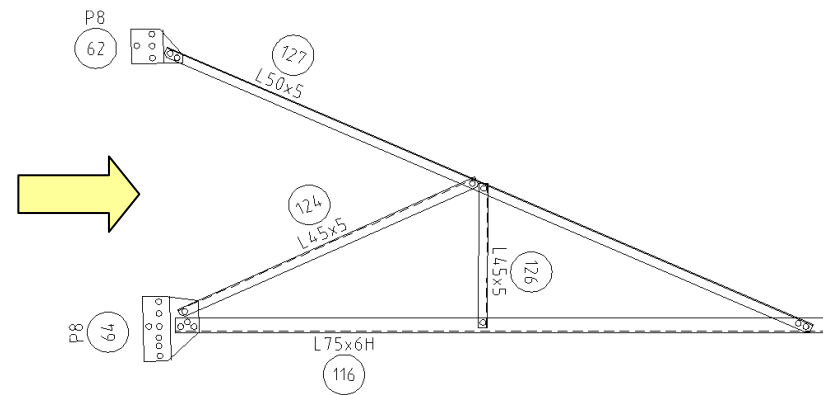
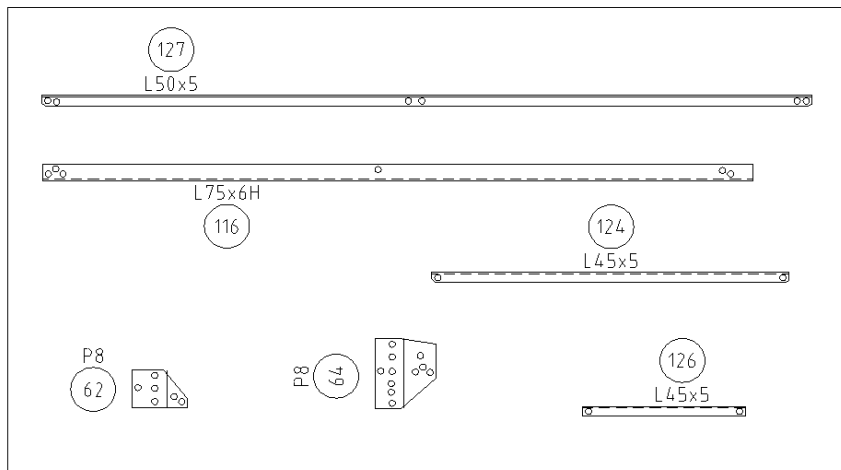


TOWERSMART

VIRTUAL PROTOTYPER

RE-USING EXISTING TOWER DESIGNS



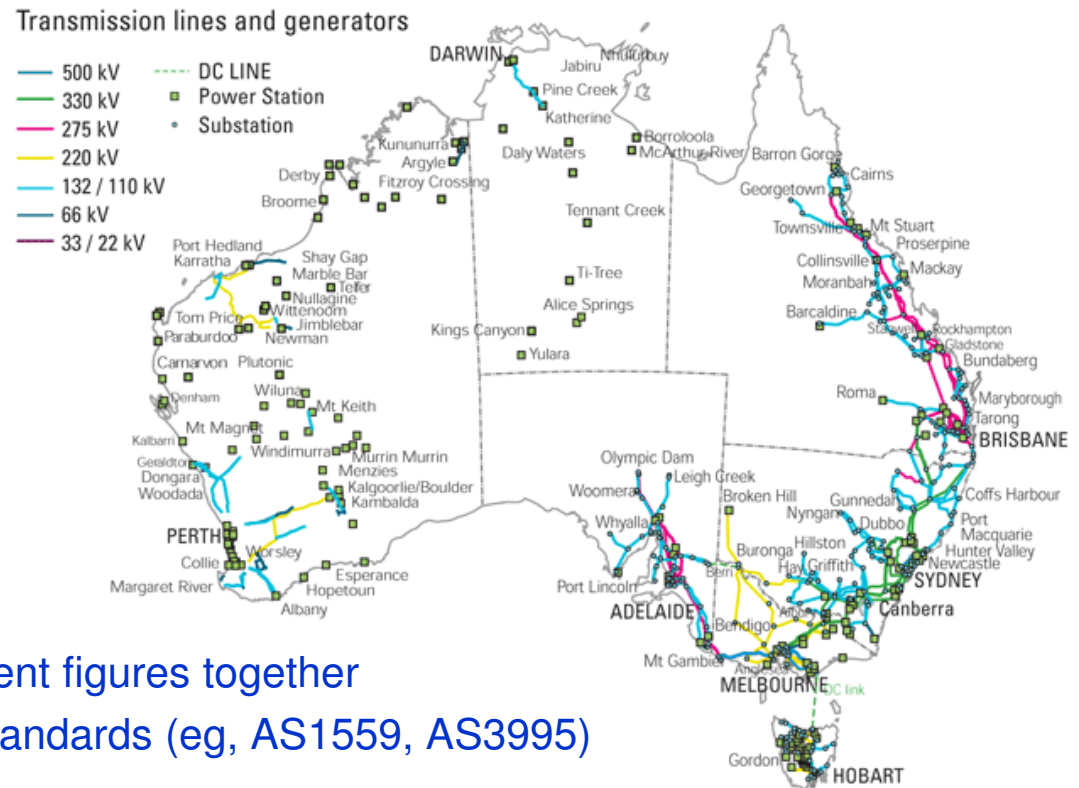
TOWERSMART VIRTUAL PROTOTYPER

In Australia alone there must be hundreds of transmission lines and TV/Radio towers designed and detailed already. The only problem is that a lot of these towers were done many years ago with probably now superseded sections (EA55x5, UE50x75x5 etc), these sections don't readily map to current steel suppliers, so they need to be checked and possibly re-detailed accordingly.

We have developed software tools that quickly check and rebuild existing detailed structures from raw manufacturing data. We are experts in 'Chinafying' or 'Indiafying' your existing designs.

This allows you then to approach any steel manufacturer with exact procurement figures together with detailing that conforms to current standards (eg, AS1559, AS3995)

In the following slides we present our approach to saving you time and money on this economical alternative.



TOWERSMART VIRTUAL PROTOTYPER

Our steps are simple because we have the experience and appropriate software tools.

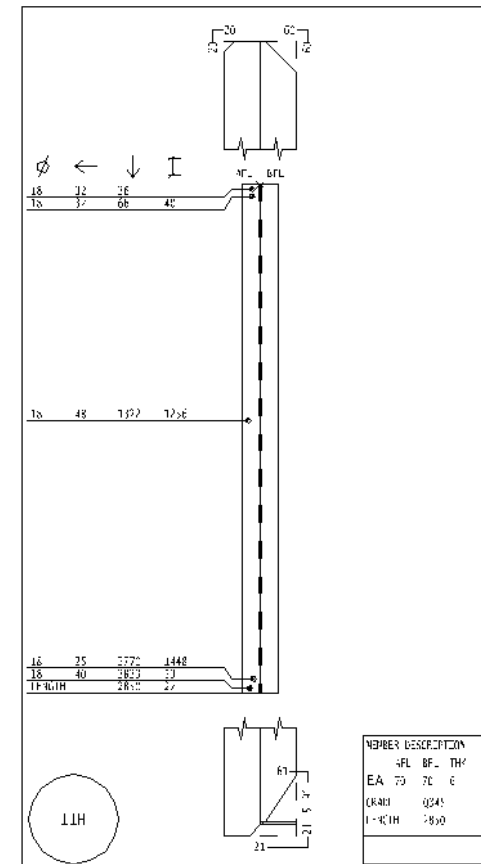
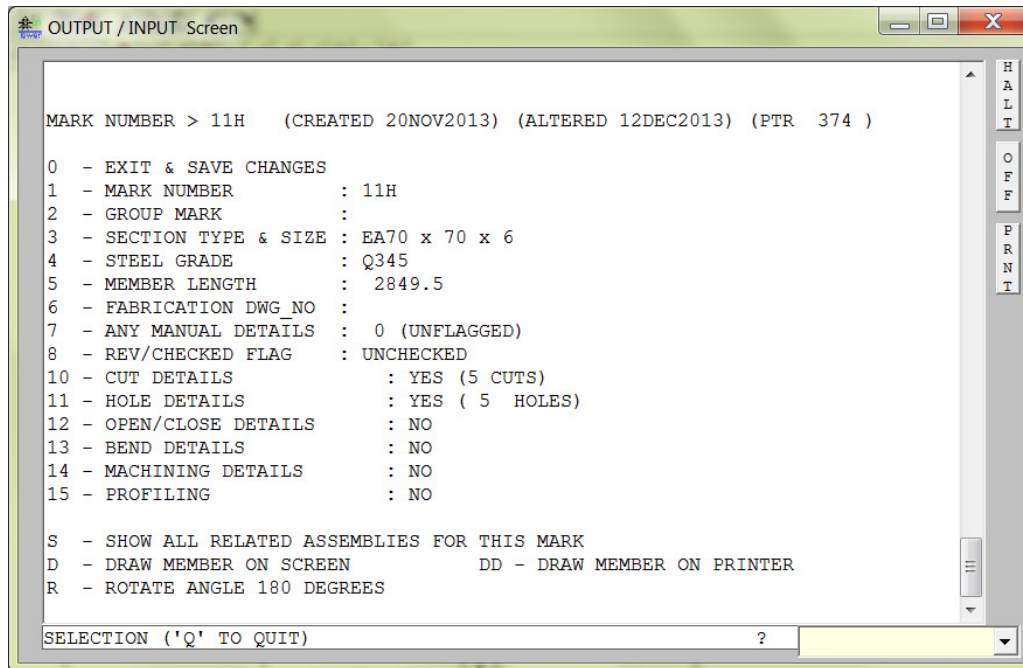
	A	B	C	D	E	F
1	Sections Lookup Tables (AUS to CH)					
2	Australian Sections (AS3995)	Grade (Mpa)		Chinese Sections (Int)	Grade (Mpa)	Notes
3						
4	EA 200 x 20	350		L 200 x 20	345	
5	EA 200 x 16	350		L 200 x 16	345	
6	EA 200 x 13	350		L 200 x 14	345	
7						
8	EA 152 x 12	350		L 160 x 12	345	
9	EA 152 x 10	350		L 160 x 10	345	
10						

How we do this ...

- 1) Key in existing manufacturing data into the manufacturing database (Tower_CNC), this takes approximately 1 to 3 days dependant on how heavy the tower is.
- 2) Exchange the sections accordingly to your sections lookup data (swap tables) and automatically modify cuts and flag bolts out of detailing standard, for example a 65x5 section swapped to 63x5 will need cuts modified and possibly side gauges checked.
- 3) Rebuild the faces of the structure and check for any fouling. The tool (Tower_VP) will redraw any mark number to scale from the Tower_CNC database. This also prepares the updated GA drawings. Sometimes new marks need to be added or safety considerations made (safe erection plates, fall arrestors, etc).
- 4) Re-calculate bolt lengths since most probably these have changed from spring washer to spring+flat or possibly a different bolt manufacturer.
- 5) Recreate BOM lists using Tower_Jobs and create extensible BOM spreadsheets.

TOWERSMART VIRTUAL PROTOTYPER

Typically if the existing towers were detailed/designed by John Holland, Transfield or UGL you will have GA (erection) drawings with all detailing data on them. If your drawings are from EPT / Downer then the details will be presented on separate drawings. Either way, we use these drawings to key in detailing data into the Tower_CNC database. If you have CNC data already available, even better, we can easily convert it to Tower_CNC data structures.



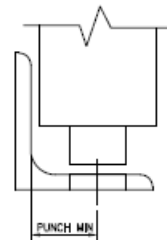
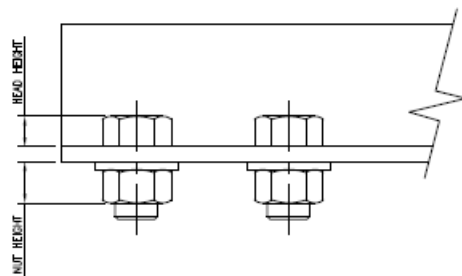
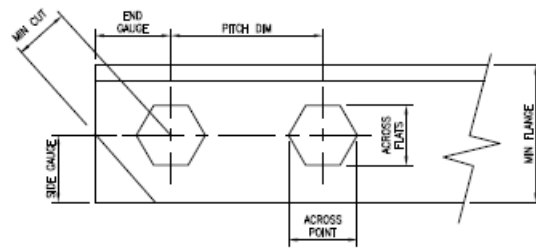
TOWERSMART VIRTUAL PROTOTYPER

We will also set up your current standards for detailing and bolt lengths, we currently have a large range of libraries or can adjust these to your requirements.

TOWERSMART – DDF (DETAIL DIMENSION FILE)

```

1 FILE >>> RPT.DDF
2
3 FOR SIDE GAUGE > ADD UNDER-NUT TOLERANCE OF RELEVANT ANGLE SECTION
4
5 -----
6 BOLT DIA  NUT DIA  ACROSS POINTS  ACROSS FLATS  HEAD HEIGHT  NUT HEIGHT  PITCH DIM  END GAUGE  HGH CUTS  SIDE GAUGE  MIN FLANGE  SYMBOL  PUNCH
7          DIA          *2.5          *1.5+2          *1.3-2
8 -----
9 10  11.5  18  15  7  9  25  20  16  18  38  16  15
10 12  13.5  21  18  8  11  30  20  16  17  38  12  15
11 16  17.5  28  24  11  15  40  26  22  21  44  16  18
12 20  22.0  35  30  14  18  50  32  28  26  55  20  19
13 22  24.0  39  33  15  20  55  35  31  29  75  16  19
14 24  26.0  42  36  16  22  60  38  33  31  75  24  19
15 30  32.0  53  45  0  0  75  47  43  42  0  16  19
16 32  34.0  56  48  0  0  80  50  46  45  0  16  19
    
```



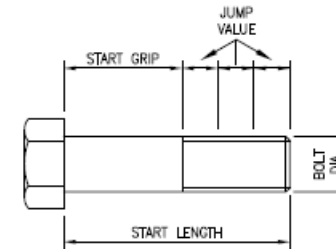
TOWERSMART – BLT (BOLT LENGTH TABLE)

BOLT LENGTH INFO

>>> INITIAL BOLT LENGTH INFO:

WASHER DESCRIPTION	BOLT DIA	START GRIP	START LENGTH	JUMP VALUE	IF #3	CALC #5	GAP #6	BELOW #8	START GRIP
FLAT	12	10	35	5	7	6			
	14	10	35	5	10	10	10	10	
	16	6	35	5	0				
	20	7	40	5	6				
	24	8	45	5	6				
SPRING	12	13	35	5	10	8	7	6	
	16	8	35	5	6				
	20	8	40	5	6				
	24	8	45	5	6				

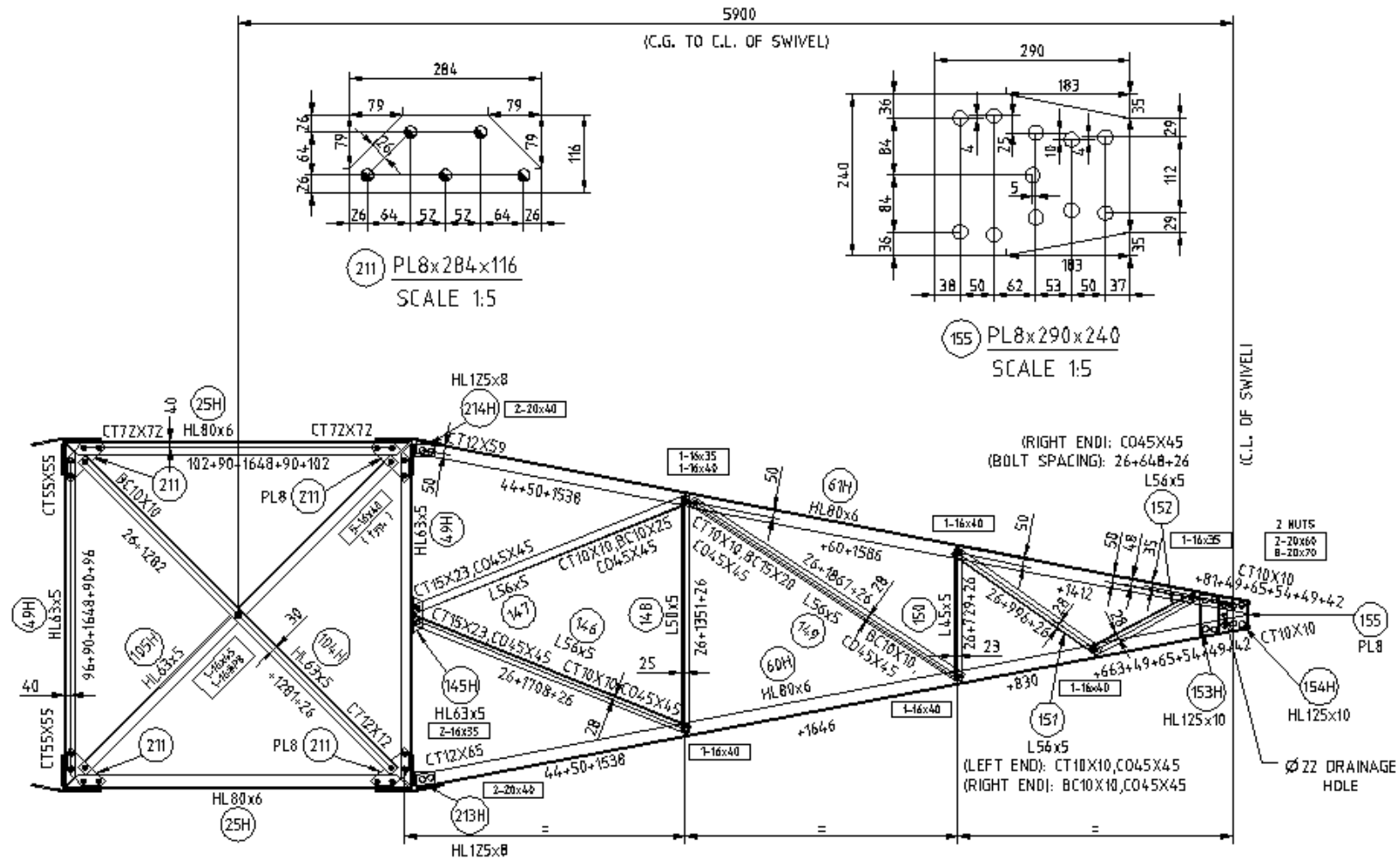
FLAT (0)
 SPRING (1) – CAN BE HEAVY OR FLAT & SPRING OR LOCK NUT



These libraries will be used to automatically check detailing while virtual prototyping. Also to recalculate the bolt lengths.

TOWERSMART VIRTUAL PROTOTYPER

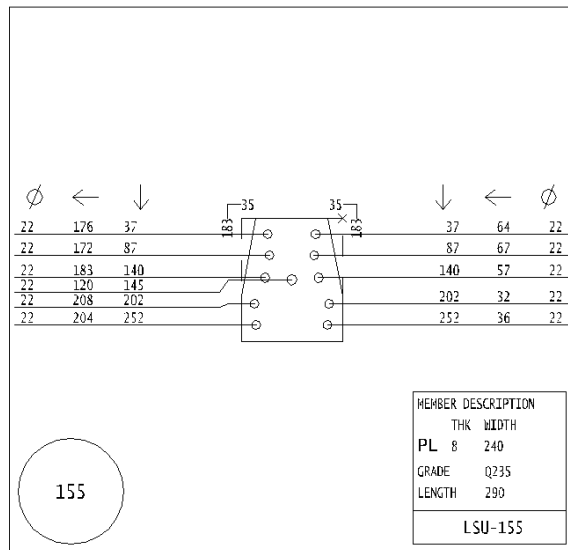
Most detailers will provide you with a set of general assembly (GA) drawings showing both construction and manufacturing data on the same drawing ...



This type of drawing is not only confusing for steel manufacturers, but confusing for on-site construction also.

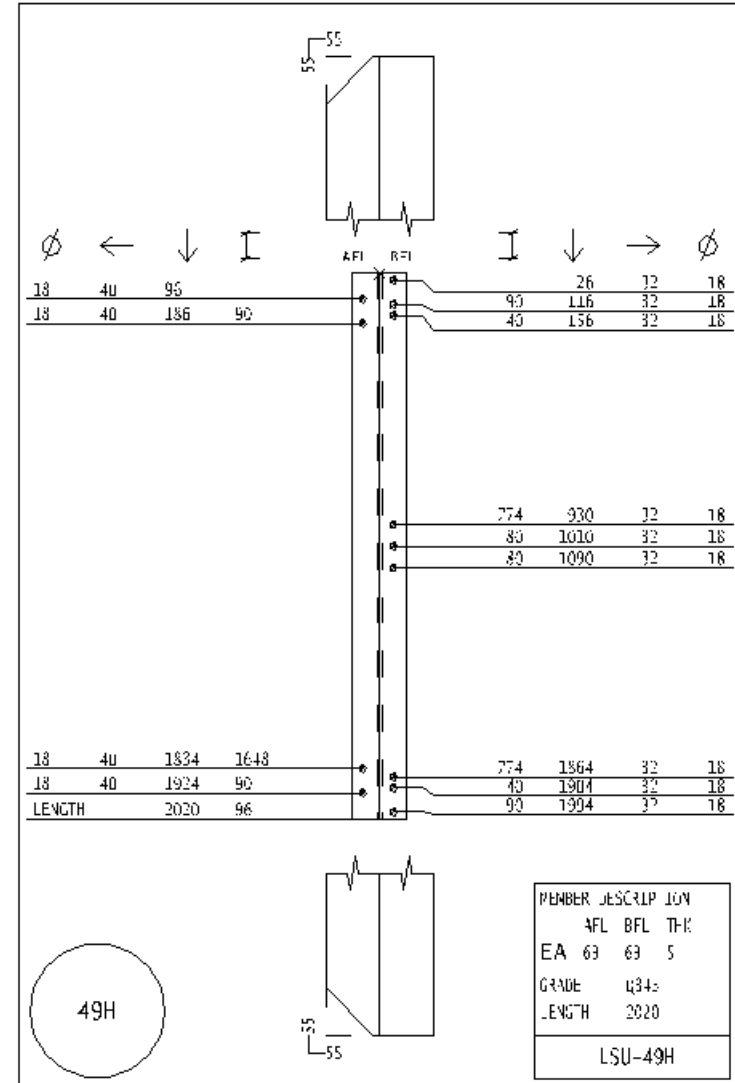
TOWERSMART VIRTUAL PROTOTYPER

All required marks are given on separate drawings (FD) complete with CNC data and full scale profile plates if required.

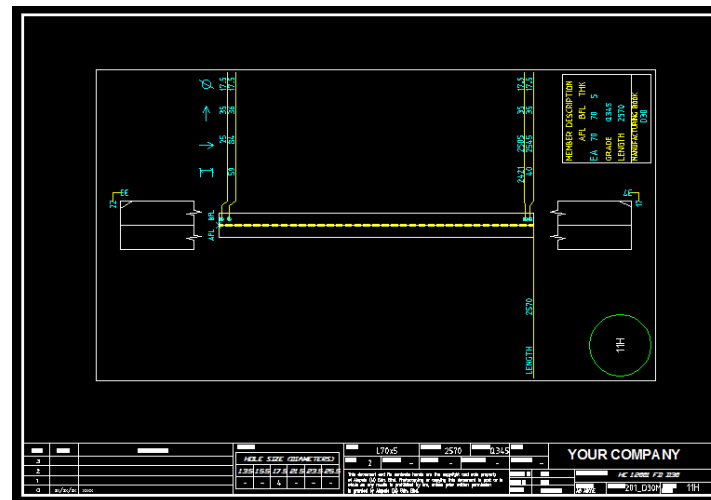


```

49H_LSU.DAT -...
File Edit Format View Help
"P:63*5"
"M:16MN"
"LP:2020"
"SA63 SB63 TA5 TB5"
"DA18 X96 TR40"
"X186 TR40"
"X1834 TR40"
"X1924 TR40"
"DB18 X26 TR32"
"X116 TR32"
"X156 TR32"
"X930 TR32"
"X1010 TR32"
"X1090 TR32"
"X1864 TR32"
"X1904 TR32"
"X1994 TR32"
"MK& 49H& X1520"
"M30"
"END"
    
```



All dwgs supplied on your companys formats



TOWERSMART VIRTUAL PROTOTYPER

We also provide extensible spreadsheets (.xls) of BOM components per sub-assembly that you can easily extend to automatically calculate total weight and procurement required for the complete project.

Microsoft Excel - LSU_BOM_current.xls

File Edit View Insert Format Tools Data Window Help

75% Arial 12 B I U

L7 Chord

	A	B	C	D	E	F	G	H	I	J	K	
1	LS tower material takeoffs										Total WT =	22176.592
2	Assy_ID	Assy_Qty	Assy_Descr	Mark	Qty	Section_Size	Steel_Grade	Length	Width (or 1000 if angle)	Unit_Weight	Total_Weight (kg)	
3												
4	EW	2	EarthWire	54H	1	EA 70 x 70 x 5	Q345	5073	1000	27	55	
5	EW	2	EarthWire	55H	1	EA 70 x 70 x 5	Q345	5073	1000	27	55	
6	EW	2	EarthWire	56H	1	EA 70 x 70 x 6	Q345	5276	1000	34	68	
7	EW	2	EarthWire	57H	1	EA 70 x 70 x 6	Q345	5276	1000	34	68	
8	EW	2	EarthWire	121	1	EA 50 x 50 x 5	Q235	1929	1000	7	15	
9	EW	2	EarthWire	122	1	EA 50 x 50 x 5	Q235	1929	1000	7	15	
10	EW	2	EarthWire	123	1	EA 45 x 45 x 5	Q235					
11	EW	2	EarthWire	124	1	EA 45 x 45 x 5	Q235					
12	EW	2	EarthWire	125	1	EA 50 x 50 x 5	Q235					
13	EW	2	EarthWire	126	1	EA 50 x 50 x 5	Q235					
14	EW	2	EarthWire	138	1	EA 50 x 50 x 5	Q235					
15	EW	2	EarthWire	139	1	EA 50 x 50 x 5	Q235					
16	EW	2	EarthWire	220	1	EA 50 x 50 x 5	Q235					
17	EW	2	EarthWire	221H	1	EA 100 x 100 x 8	Q345					
18	EW	2	EarthWire	222H	1	EA 100 x 100 x 8	Q345					
19	EW	2	EarthWire	140	1	PL16	Q235					
20												
21	X1	2	Top Xarm	58H	1	EA 63 x 63 x 5	Q345					
22	X1	2	Top Xarm	59H	1	EA 63 x 63 x 5	Q345					
23												

LS assemblies (for test tower)		
Assy_ID	Assy_QTY	Assy_Description
EW	2	EarthWire
X1	2	Top Xarm
X2	2	Middle Xarm
X3	2	Bottom Xarm
B1	1	Superstructure Body
B2	1	Upper Basic Body
B3	1	Lower Basic Body
B4	1	Body Extension (6M)
B5	0	Body Extension (3M)
L1	1	Leg 6M

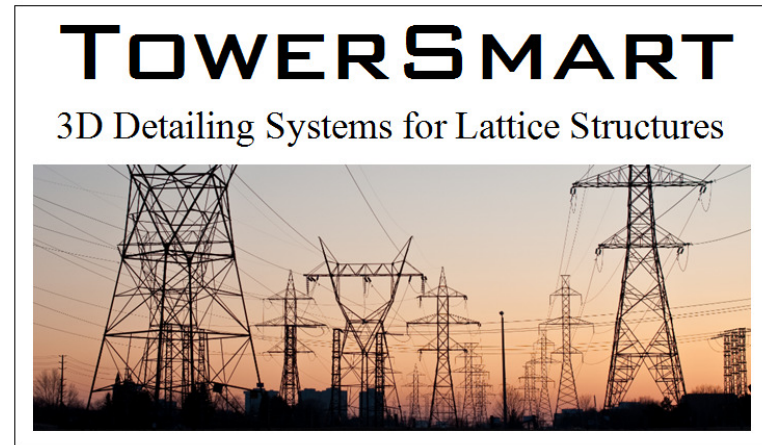
TOWERSMART VIRTUAL PROTOTYPER

For enquires or quotations, please send us an email with attachments to ...

enquires@towersmart.com.au

Or visit our website ...

www.towersmart.com.au



For fixed quotations, all we need is your marked up outlines and swap tables.

If you need assistance with this, we highly recommend our design partner ...

Alupole Australia / Alupole International, they are very experienced in all aspects of tower design and electrification.



www.alupole.com