

|                                                                                   |                            |                    |                   |                    |                       |                    |
|-----------------------------------------------------------------------------------|----------------------------|--------------------|-------------------|--------------------|-----------------------|--------------------|
|  | Project<br>Bournes Green   |                    |                   |                    | Job Ref.<br>263072    |                    |
| K D Leach Limited                                                                 | Structure<br>Nursery Block |                    |                   |                    | Sheet no.<br>Page 1/2 |                    |
| kevin@kdleach.limited                                                             | Calc. by<br>Kevin          | Date<br>26/05/2026 | Chk'd by<br>Kevin | Date<br>26/05/2026 | Rev<br>A              | Date<br>09/06/2023 |

### Structure

#### Action Codes

General Loading BS EN 1991-1-1 + UK NA (2002)  
Wind Loading BS EN 1991-1-4 + UK NA (2005)  
Snow Loading BS EN 1991-1-3 + UK NA (2003)  
Seismic Loading BS EN 1998-1 + UK NA (2004)  
Combinations BS EN 1990 + UK NA (2002)

permanent load - 0.35kN/m<sup>2</sup>  
variable load - 0.6kN/m<sup>2</sup>  
services load - 0.75kN/m<sup>2</sup>

### Structure

#### Resistance Codes

Steel Design BS EN 1993-1-1 + UK NA (2005)  
Concrete Design BS EN 1992-1-1 + UK NA (2004)  
Composite Design BS EN 1994-1-1 + UK NA (2004)  
Timber Design BS EN 1995-1-1 + UK NA (2004)  
Masonry Design BS EN 1996-1-1 + UK NA (2005)  
Foundation Design BS EN 1997-1 + UK NA (2004)  
Seismic Design and Detailing BS EN 1998-1 + UK NA (2004)  
Steel Fire Design BS EN 1993-1-2 + UK NA (2005)

### Analysis

#### Sway

#### First-order linear

| Level        | Ref.       | Stack | Combination Dir 1                       | $\alpha_{Dir 1}$ | Combination Dir 2                       | $\alpha_{Dir 2}$ | Combination Dir 1/2                     | Twist | Status |
|--------------|------------|-------|-----------------------------------------|------------------|-----------------------------------------|------------------|-----------------------------------------|-------|--------|
| St. 1<br>(1) | SC<br>B/28 | 1     | 1 STR <sub>1</sub><br>-1.35G+1.5Q+1.5RQ | 241.006          | 1 STR <sub>1</sub><br>-1.35G+1.5Q+1.5RQ | 67.864           | 1 STR <sub>1</sub><br>-1.35G+1.5Q+1.5RQ | 1.086 | ✓ Pass |
| St. 1<br>(1) | SC<br>B/8  | 1     | 1 STR <sub>1</sub><br>-1.35G+1.5Q+1.5RQ | 422.910          | 1 STR <sub>1</sub><br>-1.35G+1.5Q+1.5RQ | 67.108           | 1 STR <sub>1</sub><br>-1.35G+1.5Q+1.5RQ | 1.300 | ✓ Pass |

### Steel

#### Beam Design

#### Beam Design Summary

#### Static

| Member Reference | Group Ref. | Span | Section          | Grade | Length [mm] | No. Connectors | Camber | Utilization | Status |
|------------------|------------|------|------------------|-------|-------------|----------------|--------|-------------|--------|
| SB 1/B/8-1/C/8   | SBR27      | 1    | UB<br>356x171x51 | S355  | 10210.4     |                | 0.0    | 0.657       | ✓ Pass |
| SB 1/B/7-1/C/7   | SBR35      | 1    | UB<br>457x191x67 | S355  | 10210.4     |                | 0.0    | 0.929       | ✓ Pass |
| SB 1/B/28-1/B/8  | SBR26      | 1    | UB<br>254x102x22 | S355  | 4231.0      |                | 0.0    | 0.180       | ✓ Pass |
| SB 1/B/6-1/B/29  | SBR7       | 1    | UB<br>254x102x22 | S355  | 4231.0      |                | 0.0    | 0.107       | ✓ Pass |
| SB 1/B/6-1/C/6   | SBR36      | 1    | UB<br>457x191x67 | S355  | 10210.4     |                | 0.0    | 0.692       | ✓ Pass |
| SB 1/C/6-1/C/7   | SBR8       | 1    | UB<br>356x127x33 | S355  | 5081.0      |                | 0.0    | 0.065       | ✓ Pass |
| SB 1/C/7-1/C/8   | SBR8       | 1    | UB<br>356x127x33 | S355  | 5081.0      |                | 0.0    | 0.065       | ✓ Pass |
| SB 1/B/29-1/B/28 | SBR11      | 1    | UB<br>203x133x25 | S355  | 1700.0      |                | 0.0    | 0.299       | ✓ Pass |

|                                                                                   |                            |                    |                   |                    |                       |                    |
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## Steel

### Column Design

#### Column Design Summary

##### Static

| Member Reference | Group Ref. | Stack | Section         | Grade | Length [mm] | Utilization | Status |
|------------------|------------|-------|-----------------|-------|-------------|-------------|--------|
| SC B/8           | SCR1       | 1     | UC 152x152x23   | S355  | 3750.0      | 0.490       | ✓ Pass |
| SC C/8           | SCR1       | 1     | UC 152x152x23   | S355  | 3750.0      | 0.537       | ✓ Pass |
| SC B/28          | SCR1       | 1     | UC 152x152x23   | S355  | 3750.0      | 0.303       | ✓ Pass |
| SC B/6           | SCR1       | 1     | UC 152x152x23   | S355  | 3750.0      | 0.428       | ✓ Pass |
| SC C/7           | SCR4       | 1     | SHS 100x100x8.0 | S355  | 3750.0      | 0.460       | ✓ Pass |
| SC C/6           | SCR4       | 1     | SHS 100x100x8.0 | S355  | 3750.0      | 0.231       | ✓ Pass |
| SC B/29          | SCR1       | 1     | UC 152x152x23   | S355  | 3750.0      | 0.302       | ✓ Pass |

## Steel

### Brace Design

#### Brace Design Summary

##### Static

| Member Reference        | Group Ref. | Span | Section      | Grade | Length [mm] | Utilization | Status |
|-------------------------|------------|------|--------------|-------|-------------|-------------|--------|
| SBR 1/7/#1277-1/B/6     | SBrR9      | 1    | CHS 88.9x5.0 | S355  | 6113.6      | 0.169       | ✓ Pass |
| SBR 1/B/8-1/7/#1277     | SBrR9      | 1    | CHS 88.9x5.0 | S355  | 6113.6      | 0.064       | ✓ Pass |
| SBR 1/7/#1277-1/8/#1292 | SBrR9      | 1    | CHS 88.9x5.0 | S355  | 6113.6      | 0.097       | ✓ Pass |
| SBR 1/8/#1292-1/C/7     | SBrR9      | 1    | CHS 88.9x5.0 | S355  | 6119.4      | 0.058       | ✓ Pass |
| SBR Base/B/8-1/C/8      | SBrR1      | 1    | Flat 8x80    | S275  | 10877.2     | 0.016       | ✓ Pass |
| SBR Base/C/8-1/B/8      | SBrR1      | 1    | Flat 8x80    | S275  | 10877.2     | 0.007       | ✓ Pass |
| SBR Base/B/6-1/C/6      | SBrR1      | 1    | Flat 8x80    | S275  | 10877.2     | 0.016       | ✓ Pass |
| SBR Base/C/6-1/B/6      | SBrR1      | 1    | Flat 8x80    | S275  | 10877.2     | 0.008       | ✓ Pass |
| SBR Base/C/8-1/C/7      | SBrR3      | 1    | Flat 8x80    | S275  | 6315.0      | 0.004       | ✓ Pass |
| SBR Base/C/7-1/C/8      | SBrR3      | 1    | Flat 8x80    | S275  | 6315.0      | 0.016       | ✓ Pass |

## Steel

### Base Plate Design

#### Base Plate Design Summary

##### Static

| Base Plate | Length [mm] | Width [mm] | Thickness [mm] | No. of bolts | Utilization | Status |
|------------|-------------|------------|----------------|--------------|-------------|--------|
| BPC B/8    | 250         | 250        | 12             | 4            | 0.185       | ✓ Pass |
| BPC C/8    | 250         | 250        | 12             | 4            | 0.283       | ✓ Pass |
| BPC B/6    | 250         | 250        | 12             | 4            | 0.174       | ✓ Pass |
| BPC C/7    | 250         | 250        | 12             | 4            | 0.129       | ✓ Pass |
| BPC C/6    | 120         | 250        | 12             | 4            | 0.161       | ✓ Pass |
| BPC B/28   | 250         | 250        | 12             | 4            | 0.073       | ✓ Pass |
| BPC B/29   | 250         | 250        | 12             | 4            | 0.073       | ✓ Pass |