扩展功能

本文信息

▸ Supporting info
▸ PDF(0KB)
▸ [HTML全文]
▸ 参考文献[PDF]
▸ 参考文献

服务与反馈

▸ 把本文推荐给朋友
▸ 加入我的书架
▸ 加入引用管理器
▸ 引用本文
▸ Email Alert
▸ 文章反馈
▸ 浏览反馈信息

本文关键词相关文章

▸ N形圆钢管相贯节点
▸ 垫板加强
▸ 非线性有限元分析
▸ 极限承载力

本文作者相关文章

PubMed

学术论文

垫板加强N形圆钢管相贯节点静力性能试验研究

吴亮秦[1]， 李自林[2,3]， 韩庆华[3]

1.同济大学 桥梁工程系， 上海 200092； 2.天津城市建设学院 土木工程系， 天津 300384；3.天津大学 建筑工程学院， 天津 300072

摘要：

为研究加强垫板对承受支管轴力和主管轴力的N形圆钢管相贯节点静力性能的影响，对未加强节点和垫板加强节点试件进行了试验研究，并运用有限元方法对试验节点进行了非线性分析。比较试验与有限元分析得到的极限承载力结果和破坏模式，发现二者吻合较好。改变垫板各几何参数，对加强节点进行有限元分析。结果表明，加强垫板可以降低节点应力集中系数、减小局部变形、提高节点极限承载力；增大垫板长度和弧度对节点极限承载力的影响很小，而增大垫板厚度可有效提高节点极限承载力，但当垫板厚度增大到一定值时，再增加垫板厚度对节点极限承载力提高无益而对结构整体受力不利。

关键词： N形圆钢管相贯节点　垫板加强　非线性有限元分析　极限承载力

Experimental study on static behavior of plate reinforced tubular N-joints

WU Liangqin[1], LI Zilin[2,3], HAN Qinghua[3]

1.Department of Bridge Engineering, Tongji University, Shanghai 200092, China;
2.Department of Civil Engineering, Tianjin Institute of Urban Construction, Tianjin 300384, China;
3.School of Civil Engineering, Tianjin University, Tianjin 300072, China.

Abstract:

In order to investigate the effect of the reinforcing plate on static behavior of tubular N-joints under axial compression of brace and chord, experiment and nonlinear finite element analysis were carried out on a plate reinforced and an unreinforced tubular N-joint. Test results, including the failure mode and ultimate capacity were compared with the FEA results, showing good agreement. Analysis of geometric parameters of the reinforced plate were conducted using finite element method. The results show that the reinforcing plate can reduce stress concentration factors, decrease local deformation and increase ultimate capacity of the joint. It is found from the parametric study that the length and radian of the reinforcing plate has little influence on the ultimate capacity of joints, whereas the thickness of the reinforce plate greatly affect the ultimate capacity. The ultimate capacity of a tubular joint increases remarkably as the thickness of the reinforcing plate increases. However, when the thickness of the reinforcing plate reaches a certain value, further increase of the thickness of the reinforcing plate is useless for the ultimate capacity, and may even weakening the mechanical behavior of the overall structure.

Keywords: tubular N-joint　plate reinforced　nonlinear finite element analysis　ultimate capacity

收稿日期 修回日期 网络版发布日期

DOI：

通讯作者：吴亮秦（1985—），男，江西赣州人，博士研究生。

作者简介：
作者Email: E-mail:jetwu1985@163.com

参考文献：