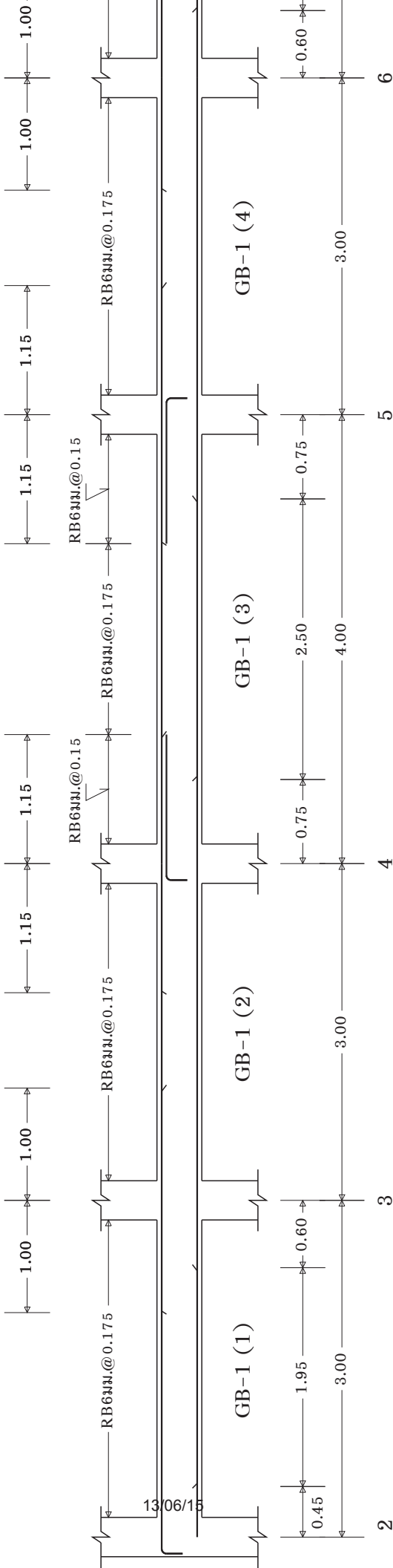
Point load & uniform load



Shear force diagram



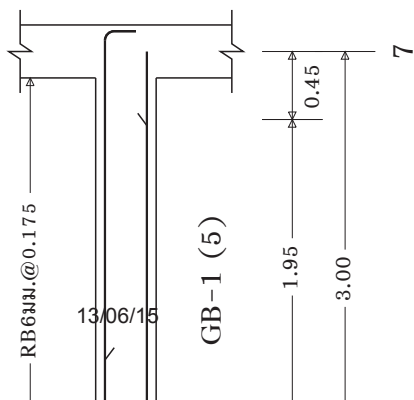
Bending moment diagram



GB-1 (1) 0.20 x 0.40		GB-1 (2) 0.20 x 0.40		GB-1 (3) 0.20 x 0.40		GB-1 (4) 0.20 x 0.40	
ตัดทางซ้าย	ตัดกลางช่วง	ตัดทางซ้าย	ตัดทางขวา	ตัดทางซ้าย	ตัดทางขวา	ตัดทางซ้าย	ตัดทางขวา
2 DB 12 มม.	2 DB 12 มม.	3 DB 12 มม.	3 DB 12 มม.	3 DB 12 มม. 2 DB 12 มม.	3 DB 12 มม. 2 DB 12 มม.	3 DB 12 มม.	3 DB 12 มม.
2 DB 12 มม.	3 DB 12 มม.	2 DB 12 มม.	2 DB 12 มม.	2 DB 12 มม.	2 DB 12 มม.	2 DB 12 มม.	2 DB 12 มม.

ปณิธิ พรหมสาขา ณ สกลนคร สย 9187





GB-1 (5) 0.20 x 0.40			
ความ	ตัดทางซ้าย	ตัดกลางช่วง	ตัดทางขวา
มม.	3 DB 12 มม.	2 DB 12 มม.	2 DB 12 มม.
มม.	2 DB 12 มม.	3 DB 12 มม.	2 DB 12 มม.

ปณิธิ พรหมสาขา ณ สกลนคร สย 9187

VisStructure 4

(สนวนลิขสิทธิ์)

วิศวกร : ปณิธิ พรหมสาขา ณ สกลนคร

Beam

ชื่อโครงการ : ตลาดสุขุมภัก

ชื่อคาน : GB-1A

Input Data

 $f_c = 65$ กก./ตร.ซม. $f_c' = 210$ กก./ตร.ซม. $f_s = 1500$ กก./ตร.ซม. $f_y = 3000$ กก./ตร.ซม. คอนกรีตหุ้มเหล็ก = 3 ซม.

คานช่วงที่ Span No.	ยาว (ม.)	กว้าง x ลึก (ซม. x ซม.)	ลดระดับ (ซม.)	Point Load		Uniform Load (กก./ ม.)
				น้ำหนัก (กก.)	ระยะห่าง (ม.)	
1	4.00	20 x 40	----	-----	-----	U = 2,250
2	3.00	20 x 40	----	-----	-----	U = 2,250

Joint No.	Grid Line	ชนิดของ Joint	ความกว้างที่รองรับ(ซม.) เมื่อเป็น Hinged / Roller	เสาเหนือคาน (ซม. x ซม. x ม.)	เสาใต้คาน (ซม. x ซม. x ม.)
1	4	ColumnS (2)	----	35 x 35 x 3.00	35 x 35 x 3.00
2	5	ColumnS (2)	----	35 x 35 x 3.00	35 x 35 x 3.00
3	6	ColumnS (2)	----	35 x 35 x 3.00	35 x 35 x 3.00

Result

 $n = 9.3117$, $R = 8.4483$, $j = 0.9042$

คานช่วงที่ Span No.	แรงเฉือน (กก.)	แรงเฉือนที่ หน้าตัดวิกฤต	โมเมนต์ดัด (กก.- ม.)	โมเมนต์ดัดที่ ขอบของที่รองรับ	เหล็กบน (ตร.ซม.)	เหล็กล่าง (ตร.ซม.)	d (ซม.)	d' (ซม.)	ระยะที่M=0 (ม.)	
1	L	+4,695	+3,393	-2,596	-1,812	3.73	0.99	35.80	4.20	0.67
	M	----	----	+1,917	----	0.00	3.95	35.80	4.20	----
	R	-5,073	-3,808	-3,353	-2,503	5.41	2.44	34.32	4.20	0.82
2	L	+4,078	+2,777	-2,427	-1,751	3.60	0.67	35.80	4.20	0.77
	M	----	----	+978	----	0.00	2.70	35.80	4.20	----
	R	-3,248	-1,946	-1,182	-651	1.79	0.67	35.80	4.20	0.43

Joint No.	Grid Line	ชนิดของ Joint	เสาเหนือคานรับโมเมนต์ดัด		เสาใต้คานรับโมเมนต์ดัด		น้ำหนักที่ถ่ายเข้าที่รองรับ(กก.)	
			ที่หัวเสา	ที่โคนเสา	ที่หัวเสา	ที่โคนเสา	ไม่รวม/ไม่มี ตัวเสา	รวมน้ำหนักเสา
1	4	ColumnS (2)	-649	+1,298	-1,298	+649	4,695	5,577
2	5	ColumnS (2)	+232	-463	+463	-232	9,152	10,034
3	6	ColumnS (2)	+295	-591	+591	-295	3,248	4,130



ปณิธิ พรหมสาขา ณ สกลนคร สย 9187

VisStructure 4

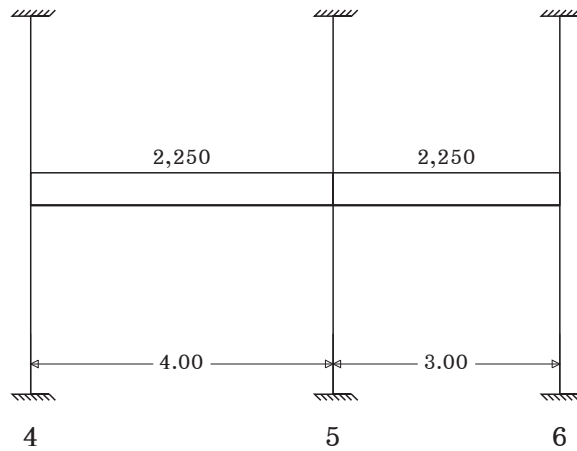
(สงวนลิขสิทธิ์)

วิศวกร : ปณิธิ พรหมสาขา ณ สกลนคร

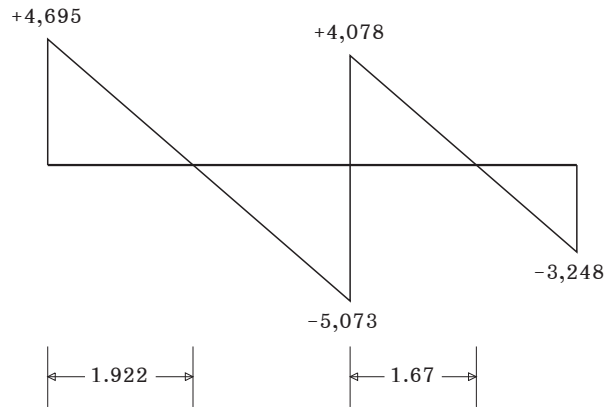
Beam

ชื่อโครงการ : ตลาดสุขมาก

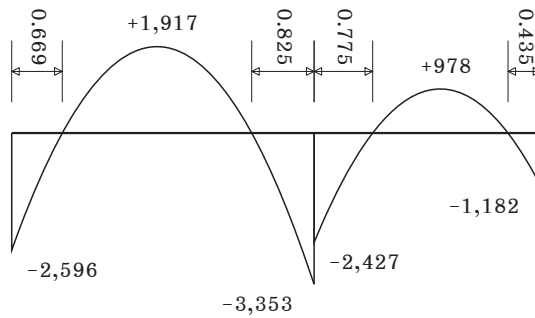
ชื่อคาน : GB-1A



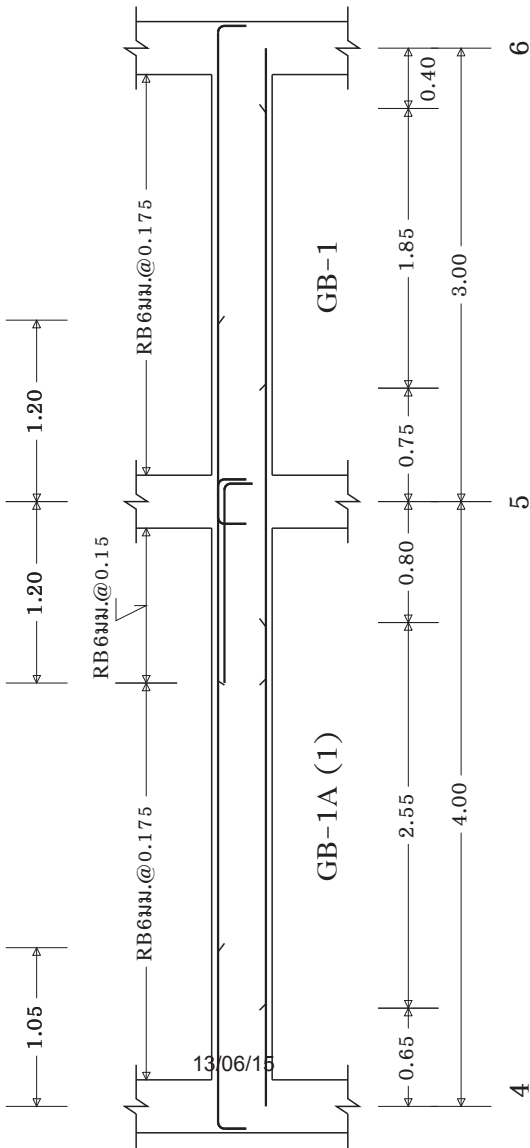
Point load & uniform load



Shear force diagram




Bending moment diagram

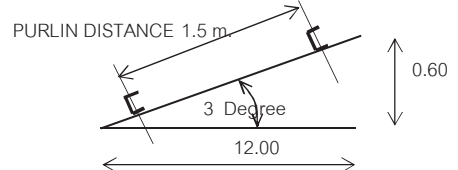


GB-1A (1) 0.20 x 0.40		GB-1 0.20 x 0.40	
ตัดทางซ้าย	ตัดกลางช่วง	ตัดทางขวา	ตัดกลางช่วง
4 DB 12 มม.	2 DB 12 มม.	3 DB 12 มม. 2 DB 12 มม.	4 DB 12 มม.
2 DB 12 มม.	4 DB 12 มม.	3 DB 12 มม.	2 DB 12 มม.
		2 DB 12 มม.	2 DB 12 มม.
		ตัดทางขวา	ตัดทางขวา

ปณิธิ

พรหมสาขา ณ สกลนคร สย 9187

	บริษัท ดีเซนอ จำกัด Diseno company limited		PURLIN DESIGN		
	Project :	อาคาร คสล. และโครงสร้างเหล็ก 3ชั้น	Date	12/6/2015 14:37	
	Owner :		Made by	Checked	Sheet no.
	Location :		PAp		1


PURLIN DESIGN			
PURLIN DISTANCE	enter = 1.50 m.		
SPAN	enter = 3.00 m.		
LOAD			
ROOF DL.	10 kg/m ² = 10 kg/m ² x 1.5 m.		15.00 kg /m.
PURLIN DL.	[]-100x50x3.2		7.01 kg /m.
LL.	30 kg/m ² = 30 kg/m ² x 1.5 m.		45.00 kg /m.
SUM		W	67.01 kg /m.
WIND LOAD	H = 15 m.		80.00 kg /m. ²
No. sagrod	0	enter Y	0.60 m.
Lx=	3 m.	enter X	12.00 m.
		∅ = tan -1 (0.6 / 12)	2.86 Degree
		SAY ∅	3.00 Degree
แรงลมตั้งฉากกับหลังคาตามสูตร KETCHUM	= (80 x 3 / 45) kg/m		5.33 kg /m. LL only
W x = W sin ∅	= 67.01 x sin 3		3.51 = 1.57 kg /m.
W y = W cos ∅ + W winload	= 67.01 x cos 3 + 5.33		72.25 = 35.29 kg /m.
M x = 1/8*Wy*Ly ²	M x = 1/8 x 72.25 x 3 ²		81.28 = 39.70 kg.m
M y = 1/8*Wx*Lx ²	M y = 1/8 x 3.51 x 3 ²		3.95 = 1.77 kg.m
Use Steel A 36	Fu = 5,000.00 kg /cm ²	Fy = 2,400.00 kg /cm ²	E = 2.04* 10 ⁶

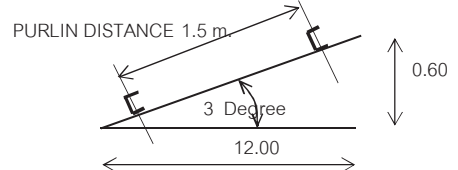
[]-100x50x3.2	w = 7.01 kg /m.
Ix = 112 cm ⁴	Iy = 38 cm ⁴
Sx = 22.5 cm ³	Sy = 15.2 cm ³
A = 8.927 cm ²	h = 10 cm

F bx = 0.6* Fy	= 1,440.00 kg /cm ²
F by = 0.75* Fy	= 1,800.00 kg /cm ²
f bx / F bx + f by / F by	= (Mx/Sx) / Fbx + (My/Sy) / Fby
	= (81.28x 100/22.5) / 1440 + (3.95x100/15.2) / 1800
	= 0.251 + 0.014 = 0.26 < 1 O.K.

Check Deflection Live Load only			
Δ Allowable	= L / 300	= 300 / 300	= 1.00 cm.
Δ ในแนวแกน Y	= 5*Wy * Ly ⁴ / (384 * E* Ix)		
	= 0.16	< 1.00	O.K.
Δ ในแนวแกน X	= 5*Wx * Lx ⁴ / (384 * E* Iy)		
	= 0.02	< 1.00	O.K.

Check Shear	Vy = 1/2 x 72.25 x 3	= 108.38 kg .
Allowable Shear	= 0.40*Fy	= 960.00 kg /cm ²
แรงเฉือนตามขวาง	V t = V / A	= 12.14 kg /cm ² < 1,008 O.K.
แรงเฉือนตามยาว	V h = V / h*t	= 2.17 kg /cm ² < 1,008 O.K.

	บริษัท ดีเซนอ จำกัด Diseno company limited		PURLIN DESIGN		
	Project :	อาคาร คสล. และโครงสร้างเหล็ก 3ชั้น	Date	12/6/2015 14:34	
	Owner :		Made by	Checked	Sheet no.
	Location :		PAP		1


PURLIN DESIGN			
PURLIN DISTANCE	enter = 1.50 m.		
SPAN	enter = 6.00 m.		
LOAD			
ROOF DL.	10 kg/m ² = 10 kg/m ² x 1.5 m.		15.00 kg /m.
PURLIN DL.	[-]-150x50x3.2		9.63 kg /m.
LL.	30 kg/m ² = 30 kg/m ² x 1.5 m.		45.00 kg /m.
SUM		W	69.63 kg /m.
WIND LOAD	H = 15 m.		80.00 kg /m. ²
No. sagrod	0	enter Y	0.60 m.
Lx=	6 m.	enter X	12.00 m.
		Ø = tan -1 (0.6 / 12)	2.86 Degree
		SAY Ø	3.00 Degree
แรงลมตั้งฉากกับหลังคาตามสูตร KETCHUM	= (80 x 3 / 45) kg/m		5.33 kg /m. LL. only
W x = W sin Ø	= 69.63 x sin 3		3.64 = 1.57 kg /m.
W y = W cos Ø + W winload	= 69.63 x cos 3 + 5.33		74.86 = 35.29 kg /m.
M x = 1/8*Wy*Ly ²	M x = 1/8 x 74.86 x 6 ²		336.87 = 158.81 kg.m
M y = 1/8*Wx*Lx ²	M y = 1/8 x 3.64 x 6 ²		16.38 = 7.07 kg.m
Use Steel A 36	Fu = 5,000.00 kg /cm ²	Fy = 2,400.00 kg /cm ²	E = 2.04* 10 ⁶

[-]-150x50x3.2	w = 9.63 kg /m.
Ix = 314.92 cm ⁴	Iy = 55.71 cm ⁴
Sx = 42.61 cm ³	Sy = 22.61 cm ³
A = 12.13 cm ²	h = 15 cm


F bx = 0.6* Fy	= 1,440.00 kg /cm ²
F by = 0.75* Fy	= 1,800.00 kg /cm ²
f bx / F bx + f by / F by	= (Mx/Sx) / Fbx + (My/Sy) / Fby
	= (336.87x 100/42.61) / 1440 + (16.38x100/22.61) / 1800
	= 0.549 + 0.04 = 0.589 < 1 O.K.

Check Deflection Live Load only			
Δ Allowable	= L / 300	= 600 / 300	= 2.00 cm.
Δ ในแนวแกน Y	= 5*Wy * Ly ⁴ / (384 * E* Ix)		
	= 0.93	< 2.00	O.K.
Δ ในแนวแกน X	= 5*Wx * Lx ⁴ / (384 * E* Iy)		
	= 0.23	< 2.00	O.K.

Check Shear	Vy = 1/2 x 74.86 x 6	= 224.58 kg .
Allowable Shear	= 0.40*Fy	= 960.00 kg /cm ²
แรงเฉือนตามขวาง	V t = V / A	= 18.51 kg /cm ² < 1,008 O.K.
แรงเฉือนตามยาว	V h = V / h*t	= 2.99 kg /cm ² < 1,008 O.K.

	
Project : ddbcb	Engineer :
Location :	Date : 22-ก.ค.-2546
Owner :	Time : 8:16:58 PM
Design For Flexible Members : SB-1	
[I.Datas For Design]	
1.1.End Moment(M ₁)	kg.-m.
1.2.Middle Moment	1,706.00 kg.-m.
1.3.End Moment(M ₂)	kg.-m.
1.4.Max. Shear(V.)	2,394.00 kg.
1.5.Deflection(Δ)	1,443.20 kg.-m. ³
1.6.Max. Length(L.)	3.00 m.
1.7.Lateral Support(L _b)	1.00 m.
1.8.Coefficient of C _b	1.00
[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. Deflexion= L /	240
[IV.Check Laterally Supported]	
4.1.Real Laterally Sup.	1.00 m.
4.2.Min. Laterall Sup.	1.95 m.
4.3.Max. Laterall Sup.	3.95 m.
[III.Result Of Calculate]	
3.1.Required (S _{x-x})	118.47 cm. ³
3.2.Type Of Section	6 WF-Beam WF
3.3.Trial Section No.	12 1 Single
3.4.Size Of Section	200*150 mm.
3.5.Thick. Web(t , t _w)	6.00 mm.
3.6.Thick. Flange(t _f)	9.00 mm.
3.7.Section Area(A _s)	39.01 cm. ²
3.8.Weight Of Section	30.60 kg./m.
3.9.Sect. Modulus(S _{x-x})	277.00 cm. ³
3.10.M. Of In.(I _{x-x})	2,690.00 cm. ⁴
3.11.Rad. Of Gyr.(r _{min})	3.61 cm.
1WF - 200*150*6*9 mm.(น้ำหนัก = 30.6 kg./m.)	
[V.Allowable Bending Stress(Fb)]	
5.1.Laterally Supported Is Sufficiently	
$\frac{b f}{2 * t f}$	= 8.33
$\frac{4 3 7 . 7}{\sqrt{F y}}$	= 8.93
$\frac{7 9 6 . 5}{\sqrt{F y}}$	= 16.26
All.Bending Stress(Fb)	1,584.00 ksc.
<< Compact Section >>	
5.2.Laterally Supported Is Non-Sufficiently	
$\frac{L}{r t}$	= *****
$\sqrt{\frac{717 * 10^4 * C b}{F y}}$	= *****
$\sqrt{\frac{3585 * 10^4 * C b}{F y}}$	= *****
All.Bending Stress(Fb)	***** ksc.
[VI.Allowable Deflexion(Δ < (L/240)]	
6.1.Max. Allowable	1.25 cm.
[III.Result Of Calculate]	
3.1.Required (S _{x-x})	118.47 cm. ³
3.2.Type Of Section	6 WF-Beam WF
3.3.Trial Section No.	12 1 Single
3.4.Size Of Section	200*150 mm.
3.5.Thick. Web(t , t _w)	6.00 mm.
3.6.Thick. Flange(t _f)	9.00 mm.
3.7.Section Area(A _s)	39.01 cm. ²
3.8.Weight Of Section	30.60 kg./m.
3.9.Sect. Modulus(S _{x-x})	277.00 cm. ³
3.10.M. Of In.(I _{x-x})	2,690.00 cm. ⁴
3.11.Rad. Of Gyr.(r _{min})	3.61 cm.
1WF - 200*150*6*9 mm.(น้ำหนัก = 30.6 kg./m.)	
[Recheck Allowable Stress On Section]	
1.Actual Bending Stress	616 ksc. OK.!
2.Actual Shear Stress	219.23 ksc. OK.!
3.Actual Deflexion	0.26 cm. < (L/240) OK.!
Select To Use Section : 1WF - 200*150*6*9 mm.(น้ำหนัก = 30.6 kg./m.)	



	
Project : ddbcb	Engineer :
Location :	Date : 22-Jul-2546
Owner :	Time : 2:14:53 AM
Design For Flexible Members : SB-2	
[I.Datas For Design]	
1.1.End Moment(M ₁)	kg.-m.
1.2.Middle Moment	7,187.00 kg.-m.
1.3.End Moment(M ₂)	kg.-m.
1.4.Max. Shear(V.)	4,914.00 kg.
1.5.Deflection(Δ)	25,620.00 kg.-m. ³
1.6.Max. Length(L.)	6.00 m.
1.7.Lateral Support(L _b)	1.00 m.
1.8.Coefficient of C _b	1.00
[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. Deflection= L /	240
[IV.Check Laterally Supported]	
4.1.Real Laterally Sup.	1.00 m.
4.2.Min. Laterall Sup.	1.95 m.
4.3.Max. Laterall Sup.	2.64 m.
<< Enough Laterally Supported >>	
[III.Result Of Calculate]	
3.1.Required (S _{x-x})	499.10 cm. ³
3.2.Type Of Section	6 WF-Beam WF
3.3.Trial Section No.	24 1 Single
3.4.Size Of Section	300*150 mm.
3.5.Thick. Web(t _w)	6.50 mm.
3.6.Thick. Flange(t _f)	9.00 mm.
3.7.Section Area(A _s)	46.78 cm. ²
3.8.Weight Of Section	36.70 kg./m.
3.9.Sect. Modulus(S _{x-x})	481.00 cm. ³
3.10.M. Of In.(I _{x-x})	7,210.00 cm. ⁴
3.11.Rad. Of Gyr.(r _{min.})	3.29 cm.
[V.Allowable Bending Stress(Fb)]	
5.1.Laterally Supported Is Sufficiently	
$\frac{b f}{2 * t f}$	= 8.33
$\frac{4 * 3 * 7.7}{\sqrt{F_y}}$	= 8.93
$\frac{7 * 9 * 6.5}{\sqrt{F_y}}$	= 16.26
All.Bending Stress(Fb)	1,584.00 ksc.
<< Compact Section >>	
5.2.Laterally Supported Is Non-Sufficiently	
$\frac{L}{r t}$	= *****
$\sqrt{\frac{717 * 10^4 * C b}{F_y}}$	= *****
$\sqrt{\frac{3585 * 10^4 * C b}{F_y}}$	= *****
All.Bending Stress(Fb)	***** ksc.
[VI.Allowable Deflection(Δ < (L/240)]	
6.1.Max. Allowable	2.50 cm.
[Recheck Allowable Stress On Section]	
1.Actual Bending Stress	1,494 ksc. OK.!
2.Actual Shear Stress	268.09 ksc. OK.!
3.Actual Deflection	1.69 cm. < (L/240) OK.!
Select To Use Section : 1WF - 300*150*6.5*9 mm.(น้ำหนัก = 36.7 kg./m.)	





Project : ddbcb

Engineer :

Location :

Date : 22-Jul-2546

Owner :

Time : 12:58:55 AM

Design For Flexible Members : SB-3

[I.Data For Design]

1.1.End Moment(M ₁)		kg.-m.
1.2.Middle Moment	1,027.00	kg.-m.
1.3.End Moment(M ₂)		kg.-m.
1.4.Max. Shear(V.)	702.00	kg.
1.5.Deflection(Δ)	3,660.00	kg.-m. ³
1.6.Max. Length(L.)	6.00	m.
1.7.Lateral Support(L _b)	1.00	m.
1.8.Coefficient of C _b	1.00	

[III.Result Of Calculate]

3.1.Required (S _{x-x})	71.32	cm. ³
3.2.Type Of Section	6	WF-Beam WF
3.3.Trial Section No.	11	1 Single
3.4.Size Of Section	200*100	mm.
3.5.Thick. Web(t _w)	5.50	mm.
3.6.Thick. Flange(t _f)	8.00	mm.
3.7.Section Area(A _s)	27.16	cm. ²
3.8.Weight Of Section	21.30	kg./m.
3.9.Sect. Modulus(S _{x-x})	184.00	cm. ³
3.10.M. Of In.(I _{x-x})	1,840.00	cm. ⁴
3.11.Rad. Of Gyr.(r _{min.})	2.22	cm.

1WF - 200*100*5.5*8 mm.(น้ำหนัก = 21.3 kg./m.)

[Recheck Allowable Stress On Section]

1.Actual Bending Stress	558	ksc. OK.!
2.Actual Shear Stress	69.37	ksc. OK.!
3.Actual Deflection	0.95	cm. < (L/240) OK.!

Select To Use Section : 1WF - 200*100*5.5*8 mm.(น้ำหนัก = 21.3 kg./m.)

[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. Deflection= L /	240

[IV.Check Laterally Supported]

4.1.Real Laterally Sup.	1.00	m.
4.2.Min. Laterall Sup.	1.30	m.
4.3.Max. Laterall Sup.	2.34	m.

<< Enough Laterally Supported >>

[V.Allowable Bending Stress(Fb)]

5.1.Laterally Supported Is Sufficiently	
$\frac{b f}{2 * t f}$	= 6.25
$\frac{4 3 7 . 7}{\sqrt{F y}}$	= 8.93
$\frac{7 9 6 . 5}{\sqrt{F y}}$	= 16.26
All.Bending Stress(Fb)	1,584.00 ksc.


<< Compact Section >>

5.2.Laterally Supported Is Non-Sufficiently


$\frac{L}{r t}$	= *****
$\sqrt{\frac{71 7 * 10^4 * C b}{F y}}$	= *****
$\sqrt{\frac{3585 * 10^4 * C b}{F y}}$	= *****
All.Bending Stress(Fb)	***** ksc.

[VI.Allowable Deflection(Δ < (L/240)]


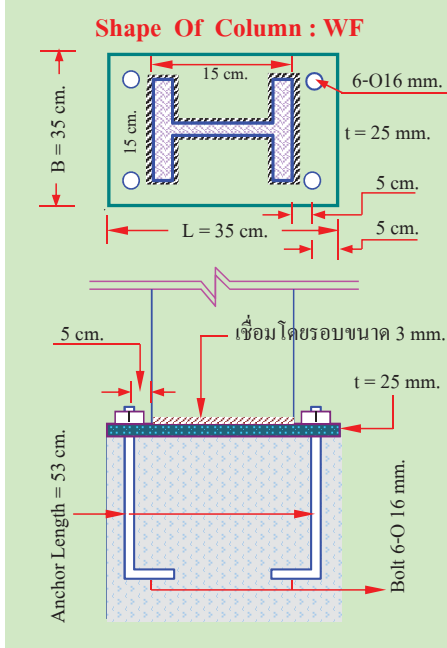
6.1.Max. Allowable	2.50	cm.
--------------------	------	-----


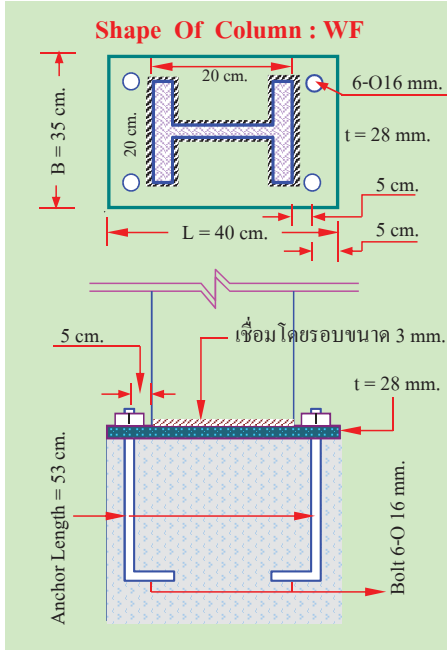
	
Project : ddbcb	Engineer :
Location :	Date : 21-Jun-2546
Owner :	Time : 1:09:24 AM
Design For Beam - Column Members : SC-1	
[I.Data For Design]	
1.1.Point Load(P _c)	16,000 kg.
1.2.Moment(M _{x-x})	1,600 kg.-m.
1.3.Moment(M _{y-y})	kg.-m.
1.4.Max. Length	3.30 m.
1.5.Min. Value Of k	0.65 [fixed-fixed]
1.6.Use Value Of k	1.20
[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. Comp. Stress	1,440 ksc.
2.6.Use Allowable KL/r	200 For Main.
[III.Result Of Calculate]	
3.1.Req. Min. Area	11.11 cm. ²
3.2.Value Of (λ) _c	131.42 ****
3.3.Value Of (λ) _(kl/r)	105.60 OK.!
3.5.Allowable Compressive Stress : F _a	
1.)Inelastic Range : λ _(kl/r) < λ _c	
F _{ai} = 853.98 ksc.	
2.)Elastic Range : λ _(kl/r) > λ _c	
F _{ae} = 0.00 ksc.	
<<--- Member Will To Fail By Yield --->>	
WF - 150*150*7*10 mm.(น้ำหนัก = 31.5 kg./m.)	
[IV.Select Type & Section Of Steel]	
4.1.Type Of Section	7 WF-Beam
4.2.Trial Section No.	7 WF
4.3.Size Of Section	150*150 mm.
4.4.Thick. Web(t, t _w)	7.00 mm.
4.5.Thick. Flange(t _f)	10.00 mm.
4.6.Section Area(A _s)	40.14 cm. ²
4.7.Weight Of Section	31.50 kg./m.
4.8.Sect. Modulus(S _{x-x})	219.00 cm. ³
4.9.Moment Of In.(I _{x-x})	1,640.00 cm. ⁴
4.10.Rad. Of Gyr.(r _{min})	3.75 cm.
[V.Recheck Design Section]	
5.1.Status Of Sect. Area : This Section OK.!	5.3.Interaction Stress 0.97 ksc. OK.!
5.2.Load Resist By Sect. 34,279 kg. OK.!	5.4.Slenderness Ratio 105.60 < 200 OK.!
f _a /F _a + f _{b_x} /F _{b_x} + f _{b_y} /F _{b_y} = 0.97 < 1.00	WF - 150*150*7*10 mm.(น้ำหนัก = 31.5 kg./m.)
Select To Use Section : WF - 150*150*7*10 mm.(น้ำหนัก = 31.5 kg./m.)	



	
Project : ddbcb	Engineer :
Location :	Date : 21-Jun-2546
Owner :	Time : 1:06:49 AM
Design For Beam - Column Members : SC-2	
[I.Datas For Design]	
1.1.Point Load(P_c)	45,000 kg.
1.2.Moment(M_{x-x})	1,770 kg.-m.
1.3.Moment(M_{y-y})	kg.-m.
1.4.Max. Length	3.30 m.
1.5.Min. Value Of k	0.65 [fixed-fixed]
1.6.Use Value Of k	1.20
[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. Comp. Stress	1,440 ksc.
2.6.Use Allowable KL/r	200 For Main.
[III.Result Of Calculate]	
3.1.Req. Min. Area	31.25 cm. ²
3.2.Value Of (λ) _c	131.42 ****
3.3.Value Of (λ) _(kl/r)	81.15 OK.!
3.5.Allowable Compressive Stress : F_a	
1.)Inelastic Range : $\lambda_{(kl/r)} < \lambda_c$	
$F_{ai} = 1,039.44$ ksc.	
2.)Elastic Range : $\lambda_{(kl/r)} > \lambda_c$	
$F_{ae} = 0.00$ ksc.	
<<--- Member Will To Fail By Yield --->>	
<u>WF - 200*200*12*12 mm.(น้ำหนัก = 56.2 kg./m.)</u>	
[IV.Select Type & Section Of Steel]	
4.1.Type Of Section	7 WF-Beam
4.2.Trial Section No.	14 WF
4.3.Size Of Section	200*200 mm.
4.4.Thick. Web(t_w)	12.00 mm.
4.5.Thick. Flange(t_f)	12.00 mm.
4.6.Section Area(A_g)	71.53 cm. ²
4.7.Weight Of Section	56.20 kg./m.
4.8.Sect. Modulus(S_{x-x})	498.00 cm. ³
4.9.Moment Of In.(I_{x-x})	4,980.00 cm. ⁴
4.10.Rad. Of Gyr.(r_{min})	4.88 cm.
[V.Recheck Design Section]	
5.1.Status Of Sect. Area	: This Section OK.!
5.2.Load Resist By Sect.	74,351 kg. OK.!
$f_a/F_a + f_b/F_b + f_c/F_c$	= 0.85 < 1.00
5.3.Interaction Stress	0.85 ksc. OK.!
5.4.Slenderness Ratio	81.15 < 200 OK.!
<u>WF - 200*200*12*12 mm.(น้ำหนัก = 56.2 kg./m.)</u>	
Select To Use Section : WF - 200*200*12*12 mm.(น้ำหนัก = 56.2 kg./m.)	



	
Project : ddbcb	Engineer :
Location :	Date : 23-Dec-2004
Owner :	Time : 1:15:10 AM
Design Column-Base For Axial-Force And Bending-Moment : CB-1	
[I.Data For Design]	[II.Properties Of Steel & Concrete]
1.1.Vertical Load 16,000 kg.	2.1.Use Steel Grade Fe-24
1.2.Bending Moment 1,600.00 kg.-m.	2.2.Modulus Of Elastic. 2,100,000 ksc.
1.3.Type Of Column 7 WF-Beam WF	2.3.Yield Strength 2,400 ksc.
1.4.Size Of Wide 150.00 mm.	2.4.Ultimate Strength 4,100 ksc.
1.5.Size Of Depth 150.00 mm.	2.5.All. Bending Stress 1,800 ksc.(Plate)
1.6.Use Plate Wide(B) 350.00 mm. OK.!	2.6.Comp. Strength(fc') 173 ksc.(Conc.)
1.7.Use Plate Long(L) 350.00 mm. OK.!	2.7.All. Comp. Stress 43.25 ksc.(Conc.)
1.8.Range Of Bolt 50.00 mm.	2.8.All. Tension Stress 1,440 ksc.(Bolt)
[III.Result Of Calculate]	2.9.All. Shear Stress 960 ksc.(Bolt)
3.1.Bearing $f_{p_{normal}}$ ***** ksc.	2.10.All. Shear Stress 960 ksc.(Weld)
3.2.Bearing $f_{p_{min}}$ -9.33 ksc. OK.!	
3.3.Edge Bearing f_{p_e} 23.63 ksc. OK.!	
3.4.Bearing $f_{p_{max}}$ 35.45 ksc. OK.!	
3.5.Edge Moment M_e 585.24 kg.-m.	
3.6.Force In Bolts 6,400.00 kg.(Tension)	
3.7.Value Of m_{min} ***** cm.	
3.8.Value Of n_{min} ***** cm.	
[IV.Design Thick. Of Plate & Bolts]	
5.1.Req. Thick. Of Plate 2.36 cm.	
5.2.Use Thick. Of Plate 2.50 cm. OK.!	
5.3.Req. Area Of Bolt 4.44 cm^2 /side	
5.4.Use Dia. Of Bolt 16.00 mm.	
5.5.Req. No. Of Bolts 3.00 per side	
5.6.Anchor Length 53.00 cm.	
	
Select To Use : Size Of Plate 35 x 35 x 2.5 cm. + Bolts 6 - Dia. 16 mm.(ระยะฝัง 53 ซม.)	

																																																			
Project : ddbcb	Engineer :																																																		
Location :	Date : 23-Dec-2004																																																		
Owner :	Time : 1:17:42 AM																																																		
Design Column-Base For Axial-Force And Bending-Moment : CB-2																																																			
<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 50%;">[I.Datas For Design]</th> <th style="width: 50%;">[II.Properties Of Steel & Concrete]</th> </tr> </thead> <tbody> <tr> <td>1.1.Vertical Load 45,000 kg.</td> <td>2.1.Use Steel Grade Fe-24</td> </tr> <tr> <td>1.2.Bending Moment 1,700.00 kg.-m.</td> <td>2.2.Modulus Of Elastic. 2,100,000 ksc.</td> </tr> <tr> <td>1.3.Type Of Column 7 WF-Beam WF</td> <td>2.3.Yield Strength 2,400 ksc.</td> </tr> <tr> <td>1.4.Size Of Wide 200.00 mm.</td> <td>2.4.Ultimate Strength 4,100 ksc.</td> </tr> <tr> <td>1.5.Size Of Depth 200.00 mm.</td> <td>2.5.All. Bending Stress 1,800 ksc.(Plate)</td> </tr> <tr> <td>1.6.Use Plate Wide(B) 350.00 mm. OK.!</td> <td>2.6.Comp. Strength(fc') 210 ksc.(Conc.)</td> </tr> <tr> <td>1.7.Use Plate Long(L) 400.00 mm. OK.!</td> <td>2.7.All. Comp. Stress 52.50 ksc.(Conc.)</td> </tr> <tr> <td>1.8.Range Of Bolt 50.00 mm.</td> <td>2.8.All. Tension Stress 1,440 ksc.(Bolt)</td> </tr> <tr> <td colspan="2" style="text-align: center;">[III.Result Of Calculate]</td> </tr> <tr> <td>3.1.Bearing $f_{p_{normal}}$ ***** ksc.</td> <td>2.9.All. Shear Stress 960 ksc.(Bolt)</td> </tr> <tr> <td>3.2.Bearing $f_{p_{min}}$ 13.93 ksc. OK.!</td> <td>2.10.All. Shear Stress 960 ksc.(Weld)</td> </tr> <tr> <td>3.3.Edge Bearing f_{p_e} 41.25 ksc. OK.!</td> <td></td> </tr> <tr> <td>3.4.Bearing $f_{p_{max}}$ 50.36 ksc. OK.!</td> <td></td> </tr> <tr> <td>3.5.Edge Moment M_e 801.56 kg.-m.</td> <td></td> </tr> <tr> <td>3.6.Force In Bolts 4,500.00 kg.(Shear)</td> <td></td> </tr> <tr> <td>3.7.Value Of m_{min} ***** cm.</td> <td></td> </tr> <tr> <td>3.8.Value Of n_{min} ***** cm.</td> <td></td> </tr> <tr> <td colspan="2" style="text-align: center;">[IV.Design Thick. Of Plate & Bolts]</td> </tr> <tr> <td>5.1.Req. Thick. Of Plate 2.76 cm.</td> <td></td> </tr> <tr> <td>5.2.Use Thick. Of Plate 2.80 cm. OK.!</td> <td></td> </tr> <tr> <td>5.3.Req. Area Of Bolt 3.13 cm.²/side</td> <td></td> </tr> <tr> <td>5.4.Use Dia. Of Bolt 16.00 mm.</td> <td></td> </tr> <tr> <td>5.5.Req. No. Of Bolts 2.00 per side</td> <td></td> </tr> <tr> <td>5.6.Anchor Length 53.00 cm.</td> <td></td> </tr> </tbody> </table>		[I.Datas For Design]	[II.Properties Of Steel & Concrete]	1.1.Vertical Load 45,000 kg.	2.1.Use Steel Grade Fe-24	1.2.Bending Moment 1,700.00 kg.-m.	2.2.Modulus Of Elastic. 2,100,000 ksc.	1.3.Type Of Column 7 WF-Beam WF	2.3.Yield Strength 2,400 ksc.	1.4.Size Of Wide 200.00 mm.	2.4.Ultimate Strength 4,100 ksc.	1.5.Size Of Depth 200.00 mm.	2.5.All. Bending Stress 1,800 ksc.(Plate)	1.6.Use Plate Wide(B) 350.00 mm. OK.!	2.6.Comp. Strength(fc') 210 ksc.(Conc.)	1.7.Use Plate Long(L) 400.00 mm. OK.!	2.7.All. Comp. Stress 52.50 ksc.(Conc.)	1.8.Range Of Bolt 50.00 mm.	2.8.All. Tension Stress 1,440 ksc.(Bolt)	[III.Result Of Calculate]		3.1.Bearing $f_{p_{normal}}$ ***** ksc.	2.9.All. Shear Stress 960 ksc.(Bolt)	3.2.Bearing $f_{p_{min}}$ 13.93 ksc. OK.!	2.10.All. Shear Stress 960 ksc.(Weld)	3.3.Edge Bearing f_{p_e} 41.25 ksc. OK.!		3.4.Bearing $f_{p_{max}}$ 50.36 ksc. OK.!		3.5.Edge Moment M_e 801.56 kg.-m.		3.6.Force In Bolts 4,500.00 kg.(Shear)		3.7.Value Of m_{min} ***** cm.		3.8.Value Of n_{min} ***** cm.		[IV.Design Thick. Of Plate & Bolts]		5.1.Req. Thick. Of Plate 2.76 cm.		5.2.Use Thick. Of Plate 2.80 cm. OK.!		5.3.Req. Area Of Bolt 3.13 cm. ² /side		5.4.Use Dia. Of Bolt 16.00 mm.		5.5.Req. No. Of Bolts 2.00 per side		5.6.Anchor Length 53.00 cm.	
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Select To Use : Size Of Plate 35 x 40 x 2.8 cm. + Bolts 4 - Dia. 16 mm.(ระยะฝัง 53 ซม.)																																																			



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Job Title Talad Sookmak		Part ST-01		
Client Talad Sookmak		Ref 01		
		By PAP	Date 09-Jun-15	Chd SB
		File Structure1.std	Date/Time 13-Jun-2015 15:26	

Job Information

	Engineer	Checked	Approved
Name:	PAP	SB	
Date:	09-Jun-15		

Structure Type | SPACE FRAME

Number of Nodes	514	Highest Node	562
Number of Elements	905	Highest Beam	1325
Number of Plates	220	Highest Plate	1254

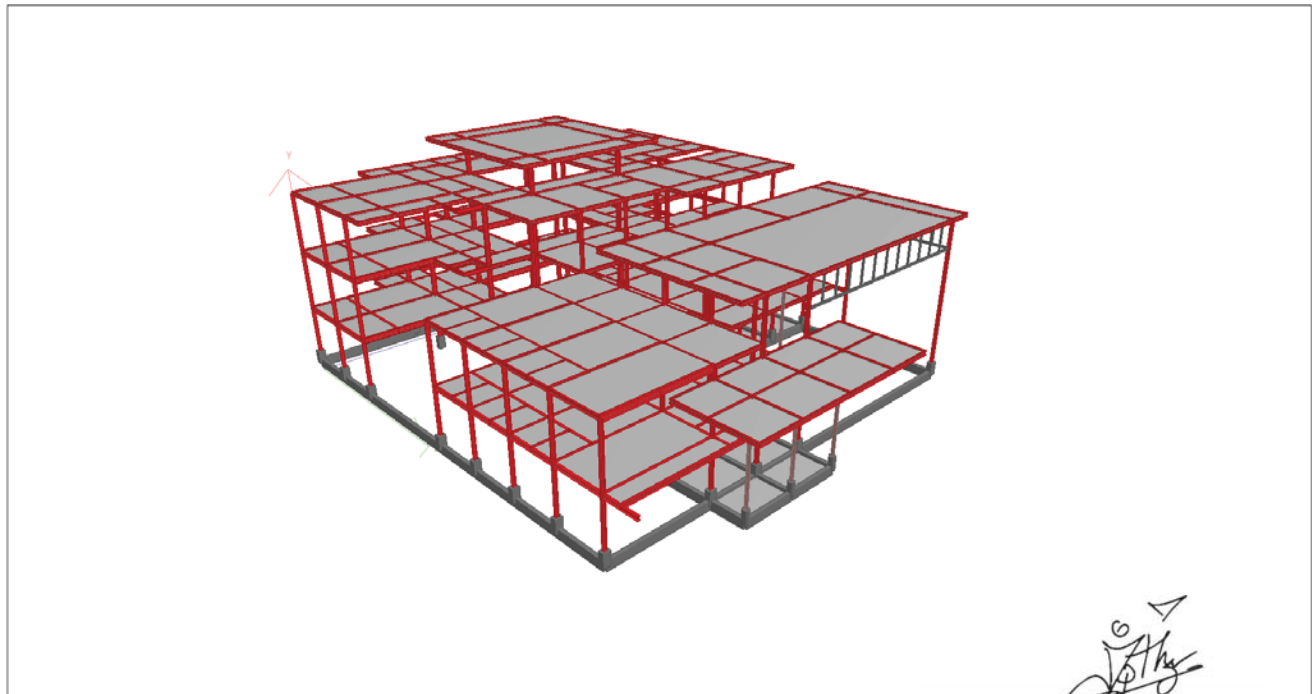
Number of Basic Load Cases	6
Number of Combination Load Cases	1

Included in this printout are data for:

All	The Whole Structure
-----	---------------------

Included in this printout are results for load cases:

Type	L/C	Name
Combination	7	DL+LL

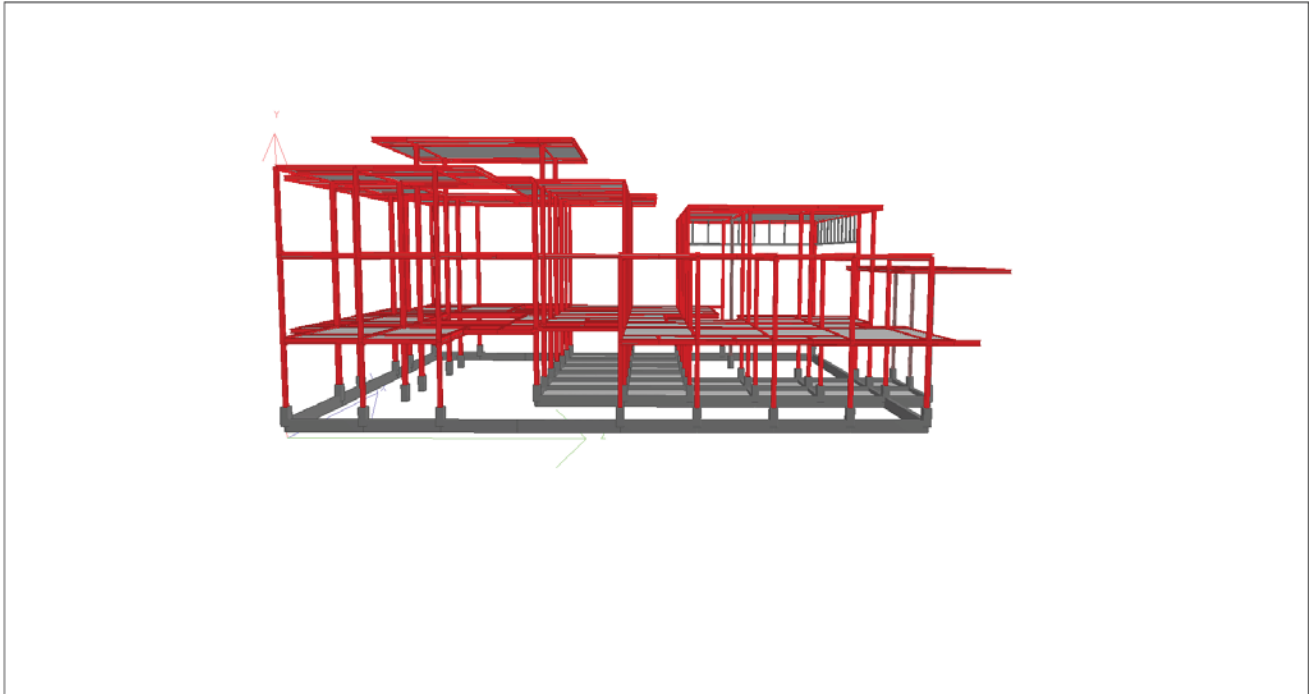


3D Rendered View

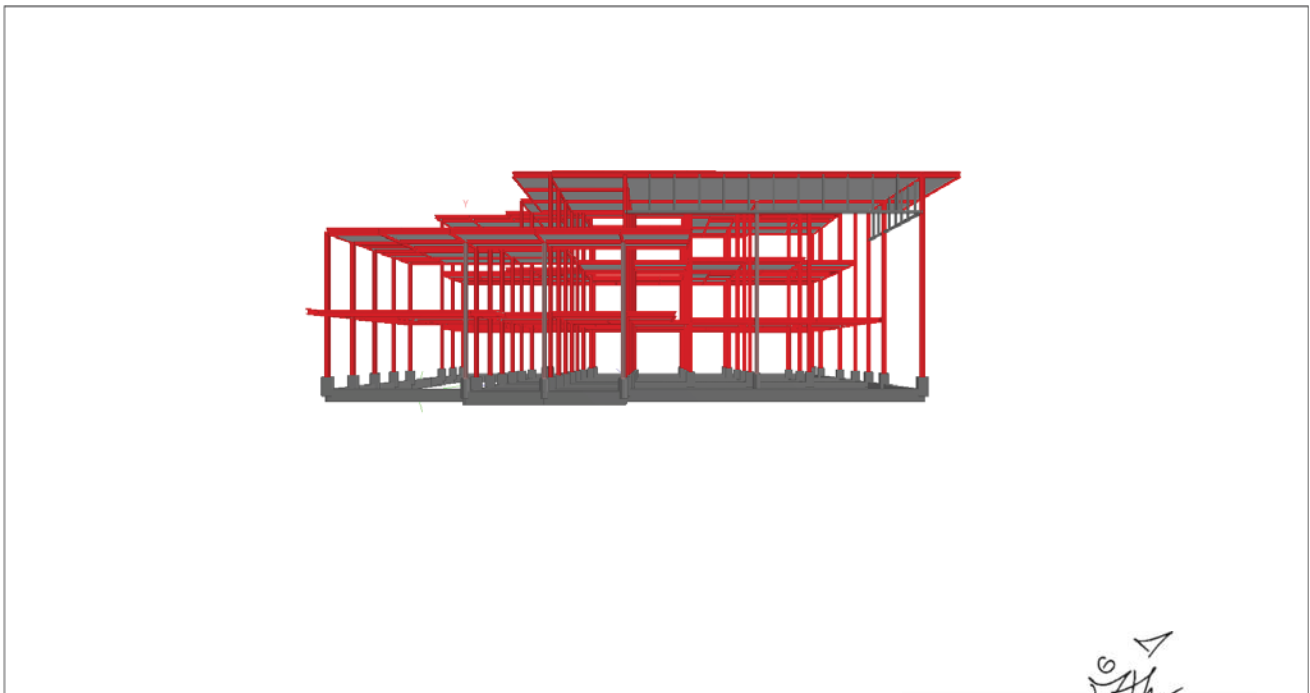
[Handwritten signature]

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Software licensed to CET engineering.co.,ltd.	Job No PT-01	Sheet No 2	Rev 01
	Part ST-01		
Job Title Talad Sookmak	Ref 01		
Client Talad Sookmak	By PAP	Date 09-Jun-15	Chd SB
	File Structure1.std	Date/Time 13-Jun-2015 15:26	



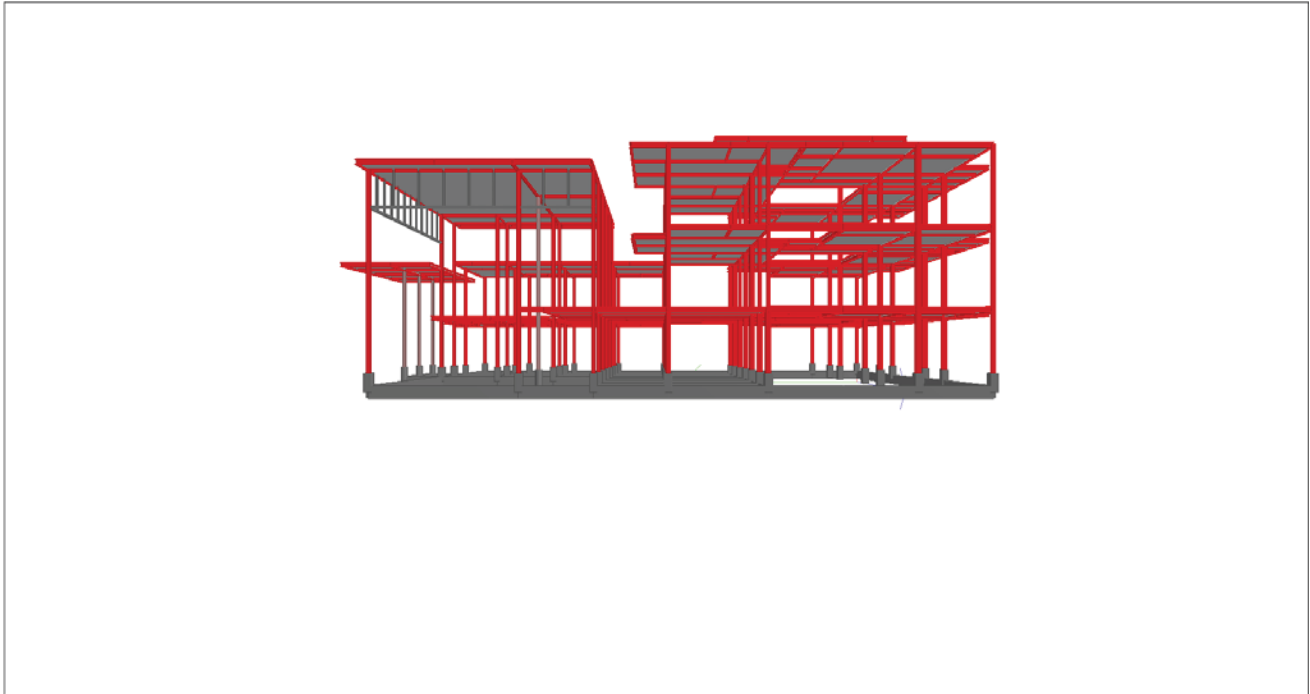
3D Rendered View



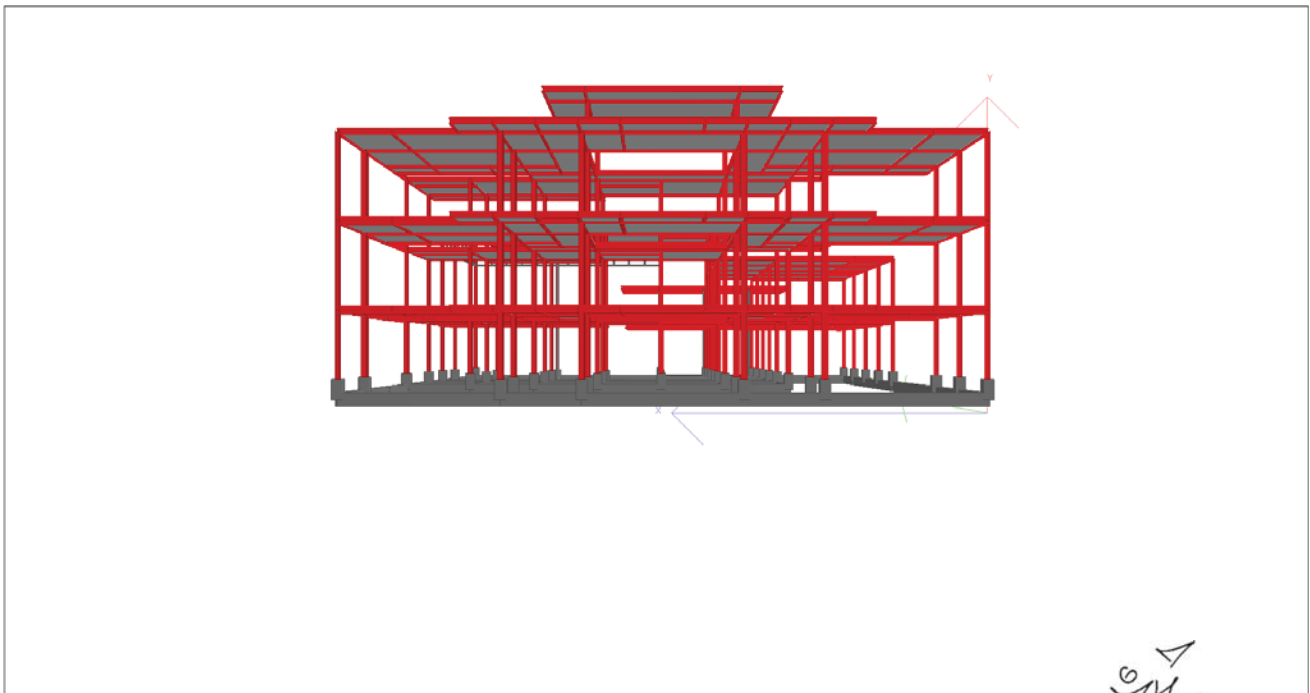
3D Rendered View

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	Part ST-01		
Job Title Talad Sookmak	Ref 01		
	By PAP	Date 09-Jun-15	Chd SB
Client Talad Sookmak	File Structure1.std	Date/Time 13-Jun-2015 15:26	



3D Rendered View

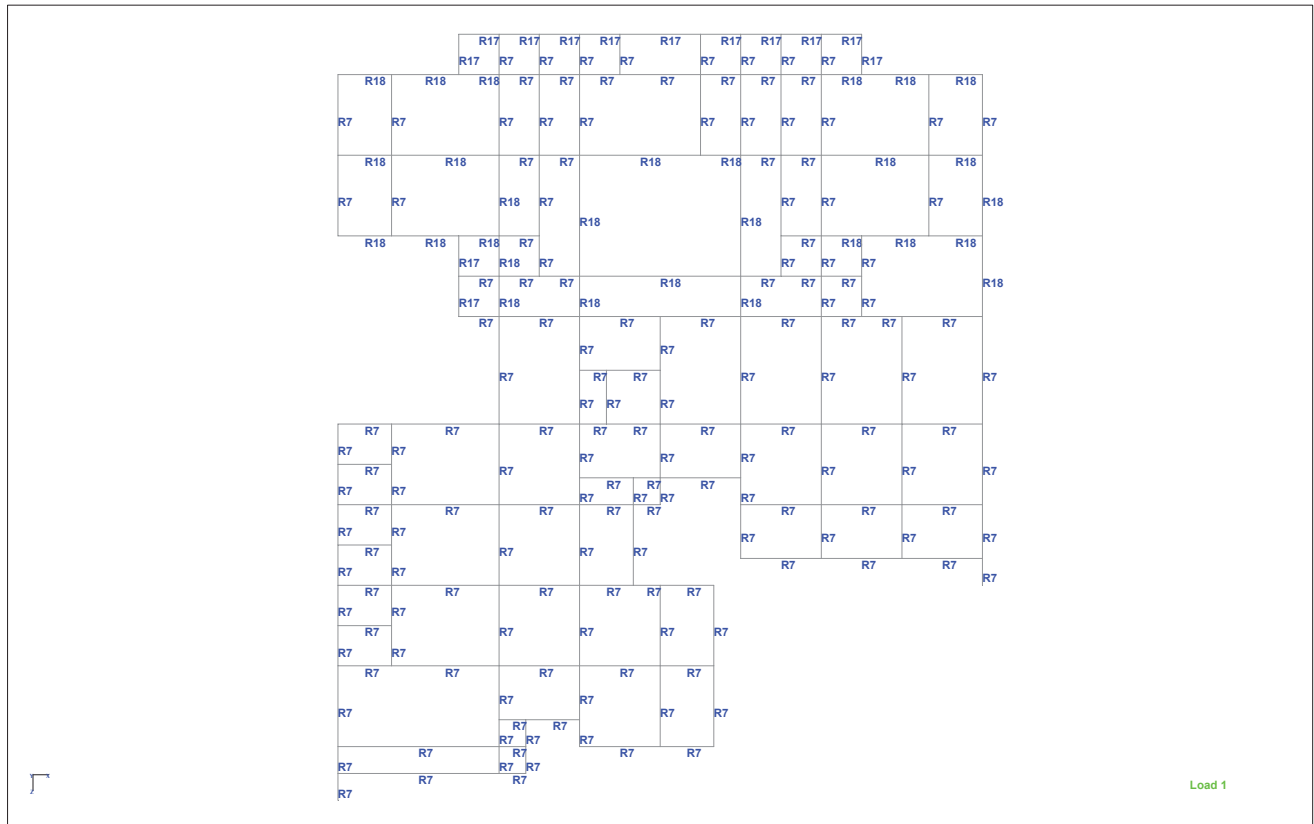


3D Rendered View

A handwritten signature in black ink, located in the bottom right corner of the page. The signature is stylized and appears to be the name of the engineer responsible for the design.

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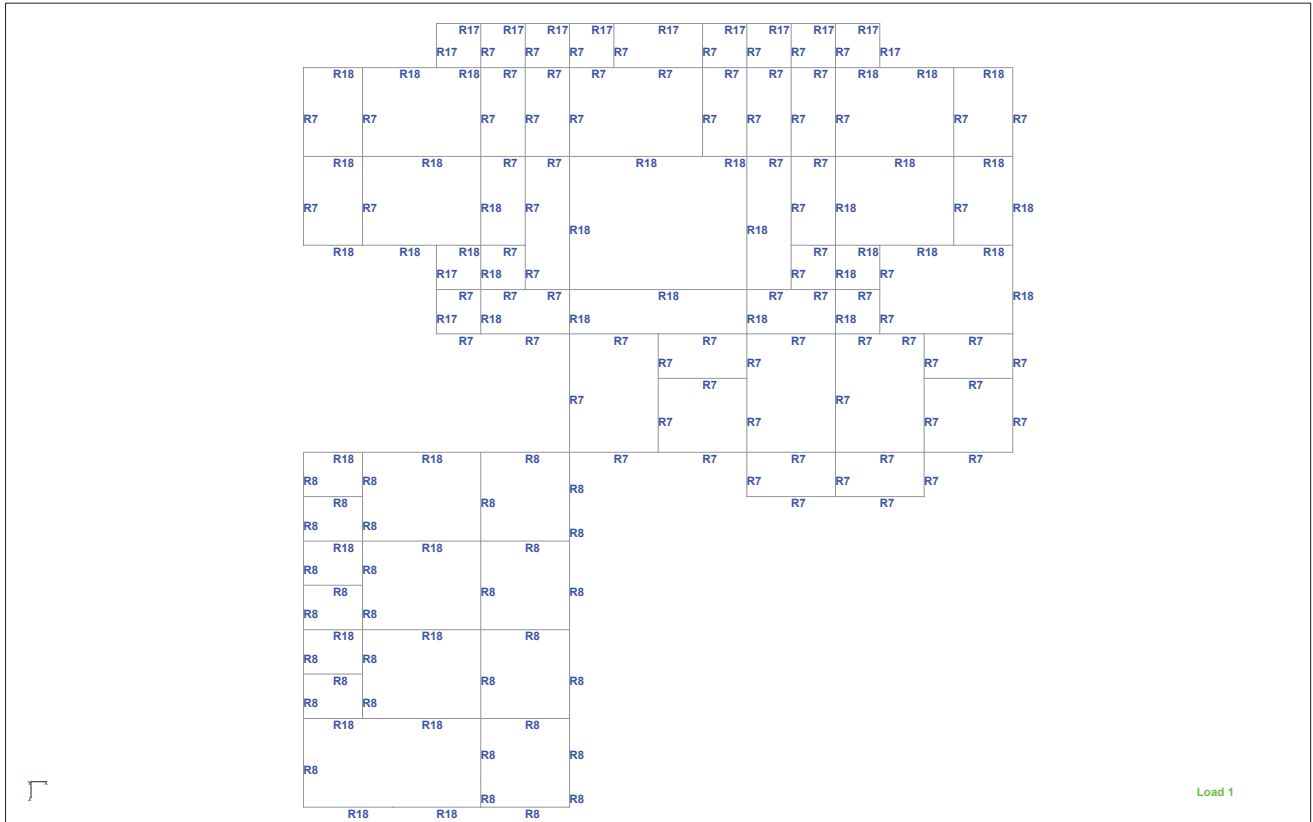
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Job Title Talad Sookmak	Part ST-01		
	Ref 01		
Client Talad Sookmak	By PAP	Date 09-Jun-15	Chd SB
	File Structure1.std	Date/Time 13-Jun-2015 15:26	



2nd Floor Framing Plan

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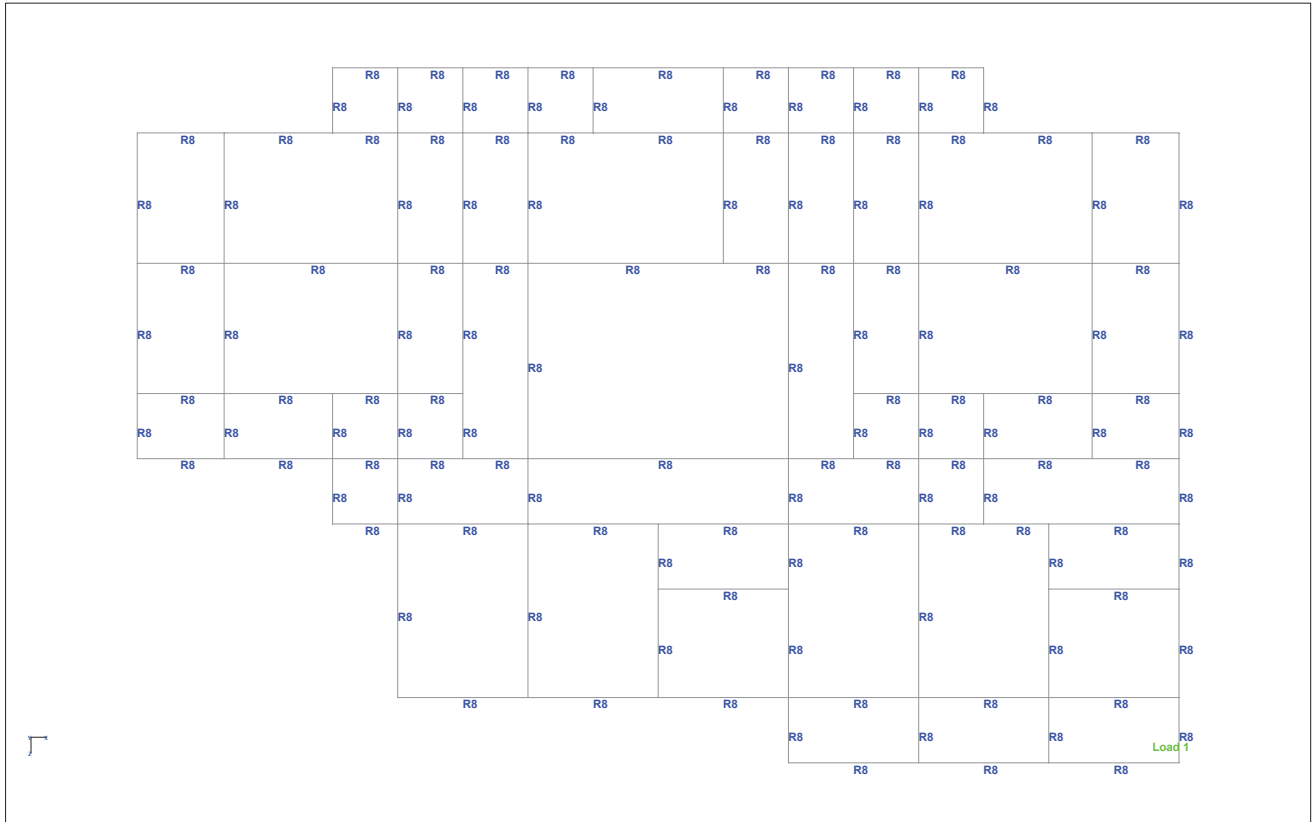
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Job Title Talad Sookmak		Part ST-01		
Client Talad Sookmak		Ref 01		
		By PAP	Date 09-Jun-15	Chd SB
		File Structure1.std	Date/Time 13-Jun-2015 15:26	



3rd Froor Framin Plan

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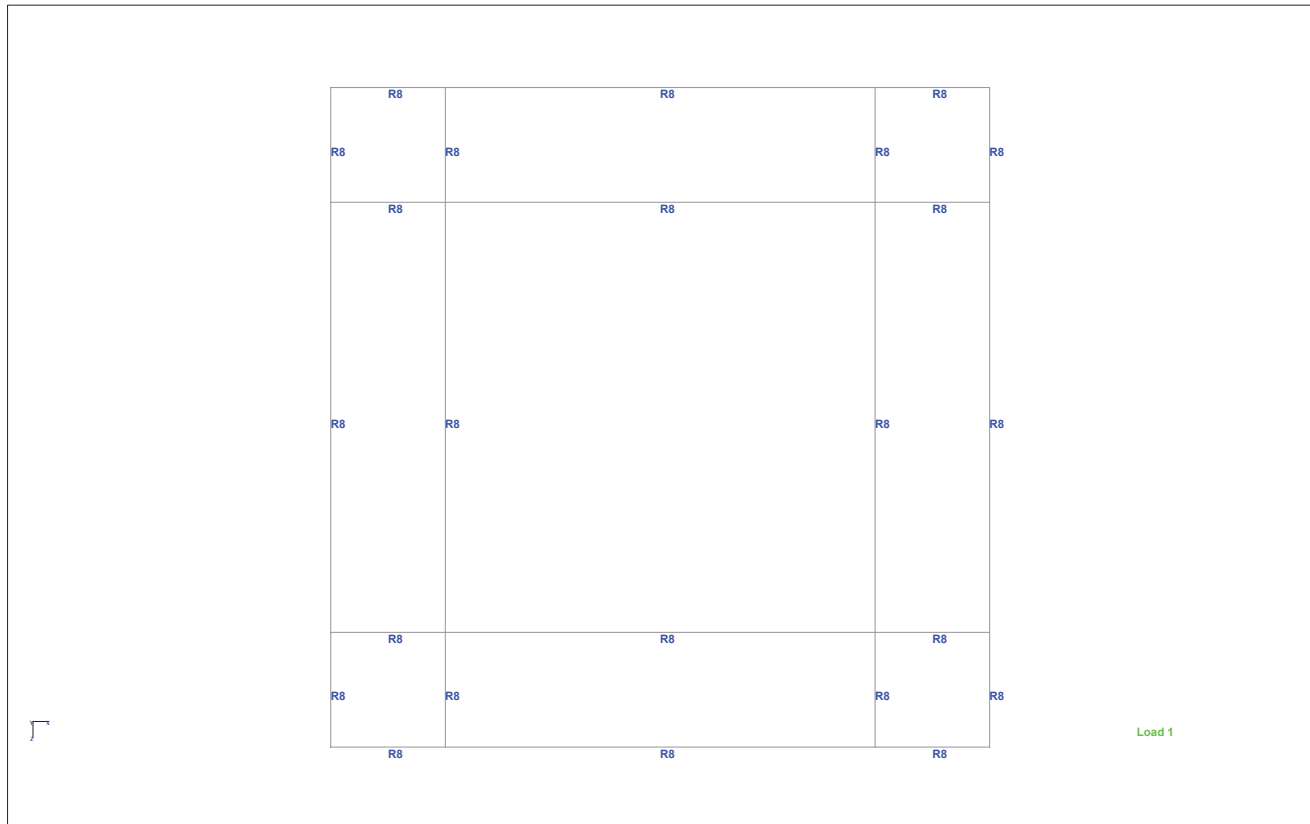
Software licensed to CET engineering.co.,Ltd.		Job No PT-01	Sheet No 6	Rev 01
Job Title Talad Sookmak		Part ST-01		
		Ref 01		
		By PAP	Date 09-Jun-15	Chd SB
Client Talad Sookmak	File Structure1.std		Date/Time 13-Jun-2015 15:26	



Roof Framing Plan 1

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Roof Framing Plan 2

Section Properties

Prop	Section	Area (cm ²)	I _{yy} (cm ⁴)	I _{zz} (cm ⁴)	J (cm ⁴)	Material
5	Rect 0.50x0.20	1E+3	33.3E+3	208E+3	99.8E+3	CONCRETE
6	H150X150X7	39.650	563.000	1.62E+3	11.601	STEEL
7	H194X150X6	38.110	507.000	2.63E+3	8.622	STEEL
8	H200X100X5.5	26.670	134.000	1.81E+3	4.478	STEEL
9	H200X100X5.5	26.670	134.000	1.81E+3	4.478	STEEL
10	TUB75753.2	8.927	75.500	75.500	118.447	STEEL
11	H200X204X12	71.530	1.7E+3	4.98E+3	34.330	STEEL
12	TUB1001003.2	12.130	187.000	187.000	290.253	STEEL
13	Rect 0.40x0.30	1.2E+3	90E+3	160E+3	194E+3	CONCRETE
14	PIP165.2X4.5	22.720	734.000	734.000	1.47E+3	STEEL
15	Cir 0.35	962.113	73.7E+3	73.7E+3	147E+3	CONCRETE
16	H194X150X6	38.110	507.000	2.63E+3	8.622	STEEL
17	H200X100X5.5	26.670	134.000	1.81E+3	4.478	STEEL
18	H300X150X6.5	46.780	508.000	7.21E+3	9.954	STEEL

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Plate Thickness

Prop	Node A (cm)	Node B (cm)	Node C (cm)	Node D (cm)	Material
1	15.000	15.000	15.000	15.000	CONCRETE
2	10.000	10.000	10.000	10.000	CONCRETE
3	10.000	10.000	10.000	10.000	CONCRETE
4	0.100	0.100	0.100	0.100	STEEL

Materials

Mat	Name	E (kN/mm ²)	v	Density (kg/m ³)	α (/°C)
1	STEEL	205.000	0.300	7.83E+3	12E -6
2	STAINLESSSTEEL	197.930	0.300	7.83E+3	18E -6
3	ALUMINUM	68.948	0.330	2.71E+3	23E -6
4	CONCRETE	21.718	0.170	2.4E+3	10E -6

Primary Load Cases

Number	Name	Type
1	DL SW	Dead
2	DL WALL	Dead
3	F 3 DL FLOOR 240+LL 300KG/SQM.	Dead
4	F 2 DL FLOOR 240+LL 300KG/SQM.	Live
5	F 1 DL FLOOR 240+LL 300KG/SQM.	Live
6	LL ROOF INCLUDE WIDE LOADS	Live

Combination Load Cases

Comb.	Combination L/C Name	Primary	Primary L/C Name	Factor
7	DL+LL	1	DL SW	1.00
		2	DL WALL	1.00
		3	F 3 DL FLOOR 240+LL 300KG/SQM.	1.00
		4	F 2 DL FLOOR 240+LL 300KG/SQM.	1.00
		5	F 1 DL FLOOR 240+LL 300KG/SQM.	1.00
		6	LL ROOF INCLUDE WIDE LOADS	1.00

Load Generators

There is no data of this type.

Loading

There is no data of this type.



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Node Displacement Summary

	Node	L/C	X (mm)	Y (mm)	Z (mm)	Resultant (mm)	rX (rad)	rY (rad)	rZ (rad)
Max X	426	7:DL+LL	1.913	-15.269	0.145	15.389	0.007	0.000	0.006
Min X	561	7:DL+LL	-2.958	-0.006	-0.515	3.003	-0.001	-0.000	0.004
Max Y	479	7:DL+LL	0.796	1.963	0.087	2.120	-0.001	-0.000	0.001
Min Y	430	7:DL+LL	1.913	-34.441	-0.949	34.507	0.006	0.000	-0.008
Max Z	275	7:DL+LL	0.949	-0.463	4.364	4.490	-0.000	-0.000	-0.000
Min Z	397	7:DL+LL	0.240	-1.830	-1.873	2.629	0.001	-0.000	-0.001
Max rX	192	7:DL+LL	0.016	-14.667	0.344	14.671	0.009	-0.000	-0.000
Min rX	159	7:DL+LL	0.040	-2.055	0.337	2.082	-0.009	-0.000	0.000
Max rY	278	7:DL+LL	0.955	-0.462	3.696	3.845	-0.001	0.001	0.000
Min rY	274	7:DL+LL	0.943	-0.305	2.922	3.086	-0.001	-0.001	0.000
Max rZ	423	7:DL+LL	1.589	-17.529	0.468	17.607	0.007	0.000	0.009
Min rZ	425	7:DL+LL	1.592	-17.818	-0.949	17.914	0.007	0.000	-0.009
Max Rst	430	7:DL+LL	1.913	-34.441	-0.949	34.507	0.006	0.000	-0.008

Reactions

Node	L/C	Horizontal	Vertical	Horizontal	Moment		
		FX (kg)	FY (kg)	FZ (kg)	MX (kg·m)	MY (kg·m)	MZ (kg·m)
1	7:DL+LL	509.038	10.7E+3	66.108	0.000	0.000	0.000
2	7:DL+LL	-572.522	26.3E+3	-172.632	0.000	0.000	0.000
3	7:DL+LL	381.632	18E+3	-19.686	0.000	0.000	0.000
4	7:DL+LL	-318.156	36.3E+3	214.380	0.000	0.000	0.000
5	7:DL+LL	712.831	29.7E+3	-222.936	0.000	0.000	0.000
6	7:DL+LL	99.657	24.9E+3	109.180	0.000	0.000	0.000
7	7:DL+LL	-857.795	31.3E+3	-181.562	0.000	0.000	0.000
8	7:DL+LL	-59.222	24.4E+3	137.410	0.000	0.000	0.000
9	7:DL+LL	504.539	25E+3	-202.668	0.000	0.000	0.000
10	7:DL+LL	361.942	39.2E+3	278.913	0.000	0.000	0.000
11	7:DL+LL	-463.336	8.71E+3	8.019	0.000	0.000	0.000
12	7:DL+LL	-776.482	28.6E+3	339.654	0.000	0.000	0.000
13	7:DL+LL	0.004	2.27E+3	0.000	0.000	0.000	0.000
14	7:DL+LL	0.761	28.6E+3	-473.852	0.000	0.000	0.000
15	7:DL+LL	141.149	38.8E+3	-142.798	0.000	0.000	0.000
16	7:DL+LL	102.371	38.8E+3	-275.155	0.000	0.000	0.000
17	7:DL+LL	-45.875	43.2E+3	-282.431	0.000	0.000	0.000
18	7:DL+LL	-445.831	23.2E+3	-273.803	0.000	0.000	0.000
19	7:DL+LL	-189.621	20.4E+3	585.280	0.000	0.000	0.000
20	7:DL+LL	-75.967	24.9E+3	766.657	0.000	0.000	0.000
21	7:DL+LL	298.610	9.02E+3	51.536	0.000	0.000	0.000
22	7:DL+LL	-360.095	20.7E+3	-60.041	0.000	0.000	0.000
23	7:DL+LL	139.694	26.7E+3	-121.789	0.000	0.000	0.000
24	7:DL+LL	-48.779	26.9E+3	-131.454	0.000	0.000	0.000
25	7:DL+LL	25.993	28.4E+3	-201.271	0.000	0.000	0.000

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Reactions Cont...

Node	L/C	Horizontal	Vertical	Horizontal	Moment		
		FX (kg)	FY (kg)	FZ (kg)	MX (kg·m)	MY (kg·m)	MZ (kg·m)
26	7:DL+LL	-193.438	13.9E+3	-172.468	0.000	0.000	0.000
27	7:DL+LL	-104.858	26.9E+3	-95.238	0.000	0.000	0.000
28	7:DL+LL	24.891	29.2E+3	-245.882	0.000	0.000	0.000
29	7:DL+LL	531.452	11.7E+3	-58.324	0.000	0.000	0.000
30	7:DL+LL	-591.133	17.8E+3	-15.127	0.000	0.000	0.000
31	7:DL+LL	181.805	16.3E+3	-14.688	0.000	0.000	0.000
32	7:DL+LL	264.869	11.8E+3	203.294	0.000	0.000	0.000
33	7:DL+LL	-49.806	16.3E+3	299.390	0.000	0.000	0.000
34	7:DL+LL	-309.366	10.1E+3	295.701	0.000	0.000	0.000
35	7:DL+LL	-264.556	11.7E+3	-136.325	0.000	0.000	0.000
36	7:DL+LL	53.967	17E+3	319.284	0.000	0.000	0.000
37	7:DL+LL	-634.682	19.1E+3	-17.113	0.000	0.000	0.000
38	7:DL+LL	43.382	16.5E+3	-49.286	0.000	0.000	0.000
41	7:DL+LL	-45.130	5.19E+3	2.527	0.000	0.000	0.000
42	7:DL+LL	300.536	12.6E+3	112.598	0.000	0.000	0.000
44	7:DL+LL	574.615	11.3E+3	-34.709	0.000	0.000	0.000
45	7:DL+LL	-534.587	17.9E+3	-67.708	0.000	0.000	0.000
46	7:DL+LL	-68.809	15.8E+3	2.250	0.000	0.000	0.000
48	7:DL+LL	450.846	16.8E+3	-15.096	0.000	0.000	0.000
49	7:DL+LL	510.126	10.1E+3	-124.119	0.000	0.000	0.000
50	7:DL+LL	-684.776	21.4E+3	51.507	0.000	0.000	0.000
51	7:DL+LL	-156.353	8.66E+3	-66.227	0.000	0.000	0.000
52	7:DL+LL	-218.892	6.67E+3	-15.738	0.000	0.000	0.000
53	7:DL+LL	644.225	19.6E+3	-136.015	0.000	0.000	0.000
54	7:DL+LL	905.900	10.9E+3	93.906	0.000	0.000	0.000
55	7:DL+LL	-108.101	5.24E+3	71.406	0.000	0.000	0.000
56	7:DL+LL	-20.507	4.19E+3	36.756	0.000	0.000	0.000
57	7:DL+LL	77.895	5.3E+3	84.280	0.000	0.000	0.000
111	7:DL+LL	356.791	12.8E+3	-101.283	0.000	0.000	0.000
113	7:DL+LL	0.006	1.19E+3	0.000	0.000	0.000	0.000
508	7:DL+LL	-0.855	1.65E+3	-2.614	0.000	0.000	0.000

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Job Title Talad Sookmak		Ref 01	
Client Talad Sookmak		By PAP	Date 09-Jun-15 Chd SB
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Reaction Summary

	Node	L/C	Horizontal	Vertical	Horizontal	Moment		
			FX (kg)	FY (kg)	FZ (kg)	MX (kg·m)	MY (kg·m)	MZ (kg·m)
Max FX	54	7:DL+LL	905.900	10.9E+3	93.906	0.000	0.000	0.000
Min FX	7	7:DL+LL	-857.795	31.3E+3	-181.562	0.000	0.000	0.000
Max FY	17	7:DL+LL	-45.875	43.2E+3	-282.431	0.000	0.000	0.000
Min FY	113	7:DL+LL	0.006	1.19E+3	0.000	0.000	0.000	0.000
Max FZ	20	7:DL+LL	-75.967	24.9E+3	766.657	0.000	0.000	0.000
Min FZ	14	7:DL+LL	0.761	28.6E+3	-473.852	0.000	0.000	0.000
Max MX	1	7:DL+LL	509.038	10.7E+3	66.108	0.000	0.000	0.000
Min MX	1	7:DL+LL	509.038	10.7E+3	66.108	0.000	0.000	0.000
Max MY	1	7:DL+LL	509.038	10.7E+3	66.108	0.000	0.000	0.000
Min MY	1	7:DL+LL	509.038	10.7E+3	66.108	0.000	0.000	0.000
Max MZ	1	7:DL+LL	509.038	10.7E+3	66.108	0.000	0.000	0.000
Min MZ	1	7:DL+LL	509.038	10.7E+3	66.108	0.000	0.000	0.000

Utilization Ratio

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
1	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
2	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
5	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
8	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
11	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
14	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
16	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
17	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
22	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
24	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
25	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
26	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
27	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
28	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
29	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
30	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
31	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
32	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
33	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
34	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
35	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
36	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
37	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
39	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
40	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
41	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3

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Client Talad Sookmak		File Structure1.std	Date/Time 13-Jun-2015 15:26

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
42	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
43	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
44	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
45	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
46	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
47	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
48	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
49	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
50	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
51	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
52	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
54	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
55	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
56	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
57	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
58	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
59	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
60	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
61	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
64	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
65	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
67	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
68	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
75	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
78	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
79	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
81	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
82	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
83	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
84	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
87	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
88	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
90	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
91	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
92	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
93	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
94	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
95	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
96	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
97	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
98	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
99	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
100	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
101	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
102	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3

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Job Title Talad Sookmak		Ref 01	
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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
103	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
104	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
105	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
106	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
107	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
108	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
109	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
110	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
111	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
112	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
113	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
115	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
116	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
117	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
118	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
119	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
120	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
121	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
122	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
123	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
124	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
125	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
126	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
127	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
128	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
129	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
130	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
131	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
132	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
133	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
134	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
135	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
136	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
137	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
138	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
139	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
141	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
142	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
143	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
144	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
145	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
146	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
147	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
148	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
150	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3

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Client Talad Sookmak		Ref 01		
		By PAP	Date 09-Jun-15	Chd SB
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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
151	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
152	Cir 0.35	N/A						962.113	73.7E+3	73.7E+3	147E+3
153	Cir 0.35	N/A						962.113	73.7E+3	73.7E+3	147E+3
154	Cir 0.35	N/A						962.113	73.7E+3	73.7E+3	147E+3
155	H300X150X	H300X150X	0.274	1.000	0.274	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
156	H194X150X	H194X150X	0.188	1.000	0.188	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
157	H194X150X	H194X150X	0.449	1.000	0.449	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
158	H300X150X	H300X150X	0.441	1.000	0.441	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
159	H194X150X	H194X150X	0.245	1.000	0.245	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
160	H194X150X	H194X150X	0.360	1.000	0.360	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
161	H194X150X	H194X150X	0.419	1.000	0.419	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
162	H194X150X	H194X150X	0.596	1.000	0.596	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
163	H300X150X	H300X150X	0.527	1.000	0.527	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
164	H194X150X	H194X150X	0.334	1.000	0.334	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
165	H194X150X	H194X150X	0.333	1.000	0.333	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
166	H194X150X	H194X150X	0.210	1.000	0.210	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
167	H194X150X	H194X150X	0.538	1.000	0.538	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
168	H300X150X	H300X150X	0.301	1.000	0.301	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
169	H300X150X	H300X150X	0.932	1.000	0.932	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
170	H194X150X	H194X150X	0.387	1.000	0.387	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
171	H194X150X	H194X150X	0.178	1.000	0.178	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
172	H300X150X	H300X150X	0.558	1.000	0.558	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
173	H194X150X	H194X150X	0.265	1.000	0.265	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
174	H194X150X	H194X150X	0.232	1.000	0.232	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
175	H194X150X	H194X150X	0.361	1.000	0.361	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
176	H194X150X	H194X150X	0.410	1.000	0.410	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
177	H194X150X	H194X150X	0.299	1.000	0.299	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
178	H194X150X	H194X150X	0.413	1.000	0.413	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
180	H194X150X	H194X150X	0.966	1.000	0.966	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
181	H194X150X	H194X150X	0.832	1.000	0.832	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
182	H194X150X	H194X150X	0.957	1.000	0.957	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
183	H194X150X	H194X150X	1.171	1.000	1.171	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
184	H194X150X	H194X150X	0.724	1.000	0.724	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
185	H194X150X	H194X150X	0.264	1.000	0.264	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
186	H194X150X	H194X150X	0.782	1.000	0.782	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
187	H194X150X	H194X150X	0.504	1.000	0.504	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
188	H194X150X	H194X150X	0.273	1.000	0.273	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
189	H194X150X	H194X150X	0.355	1.000	0.355	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
190	H194X150X	H194X150X	0.355	1.000	0.355	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
191	H194X150X	H194X150X	0.327	1.000	0.327	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
192	H194X150X	H194X150X	0.330	1.000	0.330	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
193	H194X150X	H194X150X	0.134	1.000	0.134	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
194	H194X150X	H194X150X	0.270	1.000	0.270	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
195	H194X150X	H194X150X	0.315	1.000	0.315	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
196	H194X150X	H194X150X	0.157	1.000	0.157	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
197	H194X150Xf	H194X150Xf	0.719	1.000	0.719	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
198	H194X150Xf	H194X150Xf	0.623	1.000	0.623	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
199	H194X150Xf	H194X150Xf	0.332	1.000	0.332	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
200	H194X150Xf	H194X150Xf	0.724	1.000	0.724	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
201	H194X150Xf	H194X150Xf	0.598	1.000	0.598	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
202	H194X150Xf	H194X150Xf	0.169	1.000	0.169	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
203	H194X150Xf	H194X150Xf	0.284	1.000	0.284	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
204	H194X150Xf	H194X150Xf	0.262	1.000	0.262	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
206	H194X150Xf	H194X150Xf	0.280	1.000	0.280	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
207	H194X150Xf	H194X150Xf	0.289	1.000	0.289	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
208	H194X150Xf	H194X150Xf	0.267	1.000	0.267	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
209	H194X150Xf	H194X150Xf	0.723	1.000	0.723	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
211	H194X150Xf	H194X150Xf	0.642	1.000	0.642	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
212	H194X150Xf	H194X150Xf	0.118	1.000	0.118	SHEAR -Y	7	38.110	2.63E+3	507.000	8.600
213	H194X150Xf	H194X150Xf	0.187	1.000	0.187	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
214	H194X150Xf	H194X150Xf	0.259	1.000	0.259	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
215	H194X150Xf	H194X150Xf	0.284	1.000	0.284	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
216	H194X150Xf	H194X150Xf	0.330	1.000	0.330	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
217	H194X150Xf	H194X150Xf	0.196	1.000	0.196	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
218	H194X150Xf	H194X150Xf	0.580	1.000	0.580	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
219	H194X150Xf	H194X150Xf	0.615	1.000	0.615	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
220	H194X150Xf	H194X150Xf	0.188	1.000	0.188	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
221	H194X150Xf	H194X150Xf	0.156	1.000	0.156	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
222	H194X150Xf	H194X150Xf	0.331	1.000	0.331	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
223	H194X150Xf	H194X150Xf	0.364	1.000	0.364	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
224	H194X150Xf	H194X150Xf	0.525	1.000	0.525	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
225	H194X150Xf	H194X150Xf	0.414	1.000	0.414	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
226	H194X150Xf	H194X150Xf	1.480	1.000	1.480	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
229	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
231	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
232	Rect 0.50x0.	N/A						+003E+0	208E+3	33.3E+3	99.8E+3
235	H300X150Xf	H300X150Xf	0.633	1.000	0.633	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
236	H194X150Xf	H194X150Xf	0.799	1.000	0.799	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
239	H300X150Xf	H300X150Xf	0.599	1.000	0.599	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
240	H194X150Xf	H194X150Xf	0.796	1.000	0.796	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
243	H300X150Xf	H300X150Xf	0.375	1.000	0.375	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
244	H300X150Xf	H300X150Xf	0.522	1.000	0.522	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
245	H300X150Xf	H300X150Xf	0.688	1.000	0.688	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
246	H194X150Xf	H194X150Xf	1.294	1.000	1.294	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
247	H300X150Xf	H300X150Xf	0.461	1.000	0.461	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
248	H300X150Xf	H300X150Xf	0.478	1.000	0.478	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
249	H194X150Xf	H194X150Xf	0.301	1.000	0.301	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
250	H300X150Xf	H300X150Xf	0.865	1.000	0.865	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
251	H194X150Xf	H194X150Xf	0.444	1.000	0.444	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
252	H194X150Xf	H194X150Xf	0.106	1.000	0.106	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
254	H194X150Xf	H194X150Xf	0.323	1.000	0.323	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
255	H194X150Xf	H194X150Xf	0.218	1.000	0.218	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
256	H194X150Xf	H194X150Xf	0.210	1.000	0.210	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
257	H194X150Xf	H194X150Xf	0.424	1.000	0.424	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
258	H194X150Xf	H194X150Xf	0.286	1.000	0.286	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
259	H194X150Xf	H194X150Xf	0.370	1.000	0.370	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
261	H194X150Xf	H194X150Xf	0.129	1.000	0.129	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
262	H194X150Xf	H194X150Xf	0.371	1.000	0.371	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
263	H194X150Xf	H194X150Xf	0.259	1.000	0.259	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
264	H194X150Xf	H194X150Xf	0.222	1.000	0.222	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
265	H194X150Xf	H194X150Xf	0.414	1.000	0.414	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
266	H194X150Xf	H194X150Xf	0.267	1.000	0.267	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
267	H194X150Xf	H194X150Xf	0.284	1.000	0.284	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
268	H300X150Xf	H300X150Xf	0.553	1.000	0.553	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
269	H300X150Xf	H300X150Xf	0.648	1.000	0.648	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
270	H194X150Xf	H194X150Xf	0.487	1.000	0.487	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
271	H194X150Xf	H194X150Xf	0.734	1.000	0.734	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
272	H194X150Xf	H194X150Xf	0.642	1.000	0.642	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
273	H194X150Xf	H194X150Xf	0.489	1.000	0.489	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
274	H194X150Xf	H194X150Xf	0.233	1.000	0.233	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
275	H194X150Xf	H194X150Xf	0.201	1.000	0.201	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
276	H200X100Xf	H200X100Xf	0.253	1.000	0.253	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
277	H200X100Xf	H200X100Xf	0.163	1.000	0.163	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
278	H200X100Xf	H200X100Xf	0.354	1.000	0.354	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
279	H200X100Xf	H200X100Xf	0.348	1.000	0.348	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
280	H200X100Xf	H200X100Xf	0.222	1.000	0.222	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
281	H300X150Xf	H300X150Xf	0.339	1.000	0.339	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
282	H200X100Xf	H200X100Xf	0.066	1.000	0.066	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
283	H300X150Xf	H300X150Xf	0.215	1.000	0.215	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
284	H200X100Xf	H200X100Xf	0.058	1.000	0.058	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
285	H200X100Xf	H200X100Xf	0.203	1.000	0.203	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
286	H200X100Xf	H200X100Xf	0.192	1.000	0.192	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
287	H194X150Xf	H194X150Xf	0.431	1.000	0.431	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
288	H200X100Xf	H200X100Xf	0.572	1.000	0.572	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
289	H194X150Xf	H194X150Xf	0.117	1.000	0.117	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
290	H194X150Xf	H194X150Xf	0.655	1.000	0.655	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
291	H200X100Xf	H200X100Xf	0.189	1.000	0.189	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
292	H194X150Xf	H194X150Xf	0.233	1.000	0.233	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
293	H300X150Xf	H300X150Xf	0.239	1.000	0.239	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
294	H194X150Xf	H194X150Xf	0.442	1.000	0.442	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
295	H300X150Xf	H300X150Xf	0.202	1.000	0.202	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
296	H300X150Xf	H300X150Xf	0.610	1.000	0.610	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
297	H300X150Xf	H300X150Xf	0.712	1.000	0.712	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
298	H194X150Xf	H194X150Xf	0.456	1.000	0.456	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
299	H194X150Xf	H194X150Xf	0.429	1.000	0.429	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
300	H300X150Xf	H300X150Xf	0.243	1.000	0.243	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
301	H300X150Xf	H300X150Xf	0.890	1.000	0.890	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
302	H300X150Xf	H300X150Xf	0.414	1.000	0.414	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
303	H194X150Xf	H194X150Xf	0.215	1.000	0.215	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
304	H194X150Xf	H194X150Xf	0.294	1.000	0.294	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
305	H300X150Xf	H300X150Xf	0.326	1.000	0.326	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
306	H200X100Xf	H200X100Xf	0.193	1.000	0.193	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
307	H194X150Xf	H194X150Xf	0.195	1.000	0.195	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
308	H194X150Xf	H194X150Xf	0.550	1.000	0.550	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
309	H194X150Xf	H194X150Xf	0.318	1.000	0.318	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
312	H194X150Xf	H194X150Xf	0.213	1.000	0.213	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
313	H194X150Xf	H194X150Xf	0.198	1.000	0.198	SHEAR -Y	7	38.110	2.63E+3	507.000	8.600
314	H200X100Xf	H200X100Xf	0.233	1.000	0.233	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
315	H194X150Xf	H194X150Xf	0.436	1.000	0.436	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
316	H194X150Xf	H194X150Xf	0.434	1.000	0.434	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
317	H300X150Xf	H300X150Xf	0.682	1.000	0.682	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
318	H194X150Xf	H194X150Xf	0.295	1.000	0.295	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
319	H194X150Xf	H194X150Xf	0.362	1.000	0.362	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
320	H194X150Xf	H194X150Xf	0.188	1.000	0.188	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
321	H194X150Xf	H194X150Xf	0.257	1.000	0.257	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
322	H194X150Xf	H194X150Xf	0.187	1.000	0.187	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
323	H194X150Xf	H194X150Xf	0.045	1.000	0.045	SHEAR -Y	7	38.110	2.63E+3	507.000	8.600
324	H194X150Xf	H194X150Xf	0.280	1.000	0.280	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
326	H194X150Xf	H194X150Xf	0.327	1.000	0.327	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
327	H194X150Xf	H194X150Xf	0.078	1.000	0.078	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
328	H194X150Xf	H194X150Xf	0.575	1.000	0.575	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
330	H194X150Xf	H194X150Xf	0.139	1.000	0.139	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
332	H194X150Xf	H194X150Xf	0.162	1.000	0.162	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
333	H194X150Xf	H194X150Xf	0.123	1.000	0.123	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
334	H194X150Xf	H194X150Xf	0.579	1.000	0.579	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
335	H194X150Xf	H194X150Xf	0.758	1.000	0.758	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
336	H194X150Xf	H194X150Xf	0.800	1.000	0.800	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
337	H194X150Xf	H194X150Xf	0.811	1.000	0.811	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
338	H194X150Xf	H194X150Xf	0.661	1.000	0.661	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
339	H194X150Xf	H194X150Xf	0.896	1.000	0.896	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
340	H194X150Xf	H194X150Xf	0.909	1.000	0.909	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
341	H194X150Xf	H194X150Xf	1.086	1.000	1.086	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
342	H194X150Xf	H194X150Xf	0.206	1.000	0.206	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
343	H194X150Xf	H194X150Xf	0.193	1.000	0.193	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
344	H194X150Xf	H194X150Xf	0.226	1.000	0.226	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
345	H194X150Xf	H194X150Xf	0.216	1.000	0.216	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
346	H194X150Xf	H194X150Xf	0.191	1.000	0.191	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
347	H194X150Xf	H194X150Xf	0.130	1.000	0.130	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
348	H194X150Xf	H194X150Xf	0.179	1.000	0.179	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
349	H194X150Xf	H194X150Xf	0.224	1.000	0.224	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Ratio	Allowable Ratio	Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
350	H194X150Xf	H194X150Xf	0.254	1.000	0.254	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
351	H194X150Xf	H194X150Xf	0.182	1.000	0.182	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
352	H194X150Xf	H194X150Xf	0.195	1.000	0.195	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
353	H194X150Xf	H194X150Xf	0.206	1.000	0.206	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
354	H194X150Xf	H194X150Xf	0.595	1.000	0.595	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
355	H194X150Xf	H194X150Xf	0.709	1.000	0.709	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
356	H194X150Xf	H194X150Xf	0.591	1.000	0.591	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
357	H194X150Xf	H194X150Xf	0.159	1.000	0.159	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
358	H194X150Xf	H194X150Xf	0.159	1.000	0.159	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
361	H194X150Xf	H194X150Xf	0.507	1.000	0.507	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
363	H194X150Xf	H194X150Xf	0.143	1.000	0.143	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
364	H194X150Xf	H194X150Xf	0.566	1.000	0.566	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
365	H194X150Xf	H194X150Xf	0.344	1.000	0.344	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
366	H194X150Xf	H194X150Xf	0.090	1.000	0.090	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
367	H194X150Xf	H194X150Xf	0.126	1.000	0.126	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
368	H194X150Xf	H194X150Xf	0.185	1.000	0.185	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
369	H194X150Xf	H194X150Xf	0.043	1.000	0.043	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
370	H194X150Xf	H194X150Xf	0.157	1.000	0.157	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
371	H194X150Xf	H194X150Xf	0.140	1.000	0.140	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
372	H194X150Xf	H194X150Xf	0.136	1.000	0.136	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
373	H194X150Xf	H194X150Xf	0.594	1.000	0.594	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
374	H194X150Xf	H194X150Xf	0.716	1.000	0.716	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
375	H194X150Xf	H194X150Xf	0.744	1.000	0.744	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
376	H194X150Xf	H194X150Xf	0.328	1.000	0.328	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
377	H194X150Xf	H194X150Xf	0.235	1.000	0.235	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
378	H194X150Xf	H194X150Xf	0.214	1.000	0.214	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
379	H194X150Xf	H194X150Xf	0.112	1.000	0.112	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
380	H194X150Xf	H194X150Xf	0.043	1.000	0.043	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
381	H300X150Xf	H300X150Xf	0.314	1.000	0.314	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
382	H194X150Xf	H194X150Xf	0.190	1.000	0.190	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
383	H194X150Xf	H194X150Xf	0.508	1.000	0.508	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
384	H300X150Xf	H300X150Xf	0.490	1.000	0.490	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
385	H194X150Xf	H194X150Xf	0.274	1.000	0.274	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
386	H194X150Xf	H194X150Xf	0.393	1.000	0.393	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
387	H194X150Xf	H194X150Xf	0.452	1.000	0.452	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
388	H194X150Xf	H194X150Xf	0.649	1.000	0.649	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
389	H300X150Xf	H300X150Xf	0.679	1.000	0.679	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
390	H194X150Xf	H194X150Xf	0.361	1.000	0.361	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
391	H194X150Xf	H194X150Xf	0.371	1.000	0.371	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
392	H194X150Xf	H194X150Xf	0.250	1.000	0.250	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
393	H194X150Xf	H194X150Xf	0.570	1.000	0.570	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
394	H300X150Xf	H300X150Xf	0.331	1.000	0.331	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
395	H300X150Xf	H300X150Xf	1.001	1.000	1.001	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
396	H194X150Xf	H194X150Xf	0.427	1.000	0.427	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
397	H194X150Xf	H194X150Xf	0.200	1.000	0.200	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
398	H300X150Xf	H300X150Xf	0.627	1.000	0.627	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
399	H194X150Xf	H194X150Xf	0.200	1.000	0.200	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
400	H194X150Xf	H194X150Xf	0.348	1.000	0.348	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
401	H194X150Xf	H194X150Xf	0.279	1.000	0.279	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
402	H194X150Xf	H194X150Xf	0.245	1.000	0.245	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
403	H194X150Xf	H194X150Xf	0.227	1.000	0.227	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
404	H194X150Xf	H194X150Xf	0.296	1.000	0.296	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
407	H194X150Xf	H194X150Xf	0.571	1.000	0.571	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
408	H194X150Xf	H194X150Xf	0.865	1.000	0.865	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
409	H194X150Xf	H194X150Xf	0.517	1.000	0.517	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
411	H194X150Xf	H194X150Xf	0.308	1.000	0.308	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
412	H200X100Xf	H200X100Xf	0.319	1.000	0.319	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
414	H194X150Xf	H194X150Xf	0.249	1.000	0.249	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
415	H194X150Xf	H194X150Xf	0.245	1.000	0.245	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
416	H194X150Xf	H194X150Xf	0.157	1.000	0.157	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
417	H194X150Xf	H194X150Xf	0.155	1.000	0.155	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
418	H300X150Xf	H300X150Xf	0.729	1.000	0.729	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
419	H300X150Xf	H300X150Xf	0.918	1.000	0.918	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
420	H300X150Xf	H300X150Xf	0.683	1.000	0.683	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
421	H300X150Xf	H300X150Xf	0.867	1.000	0.867	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
422	H300X150Xf	H300X150Xf	0.445	1.000	0.445	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
423	H300X150Xf	H300X150Xf	0.442	1.000	0.442	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
424	H300X150Xf	H300X150Xf	0.448	1.000	0.448	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
425	H300X150Xf	H300X150Xf	0.860	1.000	0.860	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
426	H300X150Xf	H300X150Xf	0.477	1.000	0.477	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
427	H300X150Xf	H300X150Xf	0.453	1.000	0.453	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
428	H194X150Xf	H194X150Xf	0.286	1.000	0.286	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
429	H300X150Xf	H300X150Xf	0.938	1.000	0.938	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
430	H194X150Xf	H194X150Xf	0.345	1.000	0.345	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
431	H194X150Xf	H194X150Xf	0.117	1.000	0.117	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
432	H194X150Xf	H194X150Xf	0.367	1.000	0.367	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
433	H194X150Xf	H194X150Xf	0.275	1.000	0.275	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
434	H194X150Xf	H194X150Xf	0.251	1.000	0.251	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
435	H194X150Xf	H194X150Xf	0.406	1.000	0.406	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
436	H194X150Xf	H194X150Xf	0.365	1.000	0.365	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
437	H194X150Xf	H194X150Xf	0.345	1.000	0.345	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
438	H194X150Xf	H194X150Xf	0.264	1.000	0.264	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
439	H194X150Xf	H194X150Xf	0.427	1.000	0.427	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
440	H194X150Xf	H194X150Xf	0.297	1.000	0.297	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
441	H194X150Xf	H194X150Xf	0.274	1.000	0.274	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
442	H194X150Xf	H194X150Xf	0.408	1.000	0.408	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
443	H194X150Xf	H194X150Xf	0.238	1.000	0.238	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
444	H194X150Xf	H194X150Xf	0.181	1.000	0.181	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
445	H300X150Xf	H300X150Xf	0.726	1.000	0.726	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
446	H300X150Xf	H300X150Xf	0.702	1.000	0.702	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
447	H194X150Xf	H194X150Xf	0.517	1.000	0.517	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
448	H194X150Xf	H194X150Xf	0.782	1.000	0.782	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
449	H194X150Xf	H194X150Xf	0.691	1.000	0.691	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
450	H194X150Xf	H194X150Xf	0.514	1.000	0.514	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
451	H194X150Xf	H194X150Xf	0.251	1.000	0.251	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
452	H194X150Xf	H194X150Xf	0.223	1.000	0.223	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
453	H200X100Xf	H200X100Xf	0.276	1.000	0.276	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
454	H200X100Xf	H200X100Xf	0.174	1.000	0.174	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
455	H200X100Xf	H200X100Xf	0.385	1.000	0.385	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
456	H200X100Xf	H200X100Xf	0.375	1.000	0.375	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
457	H200X100Xf	H200X100Xf	0.249	1.000	0.249	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
458	H300X150Xf	H300X150Xf	0.367	1.000	0.367	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
459	H200X100Xf	H200X100Xf	0.072	1.000	0.072	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
460	H300X150Xf	H300X150Xf	0.252	1.000	0.252	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
461	H200X100Xf	H200X100Xf	0.064	1.000	0.064	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
462	H200X100Xf	H200X100Xf	0.217	1.000	0.217	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
463	H200X100Xf	H200X100Xf	0.206	1.000	0.206	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
464	H194X150Xf	H194X150Xf	0.481	1.000	0.481	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
465	H200X100Xf	H200X100Xf	0.628	1.000	0.628	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
466	H194X150Xf	H194X150Xf	0.128	1.000	0.128	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
467	H194X150Xf	H194X150Xf	0.715	1.000	0.715	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
468	H200X100Xf	H200X100Xf	0.205	1.000	0.205	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
469	H194X150Xf	H194X150Xf	0.248	1.000	0.248	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
470	H300X150Xf	H300X150Xf	0.301	1.000	0.301	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
471	H194X150Xf	H194X150Xf	0.478	1.000	0.478	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
472	H300X150Xf	H300X150Xf	0.238	1.000	0.238	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
473	H300X150Xf	H300X150Xf	0.655	1.000	0.655	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
474	H300X150Xf	H300X150Xf	0.735	1.000	0.735	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
475	H194X150Xf	H194X150Xf	0.463	1.000	0.463	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
476	H194X150Xf	H194X150Xf	0.423	1.000	0.423	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
477	H300X150Xf	H300X150Xf	0.275	1.000	0.275	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
478	H300X150Xf	H300X150Xf	1.007	1.000	1.007	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
479	H300X150Xf	H300X150Xf	0.465	1.000	0.465	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
480	H194X150Xf	H194X150Xf	0.246	1.000	0.246	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
481	H194X150Xf	H194X150Xf	0.329	1.000	0.329	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
482	H300X150Xf	H300X150Xf	0.384	1.000	0.384	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
483	H200X100Xf	H200X100Xf	0.240	1.000	0.240	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
484	H194X150Xf	H194X150Xf	0.150	1.000	0.150	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
489	H200X100Xf	H200X100Xf	0.307	1.000	0.307	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
490	H194X150Xf	H194X150Xf	0.475	1.000	0.475	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
491	H194X150Xf	H194X150Xf	0.415	1.000	0.415	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
492	H300X150Xf	H300X150Xf	0.693	1.000	0.693	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
493	H194X150Xf	H194X150Xf	0.236	1.000	0.236	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
494	H194X150Xf	H194X150Xf	0.312	1.000	0.312	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
495	H194X150Xf	H194X150Xf	0.211	1.000	0.211	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
499	H150X150X	H150X150X	0.581	1.000	0.581	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
500	H200X204X	H200X204X	0.601	1.000	0.601	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
501	H150X150X	H150X150X	0.750	1.000	0.750	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
502	H200X204X	H200X204X	1.033	1.000	1.033	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
503	H200X204X	H200X204X	0.739	1.000	0.739	AISC- H1-2	7	71.530	4.98E+3	1.7E+3	33.600
504	H200X204X	H200X204X	0.569	1.000	0.569	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
505	H200X204X	H200X204X	0.730	1.000	0.730	AISC- H1-2	7	71.530	4.98E+3	1.7E+3	33.600
506	H200X204X	H200X204X	0.555	1.000	0.555	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
507	H200X204X	H200X204X	0.570	1.000	0.570	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
508	H200X204X	H200X204X	1.164	1.000	1.164	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
509	H150X150X	H150X150X	0.425	1.000	0.425	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
510	H200X204X	H200X204X	1.039	1.000	1.039	AISC- H1-2	7	71.530	4.98E+3	1.7E+3	33.600
512	H200X204X	H200X204X	0.903	1.000	0.903	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
513	H200X204X	H200X204X	0.499	1.000	0.499	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
514	H200X204X	H200X204X	0.488	1.000	0.488	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
515	H200X204X	H200X204X	0.628	1.000	0.628	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
516	H150X150X	H150X150X	0.573	1.000	0.573	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
517	H150X150X	H150X150X	0.599	1.000	0.599	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
518	H150X150X	H150X150X	0.636	1.000	0.636	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
519	H150X150X	H150X150X	0.660	1.000	0.660	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
520	H150X150X	H150X150X	0.359	1.000	0.359	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
521	H150X150X	H150X150X	0.314	1.000	0.314	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
522	H150X150X	H150X150X	0.268	1.000	0.268	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
523	H150X150X	H150X150X	0.305	1.000	0.305	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
524	H150X150X	H150X150X	0.339	1.000	0.339	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
525	H150X150X	H150X150X	0.349	1.000	0.349	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
526	H150X150X	H150X150X	0.413	1.000	0.413	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
527	H150X150X	H150X150X	0.656	1.000	0.656	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
528	H150X150X	H150X150X	0.415	1.000	0.415	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
529	H150X150X	H150X150X	0.142	1.000	0.142	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
530	H150X150X	H150X150X	0.189	1.000	0.189	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
531	H150X150X	H150X150X	0.202	1.000	0.202	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
532	H150X150X	H150X150X	0.363	1.000	0.363	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
533	H150X150X	H150X150X	0.189	1.000	0.189	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
534	H150X150X	H150X150X	0.183	1.000	0.183	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
535	H150X150X	H150X150X	0.428	1.000	0.428	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
536	H150X150X	H150X150X	0.074	1.000	0.074	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
539	H150X150X	H150X150X	0.661	1.000	0.661	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
540	H150X150X	H150X150X	0.359	1.000	0.359	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
541	H150X150X	H150X150X	0.135	1.000	0.135	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
542	H150X150X	H150X150X	0.150	1.000	0.150	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
543	H150X150X	H150X150X	0.586	1.000	0.586	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
544	H150X150X	H150X150X	0.487	1.000	0.487	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
545	H150X150X	H150X150X	0.117	1.000	0.117	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
547	H150X150X	H150X150X	0.329	1.000	0.329	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500

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Job Title Talad Sookmak		Part ST-01		
Client Talad Sookmak		Ref 01		
		By PAP	Date 09-Jun-15	Chd SB
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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
548	H150X150X	H150X150X	0.570	1.000	0.570	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
552	H150X150X	H150X150X	0.858	1.000	0.858	AISC- H1-2	7	39.650	1.62E+3	563.000	11.500
554	H194X150X	H194X150X	0.204	1.000	0.204	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
555	H194X150X	H194X150X	0.169	1.000	0.169	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
556	H194X150X	H194X150X	0.227	1.000	0.227	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
557	H194X150X	H194X150X	0.072	1.000	0.072	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
558	H194X150X	H194X150X	0.071	1.000	0.071	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
559	H194X150X	H194X150X	0.154	1.000	0.154	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
560	H194X150X	H194X150X	0.454	1.000	0.454	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
561	H194X150X	H194X150X	0.218	1.000	0.218	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
562	H194X150X	H194X150X	0.237	1.000	0.237	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
563	H194X150X	H194X150X	0.964	1.000	0.964	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
564	H194X150X	H194X150X	0.341	1.000	0.341	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
565	H194X150X	H194X150X	0.356	1.000	0.356	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
566	H194X150X	H194X150X	0.363	1.000	0.363	AISC- H2-1	7	38.110	2.63E+3	507.000	8.600
567	H194X150X	H194X150X	0.256	1.000	0.256	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
765	H200X100X	H200X100X	0.148	1.000	0.148	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
766	H200X100X	H200X100X	0.082	1.000	0.082	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
767	H200X100X	H200X100X	0.108	1.000	0.108	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
768	H200X100X	H200X100X	0.289	1.000	0.289	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
769	H200X100X	H200X100X	0.063	1.000	0.063	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
770	H200X100X	H200X100X	0.085	1.000	0.085	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
771	H200X100X	H200X100X	0.090	1.000	0.090	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
772	H200X100X	H200X100X	0.243	1.000	0.243	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
773	H200X100X	H200X100X	1.004	1.000	1.004	L/R-EXCEED	7	26.670	1.81E+3	134.000	4.400
774	H200X100X	H200X100X	0.107	1.000	0.107	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
775	H200X100X	H200X100X	0.059	1.000	0.059	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
776	H200X100X	H200X100X	0.128	1.000	0.128	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
777	H200X100X	H200X100X	0.081	1.000	0.081	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
778	H200X100X	H200X100X	0.150	1.000	0.150	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
779	H200X100X	H200X100X	0.607	1.000	0.607	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
780	H200X100X	H200X100X	0.032	1.000	0.032	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
781	H200X100X	H200X100X	0.129	1.000	0.129	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
782	H200X100X	H200X100X	0.279	1.000	0.279	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
783	H200X100X	H200X100X	0.086	1.000	0.086	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
784	H200X100X	H200X100X	0.092	1.000	0.092	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
785	H200X100X	H200X100X	0.055	1.000	0.055	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
786	H200X100X	H200X100X	0.071	1.000	0.071	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
787	H200X100X	H200X100X	0.119	1.000	0.119	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
788	H200X100X	H200X100X	0.097	1.000	0.097	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
789	H200X100X	H200X100X	0.193	1.000	0.193	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
790	H200X100X	H200X100X	0.246	1.000	0.246	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
791	H200X100X	H200X100X	0.123	1.000	0.123	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
792	H200X100X	H200X100X	0.082	1.000	0.082	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
793	H200X100X	H200X100X	0.035	1.000	0.035	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
794	H200X100X!	H200X100X!	0.061	1.000	0.061	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
795	H200X100X!	H200X100X!	0.082	1.000	0.082	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
796	H200X100X!	H200X100X!	0.053	1.000	0.053	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
797	H200X100X!	H200X100X!	0.069	1.000	0.069	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
798	H200X100X!	H200X100X!	0.452	1.000	0.452	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
799	H200X100X!	H200X100X!	0.503	1.000	0.503	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
800	H200X100X!	H200X100X!	0.266	1.000	0.266	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
801	H200X100X!	H200X100X!	0.311	1.000	0.311	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
802	H200X100X!	H200X100X!	0.341	1.000	0.341	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
803	H200X100X!	H200X100X!	0.185	1.000	0.185	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
804	H200X100X!	H200X100X!	0.403	1.000	0.403	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
805	H200X100X!	H200X100X!	0.396	1.000	0.396	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
806	H200X100X!	H200X100X!	0.379	1.000	0.379	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
807	H200X100X!	H200X100X!	0.383	1.000	0.383	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
808	H200X100X!	H200X100X!	0.091	1.000	0.091	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
809	H200X100X!	H200X100X!	1.338	1.000	1.338	L/R-EXCEED!	7	26.670	1.81E+3	134.000	4.400
810	H200X100X!	H200X100X!	0.198	1.000	0.198	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
811	H200X100X!	H200X100X!	0.055	1.000	0.055	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
812	H200X100X!	H200X100X!	0.064	1.000	0.064	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
813	H200X100X!	H200X100X!	0.140	1.000	0.140	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
814	H200X100X!	H200X100X!	0.076	1.000	0.076	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
815	H200X100X!	H200X100X!	0.079	1.000	0.079	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
816	H200X100X!	H200X100X!	0.186	1.000	0.186	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
817	H200X100X!	H200X100X!	0.103	1.000	0.103	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
818	H200X100X!	H200X100X!	0.080	1.000	0.080	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
819	H200X100X!	H200X100X!	0.121	1.000	0.121	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
820	H200X100X!	H200X100X!	0.122	1.000	0.122	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
821	H200X100X!	H200X100X!	0.059	1.000	0.059	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
822	H200X100X!	H200X100X!	0.116	1.000	0.116	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
823	H200X100X!	H200X100X!	0.114	1.000	0.114	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
824	H200X100X!	H200X100X!	0.043	1.000	0.043	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
825	H200X100X!	H200X100X!	1.004	1.000	1.004	L/R-EXCEED!	7	26.670	1.81E+3	134.000	4.400
826	H200X100X!	H200X100X!	1.004	1.000	1.004	L/R-EXCEED!	7	26.670	1.81E+3	134.000	4.400
827	H200X100X!	H200X100X!	0.131	1.000	0.131	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
828	H200X100X!	H200X100X!	0.180	1.000	0.180	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
829	H200X100X!	H200X100X!	0.139	1.000	0.139	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
830	H200X100X!	H200X100X!	0.136	1.000	0.136	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
831	H200X100X!	H200X100X!	0.049	1.000	0.049	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
832	H200X100X!	H200X100X!	0.042	1.000	0.042	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
833	H200X100X!	H200X100X!	0.042	1.000	0.042	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
834	H200X100X!	H200X100X!	0.047	1.000	0.047	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
835	H200X100X!	H200X100X!	0.041	1.000	0.041	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
836	H200X100X!	H200X100X!	0.044	1.000	0.044	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
837	H200X100X!	H200X100X!	0.043	1.000	0.043	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
838	H200X100X!	H200X100X!	0.183	1.000	0.183	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
839	H200X100X!	H200X100X!	0.007	1.000	0.007	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
840	H200X100X!	H200X100X!	0.082	1.000	0.082	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
841	H200X100X!	H200X100X!	0.007	1.000	0.007	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
842	H200X100X!	H200X100X!	0.043	1.000	0.043	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
843	H200X100X!	H200X100X!	0.042	1.000	0.042	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
844	H200X100X!	H200X100X!	0.175	1.000	0.175	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
845	H200X100X!	H200X100X!	0.088	1.000	0.088	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
846	H200X100X!	H200X100X!	0.011	1.000	0.011	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
847	H200X100X!	H200X100X!	0.311	1.000	0.311	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
848	H200X100X!	H200X100X!	0.041	1.000	0.041	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
849	H200X100X!	H200X100X!	0.081	1.000	0.081	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
850	H200X100X!	H200X100X!	0.291	1.000	0.291	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
851	H200X100X!	H200X100X!	0.107	1.000	0.107	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
852	H200X100X!	H200X100X!	0.141	1.000	0.141	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
853	H200X100X!	H200X100X!	0.449	1.000	0.449	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
854	H200X100X!	H200X100X!	0.084	1.000	0.084	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
855	H200X100X!	H200X100X!	0.176	1.000	0.176	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
856	H200X100X!	H200X100X!	0.193	1.000	0.193	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
857	H200X100X!	H200X100X!	0.092	1.000	0.092	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
858	H200X100X!	H200X100X!	0.571	1.000	0.571	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
859	H200X100X!	H200X100X!	0.198	1.000	0.198	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
860	H200X100X!	H200X100X!	0.069	1.000	0.069	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
861	H200X100X!	H200X100X!	0.066	1.000	0.066	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
862	H200X100X!	H200X100X!	0.144	1.000	0.144	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
863	H200X100X!	H200X100X!	0.036	1.000	0.036	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
864	H200X100X!	H200X100X!	0.091	1.000	0.091	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
865	H200X100X!	H200X100X!	0.040	1.000	0.040	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
866	H200X100X!	H200X100X!	0.085	1.000	0.085	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
867	H200X100X!	H200X100X!	0.071	1.000	0.071	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
868	H200X100X!	H200X100X!	0.223	1.000	0.223	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
869	H200X100X!	H200X100X!	0.123	1.000	0.123	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
870	H200X100X!	H200X100X!	0.123	1.000	0.123	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
871	H200X100X!	H200X100X!	0.101	1.000	0.101	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
872	H150X150X!	H150X150X!	0.390	1.000	0.390	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
873	H200X204X!	H200X204X!	0.299	1.000	0.299	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
874	H150X150X!	H150X150X!	0.490	1.000	0.490	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
875	H200X204X!	H200X204X!	0.657	1.000	0.657	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
876	H200X204X!	H200X204X!	0.416	1.000	0.416	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
877	H200X204X!	H200X204X!	0.397	1.000	0.397	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
878	H200X204X!	H200X204X!	0.427	1.000	0.427	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
879	H200X204X!	H200X204X!	0.362	1.000	0.362	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
880	H200X204X!	H200X204X!	0.291	1.000	0.291	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
881	H200X204X!	H200X204X!	0.699	1.000	0.699	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
882	H150X150X!	H150X150X!	0.263	1.000	0.263	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
883	H200X204X!	H200X204X!	0.631	1.000	0.631	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
885	H200X204X	H200X204X	0.606	1.000	0.606	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
886	H200X204X	H200X204X	0.306	1.000	0.306	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
887	H200X204X	H200X204X	0.285	1.000	0.285	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
888	H200X204X	H200X204X	0.427	1.000	0.427	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
889	H150X150X	H150X150X	0.337	1.000	0.337	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
890	H150X150X	H150X150X	0.392	1.000	0.392	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
891	H150X150X	H150X150X	0.300	1.000	0.300	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
893	H150X150X	H150X150X	0.103	1.000	0.103	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
894	H150X150X	H150X150X	0.139	1.000	0.139	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
895	H150X150X	H150X150X	0.054	1.000	0.054	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
896	H150X150X	H150X150X	0.172	1.000	0.172	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
897	H150X150X	H150X150X	0.166	1.000	0.166	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
898	H150X150X	H150X150X	0.276	1.000	0.276	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
899	H150X150X	H150X150X	0.085	1.000	0.085	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
900	H150X150X	H150X150X	0.535	1.000	0.535	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
902	H200X100X	H200X100X	0.072	1.000	0.072	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
903	H200X100X	H200X100X	0.148	1.000	0.148	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
904	H200X100X	H200X100X	0.145	1.000	0.145	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
905	H200X100X	H200X100X	0.036	1.000	0.036	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
906	H200X100X	H200X100X	0.032	1.000	0.032	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
907	H200X100X	H200X100X	0.088	1.000	0.088	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
908	H200X100X	H200X100X	0.161	1.000	0.161	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
909	H200X100X	H200X100X	0.084	1.000	0.084	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
910	H200X100X	H200X100X	0.060	1.000	0.060	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
911	H200X100X	H200X100X	0.345	1.000	0.345	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
912	H200X100X	H200X100X	0.111	1.000	0.111	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
913	H200X100X	H200X100X	0.068	1.000	0.068	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
914	H200X100X	H200X100X	0.103	1.000	0.103	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
915	H200X100X	H200X100X	0.084	1.000	0.084	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
958	H200X204X	H200X204X	0.175	1.000	0.175	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
959	H200X204X	H200X204X	0.176	1.000	0.176	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
960	H200X204X	H200X204X	0.190	1.000	0.190	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
961	H200X204X	H200X204X	0.190	1.000	0.190	AISC- H1-3	7	71.530	4.98E+3	1.7E+3	33.600
962	H200X100X	H200X100X	1.338	1.000	1.338	L/R-EXCEED!	7	26.670	1.81E+3	134.000	4.400
963	H200X100X	H200X100X	1.338	1.000	1.338	L/R-EXCEED!	7	26.670	1.81E+3	134.000	4.400
964	H200X100X	H200X100X	0.188	1.000	0.188	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
965	H200X100X	H200X100X	0.193	1.000	0.193	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
966	H200X100X	H200X100X	0.188	1.000	0.188	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
967	H200X100X	H200X100X	0.188	1.000	0.188	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
968	H200X100X	H200X100X	0.053	1.000	0.053	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
969	H200X100X	H200X100X	0.189	1.000	0.189	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
970	H200X100X	H200X100X	0.187	1.000	0.187	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
971	H200X100X	H200X100X	0.055	1.000	0.055	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
972	H200X100X	H200X100X	0.217	1.000	0.217	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
973	H200X100X	H200X100X	0.218	1.000	0.218	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
974	H200X100X!	H200X100X!	0.020	1.000	0.020	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
975	H200X100X!	H200X100X!	0.021	1.000	0.021	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
976	H200X100X!	H200X100X!	1.338	1.000	1.338	L/R-EXCEED!	7	26.670	1.81E+3	134.000	4.400
977	H200X100X!	H200X100X!	0.029	1.000	0.029	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
978	H200X100X!	H200X100X!	0.028	1.000	0.028	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
979	H200X100X!	H200X100X!	0.218	1.000	0.218	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
980	H200X100X!	H200X100X!	0.218	1.000	0.218	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
981	H200X100X!	H200X100X!	0.020	1.000	0.020	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
982	H200X100X!	H200X100X!	0.019	1.000	0.019	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
983	H200X100X!	H200X100X!	1.338	1.000	1.338	L/R-EXCEED!	7	26.670	1.81E+3	134.000	4.400
984	H200X100X!	H200X100X!	0.029	1.000	0.029	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
985	H200X100X!	H200X100X!	0.029	1.000	0.029	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
997	H200X100X!	H200X100X!	0.088	1.000	0.088	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
998	H200X100X!	H200X100X!	0.232	1.000	0.232	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
999	H200X100X!	H200X100X!	0.110	1.000	0.110	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1000	H200X100X!	H200X100X!	0.264	1.000	0.264	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1001	H200X100X!	H200X100X!	0.124	1.000	0.124	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1002	H200X100X!	H200X100X!	0.009	1.000	0.009	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1003	H200X100X!	H200X100X!	0.144	1.000	0.144	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1004	H200X100X!	H200X100X!	0.144	1.000	0.144	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1009	H200X100X!	H200X100X!	0.037	1.000	0.037	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1010	H200X100X!	H200X100X!	0.072	1.000	0.072	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1012	H200X100X!	H200X100X!	0.070	1.000	0.070	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1013	H200X100X!	H200X100X!	0.074	1.000	0.074	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1014	H200X100X!	H200X100X!	0.200	1.000	0.200	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1015	H200X100X!	H200X100X!	0.101	1.000	0.101	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1016	H200X100X!	H200X100X!	0.090	1.000	0.090	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1017	H200X100X!	H200X100X!	0.061	1.000	0.061	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1018	H200X100X!	H200X100X!	0.082	1.000	0.082	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1019	H200X100X!	H200X100X!	0.045	1.000	0.045	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1020	H200X100X!	H200X100X!	0.072	1.000	0.072	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1021	H200X100X!	H200X100X!	0.043	1.000	0.043	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1022	H200X100X!	H200X100X!	0.016	1.000	0.016	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1023	H200X100X!	H200X100X!	0.070	1.000	0.070	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1024	H200X100X!	H200X100X!	0.064	1.000	0.064	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1025	H200X100X!	H200X100X!	0.036	1.000	0.036	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1026	H200X100X!	H200X100X!	0.053	1.000	0.053	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1027	H300X150X!	H300X150X!	0.092	1.000	0.092	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
1028	H200X100X!	H200X100X!	0.031	1.000	0.031	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1029	H200X100X!	H200X100X!	0.023	1.000	0.023	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1032	H300X150X!	H300X150X!	0.188	1.000	0.188	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
1033	H300X150X!	H300X150X!	0.118	1.000	0.118	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
1034	H300X150X!	H300X150X!	0.113	1.000	0.113	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
1035	H300X150X!	H300X150X!	0.094	1.000	0.094	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
1036	H300X150X!	H300X150X!	0.278	1.000	0.278	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
1037	H300X150X	H300X150X	0.114	1.000	0.114	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
1038	H300X150X	H300X150X	0.112	1.000	0.112	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
1039	H300X150X	H300X150X	0.126	1.000	0.126	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
1040	H200X100X	H200X100X	0.095	1.000	0.095	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1041	H200X100X	H200X100X	0.070	1.000	0.070	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1042	H200X100X	H200X100X	0.045	1.000	0.045	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1043	H200X100X	H200X100X	0.045	1.000	0.045	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1044	H200X100X	H200X100X	0.015	1.000	0.015	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1045	H200X100X	H200X100X	0.037	1.000	0.037	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1046	H200X100X	H200X100X	0.078	1.000	0.078	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1047	H200X100X	H200X100X	0.045	1.000	0.045	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1048	H200X100X	H200X100X	0.031	1.000	0.031	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1049	H200X100X	H200X100X	0.051	1.000	0.051	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1050	H200X100X	H200X100X	0.037	1.000	0.037	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1051	H200X100X	H200X100X	0.036	1.000	0.036	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1052	H200X100X	H200X100X	0.028	1.000	0.028	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1053	H200X100X	H200X100X	0.084	1.000	0.084	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1068	H150X150X	H150X150X	0.183	1.000	0.183	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1069	H150X150X	H150X150X	0.133	1.000	0.133	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1070	H150X150X	H150X150X	0.312	1.000	0.312	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1074	H200X100X	H200X100X	0.556	1.000	0.556	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1075	H200X100X	H200X100X	0.278	1.000	0.278	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1077	H200X100X	H200X100X	0.100	1.000	0.100	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1079	H200X100X	H200X100X	0.668	1.000	0.668	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1080	H200X100X	H200X100X	0.703	1.000	0.703	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1081	H200X100X	H200X100X	0.248	1.000	0.248	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1082	H200X100X	H200X100X	0.711	1.000	0.711	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1083	H200X100X	H200X100X	0.034	1.000	0.034	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1085	H200X100X	H200X100X	0.710	1.000	0.710	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1086	H200X100X	H200X100X	0.033	1.000	0.033	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1087	H200X100X	H200X100X	0.733	1.000	0.733	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1088	H200X100X	H200X100X	0.363	1.000	0.363	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1089	H200X100X	H200X100X	0.735	1.000	0.735	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1090	H200X100X	H200X100X	0.065	1.000	0.065	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1091	H200X100X	H200X100X	0.066	1.000	0.066	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1092	H200X100X	H200X100X	0.388	1.000	0.388	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1093	H200X100X	H200X100X	0.389	1.000	0.389	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1094	H200X100X	H200X100X	0.323	1.000	0.323	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1095	H200X100X	H200X100X	0.324	1.000	0.324	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1104	H150X150X	H150X150X	0.077	1.000	0.077	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1105	H150X150X	H150X150X	0.086	1.000	0.086	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1106	H150X150X	H150X150X	0.042	1.000	0.042	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1108	H150X150X	H150X150X	0.080	1.000	0.080	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1109	H200X100X	H200X100X	0.126	1.000	0.126	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1110	H200X100X	H200X100X	0.131	1.000	0.131	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
1111	H200X100X!	H200X100X!	0.134	1.000	0.134	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1112	H200X100X!	H200X100X!	0.128	1.000	0.128	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1113	H200X100X!	H200X100X!	0.272	1.000	0.272	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1114	H200X100X!	H200X100X!	0.005	1.000	0.005	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1115	H200X100X!	H200X100X!	0.044	1.000	0.044	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1116	H150X150X!	H150X150X!	0.234	1.000	0.234	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1117	H200X100X!	H200X100X!	0.022	1.000	0.022	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1118	H200X100X!	H200X100X!	0.015	1.000	0.015	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1119	H200X100X!	H200X100X!	0.028	1.000	0.028	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1120	H200X100X!	H200X100X!	0.020	1.000	0.020	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1121	H200X100X!	H200X100X!	0.029	1.000	0.029	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1122	H200X100X!	H200X100X!	0.036	1.000	0.036	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1123	H200X100X!	H200X100X!	0.301	1.000	0.301	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1124	H200X100X!	H200X100X!	0.482	1.000	0.482	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1125	H194X150X!	H194X150X!	0.087	1.000	0.087	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
1126	H200X100X!	H200X100X!	0.084	1.000	0.084	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1130	H150X150X!	H150X150X!	0.282	1.000	0.282	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1133	TUB100100!	TUB100100!	0.642	1.000	0.642	AISC- H2-1	7	12.130	187.000	187.000	290.250
1135	H200X100X!	H200X100X!	0.258	1.000	0.258	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1136	H200X100X!	H200X100X!	0.160	1.000	0.160	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1137	H200X100X!	H200X100X!	0.223	1.000	0.223	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1138	H200X100X!	H200X100X!	0.249	1.000	0.249	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1139	H200X100X!	H200X100X!	0.248	1.000	0.248	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1140	H200X100X!	H200X100X!	0.247	1.000	0.247	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1141	H200X100X!	H200X100X!	0.249	1.000	0.249	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1142	H200X100X!	H200X100X!	0.228	1.000	0.228	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1143	H200X100X!	H200X100X!	0.170	1.000	0.170	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1144	H200X100X!	H200X100X!	0.240	1.000	0.240	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1145	H200X100X!	H200X100X!	0.417	1.000	0.417	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1146	TUB100100!	TUB100100!	0.267	1.000	0.267	AISC- H2-1	7	12.130	187.000	187.000	290.250
1147	TUB100100!	TUB100100!	0.307	1.000	0.307	AISC- H2-1	7	12.130	187.000	187.000	290.250
1148	TUB100100!	TUB100100!	0.313	1.000	0.313	AISC- H2-1	7	12.130	187.000	187.000	290.250
1149	TUB100100!	TUB100100!	0.282	1.000	0.282	AISC- H2-1	7	12.130	187.000	187.000	290.250
1150	TUB100100!	TUB100100!	0.225	1.000	0.225	AISC- H2-1	7	12.130	187.000	187.000	290.250
1151	TUB100100!	TUB100100!	0.206	1.000	0.206	AISC- H2-1	7	12.130	187.000	187.000	290.250
1152	TUB100100!	TUB100100!	0.268	1.000	0.268	AISC- H2-1	7	12.130	187.000	187.000	290.250
1153	TUB100100!	TUB100100!	0.303	1.000	0.303	AISC- H2-1	7	12.130	187.000	187.000	290.250
1154	TUB100100!	TUB100100!	0.304	1.000	0.304	AISC- H2-1	7	12.130	187.000	187.000	290.250
1155	TUB100100!	TUB100100!	0.236	1.000	0.236	AISC- H2-1	7	12.130	187.000	187.000	290.250
1156	TUB100100!	TUB100100!	0.749	1.000	0.749	AISC- H2-1	7	12.130	187.000	187.000	290.250
1157	TUB75753.2	TUB75753.2	0.703	1.000	0.703	AISC- H1-3	7	8.927	75.500	75.500	118.440
1158	TUB75753.2	TUB75753.2	0.812	1.000	0.812	AISC- H2-1	7	8.927	75.500	75.500	118.440
1159	TUB75753.2	TUB75753.2	0.749	1.000	0.749	AISC- H1-3	7	8.927	75.500	75.500	118.440
1160	TUB75753.2	TUB75753.2	0.566	1.000	0.566	AISC- H1-3	7	8.927	75.500	75.500	118.440
1161	TUB75753.2	TUB75753.2	0.319	1.000	0.319	AISC- H1-3	7	8.927	75.500	75.500	118.440

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
1162	TUB75753.2	TUB75753.2	0.043	1.000	0.043	AISC- H1-3	7	8.927	75.500	75.500	118.440
1163	TUB75753.2	TUB75753.2	0.249	1.000	0.249	AISC- H1-3	7	8.927	75.500	75.500	118.440
1164	TUB75753.2	TUB75753.2	0.500	1.000	0.500	AISC- H1-3	7	8.927	75.500	75.500	118.440
1165	TUB75753.2	TUB75753.2	0.693	1.000	0.693	AISC- H1-3	7	8.927	75.500	75.500	118.440
1166	TUB75753.2	TUB75753.2	0.772	1.000	0.772	AISC- H2-1	7	8.927	75.500	75.500	118.440
1167	TUB75753.2	TUB75753.2	0.713	1.000	0.713	AISC- H1-3	7	8.927	75.500	75.500	118.440
1168	H150X150X	H150X150X	0.071	1.000	0.071	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1170	TUB100100	TUB100100	0.104	1.000	0.104	AISC- H1-3	7	12.130	187.000	187.000	290.250
1171	TUB100100	TUB100100	0.070	1.000	0.070	AISC- H1-3	7	12.130	187.000	187.000	290.250
1172	H200X100X	H200X100X	0.008	1.000	0.008	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1173	H200X100X	H200X100X	0.018	1.000	0.018	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1174	TUB100100	TUB100100	0.021	1.000	0.021	AISC- H1-3	7	12.130	187.000	187.000	290.250
1175	TUB100100	TUB100100	0.028	1.000	0.028	AISC- H1-3	7	12.130	187.000	187.000	290.250
1176	TUB75753.2	TUB75753.2	0.041	1.000	0.041	AISC- H1-3	7	8.927	75.500	75.500	118.440
1177	TUB75753.2	TUB75753.2	0.029	1.000	0.029	AISC- H2-1	7	8.927	75.500	75.500	118.440
1178	H200X100X	H200X100X	0.018	1.000	0.018	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1179	H200X100X	H200X100X	0.023	1.000	0.023	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1180	H200X100X	H200X100X	0.022	1.000	0.022	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1181	H200X100X	H200X100X	0.022	1.000	0.022	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1182	H200X100X	H200X100X	0.014	1.000	0.014	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1183	TUB100100	TUB100100	0.022	1.000	0.022	AISC- H1-3	7	12.130	187.000	187.000	290.250
1184	TUB100100	TUB100100	0.022	1.000	0.022	AISC- H1-3	7	12.130	187.000	187.000	290.250
1185	TUB100100	TUB100100	0.014	1.000	0.014	AISC- H1-3	7	12.130	187.000	187.000	290.250
1186	TUB100100	TUB100100	0.013	1.000	0.013	AISC- H1-3	7	12.130	187.000	187.000	290.250
1187	TUB100100	TUB100100	0.047	1.000	0.047	AISC- H1-3	7	12.130	187.000	187.000	290.250
1188	TUB75753.2	TUB75753.2	0.071	1.000	0.071	AISC- H1-3	7	8.927	75.500	75.500	118.440
1189	TUB75753.2	TUB75753.2	0.058	1.000	0.058	AISC- H2-1	7	8.927	75.500	75.500	118.440
1190	TUB75753.2	TUB75753.2	0.037	1.000	0.037	AISC- H2-1	7	8.927	75.500	75.500	118.440
1191	TUB75753.2	TUB75753.2	0.019	1.000	0.019	AISC- H2-1	7	8.927	75.500	75.500	118.440
1192	TUB75753.2	TUB75753.2	0.034	1.000	0.034	AISC- H1-3	7	8.927	75.500	75.500	118.440
1193	H200X100X	H200X100X	0.101	1.000	0.101	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1194	H194X150X	H194X150X	0.103	1.000	0.103	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
1195	H200X100X	H200X100X	0.122	1.000	0.122	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1196	H200X100X	H200X100X	0.111	1.000	0.111	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1197	H194X150X	H194X150X	0.073	1.000	0.073	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
1198	H200X100X	H200X100X	0.067	1.000	0.067	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1199	H200X100X	H200X100X	0.099	1.000	0.099	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1233	H200X100X	H200X100X	0.033	1.000	0.033	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1234	H200X100X	H200X100X	0.249	1.000	0.249	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1235	H200X100X	H200X100X	0.549	1.000	0.549	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1238	H200X100X	H200X100X	0.180	1.000	0.180	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1240	H200X100X	H200X100X	0.012	1.000	0.012	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1241	H200X100X	H200X100X	0.032	1.000	0.032	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1242	H200X100X	H200X100X	0.033	1.000	0.033	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1243	H200X100X	H200X100X	0.031	1.000	0.031	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400

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Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
1244	H200X100X!	H200X100X!	0.031	1.000	0.031	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1255	H194X150X!	H194X150X!	0.583	1.000	0.583	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
1256	H200X100X!	H200X100X!	0.032	1.000	0.032	AISC- H2-1	7	26.670	1.81E+3	134.000	4.400
1257	H300X150X!	H300X150X!	0.059	1.000	0.059	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
1258	Cir 0.35	N/A						962.113	73.7E+3	73.7E+3	147E+3
1259	H194X150X!	H194X150X!	0.352	1.000	0.352	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
1260	H194X150X!	H194X150X!	0.347	1.000	0.347	AISC- H1-3	7	38.110	2.63E+3	507.000	8.600
1261	H150X150X!	H150X150X!	0.259	1.000	0.259	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1262	H150X150X!	H150X150X!	0.113	1.000	0.113	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1263	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
1264	Rect 0.40x0.	N/A						1.2E+3	160E+3	90E+3	194E+3
1265	H300X150X!	H300X150X!	0.714	1.000	0.714	AISC- H2-1	7	46.780	7.21E+3	508.000	9.900
1266	H300X150X!	H300X150X!	0.789	1.000	0.789	AISC- H1-3	7	46.780	7.21E+3	508.000	9.900
1267	H200X100X!	H200X100X!	0.200	1.000	0.200	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400
1268	PIP165.2X4.	PIP165.2X4.	0.140	1.000	0.140	AISC- H1-3	7	22.720	734.000	734.000	1.47E+3
1269	H150X150X!	H150X150X!	0.475	1.000	0.475	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1270	H200X204X!	H200X204X!	0.511	1.000	0.511	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1271	H150X150X!	H150X150X!	0.629	1.000	0.629	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1272	H200X204X!	H200X204X!	0.724	1.000	0.724	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1273	H200X204X!	H200X204X!	0.633	1.000	0.633	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1274	H200X204X!	H200X204X!	0.411	1.000	0.411	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1275	H200X204X!	H200X204X!	0.654	1.000	0.654	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1276	H200X204X!	H200X204X!	0.417	1.000	0.417	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1277	H200X204X!	H200X204X!	0.502	1.000	0.502	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1278	H200X204X!	H200X204X!	0.841	1.000	0.841	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1279	H150X150X!	H150X150X!	0.363	1.000	0.363	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1280	H200X204X!	H200X204X!	0.711	1.000	0.711	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1281	H200X204X!	H200X204X!	0.577	1.000	0.577	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1282	H200X204X!	H200X204X!	0.509	1.000	0.509	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1283	H200X204X!	H200X204X!	0.576	1.000	0.576	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1284	H200X204X!	H200X204X!	0.616	1.000	0.616	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1285	H200X204X!	H200X204X!	0.438	1.000	0.438	AISC- H1-1	7	71.530	4.98E+3	1.7E+3	33.600
1286	H200X204X!	H200X204X!	0.500	1.000	0.500	AISC- H1-2	7	71.530	4.98E+3	1.7E+3	33.600
1287	H200X204X!	H200X204X!	0.624	1.000	0.624	AISC- H1-2	7	71.530	4.98E+3	1.7E+3	33.600
1288	H150X150X!	H150X150X!	0.551	1.000	0.551	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1289	H150X150X!	H150X150X!	0.557	1.000	0.557	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1290	H150X150X!	H150X150X!	0.519	1.000	0.519	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1291	H150X150X!	H150X150X!	0.491	1.000	0.491	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1292	H150X150X!	H150X150X!	0.611	1.000	0.611	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1293	H150X150X!	H150X150X!	0.425	1.000	0.425	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1294	H150X150X!	H150X150X!	0.504	1.000	0.504	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1295	H150X150X!	H150X150X!	0.686	1.000	0.686	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1296	H150X150X!	H150X150X!	0.717	1.000	0.717	AISC- H1-2	7	39.650	1.62E+3	563.000	11.500
1297	H150X150X!	H150X150X!	0.621	1.000	0.621	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1298	H150X150X!	H150X150X!	0.269	1.000	0.269	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500

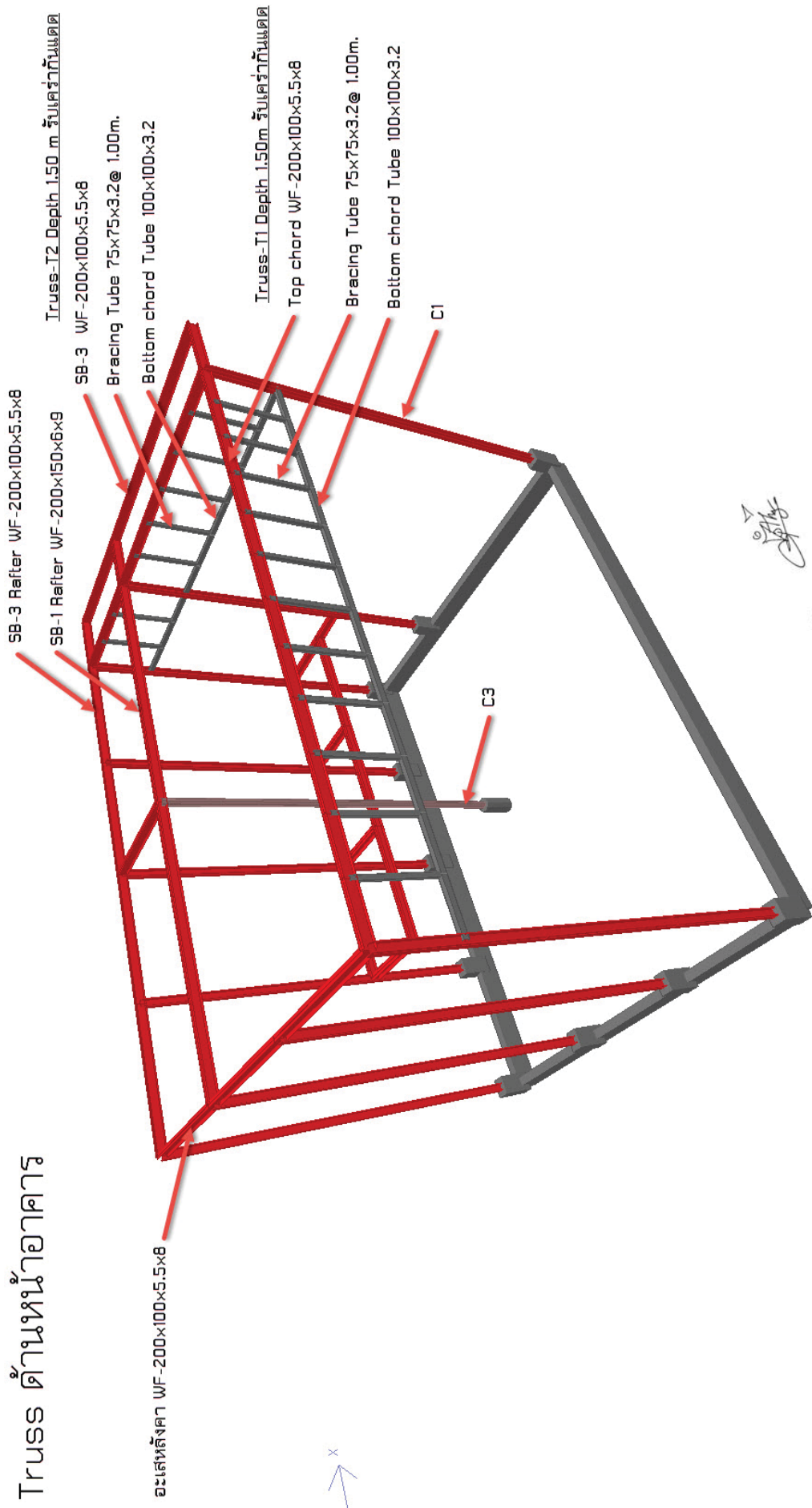
Software licensed to CET engineering.co.,ltd.		Job No PT-01	Sheet No 31	Rev 01
Job Title Talad Sookmak		Part ST-01		
Client Talad Sookmak		Ref 01		
		By PAP	Date 09-Jun-15	Chd SB
		File Structure1.std	Date/Time 13-Jun-2015 15:26	

Utilization Ratio Cont...

Beam	Analysis Property	Design Property	Actual Allowable		Ratio (Act./Allow.)	Clause	L/C	Ax (cm ²)	Iz (cm ⁴)	Iy (cm ⁴)	Ix (cm ⁴)
			Ratio	Ratio							
1299	H150X150X	H150X150X	0.540	1.000	0.540	AISC- H1-2	7	39.650	1.62E+3	563.000	11.500
1300	H150X150X	H150X150X	0.665	1.000	0.665	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1301	H150X150X	H150X150X	0.666	1.000	0.666	AISC- H1-2	7	39.650	1.62E+3	563.000	11.500
1302	H150X150X	H150X150X	0.420	1.000	0.420	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1303	H150X150X	H150X150X	0.695	1.000	0.695	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1304	H150X150X	H150X150X	0.655	1.000	0.655	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1305	H150X150X	H150X150X	0.208	1.000	0.208	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1306	H150X150X	H150X150X	0.468	1.000	0.468	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1307	H150X150X	H150X150X	0.704	1.000	0.704	AISC- H1-2	7	39.650	1.62E+3	563.000	11.500
1308	H150X150X	H150X150X	0.638	1.000	0.638	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1309	H150X150X	H150X150X	0.158	1.000	0.158	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1310	H150X150X	H150X150X	0.527	1.000	0.527	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1311	H150X150X	H150X150X	0.704	1.000	0.704	AISC- H1-2	7	39.650	1.62E+3	563.000	11.500
1312	H150X150X	H150X150X	0.717	1.000	0.717	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1313	H150X150X	H150X150X	0.192	1.000	0.192	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1314	H150X150X	H150X150X	0.576	1.000	0.576	AISC- H1-2	7	39.650	1.62E+3	563.000	11.500
1315	H150X150X	H150X150X	0.792	1.000	0.792	AISC- H1-2	7	39.650	1.62E+3	563.000	11.500
1319	H150X150X	H150X150X	0.641	1.000	0.641	AISC- H1-1	7	39.650	1.62E+3	563.000	11.500
1320	H150X150X	H150X150X	0.531	1.000	0.531	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1321	H150X150X	H150X150X	0.190	1.000	0.190	AISC- H1-3	7	39.650	1.62E+3	563.000	11.500
1322	PIP165.2X4	PIP165.2X4	0.458	1.000	0.458	AISC- H1-1	7	22.720	734.000	734.000	1.47E+3
1323	PIP165.2X4	PIP165.2X4	0.097	1.000	0.097	AISC- H1-3	7	22.720	734.000	734.000	1.47E+3
1324	PIP165.2X4	PIP165.2X4	0.434	1.000	0.434	AISC- H1-1	7	22.720	734.000	734.000	1.47E+3
1325	H200X100X	H200X100X	0.030	1.000	0.030	AISC- H1-3	7	26.670	1.81E+3	134.000	4.400

ปณิธิ พรหมสาขา ณ สกลนคร สย 9187

Truss ด้านหน้าอาคาร



Truss-T2 Depth 1.50 m รับตรงข้ามกันแดด

SB-3 WF-200x100x5.5x8

Bracing Tube 75x75x3.2@ 1.00m.

Bottom chord Tube 100x100x3.2

Truss-T1 Depth 1.50m. รับตรงข้ามกันแดด

Top chord WF-200x100x5.5x8

Bracing Tube 75x75x3.2@ 1.00m.

Bottom chord Tube 100x100x3.2

SB-3 Rafter WF-200x100x5.5x8

SB-1 Rafter WF-200x150x6x9

อะเสหตั้งคา WF-200x100x5.5x8

x

1102 วิศวกรสถาปัตย์ หรือ วิศวกร (ร.ก. 918)

VisStructure 4

(สงานลิขสิทธ์)

วิศวกร : ปณิธิ พรหมสาขา ณ สกลนคร

Rectangular Column

ชื่อโครงการ : ตลาดสุขุมวิท

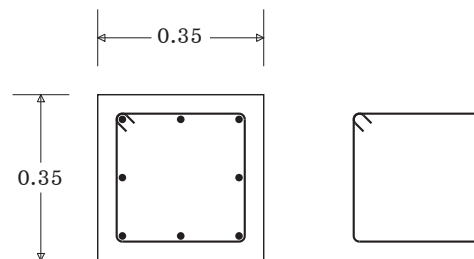
ชื่อเสา : C1

Input Data

คอนกรีตหุ้มเหล็ก	=	4	ซม.
กำลังอัดของคอนกรีต	f_c'	=	210 กก./ตร.ซม.
กำลังดลากของเหล็กปลอก	f_y	=	2,400 กก./ตร.ซม.
กำลังดลากของเหล็กเสริมเอก	f_y	=	3,000 กก./ตร.ซม.
เส้นผ่าศูนย์กลางเหล็กปลอก	=	6	มม.
เส้นผ่าศูนย์กลางเหล็กเสริมเอก	=	16	มม.
โมเมนต์รอบแกน X	M_x	=	1,600 กก.-ม.
โมเมนต์รอบแกน Y	M_y	=	0 กก.-ม.
หน้าตัดของเสา	=	0.35 x 0.35	ม. x ม.
ความยาวอิสระของเสา	=	1.20	ม.
น้ำหนักที่เสาต้องแบกรับ	=	1,600	กก.
เรียงเหล็กกระจาย 4 ด้าน			

Result

เป็นเสาสั้น รับน้ำหนักตามแกนและโมเมนต์ การออกแบบถูกควบคุมโดย แรงดึง			
ใช้เหล็กเสริมเอก	A_{st}	=	16.08 ตร.ซม.
เปอร์เซ็นต์เหล็กเสริมเอก	P_g	=	1.31 %
โมเมนต์อินเนอร์เซียรอบแกน X	I_x	=	156,180 ซม. ⁴
โมเมนต์อินเนอร์เซียรอบแกน Y	I_y	=	156,180 ซม. ⁴
ความลึกประสิทธิภาพตั้งฉากกับแกน X, d_x	=	29.60	ซม.
ความลึกประสิทธิภาพตั้งฉากกับแกน Y, d_y	=	29.60	ซม.



8-DB16มม. (เหล็กขึ้น)

1-RB6มม. @ 0.25 (เหล็กปลอก)

C1

VisStructure 4

(สงานลิขสิทธ์)

วิศวกร : ปณิธิ พรหมสาขา ณ สกลนคร

Rectangular Column

ชื่อโครงการ : ตลาดสุขุมมาก

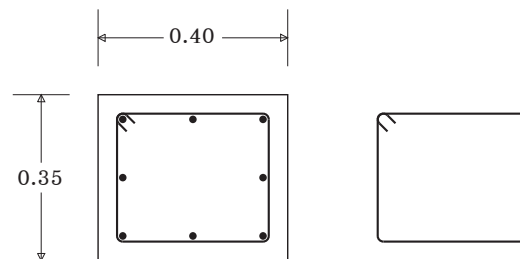
ชื่อเสา : C2

Input Data

คอนกรีตหุ้มเหล็ก	=	4	ซม.
กำลังอัดของคอนกรีต	f_c'	=	210 กก./ตร.ซม.
กำลังคลากของเหล็กปลอก	f_y	=	2,400 กก./ตร.ซม.
กำลังคลากของเหล็กเสริมเอก	f_y	=	3,000 กก./ตร.ซม.
เส้นผ่าศูนย์กลางเหล็กปลอก	=	6	มม.
เส้นผ่าศูนย์กลางเหล็กเสริมเอก	=	16	มม.
โมเมนต์รอบแกน X	M_x	=	0 กก.-ม.
โมเมนต์รอบแกน Y	M_y	=	1,700 กก.-ม.
หน้าตัดของเสา	=	0.40 x 0.35	ม. x ม.
ความยาวอิสระของเสา	=	3.30	ม.
น้ำหนักที่เสาต้องแบกรับ	=	45,000	กก.
เรียงเหล็กกระจาย 4 ด้าน			

Result

เป็นเสาสั้น รับน้ำหนักตามแกนและโมเมนต์ การออกแบบถูกควบคุมโดย แรงอัด			
ใช้เหล็กเสริมเอก	A_{st}	=	16.08 ตร.ซม.
เปอร์เซ็นต์เหล็กเสริมเอก	P_g	=	1.15 %
โมเมนต์อินเนอร์เซียรอบแกน X	I_x	=	174,044 ซม. ⁴
โมเมนต์อินเนอร์เซียรอบแกน Y	I_y	=	231,986 ซม. ⁴
ความลึกประสิทธิภาพตั้งฉากกับแกน X, d_x	=	29.60	ซม.
ความลึกประสิทธิภาพตั้งฉากกับแกน Y, d_y	=	34.60	ซม.



8-DB16มม. (เหล็กขึ้น)

1-RB6มม. @ 0.25 (เหล็กปลอก)

C2

ปณิธิ พรหมสาขา ณ สกลนคร สย 9187

Project :
 Owner :
 Location :

Date : 13/6/2015
 Column : C-3
 Floor : F 1

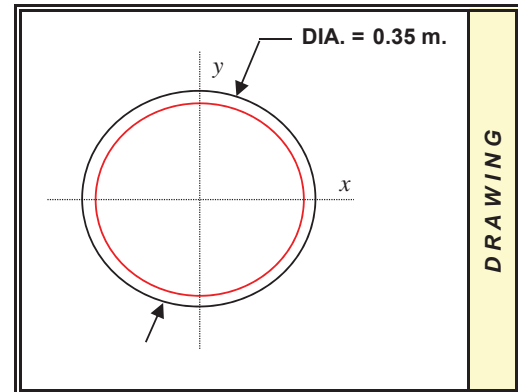
Column-Spiral Design

Constant :

Yeild Stress of Main bars, f_y (ksc) = 4,000
 Yeild Stress of Stirrup, f_{sy} (ksc) = 2,400 (Maximum of f_{sy} = 4000 ksc)
 Allowable Stress of Steel, f_s (ksc) = 1,600
 Comp. Stress of Concrete, f_c' (ksc) = 210

Input :

Column Diameter, D (m) = 0.35
 Column Length, L (m) = 2.00
 Column Load, Pcol (Tons) = 18.00
 Concrete Convering (m) = 0.030



Main Bars : 8 - DB16 mm.

Stirrup : RB6 mm. @ 0.048 m. c/c

Main Bars Design:

Ratio L/D = 5.71
 Type of Column = Short Col.
 Reduction Factor : R = 1.00
 $P_{con} = R(0.25 * A_g * f_c')$ (Tons) = 50.51
 $P_{steel} = P_{col} - P_{con}$ (Tons) = -
 A_s (cm²) = -

ปณิธิ พรหมสาขา ณ สกลนคร สย 9187

	6		7		8		9		10	
	As (cm ²)	%	As (cm ²)	%	As (cm ²)	%	As (cm ²)	%	As (cm ²)	%
RB12	6.79	0.71%	7.92	0.82%	9.05	0.94%	10.18	1.06%	11.31	1.18%
DB12	6.79	0.71%	7.92	0.82%	9.05	0.94%	10.18	1.06%	11.31	1.18%
RB15	10.60	1.10%	12.37	1.29%	14.14	1.47%	15.90	1.65%	17.67	1.84%
DB16	12.06	1.25%	14.07	1.46%	16.08	1.67%	18.10	1.88%	20.11	2.09%
RB19	17.01	1.77%	19.85	2.06%	22.68	2.36%	25.52	2.65%	28.35	2.95%
DB20	18.85	1.96%	21.99	2.29%	25.13	2.61%	28.27	2.94%	31.42	3.27%
DB25	29.45	3.06%	34.36	3.57%	39.27	4.08%	44.18	4.59%	49.09	5.10%
DB28	36.95	3.84%	43.10	4.48%	49.26	5.12%	55.42	5.76%	61.58	6.40%
DB32	48.25	5.02%	56.30	5.85%	64.34	6.69%	72.38	7.52%	80.42	8.36%

Engineer: ปณิธิ พรหมสาขา ณ สกลนคร
 Licence: สย.9187

VisStructure 4

(สงวนลิขสิทธิ์)

วิศวกร : ปณิธิ พรหมสาขา ณ สกลนคร

Square Spread Footing

ชื่อโครงการ : ตลาดสุขุมวิท

ชื่อฐานราก : F1,F1A

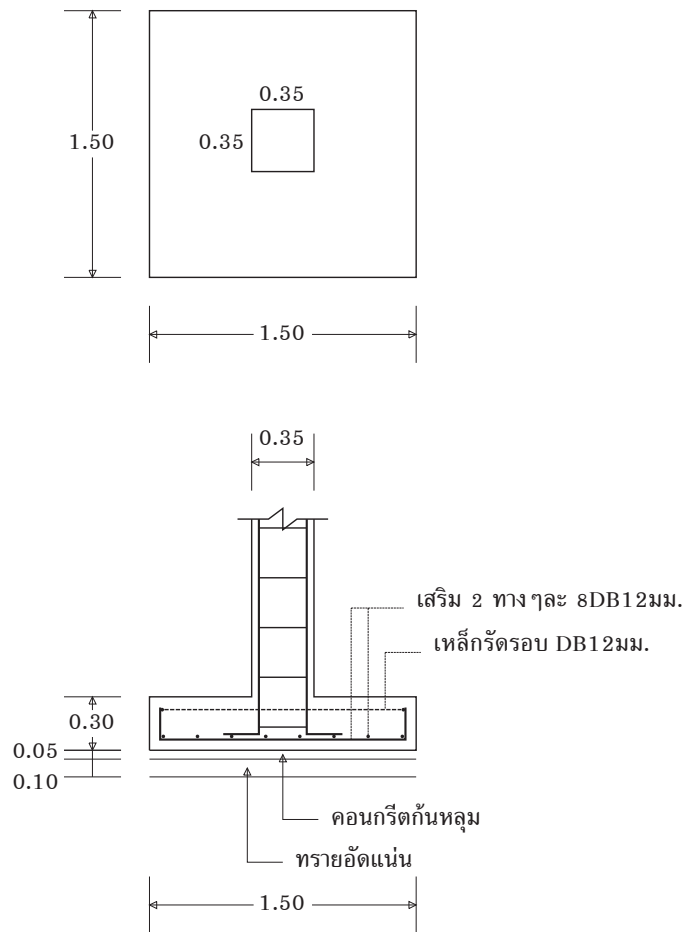
Input Data

คอนกรีตหุ้มเหล็ก	= 6	ชม.
หน่วยแรงอัดในคอนกรีต f_c	= 65	กก./ตร.ชม.
กำลังอัดของคอนกรีต f_c'	= 210	กก./ตร.ชม.
หน่วยแรงของเหล็กเสริมคอนกรีต, f_s	= 1,500	กก./ตร.ชม.
กำลังคลากของเหล็กเสริมคอนกรีต, f_y	= 3,000	กก./ตร.ชม.
ดินสามารถรับน้ำหนักปลอดภัยได้	= 12	ตัน/ตร.ม.
ขนาดของเสาตอม่อ	= 0.35 x 0.35	ม. x ม.
โมเมนต์ของเสารอบแกน X M_x	= 1,600	กก.-ม.
โมเมนต์ของเสารอบแกน Y M_y	= 0	กก.-ม.
น้ำหนักจากเสา (Column Load)	= 16,000	กก.
น้ำหนักดินที่กดทับบนฐานราก	= 2,383	กก.

Result

ขนาดของฐานราก (ม.)	= 1.50 x 1.50 x 0.30	
$n / j / R$	= 9.3117 / 0.9042 / 8.4483	
ความลึกประสิทธิผลทั้งสองแกน, d	= 22.20	ชม.
ดินใต้ฐานรากแบกรับน้ำหนักมากที่สุด	= 11,735	กก./ตร.ม.
ดินใต้ฐานรากแบกรับน้ำหนักน้อยที่สุด	= 6,046	กก./ตร.ม.
ดินใต้ฐานรากแบกรับน้ำหนักเฉลี่ย	= 8,890	กก./ตร.ม.
แรงดันขั้นสุดของดินใต้ฐานราก	= 8,205	กก./ตร.ม.
โมเมนต์ดัดของฐานรากรอบแกน X	= 1,356	กก.-ม./ม.
โมเมนต์ดัดของฐานรากรอบแกน Y	= 1,356	กก.-ม./ม.
หน่วยแรงเฉือนแบบคานรอบแกน X	= 1.51	กก./ตร.ชม.
หน่วยแรงเฉือนแบบคานรอบแกน Y	= 1.51	กก./ตร.ชม.
หน่วยแรงเฉือนแบบคานที่ยอมให้	= 4.20	กก./ตร.ชม.
หน่วยแรงเฉือนแบบเจาะทะลุ	= 3.09	กก./ตร.ชม.
หน่วยแรงเฉือนแบบเจาะทะลุยอมให้	= 7.68	กก./ตร.ชม.
เหล็กตะแกรงฐานราก 2 x 8 DB 12 มม. @ 0.192		





F1, F1A

VisStructure 4

(สวงลิขสิทธิ์)

วิศวกร : ปณิธิ พรหมสาขา ณ สกลนคร

Square Spread Footing

ชื่อโครงการ : ตลาดสุขุมวิท

ชื่อฐานราก : F2

Input Data

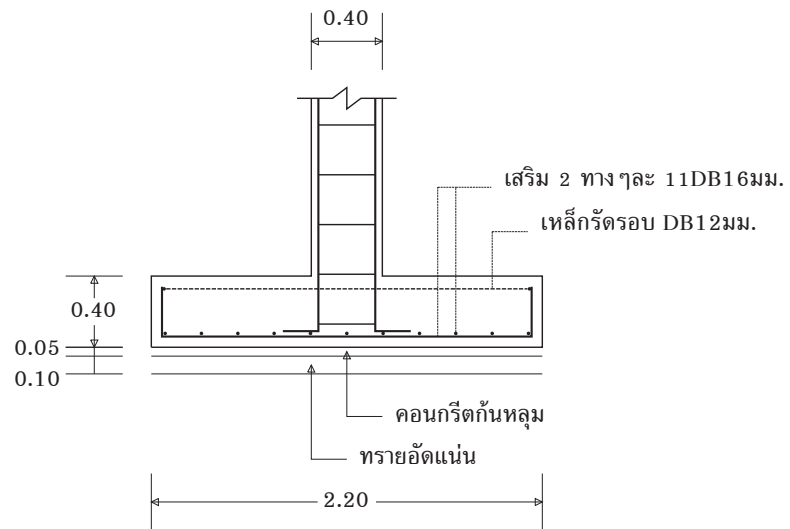
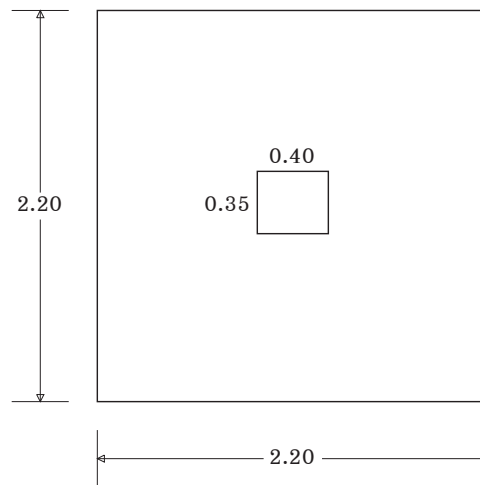
คอนกรีตหุ้มเหล็ก	= 6	ชม.
หน่วยแรงอัดในคอนกรีต f_c	= 65	กก./ตร.ชม.
กำลังอัดของคอนกรีต f_c'	= 210	กก./ตร.ชม.
หน่วยแรงของเหล็กเสริมคอนกรีต, f_s	= 1,500	กก./ตร.ชม.
กำลังคลากของเหล็กเสริมคอนกรีต, f_y	= 3,000	กก./ตร.ชม.
ดินสามารถรับน้ำหนักปลอดภัยได้	= 12	ตัน/ตร.ม.
ขนาดของเสาตอม่อ	= 0.40 x 0.35	ม. x ม.
โมเมนต์ของเสารอบแกน X M_x	= 0	กก.-ม.
โมเมนต์ของเสารอบแกน Y M_y	= 1,700	กก.-ม.
น้ำหนักจากเสา (Column Load)	= 43,500	กก.
น้ำหนักดินที่กดทับบนฐานราก	= 4,512	กก.

Result

ขนาดของฐานราก (ม.)	= 2.20 x 2.20 x 0.40	
$n / j / R$	= 9.3117 / 0.9042 / 8.4483	
ความลึกประสิทธิผลทั้งสองแกน, d	= 31.60	ชม.
ดินใต้ฐานรากแบกรับน้ำหนักมากที่สุด	= 11,838	กก./ตร.ม.
ดินใต้ฐานรากแบกรับน้ำหนักน้อยที่สุด	= 9,922	กก./ตร.ม.
ดินใต้ฐานรากแบกรับน้ำหนักเฉลี่ย	= 10,880	กก./ตร.ม.
แรงดันขั้นสุดของดินใต้ฐานราก	= 9,319	กก./ตร.ม.
โมเมนต์ดัดของฐานรากรอบแกน X	= 3,987	กก.-ม./ม.
โมเมนต์ดัดของฐานรากรอบแกน Y	= 3,774	กก.-ม./ม.
หน่วยแรงเฉือนแบบคานรอบแกน X	= 1.92	กก./ตร.ชม.
หน่วยแรงเฉือนแบบคานรอบแกน Y	= 1.84	กก./ตร.ชม.
หน่วยแรงเฉือนแบบคานที่ยอมให้	= 4.20	กก./ตร.ชม.
หน่วยแรงเฉือนแบบเจาะทะลุ	= 4.80	กก./ตร.ชม.
หน่วยแรงเฉือนแบบเจาะทะลุยอมให้	= 7.68	กก./ตร.ชม.
เหล็กตะแกรงฐานราก 2 x 11 DB 16 มม. @ 0.203		



ปณิธิ พรหมสาขา ณ สกลนคร สย 9187



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