

TOWNSHIP OF SHALER

**FINAL REPORT
KIWANIS PARK AND WILLET ROAD
SANITARY SEWER REHABILITATION PROJECTS
APRIL 2006**

KLH 
ENGINEERS, INC.
5173 CAMPBELLS RUN ROAD
PITTSBURGH, PA 15205-9733

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FINAL REPORT
KIWANIS PARK AND WILLET ROAD
SANITARY SEWER REHABILITATION PROJECTS

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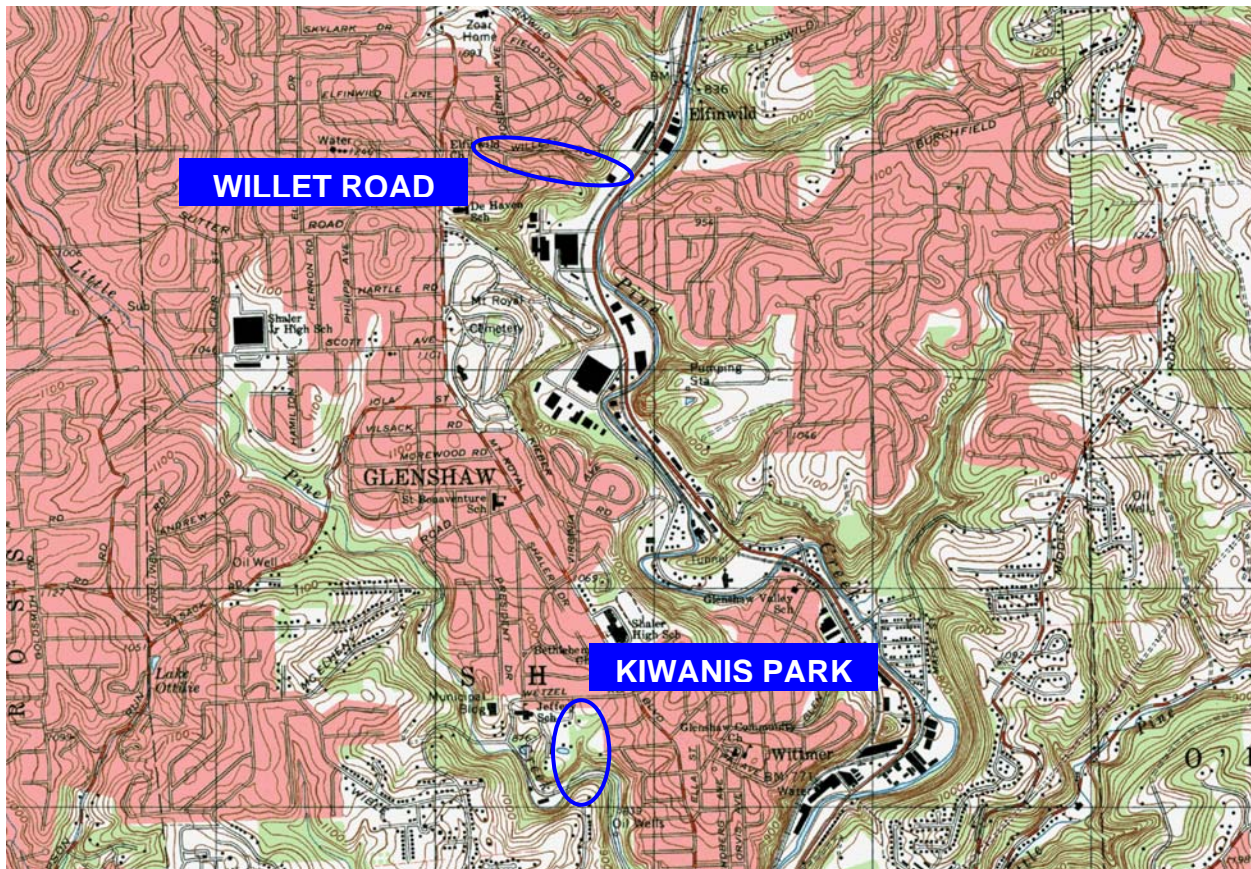
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1.0 INTRODUCTION

The Township of Shaler along with most other communities served by the Allegheny County Sanitary Authority (ALCOSAN) have been under EPA mandate to remove inflow and infiltration (I/I) from their sanitary sewer system. Typical of most sanitary sewer systems in western Pennsylvania, interceptor and collector sewers follow streams in wooded and somewhat inaccessible areas. Under this project three interceptor sewers, which traverse streams, have been identified as sources of infiltration. The three total are approximately 7,000 lineal feet. The scope of work includes the replacement of all of the 7,000 lineal feet of sanitary by trenchless technologies (pipe bursting or lining) and replacement of all brick manholes. Although bids for all three projects were solicited and received, only contracts for two areas were awarded due to their dollar value and the total available grant funding. They were the Willet Road and Kiwanis Park projects.

The goal of the project was to eliminate the severe inflow and infiltration and reduce the occurrence of overflows at the sanitary sewer overflow structures to which they contribute and demonstrate and document the impact of sanitary sewer rehabilitation on these areas.



2.0 DETERMINATION OF TRENCHLESS METHODS

Before any sewer rehabilitation was completed, CCTV inspection and evaluation was completed. Although the sanitary sewer rehabilitation portion of the project was expected to be exclusively by trenchless technologies, CCTV inspection revealed several areas of collapsed sewers which required open cut replacement. The final construction methods used for the projects were as follows:

Method	Quantity
Kiwanis Park Project	
Cured In Place Liner	199
Pipe Bursting	1,461
Open Cut	213
Total	1,873
Willet Road Project	
Cured In Place Liner	1,596
Pipe Bursting	822
Open Cut	-
Total	2,418

3.0 PRECONSTRUCTION EVALUATION

The demonstration portion of the project was to demonstrate and document the impact of sanitary sewer rehabilitation through streams in wooded and somewhat inaccessible and undeveloped areas. In order to complete the preconstruction evaluation the contractor was required to employ the services of a botanist to inventory the preconstruction conditions and recommend restoration methods to restore, as closely as possible, the preconstruction inventory.

In general, the Botanical Inventory found no “critical habitat or species of special concern” in either of the project areas. The Botanical Inventory prepared by Ecological Restoration, Inc. is provided with this report as Appendix A. Also, the methods prescribed for restoration by Ecological Restoration, Inc. varied little from those indicated in the project bid documents.

In addition to the Botanical Inventory pre and post construction aerial photography was completed for both areas. All of the preconstruction aerial photographs for the Willet Road and Kiwanis Park projects are provided as Appendices B and C, respectively. Preconstruction aerial photographs were taken on December 3, 2005.

4.0 *POSTCONSTRUCTION EVALUATION*

The projects were completed over a one month period. Restoration techniques and methods identified in the Botanical Inventory prepared by Ecological Restoration, Inc. were followed.

Post construction aerial photographs of the projects were taken on January 12, 2006. All of the postconstruction aerial photographs for the Willet Road and Kiwanis Park projects are provided as Appendices B and C, respectively.

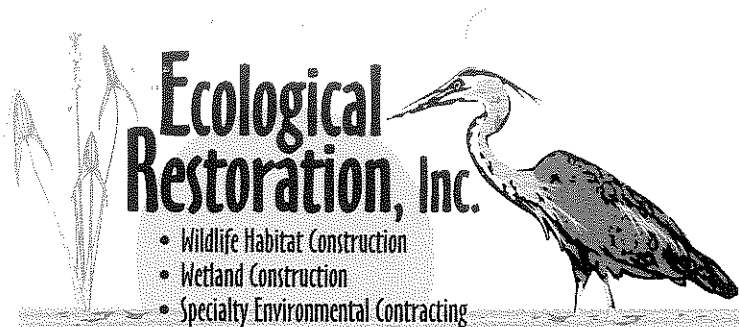
5.0 ***SUMMARY***

The project was efficient and, as seen when comparing the pre and post construction photographs, had little impact on the surroundings. These projects demonstrate that by using trenchless methods for sanitary sewer rehabilitation, impacts on the natural landscape are minimized.

Construction through narrow, heavily wooded valleys presented challenges during construction including access and staging. The contractor was able to overcome these difficulties through the use of some specialized equipment including a track mounted truck. Because access was limited to a single line of access, planning and coordination of the movement of equipment and materials to the specific area of work was critical.

APPENDIX A

BOTANICAL RESTORATION
ECOLOGICAL RESTORATION, INC.



194 Goodview Drive
Apollo, PA 15613

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Fax: (724) 727-3778
E-Mail: wetplants@aol.com

Botanical Inventory

**Kiwanis Park Storm Sewer and Sanitary Sewer Rehabilitation Project
Shaler Township, Allegheny County, Pennsylvania**

Prepared for:

**Alex Paris Contracting Co., Inc.
Route 18
Atlasburg, Pa 15004**

Prepared by:

**Dave Hails, Certified Ecologist
Ecological Restoration, Inc.
194 Goodview Dr.
Apollo, Pa 15613**

Survey Date: October 14, 2005

1.0 Introduction

Rehabilitation of the Kiwanis Park Storm Sewer and Sanitary Sewer requires the disturbance of vegetation in the vicinity of an intermittent stream channel to Little Pine Creek. A botanical survey was completed prior to the disturbance to document the vegetative community present and to aid in the recommendation for restoration.

2.0 Methods

The specifications for the project called for a complete inventory using the habitat zone method with several 5 meter sampling plots. A habitat zone was considered a distinct difference in the vegetative community. A preliminary survey determined that the entire project survey area consisted of only one habitat zone with no distinct differences. Therefore, it was decided that in order to get the most accurate documentation of the species present, the entire site would be surveyed. Species were ranked in accordance to their dominance.

3.0 Findings

Table 1 shows the results of the survey. No critical habitat or species of special concern were observed.

Table 1
List of Plant Species – Kiwanis Park Storm Sewer Rehabilitation Area

<u>Scientific Name</u>	<u>Common Name</u>	<u>Dominance*</u>	<u>Life Stage**</u>
<i>Dennstaedtia punctilobula</i>	Hay scened fern	A	A,S
<i>Berberis thunbergii</i>	Japanese barberry	O	A,S
<i>Hamamelis virginiana</i>	Witch hazel	O	A,S
<i>Viburnum dentatum</i>	Arrowwood	A	A,S
<i>Acer saccharum</i>	Sugar maple	A	A,S
<i>Polystichum acrostichoides</i>	Xmas fern	A	A,S
<i>Glechoma hederacea</i>	Ground ivy	A	A,S
<i>Toxicodendron radicans</i>	Poison ivy	A	A,S
<i>Fraxinus Americana</i>	White ash	A	A,S
<i>Carpinus carolineana</i>	Hornbeam	O	S
<i>Cornus florida</i>	Flowering dogwood	O	A,S
<i>Eupatorium rugosum</i>	White snakeroot	A	A,S
<i>Aster vimineus</i>	Small white aster	A	A
<i>Solidago graminifolia</i>	Flat-top goldenrod	A	A
<i>Polygonum persicaria</i>	Pinkweed	A	A
<i>Impatiens capensis</i>	Touch-me-not	A	A
<i>Lindera benzoin</i>	Spicebush	A	A,S
<i>Sambucus canadensis</i>	Elderberry	A	A,S
<i>Quercus rubra</i>	Red oak	A	A,S
<i>Viburnum cassinoides</i>	Wild raisin	A	A,S
<i>Polygonum cuspidatum</i>	Japanese knotweed	A	A,S
<i>Platanus occidentalis</i>	Sycamore	A	A,S
<i>Aronia melanocarpa</i>	Black chokeberry	O	A
<i>Lonicera japonica</i>	Japanese honeysuckle	A	A,S

*

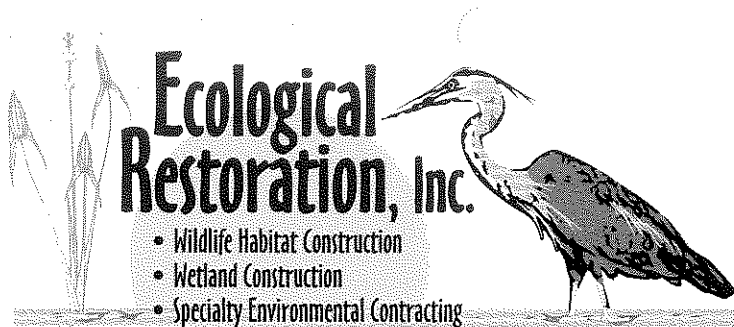
A= abundant

O= occasional

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A= adult

S= seedling/immature



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Revegetation Plan

Kiwanis Park Storm Sewer and Sanitary Sewer Rehabilitation Project Shaler Township, Allegheny County, Pennsylvania

Prepared for:

**Alex Paris Contracting Co., Inc.
Route 18
Atlasburg, Pa 15004**

Prepared by:

**Dave Hails, Certified Ecologist
Ecological Restoration, Inc.
194 Goodview Dr.
Apollo, Pa 15613**

November, 2005

1.0 Introduction

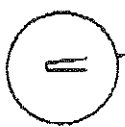
On October 14, 2005 a botanical inventory was completed in the vicinity of the Kiwanis Park Storm Sewer and Sanitary Sewer Rehabilitation Project. Findings were presented in a separate report by Ecological Restoration, Inc.

2.0 Plan for Restoration

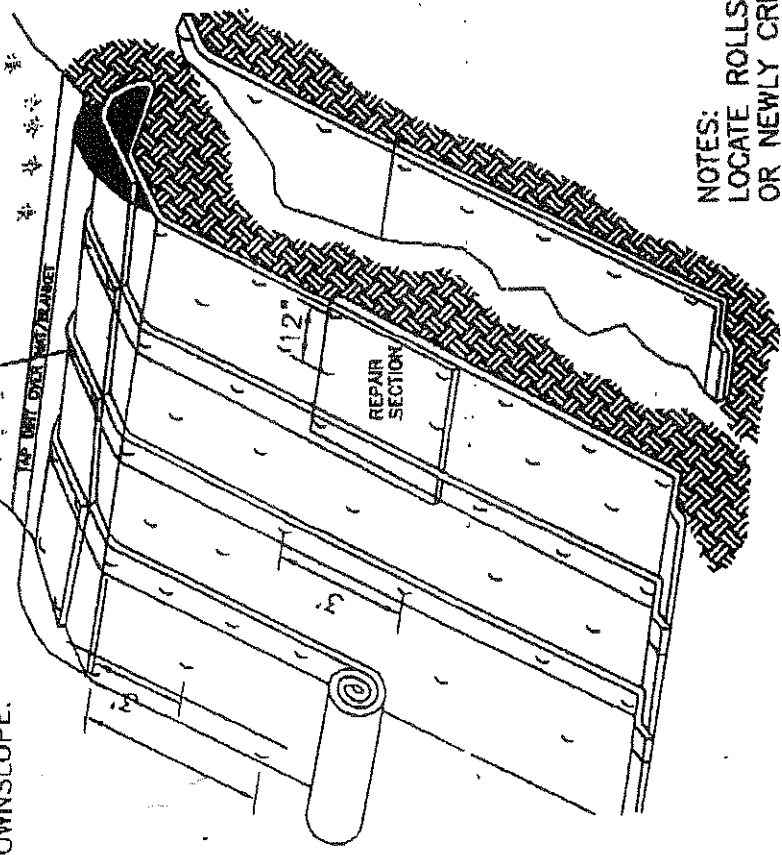
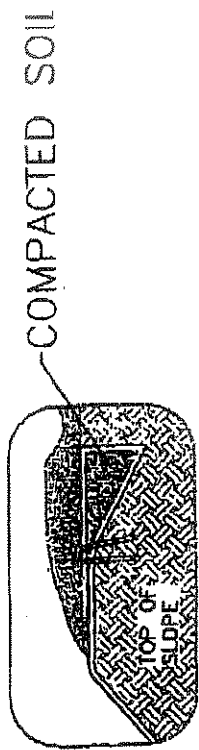
Based on the findings, it appears that there are no special needs for the restoration. Basic techniques should be used. This document can be used as a guide to complete the restoration. Due to the abundance of tree seedlings observed and the non-disturbance of many mature mast-producing trees, it does not appear as if any trees will need to be planted. However, erosion may be a concern, so a good mix of grasses will be required for the restoration. The grass mix should include, but not be limited to, several shade tolerant perennial species such as *Agrostis stolonifera* (creeping bentgrass) as well as cover crops such as annual ryegrass (*Lolium spp.*). *Panicum virgatum* (switchgrass) is recommended due to its ability to hold soil tightly together, preventing erosion. Heavy straw mulch is recommended. In addition to the grasses, *Viburnum dentatum*, a shade-tolerant streambank shrub, 12-18" bare-root seedlings should be installed on 3 foot centers, only on the disturbed banks of the stream. These will help with potential erosion due to their fibrous root system and will replace some of those lost as this was the dominant shrub in the project area. A recommended seed mix is provided in Table 1.

In areas where erosion potential is severe or where exposed freshly disturbed soil is within the wetted perimeter of the channel, high velocity WSC700 coir fiber matting (Wetland Supply Co.), or equivalent, should be used. This matting is 100% biodegradable and should be anchored using 6 or 8 inch staples on 3 foot centers. The top and bottom should be trenched-in if possible (sometimes not possible due to rock). Figure 1 shows the detail for this application. Table 2 shows the specifications for the matting.

STAPLES



MATS/BANKETS SHOULD BE VERTICALLY DOWNSLOPE.



SLOPE SURFACE SHALL BE TOPSOIL WHICH IS FREE OF ROCKS, CLODS, STICKS, AND GRASS. MATS/BANKETS SHALL HAVE GOOD SOIL CONTACT.

LAY BANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE TOPSOIL. DO NOT STRETCH.

ALTERATIONS TO INSTALLATION METHODS SHALL BE PERFORMED ONLY WITH THE APPROVAL OF THE ENGINEER.

NOTES:
LOCATE ROLLS AT BASE OF DISTURBED OR NEWLY CREATED SLOPES AND AT OTHER LOCATIONS AS DESIGNATED BY FIELD ENGINEER.

FIGURE 1
EROSION CONTROL
MAT DETAIL

Table 1

**Recommended Seed Mix
Kiwanis Park Storm Sewer and Sanitary Sewer Rehabilitation Project**

<u>Scientific Name</u>	<u>Common Name</u>	<u>% in mix</u>
Lolium multiflorum	Annual ryegrass	40
Lolium perennes	Perennial ryegrass	25
Agrostis stolonifera	Creeping bentgrass	10
Panicum virgatum	Switchgrass	10
Festuca rubra	Creeping red fescue	10
Elymus Canadensis	Canada wildrye	5

Application rate 25 lbs. per acre

Table 2

COCOMAT™ SPECIFICATIONS



PROPERTY/TEST	UNIT	400	700	CM 900
ISO 9002		CERTIFIED	CERTIFIED	CERTIFIED
Structure/Material		Woven/100% Coir	same	same
Yarns Used		Anjengo, Aratory, Vycome	same	same
MD & XD Ends		4.6 & 4.0/10 cm	11 & 7/10 cm	13 & 7/10 cm
Weight ASTM-D3776	g/m ² oz/yd ²	400.00 11.8	700.00 20.6	900.00 26.6
Thickness	mm	7.57	6.34	8.59
Thickness D1777	mils	297.80	249.60	338.30
Open Area	%	65	50	39
Grab/Elongation (DRY) ASTM-D4594	lbs/%	MD 58.8/24.6% XD 55.3/33.0%	MD 115.8/23.9% XD 54.1/33.5%	MD 154.9/31% XD 60.4/30.3%
Grab/Elongation (WET) ASTM-D4594	lbs/%	MD 45.1/35.0% XD 42.3/37.2%	MD 114.7/52.3% XD 48.4/42.9%	MD 124.4/55.0% XD 48.8/45.6%
Manning's "n" value		n=0.0254	n=0.0294	n=0.0334
Water Flow Velocity	ft/sec	8	10	15
Maximum Shear Stress	lbs/ft ²	3.1	4.46	4.63

PRODUCT

APPLICATIONS

CM 4000™	3:1 & < Slopes; Low Flow Channels; Native Seeding; Wetland Planting; Filter Strip Planting; Live Staking
CM 7000™	1:1 < Slopes; Moderate to Medium Flow Channels; Native Seeding; Vegetated Geogrids; Live Staking; Trench Packing; Brush Layering; Contour Wattling
CM 9000™	1:1 > Slopes; High Flow Channels; Vegetated Geogrids; Live Staking; Trench Packing; Brush Layering; Contour Wattling; Trail Protection; Beach/Tidal Areas
Other	Please inquire about other sizes, shapes and weights not stated.

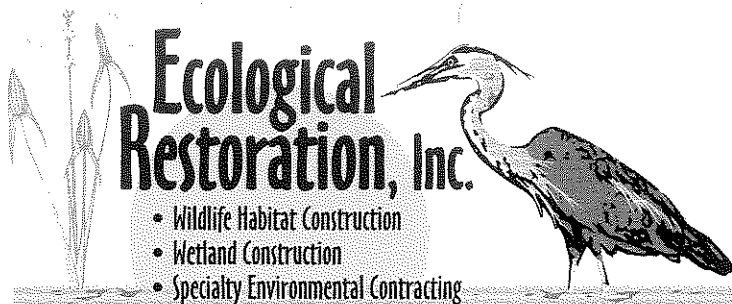
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1.0 Introduction

Rehabilitation of the Willet Road Sanitary Sewer in Allegheny County, Shaler Township, requires the disturbance of vegetation in the vicinity of an unnamed intermittent stream channel. A botanical survey was completed prior to the disturbance to document the vegetative community present and to aid in the recommendation for restoration.

2.0 Methods

The specifications for the project called for a complete inventory using the habitat zone method with several 5 meter sampling plots. A habitat zone was considered a distinct difference in the vegetative community. A preliminary survey determined that the entire project survey area consisted of only one habitat zone with no distinct differences. Therefore, it was decided that in order to get the most accurate documentation of the species present, the entire site would be surveyed. Species were ranked in accordance to their dominance.

3.0 Findings

Table 1 shows the results of the survey. No critical habitat or species of special concern were observed.

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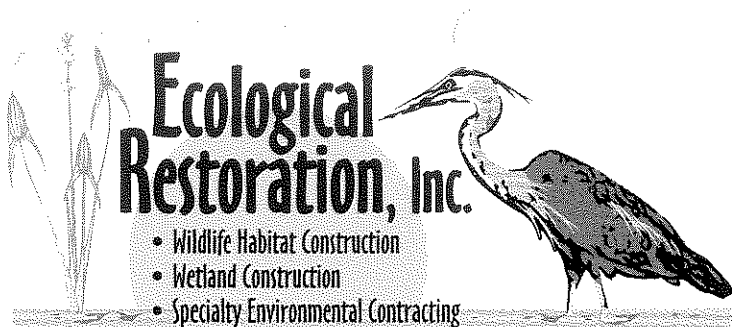
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<i>Eupatorium rugosum</i>	White snakeroot	A	A,S
<i>Lindera benzoin</i>	Spicebush	S	A,S
<i>Sambucus canadensis</i>	Elderberry	A	A,S
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<i>Viburnum cassinoides</i>	Wild raisin	A	A,S
<i>Lonicera japonica</i>	Japanese honeysuckle	A	A,S
<i>Hedera helix</i>	English Ivy	A	A
<i>Tsuga canadensis</i>	Hemlock	A	A, S
<i>Prunus serotina</i>	Black cherry	A	A,S
<i>Tilia americana</i>	Basswood	O	A

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A= abundant
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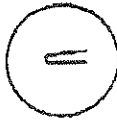
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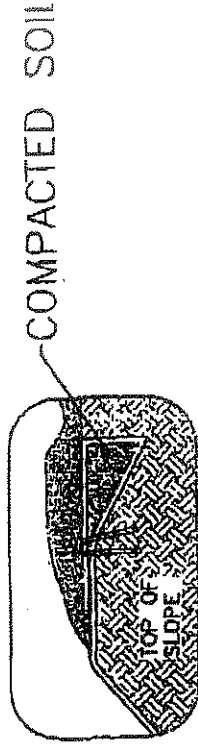
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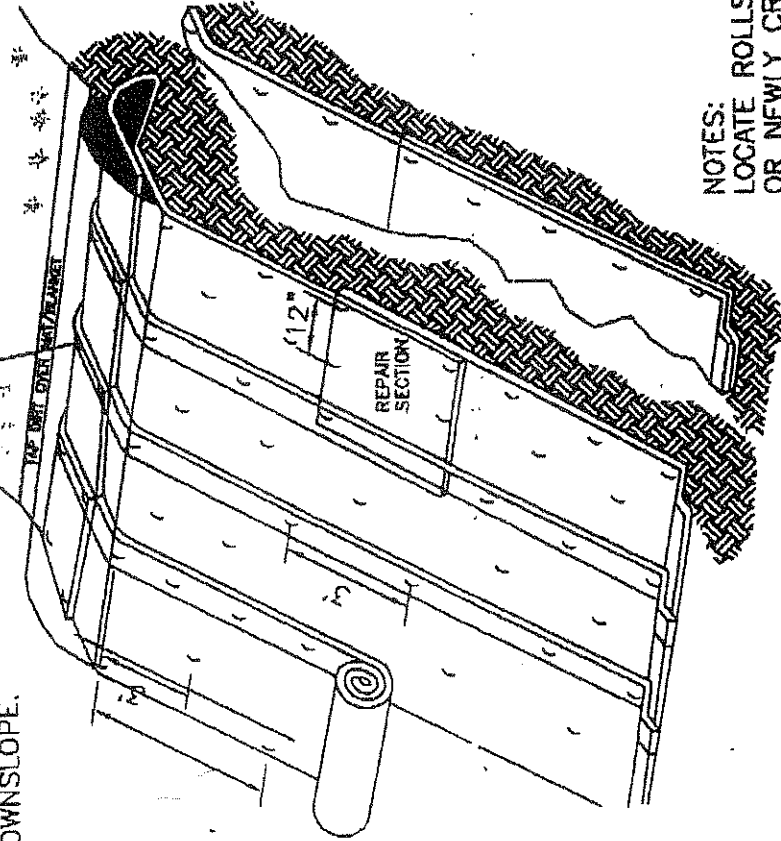


MATS/BLANKETS SHOULD BE VERTICALLY DOWN SLOPE.



COMPACTED SOIL

TOP OF SLOPE



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APPENDIX B

WILLET ROAD PROJECT
PRE CONSTRUCTION AERIAL PHOTOGRAPH
POST CONSTRUCTION AERIAL PHOTOGRAPH



Willet Road Project Area – Post Construction Photo



Willet Road Project Area – Pre Construction Photo

APPENDIX C

KIWANIS PARK PROJECT
PRE CONSTRUCTION AERIAL PHOTOGRAPH
POST CONSTRUCTION AERIAL PHOTOGRAPH



Kiwanis Park Project Area – Pre Construction Photo



Kiwanis Park Project Area – Post Construction Photograph