**刚性柱撑计算书**

**1.** **设计依据**

**《建筑结构荷载规范》(GB** **50009-2012);**

**《建筑抗震设计规范》(GB** **50011-2010);**

**《钢结构设计标准》(GB** **50017-2017);**

**《建筑结构可靠性设计统一标准》(GB** **50068-2018)** **《工程结构通用规范》(GB** **55001-2021)**

**《建筑与市政工程抗震通用规范》(GB** **55002-2021)** **《钢结构通用规范》(GB** **55006-2021)**

**2.** **计算软件信息**

**本工程计算软件为** **PKPM** **钢结构设计软件** **2021** **V1.2.0** **版** **。计算日期为** **2025** **年** **8** **月** **12** **日** **15** **时** **6** **分** **53** **秒。**

**3.** **结构计算简图**

**7000**

**1 1 2**

**实WH300X400X8X14+150X14- 0**

**1**

**4**

|  |  |
| --- | --- |
| **WH300X150X6X10- 0**  **实WH200X300X6X10+150X10- 180** | **2** |
| **3** |
|  |

**9000**

|  |  |
| --- | --- |
| **9000** |  |
|  | |

**图** **1-1** **结构简图**

**4.** **结构计算信息**

**结构类型:** **门式刚架轻型房屋钢结构**

**设计规范:** **按《钢结构设计规范》计算**

**结构重要性系数:** **1.00**

**节点总数:** **4**

**柱数:** **2**

**梁数:** **1**

**支座约束数:** **2**

**标准截面总数:** **4**

**荷载分项系数：**

**恒载:** **1.30**

**活载:** **1.50**

**风载:** **1.50**

**地震:** **1.40**

**吊车:** **1.50**

**重力荷载分项系数:** **1.30**

**活荷载计算信息:** **考虑活荷载不利布置**

**考虑结构使用年限的活荷载调整系数：1.00**

**风荷载计算信息:** **计算风荷载**

**钢材:** **Q355**

**梁柱自重计算信息:** **柱梁自重都计算**

**恒载作用下柱的轴向变形:** **考虑**

**梁柱自重计算增大系数:** **1.20**

**梁刚度增大系数:** **1.00**

**钢结构净截面面积与毛截面面积比:** **0.85**

**钢柱计算长度系数计算方法:** **有侧移**

**钢结构阶形柱的计算长度折减系数:** **0.800程序自动确定允许的长细比**

**[钢梁(恒+活)容许挠跨比:](#bookmark1)****[l](#bookmark1)****[/180](#bookmark1)**

**[钢梁(活)容许挠跨比:](#bookmark2)****[l](#bookmark2)****[/180](#bookmark2)**

**[柱顶容许水平位移/柱高:](#bookmark3)****[l](#bookmark3)****[/60](#bookmark3)**

**地震影响系数取值依据:** **10** **抗规(2010** **版)**

**特征周期(s):0.35**

**水平地震影响系数最大值αmax:0.0400**

**地震作用计算:** **计算水平地震作用**

**计算振型数：3**

**地震烈度：6.00**

**场地土类别：** **Ⅱ类**

**附加重量节点数：0**

**设计地震分组：第一组**

**周期折减系数:0.80**

**地震力计算方法：振型分解法**

**结构阻尼比：0.050**

**按** **GB50011-2010** **地震效应增大系数:1.050**

**防火设计计算信息：不考虑防火设计**

**5.** **结构基本信息**

**节点坐标**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **节点号** | **X** | **Y** | | **节点号** | **X** | **Y** |
| **1** | **0.00** | **7.00** | | **2** | **9.00** | **7.00** |
| **3** | **0.00** | | **0.00** | **4** | **9.00** | **0.00** |

**柱关联号**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **柱号** | **节点Ⅰ** | **节点Ⅱ** | | **柱号** | **节点Ⅰ** | **节点Ⅱ** |
| **1** | **3** |  | **1** | **2** | **4** | **2** |

**梁关联号**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **梁号** | **节点Ⅰ** | **节点Ⅱ** | | **梁号** | **节点Ⅰ** | **节点Ⅱ** |
| **1** | **1** |  | **2** |  |  |  |

**柱节点偏心** **(m)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **节点号** | **柱偏心值** | **节点号** | | **柱偏心值** | **节点号** | **柱偏心值** |
| **1** | **0.000** | **2** | | **0.000** | **3** | **0.000** |
| **4** | **0.000** | |  |  |  |  |

**标准截面信息**

|  |  |
| --- | --- |
| **截面号** | **截面信息** |
| **1** | **H** **形变截面:** |

|  |  |
| --- | --- |
| **截面号** | **截面信息** |
|  | **(H1~H2)\*B1\*B2\*Tw\*T1\*T2=(200~400)\*150\*150\*6\*8\*8** |
| **2** | **钢板与焊接组合** **H** **形截面实腹式组合截面|-I:**  **焊接组合** **H** **形截面：H\*B\*Tw\*T=300\*400\*10\*150**  **翼缘钢板：B\*T=150\*14**  **腹板钢板厚度：Tw=6**  **截面高：H=500** |
| **3** | **钢板与焊接组合** **H** **形截面实腹式组合截面|-I:**  **焊接组合** **H** **形截面：H\*B\*Tw\*T=200\*300\*10\*150**  **翼缘钢板：B\*T=150\*10**  **腹板钢板厚度：Tw=6**  **截面高：H=400** |
| **4** | **焊接组合** **H** **形截面:**  **H\*B1\*B2\*Tw\*T1\*T2=300\*150\*150\*6\*10\*10** |

**柱布置截面号,约束信息,截面布置角度**

|  |  |  |  |
| --- | --- | --- | --- |
| **柱号** | **标准截面号** | **约束信息** | **截面布置角度** |
| **1** | **3** | **I** **端铰接** | **180** |
| **2** | **2** | **I** **端铰接** | **0** |

**梁布置截面号,约束信息**

|  |  |  |  |
| --- | --- | --- | --- |
| **梁号** | **标准截面号** | | **约束信息** |
| **1** | | **4** | **两端刚接** |

**截面特性**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **截面号** | **Xc** **(mm)** | **Yc** **(mm)** | **Ix** **(cm4)** | **Iy** **(cm4)** | **A** **(cm2)** |
| **1** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** |
| **2** | **150.0** | **417.8** | **63193.4** | **24544.9** | **177.9** |
| **3** | **100.0** | **303.8** | **29679.9** | **5993.5** | **109.0** |
| **4** | **75.0** | **150.0** | **7407.6** | **563.0** | **46.8** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **截面号** | **ix** **(cm)** | **iy** **(cm)** | **W1x** **(cm3)** | **W2x** **(cm3)** | **W1y** **(cm3)** | **W2y** **(cm3)** |
| **1** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** |
| **2** | **18.8** | **11.7** | **2239.2** | **1512.6** | **1636.3** | **1636.3** |
| **3** | **16.5** | **7.4** | **1205.5** | **977.0** | **599.4** | **599.4** |
| **4** | **12.6** | **3.5** | **493.8** | **493.8** | **75.1** | **75.1** |

**6.** **荷载与效应组合**

**1.** **各工况荷载表**

**节点荷载**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **工况** | **节点号** | **弯矩** | **垂直力** | **水平力** |
| **--** | **--** | **--** | **--** | **--** |

**节点荷载(风)**

|  |  |  |  |
| --- | --- | --- | --- |
| **工况** | **节点号** | **水平力** | **垂直力** |
| **左风** **1** | **1** | **9.10** | **0.00** |

**柱荷载**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **工况** | **柱号** | **荷载类型** | **荷载值** | **荷载参数** **1** | **荷载参数** **2** |
| **--** | **--** | **--** | **--** | **--** | **--** |

**梁荷载**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **工况** | **连续数** | **荷载**  **个数** | | **荷载**  **类型** | **荷载值** **1** | **荷载参数** **1** | **荷载值** **2** | **荷载参数** **2** |
| **--** | **--** | | **--** | **--** | **--** | **--** | **--** | **--** |

**2.** **荷载效应组合表**

**(1)柱内力的组合值**

|  |  |
| --- | --- |
| **柱内力的组合** | |
| **(1)1.3** **恒+1.5** **活** **1** | **(2)1.3** **恒+1.5** **活** **2** |
| **(3)1.3** **恒+1.5** **活** **3** | **(4)1.3** **恒+1.5** **活** **4** |
| **(5)1.0** **恒+1.5** **活** **1** | **(6)1.0** **恒+1.5** **活** **2** |
| **(7)1.0** **恒+1.5** **活** **3** | **(8)1.0** **恒+1.5** **活** **4** |
| **(9)1.3** **恒+1.5** **左风** **1** | **(10)1.3** **恒+1.5** **右风** **1** |
| **(11)1.3** **恒+1.5** **左风** **2** | **(12)1.3** **恒+1.5** **右风** **2** |
| **(13)1.0** **恒+1.5** **左风** **1** | **(14)1.0** **恒+1.5** **右风** **1** |
| **(15)1.0** **恒+1.5** **左风** **2** | **(16)1.0** **恒+1.5** **右风** **2** |
| **(17)1.3** **恒+1.5** **活** **1+0.9** **左风** **1** | **(18)1.3** **恒+1.5** **活** **1+0.9** **右风** **1** |
| **(19)1.3** **恒+1.5** **活** **1+0.9** **左风** **2** | **(20)1.3** **恒+1.5** **活** **1+0.9** **右风** **2** |
| **(21)1.3** **恒+1.5** **活** **2+0.9** **左风** **1** | **(22)1.3** **恒+1.5** **活** **2+0.9** **右风** **1** |
| **(23)1.3** **恒+1.5** **活** **2+0.9** **左风** **2** | **(24)1.3** **恒+1.5** **活** **2+0.9** **右风** **2** |

|  |  |
| --- | --- |
| **柱内力的组合** | |
| **(25)1.3** **恒+1.5** **活** **3+0.9** **左风** **1** | **(26)1.3** **恒+1.5** **活** **3+0.9** **右风** **1** |
| **(27)1.3** **恒+1.5** **活** **3+0.9** **左风** **2** | **(28)1.3** **恒+1.5** **活** **3+0.9** **右风** **2** |
| **(29)1.3** **恒+1.5** **活** **4+0.9** **左风** **1** | **(30)1.3** **恒+1.5** **活** **4+0.9** **右风** **1** |
| **(31)1.3** **恒+1.5** **活** **4+0.9** **左风** **2** | **(32)1.3** **恒+1.5** **活** **4+0.9** **右风** **2** |
| **(33)1.0** **恒+1.5** **活** **1+0.9** **左风** **1** | **(34)1.0** **恒+1.5** **活** **1+0.9** **右风** **1** |
| **(35)1.0** **恒+1.5** **活** **1+0.9** **左风** **2** | **(36)1.0** **恒+1.5** **活** **1+0.9** **右风** **2** |
| **(37)1.0** **恒+1.5** **活** **2+0.9** **左风** **1** | **(38)1.0** **恒+1.5** **活** **2+0.9** **右风** **1** |
| **(39)1.0** **恒+1.5** **活** **2+0.9** **左风** **2** | **(40)1.0** **恒+1.5** **活** **2+0.9** **右风** **2** |
| **(41)1.0** **恒+1.5** **活** **3+0.9** **左风** **1** | **(42)1.0** **恒+1.5** **活** **3+0.9** **右风** **1** |
| **(43)1.0** **恒+1.5** **活** **3+0.9** **左风** **2** | **(44)1.0** **恒+1.5** **活** **3+0.9** **右风** **2** |
| **(45)1.0** **恒+1.5** **活** **4+0.9** **左风** **1** | **(46)1.0** **恒+1.5** **活** **4+0.9** **右风** **1** |
| **(47)1.0** **恒+1.5** **活** **4+0.9** **左风** **2** | **(48)1.0** **恒+1.5** **活** **4+0.9** **右风** **2** |
| **(49)1.3** **恒+1.05** **活** **1+1.5** **左风** **1** | **(50)1.3** **恒+1.05** **活** **1+1.5** **右风** **1** |
| **(51)1.3** **恒+1.05** **活** **1+1.5** **左风** **2** | **(52)1.3** **恒+1.05** **活** **1+1.5** **右风** **2** |
| **(53)1.3** **恒+1.05** **活** **2+1.5** **左风** **1** | **(54)1.3** **恒+1.05** **活** **2+1.5** **右风** **1** |
| **(55)1.3** **恒+1.05** **活** **2+1.5** **左风** **2** | **(56)1.3** **恒+1.05** **活** **2+1.5** **右风** **2** |
| **(57)1.3** **恒+1.05** **活** **3+1.5** **左风** **1** | **(58)1.3** **恒+1.05** **活** **3+1.5** **右风** **1** |
| **(59)1.3** **恒+1.05** **活** **3+1.5** **左风** **2** | **(60)1.3** **恒+1.05** **活** **3+1.5** **右风** **2** |
| **(61)1.3** **恒+1.05** **活** **4+1.5** **左风** **1** | **(62)1.3** **恒+1.05** **活** **4+1.5** **右风** **1** |
| **(63)1.3** **恒+1.05** **活** **4+1.5** **左风** **2** | **(64)1.3** **恒+1.05** **活** **4+1.5** **右风** **2** |
| **(65)1.0** **恒+1.05** **活** **1+1.5** **左风** **1** | **(66)1.0** **恒+1.05** **活** **1+1.5** **右风** **1** |
| **(67)1.0** **恒+1.05** **活** **1+1.5** **左风** **2** | **(68)1.0** **恒+1.05** **活** **1+1.5** **右风** **2** |
| **(69)1.0** **恒+1.05** **活** **2+1.5** **左风** **1** | **(70)1.0** **恒+1.05** **活** **2+1.5** **右风** **1** |
| **(71)1.0** **恒+1.05** **活** **2+1.5** **左风** **2** | **(72)1.0** **恒+1.05** **活** **2+1.5** **右风** **2** |
| **(73)1.0** **恒+1.05** **活** **3+1.5** **左风** **1** | **(74)1.0** **恒+1.05** **活** **3+1.5** **右风** **1** |
| **(75)1.0** **恒+1.05** **活** **3+1.5** **左风** **2** | **(76)1.0** **恒+1.05** **活** **3+1.5** **右风** **2** |
| **(77)1.0** **恒+1.05** **活** **4+1.5** **左风** **1** | **(78)1.0** **恒+1.05** **活** **4+1.5** **右风** **1** |
| **(79)1.0** **恒+1.05** **活** **4+1.5** **左风** **2** | **(80)1.0** **恒+1.05** **活** **4+1.5** **右风** **2** |
| **(81)1.3** **恒+0.65** **活** **1+1.4** **左地震** | **(82)1.3** **恒+0.65** **活** **1+1.4** **右地震** |
| **(83)1.3** **恒+0.65** **活** **2+1.4** **左地震** | **(84)1.3** **恒+0.65** **活** **2+1.4** **右地震** |
| **(85)1.3** **恒+0.65** **活** **3+1.4** **左地震** | **(86)1.3** **恒+0.65** **活** **3+1.4** **右地震** |
| **(87)1.3** **恒+0.65** **活** **4+1.4** **左地震** | **(88)1.3** **恒+0.65** **活** **4+1.4** **右地震** |
| **(89)1.0** **恒+0.5** **活** **1+1.4** **左地震** | **(90)1.0** **恒+0.5** **活** **1+1.4** **右地震** |
| **(91)1.0** **恒+0.5** **活** **2+1.4** **左地震** | **(92)1.0** **恒+0.5** **活** **2+1.4** **右地震** |
| **(93)1.0** **恒+0.5** **活** **3+1.4** **左地震** | **(94)1.0** **恒+0.5** **活** **3+1.4** **右地震** |
| **(95)1.0** **恒+0.5** **活** **4+1.4** **左地震** | **(96)1.0** **恒+0.5** **活** **4+1.4** **右地震** |

**(2)梁内力的组合值**

|  |  |
| --- | --- |
| **梁内力组合** | |
| **(1)1.3** **恒+1.5** **活** **1** | **(2)1.3** **恒+1.5** **活** **2** |
| **(3)1.3** **恒+1.5** **活** **3** | **(4)1.3** **恒+1.5** **活** **4** |
| **(5)1.0** **恒+1.5** **活** **1** | **(6)1.0** **恒+1.5** **活** **2** |
| **(7)1.0** **恒+1.5** **活** **3** | **(8)1.0** **恒+1.5** **活** **4** |
| **(9)1.3** **恒+1.5** **左风** **1** | **(10)1.3** **恒+1.5** **右风** **1** |
| **(11)1.3** **恒+1.5** **左风** **2** | **(12)1.3** **恒+1.5** **右风** **2** |
| **(13)1.0** **恒+1.5** **左风** **1** | **(14)1.0** **恒+1.5** **右风** **1** |
| **(15)1.0** **恒+1.5** **左风** **2** | **(16)1.0** **恒+1.5** **右风** **2** |
| **(17)1.3** **恒+1.5** **活** **1+0.9** **左风** **1** | **(18)1.3** **恒+1.5** **活** **1+0.9** **右风** **1** |
| **(19)1.3** **恒+1.5** **活** **1+0.9** **左风** **2** | **(20)1.3** **恒+1.5** **活** **1+0.9** **右风** **2** |
| **(21)1.3** **恒+1.5** **活** **2+0.9** **左风** **1** | **(22)1.3** **恒+1.5** **活** **2+0.9** **右风** **1** |
| **(23)1.3** **恒+1.5** **活** **2+0.9** **左风** **2** | **(24)1.3** **恒+1.5** **活** **2+0.9** **右风** **2** |
| **(25)1.3** **恒+1.5** **活** **3+0.9** **左风** **1** | **(26)1.3** **恒+1.5** **活** **3+0.9** **右风** **1** |
| **(27)1.3** **恒+1.5** **活** **3+0.9** **左风** **2** | **(28)1.3** **恒+1.5** **活** **3+0.9** **右风** **2** |
| **(29)1.3** **恒+1.5** **活** **4+0.9** **左风** **1** | **(30)1.3** **恒+1.5** **活** **4+0.9** **右风** **1** |
| **(31)1.3** **恒+1.5** **活** **4+0.9** **左风** **2** | **(32)1.3** **恒+1.5** **活** **4+0.9** **右风** **2** |
| **(33)1.0** **恒+1.5** **活** **1+0.9** **左风** **1** | **(34)1.0** **恒+1.5** **活** **1+0.9** **右风** **1** |
| **(35)1.0** **恒+1.5** **活** **1+0.9** **左风** **2** | **(36)1.0** **恒+1.5** **活** **1+0.9** **右风** **2** |
| **(37)1.0** **恒+1.5** **活** **2+0.9** **左风** **1** | **(38)1.0** **恒+1.5** **活** **2+0.9** **右风** **1** |
| **(39)1.0** **恒+1.5** **活** **2+0.9** **左风** **2** | **(40)1.0** **恒+1.5** **活** **2+0.9** **右风** **2** |
| **(41)1.0** **恒+1.5** **活** **3+0.9** **左风** **1** | **(42)1.0** **恒+1.5** **活** **3+0.9** **右风** **1** |
| **(43)1.0** **恒+1.5** **活** **3+0.9** **左风** **2** | **(44)1.0** **恒+1.5** **活** **3+0.9** **右风** **2** |
| **(45)1.0** **恒+1.5** **活** **4+0.9** **左风** **1** | **(46)1.0** **恒+1.5** **活** **4+0.9** **右风** **1** |
| **(47)1.0** **恒+1.5** **活** **4+0.9** **左风** **2** | **(48)1.0** **恒+1.5** **活** **4+0.9** **右风** **2** |
| **(49)1.3** **恒+1.05** **活** **1+1.5** **左风** **1** | **(50)1.3** **恒+1.05** **活** **1+1.5** **右风** **1** |
| **(51)1.3** **恒+1.05** **活** **1+1.5** **左风** **2** | **(52)1.3** **恒+1.05** **活** **1+1.5** **右风** **2** |
| **(53)1.3** **恒+1.05** **活** **2+1.5** **左风** **1** | **(54)1.3** **恒+1.05** **活** **2+1.5** **右风** **1** |
| **(55)1.3** **恒+1.05** **活** **2+1.5** **左风** **2** | **(56)1.3** **恒+1.05** **活** **2+1.5** **右风** **2** |
| **(57)1.3** **恒+1.05** **活** **3+1.5** **左风** **1** | **(58)1.3** **恒+1.05** **活** **3+1.5** **右风** **1** |
| **(59)1.3** **恒+1.05** **活** **3+1.5** **左风** **2** | **(60)1.3** **恒+1.05** **活** **3+1.5** **右风** **2** |
| **(61)1.3** **恒+1.05** **活** **4+1.5** **左风** **1** | **(62)1.3** **恒+1.05** **活** **4+1.5** **右风** **1** |
| **(63)1.3** **恒+1.05** **活** **4+1.5** **左风** **2** | **(64)1.3** **恒+1.05** **活** **4+1.5** **右风** **2** |
| **(65)1.0** **恒+1.05** **活** **1+1.5** **左风** **1** | **(66)1.0** **恒+1.05** **活** **1+1.5** **右风** **1** |
| **(67)1.0** **恒+1.05** **活** **1+1.5** **左风** **2** | **(68)1.0** **恒+1.05** **活** **1+1.5** **右风** **2** |
| **(69)1.0** **恒+1.05** **活** **2+1.5** **左风** **1** | **(70)1.0** **恒+1.05** **活** **2+1.5** **右风** **1** |

|  |  |
| --- | --- |
| **梁内力组合** | |
| **(71)1.0** **恒+1.05** **活** **2+1.5** **左风** **2** | **(72)1.0** **恒+1.05** **活** **2+1.5** **右风** **2** |
| **(73)1.0** **恒+1.05** **活** **3+1.5** **左风** **1** | **(74)1.0** **恒+1.05** **活** **3+1.5** **右风** **1** |
| **(75)1.0** **恒+1.05** **活** **3+1.5** **左风** **2** | **(76)1.0** **恒+1.05** **活** **3+1.5** **右风** **2** |
| **(77)1.0** **恒+1.05** **活** **4+1.5** **左风** **1** | **(78)1.0** **恒+1.05** **活** **4+1.5** **右风** **1** |
| **(79)1.0** **恒+1.05** **活** **4+1.5** **左风** **2** | **(80)1.0** **恒+1.05** **活** **4+1.5** **右风** **2** |
| **(81)1.3** **恒+0.65** **活** **1+1.4** **左地震** | **(82)1.3** **恒+0.65** **活** **1+1.4** **右地震** |
| **(83)1.3** **恒+0.65** **活** **2+1.4** **左地震** | **(84)1.3** **恒+0.65** **活** **2+1.4** **右地震** |
| **(85)1.3** **恒+0.65** **活** **3+1.4** **左地震** | **(86)1.3** **恒+0.65** **活** **3+1.4** **右地震** |
| **(87)1.3** **恒+0.65** **活** **4+1.4** **左地震** | **(88)1.3** **恒+0.65** **活** **4+1.4** **右地震** |
| **(89)1.0** **恒+0.5** **活** **1+1.4** **左地震** | **(90)1.0** **恒+0.5** **活** **1+1.4** **右地震** |
| **(91)1.0** **恒+0.5** **活** **2+1.4** **左地震** | **(92)1.0** **恒+0.5** **活** **2+1.4** **右地震** |
| **(93)1.0** **恒+0.5** **活** **3+1.4** **左地震** | **(94)1.0** **恒+0.5** **活** **3+1.4** **右地震** |
| **(95)1.0** **恒+0.5** **活** **4+1.4** **左地震** | **(96)1.0** **恒+0.5** **活** **4+1.4** **右地震** |

**7.** **地震计算信息**

**1.** **左地震**

**地震力计算质量集中信息**

|  |  |
| --- | --- |
| **质量集中节点号** | **质量重量(KN)** |
| **1** | **13.428** |

**水平地震标准值作用底层剪力：** **0.537**

**底层最小地震剪力(抗震规范** **5.2.5** **条):** **0.107**

**各质点地震力调整系数:** **1.000**

**地震力调整后剪重比：** **0.040**

**周期(已乘折减系数)**

|  |  |
| --- | --- |
| **振型号** | **周期(s)** |
| **1** | **0.327** |

**2.** **右地震**

**地震力计算质量集中信息**

|  |  |
| --- | --- |
| **质量集中节点号** | **质量重量(KN)** |
| **2** | **13.428** |

**水平地震标准值作用底层剪力：** **0.537**

**底层最小地震剪力(抗震规范** **5.2.5** **条):** **0.107**

**各质点地震力调整系数:** **1.000**

**地震力调整后剪重比：** **0.040**

**周期(已乘折减系数)**

|  |  |
| --- | --- |
| **振型号** | **周期(s)** |
| **1** | **0.327** |

**8.** **内力计算结果**

**1.** **单工况内力**

**柱内力**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **工况** | **单元** | **I** **端N(kN)** | **I** **端V(kN)** | **I** **端** **M(kN.m)** | **II** **端N(kN)** | **II** **端V(kN)** | **II** **端** **M(kN.m)** |
| **恒荷载** | **1** | **9.2** | **-0.4** | **0.0** | **-2.0** | **0.4** | **-2.7** |
| **2** | **13.7** | **0.4** | **0.0** | **-2.0** | **-0.4** | **2.7** |
| **左风** **1** | **1** | **-7.1** | **4.4** | **0.0** | **7.1** | **-4.4** | **30.9** |
| **2** | **7.1** | **4.7** | **0.0** | **-7.1** | **-4.7** | **32.8** |
| **右风** **1** | **1** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** |
| **2** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** |
| **左地震** | **1** | **-0.4** | **0.3** | **-0.0** | **0.4** | **-0.3** | **1.9** |
| **2** | **0.4** | **0.3** | **-0.0** | **-0.4** | **-0.3** | **2.0** |
| **右地震** | **1** | **0.4** | **-0.3** | **-0.0** | **-0.4** | **0.3** | **-1.9** |
| **2** | **-0.4** | **-0.3** | **-0.0** | **0.4** | **0.3** | **-2.0** |

**梁内力**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **工况号** | **单元号** | **I** **端N(kN)** | **I** **端V(kN)** | **I** **端** **M(kN.m)** | **II** **端N(kN)** | **II** **端V(kN)** | **II** **端** **M(kN.m)** |
| **恒荷载** | **1** | **0.4** | **2.0** | **2.7** | **-0.4** | **2.0** | **-2.7** |
| **左风** **1** | **1** | **4.7** | **-7.1** | **-30.9** | **-4.7** | **7.1** | **-32.8** |
| **右风** **1** | **1** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** | **0.0** |
| **左地震** | **1** | **0.0** | **-0.4** | **-1.9** | **-0.0** | **0.4** | **-2.0** |
| **右地震** | **1** | **-0.0** | **0.4** | **1.9** | **0.0** | **-0.4** | **2.0** |

**9.** **节点位移**

**恒荷载工况下节点位移（mm）**

|  |  |  |  |
| --- | --- | --- | --- |
| **节点号** | **X** **向位移** | | **Y** **向位移** |
| **1** | **-0.19** | | **0.02** |
| **2** | | **-0.20** | **0.01** |

**活荷载工况下节点位移（mm）**

|  |  |  |  |
| --- | --- | --- | --- |
| **节点号** | **X** **向位移** | | **Y** **向位移** |
| **1** | **0.00** | | **-0.00** |
| **2** | | **0.00** | **-0.00** |

**节点侧向（水平向）位移(mm)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **工况** | **节点** | **δx** | **节点** | **δx** |
| **左风** **1** | **1** | **28.15** | **2** | **28.10** |
| **3** | **0.00** | **4** | **0.00** |
| **右风** **1** | **1** | **0.00** | **2** | **0.00** |
| **3** | **0.00** | **4** | **0.00** |
| **左地震** | **1** | **1.74** | **2** | **1.74** |
| **3** | **0.00** | **4** | **0.00** |
| **右地震** | **1** | **-1.74** | **2** | **-1.74** |
| **3** | **0.00** | **4** | **0.00** |

**10.** **构件设计结果汇总**

**钢柱验算结果**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **柱号** | **应力比** | **剪应**  **力比** | **平面内稳定** | **平面外稳定** | **腹板高厚比** | **翼缘宽厚比** | **平面内**  **长细比** | **平面外**  **长细比** | **质量(kg)** | **状态** |
| **1** | **0.17** | **-** | **0.14** | **0.10** | **64.50** | **1.00** | **109.31** | **94.41** | **599.1** | **通过** |
| **2** | **0.13** | **-** | **0.12** | **0.09** | **81.00** | **1.00** | **114.18** | **59.60** | **977.7** | **通过** |

**钢梁验算结果**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **梁号** | **应力比** | **剪应力比** | | **平面内**  **(上端)稳**  **定** | **平面外**  **(下端)稳**  **定** | **腹板高厚比** | **翼缘宽厚比** | **质量(kg)** | **状态** |
| **1** | **0.39** |  | | **-** | **0.34** | **46.67** | **7.20** | **330.64** | **通过** |
| **0.32** | | **0.05** |

**11.** **构件设计结果**

**1.** **钢** **柱** **1** **设计结果**

**截面类型=50;** **布置角度=180;** **计算长度：Lx=18.04,** **Ly=7.00;** **长细比：** **λx=109.3,** **λy=94.4**

**构件长度=7.00;** **计算长度系数:** **Ux=2.58** **Uy=1.00**

**抗震等级:** **三级**

**钢板与焊接工字钢组合截面|-I:** **截面高:** **H3=400,** **腹板厚:** **Tw=6**

**焊接工字钢:** **B=300,** **HH=200,** **Tw=6,** **T1=10,** **边板:** **T2=10,** **H2=150**

**轴压截面分类:X** **轴:b** **类** **,** **Y** **轴:b** **类**

**构件钢号：Q355**

**宽厚比等级:S4**

**验算规范:** **普钢规范** **GB50017-2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **\** | **I** **端** | | | **II** **端** | | | |
| **组合** | **M** | **N** | **V** | **M** | | **N** | **V** |
| **1** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **2** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **3** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **4** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **5** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **6** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **7** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **8** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **9** | **0.00** | **1.31** | **6.11** | **42.76** | | **8.04** | **-6.11** |
| **10** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **11** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **12** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **13** | **0.00** | **-1.44** | **6.23** | **43.58** | | **8.63** | **-6.23** |
| **14** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **15** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **16** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **17** | **0.00** | **5.55** | **3.46** | **24.24** | | **3.79** | **-3.46** |
| **18** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **19** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **20** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **21** | **0.00** | **5.55** | **3.46** | | **24.24** | **3.79** | **-3.46** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **22** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **23** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **24** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **25** | **0.00** | **5.55** | **3.46** | **24.24** | | **3.79** | **-3.46** |
| **26** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **27** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **28** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **29** | **0.00** | **5.55** | **3.46** | **24.24** | | **3.79** | **-3.46** |
| **30** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **31** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **32** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **33** | **0.00** | **2.80** | **3.58** | **25.06** | | **4.39** | **-3.58** |
| **34** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **35** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **36** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **37** | **0.00** | **2.80** | **3.58** | **25.06** | | **4.39** | **-3.58** |
| **38** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **39** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **40** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **41** | **0.00** | **2.80** | **3.58** | **25.06** | | **4.39** | **-3.58** |
| **42** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **43** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **44** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **45** | **0.00** | **2.80** | **3.58** | **25.06** | | **4.39** | **-3.58** |
| **46** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **47** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **48** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **49** | **0.00** | **1.31** | **6.11** | **42.76** | | **8.04** | **-6.11** |
| **50** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **51** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **52** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **53** | **0.00** | **1.31** | **6.11** | **42.76** | | **8.04** | **-6.11** |
| **54** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **55** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **56** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **57** | **0.00** | **1.31** | **6.11** | **42.76** | | **8.04** | **-6.11** |
| **58** | **0.00** | **11.92** | **-0.50** | | **-3.53** | **-2.58** | **0.50** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **59** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **60** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **61** | **0.00** | **1.31** | **6.11** | **42.76** | | **8.04** | **-6.11** |
| **62** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **63** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **64** | **0.00** | **11.92** | **-0.50** | **-3.53** | | **-2.58** | **0.50** |
| **65** | **0.00** | **-1.44** | **6.23** | **43.58** | | **8.63** | **-6.23** |
| **66** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **67** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **68** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **69** | **0.00** | **-1.44** | **6.23** | **43.58** | | **8.63** | **-6.23** |
| **70** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **71** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **72** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **73** | **0.00** | **-1.44** | **6.23** | **43.58** | | **8.63** | **-6.23** |
| **74** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **75** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **76** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **77** | **0.00** | **-1.44** | **6.23** | **43.58** | | **8.63** | **-6.23** |
| **78** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **79** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **80** | **0.00** | **9.17** | **-0.39** | **-2.72** | | **-1.98** | **0.39** |
| **81** | **0.00** | **11.31** | **-0.12** | **-0.85** | | **-1.96** | **0.12** |
| **82** | **0.00** | **12.54** | **-0.89** | **-6.21** | | **-3.19** | **0.89** |
| **83** | **0.00** | **11.31** | **-0.12** | **-0.85** | | **-1.96** | **0.12** |
| **84** | **0.00** | **12.54** | **-0.89** | **-6.21** | | **-3.19** | **0.89** |
| **85** | **0.00** | **11.31** | **-0.12** | **-0.85** | | **-1.96** | **0.12** |
| **86** | **0.00** | **12.54** | **-0.89** | **-6.21** | | **-3.19** | **0.89** |
| **87** | **0.00** | **11.31** | **-0.12** | **-0.85** | | **-1.96** | **0.12** |
| **88** | **0.00** | **12.54** | **-0.89** | **-6.21** | | **-3.19** | **0.89** |
| **89** | **0.00** | **8.56** | **-0.01** | **-0.04** | | **-1.37** | **0.01** |
| **90** | **0.00** | **9.79** | **-0.77** | **-5.39** | | **-2.60** | **0.77** |
| **91** | **0.00** | **8.56** | **-0.01** | **-0.04** | | **-1.37** | **0.01** |
| **92** | **0.00** | **9.79** | **-0.77** | **-5.39** | | **-2.60** | **0.77** |
| **93** | **0.00** | **8.56** | **-0.01** | **-0.04** | | **-1.37** | **0.01** |
| **94** | **0.00** | **9.79** | **-0.77** | **-5.39** | | **-2.60** | **0.77** |
| **95** | **0.00** | **8.56** | **-0.01** | | **-0.04** | **-1.37** | **0.01** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **96** | **0.00** | **9.79** | **-0.77** | **-5.39** | **-2.60** | **0.77** |

**强度计算最大应力对应组合号:** **13,** **M=0.00,** **N=-1.44,** **M=43.58,** **N=8.63强度计算最大应力** **(N/mm\*mm)** **=50.91**

**强度计算最大应力比** **=0.167**

**平面内稳定计算最大应力对应组合号:** **9,** **M=0.00,** **N=1.31,** **M=42.76,** **N=8.04平面内稳定计算最大应力** **(N/mm\*mm)** **=41.57**

**平面内稳定计算最大应力比** **=0.136**

**平面外稳定计算最大应力** **(N/mm\*mm)** **=30.44**

**平面外稳定计算最大应力比** **=0.100**

**腹板容许高厚比计算对应组合号:** **81(地震组合),** **M=0.00,** **N=11.31,** **M=-0.85,** **N=-1.96对应的应力梯度α0** **=0.83**

**GB50017** **腹板容许高厚比** **[H0/TW]** **=51.61**

**GB50017** **翼缘容许宽厚比** **[B/T]** **=12.20**

**强度计算最大应力** **<** **f=305.00**

**平面内稳定计算最大应力** **<** **f=305.00**

**平面外稳定计算最大应力** **<** **f=305.00**

**腹板高厚比** **H0/TW=64.50** **>** **[H0/TW]=51.61**

**(注：高厚比超出** **GB50011** **规定，不考虑有效截面计算)**

**翼缘宽厚比** **B/T** **=1.00** **<** **[B/T]=12.20**

**---** **按规范** **GB** **50017** **7.3.3** **条规定,采用有效截面的强度、稳定计算** **---**

**(仅限于焊接箱形、H** **形、实腹式组合截面、等边单角钢按** **0** **度、180** **度布置)**

**强度计算最大应力对应组合号:** **81(地震组合),** **M=0.00,** **N=11.31,** **M=-0.85,** **N=-1.96柱构件的有效截面特性:**

**截面号:** **3** **有效截面面积:** **0.1090E-01**

**强度计算最大应力** **(N/mm\*mm)** **=0.92**

**平面内稳定计算最大应力** **(N/mm\*mm)** **=2.07**

**平面外稳定计算最大应力** **(N/mm\*mm)** **=1.66**

**强度计算最大应力** **<** **f=305.00**

**平面内稳定计算最大应力** **<** **f=305.00**

**平面外稳定计算最大应力** **<** **f=305.00**

**---** **基于有效截面的强度、稳定计算结束** **---**

**压杆,平面内长细比** **λ=109.** **≤** **[λ]=150**

**压杆,平面外长细比** **λ=94.** **≤** **[λ]=150**

**构件重量** **(Kg)=599.06**

**2.** **钢** **柱** **2** **设计结果**

**截面类型=50;** **布置角度=0;** **计算长度：Lx=21.52,** **Ly=7.00;** **长细比：** **λx=114.2,λ** **y=59.6**

**构件长度=7.00;** **计算长度系数:** **Ux=3.07** **Uy=1.00**

**抗震等级:** **三级**

**钢板与焊接工字钢组合截面|-I:** **截面高:** **H3=500,** **腹板厚:** **Tw=6**

**焊接工字钢:** **B=400,** **HH=300,** **Tw=8,** **T1=14,** **边板:** **T2=10,** **H2=150**

**轴压截面分类:X** **轴:b** **类** **,** **Y** **轴:b** **类**

**构件钢号：Q355**

**宽厚比等级:S4**

**验算规范:** **普钢规范** **GB50017-2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **\** | **I** **端** | | | **II** **端** | | | |
| **组合** | **M** | **N** | **V** | **M** | | **N** | **V** |
| **1** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **2** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **3** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **4** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **5** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **6** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **7** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **8** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **9** | **0.00** | **28.45** | **7.54** | | **52.79** | **-13.20** | **-7.54** |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **10** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **11** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **12** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **13** | **0.00** | **24.33** | **7.43** | **51.98** | | **-12.60** | **-7.43** |
| **14** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **15** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **16** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **17** | **0.00** | **24.20** | **4.73** | **33.09** | | **-8.95** | **-4.73** |
| **18** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **19** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **20** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **21** | **0.00** | **24.20** | **4.73** | **33.09** | | **-8.95** | **-4.73** |
| **22** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **23** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **24** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **25** | **0.00** | **24.20** | **4.73** | **33.09** | | **-8.95** | **-4.73** |
| **26** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **27** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **28** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **29** | **0.00** | **24.20** | **4.73** | **33.09** | | **-8.95** | **-4.73** |
| **30** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **31** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **32** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **33** | **0.00** | **20.09** | **4.61** | **32.27** | | **-8.35** | **-4.61** |
| **34** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **35** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **36** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **37** | **0.00** | **20.09** | **4.61** | **32.27** | | **-8.35** | **-4.61** |
| **38** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **39** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **40** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **41** | **0.00** | **20.09** | **4.61** | **32.27** | | **-8.35** | **-4.61** |
| **42** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **43** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **44** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **45** | **0.00** | **20.09** | **4.61** | **32.27** | | **-8.35** | **-4.61** |
| **46** | **0.00** | **13.72** | **0.39** | | **2.72** | **-1.98** | **-0.39** |

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **47** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **48** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **49** | **0.00** | **28.45** | **7.54** | **52.79** | | **-13.20** | **-7.54** |
| **50** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **51** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **52** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **53** | **0.00** | **28.45** | **7.54** | **52.79** | | **-13.20** | **-7.54** |
| **54** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **55** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **56** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **57** | **0.00** | **28.45** | **7.54** | **52.79** | | **-13.20** | **-7.54** |
| **58** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **59** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **60** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **61** | **0.00** | **28.45** | **7.54** | **52.79** | | **-13.20** | **-7.54** |
| **62** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **63** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **64** | **0.00** | **17.83** | **0.50** | **3.53** | | **-2.58** | **-0.50** |
| **65** | **0.00** | **24.33** | **7.43** | **51.98** | | **-12.60** | **-7.43** |
| **66** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **67** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **68** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **69** | **0.00** | **24.33** | **7.43** | **51.98** | | **-12.60** | **-7.43** |
| **70** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **71** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **72** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **73** | **0.00** | **24.33** | **7.43** | **51.98** | | **-12.60** | **-7.43** |
| **74** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **75** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **76** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **77** | **0.00** | **24.33** | **7.43** | **51.98** | | **-12.60** | **-7.43** |
| **78** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **79** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **80** | **0.00** | **13.72** | **0.39** | **2.72** | | **-1.98** | **-0.39** |
| **81** | **0.00** | **18.44** | **0.91** | **6.38** | | **-3.19** | **-0.91** |
| **82** | **0.00** | **17.22** | **0.10** | **0.68** | | **-1.96** | **-0.10** |
| **83** | **0.00** | **18.44** | **0.91** | | **6.38** | **-3.19** | **-0.91** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **84** | **0.00** | **17.22** | **0.10** | **0.68** | | **-1.96** | **-0.10** |
| **85** | **0.00** | **18.44** | **0.91** | **6.38** | | **-3.19** | **-0.91** |
| **86** | **0.00** | **17.22** | **0.10** | **0.68** | | **-1.96** | **-0.10** |
| **87** | **0.00** | **18.44** | **0.91** | **6.38** | | **-3.19** | **-0.91** |
| **88** | **0.00** | **17.22** | **0.10** | **0.68** | | **-1.96** | **-0.10** |
| **89** | **0.00** | **14.33** | **0.80** | **5.57** | | **-2.60** | **-0.80** |
| **90** | **0.00** | **13.10** | **-0.02** | **-0.13** | | **-1.37** | **0.02** |
| **91** | **0.00** | **14.33** | **0.80** | **5.57** | | **-2.60** | **-0.80** |
| **92** | **0.00** | **13.10** | **-0.02** | **-0.13** | | **-1.37** | **0.02** |
| **93** | **0.00** | **14.33** | **0.80** | **5.57** | | **-2.60** | **-0.80** |
| **94** | **0.00** | **13.10** | **-0.02** | **-0.13** | | **-1.37** | **0.02** |
| **95** | **0.00** | **14.33** | **0.80** | **5.57** | | **-2.60** | **-0.80** |
| **96** | **0.00** | **13.10** | **-0.02** | | **-0.13** | **-1.37** | **0.02** |

**强度计算最大应力对应组合号:** **9,** **M=0.00,** **N=28.45,** **M=52.79,** **N=-13.20强度计算最大应力** **(N/mm\*mm)** **=40.99**

**强度计算最大应力比** **=0.134**

**平面内稳定计算最大应力** **(N/mm\*mm)** **=37.80**

**平面内稳定计算最大应力比** **=0.124**

**平面外稳定计算最大应力** **(N/mm\*mm)** **=26.10**

**平面外稳定计算最大应力比** **=0.086**

**腹板容许高厚比计算对应组合号:** **90(地震组合),** **M=0.00,** **N=13.10,** **M=-0.13,** **N=-1.37对应的应力梯度α0** **=0.13**

**GB50017** **腹板容许高厚比** **[H0/TW]** **=37.32**

**GB50017** **翼缘容许宽厚比** **[B/T]** **=12.20**

**强度计算最大应力** **<** **f=305.00**

**平面内稳定计算最大应力** **<** **f=305.00**

**平面外稳定计算最大应力** **<** **f=305.00**

**腹板高厚比** **H0/TW=81.00** **>** **[H0/TW]=37.32**

**翼缘宽厚比** **B/T** **=1.00** **<** **[B/T]=12.20**

**---** **按规范** **GB** **50017** **8.4.2** **条规定,采用有效截面的强度、稳定计算** **---**

**(仅限于焊接箱形、H** **形、实腹式组合截面按** **0** **度、180** **度布置)**

**强度计算最大应力对应组合号:** **9,** **M=0.00,** **N=28.45,** **M=52.79,** **N=-13.20**

**柱构件的有效截面特性(m):**

**截面号** **A** **We1x** **We2x** **We1y** **We2y** **e**

**2** **0.1668E-01** **0.1355E-02** **0.2168E-02** **0.1636E-02** **0.1636E-02** **-0.1299E-01强度计算最大应力** **(N/mm\*mm)** **=45.96**

**平面内稳定计算最大应力** **(N/mm\*mm)** **=42.22平面外稳定计算最大应力** **(N/mm\*mm)** **=29.31**

**强度计算最大应力** **<** **f=305.00**

**平面内稳定计算最大应力** **<** **f=305.00**

**平面外稳定计算最大应力** **<** **f=305.00**

**---** **基于有效截面的强度、稳定计算结束** **---**

**压杆,平面内长细比** **λ=114.** **≤** **[λ]=180**

**压杆,平面外长细比** **λ=60.** **≤** **[λ]=180**

**构件重量** **(Kg)=977.67**

**3、** **钢** **梁** **1** **设计结果**

**截面类型=16;** **布置角度=0;** **长度:** **L=9.00,** **Ly=3.00**

**抗震等级:** **三级**

**截面参数:** **B1=150,** **B2=150,** **H=300,** **Tw=6,** **T1=10,** **T2=10**

**构件钢号：Q355**

**宽厚比等级:S4**

**验算规范:** **普钢规范** **GB50017-2017**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **\** | **I** **端** | | | **II** **端** | | | |
| **组合** | **M** | **N** | **V** | **M** | | **N** | **V** |
| **1** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **2** | **3.53** | **0.50** | **2.58** | | **-3.53** | **-0.50** | **2.58** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **3** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **4** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **5** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **6** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **7** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **8** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **9** | **-42.76** | **7.54** | **-8.04** | **-52.79** | | **-7.54** | **13.20** |
| **10** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **11** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **12** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **13** | **-43.58** | **7.42** | **-8.63** | **-51.98** | | **-7.42** | **12.60** |
| **14** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **15** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **16** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **17** | **-24.24** | **4.73** | **-3.79** | **-33.09** | | **-4.73** | **8.95** |
| **18** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **19** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **20** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **21** | **-24.24** | **4.73** | **-3.79** | **-33.09** | | **-4.73** | **8.95** |
| **22** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **23** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **24** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **25** | **-24.24** | **4.73** | **-3.79** | **-33.09** | | **-4.73** | **8.95** |
| **26** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **27** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **28** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **29** | **-24.24** | **4.73** | **-3.79** | **-33.09** | | **-4.73** | **8.95** |
| **30** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **31** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **32** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **33** | **-25.06** | **4.61** | **-4.39** | **-32.27** | | **-4.61** | **8.35** |
| **34** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **35** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **36** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **37** | **-25.06** | **4.61** | **-4.39** | **-32.27** | | **-4.61** | **8.35** |
| **38** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **39** | **2.72** | **0.39** | **1.98** | | **-2.72** | **-0.39** | **1.98** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **40** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **41** | **-25.06** | **4.61** | **-4.39** | **-32.27** | | **-4.61** | **8.35** |
| **42** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **43** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **44** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **45** | **-25.06** | **4.61** | **-4.39** | **-32.27** | | **-4.61** | **8.35** |
| **46** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **47** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **48** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **49** | **-42.76** | **7.54** | **-8.04** | **-52.79** | | **-7.54** | **13.20** |
| **50** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **51** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **52** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **53** | **-42.76** | **7.54** | **-8.04** | **-52.79** | | **-7.54** | **13.20** |
| **54** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **55** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **56** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **57** | **-42.76** | **7.54** | **-8.04** | **-52.79** | | **-7.54** | **13.20** |
| **58** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **59** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **60** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **61** | **-42.76** | **7.54** | **-8.04** | **-52.79** | | **-7.54** | **13.20** |
| **62** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **63** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **64** | **3.53** | **0.50** | **2.58** | **-3.53** | | **-0.50** | **2.58** |
| **65** | **-43.58** | **7.42** | **-8.63** | **-51.98** | | **-7.42** | **12.60** |
| **66** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **67** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **68** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **69** | **-43.58** | **7.42** | **-8.63** | **-51.98** | | **-7.42** | **12.60** |
| **70** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **71** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **72** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **73** | **-43.58** | **7.42** | **-8.63** | **-51.98** | | **-7.42** | **12.60** |
| **74** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **75** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **76** | **2.72** | **0.39** | **1.98** | | **-2.72** | **-0.39** | **1.98** |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **77** | **-43.58** | **7.42** | **-8.63** | **-51.98** | | **-7.42** | **12.60** |
| **78** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **79** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **80** | **2.72** | **0.39** | **1.98** | **-2.72** | | **-0.39** | **1.98** |
| **81** | **0.85** | **0.52** | **1.96** | **-6.38** | | **-0.52** | **3.19** |
| **82** | **6.21** | **0.49** | **3.19** | **-0.68** | | **-0.49** | **1.96** |
| **83** | **0.85** | **0.52** | **1.96** | **-6.38** | | **-0.52** | **3.19** |
| **84** | **6.21** | **0.49** | **3.19** | **-0.68** | | **-0.49** | **1.96** |
| **85** | **0.85** | **0.52** | **1.96** | **-6.38** | | **-0.52** | **3.19** |
| **86** | **6.21** | **0.49** | **3.19** | **-0.68** | | **-0.49** | **1.96** |
| **87** | **0.85** | **0.52** | **1.96** | **-6.38** | | **-0.52** | **3.19** |
| **88** | **6.21** | **0.49** | **3.19** | **-0.68** | | **-0.49** | **1.96** |
| **89** | **0.04** | **0.40** | **1.37** | **-5.57** | | **-0.40** | **2.60** |
| **90** | **5.39** | **0.38** | **2.60** | **0.13** | | **-0.38** | **1.37** |
| **91** | **0.04** | **0.40** | **1.37** | **-5.57** | | **-0.40** | **2.60** |
| **92** | **5.39** | **0.38** | **2.60** | **0.13** | | **-0.38** | **1.37** |
| **93** | **0.04** | **0.40** | **1.37** | **-5.57** | | **-0.40** | **2.60** |
| **94** | **5.39** | **0.38** | **2.60** | **0.13** | | **-0.38** | **1.37** |
| **95** | **0.04** | **0.40** | **1.37** | **-5.57** | | **-0.40** | **2.60** |
| **96** | **5.39** | **0.38** | **2.60** | | **0.13** | **-0.38** | **1.37** |

**梁的弯矩包络**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **梁下部受拉** | | | | | | | |
| **截面** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
|  | **-43.58** | **-30.13** | **-16.07** | **-2.36** | **-2.63** | **-1.69** | **-0.13** |
| **梁上部受拉** | | | | | | | |
| **截面** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
|  | **6.21** | **2.06** | **0.00** | **0.00** | **16.16** | **33.64** | **52.79** |

**梁下部受拉最大弯矩** **M=-43.58,** **最大应力** **σ=98.87<** **f=305.00**

**梁下部受拉强度计算应力比:** **0.324**

**梁下部受拉最大弯矩** **M=-43.58,** **稳定计算最大应力** **σ=102.72<** **f=305.00梁下部受拉稳定计算应力比:** **0.337**

**梁上部受拉最大弯矩** **M=52.79,** **最大应力** **σ=119.77<** **f=305.00**

**梁上部受拉强度计算应力比:** **0.393**

**最大剪力** **V=13.20,** **最大剪应力** **τ=8.20<** **fv=175.00**

**计算剪应力比:** **0.047**

**剪力** **V=13.20,** **弯矩** **M=52.79,** **折算应力** **σz=100.40<** **Bf=335.50腹板高厚比** **H0/TW=46.67** **<** **[H0/TW]=100.89** **(GB50017)**

**翼缘宽厚比** **B/T** **=7.20** **<** **[B/T]** **=12.20(GB50017)**

**(恒+活)梁的绝对挠度** **mm**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **截面** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
|  | **0.00** | **0.24** | **0.53** | **0.65** | **0.53** | **0.24** | **0.00** |

**最大挠度值** **=0.65** **最大挠度/梁跨度** **=1/13806.**

**(活)梁的绝对挠度** **mm**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **截面** | **1** | **2** | **3** | **4** | **5** | **6** | **7** |
|  | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** |

**最大挠度值** **=0.00** **最大挠度/梁跨度** **=1/100000.**

**构件重量** **(Kg)=330.64**

**风荷载作用下柱顶最大水平（X** **向）位移:**

**节点(** **1),** **水平位移** **dx=28.148(mm)** **=H** **/249.**

**梁的(恒+活)最大挠度:**

**梁(** **1),** **挠跨比** **=1** **/13806.**

**梁的(活)最大挠度:**

**梁(** **1),** **挠跨比** **=1** **/100000.**

**风载作用下柱顶最大水平位移:** **H/249<** **柱顶位移容许值:** **H/60梁的(恒+活)最大挠跨比:** **1/13806<** **梁的容许挠跨比:** **1/180**

**梁的(活)最大挠跨比:** **1/100000<** **梁的容许挠跨比:** **1/180**

**所有钢柱的总重量** **(Kg)=1577.**

**所有钢梁的总重量** **(Kg)=331.**

**钢梁与钢柱重量之和** **(Kg)=1907.**

**12.** **荷载与计算结果简图1.** **结构简图**

**1 1 2**

|  |  |
| --- | --- |
| **WH300X150X6X10- 0**  **实WH200X300X6X10+150X10- 180** | **2** |
| **3** |
|  |

|  |
| --- |
| **9000** |
| **9000** |

**7000**

**实WH300X400X8X14+150X14- 0**

**1**

**4**

**图** **12-1** **刚架简图**

**2.** **荷载简图**

**图** **12-2** **恒载简图**

**图** **12-3** **活载简图**

**9. 1**

**图** **12-4** **左风** **1** **简图**

**图** **12-5** **右风** **1** **简图**

**图** **12-6** **左风** **2** **简图**

**图** **12-7** **右风** **2** **简图**

**3.** **应力比图**

**0. 17**

**0. 32 0. 05**

**0. 14( 109)**

**0. 10( 94)**

**0. 39 0. 34**

|  |
| --- |
| **0. 13** |
| **0. 12( 114)**  **0. 09( 60)** |

**图** **12-8** **应力比图**

**4.** **内力图**

**-**

**2. 7**

**0. 0**

**- 1. 7**

**2.**

**0. 0**

**7**

**2. 7**

**-2. 7**

**图** **12-9** **恒载弯矩图**

**2. 0**

**- 0. 4 0. 4**

**0. 4**

**2. 0**

**- 0. 4**

**图** **12-10** **恒载剪力图**

**9.**

**2**

**0. 4**

**13. 7**

**图** **12-11** **恒载轴力图**

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**图** **12-12** **活载弯矩图**

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**图** **12-13** **活载剪力图**

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**图** **12-14** **活载轴力图**

**- 30. 9**

**-30.****9**

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**30. 9**

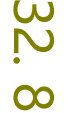




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**- 32. 8**

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**图** **12-15** **左风** **1** **弯矩图**

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**0. 0**

**图** **12-16** **右风** **1** **弯矩图**

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| **4**  **4** | |
| **- 7.**  **4. 7** | **1**  **- 4.** |
| **7.** | **1**  **7** |

**图** **12-17** **左风** **1** **剪力图**

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| **.0.**  **0**  **0.** |

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**图** **12-18** **右风** **1** **剪力图**

**4. 7**

**- 7. 1 7. 1**

**图** **12-19** **左风** **1** **轴力图**

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**图** **12-20** **右风** **1** **轴力图**

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**图** **12-21** **左风** **2** **弯矩图**

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**图** **12-22** **右风** **2** **弯矩图**

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**图** **12-23** **左风** **2** **剪力图**

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**图** **12-24** **右风** **2** **剪力图**

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**图** **12-25** **左风** **2** **轴力图**

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**图** **12-26** **右风** **2** **轴力图**

**1. 9**

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**1. 9**

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**图** **12-27** **左地震弯矩图**

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**1. 9**

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**图** **12-28** **右地震弯矩图**

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**1. 9**

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**1. 9**

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| --- |
| **0**  **0. 2.-0** |

**图** **12-29** **左地震剪力图**

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**1. 9**

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**1. 9**

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| **0**  **0. 2.-0** |

**图** **12-30** **右地震剪力图**

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**1. 9**

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**1. 9**

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| **0**  **0. 2.-0** |

**图** **12-31** **左地震轴力图**

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**1. 9**

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**1. 9**

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**图** **12-32** **右地震轴力图**

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**1. 9**

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| **0**  **0. 2.-0** |

**图** **12-33** **弯矩包络图**

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**1. 9**

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| **0**  **0. 2.-0** |

**图** **12-34** **剪力包络图**

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**图** **12-35** **轴力包络图**

**5.** **位移图**

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**图** **12-36** **恒载位移图**

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**图** **12-37** **活载位移图**

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**28. 1 ( 1/ 249)**

**28. 1 ( 1/ 249)**

**图** **12-38** **左风** **1** **位移图**

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**0. 0**

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|  | **0. 0** |

**0.**

**图** **12-39** **右风** **1** **位移图**

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**图** **12-40** **左风** **2** **位移图**

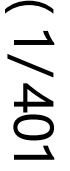
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**图** **12-41** **右风** **2** **位移图**

**1. 7 ( 1/ 4016) 1.**

**7**



**6**

**图** **12-42** **左地震位移图**

**1. 7**

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|  | **- 1** |
| **. 7 ( 1/ 4016)**  **-** | |



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**图** **12-43** **右地震位移图**

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**0. 0**

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|  | **- 0. 2** |

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**图** **12-44** **恒+活位移图**

**6.** **挠度图**

**1/ 13805**

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| **7**  **0.** |

**图** **12-45** **(恒+活)挠度图**

**图** **12-46** **(活)挠度图**

**图** **12-47** **抗风柱挠度图**

**7.** **计算长度系数图**

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| --- | --- |
|  | **2. 58( 线刚度比)** |

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**线**

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**度**

**比**

**平面内计算长度系数**

**图** **12-48**

**0. 33**

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**1. 00**

**图** **12-49** **平面外计算长度系数**