

# Special Specification 4101

## Install Recycled Plastic Pins (RPP)



### 1. DESCRIPTION

Construct reinforced slope with recycled plastic pins, also known as recycled plastic lumber.

### 2. MATERIALS

Provide recycled plastic pins manufactured from polyolefin with a minimum of 20% of fiberglass additives. Length of pins will vary from 8, 10, and 12 ft. long as indicated in the plans. Materials should satisfy the following strength properties, listed in Table 1. Besides, only rectangular cross section of the RPP is recommended in Slope Stabilization. Sectional Requirements are presented in Table 2.

**Table 1**  
**Properties of RPP**

Properties	ASTM Test	Minimum Value
Flexural Strength	D6109	2,750 psi
Flexural Modulus (Secant @ 1% strain)	D6109	288,000 psi
Compressive Strength (parallel to grain)	D6108	2,800 psi
Compressive Modulus (Secant @ 1% strain)	D6108	54,000 psi
Shear Strength	D2344	800 psi

**Table 2**

Sectional requirement of RPP Properties	Value
Minimum Cross Sectional Area	12.25 inch <sup>2</sup>
Minimum Moment of Inertia along slope movement	12.5 inch <sup>4</sup>

The materials could be supplied by the following companies:

- A. Bedford Technology LLC  
 2424 Armour Road  
 P.O. Box 609  
 Worthington, MN 56187-0609  
 (800) 721-9037 & (507)372-555  
<http://www.plasticboards.com/recycled-plastic-products/fiberforce-plastic-lumber/>
- B. Renew Plastics  
 P.O. Box 480  
 Luxemburg, WI 54217-0480  
 1-800-666-5207 & (920)845-2326  
[http://www.renewplastics.com/trimax/products/structural\\_lumber.html](http://www.renewplastics.com/trimax/products/structural_lumber.html)

Manufacturers other than those listed are allowed as long as they supply material meeting or exceeds the properties listed in Tables 1 & 2.

### 3. EQUIPMENT

Furnish a crawler type mounted drilling rig that has a mast mount vibratory hammer ( model: Klemm 802 drill rig along with a KD 1011 percussion head drifter or equivalent to drive the RPPS at a desired inclination with respect to the horizontal.

A steel predriver or predrilling equipment may be used when pin refusal occurs before complete embedment of the pin. The diameter or cross sectional area of the predriver or predrilling equipment should be smaller than the diameter or cross section of the driven pin.

### 4. CONSTRUCTION

4.1 **Regrading.** Regrade and compact failed slope to proposed grade per Item 134, "Backfilling Pavement Edges."

4.2 **Driving.** Drive the specified length of recycled plastic pin into the slope at a required spacing interval and inclination from the horizontal as indicated on the plan. The top of the pin must be driven flush or below the finished surrounding ground. If the pins are driven below the surrounding ground, fill the pin holes to finished grade.

#### 4.3 Recycled Plastic Pin Installation.

4.3.1 **Refusal Depth.** Installation of RPP must be attained up to the required depth as instructed in the drawings. Any refusal of installation must be approved by the engineer in charge or selected representative of TxDOT or reinstalled by predrilling or predriving prior to RPP installation. The new hole maybe offset a one foot from the original location.

4.3.2 **Breakage or Permanent Deformation.** No breakage or deformed RPP during the driving will be acceptable. If any breakage or permanent deformation of RPP occurs in the field during driving, a new RPP must be installed in place of the broken or deformed RPP.

### 5. MEASUREMENT

Recycled Plastic Pin (RPP) will be measured by the number of pins of required length in the plans of acceptable recycled plastic pin in place. Recycled plastic pin installation tests are subsidiary to this Item.

5.1 **As Built Drawings.** An as Built Drawing with the actual measurement of RPP must be submitted to the Engineer in charge before the project handover.

### 6. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for recycled plastic pins. This price is full compensation for materials, equipment, labor, tools, installation testing and incidentals.