SIMPSON Strong-Tie®

# ANCHOR TIEDOWN SYSTEM

## For Multi-Story Overturning Restraint

## C-ATS07


*Simpson's Tyrell Gilb Research Laboratory:*
*Where Discovery Meets Development*

SIMPSON
Strong-Tie
®

***Why Simpson?***

> *Pioneer in Lateral Systems Development*
> *History of Research and State-of-the-Art Testing*
> *Innovative Product Design*
> *Field and Technical Support*
> *On-Site Training*
> *Product Availability*

***Why Simpson Anchor Tiedown System?***

> *High Capacity Restraint*
> *Code-Compliance*
> *Reliable, Consistent Performance*
> *Ease of Installation*
> *Design Flexibility for Multistory Applications*
> *Software Support*

## A History of Testing, Innovation and Performance

Since Barclay Simpson made his first connector more than 50 years ago, Simpson Strong-Tie has worked with the engineering and building communities to develop products that have significantly improved the structural integrity of homes and buildings. Our team of engineers and product managers continue to look for new ways to solve everyday issues, and use our lab facilities to develop and test new products.

## Product Innovation

Simpson's commitment to product design and testing has grown and expanded over the years to include a whole-systems approach to building design. Our Anchor Tiedown System (ATS) is among our lateral systems solutions that is specifically designed for light-frame multi-story construction. This system offers a high-capacity restraint that can resist large uplift and overturning forces. With the introduction of ATS, specifiers and engineers have more design flexibility while increasing building performance.

## On-Site Field Support

Our ability to develop new products has a lot to do with the feedback we receive from the field. Our customers often come to us with either a product request or a problem that needs to be solved. Our engineering team is often able to respond and provide the field support needed to keep a project moving. It's these field experiences along with our in-house testing facilities that keep us in the forefront of structural systems technology.

## Unparalleled Testing

Our testing and research capabilities increased significantly when we opened our Tyrell Gilb Research Laboratory in 2003. Our state-of-the-art lab allows us to perform full-scale tests on wall sections so we can measure the performance of our products and simulate real-world conditions, such as seismic ground motion, and uplift and lateral force from high winds.

Recently, our engineers have embarked on three-dimensional testing of full-scale buildings. This testing is helping clarify issues regarding allowable resistances of bracing methods under various load conditions.

We know our customers count on us to provide them with the most accurate test results, code approvals, high load values, ease of installation and design versatility—which is why we continue to invest in testing and product development. Because of this, when our customers see the Simpson Strong-Tie brand they don't just think of us as a manufacturer, but also as a research leader with the products and people they can rely on.

# INTRODUCTION

The Simpson Strong-Tie Company was founded in Oakland, California and has been manufacturing wood-to-wood and wood-to-concrete connectors since 1956. Since then, Simpson Strong-Tie Company Inc. has grown to be the world's largest manufacturer of construction connectors. In recent years the company's growth has included expanding its product offering to include pre-manufactured shearwalls, anchor systems for concrete and masonry and collated fastening systems.

**The Simpson Strong-Tie Company Inc. "NO EQUAL" program includes:**

- Quality products value-engineered for the lowest installed cost at the highest rated performance levels.
- Most thoroughly tested and evaluated products in the industry.
- Strategically-located manufacturing and warehouse facilities.
- National Code Agency listings.
- Largest number of patented connectors in the industry.
- European locations with an international sales team.
- In-house R&D, and tool and die professionals.
- In-house product testing and quality control engineers.
- Member of AITC, ASTM, ASCE, AWPA, ACI, AISC, CSI, ICFA, NBMDA, NLBMDA, SETMA, STAFDA, SREA, NFBA, WTCA and local engineering groups.


## SIMPSON'S QUALITY POLICY

We help people build safer structures economically. We do this by designing, engineering and manufacturing "No Equal" structural connectors and other related products that meet or exceed our customers' needs and expectations. Everyone is responsible for product quality and is committed to ensuring the effectiveness of the Quality Management System.

**Tom Fitzmyers**
*Chief Executive Officer*

**Terry Kingsfather**
*President*

## WE ARE ISO 9001-2000 REGISTERED

*Simpson Strong-Tie is an ISO 9001-2000 registered company. ISO 9001-2000 is an internationally-recognized quality assurance system which lets our domestic and international customers know that they can count on the consistent quality of Simpson Strong-Tie's products and services.*

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# IMPORTANT INFORMATION & GENERAL NOTES

## WARNING

Simpson Strong-Tie Company Inc. structural connectors, anchors, and other products are designed and tested to provide specified design loads. To obtain optimal performance from Simpson Strong-Tie Company Inc. products and achieve maximum allowable design load, the products must be properly installed and used in accordance with the installation instructions and design limits provided by Simpson Strong-Tie Company Inc. To ensure proper installation and use, designers and installers must carefully read the following General Notes, General Instructions For The Installer and General Instructions For The Designer, as well as consult the applicable catalog pages for specific product installation instructions and notes.

Proper product installation requires careful attention to all notes and instructions, including these basic rules:

1. Be familiar with the application and correct use of the connector.
2. Follow all installation instructions provided in the applicable catalog, website, Pocket Installers Guide or any other Simpson publications.
3. Install all required components per installation instructions provided by Simpson Strong-Tie Company Inc.: a) use proper fastener type; b) use proper fastener quantity; c) ensure screws are completely driven.

In addition to following the basic rules provided above as well as all notes, warnings and instructions provided in the catalog, installers, designers, engineers and consumers should consult the Simpson Strong-Tie Company Inc. website at ***www.strongtie.com*** to obtain additional design and installation information, including:

- Information on workshops Simpson conducts at various training centers throughout the country;
- Product specific installation videos;
- Specialty catalogs;
- Code reports;
- Technical fliers and bulletins;
- Master format specifications;
- Material safety data sheets;
- Corrosion information;
- Connector selection guides for engineered wood products *(by manufacturer)*;
- Simpson connector selector software;
- Simpson Autocad menu;
- Simpson Strong-Wall® Selector software;
- Simpson Anchor Tiedown System Selector and anchor related software; and
- Answers to frequently asked questions and technical topics.

Failure to follow fully all of the notes and instructions provided by Simpson Strong-Tie Company Inc. may result in improper installation of products. Improperly installed products may not perform to the specifications set forth in this catalog and may reduce a structure's ability to resist the movement, stress, and loading that occurs from gravity loads as well as impact events such as earthquakes and high velocity winds.

Simpson Strong-Tie Company Inc. does not guarantee the performance or safety of products that are modified, improperly installed or not used in accordance with the design and load limits set forth in this catalog.

## GENERAL NOTES

These general notes are provided to ensure proper installation of Simpson Strong-Tie Company Inc. products and must be followed fully.

a. Simpson Strong-Tie Company Inc. reserves the right to change specifications, designs, and models without notice or liability for such changes.
b. Steel used for each Simpson product is individually selected based on the product's steel specifications, including strength, thickness, formability, finish, and weldability. Contact factory for steel information on specific products.
c. Unless otherwise noted, dimensions are in inches, loads are in pounds.
d. Do Not Overload. Do not exceed catalog allowable loads, which would jeopardize the connection.
e. Wood shrinks and expands as it loses and gains moisture, particularly perpendicular to its grain. Take wood shrinkage into account when designing and installing connections. The effects of wood shrinkage are increased in multiple lumber connections, such as floor-to-floor installations. This may result in the vertical rod nuts becoming loose, requiring tightening.
f. Built-up lumber *(multiple members)* must be fastened together to act as one unit to resist the applied load. This must be determined by the Designer.

## GENERAL INSTRUCTIONS FOR THE INSTALLER

These general instructions for the installer are provided to ensure proper selection and installation of Simpson Strong-Tie Company Inc. products and must be followed carefully. These general instructions are in addition to the specific installation instructions and notes provided for each particular product, all of which should be consulted prior to and during installation of Simpson Strong-Tie Company Inc. products.

a. All specified connectors must be installed according to the instructions in this catalog. Incorrect connection quantity, size, placement, or type may cause the connection to fail.
b. Use the materials specified in the installation instructions. Substitution of or failure to use specified materials may cause the connection to fail.
c. Do not add fastener holes or otherwise modify Simpson Strong-Tie Company Inc. products. The performance of modified products may be substantially weakened. Simpson will not warrant or guarantee the performance of such modified products.
d. Install products in the position specified in the catalog.
e. Do not alter installation procedures from those set forth in this catalog.
f. Some hardened fasteners may have premature failure if exposed to moisture. These fasteners are recommended to be used in dry interior applications.
g. Use proper safety equipment.
h. Welding galvanized steel may produce harmful fumes; follow proper welding procedures and safety precautions. Welding should be in accordance with A.W.S. *(American Welding Society)* standards. Unless otherwise noted Simpson connectors cannot be welded.
i. The installer shall cut Strong-Rod™ or threaded rod to length as required.
j. Shearwall sheathing shall not have vertical joints at any of the specified compression members except at the shearwall perimeter.
k. See page 35 for shearwall edge nailing details.
l. When installing hex nuts or Isolator Nuts on the Strong-Rod, make the nut snug on the bearing plate and tighten an additional ½ turn.

## GENERAL INSTRUCTIONS FOR THE DESIGNER

These general instructions for the designer are provided to ensure proper selection and installation of Simpson Strong-Tie Company Inc. products and must be followed carefully. These general instructions are in addition to the specific design and installation instructions and notes provided for each particular product, all of which should be consulted prior to and during the design process.

a. The term "Designer" used throughout this catalog is intended to mean a qualified licensed professional engineer, or a qualified licensed architect.
b. All connected members and related elements shall be designed by the Designer.
c. All installations should be designed only in accordance with the allowable load values set forth in this catalog.
d. The Designer is responsible for verifying that all design loads do not exceed the allowable loads listed for each component in the restraint system. This includes, but is not limited to, the cumulative tension, incremental bearing, concrete anchorage, and wood framing members. The design of these elements must be performed to the satisfaction of the building official.
e. Anchor Tiedown System (ATS) capacities listed in the catalog tables are provided based on the 9th and 13th edition AISC Allowable Stress Design (ASD). The capacities listed in the CTDS runs are based on the 9th edition ASD.
f. The Designer is responsible for verifying that the building drift is within acceptable limitations and code limitations.
g. Stock run components are designed for 4" nominal wall widths. Alternate ATS components are available that may be more economical. These components are specific to demand loads and/or 6" nominal wall widths. These configurations require the use of the ATS Selector Software. Visit www.strongtie.com to download a free copy.

# IMPORTANT INFORMATION & GENERAL NOTES

## GENERAL INSTRUCTIONS FOR THE DESIGNER (continued)

h. Studs, posts and blocking details shall be specified by the Designer and are not shipped with the Anchor Tiedown System. See tables on pages 35–41 for compression member allowable capacities, design assumptions and general notes.
i. In some cases tension anchorage solutions may be designed and provided by Simpson for ATS based on the rod tensile capacity at the first floor. Alternate anchor bolt solutions may be provided by the Designer. Foundation and reinforcement design shall be specified by the Designer. If anchorage is designed by others, contact Simpson to coordinate connecting components for the 1st level.
j. Simpson strongly recommends the following addition to construction drawings and specifications: "Simpson Strong-Tie® connectors are specifically required to meet the structural calculations of plan. Before substituting another brand, confirm load capacity based on reliable published testing data or calculations. The Designer should evaluate and give written approval for substitution prior to installation."
k. ATS is designed to be installed floor by floor as the structure is built. Installation in this manner, with shearwalls, will provide a lateral force resisting system during construction.
l. The allowable loads published in this catalog are for use when utilizing the traditional Allowable Stress Design methodology. A method for using Load and Resistance Factor Design (LRFD) for wood has been published in AF&PA/ASCE 16.
m. See pages 19–20 for a design example and guide for the Designer.
n. Do not weld products listed in this catalog unless this publication specifically identifies a product as acceptable for welding, or unless specific approval for welding is provided in writing by Simpson. Some steels have poor weldability and a tendency to crack when welded. Cracked steel will not carry load and must be replaced.
o. Refer to adjacent table for applicability of load duration factor and applicable ⅓ steel stress increase.
p. Local and/or regional building codes may require meeting special conditions. Building codes often require special inspection of anchors installed in concrete and masonry. For compliance with these requirements, it is necessary to contact the local and/or regional building authority. Except where mandated by code, Simpson's products do not require special inspection.

**Applicability of Load Duration Factor, ⅓ Steel Stress Increase Table, and Steel Code Reference**

| Code | Load Combination | Cd (Wood) Allowed | ⅓ Stress Increase (Steel) Allowed | AISC Edition |
|---|---|---|---|---|
| ASCE 7-2002<br>ASCE 7-2005 | Basic | Yes | No | 2002–9th Ed.<br>2005–13th Ed. |
| 2000 International Building Code | Basic | Yes | No | 9th Ed. |
| | Alternate | Yes | Yes | |
| 2003/2006 International Building Code | Basic | Yes | No | 2003–9th Ed.<br>2006–13th Ed. |
| | Alternate | Yes | No | |
| 1997 Uniform Building Code | Basic | Yes | No | 9th Ed. |
| | Alternate | Yes | Yes | |
| 2004 Florida Building Code | Basic | Yes | No | 9th Ed. |
| | Alternate | Yes | No | |

## LIMITED WARRANTY

Simpson Strong-Tie Company Inc. warrants catalog products to be free from defects in material or manufacturing. Simpson Strong-Tie Company Inc. products are further warranted for adequacy of design when used in accordance with design limits in this catalog and when properly specified, installed, and maintained. This warranty does not apply to uses not in compliance with specific applications and installations set forth in this catalog, or to non-catalog or modified products, or to deterioration due to environmental conditions.

Simpson Strong-Tie connectors are designed to enable structures to resist the movement, stress, and loading that results from impact events such as earthquakes and high velocity winds. Other Simpson Strong-Tie products are designed to the load capacities and uses listed in this catalog. Properly-installed Simpson Strong-Tie products will perform in accordance with the specifications set forth in the applicable Simpson catalog. Additional performance limitations for specific products may be listed on the applicable catalog pages.

Due to the particular characteristics of potential impact events, the specific design and location of the structure, the building materials used, the quality of construction, and the condition of the soils involved, damage may nonetheless result to a structure and its contents even if the loads resulting from the impact event do not exceed Simpson catalog specifications and Simpson Strong-Tie connectors are properly installed in accordance with applicable building codes.

All warranty obligations of Simpson Strong-Tie Company Inc. shall be limited, at the discretion of Simpson Strong-Tie Company Inc., to repair or replacement of the defective part. These remedies shall constitute Simpson Strong-Tie Company Inc.'s sole obligation and sole remedy of purchaser under this warranty. In no event will Simpson Strong-Tie Company Inc. be responsible for incidental, consequential, or special loss or damage, however caused.

**This warranty is expressly in lieu of all other warranties, expressed or implied, including warranties of merchantability or fitness for a particular purpose, all such other warranties being hereby expressly excluded. This warranty may change periodically – consult our website www.strongtie.com for current information.**

## TERMS & CONDITIONS OF SALE

### PRODUCT USE

Products in this catalog are designed and manufactured for the specific purposes shown, and should not be used with other connectors not approved by a qualified Designer. Modifications to products or changes in installations should only be made by a qualified Designer. The performance of such modified products or altered installations is the sole responsibility of the Designer.

### INDEMNITY

Customers or Designers modifying products or installations, or designing non-catalog products for fabrication by Simpson Strong-Tie Company Inc. shall, regardless of specific instructions to the user, indemnify, defend, and hold harmless Simpson Strong-Tie Company Inc. for any and all claimed loss or damage occasioned in whole or in part by non-catalog or modified products.

### NON-CATALOG AND MODIFIED PRODUCTS

Consult Simpson Strong-Tie Company Inc. for applications for which there is no catalog product, or for connectors for use in hostile environments, with excessive wood shrinkage, or with abnormal loading or erection requirements.

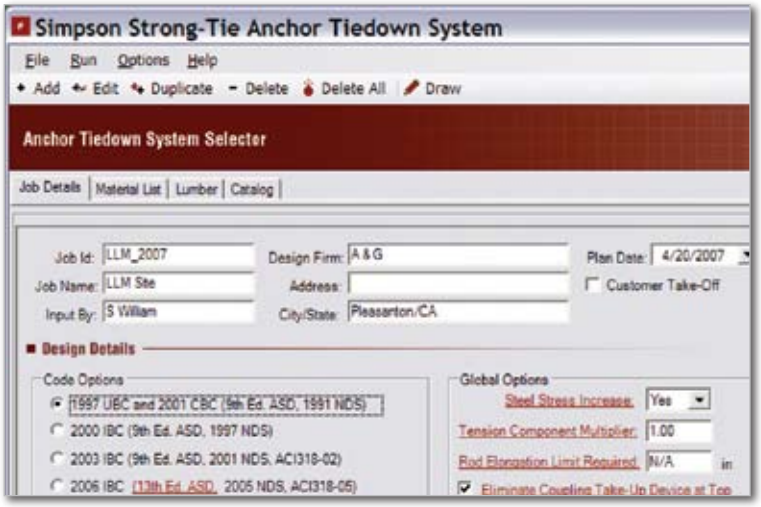
Non-catalog products must be designed by the customer and will be fabricated by Simpson Strong-Tie in accordance with customer specifications.

Simpson Strong-Tie cannot and does not make any representations regarding the suitability of use or load-carrying capacities of non-catalog products. Simpson Strong-Tie provides no warranty, express or implied, on non-catalog products. F.O.B. Shipping Point unless otherwise specified.

# ATS SELECTOR SOFTWARE

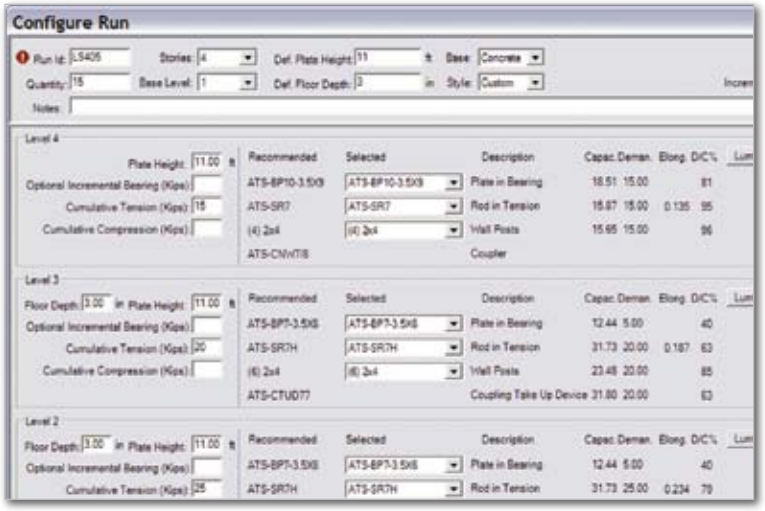
## ATS SELECTOR SOFTWARE – DESIGN MADE EASIER

The new ATS Selector software has been created with enhanced design versatility. The program allows engineers and architects to easily create a standard system design or customize the system to meet the specific needs of a project.




### Easy to use

The easy-to-use input screens make it simple to enter all the pertinent job details like project name and address as well as requirements such as number of stories (up to 6), applicable building code, and demand loads. Choose from three base types: concrete, wood and steel. You can request a solution from our stock runs or customize the solution with the "user-defined" design feature. The helpful errors and warnings feature will point out input errors as well as alert the user to any design issues they need to consider with the application.




### Customizable solutions that save time

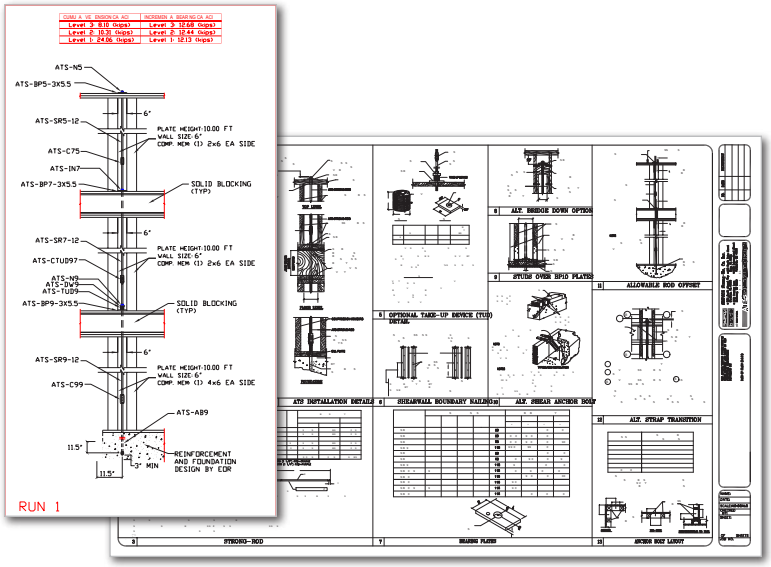
Based upon your inputs, the software recommends an ATS run to meet the requirements of your project. Once a solution is displayed, you can go in and customize it level by level based upon the demand vs. the capacity of the system. You can generate and save multiple runs and the program compiles a complete ATS materials list as well as a compression member lumber list.

### Output the way you like it

Once results are saved, they can be used in several ways:

- Send solutions electronically to others who have the ATS Selector program.
- Export the information into AutoCAD to create run drawings complete with material callouts and standard detail sheets that can be dropped into your own plans.
- Generate a complete job summary including run configurations and calculations as well as an ATS material and lumber list all in PDF format that can be saved, printed or emailed.

***Visit www.strongtie.com to download the ATS Selector software free of charge, or call 800-999-5099 to request the program on CD ROM.***




**Solutions export into AutoCAD so run drawings and standard details can be easily added to existing plans**

# THE NEW ATS

## WHAT YOU CAN EXPECT FROM THE NEW ANCHOR TIEDOWN SYSTEM

The Simpson Strong-Tie® Anchor Tiedown System (ATS) has emerged as an innovative solution for light frame multi-story construction. The continuous rod system extends from the foundation to the top of the structure and is restrained (tied off) at each level to provide the load capacity and overturning resistance that's necessary for multistory buildings—which is especially critical during earthquakes and high wind events.

Simpson launched its ATS product line in 2000. Since that time, the company has gathered feedback from engineers and installers to fine-tune the product design so that loads are higher, and installation is faster and easier.

# THE NEW ATS

## INNOVATIVE TAKE-UP DEVICE

The stacking of multiple stories can create a significant amount of settling within the structure due to shrinkage and construction loading. The ATS's new Coupling Take-Up Device (CTUD) helps resolve this issue. The CTUD is an innovative spring-driven rod coupling device, which contracts to compensate for rod movement caused by settling of the structure.

*Previous Anchor Tiedown System*

*New and Improved Anchor Tiedown System*

## LOWER INSTALLED COSTS, SAVINGS FOR BUILDERS

The new Anchor Tiedown System provides several cost advantages. The new CTUD streamlines installation and cuts labor costs by one-third compared to the previous cage system. The system design also eliminates the need for installers to precisely cut the rod at each floor—now only one precision cut is needed at the top floor. By reducing the number of parts, there are fewer materials to track and distribute, and fewer products lost at the jobsite.

## FEWER PARTS, EASIER INSTALLATION

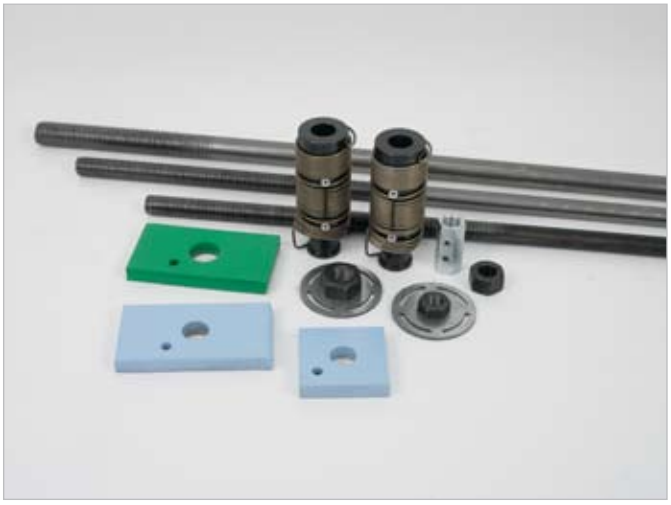
The ATS design has been simplified so there are fewer parts—64% less than the previous design, making the system easier and faster to install. The CTUD combines a coupler nut with a shrinkage take-up device, reducing the number of parts. In addition, the ATS parts are all color-coded and stamped, so it's simple to match system components.

## NEW, IMPROVED SOFTWARE

The new ATS Selector software, available at **www.strongtie.com**, has been created with enhanced design versatility. The program allows engineers and architects to easily create a standard system design or customize the system to meet the specific needs of a project. It also includes CAD drawings, calculations, installation details and elevation drawings to help simplify specification.

**Previous ATS: More Parts to Organize and Install**

**New and Improved ATS: Less Parts for a Simplified Installation**



## HIGHER LOADS, MORE DESIGN FLEXIBILITY

All of these product enhancements have increased ATS's load capacity by as much as 10,000 lbs. With higher loads, the system has a wider range of applications, and designers and engineers have more flexibility in their building design.

## CODE-LISTED, RELIABLE PERFORMANCE

As with all new products, Simpson has gone through the proper testing procedures to meet code requirements. Our CTUD and TUD are code listed per the International Building Code (ICC-ES ESR-2320), City of Los Angeles Building Code (RR 25643).

# SKIPPED FLOORS

## DO ALL FLOORS NEED TO BE TIED OFF?

There are several continuous tiedown systems available that offer solutions to resist the high overturning forces inherent in multi-story light frame structures. Typically these systems fall into one of two categories: those that call for every floor to be tied off and those where floors are skipped.

A skipped floor system restrains two or more floors with a single restraint point to provide overturning resistance. An all floors tied-off system differs in that it establishes overturning restraint at every floor.

Although a skipped floor system and an all floors tied-off system initially appear to be similar, there are some significant differences in load path and performance that could potentially compromise the integrity of a structure. Skipping floors is not recommended, and familiarization with potential issues is strongly encouraged when choosing a tiedown system.

## ISSUES TO CONSIDER WITH SKIPPED FLOOR SYSTEMS:

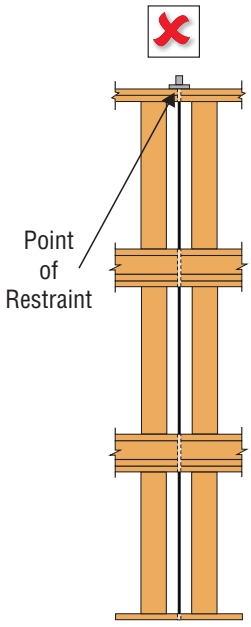
**INCREASE IN COMPONENT SIZES –** In a skipped floor system, the overturning forces transfer up the building until a restraint is reached. As a result, all elements at the restrained point have to resist uplift forces for any non-restrained stories below. This results in increased lumber, threaded rod, and bearing plate sizes. In a tied-off system, the incremental uplift at each level is transferred directly into the tiedown system at that level.

**DRIFT –** A skipped-floors system that is properly designed to resist demand loads may not be sufficient to satisfy drift requirements. Test results indicate that skipping floors has the potential to substantially increase inter-story drift. Even if drift analysis is not required in you area, it is a critical element to multi-story design.

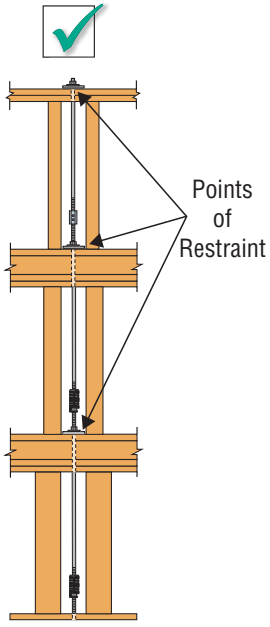
**REDUNDANCY –** Even when appropriately designed, structural elements can perform unexpectedly during major seismic and high wind events. In a skipped floor system, multiple floors rely on a single component for their performance. If that element fails, the entire uplift resistance for all non-restrained floors below may be compromised. However, with an all floors tied-off system, the lower floors do not rely on the stability of the upper floors for their performance.

**SHRINKAGE –** In tiedown systems wood shrinkage creates gaps at the restraint points. When a floor does not have a restraint, this gap will transfer up to the next restraint point, resulting in a larger space between the nut and bearing plate. This additional space will result in increased horizontal drift. In addition, it is recommended that shrinkage is compensated for at every level.

**CONSTRUCTION STABILITY –** A functioning shearwall needs to have holdowns installed to properly perform. A system where all floors are tied off requires no additional shoring or bracing during construction because the structure is restrained at each level once the system is installed. In a skipped-floor system, the designer or builder may want to consider requiring a temporary bracing method during construction until the skipped floor system is completely installed. This temporary bracing can help prevent collapse or any damage that might occur during a seismic or wind event. In a tied-off system, all holdowns are installed as the structure is built ensuring that the shearwalls will perform as designed if an event occurs during construction.




**SKIPPED FLOOR SYSTEM:**
A single point of restraint for multiple levels




**ALL FLOORS TIED-OFF SYSTEM:**
Overturning restraint provided at each level

***To learn more about skipped floor vs. tied-off systems and Simpson's ATS testing, visit www.strongtie.com/skip.***

# ROD SPECIFICATIONS AND CONTINUOUS TIEDOWN SYSTEMS

As a vital part of any continuous rod tiedown system, it is critical that the rod material have the appropriate performance characteristics. The Strong-Rod™ within the ATS system is made from rod materials chosen from the approved list in section A3 of AISC 360 (Specification for Structural Steel Buildings). This specification was developed as a consensus document to provide uniform design criteria for steel construction. Staying within the AISC specification provides a history of successful usage, advances in the state of knowledge, and changes in design practice.

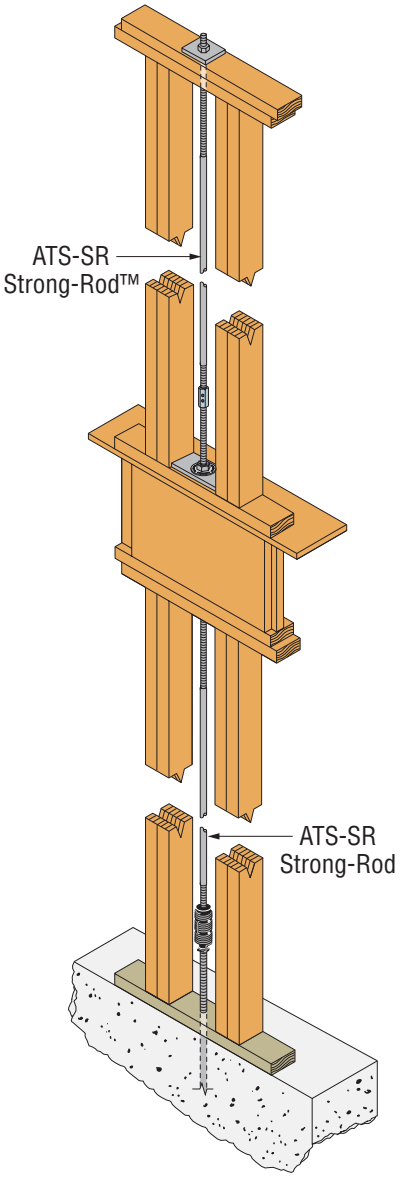
In addition to strength, ductility is an important consideration when evaluating rods in continuous tiedown systems. AISC does not establish minimum elongation requirements for ductility, however the lowest elongation of any rod material on the approved list is 14%.

### STRONG-ROD AND THE NEW ATS

There are three grades of Strong-Rod material, each one chosen based upon its performance characteristics (See page 13 for details). To eliminate confusion and ensure that the right material is used on the job, the model number and steel grade is etched on every Strong-Rod. Strong-Rod is the only rod available that is etched in this manner for easy identification, and is only available with the ATS system.

### NOT ALL RODS ARE CREATED EQUAL

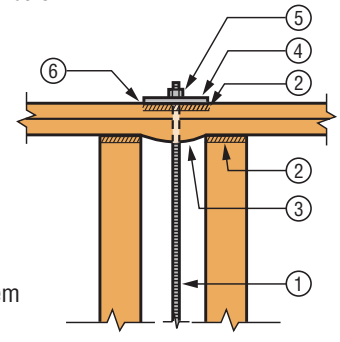
When evaluating continuous tiedown systems it is important to be aware that, in an effort to cut costs, some systems may allow rods to be used that are not approved in the AISC specification. When non-approved materials are proposed, the Designer should consider not only the material strength, but also elongation characteristics to truly provide an equivalent substitution to materials listed by AISC.



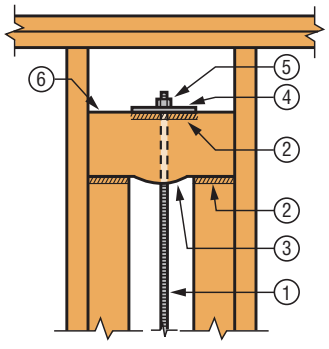

**Typical Strong-Rod Installation**

## SOURCES OF DEFLECTION IN CONTINUOUS TIEDOWN SYSTEMS AT ROD TERMINATION

1. Rod elongation occurs between floor restraints.
2. Wood crushing occurs at the points where the bearing plate bears onto the wood plates, and where the wood plates bear onto the compression members.
3. Wood bending occurs between the compression members. The deflection increases as the distance between the supports is increased.
4. Bending of the steel plate.
5. Movement can occur when the nuts are not correctly tightened.
6. Wood shrinkage can occur, creating a space between the steel plate and the nut. Shrinkage may be significantly increased when the system terminates at a bridge block rather than double top plates.
7. Rod elongation, wood bending, steel plate bending, nut movement, and wood shrinkage will occur at floor levels also, and should be considered.




**Top Plate**




**Bridge Block**

# CTUD *Coupling Take-Up Device*

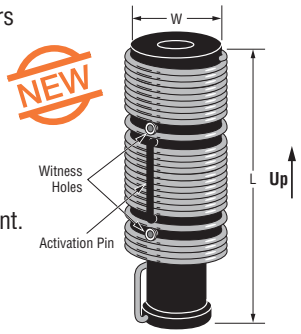
The CTUD is a combination coupler nut and take-up device. It compensates for the slack that develops in the system due to the shrinkage of wood members and settlement caused by dead load and construction loading. It will accommodate up to 1" of movement and is available in standard and reducing sizes for ⅝", ⅞" and 1⅛" diameter Strong-Rod™ or threaded rod.

- Design of the CTUD eliminates parts and simplifies installation.
- Easy installation saves time, resulting in a lower installed cost.
- Witness Holes™ allow for easy inspection to verify proper thread engagement.
- The positive stop at each end ensures that the rod is threaded to the proper depth.

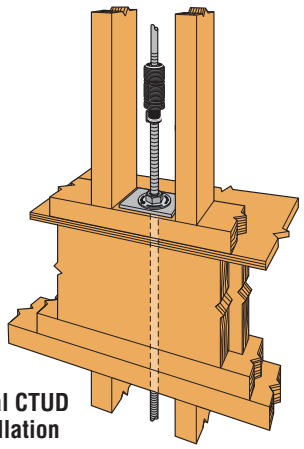
**Codes:** ICC-ES ESR-2320; City of L.A. RR-25643

**Installation:**

- Thread the specified CTUD (wider end up) onto the embedded anchor (in first floor applications) or the Strong-Rod from the level below. Position so that the activation pin faces out for easy access.
- Thread the Strong-Rod from the level above into the CTUD. The CTUD is correctly installed when the anchor or threaded rod is visible through both witness holes.
- Secure Strong-Rod at the level above with specified bearing plate and Isolator Nut. Attach Isolator Nut to sill plate above with #8 x 3" screw (included). Continue system installation at each level until the run is complete.
- Remove activation pin after level above is secured with Isolator Nut and prior to covering. IMPORTANT: DO NOT REMOVE THE ACTIVATION PIN UNTIL THE ISOLATOR NUT IS INSTALLED AT THE LEVEL ABOVE.




**CTUD**
**Patent Pending**



**Typical CTUD Installation**

| Model No. | Threaded Rod Dia. (in) | W (in) | L (in) | Allowable Tension Capacity (lbs) | Component Color Code |
|---|---|---|---|---|---|
| CTUD55 | ⅝ - ⅝ | 1⅞ | 5 | 15,520 | Blue |
| CTUD75 | ⅞ - ⅝ | 2 | 5½ | 31,795 | Green/ Blue |
| CTUD77 | ⅞ - ⅞ | 2 | 5½ | 31,795 | Green |
| CTUD97 | 1⅛ - ⅞ | 2½ | 6⅛ | 55,955 | Orange/Green |
| CTUD99 | 1⅛ - 1⅛ | 2½ | 6⅛ | 55,955 | Orange |

1. Allowable tension capacities are for CTUD only.
2. No further steel stress increase allowed.
3. Thread specification for threaded rod must be UNC class 2A per ANSI/ASME B1.1.

**Naming Scheme:**

**CTUD97**

- **Coupling Take-Up Device**
- **Strong-Rod™ Diameter from Level Above***
- **Strong-Rod Diameter from Level Below***

*** Units in ⅛" Increments (Ex: 9 = ⅝" or 1⅛")**

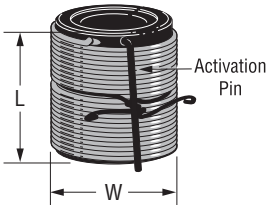
# TUD *Take-Up Device*

In some cases, the TUD and CTUD can be combined within a run to substitute a TUD for a CTUD. Call Simpson for details. The TUD is suitable for rod diameters up to 1¼".

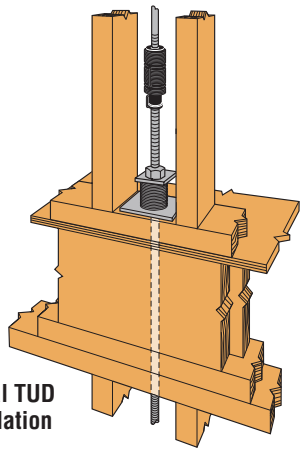
**Codes:** ICC-ES ESR-2320; City of L.A. RR-25643

**Installation:**

- Install the specified bearing plate over the Strong-Rod onto the bottom plate of the wall.
- Remove vertical plastic retaining strip and/or wires from TUD. DO NOT REMOVE ACTIVATION PIN UNTIL NUT IS INSTALLED.
- Install TUD with either end up over Strong-Rod and onto the bearing plate with the activation pin facing out.
- Install specified plate washer and then nut on top.
- Finger-tighten nut plus an additional ⅓ to ½ turn with a wrench.
- Remove tie wire and activation pin.




**TUD**



**Typical TUD Installation**

| Model No. | Maximum Threaded Rod Dia. (in) | W (in) | L (in) | Allowable Compression Capacity (lbs.) |
|---|---|---|---|---|
| TUD9 | 1⅛ | 2⅛ | 2¼ | 34,655 |
| TUD10 | 1¼ | 2⅜ | 2¼ | 45,400 |

1. Allowable capacities are for the TUD only.
2. No further steel stress increase is allowed.

**Naming Scheme:**

**TUD9**

- **Take-Up Device**
- **Maximum Rod Clearance in ⅛" Increments (Ex: 9 = ⅝" or 1⅛")**

# STRONG-ROD™

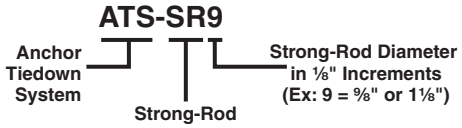
Strong-Rod™ threaded rods are the tension transfer element within the ATS system. Strong-Rods are threaded on both ends, with the top end having 48" of thread to allow for installation flexibility. Information clearly etched on the shank allows easy identification in the field.

The Strong-Rod XL is designed for applications where minimum rod elongation is critical. While the threaded ends are 1⅛" in diameter, the body of the rod is 1¾" to limit rod elongation under load.

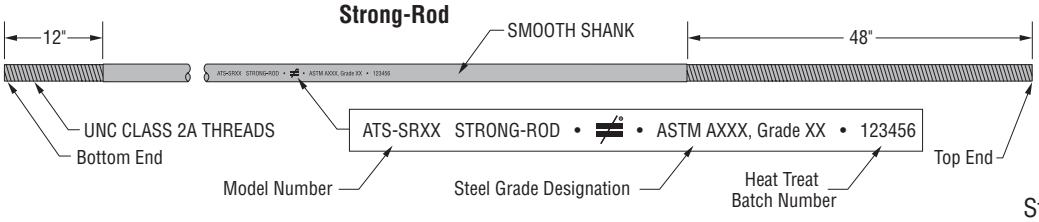
**Material:** Standard (Model SR_) – ASTM A307, Grade A
High strength (Model SR_H) – ASTM A449 or ASTM A193, Grade B7
Higher strength (Model SR_H150) – ASTM A434, Class BD or ASTM A354, Class BD

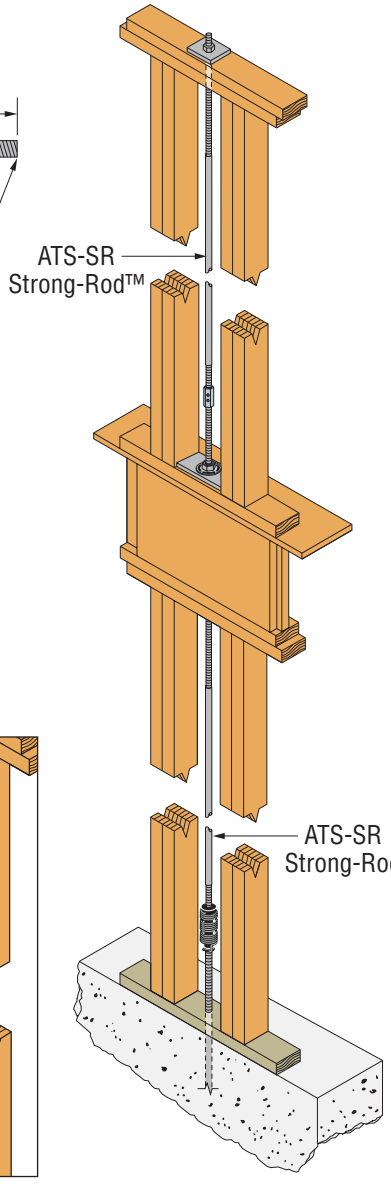
**Finish:** None

**Naming Scheme:**




**Strong-Rod**

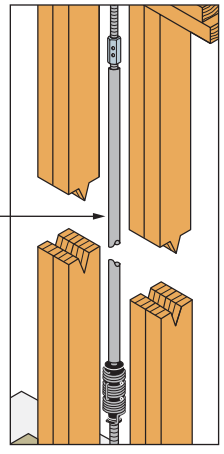



## Strong-Rod Technical Data

| Model No. | Diameter (in) | Allowable Tensile Capacity | | | Component Color Code |
|---|---|---|---|---|---|
| | | AISC 9th Ed. | | AISC 13th Ed. | |
| | | (100) | (133) | (100) | |
| ATS-SR5[1] | ⅝ | 6,075 | 8,100 | 6,340 | Blue |
| ATS-SR7[1] | ⅞ | 11,905 | 15,875 | 12,815 | Green |
| ATS-SR9[1] | 1⅛ | 19,680 | 26,240 | 21,205 | Orange |
| ATS-SR5H[2] | ⅝ | 12,150 | 16,200 | 13,570 | Blue |
| ATS-SR7H[2] | ⅞ | 23,810 | 31,745 | 27,060 | Green |
| ATS-SR9H[2] | 1⅛ | 39,365 | 52,485 | 44,730 | Orange |
| ATS-SR9H150[3] | 1⅛ | 49,205 | 65,605 | 55,915 | Orange |
| ATS-SR10H150[3] | 1¼ | 60,745 | 80,995 | 69,030 | Purple |

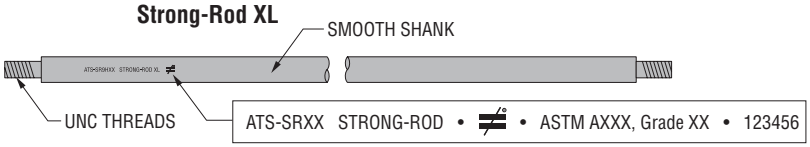
1. Standard Simpson Strong-Rod is based on minimum $F_u$ = 60,000 psi and $F_y$ = 43,000 psi.
2. High strength Simpson Strong-Rod is based on minimum $F_u$ = 120,000 psi and $F_y$ = 92,000 psi.
3. H150 Simpson Strong-Rod is based on minimum $F_u$ = 150,000 psi and $F_y$ = 130,000 psi.
4. Refer to page 6 for applicability of ⅓ steel stress increase.
5. No increase permitted on AISC 13th Edition values.




**Strong-Rod XL Installation**

**Strong-Rod Installation**

**Strong-Rod XL**

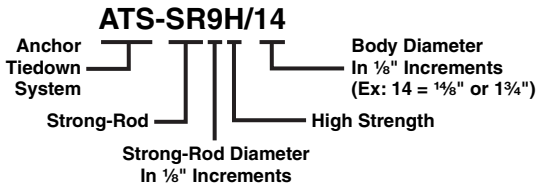



## Strong-Rod XL Technical Data

| Model No. | Thread Dia. (in) | Rod Dia. (in) | Allowable Tensile Capacity | | | Component Color Code |
|---|---|---|---|---|---|---|
| | | | AISC 9th Ed. | | AISC 13th Ed. | |
| | | | (100) | (133) | (100) | |
| ATS-SR9H/14[1] | 1⅛ | 1¾ | 39,365 | 52,485 | 44,730 | Orange |
| ATS-SR9H150/14[2] | 1⅛ | 1¾ | 49,205 | 65,605 | 55,915 | Orange |

1. High strength Simpson Strong-Rod is based on minimum Fu = 120,000 psi and $F_y$ = 92,000 psi.
2. H150 Simpson Strong-Rod is based on minimum $F_u$ = 150,000 psi and $F_y$ = 130,000 psi.
3. Refer to page 6 for applicability of ⅓ steel stress increase.
4. No increase permitted on AISC 13th Edition values.

**Naming Scheme:**



# ISOLATOR NUT

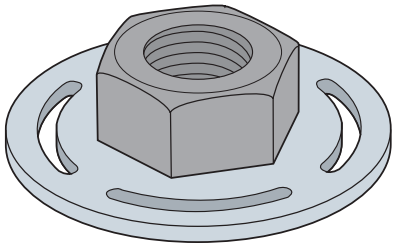
Isolator Nuts isolate the rod movement, caused by setttling of the structure, to each level within the ATS system. This segmenting of the movement ensures consistent performance. The Isolator Nut consists of a heavy hex nut connected to a slotted washer, and is fastened with one screw driven through the slotted washer and bearing plate into the bottom plate. Isolator Nuts are required on the bottom plate of the floor(s) above a level where a CTUD is used.

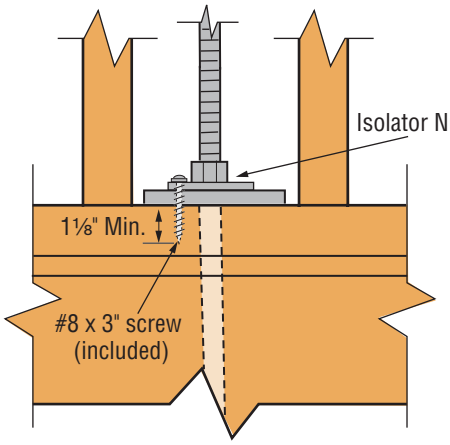
**Finish:** Nut – none; Washer – Zinc plated

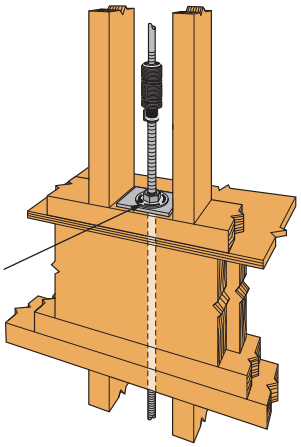
**Installation:**

- Thread the Isolator Nut onto the Strong-Rod™ from the level below until it is snug with the bearing plate, and tighten an additional ½ turn.
- Align one of the slots in the washer with the smaller hole in the bearing plate so that a screw can pass through both.
- Drive #8 x 3" screw (provided) through the washer and bearing plate into the bottom plate. A minimum of 1⅛" of penetration into the bottom plate is required.

| Model No. | Threaded Rod Diameter (in) | Fastener to Bottom Plate (provided) | Washer O.D. (in) |
|---|---|---|---|
| ATS-IN5KT | ⅝ | (1) #8 x 3" screw | 3.125 |
| ATS-IN7KT | ⅞ | (1) #8 x 3" screw | 3.125 |
| ATS-IN9KT | 1⅛ | (1) #8 x 3" screw | 3.125 |





**Isolator Nut Installation**

# COUPLER NUTS

CNW and ATS-C coupling nuts are used to connect Strong-Rods and connect to anchor bolts within the ATS system.

CNWs and ATS-C coupling nuts exceed the tensile capacity of the corresponding standard ASTM A307 Strong-Rod. ATS-HSC coupling nuts exceed the tension capacity of the corresponding high strength ASTM A449 and A193 Grade B7 Strong-Rod. ATS-HSSC coupling nuts exceed the tension capacity of the corresponding higher strength (H150) Strong-Rod.

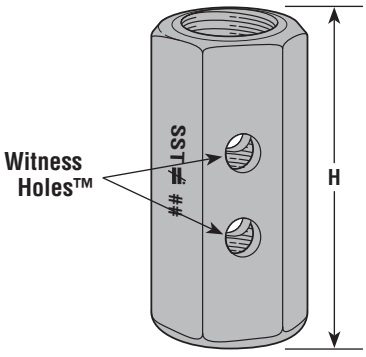
**Finish:** Zinc Plated

**Installation:**

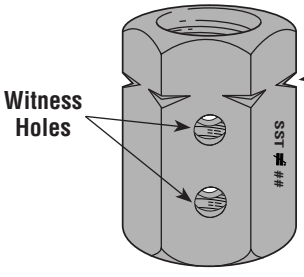
- Tighten the two rods until each all-thread rod can be fully seen in the witness hole.

| Model No. | Rod Diameter (in) | H (in) |
|---|---|---|
| CNW⅝ or ATS-C55 | ⅝ | 1½ |
| CNW⅞ or ATS-C77 | ⅞ | 2 |
| ATS-C75 | ⅞ - ⅝ | 2 |
| ATS-C97 | 1⅛ - ⅞ | 3 |
| ATS-C99 | 1⅛ | 3 |
| ATS-HSC55 | ⅝ | 2⅛ |
| ATS-HSC75 | ⅞ - ⅝ | 2 |
| ATS-HSC77 | ⅞ | 2½ |
| ATS-HSC97 | 1⅛ - ⅞ | 3 |
| ATS-HSC99 | 1⅛ | 3 |
| ATS-HSSC1010 | 1¼ | 3 |

**Additional coupler nuts including oversized (OST) couplers for galvanized anchor bolts are available. Contact Simpson for details.**




**CNW or ATS-C**



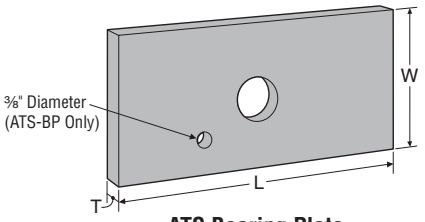

**High Strength Coupler ATS-HSC (ATS-HSSC similar)**

# BEARING PLATES

Bearing plates are used to tie down individual levels within the system. They resist incremental bearing loads by spreading forces to minimize crushing of the wood when the system is loaded. DW plates are used when TUDs or weldable cages are specified.

**Material:** ASTM A36

**Finish:** BP – Powder Coated
DW – Zinc Plated




**ATS Bearing Plate**

| Model No. | W (in) | L (in.) | T (in) | Hole Diameter (in) | Component Color Code | Allowable Bearing Capacity | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | DF-L | SP | HF | SPF |
| ATS-DW5 | 3 | 2⅞ | ¾ | 11/16 | Blue | – | – | – | – |
| ATS-DW7 | 3 | 2⅞ | ¾ | 15/16 | Green | – | – | – | – |
| ATS-DW9 | 3 | 2⅞ | ¾ | 1 3/16 | Orange | – | – | – | – |
| ATS-DW10 | 3 | 2⅞ | ¾ | 1 5/16 | Purple | – | – | – | – |
| ATS-BP5-3X3.5 | 3 | 3½ | ⅜ | 11/16 | Blue | 6,775 | 6,125 | 4,390 | 4,605 |
| ATS-BP5-3X5.5 | 3 | 5½ | ⅝ | 11/16 | Blue | 10,540 | 9,530 | 6,830 | 7,165 |
| ATS-BP5-5X5.5 | 5 | 5½ | ¾ | 11/16 | Blue | 17,885 | 16,165 | 11,590 | 12,160 |
| ATS-BP7-3X5.5 | 3 | 5½ | ⅝ | 15/16 | Green | 10,280 | 9,290 | 6,660 | 6,990 |
| ATS-BP7-5X5.5 | 5 | 5½ | ⅝ | 15/16 | Green | 17,620 | 15,930 | 11,420 | 11,985 |
| ATS-BP9-3X5.5 | 3 | 5½ | ⅝ | 1 3/16 | Orange | 9,950 | 8,995 | 6,450 | 6,765 |
| ATS-BP9-5X5.5 | 5 | 5½ | ⅝ | 1 3/16 | Orange | 17,295 | 15,635 | 11,205 | 11,760 |
| ATS-BP10-3X9 | 3 | 9 | 1 | 1 5/16 | Purple | 15,700 | 14,195 | 10,175 | 10,675 |
| ATS-BP10-3X12 | 3 | 12 | 1½ | 1 5/16 | Purple | 21,325 | 19,280 | 13,820 | 14,500 |
| ATS-BP10-3X15 | 3 | 15 | 1¾ | 1 5/16 | Purple | 26,950 | 24,365 | 17,465 | 18,325 |
| ATS-BP10-5X9 | 5 | 9 | 1 | 1 5/16 | Purple | 26,950 | 24,365 | 17,465 | 18,325 |
| ATS-BP10-5X12 | 5 | 12 | 1½ | 1 5/16 | Purple | 36,325 | 32,840 | 23,540 | 24,700 |

1. Bearing area factor, Cb, included in listed capacities.
2. Bearing plate thicknesses are such that allowable capacity is not limited by plate bending.
3. When ATS-BP hole diameter is too large for rod diameter, and Isolator Nut is not used, a DW plate may be used as a washer.

# WELDABLE CAGE

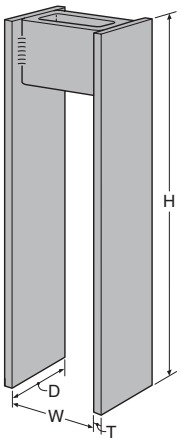
The ATS Weldable Cage is for use on projects where the run is to be anchored to steel beams. Beam design is the responsibility of the Designer.

**Material:** Side Plates - ASTM A36; Tube - ASTM A500, Grade B

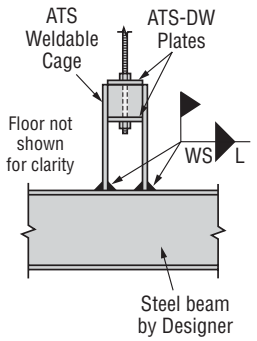
**Finish:** Gray Paint

| Model No. | T Thickness (in) | D Depth (in) | H Height (in) | W Width (in) | WS Min. Weld Size (in) | L Min. Weld Length (in) | Allowable Tensile Capacity | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | AISC 9th Ed. | | AISC 13th Ed. |
| | | | | | | | 100 | 133 | (100) |
| ATS-1/2-2B | 3/16 | 2 | 16 | 3 | 3/16 | 1½ | 16,200 | 21,600 | 16,200 |
| ATS-1/2-2D | ¼ | 3 | 16 | 3 | ¼ | 2¼ | 32,400 | 43,200 | 32,400 |
| ATS-1/2-2E | ⅜ | 3 | 16 | 3 | 5/16 | 2¾ | 48,600 | 64,800 | 48,600 |

1. ATS-1/2 cages are fabricated from A36 material, with $F_u$ = 58,000 psi.
2. 1" maximum rod diameter for ATS-1/2-2B.
3. 1¼" maximum rod diameter for ATS-1/2-2D and ATS-1/2-2E cages.
4. Minimum weld size and length listed are required to develop weldable cage tensile capacities – use E70XX electrodes.
5. No increase permitted on AISC 13th Edition values.




**Weldable Cage**



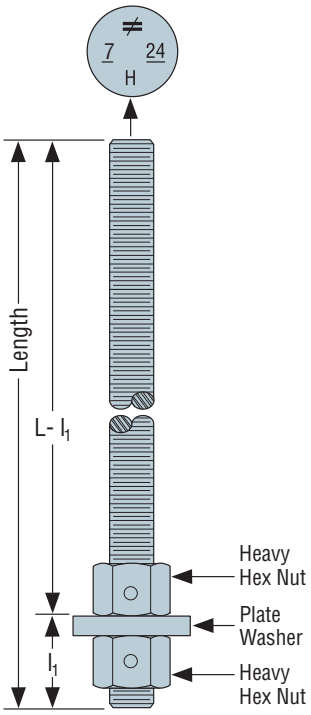

**Steel Beam Detail**

# ANCHOR BOLTS

ATS-AB anchor bolts are pre-assembled anchor bolts that have been designed for use with the ATS system. They are available in 18", 24" and 36" lengths and match the strength and material grade of the corresponding Strong-Rod connecting rods. The heavy hex nuts are pressed onto the bolt to keep them in place.

**Material:** Standard (Model AB_) – ASTM A307, Grade A
High strength (Model AB_H) – ASTM A449 or ASTM A193, Grade B7
Higher strength (Model AB_H150) – ASTM A434, Class BD or ASTM A354, Class BD

**Finish:** None




**ATS-AB Anchor Bolt**

**Naming Scheme:**

**ATS-AB5Hx24**

- ATS Anchor Bolt
- Diameter and Grade
- Length

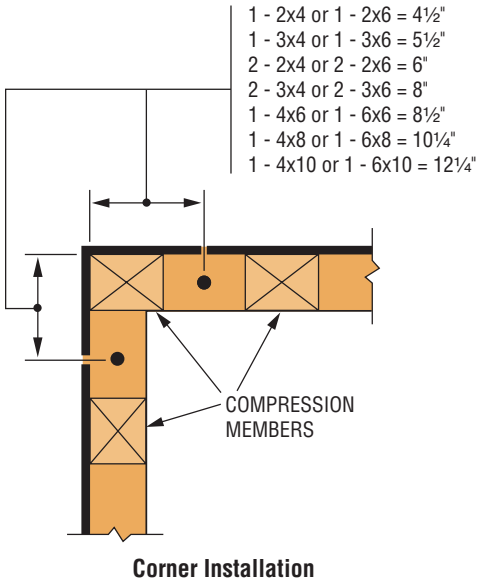
*** Units in ⅛" Increments (Ex: 9 = ⅝" or 1⅛")**

| Anchor Bolt Model No. | Bolt Diameter (in) | Plate Washer Size (in) | $l_1$ (in) | Component Color Code |
|---|---|---|---|---|
| ATS-AB5 | ⅝ | ⅜ x 1½ x 1½ | 1¼ | Blue |
| ATS-AB7 | ⅞ | ⅜ x 2¼ x 2¼ | 1½ | Green |
| ATS-AB9 | 1⅛ | ⅜ x 2¾ x 2¾ | 1¾ | Orange |
| ATS-AB5H | ⅝ | ⅜ x 1½ x 1½ | 1¼ | Blue |
| ATS-AB7H | ⅞ | ⅜ x 2¼ x 2¼ | 1½ | Green |
| ATS-AB9H | 1⅛ | ⅜ x 2¾ x 2¾ | 1¾ | Orange |
| ATS-AB9H150 | 1⅛ | ½ x 3 x 3 | 1⅞ | Orange |
| ATS-AB10H150 | 1¼ | 1 x 3½ x 3½ | 2½ | Purple |

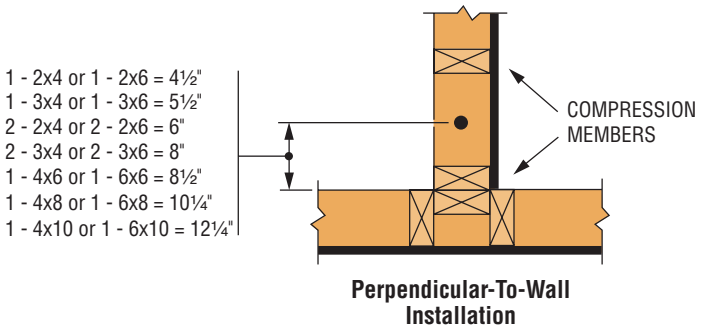
1. Anchor rods are available in 18", 24" and 36" lengths.
2. Standard Anchor bolts are based on minimum $F_u$ = 60,000 psi and $F_y$ = 43,000 psi.
3. High strength anchor bolts are based on minimum $F_u$ = 120,000 psi and $F_y$ = 92,000 psi.
4. H150 anchor bolts are based on minimum $F_u$ = 150,000 psi and $F_y$ = 130,000 psi.

## ANCHOR BOLT LOCATIONS

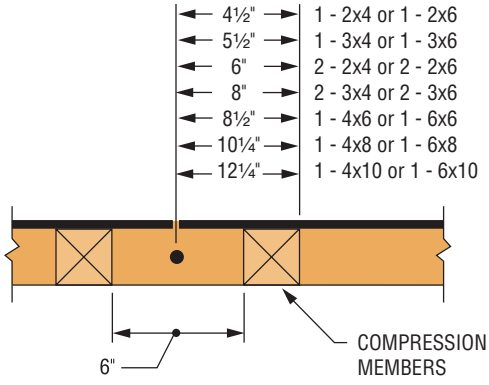
Anchor bolts shall be specified by the Designer.




**Corner Installation**




**Perpendicular-To-Wall Installation**

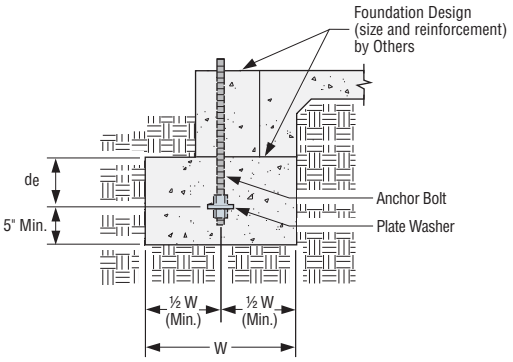



**Mid-Wall Installation**

# ANCHOR BOLTS

## Wind and Seismic Design 97 UBC with Supplementary Reinforcing

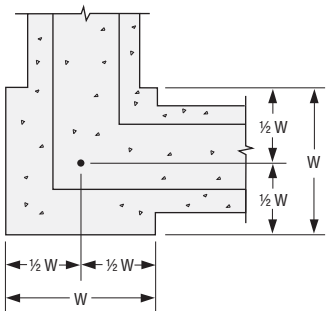
| Anchor Rod Model No. | $f'_c$ = 2500 | | $f'_c$ = 3000 | | $f'_c$ = 4500 | |
|---|---|---|---|---|---|---|
| | de | W | de | W | de | W |
| ATS-AB5 | 5.5 | 11 | 4.5 | 9 | 4 | 8 |
| ATS-AB7 | 8 | 16 | 6 | 12 | 5 | 10 |
| ATS-AB9 | 10 | 20 | 7.5 | 15 | 6.5 | 13 |
| ATS-AB5H | 8.5 | 17 | 6.5 | 13 | 5.5 | 11 |
| ATS-AB7H | 11.5 | 23 | 8.5 | 17 | 7.5 | 15 |
| ATS-AB9H | 14.5 | 29 | 11 | 22 | 10 | 20 |
| ATS-AB9H150 | 16.5 | 33 | 12.5 | 25 | 11 | 22 |
| ATS-AB10H150 | 18 | 36 | 13.5 | 27 | 12 | 24 |




**Section View**

## Wind and Seismic Design 97 UBC without Supplementary Reinforcing

| Anchor Rod Model No. | $f'_c$ = 2500 | | $f'_c$ = 3000 | | $f'_c$ = 4500 | |
|---|---|---|---|---|---|---|
| | de | W | de | W | de | W |
| ATS-AB5 | 6.5 | 13 | 5 | 10 | 4.5 | 9 |
| ATS-AB7 | 9 | 18 | 7 | 14 | 6 | 12 |
| ATS-AB9 | 11.5 | 23 | 8.5 | 17 | 8 | 16 |
| ATS-AB5H | 9.5 | 19 | 7.5 | 15 | 6.5 | 13 |
| ATS-AB7H | 13 | 26 | 10 | 20 | 9 | 18 |
| ATS-AB9H | 17 | 34 | 13 | 26 | 11.5 | 23 |
| ATS-AB9H150 | 19 | 38 | 14.5 | 29 | 13 | 26 |
| ATS-AB10H150 | 21 | 42 | 16 | 32 | 14 | 28 |




**Plan View**

## Seismic Design All IBC Codes

| Anchor Rod Model No. | $f'_c$ = 2500 | | $f'_c$ = 3000 | | $f'_c$ = 4500 | |
|---|---|---|---|---|---|---|
| | de | W | de | W | de | W |
| ATS-AB5 | 6.5 | 19.5 | 6.5 | 19.5 | 5.5 | 16.5 |
| ATS-AB7 | 10.5 | 31.5 | 10 | 30 | 8.5 | 25.5 |
| ATS-AB9 | 14 | 42 | 13.5 | 40.5 | 12 | 36 |
| ATS-AB5H | 10.5 | 31.5 | 10 | 30 | 8.5 | 25.5 |
| ATS-AB7H | 16 | 48 | 15 | 45 | 13.5 | 40.5 |
| ATS-AB9H | 21 | 63 | 20 | 60 | 18 | 54 |
| ATS-AB9H150 | 24 | 72 | 23 | 69 | 20.5 | 61.5 |
| ATS-AB10H150 | 27.5 | 82.5 | 26 | 78 | 23 | 69 |

## Wind Design All IBC Codes

| Anchor Rod Model No. | $f'_c$ = 2500 | | $f'_c$ = 3000 | | $f'_c$ = 4500 | |
|---|---|---|---|---|---|---|
| | de | W | de | W | de | W |
| ATS-AB5 | 5.5 | 16.5 | 5.5 | 16.5 | 4.5 | 13.5 |
| ATS-AB7 | 8.5 | 25.5 | 8 | 24 | 7 | 21 |
| ATS-AB9 | 12 | 36 | 11 | 33 | 10 | 30 |
| ATS-AB5H | 8.5 | 25.5 | 8 | 24 | 7 | 21 |
| ATS-AB7H | 13.5 | 40.5 | 12.5 | 37.5 | 11 | 33 |
| ATS-AB9H | 18 | 54 | 17 | 51 | 15 | 45 |
| ATS-AB9H150 | 20.5 | 61.5 | 19.5 | 58.5 | 17 | 51 |
| ATS-AB10H150 | 23 | 69 | 22 | 66 | 19.5 | 58.5 |

1. IBC calculations are based on ACI 318, Appendix D
2. For UBC and IBC wind design, embedment de, is based on the design strength of the anchor per AISC. Embedment and edge distances are calculated in order to attain a ductile steel failure mode.
3. For IBC seismic design, concrete strength is reduced by a factor of 0.75 per ACI 318, Section D.3.3.3. Steel strength is based on AISC calculations and does not include an 0.75 reduction factor. Embedment and edge distances meet the ductile requirements of ACI 318, Section D.3.3.4.
4. For UBC design anchor design for 2500 psi minimum concrete assumes no special inspection and a multiplier of 2.0 on the concrete per section 1923.3.2. For 3000 psi and 4500 psi concrete, special inspection is assumed and a multiplier of 1.3 is applied.
5. Plate washers have been designed for plate bending.
6. Alternate anchor bolt solutions may be provided by the Designer.
7. Foundation dimensions are for anchorage only. The Designer is responsible for the foundation size and reinforcement for all load conditions.

# ALTERNATE TOP STORY INSTALLATION

Reduce the number of floors in the CTDS run by using straps at the top story.

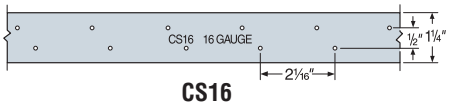
**Codes:** ICC-ES ER 5672, ICC-ES ER 4935; LA RR 25293 (CMST12 & CMST14); Florida FL 1901

See most recent *Wood Construction Connectors* catalog for additional information and requirements.

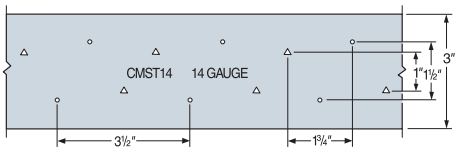
### Alternate Top Story Strap Installation

| Strap Model No. | Ga. | Width (in) | DF/SP | | | SPF/HF | | | Minimum Stud Required | Allowable Tension Loads | | Nail Spacing O.C. (in a row) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | End Length (in) | Cut Length or Actual Length | Total Number of Fasteners per Strap | End Length (in) | Cut Length or Actual Length | Total Number of Fasteners per Strap | | (133) | (160) | |
| 2-CS16 | 16 | 1 1/4 | 14 | Clear Span + 28" | 26-8d | 17 | Clear Span + 34" | 30-8d | 2x | 3410 | 3410 | 2 1/16" |
| | | | 12 | Clear Span + 24" | 22-10d | 15 | Clear Span + 30" | 26-10d | | 3410 | 3410 | |
| 2-MSTC40 | 16 | 3 | 11 1/8" | Length = 40 1/4" | 28-16d sinkers | — | Length = 40 1/4" | — | 2-2x | 4670 | 5600 | 1½" |
| | | | 12 1/8" | | 36-16d sinkers | — | | — | | 6000 | 7200 | |
| | | | — | | — | 11 1/8" | | 28-16d sinkers | | 4030 | 4840 | |
| | | | — | | — | 12 1/8" | | 36-16d sinkers | | 5180 | 6220 | |
| 2-MSTC52 | 16 | 3 | 17 1/8" | Length = 52 1/4" | 44-16 sinkers | — | Length = 52 1/4" | — | 2-2x | 7330 | 8800 | 1½" |
| | | | 18 1/8" | | 48-16 sinkers | — | | — | | 8000 | 9170 | |
| | | | — | | — | 17 1/8" | | 44-16 sinkers | | 6340 | 7600 | |
| | | | — | | — | 18 1/8" | | 48-16 sinkers | | 6910 | 8290 | |
| 2-CMSTC16 | 16 | 3 | 23 | Clear Span + 46" | 56-16d sinkers | 27 | Clear Span + 54" | 66-16d sinkers | 2-2x | 9170 | 9170 | 1½" |
| | | | 45 | Clear Span + 90" | 56-16d sinkers | 52 | Clear Span + 104" | 66-16d sinkers | | 9170 | 9170 | 3" |
| 2-CMST14 | 14 | 3 | 30 | Clear Span + 60" | 66-16d | 35 | Clear Span + 70" | 76-16d | 2-2x | 12980 | 12980 | 1¾" |
| | | | 34 | Clear Span + 68" | 76-10d | 40 | Clear Span + 80" | 88-10d | | 12980 | 12980 | 1¾" |
| | | | 59 | Clear Span + 118" | 66-16d | 68 | Clear Span + 136" | 76-16d | | 12980 | 12980 | 3½" |
| | | | 68 | Clear Span + 136" | 76-10d | 78 | Clear Span + 156" | 88-10d | | 12980 | 12980 | 3½" |
| 2-CMST12 | 12 | 3 | 39 | Clear Span + 78" | 86-16d | 45 | Clear Span + 90" | 100-16d | 2-2x | 18430 | 18430 | 1¾" |
| | | | 45 | Clear Span + 90" | 100-10d | 51 | Clear Span + 102" | 114-10d | | 18430 | 18430 | 1¾" |
| | | | 76 | Clear Span + 152" | 86-16d | 89 | Clear Span + 178" | 100-16d | | 18430 | 18430 | 3½" |
| | | | 89 | Clear Span + 178" | 100-10d | 101 | Clear Span + 202" | 114-10d | | 18430 | 18430 | 3½" |

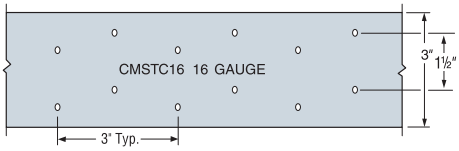
1. Loads are for 2 straps.
2. Use half of the nails at each member being connected to achieve the listed loads.
3. Fasteners shall not be located in clear span.



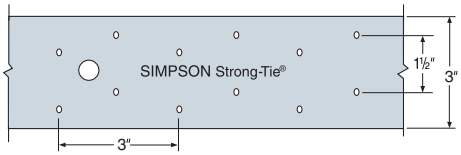

**CS16**



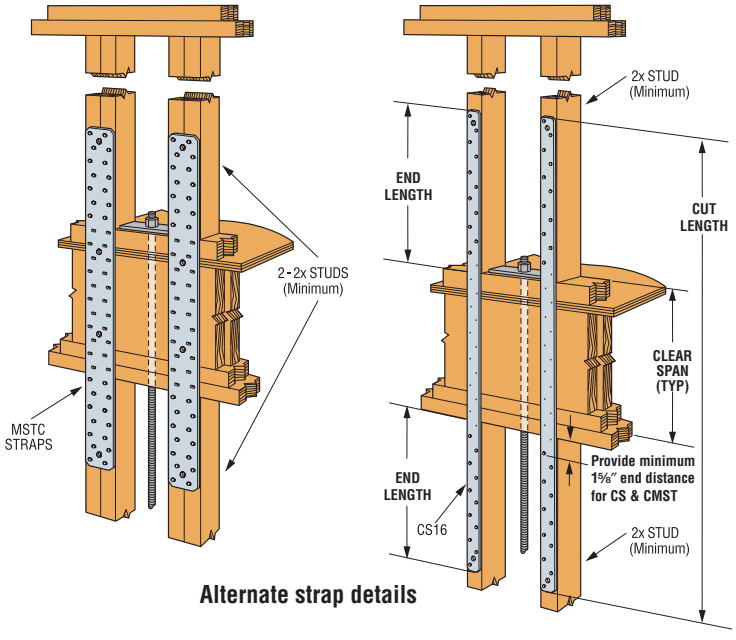

**CMST14 & CMST12**




**CMSTC16**




**MSTC52**




**Alternate strap details**

# DESIGN EXAMPLE

## DESIGN NOTES

**Specify:**

The Designer will need to determine the holdown loads required at each floor. Use the charts provided to pick the appropriate Anchor Tiedown System (ATS) run based on the number of floors and the capacity. The ATS will provide only the tension part of the shearwall; the Designer will need to determine the compression shear edge nailing schedule, horizontal drift, and meet all other requirements in accordance with the applicable building code.

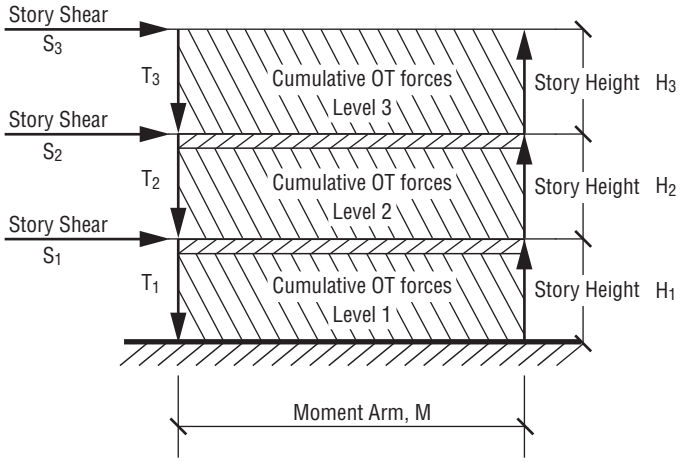
**For simplicity during installation the Designer may want to designate and group similar runs.**

**Given:** **IBC 2000 (AISC 9th Ed.), ⅓ steel stress increase applies**
**8' plate height**
**4" nominal wall thickness**
**Douglas Fir-Larch studs and wall plates**

**Given Overturning (OT) Forces**

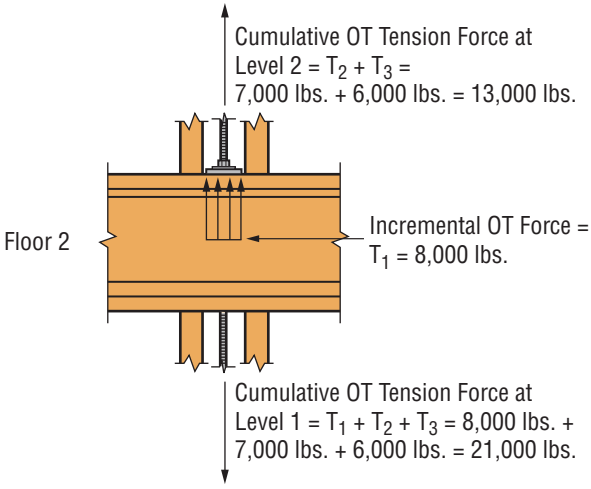
| Level | Incremental OT Forces (lbs) | ASD Cumulative OT Tension Forces (lbs) | ASD Cumulative OT Compression Forces (lbs) |
|---|---|---|---|
| 3 | 6000 | 6000 | 8000 |
| 2 | 7000 | 13000 | 16000 |
| 1 | 8000 | 21000 | 25000 |

1. The structural design overturning forces listed above are arbitrary and intended only for this design example. Simpson Strong-Tie is not responsible for structural design of the building or derivation of the structural forces.
2. The incremental OT Forces are the difference between the cumulative OT Forces at each level.




**Example for Derivation of Forces at Level 1:**

1. Note that Moment Arm, M, is the distance between the centerline of compression members to centerline of tension members.
2. Incremental OT Force = $T_1 = \frac{S_1 (H_1)}{M}$ = 8,000 lbs. The incremental OT Force is calculated at each level. $T_2$ = 7,000 lbs. $T_3$ = 6,000 lbs. The incremental OT Forces are typically the incremental bearing forces.
3. Cumulative OT Tension Force at level 1 = $T_1 + T_2 + T_3$ = 6,000 lbs. + 7,000 lbs. + 8,000 lbs. = 21,000 lbs.
4. See sketch at right for additional information.
5. Cumulative OT Compression Forces are higher than Cumulative OT Tension Forces due to the addition of code requied dead loads.




**Rod Length Calculation = Plate height plus floor system plus 12" rounded up in 1 foot increments.**

**Rod Length Example:**

| | | |
|---|---|---|
| 1 - 2x Plates | = | 1.50 |
| 2 x 12 Floor System | = | 11.25 |
| ¾" Floor | = | 0.75 |
| | | 13.50" |

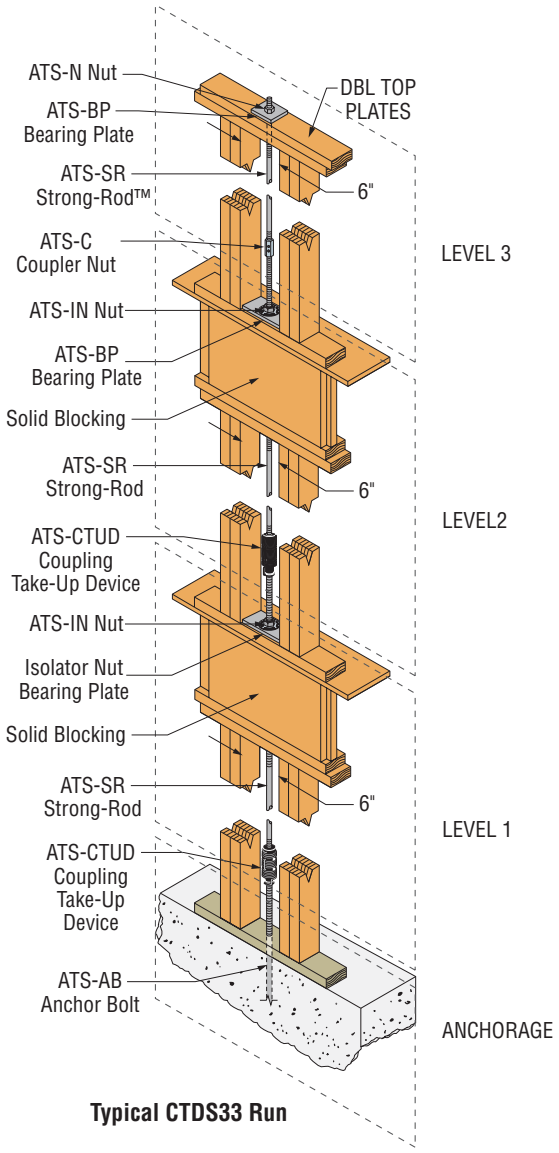
**8' Plate Height + 13½" + 8" Takeup Clearance = 9'-9½" = Rod Length 10'**
**Actual rod length will be 2' longer than the plate height for all floors except the top floor, in this example.**

# DESIGN EXAMPLE

**Step 1:** Check Incremental and Cumulative ASD OT Forces against capacities.

| Level | Load Components | CTDS33 Capacity DF | CTDS33 Capacity SP | CTDS33 Component | Demand Forces: Incremental OT Force (lbs) | Demand Forces: Cumulative OT Tension Force (lbs) |
|---|---|---|---|---|---|---|
| Three | Incremental Bearing Capacity (lb) | 10540 | 9530 | ATS-N7<br>ATS-BP5-3X5.5 | 6000 | — |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C75 | — | 6000 |
| Two | Incremental Bearing Capacity (lb) | 10280 | 9280 | ATS-IN7<br>ATS-BP7-3X5.5 | 7000 | — |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD97 | — | 13000 |
| One | Incremental Bearing Capacity (lb) | 9950 | 8995 | ATS-IN9<br>ATS-BP9-3X5.5 | 8000 | — |
| | Allowable Tension Capacity (100/133) (lb) | 19680 / 26240 | | ATS-SR9<br>ATS-CTUD99 | — | 21000 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for minimum embedment and edge distance | | ATS-SR9 | — | — |

1. The Designer is responsible for verifying that the building drift is within acceptable limitations and code limitations.




**Typical CTDS33 Run**

**Step 2:** Use Compression Member Selection Tables to Select Compression Members

| Level | Cumulative OT Compression Forces (lbs) | | 8' D. Fir-L 4x Stud Compression Capacity (lbs) | Compression Members Each Side of ATS Rod |
|---|---|---|---|---|
| 3 | 8000 | < | 10938 | (1) 3x4 |
| 2 | 16000 | < | 21875 | (2) 3x4 |
| 1 | 25000 | < | 31719 | (1) 4x8 |

1. See page 36 for 8-foot D.Fir-L compression capacity.
2. 8'–0" plate height and 1.33 load duration factor used.
3. Calculations based on 2005 NDS.
4. Example only reviews compression case for the lumber species, plate height, and loads provided. Designer must review compression post and size for any additional loads, load combinations, variation in species, variation in lumber grade, or unsupported heights as specified in the code.

**Step 3:** The Solution

**CTDS33 AND COMPRESSION MEMBERS SHOWN.**

**To identify the most economical design, download the ATS Selector software at www.strongtie.com**

# ONE STORY SYSTEMS

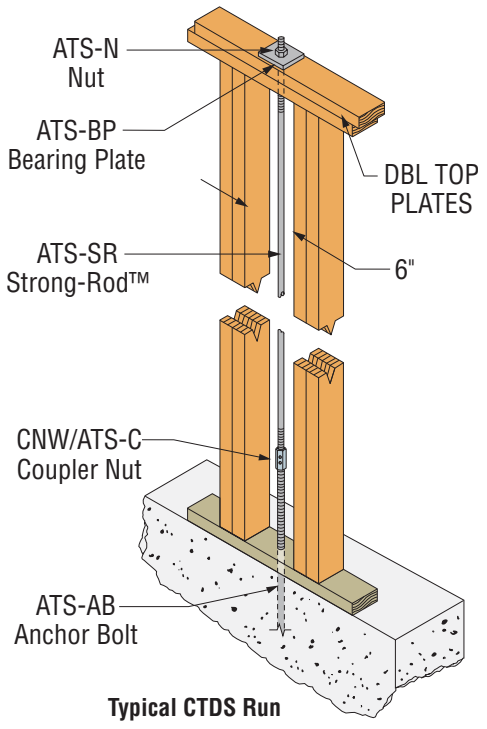
## ATS Load Capacities for One Story Applications: Douglas Fir & Southern Pine

| Level | One Story Systems | CTDS11 | | | CTDS12 | | | CTDS13 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | DF | SP | Component | DF | SP | Component | DF | SP | Component |
| | | Capacity | | | Capacity | | | Capacity | | |
| One | Incremental Bearing Capacity (lb) | 10540 | 9530 | ATS-N5<br>ATS-BP5-3.5X5.5 | 10280 | 9290 | ATS-N7<br>ATS-BP7-3X5.5 | 15700 | 14195 | ATS-N9<br>DW9<br>ATS-BP10-3X9 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C55 | 11905 / 15875 | | ATS-SR7<br>ATS-C77 | 19680 / 26240 | | ATS-SR9<br>ATS-C99 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB5 | See page 17 for min. embedment and edge distance | | ATS-AB7 | See page 17 for min. embedment and edge distance | | ATS-AB9 |

## ATS Load Capacities for One Story Applications: Hem Fir & Spruce Pine Fir

| Level | One Story Systems | CTDS11B | | | CTDS12B | | | CTDS13B | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | HF | SPF | Component | HF | SPF | Component | HF | SPF | Component |
| | | Capacity | | | Capacity | | | Capacity | | |
| One | Incremental Bearing Capacity (lb) | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 | 10175 | 10675 | ATS-N7<br>DW7<br>ATS-BP10-3X9 | 13820 | 14500 | ATS-N9<br>DW9<br>ATS-BP10-3X12 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C55 | 11905 / 15875 | | ATS-SR7<br>ATS-C77 | 19680 / 26240 | | ATS-SR9<br>ATS-C99 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB5 | See page 17 for min. embedment and edge distance | | ATS-AB7 | See page 17 for min. embedment and edge distance | | ATS-AB9 |

1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.



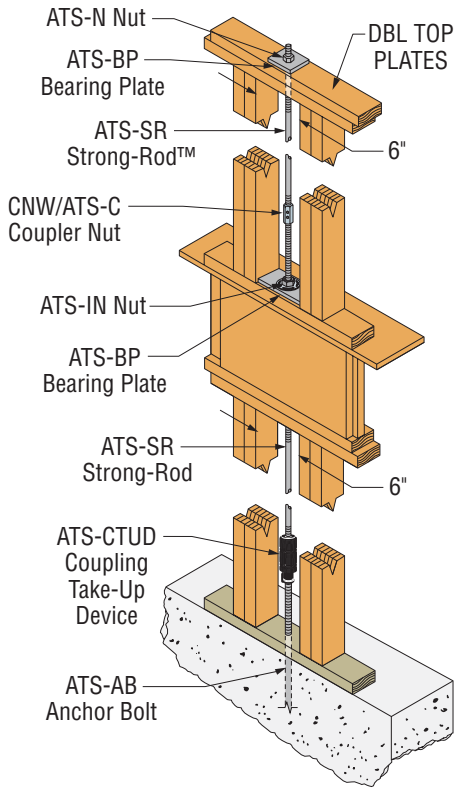

**Typical CTDS Run**

# TWO STORY SYSTEMS

### ATS Load Capacities for Two Story Applications: Douglas Fir & Southern Pine

| Level | Two Story Systems | CTDS21 | | | CTDS22 | | | CTDS23 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | DF | SP | Component | DF | SP | Component | DF | SP | Component |
| | | Capacity | | | Capacity | | | Capacity | | |
| Two | Incremental Bearing Capacity (lb) | 10540 | 9530 | ATS-N5<br>ATS-BP5-3X5.5 | 10540 | 9530 | ATS-N5<br>ATS-BP5-3X5.5 | 10280 | 9290 | ATS-N7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C55 | 6075 / 8100 | | ATS-SR5<br>ATS-C75 | 11905 / 15875 | | ATS-SR7<br>ATS-C97 |
| One | Incremental Bearing Capacity (lb) | 6775 | 6125 | ATS-IN5<br>ATS-BP5-3X3.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 | 9950 | 8995 | ATS-IN9<br>ATS-BP9-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 19680 / 26240 | | ATS-SR9<br>ATS-CTUD99 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB5 | See page 17 for min. embedment and edge distance | | ATS-AB7 | See page 17 for min. embedment and edge distance | | ATS-AB9 |

1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.



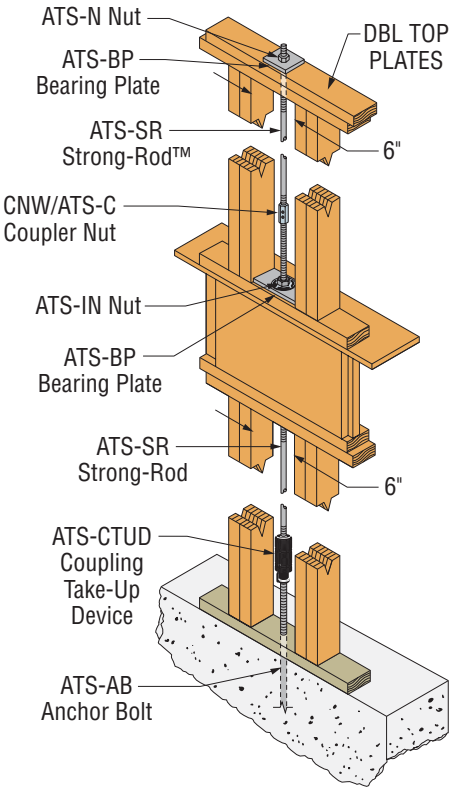

**Typical CTDS2 Run**

# TWO STORY SYSTEMS

## ATS Load Capacities for Two Story Applications: Hem Fir & Spruce Pine Fir

| Level | Two Story Systems | CTDS21B | | | CTDS22B | | | CTDS23B | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | HF | SPF | Component | HF | SPF | Component | HF | SPF | Component |
| | | Capacity | | | Capacity | | | Capacity | | |
| Two | Incremental Bearing Capacity (lb) | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 | 10175 | 10675 | ATS-N7<br>DW7<br>ATS-BP10-3X9 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C55 | 6075 / 8100 | | ATS-SR5<br>ATS-C75 | 11905 / 15875 | | ATS-SR7<br>ATS-C97 |
| One | Incremental Bearing Capacity (lb) | 4390 | 4605 | ATS-IN5<br>ATS-BP5-3X3.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 | 6450 | 6765 | ATS-IN9<br>ATS-BP9-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 19680 / 26240 | | ATS-SR9<br>ATS-CTUD99 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB5 | See page 17 for min. embedment and edge distance | | ATS-AB7 | See page 17 for min. embedment and edge distance | | ATS-AB9 |

1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.



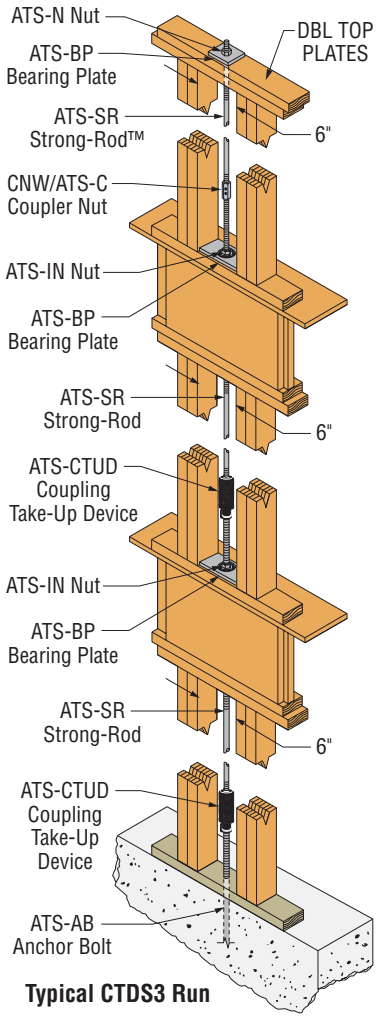

**Typical CTDS2 Run**

# THREE STORY SYSTEMS

SIMPSON Strong-Tie®

### ATS Load Capacities for Three Story Applications: Douglas Fir & Southern Pine

| Level | Three Story Systems | CTDS31 | | | CTDS32 | | |
|---|---|---|---|---|---|---|---|
| | | DF Capacity | SP Capacity | Component | DF Capacity | SP Capacity | Component |
| Three | Incremental Bearing Capacity (lb) | 10540 | 9530 | ATS-N5<br>ATS-BP5-3X5.5 | 10540 | 9530 | ATS-N5<br>ATS-BP5-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C55 | 6075 / 8100 | | ATS-SR5<br>ATS-C55 |
| Two | Incremental Bearing Capacity (lb) | 6775 | 6125 | ATS-IN5<br>ATS-BP5-3X3.5 | 6775 | 6125 | ATS-IN5<br>ATS-BP5-3X3.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD75 |
| One | Incremental Bearing Capacity (lb) | 6775 | 6125 | ATS-IN5<br>ATS-BP5-3X3.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB5 | See page 17 for min. embedment and edge distance | | ATS-AB7 |

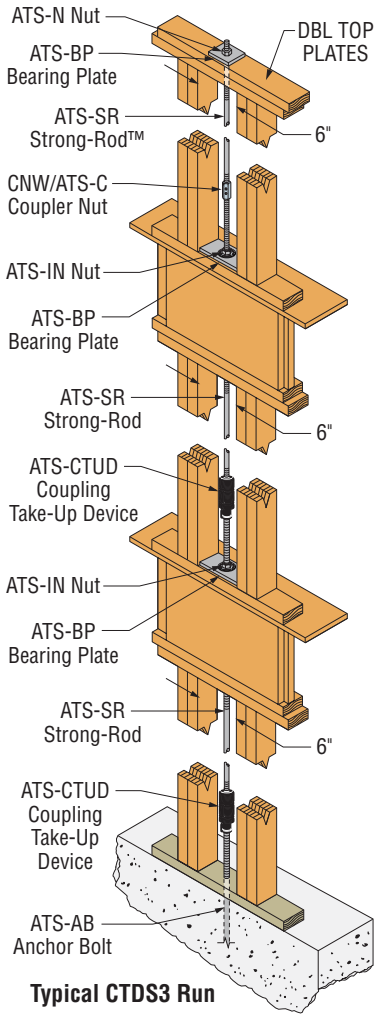



**Typical CTDS3 Run**

| Level | Three Story Systems | CTDS33 | | | CTDS34 | | | CTDS35 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | DF Capacity | SP Capacity | Component | DF Capacity | SP Capacity | Component | DF Capacity | SP Capacity | Component |
| Three | Incremental Bearing Capacity (lb) | 10540 | 9530 | ATS-N5<br>ATS-BP5-3X5.5 | 10280 | 9290 | ATS-N7<br>ATS-BP7-3X5.5 | 10280 | 9290 | ATS-N7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C75 | 11905 / 15875 | | ATS-SR7<br>ATS-C77 | 11905 / 15875 | | ATS-SR7<br>ATS-C77 |
| Two | Incremental Bearing Capacity (lb) | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3x5.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3x5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD97 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD97 |
| One | Incremental Bearing Capacity (lb) | 9950 | 8995 | ATS-IN9<br>ATS-BP9-3X5.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3x5.5 | 9950 | 8995 | ATS-IN9<br>ATS-BP9-3x5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 19680 / 26240 | | ATS-SR9<br>ATS-CTUD99 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 | 39365 / 52485 | | ATS-SR9H<br>ATS-CTUD99 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB9 | See page 17 for min. embedment and edge distance | | ATS-AB7H | See page 17 for min. embedment and edge distance | | ATS-AB9H |

1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.

# THREE STORY SYSTEMS




**Typical CTDS3 Run**

### ATS Load Capacities for Three Story Applications: Hem Fir & Spruce Pine Fir

| Level | Three Story Systems | CTDS31B | | | CTDS32B | | |
|---|---|---|---|---|---|---|---|
| | | HF Capacity | SPF Capacity | Component | HF Capacity | SPF Capacity | Component |
| Three | Incremental Bearing Capacity (lb) | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C55 | 6075 / 8100 | | ATS-SR5<br>ATS-C55 |
| Two | Incremental Bearing Capacity (lb) | 4390 | 4605 | ATS-IN5<br>ATS-BP5-3X3.5 | 4390 | 4605 | ATS-IN5<br>ATS-BP5-3X3.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD75 |
| One | Incremental Bearing Capacity (lb) | 4390 | 4605 | ATS-IN5<br>ATS-BP7-3X3.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB5 | See page 17 for min. embedment and edge distance | | ATS-AB7 |

| Level | Three Story Systems | CTDS33B | | | CTDS34B | | | CTDS35B | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | HF Capacity | SPF Capacity | Component | HF Capacity | SPF Capacity | Component | HF Capacity | SPF Capacity | Component |
| Three | Incremental Bearing Capacity (lb) | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 | 10175 | 10675 | ATS-N7<br>DW7<br>ATS-BP10-3X9 | 10175 | 10675 | ATS-N7<br>DW7<br>ATS-BP10-3X9 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C75 | 11905 / 15875 | | ATS-SR7<br>ATS-C77 | 11905 / 15875 | | ATS-SR7<br>ATS-C77 |
| Two | Incremental Bearing Capacity (lb) | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3x5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD97 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD97 |
| One | Incremental Bearing Capacity (lb) | 6450 | 6765 | ATS-IN9<br>ATS-BP9-3X5.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 | 6450 | 6765 | ATS-IN9<br>ATS-BP9-3x5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 19680 / 26240 | | ATS-SR9<br>ATS-CTUD99 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 | 39365 / 52485 | | ATS-SR9H<br>ATS-CTUD99 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB9 | See page 17 for min. embedment and edge distance | | ATS-AB7H | See page 17 for min. embedment and edge distance | | ATS-AB9H |

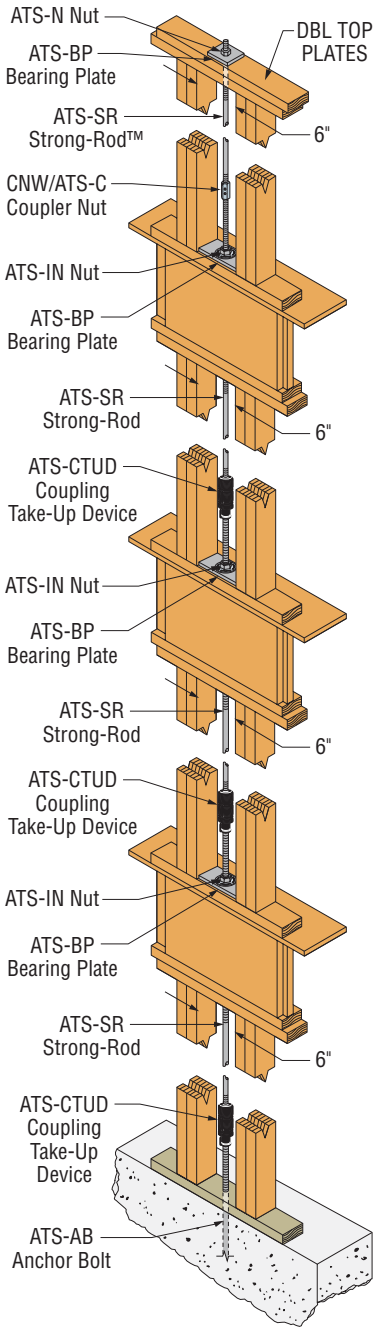
1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.

# FOUR STORY SYSTEMS

## ATS Load Capacities for Four Story Applications: Douglas Fir & Southern Pine *(Continued on next page)*

| Level | Four Story Systems | CTDS41 | | | CTDS42 | | |
|---|---|---|---|---|---|---|---|
| | | DF Capacity | SP Capacity | Component | DF Capacity | SP Capacity | Component |
| Four | Incremental Bearing Capacity (lb) | 10540 | 9530 | ATS-N5<br>ATS-BP5-3X5.5 | 10540 | 9530 | ATS-N5<br>ATS-BP5-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C55 | 6075 / 8100 | | ATS-SR5<br>ATS-C55 |
| Three | Incremental Bearing Capacity (lb) | 6775 | 6125 | ATS-IN5<br>ATS-BP5-3X3.5 | 6775 | 6125 | ATS-IN5<br>ATS-BP5-3X3.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 |
| Two | Incremental Bearing Capacity (lb) | 6775 | 6125 | ATS-IN5<br>ATS-BP5-3X3.5 | 6775 | 6125 | ATS-IN5<br>ATS-BP5-3X3.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD75 |
| One | Incremental Bearing Capacity (lb) | 6075 | 8100 | ATS-IN5<br>ATS-BP5-3X3.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB5 | See page 17 for min. embedment and edge distance | | ATS-AB7 |

| Level | Four Story Systems | CTDS43 | | | CTDS44 | | |
|---|---|---|---|---|---|---|---|
| | | DF Capacity | SP Capacity | Component | DF Capacity | SP Capacity | Component |
| Four | Incremental Bearing Capacity (lb) | 10540 | 9530 | ATS-N5<br>ATS-BP5-3X5.5 | 10540 | 9530 | ATS-N5<br>ATS-BP5-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C55 | 6075 / 8100 | | ATS-SR5<br>ATS-C75 |
| Three | Incremental Bearing Capacity (lb) | 6775 | 6125 | ATS-IN5<br>ATS-BP5-3X3.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD75 | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 |
| Two | Incremental Bearing Capacity (lb) | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3x5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD97 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 |
| One | Incremental Bearing Capacity (lb) | 9950 | 8995 | ATS-IN9<br>ATS-BP9-3X5.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3x5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 19680 / 26240 | | ATS-SR9<br>ATS-CTUD99 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB9 | See page 17 for min. embedment and edge distance | | ATS-AB7H |




**Typical CTDS4 Run**

1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.

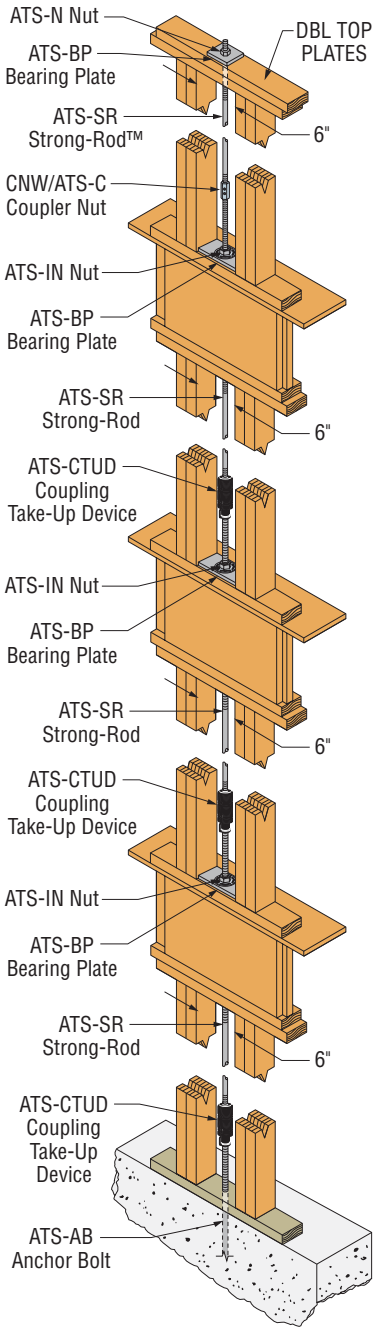
# FOUR STORY SYSTEMS

## ATS Load Capacities for Four Story Applications: Douglas Fir & Southern Pine

*(Continued from previous page)*

| Level | Four Story Systems | CTDS45 | | |
|---|---|---|---|---|
| | | DF | SP | Component |
| | | Capacity | | |
| Four | Incremental Bearing Capacity (lb) | 10280 | 9290 | ATS-N7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-C77 |
| Three | Incremental Bearing Capacity (lb) | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3x5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 |
| Two | Incremental Bearing Capacity (lb) | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3x5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD97 |
| One | Incremental Bearing Capacity (lb) | 9950 | 8995 | ATS-IN9<br>ATS-BP9-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 39365 / 52485 | | ATS-SR9H<br>ATS-CTUD99 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB9H |

1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.



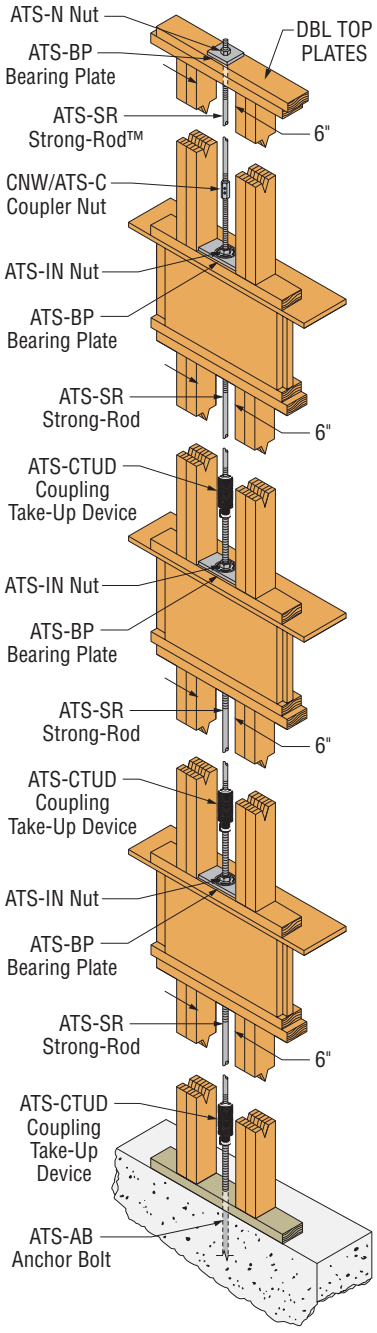

**Typical CTDS4 Run**

# FOUR STORY SYSTEMS

## ATS Load Capacities for Four Story Applications: Hem Fir & Spruce Pine Fir *(Continued on next page)*

| Level | Four Story Systems | CTDS41B | | | CTDS42B | | |
|---|---|---|---|---|---|---|---|
| | | HF Capacity | SPF Capacity | Component | HF Capacity | SPF Capacity | Component |
| Four | Incremental Bearing Capacity (lb) | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C55 | 6075 / 8100 | | ATS-SR5<br>ATS-C55 |
| Three | Incremental Bearing Capacity (lb) | 4390 | 4605 | ATS-IN5<br>ATS-BP5-3X3.5 | 4390 | 4605 | ATS-IN5<br>ATS-BP5-3X3.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 |
| Two | Incremental Bearing Capacity (lb) | 4390 | 4605 | ATS-IN5<br>ATS-BP5-3X3.5 | 4390 | 4605 | ATS-IN5<br>ATS-BP5-3X3.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD75 |
| One | Incremental Bearing Capacity (lb) | 4390 | 4605 | ATS-IN5<br>ATS-BP5-3X3.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD55 | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB5 | See page 17 for min. embedment and edge distance | | ATS-AB7 |

| Level | Four Story Systems | CTDS43B | | | CTDS44B | | |
|---|---|---|---|---|---|---|---|
| | | HF Capacity | SPF Capacity | Component | HF Capacity | SPF Capacity | Component |
| Four | Incremental Bearing Capacity (lb) | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C55 | 6075 / 8100 | | ATS-SR5<br>ATS-C75 |
| Three | Incremental Bearing Capacity (lb) | 4390 | 4605 | ATS-IN5<br>ATS-BP5-3X3.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-CTUD75 | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 |
| Two | Incremental Bearing Capacity (lb) | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD97 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 |
| One | Incremental Bearing Capacity (lb) | 6450 | 6765 | ATS-IN9<br>ATS-BP9-3X5.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 19680 / 26240 | | ATS-SR9<br>ATS-CTUD99 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB9 | See page 17 for min. embedment and edge distance | | ATS-AB7H |




**Typical CTDS4 Run**

1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.

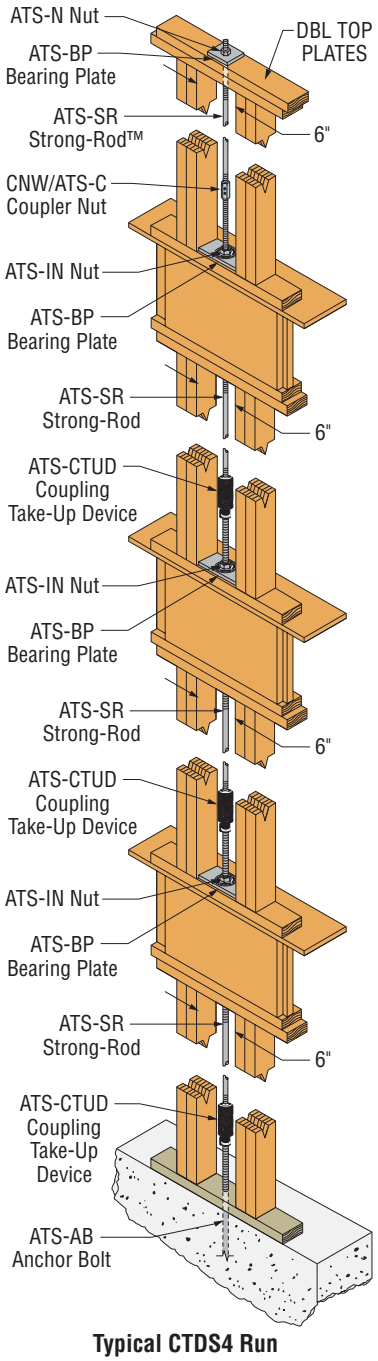
# FOUR STORY SYSTEMS

## ATS Load Capacities for Four Story Applications: Hem Fir & Spruce Pine Fir

*(Continued from previous page)*

| Level | Four Story Systems | CTDS45B | | |
|---|---|---|---|---|
| | | HF Capacity | SPF Capacity | Component |
| Four | Incremental Bearing Capacity (lb) | 10175 | 10675 | ATS-N7<br>DW7<br>ATS-BP10-3X9 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-C77 |
| Three | Incremental Bearing Capacity (lb) | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 |
| Two | Incremental Bearing Capacity (lb) | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD97 |
| One | Incremental Bearing Capacity (lb) | 6450 | 6765 | ATS-IN9<br>ATS-BP9-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 39365 / 52485 | | ATS-SR9H<br>ATS-CTUD99 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB9H |

1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.




**Typical CTDS4 Run**

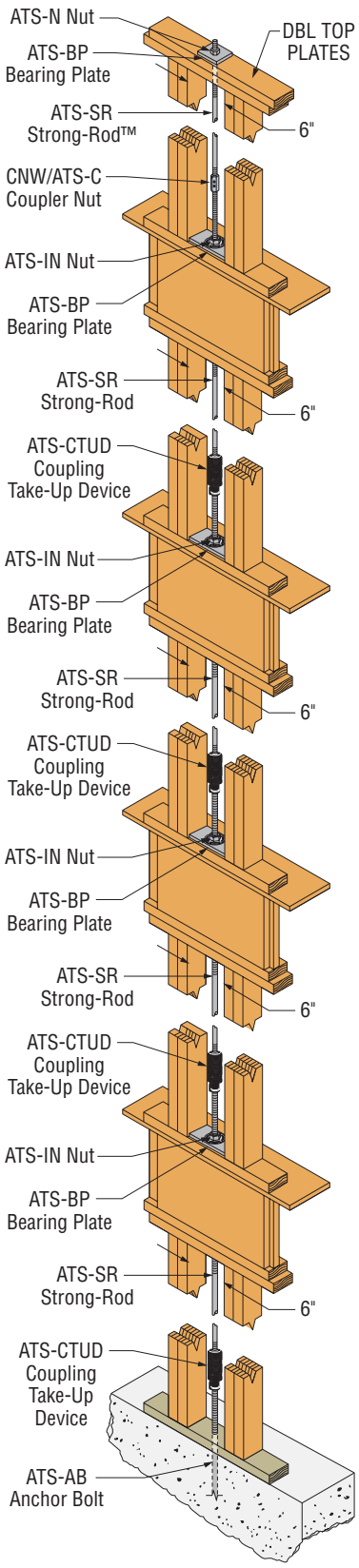
# FIVE STORY SYSTEMS

SIMPSON Strong-Tie®

**ATS Load Capacities for Five Story Applications: Douglas Fir & Southern Pine** *(Continued on next page)*

| Level | Five Story Systems | CTDS51 | | | CTDS52 | | |
|---|---|---|---|---|---|---|---|
| | | DF Capacity | SP Capacity | Component | DF Capacity | SP Capacity | Component |
| Five | Incremental Bearing Capacity (lb) | 10540 | 9530 | ATS-N5<br>ATS-BP5-3X5.5 | 10540 | 9530 | ATS-N5<br>ATS-BP5-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C75 | 6075 / 8100 | | ATS-SR5<br>ATS-C75 |
| Four | Incremental Bearing Capacity (lb) | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 |
| Three | Incremental Bearing Capacity (lb) | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD97 |
| Two | Incremental Bearing Capacity (lb) | 11905 | 15875 | ATS-IN7<br>ATS-BP7-3X5.5 | 9950 | 8995 | ATS-IN9<br>ATS-BP9-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 19680 / 26240 | | ATS-SR9<br>ATS-CTUD99 |
| One | Incremental Bearing Capacity (lb) | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 | 9950 | 8995 | ATS-IN9<br>ATS-BP9-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 19680 / 26240 | | ATS-SR9<br>ATS-CTUD99 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB7 | See page 17 for min. embedment and edge distance | | ATS-AB9 |

1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.



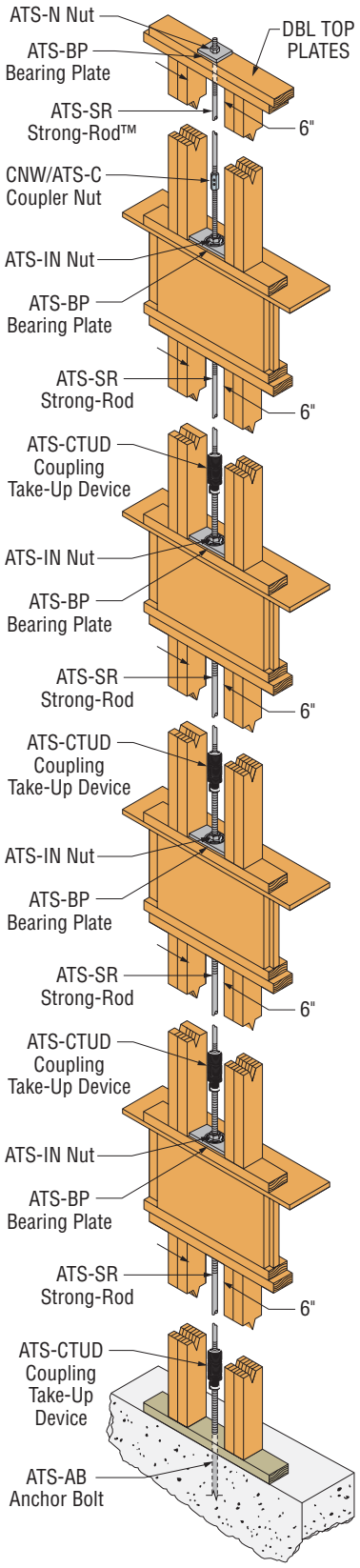

**Typical CTDS5 Run**

# FIVE STORY SYSTEMS

## ATS Load Capacities for Five Story Applications: Douglas Fir & Southern Pine *(Continued from previous page)*

| Level | Five Story Systems | CTDS53 | | | CTDS54 | | |
|---|---|---|---|---|---|---|---|
| | | DF Capacity | SP Capacity | Component | DF Capacity | SP Capacity | Component |
| Five | Incremental Bearing Capacity (lb) | 10540 | 9530 | ATS-N5<br>ATS-BP5-3X5.5 | 10280 | 9290 | ATS-N7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C75 | 11905 / 15875 | | ATS-SR7<br>ATS-C77 |
| Four | Incremental Bearing Capacity (lb) | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3x5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 |
| Three | Incremental Bearing Capacity (lb) | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3X5.5 | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3x5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD97 |
| Two | Incremental Bearing Capacity (lb) | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3x5.5 | 9950 | 8995 | ATS-IN9<br>ATS-BP9-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 | 39365 / 52485 | | ATS-SR9H<br>ATS-CTUD99 |
| One | Incremental Bearing Capacity (lb) | 10280 | 9290 | ATS-IN7<br>ATS-BP7-3x5.5 | 9950 | 8995 | ATS-IN9<br>ATS-BP9-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 | 39365 / 52485 | | ATS-SR9H<br>ATS-CTUD99 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB7H | See page 17 for min. embedment and edge distance | | ATS-AB9H |

1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.




**Typical CTDS5 Run**

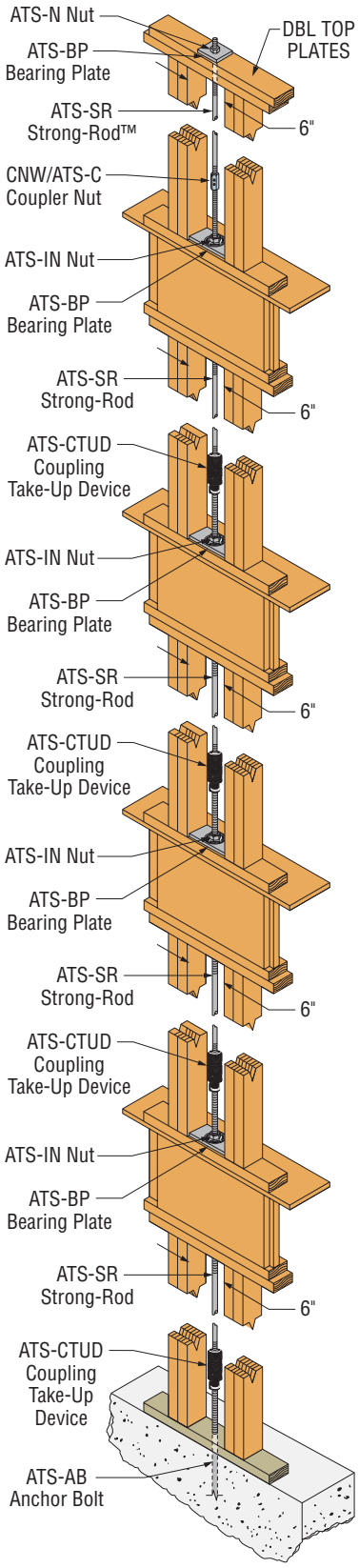
# FIVE STORY SYSTEMS

SIMPSON Strong-Tie®

## ATS Load Capacities for Five Story Applications: Hem Fir & Spruce Pine Fir *(Continued on next page)*

| Level | Five Story Systems | CTDS51B | | | CTDS52B | | |
|---|---|---|---|---|---|---|---|
| | | HF Capacity | SPF Capacity | Component | HF Capacity | SPF Capacity | Component |
| Five | Incremental Bearing Capacity (lb) | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C75 | 6075 / 8100 | | ATS-SR5<br>ATS-C75 |
| Four | Incremental Bearing Capacity (lb) | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 |
| Three | Incremental Bearing Capacity (lb) | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD97 |
| Two | Incremental Bearing Capacity (lb) | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 | 6450 | 6765 | ATS-IN9<br>ATS-BP9-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 19680 / 26240 | | ATS-SR9<br>ATS-CTUD99 |
| One | Incremental Bearing Capacity (lb) | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 | 6450 | 6765 | ATS-IN9<br>ATS-BP9-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 19680 / 26240 | | ATS-SR9<br>ATS-CTUD99 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB7 | See page 17 for min. embedment and edge distance | | ATS-AB9 |

1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.



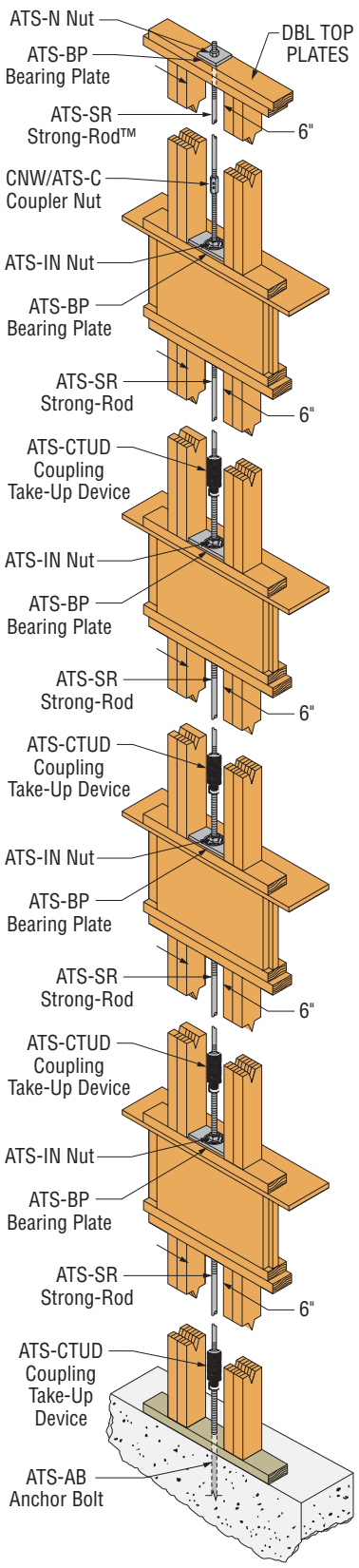

**Typical CTDS5 Run**

# FIVE STORY SYSTEMS

## ATS Load Capacities for Five Story Applications: Hem Fir & Spruce Pine Fir *(Continued from previous page)*

| Level | Five Story Systems | CTDS53B | | | CTDS54B | | |
|---|---|---|---|---|---|---|---|
| | | HF Capacity | SPF Capacity | Component | HF Capacity | SPF Capacity | Component |
| Five | Incremental Bearing Capacity (lb) | 6830 | 7165 | ATS-N5<br>ATS-BP5-3X5.5 | 10175 | 10675 | ATS-N7<br>DW7<br>ATS-BP10-3X9 |
| | Allowable Tension Capacity (100/133) (lb) | 6075 / 8100 | | ATS-SR5<br>ATS-C75 | 11905 / 15875 | | ATS-SR7<br>ATS-C77 |
| Four | Incremental Bearing Capacity (lb) | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3x5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 |
| Three | Incremental Bearing Capacity (lb) | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3X5.5 | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3x5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 11905 / 15875 | | ATS-SR7<br>ATS-CTUD77 | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD97 |
| Two | Incremental Bearing Capacity (lb) | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3x5.5 | 6450 | 6765 | ATS-IN9<br>ATS-BP9-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 | 39365 / 52485 | | ATS-SR9H<br>ATS-CTUD99 |
| One | Incremental Bearing Capacity (lb) | 6660 | 6990 | ATS-IN7<br>ATS-BP7-3x5.5 | 6450 | 6765 | ATS-IN9<br>ATS-BP9-3X5.5 |
| | Allowable Tension Capacity (100/133) (lb) | 23810 / 31745 | | ATS-SR7H<br>ATS-CTUD77 | 39365 / 52485 | | ATS-SR9H<br>ATS-CTUD99 |
| Anchorage | Anchor Bolt Grade and Size | See page 17 for min. embedment and edge distance | | ATS-AB7H | See page 17 for min. embedment and edge distance | | ATS-AB9H |

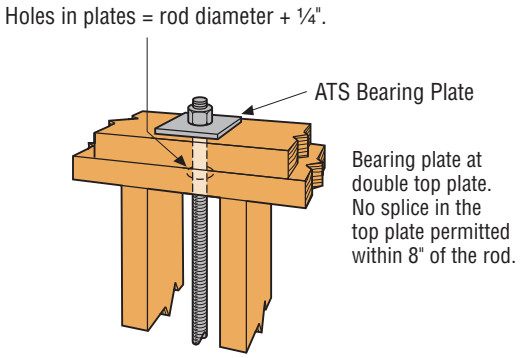
1. See General Notes for additional information.
2. These tables provide the individual ASD capacities of the ATS components. The component capacities at each level must be considered by the Designer. See the design example on pages 19 & 20 for more information.



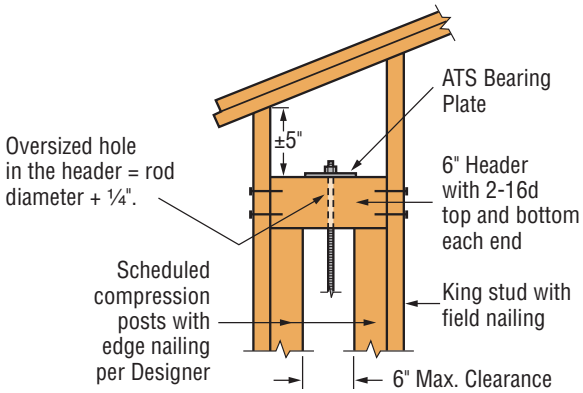

**Typical CTDS5 Run**

# INSTALLATION DETAILS

## RUN TERMINATION DETAILS

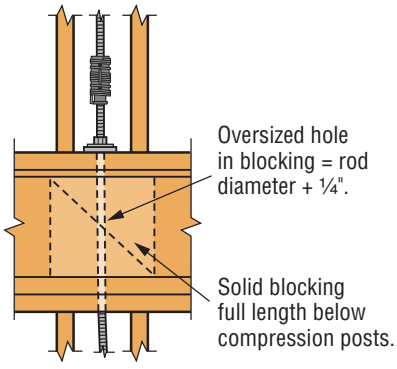



**Top Plate Detail**

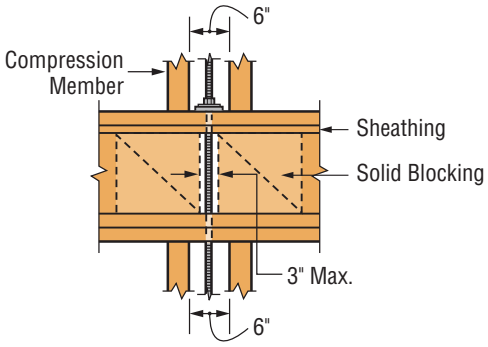



**Bridge Block Detail**

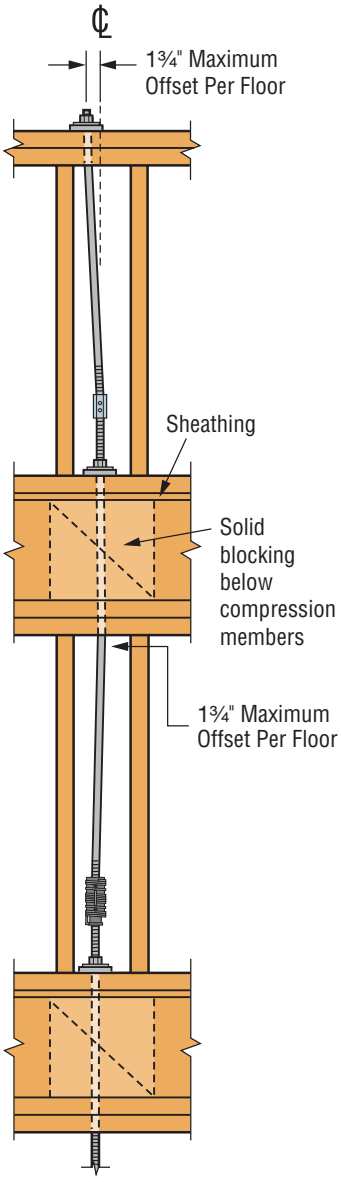
## FLOOR SYSTEM BLOCKING DETAILS




**Blocking Detail**

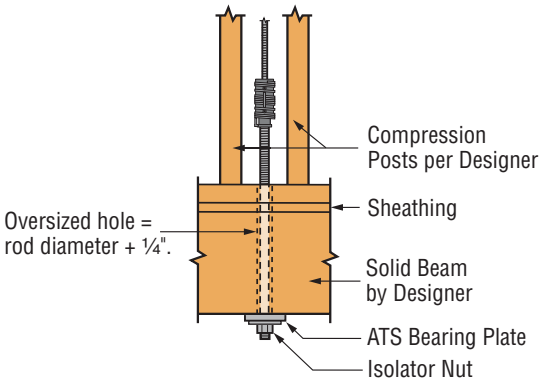



**Alternate Blocking Detail**

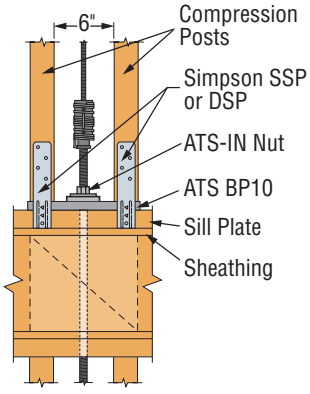



**Allowable Rod Offset From Centerline: 1¾" maximum per floor**

## ADDITIONAL DETAILS




**Wood Beam Detail**



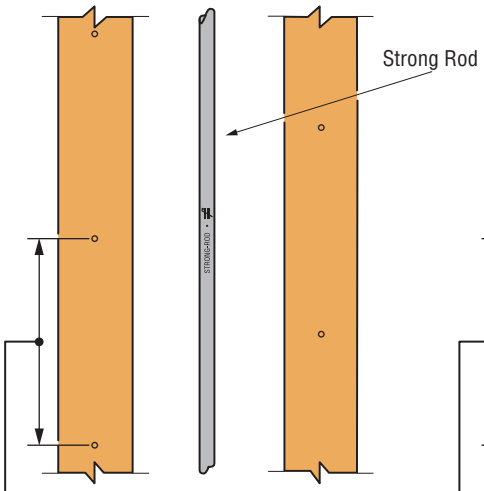

**Studs over ATS-BP10 Bearing Plates**

# INSTALLATION DETAILS (CONT.)

### SHEARWALL EDGE NAILING

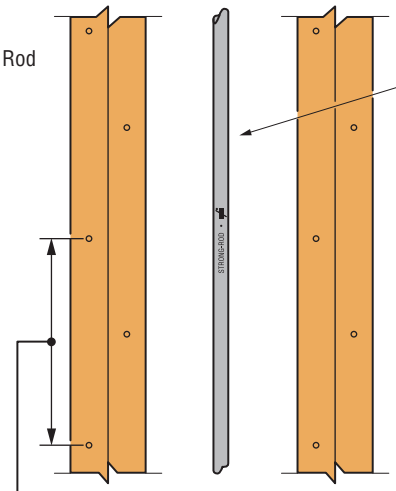
Edge nailing and compression members size shall be specified by the Designer.

**CTDS Systems with 1 compression member on either side of the ATS Strong-Rod™.**



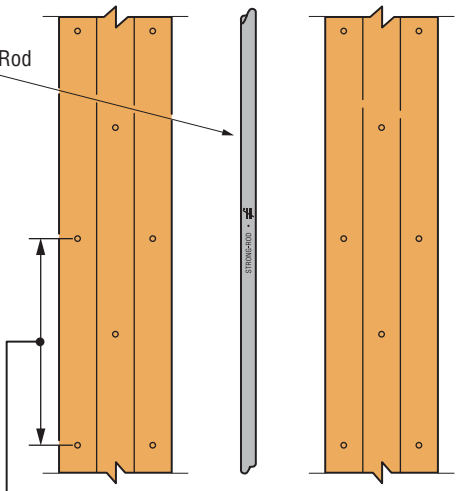

Nailing to each compression member shall be specified edge nailing, by the Designer, multiplied by two (2) but not to exceed 12" o.c.

**CTDS Systems with 2 or less compression members on either side of the ATS Strong-Rod.**




Nailing to each compression member shall be the specified edge nailing, by the Designer, multiplied by the total number of studs but not to exceed 12" on center.

**CTDS Systems with 3 or more compression members on either side of the ATS Strong-Rod.**




Nailing shall be specified by the Designer, but not to exceed a maximum of 12" on center to each compression member.

**Example:** (4) total compression members: 2" o.c. edge nailing x 4 = 8" o.c. nailing at each compression member.

# COMPRESSION MEMBERS: GENERAL NOTES

1. Studs, posts and blocking details are specified by the Designer and are not shipped with the Anchor Tiedown System.
2. With the Anchor Tiedown System, it is not necessary to design the lumber in tension. See the Compression Member Selection Tables on pages 36–41 for compression member allowable capacities and additional design assumptions.
3. The compression capacity of the lumber listed in the tables are based on the 2005 National Design Specification (NDS) for the plate heights, wall plate and compression member species specified.
4. Wall plates and stud species are assumed to be the same as specified in the Compression Member Selection Tables (UNO). The Designer must review the compression members for variation of species, or unsupported heights other than those listed in the tables.
5. Allowable perpendicular to grain stress for D.Fir-L lumber based on 625 psi, Southern Pine lumber based on 565 psi, Spruce-Pine-Fir lumber based on 425 psi, and Hem-Fir lumber based on 405 psi. Parallam lumber based on 625 psi or 565 psi as it will bear on solid sawn lumber.
6. 2x and 3x based on # 2 grade, 4x and 6x lumber based on #1 grade.
7. Bearing area factor Cb not included in lumber values.
8. Perpendicular to grain capacities listed in the Compression Member Selection Tables may be multiplied by $C_b$ for bearings not nearer than 3" to the end of the horizontal member. T is the width of the compression member.

| T (in) | 1.50 | 2.50 | 3.50 | 5.50 | ≥ 6.00 |
|---|---|---|---|---|---|
| $C_b$ | 1.25 | 1.15 | 1.11 | 1.07 | 1.0 |

9. Effective length of lumber ($l_e$) equal to plate height, less (3) 2x wall plates (i.e. 4½").
10. Capacities shown, assume $K_e$ = 1.0.

# COMPRESSION MEMBER SELECTION

SIMPSON Strong-Tie®

## Column Perpendicular and Parallel to Grain Capacities for D.Fir-L (Solid Lumber Sizes)

| Framing | Lumber Size (Each Side of ATS Rod) | Perp. To Grain, $P_{c\perp}$ | Parallel to Grain, $P_c$ Lbs. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plate Height (ft) | | | | | | | | | |
| | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) |
| 4-Inch Wall | 1-2x4 | 6,563 | 6,767 | 6,887 | 5,409 | 5,478 | 4,408 | 4,449 | 3,653 | 3,681 | 3,074 | 3,092 |
| | 1-3x4 | 10,938 | 11,279 | 11,479 | 9,015 | 9,129 | 7,346 | 7,416 | 6,089 | 6,134 | 5,123 | 5,154 |
| | 1-4x4 | 15,313 | 16,856 | 17,136 | 13,455 | 13,616 | 10,954 | 11,053 | 9,075 | 9,139 | 7,633 | 7,676 |
| | 2-3x4 | 21,875 | 22,557 | 22,957 | 18,031 | 18,259 | 14,692 | 14,831 | 12,178 | 12,269 | 10,247 | 10,308 |
| | 1-4x6 | 24,063 | 26,365 | 26,832 | 21,074 | 21,341 | 17,171 | 17,335 | 14,233 | 14,339 | 11,976 | 12,048 |
| | 1-4x8 | 31,719 | 34,574 | 35,228 | 27,677 | 28,050 | 22,573 | 22,800 | 18,722 | 18,869 | 15,760 | 15,859 |
| | 1-4x10 | 40,469 | 43,855 | 44,745 | 35,167 | 35,673 | 28,711 | 29,020 | 23,830 | 24,029 | 20,069 | 20,203 |
| | 2-4x6 | 48,125 | 52,729 | 53,663 | 42,148 | 42,681 | 34,343 | 34,669 | 28,467 | 28,678 | 23,952 | 24,095 |
| | 1-4x12 | 49,219 | 53,337 | 54,419 | 42,771 | 43,386 | 34,919 | 35,294 | 28,982 | 29,224 | 24,408 | 24,571 |
| | 2-4x8 | 63,438 | 69,147 | 70,455 | 55,355 | 56,100 | 45,145 | 45,601 | 37,444 | 37,738 | 31,519 | 31,718 |
| 6-Inch Wall | 1-2x6 | 10,313 | 21,013 | 22,543 | 17,969 | 18,879 | 15,279 | 15,831 | 13,019 | 13,368 | 11,160 | 11,390 |
| | 1-3x6 | 17,188 | 35,022 | 37,571 | 29,948 | 31,465 | 25,465 | 26,386 | 21,699 | 22,280 | 18,601 | 18,983 |
| | 1-4x6 | 22,688 | 50,043 | 53,462 | 42,562 | 44,575 | 36,056 | 37,274 | 30,649 | 31,417 | 26,230 | 26,736 |
| | 1-6x6 | 37,813 | 62,298 | 69,542 | 56,150 | 61,130 | 49,771 | 53,048 | 43,700 | 45,842 | 38,252 | 39,673 |
| | 1-6x8 | 49,844 | 82,120 | 91,668 | 74,016 | 80,581 | 65,608 | 69,928 | 57,605 | 60,428 | 50,423 | 52,297 |
| | 1-6x10 | 63,594 | 104,774 | 116,956 | 94,434 | 102,810 | 83,706 | 89,218 | 73,496 | 77,097 | 64,332 | 66,724 |
| | 1-6x12 | 77,344 | 127,428 | 142,244 | 114,852 | 125,039 | 101,805 | 108,508 | 89,387 | 93,767 | 78,242 | 81,150 |

## Column Perpendicular and Parallel to Grain Capacities for D.Fir-L (Multiple 2x Sizes)

| Framing | Lumber Size (Each Side of ATS Rod) | Perp. To Grain, $P_{c\perp}$ | Parallel to Grain, $P_c$ Lbs. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plate Height (ft) | | | | | | | | | |
| | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) |
| 4-Inch Wall | 1-2x4 | 6,563 | 6,767 | 6,887 | 5,409 | 5,478 | 4,408 | 4,449 | 3,653 | 3,681 | 3,074 | 3,092 |
| | 2-2x4 | 13,125 | 13,534 | 13,774 | 10,819 | 10,955 | 8,815 | 8,899 | 7,307 | 7,361 | 6,148 | 6,185 |
| | 3-2x4 | 19,688 | 20,302 | 20,661 | 16,228 | 16,433 | 13,223 | 13,348 | 10,960 | 11,042 | 9,222 | 9,277 |
| | 4-2x4 | 26,250 | 27,069 | 27,548 | 21,637 | 21,911 | 17,630 | 17,798 | 14,614 | 14,722 | 12,296 | 12,370 |
| | 5-2x4 | 32,813 | 33,836 | 34,436 | 27,046 | 27,388 | 22,038 | 22,247 | 18,267 | 18,403 | 15,370 | 15,462 |
| | 6-2x4 | 39,375 | 40,603 | 41,323 | 32,456 | 32,866 | 26,445 | 26,697 | 21,921 | 22,083 | 18,444 | 18,555 |
| | 7-2x4 | 45,938 | 47,370 | 48,210 | 37,865 | 38,344 | 30,853 | 31,146 | 25,574 | 25,764 | 21,518 | 21,647 |
| | 8-2x4 | 52,500 | 54,138 | 55,097 | 43,274 | 43,822 | 35,260 | 35,596 | 29,227 | 29,445 | 24,592 | 24,739 |
| | 9-2x4 | 59,063 | 60,905 | 61,984 | 48,684 | 49,299 | 39,668 | 40,045 | 32,881 | 33,125 | 27,666 | 27,832 |
| 6-Inch Wall | 1-2x6 | 10,313 | 21,013 | 22,543 | 17,969 | 18,879 | 15,279 | 15,831 | 13,019 | 13,368 | 11,160 | 11,390 |
| | 2-2x6 | 20,625 | 42,027 | 45,086 | 35,938 | 37,758 | 30,558 | 31,663 | 26,039 | 26,736 | 22,321 | 22,780 |
| | 3-2x6 | 30,938 | 63,040 | 67,629 | 53,907 | 56,637 | 45,837 | 47,494 | 39,058 | 40,105 | 33,481 | 34,170 |
| | 4-2x6 | 41,250 | 84,054 | 90,171 | 71,876 | 75,516 | 61,115 | 63,326 | 52,077 | 53,473 | 44,641 | 45,560 |
| | 5-2x6 | 51,563 | 105,067 | 112,714 | 89,845 | 94,395 | 76,394 | 79,157 | 65,097 | 66,841 | 55,802 | 56,950 |
| | 6-2x6 | 61,875 | 126,080 | 135,257 | 107,814 | 113,274 | 91,673 | 94,989 | 78,116 | 80,209 | 66,962 | 68,340 |
| | 7-2x6 | 72,188 | 147,094 | 157,800 | 125,783 | 132,153 | 106,952 | 110,820 | 91,135 | 93,578 | 78,123 | 79,730 |

1. See Compression Members: General Notes page 35 for additional information.
2. Shaded columns are limited by Parallel to Grain loads.

Refer to the ATS Selector software for alternate grade capacities.

# COMPRESSION MEMBER SELECTION

SIMPSON Strong-Tie®

### Column Perpendicular and Parallel to Grain Capacities for Spruce-Pine-Fir (Solid Lumber Sizes)

| Framing | Lumber Size (Each Side of ATS Rod) | Perp. To Grain, $P_{c\perp}$ | Parallel to Grain, $P_c$ Lbs. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plate Height (ft) | | | | | | | | | |
| | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) |
| 4-Inch Wall | 1-2x4 | 4,463 | 5,904 | 6,013 | 4,723 | 4,785 | 3,851 | 3,888 | 3,193 | 3,217 | 2,687 | 2,704 |
| | 1-3x4 | 7,438 | 9,840 | 10,021 | 7,872 | 7,975 | 6,418 | 6,481 | 5,321 | 5,362 | 4,479 | 4,506 |
| | 1-4x4 | 10,413 | 13,776 | 14,029 | 11,021 | 11,165 | 8,985 | 9,073 | 7,450 | 7,507 | 6,270 | 6,309 |
| | 2-3x4 | 14,875 | 19,680 | 20,042 | 15,744 | 15,950 | 12,835 | 12,961 | 10,643 | 10,725 | 8,957 | 9,012 |
| | 1-4x6 | 16,363 | 21,536 | 21,959 | 17,256 | 17,496 | 14,080 | 14,227 | 11,682 | 11,777 | 9,836 | 9,900 |
| | 1-4x8 | 21,569 | 28,226 | 28,818 | 22,654 | 22,990 | 18,504 | 18,709 | 15,363 | 15,496 | 12,942 | 13,031 |
| | 1-4x10 | 27,519 | 35,781 | 36,586 | 28,772 | 29,228 | 23,530 | 23,807 | 19,551 | 19,729 | 16,477 | 16,598 |
| | 2-4x6 | 32,725 | 43,073 | 43,917 | 34,511 | 34,991 | 28,161 | 28,454 | 23,365 | 23,554 | 19,672 | 19,801 |
| | 1-4x12 | 33,469 | 43,517 | 44,496 | 34,993 | 35,548 | 28,617 | 28,954 | 23,778 | 23,995 | 20,040 | 20,187 |
| | 2-4x8 | 43,138 | 56,452 | 57,636 | 45,308 | 45,979 | 37,009 | 37,418 | 30,727 | 30,991 | 25,883 | 26,062 |
| 6-Inch Wall | 1-2x6 | 7,013 | 18,173 | 19,546 | 15,592 | 16,415 | 13,289 | 13,789 | 11,341 | 11,657 | 9,732 | 9,940 |
| | 1-3x6 | 11,688 | 30,289 | 32,576 | 25,987 | 27,358 | 22,148 | 22,982 | 18,902 | 19,429 | 16,220 | 16,567 |
| | 1-4x6 | 15,428 | 39,981 | 43,001 | 34,303 | 36,112 | 29,235 | 30,337 | 24,950 | 25,646 | 21,410 | 21,868 |
| | 1-6x6 | 25,713 | 45,750 | 51,779 | 42,017 | 46,447 | 37,923 | 40,995 | 33,802 | 35,875 | 29,927 | 31,325 |
| | 1-6x8 | 33,894 | 60,307 | 68,254 | 55,386 | 61,226 | 49,990 | 54,039 | 44,557 | 47,290 | 39,449 | 41,293 |
| | 1-6x10 | 43,244 | 76,943 | 87,083 | 70,664 | 78,116 | 63,780 | 68,947 | 56,849 | 60,335 | 50,331 | 52,684 |
| | 1-6x12 | 52,594 | 93,579 | 105,912 | 85,943 | 95,006 | 77,571 | 83,854 | 69,140 | 73,380 | 61,214 | 64,075 |

### Column Perpendicular and Parallel to Grain Capacities for Spruce-Pine-Fir (Multiple 2x Sizes)

| Framing | Lumber Size (Each Side of ATS Rod) | Perp. To Grain, $P_{c\perp}$ | Parallel to Grain, $P_c$ Lbs. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plate Height (ft) | | | | | | | | | |
| | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) |
| 4-Inch Wall | 1-2x4 | 4,463 | 5,904 | 6,013 | 4,723 | 4,785 | 3,851 | 3,888 | 3,193 | 3,217 | 2,687 | 2,704 |
| | 2-2x4 | 8,925 | 11,808 | 12,025 | 9,446 | 9,570 | 7,701 | 7,777 | 6,386 | 6,435 | 5,374 | 5,407 |
| | 3-2x4 | 13,388 | 17,712 | 18,038 | 14,170 | 14,355 | 11,552 | 11,665 | 9,579 | 9,652 | 8,061 | 8,111 |
| | 4-2x4 | 17,850 | 23,615 | 24,050 | 18,893 | 19,141 | 15,402 | 15,554 | 12,771 | 12,869 | 10,749 | 10,815 |
| | 5-2x4 | 22,313 | 29,519 | 30,063 | 23,616 | 23,926 | 19,253 | 19,442 | 15,964 | 16,087 | 13,436 | 13,519 |
| | 6-2x4 | 26,775 | 35,423 | 36,075 | 28,339 | 28,711 | 23,103 | 23,331 | 19,157 | 19,304 | 16,123 | 16,222 |
| | 7-2x4 | 31,238 | 41,327 | 42,088 | 33,063 | 33,496 | 26,954 | 27,219 | 22,350 | 22,522 | 18,810 | 18,926 |
| | 8-2x4 | 35,700 | 47,231 | 48,100 | 37,786 | 38,281 | 30,804 | 31,108 | 25,543 | 25,739 | 21,497 | 21,630 |
| | 9-2x4 | 40,163 | 53,135 | 54,113 | 42,509 | 43,066 | 34,655 | 34,996 | 28,736 | 28,956 | 24,184 | 24,334 |
| 6-Inch Wall | 1-2x6 | 7,013 | 18,173 | 19,546 | 15,592 | 16,415 | 13,289 | 13,789 | 11,341 | 11,657 | 9,732 | 9,940 |
| | 2-2x6 | 14,025 | 36,346 | 39,092 | 31,184 | 32,829 | 26,577 | 27,579 | 22,682 | 23,315 | 19,464 | 19,880 |
| | 3-2x6 | 21,038 | 54,519 | 58,638 | 46,776 | 49,244 | 39,866 | 41,368 | 34,023 | 34,972 | 29,196 | 29,820 |
| | 4-2x6 | 28,050 | 72,692 | 78,183 | 62,368 | 65,658 | 53,155 | 55,158 | 45,364 | 46,630 | 38,927 | 39,760 |
| | 5-2x6 | 35,063 | 90,866 | 97,729 | 77,960 | 82,073 | 66,443 | 68,947 | 56,705 | 58,287 | 48,659 | 49,700 |
| | 6-2x6 | 42,075 | 109,039 | 117,275 | 93,553 | 98,488 | 79,732 | 82,737 | 68,046 | 69,945 | 58,391 | 59,640 |
| | 7-2x6 | 49,088 | 127,212 | 136,821 | 109,145 | 114,902 | 93,021 | 96,526 | 79,387 | 81,602 | 68,123 | 69,580 |

1. See Compression Members: General Notes page 35 for additional information.
2. Shaded columns are limited by Parallel to Grain loads.

Refer to the ATS Selector software for alternate grade capacities.

# COMPRESSION MEMBER SELECTION

SIMPSON Strong-Tie®

## Column Perpendicular and Parallel to Grain Capacities for Hem-Fir (Solid Lumber Sizes)

| Framing | Lumber Size (Each Side of ATS Rod) | Perp. To Grain, $P_{c\perp}$ | Parallel to Grain, $P_c$ Lbs. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plate Height (ft) | | | | | | | | | |
| | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) |
| 4-Inch Wall | 1-2x4 | 4,253 | 5,589 | 5,667 | 4,447 | 4,492 | 3,613 | 3,640 | 2,989 | 3,007 | 2,512 | 2,524 |
| | 1-3x4 | 7,088 | 9,315 | 9,445 | 7,411 | 7,486 | 6,021 | 6,067 | 4,981 | 5,012 | 4,186 | 4,206 |
| | 1-4x4 | 9,923 | 14,902 | 15,143 | 11,889 | 12,027 | 9,676 | 9,761 | 8,014 | 8,069 | 6,740 | 6,777 |
| | 2-3x4 | 14,175 | 18,629 | 18,890 | 14,822 | 14,972 | 12,042 | 12,135 | 9,963 | 10,023 | 8,372 | 8,413 |
| | 1-4x6 | 15,593 | 23,312 | 23,714 | 18,623 | 18,852 | 15,168 | 15,309 | 12,570 | 12,661 | 10,575 | 10,636 |
| | 1-4x8 | 20,554 | 30,575 | 31,137 | 24,460 | 24,781 | 19,941 | 20,137 | 16,535 | 16,662 | 13,916 | 14,002 |
| | 1-4x10 | 26,224 | 38,789 | 39,554 | 31,083 | 31,518 | 25,366 | 25,631 | 21,047 | 21,219 | 17,722 | 17,838 |
| | 2-4x6 | 31,185 | 46,624 | 47,427 | 37,245 | 37,704 | 30,336 | 30,618 | 25,140 | 25,322 | 21,149 | 21,273 |
| | 1-4x12 | 31,894 | 47,176 | 48,106 | 37,804 | 38,333 | 30,850 | 31,173 | 25,598 | 25,806 | 21,553 | 21,694 |
| | 2-4x8 | 41,108 | 61,150 | 62,275 | 48,921 | 49,561 | 39,882 | 40,274 | 33,069 | 33,323 | 27,832 | 28,003 |
| 6-Inch Wall | 1-2x6 | 6,683 | 18,224 | 19,260 | 15,286 | 15,882 | 12,831 | 13,189 | 10,841 | 11,068 | 9,241 | 9,391 |
| | 1-3x6 | 11,138 | 30,373 | 32,100 | 25,476 | 26,470 | 21,385 | 21,982 | 18,069 | 18,446 | 15,402 | 15,651 |
| | 1-4x6 | 14,702 | 44,506 | 47,461 | 37,765 | 39,498 | 31,942 | 32,989 | 27,124 | 27,784 | 23,197 | 23,632 |
| | 1-6x6 | 24,503 | 52,081 | 57,878 | 46,660 | 50,567 | 41,137 | 43,673 | 35,968 | 37,613 | 31,388 | 32,476 |
| | 1-6x8 | 32,299 | 68,652 | 76,293 | 61,506 | 66,656 | 54,226 | 57,569 | 47,413 | 49,581 | 41,375 | 42,810 |
| | 1-6x10 | 41,209 | 87,590 | 97,340 | 78,473 | 85,044 | 69,185 | 73,450 | 60,492 | 63,258 | 52,788 | 54,619 |
| | 1-6x12 | 50,119 | 106,529 | 118,386 | 95,440 | 103,432 | 84,144 | 89,331 | 73,572 | 76,936 | 64,202 | 66,429 |

## Column Perpendicular and Parallel to Grain Capacities for Hem-Fir (Multiple 2x Sizes)

| Framing | Lumber Size (Each Side of ATS Rod) | Perp. To Grain, $P_{c\perp}$ | Parallel to Grain, $P_c$ Lbs. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plate Height (ft) | | | | | | | | | |
| | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) |
| 4-Inch Wall | 1-2x4 | 4,253 | 5,589 | 5,667 | 4,447 | 4,492 | 3,613 | 3,640 | 2,989 | 3,007 | 2,512 | 2,524 |
| | 2-2x4 | 8,505 | 11,178 | 11,334 | 8,893 | 8,983 | 7,225 | 7,281 | 5,978 | 6,014 | 5,023 | 5,048 |
| | 3-2x4 | 12,758 | 16,766 | 17,001 | 13,340 | 13,475 | 10,838 | 10,921 | 8,967 | 9,021 | 7,535 | 7,571 |
| | 4-2x4 | 17,010 | 22,355 | 22,668 | 17,786 | 17,967 | 14,451 | 14,562 | 11,955 | 12,028 | 10,046 | 10,095 |
| | 5-2x4 | 21,263 | 27,944 | 28,335 | 22,233 | 22,458 | 18,063 | 18,202 | 14,944 | 15,035 | 12,558 | 12,619 |
| | 6-2x4 | 25,515 | 33,533 | 34,002 | 26,680 | 26,950 | 21,676 | 21,843 | 17,933 | 18,042 | 15,069 | 15,143 |
| | 7-2x4 | 29,768 | 39,121 | 39,670 | 31,126 | 31,441 | 25,289 | 25,483 | 20,922 | 21,049 | 17,581 | 17,667 |
| | 8-2x4 | 34,020 | 44,710 | 45,337 | 35,573 | 35,933 | 28,902 | 29,124 | 23,911 | 24,056 | 20,092 | 20,190 |
| | 9-2x4 | 38,273 | 50,299 | 51,004 | 40,019 | 40,425 | 32,514 | 32,764 | 26,900 | 27,062 | 22,604 | 22,714 |
| 6-Inch Wall | 1-2x6 | 6,683 | 18,224 | 19,260 | 15,286 | 15,882 | 12,831 | 13,189 | 10,841 | 11,068 | 9,241 | 9,391 |
| | 2-2x6 | 13,365 | 36,448 | 38,521 | 30,571 | 31,764 | 25,661 | 26,378 | 21,683 | 22,135 | 18,482 | 18,781 |
| | 3-2x6 | 20,048 | 54,672 | 57,781 | 45,857 | 47,646 | 38,492 | 39,568 | 32,524 | 33,203 | 27,723 | 28,172 |
| | 4-2x6 | 26,730 | 72,896 | 77,041 | 61,142 | 63,528 | 51,323 | 52,757 | 43,365 | 44,271 | 36,964 | 37,562 |
| | 5-2x6 | 33,413 | 91,120 | 96,301 | 76,428 | 79,410 | 64,154 | 65,946 | 54,206 | 55,338 | 46,205 | 46,953 |
| | 6-2x6 | 40,095 | 109,344 | 115,562 | 91,713 | 95,292 | 76,984 | 79,135 | 65,048 | 66,406 | 55,446 | 56,343 |
| | 7-2x6 | 46,778 | 127,568 | 134,822 | 106,999 | 111,174 | 89,815 | 92,325 | 75,889 | 77,473 | 64,687 | 65,734 |

1. See Compression Members: General Notes page 35 for additional information.
2. Shaded columns are limited by Parallel to Grain loads.

Refer to the ATS Selector software for alternate grade capacities.

# COMPRESSION MEMBER SELECTION

SIMPSON Strong-Tie®

## Column Perpendicular and Parallel to Grain Capacities for Southern Pine (Solid Lumber Sizes)

| Framing | Lumber Size (Each Side of ATS Rod) | Perp. To Grain, $P_{c\perp}$ | Parallel to Grain, $P_c$ Lbs. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plate Height (ft) | | | | | | | | | |
| | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) |
| 4-Inch Wall | 1-2x4 | 5,933 | 6,810 | 6,921 | 5,434 | 5,497 | 4,422 | 4,461 | 3,663 | 3,688 | 3,081 | 3,098 |
| | 1-3x4 | 9,888 | 11,350 | 11,535 | 9,056 | 9,162 | 7,371 | 7,436 | 6,105 | 6,147 | 5,134 | 5,163 |
| | 1-4x4 | 13,843 | 16,970 | 17,226 | 13,520 | 13,667 | 10,994 | 11,085 | 9,101 | 9,160 | 7,650 | 7,690 |
| | 2-3x4 | 19,775 | 22,700 | 23,069 | 18,112 | 18,323 | 14,741 | 14,871 | 12,210 | 12,294 | 10,268 | 10,326 |
| | 1-4x6 | 21,753 | 26,526 | 26,958 | 21,166 | 21,413 | 17,227 | 17,379 | 14,270 | 14,368 | 12,001 | 12,067 |
| | 1-4x8 | 28,674 | 34,753 | 35,369 | 27,780 | 28,131 | 22,635 | 22,850 | 18,762 | 18,901 | 15,787 | 15,881 |
| | 1-4x10 | 36,584 | 44,190 | 45,008 | 35,358 | 35,823 | 28,827 | 29,112 | 23,904 | 24,089 | 20,119 | 20,244 |
| | 2-4x6 | 43,505 | 53,051 | 53,917 | 42,332 | 42,827 | 34,455 | 34,759 | 28,539 | 28,736 | 24,001 | 24,135 |
| | 1-4x12 | 44,494 | 53,745 | 54,739 | 43,003 | 43,569 | 35,060 | 35,406 | 29,073 | 29,297 | 24,469 | 24,621 |
| | 2-4x8 | 57,348 | 69,507 | 70,738 | 55,559 | 56,261 | 45,270 | 45,700 | 37,524 | 37,803 | 31,573 | 31,762 |
| 6-Inch Wall | 1-2x6 | 9,323 | 21,664 | 23,081 | 18,361 | 19,191 | 15,518 | 16,019 | 13,171 | 13,487 | 11,260 | 11,468 |
| | 1-3x6 | 15,538 | 36,106 | 38,469 | 30,602 | 31,984 | 25,864 | 26,698 | 21,951 | 22,478 | 18,766 | 19,114 |
| | 1-4x6 | 20,510 | 51,202 | 54,414 | 43,254 | 45,123 | 36,477 | 37,603 | 30,914 | 31,625 | 26,404 | 26,873 |
| | 1-6x6 | 22,688 | 53,586 | 60,535 | 49,088 | 54,147 | 44,192 | 47,672 | 39,302 | 41,637 | 34,735 | 36,307 |
| | 1-6x8 | 29,906 | 70,636 | 79,796 | 64,707 | 71,376 | 58,253 | 62,840 | 51,807 | 54,886 | 45,787 | 47,859 |
| | 1-6x10 | 38,156 | 90,122 | 101,809 | 82,557 | 91,066 | 74,323 | 80,176 | 66,098 | 70,027 | 58,418 | 61,061 |
| | 1-6x12 | 46,406 | 109,608 | 123,822 | 100,408 | 110,756 | 90,393 | 97,511 | 80,390 | 85,167 | 71,049 | 74,264 |

## Column Perpendicular and Parallel to Grain Capacities for Southern Pine (Multiple 2x Sizes)

| Framing | Lumber Size (Each Side of ATS Rod) | Perp. To Grain, $P_{c\perp}$ | Parallel to Grain, $P_c$ Lbs. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plate Height (ft) | | | | | | | | | |
| | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) |
| 4-Inch Wall | 1-2x4 | 5,933 | 6,810 | 6,921 | 5,434 | 5,497 | 4,422 | 4,461 | 3,663 | 3,688 | 3,081 | 3,098 |
| | 2-2x4 | 11,865 | 13,620 | 13,842 | 10,867 | 10,994 | 8,845 | 8,923 | 7,326 | 7,377 | 6,161 | 6,195 |
| | 3-2x4 | 17,798 | 20,430 | 20,762 | 16,301 | 16,491 | 13,267 | 13,384 | 10,989 | 11,065 | 9,242 | 9,293 |
| | 4-2x4 | 23,730 | 27,240 | 27,683 | 21,734 | 21,988 | 17,690 | 17,845 | 14,652 | 14,753 | 12,322 | 12,391 |
| | 5-2x4 | 29,663 | 34,050 | 34,604 | 27,168 | 27,485 | 22,112 | 22,307 | 18,315 | 18,442 | 15,403 | 15,488 |
| | 6-2x4 | 35,595 | 40,860 | 41,525 | 32,602 | 32,982 | 26,534 | 26,768 | 21,978 | 22,130 | 18,483 | 18,586 |
| | 7-2x4 | 41,528 | 47,670 | 48,445 | 38,035 | 38,479 | 30,957 | 31,229 | 25,641 | 25,818 | 21,564 | 21,684 |
| | 8-2x4 | 47,460 | 54,480 | 55,366 | 43,469 | 43,976 | 35,379 | 35,691 | 29,304 | 29,506 | 24,644 | 24,781 |
| | 9-2x4 | 53,393 | 61,289 | 62,287 | 48,902 | 49,473 | 39,802 | 40,152 | 32,967 | 33,195 | 27,725 | 27,879 |
| 6-Inch Wall | 1-2x6 | 9,323 | 21,664 | 23,081 | 18,361 | 19,191 | 15,518 | 16,019 | 13,171 | 13,487 | 11,260 | 11,468 |
| | 2-2x6 | 18,645 | 43,327 | 46,163 | 36,722 | 38,381 | 31,036 | 32,038 | 26,341 | 26,973 | 22,520 | 22,936 |
| | 3-2x6 | 27,968 | 64,991 | 69,244 | 55,083 | 57,572 | 46,554 | 48,057 | 39,512 | 40,460 | 33,779 | 34,404 |
| | 4-2x6 | 37,290 | 86,654 | 92,326 | 73,444 | 76,763 | 62,073 | 64,076 | 52,682 | 53,946 | 45,039 | 45,872 |
| | 5-2x6 | 46,613 | 108,318 | 115,407 | 91,805 | 95,953 | 77,591 | 80,095 | 65,853 | 67,433 | 56,299 | 57,341 |
| | 6-2x6 | 55,935 | 129,982 | 138,489 | 110,166 | 115,144 | 93,109 | 96,114 | 79,023 | 80,919 | 67,559 | 68,809 |
| | 7-2x6 | 65,258 | 151,645 | 161,570 | 128,527 | 134,334 | 108,627 | 112,132 | 92,194 | 94,406 | 78,819 | 80,277 |

1. See Compression Members: General Notes page 35 for additional information.
2. Shaded columns are limited by Parallel to Grain loads.

Refer to the ATS Selector software for alternate grade capacities.

# COMPRESSION MEMBER SELECTION

SIMPSON Strong-Tie®

### Column Perpendicular and Parallel to Grain Capacities for Parallam (PSL) with Douglas Fir Sill Plate

| Framing | Lumber Size (Each Side of ATS Rod) | Perp. To Grain, $P_{c\perp}$ | Parallel to Grain, $P_c$ Lbs. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plate Height (ft) | | | | | | | | | |
| | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) |
| 4-Inch Wall | 1-3 1/2x3 1/2 | 15,313 | 26,249 | 26,513 | 20,779 | 20,922 | 16,819 | 16,904 | 13,876 | 13,930 | 11,636 | 11,672 |
| | 1-3 1/2x5 1/4 | 22,969 | 39,373 | 39,770 | 31,168 | 31,383 | 25,229 | 25,357 | 20,815 | 20,896 | 17,454 | 17,508 |
| | 1-3 1/2x7 | 30,625 | 52,498 | 53,027 | 41,558 | 41,845 | 33,638 | 33,809 | 27,753 | 27,861 | 23,272 | 23,344 |
| 6-Inch Wall | 1-5 1/4x3 1/2 | 22,969 | 78,618 | 82,323 | 65,105 | 66,934 | 53,972 | 54,960 | 45,149 | 45,729 | 38,189 | 38,555 |
| | 1-5 1/4x5 1/4 | 34,453 | 117,926 | 123,484 | 97,657 | 100,401 | 80,957 | 82,439 | 67,723 | 68,594 | 57,284 | 57,832 |
| | 1-5 1/4x7 | 45,938 | 157,235 | 164,646 | 130,210 | 133,868 | 107,943 | 109,919 | 90,297 | 91,459 | 76,378 | 77,109 |

### Column Perpendicular and Parallel to Grain Capacities for Parallam (PSL) with Southern Pine Sill Plate

| Framing | Lumber Size (Each Side of ATS Rod) | Perp. To Grain, $P_{c\perp}$ | Parallel to Grain, $P_c$ Lbs. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plate Height (ft) | | | | | | | | | |
| | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) |
| 4-Inch Wall | 1-3 1/2x3 1/2 | 13,843 | 26,249 | 26,513 | 20,779 | 20,922 | 16,819 | 16,904 | 13,876 | 13,930 | 11,636 | 11,672 |
| | 1-3 1/2x5 1/4 | 20,764 | 39,373 | 39,770 | 31,168 | 31,383 | 25,229 | 25,357 | 20,815 | 20,896 | 17,454 | 17,508 |
| | 1-3 1/2x7 | 27,685 | 52,498 | 53,027 | 41,558 | 41,845 | 33,638 | 33,809 | 27,753 | 27,861 | 23,272 | 23,344 |
| 6-Inch Wall | 1-5 1/4x3 1/2 | 20,764 | 78,618 | 82,323 | 65,105 | 66,934 | 53,972 | 54,960 | 45,149 | 45,729 | 38,189 | 38,555 |
| | 1-5 1/4x5 1/4 | 31,146 | 117,926 | 123,484 | 97,657 | 100,401 | 80,957 | 82,439 | 67,723 | 68,594 | 57,284 | 57,832 |
| | 1-5 1/4x7 | 41,528 | 157,235 | 164,646 | 130,210 | 133,868 | 107,943 | 109,919 | 90,297 | 91,459 | 76,378 | 77,109 |

1. See Compression Members: General Notes page 35 for additional information.
2. PSL Grade = 1.8E with Fc=2500 psi.
3. $F_{c\ perp}$=565 psi for Southern Pine and $F_{c\ perp}$=625 psi for Douglas-Fir Larch
4. Shaded columns are limited by Parallel to Grain loads.

Refer to the ATS Selector software for alternate grade capacities.

# COMPRESSION MEMBER SELECTION

SIMPSON Strong-Tie®

### Column Perpendicular and Parallel to Grain Capacities for Timberstrand (LSL) with Douglas Fir Larch Sill Plate

| Framing | Lumber Size (Each Side of ATS Rod) | Perp. To Grain, $P_{c\perp}$ | Parallel to Grain, $P_c$ Lbs. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plate Height (ft) | | | | | | | | | |
| | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) |
| 4-Inch Wall | 1-3 1/2x3 1/2 | 15,313 | 18,582 | 18,870 | 14,809 | 14,960 | 12,032 | 12,120 | 9,950 | 10,005 | 8,356 | 8,392 |
| | 1-3 1/2x5 1/4 | 22,969 | 27,872 | 28,305 | 22,213 | 22,440 | 18,048 | 18,180 | 14,925 | 15,007 | 12,534 | 12,588 |
| | 1-3 1/2x7 | 30,625 | 37,163 | 37,740 | 29,618 | 29,920 | 24,064 | 24,239 | 19,900 | 20,009 | 16,713 | 16,784 |
| 6-Inch Wall | 1-5 1/4x3 1/2 | 22,969 | 51,443 | 55,521 | 44,270 | 46,392 | 37,512 | 38,644 | 31,766 | 32,413 | 27,064 | 27,460 |
| | 1-5 1/4x5 1/4 | 34,453 | 77,164 | 83,281 | 66,405 | 69,588 | 56,268 | 57,966 | 47,649 | 48,619 | 40,596 | 41,191 |
| | 1-5 1/4x7 | 45,938 | 102,886 | 111,041 | 88,540 | 92,784 | 75,024 | 77,288 | 63,532 | 64,826 | 54,128 | 54,921 |

### Column Perpendicular and Parallel to Grain Capacities for Timberstrand (LSL) with Southern Pine Sill Plate

| Framing | Lumber Size (Each Side of ATS Rod) | Perp. To Grain, $P_{c\perp}$ | Parallel to Grain, $P_c$ Lbs. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Plate Height (ft) | | | | | | | | | |
| | | | 8 | | 9 | | 10 | | 11 | | 12 | |
| | | | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) | (133) | (160) |
| 4-Inch Wall | 1-3 1/2x3 1/2 | 13,843 | 18,582 | 18,870 | 14,809 | 14,960 | 12,032 | 12,120 | 9,950 | 10,005 | 8,356 | 8,392 |
| | 1-3 1/2x5 1/4 | 20,764 | 27,872 | 28,305 | 22,213 | 22,440 | 18,048 | 18,180 | 14,925 | 15,007 | 12,534 | 12,588 |
| | 1-3 1/2x7 | 27,685 | 37,163 | 37,740 | 29,618 | 29,920 | 24,064 | 24,239 | 19,900 | 20,009 | 16,713 | 16,784 |
| 6-Inch Wall | 1-5 1/4x3 1/2 | 20,764 | 51,443 | 55,521 | 44,270 | 46,392 | 37,512 | 38,644 | 31,766 | 32,413 | 27,064 | 27,460 |
| | 1-5 1/4x5 1/4 | 31,146 | 77,164 | 83,281 | 66,405 | 69,588 | 56,268 | 57,966 | 47,649 | 48,619 | 40,596 | 41,191 |
| | 1-5 1/4x7 | 41,528 | 102,886 | 111,041 | 88,540 | 92,784 | 75,024 | 77,288 | 63,532 | 64,826 | 54,128 | 54,921 |

1. See Compression Members: General Notes page 35 for additional information.
2. LSL Grade = 1.3E with Fc=1400 psi.
3. $F_{c\ perp}$=565 psi for Southern Pine and $F_{c\ perp}$=625 psi for Douglas-Fir Larch
4. Shaded columns are limited by Parallel to Grain loads.

Refer to the ATS Selector software for alternate grade capacities.

# NOTES

# NOTES

NO-EQUAL pledge of performance

Every day we work hard to earn your business, blending the talents of our people with the quality of our products and services to exceed your expectations. This is our pledge to you.

### *Wood Construction Connectors*

Includes specifications and installation instructions on wood-to-wood and wood-to-concrete structural connectors. Includes load tables and material specifications.

### *Anchoring and Fastening Systems for Concrete and Masonry*

Includes application information, specifications and load values for adhesive and mechanical anchors, PAT and carbide drill bits. A binder version is also available.

### *High Wind-Resistant Structural Connectors*

For builders and homeowners on retrofitting and new construction in highwind areas.

### *Cold-Formed Steel Connectors*

30 products have been developed and tested using screw fasteners to obtain actual load values. This catalog includes installation requirements and illustrations.

### *Strong-Wall® Shearwalls*

All the information on our Strong-Wall shearwalls is now in one easy to use catalog: technical data, installation information, structural details and more. The catalog also features new solutions for two-story and balloon frame applications as well as an extensive section on braced frame requirements under the various building codes.

### *High Wind Framing Connection Guide*

Developed for designers and engineers as a companion to the AF & PA Wood Frame Construction Manual.

### *Code Compliant Repair and Protection Guide*

Developed for building professionals to help explain products and techniques related to the installation of utilities in wood frame construction.

### *Anchoring Solutions for Simpson Strong-Tie® Connectors*

Simpson Anchor Systems specifications with our connector line. It should be used in conjunction with the current connector and anchor systems catalogs.

### *Simpson's Free CD-ROM*

Our CD-ROM features our latest catalogs, fliers, technical bulletins, code reports, product list prices, UPC information, and the Simpson Connector Selector program. It also includes the Drawing Library.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