

## $HS.2 \pmod{3}$

|       | blocks | defect | matrix                                 |
|-------|--------|--------|----------------------------------------|
| $G :$ | 1      | 2      | $9 \times 7$                           |
|       | 2      | 2      | $9 \times 7$                           |
|       | 3      | 2      | $9 \times 5$                           |
|       | 4      | 1      | $3 \times 2$                           |
|       | 5      | 1      | $3 \times 2$                           |
|       | 6      | 0      | $693_1 = \chi_{9,0}, \varphi_{11,0}$   |
|       | 7      | 0      | $693_2 = \chi_{9,1}, \varphi_{11,1}$   |
|       | 8      | 0      | $1386_1 = \chi_{17,0}, \varphi_{18,0}$ |
|       | 9      | 0      | $1386_2 = \chi_{17,1}, \varphi_{18,1}$ |
|       | 10     | 0      | $2520_1 = \chi_{22,0}, \varphi_{19,0}$ |

|         | blocks               | defect | matrix                                 |
|---------|----------------------|--------|----------------------------------------|
|         | 11                   | 0      | $2520_2 = \chi_{22,1}, \varphi_{19,1}$ |
| $2.G :$ | 12                   | 2      | $9 \times 7$                           |
|         | 13                   | 1      | $3 \times 1$                           |
|         | 14                   | 0      | $3960_1 = \chi_{37+}, \varphi_{27+}$   |
|         | 15                   | 0      | $4608_1 = \chi_{39+}, \varphi_{29+}$   |
|         | 16                   | 0      | $2520_3 = \chi_{41,0}, \varphi_{31,0}$ |
|         | $17 = \overline{16}$ | 0      | $2520_4 = \chi_{41,1}, \varphi_{31,1}$ |
|         | 18                   | 0      | $2520_5 = \chi_{42,0}, \varphi_{32,0}$ |
|         | $19 = \overline{18}$ | 0      | $2520_6 = \chi_{42,1}, \varphi_{32,1}$ |

| Block 1:               | $\varphi_{1,0}$ | $\varphi_{2,1}$ | $\varphi_{6,0}$ | $\varphi_{10,0}$ | $\varphi_{12,1}$ | $\varphi_{16,1}$ | $\varphi_{17,0}$ |                           |
|------------------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|---------------------------|
| $1_1 = \chi_{1,0}$     | 1               | .               | .               | .                | .                | .                | .                | $\varphi_{1,0} = 1_1$     |
| $22_2 = \chi_{2,1}$    | .               | 1               | .               | .                | .                | .                | .                | $\varphi_{2,1} = 22_2$    |
| $154_1 = \chi_{4,0}$   | .               | .               | 1               | .                | .                | .                | .                | $\varphi_{6,0} = 154_1$   |
| $770_2 = \chi_{10,1}$  | .               | 1               | .               | .                | 1                | .                | .                | $\varphi_{10,0} = 321_1$  |
| $1408_1 = \chi_{18,0}$ | 1               | .               | 1               | .                | .                | .                | 1                | $\varphi_{12,1} = 748_2$  |
| $1750_1 = \chi_{19,0}$ | .               | 1               | 1               | 1                | .                | .                | 1                | $\varphi_{16,1} = 1176_2$ |
| $1925_2 = \chi_{20,1}$ | 1               | .               | .               | .                | 1                | 1                | .                | $\varphi_{17,0} = 1253_1$ |
| $2750_1 = \chi_{23,0}$ | .               | .               | .               | 1                | .                | 1                | 1                |                           |
| $3200_2 = \chi_{24,1}$ | 1               | 1               | .               | .                | 1                | 1                | 1                |                           |

| Block 2:               | $\varphi_{1,1}$ | $\varphi_{2,0}$ | $\varphi_{6,1}$ | $\varphi_{10,1}$ | $\varphi_{12,0}$ | $\varphi_{16,0}$ | $\varphi_{17,1}$ |                           |
|------------------------|-----------------|-----------------|-----------------|------------------|------------------|------------------|------------------|---------------------------|
| $1_2 = \chi_{1,1}$     | 1               | .               | .               | .                | .                | .                | .                | $\varphi_{1,1} = 1_2$     |
| $22_1 = \chi_{2,0}$    | .               | 1               | .               | .                | .                | .                | .                | $\varphi_{2,0} = 22_1$    |
| $154_2 = \chi_{4,1}$   | .               | .               | 1               | .                | .                | .                | .                | $\varphi_{6,1} = 154_2$   |
| $770_1 = \chi_{10,0}$  | .               | 1               | .               | .                | 1                | .                | .                | $\varphi_{10,1} = 321_2$  |
| $1408_2 = \chi_{18,1}$ | 1               | .               | 1               | .                | .                | .                | 1                | $\varphi_{12,0} = 748_1$  |
| $1750_2 = \chi_{19,1}$ | .               | 1               | 1               | 1                | .                | .                | 1                | $\varphi_{16,0} = 1176_1$ |
| $1925_1 = \chi_{20,0}$ | 1               | .               | .               | .                | 1                | 1                | .                | $\varphi_{17,1} = 1253_2$ |
| $2750_2 = \chi_{23,1}$ | .               | .               | .               | 1                | .                | 1                | 1                |                           |
| $3200_1 = \chi_{24,0}$ | 1               | 1               | .               | .                | 1                | 1                | 1                |                           |

| <b>Block 3:</b>        | $\varphi_{3+}$ | $\varphi_{5,0}$ | $\varphi_{5,1}$ | $\varphi_{7+}$ | $\varphi_{13+}$ |                          |
|------------------------|----------------|-----------------|-----------------|----------------|-----------------|--------------------------|
| $77_1 = \chi_{3,0}$    | .              | 1               | .               | .              | .               |                          |
| $77_2 = \chi_{3,1}$    | .              | .               | 1               | .              | .               | $\varphi_{3+} = 98_1$    |
| $308_1 = \chi_{5+}$    | .              | .               | .               | 1              | .               | $\varphi_{5,0} = 77_1$   |
| $175_1 = \chi_{7,0}$   | 1              | 1               | .               | .              | .               | $\varphi_{5,1} = 77_2$   |
| $175_2 = \chi_{7,1}$   | 1              | .               | 1               | .              | .               | $\varphi_{7+} = 308_1$   |
| $1540_1 = \chi_{11+}$  | .              | .               | .               | .              | 1               | $\varphi_{13+} = 1540_1$ |
| $1792_1 = \chi_{14+}$  | 1              | 1               | 1               | .              | 1               |                          |
| $1925_3 = \chi_{21,0}$ | .              | 1               | .               | 1              | 1               |                          |
| $1925_4 = \chi_{21,1}$ | .              | .               | 1               | 1              | 1               |                          |

| <b>Block 4:</b>        | $\varphi_{9,0}$ | $\varphi_{15,1}$ |                          |
|------------------------|-----------------|------------------|--------------------------|
| $231_1 = \chi_{8,0}$   | 1               | .                | $\varphi_{9,0} = 231_1$  |
| $825_2 = \chi_{13,1}$  | .               | 1                | $\varphi_{15,1} = 825_2$ |
| $1056_2 = \chi_{16,1}$ | 1               | 1                |                          |

| <b>Block 5:</b>        | $\varphi_{9,1}$ | $\varphi_{15,0}$ |                          |
|------------------------|-----------------|------------------|--------------------------|
| $231_2 = \chi_{8,1}$   | 1               | .                | $\varphi_{9,1} = 231_2$  |
| $825_1 = \chi_{13,0}$  | .               | 1                | $\varphi_{15,0} = 825_1$ |
| $1056_1 = \chi_{16,0}$ | 1               | 1                |                          |

| <b>Block 12:</b>       | $\varphi_{20,0}$ | $\varphi_{20,1}$ | $\varphi_{21+}$ | $\varphi_{23,0}$ | $\varphi_{23,1}$ | $\varphi_{26,0}$ | $\varphi_{26,1}$ |                           |
|------------------------|------------------|------------------|-----------------|------------------|------------------|------------------|------------------|---------------------------|
| $56_1 = \chi_{25,0}$   | 1                | .                | .               | .                | .                | .                | .                | $\varphi_{20,0} = 56_1$   |
| $56_2 = \chi_{25,1}$   | .                | 1                | .               | .                | .                | .                | .                | $\varphi_{20,1} = 56_2$   |
| $352_1 = \chi_{26+}$   | .                | .                | 1               | .                | .                | .                | .                | $\varphi_{21+} = 352_1$   |
| $1232_1 = \chi_{28+}$  | .                | .                | 1               | 1                | 1                | .                | .                | $\varphi_{23,0} = 440_1$  |
| $1000_1 = \chi_{32,0}$ | .                | .                | .               | .                | .                | 1                | .                | $\varphi_{23,1} = 440_2$  |
| $1000_2 = \chi_{32,1}$ | .                | .                | .               | .                | .                | .                | 1                | $\varphi_{26,0} = 1000_1$ |
| $2464_1 = \chi_{33+}$  | 1                | 1                | 1               | .                | .                | 1                | 1                | $\varphi_{26,1} = 1000_2$ |
| $1792_2 = \chi_{35,0}$ | .                | .                | 1               | .                | 1                | 1                | .                |                           |
| $1792_3 = \chi_{35,1}$ | .                | .                | 1               | 1                | .                | .                | 1                |                           |

| <b>Block 13:</b>       | $\varphi_{24+}$ |
|------------------------|-----------------|
| $1848_1 = \chi_{30+}$  | 1               |
| $1848_2 = \chi_{36,0}$ | 1               |
| $1848_3 = \chi_{36,1}$ | 1               |

$$\varphi_{24+} = 1848_1$$