

## Intermodal Shipping Container Small Steel Buildings

Includes photos, diagrams, plans, and charts.

11" x 8.5", 103 pages, soft cover

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cover

# Intermodal Shipping Container Small Steel Buildings



By Paul Sawyers

back

This book is for anyone who is thinking about constructing a small building, and enjoys saving money. Learn how you can save up to 40% over tradition lumber or factory made steel structures using intermodal shipping containers as building blocks. It's easy to buy steel containers and modify them for use as workshops, garages, cabins, guest houses, super carports, RV - 5th wheel covers, and much more. Containers are water-proof, and ready for use upon delivery with very little set-up required. Minimal amounts of extra building materials (optional; for interior framing, insulation, paneling, windows, etc) can be used to 'fit-out' your container building. Choose from one of two common standardized sizes: 20 ft or 40 ft long, by 8 ft wide, by 8-1/2 ft high, then stack or set units side by side into one of many building configurations. Enjoy a building that's up to fifty times stronger than most structures, built quick and with amazingly little labor. Take part in the shipping container building revolution with the worlds first book on the subject... Intermodal Shipping Container Small Steel Buildings!

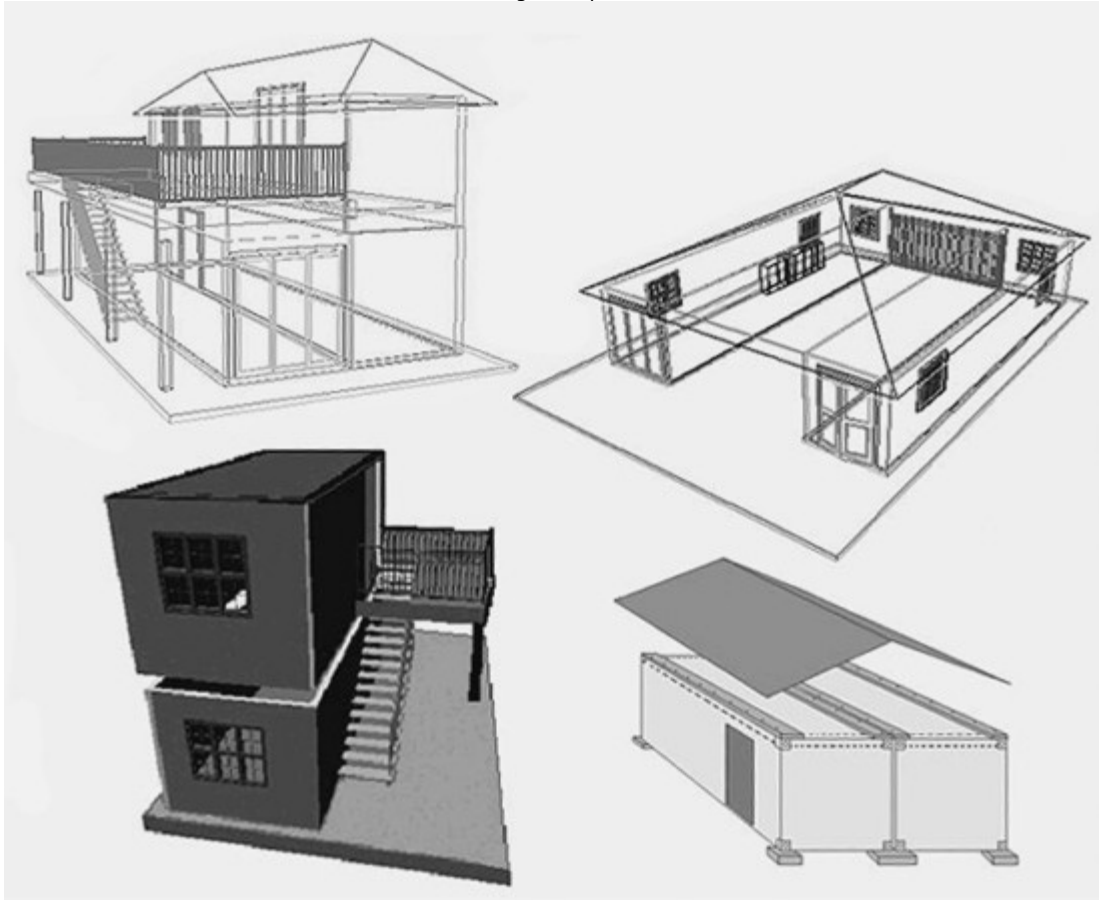
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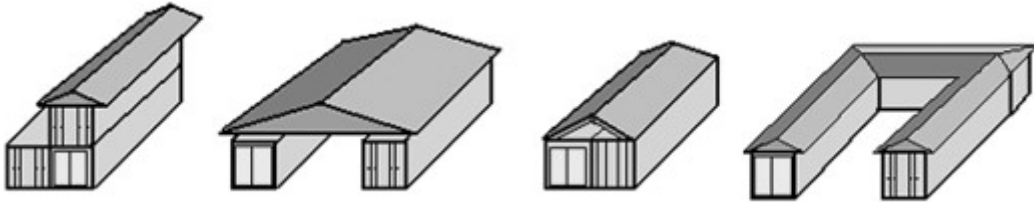


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### Contents

Introduction - 4

Chapter 1 - Intermodal Containers: Building Blocks - 8

Chapter 2 - Purchase and Delivery of Containers - 18

Chapter 3 - Footings and Foundations - 27

Chapter 4 - Joining Containers - 35

Chapter 5 - Roofing Containers - 46

Chapter 6 - Fitting Out Container Buildings - 60

Chapter 7 - Trifecta of Winning Container Building Plans - 73

Chapter 8 - Miscellaneous Container Building Ideas - 91

Builders Stories - 98

Summary -101

Last Words - 102

Intermodal Shipping Container Small Steel Buildings explains how to purchase steel cargo containers and modify them for use as buildings under 1000 sq ft in size. Learn how you can save up to 40% over tradition lumber and factory made steel structures with these unique building blocks. New and used steel shipping containers are available nationwide. It's easy to buy containers and modify them for use as workshops, garages, cabins, guest houses, super carports, RV - 5th wheel covers, and much more (the book shows how). Enjoy a building that's up to fifty times stronger than most structures, built quick and with amazingly little labor. Take part in the shipping container building revolution with the worlds first book on the subject...Intermodal Shipping Container Small Steel Buildings! Includes photos, diagrams, plans, and charts. 103 pages, soft cover.  
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## Introduction



Small utility or residential structures under 1000 sq ft can be costly to build. This book is designed for those of you who are searching for a way to cut this cost without sacrificing the strength or visual aesthetics of your structure. I recommend you the reader, consider using heavy duty welded steel boxes, (containers) as the building blocks of your new structure. The Intermodal Shipping Container, designed and manufactured to transport goods safely over the high seas, but also a low cost, easy to construct, and super strong building solution.

My first glimpse of shipping container buildings was during a late night cable TV viewing of the 1986 low budget science fiction movie *Space Rage: Breakout on Prison Planet*. This B movie featured an extensive set built entirely from 20, and 40 foot shipping containers. The movies plot was a wild-west space-age shoot-em-up, and utilized a futuristic old west town (saloon, general store, etc) all made out of containers. The Sheriff even lived in a 40 ft container house that was especially nice inside. The prison escapees ended up shooting it full of bullet holes in one scene...but I digress.

Seeing that movie many years ago was officially my first sighting of container buildings, but now I see them all the time. This is probably due to the non-stop growth of Intermodal container deployment, and the fact that container sales and delivery companies have sprung up coast to coast. So naturally you tend to see more containers used as buildings scattered across the countryside.

Budget conscious builders traditionally tend to use materials that appear in abundance. Over produced materials, or material that is considered excess stock, can usually be purchased at a discounted price. Often times, a used container is considered a nuisance by the seller, something just taking up space, and can be purchased for a few hundred dollars with the buyer providing pick-up via a 3rd party trucking company.

The plans and information contained here are geared towards the individual builder working on a budget. In a nutshell, this book will strive to provide the bulk of it's content in the following two areas: 1) plans for constructing three different super strong steel buildings under 1000 square feet in size, and 2) plans for foundations, roofs, framing, movement, and other universal aspects of container building that are interchangeable on these and other small scale container building projects.

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Many North Americans are learning what ocean freight insiders, and port city dwellers have long known; cargo boxes make great low cost buildings. Paul Sawyers, author of 'Intermodal Shipping Container Small Steel Buildings', envisions people creating everything from fifth wheel covers to bomb shelters using these units. "The fact that so many folks are interested in these buildings really says a lot. People are on a tight budget these days, and some can't afford pre-fabricated steel buildings. Plus, lumber just keeps going up in price". With real estate being the hottest thing going now, it only stands to reason that all things real estate related, such as building materials, lumber, and labor, are skyrocketing in price.

Savvy do-it-yourselfers have found another alternative; used ocean cargo boxes. The general public can purchase these units used, and pay a trucking company to deliver them via roll-bed truck. The units are pre-built, and ten times stronger than factory made steel buildings (and usually ten times cheaper too). "It's not uncommon to see someone set up a 8' x 40' or 16' x 20' Intermodal Container building for under \$1100. You also have to keep in mind that these boxes are designed to hold up in a really brutal environment...the high seas". So, just how strong are these containers? You may be surprised to hear that one single twenty foot unit, can support ten similar units stacked on top of it.

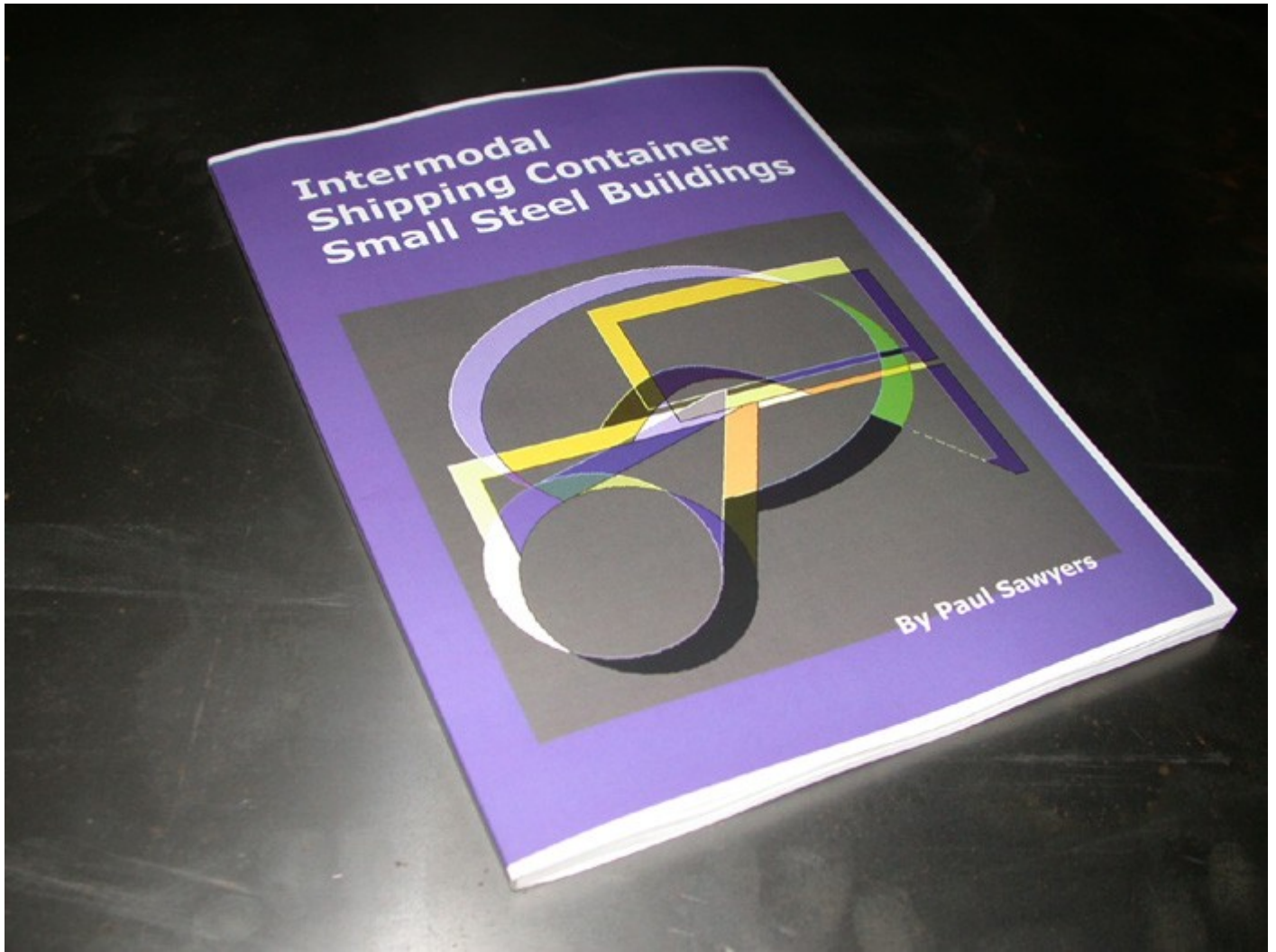
The author says the most difficult task in setting up a shipping container steel building is probably building the concrete footings for a foundation. "But you really don't even need a foundation. It's completely optional. Some people just lay down some pressure treated 2x8's." Is taking delivery is ever a problem? "Sometimes, if the delivery truck is not able to reach semi-isolated acreage, you will have to move the unit into place yourself. This sounds difficult, but using steel pipes or logs and a truck, they tow pretty good. Once in place, you have an instant weather proof steel building". Minimal amounts of extra building materials (optional; for interior framing, insulation, paneling, windows, etc) can be used to fit-out your container building.

So who builds shipping container structures? Farmers and rural folks mostly, but one of largest emerging groups of builders are classic car and motorcycle re-builders. "These guys usually own thousands of dollars worth of tools, and have a few vehicles that can't be replaced. They want a good theft and vandal proof building. Even in a twenty foot unit with two big street bikes, you still have room for a shop area near the front doors". Containers are made from fourteen gauge corrugated steel on the sides, belly, and roof, with seven gauge tubular steel frames on each of the four corners, plus one and a half inch thick marine grade plywood over welded load bearing beams for the interior flooring.

If you are considering the idea of buying a used shipping container, keep in mind that the price you pay will vary greatly depending on the source and condition of the unit. You can find deals if you look around. New and used containers are available nationwide. "A realistic cost per unit ranges from \$500 and up, depending on size, condition, and source. You can often find containers with 2-3 years of travel on them, being liquidated at bargain prices to make room for new models. Check your local classified ad papers, or do an internet search for shipping containers near your city. You probably drive by a trucking company with containers for sale everyday and don't even realize it". Port city dwellers have a distinct advantage over people located far inland. Never the less, Intermodal units have become so prevalent in recent years, they are beginning to turn up in Wyoming, Indiana, and other places nowhere near either coast.

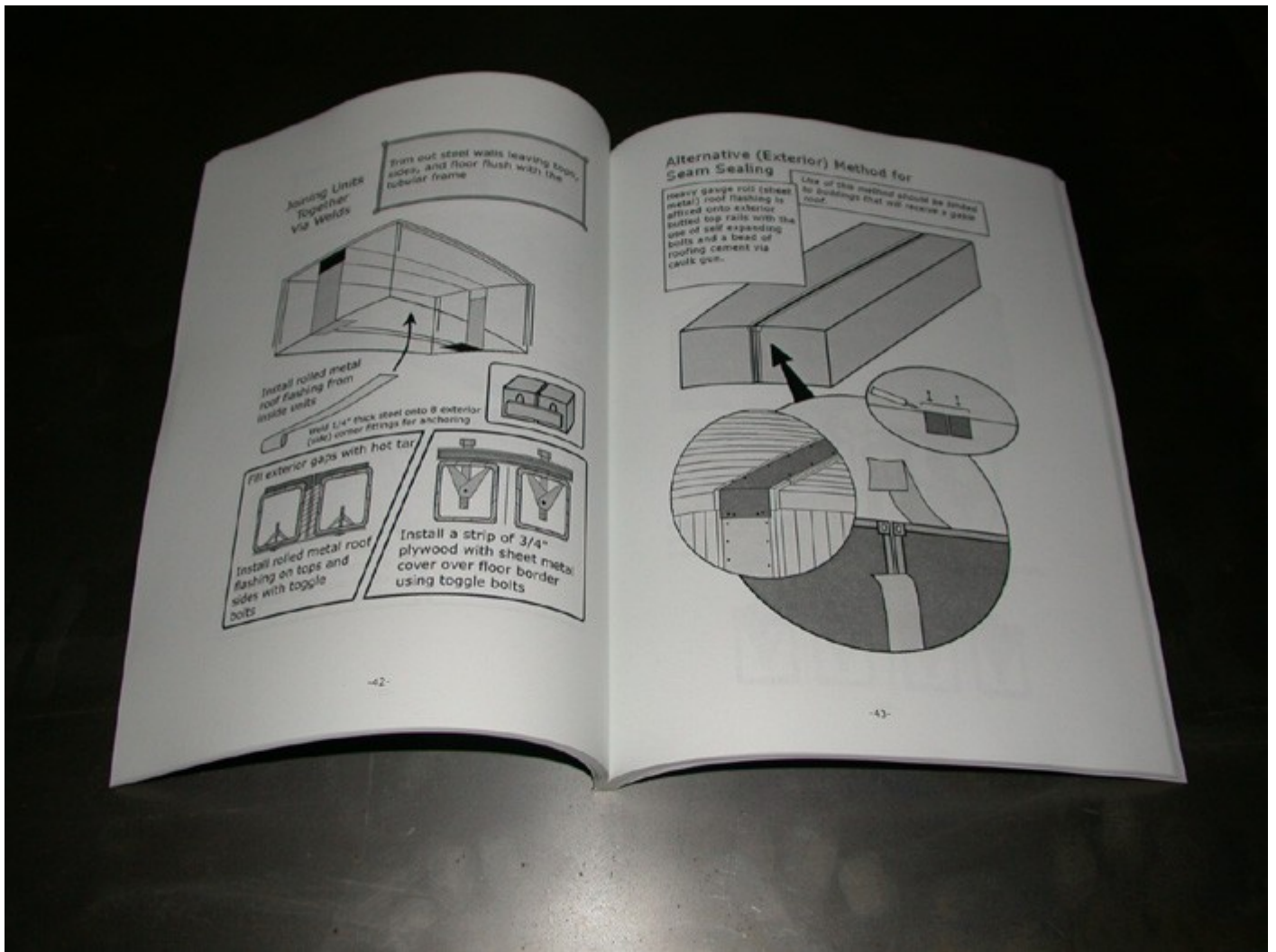
These buildings are as unique as the people that build them, no two ever look the same, but cost savings and high strength is inherent in all Intermodal Container structures. If you really need a steel building, but lack the funds for a new pre-fab affair, Intermodal Container Buildings might be right up your alley.





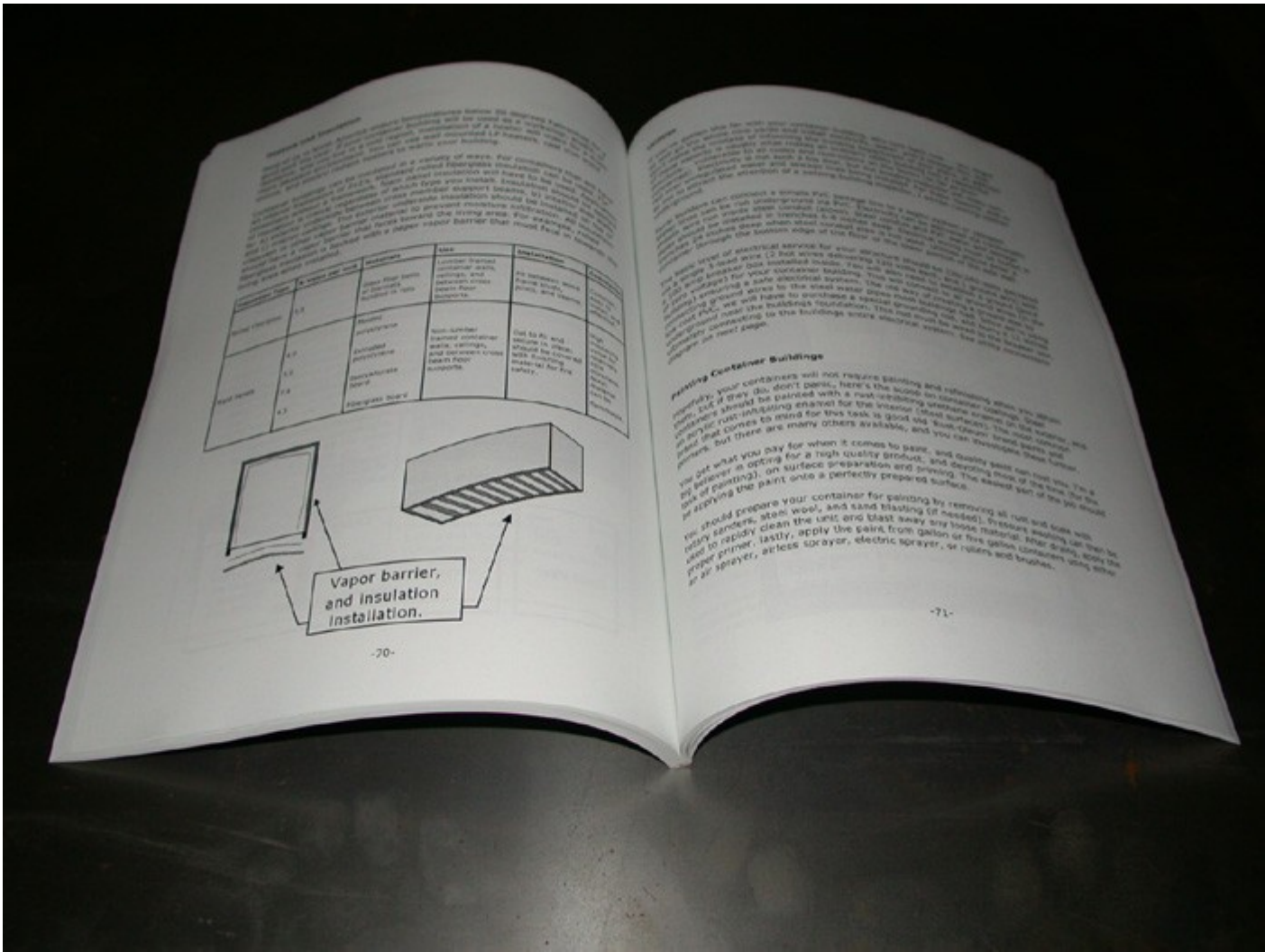
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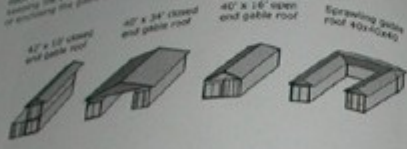
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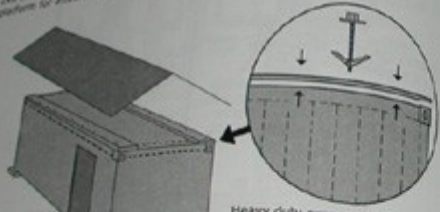


Chapter 3 - Roofing Containers

One of the purposes of container buildings, and a reason why they cost less than traditional buildings, is the fact that they do not require a roof. There's the good news. The bad news is that containers need as bulging, void of corrugated metal, roof beams. The roof needs to be high, and built on the low channels of the corrugated metal. Each of any three main plans and details for building a gable roof on these containers. I fear this add-on improves the visual and functional appearance of these roofs. I fear this add-on improves the visual and functional appearance of these roofs. I fear this add-on improves the visual and functional appearance of these roofs.



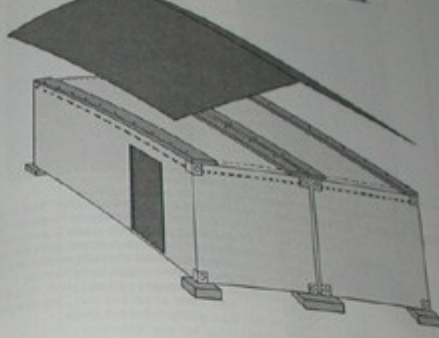
**Top Plates**  
The very first step of building any gable container roof is to install top plates made from 2x6 studs 2 ft in length. Top plates serve as the foundation of any roof providing a platform for attachment of rafters or trusses.



Heavy duty expanding style bolts, or toggle type bolts that can be installed from the top, are used to secure 2x6 studs to top rails.

Securing 2x6 top plates to the top rails of the container is a simple matter of drilling and bolting them as you go. Start at a corner. Lay an 8 ft long 2x6 on the roof. Use the hammer and work chisel to notch a notch of the stud (about 3/4" deep) to allow clearance for the end fitting and a flush fit on the top rail. Tap the 2x6 down to allow the chisel to cut a 1/2" deep notch in the top rail. Start a 1/2" toggle (or a 1/2" expanding style bolt) through the hole into the top rail. Tighten the toggle (or expanding style bolt) to seat the top plate against the top rail. Apply light upward pressure on the 2x6 to seat the toggle (or expanding style bolt) into the top rail. Tighten the toggle (or expanding style bolt) to seat the top plate against the top rail. Apply light upward pressure on the 2x6 to seat the toggle (or expanding style bolt) into the top rail. Tighten the toggle (or expanding style bolt) to seat the top plate against the top rail.

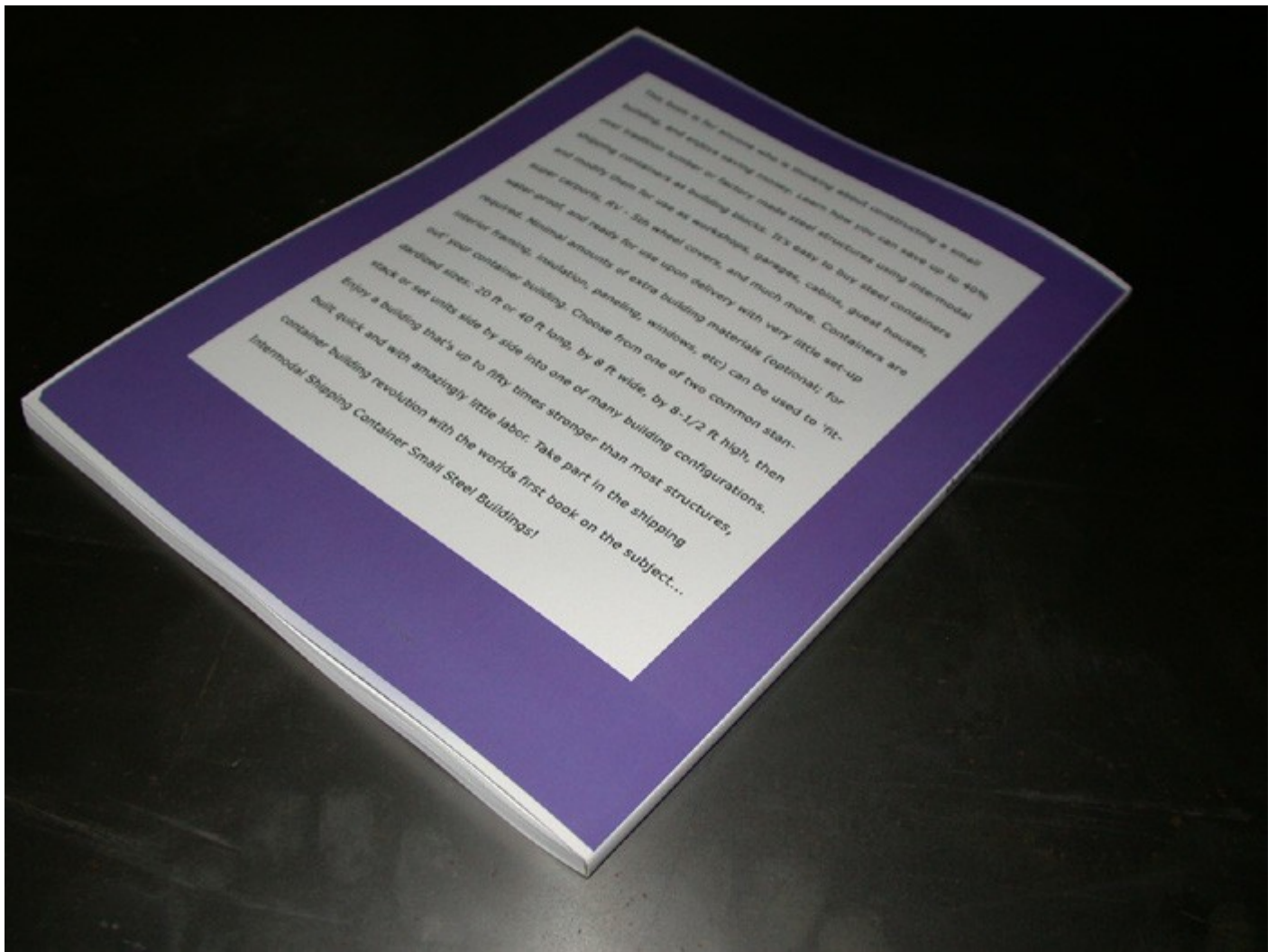
Install top plates around the full perimeter of your containers if planning an enclosed and gable roof. You only need to install top plates on the longer sides, in contrast, if planning an open end gable roof.



**Self expanding bolts:** I use the term "toggle bolts" rather loosely throughout this book in reference to any appropriate style of heavy duty self-expanding bolt. Design of self-expanding Rebar's change often, with new styles being introduced all the time. Because of this, I decided to simply use the term "toggle bolt" in describing self-expanding bolts. A trip to your local builders store will reveal a large selection of these style Rebar's. You should choose a self-expanding fastener that is made from weather resistant metal, and offers adequate loading strength for your container application.

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## Paul Sawyers Unique DIY Building Manuals & Plans Publications

### **Steel Shipping Containers: Building Blocks of the Future**

As a person who resides in the Pacific Northwest of the United States I get to observe the timber industry in action. Harvesting timber takes a lot time, heavy equipment, and now also involves a lot of taxation, and red tape. Hence the high cost. Building with lumber is always a pleasure, but the current high cost can be constraining. If you've ever drove a truck load of 2x4's out the parking lot of your local home improvement superstore you know what I'm talking about. I once spent \$1700 at The Home Depot for the lumber, drywall, doors, and insulation to build an 10 ft long wall and a vestibule. I could of purchased a nice 40 ft steel container for less. Ah, but that was the late 90's. Most of us are more careful with our money these days.

Taxes, restrictions, and the current U.S. ban on Canadian softwood imports has caused lumber prices to jump up and sock the weekend builder in the eye. The devastating hurricane season of 2004 has created an unexpected demand for lumber, raising prices and reducing supply even more. To hope that lumber will once again become affordable is wishful thinking. The free-for-all that was the Lower 48 States pool of natural resources (last century), not surprisingly, has ended. Even mainstream builders have begun to use alternative structural products. The most obvious examples of this trend are OSB (chip board sheathing) in place of plywood, and OSB engineered joists. My container plans still call for the use of some lumber, but on a much smaller scale than a ground-up building.

I feel that alternative structures and structural products have evolved for two reasons; 1) they are cheaper, and 2) they are easier to build. Some would argue other reasons for devising unique structural variations are earth friendliness, and architectural innovation, but these are not factors that come into play in my personal world. You might feel the same about this, especially if you inhabit today's North America, which can often be a society that forces us to think in solely capitalistic terms.

Container buildings might fit into the earth-friendly category by possessing the properties of a 'recycled' material, and they might be architecturally significant for philanthropical mass housing designs, but that is pretty much the extent of the save-the-earth-and-people groups advocacy of container buildings. Many of the alternative building publishers had no interest in this book at all when it was offered to them. It seems they prefer to release books on building mud huts and straw block cabins. That's ok. I don't hold a grudge, and I honestly admire the people who have found their higher calling in assisting the global village.

I think many readers of this book may tend to live in the world of paying bills, perhaps just getting by, and have real needs when it comes to a small building. Buckminster Fuller, the celebrated designer of the geodesic dome house design, was concerned about saving the earth and creating housing for the third world. He aspired to much more than simply inventing a cheap, easy to build, dome home. But alas, I am no Buckminster Fuller.

*From the new book 'Intermodal Shipping Container Small Steel Buildings'*  
available at [www.lulu.com/paulsawyers](http://www.lulu.com/paulsawyers)