

Architectural Guidelines and Technical Specifications for Designing with Platinum Advanced Technologies products

Platinum Technology™ [*plat-i-num tek-nol-o-gee*] Noun 1: An innovative system of composite wall, ceiling and roof products made of fiber-reinforced polyurethane and galvanized steel. Platinum Technology borrows proven techniques from the automotive, steel and polymer industries and applies them to construction. Platinum products combine structural strength and insulation in a single building material

Platinum Technology™ provides *structural strength* and *insulation* in a single building product for wall, ceilings and roofs. Our products replace other conventional construction components, such as wood framing, concrete block, poured-in-place concrete and even steel framing. Platinum's innovative light-gage steel, fiber-reinforced, polyurethane insulated panels allow construction of a safer, more energy efficient, faster, cost-competitive building, free from worries about mold, mildew rot, fungus, or termites.

Our exterior foamed products (walls, ceilings, and roofs) rely upon a fiber reinforcing structural fabric on both surfaces to create a structural composite, which produces a SIP-like panelized product with shear properties and debris impact resistance.

Design Protocol

Designing with Platinum Technology™ products and conventional 2x4 or 2x6 framing is nearly identical. The structural and design criteria are based on the accepted practices contained in the 2001 AISI/COFS Prescriptive Method for Residential Cold-formed Steel Framing (as published by the North American Steel Framing Alliance).

Further, we use the proprietary NUFRAME system for our steel framing members. The NUFRAME system was developed using accepted engineering and building practices as found in the 2003 International Residential Code (IRC), and the AISI North American Specification for the Design of Cold-formed Steel Structural Members, ASCE Minimum Design Loads, IBC and IRC. Specific reference should be made to the NUFRAME Design Manual, where indicated.

Design Rules

Platinum products are panelized so that designing with PAT is optimized when a few simple design rules are followed. Our wall, ceiling, and roof products are normally 4' wide, or less. Therefore, designing to 4' dimensions, plus the wall thickness, works out best. Our product customarily utilizes 16"o.c. framing but can also manufacture 24" and 12"o.c.

We have the following product categories:

- EXF – exterior foamed product, either 2x4 (3.5" actual) or 2x6 (5.5" actual), in varying lengths
- EXO – exterior open-framed product, either 2x4 or 2x6
- INF – interior foamed product, similar to exterior foamed, except without the structural fabric skin
- INO – interior open-framed, either 2x4 or 2x6, to match ceiling heights and of varying gauges for structural strength
- CEIL – ceiling product, either 2x4 or 2x6 thick, varying lengths, may be foamed or open-framed
- ROOF – roof product, either 2x4 or 2x6, most normally foamed, but may be open-framed, as for over porch, etc.

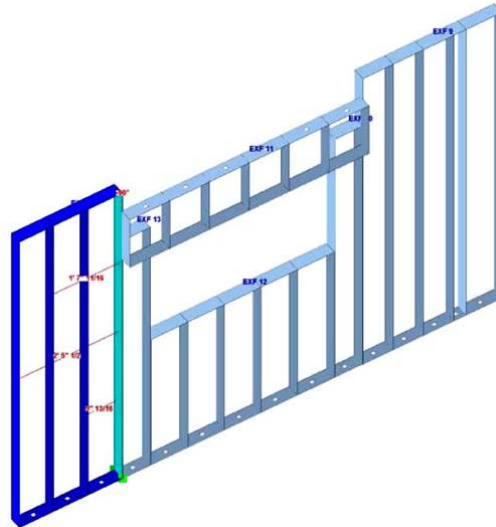
Please consider the following information as you begin schematic design:

General:

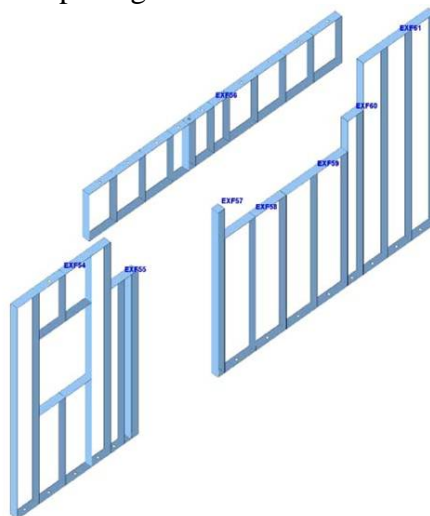
1. Consider which anchors will be used and whether the anchor head will present interference for the panel's bottom edge when placed into the mounting track.
2. Maximizing 4' wide standard panels speeds construction time and minimizes cost.
3. There is a 3.5" overlap of product at all corners, therefore, design in increments of 4', plus 7" for wall thickness (or 11" for 2x6 walls)
4. Consider which wall by-passes the other at exterior corners, and dimension accordingly.
5. Placement and sizing of jogs in exterior walls can be designed to maximize 4' panels, but remember panels will overlap at corners 3.5"
6. Interior wall intersections may add additional steel in exterior walls for drywall backing, just as in conventional framing. Please design at least 3.5" between intersecting interior walls and windows or doors, as the minimum distance between studs is 3.5". (See #14 below)
7. Consider the exterior finish if it will affect the size of the foundation; i.e. brick ledges.
8. Consider changes in elevation of the foundation for ceiling heights, beams, etc. and note if they will affect resultant wall heights.
9. Consider stem walls or curbs needed at garage and how they might affect wall panel heights.
10. Gable panels can be added to the platinum package if needed but will normally be designed as a separate panel, to bear on top of the wall panel below it. However, gable panels may be designed as "balloon" framing, whereby it is continuous with the wall below.

Window and Door Openings:

11. Design windows and doors within the center of a 4' panel, equalizing the framing on either side of the rough opening.
12. Windows and doors with rough openings greater than 3'5" must be manufactured as a multi-panel assembly: header, sill, two jacks.



13. Panels will be manufactured precisely, so provide actual rough openings for all windows and doors, interior as well as exterior. Use of a window/door schedule is best. Ensure that any “bucking” desired is included in the rough opening dimensions.
14. The minimum spacing of steel is 3.5”, and is needed on either side of an opening. As a result, small wall segments containing an opening should be at least 7” wider than the rough opening, in order to accommodate the necessary framing.
15. If adequate space is not provided for the necessary framing, such as with linen closets, pantries, etc., a separate header will be provided, and field framing will be necessary for the additional jacks.
16. If large openings are closely adjacent, it may be necessary to design for them to share a large header, with jacks separating the openings.



Electrical:

17. Electrical outlets should not be located beneath windows. Please plan accordingly.
18. Please note that electrical boxes must be fastened to a nearby stud for manufacturing and code compliance which may result in a minor adjustment in spacing.
19. Please specify any non-standard heights for outlets and switches, such as ovens, A/C, or at bathroom or kitchen counters.
20. If using pocket doors, do not place outlets within the necessary spaced needed to frame the pocket of the door.
21. Make sure plans include all needed electrical outlets, j-box, and switches; including exterior lighting, landscape lighting, HVAC and water heaters, etc.
22. Exterior PAT panels have electrical conduit already in them, according to the electrical plan.
23. Interior PAT wall panels are normally already ported at 36" A.F.F. for electrical rough-in.

Plumbing:

24. Try to **avoid** locating plumbing on exterior walls; if possible, otherwise it slows down assembly, and insulation value could be compromised during field modifications.
25. Note any irregularities needed in framing for surrounding fixtures that require plumbing, i.e. specified steel spacing for the fastening of shower enclosures.
26. Plumbing vents and stacks can usually be accommodated within a 3.5" wall. A 5.5" wall section can also be used, if necessary, instead of a double 2x4 wall.
27. Consider if recessed bathroom cabinets will be used, and design accordingly, providing information about placement and size.
28. If dryer does not vent directly through an adjacent exterior wall, a 5.5" thick panel will be required to vent vertically.

Roof/Ceiling:

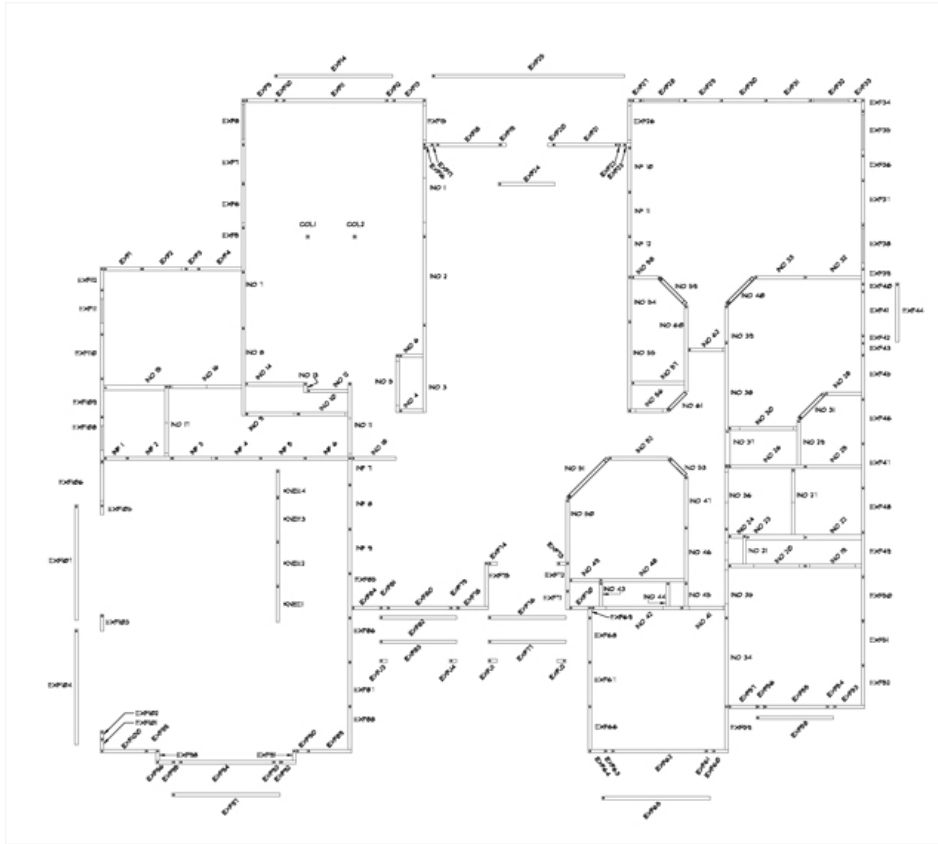
29. Note that additional steel framing can be added in any panel to accommodate for any points and amounts of loads, and should be highlighted in your design.
30. Ceiling product more easily accommodates flat ceilings, but tray ceilings are possible.
31. If using PAT ceiling product, your truss bearing height will be raised in section, either 3.5" or 5.5" depending on the product chosen.
32. Consider if designing gable panels, to note the size and slope required.

Interior Finishes:

33. Conventional finishes may be used just as with conventional framing

Exterior Finishes:

34. Any type of conventional exterior finish may be used on PAT product, just as with conventional framing.
35. Many builders are using a direct-applied cementious finish when a bonding additive is used in the scratch coat.
36. Metal lath or fiberglass mesh is often used to apply cementious finishes, if not over the entire exterior, at least over the metal join straps and any dynamic joints.
BE SURE TO CONSULT A REPUTIBLE FINISHER FOR THEIR EXACT RECOMMENDATIONS.



Technical Specifications

Platinum Technology™ Wall, Ceiling and Roof Products Technical Specifications (and What They Mean in English instead of Techno-speak)

OUTER SURFACE: Uni-Directional Fiberglass Cloth

INNER SURFACE: Uni-Directional Fiberglass Cloth

[These fibers provide shear strength and disperse the force of wind-blown projectiles.]

INSULATION CORE: 3 ½ inches and 5 ½ inches of Polyurethane, 2.2 lbs/ft³ Density, Class 1 Closed Cell Foam.

[Provides superior insulation yet builders are used to these two-by-four and two-by-six dimensions.]

ADHESION: A strong, durable bond exists between the foam core, steel framing and fiberglass skins created in the manufacturing process under heat and pressure.

[Our technology forms an integral wall, ceiling or roof...providing a hurricane-strong home.]

DIMENSIONS AND WEIGHT:

Overall Thickness: 3 ½ inches and 5 ½ inches for Wall and Ceiling/Roof Products, respectively.

[Same as above.]

Thickness Tolerance: 1/16th inch

[No wall, ceiling or roof is ever out of plumb]

Standard Width: 3 feet 11-7/8 inches

[Four feet for discussion purposes...builders are used to four-foot wide plywood, drywall and other materials.

The 1/8th inch provides perfect spacing for wall connections.]

Standard Height: 10 feet [Provides volume ceilings...can be 8 ft, 9 ft...up to 20 ft]

Height Tolerance: 1/16th inch [The walls are uniformly perfect.]

Weight: Varies between wall, ceiling and roof product 2-4 lbs/ft²

[Provides the necessary insulation performance.]

STRUCTURAL PROPERTIES OF FOAM:

(These numbers exceed building codes easily and make it possible for Platinum Technology wall, ceiling and roof products to stand up to high winds, projectiles...whatever Mother Nature throws at them.)

- Compressive Strength: 35 psi.
- Compressive Modulus: 790 psi.
- Tensile Strength: 16 psi.
- Tensile Modulus: 325 psi.
- Shear Strength: 26 psi.
- Shear Modulus: 325 psi.

THERMAL PERFORMANCE:

- Conductivity of Foam: 0.13-0.15 Btu-in/ft²hr°F
 - Minimum R Value: 7 per inch of thickness.
- (Means our products can cut most home heating and cooling bills in half)

MOISTURE:

- Vapor Permeability: 2 perm/in (Water isn't a problem...unlike block or wood.) Absorption: 2.4% (Ditto)
- Solvent Resistance: Excellent (Stands up to abuse.)
- Mold/Mildew Resistance: Excellent (Wood and block are breeding grounds for both.)

FIRE SAFETY:

- Finish Rating: Sheetrock required on inside.
 - Foam Fire Rating: Class 1 (What you need to build in Florida...anywhere.)
 - Smoke Developed: <400 ASTM E-84 (Both smoke and fire tests far exceed building codes.)
- Flame Spread: <25 ASTM E-84

STRUCTURAL INTEGRITY IN FIRE CONDITIONS:

Polyurethane foam is a thermoset plastic and retains its structural integrity until completely consumed by fire. Melting does not occur. (Better than wood and equals block.)

TOXICITY OF COMBUSTION:

The overall toxic potency of the decomposition products released by polyurethane foam under comparable fire conditions was the same as for wood or wool. (As safe as widely used building materials.)



Steel Frame Specifications

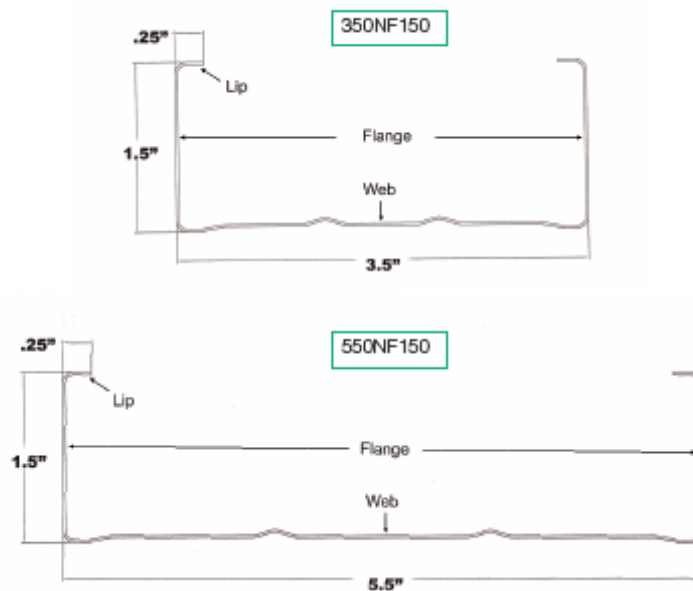
Platinum Advanced Technologies uses NUCONSTEEL™ Framing Members. The load bearing steel framing members are cold-formed C-shapes produced from structural quality steel complying with the requirements of one of the following:

1. ASTM A653 / A653M: SS Grades 33, 37, 40, & 50 (Class 1 and 3); or
2. ASTM A792 / A792M: Grades 33, 37, 40, & 50 (Class 1); or
3. ASTM A875 / A875M: SS Grades 33, 37, 40, & 50 (Class 1 and 3); or
4. ASTM A1003 / A1003M
5. Steels that comply with ASTM A653, except for tensile and elongation requirements, are permitted provided the ratio of tensile strength to yield point is at least 1.08 and the total elongation is at least 10 percent for a two-inch gage length or 7 percent for an eight-inch gage length.

Non load-bearing members (for partition walls) comply with ASTM C-645, or any of the above load bearing members can be used for partitions.

C-Shape Dimensions

Framing members consist of NUCONSTEEL™ C-Shapes with nominal dimensions and properties shown in tables below. The same members are used for studs, joists, blocking and tracks.



Design Load Tables

Under Construction . . . please refer to the NUFRAME Design Manual for structural properties until Tables specific to Platinum product properties are completed.