

The Noble Foundation

# Easy Access Raised Garden Bed

Steve Upson



THE SAMUEL ROBERTS  
**NOBLE**  
FOUNDATION

NF-HO-15-01

This publication is a creative work fully protected by all applicable copyright laws, as well as by misappropriation, trade secret, unfair competition and other applicable laws. Except for appropriate use in critical reviews or works of scholarship, the reproduction or use of this work in any form or by any electronic, mechanical or other means now known or hereafter invented, including photocopying, digital imaging, and in any information storage and retrieval system is forbidden without express permission of the authors.

The Samuel Roberts Noble Foundation Inc.  
2510 Sam Noble Parkway  
Ardmore, Oklahoma 73401

CIP Publisher Data

Steve Upson  
The Noble Foundation Easy Access Raised Garden Bed  
Ardmore, Oklahoma, The Samuel Roberts Noble Foundation Inc.

ISBN 978-0-9754303-4-7

© 2015  
Printed in the United States of America

# Table of Contents

Introduction .....	4
Tire specifications .....	5
Base construction .....	9
Frame construction .....	22
Liner installation .....	39
Growing media options .....	53
Parts list .....	55
Mini tunnel bed cover .....	56
Mini cover parts list .....	73



## INTRODUCTION

This construction guide is the product of more than 20 years of designing and using various types of raised beds for both hobby and commercial gardening. In particular, this design is in response to requests by gardeners for a relatively low cost bed with a sufficiently high growing platform to enable gardening in the standing position. It is my hope that this design will assist senior and physically challenged gardeners more fully engage and enjoy their gardening experience.

The use of discarded truck (tractor-trailer) tires to create an elevated base for the bed is what makes this design unique and reduces construction costs. The tire base is arranged in such a way as to permit the gardener to place one foot under the bed while standing at the side of the bed, effectively reducing stress on the lower back.

This design can be used to construct a bed of any length and up to 35 inches in height. The height can be lowered to accommodate shorter (younger) gardeners by simply reducing the length of the framing material.

The plans outlined in this publication are specific for construction of a 10-foot-long-by-40-inch-wide-by-35-inch-high bed. Six tires are needed for the construction of this bed.



## TIRE SPECIFICATIONS



As with automobile tires, there are several different sizes of truck tires. This publication calls for the use of 295/75R22.5 size tires. This is a very common size and should be readily available.



**Obtain six discarded truck tires. Check local truck tire repair stores for availability. Many truck stops offer tire repair services and will have used tires. While the tires are free, they are also heavy, so plan on taking a friend to load the tires. To reduce the possibility of straining your back, use a ramp to roll the tires onto a trailer. One person can roll a tire while it may take two to tote the tire.**





To simplify construction, do your best to select tires that are the same diameter. The same classification of tire can vary by as much as an inch in diameter due to tread wear. No two used tires will have the exact same diameter so be realistic when making your selection. For best results, the tires should not vary more than 1/4-inch in diameter. Be sure to take a tape measure with you when making your selection. A pair of gloves will also come in handy.

Also, select only intact tires. Avoid tires that are shredded or have exposed steel belts.



Use a paint pen to indicate the diameter of each tire



## BASE CONSTRUCTION



While not absolutely necessary, the use of a circular alignment guide during construction greatly simplifies the task of aligning the tires to form a straight bed and accurately positioning the bed frame members. Our circular guide is made from 1/4-inch plywood and is 23 3/8 inches wide. Use a framing square and marker to cross mark the guide. The guide is used to designate four equidistant corners on each tire.



**With the alignment guide centered on the tire, use a white paint pen and straight edge to designate four corners on all six tires.**





Prepare the site for the bed. The bed requires a level surface, so it may be necessary to till the soil in order to level the site. If a perennial sod is established on the site, consider eliminating it with the use of a herbicide such as glyphosate (Round-up) prior to leveling. Designate the ends of the bed by driving two stakes into the ground 10 feet apart. The stakes should extend out of the soil 24 inches. To assist the leveling process, attach a line between the stakes making sure the line is taut. With the line positioned 6 inches above the soil, attach a line level. Adjust one end of the line until it is level.





**Next, use the line to gauge if the ground is level. Using a rake, move the soil around until the site is level. In situations requiring deep tillage to level the site or when a large quantity of fill is required to form a pad for the bed, make sure to pack or roll the soil (site) prior to bed construction to prevent settling of the bed. A good rain or sprinkle irrigation on the site will also settle the soil.**



**Next, form the base of the bed by moving tires into place. It is much easier to move tires by rolling as opposed to dragging. When using tires with varying diameters, use the larger ones on the bottom.**





**Depending on the diameter of the tires, the tires may or may not touch each other when aligned end to end. When setting the tires into place, the paint marks on adjacent tires should be directly across from one another.**





**Reattach the string line and position just above the base row of tires. To ensure the tires are positioned in a straight row, the paint marks on the tires must be aligned with the string line.**



**Tires perfectly aligned in a row. Using this procedure to align the tires is especially helpful when constructing long beds because the longer the bed, the more difficult it becomes to use line of sight to center objects like tires that do not have straight edges.**





**A carpenter's level may be used to ensure the base is level side to side.**





**A long section of square tubing or angle iron can be used to check the level of the bed end to end. If you did a good job of leveling the site, the base row of tires should be fairly level. If not, lift the tires where needed and remove or add soil until the base is level.**



**Install the top row of tires making sure the paint marks on adjacent tires are directly across from one another.**





**Reattach the string line and position just above the top row of tires. Once again, align the paint marks on the tires with the string line. Be sure each tire in the top row is centered on the tire below it.**





**With the tire base in place, fill the tires with soil. You can choose to fill the first tier of tires before adding the second or fill both tiers at the same time. Work the soil toward the outer edges of the tires to fill as much of the available space as possible. Because plants will root down into the tires, choose a loam or sandy loam as fill. Avoid the use of clay or gravel as clay is poorly drained and the gravel is excessively drained. There is no need to amend the soil used in this step of bed construction.**



## FRAME CONSTRUCTION



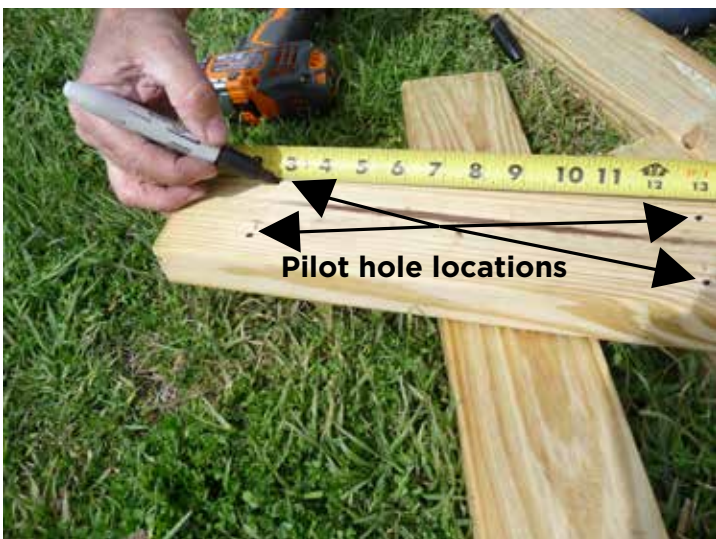
Using 2-inch-by-4-inch treated lumber, prepare the vertical frame members. Three 32-inch-long frame members can be cut from an 8-foot board. The number of frame members will vary depending on bed length. A 10-foot long bed will require 40 members.





**Mark a line down the center of six of the vertical frame members. The lines will serve as reference points when installing the vertical members on the sides of the bed.**





To avoid splitting the frame members when attaching to the tire base, pre-drill pilot holes for the 3-inch deck screws. Locate a set of two pilot holes 2 1/2 inches from one end of the wood member and another set 13 inches from the same end. All holes should be 3/4 inch from the edge of the member.





**Pre-install screws to make vertical frame member installation easier.**



Prior to installing vertical frame members, decide on the height of the bed. A bed height of 35 inches can be achieved using 32-inch-long vertical members and a couple of 2-by-4-inch blocks to elevate the frame members. To lower the height of the bed, simply shorten the length of the frame members. To prevent rotting, never install the wood frame members with the base resting on the ground.





**Before fastening the six vertical frame members to the sides of the tire base, align the reference line on the back of the vertical members with the mark on the tires. Use a carpenter's level to make sure the members are plumb.**



**Use a level to ensure the top of each vertical frame member is level with the other members.**





**If the top tire in a particular stack is smaller in diameter than the base tire, you may need to use a shim in order to plumb the vertical member. To avoid the need for shims, select tires with similar diameters.**



**Once the installation of the six vertical frame members on the bed sides is complete, frame in the ends of the bed using additional vertical members. Check the level of each frame member before attaching.**





**Cut to fit the last vertical frame member installed on each end of the bed.**



**Fortify the frame at each end of the bed by connecting the individual vertical members along the top of the frame. Start at one side and work your way to the other side connecting the members using 3-inch deck screws. Be sure to drill pilot holes to reduce the chance of splitting.**





**By design, the center vertical frame member on each side of the bed is required to handle a greater portion of the soil load in the bed. To make sure it doesn't pull loose from the tire, insert a third 3-inch deck screw just above the other screws.**



**Completed installation of vertical frame members. A total of 40 vertical members are needed when constructing a 10-foot-long bed.**





Next, attach the 2-by-4-inch hanger brackets to the side vertical frame members. With a bracket correctly positioned on the side of the vertical member, mark the locations for the screws.

Position the base of the bracket 3 1/2 inches from the top of the frame member.



**Drill pilot holes prior to attaching bracket. Use 1-inch wood screws to fasten bracket to frame member.**





**Complete construction of the frame by installing the cross members. Cut each member to fit. Install using 1-inch wood screws. Remember to drill pilot holes before inserting screws.**



**A completed frame ready for installation of the metal liner.**



## LINER INSTALLATION



Begin preparation of the metal bed liner by applying a spray-on truck bed coating to the corrugated metal sheeting. The galvanization imparts rust protection to the metal; however, because the corrugated sheeting is designed for use on roofs and not as a liner for garden beds, it is highly recommended you apply the truck bed coating. One coat is good; two is better.



**Using tin snips, cut the liner to fit your bed. When constructing a 10-foot-long bed, the liner should measure between 79 and 80 inches in length. Before cutting, measure the bed to make sure the liner is long enough to attach to the closest vertical frame member on each end of the bed.**





**To assist with the installation of the liner, mark a line on the inner surface of the cross members 1 inch from the top.**



**Center a section of the liner on one side of the bed, and align the top with the line on the cross members.**





**Attach the liner to the frame using 1 1/2-inch self-tapping roofing screws.**



**Both sections of the liner attached to the top of the frame using five screws per side.**





**Next, bend the liner to conform to the shape of the bed.**



**Holding the liner in position, attach the free end to the tire base, using roofing screws.**





**Next, cut to fit two pieces of corrugated tin to cover the gaps in the tire base and fasten with roofing screws.**



**Finish liner installation by inserting three screws in the middle of each liner section along the fold.**





**Seal gaps between the vertical frame members using clear silicon caulking.**



**Seal gaps at all four corners of the bed using foam sealant. After the foam cures, use a knife to remove excess.**







**Use foam sealant to seal gaps between vertical frame members and tires on each end of the bed.**



**Completed bed ready to fill with amended topsoil or containers.**



## GROWING MEDIA OPTIONS



The bed base and frame are strong enough to permit filling with soil. To ensure adequate drainage, we recommend using a coarse textured soil such as fine sandy loam. If a finer textured soil is chosen such as clay loam, the soil should be amended with equal parts sand. Although more expensive, excellent results can be expected using a commercial potting soil as fill.



**One of many container options using the easy access raised garden bed.**



## PARTS LIST

### Easy Access Raised Garden Bed Parts List (10-foot bed) 2015

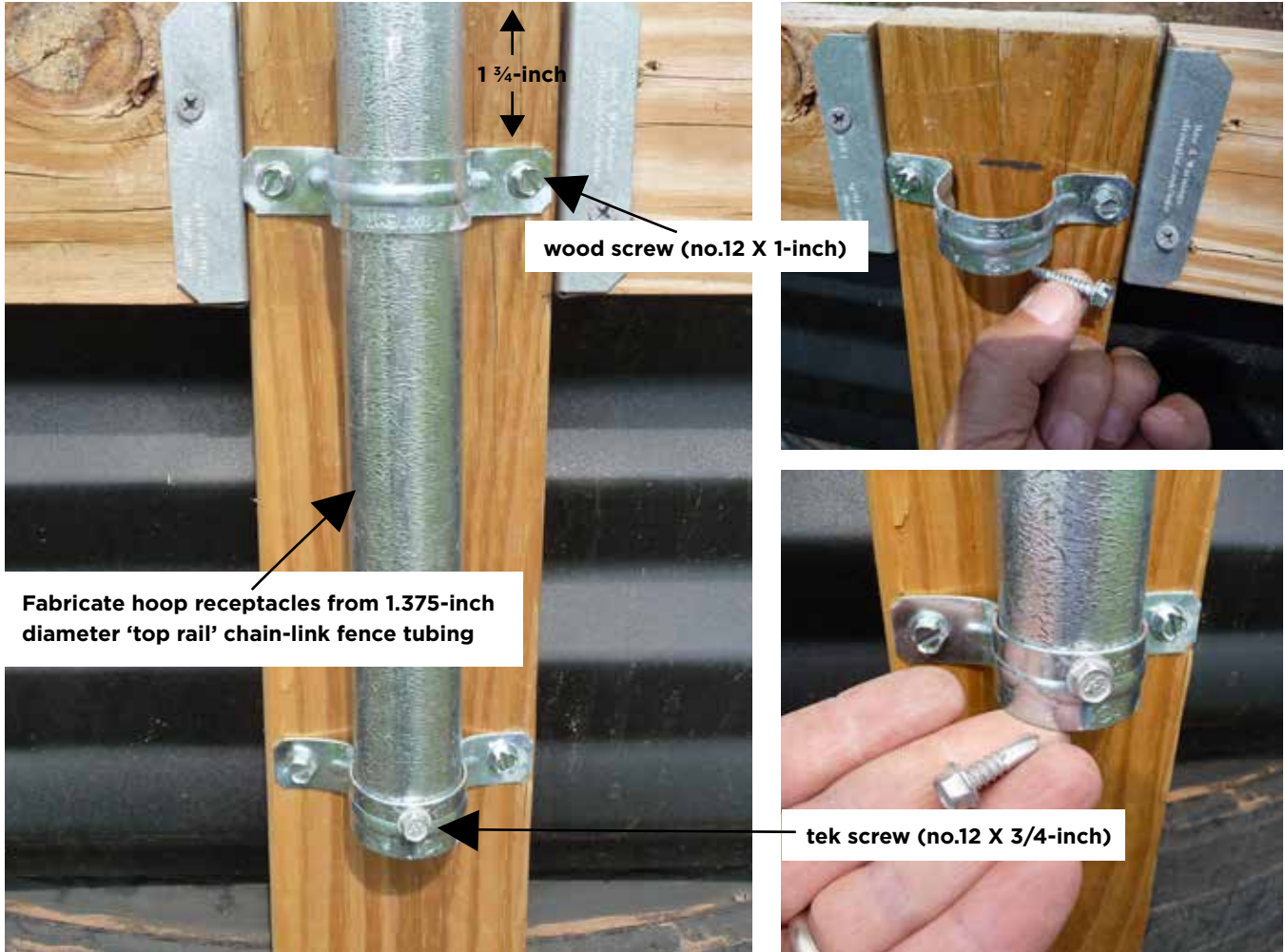
Item	Quantity	Unit	Total
Corrugated metal roof sheeting (galvanized) 26-in-by-8-ft.	2	\$ 14.50	\$ 29.00
Truck tires (295/75R22.5)	6	no cost	no cost
2-in.-by-4-in.-by-8-ft. pressure treated lumber	16	\$ 4.20	\$67.20
Deck screws (3-in.)	3 lbs.	\$ 8.50	\$ 25.50
Sheet metal roofing screws (1 1/2-in.)	1 box (35-count)	\$ 6.00	\$ 6.00
Wood screws (no 8 X 1-inch)	1 box (100-count)	\$ 6.00	\$ 6.00
Hanger brackets (2-in.-by-4-in. wood)	8	\$ 0.70	\$ 5.60
Spray-on truck bed coating	2 cans	\$ 11.25	\$ 22.50
Silicon caulking (clear)	4 tubes	\$ 4.00	\$ 16.00
Foam sealant (spray)	2 cans	\$ 4.00	\$ 8.00
Topsoil (amended with organic matter)	2 cubic yards	\$ 30.00	\$ 60.00
<b>Total</b>			<b>\$245.80</b>

## A MINI TUNNEL PROTECTIVE COVER FOR YOUR EASY ACCESS GARDEN BED



Now that you've constructed an easy access raised bed, consider taking your gardening experience to a new level. A mini tunnel cover will enable you to extend the growing season and protect plants from inclement weather. The mini tunnel can be assembled in less than a day using materials available at any home improvement store. While construction grade poly film may be used as a covering for the tunnel, it will need to be replaced on an annual basis due to sunlight degradation. For extended life, choose a greenhouse grade poly film available from horticulture supply stores, local or online.





Start by installing the hoop receptacles. Attach a 10-inch long hoop receptacle to the sides of the initial six frame members as shown using 1 1/4-inch pipe hangers.



**Install the remaining four hoop receptacles on the ends of the bed, two on each end. Using a tape measure as shown, mark the location of the remaining hoop receptacles approximately 18 inches from the adjacent corner receptacle.**





**Fabricate hoops from 3/4-inch gray PVC conduit. You can adjust the height of the tunnel by varying hoop length. A 3-foot-tall tunnel requires three hoops measuring 9 feet long and two hoops measuring 7 feet long.**



**Install hoops making sure the short hoops are installed at the end of the beds. Hoop ends should rest on the tek screw at the base of each receptacle.**





**Install eight eye screws on the underside of the cross members. Locate two screws to either side of the center vertical frame member and one screw at the opposite end of each cross member.**



braided clothesline

Attach the rope straps to the eye screws. To reduce abrasion to the poly cover, select braided nylon rope. We use 3/16-inch-diameter rope on our tunnels. To accommodate a 3 foot high tunnel, cut a set of four ropes, 4 feet long and a set of four ropes, 7 feet long. Attach the 4-foot ropes to one side of the bed and the 7-foot ropes to the other side.





**Install the poly cover. To accommodate a 10 foot long bed, prepare an 8-by-18-foot piece of poly film. Center the cover on the bed. Many greenhouse supply companies offer custom cut sizes of greenhouse poly film. Choose construction grade poly film as your last option.**



**Secure the poly cover to the hoop frame by connecting the rope straps on opposite sides of the bed. Tie a loop at the end of each 7-foot rope strap. Draw the free end of the 4-foot strap through the loop and tie off using a half hitch knot. Do not pull the rope straps taut at this time.**





**Attach the ends of the poly cover to the bed frame.  
Place a tennis ball in the center of the cover at one end  
and roll the film around the ball several times as shown.**



**While holding the wrapped tennis ball, pull the film toward you and twist the film clockwise creating an ever tightening roll of film.**





**Attach a ball bungee cord to the poly film "tail" just ahead of the covered tennis ball. The tennis ball is needed to prevent the ball bungee cord from slipping off the end of the "tail."**



**Place the “tail” against the side of the bed and insert a hook screw into the wood frame adjacent to the ball bungee. Use the screw hook to secure the poly cover to the frame. You may need to wrap the bungee cord around the “tail” several times to remove any slack. Repeat the process at the other end of the bed.**





**To prevent flapping of the cover in the wind, use the rope straps to apply tension. To increase the amount of tension, loosen the knot, pull down on the free end of the strap and retie the knot. The use of a half hitch allows you to quickly untie the knot, readjust the tension and retie quickly.**



**A properly tensioned poly cover.**





**To vent the mini tunnel, pull the edges of the cover upward. Depending on the height you raise the cover, you may find it necessary to loosen the ball bungees to provide the needed slack.**



**The use of 4-foot bungee cords to maintain the cover in a fully vented position.**



### Mini Tunnel Parts List (10 foot bed) 2015

Item	Quantity	Unit	Total
Pipe hanger (1 1/4-in.)	20	\$0.40	\$8.00
Top rail chain-link fence tubing (1.375-in.-by-10-ft)	1	\$10.70	\$10.70
Wood screw (no.12 X 1-inch) hex head	1 box (50 count)	\$6.60	\$6.60
Tech screw (no.12 X 3/4-inch)	1 box (35 count)	\$6.60	\$6.60
PVC conduit (3/4-in.-by-10-ft) gray	5	\$2.25	\$11.25
Eye screw (no.10 X 1 3/8-inch)	8	\$0.35	\$2.80
Braided nylon rope (3/16-in.-by-50-ft)	1	\$3.80	\$3.80
Ball bungee	1 container (8 count)	\$4.00	\$4.00
Hook screw (1 1/4-inch)	2	\$0.65	\$1.30
Bungee cord (4-foot)	2	\$1.90	\$3.80
Tennis balls (used)	2	no cost	no cost
Greenhouse poly film (8-ft.-by-18-ft.-by-6-mil)	1	\$21.00	\$21.00
<b>Total</b>			<b>\$79.85</b>