## Second-Order Analysis of an Uncracked Member

| | | |
|---|---|---|
| 1. ECCENTRICITY OF APPLIED LOAD = | 8 | in. |
| 2. TEMP. DIFF. INSIDE TO OUTSIDE = | 50 | Degrees |
| 3. MIDSPAN BOWING DUE TO TEMP. = | 0.61 | in. |
| 4. BRACED FRAME - NO JOINT TRANSLATION | | |
| 5. JOINTS ASSUMED PINNED TOP AND BOTTOM. | | |
| 6. MEMBER HAS A SIMPLE SPAN LENGTH = | 32 | ft. |
| 7. MOMENTS OR DEFLECTIONS THAT CAUSE OUTWARD BOWING ARE POSITIVE. | | |
| 8. SERVICE LOAD: | | |
| LATERAL LOADS DUE TO WIND, W = | 0.2 | kip/ft. |
| APPLIED DEAD LOAD, P(dl) = | 10 | kips |
| APPLIED LIVE LOAD, P(ll) = | 10 | kips |
| PANEL WEIGHT AT MID-HEIGHT = | 12.0 | kips |

OUTWARD

## Section Properties:

| | | | | | |
|---|---|---|---|---|---|
| | | | Cracking Moment Modification Factor, CMMF = | .075 | |
| Igros = | 7020 | in4 | AREA = | 720 | in |
| S(in) = | 1560 | in3 | f'c = | 6 | ksi |
| S(out) = | 1560 | in3 | Concrete Unit Weight | 150 | pcf |
| | | | Ec = | 4696 | ksi |

## Pre Stressing Data:

| | | | | | |
|---|---|---|---|---|---|
| Fpu = | 270 | ksi | PRESTRESS LOSSES = | 0.1 | Decimal |
| Total Aps = | 0.85 | in | PRESTRESS ECCEN = | 0 | in. |
| JACKING = | 0.7 | Decimal | (ECCEN. IS + IF BOWING IS OUTWARD) | | |

## Loading Assumption #1 : U = 1.2D + 1.6W + 0.5L

| | | | | | |
|---|---|---|---|---|---|
| | | | Truss Beam Theory Modification Factor, TBMF = | 0.25 | |
| | | | Pu = | 17.0 | kips |
| Wu = | 0.320 | kip/ft. | Pu(dl) = | 12.0 | kips |
| BETA(d) + | 0.71 | | PHI (k) = | 0.75 | |
| | | | EI = TBMF *PHI(k)*Ec*Ig/(1+BETA(d)) = | 3.62E+06 | kip-in$^2$ |

## Pre Stressing Data:

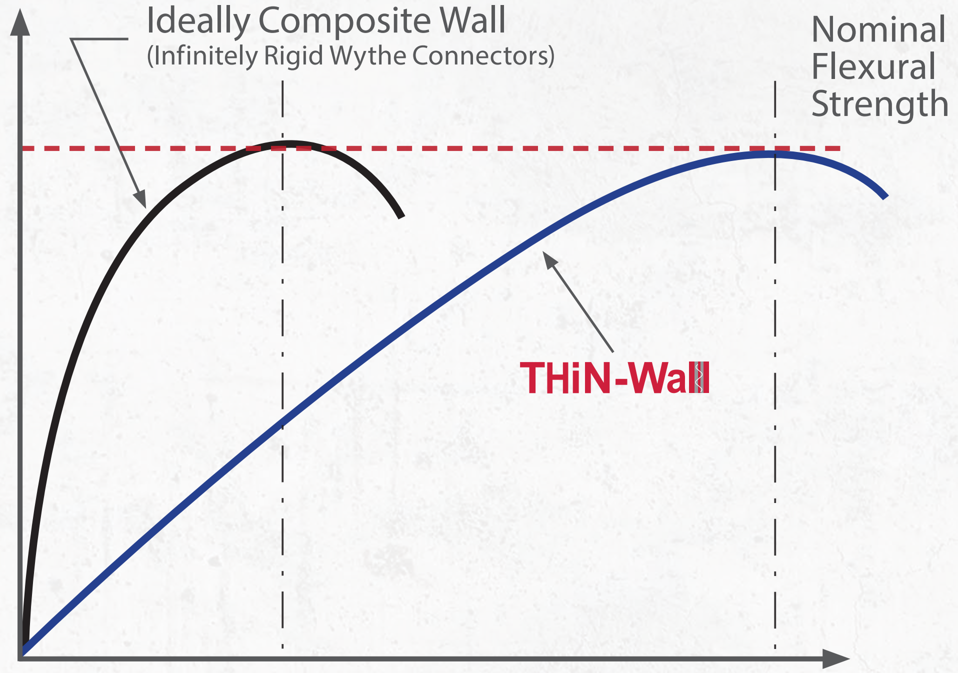
| | | |
|---|---|---|
| DEFLECTION AT MIDSPAN DUE TO Pu*e = | 0.346 | in. |
| DEFLECTION AT MIDSPAN DUE TO P/S = | 0.000 | in. |
| DEFLECTION AT MIDSPAN DUE TO Wu = | 1.221 | in. |
| TOT. ULT. DEFLECTION AT MIDSPAN + TEMP. = | 2.182 | in. |

## Determine Additional Deflection at Midspan Due to Total Ultimate Deflection

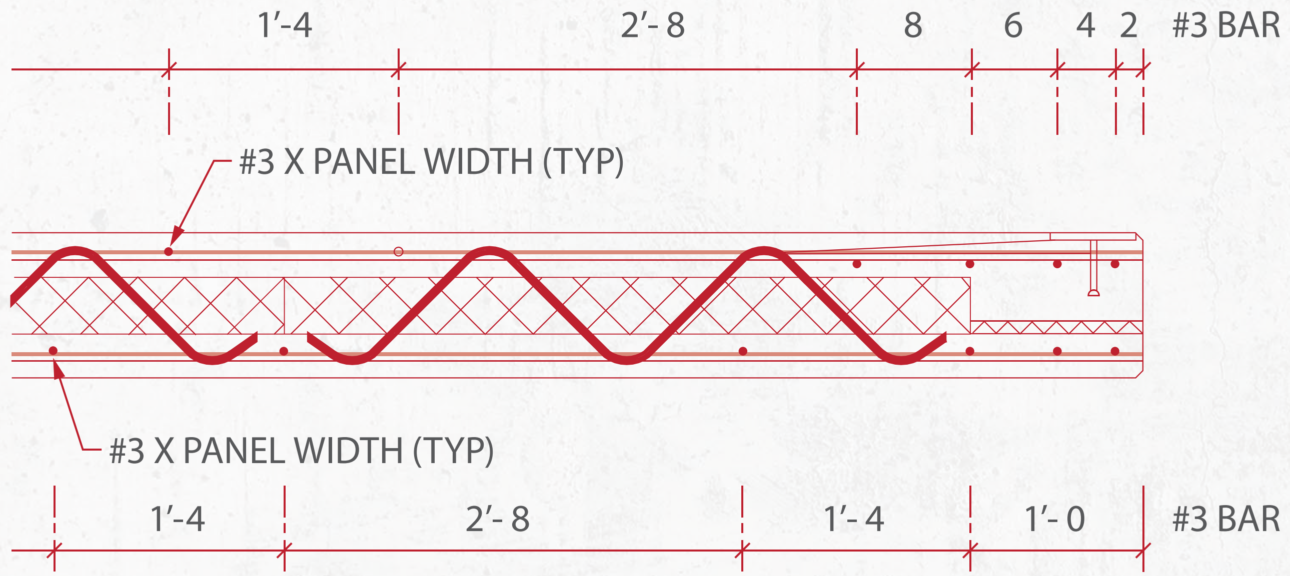
| | | | | | |
|---|---|---|---|---|---|
| DELTA1 = | 0.189 | in. | DELTA2 = | 0.205 | in. |
| DELTA3 = | 0.206 | in. | DELTA4 = | 0.207 | in. |
| DELTA5 = | 0.207 | in. | DELTA6 = | 0.207 | in. |

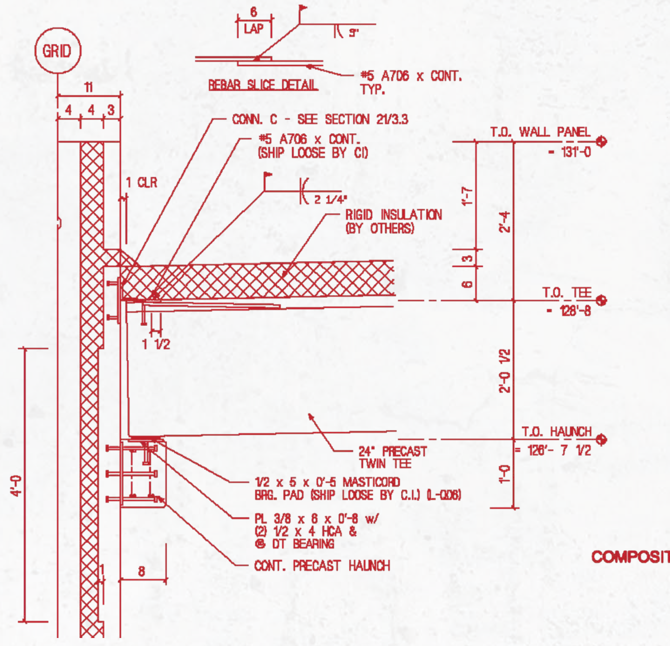
## THiN-Wall —Redefining what eco-friendly buildings can be.

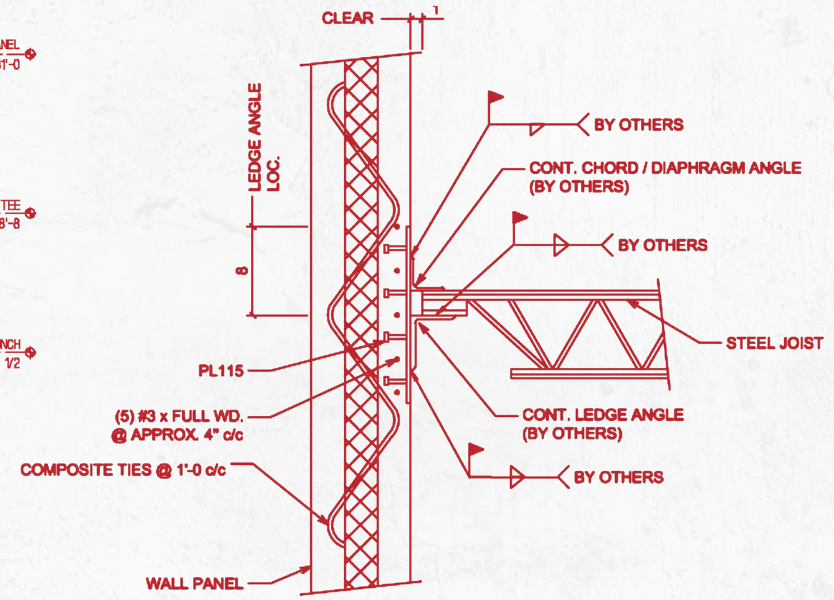
With two 3" layers of concrete, THiN-Wall delivers the same insulating and load-bearing performance of thicker walls while using less cement, which minimizes carbon dioxide emissions. THiN-Wall has architects rethinking their approach to sustainable buildings.



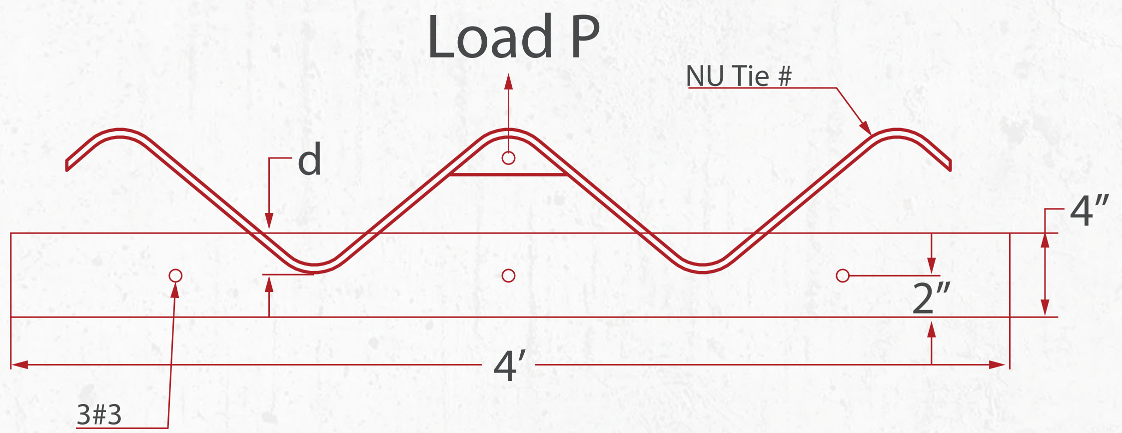

- **100% Composite Action for "Nominal Flexural Strength"**
- **75% Composite Action for "Flexure Cracking Checks"**
- **25% Composite Action for "Deflection Analysis"**




| NU-Tie Size | Embedment Depth (d) | Ultimate Load (P) in pounds | | | | | |
|---|---|---|---|---|---|---|---|
| | | Test #1 | Test #2 | Test #3 | Test #4 | Test #5 | Test #6 |
| #3 | 0.175 | 525 | 623 | 479 | Pull-out | 542 | 0.14 |
| | 1 | 1,594 | 906 | 1,431 | Pull-out | 1,310 | 0.27 |
| | 1.5 | 3,091 | 3,534 | 1,686 | Pull-out | 2,770 | 0.35 |
| | 2 | 6,145 | 6,387 | 5,565 | Tie rupture | 6,032 | 0.07 |

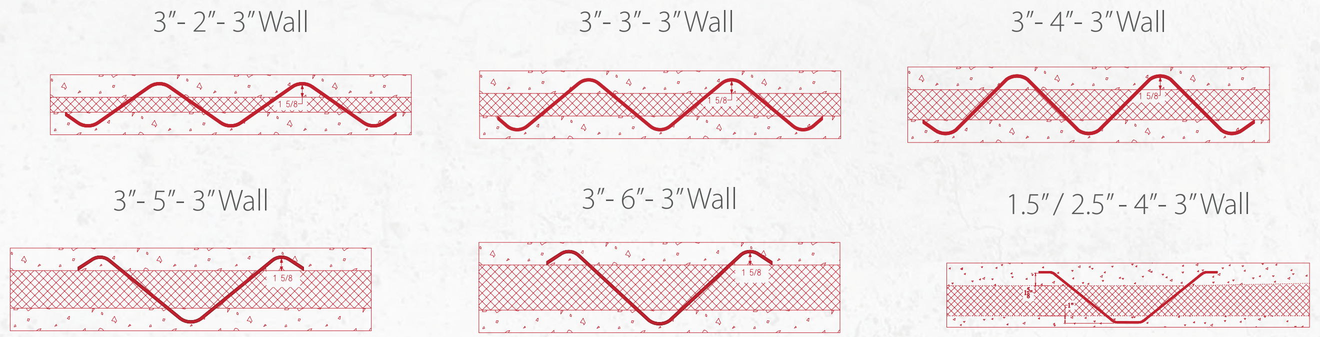



## Contact Information

To learn more, visit thin-wall.com
or email Douglas.Gremel@owenscorning.com to request a USB drive full of additional information.

## Nu-Tie Shear Connector

- Very High Tensile Strength - 110 KSI
- Thermally Non-Conductive
- Low Stiffness (Modulus) Mitigates Thermal Bowing - 7,000 KSI
- Strong yet Flexible is the best Balance of Strength and Stiffness for Wall Panel Construction
- 2" Embedment - 3 kip pullout capacity




## Benefits of Nu-Tie

- Fully Insulated Wall Panels with NO thermal bridges from connectors
- Use less concrete - Overall wythe thickness reduced
- Use the insulation of your choice from multiple suppliers (EPS or XPS)
- Straight forward and validated design methodology

## Design Guidance

The design of structural load bearings walls for the THiN-Wall system follows the methodology of the PCI Handbook. The Nu-Ties are oriented vertically and positioned as per the latest version of the THiN-Wall design software.

| Part Number | Insulation Thickness | Color Code |
|---|---|---|
| RNU3 - 2I6H | 2" (50mm) | Green |
| RHU3 - 3I7H | 3" (75mm) | Red |
| RHU3 - 4I8H | 4" (100mm) | Yellow |
| RNU3 - 5I9H - 24P | 5"(125 mm) | Blue |
| RNU3 - 6I10H - 24P | 6" (150 mm) | White |
| RNU2 - 4I7H - 24FP | 4" (100 mm) | Red |