

# Lake Bank Barrier Restoration – Pembroke Lakes Golf Course

## Invitation for Bids # RE-20-09

General Information				
Project Cost Estimate	\$65,000	See Section 1.4		
Project Timeline	60 calendar days from NTP	See Section 1.4		
	with an estimated start date of			
	December 1, 2020			
Evaluation of Proposals	Staff	See Section 1.7		
Mandatory Pre-Bid Meeting	10:00 a.m. on October 1, 2020	See Section 1.8		
	at the Pembroke Lakes Golf Pro Shop,			
	10500 Taft Street,			
	Pembroke Pines, FL 33026-2821			
Question Due Date	October 5, 2020	See Section 1.8		
Proposals will be accepted until	2:00 p.m. on October 20, 2020	See Section 1.8		

THE CITY OF PEMBROKE PINES
PURCHASING DIVISION
8300 SOUTH PALM DRIVE
PEMBROKE PINES, FLORIDA 33025
(954) 518-9020



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## City of Pembroke Pines

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#### **ATTACHMENTS**

Attachment A: Contact Information Form

Attachment B: Non-Collusive Affidavit

Attachment C: Proposer's Qualifications Statement

Attachment D: Sample Insurance Certificate

Attachment E: Specimen Contract - Construction Agreement

Attachment F: References Form

Attachment G: Standard Release of Lien Form

Attachment H: Site Survey

Attachment I: Detail Sheet

Attachment J: Aerial Map of Project Site

#### **SECTION 1 - INSTRUCTIONS**

#### **1.1 NOTICE**

Notice is hereby given that the City Commission of the City of Pembroke Pines is seeking sealed proposals for:

# IFB # RE-20-09 "Lake Bank Barrier Restoration – Pembroke Lakes Golf Course"

Solicitations may be obtained from the City of Pembroke Pines website at <a href="http://www.ppines.com/index.aspx?NID=667">http://www.ppines.com/index.aspx?NID=667</a> and on the <a href="www.BidSync.com">www.BidSync.com</a> website.

If you have any problems downloading the solicitation, please contact the BidSync Support line at 1-800-990-9339.

If additional information help is needed with downloading the solicitation package please contact the Purchasing Office at (954) 518-9020 or by email at <a href="mailto:purchasing@ppines.com">purchasing@ppines.com</a>. The Purchasing Office hours are between 7:00 a.m. - 6:00 p.m. on Monday through Thursday and is located at 8300 South Palm Drive, Pembroke Pines, Florida 33025.

The City requires all questions relating to the solicitation be entered through the "Ask a Question" option tab available on the BidSync website. Responses to the questions will be provided online at www.bidsync.com. Such request must be received by the "Question Due Date" stated in the solicitation. The issuance of a response via BidSync is considered an Addendum and shall be the only official method whereby such an interpretation or clarification will be made.

**Proposals will be accepted until 2:00 p.m., Tuesday, October 20, 2020.** Proposals must be **submitted electronically at <u>www.BidSync.com</u>**. The sealed electronic proposals will be publicly opened at 2:30 p.m. by the City Clerk's Office, in the City Hall Administration Building, 4<sup>th</sup> Floor Conference Room located at 601 City Center Way, Pembroke Pines, Florida, 33025.

#### 1.1.1 VIRTUAL BID OPENING

At the time of writing of this notice, Florida Governor Ron DeSantis' Executive Order No. 20-69 (extended by EO 20-150 and EO 20-179) on the Coronavirus health alert, is due to expire on September 1, 2020. If the executive order is not extended then meetings may be a combination of in-person and virtual, all as provided by law, or as otherwise entered via an executive order of the governor. In any event, the public is encouraged to attend the bid opening process virtually in lieu of attending the meeting in person.

In addition, at the time of writing this notice, the City will not be opening up the physical location for public access as <u>City offices are closed to the public</u>, due to the COVID-19 Coronavirus Pandemic.

Bid openings for this project will be live-streamed from the City Clerk's Office, in the City Hall Administration Building, 4th Floor Conference Room located at 601 City Center Way, Pembroke Pines, Florida, 33025 at **2:30 PM on the bid due date.** 

While recognizing the importance of public accessibility to the bid openings, and considering public health concerns, in the abundance of caution, the City is requesting that interested parties utilize live streaming as a safe way for vendors and the public to view the bid opening process in lieu of attending the meeting in person.

The public is invited to attend the meeting virtually via the Cisco Webex Meetings platform.

Cisco Webex Meeting Number: 717 019 586
 Join by Phone Number: +1-408-418-9388

The public may download the **Cisco Webex Meetings app** from <a href="https://www.webex.com/downloads.html/">https://www.webex.com/downloads.html/</a>, to view and listen to the meeting, however please make sure to mute your phone/microphone/device's audio and camera as the <a href="public may attend the meeting but will not be allowed to comment or participate in the proceedings.">public may attend the meeting but will not be allowed to comment or participate in the proceedings.</a>

If any member of the public requires additional information about this meeting or has any questions about how to access the meeting, please contact:

Danny Benedit, Procurement Department City of Pembroke Pines 8300 South Palm Drive, Pembroke Pines, FL 33025 954-518-9022 purchasing@ppines.com

#### 1.2 PURPOSE

The City of Pembroke Pines is seeking proposals from qualified firms, hereinafter referred to as the Contractor, to supply and install approximately 650 linear feet of flexible erosion barrier tubing for Lake Bank Erosion Barrier Restoration at the Pembroke Lakes Golf Course, in accordance with the terms, conditions, and specifications contained in this solicitation.

The City's goals are to accomplish the following:

- Repair the erosion damage along the south side of the driving range lake.
- Prevent erosion of the lake bank.
- Improve aesthetics and grade of lake banks.
- Improved water quality by filtering irrigation and storm water runoff.



#### 1.3 SCOPE OF WORK

Below are the flexible erosion barrier tubing specifications:

- First Back (Base Back or Base Tube) shall be 404 woven monofilament polypropylene or approved equal.
- The backfill tube shall be six-ounce non-woven fabric.

#### 1.3.1 SCOPE OF WORK

The 650 feet repair will be on the large driving range lake identified as "Lake G" on the attached survey prepared by HSQ Group, Inc. (Attachment H)

The selected vendor shall:

- A. Remove all trash and debris along shoreline and in the water within the areas identified in the proposal. Any golf balls removed must be set aside and returned to the City.
- B. Level construction site for proper installation of tubes. There is one large ficus tree and one large black olive tree along shoreline of the 650-foot repair area. These trees are to remain and the work needs to be incorporated around the roots of these trees. There are also approximately 400 feet of hedge material planted along shoreline of the repair area. This plant material may be removed if necessary to properly install the Geotubes.
- C. The Geotube shall be anchored at 1.5' intervals prior to filling the tubes.
- D. Steel rods (#5) shall be used for anchoring and shall be kept in place for the duration of construction. Rods must be long enough to keep material in place. The rods must be removed once the Geotubes have settled, and prior to site restoration.
- E. Install three (3) Geotubes for the distance shown per site. Tube Material Specifications can be found on the attached detail. Contractors that want to use a substitute product must provide sufficient detail in the bid response for the City to determine the proposed substitutes' equivalency.
- F. Refer to diagram on Detail sheet (Attachment I), page and specifications on construction and installation of Geotube, backfill, Mirafi with blanket protection, sod, etc. (Please note: All barriers installed shall have a minimum 1:4 slope shown on the attached detail.)



- G. All material for filling the Geotube may come from the center of the adjacent lake, specific location to be identified, and/or may be imported fill (City approved.) Pine straw will not be permitted.
- H. Remove and dispose off-site, all trash and/or material that cannot be properly dredged.
- I. New lake slopes shall be graded to a slope not steeper than 4H:1V, sodded with Seashore Paspalum, grass shall be pinned and watered for 14 days.
- J. Contractor shall do all work between 7:30 a.m. and 6:00 p.m. Monday through Thursday only. The golf course will not be closed while this project is being constructed.

#### **1.3.2 ADDITIONAL INFORMATION**

Attached is a dredging/shoreline restoration survey developed by HSQ Group, Inc. The contractor shall use City of Pembroke Pines specifications, and South Broward Drainage District General Notes (attached), in addition to the aforementioned materials specifications, to install the proposed lake bank erosion barrier.

#### 1.4 PROJECT COST ESTIMATE & TIMELINE

Staff estimates this project to cost approximately \$60,000, which does not include permit costs.

Please note the City will include a Permit Allowance for this project, therefore proposers should not include permit costs in their total proposal price.

The work shall be completed within 60 days from issuance of CITY's Notice to Proceed, with an estimated start date of December 1, 2020.

#### **1.4.1 PERMITS**

The City anticipates this project to require the following permits:

Permit	Agency	Cost (or related	
		method of calculation)	
Engineering	City of Pembroke Pines	4.9136% of construction costs	
	Engineering Department		
Drainage	South Broward Drainage	\$500	
	District		



#### 1.4.2 PERMIT ALLOWANCE

The City shall include a "Permit Allowance" for this project. The Contractor shall obtain all required permits to complete the work, however the City shall utilize the Permit Allowance to reimburse the contractor for the related permit, license, impact or inspection fees. Payments will be made to the contractor based on the actual cost of permits upon submission of paid permit receipts. The City shall not pay for other costs related to obtaining or securing permits.

The City shall determine the amount of the allowance at time of award. The allowance may be based on a specified percent of the proposed project amount and shall be established for the specific project being performed under the contract. This dollar amount shall be shown on the specific project purchase order as a distinct item from the vendor's overall offer to determine the total potential dollar value of the contract. Any Permit Allowance funds that have not been utilized at the end of the project will remain with the City, if the City Permit fees exceed the allowance indicated, the City will reimburse the contractor the actual amount of City Permit Fees required for project completion.

#### 1.5 PROPOSAL REQUIREMENTS

The <u>www.bidsync.com</u> website allows for vendors to complete, scan and upload their documents as part of the bidder's submittal on the website. Prospective proposers interested in responding to this solicitation are requested to provide all of the information listed in this section. Submittals that do not respond completely to all of requirements specified herein may be considered non-responsive and eliminated from the process. Brevity and clarity are encouraged.

#### 1.5.1 Attachment A: Contact Information Form

- a. Attached is contact information form (Attachment A) where the vendor will enter their contact information and complete the proposal checklist. The Contact information form shall be electronically signed by the contact person authorized to represent the contractor. This form must be completed and submitted through <a href="https://www.bidsync.com">www.bidsync.com</a> as part of the bidder's submittal.
- b. The vendor must provide their pricing through the designated lines items listed on the BidSync website.
- c. Please note vendors should be registered on BidSync under the name of the organization that they are operating as and it should match the organization name on the documents that they are submitting and utilizing when responding to the solicitation.
- d. The contact information form should contain an electronic signature of the authorized representative of the Proposer along with the address and telephone number for communications regarding the Proposal.

- e. Proposals by corporations should be executed in the corporate name by the President or other corporate officer accompanied by evidence of authority to sign. The corporate address and state of incorporation must also be shown.
- f. Proposals by partnerships should be executed in the partnership name and signed by a partner whose title and the official address of the partnership must be shown.

#### 1.5.2 Attachment B: Non-Collusive Affidavit

#### 1.5.3 Attachment C: Proposer's Qualifications Statement

#### **1.5.4** Attachment F: References Form

a. Complete **Attachment F: References Form**, preferably where the team was the same. References should be from the last five years and should be capable of explaining and confirming your firm's capacity to successfully complete the scope of work outlined herein. As part of the proposal evaluation process, the City may conduct an investigation of references, including a record check or consumer affairs complaints. Proposers' submission of a proposal constitutes acknowledgment of the process and consent to investigate. The City is the sole judge in determining Proposers qualifications.

#### 1.6 VENDOR REGISTRATION AND QUALIFICATION DOCUMENTS

The City has implemented a new process that is intended to make the bidding process easier for vendors that bid on multiple City projects. This process will require vendors to complete and submit the following standard forms and documents at any time prior to bidding on a project. In addition, the vendors will be able to utilize these same forms without the need to re-fill and resubmit the forms each time they bid on a City project.

# <u>Furthermore</u>, please make sure to update this information on an as-needed basis so that all pertinent information is accurate, such as local business tax receipts, and any other relevant information.

These forms will be found under the "Vendor Registration" group of "Qualifications" on the BidSync website for the City of Pembroke Pines. Please note that the BidSync website requires bidders to complete all of these qualifications prior to being able to submit questions on any bids, therefore, please make sure to complete this information as soon as possible.

The following documents can be completed prior to the bidding process through the BidSync website and do not need to be attached to your submittal as the BidSync website will automatically include it.



#### 1.6.1 Vendor Information Form

#### 1.6.2 Form W-9 (Rev. October 2018)

a. Previously dated versions of this form will delay the processing of any payments to the selected vendor.

#### 1.6.3 Sworn Statement on Public Entity Crimes Form

#### 1.6.4 Local Vendor Preference Certification

- a. If claiming Local Pembroke Pines Vendor Preference, business must attach a current business tax receipt from the City of Pembroke Pines
- b. If claiming Local Broward County Vendor Preference, business must attach a current business tax receipt from Broward County or the city within Broward County where the business resides.
- c. The Local Vendor Preference Certification form must be completed by/for the proposer; the proposer <u>WILL NOT</u> qualify for Local Vendor Preference based on their sub-contractors' qualifications.

#### 1.6.5 Local Business Tax Receipts

#### 1.6.6 Veteran Owned Small Business Preference Certification

- a. If claiming Veteran Owned Small Business Preference Certification, business must attach the "Determination Letter" from the United States Department of Veteran Affairs Center for Verification and Evaluation notifying the business that they have been approved as a Veteran Owned Small Business (VOSB).
- b. The Veteran Owned Small Business Preference Certification form must be completed by/for the proposer; the proposer <u>WILL NOT</u> qualify for Veteran Owned Small Business Preference based on their sub-contractors' qualifications.

#### 1.6.7 Equal Benefits Certification Form

#### 1.6.8 Vendor Drug-Free Workplace Certification Form

#### **1.6.9** Scrutinized Company Certification

#### 1.7 EVALUATION OF PROPOSALS & PROCESS OF SELECTION



- A. Staff will evaluate all responsive proposals received from proposers who meet or exceed the bid requirements contained in the solicitation. Evaluations shall be based upon the information contained in the proposals as submitted.
- B. Staff will make a recommendation to the City Commission for award of contract.

#### 1.8 TENTATIVE SCHEDULE OF EVENTS

Event	Time &/or Date
Issuance of Solicitation (Posting Date)	Tuesday, September 22, 2020
Mandatory Pre-Bid Meeting	10:00 a.m. on October 1, 2020
Question Due Date	Monday, October 5, 2020
Anticipated Date of Issuance for the	Thursday, October 8, 2020
Addenda with Questions and Answers	
Proposals will be accepted until	2:00 p.m. on October 20, 2020
Proposals will be opened at	2:30 p.m. on October 20, 2020
Evaluation of Proposals by Staff	TBD
Recommendation of Contractor to City	TBD
Commission award	
Issuance of Notice to Proceed	<b>December 1, 2020</b>
Project Commencement	Not later than 10 days after NTP
Project Completion	60 days after NTP

#### 1.7.1 MANDATORY PRE-BID MEETING / SITE VISIT

There will be a **mandatory** scheduled pre-bid meeting on **October 1, 2020 at 10:00 a.m.** Meeting location will be at the Pembroke Lakes Golf Pro Shop 10500 Taft Street, Pembroke Pines, FL 33026-2821

All vendors will be required to sign in at the meeting to show proof of attendance to the mandatory meeting. It is the vendor's responsibility to make sure that they sign in at the meeting.

#### 1.9 SUBMISSION REQUIREMENTS

Bids/proposals <u>must be submitted electronically</u> at <u>www.bidsync.com</u> on or before 2:00 p.m. on October 20, 2020.

Please note vendors should be registered on BidSync under the name of the organization that they are operating as and it should match the organization name on the documents that they are submitting and utilizing when responding to the solicitation.

The vendor must provide their pricing through the designated lines items listed on the BidSync website. In addition, the vendor must complete any webforms on the BidSync website and provide any additional information requested throughout this solicitation. Any additional



information requested in the solicitation should be scanned and uploaded. <u>Unless otherwise</u> specified, the City requests for vendors to upload their documents as one (1) <u>PDF</u> document in the order that is outline in the bid package.

The City recommends for proposers to submit their proposals as soon as they are ready to do so. Please allow ample time to submit your proposals on the BidSync website. Proposals may be modified or withdrawn prior to the deadline for submitting Proposals. BidSync Support is happy to help you with submitting your proposal and to ensure that you are submitting your proposals correctly, but we ask that you contact their support line at 1-800-990-9339 with ample time before the bid closing date and time.

PLEASE DO NOT SUBMIT ANY PROPOSALS VIA MAIL, E-MAIL OR FAX.

#### **CONTACT INFORMATION FORM**

IN ACCORDANCE WITH **RE-20-09** titled "**Lake Bank Barrier Restoration-Pembroke Pines Lakes Golf Course**" attached hereto as a part hereof, the undersigned submits the following:

#### **A)** Contact Information

The Contact information form shall be electronically signed by one duly authorized to do so, and in case signed by a deputy or subordinate, the principal's properly written authority to such deputy or subordinate must accompany the proposal. This form must be completed and submitted through <a href="https://www.bidsync.com">www.bidsync.com</a> as part of the bidder's submittal. The vendor must provide their pricing through the designated lines items listed on the BidSync website.

<b>COMPANY INFORMATION</b>	<u>1:</u>	
COMPANY:		
STREET ADDRESS:		
CITY, STATE & ZIP CODE: _		
PRIMARY CONTACT FOR	THE PROJECT:	
NAME:	TITLE:	
E-MAIL:		
	FAX:	
AUTHORIZED APPROVER	<u>:</u>	
NAME:	TITLE:	
E-MAIL:		
TELEPHONE:	FAX:	
SIGNATURE:		
B) Proposal Checklist		
Did you make sure to submit the for Requirements" of the bid package?	llowing items, as stated in section 1.5 "P	roposal
Attachment A - Contact Informa	tion Form	Yes_

#### Attachment A

Attachment B - Non-Collusive Affidavit	Yes
Attachment C - Proposer's Completed Qualification Statement	Yes
Attachment F - References Form	Yes

Did you make sure to update the following documents found under the "Vendor Registration" group of "Qualifications" on the BidSync website for the City of Pembroke Pines?

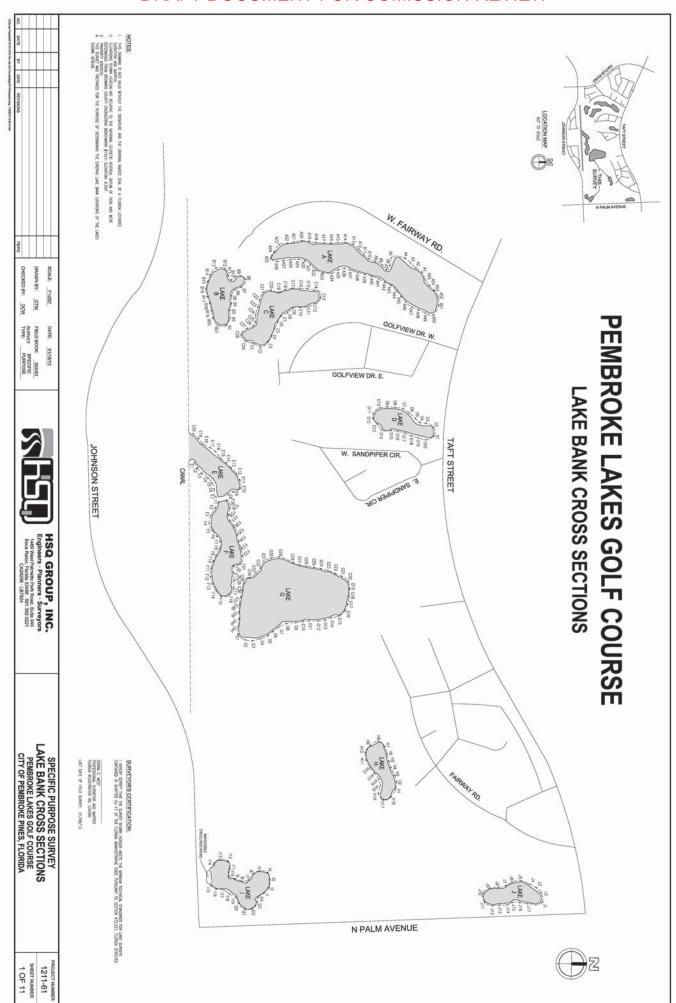
Vendor Information Form	Yes
Form W-9 (Rev. October 2018)	Yes
Sworn Statement on Public Entity Crimes Form	Yes
Local Vendor Preference Certification	Yes
Local Business Tax Receipts	Yes
Veteran Owned Small Business Preference Certification	Yes
Equal Benefits Certification Form	Yes
Vendor Drug-Free Workplace Certification Form	Yes
Scrutinized Company Certification	Yes

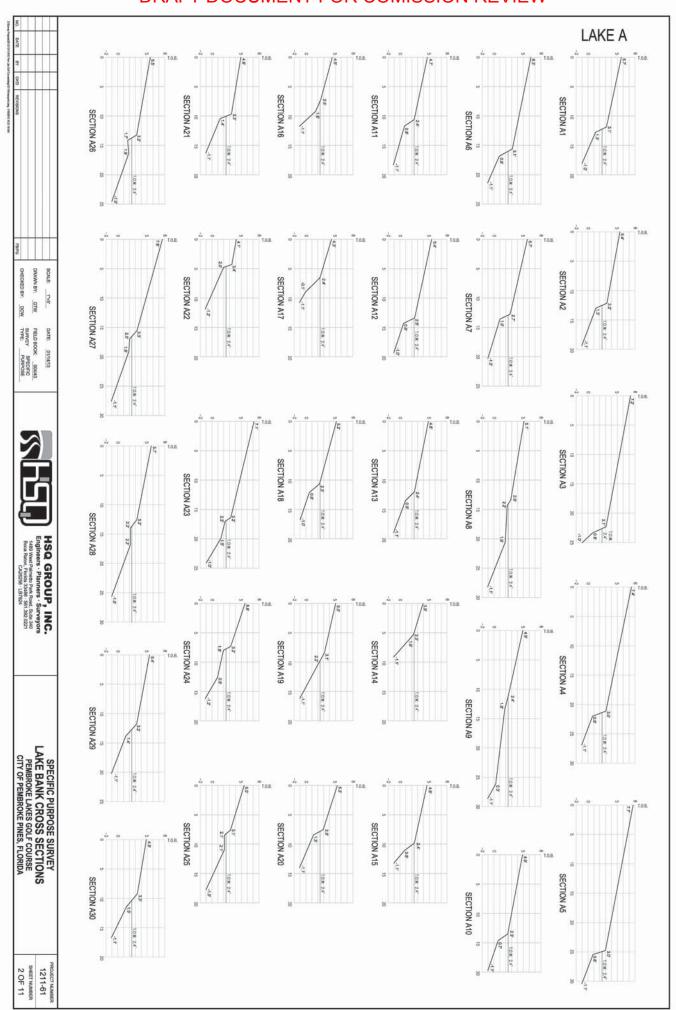
## C) Sample Proposal Form

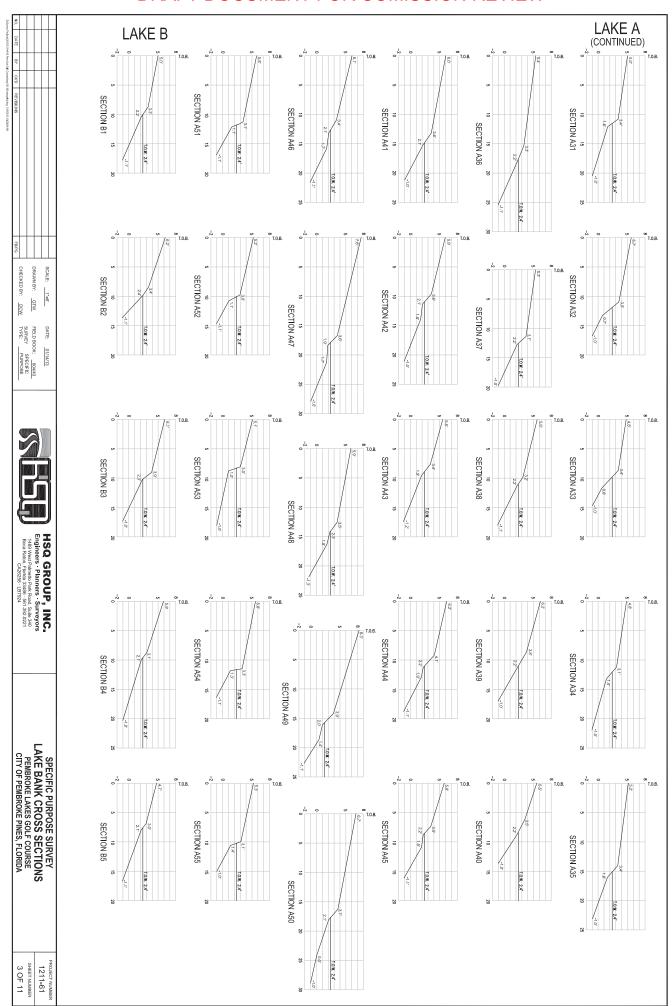
The following sample price proposal is for information only. The vendor must provide their pricing through the designated lines items listed on the BidSync website.

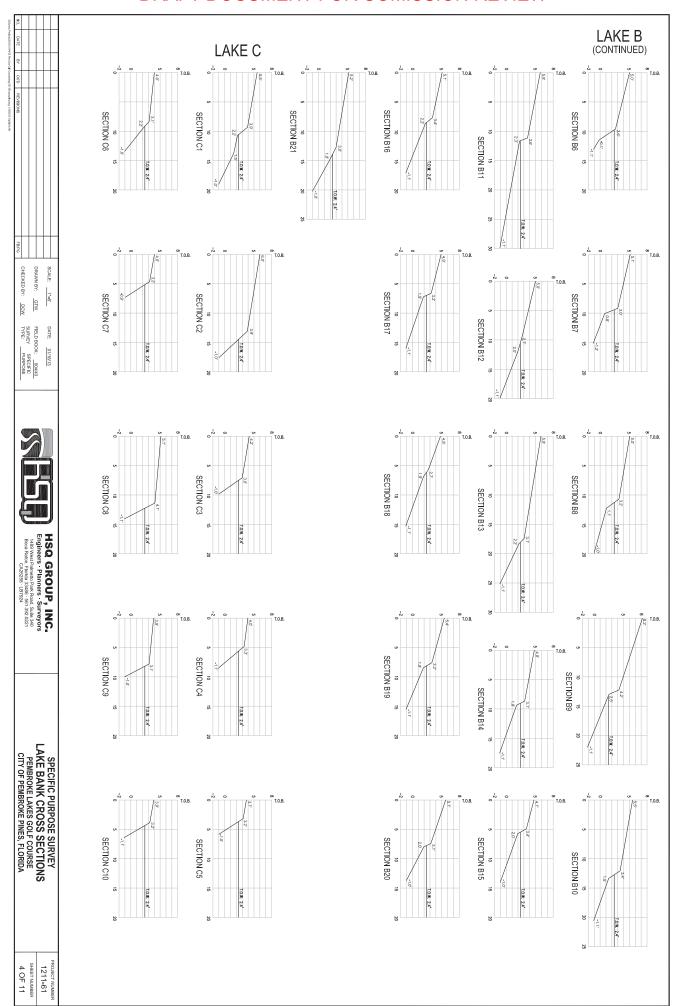
#### **Base Option:**

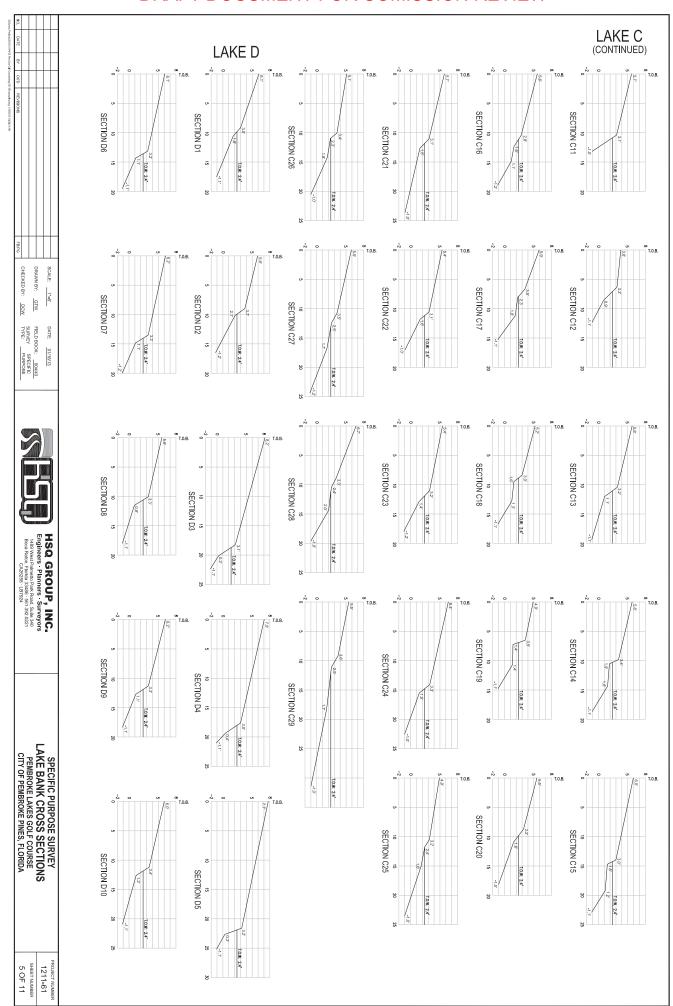
Item #	Item Description	<b>Total Cost</b>
1)	Installation of 650 linear feet of flexible erosion barrier	<b>Price to be Submitted</b>
	tubing for Lake Bank Erosion Barrier Restoration at the	Via BidSync
	Pembroke Lakes Golf Course.	-

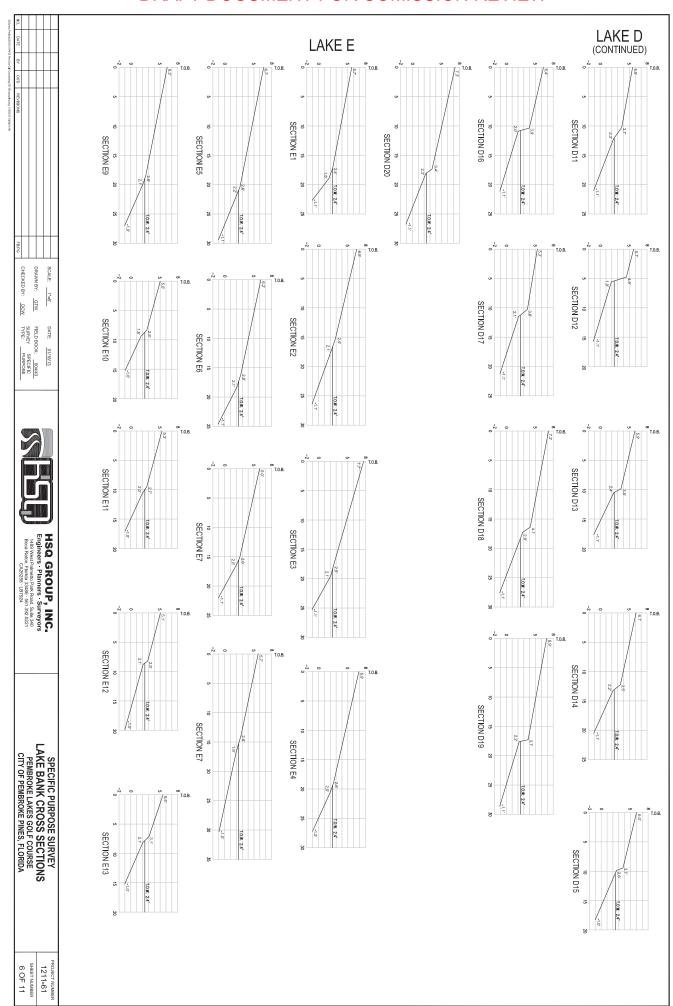


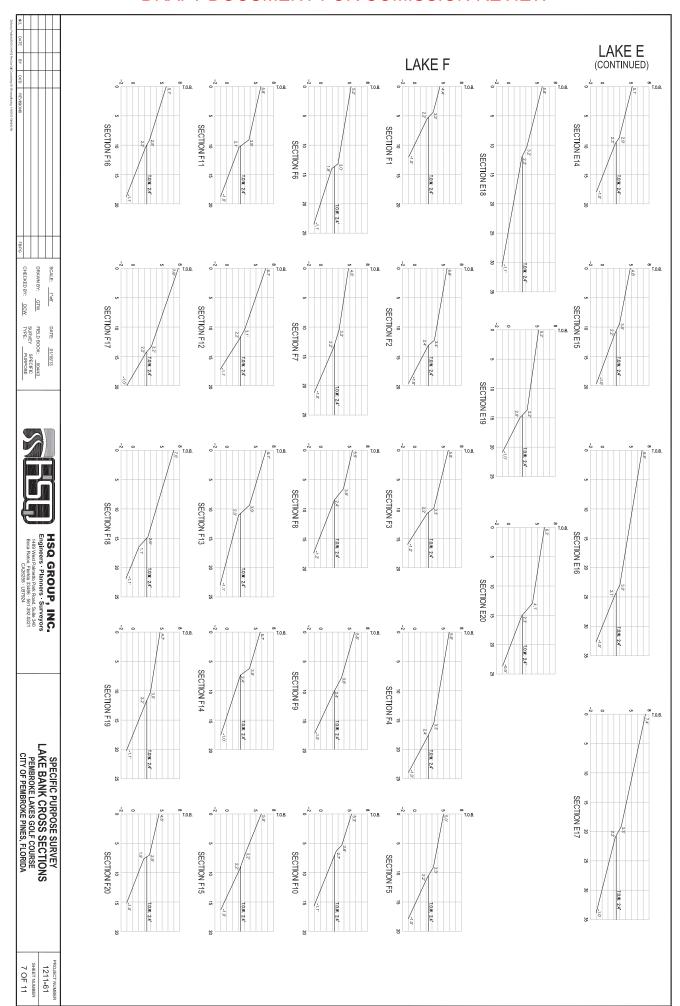


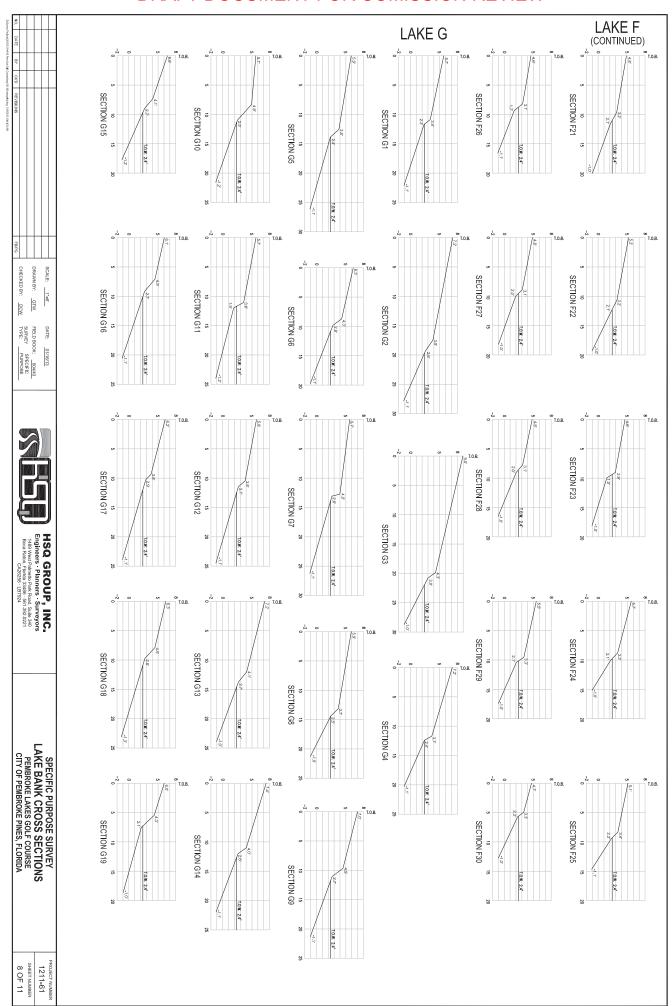


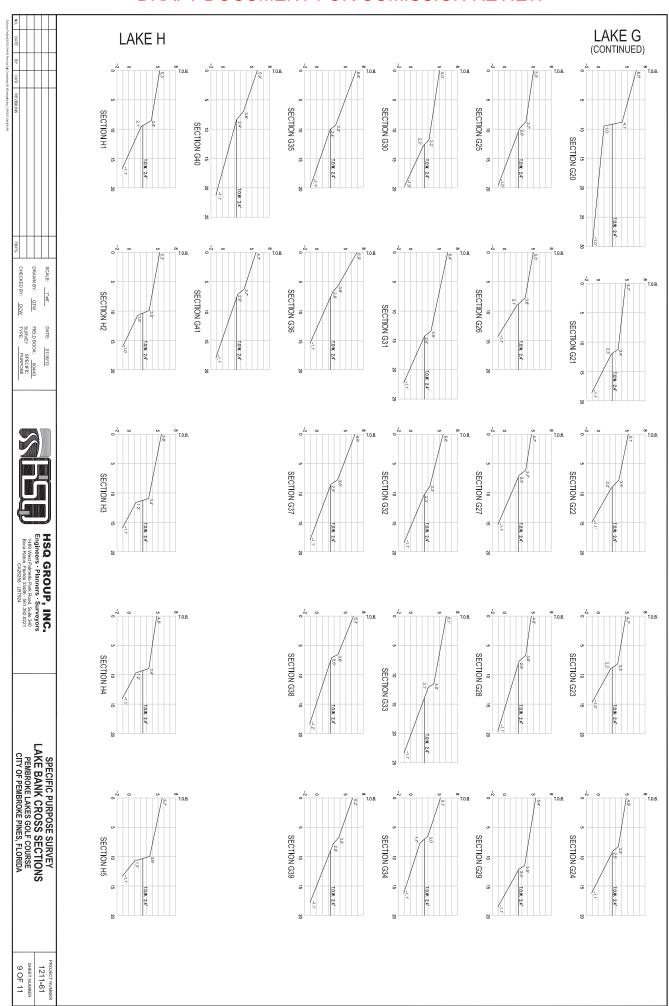


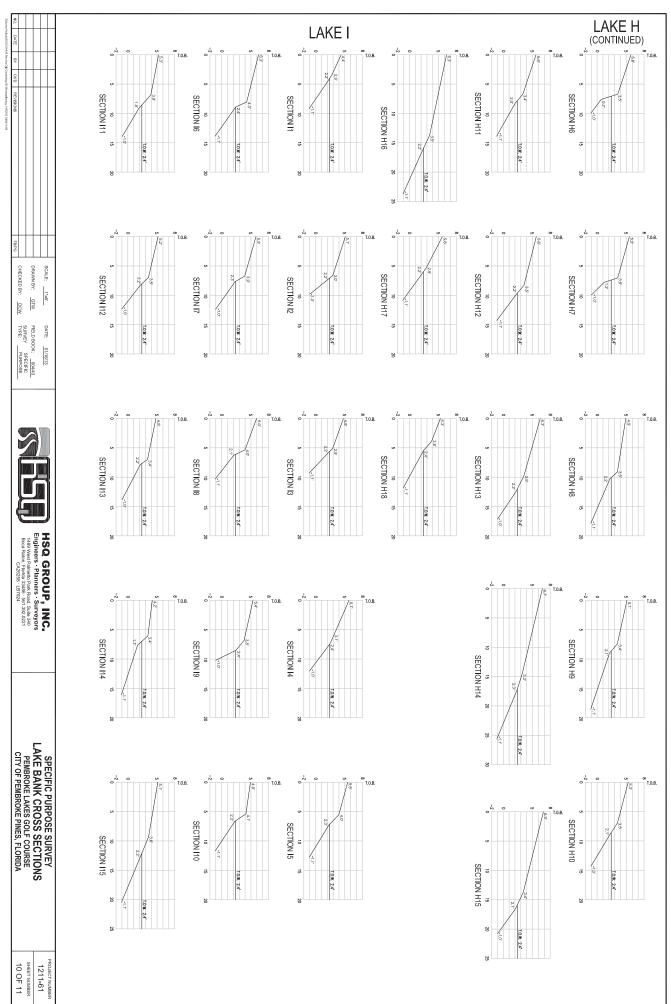


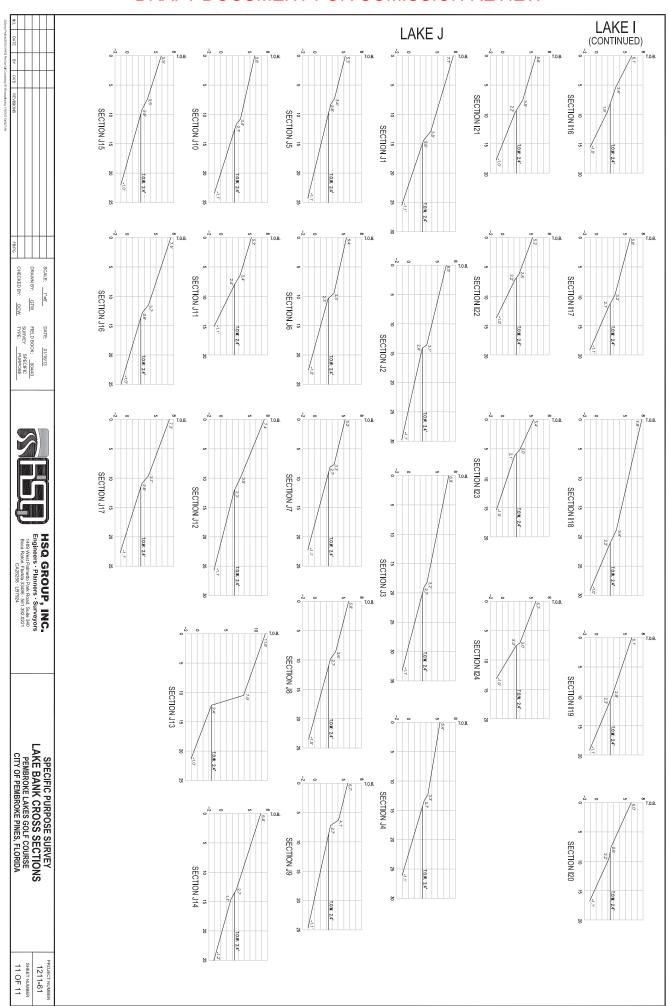














TENCATE GEOSYNTHETICS Americas

## Mirafi® 140N





Mirafi<sup>®</sup> 140N is a nonwoven geotextile composed of polypropylene fibers, which are formed into a stable network such that the fibers retain their relative position. Mirafi<sup>®</sup> 140N is inert to biological degradation and resists naturally encountered chemicals, alkalis, and acids. Mirafi<sup>®</sup> 140N meets AASHTO M288-06 Class 3 for Elongation > 50%.

TenCate Geosynthetics Americas Laboratories are accredited by <u>a2La</u> (The American Association for Laboratory Accreditation) and Geosynthetic Accreditation Institute – Laboratory Accreditation Program (<u>GAI-LAP</u>). <u>NTPEP Listed</u>

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
·			MD	CD
Grab Tensile Strength	ASTM D4632	lbs (N)	120 (534)	120 (534)
Grab Tensile Elongation	ASTM D4632	%	50	50
Trapezoid Tear Strength	ASTM D4533	lbs (N)	50 (223)	50 (223)
CBR Puncture Strength	ASTM D6241	lbs (N)	310 (1380)	
			Maximum Opening Size	
Apparent Opening Size (AOS)	ASTM D4751	U.S. Sieve (mm)	70 (0.	.212)
			Minimum Roll Value	
Permittivity	ASTM D4491	sec <sup>-1</sup>	1.7	
Flow Rate	ASTM D4491	gal/min/ft2 (l/min/m2)	135 (5500)	
			Minimum Test Value	
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70	)

Physical Properties	Unit	Roll Sizes		
Roll Dimensions (width x length)	ft (m)	12.5 x 360 (3.8 x 110) 15 x 360 (4.5 x 110)		
Roll Area	yd² (m²)	500 (418)	600 (502)	

**Disclaimer:** TenCate assumes no liability for the accuracy or completeness of this information or for the ultimate use by the purchaser. TenCate disclaims any and all express, implied, or statutory standards, warranties or guarantees, including without limitation any implied warranty as to merchantability or fitness for a particular purpose or arising from a course of dealing or usage of trade as to any equipment, materials, or information furnished herewith. This document should not be construed as engineering advice.

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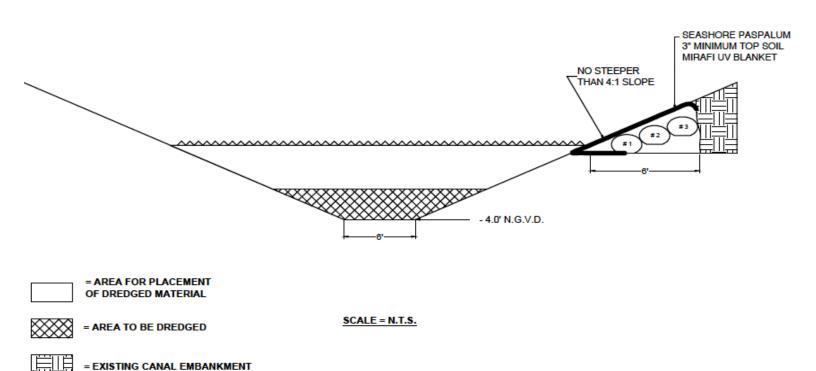
Testing Lab 1291.01 & 1291.02

Attachment I: Detail Sheet

FGS000385 ETQR77

#### **DETAIL SHEET**

- 1) Geotube # 1 and # 2 must be 7 ft. circumference Geotube GT300 woven monofilament polypropylene fabric or approved equal. See attached specification sheet.
- 2) Geotube # 1 and # 2 must be filled more than 1.5 ft. tall.
- Geotube must have a self-sealing injection port. There will be no more than 80 FT between self-sealing injection ports.
- 4) Rake-out tube # 3 size and specifications are at the discretion of the contractor. The tube shall be of sufficient size so that the dredged material will fill in all voids and can be raked-out over Geotube # 1 and # 2. The slope obtained should be a continuous 4:1 slope from the existing canal bottom safety shelf up to and intersecting with the existing embankment slope.
- 5) Mirafi non-woven UV protection blanket shall be placed underneath Geotube # 1 as an anchor point and stretched up and over the 4:1 slope created during the rake-out. Mirafi should be locked in 1 ft. below the existing ground at the junction point with the existing embankment. When placing adjacent blankets there should be a 8" minimum overlap. Mirafi 140n shall be used or approved equal. See attached specification sheet.
- 6) Topsoil (3" minimum thickness) should be spread over the Mirafi blanket. No steeper than a 4:1 slope shall be maintained.
- 7) Seashore Paspalum sod shall be placed on top of the topsoil and from the edge of water upland to the existing embankment. All areas disturbed during construction shall be re-sodded. The bottom two rows of sod shall be staked. Sod shall be watered immediately after installation.
- 8) The area to be dredged is in the center of the canal bottom for a width of 6 ft. and should be centered on the culvert at N.W. 85th way. Maximum depth to be obtained during dredging is -4.0' N.G.V.D..
- 9) The length of the dredging shall extend to the distance required to fill the three rows of Geotube and rake-out tube for 500 ft.



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## Geotube® GT300

Geotube<sup>®</sup> GT300 geotextile is composed of high-tenacity polypropylene monofilament yarns, which are woven into a stable network such that the yarns retain their relative position. Geotube<sup>®</sup> GT300 geotextile is inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value	
			MD	CD
Wide Width Tensile Strength	ASTM D4595	lbs/in (kN/m)	250 (43.8)	230 (40.3)
Grab Tensile Strength	ASTM D4632	lbs (N)	400 (1780)	315(1402)
Grab Tensile Elongation	ASTM D4632	%	15	15
Trapezoid Tear Strength	ASTM D4533	lbs(N)	150 (668)	165 (734)
CBR Puncture Strength	ASTM D6241	lbs (N)	1150	(5118)
Apparent Opening Size (AOS) <sup>1</sup>	ASTM D4751	U.S. Sieve (mm)	40 (0.43)	
Percent Open Area	COE-02215	%	1	
Permittivity	ASTM D4491	sec <sup>-1</sup>	0.90	
Permeability	ASTM D4491	cm/sec	0.07	
Flow Rate	ASTM D4491	(gal/min/ft <sup>2</sup> )	70	
Flow Rate	ASTIVI D4491	l/min/m <sup>2</sup>	(2852)	
Pore O <sub>50</sub>	ASTM D6767	microns	190 <sup>2</sup>	
Pore O <sub>95</sub>	ASTM D6767	microns	330 <sup>2</sup>	
Abrasion Resistance	ASTM D4886	% retained	60 <sup>2</sup>	
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	90	

<sup>&</sup>lt;sup>1</sup> ASTM D 4751: AOS is a Maximum Opening Diameter Value

<sup>&</sup>lt;sup>2</sup> Typical

Physical Properties	Unit	Typical Value
Mass/Unit Area (ASTM D5261)	oz/yd² (g/m² )	8.8 (298)
Thickness (ASTM D5199)	mils (mm)	34 (0.9)
Roll Dimensions (width x length)	ft (m)	15 x 300 (4.5 x 91)
Roll Area	$yd^2 (m^2)$	500 (418)
Estimated Roll Weight	lbs (kg)	292 (132)

Percent Open Area (COE-02215) is not covered by our current A2LA accreditation.

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