

**RDA SHEAR FORCES TO RC ELEMENTS - LEVEL 2**  
**ASCE 7-10 SECTION 12.8 - EQUIVALENT LATERAL FORCE PROCEDURE - RIGID DIAPHRAGM ANALYSIS**  
**SAMPLE PROJECT, ANYTOWN - NEW DESIGN**

Floor Level : 2

**1. General Design Parameters**

H<sub>A</sub> = 12.00 feet (Height of Floor Level Above)  
 H<sub>B</sub> = 14.00 feet (Height of Floor Level Below)

Story Shear - N-S Direction (Y)

LFRS System: RC SMRF V<sub>S</sub> = 1,323 kips (Story Shear)  
 C<sub>S</sub> = 0.079 g's (Seismic Coefficient)

Story Shear - W-E Direction (X)

LFRS System: RC SMRF V<sub>S</sub> = 1,323 kips (Story Shear)  
 C<sub>S</sub> = 0.079 g's (Seismic Coefficient)

Accidental Eccentricity (ASCE (Section 12.8.4.2):

e<sub>MIN</sub> = 5.0 % (accidental eccentricity)  
 => e<sub>AX</sub> A<sub>XY</sub> = 3.70 feet for A<sub>XY</sub> = 1.00 (N-S Amplification of Accidental Torsional Moment - from RDA Displacements)  
 e<sub>AY</sub> A<sub>XX</sub> = 9.20 feet for A<sub>XX</sub> = 1.00 (W-E Amplification of Accidental Torsional Moment - from RDA Displacements)

Material Data:

f<sub>c</sub> = 4.00 Ksi (Compressive Strength - Concrete)  
 E<sub>m</sub> = \_\_\_\_\_ Ksi (Modulus of Rupture - Masonry)  
 => E<sub>c</sub> = 3,605 ksi

**2. Stiffness Parameters**

Center of Mass (CM):

Center of Rigidity (CR):

X<sub>CM</sub> = 92.02 feet X<sub>CR</sub> = 92.13 feet  
 Y<sub>CM</sub> = 37.02 feet Y<sub>CR</sub> = 37.11 feet

Note: Center of Mass calculations neglect weight of walls parallel to loading direction.

Eccentricities:

	CR - CM	e <sub>Acc</sub> A <sub>X</sub>	Sum Value
e <sub>X</sub>	0.11	3.70	3.81 feet
e <sub>Y</sub>	0.10	9.20	9.30 feet

Polar Moment of Inertia: J<sub>o</sub> = Σ (r<sub>i</sub><sup>2</sup> K<sub>i</sub>) Where r<sub>i</sub> = As shown in Table below  
 K<sub>i</sub> = As shown in Table below

J<sub>o</sub> = 199,755 ft<sup>2</sup>

Section	Length (feet)	Width (feet)	Thickness (inches)	x (feet)	y (feet)	Weight (kips)
1	184.00	74.00	12.00	-	-	1,906
2						
3						

for ρ = 140 pcf (Unit Weight)

Moment Frame Beams - N-S Direction (Y)

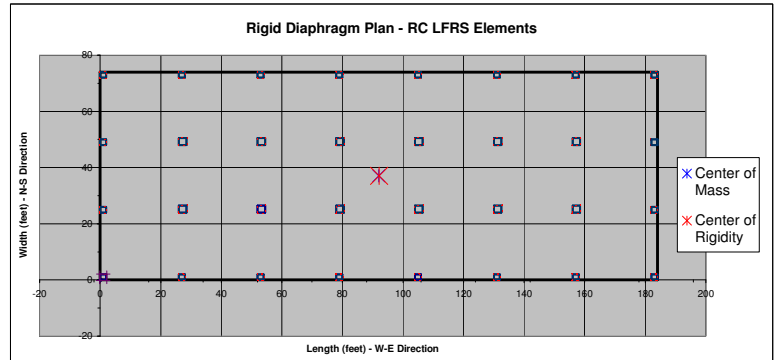
b = 20.00 inches  
 d = 24.00 inches

Moment Frame Beams - W-E Direction (X)

b = 20.00 inches  
 d = 24.00 inches

Allowable Offset between Columns along LFRS:

LFRS Offset = 2.00 feet



**3. Building Lateral and Torsional Loading:**

$$V_C = F_C = F_{Shear} + F_{Torsion} + F_{LFRS} = (F K_i) / \sum K_i +/- (T r_i K_i) / J_o + C_S W_{LFRS}$$

a) North-South Loading

F<sub>NS</sub> = C<sub>S</sub> W<sub>NS</sub> or V<sub>S</sub> Where C<sub>S</sub> = 0.079 g's (Seismic Coefficient)  
 W<sub>NS</sub> = \_\_\_\_\_ kips (Floor + WE Walls)  
 V<sub>S</sub> = 1,323 kips (Story Shear)

F<sub>NS</sub> = 1,323 kips (Story Shear - N-S)

T<sub>NS</sub> = F<sub>NS</sub> e<sub>X</sub> Where e<sub>X</sub> = 3.81 feet for Loading Direction = \_\_\_\_\_ (+/-)

T<sub>NS</sub> = 5,047 kip-ft (Torsional Loading - N-S)

F<sub>LFRS</sub> = C<sub>S</sub> W<sub>NS</sub> LFRS Where W<sub>NS</sub> LFRS = Σ 2 x W H/2 (Full height N-S LFRS)

a) West-East Loading

F<sub>WE</sub> = C<sub>S</sub> W<sub>WE</sub> or V<sub>S</sub> Where C<sub>S</sub> = 0.079 g's (Seismic Coefficient)  
 W<sub>WE</sub> = \_\_\_\_\_ kips (Floor + NS Walls)  
 V<sub>S</sub> = 1,323 kips (Story Shear)

F<sub>WE</sub> = 1,323 kips (Story Shear - W-E)

T<sub>WE</sub> = F<sub>WE</sub> e<sub>Y</sub> Where e<sub>Y</sub> = 9.30 feet for Loading Direction = \_\_\_\_\_ (+/-)

T<sub>WE</sub> = 12,306 kip-ft (Torsional Loading - W-E)

F<sub>LFRS</sub> = C<sub>S</sub> W<sub>WE</sub> LFRS Where W<sub>WE</sub> LFRS = Σ 2 x W H/2 (Full height W-E LFRS)

**4. RDA Load Distribution to RC Elements (MRF or Shear Walls)**

LFRS Direction	RC Element ID	Slab Conn (F or P)	RC Element Dimensions and Data										RC LFRS Stiffness		Loads to RC Elements												
			Dimensions				Coordinates <sup>1</sup>			Element Data			K (kip/in)	Relative Stiffness	N-S Loading			V <sub>C</sub> (kips)									
			H <sub>below</sub> <sup>2</sup> (feet)	H <sub>above</sub> <sup>3</sup> (feet)	L (feet)	t (inches)	x (feet)	y (feet)	K (kip/in)	W <sub>above</sub> <sup>4</sup> (Kips)	W <sub>below</sub> <sup>5</sup> (Kips)	X <sub>wall</sub> (ft)			Y <sub>wall</sub> (ft)	r <sub>i</sub> (ft)	F <sub>Shear</sub> (kips)		F <sub>Torsion</sub> (kips)	F <sub>LFRS</sub> (kips)	F <sub>C</sub> (kips)						
N-S	1	F	14.00	12.00	2.00	24.00	x	0.00	0.00			3.92	3.36	1.00	1.00	-91.13	75	1.00	28	2.3	0.6	31	-	-5.6	-	-6	31
N-S	2	F	14.00	12.00	2.00	24.00	x	26.00	0.00			3.92	3.36	27.00	1.00	-65.13	75	1.00	28	1.6	0.6	30	-	-4.0	-	-4	30
N-S	3	F	14.00	12.00	2.00	24.00	x	52.00	0.00			3.92	3.36	53.00	1.00	-39.13	75	1.00	28	1.0	0.6	29	-	-2.4	-	-2	29
N-S	4	F	14.00	12.00	2.00	24.00	x	78.00	0.00			3.92	3.36	79.00	1.00	-13.13	75	1.00	28	0.3	0.6	29	-	-0.8	-	-1	29
N-S	5	F	14.00	12.00	2.00	24.00	x	104.00	0.00			3.92	3.36	105.00	1.00	12.87	75	1.00	28	-0.3	0.6	28	-	0.8	-	1	28
N-S	6	F	14.00	12.00	2.00	24.00	x	130.00	0.00			3.92	3.36	131.00	1.00	38.87	75	1.00	28	-1.0	0.6	27	-	2.4	-	2	27
N-S	7	F	14.00	12.00	2.00	24.00	x	156.00	0.00			3.92	3.36	157.00	1.00	64.87	75	1.00	28	-1.6	0.6	27	-	4.0	-	4	27
N-S	8	F	14.00	12.00	2.00	24.00	x	182.00	0.00			3.92	3.36	183.00	1.00	90.87	75	1.00	28	-2.3	0.6	26	-	5.6	-	6	26
N-S	9	F	14.00	12.00	2.00	24.00	x	0.00	24.00			3.92	3.36	1.00	25.00	-91.13	131	1.75	49	4.0	0.6	53	-	-9.8	-	-10	53
N-S	10	F	14.00	12.00	2.50	30.00	x	26.00	24.00			6.13	5.25	27.25	25.25	-64.88	154	2.05	57	3.4	1.0	61	-	-8.2	-	-8	61
N-S	11	F	14.00	12.00	2.50	30.00	x	52.00	24.00			6.13	5.25	53.25	25.25	-38.88	154	2.05	57	2.0	1.0	60	-	-4.9	-	-5	60
N-S	12	F	14.00	12.00	2.50	30.00	x	78.00	24.00			6.13	5.25	79.25	25.25	-12.88	154	2.05	57	0.7	1.0	59	-	-1.6	-	-2	59
N-S	13	F	14.00	12.00	2.50	30.00	x	104.00	24.00			6.13	5.25	105.25	25.25	13.12	154	2.05	57	-0.7	1.0	57	-	1.7	-	2	57
N-S	14	F	14.00	12.00	2.50	30.00	x	130.00	24.00			6.13	5.25	131.25	25.25	39.12	154	2.05	57	-2.0	1.0	56	-	4.9	-	5	56
N-S	15	F	14.00	12.00	2.50	30.00	x	156.00	24.00			6.13	5.25	157.25	25.25	65.12	154	2.05	57	-3.4	1.0	55	-	8.2	-	8	55
N-S	16	F	14.00	12.00	2.00	24.00	x	182.00	24.00			3.92	3.36	183.00	25.00	90.87	131	1.75	49	-4.0	0.6	45	-	9.8	-	10	45
N-S	17	F	14.00	12.00	2.00	24.00	x	0.00	48.00			3.92	3.36	1.00	49.00	-91.13	131	1.75	49	4.0	0.6	53	-	-9.8	-	-10	53
N-S	18	F	14.00	12.00	2.50	30.00	x	26.00	48.00			6.13	5.25	27.25	49.25	-64.88	154	2.05	57	3.4	1.0	61	-	-8.2	-	-8	61
N-S	19	F	14.00	12.00	2.50	30.00	x	52.00	48.00			6.13	5.25	53.25	49.25	-38.88	154	2.05	57	2.0	1.0	60	-	-4.9	-	-5	60
N-S	20	F	14.00	12.00	2.50	30.00	x	78.00	48.00			6.13	5.25	79.25	49.25	-12.88	154	2.05	57	0.7	1.0	59	-	-1.6	-	-2	59
N-S	21	F	14.00	12.00	2.50	30.00	x	104.00	48.00			6.13	5.25	105.25	49.25	13.12	154	2.05	57	-0.7	1.0	57	-	1.7	-	2	57
N-S	22	F	14.00	12.00	2.50	30.00	x	130.00	48.00			6.13	5.25	131.25	49.25	39.12	154	2.05	57	-2.0	1.0	56	-	4.9	-	5	56
N-S	23	F	14.00	12.00	2.50	30.00	x	156.00	48.00			6.13	5.25	157.25	49.25	65.12	154	2.05	57	-3.4	1.0	55	-	8.2	-	8	55
N-S	24	F	14.00	12.00	2.00	24.00	x	182.00	48.00			3.92	3.36	183.00	49.00	90.87	131	1.75	49	-4.0	0.6	45	-	9.8	-	10	45
N-S	25	F	14.00	12.00	2.00	24.00	x	0.00	72.00			3.92	3.36	1.00	73.00	-91.13	75	1.00	28	2.3	0.6	31	-	-5.6	-	-6	31
N-S	26	F	14.00	12.00	2.00	24.00	x	26.00	72.00			3.92	3.36	27.00	73.00	-65.13	75	1.00	28	1.6	0.6	30	-	-4.0	-	-4	30
N-S	27	F	14.00	12.00	2.00	24.00	x	52.00	72.00			3.92	3.36	53.00	73.00	-39.13	75	1.00	28	1.0	0.6	29	-	-2.4	-	-2	29
N-S	28	F	14.00	12.00	2.00	24.00	x	78.00	72.00			3.92	3.36	79.00	73.00	-13.13	75	1.00	28	0.3	0.6	29	-	-0.8	-	-1	29
N-S	29	F	14.00	12.00	2.00	24.00	x	104.00	72.00			3.92	3.36	105.00	73.00	12.87	75	1.00	28	-0.3	0.6	28	-	0.8	-	1	28
N-S	30	F	14.00	12.00	2.00	24.00	x	130.00	72.00			3.92	3.36	131.00	73.00	38.87	75	1.00	28	-1.0	0.6	27	-	2.4	-	2	27
N-S	31	F	14.00	12.00	2.00	24.00	x	156.00	72.00			3.92	3.36	157.00	73.00	64.87	75	1.00	28	-1.6	0.6	27	-	4.0	-	4	27
N-S	32	F	14.00	12.00	2.00	24.00	x	182.00	72.00			3.92	3.36	183.00	73.00	90.87	75	1.00	28	-2.3	0.6	26	-	5.6	-	6	26

RDA SHEAR FORCES TO RC ELEMENTS - LEVEL 2  
 ASCE 7-10 SECTION 12.8 - EQUIVALENT LATERAL FORCE PROCEDURE - RIGID DIAPHRAGM ANALYSIS  
 SAMPLE PROJECT, ANYTOWN - NEW DESIGN

Floor Level : **2**

**1. General Design Parameters**

$H_A$  = 12.00 feet (Height of Floor Level Above)  
 $H_B$  = 14.00 feet (Height of Floor Level Below)

Story Shear - N-S Direction (Y)

LFRS System: RC SMRF  $V_S = 1,323$  kips (Story Shear)  
 $C_S = 0.079$  g/s (Seismic Coefficient)

Story Shear - W-E Direction (X)

LFRS System: RC SMRF  $V_S = 1,323$  kips (Story Shear)  
 $C_S = 0.079$  g/s (Seismic Coefficient)

Accidental Eccentricity (ASCE (Section 12.8.4.2):

$e_{MIN} = 5.0$  % (accidental eccentricity)  
 $= > e_{AX}$   $A_{XY} = 3.70$  feet for  $A_{XY} = 1.00$  (N-S Amplification of Accidental Torsional Moment - from RDA Displacements)  
 $e_{AY}$   $A_{XX} = 9.20$  feet  $A_{XX} = 1.00$  (W-E Amplification of Accidental Torsional Moment - from RDA Displacements)

Material Data:

$f_c = 4.00$  Ksi (Compressive Strength - Concrete)  
 $E_m =$  Ksi (Modulus of Rupture - Masonry)  
 $= > E_c = 3,605$  ksi

**2. Stiffness Parameters**

Center of Mass (CM):  $x_{CM} = 92.02$  feet  $y_{CM} = 37.02$  feet  
 Center of Rigidity (CR):  $x_{CR} = 92.13$  feet  $y_{CR} = 37.11$  feet

Note: Center of Mass calculations neglect weight of walls parallel to loading direction.

Eccentricities:

	CR - CM	$e_{Ax} A_X$	Sum Value	
$e_x$	0.11	3.70	3.81	feet
$e_y$	0.10	9.20	9.30	feet

Polar Moment of Inertia:  $J_o = \sum r_i^2 K_i$  Where  $r_i =$  As shown in Table below  
 $K_i =$  As shown in Table below  
 $J_o = 199,755$  ft<sup>2</sup>

RC Diaphragm Dimensions

Section	Length (feet)	Width (feet)	Thickness (inches)	x (feet)	y (feet)	Weight (kips)
1	184.00	74.00	12.00	-	-	1,906
2						
3						

Moment Frame Beams - N-S Direction (Y)

b = 20.00 inches  
 d = 24.00 inches

Moment Frame Beams - W-E Direction (X)

b = 20.00 inches  
 d = 24.00 inches

Allowable Offset between Columns along LFRS:

LFRS Offset = 2.00 feet

**3. Building Lateral and Torsional Loading:**

$V_C = F_C = F_{Shear} + F_{Torsion} + F_{LFRS} = (F K_i) / \sum K_i +/- (T r_i K_i) / J_o + C_S W_{LFRS}$

a) North-South Loading

$F_{NS} = C_S W_{NS}$  or  $V_S$  Where  $C_S = 0.079$  g/s (Seismic Coefficient)  
 $W_{NS} =$  Kips (Floor + WE Walls)  
 $V_S = 1,323$  kips (Story Shear)  
 $F_{NS} = 1,323$  kips (Story Shear - N-S)

$T_{NS} = F_{NS} e_x$  Where  $e_x = 3.81$  feet for Loading Direction = +/-

$T_{NS} = 5,047$  kip-ft (Torsional Loading - N-S)

$F_{LFRS} = C_S W_{NS} L_{FRS}$  Where  $W_{NS} L_{FRS} = \sum 2 \times W H/2$  (Full height N-S LFRS)

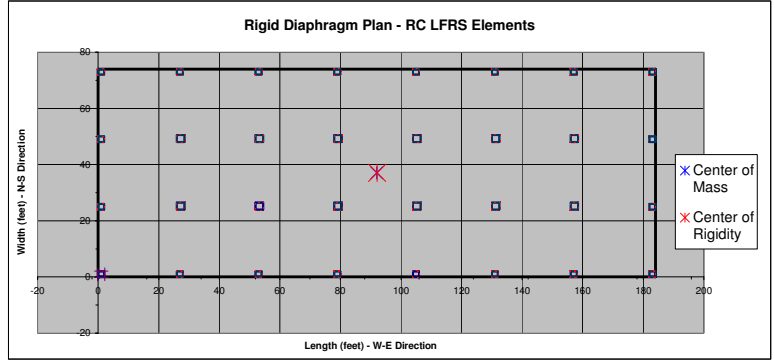
a) West-East Loading

$F_{WE} = C_S W_{WE}$  or  $V_S$  Where  $C_S = 0.079$  g/s (Seismic Coefficient)  
 $W_{WE} =$  kips (Floor + NS Walls)  
 $V_S = 1,323$  kips (Story Shear)  
 $F_{WE} = 1,323$  kips (Story Shear - W-E)

$T_{WE} = F_{WE} e_y$  Where  $e_y = 9.30$  feet for Loading Direction = +/-

$T_{WE} = 12,306$  kip-ft (Torsional Loading - W-E)

$F_{LFRS} = C_S W_{WE} L_{FRS}$  Where  $W_{WE} L_{FRS} = \sum 2 \times W H/2$  (Full height W-E LFRS)



**4. RDA Load Distribution to RC Elements (MRF or Shear Walls)**

LFRS Direction	RC Element ID	Slab Conn (F or P)	RC Element Dimensions and Data							RC LFRS Stiffness		Loads to RC Elements													
			Dimensions			Coordinates				Element Data				K (kip/in)	Relative Stiffness	N-S Loading			W-E Loading			Vc (kips)			
			$H_{below}^2$ (feet)	$H_{above}^3$ (feet)	L (feet)	t (inches)	SMRF Column	x (feet)	y (feet)	K (kip/in)	$W_{above}^4$ (Kips)	$W_{below}^5$ (Kips)	$X_{wall}$ (ft)			$Y_{wall}$ (ft)	$r_i$ (ft)	$F_{Shear}$ (kips)	$F_{Torsion}$ (kips)	$F_{LFRS}$ (kips)	$F_C$ (kips)		$F_{Shear}$ (kips)	$F_{Torsion}$ (kips)	$F_{LFRS}$ (kips)
W-E	1	F	14.00	12.00	2.00	24.00	x	0.00	0.00	3.92	3.36	1.00	1.00	-36.11	75	1.00	-	-0.9	-	-0.9	25	-2.2	0.6	23	23
W-E	2	F	14.00	12.00	2.00	24.00	x	26.00	0.00	3.92	3.36	27.00	1.00	-36.11	131	1.75	-	-1.6	-	-1.6	43	-3.9	0.6	40	40
W-E	3	F	14.00	12.00	2.00	24.00	x	52.00	0.00	3.92	3.36	53.00	1.00	-36.11	131	1.75	-	-1.6	-	-1.6	43	-3.9	0.6	40	40
W-E	4	F	14.00	12.00	2.00	24.00	x	78.00	0.00	3.92	3.36	79.00	1.00	-36.11	131	1.75	-	-1.6	-	-1.6	43	-3.9	0.6	40	40
W-E	5	F	14.00	12.00	2.00	24.00	x	104.00	0.00	3.92	3.36	105.00	1.00	-36.11	131	1.75	-	-1.6	-	-1.6	43	-3.9	0.6	40	40
W-E	6	F	14.00	12.00	2.00	24.00	x	130.00	0.00	3.92	3.36	131.00	1.00	-36.11	131	1.75	-	-1.6	-	-1.6	43	-3.9	0.6	40	40
W-E	7	F	14.00	12.00	2.00	24.00	x	156.00	0.00	3.92	3.36	157.00	1.00	-36.11	131	1.75	-	-1.6	-	-1.6	43	-3.9	0.6	40	40
W-E	8	F	14.00	12.00	2.00	24.00	x	182.00	0.00	3.92	3.36	183.00	1.00	-36.11	75	1.00	-	-0.9	-	-0.9	25	-2.2	0.6	23	23
W-E	9	F	14.00	12.00	2.00	24.00	x	0.00	24.00	3.92	3.36	1.00	25.00	-12.11	75	1.00	-	-0.3	-	-0.3	25	-0.7	0.6	25	25
W-E	10	F	14.00	12.00	2.50	30.00	x	26.00	24.00	6.13	5.25	27.25	25.25	-11.86	154	2.05	-	-0.6	-	-0.6	51	-1.5	1.0	50	50
W-E	11	F	14.00	12.00	2.50	30.00	x	52.00	24.00	6.13	5.25	53.25	25.25	-11.86	154	2.05	-	-0.6	-	-0.6	51	-1.5	1.0	50	50
W-E	12	F	14.00	12.00	2.50	30.00	x	78.00	24.00	6.13	5.25	79.25	25.25	-11.86	154	2.05	-	-0.6	-	-0.6	51	-1.5	1.0	50	50
W-E	13	F	14.00	12.00	2.50	30.00	x	104.00	24.00	6.13	5.25	105.25	25.25	-11.86	154	2.05	-	-0.6	-	-0.6	51	-1.5	1.0	50	50
W-E	14	F	14.00	12.00	2.50	30.00	x	130.00	24.00	6.13	5.25	131.25	25.25	-11.86	154	2.05	-	-0.6	-	-0.6	51	-1.5	1.0	50	50
W-E	15	F	14.00	12.00	2.50	30.00	x	156.00	24.00	6.13	5.25	157.25	25.25	-11.86	154	2.05	-	-0.6	-	-0.6	51	-1.5	1.0	50	50
W-E	16	F	14.00	12.00	2.00	24.00	x	182.00	24.00	3.92	3.36	183.00	25.00	-12.11	75	1.00	-	-0.3	-	-0.3	25	-0.7	0.6	25	25
W-E	17	F	14.00	12.00	2.00	24.00	x	0.00	48.00	3.92	3.36	1.00	49.00	11.89	75	1.00	-	0.3	-	0.3	25	0.7	0.6	26	26
W-E	18	F	14.00	12.00	2.50	30.00	x	26.00	48.00	6.13	5.25	27.25	49.25	12.14	154	2.05	-	0.6	-	0.6	51	1.5	1.0	53	53
W-E	19	F	14.00	12.00	2.50	30.00	x	52.00	48.00	6.13	5.25	53.25	49.25	12.14	154	2.05	-	0.6	-	0.6	51	1.5	1.0	53	53
W-E	20	F	14.00	12.00	2.50	30.00	x	78.00	48.00	6.13	5.25	79.25	49.25	12.14	154	2.05	-	0.6	-	0.6	51	1.5	1.0	53	53
W-E	21	F	14.00	12.00	2.50	30.00	x	104.00	48.00	6.13	5.25	105.25	49.25	12.14	154	2.05	-	0.6	-	0.6	51	1.5	1.0	53	53
W-E	22	F	14.00	12.00	2.50	30.00	x	130.00	48.00	6.13	5.25	131.25	49.25	12.14	154	2.05	-	0.6	-	0.6	51	1.5	1.0	53	53
W-E	23	F	14.00	12.00	2.50	30.00	x	156.00	48.00	6.13	5.25	157.25	49.25	12.14	154	2.05	-	0.6	-	0.6	51	1.5	1.0	53	53
W-E	24	F	14.00	12.00	2.00	24.00	x	182.00	48.00	3.92	3.36	183.00	49.00	11.89	75	1.00	-	0.3	-	0.3	25	0.7	0.6	26	26
W-E	25	F	14.00	12.00	2.00	24.00	x	0.00	72.00	3.92	3.36	1.00	73.00	35.89	75	1.00	-	0.9	-	0.9	25	2.2	0.6	28	28
W-E	26	F	14.00	12.00	2.00	24.00	x	26.00	72.00	3.92	3.36	27.00	73.00	35.89	131	1.75	-	1.6	-	1.6	43	3.9	0.6	48	48
W-E	27	F	14.00	12.00	2.00	24.00	x	52.00	72.00	3.92	3.36	53.00	73.00	35.89	131	1.75	-	1.6	-	1.6	43	3.9	0.6	48	48
W-E	28	F	14.00	12.00	2.00	24.00	x	78.00	72.00	3.92	3.36	79.00	73.00	35.89	131	1.75	-	1.6	-	1.6	43	3.9	0.6	48	48
W-E	29	F	14.00	12.00	2.00	24.00	x	104.00	72.00	3.92	3.36	105.00	73.00	35.89	131	1.75	-	1.6	-	1.6	43	3.9	0.6	48	48
W-E	30	F	14.00	12.00	2.00	24.00	x	130.00	72.00	3.92	3.36	131.00	73.00	35.89	131	1.75	-	1.6	-	1.6	43	3.9	0.6	48	48
W-E	31	F	14.00	12.00	2.00	24.00	x	156.00	72.00	3.92	3.36	157.00	73.00	35.89	131	1.75	-	1.6	-	1.6	43	3.9	0.6	48	48
W-E	32	F	14.00	12.00	2.00	24.00	x	182.00	72.00	3.92	3.36	183.00	73.00	35.89	75	1.00	-	0.9	-	0.9	25	2.2	0.6	28	28