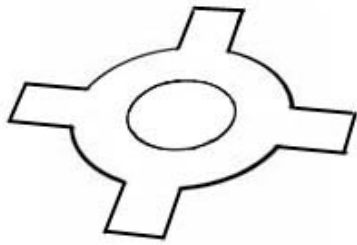
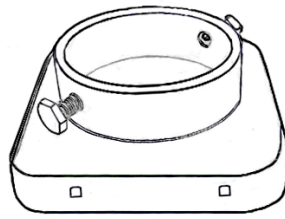


# STRUCTURAL PERGOLAS WITH COLUMNS

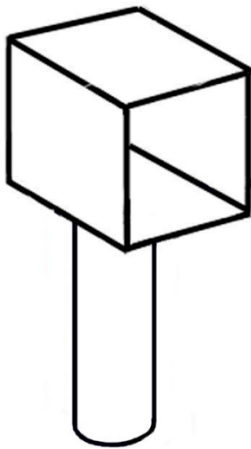
Featuring *THE STEEL INSERT SYSTEM*®



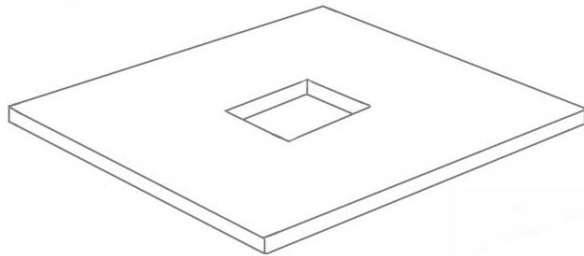
Post Adapter Plate



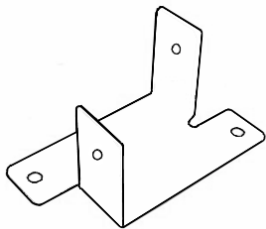
Post Adapter



Column Adapter



Adjustable PVC  
Column Cap



Powder Coated Steel  
Stringer Bracket



Stainless Steel  
Powder Coated Screw



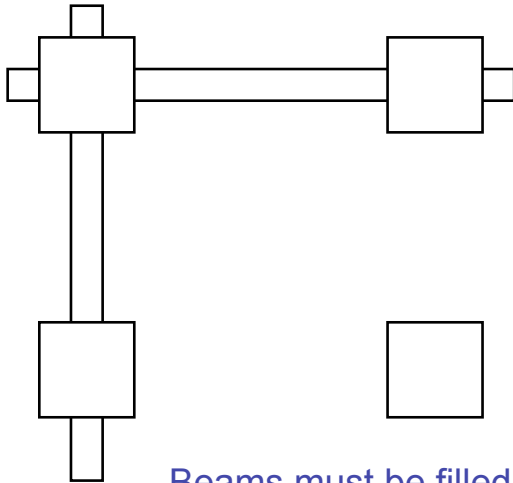
Pergola Caps

# STRUCTURAL PERGOLAS WITH COLUMNS

Featuring the **STEEL INSERT SYSTEM**®

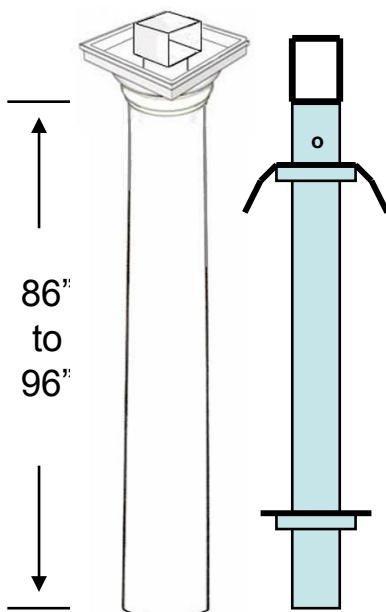
## Important information:

1. Placement of post holes.
2. Height of bottom beam.



Beams must be filled with aluminum or steel to maintain metal to metal connection.

1. **At least 3" of beam must protrude from column trim** (before cap is added). *For example:* If beam is 16' long, columns can be a **maximum** of 15'6" outside to outside. If it is shorter, beam can be trimmed. Post placement is critical to achieve structural integrity. These measurements may be adjusted. For best results, lay out footprint to ensure material fits correctly. **Read instructions thoroughly so important steps will not be omitted.**



2. Determine the height of your bottom beam (generally between 86" and 96"). **The steel post must be installed so the top of steel post is level with the top of the column.** Column Adapter inserts into steel post, is drilled and through bolted. The column is sleeved over the steel post. Top and bottom column trim pieces are installed next, followed by the Adjustable PVC Column Cap. The filled carrying beam rests on the Adjustable PVC Column Cap, then is through-bolted to the Column Adapter. The steel posts can be set higher and cut to fit if necessary. **3" or 4" 40wt galvanized pipe is recommended.**

Following steps 1&2 will ensure your pergola is structural and the material will fit correctly.

Determine post placement, dig holes (at least 3' deep) and set in concrete, or core drill into concrete pad (8" -12" recommended) and set with hydraulic cement, **following steps 1 & 2.** **3 or 4" 40wt galvanized pipe is recommended\***. Cross measure for square. Allow concrete to cure (typically 1 day). **Check posts for correct height before continuing.**

Remove set screws from Post Adapters, place Post Adapter Plates over Post Adapters. Re install set screws. Attach Post Adapter Plates to Post Adapters with 4 Tek Screws (*confirm plate placement only if using square columns – plates must be placed so tips fit square columns correctly*) (**Fig. 1**). Slide assembled Post Adapters over steel posts (2 per post) and set a maximum of 12" from top & bottom of posts. Tighten set screws and tek screw to posts (**Fig. 2**).

\* Modify adapters to fit into columns. **Top Post Adapter:** bend plate tips downward so column will fit snugly over adapters (**Fig. 3**). Do not over bend tips. **Bottom Post Adapter:** subtract outside diameter of post adapter top (A) from inside diameter of column bottom (B). Divide by two. This will be the distance from the top of post adapter the post plate tips will be cut. Mark and cut with band saw/jigsaw. **Alternate Method:** Measure and cut tips before attaching adapter to post. Dry fit cut adapter into column bottom to determine adapter placement on post (C). **Double check plate tip positions before sleeving column over posts.**

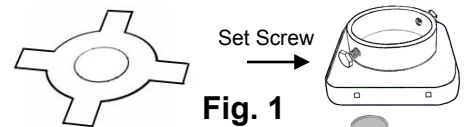
\* Determine height of steel post at this time. Steel post and column must be the same height. Bottom of carrying beam will be slightly above this height.

\* Column adapters fit inside of steel posts. Align to fit layout (**Fig. 3&4**). Drill pilot hole to secure column adapters to steel posts (either through bolt, tek screw or shear pin). **Double check adapter alignment before fastening. Adapter must be aligned so beams will run correctly.**

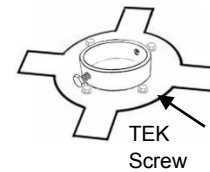
\* **Double check all adapters before installing columns. Columns will be very difficult to remove once installed.** Sleeve PVC columns over steel posts (**Fig.5**). Apply downward pressure so column will fit correctly. When column reached bottom adapter, adjust column so it fits over adapter and push down to ground level.

Column Post Adapter Plates

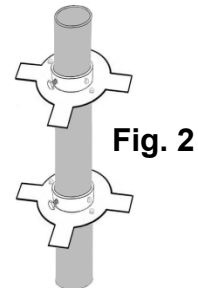
Post Adapters



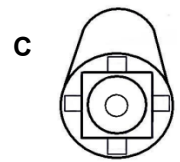
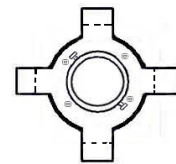
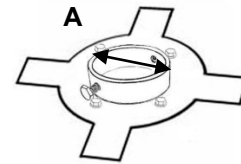
**Fig. 1**



TEK Screw

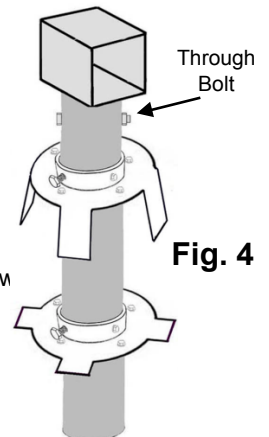
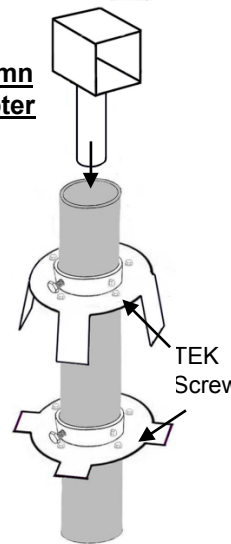


**Fig. 2**



Column Adapter

**Fig. 3**

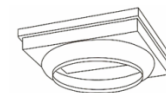


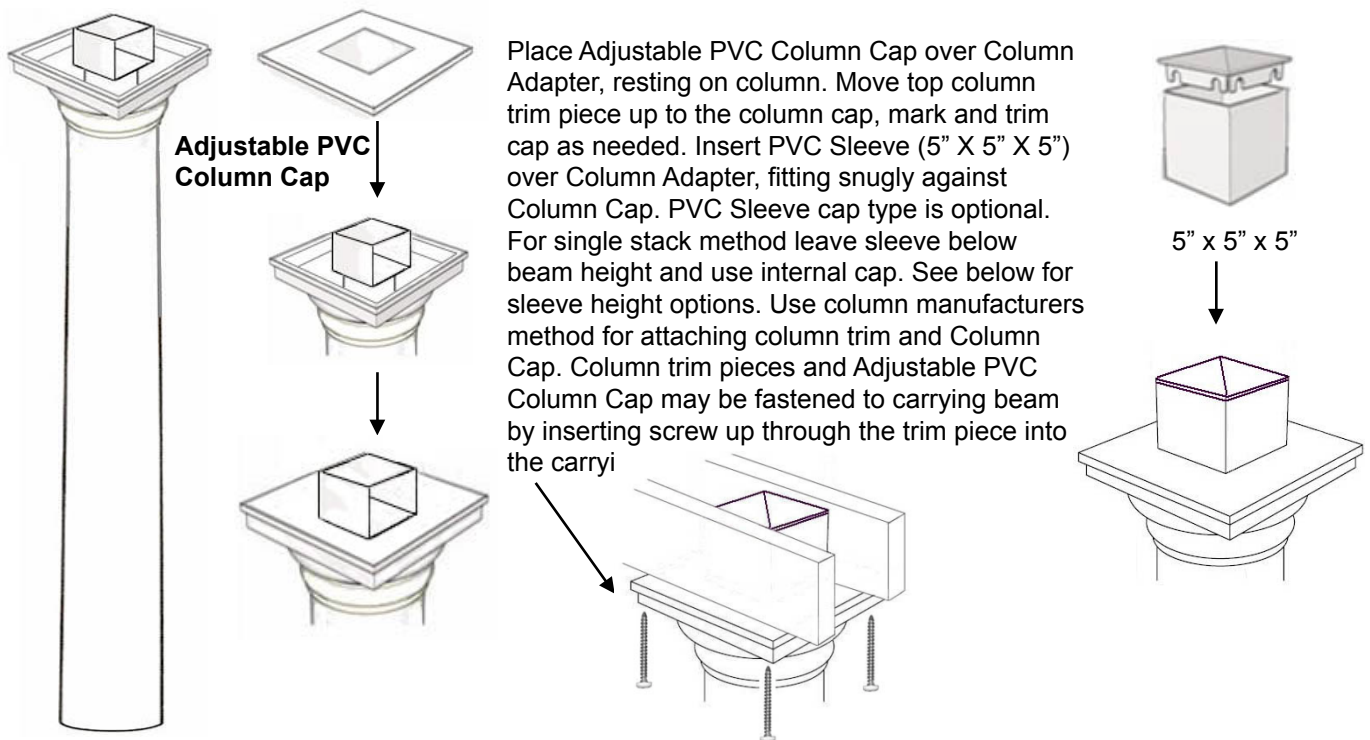
**Fig. 4**

**Fig. 5**



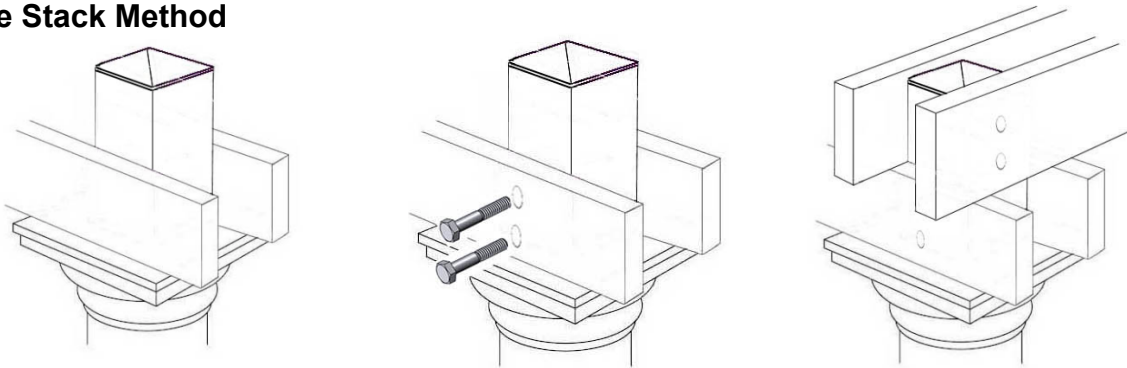
\* Place top and bottom column trim pieces over column. **They must be installed on the column before continuing.**



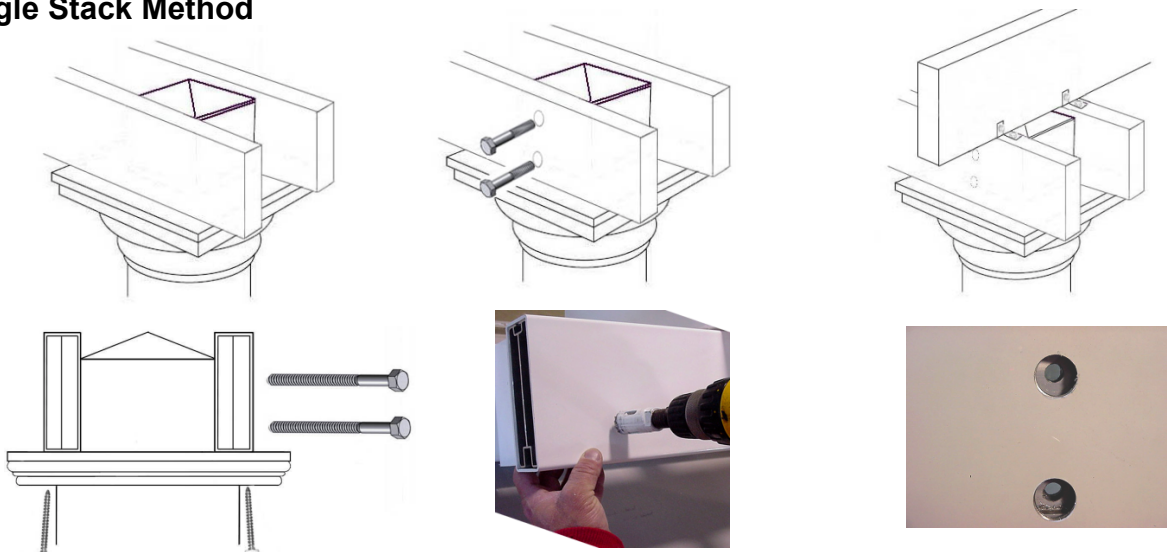


Begin placement of filled carrying beams. Ensure carrying beams extend beyond column trim equally. Dry fit beams, clamp in place. Mark and drill beams. Through bolt.

### Double Stack Method



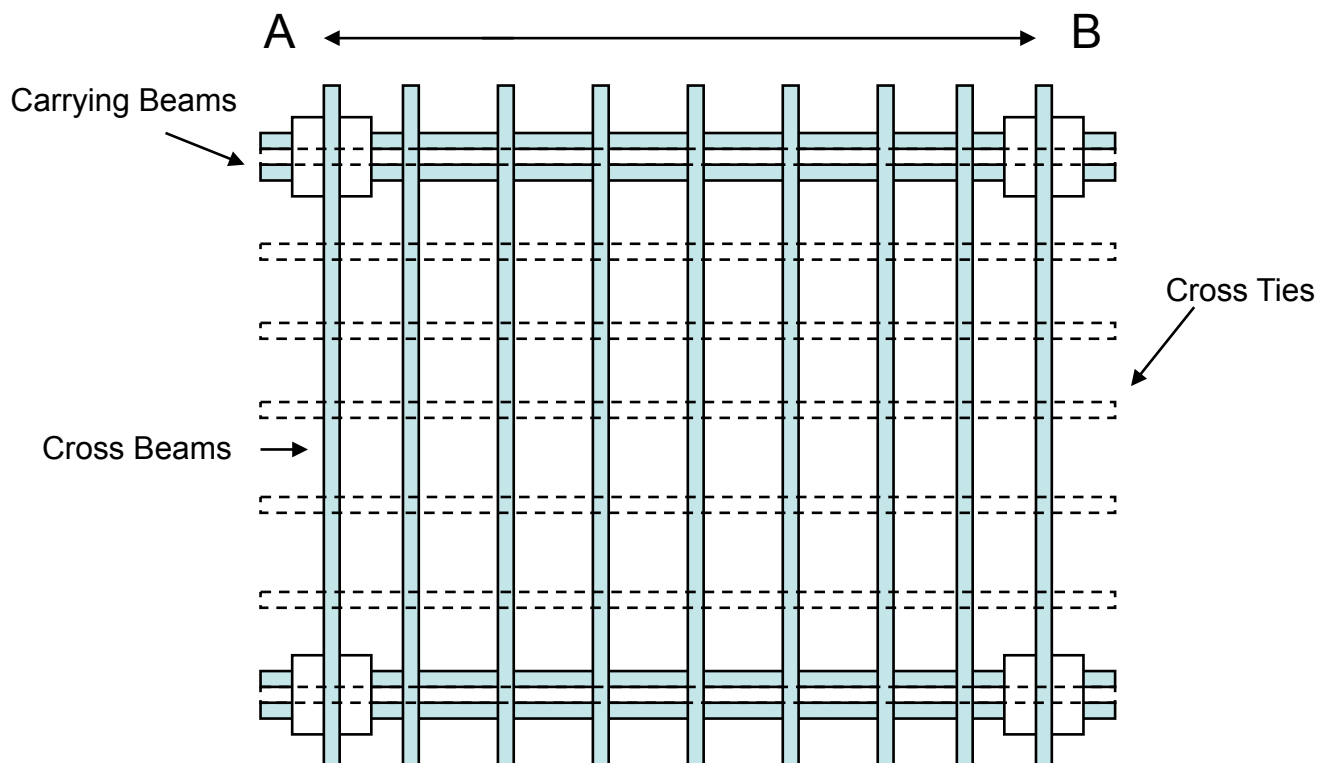
### Single Stack Method



Drill carrying beams, drill pilot hole through column adapters and through bolt beams to post.

Determine placement for remaining cross beams. For a **four post pergola\***, all cross beams must be filled. Measure bay (AB) and divide into equal increments. Place cross beams on carrying beams, fasten with 2" steel beam brackets

Determine placement for top cross ties using the same template. Cross ties may be 1 ½" square or 2" x 3 ½". Fasten to cross beams with steel beam brackets (1 ½" or 2"). Begin with cross tie directly above carrying beam. The end ties can be cut to fit between posts or routed into posts.



Beams must be filled with aluminum or steel to maintain metal to metal connection.

Attach all brackets. Install pergola caps. A small spot of glue on inside top and bottom of pergola cap is sufficient.

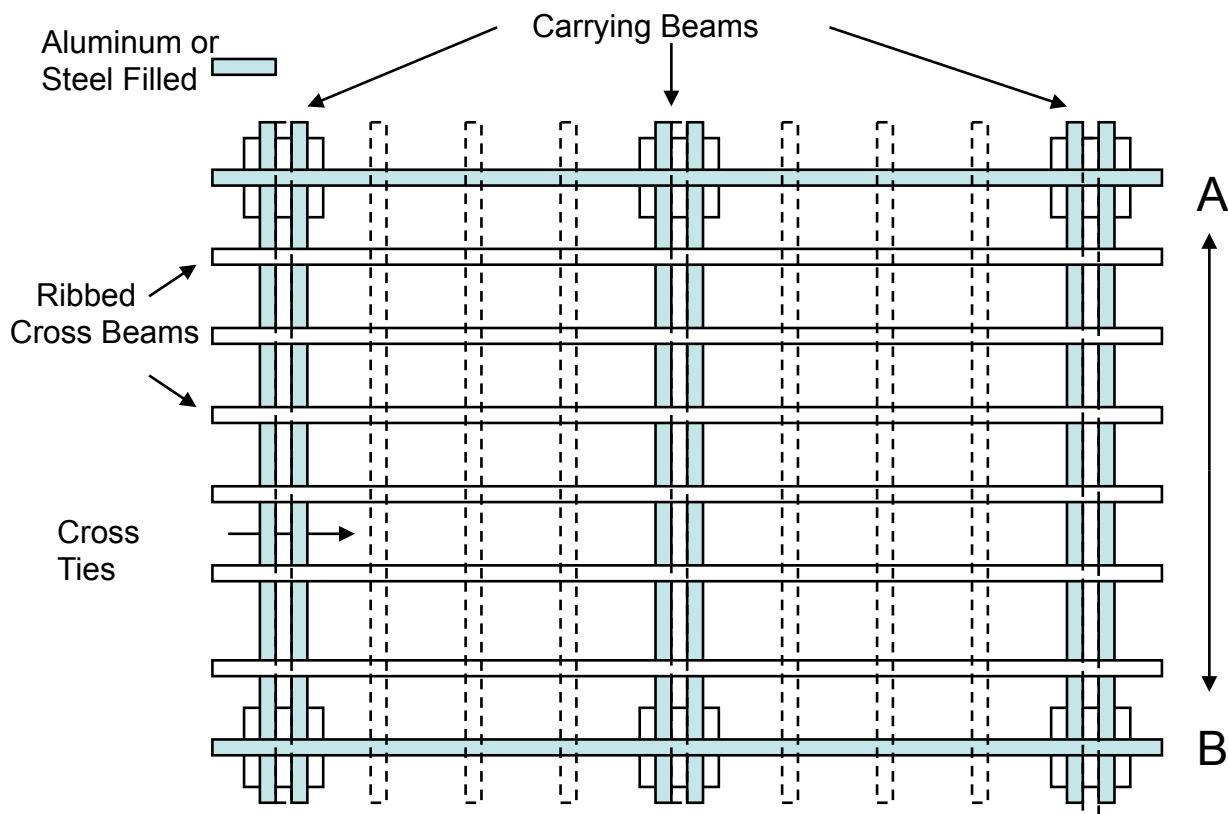
**\*Four post pergola- all beams are filled, OPTION: carrying beams and end cross beams are filled, remaining cross beams may be ribbed (without stiffeners) only if distance between carrying beams (AB) is 8' or less. If over 8', all beams must be filled.**

Determine placement for remaining cross beams. For a **six post pergola\***, end cross beams must be filled. Measure bay (AB) and divide into equal increments. Place ribbed cross beams on carrying beams, fasten with 2" steel beam brackets

Determine placement for top cross ties using the same template. Cross ties may be 1 ½" square or 2" x 3 ½". Fasten to cross beams with steel beam brackets (1 ½" or 2"). Begin with cross tie directly above carrying beam.

Beams must be filled with aluminum or steel to maintain metal to metal connection.

### Six Post Pergola with Ribbed Cross Beams



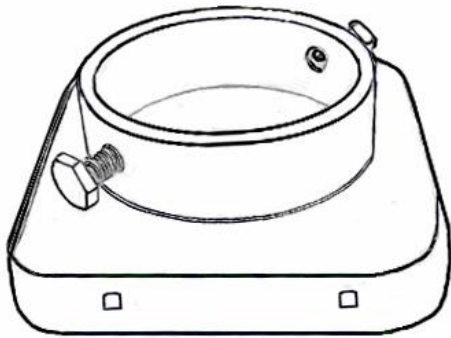
Attach all brackets. Install pergola caps. A small spot of glue on inside top and bottom of pergola cap is sufficient.

**\*Six post pergola- end and mid cross beams are filled, remaining cross beams may be ribbed (without stiffeners) only if distance between carrying beams (AB, BC) is 8' or less. If over 8', all beams must be filled).**

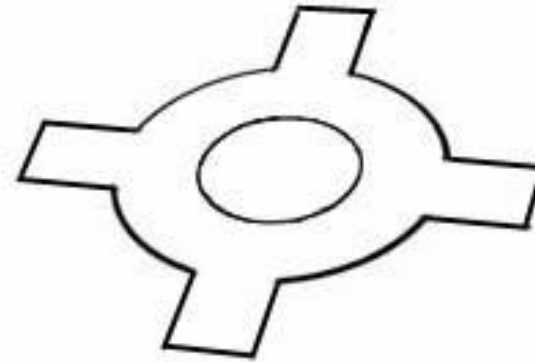


# STRUCTURAL PERGOLAS w ith COLUMNS

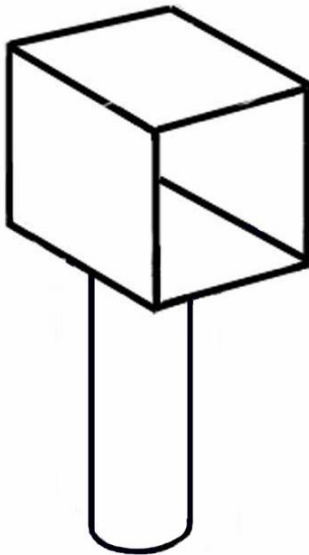
*Featuring THE STEEL INSERT SYSTEM<sup>®</sup>*



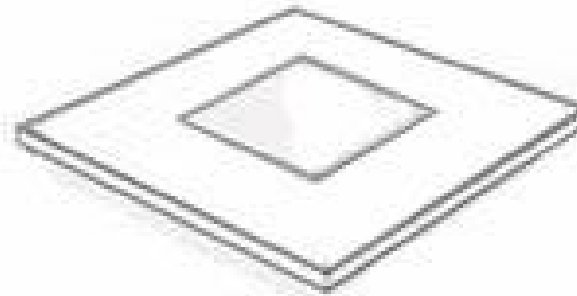
*Post Adapter*



*Post Adapter Plate*



*Column Adapter*



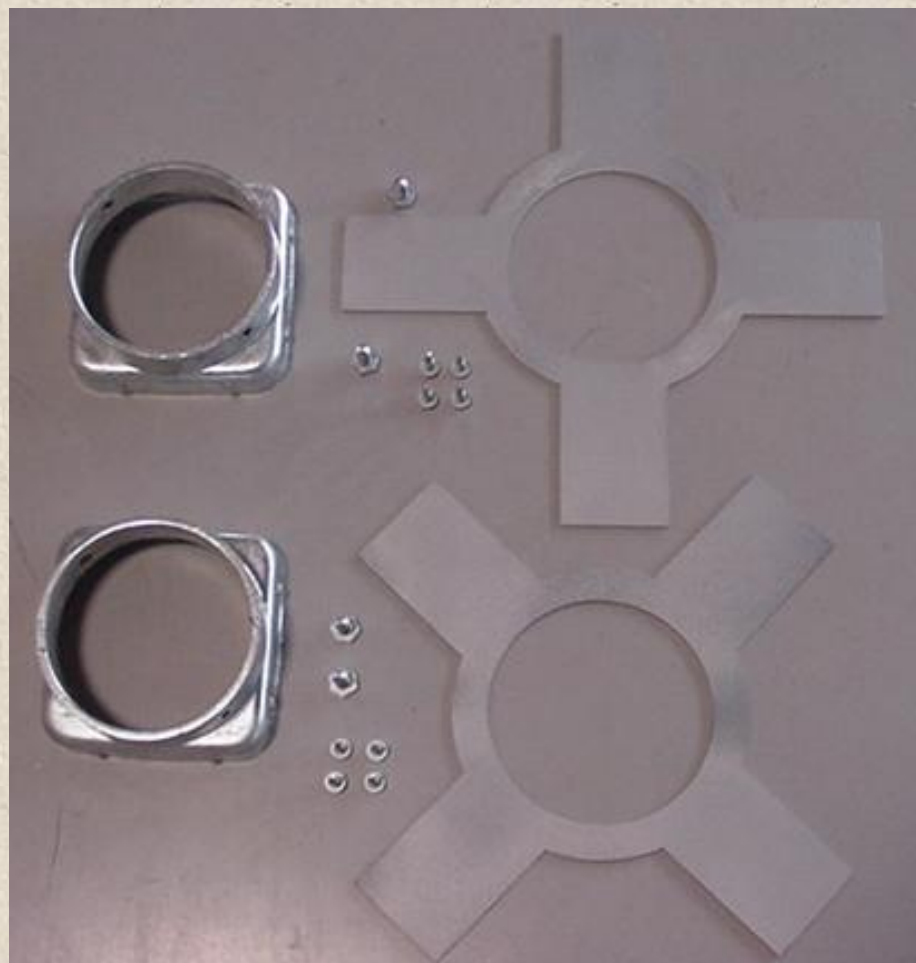
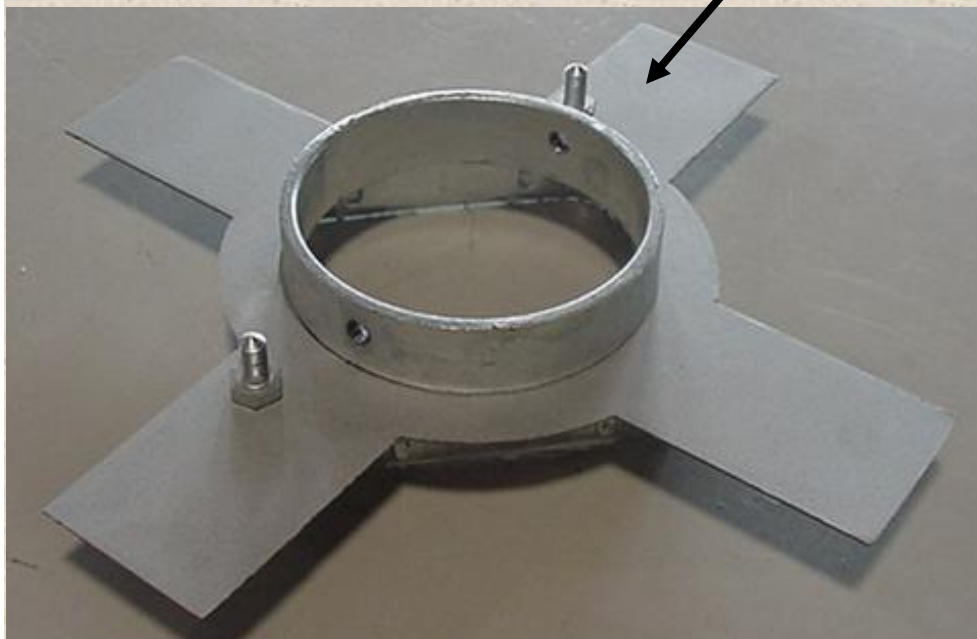
*Adjustable PVC  
Column Cap*



***This system is available for 3" or 4" steel pipe. 3" pipe is strong enough for most applications. 4" pipe is used for this project.***

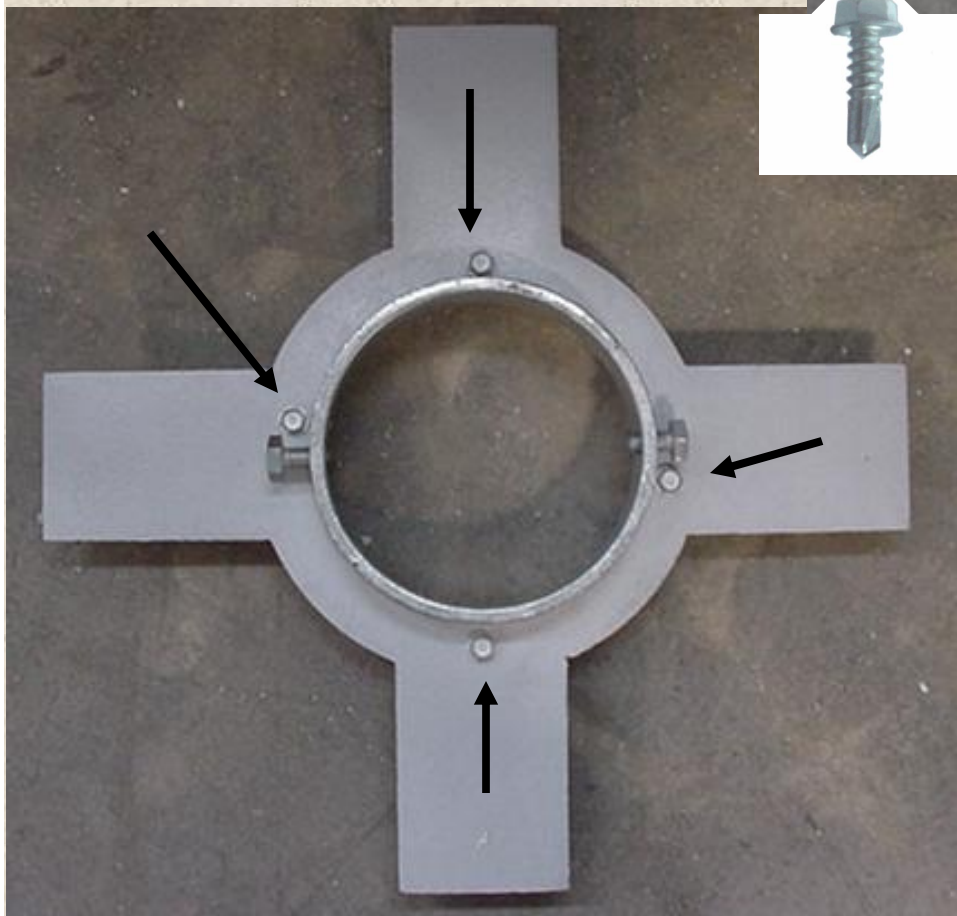
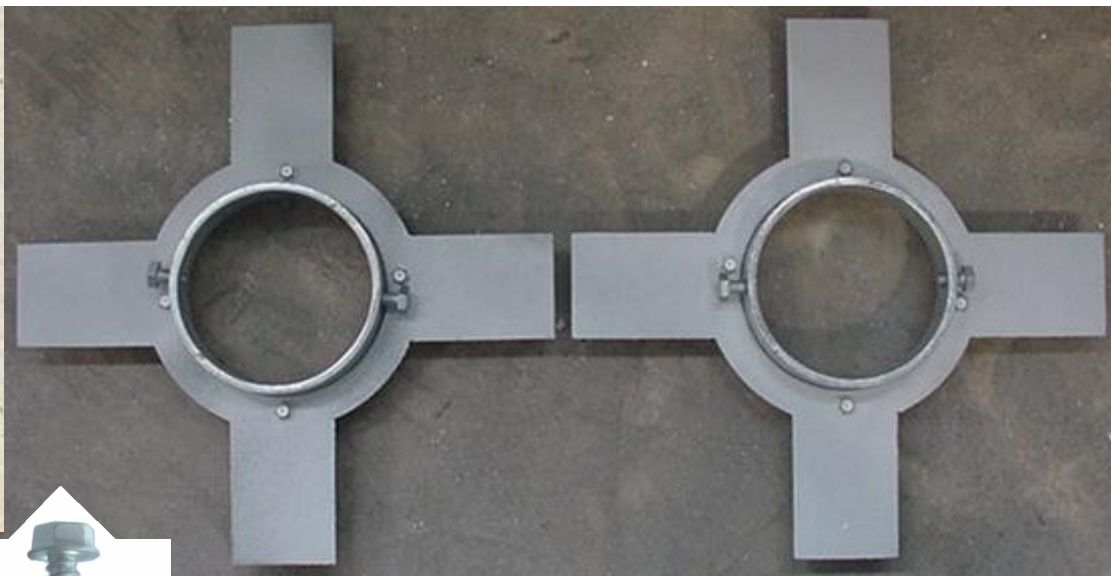
**Gather adapters and plates. Remove set screws from adapters, place plate over adapter, reinstall set screws.**

**Align plate so tabs are in line with set screws.**





**Using self tapping screws, attach plate to adapter, placing screws close to adapter base and just to one side of the set screws.**



**Set one adapter aside. Use remaining adapter to prepare for bottom installation.**





Measure inside  
diameter of  
column bottom  
and outside  
diameter of  
adapter.

**Subtract**  
diameter of  
adapter from  
column  
diameter,  
**divide** by 2 to  
determine plate  
tab length.

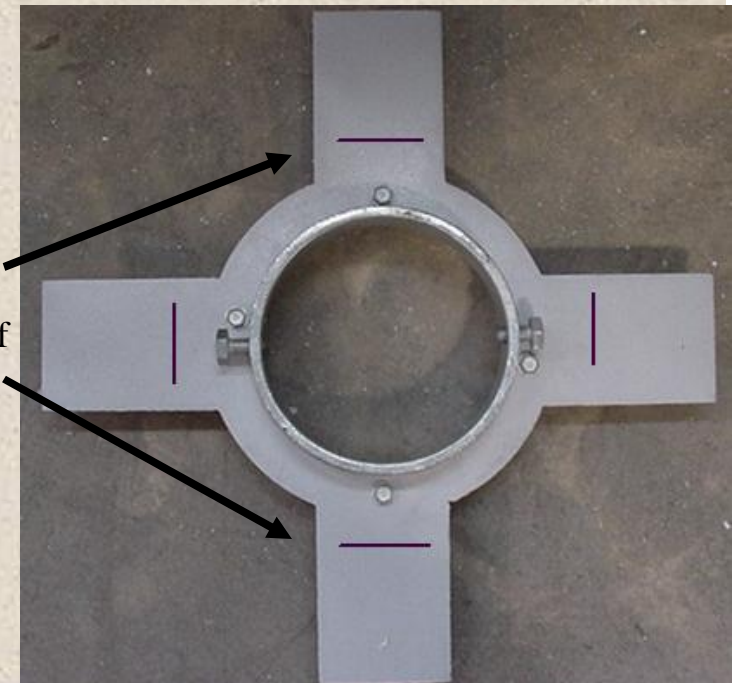


In this example:  
*column diameter* - 7 3/8  
*adapter diameter* - 4 3/8  
Total remaining - 3 0  
Divide by 2 = 1 1/2

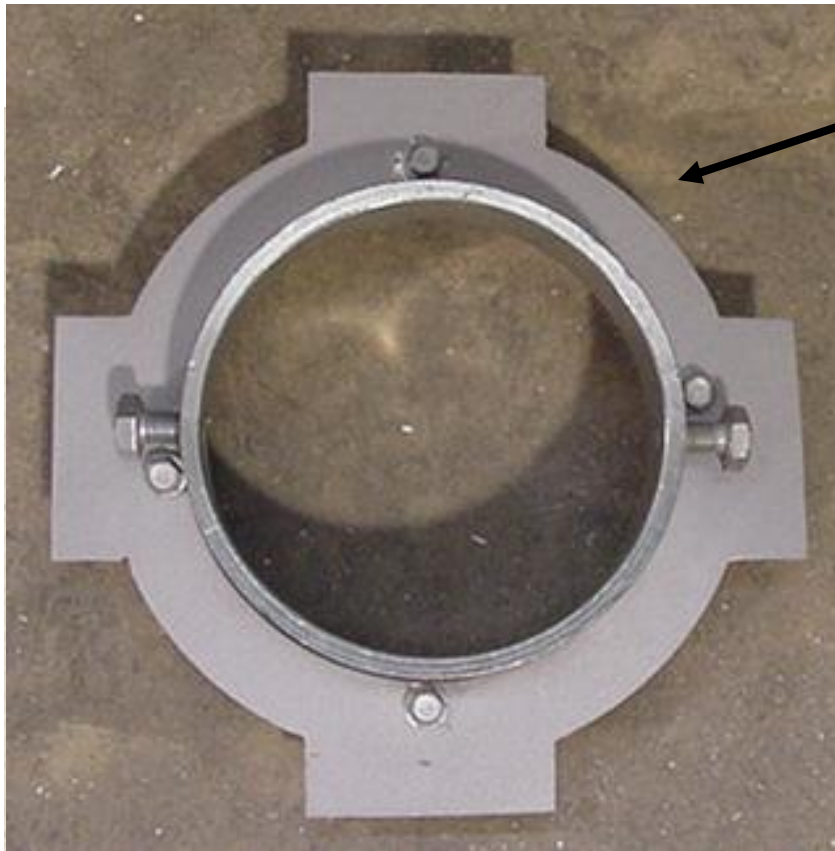
Measure and mark tabs  
1 1/2 inches from outside wall of  
adapter.

Carefully cut plate tabs  
with band saw/jigsaw.

Columns will differ in  
size so measure carefully.



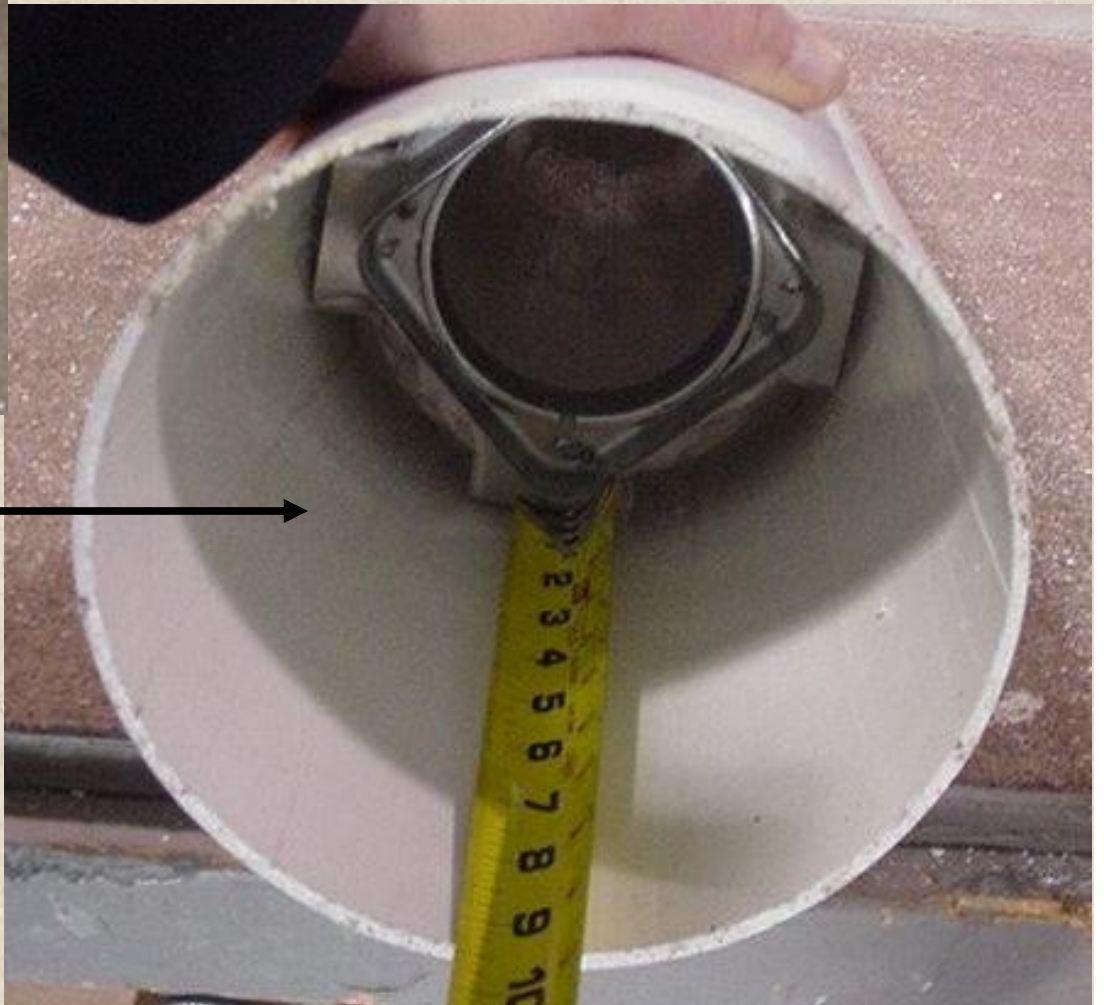




**Finished bottom column adapter.**

**Slide bottom adapter up inside column bottom until snug against column sides to establish finished adapter height. Trim if necessary. Measure distance. This will be where bottom adapter will be attached to the steel post.**

**For this example, the bottom adapter will be set 9 ½" up from ground level.**







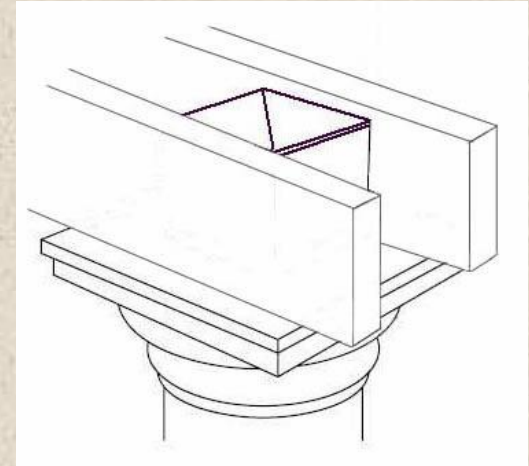
**Slide bottom adapter over steel post and set to correct height (example – 9 1/2"). Secure with set screws. Determine placement for top adapter (example – 16"), slide top adapter over steel post and secure with set screws. At this time, secure adapters to posts with Tek Screws.**







**Drill hole through steel post between 4" and 8" from the top. Insert column adapter into steel post. IMPORTANT: Before drilling through adapter, adapter MUST be aligned correctly. Carrying beam placement will be parallel to the closed sides of the adapters.** →



**When column adapter is aligned correctly, drill through adapter and through bolt.**







**Bend plate tabs downward to correspond with inside column diameter and the height of adapter.**

**Do not bend tabs too much. Leave tabs slightly larger than inside column diameter. This will allow column to fit snugly against post adapter.**





**IMPORTANT:** It is very important that the column is the same height as the steel post. Double check column and steel post heights before installing column. Place column over steel posts and lower onto post adapter. Push downward to make tabs bend inward to accept column. When column touches bottom post adapter, move column so it will fit over adapter correctly. Guide column the remaining distance to ground level.







**Place bottom trim over column, then set top trim in place. Trim placement varies according to column size, type and manufacturer.**



**This top trim was cut out to match adapter size.**







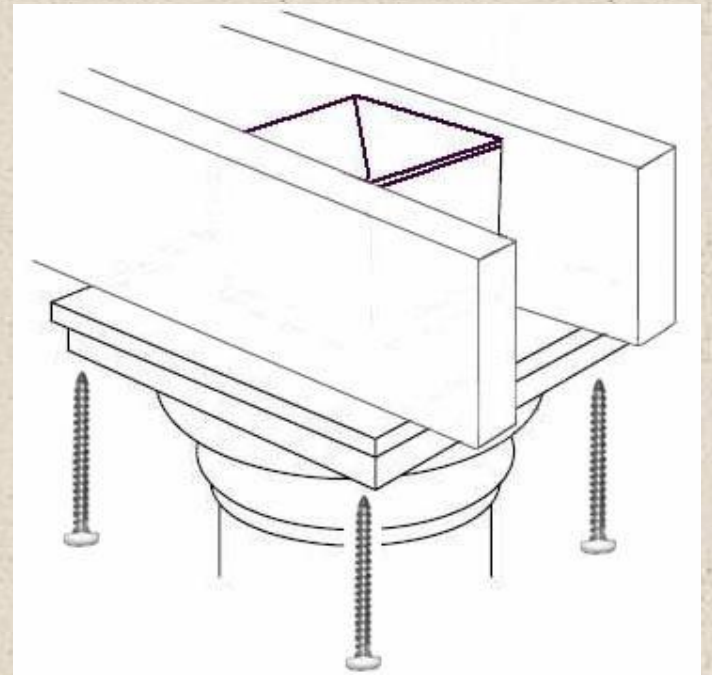
**Modify PVC  
column cap to  
fit top trim.  
Place over  
column  
adapter.**



**Place 5x5 PVC  
sleeve over  
column  
adapter, and  
add post cap.**

**Trim  
attachment  
depends on  
column  
manufacturer.**

***Preferred method:  
attach trim and PVC  
column cap to  
carrying beams.***

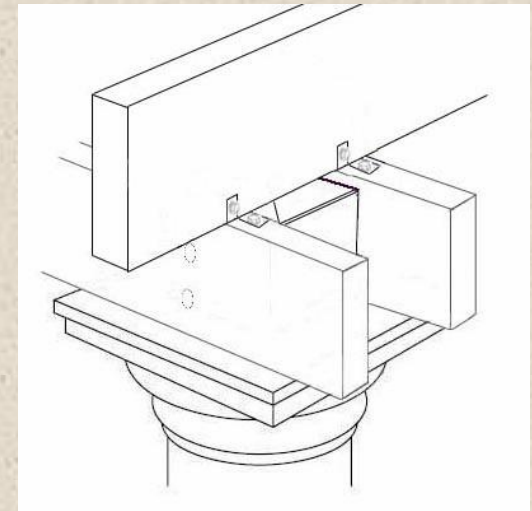
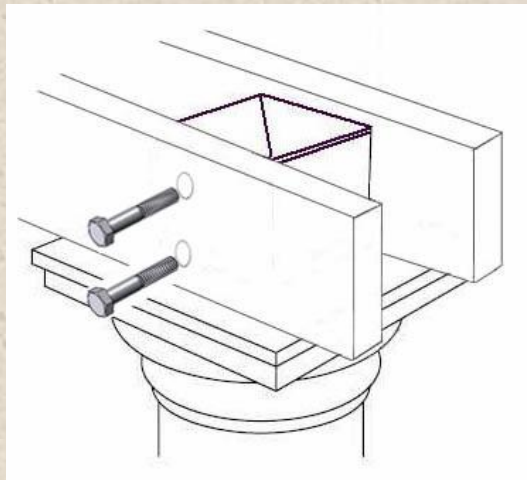




## Finished Column

**The column is now ready for beam attachment. If the span between columns is greater than 8', the beams must be filled, either with aluminum, steel or wood.**

**The carrying beams are placed on each side of the adapter, drilled and through-bolted.**



**PVC sleeve height on the column adapter may be modified depending on cross beam placement, single (above), or double (below).**

