

Reducing Hand-Arm Vibration Exposure in Steelwork Fabrication

Hand Arm Vibration Syndrome (HAVS) is the transmitting of vibration into workers hands and arms. This can be from many different and varied processes such as hand held power tools and holding material being worked on. This vibration can cause the following in operatives hands and arms:

- Severe Pain and numbness
- Loss of a sense of touch
- Pins and needles
- Loss of grip strength
- Painful wrist (Carpel Tunnel Syndrome)

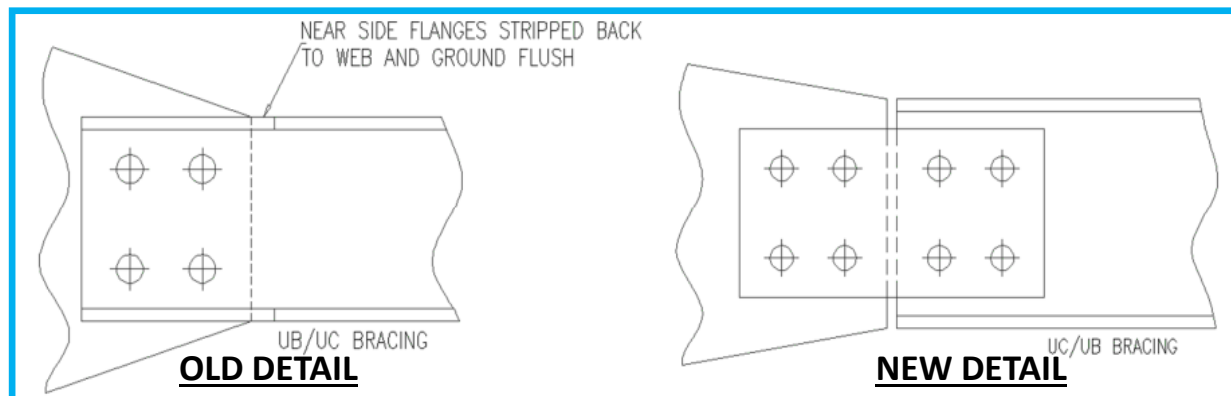
Symptoms can come and go, but continued exposure to vibration may lead to them being prolonged / permanent.

Controlling the risks from HAVS

From a steelwork fabrication view point the best way to control HAVS is to remove the process that can be the main cause i.e. grinding. Various practices have been implemented by Peers to reduce or remove the need for grinding.

- Beam to column moment connection - Project end plate above beam top flange – This allows a fillet weld to the outside of the flange instead of a butt weld which requires a prep to ground into the steel.
- Beam to column simple connection – Set the end plate down from top flange to allow a fillet weld or seal weld to be laid – This removes the need to grind a prep or flush off seal welds.
- FSBW or PPBW – If nothing is sitting directly over these welds don't grind flush, leave pronounced.
- Shot Blast Steelwork – All steelwork is now purchased pre-shot blasted which prevents the need to grind areas clear of rust or mill scale prior to welding – Cost is approximately £25/Tonne.
- Trigger Times – The overall usage time of grinders has been reduced and the remaining time is closely monitored with strict controls on trigger times for operatives.

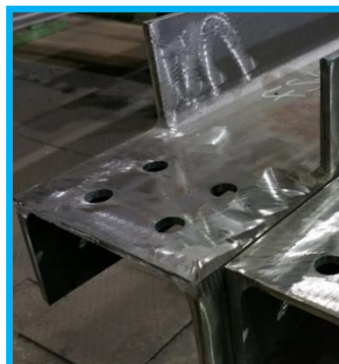
In addition to the above the typical Universal Column (UC) bracing connection has been amended to remove the excessive grinding. Original connection with grinding and new connection are shown below.



Alternative Bracing Detail



Pre-Grinding



Post Grinding

The picture on the far left is the UC bracing after it has been profiled and the picture to the near left is the bracing once it has been dressed with a grinder (substantial grinding is required). The preferred connection above uses cover plates with a pack to produce a square cut section therefore eliminating any grinding and risk of HAVS.