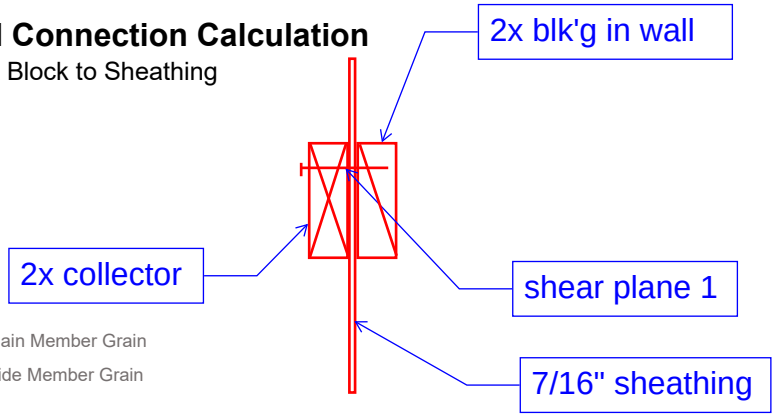
[redacted]

Project Name:
Project Number: 20XX-0XXX

Designed By: XXX
Checked By: XXX

# Dowel Single Shear Wood Connection Calculation

Calculation Name: 2x Block to Sheathing




## Dowel Properties:

Fastener Type: Nail

| | | | |
|---|---|---|---|
| $D$ = | 0.148 | | Nominal Diameter |
| $D_r$ = | 0.148 | | Root Diameter |
| $L$ = | 3 | in | Length |
| $F_{yb}$ = | 90000 | psi | Dowel Yield Strength |
| $\theta_m$ = | 0 | deg | Angle Between Load Direction and Main Member Grain |
| $\theta_s$ = | 0 | deg | Angle Between Load Direction and Side Member Grain |

## Side Member Properties:

| | | | |
|---|---|---|---|
| $G$ = | 0.43 | | Specific Gravity |
| $t_s$ = | 1.5 | in | Side Member Thickness |
| $W_s$ = | 3.5 | in | Side Member Width |
| $F_{e,parallel}$ = | 3513 | psi | Parallel Bearing Strength |
| $F_{e,perp.}$ = | 3513 | psi | Perp. Bearing Strength |
| $F_{es}$ = | 3513 | psi | Dowel Bearing Strength |

## Main Member Properties:

| | | | |
|---|---|---|---|
| $G$ = | 0.42 | | Specific Gravity |
| $t_m$ = | 0.4375 | in | Main Member Thickness |
| $W_m$ = | 3.5 | in | Main Member Width |
| $F_{e,parallel}$ = | 3364 | psi | Parallel Bearing Strength |
| $F_{e,perp.}$ = | 3364 | psi | Perp. Bearing Strength |
| $F_{em}$ = | 3364 | psi | Dowel Bearing Strength |

## Shear Yield Limit Equations

Reduction Term:

| Fastener Size | Yield Mode | Rd |
|---|---|---|
| 0.25" < D < 1" | Im, Is | 4 |
| | II | 3.6 |
| | IIIm, IIIs, IV | 3.2 |
| D < 0.25" | All | 2.2 |

## Variables

| | | | |
|---|---|---|---|
| $t_o$ = | 0 | in | Thickness of additional members in connection prior to side member |
| $L_s$ = | 1.5 | in | Side member dowel bearing length |
| $L_m$ = | 0.4375 | in | Main member dowel bearing length |
| $R_e$ = | 0.958 | | |
| $R_t$ = | 0.292 | | |
| $K_1$ = | 0.332 | | |
| $K_2$ = | 1.103 | | |
| $K_3$ = | 1.145 | | |

| Yield Mode | Z | | |
|---|---|---|---|
| $I_m$ | 99 | lb | Wood crushing in main member |
| $I_s$ | 355 | lb | Wood crushing in side member |
| II | 118 | lb | Rotation of fastener |
| $III_m$ | 37 | lb | Plastic hinge in fastener + wood crushing in main member |
| $III_s$ | 131 | lb | Plastic hinge in fastener + wood crushing in side member |
| IV | 101 | lb | Plastic hinge in fastener on each side of shear plane |

| | | |
|---|---|---|
| 37 | lb/fastener | 10d commons |
| 11 | lb/fastener | adjusted for P/10*Dia |