

INVESTIGATION OF THE ROAD REHABILITATION OPTIONS

LONGMEADOW DRIVE

TOWN OF POMFRET, CONNECTICUT

April 20, 2017

Prepared by:

LENARD ENGINEERING, INC.
GLASTONBURY, CONNECTICUT

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1. INTRODUCTION

On March 20, 2017 the Town of Pomfret, Connecticut retained Lenard Engineering, Inc. (LEI) to investigate pavement rehabilitation options and their environmental implications for Longmeadow Drive and its seven cul-de-sacs. The investigation became necessary because last summer a coal tar containing rejuvenator product, called *Pavement Dressing Conditioner (PDC)* was applied over the surface of said road and neighborhood residents became concerned about the short and long term health effects of *Polycyclic Aromatic Hydrocarbons (PAH's)* in the coal tar product.

From engineering perspective coal tar containing pavement sealcoats and rejuvenators are good and reliable. These products are used widely in commercial and military applications, however, since PAH's were discovered to be potentially cancer causing agents, their residential use is being gradually phased out.

Contact with PAH containing compounds can have short and long term health effects. The short term effects occur during the one to three weeks long curing period of the pavement sealants and rejuvenators and are associated with inhalation of airborne fumes from and direct contact with the tacky surface of the curing products. By the end of the curing period coal tar becomes chemically stable and the short term health effects dissipate. The long term health effects however may persist as long as the product is present on the road surface. PAH's are not soluble in water, but can be transported and get into biological systems on airborne dust and waterborne particles from the wearing road surface.

Longmeadow Drive and its cul-de-sacs were built in the mid - 1990's. PDC was applied last summer over the 23 years old roads and curbs in an attempt to stop and possibly reverse their deterioration and possibly postpone a more substantial and expensive pavement rehabilitation. By the time the implications of the coal tar based rejuvenator were realized the period of the short term health effects was over. The municipality's current objective is rehabilitation the road and the abatement of the PDC in an environmentally acceptable way.

A town commission, formed by and of knowledgeable local residents conducted extensive research on the PDC and the environmental/health effects of coal tars and PAH's. They made their results available to LEI, so we could focus on engineering issues in our investigation.

2. EXISTING CONDITIONS

Longmeadow Drive is a loop collector subdivision road connecting to Route 44 and Gary School House Road at its southerly and easterly ends respectively. The easterly terminal point of the road at its intersection with Gary School House Road is coincidental with the Pomfret/Putnam Town Line. Seven short, dead end side streets (called circles) of the average length of 300 feet connect to the road. The road was designed in 1993 by *Wenners Engineering Group of Hartford Connecticut*.

For layout and dimensions of Longmeadow Drive LEI utilized the information available in the original design documents. Construction line item quantities were estimated based on the following original survey and design drawings by Wenners Engineering Group:

- Sheet 2 of 7 – Property History / Index Map
- Sheet 6 of 7 – Construction Detail & Notes
- Sheet 7 of 7 – Erosion & Sediment Control Requirements and Details

Design specifications of the roadway reference the State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges, and Incidental Construction, Form 814, 1988.

The combined length of Longmeadow Drive and its side streets is approximately 7,200 feet. The typical curb to curb width of the roadway is 26 feet. The cross-slope of the crowned section is ¼ inch per foot (2.0 %). The cross slope varies; the road appears slightly superelevated in the horizontal curves. Curbs along the road are 6 inch bituminous lip curbing. The pavement structure consists of a 1 inch thick, class 2 wearing course overlying a 2 inches thick, class 1 base course. The road base consists of 6 inches of compacted processed aggregate over 12 inches thick rolled gravel subbase. The existing storm drainage consists of 26 type “C” catch basins and pipes. The drain pipes outlet into natural water courses at low points. There are no overhead wire utilities along the road. Power and communication cables are buried along the road right-of-way.

3. CONSTRUCTION ESTIMATES AND LINE ITEMS

The attached construction cost estimates were prepared with the Connecticut Department of Transportation Estimator software and data base of line items and unit prices. The data base cannot be customized for specific projects therefore item not found in the database were substituted with similar, available items. For example, item 0406133 – Rubberized Chip Seal was used for Stress Absorbing Membrane by All States Material Group, and item 0406278 – Micro-Milling of H.M.A. (0”-2”) was used for Shot Blasting of the existing pavement. No Prevailing Wage Rates were assumed in the estimates. The estimates are surcharged 10% for contingencies.

The estimates are not competitive bids, and are based on estimated quantities generated from the available documents, not on exact design plans. The estimated construction costs therefore are comparative only, can be used to select the most prudent rehabilitation option, but should not be used for budgeting purposes. The estimates for the four construction options are included in Appendix A.

4. HEALTH AND ENVIRONMENTAL CONSIDERATIONS DURING CONSTRUCTION

The PDC rejuvenator on the existing pavements, curbs, catch basins, etc. is cured already, and can have long-term health effect only as it is transported on airborne dust or waterborne debris. Therefore it is imperative to prevent or minimize the generation of dust or sediment during construction in each of the rehabilitation options investigated. Dust and sediment are generated primarily during shot blasting and pavement milling and to a lesser extent in other construction procedures.

- Shot blasting is a relatively inexpensive procedure, primarily used for cleaning of concrete floors in buildings as a preparation for application of coating or finishing. Not often, but it is also used to clean bituminous road surfaces prior to seal coating or overlaying. Shot blasting is performed by high-speed striking the surface with small size steel media. The contact area with the

pavement is sealed in a curtain enclosure, and the steel media and the pavement particles are vacuumed back into a collection drum. The steel media is magnetically separated from the pavement millings and re-used. In addition to its relatively low cost the controlled dust/sediment generation is an advantage of this procedure. A disadvantage of the procedure is its limited (less than ¼ inches) penetration into the pavement; less than the estimated 3/8 inches penetration of PDC. Shot blasting would not remove PDC from the existing pavement completely, but would well prepare its surface for SAM coting or HMA overlay. Millings collected in the machine's storage drum will be PAH-laden material and would need to be handled and disposed of as *controlled material*.

One company we managed to contact, and is a potential candidate for this project:

Shot Blast Inc.

203 East 10th Street.

Box # 19

Marcus Hook, Pa 1906

Email: info@shotblastinc.com

Office: 610.494.1330

Fax: 610.494.1870

- Pavement milling is the most wildy used method to recycle bituminous pavement. It can be partial- depth as preparation for overlaying or full-depth as part of pavement reclamation. It would remove PDC from the pavement completely, but dust and sediment control is not integral part of the procedure and has to be provided for separately. Water spaying over the milled surface helps to reduce dust, but the volume of water used shall be limited, otherwise PAH-laden sediment would be carried into the drainage system. Immediate vacuuming the roadway behind the milling machine can help to minimize the entry of water and sediment into the drainage structures. Contract specifications shall be carefully worded to make dust control effective. In case of partial-depth procedure the milling has to be handled and disposed of as *controlled material*. In case the pavement milled full-depth, the milling can be either disposed of or reclaimed and added to the road base. In case of the reclamation the PAH-containing millings would remain at the site but locked permanently in the road base.
- Catch basin protection - Geotextile silt sacks shall be installed in the catch basing under the grates to catch and retain PAH-contaminated and water-transported sediment. The sediment collected on the fabric can be safely removed, transported, and disposed of with the geotextile silt sacks. The silt sack can typically safely retain grain sizes between 0.002 mm and 0.075 mm. Silt sacks can be either purchased ready or prepared at the site. If prepared at the site, sediment control geotextile material (wire-supported or self-supported) from the Connecticut Department of Transportation Qualified Product List is recommended.
- Catch basin cleaning is likely the most problematic component of all four rehabilitation options. The precast concrete tops and steel grates as well as partially the interiors of the existing catch basins were sprayed with PDC. Due to the abrasive effect of traffic and the water-transported

road sand the PDC spraying on the catch basing components would gradually erode and the particles end up in the receiving water bodies. To prevent this undesirable process the following construction line items are recommended and used in the cost estimates:

- a) Line item 0507006 – Type “C” Catch Basin Top covers for the replacement of the pre-cast concrete catch basing top. Few of the existing 26 catch basins will have their tops replaced; this item is used as a contingency. Replacement of the tops could be considered specifically in Option No. 4, in which the tops need to be reset to the new roadway grade.
 - b) Line item 0507014 – Type “C” Catch Basin – Frame and Grate covers for the replacement of the grates on all 26 catch basins. Replacing the grates is more cost effective than cleaning them.
 - c) Line item 0653001 – Clean Existing Catch Basin covers for the collection and removal of all contaminated sediment that accumulated in the sump of each structure. The sediment can be vacuumed out of the structures easily and inexpensively upon completion of the project. This line item however does not cover for the cleaning the sprayed interior of the catch basins. The vertical walls are not subject to direct wear, and sprayings will likely stay on the walls indefinitely. Cleaning of the walls therefore can be omitted.
- Curb replacement – The existing bituminous curbs, just as the catch basin tops and grates, were sprayed with PDC. In lieu of cleaning, the curbs should be removed, ground, disposed of as *controlled material*, and replaced with new curbs. Replacement is also justified by the age of the curbs.
 - Controlled Material – This terminology is used in the Connecticut Department of Transportation Estimator software, and conveniently used this report for waste materials resulting from pavement milling, pavement shot blasting, or cleaning of the catch basins. Unless reclaimed at the site or utilized otherwise locally or by the contractor, these materials can be disposed of with a permit from the Connecticut DEEP, only in landfills stipulated in the permit. The Connecticut DEEP sometimes uses the terminology “Special Waste” for these materials.
 - Pilot Program – In all four options dust generation and dust control is of major concern in the community. Whichever option is eventually selected for the project, it is recommended that the contract specifications include a pilot program to be executed in a remote area within the town, where the effectiveness of the dust control can be observed and evaluated before the procedure is applied in the actual project site.

5. REHABILITATION OPTIONS

As was stated, the two objectives of the project are the rehabilitation of the roadway and the abatement the environmentally harmful pavement rejuvenator (PDC) previously applied to the road surface.

We examined four rehabilitation/abatement options with their associated environmental and health effects, advantages and disadvantages. The following is a tabulated summary of the four options:

OPTION	SCOPE OF CONSTRUCTION	ENVIRONMENTAL & HEALTH CONSIDERATIONS		ESTIMATED CONSTR. COST
		ADVANTAGES	DISADVANTAGES	
Option No. 1 Mill 1 inch and overlay with HMA	<ol style="list-style-type: none"> 1. Set up E&S control along curbs and at CB's 2. Remove existing curbing 3. Mill top 1 inch of pavement 4. Dispose of millings as controlled material 5. Clean catch basins 6. Overlay with 1 inch HMA 7. Install new AC curbing 8. Restore top soil and grass area behind curb 9. Clean catch basins upon project completion 10. Provide MPT, cleanup 	<ol style="list-style-type: none"> 1. All PAH-contaminated asphalt pavement and curb are removed from the site 	<ol style="list-style-type: none"> 1. PAH-laden dust during milling may be difficult to control and require special procedures (water spraying, vacuuming). 2. Catch basins have to be protected against entry of sediment 3. 	\$655,000 (see Appendix for detailed Estimate)
Option No. 2 Shot Blast and overlay with SAM	<ol style="list-style-type: none"> 1. Set up E&S control at CB's 2. Remove existing curbing 3. Clean pavement by shot blasting 4. Patch pavement as needed 5. Dispose of millings as controlled material 6. Clean catch basins 7. Apply SAM over the shot-blasted pavement 8. Install new AC curbing 9. Restore top soil and grass area behind curb 10. Clean catch basins upon project completion 11. Provide MPT, cleanup 	<ol style="list-style-type: none"> 1. PAH-laden dust is well controlled during shot blasting 2. Small amount of controlled material needs to be disposed of 	<ol style="list-style-type: none"> 1. Not all PAH-contaminated asphalt material leaves the site, and may have to be dealt with in the future 2. Catch basins have to be protected against entry of sediment 3. Shot blasting contractor may be hard to find – reflected in mobilization cost 4. SAM is not more durable than common chip seal 	\$509,000 (see Appendix for detailed Estimate)
Option No. 3 Shot blast and overlay with HMA	<ol style="list-style-type: none"> 1. Set up E&S control at CB's 2. Remove existing curbing 3. Clean pavement by shot blasting 4. Patch pavement as needed 5. Dispose of millings as controlled material 6. Clean and adjust to grade catch basins 7. Overlay the shot-blasted pavement with 1 inch HMA 8. Install new AC curbing 9. Restore top soil grass area behind curb 10. Clean catch basins upon project completion 11. Provide MPT, cleanup 	<ol style="list-style-type: none"> 1. PAH-laden dust is well controlled during shot blasting 2. Small amount of controlled material needs to be disposed of 	<ol style="list-style-type: none"> 1. Not all PAH-contaminated asphalt material leaves the site, and may have to be dealt with in the future 2. Catch basins have to be protected against entry of sediments 3. Shot blasting contractor may be hard to find – may be reflected in mobilization cost 	\$592,000 (see Appendix for detailed Estimate)
Option No. 4 Full reclamation	<ol style="list-style-type: none"> 1. Set up E&S control along road and at CB's 2. Reclaim entire bituminous curbing and pavement, mix with existing road base 3. Dispose of surplus as controlled material 4. Clean, adjust to grade CB's 5. Install new pavement and curbing 6. Restore top soil grass area behind curb 7. Clean catch basins upon project completion 8. Provide MPT, cleanup 	<ol style="list-style-type: none"> 1. The PAH – contaminated asphalt material remains at the site but is locked permanently in the road base 2. Little amount of controlled material has to be disposed of. 	<ol style="list-style-type: none"> 1. PAH-laden dust during milling may be difficult to control and require special procedures (water spraying, vacuuming). 2. The PAH contaminated asphalt material remains at the site 3. Catch basins have to be protected against entry of sediment 	\$1,066,000 (see Appendix for detailed Estimate)

6. CONCLUSIONS AND RECOMMENDATIONS

It is our recommendation that either Option No. 1 or Option No. 3 be selected for this project.

The two options are comparably priced, in both the PDC would be either completely or mostly removed from the site, and both would provide a brand new, aesthetically pleasing, long lasting road surface. They differ that the road surface is cleaned by 1 inch deep milling in Option 1 and by shot blasting respectively in Option 3.

Dust control may be easier in Option 3 nevertheless it is very important in both. We recommend that whichever option is selected, the effectiveness of the dust control be tested through a pilot program at another site in town, where PDC is not present on the pavement. The pilot program should be included in the contract documents and specifications.

Contractor availability might be a problem in Option 3. Contractors specializing in shot blasting typically service larger areas, sometimes several states. Mobilization in Option 3 can be more expensive than in Option 1, which can be provided by local contractors.

Waste Disposal – the way waste material is disposed of has to be accurately specified in the contract documents since it can be of significant cost.

APPENDIX

CONSTRUCTION COST ESTIMATES

ESTIMATE – OPTION NO. 1

Estimate

Estimated Cost:\$595,139.66

Contingency: 10.00%

Estimated Total: \$654,653.63

PAVEMENT REHABILITATION - OPTION NO. 1

(Mill 1 inch and overlay)

LONGMEADOW ROAD, POMFRET, CONNECTICUT

Base Date: 04/20/17

Spec Year: 11

Unit System: E

Work Type: ASPHALT PAVING

Highway Type: MINOR ART - Minor Arterial

Urban/Rural Type: Rural

Season: SUMMER 6/21 - 9/20

County: WINDHAM

Latitude of Midpoint: 415409

Longitude of Midpoint: 715614

District: 2

Federal/State Project Number: N/A

Estimate Type: Engineering Report

Prepared by Lenard Engineering, Inc. on 04/20/17

Checked by Paul Magyar, P.E. on 04/20/17

Approved by Paul Magyar, P.E. on 04/20/17

Estimate:

Line #	Item Number	Quantity	Units	Unit Price	Extension
Description					
Supplemental Description					
Group 0001: Group					
Initial Group					
0001	0101099	1.000	ea.	\$1,000.00000	\$1,000.00
SPOIL HANDLING AREAS					
0002	0202312	0.000	c.y.	\$120.00000	\$0.00
REMOVAL AND DISPOSAL OF CONTAMINATED SOIL					
0003	0202315	1,100.000	ton	\$65.00000	\$71,500.00
DISPOSAL OF CONTROLLED MATERIALS					
0004	0202522	0.000	s.y.	\$3.50000	\$0.00
REMOVAL OF BITUMINOUS TYPE PAVEMENT					
0005	0202529	0.000	l.f.	\$6.15000	\$0.00
CUT BITUMINOUS CONCRETE PAVEMENT					
0006	0202533	15,000.000	l.f.	\$2.80000	\$42,000.00
REMOVAL OF EXISTING CURBING					
0007	0202896	1.000	LS	\$2,000.00000	\$2,000.00
PROTECTION OF BUILDING AND PROPERTY					
0008	0209001	0.000	s.y.	\$4.50000	\$0.00
FORMATION OF SUBGRADE					
0009	0212000	0.000	c.y.	\$100.00000	\$0.00
Subbase					
0010	0219001	100.000	l.f.	\$4.00000	\$400.00
SEDIMENTATION CONTROL SYSTEM					
0011	0219002	50.000	l.f.	\$12.00000	\$600.00
SEDIMENTATION CONTROL HAY BALE SYSTEM					
0012	0219011	26.000	ea.	\$81.28118	\$2,113.31
SEDIMENT CONTROL SYSTEM AT CATCH BASIN					
0013	0304002	0.000	c.y.	\$47.00000	\$0.00
PROCESSED AGGREGATE BASE					
0014	0403873	0.000	s.y.	\$3.50000	\$0.00
FULL-DEPTH RECLAMATION - LOCAL ROADS					
0015	0404101	10.000	s.y.	\$63.00000	\$630.00
BITUMINOUS CONCRETE PATCHING - PARTIAL DEPTH					
0016	0406133	0.000	s.y.	\$3.80000	\$0.00
RUBBERIZED CHIP SEAL					
0017	0406170	0.000	ton		\$0.00
HMA S1					

Estimate:

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					
0018	0406172	1,150.000	ton	\$147.63698	\$169,782.53
HMA S0.375					
0019	0406236	1,000.000	gal	\$7.44922	\$7,449.22
MATERIAL FOR TACK COAT					
0020	0406267	0.000	s.y.	\$6.35000	\$0.00
MILLING OF HMA (0" TO 4")					
0021	0406278	20,000.000	s.y.	\$2.85435	\$57,087.00
MICRO-MILLING OF H.M.A. (0" - 2")					
0022	0507006	0.000	ea.	\$500.00000	\$0.00
TYPE "C" CATCH BASIN TOP					
0023	0507014	26.000	ea.	\$250.00000	\$6,500.00
TYPE "C" CATCH BASIN - FRAME AND GRATE					
0024	0507554	0.000	ea.	\$350.00000	\$0.00
RESET FRAME AND GRATE FOR CATCH BASIN					
0025	0653001	26.000	ea.	\$246.00000	\$6,396.00
CLEAN EXISTING CATCH BASIN					
0026	0815001	15,000.000	l.f.	\$11.00000	\$165,000.00
BITUMINOUS CONCRETE LIP CURBING					
0027	0944000	4,500.000	s.y.	\$8.66000	\$38,970.00
Furnishing And Placing Topsoil					
0028	0950005	4,500.000	s.y.	\$1.60000	\$7,200.00
TURF ESTABLISHMENT					
0029	0971001	1.000	LS	\$5,000.00000	\$5,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC					
0030	0975004	1.000	LS	\$10,000.00000	\$10,000.00
MOBILIZATION AND PROJECT CLOSEOUT					
0031	0977001	25.000	ea.	\$23.28675	\$582.17
TRAFFIC CONE					
0032	0978002	10.000	ea.	\$92.94286	\$929.43
TRAFFIC DRUM					
0033	0980001	0.000	LS	\$4,500.00000	\$0.00
CONSTRUCTION STAKING					

Total for Group 0001:\$595,139.66

ESTIMATE – OPTION NO. 2

Estimate

Estimated Cost:\$462,827.91

Contingency: 10.00%

Estimated Total: \$509,110.70

PAVEMENT REHABILITATION - OPTION NO. 2

(Shot Blast and overlay with SAM)

LONGMEADOW ROAD, POMFRET, CONNECTICUT

Base Date: 04/20/17

Spec Year: 11

Unit System: E

Work Type: ASPHALT PAVING

Highway Type: MINOR ART - Minor Arterial

Urban/Rural Type: Rural

Season: SUMMER 6/21 - 9/20

County: WINDHAM

Latitude of Midpoint: 415409

Longitude of Midpoint: 715614

District: 2

Federal/State Project Number: N/A

Estimate Type: Preliminary Engineering Report

Prepared by Lenard Engineering, Inc. on 04/20/17

Checked by Paul Magyar, P.E. on 04/20/17

Approved by Paul Magyar, P.E. on 04/20/17

Estimate:

Line #	Item Number	Quantity	Units	Unit Price	Extension
Description					
Supplemental Description					
Group 0001: Group					
Initial Group					
0001	0101099	1.000	ea.	\$1,000.00000	\$1,000.00
SPOIL HANDLING AREAS					
0002	0202312	0.000	c.y.	\$120.00000	\$0.00
REMOVAL AND DISPOSAL OF CONTAMINATED SOIL					
0003	0202315	50.000	ton	\$65.00000	\$3,250.00
DISPOSAL OF CONTROLLED MATERIALS					
0004	0202522	0.000	s.y.	\$3.50000	\$0.00
REMOVAL OF BITUMINOUS TYPE PAVEMENT					
0005	0202529	0.000	l.f.	\$6.15000	\$0.00
CUT BITUMINOUS CONCRETE PAVEMENT					
0006	0202533	15,000.000	l.f.	\$2.80000	\$42,000.00
REMOVAL OF EXISTING CURBING					
0007	0202896	1.000	LS	\$2,000.00000	\$2,000.00
PROTECTION OF BUILDING AND PROPERTY					
0008	0209001	0.000	s.y.	\$4.50000	\$0.00
FORMATION OF SUBGRADE					
0009	0212000	0.000	c.y.	\$100.00000	\$0.00
Subbase					
0010	0219001	0.000	l.f.	\$4.00000	\$0.00
SEDIMENTATION CONTROL SYSTEM					
0011	0219002	0.000	l.f.	\$12.00000	\$0.00
SEDIMENTATION CONTROL HAY BALE SYSTEM					
0012	0219011	26.000	ea.	\$81.28118	\$2,113.31
SEDIMENT CONTROL SYSTEM AT CATCH BASIN					
0013	0304002	0.000	c.y.	\$47.00000	\$0.00
PROCESSED AGGREGATE BASE					
0014	0403873	0.000	s.y.	\$3.50000	\$0.00
FULL-DEPTH RECLAMATION - LOCAL ROADS					
0015	0404101	100.000	s.y.	\$63.00000	\$6,300.00
BITUMINOUS CONCRETE PATCHING - PARTIAL DEPTH					
0016	0406133	20,000.000	s.y.	\$5.00000	\$100,000.00
RUBBERIZED CHIP SEAL					
0017	0406170	0.000	ton		\$0.00
HMA S1					

Estimate:

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					
0018	0406172	0.000	ton		\$0.00
HMA S0.375					
0019	0406236	0.000	gal		\$0.00
MATERIAL FOR TACK COAT					
0020	0406267	0.000	s.y.	\$6.35000	\$0.00
MILLING OF HMA (0" TO 4")					
0021	0406278	20,000.000	s.y.	\$2.85435	\$57,087.00
MICRO-MILLING OF H.M.A. (0" - 2")					
0022	0507006	0.000	ea.	\$500.00000	\$0.00
TYPE "C" CATCH BASIN TOP					
0023	0507014	26.000	ea.	\$250.00000	\$6,500.00
TYPE "C" CATCH BASIN - FRAME AND GRATE					
0024	0507554	0.000	ea.	\$350.00000	\$0.00
RESET FRAME AND GRATE FOR CATCH BASIN					
0025	0653001	26.000	ea.	\$246.00000	\$6,396.00
CLEAN EXISTING CATCH BASIN					
0026	0815001	15,000.000	l.f.	\$11.00000	\$165,000.00
BITUMINOUS CONCRETE LIP CURBING					
0027	0944000	4,500.000	s.y.	\$8.66000	\$38,970.00
Furnishing And Placing Topsoil					
0028	0950005	4,500.000	s.y.	\$1.60000	\$7,200.00
TURF ESTABLISHMENT					
0029	0971001	1.000	LS	\$5,000.00000	\$5,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC					
0030	0975004	1.000	LS	\$14,000.00000	\$14,000.00
MOBILIZATION AND PROJECT CLOSEOUT					
0031	0977001	25.000	ea.	\$23.28675	\$582.17
TRAFFIC CONE					
0050	0978002	10.000	ea.	\$92.94286	\$929.43
TRAFFIC DRUM					
0051	0980001	1.000	LS	\$4,500.00000	\$4,500.00
CONSTRUCTION STAKING					

Total for Group 0001:\$462,827.91

ESTIMATE – OPTION NO. 3

Estimate

Estimated Cost:\$538,250.37

Contingency: 10.00%

Estimated Total: \$592,075.41

PAVEMENT REHABILITATION - OPTION NO. 3

(Shot Blast and overlay with HMA)

LONGMEADOW ROAD, POMFRET, CONNECTICUT

Base Date: 04/20/17

Spec Year: 11

Unit System: E

Work Type: ASPHALT PAVING

Highway Type: MINOR ART - Minor Arterial

Urban/Rural Type: Rural

Season: SUMMER 6/21 - 9/20

County: WINDHAM

Latitude of Midpoint: 415409

Longitude of Midpoint: 715614

District: 2

Federal/State Project Number: N/A

Estimate Type: Preliminary Engineering Report

Prepared by Lenard Engineering, Inc. on 04/20/17

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Estimate:

Line #	Item Number	Quantity	Units	Unit Price	Extension
<u>Description</u>					
<u>Supplemental Description</u>					
Group 0001: Group					
Initial Group					
0001	0101099	1.000	ea.	\$1,000.00000	\$1,000.00
SPOIL HANDLING AREAS					
0002	0202312	0.000	c.y.	\$120.00000	\$0.00
REMOVAL AND DISPOSAL OF CONTAMINATED SOIL					
0003	0202315	50.000	ton	\$65.00000	\$3,250.00
DISPOSAL OF CONTROLLED MATERIALS					
0004	0202522	0.000	s.y.	\$3.50000	\$0.00
REMOVAL OF BITUMINOUS TYPE PAVEMENT					
0005	0202529	200.000	l.f.	\$6.15000	\$1,230.00
CUT BITUMINOUS CONCRETE PAVEMENT					
0006	0202533	15,000.000	l.f.	\$2.80000	\$42,000.00
REMOVAL OF EXISTING CURBING					
0007	0202896	1.000	LS	\$2,000.00000	\$2,000.00
PROTECTION OF BUILDING AND PROPERTY					
0008	0209001	0.000	s.y.	\$4.50000	\$0.00
FORMATION OF SUBGRADE					
0009	0212000	0.000	c.y.	\$100.00000	\$0.00
Subbase					
0010	0219001	0.000	l.f.	\$4.00000	\$0.00
SEDIMENTATION CONTROL SYSTEM					
0011	0219002	0.000	l.f.	\$12.00000	\$0.00
SEDIMENTATION CONTROL HAY BALE SYSTEM					
0012	0219011	26.000	ea.	\$81.28118	\$2,113.31
SEDIMENT CONTROL SYSTEM AT CATCH BASIN					
0013	0304002	0.000	c.y.	\$47.00000	\$0.00
PROCESSED AGGREGATE BASE					
0014	0403873	0.000	s.y.	\$3.50000	\$0.00
FULL-DEPTH RECLAMATION - LOCAL ROADS					
0015	0404101	100.000	s.y.	\$63.00000	\$6,300.00
BITUMINOUS CONCRETE PATCHING - PARTIAL DEPTH					
0016	0406133	0.000	s.y.	\$3.80000	\$0.00
RUBBERIZED CHIP SEAL					
0017	0406170	0.000	ton		\$0.00
HMA S1					

Estimate:

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					
0018	0406172	1,150.000	ton	\$147.63698	\$169,782.53
HMA S0.375					
0019	0406236	500.000	gal	\$8.81987	\$4,409.93
MATERIAL FOR TACK COAT					
0020	0406267	0.000	s.y.	\$6.35000	\$0.00
MILLING OF HMA (0" TO 4")					
0021	0406278	20,000.000	s.y.	\$2.85435	\$57,087.00
MICRO-MILLING OF H.M.A. (0" - 2")					
0022	0507006	0.000	ea.	\$500.00000	\$0.00
TYPE "C" CATCH BASIN TOP					
0023	0507014	26.000	ea.	\$250.00000	\$6,500.00
TYPE "C" CATCH BASIN - FRAME AND GRATE					
0024	0507544	0.000	ea.	\$350.00000	\$0.00
TYPE "P-R-W" CATCH BASIN DOUBLE GRATE TYPE I OVER 10' DEEP					
0025	0653001	26.000	ea.	\$246.00000	\$6,396.00
CLEAN EXISTING CATCH BASIN					
0026	0815001	15,000.000	l.f.	\$11.00000	\$165,000.00
BITUMINOUS CONCRETE LIP CURBING					
0027	0944000	4,500.000	s.y.	\$8.66000	\$38,970.00
Furnishing And Placing Topsoil					
0028	0950005	4,500.000	s.y.	\$1.60000	\$7,200.00
TURF ESTABLISHMENT					
0029	0971001	1.000	LS	\$5,000.00000	\$5,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC					
0030	0975004	1.000	LS	\$14,000.00000	\$14,000.00
MOBILIZATION AND PROJECT CLOSEOUT					
0031	0977001	25.000	ea.	\$23.28675	\$582.17
TRAFFIC CONE					
0032	0978002	10.000	ea.	\$92.94286	\$929.43
TRAFFIC DRUM					
0033	0980001	1.000	LS	\$4,500.00000	\$4,500.00
CONSTRUCTION STAKING					

Total for Group 0001:\$538,250.37

ESTIMATE – OPTION NO. 4

Estimate

Estimated Cost:\$969,211.63

Contingency: 10.00%

Estimated Total: \$1,066,132.79

PAVEMENT REHABILITATION - OPTION NO. 4

(Full reclamation)

LONGMEADOW ROAD, POMFRET, CONNECTICUT

Base Date: 04/20/17

Spec Year: 11

Unit System: E

Work Type: ASPHALT PAVING

Highway Type: MINOR ART - Minor Arterial

Urban/Rural Type: Rural

Season: SUMMER 6/21 - 9/20

County: WINDHAM

Latitude of Midpoint: 415409

Longitude of Midpoint: 715614

District: 2

Federal/State Project Number: N/A

Estimate Type: Preliminary Engineering Report

Prepared by Lenard Engineering, Inc. on 04/20/17

Checked by Paul Magyar, P.E. on 04/20/17

Approved by Paul Magyar, P.E. on 04/20/17

Estimate:

Line #	Item Number	Quantity	Units	Unit Price	Extension
Description					
Supplemental Description					
Group 0001: Group					
Initial Group					
0001	0101099	1.000	ea.	\$1,000.00000	\$1,000.00
SPOIL HANDLING AREAS					
0002	0202312	10.000	c.y.	\$120.00000	\$1,200.00
REMOVAL AND DISPOSAL OF CONTAMINATED SOIL					
0003	0202315	150.000	ton	\$65.00000	\$9,750.00
DISPOSAL OF CONTROLLED MATERIALS					
0004	0202522	0.000	s.y.	\$3.50000	\$0.00
REMOVAL OF BITUMINOUS TYPE PAVEMENT					
0005	0202529	200.000	l.f.	\$6.15000	\$1,230.00
CUT BITUMINOUS CONCRETE PAVEMENT					
0006	0202533	15,000.000	l.f.	\$2.80000	\$42,000.00
REMOVAL OF EXISTING CURBING					
0007	0202896	1.000	LS	\$2,000.00000	\$2,000.00
PROTECTION OF BUILDING AND PROPERTY					
0008	0209001	200.000	s.y.	\$4.50000	\$900.00
FORMATION OF SUBGRADE					
0009	0212000	65.000	c.y.	\$100.00000	\$6,500.00
Subbase					
0010	0219001	300.000	l.f.	\$4.00000	\$1,200.00
SEDIMENTATION CONTROL SYSTEM					
0011	0219002	100.000	l.f.	\$12.00000	\$1,200.00
SEDIMENTATION CONTROL HAY BALE SYSTEM					
0012	0219011	26.000	ea.	\$81.28118	\$2,113.31
SEDIMENT CONTROL SYSTEM AT CATCH BASIN					
0013	0304002	30.000	c.y.	\$47.00000	\$1,410.00
PROCESSED AGGREGATE BASE					
0014	0403873	20,000.000	s.y.	\$3.50000	\$70,000.00
FULL-DEPTH RECLAMATION - LOCAL ROADS					
0015	0404101	0.000	s.y.	\$63.00000	\$0.00
BITUMINOUS CONCRETE PATCHING - PARTIAL DEPTH					
0016	0406133	0.000	s.y.	\$3.80000	\$0.00
RUBBERIZED CHIP SEAL					
0017	0406170	2,300.000	ton	\$115.56477	\$265,798.97
HMA S1					

Estimate:

<u>Line #</u>	<u>Item Number</u>	<u>Quantity</u>	<u>Units</u>	<u>Unit Price</u>	<u>Extension</u>
<u>Description</u>					
<u>Supplemental Description</u>					
0018	0406172	1,150.000	ton	\$147.63698	\$169,782.53
HMA S0.375					
0019	0406236	1,000.000	gal	\$7.44922	\$7,449.22
MATERIAL FOR TACK COAT					
0020	0406267	20,000.000	s.y.	\$6.35000	\$127,000.00
MILLING OF HMA (0" TO 4")					
0021	0406278	0.000	s.y.		\$0.00
MICRO-MILLING OF H.M.A. (0" - 2")					
0022	0507006	5.000	ea.	\$500.00000	\$2,500.00
TYPE "C" CATCH BASIN TOP					
0023	0507014	26.000	ea.	\$250.00000	\$6,500.00
TYPE "C" CATCH BASIN - FRAME AND GRATE					
0024	0507554	26.000	ea.	\$350.00000	\$9,100.00
RESET FRAME AND GRATE FOR CATCH BASIN					
0025	0653001	26.000	ea.	\$246.00000	\$6,396.00
CLEAN EXISTING CATCH BASIN					
0026	0815001	15,000.000	l.f.	\$11.00000	\$165,000.00
BITUMINOUS CONCRETE LIP CURBING					
0027	0944000	4,500.000	s.y.	\$8.66000	\$38,970.00
Furnishing And Placing Topsoil					
0028	0950005	4,500.000	s.y.	\$1.60000	\$7,200.00
TURF ESTABLISHMENT					
0029	0971001	1.000	LS	\$5,000.00000	\$5,000.00
MAINTENANCE AND PROTECTION OF TRAFFIC					
0030	0975004	1.000	LS	\$12,000.00000	\$12,000.00
MOBILIZATION AND PROJECT CLOSEOUT					
0031	0977001	25.000	ea.	\$23.28675	\$582.17
TRAFFIC CONE					
0032	0978002	10.000	ea.	\$92.94286	\$929.43
TRAFFIC DRUM					
0033	0980001	1.000	LS	\$4,500.00000	\$4,500.00
CONSTRUCTION STAKING					

Total for Group 0001:\$969,211.63

APPENDIX B

SILT SACK AND GEOTEXTILE MATERIAL INFORMATION

Canada's leader of complete geosynthetic solutions

terrafix[®]
geosynthetics inc.

SILTSACK[®]
Catch Basin

To view our complete product line visit us at www.terrafixgeo.com

terrafix®

geosynthetics inc.

Construction Sequence

To install the SILTSACK® in the catch basin, remove the grate and place the sack in the opening. Hold approximately six inches of the sack outside the frame. This is the area of the lifting straps. Replace the grate to hold the sack in place.

The SILTSACK® is full and should be emptied when the restraint cord is no longer visible.

To remove the SILTSACK®, take two pieces of 1" diameter rebar and place through the lifting loops on each side of the sack to facilitate the lifting of the SILTSACK®.

To empty the SILTSACK®, place it where the contents will be collected. Place the rebar through the lift straps (connected to the bottom of the sack) and lift. This will turn the SILTSACK® inside out and empty the contents. Clean out and rinse. Return the SILTSACK® to its original shape and place back in the basin.

The SILTSACK® is reusable. Once the construction cycle is complete, remove the SILTSACK® from the basin and clean. The SILTSACK® should be stored out of the sunlight until needed on another project.



SILTSACK® Specifications

Control of Sediment Entering Catch Basins for Storm Water Management

The SILTSACK® will be manufactured from a woven polypropylene geotextile and sewn by a double needle machine, using a high strength nylon thread.

The SILTSACK® seams have a certified average wide width strength per ASTM D-4884 standards as follows:

SILTSACK® Style	Test Method	Minimum Values
Regular Flow	ASTM D-4884	165.0 lbs./in

The SILTSACK® will be manufactured to fit the opening of the catch basin or drop inlet. The SILTSACK® will have the following features: two dump straps attached at the bottom to facilitate the emptying of the SILTSACK®; the SILTSACK® will also have lifting loops as an integral part of the system to be used to lift the SILTSACK® from the basin. The SILTSACK® will have a restraint cord approximately halfway up the sack to keep the sides away from the catch basin walls, this yellow cord is also a visual means of indicating when the sack should be emptied. Once the strap is covered with sediment, the SILTSACK® should be emptied, cleaned, and placed back into the basin.

The geotextile fabric will be woven polypropylene fabric with the following properties:

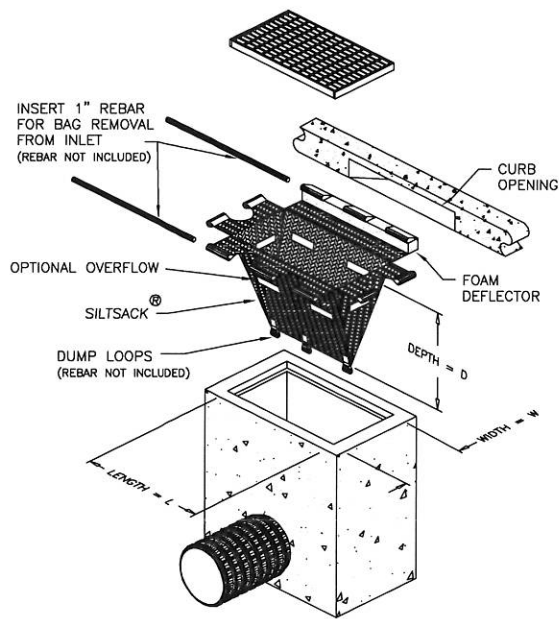
SILTSACK® Regular Flow

Property	Test Method	Minimum Value
Grab Tensile	ASTM D-4632	300 lbs.
Grab Elongation	ASTM D-4632	20%
Puncture	ASTM D-4633	120 lbs.
Mullen Burst	ASTM D-3786	800 psi
Trapezoid Tear	ASTM D-4533	120 lbs.
UV Resistance	ASTM D-4355	80%
Apparent Opening	ASTM D-4751	40 US Sieve
Flow Rate	ASTM D-4491	40 Gal/Min/Ft ²
Permittivity	ASTM D-4491	0.55 sec ⁻¹

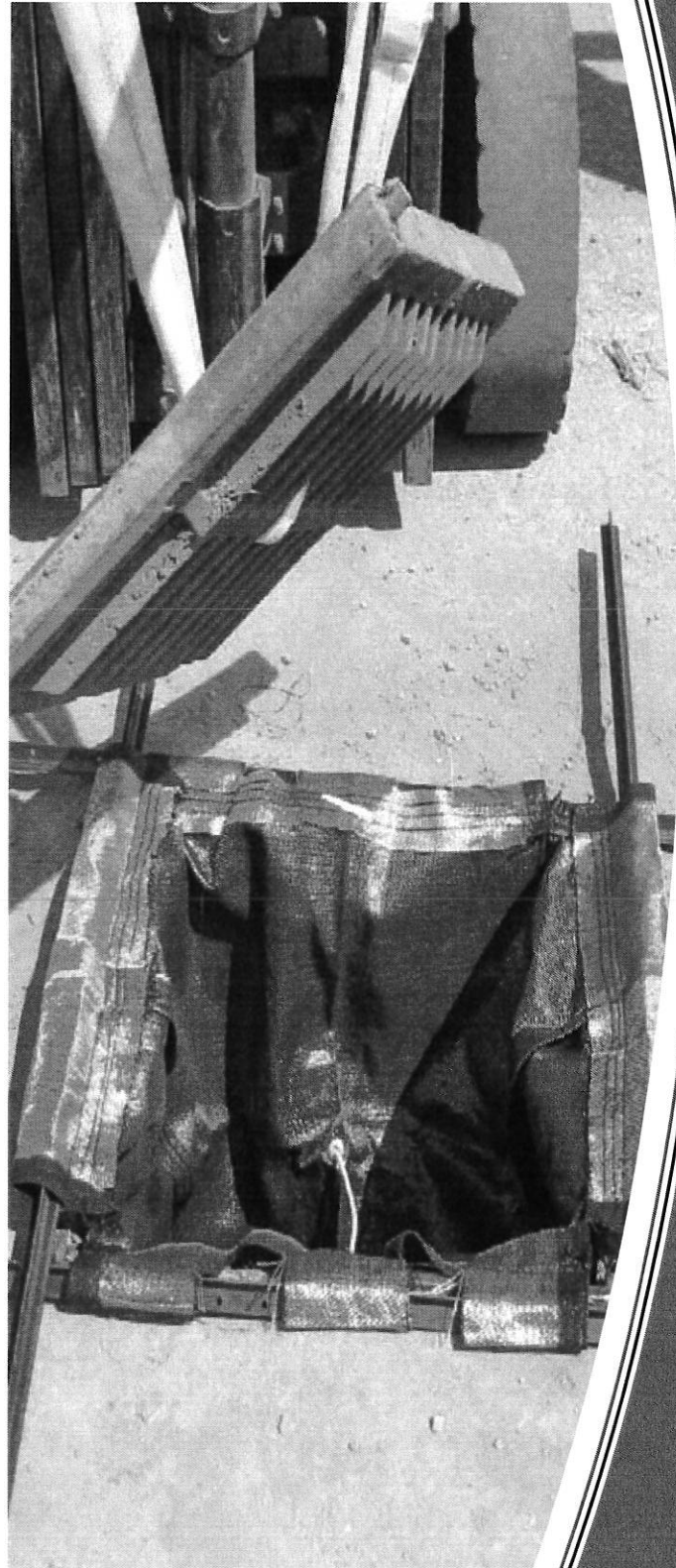
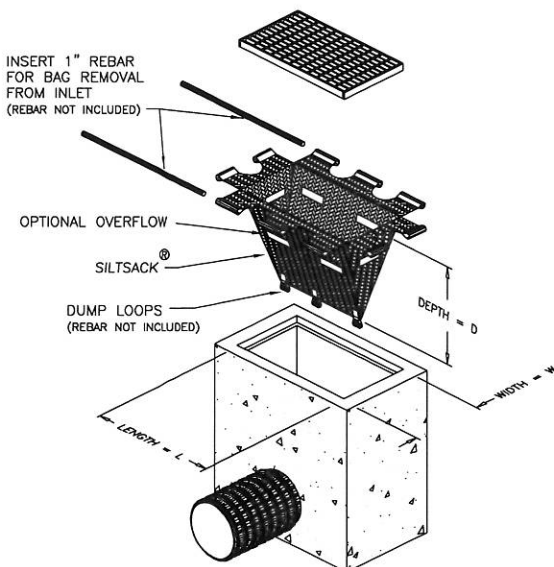
All properties are minimum average roll values

Catch Basin Sediment Capture Device

Typical Siltsack® Construction - Type A

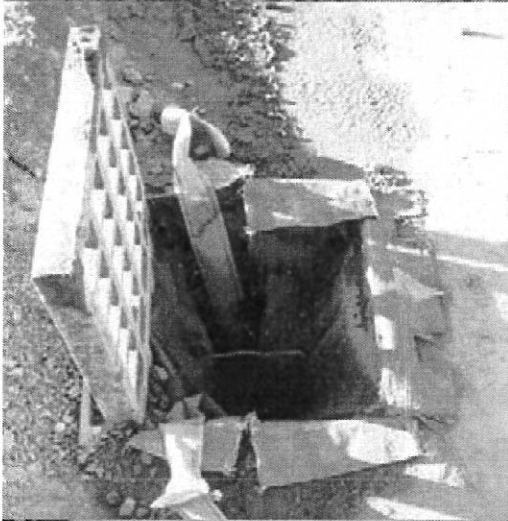


Typical Siltsack® Construction - Type B





Catch Basin Sediment Capture Device



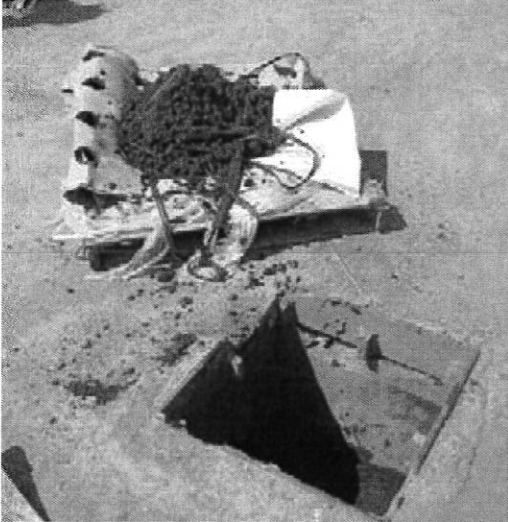
SILTSACK® Catch Basin

SILTSACK® is a simple and cost-effective solution to prevent clogging of catch basins.

SILTSACK® is a sediment control device used to prevent silt and sediment from entering your drainage system. SILTSACK® traps the silt / sediment but allows water to pass through into the sewer. SILTSACK® can be used as a primary or secondary sediment control device to prevent failure of drainage system due to clogging with silt / sedimentation. Maintenance of the SILTSACK® on a regular basis will ensure that the SILTSACK® will function properly.

Available in two styles:

- Regular flow
- High flow



Basic Installation Instructions

- Remove drain gate
- Insert SILTSACK®
- Replace grate to hold SILTSACK® in position

Benefits

- SILTSACK® traps silt & sediment
- Saves money and time

Routine inspection of the SILTSACK®'s collected sediment level is important to prevent over-flow of silt and sediment.

SILTSACK® should be inspected every 2-3 weeks and after every major storm.

The yellow restraint cord should be visible at all times. If the cord is covered with sediment, the SILTSACK® should be emptied.

The information contained herein has been compiled by Terrafix Geosynthetics Inc. and is, to the best of knowledge, true and accurate. All suggestions and recommendations are offered without guarantee. Final determination of suitability for use based on any information provided is the sole responsibility of the user. There is no implied or expressed warranty of merchantability or fitness of the product for the contemplated use.

DISTRIBUTED BY

terrafix[®]
geosynthetics inc.

455 Horner Avenue
Toronto, Ontario • M8W 4W9

Telephone (416) 674-0363
Fax (416) 674-1159

December 2009 • 1435



Qualified Product Lists - continued

Geotextiles:

SPECIFICATION: Form 816, Sections 2.19, 7.51, 7.55 and M.08.01-19

PREAPPROVAL CRITERIA: Certified Test Report According to AASHTO M 288

The following list denotes those geotextiles that are approved for use on ConnDOT projects. The categories listed are in accordance with the AASHTO M 288 specification. Geotextile selection shall be based on the following definitive information and the applicable design criteria.

1. **Subsurface Drainage** - Geotextiles within this category shall be used for, but not limited to the following applications: pavement edge drains; interceptor drains; wall drains; recharge basins and relief wells. The geotextile shall be designed to allow the passage of water normal to its surface while retaining in situ soil without clogging. Class A drainage applications for fabrics are where installation stresses are more severe than Class B applications; i.e., very coarse, sharp, angular aggregate is used; a heavy degree of compaction (95% or greater by AASHTO method T 99) is specified; or depth of trench is greater than 3.00 m. Class B drainage applications are those where the fabric is used with smooth graded surfaces having no sharp angular projections, no sharp angular aggregate is used; compaction requirements are light (less than 95% by AASHTO method T 99); and trenches are less than 3.00 m in depth.
2. **Sediment Control** - Geotextiles within this category shall be used as a barrier-fence designed to remove suspended particles from the water that passes through it. "Wire Supported" signifies that fabric is supported with a mesh made of wire or plastic.
3. **Erosion Control** - Geotextiles within this category shall be used for, but not limited to the following applications: cut and fill slope protection; protection of various small drainage structures and ditches, wave protection for causeways and shoreline roadway embankments and scour protection for structures such as bridges and abutments. The geotextile shall be designed to allow the passage of water while retaining in situ soil without clogging. Class A erosion control applications are those where the fabrics are used under conditions where installation stresses are more severe than Class B, i.e., aggregate placement height should be less than 1.00 m, and aggregate weights should not exceed 115.00 kg. Class B erosion control applications are those where the fabric is used in structures or under conditions where the fabric is protected by a sand cushion or by "zero drop height" placement of aggregate.
4. **Separation** - Geotextiles within this category shall be used for, but are not limited to, the following applications: separation of dissimilar materials, such as subgrades and pavement base courses and zones in embankments, foundations and select fill materials. When soil stabilization is the primary concern, the Design Engineer is cautioned that a detailed process must be followed, taking into consideration not only the separation properties of the geotextile, but its reinforcement function as well. The geotextile shall be designed to allow the passage of water while retaining in situ soil without clogging

Qualified Product Lists - continued

Geotextiles:

SPECIFICATION: Form 816, Sections 2.19.02, 7.51, 7.55 and M.08.01-19

PREAPPROVAL CRITERIA: Certified Test Report According to AASHTO M 288

	SUBSURFACE DRAINAGE		SEDIMENT CONTROL		EROSION CONTROL		SEPARATION	
	Class A	Class B	Wire Supported	Self Supported	Class A	Class B	High Surviv.	Medium Surviv.
A.H. Harris & Sons Inc. P.O. Box 311058 367 Alumni Road Newington, CT 06131			Harris Siltfence	Harris Siltfence				
American Engineering Fabrics, Inc. 1 Coffin Ave. New Bedford, MA 02746 www.boomenviro.com	AEF: 880 1080 1280 600W 650W 200W 300W	AEF: 480 480HS 680 880 1080 1280 600W 650W 200W 300W 100W 130W 150W	AEF: 180W	AEF: 100W 150W 180W	AEF: 880 1080 1280 650W 300W	AEF: 480 480HS 680 880 1080 1280 650W 300W 100W 180W	AEF: 1080 1280 300W	AEF: 880 1080 1280 600W 200W 300W
Belton Industries, Inc. P.O. Box 127 Belton, SC 29627 www.boomenviro.com	768 769 977 1475	307 308 751 768 769 977 1475	940	307 940	769 1475	307 769 940 1475	1475	768 977 1475
BBA Fiberweb Inc. 70 Old Hickory Blvd. Old Hickory, TN 37138		Typar: 3401G	Typar: 3401G	Typar: 3401G		Typar: 3401G	Typar: 3631G	Typar: 3401G

* Product is satisfactory only where the affected soil contains less than 50% material, by weight, passing the number 200 sieve.

Qualified Product Lists - continued

Geotextiles:

SPECIFICATION: Form 816, Sections 2.19.02, 7.51, 7.55 and M.08.01-19

PREAPPROVAL CRITERIA: Certified Test Report According to AASHTO M 288

	SUBSURFACE DRAINAGE		SEDIMENT CONTROL		EROSION CONTROL		SEPARATION	
	Class A	Class B	Wire Supported	Self Supported	Class A	Class B	High Surviv.	Medium Surviv.
Carthage Mills 4243 Hunt Road Cincinnati, OH 45242 www.carthagemills.com	FX-75NW Carthage-6%	FX-35HS FX-40HS FX-35NW FX-40NW FX-75NW Carthage-6%	FX-11	FX-11	FX-75NW FX-55 * FX-66 Carthage-6%	FX-35HS FX-40HS FX-35NW FX-40NW FX-33 FX-44 FX-75NW FX-55 * FX-66 Carthage-6%	FX-66 FX-75NW	FX-55 * FX-66 FX-75NW
DGI Industries P.O. Box 16522 Hooksett, NH 03442 www.dgiindustries.com			CT138036 CT213036	CT138036 CT213036				
Evergreen Technologies Inc. (Div. of Tensar) 200 Miller Sellers Dr. Evergreen, AL 36401	TG650	TG650 TG500 TG420 *	TG420	TG550	TG700	TG700 TG500 TG420 *	TG650	TG650 TG500
First Line Corp. P.O. Box 68 Pearson, GA 31642			CSF 330	CSF 330				
Hanes Geo Components 815 Buxton St. Winston-Salem, NC 27101 www.hanesgeo.com	Terratex: EP NO8	Terratex: SD NO4 EP NO8 SO4	Terratex: SC SC-90	Terratex: SC SC-90	Terratex: GS * NO8	Terratex: SD NO4 GS-150 * GS * NO8	Terrate x: HD * EP	Terratex: GS * NO8 HD * EP
Hoechst Celanese Corp. P.O. Box 5650 Spartanburg, SC 29304-5650			Trevira: 011/140			Trevira: 011/140		Trevira: 011/200

* Product is satisfactory only where the affected soil contains less than 50% material, by weight, passing the number 200 sieve.

Qualified Product Lists - continued

Geotextiles:

SPECIFICATION: Form 816, Sections 2.19.02, 7.51, 7.55 and M.08.01-19

PREAPPROVAL CRITERIA: Certified Test Report According to AASHTO M 288

	SUBSURFACE DRAINAGE		SEDIMENT CONTROL		EROSION CONTROL		SEPARATION	
	Class A	Class B	Wire Supported	Self Supported	Class A	Class B	High Surviv.	Medium Surviv.
Indian Valley Industries Inc. 60-100 Corliss Avenue Johnson City, NY 13790 www.iviindustries.com			CT-3611	CT-3611		CT-3611		
LIHQ Industrial Fabrics, Inc. 4550 W. Fifth North St. Summerville, SC 29483	180EX 225EX 250EX 275EX 350EX	180EX 125EX 130EX 150EX 225EX 250EX 275EX 350EX	180 102 104 105	180 102 104 105	180EX 225EX 250EX 275EX 350EX GTF 400E	180EX 125EX 130EX 150EX 225EX 250EX 275EX 350EX GTF 400E	180EX 225EX 250EX 275EX GTF 300 * 350#X Typar: 3631	180EX GTF 200S GTF 200 * GTF 300 * 130EX 150EX 225EX 250EX 275EX 350EX
Mutual Industries Inc. 707 West Grange Street Philadelphia, PA 19120			MISF 1830 MISF 1855	MISF 1830 MISF 1855				
OnSite Systems, Inc. P.O. Box 241166 Charlotte, NC 28224			WCF 120	WCF 120	WCF 200	WCF 150 WCF 200	WCF 300	WCF 200 WCF 300
Propex Geosolutions 6025 Lee Highway Suite 425 PO Box 22788 Chattanooga, TN 37422 www.geotextile.com	Geotex 104F 135ST 102F 200ST 401 701 801 1071 1291 1701	Geotex 200ST 311 351 401 451 501 601 701 801 1071 1291 1701		Geotex 117F 2130	Geotex 104F 200ST 315ST 102F 801 1071 1291 1701	Geotex 104F 200ST 315ST 102F 351 401 451 601 801 1071 1291 1701	Geotex 315ST 2x2HF 701 801 1071 1291 1701	Geotex 200ST 315ST 2x2HF 451 501 601 701 801 1071 1291 1701

* Product is satisfactory only where the affected soil contains less than 50% material, by weight, passing the number 200 sieve.

Qualified Product Lists - continued

Geotextiles:

SPECIFICATION: Form 816, Sections 2.19.02, 7.51, 7.55 and M.08.01-19

PREAPPROVAL CRITERIA: Certified Test Report According to AASHTO M 288

	SUBSURFACE DRAINAGE		SEDIMENT CONTROL		EROSION CONTROL		SEPARATION	
	Class A	Class B	Wire Supported	Self Supported	Class A	Class B	High Surviv.	Medium Surviv.
SKAPS INDUSTRIES 335 ATHENA DRIVE ATHENS, GA 30601	M706 GT170 GT180	GT131 GT135 GT140 GT142 M706	GT135 W100	W100	SW200* Sw315* GT180 M706	GT135 GT140 GT142 SW200* SW315*	M760 SW315* GT170 GT180	M706 GT140 GT142 SW200* SW315* GT180
TenCate Geosynthetics North America (formerly TC Mirafi) 365 South Holland Drive Pendergrass, GA 30567 www.tencate.com	FW404 FW500 FW700 170N 180N	FW404 FW500 FW700 140N 140NL 135N 140NC	FW500 100X FW700	FW404 FW500 FW700 100X Enviro-Fence	FW404 FW500 FW700 180N 500X * 600X *	FW404 FW500 FW700 140N 140NL 500X * 600X * 600X *	HP370 FW404 FW500 FW700 600X * 170N 180N	FW500 FW700 140N 500X * 550X 600X *
TNS Advanced Technologies Inc. 681 DeYoung Road Greer, SC 29651	R070 R080	R031 R035 R040 R042	R035	W 280	R080	R035 R040 R042	R070 R080	R042
US Silt & Site Supply/ GETSco sales@ussilt.com PH: 603-225-4600 X10 www.ussilt.com			CT36112130	CT36112130				
Willacoochee Industrial Fabrics, Inc. PO Box 599 769 W Main St Willacoochee, GA 31650 www.winfabusa.com	WINFAB: 2199 200W 400N 700N 800N 1000NE	WINFAB: 600N 700N 800N 1000NE			WINFAB: 2199 200W 315W 800N 1000NE	WINFAB: 2199 200W 315W 400N 600N 700N 800N 1000NE	WINFAB: 315W 700N 800N 2x2HF 1000NE	WINFAB: 200W 315W 600N 700N 800N 2x2HF 1000NE

* Product is satisfactory only where the affected soil contains less than 50% material, by weight, passing the number 200 sieve.