

Good Neighbor Privacy Fence

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Submitted by

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In cooperation with

New Jersey
Department of Transportation
Bureau of Research
and
U.S. Department of Transportation
Federal Highway Administration

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16. Abstract <p>Privacy fencing which is typically 6 to 8 ft in height is a lightweight, non-engineered installation which is not designed to provide noise mitigation. In keeping with NJDOT's Good Neighbor Program, for locations where noise barriers are not required or feasible, privacy fencing can provide a visual screen between the homeowner and the highway. This visual and physical screening has the potential to significantly improve the quality of life for people living adjacent to highways.</p> <p>Commercially available privacy fencing made of Polyvinyl Chloride (PVC) or thin precast concrete panels can provide an aesthetically pleasing visual screen for both the property owner and the highway user. These fences typically are made as "good neighbor fences" where both sides are visually the same with no front or back. With minor component modifications both PVC and concrete fences are low maintenance installations with an expected life of 25 to 50 years. The installed cost on NJDOT projects of 6 ft. high privacy fencing is estimated at \$60 per ft for PVC and \$125 per ft for concrete.</p> <p>It is envisioned that for the majority of installations, PVC will be the fence material of choice. For locations where the fencing is set close to the roadway and where a high volume of traffic is present, thin panel concrete fencing should be considered.</p>			
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SUMMARY

Privacy fencing which is typically 6 to 8 ft in height is a lightweight, non-engineered installation which is not designed to provide noise mitigation. In keeping with NJDOT's Good Neighbor Program, for locations where noise barriers are not required or feasible, privacy fencing can provide a visual screen between the homeowner and the highway. This visual and physical screening has the potential to significantly improve the quality of life for people living adjacent to highways.

Commercially available privacy fencing made of Polyvinyl Chloride (PVC) (Fig 1) or thin precast concrete panels (Fig 2) can provide an aesthetically pleasing visual screen for both the property owner and the highway user. These fences typically are made as "good neighbor fences" where both sides are visually the same with no front or back. The fencing is light weight and easy to install. With minor component modifications both PVC and concrete fences are low maintenance installations with an expected life of 25 to 50 years which meets the three objectives of the project as listed in the introduction. The installed cost on NJDOT projects of 6 ft high privacy fencing is estimated at \$60 per ft for PVC and at \$125 per ft for concrete.



Figure 1 Six Foot PVC Privacy Fence

The installed cost of concrete fence is double that of PVC. It is expected that the majority of fences installed by the NJDOT will be PVC. Concrete fences will be used in the special cases where the fence requires greater strength due to the level of activity in the area such as snow loads from snow removal from the

adjacent roadway or heavy truck traffic where added noise attenuation may be desirable and other special situations as may arise.

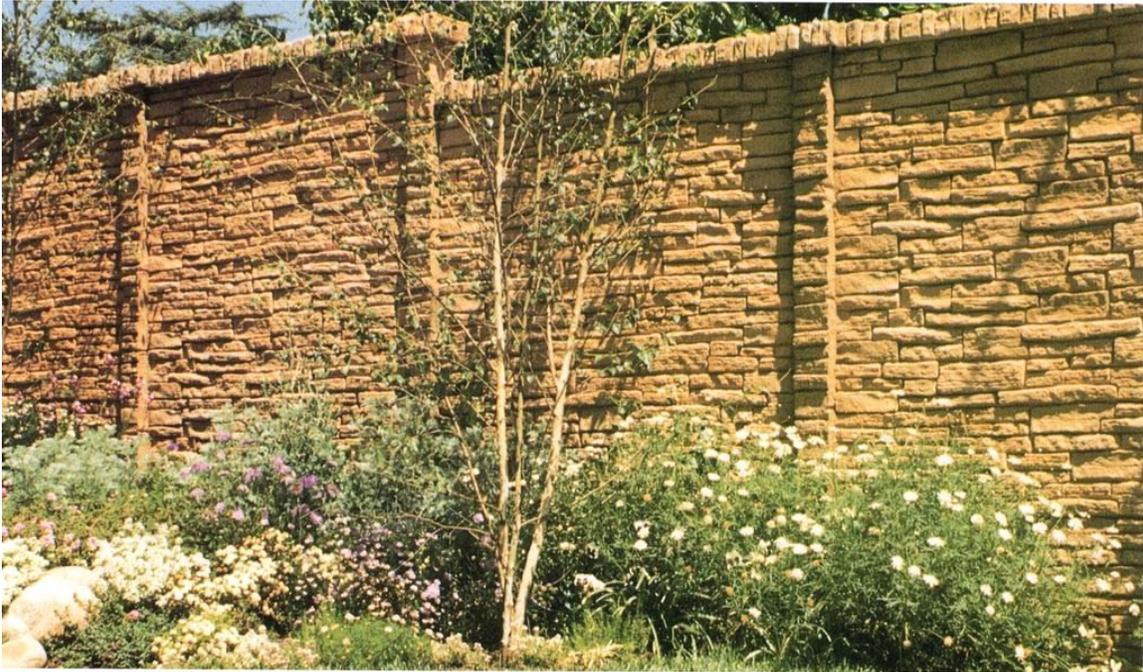


Figure 2 Thin Panel Concrete Wall – FENCESTONE™

Engineered wood/plastic composite materials also have good potential for use as privacy fencing but there are currently few such fence installations and the long term use of this material in privacy fencing needs further study.

Table 1, next page, shows a comparison of the various fences considered in this project.

INTRODUCTION

Privacy fencing has the potential for improving the quality of life for neighbors of our highways. In keeping with NJDOT's Good Neighbor Program, for situations where noise barriers are not required or feasible, there is a need for low height fencing that can provide a visual screen. Privacy fencing which is typically limited to 8 feet in height is a lightweight, non-engineered installation which is not designed to provide noise mitigation. Fencing such as wood, chain link, concrete, and metal have often not provided adequate visual screening, were below standard aesthetically, were difficult to construct, had a short useful life, or required an unacceptable level of maintenance. Highway privacy fencing needs to provide an acceptable level of aesthetics, for the property owner and the highway user, as well as being able to resist the harsh road salt environment it will be exposed to in New Jersey.

	STUDY OBJECTIVE #1. (P.3)	STUDY OBJECTIVE #2. (P.3)	STUDY OBJECTIVE #3. (P.3)	ESTABLISHED TRACK RECORD IN SERVICE	ENVIRONMENTALLY ACCEPTABLE	COST \$/LIN. FT. (-6 FT. HIGH)
WOOD	✓		✓	✓	✓	50
PRESSURE TREATED WOOD	✓		✓	✓		60
PVC	✓	✓	✓	✓	✓	60
ENG. WOOD COMP./REC. PLASTICS	✓	✓	✓		✓	85
CHAIN LINK	✓			✓	✓	30
METAL PANELS	✓			✓	✓	75
CONCRETE	✓	✓	✓	✓	✓	125
FIBERGLASS	✓	✓			✓	140
BERMS AND SHRUBS			✓	✓	✓	30

Table 1 Tabular Comparison of Fence Types v. Study Objectives

The overall objective of this research is to evaluate, select and design an aesthetically pleasing, durable, minimum maintenance, low height “Good Neighbor” privacy fence.

The objectives of this study are to:

1. Design a low height, “Good Neighbor” privacy fence that can be erected quickly and simply without the use of major equipment and one whose design does not require engineering inputs for installation.
2. Design this 6-8 foot high privacy fence so that it is low maintenance or maintenance free for its life cycle of approximately 50 years, and is reasonable in cost.
3. Design this privacy fence so that it provides adequate visual screening, is aesthetically appropriate, and does not create the misconception that it provides a noise benefit.

BACKGROUND

Privacy fencing has been in use along roadways for many years. The most common application occurs along double frontage lots where the entrance to the houses is on a local road and a second, usually, larger road is on the opposite side of the properties. To give privacy to the backyards, a six to eight foot fence is placed along the rear of the properties.

An early example of a privacy fence along a state highway may be found on Route 9 in Manalapan Township, Monmouth County. Approximately thirty-five years ago a large development was constructed along Route 9. The developer placed a six foot wooden stockade fence along the highway at that time which the authors believe was at the developer's expense (see Figs. 3, 4).

Route 9 is a State highway. As may be seen, the stockade fence is in good repair, At the left edge of the photograph, Figure 3, it is seen that the homeowner has constructed a white PVC fence inside the stockade fence. One would assume that this was done for aesthetic reasons. One also may observe that there are trees all along the fence on the homeowner's property.

Figure 4 is a continuation to the left of the fence shown in Figure 3. It is seen that a few sections of the fence have recently been replaced by the homeowner or the homeowner's association. By using a basic style for the privacy fences, it is easy to replace sections as needed. Within a year or two, the new sections will age to the same color as the older sections, thus maintaining the appearance of the fence.



Figure 3 Privacy Fence Along Route 9, Manalapan Twp.



Figure 4 Repaired Sections Privacy Fence Along Route 9, Manalapan Twp.

The authors recommend that the NJDOT consider a policy that requires developers to place privacy fences along adjoining state highways where double frontage occurs. This may require the cooperation of the local municipality who will also benefit from the recommended action.

This can be accomplished in situations where the developer requires a street or curb cut on the state highway. In other situations, the NJDOT can request that the local planning board require the privacy fence. This will avoid future expense that will undoubtedly occur.

An example of a local planning board requiring a privacy fence along major local roads is illustrated by the following photograph, Fig 5, and other photographs which may be found in Appendix 1- NY, NJ Local Privacy Fences, page 34. In this case, wooden fences were used supplemented by shrubbery placed by the developer and the eventual homeowners.



Figure 5 Privacy Fence Installed by Developer

It is of interest to review practices in other states. In Las Vegas, NV, the majority of the roads are six to eight lanes wide. Developments built along the roads invariably have privacy fences which are decorative in nature. Examples of these may be found in Appendix 1-Las Vegas, NV Privacy fences, page 52. These privacy fences are often masonry because this material is readily available and has low maintenance once built.

Albuquerque, NM is similar to Las Vegas. Their privacy fences are even more ornate in Albuquerque as shown in Appendix 1-Albuquerque, NM Privacy Fences, page 67 and Figure 6. This may be part of their cultural history. It is clear from these western cities, that privacy fences can be more than just a screen. They can be an aesthetic asset to the property.



Figure 6 Privacy Fence - Albuquerque, NM

Figure 7 illustrates the penchant of people to use privacy fences. The photo was taken in Freehold Township.



Figure 7 Privacy Fence in a Residential Neighborhood

Along the Garden State Parkway, in the vicinity of exit 154, homeowners have erected their own privacy fences. Photos of these fences are shown in Figure 8.



Figure 8 Privacy Fences Along the Garden State Pkwy

RESEARCH APPROACH

Literature Review

The team conducted a literature search covering the current state of practice of using low height privacy fences adjacent to highways by contacting fence manufacturers, transportation agencies and installation contractors and reviewing their literature and practices. General design and construction publications and handbooks on fence selection and installation factors were also reviewed.

Transportation Agencies

The team contacted neighboring states, New York, Pennsylvania and Maryland to determine privacy fence practices in those states.

New York, Pennsylvania and Maryland, states near New Jersey, were contacted by the project team on their policies and specifications on the use of privacy fences. They do not use privacy fences. They only use right of way fences which are chain link. If needed slats are used in the chain link fences for additional privacy.

The individuals contacted in the three states are:

Rabi Tanvir, MDDOT, 410-677-4025
Divyang Pathak, PENNDOT, 717-705-4190
Brian DeWald, NYDOT, 518-457-9688

International Practices

Preliminary discussions showed that European road designers had considerable experience in utilizing aesthetically pleasing low height visual screen fencing. Mr. A. Fekete of NJDOT provided a list of some 45 foreign and domestic highway agencies and request letters for fence information were sent to each of these agencies. Responses were received from the following:

- Swedish National Road Administration
- Japan Ministry of Construction – Traffic Environment Division
- Norwegian Public Roads Administration
- French Highways Administration – Sustained Development Committee
- Belgium Public Works Ministry
- Mice Co. – Belgium – Noise Wall/Fence MFG.
- Sotrabois S.A. Co.- Belgium – Noise Wall/Fence MFG.

This information as well as additional foreign fence design practices was reviewed. It was found that European highway screening and fencing was generally installed with unique features such as design patterns, trellises for plantings and clear Plexiglas sections which can provide a glimpse through the screen (Figure 8), (Appendix 1-International Privacy Fences, page 81).



Figure 9 European Privacy Fence

These unique features contribute to making these fences varied and aesthetically pleasing. However, most of these screens and fences are custom designed, require engineering input, and are not standard low cost off the shelf items which could be easily replaced if damaged.

Privacy screening in the Caribbean generally tended toward masonry walls. (See Appendix 1- Caribbean Privacy Fences, page 102). While masonry walls are suitable in warm climates, they do require a continuous footing below the frost line for NJ installations and as such are not compatible with the project installation objectives.

The team contacted fence contractors to gain an understanding of factors affecting the various type of fence installations. Site inspections of existing fence installations were conducted to document fence deterioration and distress and evaluate maintenance and repair requirements. The project team had discussions with Ray Burroughs of NJDOT maintenance who provided valuable insight. These inspections and discussions lead to an understanding of problems and shortcomings associated with various fence materials and installations and provided a basis for evaluating the suitability of fence material types to meet the study objectives.

The Study

As the good neighbor privacy fence study continued the research team's efforts focused on fence types and materials that were readily available and compatible with local custom, practice and environment.

These fence types included:

1. Wood and pressure treated wood
2. Polyvinyl Chloride (PVC)
3. Engineered wood composites & recycled plastics
4. Chain link
5. Metal panel
6. Concrete
7. Fiberglass
8. Berms and shrubs

Of this list it was found that two commercially available fence types had a high probability of meeting the stated objectives of the study. These two are PVC privacy fencing and thin post and panel concrete fencing. Additionally engineered wood composites also hold some promise of meeting the objectives. The following is a review of each of the fence material types.

Wood

Wood has traditionally been the most common material used for privacy fencing in the northeast. This fencing is readily available in a wide variety of styles (Figures 10, 11, pp. 13-14). A basic privacy fence style is the picket fence (Figure 10) which consists of end posts, with a top, a bottom and mid rail structure and has tightly spaced vertical pickets nailed to the rails.

This style of fencing has a front side and a back (less attractive) side where the rails and posts are visible. Picket fences can be decorated with concave or convex picket top arrangements and by the use of cut individual picket tops.

Board fencing is similar to a picket fence, but uses wider boards rather than narrow pickets nailed to the rails (Figure 11). A board on board fence has offset boards attached to both the front and back sides of the rails. This offers visual privacy while allowing some light and air to come through the offset boards. It also provides what is termed in the industry a “good neighbor fence” where both sides are visually the same with no front or back.

Solid 5ft high vertical board fencing topped with a 1 ft high open picket or lattice, which allows some air and light to pass through the upper part of the fence is often referred to as a “traditional” style. This style is aesthetically pleasing and is a popular type of privacy screening. Traditional style 6 ft high wood fencing typically costs some \$25 per linear ft for materials and has a union labor installation cost of \$25 per linear ft for a combined installed cost of some \$50 per linear ft in the N.J. area.

Wood fences, however, require a significant amount of maintenance and repairs. Wood members are subject to dry rot decay, insect damage (termites), weathering, warping, splitting and cracking. Most species of wood need periodic protective staining or painting. The species and grade of lumber used affect its

resistance to weathering, dry rot and insect attack. Naturally decay resistant wood species such as redwood and cedar are preferred. Nailed connections often work themselves loose due to wood movement induced by wind, temperature and moisture.

Wood fencing is low in cost and popular with home owners, however, due to its high maintenance requirement it does not meet the study objectives.

Further information on wood fences may be found in Appendix 2, page 110.

AVAILABLE STYLE OF CUSTOM WOOD FENCES

BY:

NATIONAL FENCE SYSTEMS, INC.

1033 ROUTE 1, AVENEL, NEW JERSEY 07001

732-636-5600

732 636- 5605

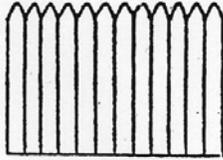
web.www.national-fence.com

e-mail fencin@concentric.net

SPACE PICKET

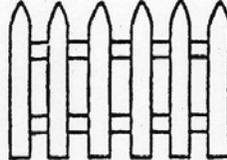
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STOCKADE



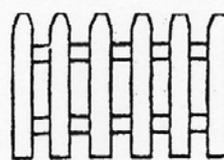
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REGULAR POINT



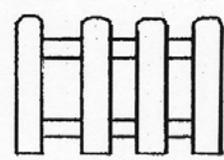
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MODIFY POINT



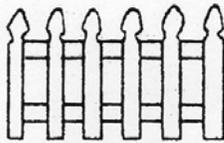
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DOG EAR CUT



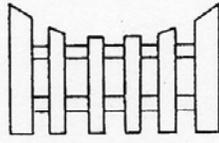
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GOTHIC POINT



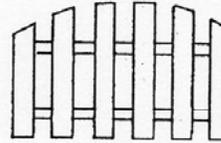
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SINGLE CONCAVE



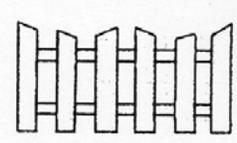
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SINGLE CONVEX



108

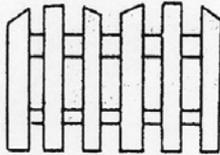
DOUBLE CONCAVE



SOLID SECTIONS

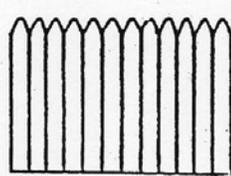
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DOUBLE CONVEX



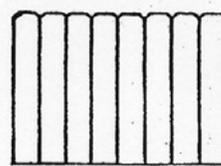
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REGULAR POINT



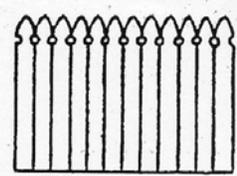
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DOG EAR CUT



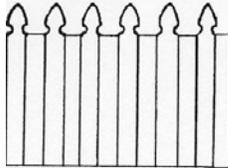
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GOTHIC POINT



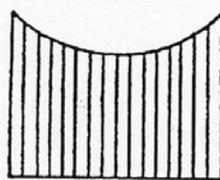
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ALTERNATING GOthic



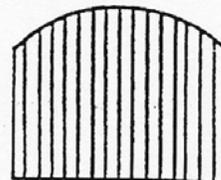
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CONCAVE



115

CONVEX



116

DOUBLE CONCAVE

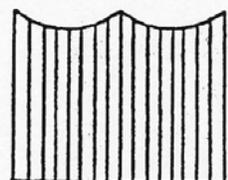


Figure 10 Wood Fence Styles

AVAILABLE STYLE OF CUSTOM WOOD FENCES

BY:

NATIONAL FENCE SYSTEMS, INC.

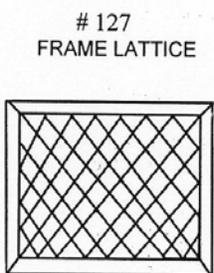
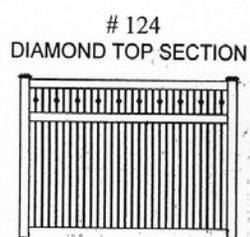
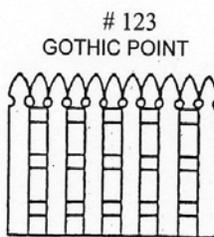
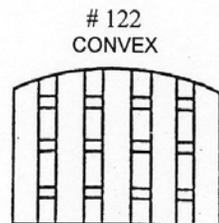
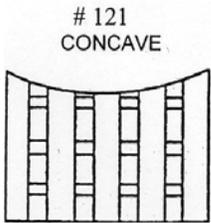
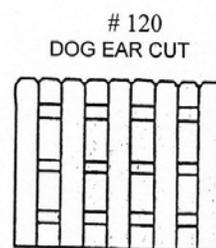
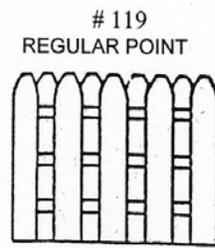
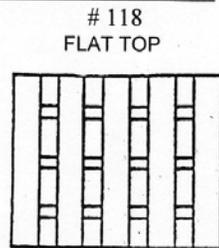
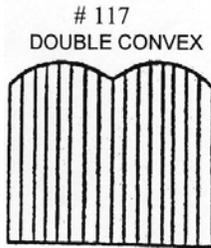
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BOARD ON BOARD



AVAILABLE IN 4', 5', 6' HIGH ALL SECTIONS 8' LONG
1" X 4" BOARD OR 1" X 6" BOARD

CHOOSE FROM:

1 SPRUCE, # WHITE CEDAR, # RED CEDAR, PRESSURE TREATED

IF YOU HAVE ANY QUESTION
PLEASE CALL US OR ASK A SALESPERSON

Figure 11 Wood Fence Styles

11-01-01

Pressure Treated Wood

Most readily available wood species can be treated with chromate copper arsenate (CCA) (often referred to by its brand name Wolmanized) (Appendix 2, p.128) to protect the wood from termite and fungus attack. Products such as Wolmanized Extra provide some degree of protection from water damage by stabilizing swelling and shrinkage.

CAA has a 60 year proven record of protecting wood against termite and fungi. Wood cracking, splitting and warping, however, still remain a problem (Appendix 2, p.128) and nailed connections still work themselves loose. It is recommended that gloves and dust masks be used when handling, cutting or machining CCA treated wood. Some studies claim that arsenic a known carcinogen can leak from the wood into the soil and water.

The wood preservative industry has decided to voluntarily phase out CCA pressure treated wood products for the residential building market by December 2003 to avoid a potential showdown with the USEPA. The phase out does not affect industrial or commercial CCA-treated products such as poles, piling and heavy timbers. The EPA has concluded that CCA treated wood does not pose an unreasonable risk to the public and has not recommended the removal of CCA treated products already in use.

There are alternatives to CCA such as amine copper quat (ACQ) and copper boron azole (CBA) but these are more expensive and have only a limited track record.

Due to the environmental concern posed by pressure treated wood it can not be recommended for use in privacy fencing at this time.

Further information on pressure treated wood fences may be found in Appendix 2, page 110.

Polyvinyl Chloride (PVC)

PVC has been used successfully as a house siding material for many years and is now widely used for fencing. Fence posts, rails and boards are made of extruded polyvinyl chloride and resin. The material is combined with titanium dioxide UV inhibitors to prevent discoloration and with impact modifiers to provide strength, flexibility, and impact resistance. No special tools are required to work with the material as it can be easily cut, sawed, screwed or glued. PVC is virtually maintenance free and has good weatherability and durability. Manufacturers typically provide a lifetime warranty against, rotting, chipping, peeling, and cracking. Appendix 3, page 132 contains product information for various PVC manufacturers.

PVC for fences is manufactured as a mono extrusion where the entire profile (thickness) of the material is of the same composition, or as a co-extrusion which produces an inner structural layer and an outer cap stock layer high in titanium dioxide which provides UV resistance. Both methods can produce high quality PVC fence materials. PVC for fence use is specified as per ASTM F 964, Appendix 3, page 379 Rigid PVC Exterior Profiles Used for Fencing.

Rigid PVC material is further specified by ASTM D 1784 Appendix 3, page 375 which is a cell classification. The cell classification aids in selecting and identifying PVC material properties. The properties are shown in Table 2 (ASTM D 1784).

Table 2 Class Requirements for Rigid PVC

TABLE 1 Class Requirements for Rigid Poly(Vinyl Chloride) (PVC) and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

NOTE 1—The minimum property value will determine the cell number although the maximum expected value may fall within a higher cell.

Designation Order No.	Property and Unit	Cell Limits												
		0	1	2	3	4	5	6	7	8	9	10	11	
1	Base resin	unspecified	poly(vinyl chloride) homopolymer	chlorinated poly(vinyl chloride)	vinyl copolymer									
2	Impact strength (Izod), min: J/m of notch	unspecified	<34.7	34.7	80.1	266.9	533.8	800.7						
3	ft-lb/in. of notch		<0.65	0.65	1.5	5.0	10.0	15.0						
4	Tensile strength, min: MPa	unspecified	<34.5	34.5	41.4	48.3	55.2							
	psi		<5 000	5 000	6 000	7 000	8 000							
5	Modulus of elasticity in tension, min: MPa	unspecified	<1930	1930	2206	2482	2758	3034						
	psi		<280 000	280 000	320 000	360 000	400 000	440 000						
5	Deflection temperature under load, min, 1.82 MPa (264 psi): °C	unspecified	<55	55	60	70	80	90	100	110	120	130	140	
	°F		<131	131	140	158	176	194	212	230	251	266	284	
	Flammability	A	A	A	A	A	A	A	A	A	A	A	A	

^A All compounds covered by this specification, when tested in accordance with Test Method D 635, shall yield the following results: average extent of burning of <25 mm; average time of burning of <10 s.

As an example a rigid PVC material with an ASTM D 1784 Cell Classification of 12454 has the following requirements (ASTM D1784 as shown in Figure 12)

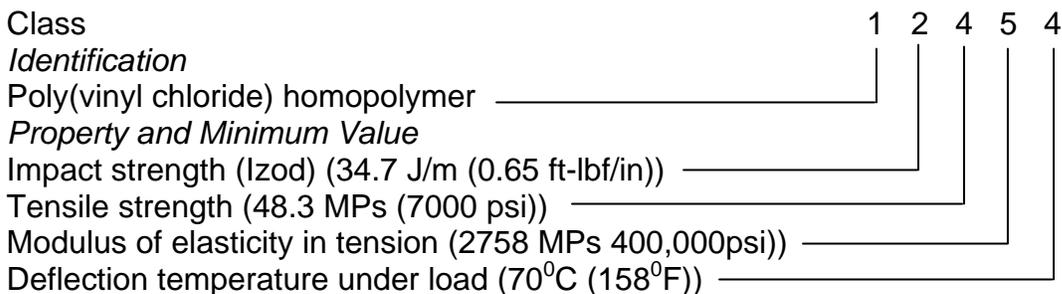


Figure 12 ASTM 1784 Cell Classification Example

Most PVC fence manufactures use rigid PVC which is high impact, UV resistant with an ASTM D1784 cell classification of 14344 or better.

The surface of PVC fence members can be smooth or wood grain embossed. White is the traditional color. There is limited availability of other colors such as ivory, sand, cedar, and green. The surface can be cleaned by pressure washing or with a non-abrasive cleaner on a hose sprayer. While the material never needs painting, it can be painted with alkyd paint to cover graffiti.

Most wood privacy fence designs can be duplicated with PVC fencing. Standard 6 ft. high privacy fence designs are readily available from all manufacturers. Custom designed 8 ft. high privacy fences can also be specified. Most PVC privacy fences have a "good neighbor" design which looks the same from both sides.

PVC privacy fencing is assembled from manufactured pre-cut components or more typically from pre assembled fence panels which then are attached in one piece to the PVC posts. Post to panel attachment differs somewhat by manufacturer but typically metal brackets, screws or lock rings are used. Damaged fence components or panels are readily available and can be easily replaced.

While all PVC manufacturers produce several styles of privacy fencing, the specifics of each manufacturer differ somewhat. These specifics are summarized as follows:

BUFFTECH (1-800-333-0569) www.bufftech.com

Several styles (Chesterfield, Norfolk I, Lewiston) of 6ft and 5ft plus 1ft accent lattice top, fence heights are available. There is also a Galveston style, which comes in 7 ft, 8ft, and 7ft plus 1ft accent top, heights. All have a limited, non-prorated lifetime homeowner warranty or a 30-year non-homeowner (institutional, corporate, governmental, etc) warranty from the manufacturer.

All fence components are manufactured as a co-extrusion with an ASTM D1784 cell class of 14344B. The fence posts are available in 5 by 5 inch sizes with either standard (0.135 inch) or heavy-duty (0.170 inch) wall thickness. Available colors are white and tan.

ULTRA GUARD (1-800-592-6220) www.ultraguardvinylfence.com

Several styles (Panel Privacy, 6 inch Board Privacy, 6 inch T&G Privacy, Privacy with Lattice) of 6ft and 5ft plus 1ft accent lattice top, fence heights are available in white, and Monterey sand colors. The 7ft and 8ft heights are a custom design and are not warranted by the manufacturer. The 6ft high fences have a limited lifetime manufacturer warranty. This manufacturer also has a Woodgrain Privacy fence style available in 6ft and 8ft heights, which has a wood texture finish and sound absorbing foam inserts in the PVC board cavity. The Woodgrain is

available in harvest ash, laurel gray, and weathered cedar colors. Both the 6ft and 8ft Woodgrain Privacy fence carry a limited lifetime manufacturer warranty.

All fence components are manufactured as a co-extrusion with an ASTM D1784 cell class of 16344. The impact strength of the PVC of this manufacturer is significantly better than most other manufacturers. The fence posts are available in 5 by 5 inch sizes with a standard 0.145inch wall thickness.

COUNTRY ESTATE (Nebraska Plastics) (1-800-445-2887) www.countryestate.com
Several styles (Kensington, Lakeland, Hallingsworth Montauk, Melbourne, Rochester) of 6ft and 5ft plus 1ft accent lattice top, fence heights are available. They carry a 50 year residential consumer and a 20 year commercial consumer, non-prorated limited manufacturer warranty. This manufacturer will also warrantee their product using any other major manufacturer's published warranty on PVC fencing when requested to do so in writing.

All fence components are manufactured as a mono-extrusion with an ASTM D1784 cell class of 14344B. The fence posts are available in 5 by 5 inch sizes with either standard or heavy wall thickness.

Available colors are white, light almond, and light gray.

PALKAR (1-866-472-5527) www.palkarfence.com
Several styles (Carlisle, Lancaster, Kinzer, Berwick, Williamsport) of 6ft and 5ft plus 1ft accent lattice top, fence height are available. Custom heights up to 12ft are also available on most styles. All fence heights carry a lifetime manufacturer warranty. The fence boards are manufactured with a wood texture finish and have a PVC foam interior core. Available colors are white, ivory, sand, forest, and cedar.

HERITAGE (1-800-736-5143) www.heritagevinyl.com / www.a-fence.com
Several styles (Laurel II, Kingswood II, Vicksburg) of 6ft and 5ft plus 1ft accent lattice top, fence heights are available. The fences carry a non-prorated limited lifetime manufacturer warranty.

All fence components are manufactured as a co-extrusion with an ASTM D1784 cell class of 14344B. The fence parts are available in 5 by 5inch sizes with a standard wall thickness of 0.135 inches. Available colors are white, tan, ivory, and oyster (light gray).

STANCO www.stanco-inc.com See website for information.

Traditional style 6 ft. high PVC privacy fencing with decorative lattice tops and post caps costs \$35 per linear ft. for the material and has a \$25 per linear ft installation cost using union labor for a combined installed cost of some \$60 per linear ft in the N.J. area. Minor modifications to improve post rigidity and the use

of non corroding hardware made of 317 stainless steel could significantly extend the useful life of this virtually maintenance free fencing. PVC privacy fencing is a good candidate to meet the stated project objectives.

In May 2003, as an addendum to “Maintenance Roadway Repair Contract No. 227-Central 20002, Monmouth County,” NJDOT installed 925 ft (282 meters) of Bufftech, Galveston style 8 ft high PVC privacy fence (Figure 12) (Appendix 3-Contract Rt 138/18, page 391) with a cell classification of 14344. A photo of the completed project may be found below. Details of the fence may be found in Appendix 3-Rt 138/18Photographs, page 385.



Figure 13 8ft High Privacy Fence for Route 138 & 18 Intersection

The PVC fence was installed on the new ramp at Rt. 138 E.B. and Rt. 18 N.B. at a cost of \$62 per linear ft (\$204 per meter).

Engineered Wood Composites

Wood thermoplastic composite material is manufactured by a continuous extrusion process producing nominal lumber sizes from 1-by 6 inches up to 6-by 10-inches. Trex a brand name of this type of product is a wood – plastic composite made primarily from equal parts of reclaimed hardwood sawdust and recycled polyethylene plastic. The plastic component shields the wood from moisture and insect damage, while the wood protects the plastic from UV

damage. The material comes in several colors (natural, grey, brown) and needs no weatherproofing or sealants. It has good paint adhesion and can be painted to cover graffiti if necessary. It does not split, crack, or warp and is not susceptible to dry rot or termite damage. It can be sawn, nailed, screwed or bolted just like wood. The product is readily available at lumber yards and has been widely used as decking material. The product (Appendix 4, p.404), however, is not as stiff as wood and is currently not recommended for use as primary load bearing, members such as deck parts, beams or joists.

EVERGRAIN by Epoch is a similar product with a 50% plastic and 50% wood fiber composition which contains recycled materials. It is available in ½ by 6 inch board sizes as well as larger post and rail sizes. The material will not readily absorb paint and stains. Evergrain comes with a 10 year limited material warranty. Fence design and installation information is shown in Appendix 4, p.436.

POLYWOOD Plastic Lumber is all plastic as contrasted with Trex and Evergrain which are wood/plastic composites. The product is manufactured in Edison, N.J. from 100% post consumer plastics and is available in sizes ranging from 1-by 6-inches to 6-by 6-inches. The material is non-porous, will not rot or split, is impervious to insect infestation, is graffiti resistant, and contains colorant and UV inhibitors to protect against fading and UV degradation. As of this writing, they are not manufactured as fences. The NJDOT may wish to revisit this material in the future as the technology improves.

Engineered composites are currently not available in pre-assembled fence sections. The products are sold as individual “lumber” pieces which would still have to be cut, finished and assembled on site. The durability of the material when assembled using stainless steel fasteners holds promise. However, there are currently few engineered wood composite privacy fence installations and the overall long term use of this material for privacy fencing has not yet been fully documented. A traditional style 6 ft high engineered wood/plastic composite privacy fence would cost an estimated \$30 for materials, \$30 for site assembly and finishing, and \$25 for installation for a combined installed cost using union labor of some \$85 per linear ft of fence.

Wood composite lumber has the potential for use as a privacy fence material that can meet the stated objectives of the study. The material, however, is not currently being widely used in privacy fencing. A significant drawback to its widespread use is that engineered wood composite fencing has to be job built from individual “lumber” components rather than being available in pre assembled fence sections. Additional testing/field evaluation of fence assemblies made from the various available materials is still needed. Additional information may be found in Appendix 4.

Chain Link

Metal chain link fencing is widely used as right of way (ROW) fencing along roads and as security fencing around industrial and residential properties. The fencing typically is built using 2 inch diameter steel line posts located at 6 ft. centers, set in augered holes and concreted in place, with fence framework on the posts. Then 9 ga to 11 ga galvanized steel or aluminum wire chain link is attached to the posts. Typical installation details and general notes are shown in Appendix 5, page 474. Steel chain link is typically galvanized before weaving (GBW) or galvanized after weaving (GAW) to protect the base metal. This is then combined with zinc coated framework and posts. A more attractive alternative is the use of a polyvinyl chloride (PVC) coating which is thermally fused and bonded to a galvanized steel core wire by a fluidized bed process. This dense PVC coating is baked to a smooth, tough finish and offers the wire maximum protection. The PVC finish is available in many colors including black, brown and green. While both the galvanized and PVC coated fences are marketed as maintenance free fences the coating of both can deteriorate and eventually corrosion of the base metal will start.

Chain link ROW fencing can be modified for use as privacy fencing by placing decorative fence inserts into the chain link slots. These decorative slats come in plastic filler strip (Figure 14) or in a plastic privacy hedge configuration (Figure 15) and can be purchased and installed into any chain link fence.



Horizontally installed DuraSlatt fillerstrips with contrasting feature strips

Figure 14 Decorative Slats

The cost of 6 ft high PVC coated steel wire chain link fencing is \$6 per linear ft for the materials. Installation costs using union labor run \$18 per linear ft for a total cost of some \$24 per linear ft installed. The field installation of plain or hedge slats into the fence to provide screening is very labor intensive and results in an additional \$12 per linear ft cost for a total installed cost with slats of some \$36 per linear foot. The use of chain link fencing with manufacturers installed slats reduces the installed cost to \$28 per linear ft. If aluminum wire is used it adds \$2

per linear ft to the overall installed cost. The installation of an 8 ft high rather than a 6 ft high fence adds \$2 per linear ft to the overall cost.



Horizontal/Diagonal DuraSlatt installation
retains privacy around dumpster area

Figure 15 Privacy Hedge Slats

Chain link fence manufacturers also supply fencing with slats already in the wire. Both the PVC coated wire and the slats are available in a variety of colors.

Chain link fencing with privacy slats can provide low cost readily available privacy fencing. Its appearance, however, is generally perceived as being aesthetically poor and as such it does not meet the stated objectives of the study.

Metal Panel

Fixed louver galvanized steel, stainless steel and aluminum fencing provides direct visual screening but allows airflow through the fence. It has been used for enclosure applications such as equipment storage, trash disposal and parking garages and can also be used for privacy fencing (Appendix 6, p482). The louvers come in 80% or 100% direct visual screening configuration and can be positioned vertically or horizontally. All three metal types are available in a variety of colors. The colors are applied by coating the base metal with an epoxy and/or polyester powder coating.

Fixed panel metal fencing is also available in galvanized steel, stainless steel and aluminum. The sheet pile shaped metal panels are from 5 to 12 inches wide and can be fixed to metal rails in a “board on board” configuration (Appendix 6, p 488) which provides for direct visual screening but allows airflow. Panels are typically available in both 6 and 8 ft lengths and form 6 ft or 8ft long fence sections when assembled. An alternate design is a vertical panel fence that is sight restricted (Appendix 6, page 484). The vertical interlocking panels are placed into top and bottom rails which are then attached to the fence parts. This system is made of non corrosive metals which are finished in any of a variety of colored powder coatings. Typical specifications and installation details are

available (Appendix 6, page 487). Most manufacturers provide limited warranties on their coatings of from 7 to 20 years.

While there have been visual improvements made in metal louver and panel fencing, the fencing is still generally used for and associated with trash and HVAC enclosures. The powder coatings covering the base metals provide top of the line protection but are still only good for 10 to 20 years. After this time period the fences could require extensive maintenance and painting. Based on these considerations this fence type does not meet the stated objectives of the study.

An example of a metal privacy fence between R678 and the service road in Whitestone, NYC as shown in Figure 16.



Figure 16 Metal Privacy Fence

Concrete

Precast concrete thin post and panel fences reinforced with steel are manufactured to resemble wood, brick or natural stone installations (Appendix 7, page 491). The fencing presents a solid pleasing wall like appearance which is visually the same on both sides (“good neighbor”).

Precast concrete 5 inch H posts are typically set at 5 ft centers into 1 ft diameter augered holes which are then filled with concrete to secure the posts into position. Individual, 2 inch thick by 12 inch high, precast concrete panels are then inserted from the top into the H post slots (Appendix 7, page 499). Vertical panel installation into precast top and bottom rails which are set in the posts is

also available (Appendix 7, page 509). Typical manufacturers technical and installation specifications are shown in Appendix 7.

The light weight, low height nature of this system eliminates the need for heavy equipment or engineering input for its installation. A 6 ft high thin wall precast concrete fence costs \$35 per linear ft for materials and has an estimated installation cost (using union labor) of \$85 per linear ft for a total installed cost of \$120 per linear ft. An 8 ft high fence has an estimated installed cost of \$140 per linear ft.

The corrosion resistance of steel reinforcing in thin post and panel concrete fences can be a problem when the installed fence is located in close proximity to roads using winter salt mix. To reduce steel corrosion manufacturers use epoxy coated reinforcing and some incorporate a 5% to 10% micro silica additive to reduce the chloride ion permeability of the concrete. The corrosion problem could, however, be eliminated by specifying the use of stainless steel reinforcing in place of mild steel. The manufacturers of thin post and panel concrete fences have the ability to make this improvement at an estimated cost increase of some \$5 per linear ft. for 6 ft. high fence. With stainless steel reinforcing precast concrete fencing would meet the stated objectives of the study.

Most manufactured styles of concrete fence incorporate the use of thin precast panels set in precast H posts. The nominal two inch thick, twelve inch high and five feet long panels weigh eighty-five pounds each. A typical ten feet long, five inch by five inch H posts weighs three hundred pounds. Site equipment, typically used to install an eight foot high wall, consists of a truck mounted auger and a bobcat with a forklift attachment. The specifics of the manufacturers are as follows:

1. FADDIS Concrete:
(610)-269-4685
www.FADDIS.com

Several styles (Hessian, Victory, Wicker) are available in heights from 6 to 12 ft. in a variety of colors. The concrete H posts are typically set 5 to 10 ft. on centers depending on the style selected. Concrete panels are 2¾ inches thick. The precast concrete members have a micro-silica additive and use epoxy coated reinforcing.

2. Superior Concrete:
(800) 942-9255
www.SUPERIORCONCRETE.com

Several styles (Superior-Brick, Wood, Ledgestone, Cobblestone) are available in heights from 6 to 8 ft. in a

variety of colors. The concrete H posts are typically set 5 ft on center. The 1¾ inch thick concrete panels incorporate glass fiber reinforcing. The manufacturer offers a 5 year limited warranty.

3. Designer Concrete (American Technocrete):
(800) 624-WALL
www.Technocrete.com

Several styles (Cedarcrete, Woodcrete, Fencestone, Brickcrete) are available in heights from 6 to 8 ft. in a variety of colors. The concrete H posts are typically set 5 ft. on center. The precast panels are 1¾ to 2 inches thick and are manufactured with steel and fiber reinforcing.

Examples of a concrete privacy fence in Margate, NJ are shown in Figures 17 and 18.



Figure 17 Concrete Privacy Fence



Figure 18 Concrete Privacy Fence

Fiberglass

Fiberglass reinforced polymer composite material has good mechanical properties, can withstand harsh weather conditions, will not corrode from chemicals and salt and when protected by UV inhibitors is resistant to solar degradation. The material is manufactured in panel form for light weight noise walls (Appendix 8, page 586). The 6 inch high by 2-1/2 inch wide tongue and groove fiberglass panels are stacked one on top of another between vertical steel or concrete H posts. The panels can be filled with ground recycled tire waste to improve their sound transmission rating or can be used hollow for a privacy fence application. A noise wall using this material was recently (2001) installed on the I 87 – I 287 interchange in NY (Appendix 8, page 581). Typical material specifications and installation details are shown in Appendix 8, page 587. The estimated cost of a 6 ft high privacy fence is \$80 per linear ft for materials and \$60 per linear ft for installation for a total installed cost of some \$140 per linear ft of fiberglass fence.

While the cost and aesthetics of this fence type needs improvement the good durability and maintenance free nature of fiberglass make it a candidate for future study and evaluation. Currently, however, this material due to its poor aesthetics and high cost does not meet the stated objectives of the study.

Berms and Shrubs

Berms are natural barriers constructed of soil or rock in an unsupported condition. They can be used in conjunction with a privacy fence to reduce the required height of the fence. The principal disadvantage of berms is that they occupy much more space than a fence. This is due to the sloping sides of the berms which must be gradual enough to remain stable. Soil berms require a 1 on 2 slope while rock slopes can be stable at a 1 on 1 slope. The top of the berm should be a minimum width of 1 ft. Wider level plateaus result in even larger space requirements for the berm but provide for easier maintenance of the berm and any fencing or shrubs located on top of the berm.

A 6 ft high privacy fence could be replaced with a 2 ft. high earth berm and a 4 ft high privacy fence but would require a minimum width (direction perpendicular to the fence) of 9 ft. Privacy fencing on top of berms or rock walls can produce an aesthetically pleasing combination. A soil berm 6 ft high, however, would require a minimum width of 25 ft which in most cases is not practical.

Fast growing shrubs and plantings can provide attractive privacy screening but will require a few years of patience until they become established and reach a screening height. Shrubs and planting typically need start up maintenance such as watering, fertilizing and pruning. Standard specifications for the installation of shrubbery may be found in Appendix 9 page 588.

Berms and shrubs can be used in combination with privacy fencing to improve the aesthetics and acceptance of most fence installations. Both should be considered alone or in combination with fences where they are feasible.

Guidelines for the Selection of Privacy Fencing

At locations where visual and physical separation of the roadway from residential neighborhoods can significantly improve the quality of life and promote good neighbor relations, 6 to 8 ft high privacy fencing can be used.

It is envisioned that for the majority of installations, PVC will be the fence material of choice. The PVC fence sections and posts are light and can be readily carried and installed without special equipment. The volume of concrete required for PVC post filling and footing encasement is small and can be handled manually. The lower rail of PVC fencing is installed 3 inches above grade, which eliminates the need for special surface drainage considerations. PVC privacy fencing can provide an aesthetically pleasing, low maintenance, economical installation at most locations.

For locations where the fencing is set close to the roadway where snowplowing could impact the fence and where a high traffic volume is present, the more massive thin panel concrete fencing should be considered. This heavier fencing

may require equipment to unload and transport fence components and will require special drainage considerations where surface runoff is a factor. Thin panel concrete privacy fencing is an aesthetically pleasing, more massive, low maintenance solution for special locations where the additional expense is warranted.

Both types of fencing require augered holes for post installation which are most economically accomplished by the use of a truck mounted soil auger. This requires truck access at the fence installation site. Both types of fencing need a sufficient clear zone between the roadway and fence; where this is not available, a guard rail system needs to be installed to protect the fence from vehicular impact damage.

Separate generic specifications for PVC and thin walled concrete privacy fences were developed and are presented BELOW. Manufacturer developed specifications may be found in Appendices 3 & 7.

RECOMMENDED PVC FENCE SPECIFICATION
DESCRIPTION

This work shall consist of the construction of vinyl privacy fences and gates.

MATERIALS

The fence shall be constructed with materials made of high impact, ultra-violet (UV) resistant, rigid Poly Vinyl Chloride (PVC). The extruded product shall conform to the requirements of ASTM D 1784 Class 14344B or better. The product shall be as follows:

Product: _____ style _____ color _____ ft high
Manufacturer: Bufftech
2525 Walden Avenue
Buffalo, NY 14225
1-800-233-8990
www.bufftech.com

Product: _____ style _____ color _____ ft high
Manufacturer: Ultra Guard
3773 State Road
Cuyahoga Falls, OH 44223
1-800-457-4342
www.ultraguardsvinylfence.com

Product: _____ style _____ color _____ ft high
Manufacturer: Country Estate (Nebraska Plastics, Inc.)
PO Box 45
Cozad, NE 69130-0045
1-800-445-2887
www.countryestate.com

Gates shall be of the same materials as the fence to which the gates are attached. All metal components and hardware (brackets, screws, clips, etc.) shall be made of stainless steel. All other components shall be as specified by the manufacturer.

CONSTRUCTION

Vinyl Privacy Fence

The fence and the gate shall be constructed according to the manufacturer's specifications. A representative from the manufacturer shall be present at the time of installation, to ensure proper construction procedure and training.

COMPENSATION

Method of Measurement

Vinyl privacy fence will be measured by the linear foot along the bottom line of the panel, deducting the width of the gates.

Gates of various sizes will be measured by the unit.

Basis of payment

Payment will be made under:

<i>Pay item</i>	<i>Pay Unit</i>
VINYL PRIVACY FENCE _____ ft high	LINEAR FOOT
GATES, VINYL PRIVACY FENCE, _____ ft wide	UNIT

Separate payment will not be made for the construction of the reinforced concrete footing and drainage layer.

RECOMMENDED CONCRETE FENCE SPECIFICATIONS

DESCRIPTION

This work shall consist of the construction of precast concrete fencing.

MATERIALS

The fence shall be constructed of precast concrete members meeting the requirements of:

PCI's MNL-117 "Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products"
PCI's MNL-120 "PCI Design Handbook - Precast and Prestressed Concrete"
ACI 318 (ACI 318M) "Building Code Requirements for Reinforced Concrete"
ACI 305R – "Hot-Weather Placement"
ACI 306R – "Cold-Weather Placement"
CRSI's "Manual of Standard Practice" for fabricating, placing and supporting reinforcement
ASTM A82 – "Reinforcing Wire"
ASTM A615 – "Reinforcing Bars"
ASTM C33 - "Coarse Aggregate"
ASTM C33 – "Fine Aggregate"
ASTM C150 – "Portland Cement"
ASTM C260 – "Air-Entraining Admixture"
ASTM C494 – "High-Range, Water-Reducing Admixture"
ASTM C979 – "Coloring Agent"
ASTM C1107 – "Non-Shrink Grout"
ASTM C1116 – "Synthetic Fiber-Reinforced Concrete"

All embedded steel (reinforcing bars, reinforcing wire, stirrups, ties, etc.) in the precast concrete members shall be stainless steel. All other components shall be as specified by the manufacturer. The product shall be as follows or approved equal:

Product: _____ style _____ color _____ ft high
Manufacturer: Faddis Concrete Products
3515 Kings Highway
Downingtown, PA 19335
1-800-777-7973
www.faddis.com

Product: _____ style _____ color _____ ft high
Manufacturer: Superior Concrete Products
PO Box 201625
Arlington, TX 76006
1-800-942-9255
www.concretefence.com

Product: _____ style _____ color _____ ft high
Manufacturer: Designer Concrete Fences

4925 Sepulveda Blvd.
Sherman Oaks, CA 91403
1-800-624-WALL
www.designerconcrete.com

CONSTRUCTION

The precast concrete fence shall be constructed according to the manufacturer's specifications. The size and location of drain openings, where required, will be determined prior to fence installation. The embedment of precast fence posts in the cast in place concrete footings shall be at least 4 ft for 6 ft high walls and 5 ft for 8 ft high walls. A representative from the manufacturer shall be present at the time of installation to ensure proper construction procedure and training.

COMPENSATION

Method of Measurement

The precast concrete fence will be measured by the linear foot along the bottom line of the panel.

Basis of Payment

Payment will be made under:

<i>Pay Item</i>	<i>Pay Unit</i>
Precast Concrete Fence _____ ft high	Linear foot

LEGAL AND CODE REQUIREMENTS

Fence design and performance standards for structural integrity, safety or visual quality are typically part of many land use ordinances in N.J. communities. One such ordinance in effect in the Township of Freehold, N.J. (Appendix 10, page 594) restricts privacy fencing for rear and side yards to a maximum height of 6 ft and requires the framework or supporting structure to face the inside of the lot. The fences must be maintained in a safe, sound and upright condition. The 6 ft maximum height restriction is typical of many such ordinances in N.J. and may require this project's fencing to be limited to a maximum height of 6 ft.

Utility and drainage easements across a potential fence location site generally preclude the erection of permanent walls and fences. Movable fencing or shrubs may be permitted in such cases and would need to be considered.

ALTERNATIVE APPROACH

The overall objective of this research is to evaluate, select and design an aesthetically pleasing, durable, minimum maintenance, low height "Good

Neighbor” privacy fence. During the research, the authors became aware of an alternate approach to accomplish the objectives of the research. In a land development project in a local municipality, a set of houses along a street parallel to a major street had double frontage. The municipality required the developer to place a privacy fence along the major road. The developer was responsible for the installation of the fence; however, the eventual homeowners are responsible for the maintenance and/or replacement when necessary.

This general approach could also be adopted by the NJDOT. Where the Department decides that the installation of a privacy fence along one of their highways is needed, they could install the fence either on the neighbor’s property or along their right-of-way. The legal questions associated with building on private lands or providing an easement on State lands to a private party will be explored with the Attorney General’s Office.

The advantage of this approach is that the NJDOT has no responsibilities for the maintenance or replacement of the fence over time while providing a privacy fence where required. The fences made available to adjacent landowners would include those fences identified in this report.

CONCLUSIONS

Commercially available privacy fencing made of PVC or thin precast concrete panels can provide an aesthetically pleasing visual screen for both the property owner and the highway user. This visual and physical screening has the potential to significantly improve the quality of life for people living adjacent to highways.

With minor component modifications both commercially available PVC and concrete privacy fences are low maintenance, non engineered installations with an expected life of 25 to 50 years and as such meet the stated objectives of this study. The installed cost on NJDOT projects of 6 ft high privacy fencing is estimated at \$60 per ft for PVC and at \$125 per ft for concrete. The fencing is light weight and easy to install.

RECOMMENDATIONS

Commercially available privacy fencing 6 to 8 ft high made of PVC or thin precast concrete panels should be used in locations where such fencing can significantly improve the quality of life for people living adjacent to highways. Both PVC and concrete fencing are non engineered low maintenance installations.

The useful life of this fencing can be extended up to 25 to 50 years by specifying that all hardware (brackets, screws, clips, etc.) in PVC fences and all reinforcing steel in concrete fences be made of stainless steel. Both PVC and concrete privacy fencing is subject to vehicular impact damage and the fencing needs to

be protected by guard rails where the distance between the roadway and fence is minimal. Where fencing is damaged by impact it can be readily replaced by parts or sections available from the fence manufacturer.

PVC and concrete fencing are typically made with both sides visually the same (with no back side) and are available in aesthetically pleasing styles. The use of decorative features such as lattice top on PVC fences creates a softer, less industrial appearance and should be considered for appropriate locations.

After a fence has been installed, there is often settlement or erosion where the columns are anchored in the ground. These should be inspected shortly after installation to ensure a solid foundation for the fence.

Where the Department decides that the installation of a privacy fence along one of their highways is needed, it is recommended that they install the fence on the neighbor's property along their right-of-way.

Recommended Variations on Manufactured PVC & Concrete Fences

The NJIT team has made recommendations on both of the selected standard fences in PVC and concrete. These are as follows:

- All six foot high fences, in both materials, should have anchor posts set four feet in the ground. Likewise they should be set five feet in the ground for an eight foot fence.
- The reinforcing steel in the concrete fence should be stainless steel of any grade.
- The hardware, including hinges and other connection pieces as well as screws and other similar pieces should be stainless steel of any grade.

**APPENDIX 1
PRIVACY FENCES IN THE UNITED STATES & INTERNATIONALLY**

NEW JERSEY PRIVACY FENCES

A sampling of privacy fence types found in the NJ area are shown. These tend to be wood, treated wood and PVC. The photos shown are of wood fences only. Photos of the other materials are found in other appendices.











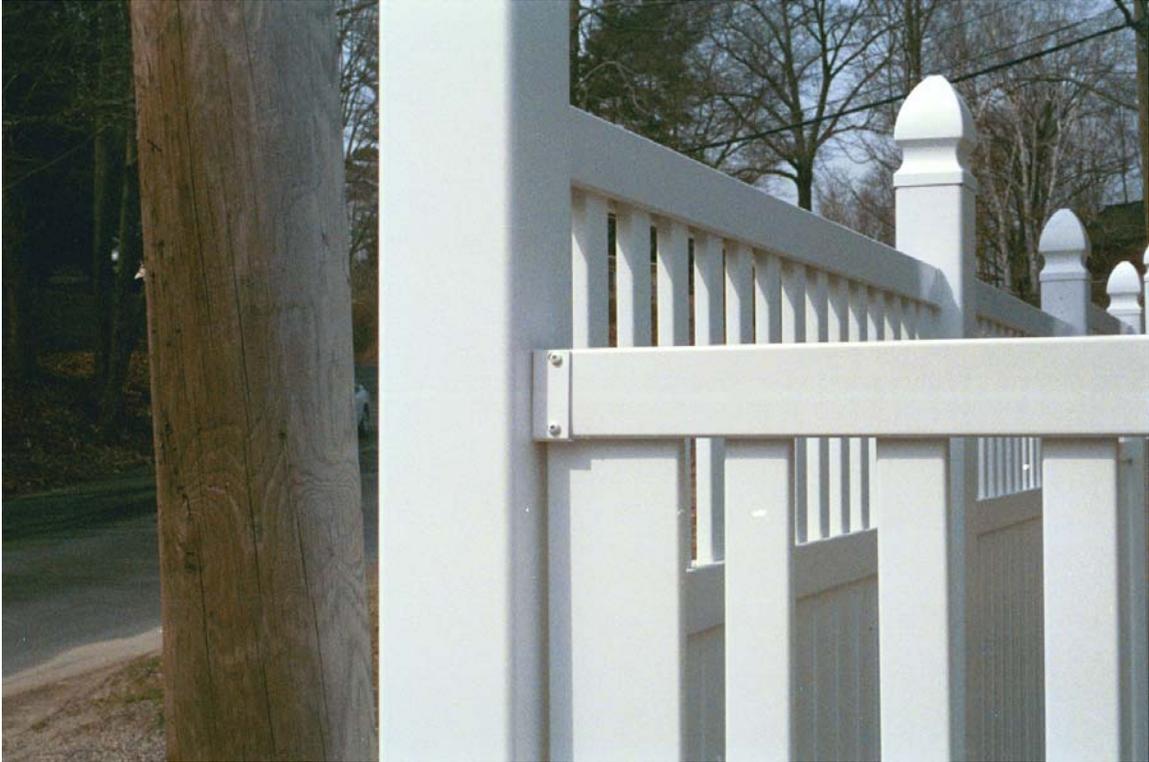
NEW YORK PRIVACY FENCES

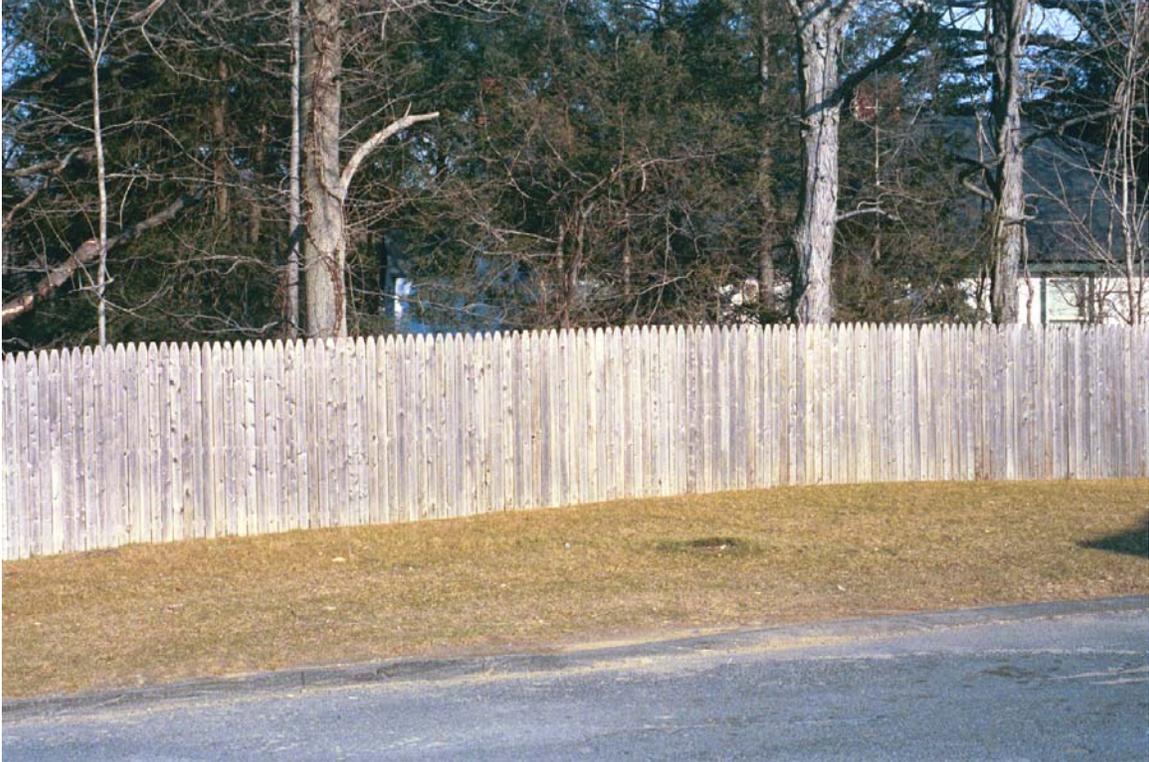
A sampling of privacy fence types.





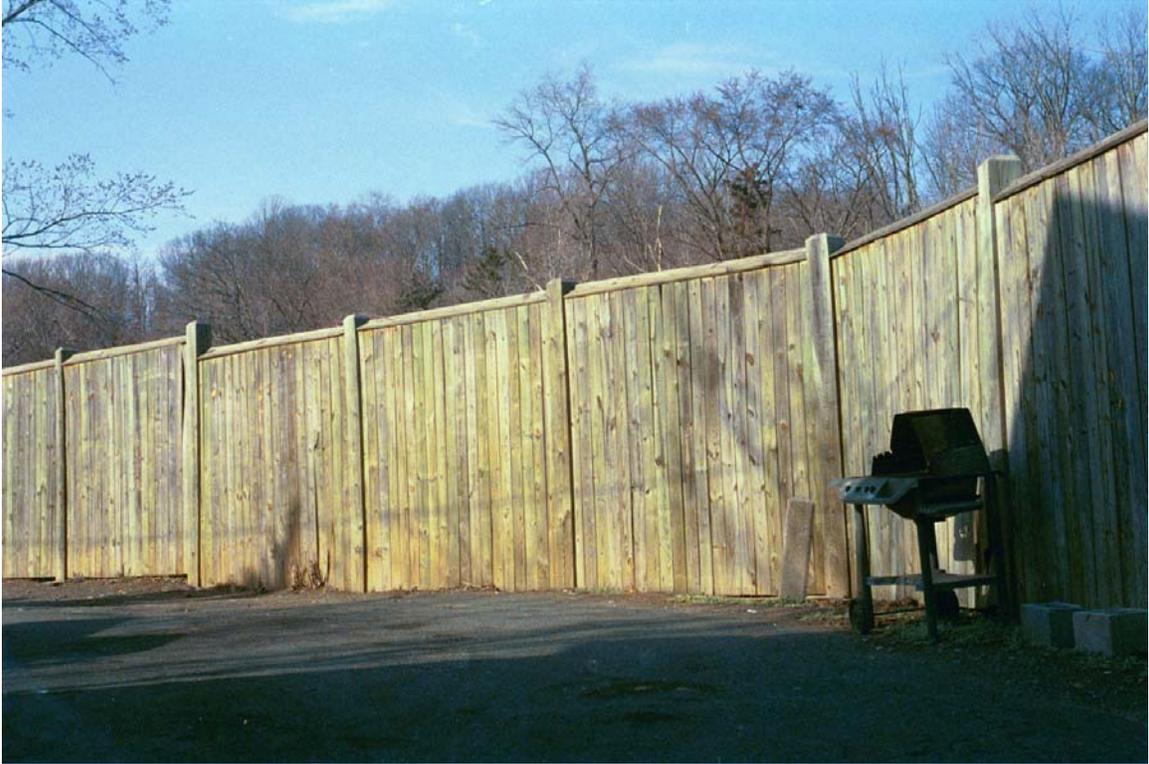


















LAS VEGAS, NV PRIVACY FENCES

A sampling of privacy fence types shielding gated communities from the roadway.





























ALBUQUERQUE, NM PRIVACY FENCES

A sampling of privacy fence types of the Southwest, US. These are predominantly masonry in keeping with local tradition.



























INTERNATIONAL PRIVACY FENCES

A sampling of privacy fences used in Europe and Japan. These tend to be individually designed with unique features such as decorative patterns, trellises for plantings, and clear Plexiglas sections to provide a glimpse through the screen.

JAPAN



Photo 1
The road landscape is much improved by noise barriers covered with ivy. It also reduces the sense of discomfort given to the surrounding area. (Chuo Expressway)

duce traffic noise on roads. A barrier is placed between the noise source and the affected part to obtain a damping effect by diffraction of the noise. This does not require further acquisition of the site, and provides a considerably effective means to reduce noise by a road structure. However, if this barrier is high, it may give a sense of discomfort to pedestrians and inhabitants along the road, deteriorating fine landscape and sunshine.

In recent years there has been an increasing demand for kindness, harmony with landscape, and comfortable driving along roads. Under these circumstances, the noise barrier is being improved and reformed to meet social requirements. The following introduces some cases of such improvements :



Photo 2
The noise barrier uses aluminum decorated plates to emphasize the horizontal line and to hide the pillars, and the beam side is covered with the panel having similar features, thereby ensuring fine views. (Kobe Line, Hanshin Expressway NO.3)



Photo 3
Use of curved noise barriers reduces the influence of reflected noise and gives a soft image to the structures. (New Shonan Bypass, National Highway NO.1)



Photo 4
Use of wooden noise barriers in harmony with the surrounding landscape is peaceful for drivers. (Chuo Expressway)

Noise barriers other than walls.



Photo 5
Noise barriers often cannot be installed in an area where roadsides are used for other purposes. In such places, planting tubs serve as noise barriers to some extent.



Photo 7
Installation of the noise reducer (cylindrical noise absorber on the top of the noise barrier) reduces diffraction noise, giving a greater effect than expected from the barrier height. This is effective when the barrier height is restricted. (Hamanote Bypass, National Highway NO.2)



Photo 8
Phase difference is created by separating the sound wave to get a noise reducing effect by interference. Installation of the interference type special noise barrier protects sunshine against deterioration and reduces the sense of discomfort. (Kanagawa NO. 3, Metropolitan Expressway)



Photo 9
Installation of the translucent plate sound barrier protects sunshine and landscape. (Nagoya Expressway Branch NO.3)

Translucent plate sound barrier



Photo 10
The translucent plate is provided at the height of the drivers' eyes to protect the landscape. The upper part overhangs to protect against reflected noise. (Kanagawa NO.3, Metropolitan Expressway)

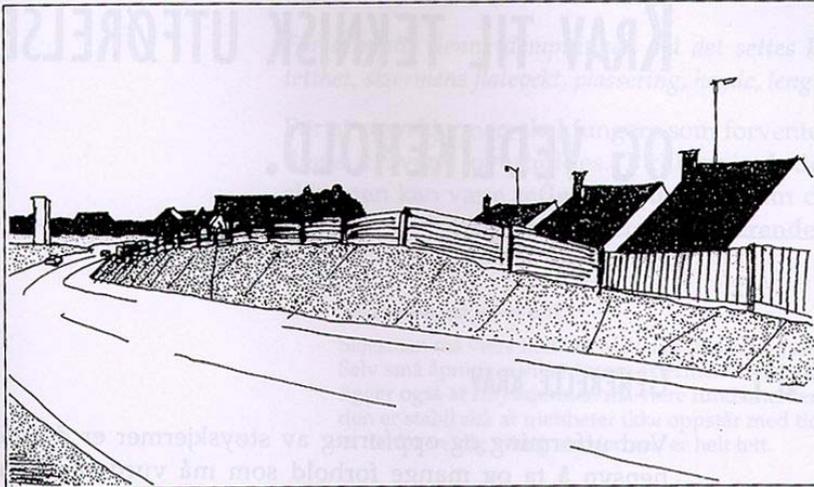


Photo 6
A comfortable roadside environment and driving environment are possible by building embankments if there is a sufficient width for buffer zones. (Seishin Bypass, National Highway No.1)

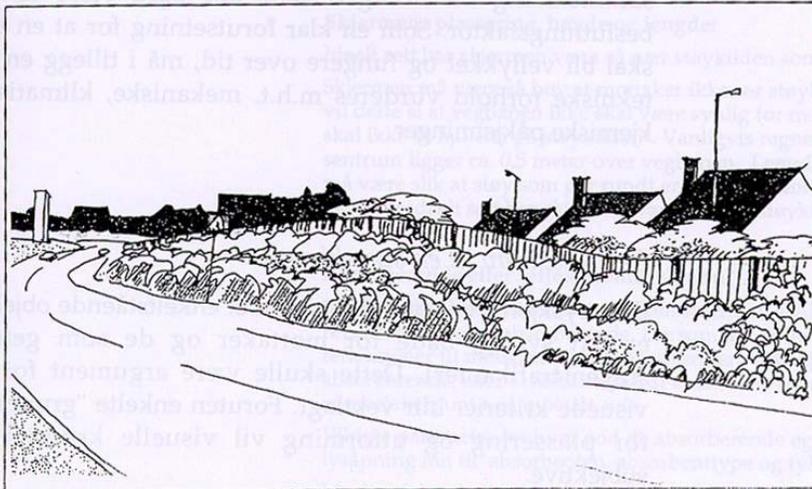
As can be seen from the above introduction, a great variety of noise barriers have been developed and used in many parts of the country, showing good results. Further study efforts are required to create comfortable road environments.

The photos introduced above have been provided by the Japan Highway Public Corporation, the Metropolitan Expressway Public Corporation, the Hanshin Expressway Public Corporation, the Nagoya Expressway Public Corporation, and Construction Bureaus in the Kanto, Chubu and Kinki areas, to which we wish to express our sincere gratitude.

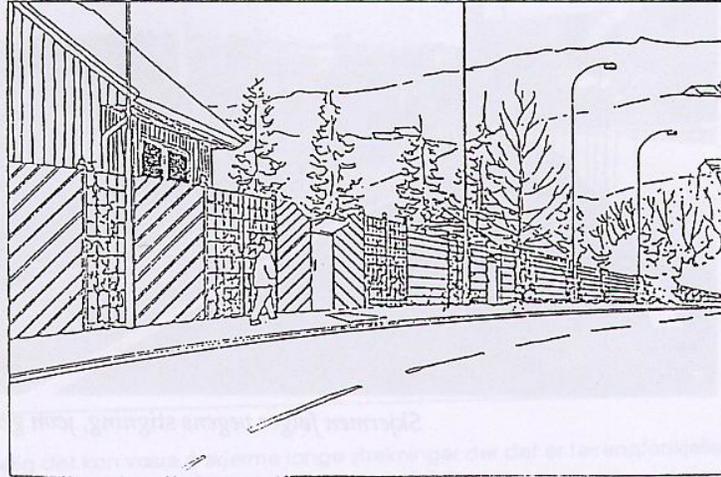
FENCES FROM NORWAY



Dette eksempelet viser hvor vanskelig det kan være å skjeme lange strekninger der det er terrengforskjeller:
 - spinkel konstruksjon, skjev og uteff skjermvegg, upresise topp- og bunnavlutninger.
 At det ikke er beplantning forverrer situasjonen ytterligere.



Virkemidler til å forbedre utseendet og effekten av skjermen:
 - skifte ut treskjermen med løsninger som er lettere å tilpasse terrengforskjeller: enten med en lav mur i natur- eller betongstein med beplantning, eller med en mer solid treskjerm med stående bord.
 - her er god plass til beplantning, f.eks større busker foran og trær bak. Vegetasjonen vil skjule de vanskelige avslutningene mot terreng og himmel.



Forslag til forbedret situasjon i Messnalivegen i Lillehammer. Støyskjermene er utformet som hagegjerder med porter. Hagegjerdene følger tomtestrukturen med tildels ulik utforming og fargesetting.

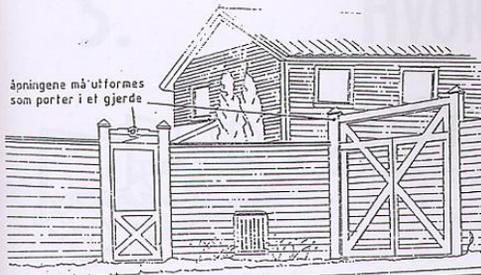
Kilde: Designprogram for trafikktutstyr og gatemøbler i Lillehammer, Oppland vegkontor



Skjermen trappes etter fallende terreng, avbrutt gesims. Nedre Breidablikk i Trondheim

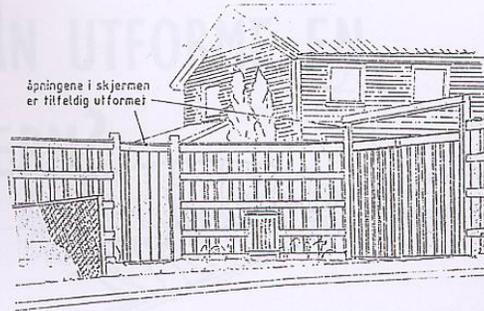
Denne skjermen får sitt uttrykk ved å stable elementer.

Skjerm som Gjerde
God



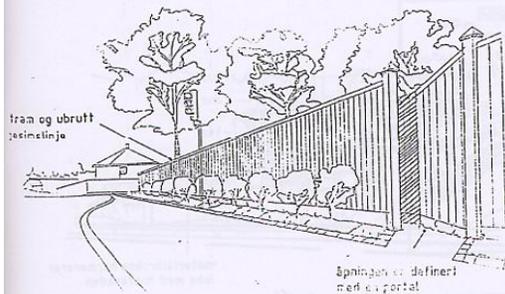
Panelet til skjermen er av samme type som huset, skjerm og hus tilhører hverandre.

Dårlig



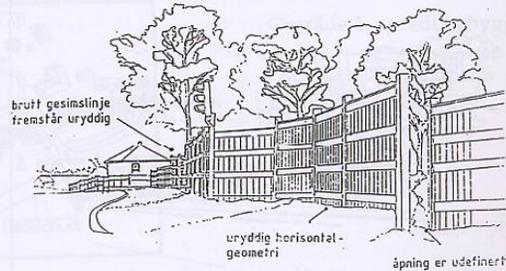
Skjermen er et fremmedelement i forhold til huset. Skjermen manifesterer støytiltaket.

Skjermens Linjeføring
God



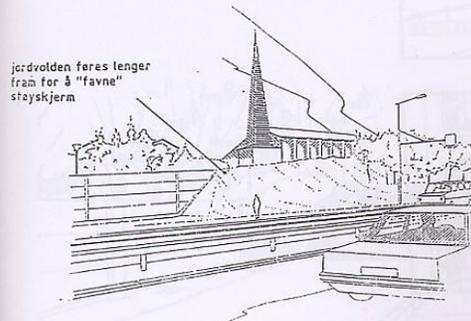
En rolig skjerm som forholder seg til veggen gir et visuelt godt inntrykk

Dårlig



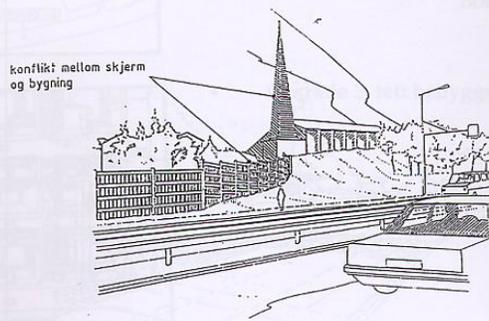
Uheldig linjeføring av skjermen. Sprangene frem og tilbake gir et uryddig uttrykk

Offentlige bygninger
God



Skjermens linjeføring tilpasses jordvoller som er den fdominerende formen.

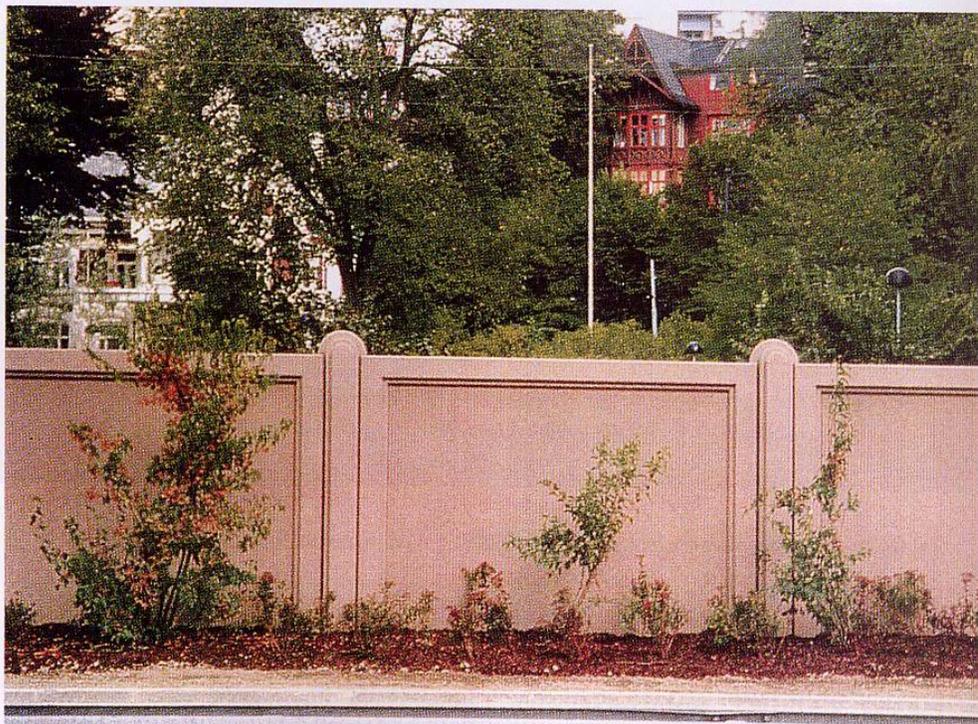
Dårlig



Skjermen tar ikke hensyn til bygningen og underordner seg denne.

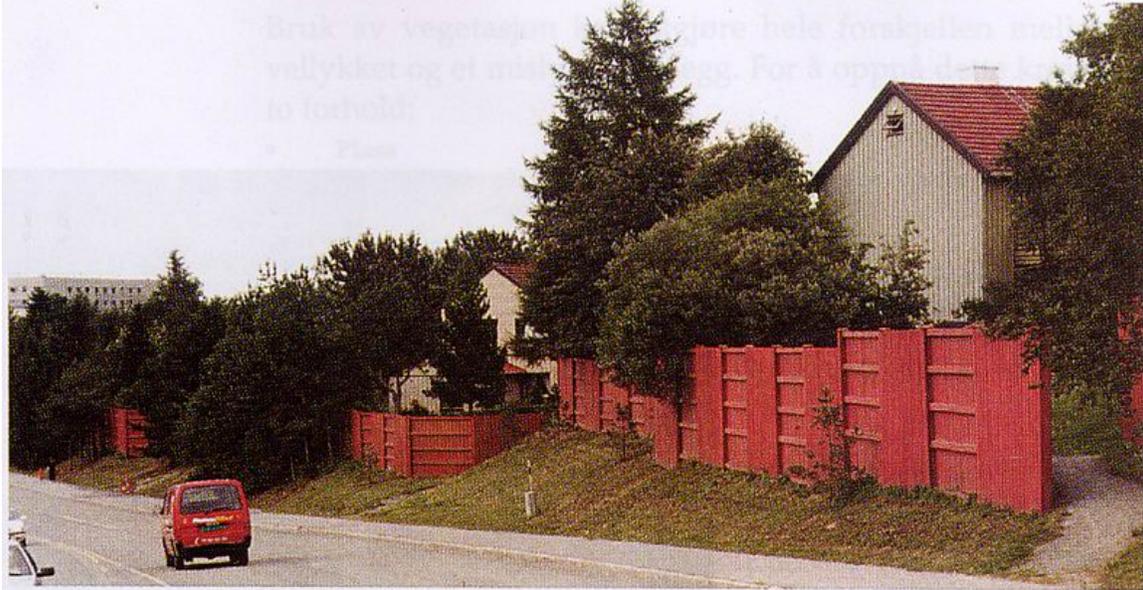


Fra E-18 i Stokke kommune i Vestfold
Betongskjermer



Fra Frognerstranda E18, bilde fra Støyskjermer i Oslo - en idékatalog

Treskjermer

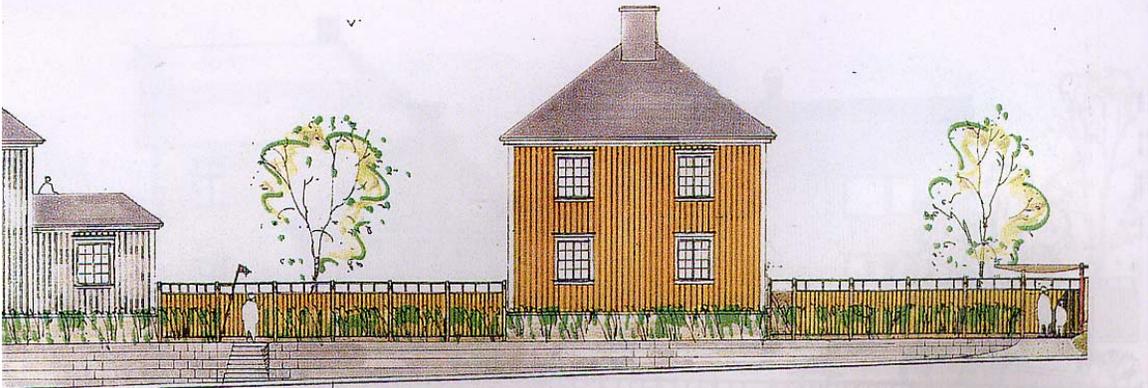
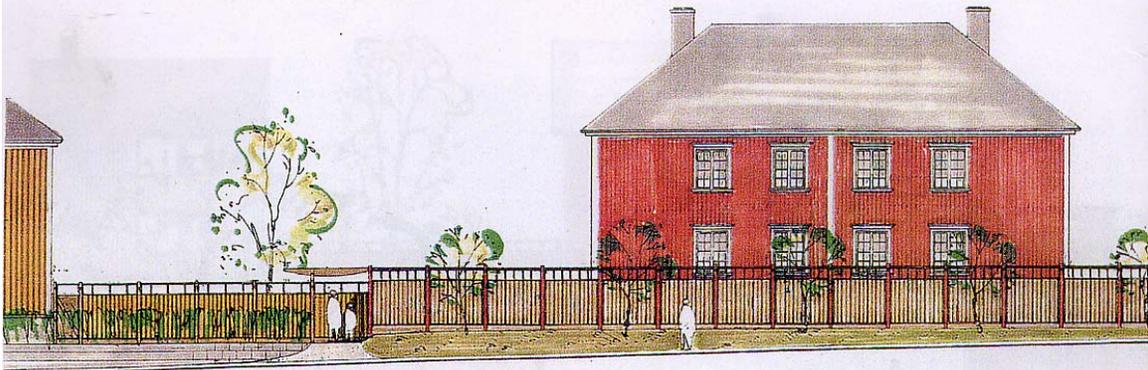
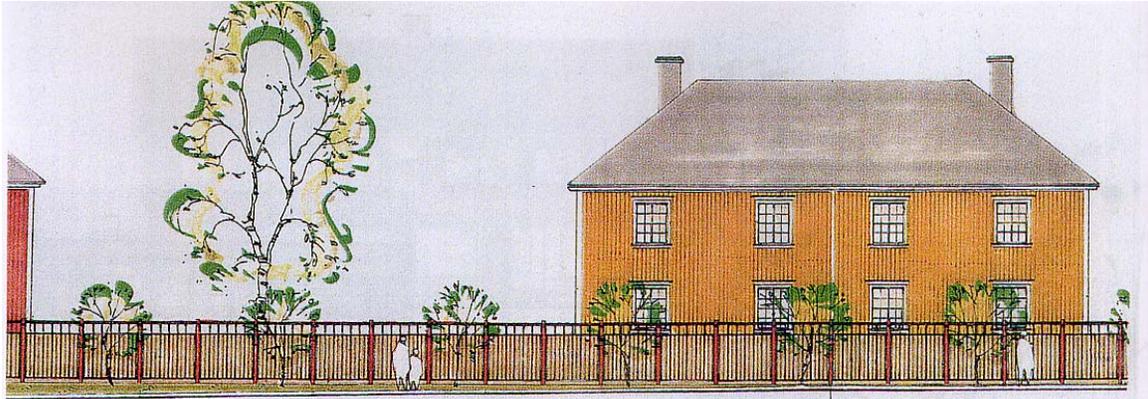


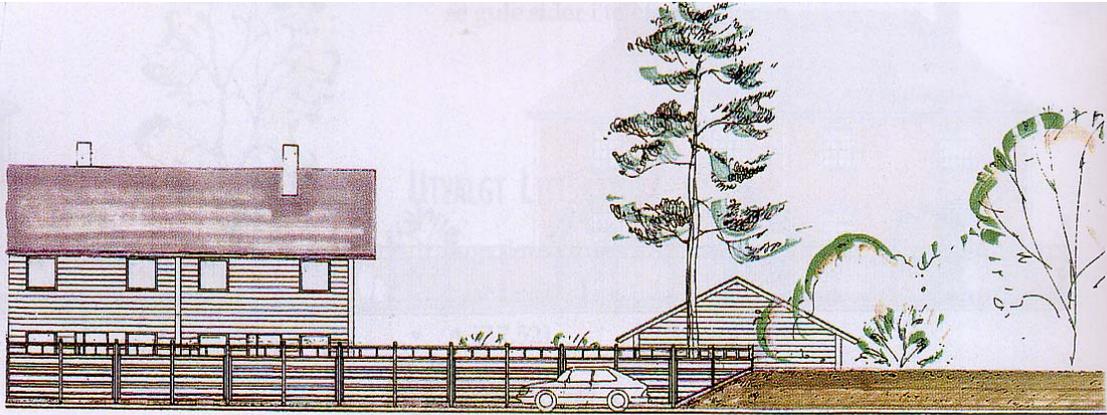
Fra Torbjørn Bratt veg i Trondheim. Treskjermeren har vegetasjon på begge sider.

Glasskjermer

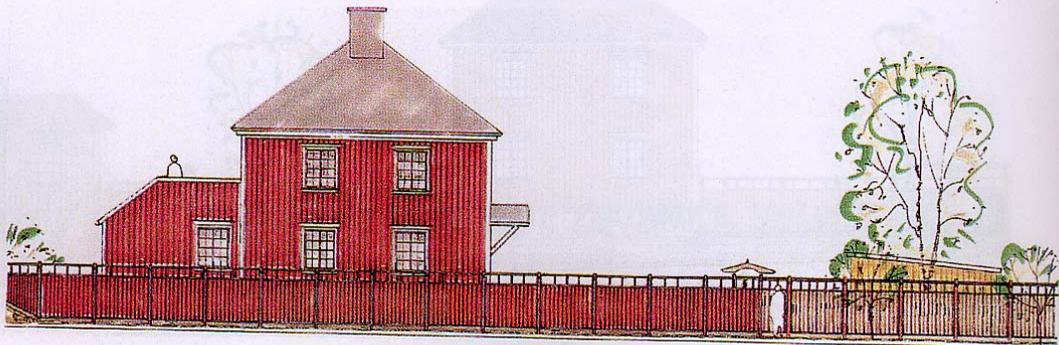
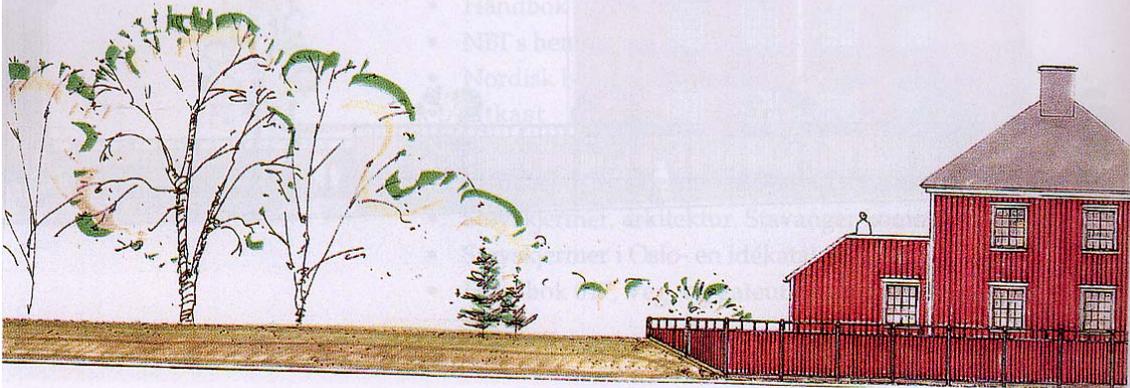


Glasskjermer fra Fredrikstad . Glasset gir lys, luft og utsikt, og reduserer følelse av innestengthet.



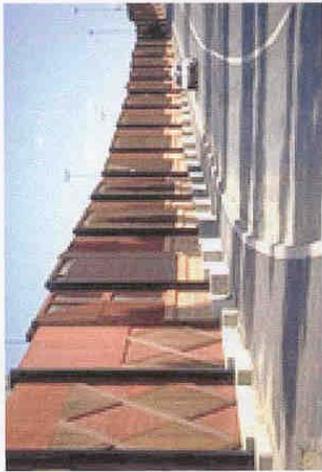


- Kompendie nr 925, Gate og vegtrafikkstatistikk
- Torbjørn Haugen og Knut Selberg
- Prinsipper for utforming av støyskjermet
- Byggeforskriften
- NS 8175
- Støyhåndboka



FENCES from FRANCE

FRANCE



© E. Bénaud - A 86 Rosny-Sous-Bois



© E. Bénaud - Carbon Blanc



© T. Dragan - La Mothe



© T. Dragan - RN 274 Dijon



© E. Bénaud - RN 7 Sorgues



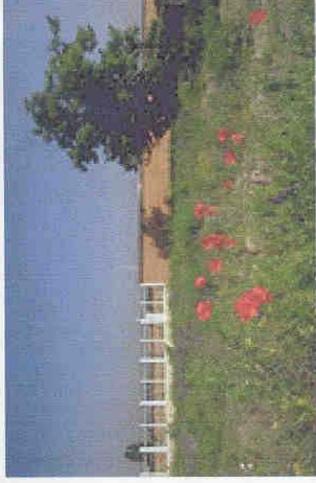
© T. Dragan - A1 Moulin Basset



© A. Béranguier - A 86 Bobigny



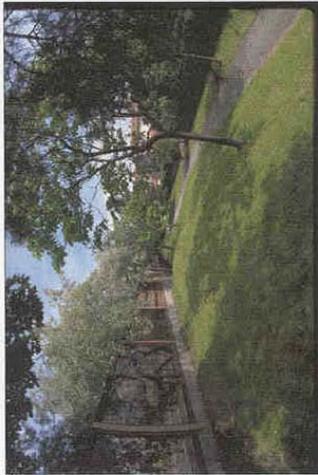
© A. Béranguier - RN 170 St Gratien



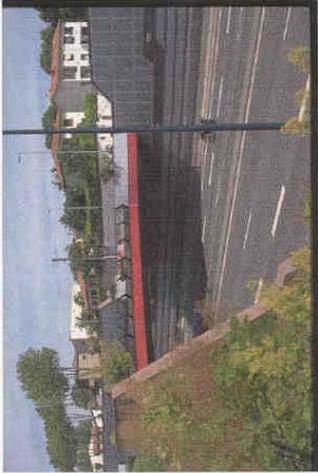
© A. Béranguier - RN 170 Parisis

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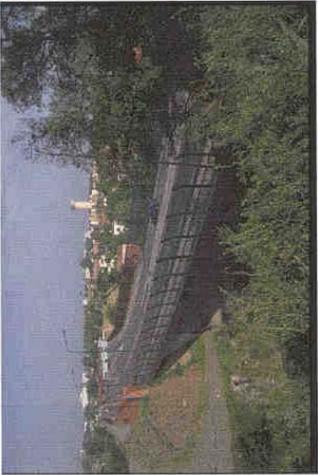
FRANCE



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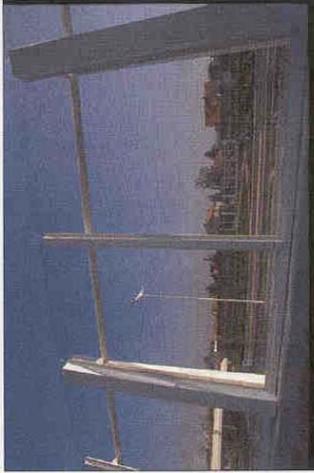
© Rubans d 'Or 0015



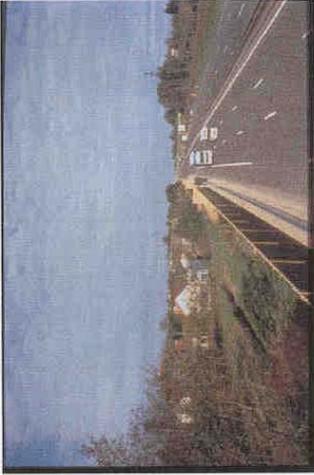
© Rubans d 'Or 0016



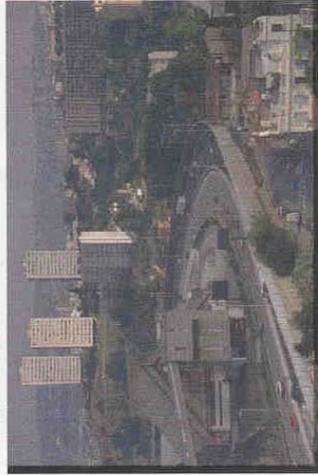
© Rubans d 'Or 0041



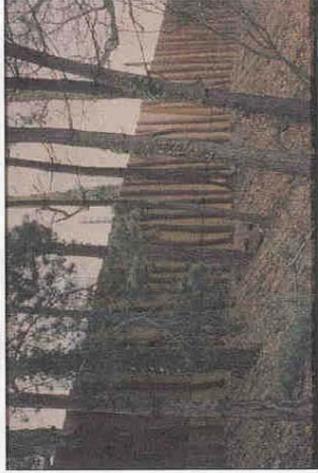
© Rubans d 'Or 0062



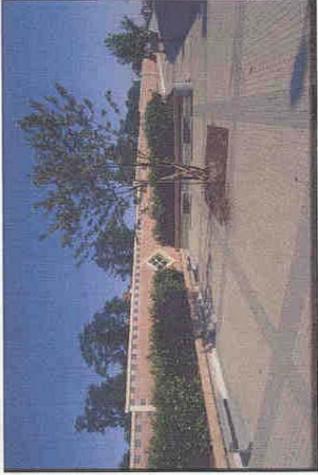
© Rubans d 'Or 0872



© Rubans d 'Or 0088

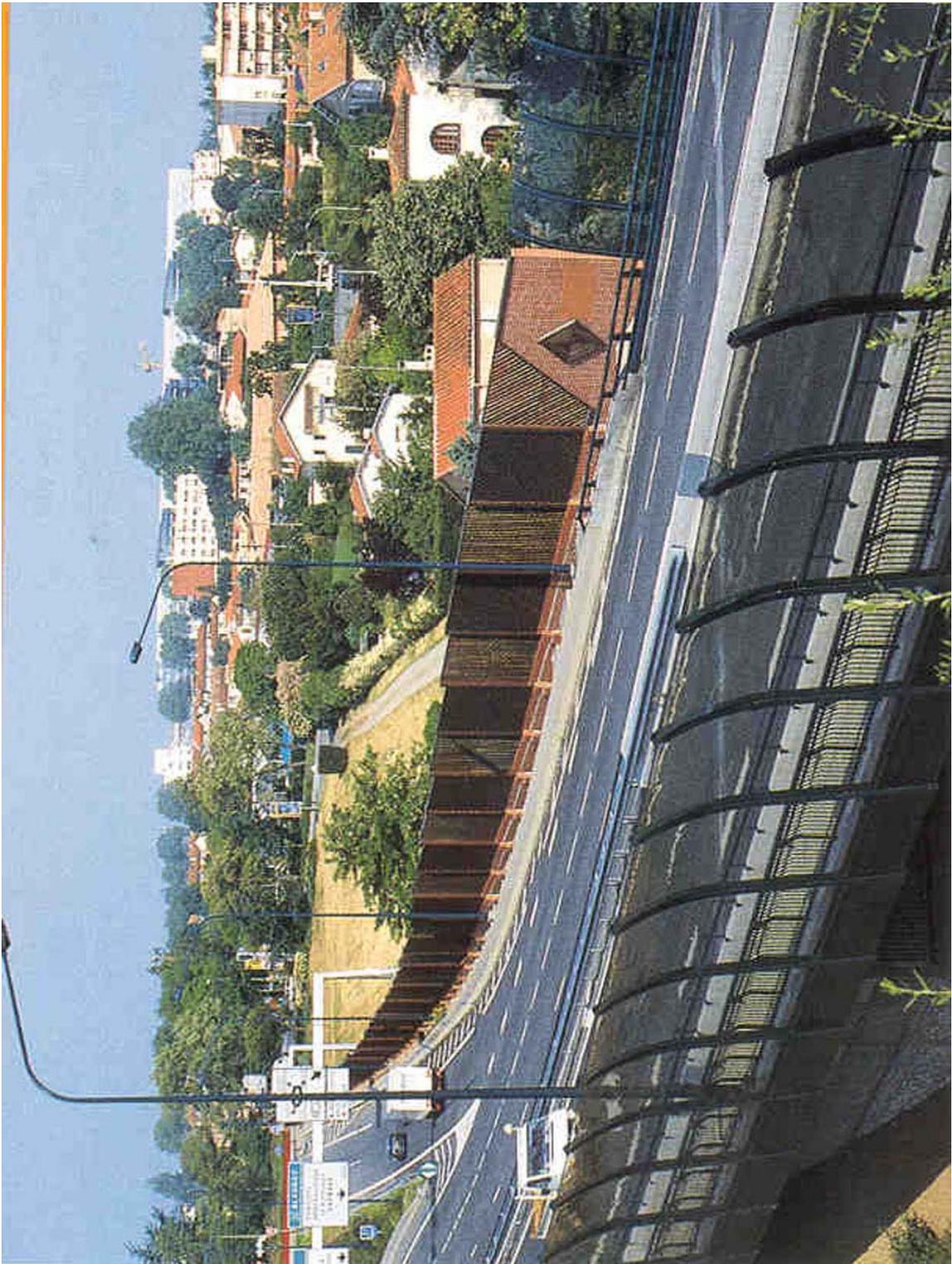


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© Rubans d 'Or 0099















CARIBBEAN PRIVACY FENCES

A sampling of privacy fences which are generally masonry and low height.















APPENDIX 2
WOOD, PRESSURE TREATED WOOD PRIVACY FENCING

A listing of available wood fence types and species. Manufacturers information and specifications for treated wood post and panel fencing of various manufacturers.

NATIONAL WOOD PRIVACY FENCING

AVAILABLE STYLE OF CUSTOM WOOD FENCES

BY:

NATIONAL FENCE SYSTEMS, INC.

1033 ROUTE 1, AVENEL, NEW JERSEY 07001

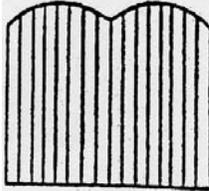
732-636-5600 732 636- 5605

web. www.national-fence.com

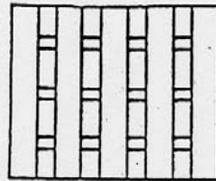
e-mail fencin@concentric.net

BOARD ON BOARD

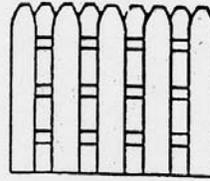
117
DOUBLE CONVEX



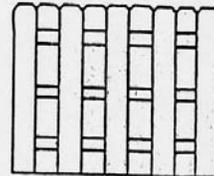
118
FLAT TOP



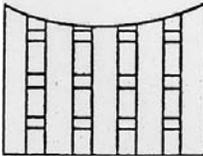
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REGULAR POINT



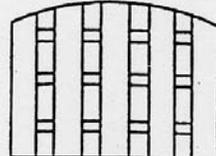
120
DOG EAR CUT



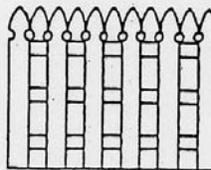
121
CONCAVE



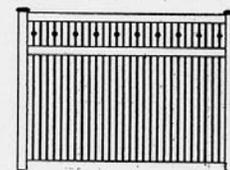
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CONVEX



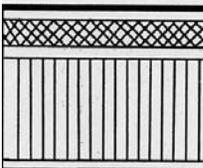
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GOTHIC POINT



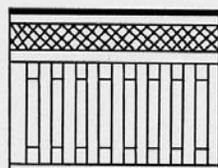
124
DIAMOND TOP SECTION



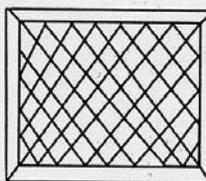
125
SOLID BOTTOM
LATTICE TOP



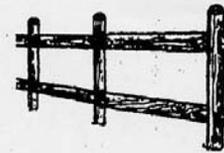
126
BOARD ON BOARD
LATTICE TOP



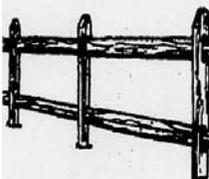
127
FRAME LATTICE



128
POST & RAIL
2 OR 3 HOLE



129
SPLIT RAIL
2 OR 3 HOLE



AVAILABLE IN 4', 5', 6' HIGH ALL SECTIONS 8' LONG
1" X 4" BOARD OR 1" X 6" BOARD

CHOOSE FROM:

1 SPRUCE, # WHITE CEDAR, # RED CEDAR, PRESSURE TREATED

IF YOU HAVE ANY QUESTION
PLEASE CALL US OR ASK A SALESPERSON

11-01-01

AVAILABLE STYLE OF CUSTOM WOOD FENCES

BY:

NATIONAL FENCE SYSTEMS, INC.

1033 ROUTE 1, AVENEL, NEW JERSEY 07001

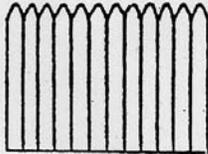
732-636-5600 732 636- 5605

web.www.national-fence.com

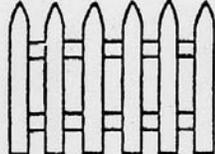
e-mail fencin@concentric.net

SPACE PICKET

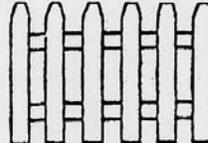
101
STOCKADE



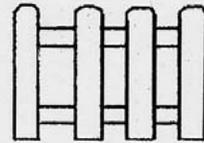
102
REGULAR POINT



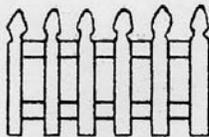
103
MODIFY POINT



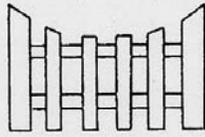
104
DOG EAR CUT



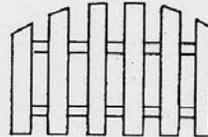
105
GOTHIC POINT



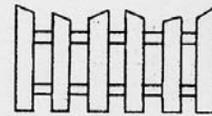
106
SINGLE CONCAVE



107
SINGLE CONVEX

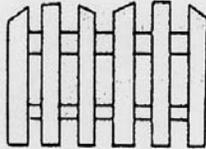


108
DOUBLE CONCAVE

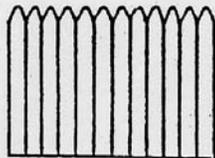


SOLID SECTIONS

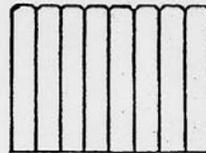
109
DOUBLE CONVEX



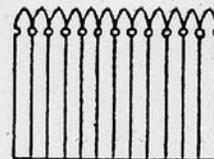
110
REGULAR POINT



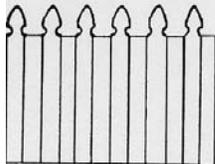
111
DOG EAR CUT



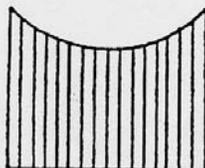
112
GOTHIC POINT



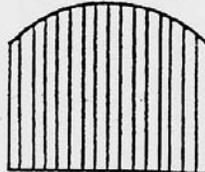
113
ALTERNATING GOthic



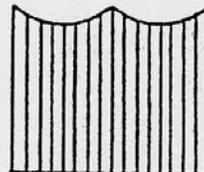
114
CONCAVE



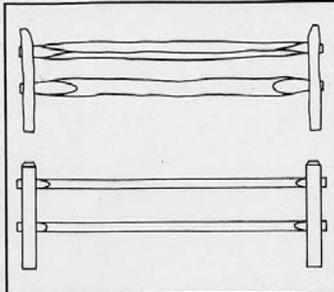
115
CONVEX



116
DOUBLE CONCAVE



ALL FENCING SHOWN ON THESE PAGES IS IN STOCK



Poplar and locust Hardwood SPLIT RAIL FENCE

- 11' Mixed Hardwood Rails (Oak & Poplar)
- Locust Posts with Staples on Top to Prevent Splitting
- Corner and End Posts are also in Stock

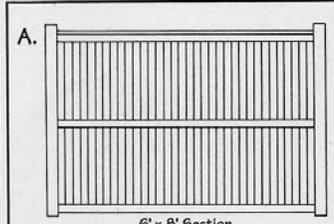
2 Rail Section...
Includes: 1 Line Post #2LS, 2 - 11' Rails **\$15⁹⁹**

3 Rail Section...
Includes: 1 Line Post #3LS, 3 - 11' Rails **\$19⁹⁹**
\$6⁴⁰ #11HRT

11' Pressure Treated Rails #11HRT

Premium Grade CEDAR POST & RAIL FENCE

• Corner and End Posts are also in stock
2 Rail Section...
Includes: 1 Line Post & 2 - 10' Rails **\$22⁹⁹** #2PRS

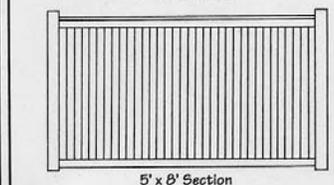


A. Premium Grade CEDAR BOARD FENCE

- 1" x 3" Tongue & Groove, V-Joint Boards
- 4" Top Cap
- 6' High has Middle Support Rail
- Nail on the Post

POSTS EXTRA... Use with blank 5" x 5" cedar post below

6' x 8' Section... **\$75⁹⁹** #TGCBF
5' x 8' Section... **\$65⁹⁹** #TGCBF5

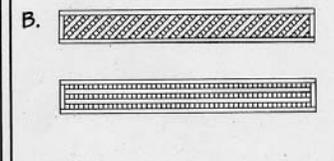


5" x 5" x 10' CEDAR BLANK POST **\$22³⁰**
Square Top #CPS

B. Premium Grade CEDAR FENCE TOP PANELS

Panels for use with Cedar Board Fences Above

1'x8' Diagonal Lattice **\$26⁹⁹** #18DLT
1'x8' Square Lattice **\$26⁹⁹** #18SLT



C. "Estate" 6' CEDAR BOARD FENCE

• 1"x4" Squared Edge Boards with 2"x3" Dowel On Post Backer Rails
6' x 8' Section... **\$61⁹⁹** #EBF
POSTS EXTRA... Use with dowelled 5" x 5" cedar post below

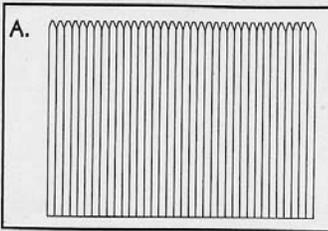
5" x 5" x 10' CEDAR DOWELLED FINIAL POSTS

Line Post #FP5L **\$26⁶⁹**
End Post #FP5E **\$26⁶⁹**
Corner Post #FP5C **\$26⁶⁹**

Prices are for reference only- Please call for up to date costs and current specials

104 Ring's End...The Leader in Quality and Service

COMPARE OUR QUALITY!



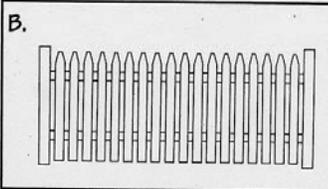
**A. Premium Grade
SPRUCE STOCKADE FENCE**

- 36 - 5/8" x 2-5/8" Pickets
- 3 - 2"x3" Backer Rails
- Posts not included

4' x 8' Section **\$17⁹⁹** #4SF

5' x 8' Section **\$19⁹⁹** #5GF

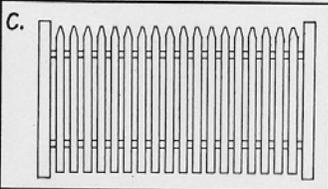
6' x 8' Section **\$22⁹⁹** #6SF



**A. Premium Grade
6' CEDAR STOCKADE**

- 32 - 3/4"x3" Pickets
- 3 - 2"x3" Spruce Backer Rails
- Posts not included

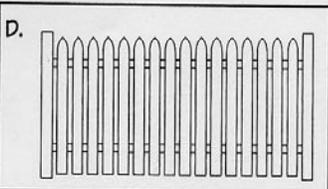
6' x 8' Section **\$45⁹⁹** #6PSF



**B. Premium Grade
CEDAR MILLED PICKET**

- 3/4"x3" Rounded Picket
- 2"x3" Spruce Backers
- Posts not included

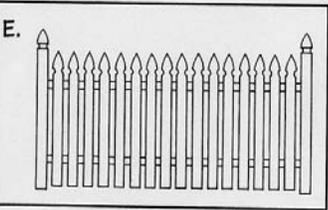
3' x 8' Section **\$18⁹⁹** #3SPF



**C. Premium Grade
BALSAM FIR PICKET FENCE**

- Smoothly Milled Pickets to Make Painting Easier
- Posts not included

4' x 8' Section **\$14⁹⁹** #31PF



**D. Premium Grade
CEDAR GOTHIC PICKET**

- Heavy Duty Picket
- Cedar Backer Rail
- Posts not included

3' x 8' Section **\$29⁹⁹** #3CPF

**E. "Williamsburg"
CEDAR PICKET FENCE**

- 3/4"x4" Pickets
- 2"x3" Doweled Cedar Backer Rail
- Posts extra - Use with dowelled 4"x4" post

4' x 8' Section **\$37⁹⁹** #WPF

<p>4"x4" Post Stocked in the Following Species:</p> <ul style="list-style-type: none"> • Red Cedar • Pressure Treated • Clear Redwood • Construction-Heart Redwood <p><i>Please call for current pricing.</i></p>		<p>4"x4"x8' Cedar Finial Top Post</p> <p>Line Post \$15⁴⁹</p> <p>End Post \$15⁴⁹</p> <p>Corner Post \$15⁴⁹</p> <p>Blank Post \$15⁴⁹</p> <p><i>Dowelled-Use with "Williamsburg" Pickets</i></p>		<p>5"x5"x10' Cedar Blank Top Post</p> <ul style="list-style-type: none"> • Use with nail-on-post cedar fences <p>\$24⁹⁹ #CPB</p>		<p>5"x5"x10' Cedar Finial Top Post</p> <p>Line Post \$29⁹⁹</p> <p>End Post \$29⁹⁹</p> <p>Corner Post \$29⁹⁹</p> <p><i>Dowelled-Use with "Estate" Board Fence</i></p>
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Prices are for reference only. Please call for up to date costs and current specials

BARFIELD FENCE

Barfield Fence Co. will build any style fence including custom designs to your specifications. Call or email us to quote your next project. ([Return to Standard Wood Fences](#))

This style features Lattice over Board on Board with Decorator 10ft posts (also available in Lattice over Shadowbox or Stockade).



[Click to View Enlarged](#)

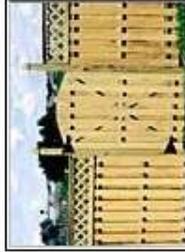
Shown here is a Scallop Top Board on Board with Lattice and Decorator posts (yes, that really is a wood fence).



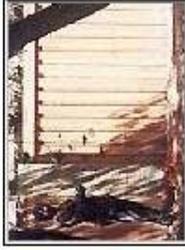
We can install to any terrain. Grade inclines are not a problem as shown here with a "Stair Step" installation (shown are 4ft sections).



Another example of "Stair Stepping" with a gate included.



The beauty of Board on Board accented with a Cap board and Facial trim. Concrete columns or Decorator Wood Posts, can add to the appearance.



Safety and beauty for pool and patio. This custom lattice fence with cap board provides an attractive alternative for securing a pool area.



Another custom Lattice Installation by Barfield Fence. This enclosure features 1x2 lattice with 2x6 cap board and 1x4 facial trim. Installation is in Celebration.



[Click to View Enlarged](#)

PVC Lattice atop 1x6 vertical pickets, installed inline between extended 4x4 posts. Installation is in Celebration.



[Click to View Enlarged](#)

[Return to Standard Wood Fences](#)

**Barfield Fence (321) 396-0001 · Fax (321) 396-0005
2266 Clark Street · Apopka, FL 32703**

RING'S END FENCING

GET READY FOR SUMMER...
Plan your fencing project now!



Premium Grade CEDAR BOARD FENCE

- 1" x 3" Tongue & Groove, V-Joint Boards
- 4" Top Cap • 6' High has Center Rail
- Nail on the Post

6' x 8' Section... In Stock

5' x 8' Section... In Stock

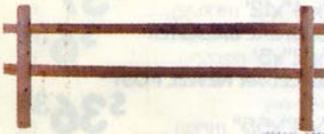
POSTS EXTRA...
Use with blank
5" x 5" cedar post

\$79⁹⁹ #10CBF

\$71⁹⁹ #10CBF5

Premium Grade CEDAR POST & RAIL FENCE

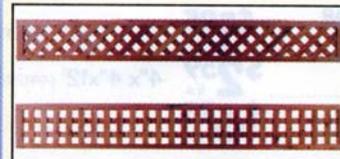
- 2 Rail Section Includes
- 1 Line Post
 - 2 - 10' Rails
 - Corner & End Posts In Stock



\$22⁹⁹ #2FK5

CEDAR FENCE TOP PANELS

1' x 8' Panels for use with Cedar Board Fences Above



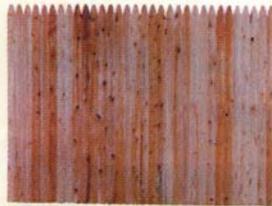
Diagonal Lattice

\$28⁹⁹ #18DLT

Square Lattice

\$28⁹⁹ #18SLT

Premium Grade 6' CEDAR STOCKADE



- 32 - 3/4"x3" Pickets
- 3 - 2"x3" Spruce Backer Rails

6' x 8' Section... In Stock

POSTS EXTRA

\$48⁹⁹ #6PSF

"Estate" 6' CEDAR BOARD FENCE



- 1"x4" Squared Edge Boards with 2"x3" Dowel On Post Rails

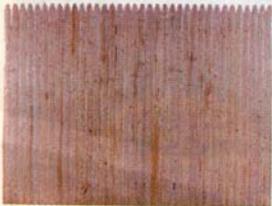
6' x 8' Section... In Stock

POSTS EXTRA...

Use dowelled 5" x 5" finial cedar post

\$69⁹⁹ #EBF

Premium Grade SPRUCE STOCKADE



- 36 - 5/8" x 2-5/8" Pickets
- 3 - 2"x3" Backer Rails

4' x 8' Section **\$17⁹⁹** #4SF

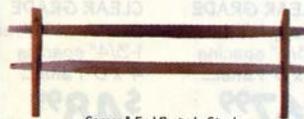
5' x 8' Section **\$20⁹⁹** #5SF

6' x 8' Section **\$25⁹⁹** #6SF

POSTS EXTRA

Poplar and Locust Hardwood POST & RAIL FENCE

- 11' Mixed Hardwood Rails (Oak & Poplar)
- Locust Posts with Staples on Top to Prevent Splitting
- Corner and End Posts are also in Stock



Corner & End Posts In Stock

2 Rail Section...

Includes:

1 Line Post

2 - 11' Rails

\$16⁹⁹ #2LS

3 Rail Section...

Includes:

1 Line Post

3 - 11' Rails

\$21⁹⁹ #3LS

11' Pressure Treated Rails... **\$640** #11HRT

Barfield Fence Co. has been building and installing the very best quality privacy fences for over 32 years. Hunters Creek Home Owners Association, has established guidelines for all fencing in your community. Please view Exhibit "A" and "B" before installing a wood fence. Your H.O.A. requires that you obtain written approval for this type of improvement. ([Back To Wood Fences](#))

Exhibit "A" 6ft high Shadowbox Fence		Exhibit "B" Enclosurer Specifications	
Style	Shadowbox Style (6' High)	Style	Shadowbox or Stockade (Minimum 3' High/Maximum 6' High). Entire enclosure must be same materials.
Pickets	1" x 4" x 6' Western Red Cedar or Cypress, dog-eared with 3" spacing to provide 1/2" overlap.	Pickets	1"x4" (nominal 3/4" x 3 1/2") or 1/2" x 4" (nominal 3/8" x 3 1/2") Western Red Cedar or Cypress, 3" spacing to provide 1/2" overlap on Shadowbox. NOTE: Height must be the same, All pickets must be vertical.
Horizontal Supports (3)	Pressure Treated Pine 2" x 4" with the 4" support being vertical	Horizontal Supports	Pressure Treated Pine 2" x 4" with the 4" support being vertical
Posts	8" o.c. maximum - 4"x4"x8' Pressure Treated Pine. Posts installed on inside of yard.	Posts	8" o.c. maximum - 4"x4"x8' Pressure Treated Pine. Posts installed on inside of enclosure.
Nails	16D and 10D penny galvanized on horizontal supports, 4D on pickets (STAPLES ARE NOT ALLOWED).	Nails	16D and 10D penny galvanized on horizontal supports, 4D on pickets (STAPLES ARE NOT ALLOWED).
Fence	Must tie into the house at least 3' (three feet) back from the front of the house. Engineerer to be level and straight. If the fence ties into a brick wall, taper the fence at a ratio no greater than one (1) foot drop in the vertical height to three (3) feet in horizontal length, so that the top of the fence is below the top of the brick walls. (SHOULD NOT BE SEEN OVER THE BRICK WALL).		
Gates	2" x 4" Cedar or Cypress frame (Shadowbox). Ornamental Hinges, Spring Latch.	Gates	(Optional) 2"x4" Cedar or Cypress frame (Shadowbox or Stockade). If gate(s) installed must be same material and design as the rest of the enclosure. Ornamental Hinges, Spring Latch.
Stain	ALL FENCES MUST BE PAINTED WITHIN 30 DAYS OF INSTALLATION. Paint must be Solid Latex Stain "Dewdrop" by Sherwin-Williams. (Suggest contacting the manager at Sherwin Williams on South Orange Blossom Trail. Phone number is 855-8843).	Paint	ALL ENCLOSURES MUST BE PAINTED THE BASE COLOR OF THE HOUSE WITHIN 30 DAYS OF INSTALLATION.
Note	In accordance with the CC&R's, properties on the lakes are not to be fenced within 20' of the rear property line along the lake. Special provisions may be made by the Architectural Review Committee for pool fencing.	Note	<ol style="list-style-type: none"> 1. Must shield equipment from view (100%) from the front and side of the house. 2. Cannot extend beyond the back corner of the house. 3. Can have opening in rear for access. If corner lot and equipment is visible from street, must be shielded on all sides. 4. Side portion can extend no more than 12" past equipment 5. If enclosure <u>must extend</u> more than 4 feet from the house, to cover equipment, then Hunter's Creek Exhibit "A" Fence Specifications must be used. 6. If enclosure is 6' tall and comes out more than 4 feet from the house, it must be painted Solid Latex Stain "Dew Drop" by Sherwin Williams. Exhibit "A" - Fencing specifications apply. 7. Numbers 5 & 6 may be appealed.

Published Specifications by Hunter's Creek Master Association dated 08/26/99

PLYWALL WOOD PRIVACY FENCING

Plywall Sound Barrier Sample Specification

Products

Overview

Specifications

Tech Notes

PLYWALL SOUND BARRIER SAMPLE SPECIFICATION

1. DESCRIPTION:

This work shall consist of the construction of sound barrier consisting of Plywall panels as manufactured by Hoover Treated Wood Products, Inc., supported by Parallam[®] PSL posts as manufactured by Trus Joist MacMillan. Sound Barrier shall be designed to withstand a wind load of (20 to 40 psf) (.958 to 1.915 kN/sm).

2. MATERIALS:

Materials shall conform to the following:

2.1 SOUND BARRIER PANELS

Panels shall be fabricated as (one) (two) (three) piece "Plywall" panels (6 to 24 ft./1.8 to 7.3m) high by (8ft./2.44m OR 12ft./3.66m OR 16ft./4.88m) wide, as manufactured by Hoover Treated Wood Products, Inc. Panels design shall have been tested in accordance with ASTM E-90 and ASTM E-413 and shall result in a sound transmission class of 38 or better. Panels shall consist of a structurally sound frame of 2" by 4"/50mm by 100mm (nominal) Southern Yellow Pine lumber, surfaced four sides, covered on both panel faces by shiplap-jointed, APA-303 specialty siding, Southern Pine, exposure durability classification Exterior, Texture 1-11, 5-ply, 19/32"/15mm thick, grooves 8"/200mm o.c., wood patches. All wood used in panel construction shall be pressure preservative treated with CCA preservative to a minimum net retention of (.40 OR

.60 pcf) (6.4 kg/m³ OR 9.6 kg/m³) in accordance with American Wood Preservers Association C-2 and C-9. All plywood siding and 2"/50mm (nominal) lumber shall be kiln dried after treatment to a moisture content of 19% or less. All panel sections shall be fabricated prior to shipment. All panels shall have two nylon lifting webs, securely attached along the top.

2.2 SUPPORT POSTS

Posts shall be ____"/____mm x ____"/____mm x ____ft/____m long (from wind load/height chart), ParrallamÒ PSL Southern Pine Parallel Strand Lumber, 2.0 E, as manufactured by Trus Joist MacMillan. Minimum net retention of preservative shall be .40 pcf/9.6kg/m³ of CCA. Posts shall be bundled so that each layer is separated by wood spacers to allow air drying after treatment.

2.3 CLEATS

Vertical cleats for attaching panels to posts shall be 4" x 4" /100mm x 100mm (nominal) Southern Pine timbers, surfaced four sides. Minimum net retention shall be (.40 pcf/6.4 kg/m³) of CCA preservative.

2.4 FASTENERS

All nails, spikes (or lag bolts, if applicable) shall be hot dip galvanized zinc coated per ASTM A-153.

2.5 SOURCING

All Wood Sound Barrier System Materials, including posts, panels and cleats shall be treated and fabricated at one location. The following is a list of known suppliers: Hoover Treated Wood Products, Inc., 1-800-531-5558.

3. CONSTRUCTION::

3.1 MATERIAL UNLOADING AND STORAGE

Contractor shall provide suitable unloading equipment and storage space for Sound Barrier Materials. Sound Barrier Materials shall be kept off the ground and shall be protected from mud, splattering, staining, vandalism or physical damage.

3.2 POST HOLES

Post holes shall be augered to the require diameter and depth, which shall be determined by the owner's engineer. Spacing shall allow clear spans equal to the panel width plus one inch/25mm tolerance. Posts may shrink slightly after erection. The contractor shall take all measures and precautions necessary to prevent collapse of the hole sides. Actual post width shall be checked at delivery because treatment may cause some swelling. Actual panel width shall also be verified at delivery.

3.3 POST SETTING

Posts shall be set plumb and in precise position to accept panels and shall be braced in such a manner as to remain plumb and in the required lateral position during backfilling. Post spacing shall

allow clear spans between posts equal to the panel width plus a maximum one inch/25mm tolerance. In no case shall the erection tolerance between posts exceed 1 inch.

3.4 BACKFILLING

(Crushed stone) Backfill consisting of Soil Aggregate Mix _____ shall be placed around the posts in six-inch/300mm maximum lifts and shall be compacted between lifts. Compaction shall be achieved by making a minimum of three passes per lift with a flat faced mechanical tamper.

3.5 BACKFILLING

(concrete) (per engineer)

3.6 BACKFILLING

(reinforced concrete) (per engineer)

3.7 ATTACHMENT OF REAR CLEATS

Prior to setting panels, the rear cleats shall be fully attached to each post to support the Sound Barrier panels during placement. Cleats shall be placed at an elevation that will insure support of the panel over the entire height. The rear edge of the cleat shall be flush with the rear face of the post. The cleats shall be attached with hot dip galvanized zinc coated (spikes) (lag bolts) as shown. Note: Contractor may attach rear cleats prior to setting posts.

3.8 SETTING PANELS

Sound Barrier panels shall be lifted by the provided lift straps and seated firmly against the prefixed rear cleats in a manner which maintains panel plumb and level while providing a maximum one inch tolerance between the posts. The panel will then be secured by attaching the front cleats to the posts along the unsecured panel face. Nails shall not be driven into the panel. Note: Front cleats shall be firmly and securely fixed to the post at both ends before releasing lifting straps.

3.9 PANEL BOTTOM EMBEDMENT

Bottom of panels shall be (embedded in the earth per _____ to prevent the passage of sound) (backfilled with crushed stone per _____ to prevent the passage of sound and to provide drainage).

3.10 FIELD TRIMMING OF POST TOPS

After panels have been set, the post tops shall be rough trimmed (with a square cut 3"/74mm above the top of the panel) (with a

peaked cut per _____) (with a beveled cut per _____).

3.11 DISPOSAL OF TREATED WOOD SCRAPS

Do not burn scraps. Dispose of scraps as ordinary trash. Landfilling is acceptable for CCA treated wood.

3.12 WOOD FINISH

(No finish is required) OR (Stain shall be applied per _____.)

Pwall-spec: 1/01

E-mail Hoover's Technical Service Department or request sales information.

© 2000 Hoover Treated Wood Products. For immediate assistance, or use this form.

"The Sound Solution"

PLYWALL Post and Panel
Permanent Engineered Wood Sound Barriers



This Plywall barrier doubles as a wind screen for the jetwash from taxiing cargo planes at the air terminal. A parking lot is just beyond the barrier and it would have been unusable without noise and wind protection. Due to the unusually high design wind load, 50 PSF, the barrier's posts are oversized and are set 13' deep in 36" diameter concrete foundations. The structural framing of the panels is also unusually heavy, with edgewise 2 x 4 framing at 12" c/c spacing instead of flatwise 2 x 4 framing at 16" c/c spacing.

HOOVER
TREATED WOOD PRODUCTS, INC.

IN ASSOCIATION WITH



Trus Joist MacMillan™

A LIMITED PARTNERSHIP

HOOVER TREATED WOOD PRODUCTS, INC.

TECHNICAL NOTE

FOR ADDITIONAL INFORMATION: 1-800-TEC-WOOD (832-9663), Ext. 124

INSTALLATION INSTRUCTIONS FOR PLYWALL BARRIERS

PLYWALL is a panelized post and panel barrier system that is very simple to install. All components are made of pressure treated wood and can be installed by non-specialized crews without heavy equipment.

SHIPPING: PLYWALL is panelized and ready to install when shipped. Shipment is by truck to the job site. Unloading requires a large forklift or a crane and slings. Bundles can weigh as much as 8,000 pounds. Panels are stacked flat in bundles 8 feet across, requiring long forks if a forklift is used. Posts are bundled in standard lumber bundles, about 3.5 feet across, which can be handled with standard 4-foot forks.

Shipping usually consists of posts on the first loads. Loads can be mixed with both posts and panels if desired. Staging of materials may be a problem on tight sites. Materials can be staged nearby at a lumberyard or other storage area and shuttled to the site as needed. This is helpful when space is limited at the site. It is important to store the bundles off the ground and to keep them clean.

INSTALLATION - POSTS: Installation begins with laying out and boring the post holes. The Panel size will determine the depth and diameter of the footings. Recommendations are based on a minimum allowable soil load bearing capacity of 1500 psf and 1/2" to 3/4" clean and well graded stone backfill. Posts must be set accurately and plumb so that the panels will fit neatly between the posts with a construction allowance determined by the panel size (see drawing). Posts are supplied with one foot extra length so that they can be set without having to have the top at a precise elevation. They can be easily trimmed to the proper elevation later. Additional length can be supplied on request.

INSTALLATION - PANELS: Panels are fabricated in modules that are a maximum of either 8 feet high or 8 feet wide. Two built-in nylon web lifting loops are provided at the top of each panel for lifting by crane with two hooks. Before lifting and positioning the panel between posts, attach the rear, pre-drilled, long 4x4 cleats vertically to each post, then swing the panel into position. When the panel is in position against the rear 4x4 cleats, spike or lag the front 4x4 cleats to the post through the pre-drilled holes in the 4x4's, "squeezing" the panel between the rear and front 4x4 attachment members. The panels are not nailed to the 4x4 attachment members or the posts, and they bear directly on earth at the bottom. After securing the panels, the lifting loops may be cut off with a sharp utility knife or folded and tacked to the top framing member for possible future use if the wall might need to be relocated.

INSTALLATION- STACKABLE PANELS:

Stacking panels between posts is accomplished by lowering the top panel down onto the lower panel, guiding the plywood edges over the protruding, beveled "tongue" formed by the lower panel's topmost framing member. It is not necessary to slide the panels all the way down from the top of the posts as would be the case with steel or concrete h-beams. After setting the panels, the lifting loops may be cut off with a sharp utility knife or folded and tacked to the top framing member for possible future use if the wall might need to be relocated. The horizontal panel joint is not designed for the plywood edges to meet due to the difficulty of assuring a perfect joint. A gap of about 1/4" is normal between the plywood butts.

Smaller panels are stacked on top to achieve the desired top elevation. The size and number of panels are determined in advance by the panel size.

To finish off the wall, trim the posts to the desired height, bevel, or slope with a chain saw after setting panels. Be sure to order extra post length if the normal one foot is determined inadequate for your desired post finishing method. No finishing or maintenance of the panels or posts is necessary.

03/01

PLYWALL Post and Panel

Permanent Engineered Wood Sound Barriers

Hoover Treated Wood Products, Inc. is one of the U.S.'s largest producers of pressure treated wood, specializing in government specifications, high retentions, and treatment of plywood. Hoover also specializes in kiln drying after treatment, which produces wood that is stronger, lighter, and pre-shrunk.

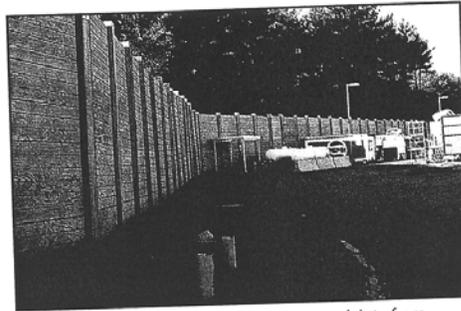
CCA, the clean waterborne preservative of choice for 60 years, is used by Hoover because it has an excellent performance record against termites and decay, excellent environmental qualities, and it's economical.

In addition to Hoover's core business of treating lumber, plywood and timbers in bulk for wholesale distribution, Hoover also engineers and fabricates the PLYWALL Permanent Engineered Wood Barrier System for noise abatement and aesthetic screening.

General Description

PLYWALL is a prefabricated, pre-engineered noise barrier system constructed entirely with pressure treated wood. It's easy to install, economical, and aesthetically pleasing. It's ready to install when delivered, and it requires no concrete footings, heavy equipment, or special skills for installation.

PLYWALL has been used on highways, construction sites, industrial plants, municipal maintenance facilities, retail properties, power substations, residential properties and other applications. It's ideal for cost-



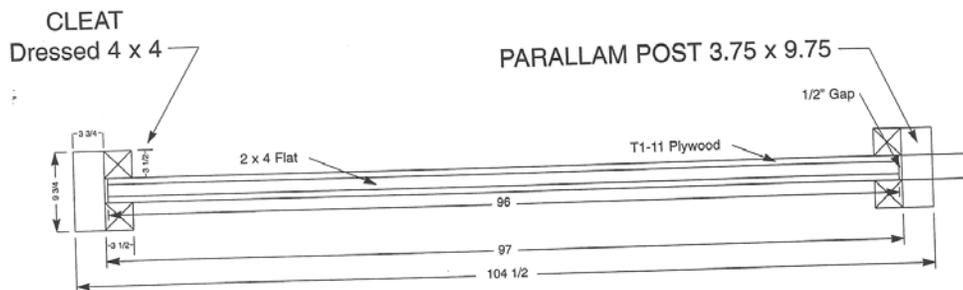
This bottling plant had received noise complaints from nearby homes. The complaints stopped after installation of this 15-foot high PLYWALL barrier

effective noise reduction and/or visual screening.

Design Details

PLYWALL Post and Panel consists of prefabricated pressure treated wood "sandwich" panels supported between pressure treated Parallam® PSL engineered timber posts. The panels are 2-5/8 inches thick and they are secured to the posts in channels created by pressure treated 4x4" cleats that are spiked or lagged to the posts.

Prefabricated panels are 8, 12, or 16 feet wide, covered on both sides with pressure treated, exterior-rated 4' by 8' Texture 1-11 plywood siding. Interior



framing is sandwiched between the plywood faces to provide a stiff structural "skin" to enable the panels to resist high wind loads.

Fabricated height of the 1-piece panels is variable, depending on job requirements and panel width. Pressure treated Parallam® PSL engineered timber posts support the panels at exposed heights to 30 feet or more.

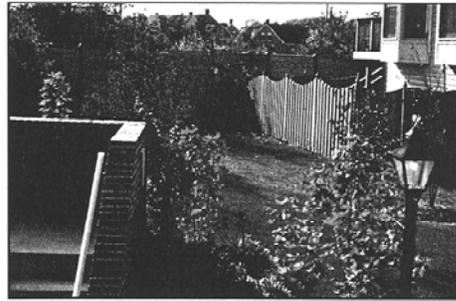
Posts are embedded in the ground to a depth of at least half the exposed height of the barrier and back-filled with crushed stone or concrete.

Benefits to Installers and Residents

The PLYWALL Post and Panel system is user-friendly, both for the residents as well as for the installers.

Residents appreciate PLYWALL's warm, natural appearance. Unlike concrete or masonry walls, there is no "prison wall" feeling. PLYWALL is "neighborly" because it is identical in appearance and attractiveness from either side with no unsightly back side. In spite of its lighter weight, PLYWALL's installed noise reduction is just as good as solid concrete or masonry.

Installers like its complete prefabrication, relatively light weight, minimal skilled labor requirements, and its simplicity.



This bottling plant had received noise complaints from nearby homes. The complaints stopped after installation of this 15-foot high PLYWALL barrier

Engineering

PLYWALL is engineered for any specified wind load, expressed as pounds per square foot. Typical design wind loads range from 20 to 40 PSF. This value, along with the exposed height of the barrier, determines the required post size as shown in the table below.

Noise Reduction

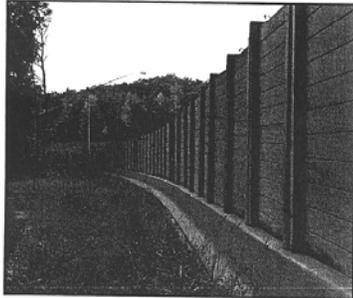
The effectiveness of any noise barrier is determined by many factors. Two of the most important are noise leaks (openings), and mass (weight). PLYWALL panels

Height	Wind Load (PSF)						
	20	25	28	30	33	35	40
6'	3.5 x 9.75	3.5 x 9.75	3.5 x 9.75	3.5 x 9.75	3.5 x 9.75	3.5 x 9.75	3.5 x 9.75
8'	3.5 x 9.75	3.5 x 9.75	3.5 x 9.75	3.5 x 9.75	3.5 x 9.75	3.5 x 9.75	3.5 x 9.75
10'	3.5 x 9.75	3.5 x 9.75	5.25 x 9.75	5.25 x 9.75	5.25 x 9.75	5.25 x 9.75	5.25 x 9.75
12'	5.25 x 9.75	5.25 x 9.75	5.25 x 12				
14'	5.25 x 12	5.25 x 12	5.25 x 12	5.25 x 12	5.25 x 12	5.25 x 12	5.25 x 14
16'	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 14	5.25 x 14	7 x 14
18'	7 x 14	7 x 14	7 x 14	7 x 14	7 x 14	7 x 14	7 x 14
20'	7 x 14	7 x 14	7 x 14	7 x 14	7 x 14	7 x 16	7 x 16
22'	7 x 16	7 x 16	7 x 16	7 x 16	7 x 16	7 x 16	11 x 14
24'	11 x 12	11 x 12	11 x 14	11 x 14	11 x 14	11 x 14	11 x 16
26'	11 x 16	11 x 16	11 x 16	11 x 16	11 x 16	11 x 16	11 x 19
28'	11 x 19	11 x 19	11 x 19	11 x 19	11 x 19	11 x 19	11 x 19
30'	11 x 19	11 x 19	11 x 19	11 x 19	11 x 19	11 x 19	11 x 19

The design for post heights 6' through 12' assumes embedment in soil or gravel. Posts 14' or greater in height are assumed to be embedded in concrete. Post embedment depth to be determined by local engineer. Panel width 8'.

are free of noise leaks because of their 2-sided covering of dimensionally stable pressure treated 4' by 8' Texture 1-11 siding with shiplapped joints backed up by pressure treated internal 2x4 framing.

In addition to being free of noise leaks, PLYWALL panels have sufficient mass to produce the same field noise reduction as much heavier and more expensive concrete and masonry barriers. The minimum panel



PLYWALL can be mounted on traffic barriers and bridges. These posts were inserted into cast-in-place sockets which extended down the footing of this traffic barrier.

mass to assure good acoustical performance is 4 pounds per square foot. PLYWALL panels weigh 6 to 8 pounds per square foot, assuring good acoustical performance.

PLYWALL panels have been tested in accordance with ASTM E-90, resulting in a measured Sound Transmission Class (STC) of 38.

Laboratory sound transmission tests show a direct relationship between mass and noise reduction, but this is in a sealed test apparatus where there is no diffracted noise. In actual field installations diffracted noise is far greater than the insignificant amount of transmitted noise that actually passes through a barrier.

Diffracted noise "bends" around corners and is the reason why noise can be heard even though there is no direct "line of sight" to its source. This is why a noise barrier must be high enough and long enough to "break the line of sight", and then some, in order to produce satisfactory noise reduction.

Pressure Treatment

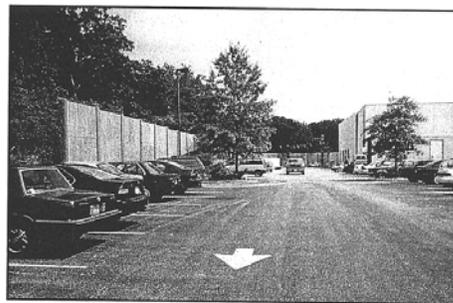
All of the components used in PLYWALL are pressure treated to American Wood Preservers Association

Standards with CCA waterborne preservative, which has been used safely and effectively for 60 plus years to permanently protect wood from termites and decay. CCA is EPA-approved and it's widely used for playground equipment, decks, fences, utility poles, docks, sign posts, foundations, pole structures and many other uses.

CCA treated wood is odorless and it's harmless to plants, animals and humans. In addition to permanent protection, CCA provides permanent coloration which gradually ages during the first year or two from light green to gray.

The pressure treatment process at Hoover is computer controlled, and it takes place inside large pressure cylinders containing tram cars loaded with seasoned wood.

A vacuum is drawn first and held for a period of time, after which the waterborne preservative solution



When this plant applied for a permit to expand, there was concern about its effect on adjoining residences so a 14-foot high Plywall barrier was proposed. It was installed early in the project to screen the construction noise and activity. Response has been very favorable. Neighbors say it is nicer-looking than the concrete highway barriers in the area. 12-foot wide panels were used to reduce the number of posts and foundations. Panels were stacked, with 8-foot high panels on the bottom and 6-foot high panels on top.



A new grocery superstore anchors this strip shopping center in trendy north Atlanta. It backs up to an upscale residential area and the owners wanted to be good neighbors so the Plywall system was installed just beyond the service area at the rear of the buildings, much of which is at the crest of a high embankment. The wall serves as a visual screen and glare screen, as well as a noise screen. The rear face of the wall was stained driftwood grey to make it blend in with the rear of the buildings.

fills the cylinder. Pumps then pressurize the wood to 150 PSI until the required uptake has been achieved, then the pressure is released, followed by a final vacuum period.

In addition to precise computer control of the treating process, Hoover exercises extensive quality control to assure proper depth of penetration of the preservative into the wood, and to assure proper retention of preservative in pounds of preservative (dry basis) per cubic foot of wood.

Hoover's quality control department is equipped with sophisticated equipment to analyze borings for proper penetration and retention.

The lumber, plywood and posts used in PLYWALL are all treated to a retention of .60 pounds of CCA per cubic foot of wood, which is the same retention required for the Permanent Wood Foundation, utility poles, and highway uses.

Southern Pine

All of the lumber, plywood siding and Parallam® PSI posts used in PLYWALL is southern pine, because of its superior strength and treatability. Southern pine's unique cell structure allows excellent penetration of CCA preservative for protection against termites and decay. Furthermore, Hoover uses state-of-the-art computerized processing and extensive quality control

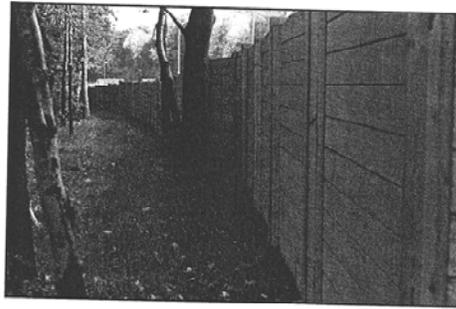
procedures to assure good results from the treatment process.

Fabrication And Shipment

Fabrication takes place in Hoover's all-weather indoor facilities.

All nails are double hot dip galvanized per ASTM A-153, ring shank, for decades of rust protection and maximum holding power. Panels are bundled in flat stacks. These stacks are loaded by Hoover's large forklifts equipped with 8-foot-long forks.

PLYWALL is shipped economically throughout the United States by truck from Thomson, Georgia. Shipping is included in the selling price. Unlike concrete or masonry, several thousand square feet of ready-to-install PLYWALL materials can be shipped on one truck.

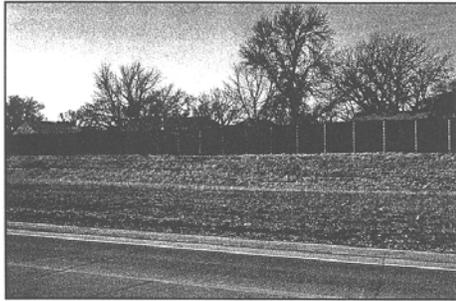


PLYWALL easily accommodates existing trees or other obstacles. Site disturbance is minimized with lightweight materials and elimination of concrete.

Posts and panels can be shipped together, or staggered shipments can be made consisting of posts on the early loads and panels on the later loads. Materials are unloaded at the job site or at a storage yard where they can be shuttled to the job as needed. Unloading of panels requires a large forklift with 6-foot or 8-foot long forks, or a crane and slidings.

Installation

PLYWALL is shipped complete and ready-to-install, including posts, panels, cleats and spikes (or lag bolts). Installation is done by a local contractor, often a

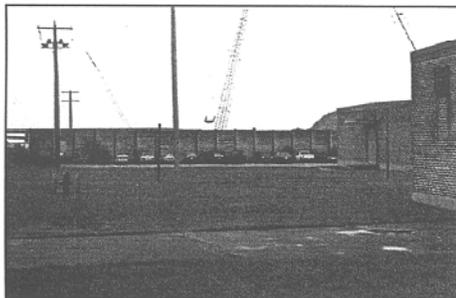


When the Lincoln West Bypass was widened the Nebraska Department of Roads chose Plywall to protect a stretch of residences adjoining the right of way. This barrier varies from 8 to 13 feet high.

commercial fence contractor. PLYWALL is also well suited for installation by general contractors or maintenance personnel. No special skills are required.

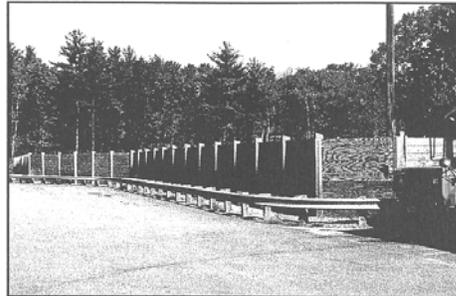
A truck mounted auger often works well for digging the post holes. Hole diameters can be as large as 24 inches or greater for the largest posts. Recommended backfill is crushed stone, which provides excellent lateral support and allows easy removal for future relocation. Concrete footings are not required at lower heights.

Parallam® posts are set on clear spacings, or between posts of a panel width plus 1/2 inch erection



This 15-foot high PLYWALL barrier provides temporary screening for a wastewater project under construction.

tolerance. The unique panel-to-post attachment method, using spiked or lagged 4x4 cleats to create a channel, provides an expansion joint and utilizes the exposed post face to add extra linear coverage per panel.



PLYWALL's installation creates very little site disturbance. This barrier was installed a few months earlier with no damage to the trees or overhanging limbs. Sloping ground is easily accommodated.

Individual panels are lifted into position by a crane using the built-in loops at the top of each panel. One cleat is spiked or lagged to each post with the provided hot dipped ring shank spikes or lag bolts, and then the panel is swung into position and fixed by attachment of the opposing cleat. Panels do not have to be lowered from the top of the posts. Holes are predrilled in each cleat for the spikes or lag bolts. The finishing touches are added by simply sawing off the excess post tops and cutting off the nylon web lifting loops with a utility knife.

Field cuts and modifications are easily made to PLYWALL panels to accommodate odd span widths or other field conditions where a standard panel will not fit.

Maintenance and Finishing

PLYWALL is maintenance-free. Permanent coloration and UV resistance is provided by the CCA preservative, which also provides decades of protection against decay and termites.

If a special finish is desired, the rough texture enhances finish adhesion. Neither staining or painting



The peace and tranquility of the picturesque stone home on this site was interrupted in the early 1960's when I-285, the Atlanta perimeter road, was built right beside it. Later, the expressway was widened and a noise barrier was installed to reduce the noise level for the occupants. This is the oldest Plywall barrier and as such it demonstrates the treatment's longevity. There is no deterioration at the groundline which is the area of severest decay and termite hazard. Noise measurements were taken before and after to confirm its acoustical effectiveness.

is required, however, due to the permanent protection and coloration provided by treatment.

Relocation and Reuse

One of PLYWALL Post and Panel's major advantages is its complete relocatability. This feature has been utilized on construction projects where the barrier was moved as the work progressed, and it is an advantage on highway projects where future widening may require the barrier to be moved.

Attachments of cleats with hot dipped galvanized

lag bolts instead of spikes allows damage-free removal of cleats and panels. Parallam® posts, when set in crushed stone, can be pulled without damage for reuse. None of the components are damaged or destroyed during removal.

Repairs

Vehicle damage can be readily repaired. Entire replacement panels can be provided or minor repairs can be done with unassembled components (lumber, plywood and nails) shipped LTL. In either case, local carpenters can make the repairs.

Pricing and Availability

PLYWALL prices are quoted for individual jobs and are subject to some variability due to fluctuations in the cost of untreated wood. Lead time is approximately 60 days for most orders.

For More Information Contact PLYWALL SALES:

1-800-531-5558

FAX 706/595-8462

WEB Address • FRTW.com E-mail • hoover@FRTW.com

**HOOVER**
TREATED WOOD PRODUCTS, INC.
P.O. Box 746 • Thomson, GA 30824

APPENDIX 3 - PVC PRIVACY FENCES

Stanco PVC Privacy Fence

Available styles and installation/assembly details.



PRIVACY FENCING



STANCO®'s Lexus fence offers beauty and elegance as well as versatility in the way it can be installed. Create the look that fits your needs.

If you are seeking full privacy in your backyard, the Cascade is for you. This style now comes with a mid-rail to provide extra strength and durability.



STYLES

(Call STANCO® for the details on our different fence heights and spacing):

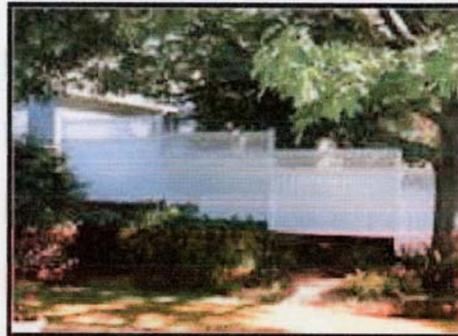
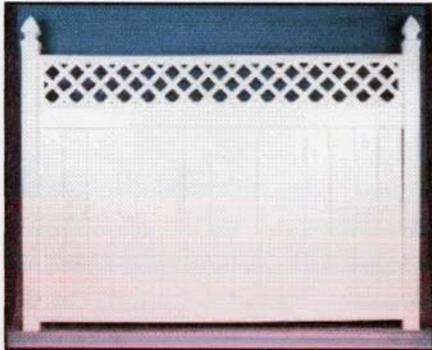


<http://www.stanco-inc.com/privacyproducts.htm>

3/25/2002

Lexus - Privacy Style Fence

STANCO®'s Lexus style will add a nice finished look to your home as well as privacy. Ask about our [custom designs](#) for that special ornamental look. We offer you many heights and widths of Lexus fences to choose from.



Width:	Height:	Color:	To View CADD Drawings:	Name:	Style Number:
94 1/2"	48"	Only White	CADD	4' High Lexus III Fence	B-5004-R
94 1/2"	60"	Only White	CADD	5' High Lexus III Fence	B-5005-R
94 1/2"	72"	Only White	CADD	6' High Lexus III Fence	B-5006-R

STYLES

(Call STANCO® for the details on our different fence heights and spacing):



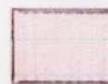
Lexus



Cascade



Basket Weave



Shadow Box



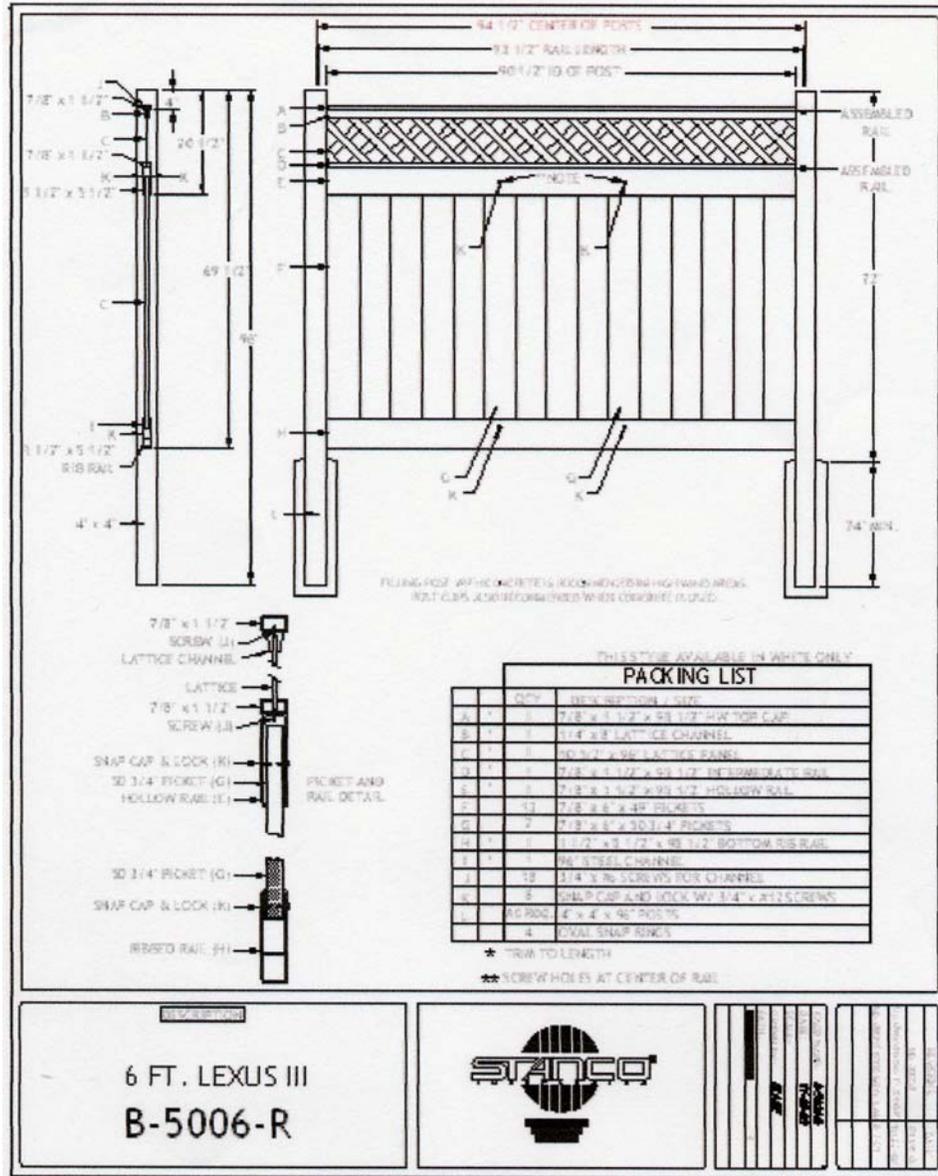
Custom

Click on the style picture to see an enlarged view. If you would like to view a catalog, don't hesitate to [contact us](#).

Stanco® Products

Fence	Deck & Handrail	Gazebos	Pergolas	Arbors	Trellises	Garden Products	Electric Openers	Gates

[Home](#)



FIELD JOINT WITH METRIC LOCKING BOLTS AND WASHERS. METRIC BOLTS AND WASHERS MUST BE USED.

THIS STYLE AVAILABLE IN WHITE ONLY

PACKING LIST

QTY	ITEM DESCRIPTION - SIZE
1	7/8" x 1 1/2" x 33 1/2" HW TOP CAP
1	1/4" x 3/8" LATTICE CHANNEL
1	30 3/4" x 36" LATTICE PANEL
1	7/8" x 1 1/2" x 33 1/2" INTERMEDIATE RAIL
1	7/8" x 1 1/2" x 33 1/2" HOLLOW RAIL
13	7/8" x 3/4" x 49" PICKETS
2	7/8" x 3/4" x 30 3/4" PICKETS
1	1 1/2" x 3 1/2" x 98 1/2" BOTTOM RISER RAIL
1	36" STEEL CHANNEL
19	3/4" x 3/8" SLIP ON PUS CHANNEL
8	SNAP CAP AND LOCK W/ 3/4" x 1 1/2" SCREW
1	40 Pkg. 4" x 4" x 96" POSTS
4	OXAL SNAP BENDS

* TRIM TO LENGTH
** SCREW HOLES AT CENTER OF RAIL

6 FT. LEXUS III
B-5006-R



1	7/8" x 1 1/2" x 33 1/2" HW TOP CAP
1	1/4" x 3/8" LATTICE CHANNEL
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4	OXAL SNAP BENDS



Vinyl Fence

Vinyl Railing

Vinyl Garden

Dealer Locator

Site Map

Dealer Setup

Contact Us

Stanco Elite Garden Collection™

Privacy Fence Styles Include:



T&G Cascade

Lexus

Basket Weave

Shadow Box

Stanco brand vinyl privacy fence is an elegant way to add privacy to your property. These Vinyl Fences are available in a variety of heights including: 4, 5 & 6 Feet. With all of our fences coming with a limited lifetime warranty, you know you will never have to paint, or replace rotten fence posts. All of our fence styles have matching gates available in a variety of sizes, simply [contact us](#) for more information.

If for some reason you do not see the fence style you're looking for, or just have a question please [e-mail us](#).

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Locator](#)

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Bufftech PVC Privacy Fence

Available styles, style system details, warranty, contract specifications, post footing depth requirements, installation manual, color chart.

Bufftech

America's Choice for Vinyl Fence™



Dealer Catalog

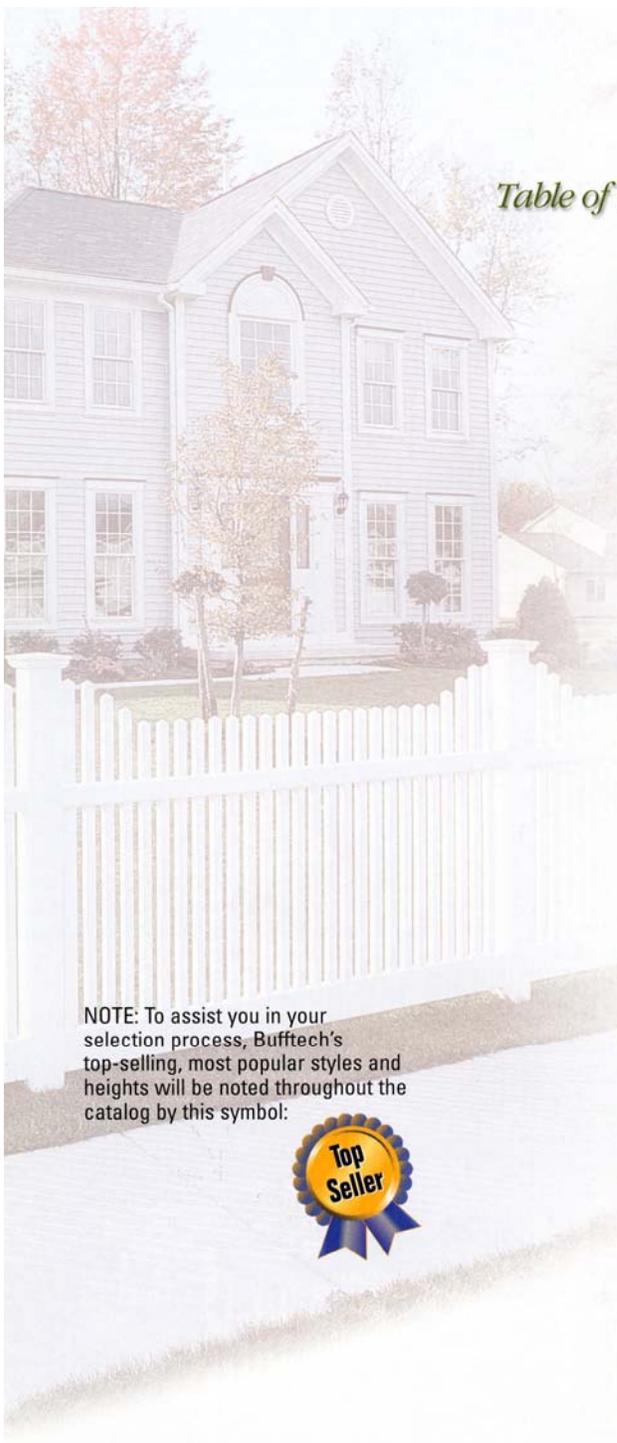


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NOTE: To assist you in your selection process, Bufftech's top-selling, most popular styles and heights will be noted throughout the catalog by this symbol:



Bufftech

Bufftech, established in 1979 in Buffalo, New York, was one of the earliest pioneers of the vinyl fencing business. In 1996, Bufftech was acquired by CertainTeed Corporation, headquartered in Valley Forge, Pennsylvania.

CertainTeed is a world leading manufacturer of building materials with a major commitment to vinyl products including windows, siding, pipe, fence, deck and railings. The union of Bufftech and CertainTeed provides high levels of confidence with customers due to capital resources, state of the art research facilities, as well as manufacturing and distribution sites throughout the United States.

Bufftech vinyl products can beautify your property while enriching your lifestyle with safety, durability and virtual freedom from maintenance.



Bufftech is America's leading choice for vinyl fence, deck and railing

Feature	Benefits
Manufactured with state-of-the-art co-extrusion technology	Outlasts and outperforms most other types of fence materials
Physically beautiful, superior appearance	Can enhance your property value
High concentration of UV protection and excellent impact resistance	Highly weather resistant Will not chip, fade or rot
Never needs painting or staining	Time and money savings on maintenance
No splinters, nails or sharp edges	Safer for you, your family and pets
Lifetime non-prorated limited warranty	Your assurance of quality, year after year
Recyclable and non-toxic	Environmentally friendly

Choose the post cap that suits your taste.



Gothic



Ball



New England



External Flat



Internal Flat

A full line of vinyl products

This catalog details Bufftech's extensive product line of vinyl fence, deck and railing systems. You have a choice of colors, styles, heights, pickets and post caps, allowing you the flexibility to create the look you want to complement your property.

Note On Color Choices: White, tan and grey are represented in this catalog. Reproduction of the color shown is as accurate as modern printing will permit. Before making final selection, request color sample from dealer. Not all styles are available in all colors.



Traditional

Cape Cod Concave

Heights: 3', 4' & 5'
Colors: White and Tan
Picket Style: 3" Pointed Picket



3', 4' White

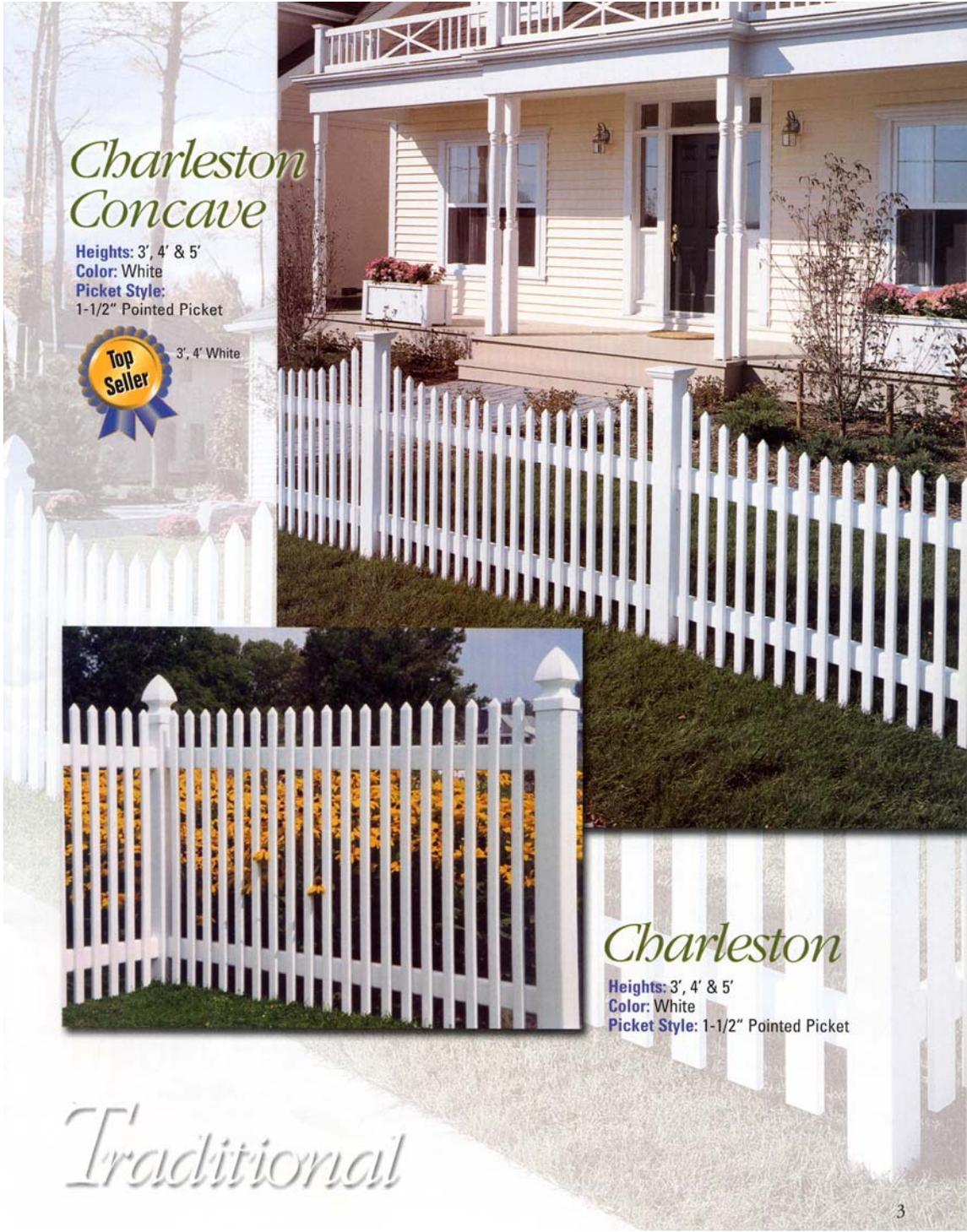
Cape Cod

Heights: 3', 4' & 5'
Colors: White and Tan
Picket Style: 3" Pointed Picket



3', 4' White





Charleston Concave

Heights: 3', 4' & 5'
Color: White
Picket Style: 1-1/2" Pointed Picket



3', 4' White



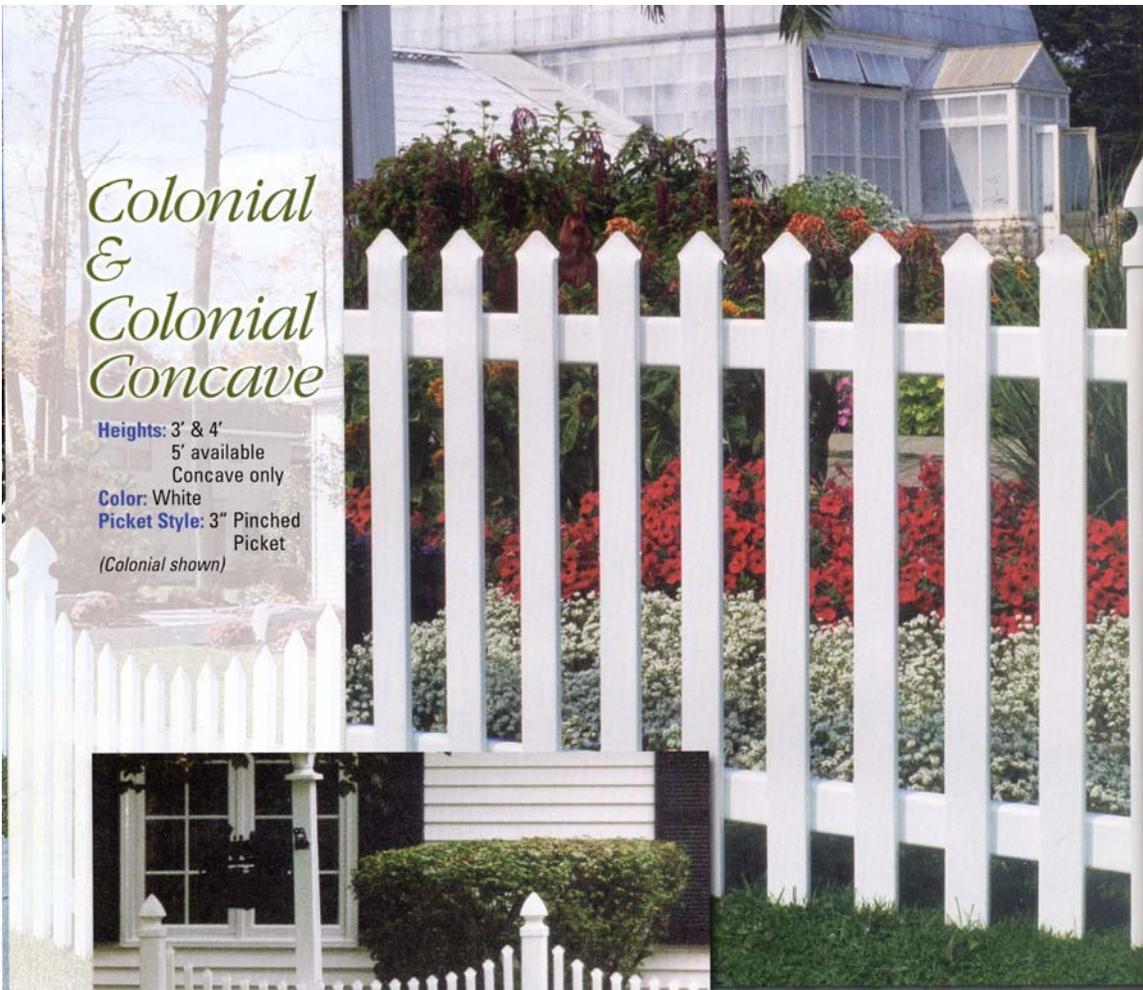
Charleston

Heights: 3', 4' & 5'
Color: White
Picket Style: 1-1/2" Pointed Picket

Traditional

*Colonial
&
Colonial
Concave*

Heights: 3' & 4'
5' available
Concave only
Color: White
Picket Style: 3" Pinched
Picket
(Colonial shown)



*Hudson &
Hudson
Concave*

Heights: 3' & 4'
Color: White
Picket Style: 1-1/2" Pinched Picket
(Hudson Concave shown)

Traditional



Yorkshire

Heights: 3' & 4'
Color: White
Picket Style: 3" Dog Ear Picket



3', 4' White

Yorkshire Concave

Heights: 3', 4' & 5'
Color: White
Picket Style: 3" Dog Ear Picket



Meets most pool codes

Providence & Providence Concave

Traditional

Height: 4'
Colors: White & Tan
Picket Style: 3" Pointed Picket
(Providence shown)



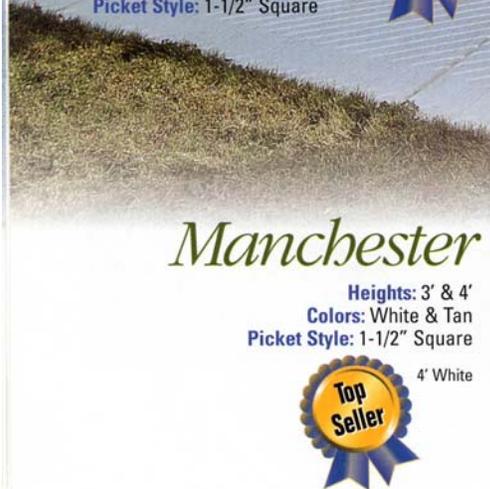
Classic

Manchester Concave

Heights: 3' & 4"
Colors: White and Tan
Picket Style: 1-1/2" Square



4' White



Manchester

Heights: 3' & 4'
Colors: White & Tan
Picket Style: 1-1/2" Square



4' White



Canterbury

Height: 3' & 4'
Color: White
Picket Style: 1-1/2" Square

Canterbury Swoop

Height: 4' to 3'
Color: White
Picket Style: 1-1/2" Square



New Castle

Heights: 4', 5' & 6'
 (5' & 6' include midrail - see inset)
Color: White
Picket Style: 1" Square
Picket Cap: Steeple or Tri-point



Normandy

Heights: 5' & 6'
Color: White
Picket Style: Alternating 1" Square Pickets
Picket Cap: Steeple or Tri-point



Classic

Contemporary



Princeton

Heights: 3', 4', 5' & 6'
(5' & 6' include midrail - see inset)
Colors: White, Tan or Grey
Picket Style: 7/8" x 1-1/2"



Baron

Heights: 3', 4', 5' & 6'
(5' & 6' include midrail - see inset)
Colors: White, Tan or Grey
Picket Style: 7/8" x 3"

Countess

Heights: 3', 4', 5' & 6'
(5' & 6' include midrail - see inset)
Colors: White, Tan or Grey
Picket Styles: 7/8" x 1-1/2"
7/8" x 3"



4', 5', 6'
White



Victorian

Heights: 3', 3-1/2', 4', 5' & 6'
(5' & 6' include midrail - see inset)
Colors: White, Tan or Grey
Picket Style: 7/8" x 1-1/2"



4', 5', 6'
White



Monarch

Heights: 3', 4', 5' & 6'
(5' & 6' include midrail - see inset)
Colors: White, Tan or Grey
Picket Styles: 7/8" x 1-1/2"
7/8" x 3"



Contemporary

Semi-Private



4', 5', 6'
White

Imperial

Heights: 3', 4', 5' & 6'
(5' & 6' include midrail – see inset)

Color: White, Tan or Grey

Picket Style: 7/8" x 3"

Columbia

Heights: 5' & 6' and 5' plus
1' Lattice Accent

Color: White

Picket Style: 7/8" x 6"
Ribbed



Millbrook

Heights: 5' & 6'

Colors: White and Tan

Picket Style: 7/8" x 6" Ribbed



Semi-Private



6' White, Tan

Chesterfield

Heights: 5', 6' & 5' plus 1' Accent
Color: White, Tan or Grey
 Lattice Accent: White Only
 Victorian Accent: White and Tan
Picket Style: 7/8" x 7" Tongue & Groove



5' plus 1' Accent, White Only

Victorian Accent

Lattice Accent



5' plus 1' Accent, White Only



Norfolk

Heights: 5', 6' and 5' plus 1' Accent
Colors: White or Tan
Lattice Accent: White Only
Picket Style: 7/8" x 6" Ribbed



Lattice Accent
(Victorian Accent available but not shown)

Privacy



Norfolk I

Heights: 4', 5', 6' &
5' plus 1' Accent
- 4' plus 1' Lattice
Accent also available
(4' has no midrail)
Colors: White and Tan
Lattice Accent: White
Only
Picket Style: 7/8" x 3"



Lattice Accent

Privacy



Lewiston

Heights: 5' & 6'
Colors: White and Tan
Picket Style: 7/8" x 6" Ribbed



Winchester

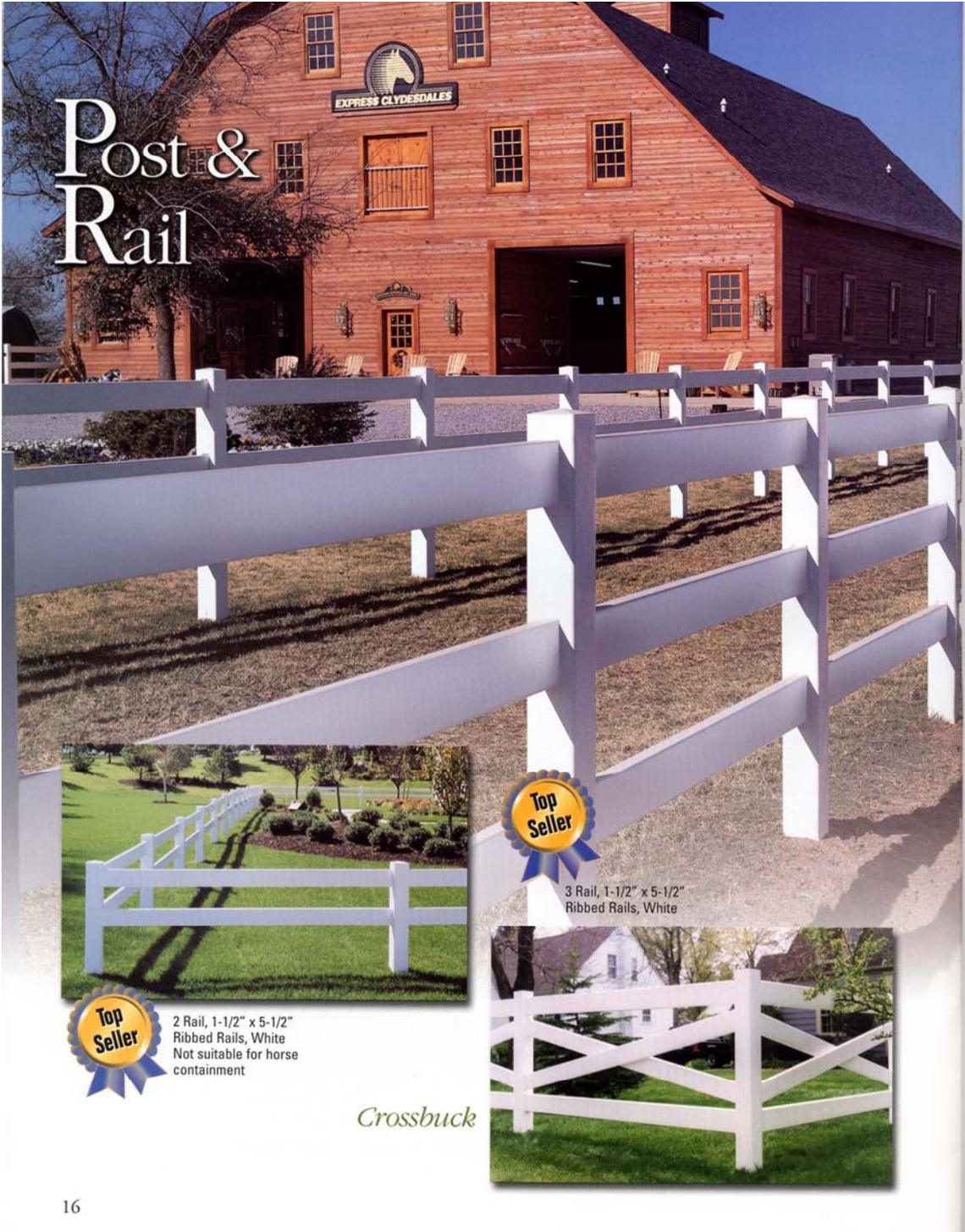
Heights: 5' & 6'
Color: Woodgrain desert tan
Picket Style: 7/8" x 7" Tongue & Groove



Galveston

Heights: 7', 8' and 7' plus 1' Accent
Colors: White or Tan
 Lattice Accent: White Only
Picket Style: 7/8" x 6" Ribbed
 (7' plus 1' Accent shown)

Privacy



Post & Rail



2 Rail, 1-1/2" x 5-1/2"
Ribbed Rails, White
Not suitable for horse
containment



3 Rail, 1-1/2" x 5-1/2"
Ribbed Rails, White



Crossbuck



Post & Rail

Styles: 2, 3 or 4 rail and Crossbuck

Color: White, Tan or Grey
Colors are only available with ribbed rails

Rail Size: 1-1/2" x 5-1/2"
 Ribbed
 2" x 6" Hollow
 2" x 6" Ribbed



Woodgrain Desert Tan

Available with 1-1/2" x 5-1/2" ribbed rails:
2, 3, or 4 Rail Style

Diamond Rail

Styles: 2 & 3 rail
Color: White
Not suitable for horse containment



Post & Rail

Note: For additional information, request Bufftech's Post & Rail brochure.



Deck, Railing & Porch Post



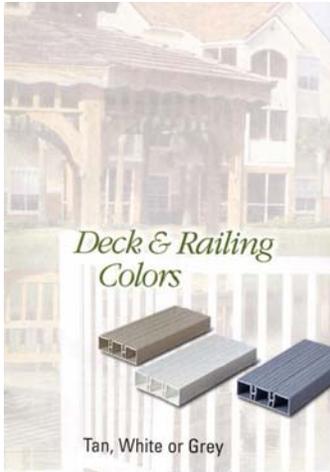
Top Rail Styles

- "T" Top Olympia Rail
- 2" x 4" Century Rail



Picket Styles

- 1-1/4" Square Picket
- 1-1/4" Spindle
- 1-1/4" Baluster



Deck & Railing Colors



Tan, White or Grey

Note On Color Choices: White, tan and grey are represented in this catalog. Reproduction of the color shown is as accurate as modern printing will permit. Before making final selection, request color sample from dealer.



Deck Components

- Deck Planks
- Deck Fill Pieces
- Deck End Covers

For complete installation details, refer to Bufftech's Installation Manual.



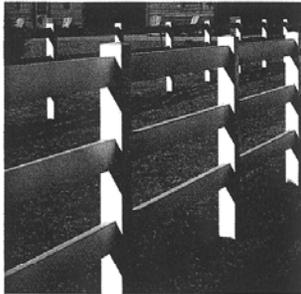
Porch Post

Note: For additional information, request Bufftech's Deck, Railing & Porch Post brochure.

Deck, Railing & Porch Post

Post & Rail

02825/BUF
BuyLine 6727



WARNING: If fencing which has been noted as not suitable for animal containment is used as the only means of animal restraint, animals may escape with the risk of serious injury to animals and people. Only use 3 and 4 rail fence for animal containment due to its sturdy construction.

Post & Rail

Styles: 2, 3 or 4 rail and Crossbuck

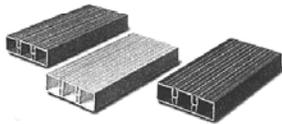
Colors: White, Tan

(Tan only available with ribbed rails)

Rail Size: 1-1/2" x 5-1/2" Ribbed, 2" x 6" Hollow, 2" x 6" Ribbed

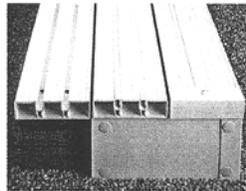
Deck, Railing & Porch Post

Buftech vinyl deck, Olympia and Century guard railing, and stair treads officially comply with NES, BOCA and SBCCI codes.



Deck Colors

• Tan, White or Grey
(Railing available in White or Tan)



Deck Components

- Deck Planks
- Deck Fill Pieces
- Deck End Covers



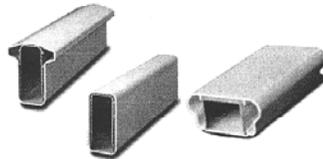
Porch Post

Note: For additional information, request Buftech's Deck, Railing & Porch Post brochure.



Baluster Styles

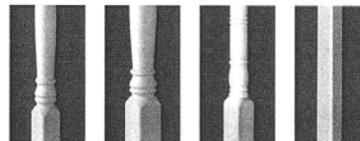
- 1-1/4" Square
- 1-1/4" Colonial
- 1-1/2" Square
- 1-1/2" Traditional



Top Rail Styles

- "T" Top Olympia Rail
- 2" x 4" Century Rail
- Top Round Keystone Rails

Post Styles



Colonial 4 x 4 Colonial 5 x 5 Traditional 4-1/2 x 4-1/2 Square 5 x 5

Bufftech Fence Systems Specifications

STYLE	PICKET SIZE	PICKET SPACING	SECTION WIDTH (NOMINAL)	RAILS	STEEL REINFORCEMENT RAIL**
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Traditional

12 Picket					
Cape Cod (Pointed Cap)	7/8" x 3"	2-7/16"	72"	1-3/4" x 3-1/2" x 72"	None
Colonial (Pinched Picket)	7/8" x 3"	2-7/16"	72"	1-3/4" x 3-1/2" x 72"	None
Yorkshire (Dog Ear Cap)	7/8" x 3"	2-7/16"	72"	1-3/4" x 3-1/2" x 72"	None
14 Picket					
Providence (Pointed Cap)	7/8" x 3"	1-3/4"	72"	1-3/4" x 3-1/2" x 72"	None
19 Picket					
Charleston (Pointed Cap)	7/8" x 1-1/2"	2"	72"	1-3/4" x 3-1/2" x 72"	None
Hudson (Pinched Picket)	7/8" x 1-1/2"	2"	72"	1-3/4" x 3-1/2" x 72"	None

Classic

Manchester	1-1/2" x 1-1/2"	1-9/16"	90"	2" x 6" x 88" (Bottom) 3" x 3" x 88" (Top)	Bottom
Canterbury	1-1/2" x 1-1/2"	1-9/16"	90"	2" x 6" x 88" (Ribbed Bottom) 3" x 3" x 88" (Mid/Top)	Bottom
New Castle	1" x 1"	3-13/16"	90"	1-3/4" x 3-1/2" x 90"	Bottom
Normandy	1" x 1"	3-13/16"	90"	1-3/4" x 3-1/2" x 90"	Bottom

Contemporary

Baron	7/8" x 3"	3-7/8"	90"	1-3/4" x 3-1/2" x 90"	Bottom
Countess	7/8" x 1-1/2" 7/8" x 3"	2"	90"	1-3/4" x 3-1/2" x 90"	Bottom
Monarch	7/8" x 1-1/2" 7/8" x 3"	3-5/16"	90"	1-3/4" x 3-1/2" x 90"	Bottom
Princeton	7/8" x 1-1/2"	1-3/4"	90"	1-3/4" x 3-1/2" x 90"	Bottom
Victorian	7/8" x 1-1/2"	3-5/8"	90"	1-3/4" x 3-1/2" x 90"	Bottom

Privacy

Chesterfield*/ Winchester Desert Tan	7/8" x 7" Tongue & Groove	N/A	90"	1-1/2" x 5-1/2" x 88" (Ribbed)	Bottom
Galveston*	7/8" x 6" Ribbed	N/A	90"	2" x 6" x 88" (Ribbed)	Top, Mid, Bottom
Lewiston	7/8" x 3"	N/A	90"	7/8" x 6" x 88" (Ribbed)	None
Norfolk*	7/8" x 6" Ribbed	N/A	90"	1-1/2" x 5-1/2" x 88" (Ribbed) 7/8" x 3" x 88" (midrail)	Bottom
Norfolk I*	7/8" x 3"	N/A	90"	1-1/2" x 5-1/2" x 88" (Ribbed) 7/8" x 3" x 88" (midrail)	Bottom

Bufftech Fence Systems Specifications

STYLE	PICKET SIZE	PICKET SPACING	SECTION WIDTH (NOMINAL)	RAILS	STEEL REINFORCEMENT RAIL**
Semi-Private					
Columbia	7/8" x 6" Ribbed	5-1/8"	90"	3-1/2" x 3-1/2" x 88"	Bottom (Aluminum)
Imperial	7/8" x 3"	9/16"	90"	1-3/4" x 3-1/2" x 90"	Bottom
Millbrook	7/8" x 6" Ribbed	15/16"	90"	1-1/2" x 5-1/2" x 88" (Top/Bottom) 1-3/4" x 3-1/2" x 88" (mid)	Bottom

Post & Rail

STYLE	POSTS	RAILS	GATES
Post & Rail	5" x 5" on 8' Centers	1-1/2" x 5-1/2" Ribbed, or 2" x 6" Ribbed or Hollow	2 Rail - 4' & 6' up to 12' Double Drive 3 Rail - 4', 6' & 8' up to 16' Double Drive
Crossback	5" x 5" on 8' Centers	1-1/2" x 5-1/2" Ribbed Crossrails, 2" x 6" Ribbed Top and Bottom Rails	Available in 8' Width Only, 16' Double Drive
Diamond Rail	5" x 5" on 6' Centers	3" x 3" x 144" (6' on center)	2 Rail - 4' & 6' up to 12' Double Drive 3 Rail - 4', 6' & 8' up to 16' Double Drive

Deck

STYLE	PLANK SIZE	PLANK SPACING	PLANK LENGTHS	ALUMINUM REINFORCEMENT
Deck	1-1/2" x 5-1/2"	1/8"	10', 12', 16'	N/A

*Dealer Note: 20' and 24' planks must be ordered in full pallet quantity (87 pieces) and as part of a half truckload or more of Bufftech products.

Railing and Porch Post

STYLE	PICKET SIZE	PICKET SPACING	SECTION WIDTH (NOMINAL)	RAILS	ALUMINUM REINFORCEMENT
Century (2" x 4" Top Rail)	1-1/4" x 1-1/4"	3-3/8"	72" & 96"	1-3/4" x 3-1/2" x 72" or 96" Top & Bottom	Top & Bottom Rails
Olympia ("T"-Shaped Top Rail)	1-1/4" x 1-1/4"	3-3/8"	72" & 96"	Top = 3" x 3-1/2" x 72" or 96" Bottom = 1-3/4" x 3-1/2" x 72" or 96"	Top & Bottom Rails
Porch Post	5" x 5" x 104"	N/A	N/A	N/A	Yes

*Lattice & Victorian accents available.

**Standard for bottom rails where noted. Optional for top rails. Aluminum channel available and recommended for high corrosion areas.

Intermediate rails: All 5', 6', 7' and 8' heights have an additional midrail with the same dimensions as top/bottom rails (except Chesterfield, Winchester and all Traditional fences). Other exceptions are noted on specifications chart.
Posts: All 3' & 4' high fences available with true 4" x 4" posts except Manchester and Canterbury (5" x 5" posts). Post & Rail and all 5', 6', 7' and 8' fences available with 5" x 5" posts.
Caps: Choice of External Flat, Internal Flat, Gothic, New England or Ball.
Gates: Factory pre-assembled 50" wide gates are available for residential style fences; other widths assembled by dealer.

Bufftech Fence Systems Specifications

STYLE	PICKET SIZE	PICKET SPACING	SECTION WIDTH (NOMINAL)	RAILS	STEEL REINFORCEMENT RAIL**
Semi-Private					
Columbia	7/8" x 6" Ribbed	5-1/8"	90"	3-1/2" x 3-1/2" x 88"	Bottom (Aluminum)
Imperial	7/8" x 3"	9/16"	90"	1-3/4" x 3-1/2" x 90"	Bottom
Millbrook	7/8" x 6" Ribbed	15/16"	90"	1-1/2" x 5-1/2" x 88" (Top/Bottom) 1-3/4" x 3-1/2" x 88" (mid)	Bottom

Post & Rail

STYLE	POSTS	RAILS	GATES
Post & Rail	5" x 5" on 8' Centers	1-1/2" x 5-1/2" Ribbed, or 2" x 6" Ribbed or Hollow	2 Rail - 4' & 6' up to 12' Double Drive 3 Rail - 4', 6' & 8' up to 16' Double Drive
Crossbuck	5" x 5" on 8' Centers	1-1/2" x 5-1/2" Ribbed Crossrails, 2" x 6" Ribbed Top and Bottom Rails	Available in 8' Width Only, 16' Double Drive
Diamond Rail	5" x 5" on 6' Centers	3" x 3" x 144" (6' on center)	2 Rail - 4' & 6' up to 12' Double Drive 3 Rail - 4', 6' & 8' up to 16' Double Drive

Deck

STYLE	PLANK SIZE	PLANK SPACING	PLANK LENGTHS	ALUMINUM REINFORCEMENT
Deck	1-1/2" x 5-1/2"	1/8"	10', 12', 16'	N/A

*Dealer Note: 20' and 24' planks must be ordered in full pallet quantity (87 pieces) and as part of a half truckload or more of Bufftech products.

Railing and Porch Post

STYLE	PICKET SIZE	PICKET SPACING	SECTION WIDTH (NOMINAL)	RAILS	ALUMINUM REINFORCEMENT
Century (2" x 4" Top Rail)	1-1/4" x 1-1/4"	3-3/8"	72" & 96"	1-3/4" x 3-1/2" x 72" or 96" Top & Bottom	Top & Bottom Rails
Olympia (T"-Shaped Top Rail)	1-1/4" x 1-1/4"	3-3/8"	72" & 96"	Top = 3" x 3-1/2" x 72" or 96" Bottom = 1-3/4" x 3-1/2" x 72" or 96"	Top & Bottom Rails
Porch Post	5" x 5" x 104"	N/A	N/A	N/A	Yes

*Lattice & Victorian accents available.

**Standard for bottom rails where noted. Optional for top rails. Aluminum channel available and recommended for high corrosion areas.

Intermediate rails: All 5', 6', 7' and 8' heights have an additional midrail with the same dimensions as top/bottom rails (except Chesterfield, Winchester and all Traditional fences). Other exceptions are noted on specifications chart.

Posts: All 3' & 4' high fences available with true 4" x 4" posts except Manchester and Canterbury (5" x 5" posts). Post & Rail and all 5', 6', 7' and 8' fences available with 5" x 5" posts.

Caps: Choice of External Flat, Internal Flat, Gothic, New England or Ball.

Gates: Factory pre-assembled 50" wide gates are available for residential style fences; other widths assembled by dealer.

Bufftech...

For more than 20 years, the Bufftech name has been synonymous with quality. A pioneer in the development of vinyl fence, Bufftech continues to lead the way with a winning combination of innovative products and distinctive designs for both residential and commercial applications. Bufftech's reputation as an industry

leader is enhanced by our partnership with CertainTeed, America's leading manufacturer of building products. State-of-the-art manufacturing and research facilities enable us to bring the latest breakthroughs in vinyl technology to the marketplace.

The Bufftech advantage

Thanks to state-of-the-art vinyl technology, Bufftech's premium vinyl fence is engineered

to last. The weather-resistant vinyl construction won't corrode, peel, flake or discolor. Our innovative co-extrusion process offers increased durability and UV protection, while precision pre-routed posts provide for easy, bracket-free installation. All Bufftech products are backed by an outstanding lifetime, limited warranty.

Note: Color may vary slightly from actual product

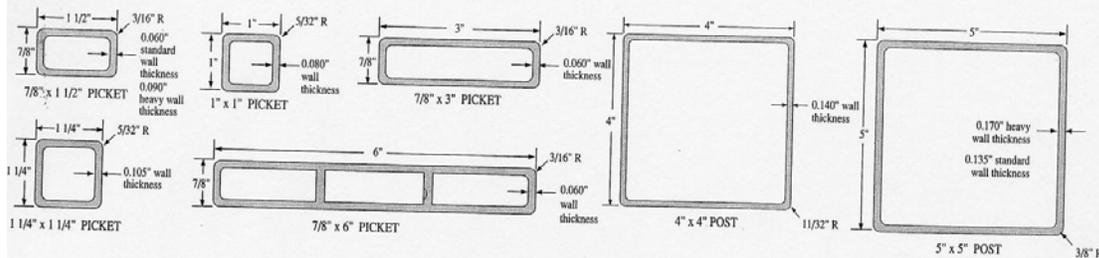
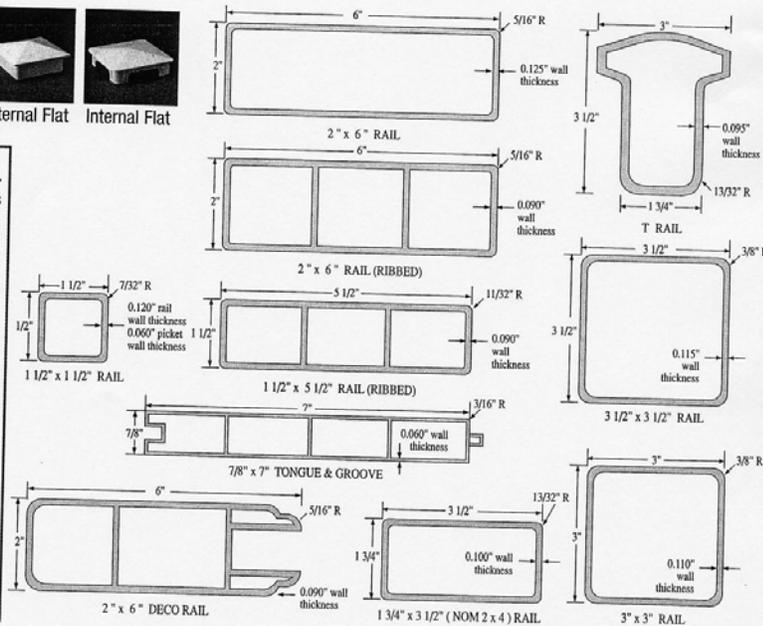
Here is why Bufftech is the leading brand of vinyl fence

Feature	Benefits
Manufactured with state-of-the-art co-extrusion technology	Outlasts and outperforms most other types of fence materials
Physically beautiful, superior appearance	Can enhance your property value
High concentration of UV protection and excellent impact resistance	Highly weather resistant, will not chip, fade or rot
Never needs painting or staining	Time and money savings on maintenance
No splinters, nails or sharp edges	Safer for you, your family and pets
Lifetime non-prorated limited warranty	Your assurance of quality, year after year
Recyclable and non-toxic	Environmentally friendly

A Choice of Post Cap Styles



Profile Dimensions Cross Section	Wall Thickness	Corner Radius
Posts		
4" x 4"	0.140"	11/32"
5" x 5"	0.135" Standard Wall	3/8"
5" x 5"	0.170" Heavy Wall	3/8"
Rails		
1-1/2" x 1-1/2"	0.120"	7/32" R
1-3/4" x 3-1/2"	0.100"	13/32"
3" x 3-1/2" "T" Rail	0.095"	13/32"
2" x 6" Hollow	0.125"	5/16"
1-1/2" x 5-1/2" Ribbed	0.090"	11/32"
2" x 6" Ribbed	0.090"	5/16"
2" x 6" Deco Rail	0.090"	5/16"
3" x 3"	0.110"	5/16"
3-1/2" x 3-1/2"	0.115"	3/8"
Pickets		
7/8" x 1-1/2"	0.060"	3/16"
7/8" x 1-1/2" Heavy Wall	0.090"	3/16"
7/8" x 3"	0.060"	3/16"
7/8" x 6" Ribbed	0.060"	3/16"
7/8" x 7" Tongue & Groove	0.060"	3/16"
1-1/2" x 1-1/2"	0.060"	7/32"
1" x 1"	0.080"	5/32"



Bufftech

Bufftech, established in 1979 in Buffalo, New York, was one of the earliest pioneers of the vinyl fencing business. In 1996, Bufftech was acquired by CertainTeed Corporation, headquartered in Valley Forge, Pennsylvania.

CertainTeed is a world leading manufacturer of building materials with a major commitment to vinyl products including windows, siding, pipe, fence, deck and railings. The union of Bufftech and CertainTeed provides high levels of confidence with customers due to capital resources, state of the art research facilities, as well as manufacturing and distribution sites throughout the United States.

Bufftech vinyl products can beautify your property while enriching your lifestyle with safety, durability and virtual freedom from maintenance.



Bufftech is America's leading choice for vinyl fence, deck and railing

Feature	Benefits
Manufactured with state-of-the-art co-extrusion technology	Outlasts and outperforms most other types of fence materials
Physically beautiful, superior appearance	Can enhance your property value
High concentration of UV protection and excellent impact resistance	Highly weather resistant Will not chip, fade or rot
Never needs painting or staining	Time and money savings on maintenance
No splinters, nails or sharp edges	Safer for you, your family and pets
Lifetime non-prorated limited warranty	Your assurance of quality, year after year
Recyclable and non-toxic	Environmentally friendly

Choose the post cap that suits your taste.



Gothic



Ball



New England



External Flat



Internal Flat

A full line of vinyl products

This catalog details Bufftech's extensive product line of vinyl fence, deck and railing systems. You have a choice of colors, styles, heights, pickets and post caps, allowing you the flexibility to create the look you want to complement your property.

Note On Color Choices: White, tan and grey are represented in this catalog. Reproduction of the color shown is as accurate as modern printing will permit. Before making final selection, request color sample from dealer. Not all styles are available in all colors.



Good for Life™

Monday, April 28, 2003

Walter Kronon
NJIT
CE Department
Newark, NJ 07102-1982

Dear Walter:

Thank you for your interest in Bufftech's quality vinyl products!

Pursuant to our discussion earlier this year, I am enclosing our architectural binder and small color samples for your review. Please accept my apologies for the delay in getting this binder out to you; we had to wait for new literature and binders to be printed and made available. Our binder includes technical information and installation instructions as well as "EZ Spec's" for specifying our product. You can also find our specifications and CAD drawings by visiting our website at www.certainteed.com or www.bufftech.com. The "CADdetails" icon can be found in the "Products" section of the Professional portion of either site.

A Bufftech fence, deck or railing always looks new, with little or no maintenance and is much safer than wood, since it has no nails, sharp edges, or splinters, making it a more cost effective investment than wood. Due to its low maintenance, the return on investment for a Bufftech fence, deck or railing system is usually within the first five or six years.

Made from a unique vinyl compound to provide durability, strength and exquisite beauty, Bufftech's fencing, decking, railing and lawn and garden products will not peel, rust, chip or ever require painting! To support this investment, we offer a lifetime warranty on residential projects and a 30 year warranty on commercial projects.

We have an extensive network of Bufftech dealers across the United States. The Bufftech dealer in your area is Artistic Fence, who can be reached at 973-779-4540. Our dealers are able to assist you with any pricing, style and installation questions you may encounter. Please also feel free to contact me with any questions you may have; you can reach me at (800) 333-0569, extension 245. Thank you!

Sincerely,

Bufftech

Jodene Wheeler
Commercial Sales Representative

Enclosures





About Us

Thank you for choosing Bufftech!

You have chosen a product that combines the elements of elegant design and function with the benefits of being virtually maintenance-free. Made from a unique vinyl compound to provide durability, strength and consistent color, Bufftech fence, decking and railing systems will not peel, fade, rust, chip or ever require painting.

Bufftech is a quality brand name of CertainTeed Corporation, a leader in the building materials industry for almost 100 years, assuring you of the highest quality products available in the vinyl industry today.

To facilitate your specification process, Bufftech offers you the following services:

- An architectural binder organized to present our products and technical information in an easy to follow format. The binder features our exclusive "EZ Specs" pre-written in a standard AIA format for your convenience.
- A website at www.bufftech.com, www.prestigefencing.com or at www.certainteed.com provides a complete overview of Bufftech vinyl systems.
- To easily download directly to your spec, we participate in "CADdetails" at www.caddetails.com. This site is hyperlinked to the product and specification portions of our own website; just click on the "CADdetails" icon.

To satisfy the aesthetic and functional requirements of your projects, Bufftech has a professional staff that will assist you with the design of a fence, deck, or railing system. For further assistance, please contact us (800) 333-0569.

Again, thank you for choosing Bufftech. We look forward to serving you.

Sincerely,

Ralph J. Palmieri
Director of Sales
Ext. 244

Jodene M. Wheeler
Corporate Sales Representative
Ext. 245



Why Bufftech?

Vinyl fence products have grown in popularity over the years and Bufftech has led the way in this growth. When choosing the right fence for your commercial or residential installation, consider the reasons why Bufftech remains your best choice.

Leadership For Over 20 Years

- A quality fencing brand since 1979.
- A pioneer in the industry, constantly creating new and innovative products
- A credible and recognizable quality brand of CertainTeed Corporation, one of North America's leading building products manufacturers since 1904
- Active member of the American Fence Association (AFA), with participants in national and regional chapters

Superior Quality & Proven Performance

- Co-extrusion technology for essential UV protection and increased impact resistance
- All systems designed and engineered for long term performance
- Manufacturing facilities ISO 9002 Certified

- Virtually maintenance-free
- Manufactured to withstand the test of time in any climate
- A large variety of styles for consumer and commercial applications
- Lifetime, non-prorated limited warranty is CertainTeed's assurance of quality performance

Commitment to Service

- Professional technical support and installation
- Provide job quotations, ship status inquiries and lead generation
- Distributed only through professional fence dealers
- Strategically located manufacturing and distribution centers
- Network of over 1,300 dealers
- Assistance in specification and job coordination for commercial projects
- Extensive dealer support programs, including seminars, sales meetings, and training sessions



Familiar Projects

Maybe you have seen our work around town.

<u>PROJECT</u>	<u>LOCATION</u>
Alliance Airport	Fort Worth, TX
Block Island Airport	Rhode Island
Burger King	Various Locations
Carousel Mall	Syracuse, NY
Centex Homes	Minneapolis, MN
Hill Air Force Base	Fruit Heights, UT
Holloman Air Force Base	Albuquerque, NM
Jesse James Park	Kearny, MO
Arrowhead Stadium (Kansas City Chiefs)	Kansas City, MO
McDonald's Restaurants	Various Locations
Mormon Temple	Salt Lake City, UT
Nassau Community	Long Island, NY
Pulte Homes	Chicago, IL
San Diego Marina	San Diego, CA
Toll Brothers Homes	Various Locations
Whitlatch & Co. (developer)	Cleveland, OH

CertainTeed Corporation Bufftech Brand Products

Lifetime Warranty Limited, Non-prorated

What and Who is Covered and for How Long

CertainTeed warrants to the original homeowner/consumer that its Bufftech vinyl fencing, decking and railing products will be free from manufacturing defects - including peeling, flaking, blistering and corroding - when subject to normal and proper use.

Should any such defect occur during the lifetime of the original purchaser (and as long as the original purchaser is still living and retains ownership of the property), CertainTeed will repair or replace, at its option, the defective fencing, decking or railing product. Except during the Sure Start™ protection period, described below, CertainTeed also reserves the right to refund the amount paid by the original owner for the fencing, decking or railing.

CertainTeed shall not be liable or responsible for labor charges or other expenses whatsoever in connection with removal or installation of either the original or replacement product.

In the event of repair or replacement under the terms of this warranty, the original warranty shall apply to the repaired or replacement fencing, decking or railing material, and will extend for the balance of the warranty period in effect at the time the material proved defective.

The lifetime coverage offered by this warranty automatically ends upon the sale of the property or death of the last of the original owners of the property at the time of installation.

The lifetime coverage offered by this warranty is designed to cover individual homeowners only. In the case of fencing, decking or railing material purchased by, or installed upon property owned by, corporations, governmental agencies, partnerships, trusts, religious organizations, schools, condominiums or cooperative housing arrangements, or installed on apartment buildings or any other type of building or premises not used by individual homeowners as their residences, the warranty period will be 30 years following the installation of the fencing, decking, or railing.

Sure Start™ Protection



CertainTeed vinyl fencing, decking and railing products are covered by Sure Start protection for a period of five years following the date when installation has been completed. Under this warranty feature, CertainTeed, at no charge, will repair or replace, at its option, any fencing, decking or railing proven to be defective during the five year Sure Start period. CertainTeed's maximum liability under Sure Start will be equal to the reasonable cost to replace the defective fencing, decking or railing at its current value, including labor.

Limitations

This warranty does not provide protection against any failure, defect or damage caused by situations and events beyond normal exposure conditions, including but not limited to:

- Misuse, abuse, neglect or improper handling or storage;
- Improper installation or installation not in strict adherence to CertainTeed's written instructions;
- Use of accessories which do not properly receive and/or secure CertainTeed fencing, decking and railing;
- Impact of foreign objects, fire, earthquake, flood, lightning, hail, hurricane, tornado or other casualty or act of God;
- Movement, distortion, collapse or settling of the ground or structure on which the fencing, decking or railing is installed;
- Any other cause not involving manufacturing defects in the material supplied by CertainTeed.

The fencing, decking and railing is not warranted against discoloration or other damage caused by air pollution (including but not limited to metal oxides or metallic particles), mildew, exposure to harmful chemicals or normal weathering from the elements.

Normal weathering is defined as exposure to sunlight and extremes of weather and atmosphere which will cause any colored surface to gradually fade, chalk, or accumulate dirt or stains. The severity of any condition depends on the geographical location of the fencing, decking or railing, the cleanliness of the air in the area, and many other influences over which CertainTeed has no control.

Notwithstanding anything set forth above, the fencing, decking and railing is warranted against yellowing of the product due to normal weathering from the elements.

CertainTeed shall have sole discretion to determine, based on reasonable criteria, whether the fencing, decking or railing is suffering from normal weathering. If the fencing, decking or railing weathers to a degree determined by CertainTeed to be beyond normal, CertainTeed will either repair or provide replacement material, at its option, for the defective fencing, decking or railing. CertainTeed also reserves the right to refund the amount paid by the original owner for the fencing, decking or railing material and accessories (but not including the cost of its initial installation).

This warranty does not apply to fencing, decking or railing which has been painted, varnished or coated over the manufacturer's original finish.

CertainTeed reserves the right to discontinue or modify any of its products, including the color, without notice to the homeowner/consumer, nor shall CertainTeed be liable in the event the replacement material may vary in color or gloss in comparison to the original product as a result of normal weathering. If CertainTeed replaces any material under this warranty, it may substitute products designated by CertainTeed to be of comparable quality or price range in the event the product initially installed has been discontinued or modified.

See Reverse Side for Additional Terms and Conditions

Transferability

This warranty is not transferable, with the exception of the following circumstance:

In any instance in which the property owner at the time of installation is not an individual homeowner, then in the event the ownership of the fencing, decking or railing reverts or is transferred by the property owner at the time of installation to an individual homeowner within the original 30 year warranty period, then the lifetime coverage offered by this warranty shall apply to the homeowner to whom ownership passes. Under no circumstances shall the lifetime coverage apply to common perimeter or common pool fencing.

Other Conditions

THIS WARRANTY REPLACES ALL OTHER ORAL OR WRITTEN WARRANTIES, LIABILITIES, OR OBLIGATIONS OF CERTAINTEED. PERTINENT STATE LAW SHALL CONTROL FOR WHAT PERIOD OF TIME FOLLOWING THE SALE A HOMEOWNER/ CONSUMER MAY SEEK A REMEDY UNDER THE IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL CERTAINTEED BE LIABLE FOR CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY KIND, INCLUDING ANY DAMAGE TO THE BUILDING, ITS CONTENTS OR ANY PERSON THEREIN, RESULTING FROM THE BREACH OF THIS WARRANTY. CERTAINTEED DOES NOT AUTHORIZE ITS FIELD REPRESENTATIVES, DISTRIBUTORS OR DEALERS TO MAKE ANY CHANGE OR MODIFICATION TO THIS WARRANTY. SOME STATES DO NOT ALLOW LIMITATIONS ON, OR THE EXCLUSION OF, INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSIONS MAY NOT APPLY TO YOU.

This warranty gives you specific legal rights, and you may also have other rights which may vary from state to state.

What the Customer Must Do

The homeowner/consumer must promptly notify CertainTeed in writing of any manufacturing defect and provide proof of the date of purchase and installation, as well as proof of property ownership. All notifications should be sent to: **CertainTeed Corporation, 2525 Walden Avenue, Buffalo, NY 14225, Attn: Consumer Services Department.** The consumer may be required to submit a sample of the defective material to CertainTeed for analysis. CertainTeed will then investigate the claim and may examine the material claimed to be defective. If a defect covered by this warranty is confirmed, CertainTeed, within a reasonable amount of time after the inspection, will repair or provide replacement material for the fencing, decking or railing, or refund the amount paid by the original owner for the fencing, decking or railing, and accessories, per the terms of this warranty.

This warranty is effective for products purchased after February 1, 2000.

CertainTeed Corporation
2525 Walden Avenue
Buffalo, NY 14225

Care and Maintenance

While CertainTeed vinyl fencing, decking and railing resist most common household stains like oil and grease, it will become dirty like any other product that is exposed to atmospheric conditions. Chalk may also accumulate on the surface. This is a normal condition for all pigmented materials which are constantly exposed to sunlight and the elements. Soil, grime and chalk can be simply removed with the help of your garden hose and a bucket of soapy water. If especially stubborn stains cannot be removed with normal household detergents, request a cleaner from your contractor. Always test cleaner on an inconspicuous area before full use.

Mildew may be a problem in some areas. It appears as black spots on surface dirt and is usually first detected in areas not subjected to rainfall, such as under eaves and porch enclosures. For removal, prepare a solution as shown. CAUTION: greater concentrations may cause damage to the vinyl materials.

Mix together:

- 1/3 cup detergent (Tide, for example)
- 2/3 cup Trisodium Phosphate (Soilax, for example)
- 1 quart 5% Sodium Hypochlorite (Clorox, for example)
- 3 quarts of water

If the above solution does not readily remove the mildew spots, request a mildew-type cleaner from your contractor.

The chemical agents referenced herein may be hazardous to the user or to the environment. Be sure to follow all precautions and warnings on the product label, and particularly those which may be necessary to prevent personal injury. Please dispose of these chemical agents in a manner prescribed by the manufacturer. If you are unsure how to use or how to dispose of these chemical agents, contact the manufacturer of these products for instructions.

Important: Fire Safety Information

Exterior vinyl building materials require little maintenance for many years. Nevertheless, common sense dictates that builders and suppliers of vinyl products store, handle and install vinyl materials in a manner that avoids damage to the product and/or the structure. Owners and installers should take a few simple steps to protect vinyl building materials from fire. Rigid vinyl fencing, decking and railing are made from organic materials that will melt or burn when exposed to a significant source of flame or heat. Building owners, occupants and outside maintenance personnel should always take normal precautions to keep sources of fire, such as barbecues and combustible materials, such as dry leaves, mulch and trash, away from vinyl fencing, decking and railing.





NOW AVAILABLE...
CLAY COLOR OPTION

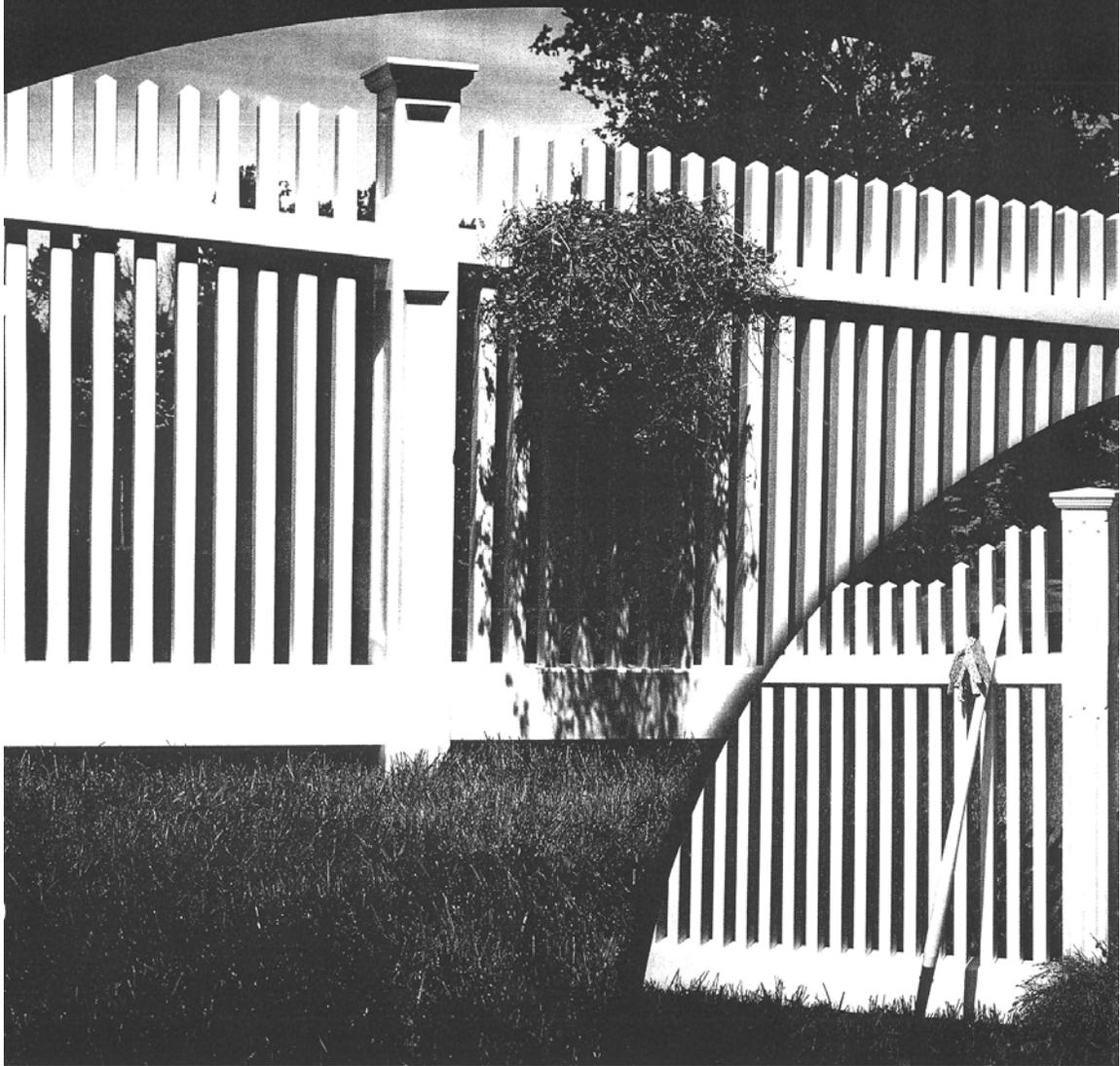
*Bufftech broadens its color offering
with the addition of a new, darker shade*





CLASSIC IMPRESSIONS™

Bufftech's Classic Impressions fence posts bring together the traditional look of handcrafted wood with the modern convenience of easy-care vinyl. Available in two distinctive styles, Classic Impressions fence posts are the perfect complement to Bufftech's Manchester fence.



Part 1 - General

1.01 Related Documents:

- A) Drawings and general provisions of the contract apply to this section.

1.02 Summary:

- A) This section includes the following:
 - 1) Polyvinyl chloride (PVC) fence and gate components.
 - 2) Gate hardware.
 - 3) Reinforcing steel for concrete-filled, reinforced fence posts.
 - 4) Concrete for post footings and for concrete filled reinforced fence posts.
- B) Related sections: The following sections contain requirements that relate to this section.
 - 1) Section 02200-Earthwork
 - 2) Section 03300-Cast-in-Place concrete

1.03 Definitions:

- A) Posts are the vertical structure support members of the fence.
- B) Rails are the horizontal structural support members of the fence or gate frame.
- C) Pickets are the vertical, non-structural members between bottom and top rails.
- D) Gate Uprights are the vertical structural support members of the gate frame.

1.04 Submittals:

- A) General: Submit the following according to the conditions of the contract.
- B) Product Data: In the form of manufacturer's technical data, specifications, and installations for fence, posts, gate uprights, post caps, gates, gate hardware and accessories.
- C) Samples for verification of PVC color in form of 3-inch lengths of actual product to be used in color selection.
- D) Shop Drawings showing fence design.

1.05 Quality Assurance:

- A) Installer Qualifications: Engage an experienced installer who has at least three years experience and has completed at least five PVC fence projects with same material and of similar scope to that indicated for this project with a successful construction record of in-service performance.
- B) Single-Source Responsibility: Obtain PVC fences and gates, including accessories, fittings, and fastenings, from a single source.

1.06 Project Conditions:

- A) Field Measurements: Verify layout information for fences and gates shown on the drawings in relation to the property survey and existing structures. Verify dimensions by field measurements.

1.07 Warranty:

- A) Manufacturer's Warranty: Lifetime non-prorated limited warranty applies to original homeowner/consumer, or 30 year non-prorated limited warranty applies to commercial applications.

Part 2 - Products

2.01 Fence Materials:

- A) General: Provide PVC fence materials recognized to be of type indicated and tested to show compliance with indicated performances.
- B) Available Manufacturer: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include:
 - 1) CertainTeed, 2525 Walden Avenue, Buffalo, NY 14225 (800) 333-0569 Contact-Ralph Palmieri
 - 2) Style Name _____
Height _____ minimum
 - 3) Color Match CertainTeed _____

2.02 Polyvinyl Chloride (PVC)

Fence Components:

- A) General: Posts, rails, pickets, gate uprights, post caps, and accessories shall be of high impact, Ultra Violet (U.V.) resistant, rigid PVC, and shall comply with ASTM D 1784, Class 14344B.
- B) Fence Posts: One piece extruded, of lengths indicated and pre-routed to receive rails at spacing indicated.
 - 1) Cross Section: _____ minimum
 - 2) Wall Thickness: _____ minimum
 - 3) Corner Radius: _____ minimum
- C) Rails: One piece extruded, of lengths indicated pre-routed to receive pickets at spacing indicated.
 - 1) Cross Section: _____ minimum
 - 2) Wall Thickness: _____ minimum
 - 3) Corner Radius: _____ minimum
- D) Pickets: One piece extruded, of lengths indicated.
 - 1) Cross Section: _____ minimum
 - 2) Wall Thickness: _____ minimum
 - 3) Corner Radius: _____ minimum
- E) Gate Uprights: One piece extruded, of lengths indicated.
 - 1) Cross Section: _____ minimum
 - 2) Wall Thickness: _____ minimum
 - 3) Corner Radius: _____ minimum
- F) Post Caps: Molded, one piece.
 - 1) Cross Section: Match post or gate upright cross section.
 - 2) Thickness: 0.095" minimum.
 - 3) Configuration: Flat or four-sided as required for installation to top of posts and gate.
- G) Accessories: Manufacturers' standard gate brace, screw caps, rail end reinforcers, and other accessories as required.

2.03 Miscellaneous Materials:

- A) Stiffener Channels: Galvanized steel structural channel. Configure channels for concealed installation within PVC rails with pre-drilled holes for drainage. Aluminum extruded channel available upon request.
 - 1) Cross Section: 3.00" x 3.00" x 1.500" hourglass shape to grip picket.
 - 2) Thickness: 0.040 Gauge (minimum)
- B) Fasteners and Anchorage: Stainless Steel. All fasteners to be concealed or colored heads to match. Provide sizes as recommended by fence manufacturer.
- C) PVC Cement: As recommended by fence manufacturer.

2.04 Gate Hardware and Accessories:

- A) General: Provide hardware and accessories for each gate according to the following requirements:
- B) Hinges: Size and material to suit gate size, non lift-off type, self closing, glass filled nylon with adjuster plates, offset to permit 120 degree gate opening. Provide one pair of hinges for each gate.
 - 1) Color: Black
- C) Latch: Manufacturers' standard self latching, glass filled nylon and stainless steel composition single or dual access gravity latch. Provide one latch per gate.
 - 1) Finish: Match gate hinge finish.
- D) Hardware: Stainless Steel. Provide sizes as recommended by fence manufacturer.
 - 1) Finish: Match gate hinge finish.

2.05 Concrete:

- A) Concrete: Provide concrete consisting of portland cement per ASTM C 150, aggregates per ASTM C 33, and potable water. Mix materials to obtain concrete with a minimum 28-day compressive strength of 2000 psi. Use at least four sacks of cement per cubic yard, 1-inch maximum size aggregate, 3-inch maximum slump. Use 1/2 inch maximum size aggregate in post where required.
- B) Packages Concrete Mix: Mix dry-packaged normal- weight concrete conforming to ASTM C 387 with clean water to obtain a 2 to 3 inch slump.

2.06 Reinforcement for Filled Posts:

- A) Reinforcing Steel:
 - 1) Steel Reinforcing Bars: ASTM A 615. Grade 60. Deformed (#4 or 1/2"). Install 2 bars for each post to a length of _____ feet.

Part 3 - Execution

3.01 Installation, General:

- A) Install fence in compliance with manufacturer's written instructions. During installation, PVC components shall be carefully handled and stored to avoid contact with abrasive surfaces. Install components in sequence as recommended by fence manufacturer.
- 1) Install fencing as indicated on the drawings provided.
 - 2) Variations from the installation indicated must be approved.
 - 3) Variations from the fence and gate installation indicated and all costs for removal and replacement will be the responsibility of the contractor.

3.02 Fence Installation:

- A) **Excavation:** Drill or hand-excavate (using post hole digger) holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.
- 1) If not indicated on drawings, excavate holes for each post to a minimum diameter of _____ inches.
 - 2) Unless otherwise indicated, excavate hole depths not less than 30 inches or to frost line.
- B) **Posts:** Install posts in one piece, plumb and in line. Space a maximum of _____ feet o.c. unless otherwise indicated. Enlarge excavation as required to provide clearance indicated between post and side of excavation.
- 1) Protect portion of posts above ground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Check each post for vertical and top alignment and hold in position during placement and finishing operations.
 - a) Unless otherwise indicated, terminate top of concrete footings 3 inches below adjacent grade and trowel to a crown to shed water.
 - b) Secure posts in position for manufacturers' recommendations until concrete sets.
 - c) After installation of rails and unless otherwise indicated, install reinforcing in posts in opposing corners of post as shown and fill end and gate posts with concrete to level as indicated. Concrete fill shall completely cover the reinforcing steel and gate hardware fasteners. Consolidate the concrete by striking the post face with a rubber mallet, carefully tamping around the exposed post bottom.

- d) Install post caps. Use #8 screws, nylon washers and snap caps.
 - e) Remove concrete splatters from PVC fence materials with care to avoid scratching.
- C) **Top and Bottom Rails:** Install rails in one piece into routed hole fabricated into posts to receive top and bottom rails, and middle where necessary. Except at sloping terrain, install rails level.
- 1) Prior to installation of rails into posts, insert concealed steel channel stiffeners in top rail, where necessary. Bottom rails shall include minimum (2) 1/4" drainage holes.
 - 2) At posts to receive concrete fill, tape rail ends to prevent seepage when filling post with concrete.
- D) **Middle Rails:** Where necessary, install middle rails in one piece into routed hole in posts with larger holes facing down. Except at sloping terrain, install middle rails level. Secure mid rail to pickets with 2-#8 x 1-1/2" screws evenly spaced.
- 1) At posts to receive concrete fill, tape rail ends to prevent seepage when filling post with concrete.
- E) **Pickets:** Install pickets in one piece as per manufacturer recommendations. Install pickets plumb.
- F) **Fence Installation at Sloping Terrain:** At sloping terrain rails may be racked (sloped) or stepped to comply with manufacturers' recommendations.

3.03 Gate Installation:

- A) Prior to installation of rails into posts, apply PVC cement into sockets per manufacturer's recommendations. Bottom rail shall include minimum (2) 1/4" drainage holes.
- B) Assemble gate prior to fence installation to accurately locate hinge and latch post. Align gate horizontal rails with fence horizontal rails.
- C) Install gates plumb, level, and secure for full opening without interference according to manufacturer's instructions.
- D) **Gate Latch Installation.** Install gate latch according to manufacturer's instructions. Adjust for smooth, trouble-free operation.
- E) Allow minimum 72 hours to let concrete set-up before opening gates.

3.04 Adjusting and Cleaning:

- A) Remove all traces of dirt and soiled areas.

3.05 Demonstration:

- A) Instruct the owner's personnel on proper operation and maintenance of fence components.



OUTDOOR LIVING PRODUCTS

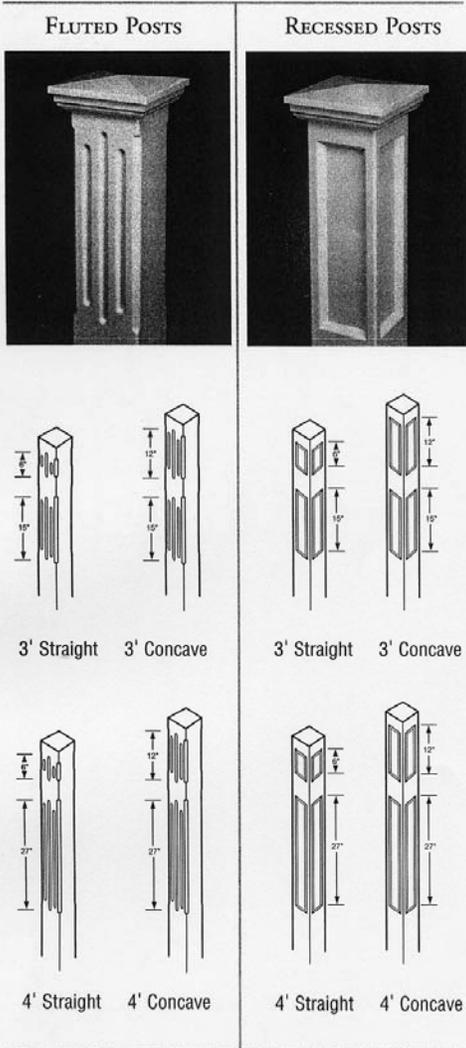
2525 Walden Ave • Buffalo, NY 14225
 716-685-1600 • 800-333-0569
 Fax: 716-685-1172 • http://www.certainteed.com

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CLASSIC IMPRESSIONS™

Decorative Panel Posts

- Virtually maintenance-free vinyl
- Never needs painting
- Lifetime limited warranty
- Available in white only



2525 Walden Ave., Buffalo, NY 14225
 1-800-333-0569 Fax: 716-685-1172
www.bufftech.com

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CLASSIC IMPRESSIONS RECESSED PANEL POSTS*

Recesses occur on all 4 sides of post.

Product No.	Routed Post Descriptions	
For 3' high Manchester (straight)		
72361	Recessed corner post	5 x 5 x 72
72362	Recessed line post	5 x 5 x 72
72363	Recessed end post	5 x 5 x 72
72364	Recessed 3-way post	5 x 5 x 72
739072	Recessed blank post	5 x 5 x 72
For 3' high Manchester (concave)		
72371	Recessed corner post	5 x 5 x 78
72372	Recessed line post	5 x 5 x 78
72373	Recessed end post	5 x 5 x 78
72374	Recessed 3-way post	5 x 5 x 78
739078	Recessed blank post	5 x 5 x 78
For 4' high Manchester (straight)		
72261	Recessed corner post	5 x 5 x 84
72262	Recessed line post	5 x 5 x 84
72263	Recessed end post	5 x 5 x 84
72264	Recessed 3-way post	5 x 5 x 84
739084	Recessed blank post	5 x 5 x 84
For 4' high Manchester (concave)		
72331	Recessed corner post	5 x 5 x 90
72332	Recessed line post	5 x 5 x 90
72333	Recessed end post	5 x 5 x 90
72334	Recessed 3-way post	5 x 5 x 90
739090	Recessed blank post	5 x 5 x 90

CLASSIC IMPRESSIONS FLUTED POSTS*

All 4 corners of posts are beveled; however, only two sides are fluted.

Product No.	Routed Post Descriptions	
For 3' high Manchester (straight)		
82361	Fluted corner post	5 x 5 x 72
82362	Fluted line post	5 x 5 x 72
82363	Fluted end post	5 x 5 x 72
82364	Fluted 3-way post	5 x 5 x 72
839072	Fluted blank post	5 x 5 x 72
For 3' high Manchester (concave)		
82371	Fluted corner post	5 x 5 x 78
82372	Fluted line post	5 x 5 x 78
82373	Fluted end post	5 x 5 x 78
82374	Fluted 3-way post	5 x 5 x 78
839078	Fluted blank post	5 x 5 x 78
For 4' high Manchester (straight)		
82261	Fluted corner post	5 x 5 x 84
82262	Fluted line post	5 x 5 x 84
82263	Fluted end post	5 x 5 x 84
82264	Fluted 3-way post	5 x 5 x 84
839084	Fluted blank post	5 x 5 x 84
For 4' high Manchester (concave)		
82331	Fluted corner post	5 x 5 x 90
82332	Fluted line post	5 x 5 x 90
82333	Fluted end post	5 x 5 x 90
82334	Fluted 3-way post	5 x 5 x 90
839090	Fluted blank post	5 x 5 x 90

*Note: These posts are designed to coordinate with the Manchester style only.



40-40-80098

THE NEW CLAY COLOR

Clay: A natural choice

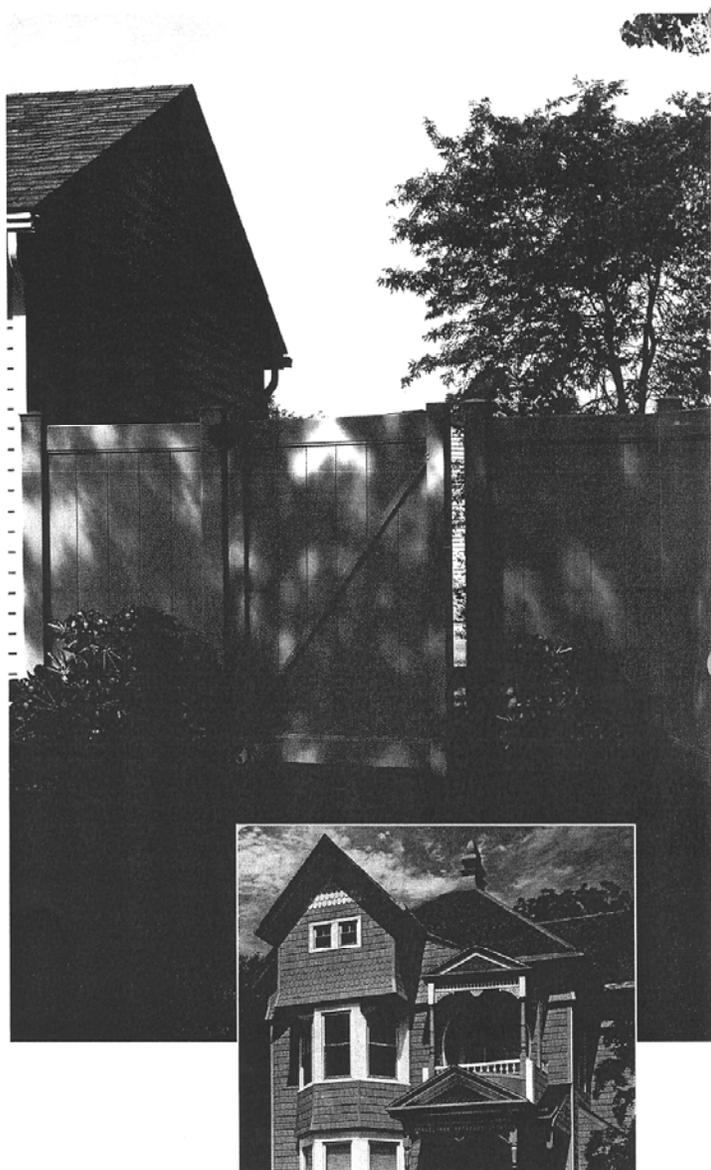
In response to customer requests, Bufftech has added a new tone to its color palette. Clay, a natural shade similar to taupe, is now available in the popular Chesterfield privacy fence (5' and 6' styles).

The latest in color technology

Bufftech's newest color was developed using an innovative resin formulation known as ASA (Acrylic-Styrene-Acrylonitrile). ASA is specially engineered to retain its color and mechanical properties under long-term exposure to ultraviolet light, moisture and heat. This is particularly critical with darker shades, which tend to weather more quickly than lighter tones. The ASA formulation delivers a rich, long-lasting color that will resist fading for years to come.

More options in exterior design

The addition of clay to the Bufftech color menu gives homeowners even more options in outdoor design. Consumers can now choose a fence in clay, white, tan or gray to achieve a look that matches or contrasts with other exterior elements of their home. By pairing different fence colors with various siding and trim color combinations, the design possibilities are virtually limitless!



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1-800-333-0569 Fax: 716-685-1172
www.bufftech.com



40-40-80108

June 16, 1998

TO WHOM IT MAY CONCERN:

I have performed a complete structural analysis on a range of PVC fence styles to determine their resistance to high wind loading. A detailed report outlining the calculation performed in this study is available for review.

The loading used in this analysis, based on a basic wind speed of 110 MPH, was taken from Section 6 of ASCE 7-93, "Minimum Design Loads for Buildings and Other Structures". Within this specification, the effects of local conditions are accounted for by classifying each installation into one of the four exposure categories defined page 2.

The picket and rail components of all fence designs provide adequate resistance to this wind loading regardless of exposure category. However, it was determined that the fence posts are the most critically loaded component of the design. In many cases, every fence post in the installation will need some type of reinforcement. A small number of designs are not recommended for use under certain exposure categories. All fence post design limits used in this analysis were verified by performing bend tests on actual reinforced PVC posts.

Using the loads from the analysis and the fence post test data, the table on page 3 defines the recommended fence post reinforcement for all of the fence designs in each of the four wind exposure categories. I certify that this analysis was done using the best available analytical techniques, and was checked for error.





Richard S. Duncan, Ph.D., P.E.
Pennsylvania Professional Engineer
PE-042648-E

ASCE 7-93 standard Local Exposure Category Descriptions

Exposure A:

Large city centers with at least 50% of the buildings having a height in excess of 70 ft. Use of this exposure category shall be limited to those areas for which the terrain representative of Exposure A prevails in the upwind direction for distance of at least $\frac{1}{2}$ mile or 10 times the height of the building or structure, which ever is greater. Possible channeling effects or increased velocity pressures due to the building or structure being located in the wake of adjacent buildings shall be taken into account.

Exposure B:

Urban and suburban areas, wooded areas, or terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger. Use of this exposure category shall be limited to those areas for which the terrain representative of Exposure B prevails in the upwind direction for distance of at least 1500 ft or 10 times the height of the building or structure, which ever is greater.

Exposure C:

Open terrain with scattered obstructions having heights generally less than 30 feet. This category includes flat open country and grasslands.

Exposure D:

Flat, unobstructed areas exposed to wind flowing over large bodies of water. This exposure shall apply only to those buildings and other structures exposed to the wind coming over the water. Exposure D extends inward from the shoreline to a distance of 1500 feet or 10 times the height of the building or structure, whichever is greater.

**RECOMMENDED INSTALLATION FOR PVC FENCE POSTS
IN AREAS WITH 110 MPH BASIC WIND SPEEDS**

FENCE STYLE	Wind Exp.a	POST REINF.	MINIMUM EMBEDMENT DEPTH (in)			
			2000 psfb	4000 psf	6000 psf	8000 psf
5' NORFOLK	A	0	30	30	30	30
	B	1	30	30	30	30
	C	1	48	30	30	30
	D	2	56	36	30	30
6' NORFOLK	A	0	30	30	30	30
	B	1	36	30	30	30
	C	2	54	36	30	30
	D	3	66	39	30	30
8' GALVESTON	A	1	30	30	30	30
	B	3	48	36	30	30
	C	3	72	48	36	30
	D	NR				
6' IMPERIAL	A	0	30	30	30	30
	B	1	36	30	30	30
	C	2	48	30	30	30
	D	3	60	36	30	30
6' COLUMBIA	A	0	30	30	30	30
	B	1	36	30	30	30
	C	2	54	36	30	30
	D	3	66	42	30	30
4' PRINCETON	A	0	30	30	30	30
	B	0	30	30	30	30
	C	1	36	30	30	30
	D	2	42	30	30	30
6' PRINCETON	A	0	30	30	30	30
	B	1	30	30	30	30
	C	1	42	30	30	30
	D	2	54	36	30	30
4' VICTORIAN	A	0	30	30	30	30
	B	0	30	30	30	30
	C	1	30	30	30	30
	D	1	36	30	30	30
6' VICTORIAN	A	0	30	30	30	30
	B	0	30	30	30	30
	C	1	42	30	30	30
	D	2	48	30	30	30
4' CAPE COD	A	0	30	30	30	30
	B	0	30	30	30	30
	C	1	30	30	30	30
	D	1	36	30	30	30

a-see page 2

b-soil bearing limit

KEY	No. of #4 Rebar	Concrete Fill Level
0	0	none
1	2	24" above ground
2	2	full
3	4	full
NR	Not Recommended	



Vinyl Fencing

INSTALLATION MANUAL

TRADITIONAL
CLASSIC
CONTEMPORARY
SEMI-PRIVATE
PRIVACY
RAILING
POST & RAIL

800-333-0569 FOR TECHNICAL INSTALLATION ASSISTANCE

2525 WALDEN AVE -BUFFALO, NY 14225

TOLL FREE 800-333-0569 PHONE 716 685 1600 FAX 716 685 1172

revised JUNE 2000

INSTALLATION INSTRUCTION MANUAL

CONTENTS

THE INFORMATION IN THIS INSTALLATION INSTRUCTION MANUAL IS ORGANIZED BY **INSTALLATION SYSTEM**. REFER TO THE LISTS BELOW TO DETERMINE WHICH INSTALLATION SYSTEM IS RECOMMENDED FOR YOUR STYLE OF FENCE.

CONTEMPORARY PICKET	TRADITIONAL PICKET (STRAIGHT & CONCAVE)	PRIVACY	POST & RAIL	RAILING SYSTEM
<input type="checkbox"/> BARON	<input type="checkbox"/> CAPE COD	<input type="checkbox"/> NORFOLK 1 NORFOLK	<input type="checkbox"/> 2 RAIL FENCE	<input type="checkbox"/> CENTURY
MONARCH	CHARLESTON		3 RAIL FENCE	ESSEX
PRINCETON	COLONIAL	<input type="checkbox"/> CHESTERFIELD	4 RAIL FENCE	FAIRMONT
VICTORIAN	HUDSON	WINCHESTER	CROSSBUCK	OLYMPIA
MANCHESTER	YORKSHIRE	<input type="checkbox"/> GALVESTON		
<input type="checkbox"/> SEMI PRIVATE	PROVIDENCE	<input type="checkbox"/> LATTICE ACCENT		
COUNTESS		VICTORIAN ACCENT		
IMPERIAL				
COLUMBIA				

FOR INSTALLATIONS ON CONCRETE OR WOOD REFER TO RAILING SYSTEM SECTION.
FOR STEPPING AND RACKING SEE VARIABLE TERRAIN INSTALLATION.

INSTALLATION INSTRUCTIONS

GENERAL INFORMATION

CARE OF PRODUCT

PLACE VINYL FENCE COMPONENTS ON A NON - ABRASIVE SURFACE, SUCH AS A DROP CLOTH, TO AVOID SCRATCHING.

PROTECT COMPONENTS DURING TRANSPORTATION TO YOUR INSTALLATION SITE TO AVOID DAMAGE.

AVOID EXCESSIVE FORCE WHEN ASSEMBLING COMPONENTS.

AVOID OVERTIGHTENING SCREWS.

CLEAN VINYL FENCE WITH MILD DETERGENT AND A PLASTIC SCOURING PAD SUCH AS SCOTCH BRITE. FOR MORE STUBBORN STAINS, USE A CLEANSER SUCH AS SOFT SCRUB.

CONCRETE IS EASILY WASHED OFF WHEN WET, BUT CAN ALSO BE REMOVED WHEN DRY.

GENERAL INFORMATION (CONT)

WHEN CUTTING RAILS FOR SHORT SECTIONS OR GATES, ALWAYS INCLUDE 1/4" DRAINAGE HOLES.

WHEN CUTTING RAILS FOR POST AND RAIL FENCE, ALWAYS INCLUDE 3/8" HOLES FOR LOCKING RING.

MIDDLE RAILS HAVE LARGER HOLES ROUTED IN THE UNDERSIDE FOR EASE OF INSTALLATION. THIS WILL ALLOW THE FENCE TO FOLLOW A SLOPING GRADE.

ALWAYS CHECK LOCAL CODE REQUIREMENTS BEFORE INSTALLING A FENCE.

BOTTOM RAILS ARE STEEL REINFORCED, EXCEPT FOR TRADITIONAL PICKET FENCE.

SECURE MIDDLE RAILS IN POSITION WITH (2) #8 X 1 1/2" SCREWS, SNAP CAPS AND WASHERS. SPACE EVENLY ALONG RAIL TO AVOID SAG.

GENERAL INFORMATION

ALL #8 SCREWS REQUIRE A 1/8" PILOT HOLE.

ALL HINGE, LATCH AND END POSTS REQUIRE 2 PIECES OF 1/2" REBAR INSERTED IN OPPOSING CORNERS OF THE POST. FILL WITH CONCRETE TO COVER THE REBAR AND GATE HARDWARE. USE REBAR CLIPS TO SEPARATE REBAR.

TAP OUTSIDE OF POST WITH A RUBBER MALLET TO ELIMINATE AIR POCKETS IN CONCRETE.

CONCRETE AND REBAR ARE NOT REQUIRED IN LINE AND CORNER POSTS.

USE DUCT TAPE TO SEAL ENDS OF ANY RAILS INSERTED IN A POST THAT IS TO BE FILLED WITH CONCRETE AND REBAR (END & GATE POSTS). THIS WILL PREVENT THE MIX FROM FLOWING ALONG THE RAILS. THE WEIGHT OF THE CONCRETE IN THE RAIL COULD CAUSE IT TO SAG AND MAY BLOCK DRAIN HOLES.

WHEN CUTTING RAILS FOR SHORT SECTIONS OR GATES, ALWAYS MEASURE FROM THE CENTER AND TRIM BOTH ENDS. THIS WILL GIVE YOU EVEN PICKET SPACING. REMEMBER. MEASURE TWICE, CUT ONCE.

GENERAL INFORMATION (GATES)

GATE(S) MUST BE ASSEMBLED PRIOR TO FENCE TO ACCURATELY ESTABLISH SPACE BETWEEN HINGE AND LATCH POSTS AND HEIGHT OF FENCE.

USE EXTREME CARE WHEN APPLYING P V C CEMENT AS IT DRIES QUICKLY.

GATE REQUIRES 2" CLEARANCE UNDER BOTTOM RAIL ON LEVEL GROUND.

GATE HARDWARE **MUST** BE ATTACHED TO 2 SIDES OF EACH POST.

STEEL BRACKET FOR GATE HINGE **MUST** BE ATTACHED TO 2 SIDES OF GATE UPRIGHT POST.

GATE HARDWARE REQUIRES 1" SPACING BETWEEN HINGE POST AND 3/4" SPACING BETWEEN LATCH POST.
POST AND RAIL GATE HARDWARE REQUIRES 1 1/2" SPACING BETWEEN HINGE POST AND 1 1/4" BETWEEN LATCH POST.

IT IS EXTREMELY IMPORTANT TO LET CONCRETE IN GATE POSTS SET UP FOR A MINIMUM OF 72 HOURS BEFORE REMOVING BLOCKS FROM UNDER GATE.

REPLACE THE PLASTIC WRAP IMMEDIATELY AFTER EACH USE.

INSTALLATION INSTRUCTIONS

TOOLS & MATERIALS

TOOLS RECOMMENDED

- GETTING STARTED
- SITE PLANS AND PERMITS
- MEASURING TAPE
- HAMMER
- WOODEN STAKES
- STRING LINE
- SPRAY PAINT FOR HOLE CENTERS
- WOODEN SPACER BAR FOR POST AND GATE SPACING
- ASSEMBLING GATES
- DROP CLOTH
- HACKSAW, CIRCULAR SAW OR CHOP SAW WITH MASONRY BLADE
- SQUARE
- PHILLIPS #2 SCREWDRIVER
- DRILL & DRILL BITS
 - 1/8" FOR # 8 SCREWS
 - 1/8" HINGE, GRAVITY LOKK LATCH & ACCESS KIT
 - 1/4" FOR BULLET CLIPS & DRAIN HOLES
 - 3/8" FOR LOCK RINGS

- ASSEMBLING FENCE
- SUPPORT ROPES & STAKES
- 1/2" DEEP SOCKET FOR TRADITIONAL PICKET
- INSTALLING GATE(S)
 - WRENCH
 - 7/16" FOR HINGE NUTS
 - FLAT SCREWDRIVER TO ACTIVATE HINGE SPRING
- FILLING POST WITH CONCRETE
 - RUBBER MALLET TO TAMP POST
 - FUNNEL FOR FILLING POST
 - LADDER FOR HIGH FENCES
- CLEANING UP
 - SCOTCH BRITE TYPE PAD
 - BUCKET & SPONGE

- DIGGING HOLES
- POST HOLE DIGGING TOOLS
 - SHOVEL
 - POST HOLE DIGGER
 - 10" AUGER FOR 4 X 4 POSTS
 - 12" AUGER FOR 5 X 5 POSTS

- INSTALLING POST
 - WHEELBARROW
 - CONCRETE MIXING TOOLS
 - SHORT LENGTH OF WOOD 2 X 4 FOR TAMPING CONCRETE
 - GARDEN HOSE
 - LEVEL
 - FLAT FILE TO ENLARGE HOLES

- INSTALLING BOTTOM RAIL
- LEVELING BLOCKS
- SHIM STOCK
- DUCT TAPE TO SEAL RAIL ENDS

- ADDITIONAL TOOLS
- INSTALLING ON WOOD
 - 1 3/4" HOLE SAW
 - 1/2" DRILL BIT
 - 3/4" WRENCH

- ADDITIONAL TOOLS
- INSTALLING ON CONCRETE
 - 1/2" MASONRY DRILL

- ADDITIONAL TOOLS
- WALL MOUNT BRACKETS
 - 1/4" MASONRY DRILL FOR BRICK
 - 1/4" DRILL BIT FOR WOOD PILLAR

- ADDITIONAL TOOLS
- E Z SET BRACKETS
 - 7/16" WRENCH

MATERIALS

CONCRETE REQUIREMENTS

ALL POST REQUIRE CONCRETE TO BE POURED AROUND THE POST BASE. ALL HINGE, LATCH AND END POST REQUIRE CONCRETE TO FILL THE POST INSIDE, ENOUGH TO COVER THE REBAR AND GATE HARDWARE. CONCRETE MUST BE MIXED PRIOR TO POURING IN HOLE.

CONCRETE USAGE FOR POSTS					
POST SIZE	FENCE HEIGHT	LINE OR CORNER POSTS	END POSTS	GATE POSTS	
4 X 4	3'	100 lbs	145 lbs	160 lbs	
4 X 4	4'	100 lbs	155 lbs	175 lbs	
5 X 5	5'	140 lbs	235 lbs	270 lbs	
5 X 5	6'	140 lbs	240 lbs	285 lbs	
5 X 5	2 RAIL	140 lbs	210 lbs	240 lbs	
5 X 5	3 RAIL	140 lbs	230 lbs	260 lbs	
5 X 5	4 RAIL	140 lbs	250 lbs	280 lbs	

NOTE: DETERMINE TOTAL POUNDS OF CONCRETE REQUIRED BASED ON NUMBER OF POSTS REQUIRED. DIVIDE BY 60 OR 80 LB BAG. FIGURES BASED ON 4 X 4 HOLE = 10" X 5.5 HOLE = 12" BOTH 30" DEEP.

REBAR REQUIREMENTS

ALL HINGE AND GATE POSTS REQUIRE 2 PIECES OF 1/2" REBAR INSTALLED IN OPPOSING CORNERS OF THE POST. LENGTH TO EXTEND FROM BOTTOM OF HOLE TO 12" FROM TOP OF POST. ALL END POSTS REQUIRE 2 PIECES OF 1/2" REBAR INSTALLED IN OPPOSING CORNERS OF THE POST. LENGTH TO EXTEND FROM BOTTOM OF HOLE TO HALF WAY UP POST.

REBAR SEPARATOR CLIPS

USE CLIPS FOR EACH POST. POSITION CLIPS ON REBAR 6" DOWN FROM TOP AND 6" UP FROM BOTTOM. CLIPS ARE LOCATED IN SOCKET GATE HARDWARE BOX.

ALTERNATIVE FENCE INSTALLATIONS

RAILING SYSTEMS ON WOOD OR CONCRETE USE STEEL POST SUPPORT KITS
 FENCE SYSTEMS ON WOOD OR CONCRETE USE STEEL POST SUPPORT KITS
 ON CONCRETE APPLICATIONS MAY BE INSTALLED WITH 1 5/8" (4 X 4 POST) OR 2" (5 X 5 POST) GALVANIZED STEEL POST SET IN HYDRAULIC CEMENT. E Z SET BRACKETS BOLTS TO POST AS A SPACER.
 WALL MOUNTING USE WALL MOUNT BRACKETS

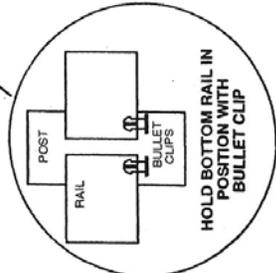
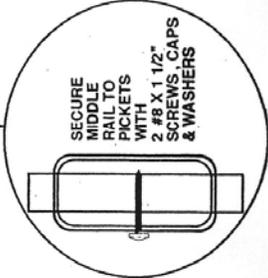
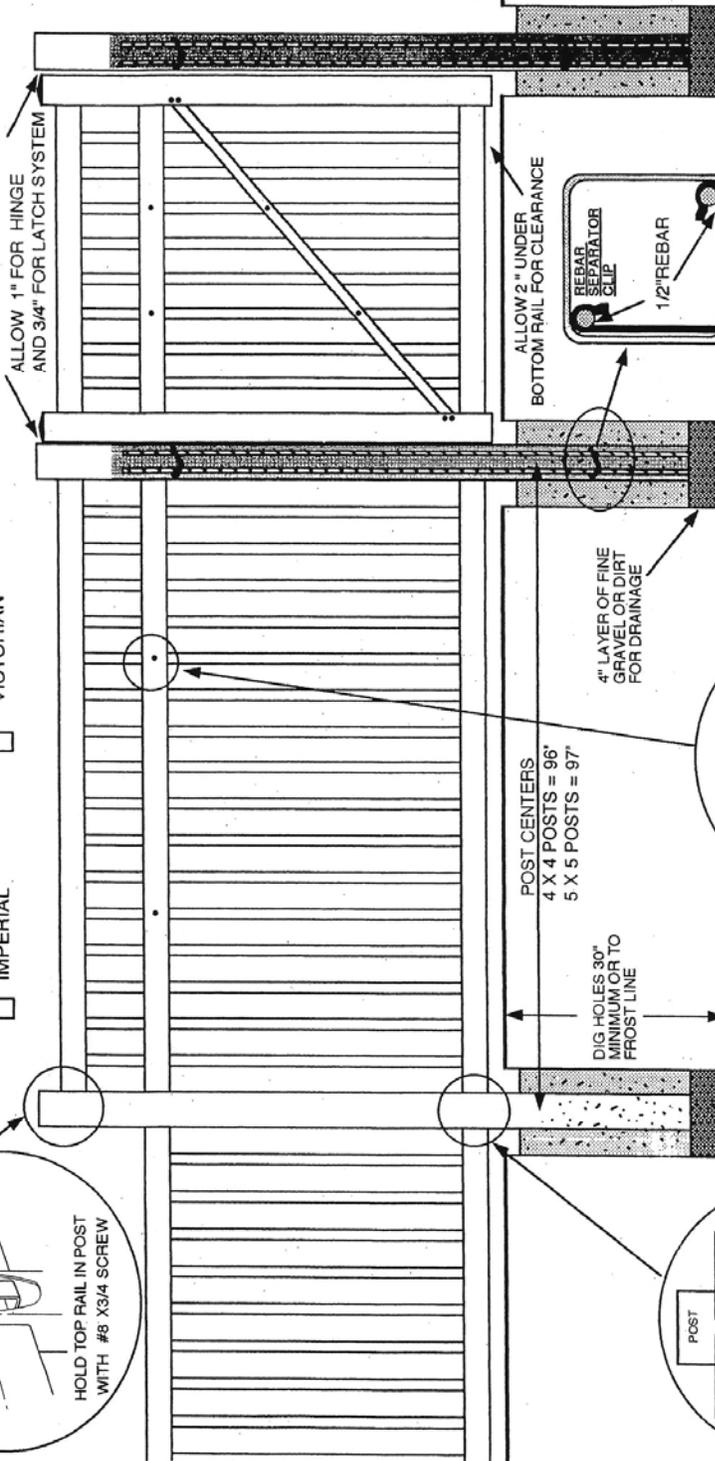
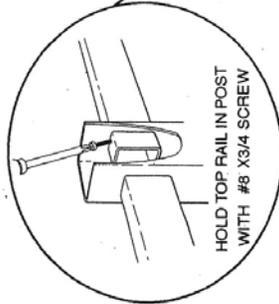
INSTALLATION INSTRUCTIONS 111682

CONTEMPORARY PICKET FENCE

INSTALLATION INSTRUCTIONS

INCLUDE

- | | | | |
|--------------------------|----------|--------------------------|-----------|
| <input type="checkbox"/> | BARON | <input type="checkbox"/> | MONARCH |
| <input type="checkbox"/> | COUNTESS | <input type="checkbox"/> | PRINCETON |
| <input type="checkbox"/> | IMPERIAL | <input type="checkbox"/> | VICTORIAN |



USE (2) PIECES OF 1/2" REBAR IN THE HINGE, LATCH & END POSTS. POSITION REBAR IN OPPOSING CORNERS OF EACH POST.

USE REBAR SEPARATOR CLIPS TO HOLD REBAR IN CORRECT VERTICAL POSITION UNTIL CONCRETE IS POURED INSIDE POSTS.

INSTALLATION INSTRUCTION 3/18/99

INSTALLATION INSTRUCTIONS

CONTEMPORARY FENCE STYLES

1 LAY OUT FENCE LINE
 CHECK FOR BURIED UTILITY LINES.
 STAKE OUT FENCE LINE.
 DETERMINE GATE LOCATION (S) &
 ROUGH OPENING SIZE.
 FOR GATE HARDWARE ALLOW 1"
 GAP FOR HINGE & 3/4" FOR LATCH.
 LOCATE POST LOCATIONS.
 POST CENTERS
 FOR 4 X 4 POSTS = 90"
 FOR 5 X 5 POSTS = 91"
 DETERMINE NON STANDARD FENCE
 SECTIONS DUE TO TERRAIN
 CHANGE.

2 ASSEMBLE GATES
 ASSEMBLE GATE TO DETERMINE
 EXACT WIDTH OF GATE OPENING.
 DETERMINE GATE SWING AND
 ALLOWANCE FOR GROUND
 CLEARANCE.
 CONSULT GATE ASSEMBLY
 INSTRUCTIONS FOUND IN GATE
 HARDWARE PACKAGE FOR
 DETAILED INSTRUCTIONS.
 HINGE AND LATCH POST **MUST** BE
 INSTALLED WITH CONCRETE AND
 2 PIECES OF 1/2" REBAR INSIDE
 THE POST.

3 DIG HOLES
 DIG HOLES 30" DEEP OR TO
 FROST LINE.
 HOLE SIZE FOR 5 X 5 POSTS = 12"
 HOLE SIZE FOR 4 X 4 POSTS = 10"
 CLEAN HOLES AND CHECK FOR
 STRAIGHT WALLS.

4 INSTALL FIRST POST
 PLACE A 4" LAYER OF FINE GRAVEL
 OR DIRT IN THE HOLE FOR
 DRAINAGE.
 INSERT POST IN HOLE.
 DETERMINE ROUGH HEIGHT.
 FILL HOLE AROUND POST WITH
 CONCRETE MIX (SAND, GRAVEL &
 CEMENT) APPROX 2" BELOW GRADE.
 TAMP CONCRETE IN HOLE TO
 ELIMINATE AIR POCKETS.
 LEVEL AND SQUARE POST.

5 INSTALL BOTTOM RAIL
 CHECK BOTTOM RAIL FOR DRAIN
 HOLES.
 TAPE THE ENDS OF ANY RAIL BEING
 INSERTED INTO A POST THAT IS TO
 BE FILLED WITH CONCRETE TO
 PREVENT CONCRETE SEEPAGE.
 DEPRESS BULLET CLIP. INSERT RAIL
 IN POST. BULLET CLIP WILL DROP
 DOWN AND LOCK RAIL IN PLACE.

6 INSTALL SECOND POST
 INSERT SECOND POST IN HOLE.
 INSERT BOTTOM RAIL IN POST.
 BLOCK UP BOTTOM RAIL TO
 DETERMINE CORRECT FENCE
 HEIGHT.
 FILL HOLE AROUND SECOND POST
 WITH CONCRETE MIX.
 TAMP, LEVEL AND SQUARE.
 FENCE ASSEMBLY MAY BE
 CONTINUED BY INSTALLING ALL
 BOTTOM RAILS FIRST, OR ONE
 SECTION AT A TIME.

7 SUPPORT & SECURE
 LEVEL AND SQUARE FENCE.
 TO LOWER A POST PLACE A
 PIECE OF WOOD, LARGER THAN
 THE POST, ON TOP OF THE POST
 AND CAREFULLY TAP WITH A
 Mallet.
 NEVER STRIKE THE P V C POST
 WITHOUT A WOOD SUPPORT.

8 INSTALL PICKETS & RAILS
 INSERT MIDDLE RAIL (IF
 APPLICABLE) IN POST WITH LARGE
 HOLES FACING DOWN.
 INSERT PICKETS THROUGH HOLES
 IN MIDDLE RAIL. INSERT PICKETS IN
 BOTTOM RAIL.
 REMOVE MIDDLE RAIL FROM POST.
 INSERT TOP RAIL OVER PICKETS.
 INSERT MIDDLE RAIL AND TOP RAIL
 IN POST.

9 SECURE RAILS
 SQUARE PICKETS AND RAILS.
 CHECK FOR EVEN PICKET SPACING
 ON EACH END OF RAIL.
 DRILL 1/8" PILOT HOLE INSIDE POST
 INTO RAIL. (SEE ILLUSTRATION ON
 FRONT PAGE) SECURE RAIL INSIDE
 POST WITH A # 8 X 3/4" SCREW.
 DO THIS ON BOTH ENDS.
 LEVEL MIDDLE RAIL. SECURE RAIL
 TO PICKETS WITH (2) # 8 X 1 1/2"
 SCREWS. SNAP CAPS & WASHERS
 EVENLY SPACED ALONG RAIL.

**10 HANG GATE
 INSTALL HARDWARE**
 POSITION GATE BETWEEN POSTS.
 ALLOW 1" GAP FOR HINGE AND
 3/4" FOR LATCH AND GATE SWING.
 BLOCK UP GATE TO SQUARE WITH
 FENCE. RAILS SHOULD BE LEVEL.
 GATE HARDWARE MUST BE
 MOUNTED TO TWO SIDES OF THE
 POST.
 FOR COMPLETE DETAILS SEE GATE
 INSTALLATION INSTRUCTIONS IN
 HARDWARE BOX.

11 LOCATE REBAR
 USE AND PLACEMENT OF REBAR IS
 CRITICAL FOR THE STRENGTH AND
 QUALITY OF A FENCE. INSTALLATION
 USE 2 PIECES OF 1/2" REBAR IN EACH
 HINGE, LATCH AND END POST.
 REBAR SHOULD EXTEND FROM THE
 BOTTOM OF THE HOLE TO 12" FROM
 THE TOP OF THE POST.
 CONNECT REBAR TOGETHER WITH
 REBAR SEPARATOR CLIPS.
 INSERT IN OPPOSING CORNERS OF
 POST.

12 FILL POSTS
 FILL POST WITH CONCRETE MIX TO
 COVER REBAR AND HARDWARE
 FASTENERS. TAMP POST WITH A
 RUBBER Mallet TO ELIMINATE AIR
 POCKETS. LEAVE GATE ON BLOCKS
 FOR 72 HOURS TO ALLOW
 CONCRETE TO SET.

13 INSTALL CAPS
 INSTALL POST CAPS
 SECURE WITH # 8 X 3/4 SCREWS,
 CAPS & WASHERS.

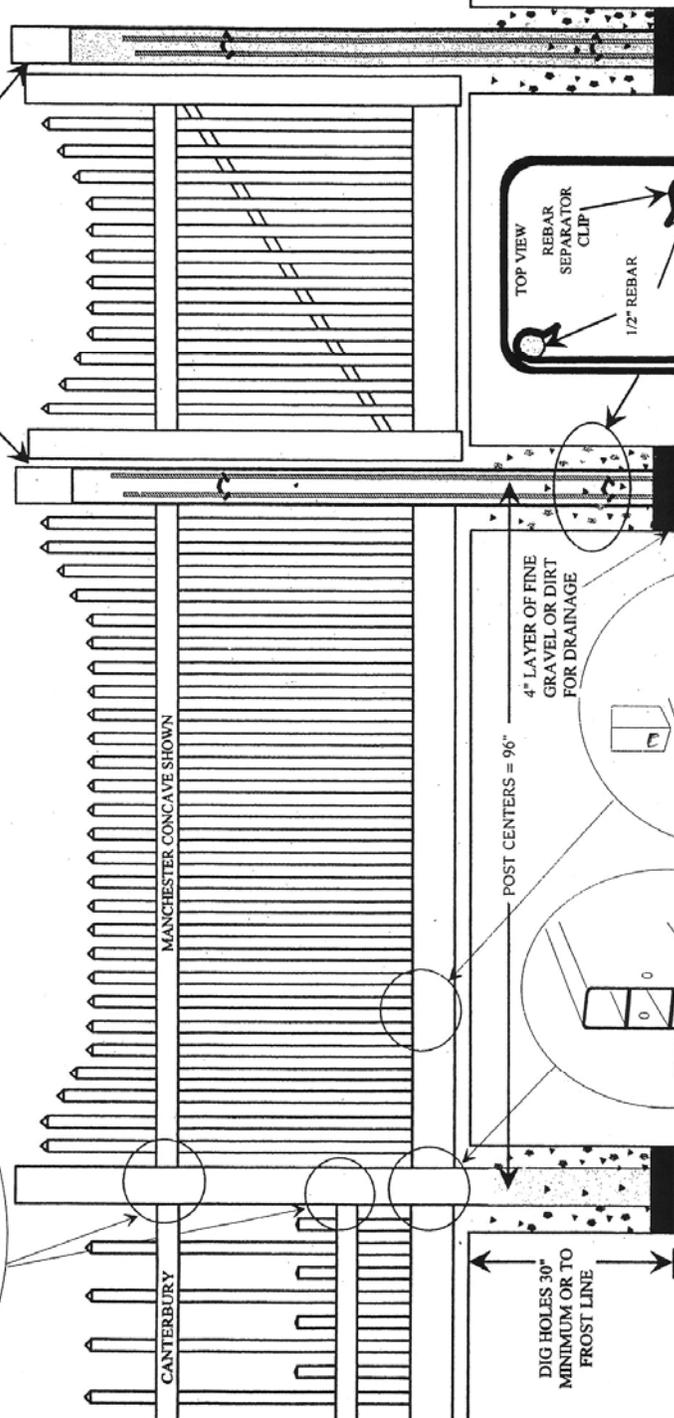
INSTALLATION INSTRUCTION HIGHLIGHTS

**CLASSIC
STYLE FENCE**

- INCLUDE
- MANCHESTER
 - CANTERBURY
 - STRAIGHT & CONCAVE

HOLD TOP AND MIDDLE (CANTERBURY) RAILS IN POST WITH BULLET CLIP

ALLOW 1" GAP FOR HINGE AND 3/4" GAP FOR LATCH SYSTEM

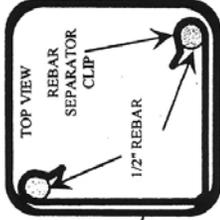


4" LAYER OF FINE GRAVEL OR DIRT FOR DRAINAGE

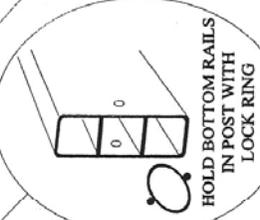
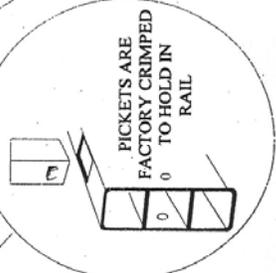
POST CENTERS = 96"

DIG HOLES 30" MINIMUM OR TO FROST LINE

HOLE SIZE 5" POST = 12"



USE (2) PIECES OF 1/2" REBAR IN THE HINGE, LATCH AND END POSTS. POSITION REBAR IN OPPOSING CORNERS OF EACH POST. USE REBAR SEPARATOR CLIPS TO HOLD REBAR IN CORRECT VERTICAL POSITION WHILE CONCRETE IS POURED INSIDE POST.



FOR MANCHESTER CONCAVE FIRST 4 AND LAST 4 PICKETS MAY BE FIELD CUT TO FORM DESIRED DESIGN. TO HOLD PICKET IN BOTTOM RAIL DRILL 1/4" HOLE THROUGH SIDE OF PICKET AND INSERT BULLET CLIP

INSTALLATION INSTRUCTIONS

CLASSIC FENCE STYLES

1 LAY OUT FENCE LINE
CHECK FOR BURIED UTILITY LINES. STAKE OUT FENCE LINE. DETERMINE GATE LOCATION (S) AND ROUGH OPENING SIZE. FOR GATE HARDWARE ALLOW 1" GAP FOR HINGE AND 3/4" FOR LATCH. LOCATE POST LOCATIONS. POST CENTERS 5 X 5 POSTS = 89" DETERMINE NON STANDARD FENCE SECTIONS DUE TO TERRAIN CHANGE

2 ASSEMBLE GATES
ASSEMBLE GATE TO DETERMINE EXACT WIDTH OF GATE OPENING. DETERMINE GATE SWING AND ALLOWANCE FOR GROUND CLEARANCE. CONSULT GATE ASSEMBLY INSTRUCTIONS FOUND IN GATE HARDWARE PACKAGE FOR MORE DETAILED INSTRUCTIONS. HINGE AND LATCH POST **MUST** BE INSTALLED WITH CONCRETE AND 2 PIECES OF 1/2" REBAR IN OPPOSING CORNERS OF THE POSTS.

3 DIG HOLES
DIG HOLES 30" DEEP OR TO FROST LINE. HOLE SIZE FOR 5 X 5 POSTS = 12" CLEAN HOLES AND CHECK FOR STRAIGHT WALLS.

4 INSTALL FIRST POST
PLACE A 4" LAYER OF FINE GRAVEL OR DIRT IN THE HOLE FOR DRAINAGE. INSERT POST IN HOLE. DETERMINE ROUGH HEIGHT. FILL HOLE AROUND POST WITH CONCRETE MIX (SAND, GRAVEL & CEMENT). APPROX. 2" BELOW GRADE. TAMP CONCRETE IN HOLE TO ELIMINATE AIR POCKETS. LEVEL, SQUARE AND PLUMB POST.

5 INSTALL BOTTOM RAIL
DUCT TAPE THE END OF ANY RAIL GOING INTO A POST THAT IS TO BE FILLED WITH CONCRETE. THIS WILL STOP CONCRETE FROM SEEPING INTO THE RAIL CAUSING IT TO SAG. INSERT LOCK RING IN EACH END OF RAIL. INSERT RAIL IN POST.

6 INSTALL SECOND POST
INSERT SECOND POST IN HOLE. INSERT BOTTOM RAIL IN POST. BLOCK UP FENCE TO DETERMINE CORRECT HEIGHT. FILL HOLE AROUND SECOND POST WITH CONCRETE MIX. TAMP, LEVEL AND SQUARE. FENCE ASSEMBLY MAY BE CONTINUED BY INSTALLING ALL BOTTOM RAILS FIRST OR ONE SECTION AT A TIME.

7 SUPPORT & SECURE
LEVEL AND SQUARE FENCE. TO LOWER A POST PLACE A WOOD BLOCK FROM CORNER TO CORNER ON THE POST AND CAREFULLY TAP WITH A Mallet. NEVER STRIKE THE PVC POST WITHOUT A WOOD SUPPORT.

8 INSTALL RAILS
MIDDLE AND UPPER RAILS ARE ROUTED WITH LARGER HOLES ON THE BOTTOM. FOR EASE OF INSTALLATION & RACKING.

9 INSTALL RAILS (CONT)
FOR CANTERBURY, INSTALL MIDDLE RAIL. HOLD IN POST WITH BULLET CLIP. INSERT SHORT PICKETS. INSTALL TOP RAIL AND INSERT LONGER PICKETS. FENCE IS DESIGNED TO START WITH A SHORT PICKET. FOR MANCHESTER, INSERT TOP RAIL IN POST, HOLD WITH BULLET CLIP. PICKETS ARE FACTORY CRIMPED TO HOLD IN RAIL. INSERT PICKETS THROUGH RAIL INTO BOTTOM RAIL. MANCHESTER CONCAVE 8 LONGER PICKETS ARE SUPPLIED FOR IN FIELD DESIGN AND CUTTING.

10 INSTALL PICKETS
FIELD CUT PICKETS SHOULD BE CUT TO SIZE AND THEN DRILLED WITH 1/4" HOLE IN ONE SIDE, 2" FROM BOTTOM. INSTALL BULLET CLIP IN HOLE AND INSERT IN RAIL.
CANTERBURY SWOOP, ALL LONG PICKETS NEED TO BE FIELD CUT. MEASURE FROM CAP AND CUT OFF CRUMPED END. PICKET LENGTHS ARE:
#1 = 33 5/8" #5 = 37 1/8" #9 = 40 3/4"
#2 = 34 1/2" #6 = 38" #10 = 41 1/2"
#3 = 35 3/8" #7 = 38 7/8" #11 = 42 3/8"
#4 = 36 1/4" #8 = 39 3/4" #12 = 43 1/4"
#13 = 44 1/8"

11 HANG GATE
INSTALL HARDWARE
POSITION GATE BETWEEN POSTS. ALLOW 1" GAP FOR HINGE AND 3/4" GAP FOR LATCH. CHECK HEIGHT FOR GATE SWING. BLOCK UP GATE TO BE SQUARE WITH FENCE. GATE RAILS SHOULD BE LEVEL WITH FENCE RAILS. GATE HARDWARE MUST BE MOUNTED TO TWO SIDES OF THE POST. FOR COMPLETE DETAILS SEE GATE INSTALLATION INSTRUCTIONS IN HARDWARE BOX.

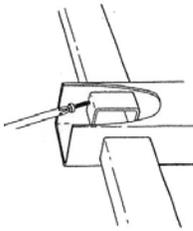
12 LOCATE REBAR
USE AND PLACEMENT OF REBAR IS CRITICAL FOR THE STRENGTH AND QUALITY OF A FENCE INSTALLATION. USE 2 PIECES OF 1/2" REBAR IN EACH HINGE, LATCH AND END POST. REBAR SHOULD EXTEND FROM THE BOTTOM OF THE HOLE TO 12" FROM THE TOP OF THE POST. CONNECT REBAR TOGETHER WITH REBAR SEPARATOR CLIPS. INSERT IN OPPOSING CORNERS OF POST.

13 FILL POSTS
FILL POST WITH CONCRETE MIX TO COVER REBAR AND HARDWARE FASTENERS. TAMP POST WITH A RUBBER Mallet TO ELIMINATE AIR POCKETS. LEAVE GATE ON BLOCKS FOR 72 HOURS TO ALLOW CONCRETE TO SET

14 INSTALL CAPS
POSITION POST CAP ON POST. DRILL 1/8" PILOT HOLE. SECURE WITH #8 X 1 1/2" SCREW, WITH WASHER AND CAP.

INSTALLATION INSTRUCTIONS

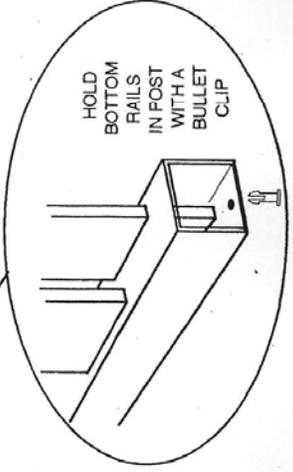
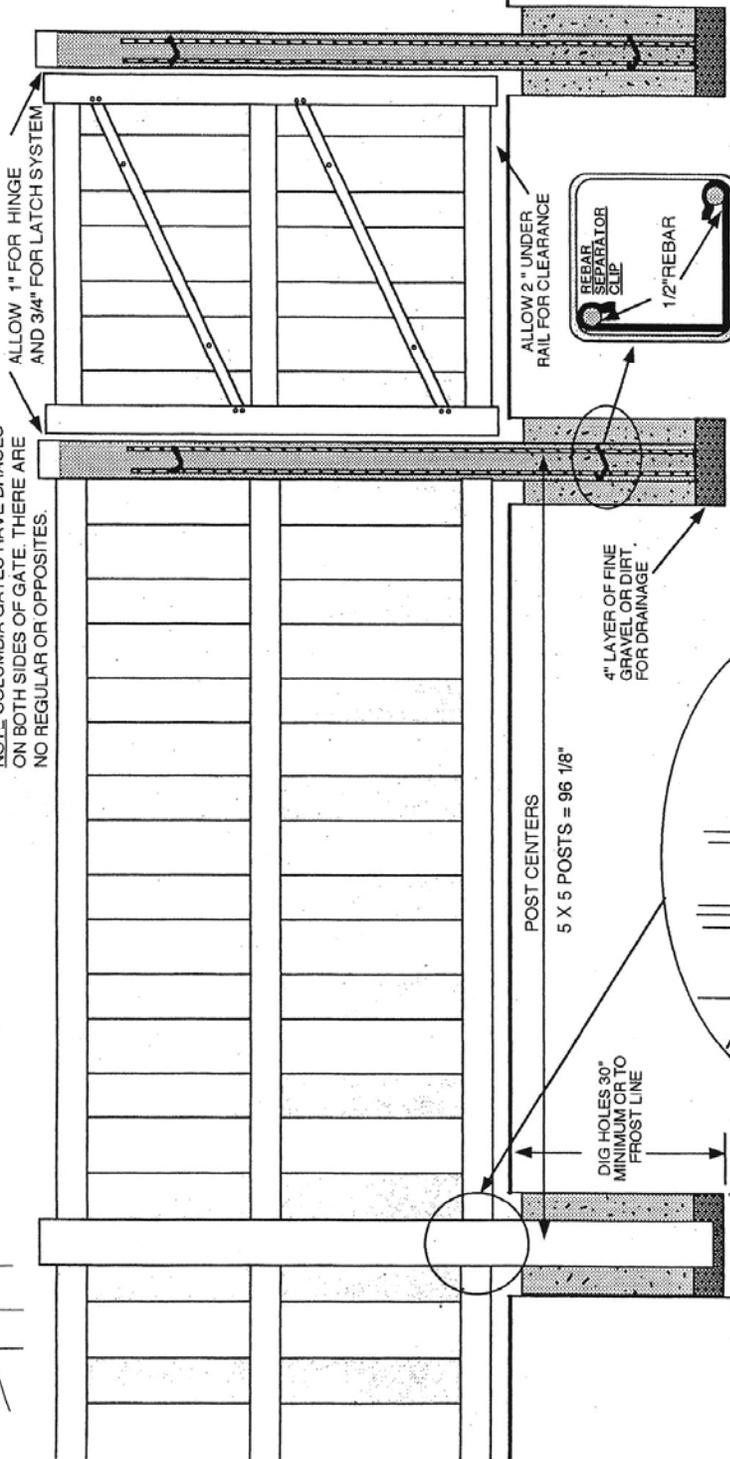
SEMI-PRIVATE FENCE



INCLUDE

COLUMBIA

NOTE COLUMBIA GATES HAVE BRACES ON BOTH SIDES OF GATE. THERE ARE NO REGULAR OR OPPOSITES.



USE (2) PIECES OF 1/2" REBAR IN THE HINGE, LATCH & END POSTS. POSITION REBAR IN OPPOSING CORNERS OF EACH POST.
USE REBAR SEPARATOR CLIPS TO HOLD REBAR IN CORRECT VERTICAL POSITION UNTIL CONCRETE IS POURED INSIDE POSTS.

INSTALLATION INSTRUCTION 3/18/99

INSTALLATION INSTRUCTIONS

TRADITIONAL PICKET FENCE

<p>1 LAY OUT FENCE LINE</p> <p>CHECK FOR BURIED UTILITY LINES. STAKE OUT FENCE LINE. DETERMINE GATE LOCATION (S) & ROUGH OPENING SIZE FOR GATE HARDWARE. ALLOW 1" GAP FOR HINGE & 3/4" FOR LATCH LOCATE POST LOCATIONS. POST CENTERS FOR 4 X 4 POSTS 1 1/2" PICKETS = 72 1/2" 3" PICKETS = 73" DETERMINE NON STANDARD FENCE SECTIONS DUE TO TERRAIN CHANGE</p>	<p>2 ASSEMBLE GATES</p> <p>ASSEMBLE GATE TO DETERMINE EXACT WIDTH OF GATE OPENING. DETERMINE GATE SWING AND ALLOWANCE FOR GROUND CLEARANCE. CONSULT GATE ASSEMBLY INSTRUCTIONS FOUND IN GATE HARDWARE PACKAGE FOR DETAILED INSTRUCTIONS. HINGE AND LATCH POST MUST BE INSTALLED WITH CONCRETE AND 2 PIECES OF 1/2" REBAR INSIDE THE POST.</p>	<p>3 DIG HOLES</p> <p>DIG HOLES 30" DEEP OR TO FROST LINE. HOLE SIZE FOR 4 X 4 POSTS = 10" CLEAN HOLES AND CHECK FOR STRAIGHT WALLS.</p>	<p>4 INSTALL FIRST POST</p> <p>PLACE A 4" LAYER OF FINE GRAVEL OR DIRT IN THE HOLE FOR DRAINAGE. INSERT POST IN HOLE. DETERMINE ROUGH HEIGHT. FILL HOLE AROUND POST WITH CONCRETE MIX (SAND, GRAVEL & CEMENT) APPROX 2" BELOW GRADE. TAMP CONCRETE IN HOLE TO ELIMINATE AIR POCKETS. LEVEL AND SQUARE POST.</p>
<p>5 INSTALL BOTTOM RAIL</p> <p>TAPE THE ENDS OF ANY RAIL GOING INTO A POST THAT IS TO BE FILLED WITH CONCRETE TO PREVENT CONCRETE SEEPAGE. INSERT RAIL IN POST. RAIL ENDS HAVE BEEN CRIMPED TO LOCK INSIDE POSTS.</p>	<p>6 INSTALL SECOND POST</p> <p>INSERT SECOND POST IN HOLE. INSERT BOTTOM RAIL IN POST. BLOCK UP BOTTOM RAIL TO DETERMINE CORRECT FENCE HEIGHT. FILL HOLE AROUND SECOND POST WITH CONCRETE MIX. TAMP. LEVEL AND SQUARE. FENCE ASSEMBLY MAY BE CONTINUED BY INSTALLING ALL BOTTOM RAILS FIRST OR ONE SECTION AT A TIME.</p>	<p>7 SUPPORT & SECURE</p> <p>LEVEL AND SQUARE FENCE. TO LOWER A POST PLACE A PIECE OF WOOD, LARGER THAN THE POST ON TOP OF THE POST AND CAREFULLY TAP WITH A MALLET. NEVER STRIKE THE P V C POST WITHOUT A WOOD SUPPORT.</p> <p>8 INSTALL RAILS</p> <p>INSERT TOP RAIL IN POST. RAILS ARE CRIMPED ON THE ENDS TO LOCK IN POSTS</p>	<p>9 INSTALL PICKETS</p> <p>FOR FIELD ASSEMBLY INSERT HEX WASHER HEAD SCREW THROUGH PRE - DRILLED HOLE IN TOP RAIL. ALIGN PRE DRILLED HOLE IN PICKET, TIGHTEN WITH 1/2" DEEP SOCKET WRENCH. REPEAT FOR BOTTOM RAIL. INSERT HOLE PLUG IN HOLE IN RAIL.</p>
<p>10 SECURE RAILS</p> <p>SQUARE PICKETS AND RAILS. CHECK FOR EVEN PICKET SPACING ON EACH END OF RAIL.</p>	<p>11 HANG GATE INSTALL HARDWARE</p> <p>POSITION GATE BETWEEN POSTS. ALLOW 1" GAP FOR HINGE AND 3/4" FOR LATCH AND GATE SWING. BLOCK UP GATE TO SQUARE WITH FENCE. RAILS SHOULD BE LEVEL. GATE HARDWARE MUST BE MOUNTED TO TWO SIDES OF THE POST. FOR COMPLETE DETAILS SEE GATE INSTALLATION INSTRUCTIONS IN HARDWARE BOX.</p>	<p>12 LOCATE REBAR</p> <p>USE AND PLACEMENT OF REBAR IS CRITICAL FOR THE STRENGTH AND QUALITY OF A FENCE. INSTALLATION USE 2 PIECES OF 1/2" REBAR IN EACH HINGE, LATCH OR END POST. REBAR SHOULD EXTEND FROM THE BOTTOM OF THE HOLE TO 12" FROM THE TOP OF THE POST. CONNECT REBAR TOGETHER WITH REBAR SEPARATOR CLIPS. INSERT IN OPPOSING CORNERS OF POST.</p>	<p>13 FILL POSTS</p> <p>FILL POST WITH CONCRETE MIX TO COVER REBAR AND HARDWARE FASTENERS. TAMP POST WITH A RUBBER MALLET TO ELIMINATE AIR POCKETS. LEAVE GATE ON BLOCKS FOR 72 HOURS TO ALLOW CONCRETE TO SET.</p> <p>14 INSTALL CAPS</p> <p>INSTALL POST CAPS. SECURE WITH #8 X 3/4 SCREWS, CAPS & WASHERS.</p>

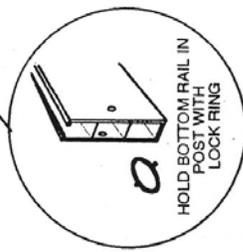
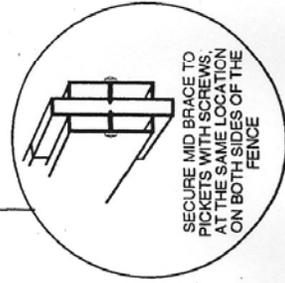
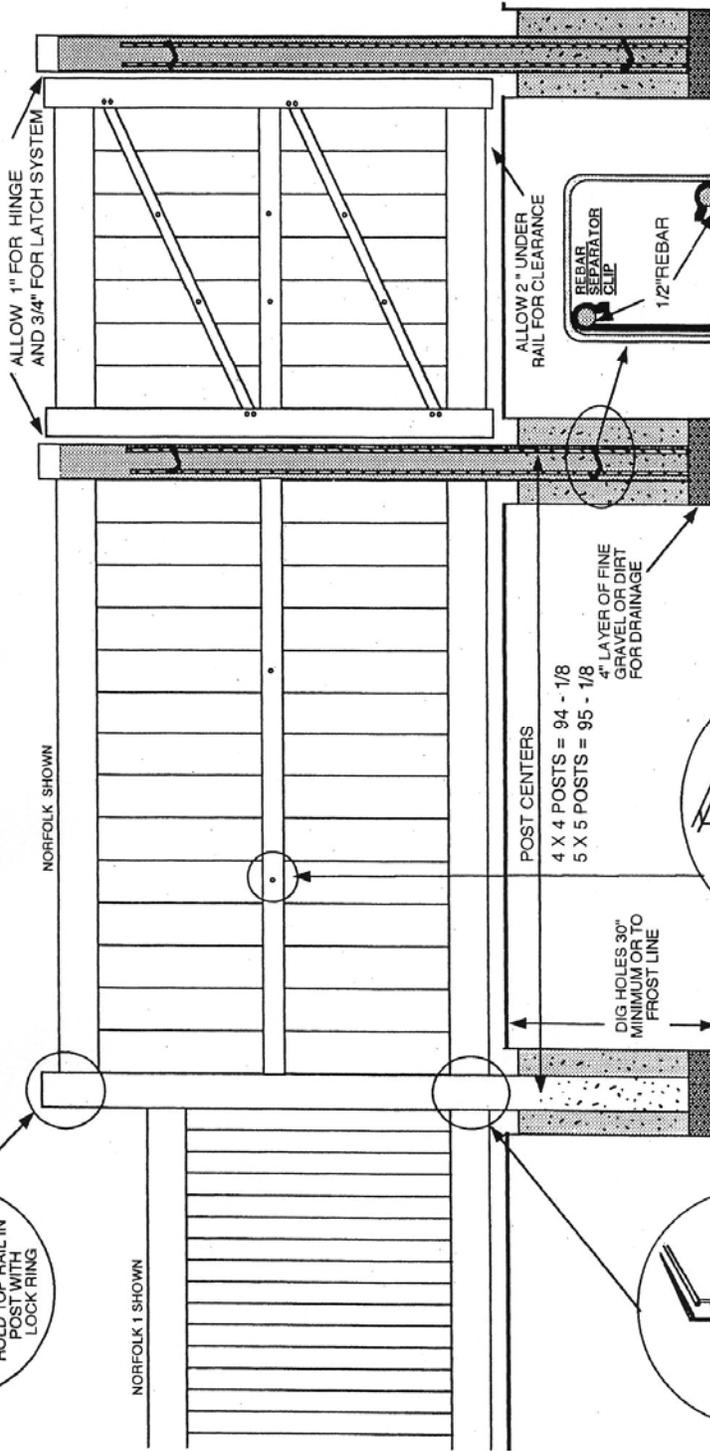
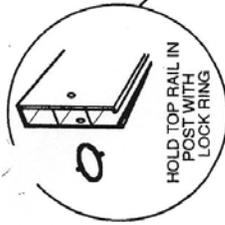
FENCE INSTALLATION INSTRUCTIONS 310489

INSTALLATION INSTRUCTIONS

• PRIVACY STYLE FENCE

INCLUDE

- NORFOLK
- NORFOLK 1



USE (2) PIECES OF 1/2" REBAR IN THE HINGE, LATCH & END POSTS. POSITION REBAR IN OPPOSING CORNERS OF EACH POST. USE REBAR SEPARATOR CLIPS TO HOLD REBAR IN CORRECT VERTICAL POSITION UNTIL CONCRETE IS POURED INSIDE POSTS.

INSTALLATION INSTRUCTION 2/2/99

INSTALLATION INSTRUCTIONS

PRIVACY STYLE FENCE NORFOLK

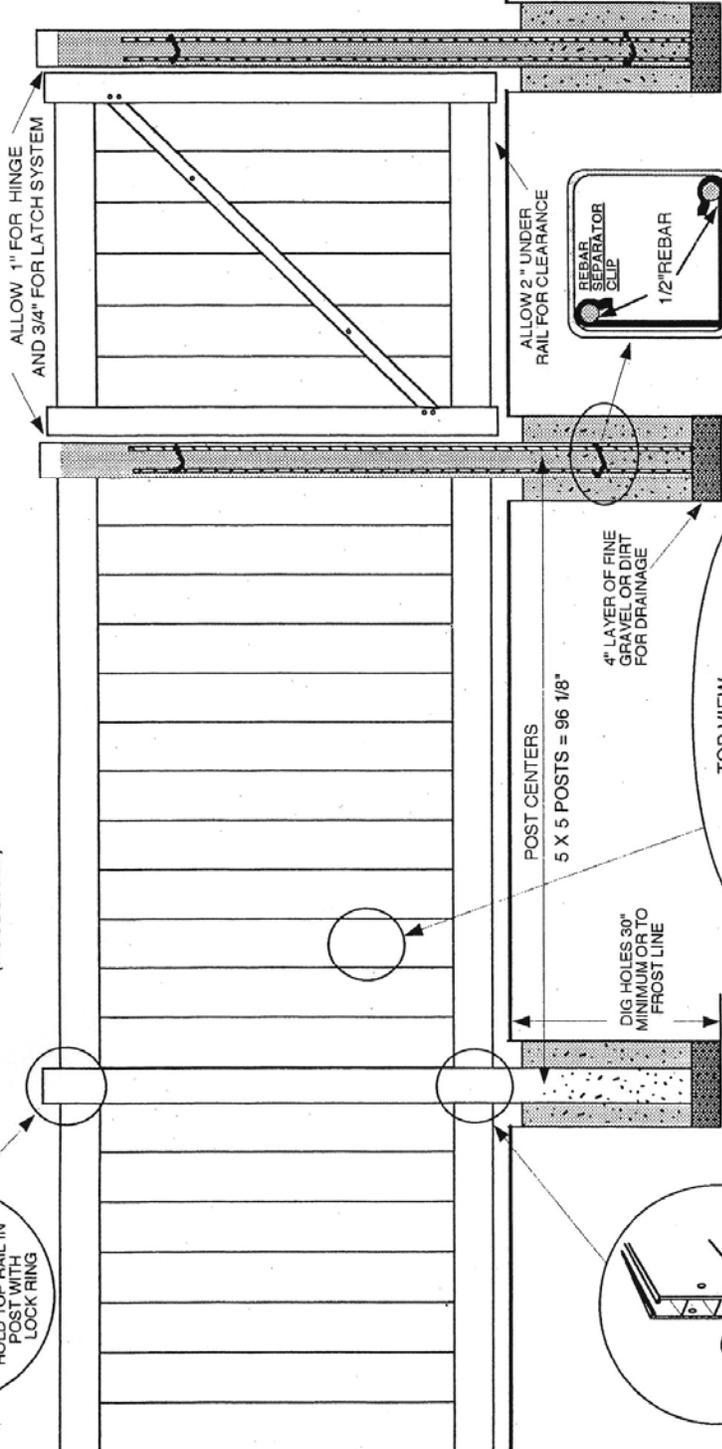
<p>1 LAY OUT FENCE LINE CHECK FOR BURIED UTILITY LINES. STAKE OUT FENCE LINE. DETERMINE GATE LOCATION(S) & ROUGH OPENING SIZE. FOR GATE HARDWARE ALLOW 1" GAP FOR HINGE & 3/4" FOR LATCH LOCATE POST LOCATIONS. POST CENTERS FOR 5 X 5 POSTS = 89 1/8" FOR 4 X 4 POSTS = 88 1/8" DETERMINE NON STANDARD FENCE SECTIONS DUE TO TERRAIN CHANGE</p>	<p>2 ASSEMBLE GATES ASSEMBLE GATE TO DETERMINE EXACT WIDTH OF GATE OPENING. DETERMINE GATE SWING AND ALLOWANCE FOR GROUND CLEARANCE. CONSULT GATE ASSEMBLY INSTRUCTIONS FOUND IN GATE HARDWARE PACKAGE FOR DETAILED INSTRUCTIONS. HINGE AND LATCH POST MUST BE INSTALLED WITH CONCRETE AND 2 PIECES OF 1/2" REBAR INSIDE THE POST.</p>	<p>3 DIG HOLES DIG HOLES 30" DEEP OR TO FROST LINE. HOLE SIZE 5 X 5 = 12" 4 X 4 = 10" CLEAN HOLES AND CHECK FOR STRAIGHT WALLS.</p>	<p>4 INSTALL FIRST POST PLACE A 4" LAYER OF FINE GRAVEL OR DIRT IN THE HOLE FOR DRAINAGE. INSERT POST IN HOLE. DETERMINE ROUGH HEIGHT. FILL HOLE AROUND POST WITH CONCRETE MIX (SAND, GRAVEL & CEMENT) APPROX 2" BELOW GRADE. TAMP CONCRETE IN HOLE TO ELIMINATE AIR POCKETS. LEVEL AND SQUARE POST.</p>
<p>5 INSTALL BOTTOM RAIL TAPE THE ENDS OF ANY RAIL GOING INTO A POST THAT IS TO BE FILLED WITH CONCRETE TO PREVENT CONCRETE SEEPAGE. DEPRESS LOCK RING TABS. INSERT BOTTOM RAIL IN POST. TABS WILL RECOIL TO LOCK RAIL IN POST.</p>	<p>6 INSTALL SECOND POST INSERT SECOND POST IN HOLE. INSERT BOTTOM RAIL IN POST. SPACING BETWEEN FACING SURFACES OF POSTS MUST BE 84 1/8". BLOCK UP BOTTOM RAIL TO DETERMINE CORRECT FENCE HEIGHT. FILL HOLE AROUND SECOND POST WITH CONCRETE MIX. TAMP, LEVEL AND SQUARE. FENCE ASSEMBLY MAY BE CONTINUED BY INSTALLING ALL BOTTOM RAILS FIRST, OR ONE SECTION AT A TIME.</p>	<p>7 SUPPORT & SECURE LEVEL AND SQUARE FENCE. TO LOWER A POST PLACE A PIECE OF WOOD, LARGER THAN THE POST ON TOP OF THE POST AND CAREFULLY TAP WITH A Mallet. NEVER STRIKE THE P V C POST WITHOUT A WOOD SUPPORT.</p>	<p>8 INSTALL PICKETS & RAILS INSERT PICKETS IN BOTTOM RAIL. INSERT TOP RAIL OVER PICKETS. DEPRESS LOCK RING TABS. INSERT TOP RAIL IN POST.</p>
<p>9 SECURE MID BRACES LEVEL MID BRACE (WHERE APPLICABLE) ATTACH MID BRACES TO PICKETS WITH (2) #8 X 3/4" SCREWS, SNAP CAPS AND WASHERS. SECURE MID BRACE TO THE SAME PICKET ON BOTH SIDES OF FENCE. SPACE SCREWS EVENLY ALONG MID BRACE.</p>	<p>10 HANG GATE INSTALL HARDWARE POSITION GATE BETWEEN POSTS. ALLOW 1" GAP FOR HINGE AND 3/4" FOR LATCH AND GATE SWING. BLOCK UP GATE TO SQUARE WITH FENCE. RAILS SHOULD BE LEVEL. GATE HARDWARE MUST BE MOUNTED TO TWO SIDES OF THE POST. FOR COMPLETE DETAILS SEE GATE INSTALLATION INSTRUCTIONS IN HARDWARE BOX.</p>	<p>11 LOCATE REBAR USE AND PLACEMENT OF REBAR IS CRITICAL FOR THE STRENGTH AND QUALITY OF A FENCE. INSTALLATION USE 2 PIECES OF 1/2" REBAR IN EACH HINGE, LATCH OR END POST. REBAR SHOULD EXTEND FROM THE BOTTOM OF THE HOLE TO 12" FROM THE TOP OF THE POST. CONNECT REBAR TOGETHER WITH REBAR SEPARATOR CLIPS. INSERT IN OPPOSING CORNERS OF POST.</p>	<p>12 FILL POSTS FILL POST WITH CONCRETE MIX TO COVER REBAR AND HARDWARE FASTENERS. TAMP POST WITH A RUBBER Mallet TO ELIMINATE AIR POCKETS. LEAVE GATE ON BLOCKS FOR 72 HOURS TO ALLOW CONCRETE TO SET.</p> <p>13 INSTALL CAPS INSTALL POST CAPS SECURE WITH #8 X 3/4" SCREWS, CAPS & WASHERS.</p>

FENCE INSTRUCTIONS NORFOLK

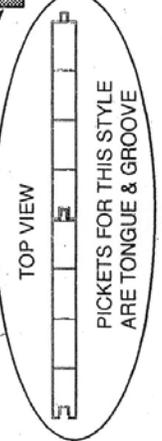
• PRIVACY STYLE FENCE

INSTALLATION INSTRUCTIONS

- INCLUDE WINCHESTER (WOODGRAIN) CHESTERFIELD



USE (2) PIECES OF 1/2\"/>



INSTALLATION INSTRUCTION 12901

INSTALLATION INSTRUCTIONS **PRIVACY STYLE FENCE** **TONGUE & GROOVE**

<p>1 LAY OUT FENCE LINE</p> <p>CHECK FOR BURIED UTILITY LINES. STAKE OUT FENCE LINE. DETERMINE GATE LOCATION (S) & ROUGH OPENING SIZE. FOR GATE HARDWARE ALLOW 1" GAP FOR HINGE & 3/4" FOR LATCH. LOCATE POST LOCATIONS. POST CENTERS FOR 5 X 5 POSTS = 89 1/8". DETERMINE NON STANDARD FENCE SECTIONS DUE TO TERRAIN CHANGE.</p>	<p>2 ASSEMBLE GATES</p> <p>ASSEMBLE GATE TO DETERMINE EXACT WIDTH OF GATE OPENING. DETERMINE GATE SWING AND ALLOWANCE FOR GROUND CLEARANCE. CONSULT GATE ASSEMBLY INSTRUCTIONS FOUND IN GATE HARDWARE PACKAGE FOR DETAILED INSTRUCTIONS. HINGE AND LATCH POST MUST BE INSTALLED WITH CONCRETE AND 2 PIECES OF 1/2" REBAR INSIDE THE POST.</p>	<p>3 DIG HOLES</p> <p>DIG HOLES 30" DEEP OR TO FROST LINE. HOLE SIZE 5 X 5 = 12". CLEAN HOLES AND CHECK FOR STRAIGHT WALLS.</p>	<p>4 INSTALL FIRST POST</p> <p>PLACE A 4" LAYER OF FINE GRAVEL OR DIRT IN THE HOLE FOR DRAINAGE. INSERT POST IN HOLE. DETERMINE ROUGH HEIGHT. FILL HOLE AROUND POST WITH CONCRETE MIX (SAND, GRAVEL & CEMENT) APPROX 2" BELOW GRADE. TAMP CONCRETE IN HOLE TO ELIMINATE AIR POCKETS. LEVEL AND SQUARE POST.</p>
<p>5 INSTALL BOTTOM RAIL</p> <p>TAPE THE ENDS OF ANY RAIL GOING INTO A POST THAT IS TO BE FILLED WITH CONCRETE TO PREVENT CONCRETE SEEPAGE. DEPRESS LOCK RING TABS, INSERT BOTTOM RAIL IN POST. TABS WILL RECOIL TO LOCK RAIL IN POST.</p>	<p>6 INSTALL SECOND POST</p> <p>INSERT SECOND POST IN HOLE. INSERT BOTTOM RAIL IN POST. SPACING BETWEEN FACING SURFACES OF POSTS MUST BE 84 1/8". BLOCK UP BOTTOM RAIL TO DETERMINE CORRECT FENCE HEIGHT. FILL HOLE AROUND SECOND POST WITH CONCRETE MIX. TAMP, LEVEL AND SQUARE. FENCE ASSEMBLY MAY BE CONTINUED BY INSTALLING ALL BOTTOM RAILS FIRST, OR ONE SECTION AT A TIME.</p>	<p>7 SUPPORT & SECURE</p> <p>LEVEL AND SQUARE FENCE. TO LOWER A POST PLACE A PIECE OF WOOD, LARGER THAN THE POST ON TOP OF THE POST AND CAREFULLY TAP WITH A MALLET. NEVER STRIKE THE P V C POST WITHOUT A WOOD SUPPORT.</p>	<p>8 INSTALL PICKETS & RAILS</p> <p>INSERT PICKETS IN BOTTOM RAIL. INSERT TOP RAIL OVER PICKETS. DEPRESS LOCK RING TABS, INSERT TOP RAIL IN POST.</p>
<p>9 HANG GATE INSTALL HARDWARE</p> <p>POSITION GATE BETWEEN POSTS. ALLOW 1" GAP FOR HINGE AND 3/4" FOR LATCH AND GATE SWING. BLOCK UP GATE TO SQUARE WITH FENCE. RAILS SHOULD BE LEVEL. GATE HARDWARE MUST BE MOUNTED TO TWO SIDES OF THE POST. FOR COMPLETE DETAILS SEE GATE INSTALLATION INSTRUCTIONS IN HARDWARE BOX.</p>	<p>10 LOCATE REBAR</p> <p>USE AND PLACEMENT OF REBAR IS CRITICAL FOR THE STRENGTH AND QUALITY OF A FENCE. INSTALLATION USE 2 PIECES OF 1/2" REBAR IN EACH HINGE, LATCH OR END POST. REBAR SHOULD EXTEND FROM THE BOTTOM OF THE HOLE TO 12" FROM THE TOP OF THE POST. CONNECT REBAR TOGETHER WITH REBAR SEPARATOR CLIPS. INSERT IN OPPOSING CORNERS OF POST.</p>	<p>11 FILL POSTS</p> <p>FILL POST WITH CONCRETE MIX TO COVER REBAR AND HARDWARE FASTENERS. TAMP POST WITH A RUBBER MALLET TO ELIMINATE AIR POCKETS. LEAVE GATE ON BLOCKS FOR 72 HOURS TO ALLOW CONCRETE TO SET.</p>	<p>12 INSTALL CAPS</p> <p>INSTALL POST CAPS. SECURE WITH #8 X 3/4 SCREWS, CAPS & WASHERS.</p>

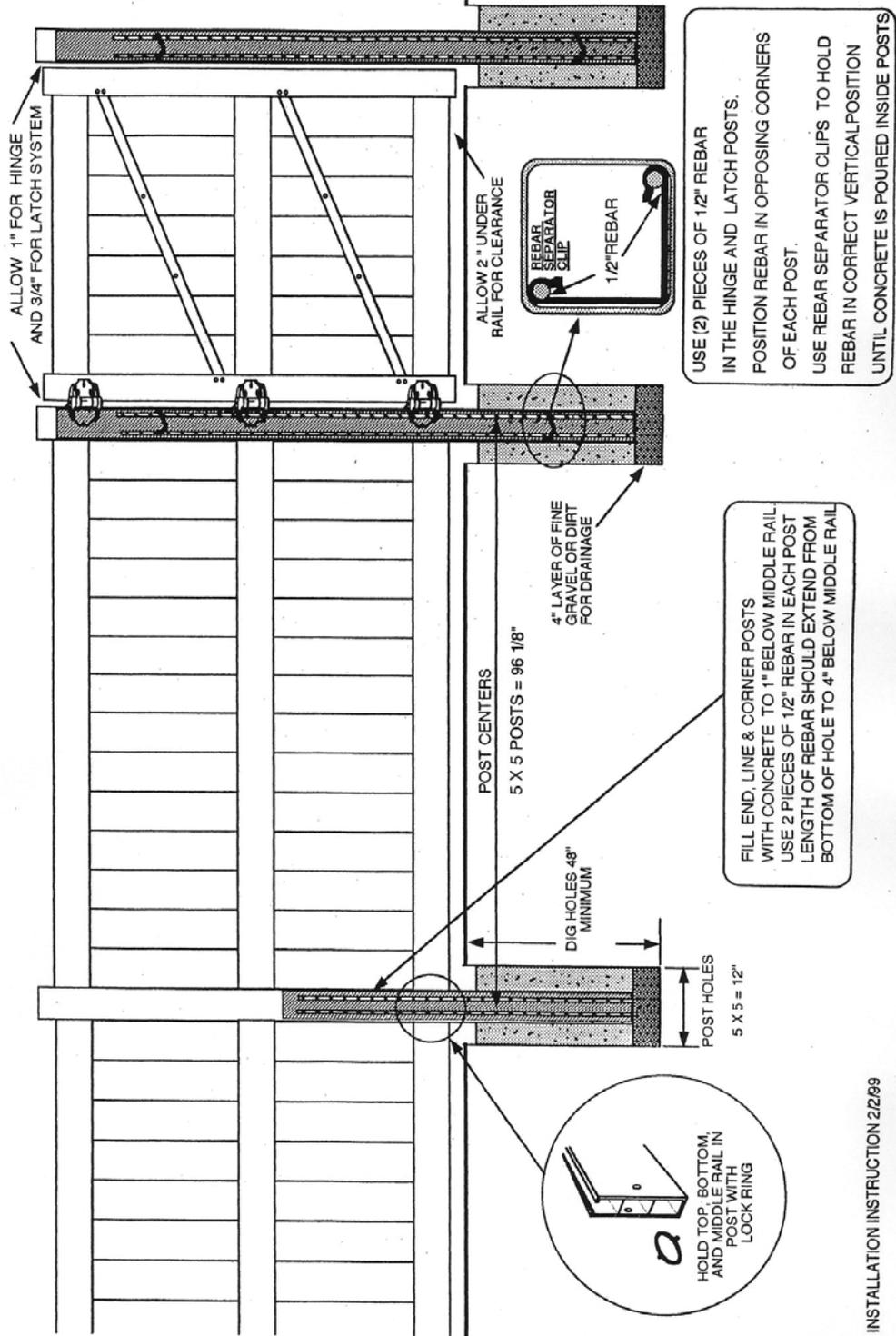
FENCE INSTALLATION INSTRUCTIONS 2009

INSTALLATION INSTRUCTIONS

INCLUDE

GALVESTON

• PRIVACY STYLE FENCE



INSTALLATION INSTRUCTION 22/69

INSTALLATION INSTRUCTIONS

GALVESTON PRIVACY STYLE FENCE

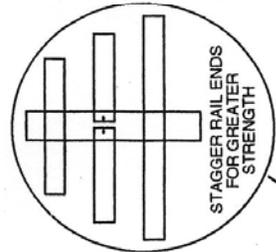
<p>1 LAY OUT FENCE LINE</p> <p>CHECK FOR BURIED UTILITY LINES. STAKE OUT FENCE LINE. DETERMINE GATE LOCATION (S) & ROUGH OPENING SIZE. FOR GATE HARDWARE ALLOW 1" GAP FOR HINGE & 3/4" FOR LATCH. LOCATE POST LOCATIONS. POST CENTERS FOR 5 X 5 POSTS = 89 1/8" DETERMINE NON STANDARD FENCE SECTIONS DUE TO TERRAIN CHANGE</p>	<p>2 ASSEMBLE GATES</p> <p>ASSEMBLE GATE TO DETERMINE EXACT WIDTH OF GATE OPENING. DETERMINE GATE SWING AND ALLOWANCE FOR GROUND CLEARANCE. CONSULT GATE ASSEMBLY INSTRUCTIONS FOUND IN GATE HARDWARE PACKAGE FOR DETAILED INSTRUCTIONS. HINGE AND LATCH POST MUST BE INSTALLED WITH CONCRETE AND 2 PIECES OF 1/2" REBAR INSIDE THE POST.</p>	<p>3 DIG HOLES</p> <p>DIG HOLES 48" DEEP HOLE SIZE 5 X 5 = 12" CLEAN HOLES AND CHECK FOR STRAIGHT WALLS.</p>	<p>4 INSTALL FIRST POST</p> <p>PLACE A 4" LAYER OF FINE GRAVEL OR DIRT IN THE HOLE FOR DRAINAGE. INSERT POST IN HOLE. DETERMINE ROUGH HEIGHT. FILL HOLE AROUND POST WITH CONCRETE MIX (SAND, GRAVEL & CEMENT) APPROX 2" BELOW GRADE. TAMP CONCRETE IN HOLE TO ELIMINATE AIR POCKETS. LEVEL AND SQUARE POST.</p>
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<p>9 HANG GATE INSTALL HARDWARE</p> <p>POSITION GATE BETWEEN POSTS. ALLOW 1" GAP FOR HINGE AND 3/4" FOR LATCH AND GATE SWING. BLOCK UP GATE TO SQUARE WITH FENCE. RAILS SHOULD BE LEVEL. GATE HARDWARE MUST BE MOUNTED TO TWO SIDES OF THE POST. FOR COMPLETE DETAILS SEE GATE INSTALLATION INSTRUCTIONS IN HARDWARE BOX.</p>	<p>HANG GATE INSTALL HARDWARE NOTE</p> <p>GALVESTON GATE REQUIRES 3 HINGES. DETERMINE POSITION OF GATE. MOUNT STEEL BRACKETS ON GATE UPRIGHT. MOUNT HINGES ON GATE. MOUNT LATCH CATCH. BLOCK UP GATE OR REMOVE GATE FROM STEEL BRACKETS TO ALLOW HINGE AND LATCH POSTS TO SET UP</p>	<p>10 LOCATE REBAR</p> <p>USE AND PLACEMENT OF REBAR IS CRITICAL FOR THE STRENGTH AND QUALITY OF A FENCE. INSTALLATION USE 2 PIECES OF 1/2" REBAR IN EACH POST. FOR LINE, END, AND CORNER POSTS REBAR SHOULD EXTEND FROM THE BOTTOM OF THE HOLE TO 4" BELOW MIDDLE RAIL. REBAR SHOULD EXTEND FROM HINGE AND LATCH POSTS. BOTTOM OF HOLE TO 12" FROM TOP OF POST. USE REBAR CLIPS.</p>	<p>11 FILL POSTS</p> <p>FILL POST WITH CONCRETE MIX TO COVER REBAR AND HARDWARE FASTENERS. TAMP POST WITH A RUBBER Mallet TO ELIMINATE AIR POCKETS. LEAVE GATE ON BLOCKS FOR 72 HOURS TO ALLOW CONCRETE TO SET.</p> <p>12 INSTALL CAPS</p> <p>INSTALL POST CAPS SECURE WITH #8 X 3/4" SCREWS, CAPS & WASHERS.</p>

FENCE INSTALLATION INSTRUCTIONS 301669

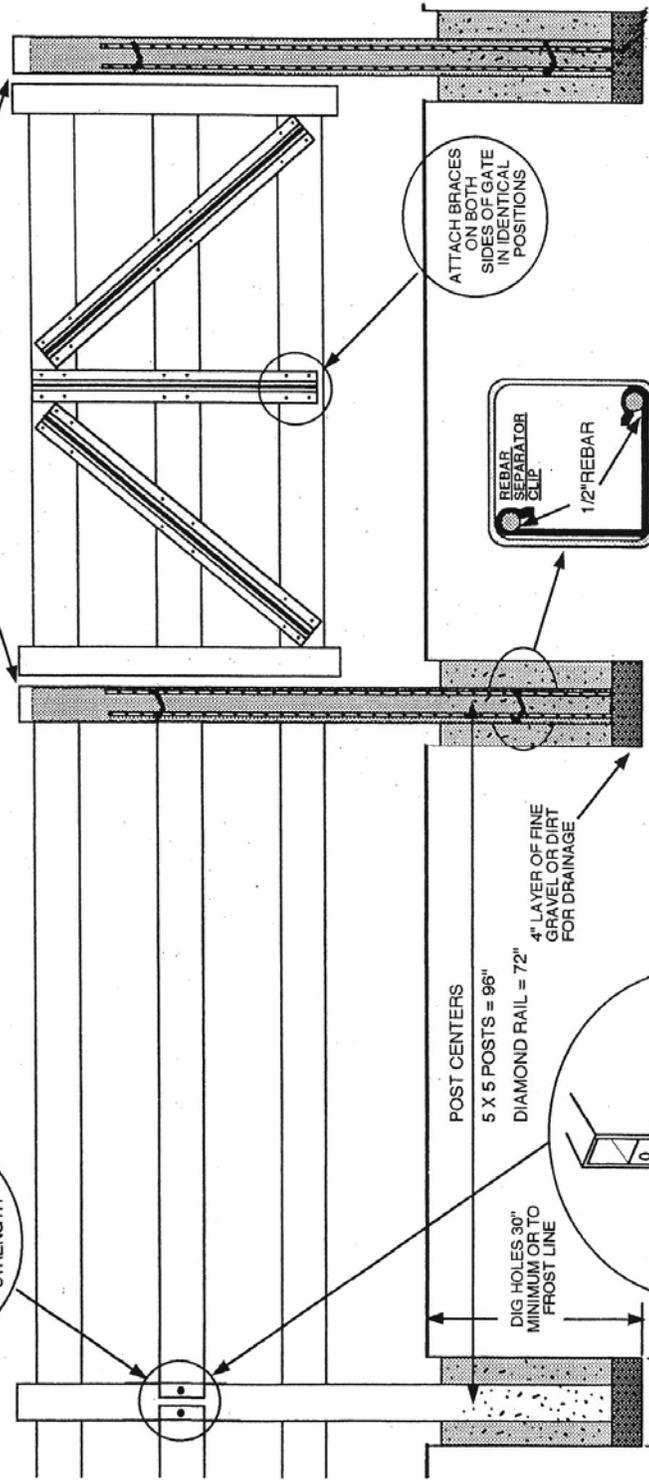
POST & RAIL FENCE

INSTALLATION INSTRUCTIONS

- INCLUDE
- POST & RAIL
 - CROSSBUCK



ALLOW 1 1/2" GAP ON HINGE SIDE OF GATE AND 1 1/4" ON LATCH SIDE OF GATE HARDWARE



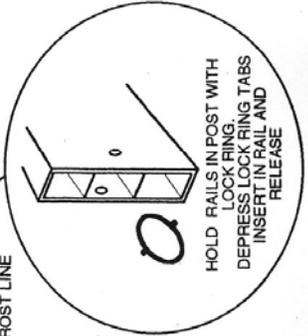
USE (2) PIECES OF 1/2" REBAR IN THE HINGE, LATCH & END POSTS. POSITION REBAR IN OPPOSING CORNERS OF EACH POST. USE REBAR SEPARATOR CLIPS TO HOLD REBAR IN CORRECT VERTICAL POSITION UNTIL CONCRETE IS POURED INSIDE POSTS.

RAILS CUT TO LENGTH IN THE FIELD MUST BE RE CRIMPED OR A BULLET CLIP INSERTED TO HOLD RAIL IN POST.

DIAMOND RAIL INSTALLATION NOTE

TOP VIEW

WHEN INSTALLING RAILS IN A CORNER POST, RAIL ENDS MUST BE MITER CUT AT 45 DEGREES TO FIT IN POST.



INSTALLATION INSTRUCTION 4/14/97

INSTALLATION INSTRUCTIONS

POST & RAIL FENCE

FENCE

<p>1 LAY OUT FENCE LINE CHECK FOR BURIED UTILITY LINES. STAKE OUT FENCE LINE. DETERMINE GATE LOCATION (S) & ROUGH OPENING SIZE. ALLOW 1 1/2" GAP ON HINGE SIDE OF GATE AND 1 1/4" ON LATCH SIDE FOR HARDWARE. LOCATE POST LOCATIONS. POST CENTERS FOR 5 X 5 POSTS 96" DIAMOND RAIL = 72" DETERMINE NON STANDARD FENCE SECTIONS DUE TO TERRAIN CHANGE</p>	<p>2 ASSEMBLE GATES ASSEMBLE GATE TO DETERMINE EXACT WIDTH OF GATE OPENING. DETERMINE GATE SWING AND ALLOWANCE FOR GROUND CLEARANCE. CONSULT GATE ASSEMBLY INSTRUCTIONS FOUND IN GATE HARDWARE PACKAGE FOR DETAILED INSTRUCTIONS. HINGE AND LATCH POST MUST BE INSTALLED WITH CONCRETE AND 2 PIECES OF 1/2" REBAR INSIDE THE POST.</p>	<p>3 DIG HOLES DIG HOLES 30" DEEP OR TO FROST LINE. HOLE SIZE FOR 5 X 5 POSTS = 12" CLEAN HOLES AND CHECK FOR STRAIGHT WALLS.</p>	<p>4 INSTALL FIRST POST PLACE A 4" LAYER OF FINE GRAVEL OR DIRT IN THE HOLE FOR DRAINAGE. INSERT POST IN HOLE. DETERMINE ROUGH HEIGHT. FILL HOLE AROUND POST WITH CONCRETE MIX (SAND, GRAVEL & CEMENT), APPROX. 2" BELOW GRADE. TAMP CONCRETE IN HOLE TO ELIMINATE AIR POCKETS. LEVEL AND SQUARE POST. FENCE MAY BE INSTALLED POST AND BOTTOM RAILS FIRST, THEN UPPER RAILS.</p>
<p>5 PREPARE RAILS TAPE THE ENDS OF ANY RAIL BEING INSERTED IN A POST TO BE FILLED WITH CONCRETE. RAILS ARE SUPPLIED IN 16 FOOT LENGTHS. RAILS MAY NEED TO BE CUT TO 95 1/2" FOR ROLLING TERRAIN. STAGGER RAIL ENDS INSIDE POSTS. CUT ONE RAIL TO 95 1/2". DRILL A 3/8" HOLE IN ANY FIELD CUT RAIL TO ACCEPT LOCK RINGS. DEPRESS LOCK RING TABS, INSERT IN RAIL END AND RELEASE. TABS WILL HOLD RAIL IN POST.</p>	<p>6 INSTALL BOTTOM RAIL INSERT BOTTOM RAIL IN FIRST POST. IF BOTTOM RAIL IS 16' LONG, INSERT RAIL THROUGH 2ND POST FIRST. INSERT LOCK RING IN RAIL END, INSERT IN 3RD POST. OF RAIL, INSERT RAIL IN FIRST POST. WHEN INSTALLING RAILS LEAVE A 1" GAP BETWEEN RAIL ENDS INSIDE POST TO ALLOW FOR EXPANSION</p>	<p>7 INSTALL SECOND POST INSERT SECOND POST IN HOLE. INSERT BOTTOM RAIL IN POST. BLOCK UP BOTTOM RAIL TO DETERMINE CORRECT FENCE HEIGHT. FILL HOLE AROUND SECOND POST WITH CONCRETE MIX. TAMP, LEVEL AND SQUARE. FENCE ASSEMBLY MAY BE CONTINUED BY INSTALLING ALL BOTTOM RAILS FIRST OR ONE SECTION AT A TIME.</p>	<p>8 SUPPORT & SECURE LEVEL AND SQUARE FENCE. TO LOWER A POST, PLACE A PIECE OF WOOD, LARGER THAN THE POST ON TOP OF THE POST AND CAREFULLY TAP WITH A MALLET. NEVER STRIKE THE P.V.C POST WITHOUT A WOOD SUPPORT.</p>
<p>9 HANG GATE INSTALL HARDWARE POSITION GATE BETWEEN POSTS. ALLOW FOR 1 1/2" GAP ON HINGE SIDE OF THE GATE AND 1 1/4" ON LATCH SIDE TO ALLOW FOR GATE SWING AND HARDWARE. BLOCK UP GATE TO SQUARE WITH FENCE. RAILS SHOULD BE LEVEL. GATE HARDWARE MUST BE MOUNTED TO TWO SIDES OF THE POST. FOR COMPLETE DETAILS SEE GATE INSTALLATION INSTRUCTIONS IN HARDWARE BOX.</p>	<p>10 LOCATE REBAR USE AND PLACEMENT OF REBAR IS CRITICAL FOR THE STRENGTH AND QUALITY OF A FENCE. INSTALLATION USE 2 PIECES OF 1/2" REBAR IN EACH HINGE, LATCH AND ENDPPOST. REBAR SHOULD EXTEND FROM THE BOTTOM OF THE HOLE TO 12" FROM THE TOP OF THE POST. CONNECT REBAR TOGETHER WITH REBAR SEPARATOR CLIPS. INSERT IN OPPOSING CORNERS OF POST.</p>	<p>11 FILL POSTS FILL POST WITH CONCRETE MIX TO COVER REBAR AND HARDWARE FASTENERS. TAMP POST WITH A RUBBER MALLET TO ELIMINATE AIR POCKETS. LEAVE GATE ON BLOCKS FOR 72 HOURS TO ALLOW CONCRETE TO SET.</p>	<p>12 INSTALL CAPS INSTALL POST CAPS.</p> <p>NOTE DIAMOND RAIL RAILS ARE SUPPLIED IN 6' & 12' LENGTHS. POST CENTERS WILL BE 72"</p>

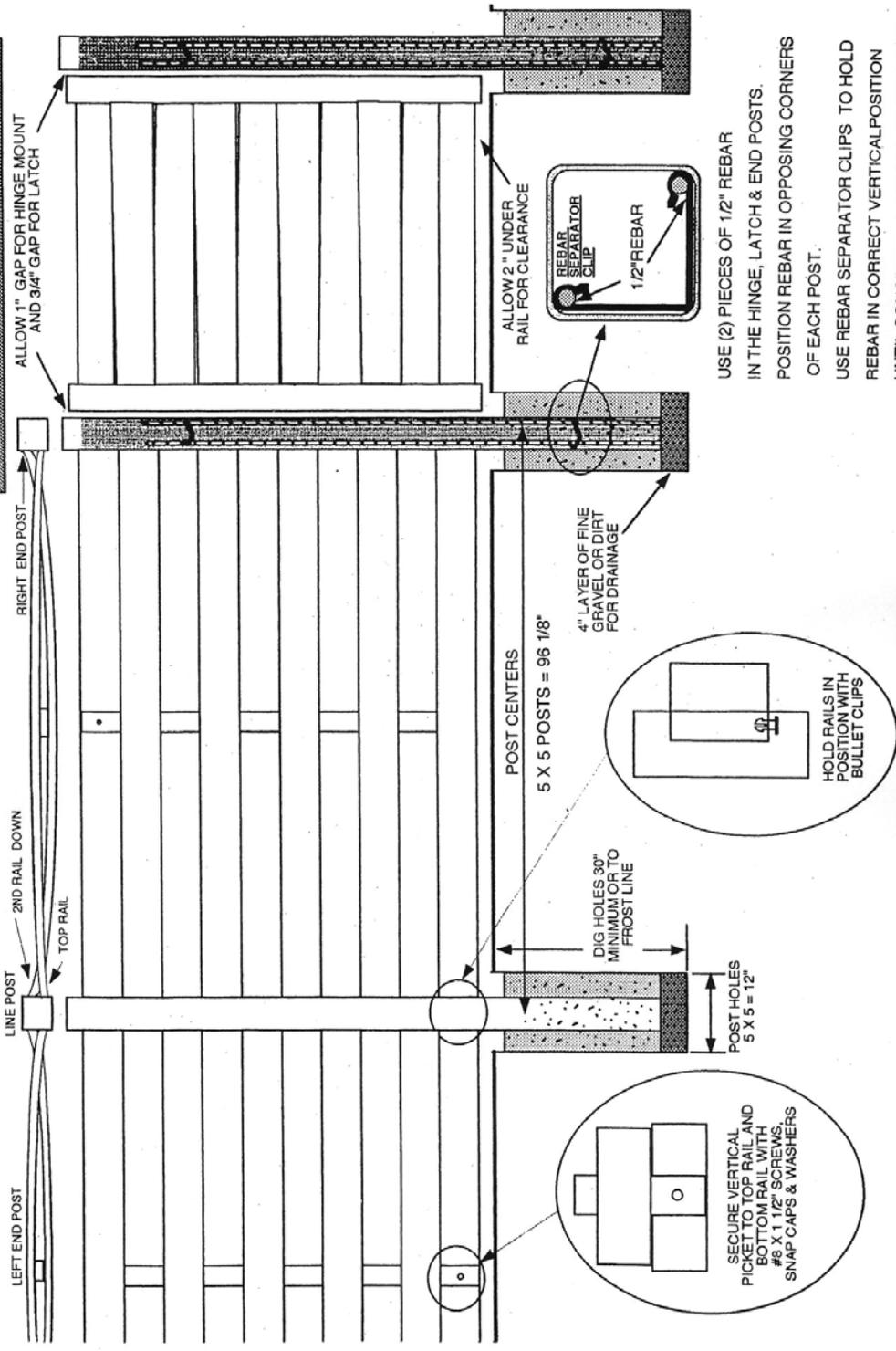
FENCE INSTALLATION INSTRUCTIONS 41467

INSTALLATION INSTRUCTIONS

PRIVACY STYLE FENCE

INCLUDE
 LEWISTON

TOP VIEW SHOWN



USE (2) PIECES OF 1/2" REBAR
 IN THE HINGE, LATCH & END POSTS.
 POSITION REBAR IN OPPOSING CORNERS
 OF EACH POST.
 USE REBAR SEPARATOR CLIPS TO HOLD
 REBAR IN CORRECT VERTICAL POSITION
 UNTIL CONCRETE IS POURED INSIDE POSTS.

INSTALLATION INSTRUCTION 23001

INSTALLATION INSTRUCTIONS

LEWISTON STYLE FENCE

1 LAY OUT FENCE LINE
 CHECK FOR BURIED UTILITY LINES.
 STAKE OUT FENCE LINE.
 DETERMINE GATE LOCATION (S) & ROUGH OPENING SIZE
 ALLOW 3/4" ON EITHER SIDE OF GATE FOR HARDWARE.
 LOCATE POST LOCATIONS.
 POST CENTERS
 FOR 5 X 5 POSTS = 89 1/8"
 DETERMINE NON STANDARD FENCE SECTIONS DUE TO TERRAIN CHANGE.

2 ASSEMBLE GATES
 ASSEMBLE GATE TO DETERMINE EXACT WIDTH OF GATE OPENING.
 DETERMINE GATE SWING AND ALLOWANCE FOR GROUND CLEARANCE.
 CONSULT GATE ASSEMBLY INSTRUCTIONS FOUND IN GATE HARDWARE PACKAGE FOR DETAILED INSTRUCTIONS.
 HINGE AND LATCH POST **MUST** BE INSTALLED WITH CONCRETE AND 2 PIECES OF 1/2" REBAR INSIDE THE POST.

3 DIG HOLES
 DIG HOLES 30" DEEP OR TO FROST LINE. 5 X 5 = 12" HOLE SIZE
 CLEAN HOLES AND CHECK FOR STRAIGHT WALLS.
 PLACE A 4" LAYER OF FINE GRAVEL OR DIRT IN THE HOLE FOR DRAINAGE.

4 INSTALL FIRST POST
 DETERMINE STARTER POST. ALWAYS START WITH A LEFT END POST AND FINISH THE RUN WITH A RIGHT END POST.
 INSERT POST IN HOLE.
 DETERMINE ROUGH HEIGHT.
 FILL HOLE AROUND POST WITH CONCRETE MIX (SAND, GRAVEL & CEMENT) APPROX 2" BELOW GRADE.
 TAMP CONCRETE IN HOLE TO ELIMINATE AIR POCKETS.
 LEVEL AND SQUARE POST.

5 INSTALL BOTTOM RAIL
 TAPE THE ENDS OF ANY RAIL GOING INTO A POST THAT IS TO BE FILLED WITH CONCRETE TO PREVENT CONCRETE SEEPAGE.
 INSERT BULLET CLIPS IN HOLE IN RAIL ENDS. DEPRESS BULLET CLIP INSERT BOTTOM RAIL IN POST.
 BULLET CLIP WILL DROP DOWN TO HOLD RAIL IN POSITION.

6 INSTALL SECOND POST
 INSERT SECOND POST IN HOLE.
 INSERT BOTTOM RAIL IN POST.
 BLOCK UP BOTTOM RAIL TO DETERMINE CORRECT FENCE HEIGHT.
 FILL HOLE AROUND SECOND POST WITH CONCRETE MIX. TAMP.
 LEVEL AND SQUARE.
 FENCE ASSEMBLY MAY BE CONTINUED BY INSTALLING ALL BOTTOM RAILS FIRST, OR ONE SECTION AT A TIME.

7 SUPPORT & SECURE
 LEVEL AND SQUARE FENCE.
 TO LOWER A POST PLACE A PIECE OF WOOD, LARGER THAN THE POST ON TOP OF THE POST AND CAREFULLY TAP WITH A MALLET.
 NEVER STRIKE THE P V C POST WITHOUT A WOOD SUPPORT.

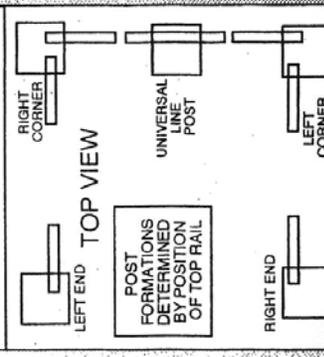
8 INSTALL RAILS
 INSERT BULLET CLIPS IN ALL RAIL ENDS.
 INSERT RAILS IN POSTS.
 INSERT VERTICAL PICKET DOWN THROUGH EACH RAIL OF FENCE SECTION TO FORM A WEAVE.
 CENTER PICKET ON FENCE SECTION.
 SECURE PICKET TO RAILS ON TOP AND BOTTOM WITH #8 X 1 1/2" SCREWS, WASHERS AND SNAP CAPS.

9 HANG GATE
INSTALL HARDWARE
 POSITION GATE BETWEEN POSTS. ALLOW FOR 3/4" GAP ON LATCH SIDE OF THE GATE AND 1" FOR HINGE SIDE.
 BLOCK UP GATE TO SQUARE WITH FENCE. RAILS SHOULD BE LEVEL.
 GATE HARDWARE MUST BE MOUNTED TO TWO SIDES OF THE POST.
 FOR COMPLETE DETAILS SEE GATE INSTALLATION INSTRUCTIONS IN HARDWARE BOX.

10 LOCATE REBAR
 USE AND PLACEMENT OF REBAR IS CRITICAL FOR THE STRENGTH AND QUALITY OF A FENCE INSTALLATION. USE 2 PIECES OF 1/2" REBAR IN EACH HINGE, LATCH OR END POST.
 REBAR SHOULD EXTEND FROM THE BOTTOM OF THE HOLE TO 12" FROM THE TOP OF THE POST.
 CONNECT REBAR TOGETHER WITH REBAR SEPARATOR CLIPS.
 INSERT IN OPPOSING CORNERS OF POST.

11 FILL POSTS
 FILL POST WITH CONCRETE MIX TO COVER REBAR AND HARDWARE FASTENERS. TAMP POST WITH A RUBBER MALLET TO ELIMINATE AIR POCKETS. LEAVE GATE ON BLOCKS FOR 72 HOURS TO ALLOW CONCRETE TO SET.

12 INSTALL CAPS
 INSTALL POST CAPS
 SECURE WITH #8 X 3/4 SCREWS, CAPS & WASHERS.

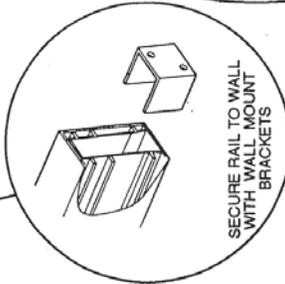
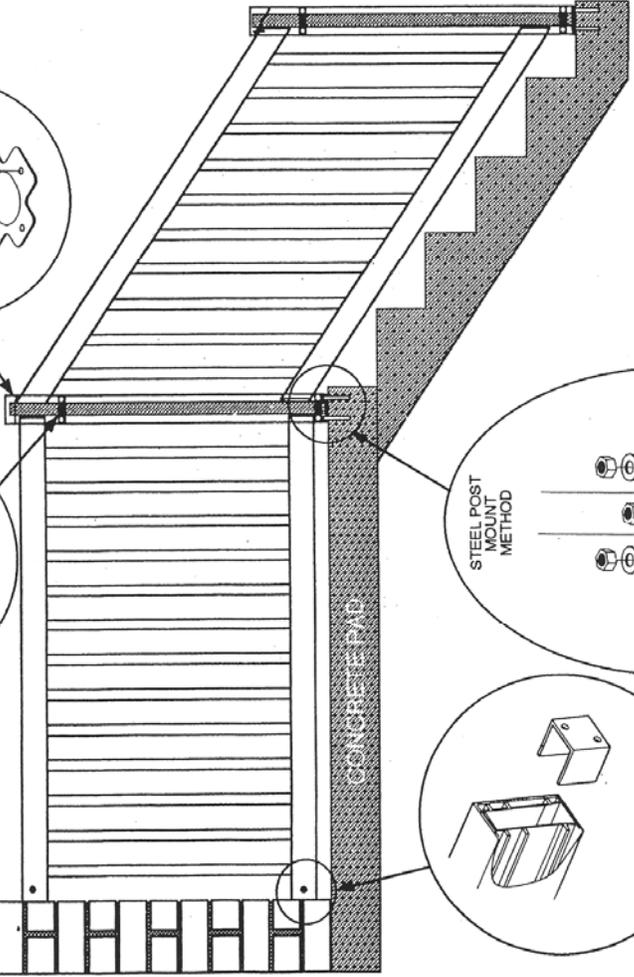
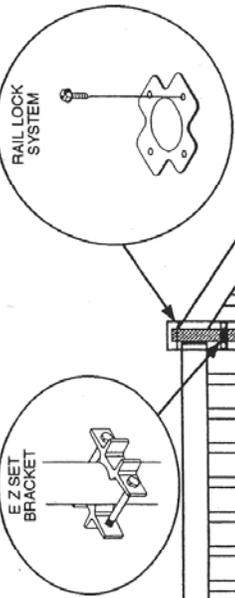


FENCE INSTALLATION INSTRUCTIONS 2021

RAILING SYSTEM ON CONCRETE WITH POST MOUNTS

INSTALLATION INSTRUCTIONS

- CENTURY
- ESSEX
- FAIRMONT
- OLYMPIA

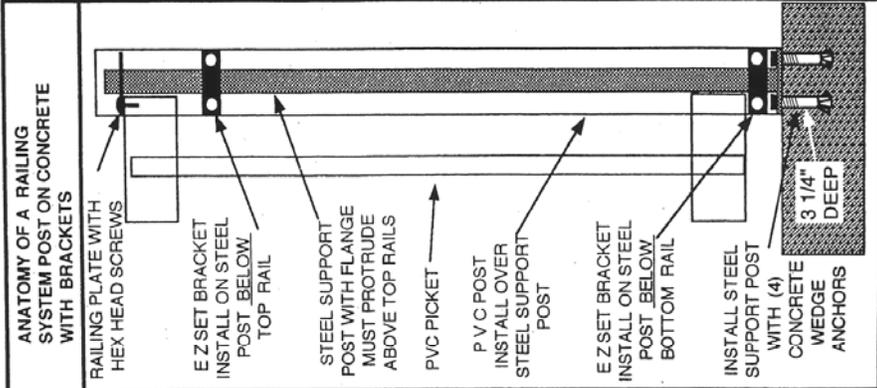


POSITION STEEL SUPPORT POST
 MARK LOCATION OF ANCHOR HOLES
 DRILL (4) 1/2" HOLES
 3 1/4" DEEP IN CONCRETE PAD.

ASSEMBLE NUT AND WASHER ON TOP OF ANCHOR.
 POSITION STEEL SUPPORT POST
 DRIVE ANCHORS THROUGH POST FLANGE INTO PAD
 EXPAND ANCHOR BY TIGHTENING NUT 3 TO 5 TURNS

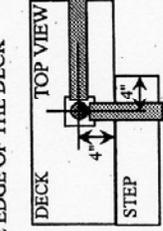
IMPORTANT
 RAILING SYSTEM MUST BE
 INSTALLED AS PER
 MANUFACTURERS
 RECOMMENDATION

INSTALLATION INSTRUCTION 3/15/06
 REVISED 9/11/07



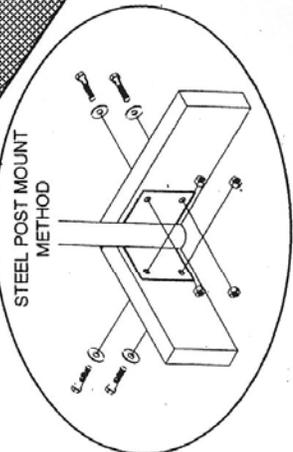
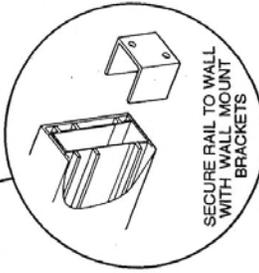
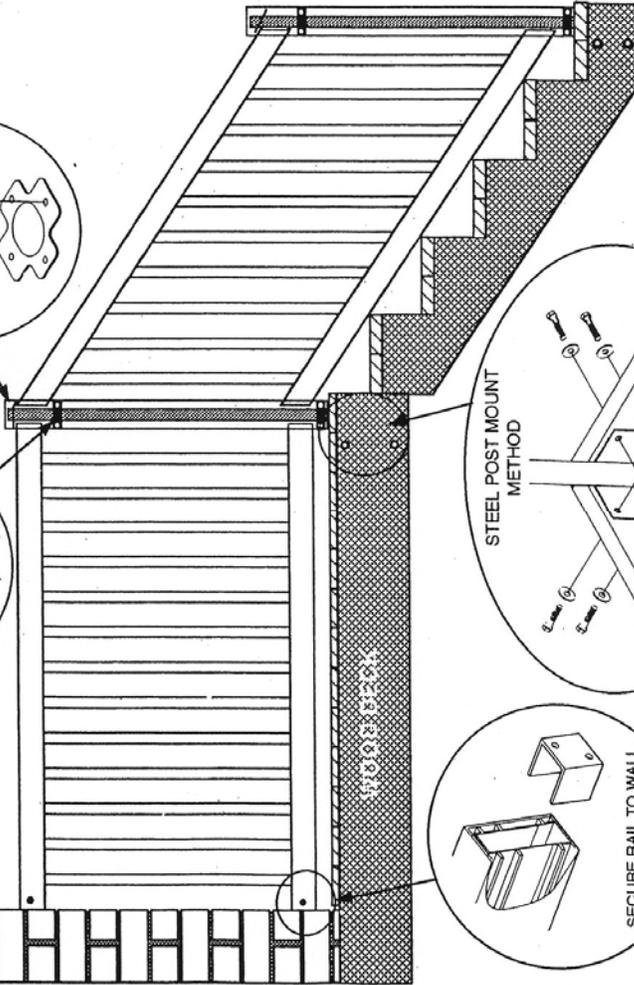
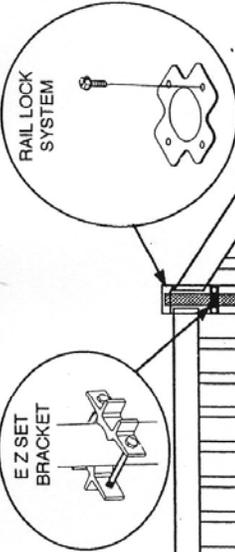
RAILING SYSTEM ON CONCRETE WITH BRACKETS

INSTALLATION INSTRUCTIONS

<p>GENERAL</p> <p>CHECK CODE REQUIREMENTS BEFORE INSTALLING RAILING. POST CENTERS ON LEVEL SURFACE = 72" OR 96" STAIRS OR SLOPES = 57" OR 78" STAIR RAILS ARE ROUTED TO ACCEPT A 32 DEGREE ANGLE. RAILING WILL BE INSTALLED WITH A GALVANIZED STEEL SUPPORT POST AND E Z SET BRACKETS ANCHORED TO CONCRETE BASE. PVC POST FITS OVER STEEL POST. INSERT RAILS SECURE RAILS INSIDE POST WITH STAINLESS STEEL PLATE AND #14 X 1" HEX HEAD SCREWS. UNEVEN STEPS MAY REQUIRE WALL MOUNT BRACKETS OR LONGER STEEL SUPPORT POSTS. STEEL SUPPORT POST MUST EXTEND ABOVE TOP RAIL.</p> <p>ALTERNATIVE MOUNTING</p> <p>WALL MOUNT BRACKETS MARK LOCATION OF BRACKET(S). DRILL 1/4" HOLES. (2) FOR NO PLATE (4) WITH PLATE, USE EXPANSION RIVETS OR LAG BOLTS TO ATTACH BRACKET TO WALL. FOR RAILING BEING INSTALLED BETWEEN 2 PILLARS USE BRACKET WITH PLATE. MEASURE DISTANCE BETWEEN PILLARS. ALLOW 1/4" FOR BRACKET PLATES, CUT RAILS, ASSEMBLE RAILING. INSTALL OPTIONAL TRIM PIECES ON RAIL ENDS. INSERT BRACKETS IN RAIL ENDS, POSITION AT CORRECT HEIGHT. ATTACH BRACKETS TO WALL LEVEL AND SQUARE RAILING SECURE RAILS TO BRACKETS DRILL 1/8" PILOT HOLES TO ACCEPT #8 X 3/4" SCREW, WASHER AND CAP.</p>	<p>1 LAY OUT RAILING LINE</p> <p>IDENTIFY LOCATION OF RAILING. DETERMINE SECTION LENGTHS. MARK POST LOCATIONS. ON LEVEL SURFACE = 72" OR 96" STAIR OR SLOPES = 57" OR 78" (MEASURED ON A LEVEL PLAIN) WALL MOUNT BRACKETS. ALLOW ROOM FOR POST TRIM BASE. LAY OUT RAILING LINE STARTING WITH A FLAT TO STAIR POST (IF APPLICABLE)</p>	<p>2 LOCATE STEEL POST</p> <p>WHEN USING A FLAT TO STAIR POST (START THE INSTALLATION AT THIS POINT) THE STEEL SUPPORT POST MUST BE INSTALLED NO MORE THAN 4" ON CENTER FROM THE EDGE OF THE DECK OR PAD.</p>  <p>DECK STEP TOP VIEW 4" 4"</p>	<p>3 INSTALL STEEL POST</p> <p>DETERMINE LOCATION OF STEEL SUPPORT POST. MARK LOCATION OF ANCHOR HOLES. DRILL (4) 1/2" HOLES 3 1/4" DEEP IN CONCRETE SURFACE. ASSEMBLE NUT AND WASHER ON ANCHOR. POSITION STEEL SUPPORT POST. DRIVE ANCHORS THROUGH POST FLANGE INTO PAD. EXPAND ANCHOR BY TIGHTENING NUT 3 TO 5 TURNS USING A 3/4" WRENCH</p>
	<p>4 ATTACH E Z SET BRACKETS</p> <p>E Z SET BRACKETS ARE DESIGNED TO CENTER P V C POST ON STEEL SUPPORT POST. ASSEMBLE BRACKET AND SLIDE OVER SUPPORT POST. BOTTOM BRACKET MUST BE LOCATED BELOW BOTTOM RAIL AS CLOSE TO THE SUPPORT POST HARDWARE AS POSSIBLE. TOP BRACKET IS LOCATED APPROX. 3" UNDER TOP RAIL. TIGHTEN WITH 7/16" WRENCH</p>	<p>5 CUT POSTS</p> <p>DETERMINE HEIGHT OF RAIL OFF PAD. TO CUT POST TO CORRECT LENGTH MEASURE DOWN FROM BOTTOM CUT OUT. MARK AND CUT. AT BASE OF STEPS OR STAIRS POST MAY NEED TO BE LONGER TO ACCOMMODATE RAIL ANGLE. LAY RAIL IN POSITION. MARK POST AT CORRECT HEIGHT. CUT POST. NOTE MAKE CERTAIN THAT STEEL SUPPORT POST WILL PROTRUDE ABOVE TOP RAIL.</p>	<p>6 CUT RAILS</p> <p>MEASURE DISTANCE BETWEEN INSIDE FACE OF STEEL SUPPORT POSTS. TRANSFER MEASUREMENT TO RAIL. MEASURE OUT FROM CENTER OF RAIL AND CUT BOTH ENDS. ALLOW APPROX. 1/8" FOR EXPANSION. MAKE SURE PICKET HOLES WILL NOT BE PARTIALLY EXPOSED AND PICKETS ARE EVENLY SPACED ON BOTH ENDS. ALUMINUM CHANNEL MUST BE SAME LENGTH AS RAIL.</p>
	<p>7 ASSEMBLE RAILING</p> <p>SLIDE POST BASE TRIM OVER P V C POST, INSERT POST OVER STEEL SUPPORT POST. INSERT BOTTOM RAIL IN POST. INSTALL POST BASE TRIM OVER 2ND POST, BRING 2ND POST DOWN PAST TOP E Z SET BRACKET. INSERT RAIL IN 2ND POST BEFORE IT PASSES OVER BOTTOM E Z SET BRACKET. INSERT PICKETS IN BOTTOM RAIL.</p>	<p>8 ASSEMBLE RAILING (CONT.)</p> <p>SLIDE TOP RAIL OVER PICKETS. INSERT TOP RAIL IN FIRST POST. RAISE UP 2ND POST UNTIL TOP HOLE CUT OUT WILL ACCEPT TOP RAIL. INSERT TOP RAIL IN HOLE AND PUSH WHOLE ASSEMBLY DOWN TO CONCRETE BASE. REPEAT THIS PROCEDURE UNTIL ALL SECTIONS ARE INSTALLED.</p>	<p>9 SECURE RAILING</p> <p>SQUARE PICKETS WITH POST. INSERT RAILING PLATE OVER STEEL SUPPORT POST. FOR FLAT TO STAIR SITUATIONS BEND ONE TAB OF THE PLATE TO FIT THE ANGLE. DRILL 3/16" HOLE THROUGH PLATE INTO RAIL & ALUMINUM CHANNEL. SECURE WITH #14 X 1" SCREW.</p> <p>10 INSTALL POST CAPS</p> <p>TO SECURE EXTERNAL CAPS ON POST DRILL 1/8" PILOT HOLE, SECURE WITH (2) SCREWS, CAPS & WASHERS. INTERNAL CAPS FIT INSIDE POST.</p>

INSTALLATION INSTRUCTIONS

- CENTURY ESSEX
- FAIRMONT OLYMPIA



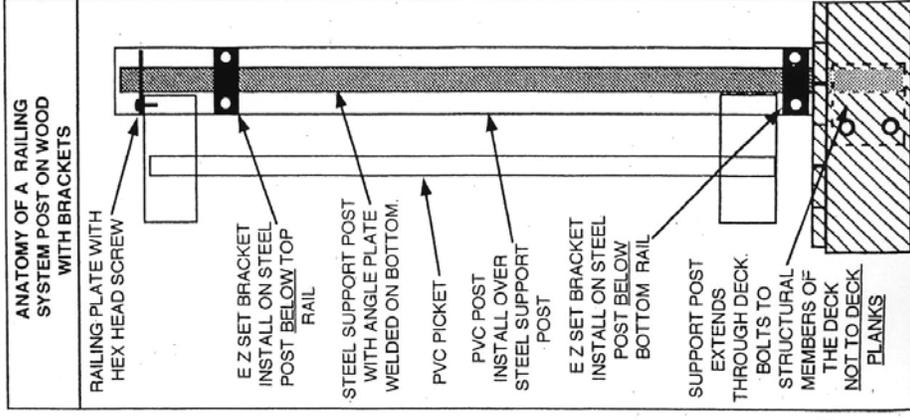
IMPORTANT
 RAILING SYSTEM MUST BE
 INSTALLED AS PER
 MANUFACTURERS
 RECOMMENDATION

IMPORTANT
 DETERMINE LOCATION OF STEEL SUPPORT POST
 DRILL 1 7/8" HOLE THROUGH DECK BOARD
 CLAMP ANGLE PLATE TO DECK JOIST
 CHECK SUPPORT POST FOR PLUMB & SQUARE
 MARK HOLE LOCATIONS, DRILL 1/2" HOLES
 SECURE SUPPORT POST WITH (4) 1/2" BOLTS

IMPORTANT NOTE
 ALL 4 BOLT HOLES OF
 ANGLED PLATE MUST BE
 ATTACHED TO JOIST.
 BOX IN JOIST WHERE
 REQUIRED

INSTALLATION INSTRUCTION 3/15/06
 REVISED 9/12/07

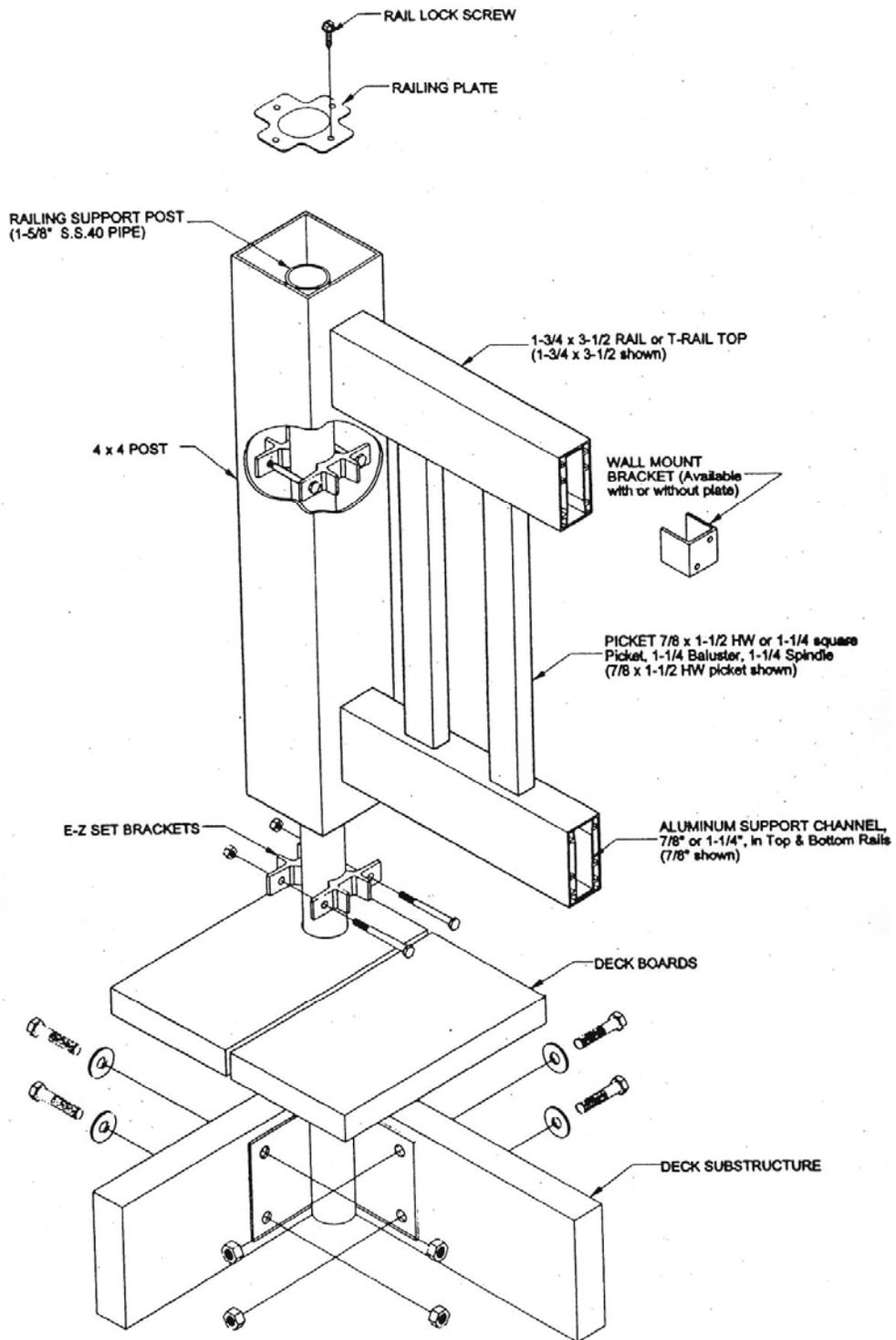
RAILING SYSTEM ON WOOD WITH POST MOUNTS



RAILING SYSTEM ON WOOD WITH BRACKETS

INSTALLATION INSTRUCTIONS

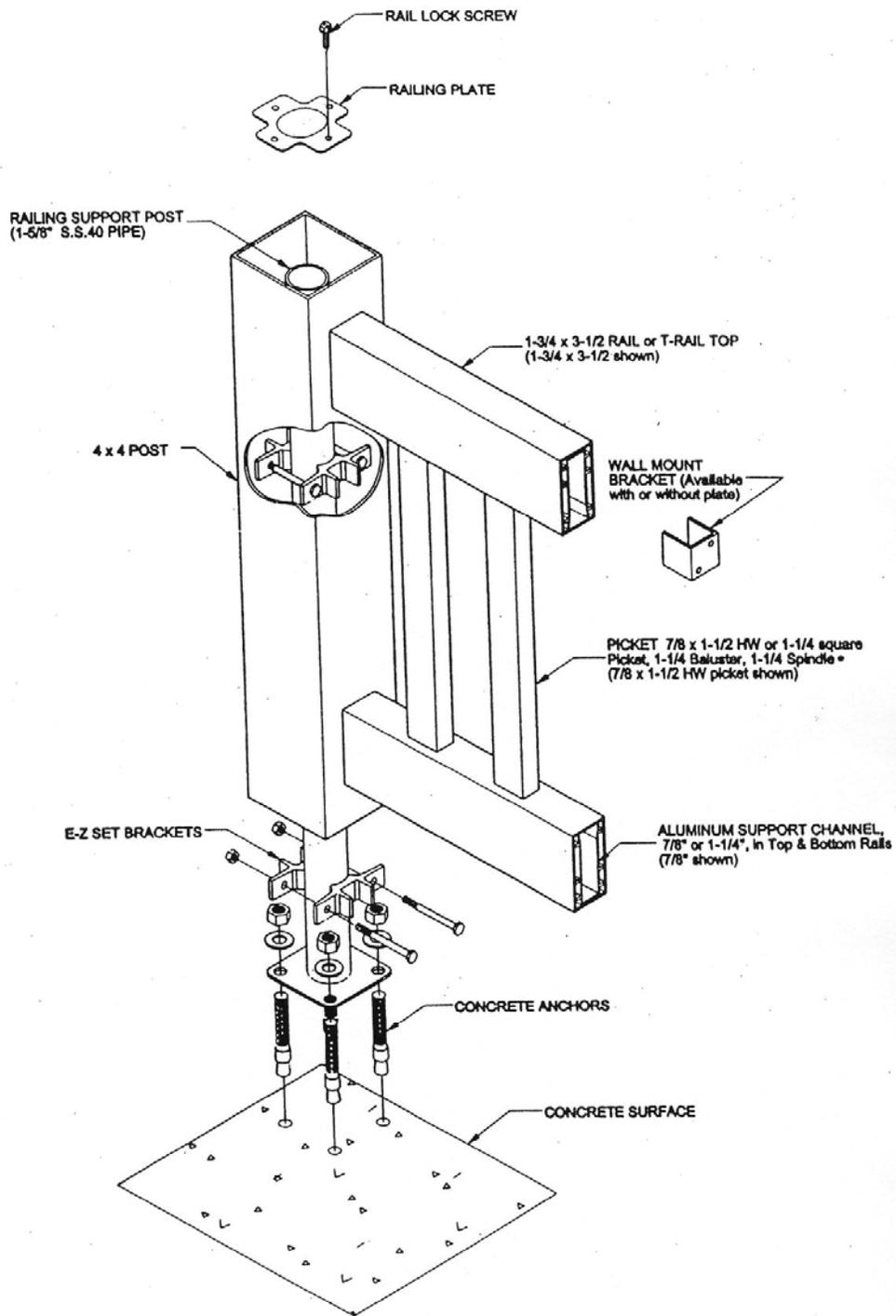
GENERAL	
<p>1 LAY OUT RAILING LINE IDENTIFY LOCATION OF RAILING. DETERMINE SECTION LENGTHS. MARK POST LOCATIONS. POST CENTERS ON LEVEL SURFACE = 72" OR 96" STAIRS OR SLOPES = 57" OR 78" STAIR RAILS ARE ROUTED TO ACCEPT A 32 DEGREE ANGLE. RAILING MUST BE INSTALLED WITH A GALVANIZED STEEL SUPPORT POST AND E Z SET BRACKETS BOLTED TO WOODEN JOIST. PVC POST FITS OVER STEEL POST. INSERT RAILS. SECURE RAILS INSIDE POST WITH STAINLESS STEEL PLATE AND #14 X 1" HEX HEAD SCREWS. UNEVEN STEPS MAY REQUIRE WALL MOUNT BRACKETS OR LONGER STEEL SUPPORT POSTS. STEEL SUPPORT POST MUST EXTEND ABOVE TOP RAIL.</p>	<p>2 LOCATE STEEL POST CHECK SQUARENESS OF DECK BEFORE ATTACHING STEEL SUPPORT POSTS. SHIM IF NEEDED. WHEN USING A FLAT TO STAIR POST START THE INSTALLATION AT THIS POINT. ALL STEEL SUPPORT POSTS MUST PROTRUDE THROUGH DECK AND ATTACH TO JOISTS IN 2 DIRECTIONS. IF ONLY ONE JOIST SURFACE IS AVAILABLE, BUILD UP JOIST TO SUPPORT BOTH ANGLES OF SUPPORT POST BASE. SUPPORT POST MUST PROTRUDE ABOVE TOP RAIL.</p>
<p>3 INSTALL STEEL POST DETERMINE LOCATION OF STEEL SUPPORT POST. MARK DECK BOARD. DRILL 1 7/8" HOLE THROUGH BOARD. FEED POLE UP THROUGH DECK OR REMOVE BOARD FOR ACCESS. TEMPORARILY CLAMP STEEL POST IN POSITION. LEVEL AND SQUARE STEEL POST. DRILL 1/2" HOLES THROUGH PLATE AND JOIST. SECURE WITH (4) 1/2" BOLTS NUTS AND WASHERS. CHECK LEVEL BEFORE TIGHTENING BOLTS. USE 3/4" WRENCH TO TIGHTEN</p>	<p>4 ATTACH E Z SET BRACKETS E Z SET BRACKETS ARE DESIGNED TO CENTER P V C POST ON STEEL SUPPORT POST. ASSEMBLE BRACKET AND SLIDE OVER SUPPORT POST. BOTTOM BRACKET MUST BE LOCATED BELOW BOTTOM RAIL. CLOSE TO THE DECK BOARDS. TOP BRACKET IS LOCATED APPROX. 3" UNDER TOP RAIL TIGHTEN WITH 7/16" WRENCH.</p>
<p>5 CUT POSTS DETERMINE HEIGHT OF RAIL. OFF DECK. TO CUT POST TO CORRECT LENGTH MEASURE DOWN FROM BOTTOM CUT OUT. MARK AND CUT. AT BASE OF STEPS OR STAIRS POST MAY NEED TO BE LONGER TO ACCOMMODATE RAIL ANGLE. LAY RAIL IN POSITION. MARK POST AT CORRECT HEIGHT. CUT POST. NOTE MAKE CERTAIN THAT STEEL SUPPORT POST WILL PROTRUDE ABOVE TOP RAIL.</p>	<p>6 CUT RAILS MEASURE DISTANCE BETWEEN INSIDE FACE OF STEEL SUPPORT POSTS. TRANSFER MEASUREMENT TO RAIL. MEASURE OUT FROM CENTER OF RAIL AND CUT BOTH ENDS. ALLOW APPROX. 1/8" FOR EXPANSION. MAKE SURE PICKET HOLES WILL NOT BE PARTIALLY EXPOSED AND PICKETS ARE EVENLY SPACED ON BOTH ENDS. ALUMINUM CHANNEL MUST BE SAME LENGTH AS RAILS.</p>
<p>7 ASSEMBLE RAILING SLIDE POST BASE TRIM OVER P V C POST. INSERT POST OVER STEEL SUPPORT POST. INSERT BOTTOM RAIL IN POST. INSTALL POST BASE TRIM OVER 2ND POST. BRING 2ND POST DOWN PAST TOP E Z SET BRACKET. INSERT RAIL IN 2ND POST BEFORE IT PASSES OVER BOTTOM E Z SET BRACKET. INSERT PICKETS IN BOTTOM RAIL.</p>	<p>8 ASSEMBLE RAILING (CONT.) SLIDE TOP RAIL OVER PICKETS. INSERT TOP RAIL IN FIRST POST. RAISE UP 2ND POST UNTIL TOP HOLE CUT OUT WILL ACCEPT TOP RAIL. INSERT TOP RAIL IN HOLE AND PUSH WHOLE ASSEMBLY DOWN TO DECK BOARD. REPEAT THIS PROCEDURE UNTIL ALL SECTIONS ARE INSTALLED.</p>
<p>9 SECURE RAILING SQUARE PICKETS WITH POST. INSERT RAILING PLATE OVER STEEL SUPPORT POST. ON FLAT TO STAIR SITUATIONS BEND ONE TAB OF THE PLATE TO FIT THE ANGLE. DRILL 3/16" HOLE THROUGH PLATE INTO PVC RAIL & ALUMINUM SECURE WITH #14 X 1" SCREW.</p>	<p>10 INSTALL POST CAPS TO SECURE EXTERNAL CAPS ON POST DRILL 1/8" PILOT HOLE. SECURE WITH (2) SCREWS, CAPS & WASHERS. INTERNAL CAPS FIT INSIDE POST.</p>



BUFFTECH VINYL RAILING SYSTEM
Wood Deck Mounting

Available in 72" & 96" Wide Sections
 36" & 42" Heights

Mark S
 10-8-87



BUFFTECH VINYL RAILING SYSTEM Concrete Surface Mounting

Available in 72" & 96" Wide Sections
36" & 42" Heights

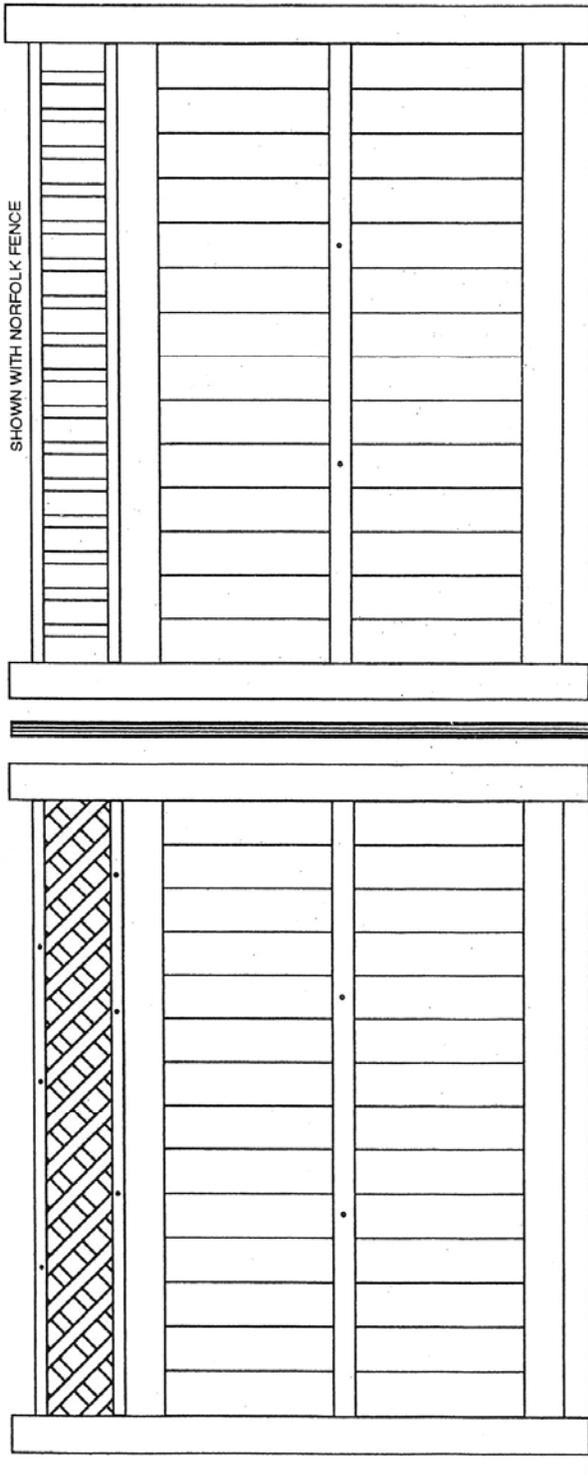
Mark 8
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INSTALLATION INSTRUCTIONS

ACCENT STYLE FENCE

INCLUDE

- LATTICE
- VICTORIAN



LATTICE

- MEASURE DISTANCE BETWEEN INSIDE FACES OF POSTS.
- CUT BOTTOM CHANNEL TO FIT BETWEEN INSIDE FACES OF POSTS
- FASTEN BOTTOM CHANNEL TO TOP FENCE RAIL WITH (5) #8 X 3/4" SCREWS EVENLY SPACED ALONG CHANNEL.
- INSERT LATTICE PANEL IN CHANNEL
- INSERT TOP CHANNEL OVER LATTICE.
- INSERT TOP CHANNEL INTO POSTS.
- SECURE CHANNEL INSIDE POSTS WITH #8 X 3/4" SCREWS
- FASTEN LATTICE TO BOTH CHANNELS WITH #8 X 3/4" SCREWS, WASHERS & SNAP CAPS. (CONNECT TO SAME LATTICE STRIP ON TOP AND BOTTOM)

VICTORIAN

- MEASURE DISTANCE BETWEEN INSIDE FACES OF POSTS.
- CUT BOTTOM ACCENT RAIL TO FIT BETWEEN INSIDE FACES OF POSTS.
- FASTEN ACCENT RAIL TO TOP FENCE RAIL WITH (5) #8 X 3/4" SCREWS INSERTED THROUGH ROUTED PICKET HOLES
- INSERT PICKETS IN RAIL
- INSERT TOP RAIL OVER PICKETS
- INSERT TOP RAIL INTO POSTS
- SECURE RAIL INSIDE POSTS WITH #8 X 3/4" SCREWS

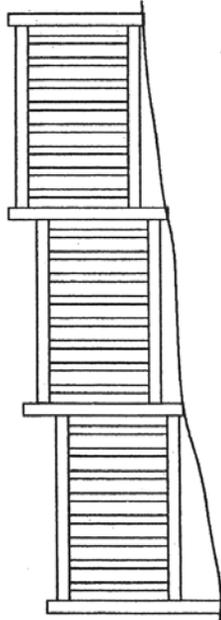
INSTALLATION INSTRUCTIONS

VARIABLE TERRAIN INSTALLATION

TWO METHODS EXIST FOR INSTALLING A FENCE ON VARIABLE SLOPING TERRAINS - STEPPING OR RACKING.

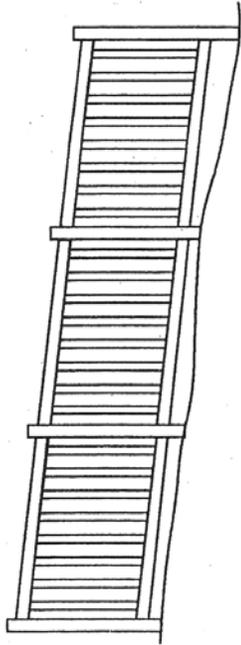
STEPPING METHOD

WITH THE STEPPING METHOD, THE RAILS REMAIN HORIZONTAL AND THE POSTS ARE EXTENDED TO ACCOMMODATE THE VARIANCE IN TERRAIN. LONGER END POSTS SHOULD BE USED AND CAN BE FIELD CUT TO ACCEPT RAILS.



RACKING METHOD - 10° OR LESS

WITH THE RACKING METHOD, THE HORIZONTAL RAILS WILL FOLLOW THE SLOPING TERRAIN. MOST FENCE STYLES WILL RACK NATURALLY UP TO 10° (OR 2" RISE PER FOOT) WITHOUT ENLARGING PICKET OR RAIL HOLES. REFER TO THE NATURAL RACKING CHART TO DETERMINE WHICH STYLES WILL RACK NATURALLY.



RACKING METHOD - 10° OR GREATER

WHEN INSTALLING A FENCE ON A SLOPE THAT IS GREATER THAN 10 DEGREES, IT IS NECESSARY TO ENLARGE THE HOLES IN THE POSTS AND RAILS. IT IS ALSO NECESSARY TO MITER THE RAILS AND PICKETS TO THE ANGLE. REFER TO THE RACKING CHART FOR PICKET AND RAIL ENLARGEMENT. TO OBTAIN EVEN PICKET SPACING AT ENDS OF FENCE SECTIONS.

MAXIMUM SLOPE CHART

FENCE STYLE	MAXIMUM SLOPE / RISE FOOT	MAXIMUM ANGLE
CONTEMPORARY	6 3/4"	35°
TRADITIONAL	6 5/16"	32°
POST & RAIL	6 3/4"	35°

DIFFICULT TO RACK, STEPPING IS RECOMMENDED

NATURAL RACKING CHART

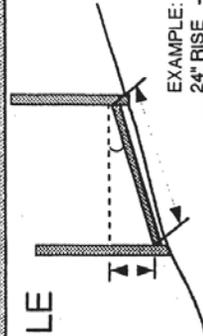
FENCE STYLE	NATURAL SLOPE / RISE FOOT	SLOPE ANGLE
CONTEMPORARY	2"	10°
TRADITIONAL	WILL RACK INDEFINITELY SEE NOTE BELOW	
POST & RAIL	2" WITH 8' LONG RAIL	10°
PRIVACY	DIFFICULT TO RACK, STEPPING IS RECOMMENDED	

NOTE: ON SEVERE SLOPES IT IS RECOMMENDED THAT END POSTS BE USED AND FIELD CUT TO ACHIEVE PROPER RAIL POSITIONING. HOLES WILL HAVE TO BE ENLARGED. ON MORE RACKS THE RAILS AND PICKETS MAY NEED TO BE CUT. ENLARGEMENT CAN BE DONE WITH A FILE OR SABER SAW.

SPECIAL NOTE: SOCKET GATES WILL NOT RACK

CALCULATE RISE / FOOT ANGLE

TO DETERMINE THE HOLE ENLARGEMENT SIZE, FIRST CALCULATE THE SLOPE RISE / FOOT OR THE ANGLE OF SLOPE. REFER TO THE DIAGRAM AND EXAMPLES.



EXAMPLE:
24" RISE → 96" LENGTH = .25 RISE PER INCH = 3" RISE PER FOOT

- 1 MEASURE SECTION LENGTH IN INCHES.
- 2 DETERMINE SECTION RISE BY USING LINE LEVEL AND MEASURING VERTICAL RISE.
- 3 DIVIDE RISE BY SECTION LENGTH TO GET RISE PER INCH.
- 4 MULTIPLY BY 12 TO DETERMINE RISE PER FOOT.
- 5 ONCE YOU HAVE DETERMINED THE RISE PER FOOT OR ANGLE, REFER TO THE HOLE ENLARGEMENT SIZE CHART

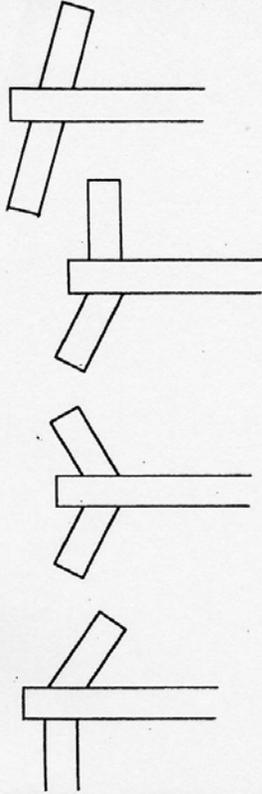
INSTALLATION INSTRUCTIONS

VARIABLE TERRAIN INSTALLATION

HOLE ENLARGEMENT SIZE CHART

RISE PER FOOT	7/8 X 1 1/2" PICKET	7/8 X 3" PICKET	2 X 4" RAIL	ANGLE
2" OR LESS	1-1/2"	3"	3-1/2"	10°
3"	1-9/16"	3-1/8"	3-5/8"	15°
4"	1-5/8"	3-1/4"	3-13/16"	20°
5"	1-11/16"	3-3/8"	3-15/16"	25°
6"	1-13/16"	3-1/2"	4-1/8"	30°
7"	1-15/16"	3-3/4"	4-3/8"	35°

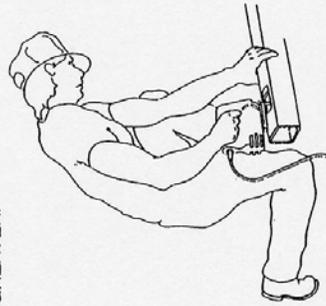
POST SELECTION
 FOR A STEADY SLOPING TERRAIN, USE END POSTS OR BLANK POSTS. MARK POSTS AND MAKE HOLES ON OPPOSITE SIDE TO ALLOW RAIL ALIGNMENT ON BOTH SIDES OF POSTS.



FOR VARIABLE SLOPING TERRAIN, USE LINE POSTS AND ENLARGE RAIL HOLES.

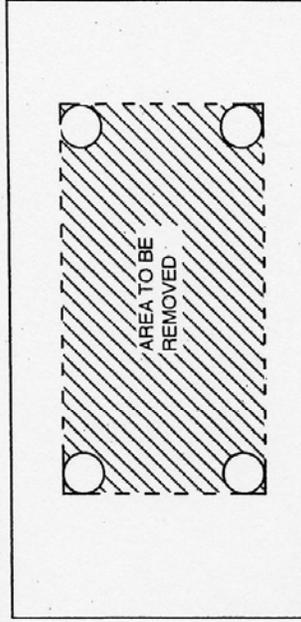
ENLARGE HOLES

USE A SABER SAW TO ENLARGE RAIL HOLE IN POST.
 EXAMPLE: MATERIAL REMOVED FROM RAIL HOLE FOR SLOPE 10° OR GREATER.



USE A FILE FOR MINOR ENLARGING AND HOLE CLEANING.

HOLE CUTTING



DETERMINE HOLE SIZE REQUIRED.
 MARK HOLE CUT OUT ON POST IN CORRECT LOCATION.
 DRILL 4 HOLES IN CORNERS, SAME AS RADIUS REQUIRED.
 CUT ALONG STRAIGHT LINES WITH A SABER SAW.
 CLEAN HOLES WITH A FILE.