

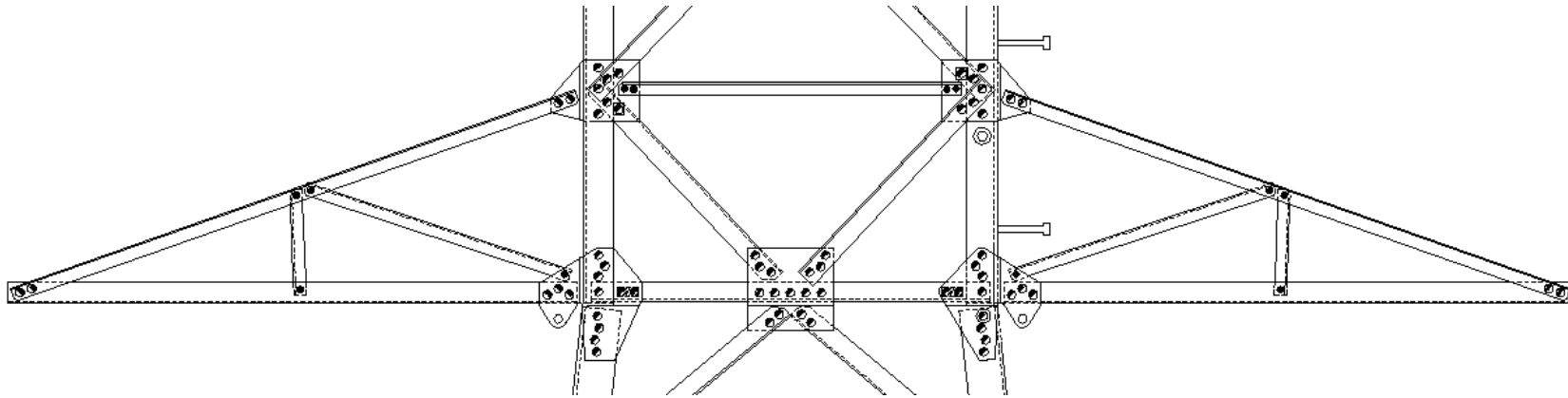
# TOWERSMART

## TOWER DETAILING TIPS

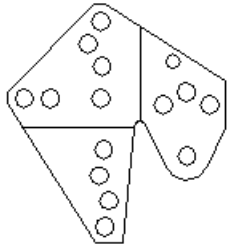


SERIES 5

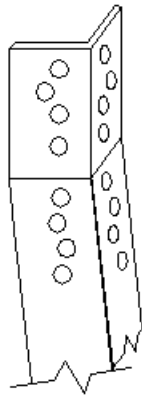
# TOWER DETAILING TIPS



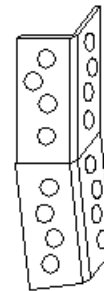
The tower 'waist' is a crucial area that transfers all of the forces from the upper structure (superstructure) to the lower structure (common body). There are many ways to detail this connection and the method chosen depends on designers preference and also the manufacturers capabilities. Below are some of the common options ...



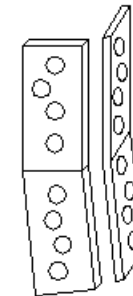
**Thick Waist Plate**



**Bent Lower Corner**

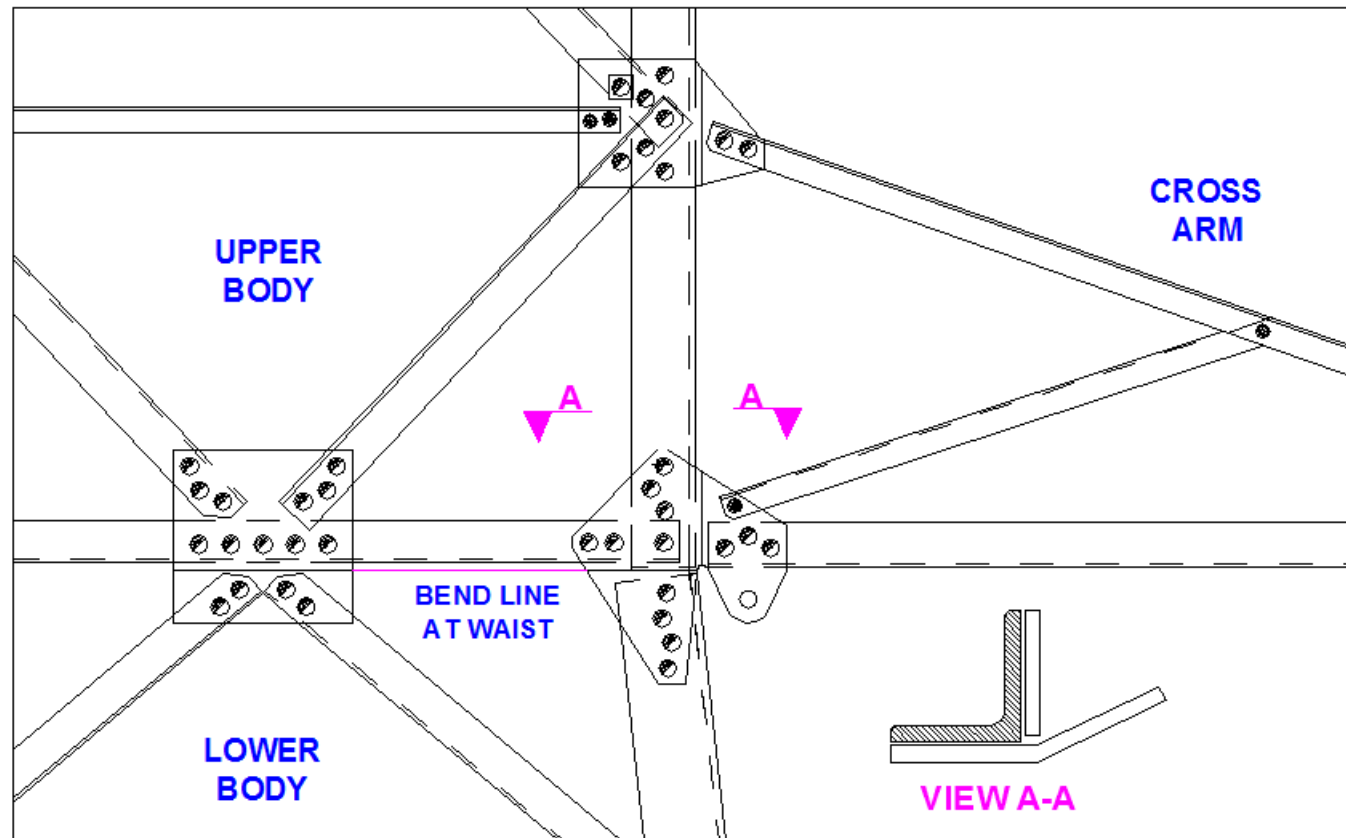


**Bent Backing Angle**



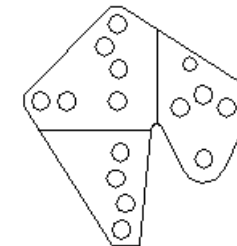
**Internal Waist Plates**

# TOWER DETAILING TIPS

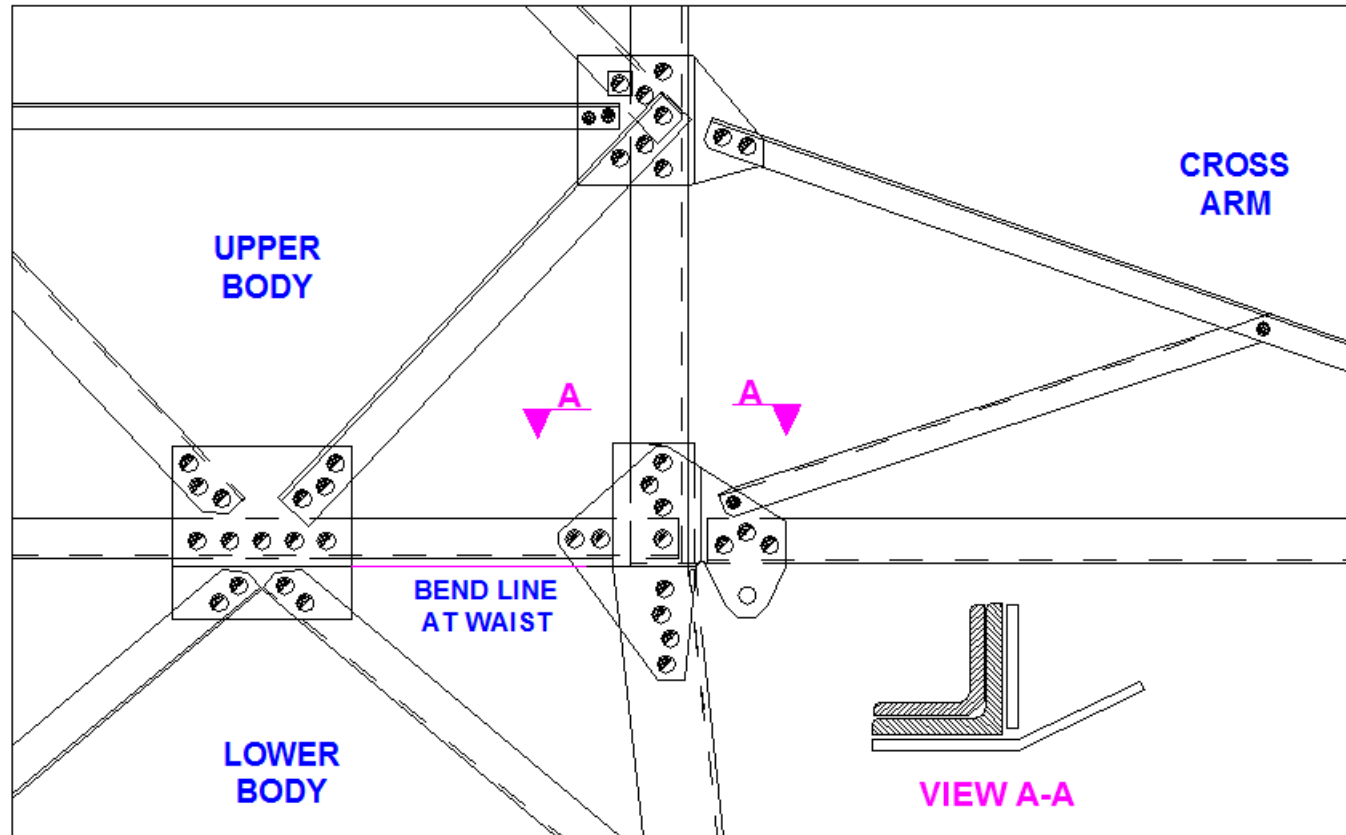


## Thick Waist Plate

This solution is probably the simplest to detail and manufacture since it eliminates the need to bend corners. The engineer needs to determine the required plate thickness of the waist plate in consideration with bolts being in single shear.

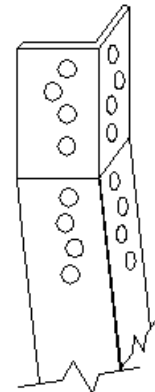


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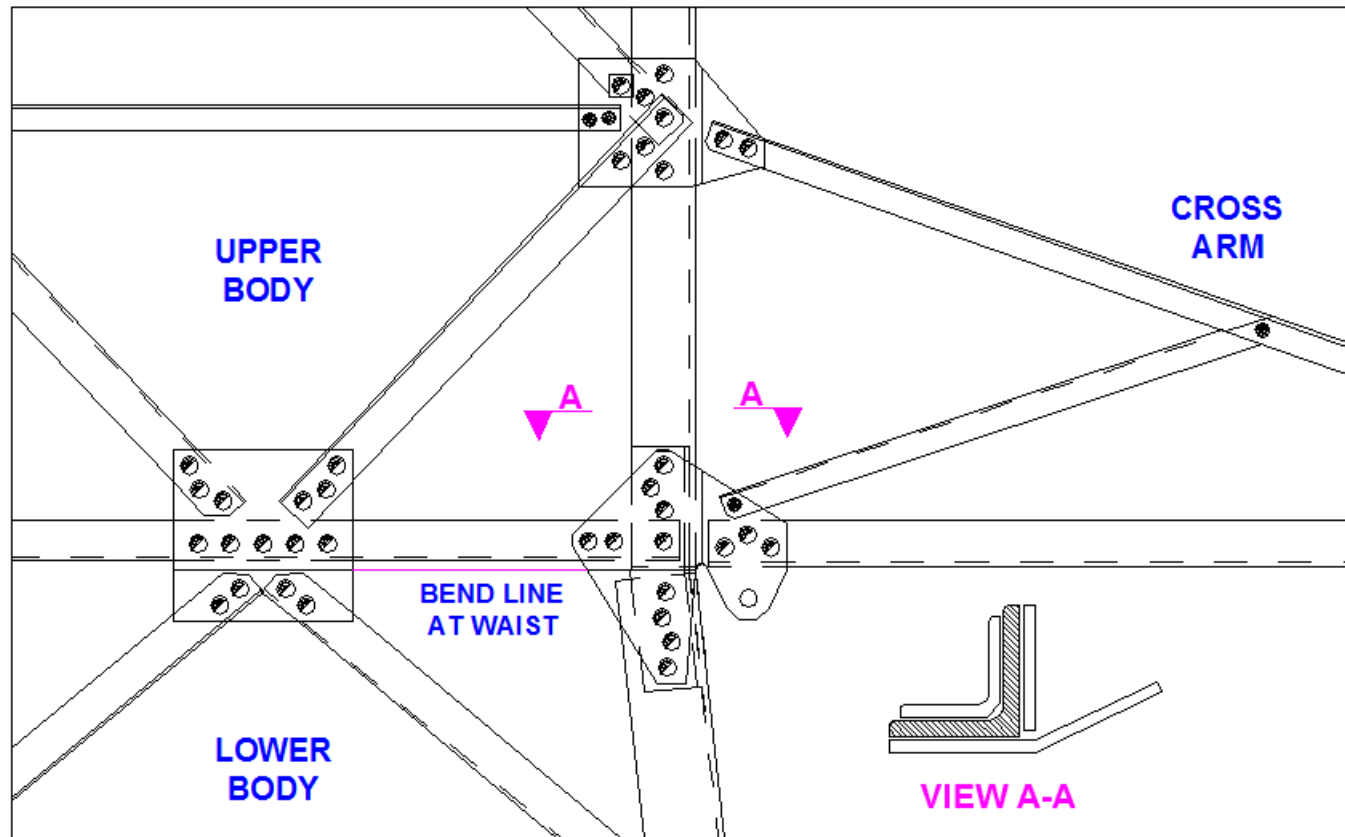


## Bent Lower Corner

This was the initial solution used when lattice towers were first detailed. It is still fairly common today but is not manufacturing friendly due to the double bend required on the lower corner member. Bent hot rolled angles are difficult to control consistency when mass produced and cumbersome to deliver to site. Refer to our 'Tower Detailing Tips – Series 2' on bends.

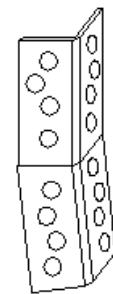


# TOWER DETAILING TIPS

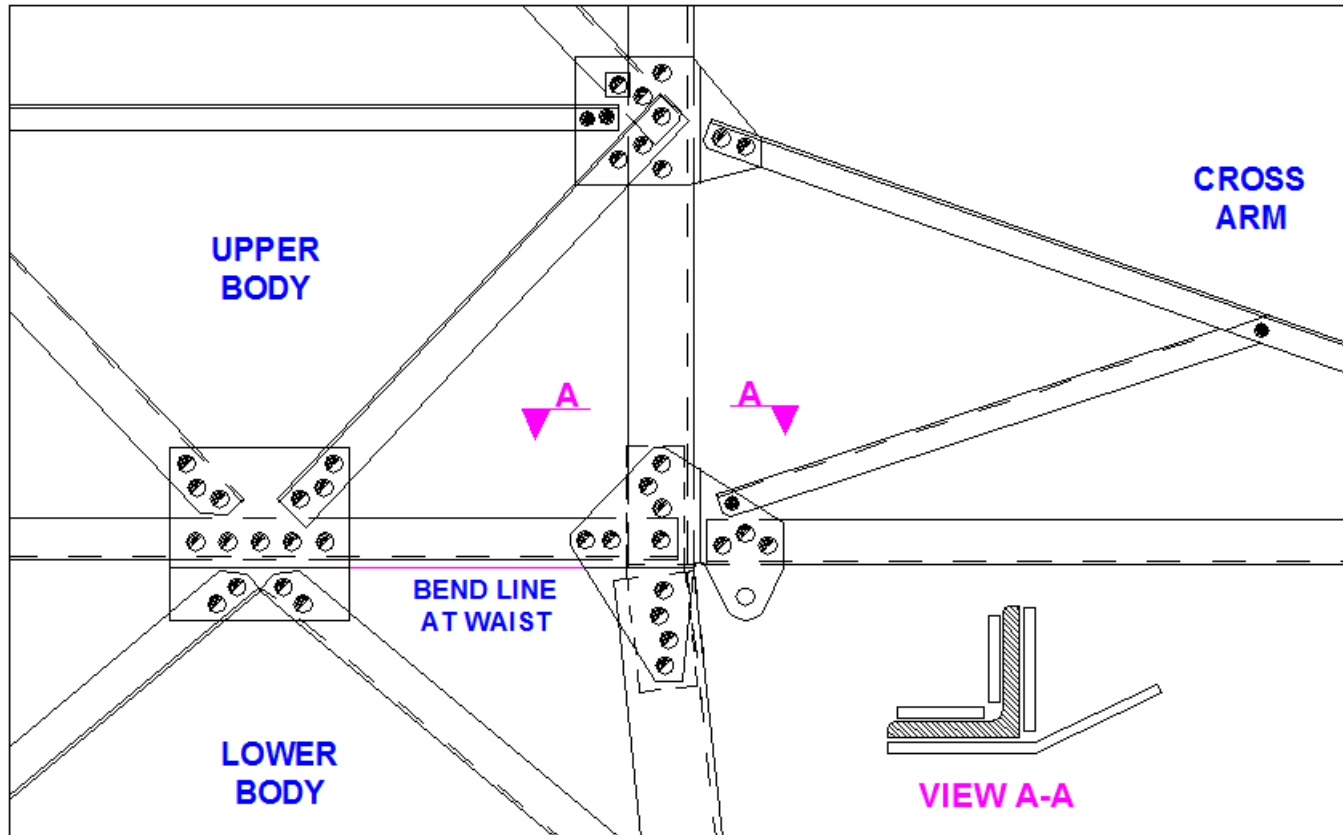


## Bent Backing Angle

This solution still requires a bent member but it is on a shorter backing angle instead of a long corner member. Like the Bent Lower Corner solution, the main issue is fitting other main members (frame or diagonals) inside the corner due to the extra thickness. The affect is similar to a 'Butt' splice where bolts are in double shear.

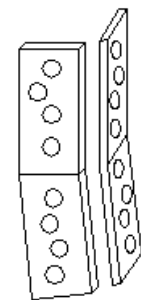


# TOWER DETAILING TIPS

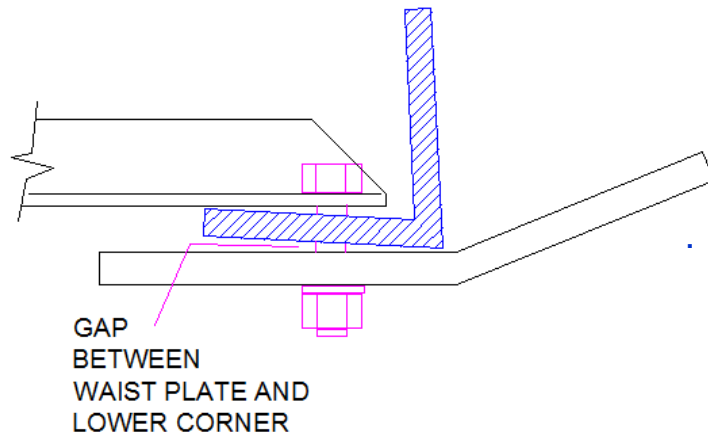


## Internal Waist Plates

I have not seen this solution used yet but see no problem why it wont work. Basically it is similar to the Bent Backing Angle detail but replacing the internal backing angle with 2 thick bent plates instead. This eliminates the need to bend any hot rolled angles. The reason I believe this will be as affective as the bent backing angle method is because the heel of backing angle still has to be ground down to fit inside the corner, thus creating a similar affect.

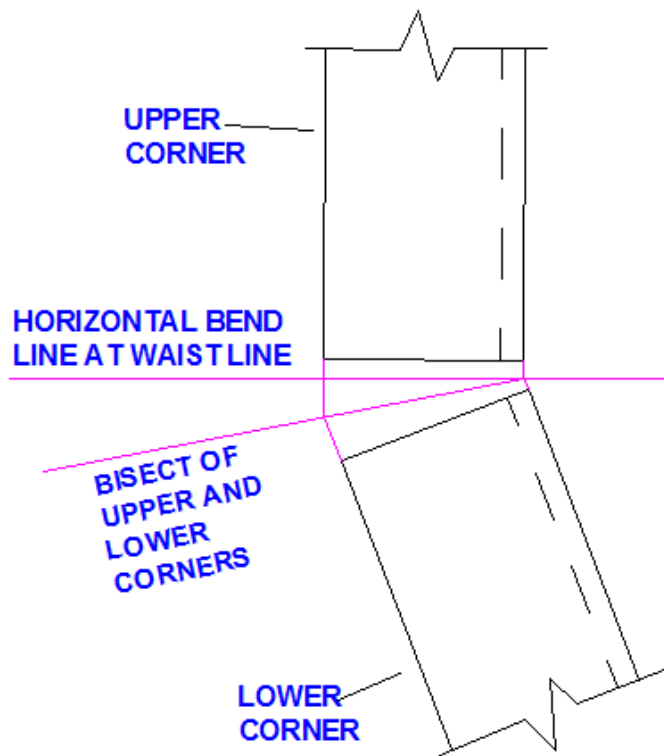


# TOWER DETAILING TIPS

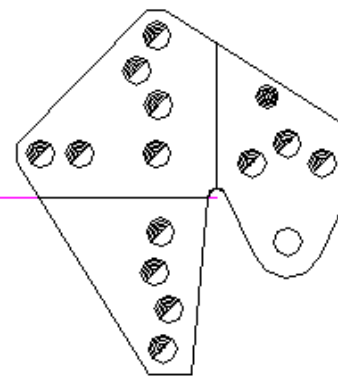


Another issue to consider for waist plates on wide towers is the 'gap' affect. This is caused by utilising a horizontal bend line at the waist. Refer to our 'Tower Detailing Tips – Series 1' for an explanation on the 'gap' affect.

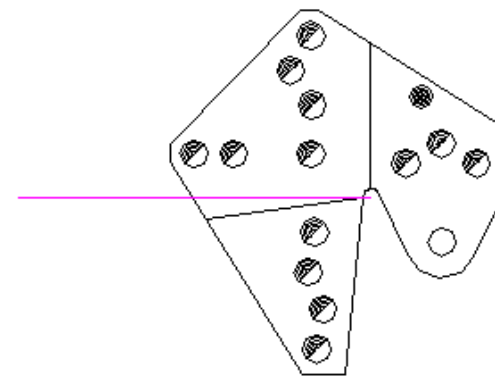
One solution to eliminate this gap is to 'open' the lower corner, but if this is not preferred then another solution is to rotate the bend line to where the faces of the upper and lower corners intersect.



Note that if you are going to use the rotated bend line then consideration must be given to the incoming lower main members (KUP or Diagonal) at this point since they will need small bending (around 1 to 2 degrees)



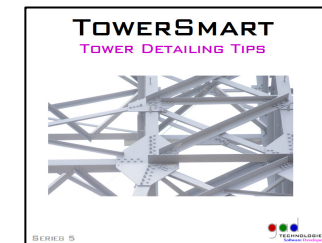
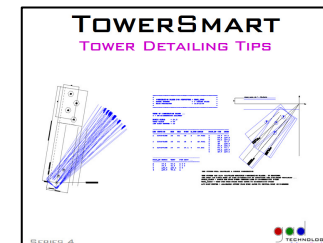
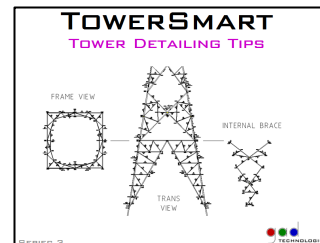
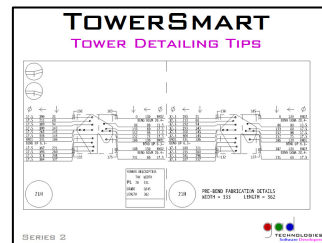
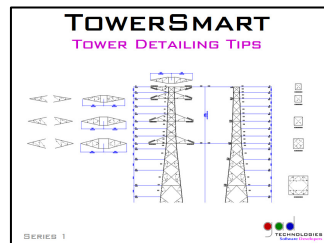
WAIST PLATE WITH HORIZONTAL BEND LINE CAUSES 'GAP' AFFECT



WAIST PLATE WITH ROTATED BEND LINE WITHOUT 'GAP' AFFECT

# TOWER DETAILING TIPS

I hope you have found these presentations on tower detailing helpful and informative. This will be the last of my publications for now since I am focusing more on software development. When I do get some spare time I will endeavour to create more free tips since I have found that tower detail knowhow is slowly diminishing due to experienced detailers retiring and not having the benefit to pass on their invaluable knowledge to trainees and apprentices.



For further information on tower detailing,  
visit us at ...

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or send us an email ...

[enquires@towersmart.com.au](mailto:enquires@towersmart.com.au)

## TOWERSMART

3D Detailing Systems for Lattice Structures

