



COMPANY
Virtual Creations Inc
205-17 King Street East
Dundas Ontario
L9H1B7
June 8, 2021 10:16

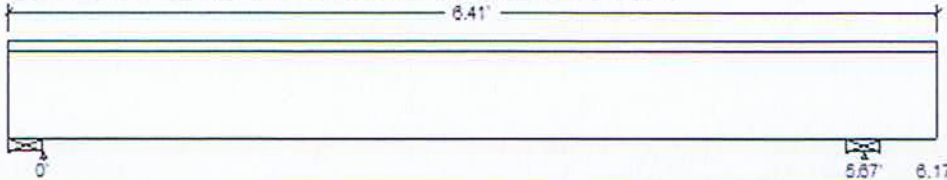
PROJECT
Beam1

Design Check Calculation Sheet
WoodWorks Sizer 9.0

Loads:

| Load | Type | Distribution | Pattern | Location [ft] | | Magnitude | | Unit |
|-------------|------|--------------|---------|---------------|-----|-----------|-----|------|
| | | | | Start | End | Start | End | |
| Load1 | Dead | Full UDL | No | | | 10.0 | | plf |
| Load2 | Live | Full UDL | Yes | | | 40.0 | | plf |
| Load3 | Dead | Point | No | 3.24 | | 34 | | lbs |
| Load4 | Live | Point | Yes | 3.24 | | 135 | | lbs |
| Self-weight | Dead | Full UDL | No | | | 4.6 | | plf |

Maximum Reactions (lbs), Bearing Resistances (lbs) and Bearing Lengths (in) :



| | | | |
|-------------|-------|--|-------|
| Unfactored: | | | |
| Dead | 59 | | 67 |
| Live | 127 | | 306 |
| Factored: | | | |
| Total | 354 | | 392 |
| Pt. load | 15 | | |
| Bearing: | | | |
| Resistance | | | |
| Beam | 7291 | | 8302 |
| Support | 8204 | | 8204 |
| Anal/Des | | | |
| Beam | 0.05 | | 0.05 |
| Support | 0.04 | | 0.05 |
| Load comb | #4 | | #2 |
| Length | 2.00' | | 2.00' |
| Min req'd | 0.15 | | 0.05 |
| NB | 1.00 | | 1.13 |
| NB min | 1.00 | | 1.75 |
| Nd | 1.00 | | 1.00 |
| NB support | 1.13 | | 1.13 |
| fcp sup | 1015 | | 1015 |
| fcsp sup | 1.00 | | 1.00 |

*Minimum bearing length setting used: 3" for end supports and 3" for interior supports

Built-up, D Fir-L, No.1/No 2, 2x8, 2-ply (3"x7-1/4")
Supports: All - Timber Beam, D.Fir-L No.2
Total length: 6.41; volume = 1.0 cuft;
Load sharing: Yes;

Force vs. Resistance and Deflection using CSA-O86-09:

| Criterion | Analysis Value | Design Value | Unit | Analysis/Design |
|---------------|----------------|--------------|--------|------------------|
| Shear | V_E Ed = 296 | V_R = 4731 | lbs | V_E/V_R = 0.06 |
| Moment(+) | M_E = 657 | M_R = 2752 | lbs-ft | M_E/M_R = 0.17 |
| Moment(-) | M_E = 10 | M_R = 2752 | lbs-ft | M_E/M_R = 0.00 |
| Deflection: | | | | |
| Interior Perm | 0.00 = <L/999 | 0.19 = L/360 | in | 0.02 |
| Live | 0.01 = <L/999 | 0.19 = L/360 | in | 0.06 |
| Total | 0.02 = <L/999 | 0.38 = L/180 | in | 0.04 |
| Cantil. Perm | -0.00 = <L/999 | 0.03 = L/180 | in | 0.03 |
| Live | -0.00 = <L/999 | 0.02 = L/180 | in | 0.10 |
| Total | -0.00 = <L/999 | 0.07 = L/250 | in | 0.06 |

294 BOLD ST
HAMILTON ONT

28844
ECP

Additional Data:

| FACTORS: | f/E (psi) | KD | KH | KZ | KL | KT | KS | KN | LC# |
|----------|-------------|------|------|-------|-------|------|------|----|-----|
| Fv | 276 | 1.00 | 1.10 | 1.200 | - | 1.00 | 1.00 | - | #2 |
| Fb+ | 1450 | 1.00 | 1.10 | 1.200 | 1.000 | 1.00 | 1.00 | - | #4 |
| Fb- | 1450 | 1.00 | 1.10 | 1.200 | 1.000 | 1.00 | 1.00 | - | #2 |
| Ecp | 1015 | - | - | 1.000 | - | 1.00 | 1.00 | - | #- |
| Es | 1.6 million | - | - | - | - | 1.00 | 1.00 | - | #4 |

CRITICAL LOAD COMBINATIONS:

Shear : LC #2 = 1.2SD + 1.5L
 Moment(+) : LC #4 = 1.2SD + 1.5L (pattern: L_)
 Moment(-) : LC #2 = 1.2SD + 1.5L
 Deflection: LC #1 = 1.0D (permanent)
 LC #4 = 1.0D + 1.0L (pattern: L_) (live)
 LC #4 = 1.0D + 1.0L (pattern: L_) (total)
 Bearing : Support 1 - LC #4 = 1.2SD + 1.5L (pattern: L_)
 Support 2 - LC #2 = 1.2SD + 1.5L
 Support 3 - LC #0 = Self-weight
 Load Types: D=dead W=wind S=snow H=earth,groundwater E=earthquake
 L=live(use,occupancy) Ls=live(storage,equipment) F=fire
 Load Patterns: s=S/D L=L+Ls _=no pattern load in this span
 All Load Combinations (LCs) are listed in the Analysis output

CALCULATIONS:

Deflection: EI = 76e06 lb-in²/ply
 "Live" deflection = Deflection from all non-dead loads (live, wind, snow.)

Design Notes:

1. WoodWorks analysis and design are in accordance with the 2010 National Building Code of Canada (NBC Part 4) and the Sept 2010 reprint of the CSA-O88-09 Engineering Design in Wood Standard, which includes Update No.1.
2. Please verify that the default deflection limits are appropriate for your application.
3. Clause 5.5.3 requires that beam and stringer grades shall not be designed for continuity in determining requirements for bending resistance, unless regraded along the full length of the member.
4. BEAMS require restraint against lateral displacement and rotation at points of bearing (5.5.4.2.1).
5. BUILT-UP BEAMS: It is assumed that each ply is a single continuous member (that is, no butt joints are present) fastened together securely at intervals not exceeding 4 times the depth and that each ply is equally top-loaded. Where beams are side-loaded, special fastening details may be required.
6. The critical deflection value has been determined using maximum back-span deflection. Cantilever deflections do not govern design.
7. Total reaction used to check O88 5.5.7.2 for effect of all applied loads; point load reaction is used to check 5.5.7.3 for effect of loads near a support.

294 BOLD ST
HAMINGTON ONT.

28844
E.C.F.