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Design Calculation for water tank foundation

Assumption:

1. The SBC as per soil report = 180 Kn/m² for Raft foundation
2. The grade of concrete shall be M40
3. The height of water tank is 7.395m
4. The height of water column is 7.2m
5. The density of water = 10 Kn/m³
6. The characteristic strength of Rebar shall be 460 N/mm²
7. For Water tank Design Refer the following attached supplier's Data sheet.

Load Calculation:

Weight of tank and Roof = 47.00 Kn (As per supplier Data attached sheet No:8)

Water weight = 7.2x10x9.358² x Π/4 = 4952.00 Kn

Total Weight = 4999.00 Kn

Diameter of foundation = 10.058m

Pressure on soil Due to Dead load = 47/(10.058² Π/ 4) = 0.59 Kn/m²

Pressure on soil Due to total load = 4999/(10.058² Π/ 4) = 62.92 Kn/m² < 180 Kn/m²

Moment Due to Dead Load (M1) = (0.59x Π x10.058x0.35²/2)x1.4 = 1.6 Knm

Moment Due to Wt. of tank + Water Load (M2) = (62.92x Π x10.058x0.35²/2)x1.5 = 182.66 Knm

Moment Due to wind (M3) = 211 Knm (As per supplier Data attached sheet No:8)

Moment Due to Earthquake (M3) = 1410 Knm (As per supplier Data attached sheet No:8)

Case 1

Moment Due to Wind and Dead Load = 211 Knm

Case 2

Moment Due to Wind, Dead Load and Water = 395.26 Knm

Case 3

Moment Due to EQ, Dead Load and Water = 1594.26 Knm

Case 4

Moment Due to Dead Load and Water = 184.26 Knm

Maximum moment in Case 3 = 1594.26 Knm

K= Mu/fckbd² = 0.0019 , z = 0.95d, Assume d = 500-75 = 425 mm, b= 10058mm

Ast = 1594.26x10^6/0.95x460x0.95x425= 9035.77mm²

Provide 16mmø @ 200mm c/c for both top and bottom reinforcement.

Minimum Ast = 0.13x1000x500/100 = 650mm² < Provided Ast

Hence safe.

Let the depth of Raft = 500 mm

Effective Depth = 425 mm

Diameter of the Raft = 10.058m

Pressure on soil = 4999/(10.058² П/ 4) = 62.92 Kn/m² < 180 Kn/m²

Moment in cantilever portion Mu = (62.92x1.0x0.35²/2)x1.5 = 5.8 Knm/m

Ast = 5.8x10^6/0.95x460x0.95x425 = 32.87 mm²< Ast Provided

Hence Safe

Vu = [(62.92 x 1.0) x 0.35] = 22.02 KN

Check for punching shear

Perimeter = π x10.058

= 31.60 m

Actual Shear stress, v = 22.02 x10^3 / (31600 x 425)

= 0.00163 N / mm^2

Allowable Shear Stress, V_c = 0.844 x 1.17 = 0.987 N/mm^2 > 0.00169 N / mm^2

(BS 8110: Part 1, Table 3.8)

Hence it is safe in punching shear.

Column Loads

Return to Index

Ref 1: AS/NZS 4600:2005 - Cold-formed steel structures

Tank Model =	XL30		
Rings =	7		
Tank diameter =	9.358	m	
Tank height =	7.395	m	
No. Columns =	14		
Reference code for wind =	Ref 2:		
Code =	Ref 2: AS1170.2:2002		
Base shear due to wind =	53	kN	
Total uplift due to wind =	40.1	kN	This refers to an old sheet 'S
OT Moment due to wind =	211	kNm	This refers to an old sheet 'S
Base shear due to EQ =	452	kN	
OT Moment due to EQ =	1410	kNm	
Weight of tank & roof =	47	kN	

Column Loads

Tank wt =	3.4	kN	
Wind =	9.3	kN	=4*Mom/(n*Dia)+Uplift/n
Earthquake =	43.1	kN	=4*Mom/(n*Dia)
Max Uplift Load =	39.7	kN	Due to earthquake
Max Compressive Load =	46.4	kN	
Max shear load =	64.5	kN	Per panel or column

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WATER

Title: **Dubai Water and Electricity Dept. (Draft Calculations)**

Contents:

Part 1	Tank design	(5 Pages)
Part 2	Roof design	(8 Pages)

Design Codes used in these calculations:

1	AS/NZS 1170.0 Structural Design Actions
2	AS/NZS 1170.1 Dead and Live Loads
3	AS/NZS 1170.2 Dead and Live Loads
4	AS/NZS 1170.4 Wind Loads
5	AS 4100 Steel Structures
6	AS/NZS 4600 Cold Formed Steel Structures

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TANK DESIGN COVER SHEET	CHECKED	PAGE No.
Tank Data	✓	2
Load Data		2
Water Loads	✓	2
Live Loads	✓	2
Dead Loads	✓	2
Wind Loads	✓	2
Seismic Loads	✓	2
Component Data & Checks		3
Ring Beam Data	✓	3
Column Data	✓	3
Swivel Foot Data	✓	3
Hold Down Bracket Data	✓	3
Roof Tek Screw Data	✓	3
Wind Girder Data	✓	3
Panels - Hydrostatic and Hydrodynamic Pressure checks	✓	4
Panels - Wind Buckling Pressure checks	✓	4
Hoop Tension Bolts checks	✓	4
Lap Bolts checks	✓	4

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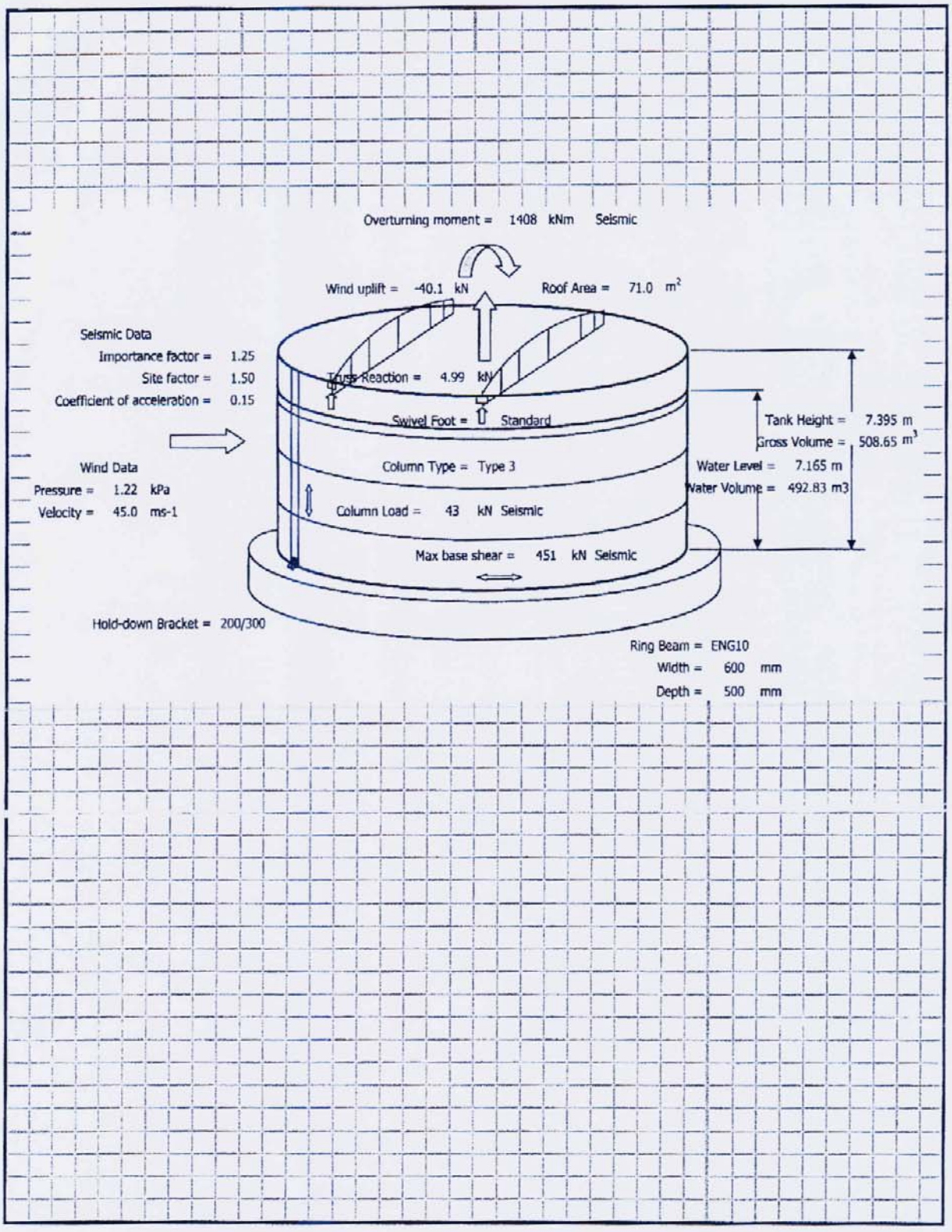

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TANK DATA

Model:	XL30		
Rings:	7		
Roof:	Standard		
Diameter:	9.358	m	
Height:	7.395	m	
Lap Bolt size:	10	mm	
Lap Bolt spacing:	210	mm	
Wind Girt Design:	Type 3		

Ring	Std Thick	This Design	Bolt Size
R1	0.8	0.8	10
R2	1.0	1.0	10
R3	1.2	1.6	10
R4	2.0	2.0	12
R5	2.0	2.4	12
R6	2.4	2.4	12
R7	3.0	3.0	16
R8		0.0	0

This is a NON-STD TANK DESIGN — Panel Thickness Multiple 1.06

Swivel Foot Design:	Standard
Hold Down Bracket Design:	200/300
Roof Tek Screws:	467 off 12g -14 x 20 gauge Tek Screws
Ring Beam:	ENG10

LOAD DATA

WATER

Water SG:	1	
Water Level:	7.165	m
Water volume:	492.8	m^3
Storage Efficiency:	96.9%	
Clearance:	0.002	m

LIVE

Live Distributed Load:	0.25	kPa
Live Concentrated Load:	1.4	kN

DEAD

Roof Sheet Load:	0.042	kPa

SEISMIC

Acceleration coefficient:	0.15
Site Factor:	1.5
Kp:	1.25

WIND

Wind Region:	A1	
Stream Pressure:	1.22	kPa
Stream Velocity:	45.0	ms^{-1}
Wind Design Code:	Ref 2: AS1170.2:2002	
Wind Buckling Pressure:	1.26	kPa
Importance Factor:	Normal Structures	
Design Life:	25 years	
Wind Direction:	Any	
Terrain Category:	Category 2	
Height:	8.4 m	
Shielding Considered:	No	
Topographical Features:	No	

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COMPONENT DATA & CHECKS

RING BEAM DATA — CHECKED

Ring Beam:	ENG10	
Width:	600	mm
Depth:	500	mm
SR:	0.92	

Okay

COLUMN DATA

Column Design:	Type 3				Okay
Column axial load:	39.9	kN	Column compressive load:	42.99	kN
SR:	0.85		SR:	0.28	

SWIVEL FOOT DATA

Design Type:	Standard	Okay
Capacity:	12	kN
SR:	0.46	

HOLD DOWN BRACKET DATA

Design Type:	200/300		Hilti Hold Down Bolt:	M16	Okay
Capacity:	48.1	kN	Tensile Capacity:	67.2	kN
SR:	0.83		SR:	0.59	

ROOF TEK SCREW DATA

Tek Screw Gauge:	12g -14 x 20 gauge @ 150 mm spacing	Okay
Est. No. Tek Screws:	467	
Capacity:	379 kN	
SR:	0.11	

WIND GIRDER DATA

Wind Girder Required?: Not Required

	Wind Girder Required?	Required I_x Value (mm^4)	Single or Double Section	Spacing if Double (mm)	Section Size	Orientation	Actual I_x Value (mm^4)	Check?
R1 (Top)	0.0							
R2	0.0							
R3	0.0							
R4	0.0							
R5	0.0							
R6	0.0							
R7	0.0							
R8 (Bottom)	0.0							

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PANELS - HYDROSTATIC & HYDRODYNAMIC PRESSURE CHECK

	Ring Thickness	Hoop T Static	Hoop T Combined	Panel Capacity	SR	Check ?
	(mm)	kN/80mm	kN/80mm	kN/80mm		
R1 (Top)	0.8	3.8	4.8	15.07	0.32	Okay
R2	1.0	8.4	9.6	18.84	0.51	Okay
R3	1.6	12.9	14.5	30.14	0.48	Okay
R4	2.0	17.5	19.3	36.64	0.53	Okay
R5	2.4	22.1	24.0	43.96	0.55	Okay
R6	2.4	26.7	28.7	43.96	0.65	Okay
R7	3.0	31.5	33.6	51.84	0.65	Okay
R8 (Bottom)	0.0					

PANELS - WIND BUCKLING PRESSURE CHECK

	Ring Thickness	Panel Capacity	SR	Check ?
	(mm)	kPa		
R1 (Top)	0.8	2.3	0.53	Okay
R2	1.0	1.6	0.78	Okay
R3	1.6	1.8	0.69	Okay
R4	2.0	1.7	0.70	Okay
R5	2.4	1.7	0.73	Okay
R6	2.4	1.5	0.83	Okay
R7	3.0	1.3	0.97	Okay
R8 (Bottom)	0.0			

HOOP TENSION BOLTS - HYDROSTATIC & HYDRODYNAMIC PRESSURE

	Ring Thickness	Bolt Size	No Bolts	Load per Bolt Static	Load / Bolt Combined	Connection Capacity	SR	Check ?
	(mm)	(mm)		(kN)	(kN)	(kN)		
R1 (Top)	0.8	10	2	1.9	2.4	9.0	0.53	Okay
R2	1.0	10	2	4.2	4.8	12.2	0.79	Okay
R3	1.6	10	2	6.5	7.2	19.6	0.74	Okay
R4	2.0	12	2	8.8	9.6	24.7	0.78	Okay
R5	2.4	12	2	11.0	12.0	29.6	0.81	Okay
R6	2.4	12	2	13.3	14.3	29.6	0.97	Okay
R7	3.0	16	2	15.8	16.8	34.8	0.96	Okay
R8 (Bottom)	0.0							

LAP BOLTS - WIND AND EARTHQUAKE LOAD

	Ring Thickness	Wind Shear Load per Bolt	EQ Shear Load per Bolt	Connection Capacity	SR	Check ?
	(mm)	(kN)	(kN)	(kN)		
R1 (Top)	0.8	0.0	3.5	3.8	0.92	Okay
R2	1.0	0.0	4.5	4.7	0.95	Okay
R3	1.6	0.1	5.4	7.5	0.71	Okay
R4	2.0	0.3	6.1	9.4	0.65	Okay
R5	2.4	0.5	6.7	11.3	0.59	Okay
R6	2.4	0.7	7.0	11.3	0.62	Okay
R7	3.0	0.8	7.2	14.1	0.51	Okay
R8 (Bottom)	0.0					

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ROOF DESIGN COVER SHEET		CHECKED	PAGE No.
Spacegass Model Rules		✓	2
Roof Design Data and Loads		✓	3
Roof Design Geometry		✓	3
Summary of Space Gass Analysis Results		✓	4
ADDITIONAL DESIGN DATA			
Drawings and Sketches			
Roof Truss Layout -	Space Gass colour print of graphics with all sections shown	✓	5
Roof Truss Elevations -	From sheet "7"		
Model Member Nos. -	Space Gass colour print of graphics with member numbers on		
Model Node Nos. -	Space Gass colour print of graphics with node numbers on		
Truss Reactions -	Space Gass colour print of graphics with reactions on for worst LC	✓	6
Axial Load Diagram -	Space Gass colour print of graphics with axial forces on for worst LC	✓	7
Spacegass Reports			
Member Results Summary			VW 21 OCT 10
Member Forces and Moments + Reactions for each truss			
use envelope summary for LC's 11-14			
eg. Nodes 100-199, Members 1000-1999 = T1, Nodes 200-299, Members 2000-2999 = T2			
Member Forces and Moments for verticals only			
use envelope summary for LC's 11-14			
eg. Section No + Members 1000-1999 = T1, Section No + Members 2000-2999 = T2			
Member Forces and Moments for Centre Post only			
use envelope summary for LC's 11-14			
eg. Section No + Members 1000-1999 = T1, Section No + Members 2000-2999 = T2			
Node Displacements			
use envolope summary for LC's 15 & 16			
eg Nodes 100-199			

REFERENCE DOCUMENTATION

Roof Design Procedure - PWT-ENG-XX - Roof Design Basis.doc

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ROOF DESIGN DATA AND LOADS

Roof Design Type:	Heavy Duty				
Number of roof trusses:	5				
Roof truss spacing:	1600	mm			
Edge distance:	1479	mm			
Roof sheet dead load:	0.048	kPa	Design Wind Pressure:	1.22	kPa
Roof distributed live load:	0.250	kPa			
Roof concentrated live load:	1.4	kN			
End post height:	80	mm			

Truss No.	Span (m)	Tributary Area (m2)	Dead Load (kN/m) LC2	Live Conc Load (kN) LC4	Live Dist Load (kN/m) LC3	Perp Wind Load (kN/m) LC6	Parallel Wind Zone A length (m)	Parallel Wind Zone A Load (kN/m) LC5	Parallel Wind Zone B length (m)	Parallel Wind Zone B Load (kN/m) LC5
T1	9.358	14.900	0.076	1.400	0.398	-0.936	2.109	-1.488	7.250	-0.937
T2	8.794	13.982	0.076	1.400	0.397	-0.940	1.827	-1.491	6.968	-0.942
T3	6.828	10.428	0.073	1.400	0.382	-1.408	0.843	-1.445	5.984	-0.928
T4	0.000									
T5	0.000									
T6	0.000									
T7	0.000									
T8	0.000									
T9	0.000									
T10	0.000									
T11	0.000									
T12	0.000									

ROOF DESIGN GEOMETRY

Truss No.	Truss Span	z		Centre Point	1st Point	2nd Point	3rd Point	4th Point	5th Point	6th Point	7th Point	8th Point	9th Point	10th Point	11th Point	L_c Restraint
T1	9.358	0.000	X	0.000	1.000	2.000	3.000	4.000	4.679	4.679	4.679	4.679	4.679	4.68	4.679	0.107
			Y	0.392	0.378	0.335	0.264	0.164	0.080	0.000	0.000	0.000	0.000	0.000	0.000	9 @ 0.1
T2	8.794	1.600	X	0.000	1.000	2.000	3.000	4.000	4.397	4.397	4.397	4.397	4.397	4.397	4.397	0.114
			Y	0.356	0.341	0.299	0.228	0.128	0.080	0.000	0.000	0.000	0.000	0.000	0.000	9 @ 0.1
T3	6.828	3.200	X	0.000	1.000	2.000	3.000	3.414	3.414	3.414	3.414	3.414	3.414	3.414	3.414	0.146
			Y	0.246	0.232	0.189	0.118	0.080	0.000	0.000	0.000	0.000	0.000	0.000	0.000	7 @ 0.125
T4	0.000	0.000	X													
			Y													
T5	0.000	0.000	X													
			Y													
T6	0.000	0.000	X													
			Y													
T7	0.000	0.000	X													
			Y													
T8	0.000	0.000	X													
			Y													
T9	0.000	0.000	X													
			Y													
T10	0.000	0.000	X													
			Y													
T11	0.000	0.000	X													
			Y													
T12	0.000	0.000	X													
			Y													
TT	9.045	1.200	X	0.000	1.000	2.000	3.000	4.000	4.523	4.523	4.523	4.523	4.523	4.523	4.523	0.111
			Y	0.371	0.357	0.315	0.244	0.144	0.080	0.000	0.000	0.000	0.000	0.000	0.000	9 @ 0.1

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SPACE GASS MODEL RULES		CHECKED
Member label convention is to use a four digit number as follows:		
first digit is for the truss number	1 = T1 use 9 for Trimming Trusses	✓
second digit is for member type:	2 = top chord	
	3 = bottom chord	
	4 = verticals	
	5 = centre posts	
	6 = diagonals	
the last two digits are sequential numbers to identify individual members		
eg: 2213 is truss T2, top chord 13th member		
Node numbers should preferably be 100 to 199 for T1, 200 to 299 for T2 etc		✓
TT should be 900 to 999.		
This will make reports easier to generate per truss in Space Gass.		
Add section properties to members - do not use 1 start with 2 and use 350 Grade sections		✓
Node restraint settings for trusses shall be LHS = FFFFRR, RHS = RFFFRR		✓
If a 2m platform is in the design then the restraint settings shall be = FFFRRR on the trimming trusses and then the LHS of other trusses should change to RFFFRR		✓
Load case titles shall be as follows:		
LC1 - Self Weight		✓
LC2 - Dead Load		✓
LC3 - Live Distributed Load		✓
LC4 - Live Concentrated Load		✓
LC5 - Wind Parallel		✓
LC6 - Wind Perpendicular		✓
Combination load cases are as follows:		
LC11 - Dead + Live Distributed	= LC1*1.2 + LC2*1.2 + LC3*1.5	✓
LC12 - Dead + Live Concentrated	= LC1*1.2 + LC2*1.2 + LC4*1.5	✓
LC13 - Reduced Dead + Wind Parallel	= LC1*0.9 + LC2*0.9 + LC5*1.0	✓
LC14 - Reduced Dead + Wind Perpendicular	= LC1*0.9 + LC2*0.9 + LC6*1.0	✓
LC15 - Dead + Live Distributed (Serviceability)	= LC1*1 + LC2*1 + LC3*1	✓
LC16 - Dead + Live Concentrated (Serviceability)	= LC1*1 + LC2*1 + LC4*1	✓
Design steel member frame dataset rules		
Major and minor axis effective length ratio L_e = Max spacing between vertical members/truss span		✓
Intermediate flange restraints positions = the number of vertical members @ 1/No. spaces		✓
eg: 7@0.125		
Intermediate flange restraint type is PPP		✓
Platform Loads		
For a MARS roof design the platform dead load shall be 0.42kN/m and the live load		✓
shall be 1.44kN/m these loads shall be applied to the platform support angle.		
Parallel and Perpendicular wind loads for the last truss or rafter member shall be		✓
applied to the platform support angle for each of the wind load cases.		

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SUMMARY OF SPACE GASS MODEL RESULTS

Name of Model: XL30 Heavy Duty
Location of Model: G:\Space Gass Models\Project Models\S02326 DEWA Dubai

Truss No.	Truss Type	SHS Size	Space Gass Results			Axial Load			Web Shear			Displacement			Total Check
			Min SR	Memb	LC	Load	Capacity	SR	Load	Capacity	SR	m	Ratio	Check	
T1	Truss	50x2	1.45	1301	13	24.68	75	0.33	13.30	30	0.44	0.02	473	Okay	Okay
T2	Pickup	65x2	1.16	2201	11	41.10	105	0.39	15.33	41	0.37	0.04	235	Okay	Okay
T3	Half	50x2	2.58	3201	14	0.13	75	0.00	1.46	30	0.05	0.02	322	Okay	Okay
T4	0														
T5	0														
T6	0														
T7	0														
T8	0														
T9	0														
T10	0														
T11	0														
T12	0														
TT	Trim	50x2	1.43	9201	11	10.50	75	0.14	1.40	30	0.05	0.04	0	0	Okay

End Strut Check

Size	Axial Capacity			Moment Capacity		
(mm)	(kN)	SR	Check	(kNm)	SR	Check
75 x 10 FL	18.0	0.06	Okay	0.6	0.24	Okay
75 x 12 FL	20.0	0.05	Okay	0.8	0.18	Okay
90 x 12 FL	16.8	0.06	Okay	1.0	0.15	Okay
90 x 16 FL	29.4	0.03	Okay	1.7	0.08	Okay
100 x 16 FL	25.0	0.04	Okay	1.9	0.08	Okay
Max Load =		1.02	kN		0.15	kNm

Truss Foot Check

Type	Capacity		
	(kN)	SR	Check
Standard	12	0.47	Okay
Cyclonic	21	0.27	Okay
Max Reaction =		5.58	kN

Cross Bracing Check

Size	Capacity		
(mm)	(kN)	SR	Check
32 x 1.6 Galv Strap	7.8	0.24	Okay
Max Bracing Load =		1.85	kN

Steel Member Design

	Group	Description	Member List	Strength Grade	Units	Load Height Position	Span Code	Calculate Lo-Major from Buckling Analysis	Lo for Major Axis Buckling (m or Ratio)	Major Axis Braced in Position at Group Ends	Calculate Lo-Minor from Buckling Analysis	Lo for Minor Axis Buckling (m or Ratio)	Minor Axis Braced in Position at Group Ends	Calculate Lb from Flange Restraints	Lb for Bendir (m or F
▶	9		9	Normal	Ratio	Centre	AS	No	0.125	No	No	0.125	No	Yes	1
	1201	Top chord T1	1201,1202,1203,1204,1205,12(	Normal	Ratio	Centre	AS	No	0.107	No	No	0.107	No	Yes	1
	1301	Bottom chord T1	1301,1302,1303,1304,1305,13(	Normal	Ratio	Centre	AS	No	0.107	No	No	0.107	No	Yes	1
	1401	vertical	1401	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	1402	vertical	1402	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	1403	vertical	1403	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	1404	vertical	1404	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	1405	vertical	1405	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	1406	vertical	1406	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	1407	vertical	1407	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	1408	vertical	1408	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	1409	vertical	1409	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	1410	vertical	1410	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	1501	Centre post T1	1501	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	2201	Top Chord T2	2201,2202,2203,2204,2205,22(	Normal	Ratio	Centre	AS	No	0.114	No	No	0.114	No	Yes	1
	2301	Bottom chord T2	2301,2302,2303,2304,2305,23(	Normal	Ratio	Centre	AS	No	0.114	No	No	0.114	No	Yes	1
	2401	VERTICAL	2401	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	2402	VERTICAL	2402	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	2403	VERTICAL	2403	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	2404	VERTICAL	2404	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	2405	VERTICAL	2405	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	2406	VERTICAL	2406	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	2407	VERTICAL	2407	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	2408	VERTICAL	2408	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	2409	VERTICAL	2409	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	2410	VERTICAL	2410	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	2501	Centre post T2	2501	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	3201	Rafter 1	3201,3202,3203	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	3204	Rafter 2	3204,3205,3206	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	9201		9201,9202,9203,9204,9205	Normal	Ratio	Centre	AS	No	0.5	No	No	0.5	No	Yes	1
	9206		9206,9207,9208,9209,9210	Normal	Ratio	Centre	AS	No	0.5	No	No	0.5	No	Yes	1
	9301		9301,9302,9303,9304	Normal	Ratio	Centre	AS	No	0.5	No	No	0.5	No	Yes	1
	9305		9305,9306,9307,9308	Normal	Ratio	Centre	AS	No	0.5	No	No	0.5	No	Yes	1
	9501	Centre post TT	9501	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
	9502	Centre post TT	9502	Normal	Ratio	Centre	AS	No	1	No	No	1	No	Yes	1
*															

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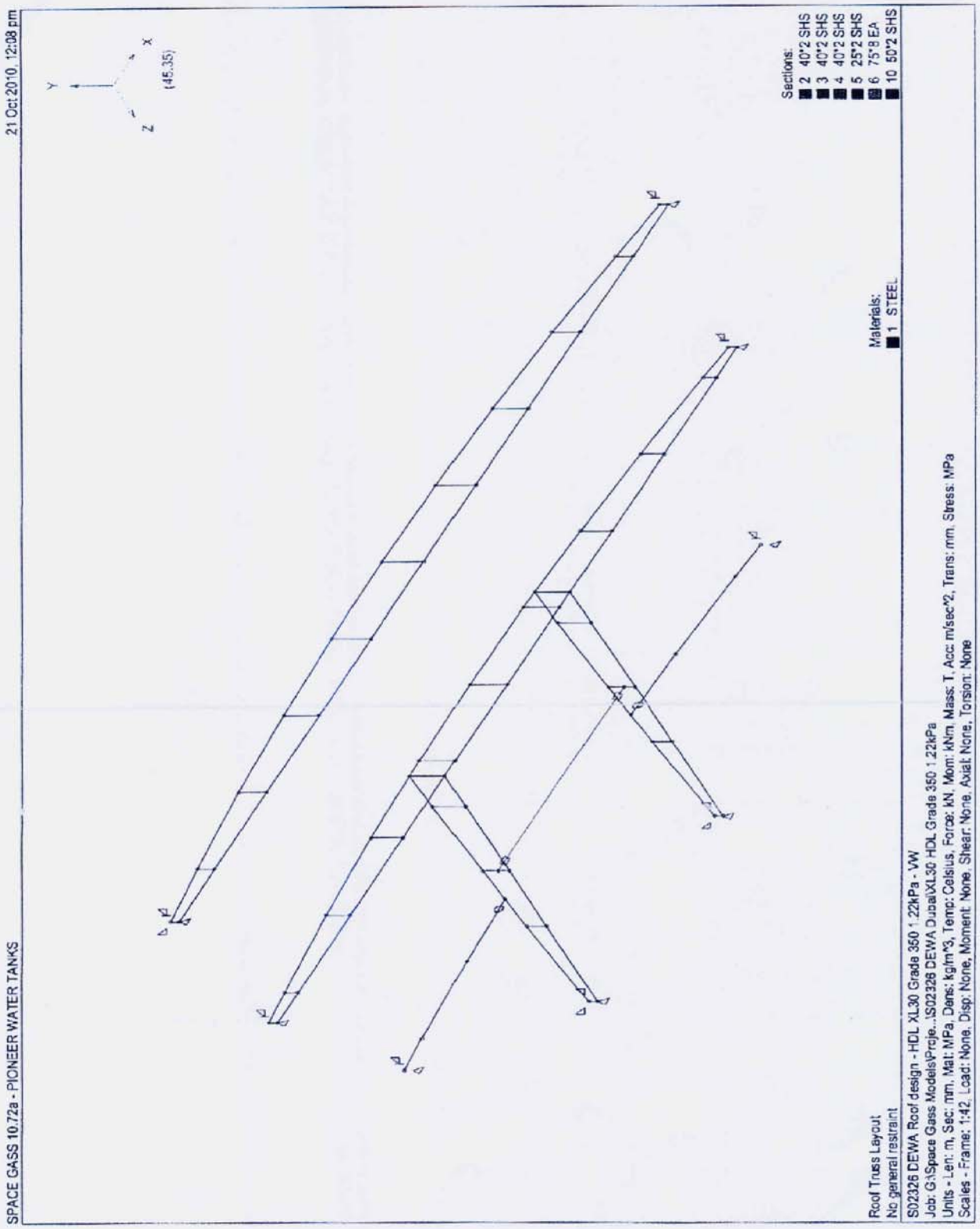

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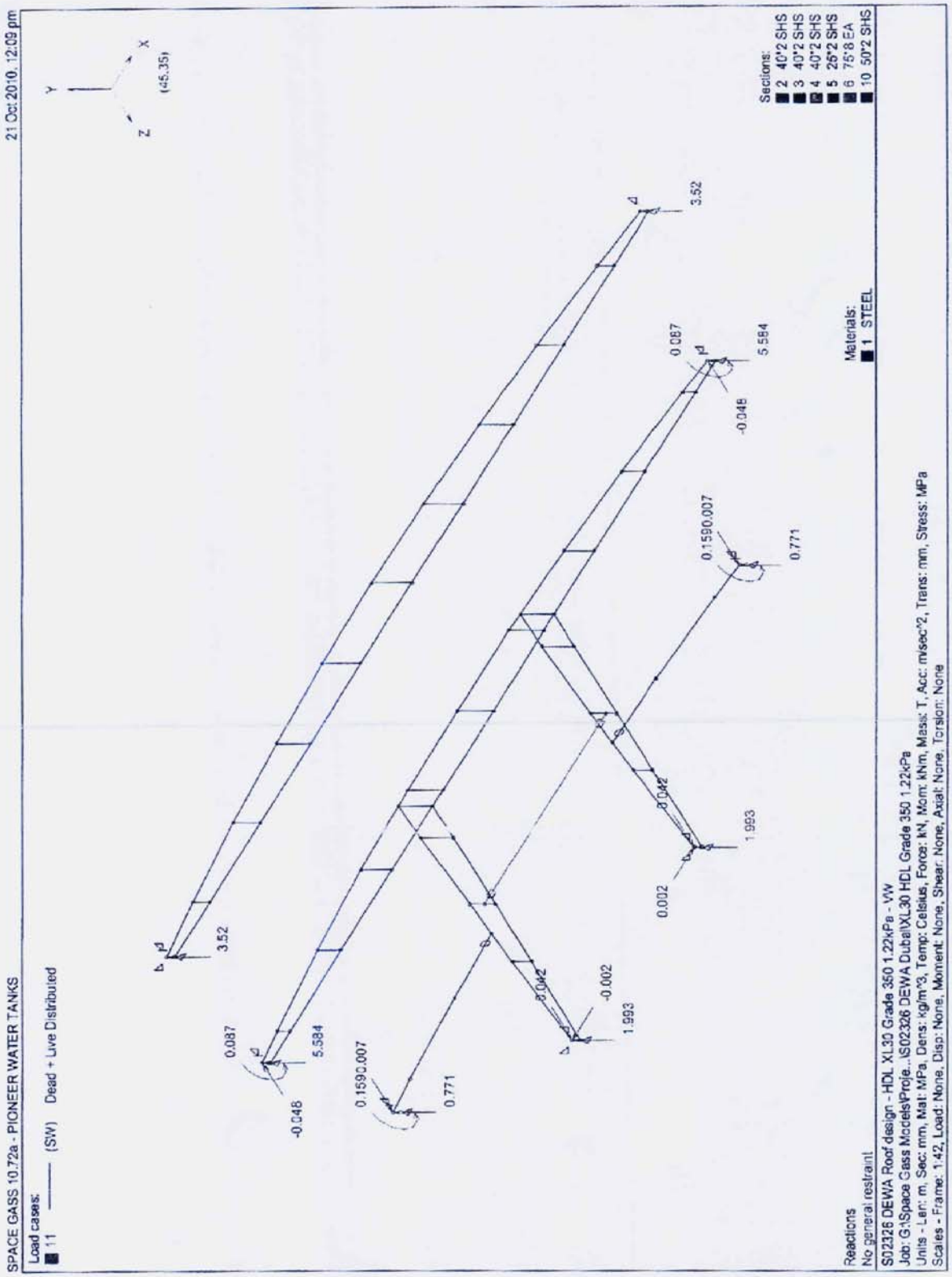
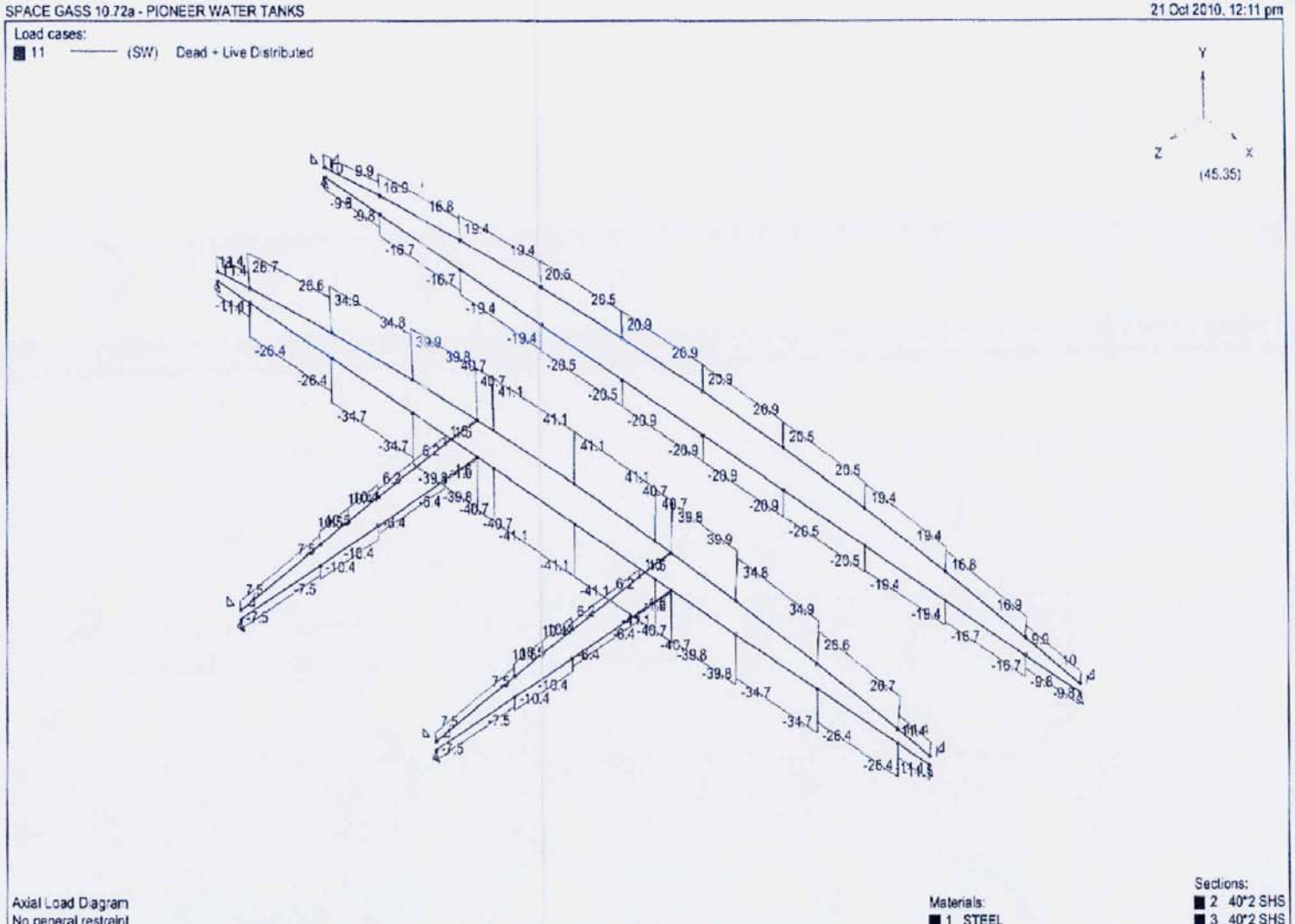


SPACE GASS 10.72a - PIONEER WATER TANKS 21 Oct 2010, 12:11 pm



S02326 DEWA Roof design - HDL XL30 Grade 350 1.22kPa - VW
Job: G:\Space Gass Models\Proje...\S02326 DEWA Dubai\XL30 HDL Grade 350 1.22kPa
Filter: Top and Bottom Chords
Units - Len: m, Sec: mm, Mat: MPa, Dens: kg/m^3, Temp: Celsius, Force: kN, Mom: kNm, Mass: T, Acc: m/sec^2, Trans: mm, Stress: MPa
Scales - Frame: 1:42, Load: None, Disp: None, Moment: None, Shear: None, Axial: 3.662109, Torsion: None

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