



DEPARTMENT OF THE NAVY

CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE, INDIANA 47522-5000

N00164.AR.000229
NSWC CRANE
5090.3a

IN REPLY REFER TO:
5090
Ser 095/6157

07 JUN 1990

U.S. Environmental Protection Agency, Region V
Waste, Pesticides, & Toxics Division
Waste Management Branch
Illinois, Indiana, and Michigan Section
Attn: Ms. Carol Witt-Smith (HRP-8J)
77 West Jackson Blvd.
Chicago, IL 60604

Dear Ms. Witt-Smith:

Crane Division, Naval Surface Warfare Center (NAVSURFWARCENDIV Crane) submits two copies of the Final Interim Measures Cleanup Work Plan and Task-Specific Site Safety and Health Plan for the Dye Burial Ground as enclosure (1). A copy of the Dye Burial Ground Cap Panel Installation Information from Smith Environmental is included as enclosure (2). Enclosure (3) is the required certification statement.

NAVSURFWARCENDIV Crane point of contact is Mr. Thomas J. Brent, Code 09510, telephone 812-854-6160.

Sincerely,

R. L. LEWIS
Director, Public Works Division
Naval Surface Warfare Center

Encl:

- (1) Dye Burial Ground Interim Measures Cleanup Work Plan and Task-Specific Site Safety and Health Plan
- (2) Dye Burial Ground Cap Panel Installation Information
- (3) Certification Statement

Copy to: (w/o encls)
SOUTHNAVFACENGCOM, (Code 1864)
MK (Steve Downey)



RECEIVED
MAY 30 1996

NSWC - CRANE			
4324-0009			
PROJECT MEMBER	ACT	INFO	INT
PROJECT MANAGER	X		879
PROJECT ENGINEER			
GNL SUPT	X		
SAFETY AND HEALTH			
QA/QC SUPERVISOR	X		
PROJECT CONTROLS			
FIELD ENGINEERING			
PMO-CHARLESTON	X		
SOUTH DIV	X		
EPD	X		
FILE:			
FILE:			
FILE:			

Riedel-Peterson Environmental Services **MK-CRANE**

From the Desk Of:
Robert Tennyson
Project Manager, Houston District
1110 Howard Drive
Houston, Texas 77536
(713) 479-5295
Fax (713) 479-6358
Pager (800) 844-8084, Pin 529-5757

DATE: May 28, 1996

TO: Steve Downey
Morrison Knudsen Corporation
Job Site Facility
NSWC
Crane, In.

Correspondence #
Admin-0004
Dye Burial Cap

fax - (812) 854-6944

RE: Dye Burial Ground Cap, Crane, In.
MK Contract # N62467-93-D-1106. MKSC 4324-054.

Subject: Cut Sheet for Liner Installation

Smith Environmental Technologies Corp. (Smith) presents the following information for your review.

Enclosed please find the information on the attached cut sheets for the panel installations on the Dye Burial Ground Cap.

If you have any questions or comments please feel free to call me. Thank You.

Sincerely,

Robert Tennyson,
Project Manager

cc: John McCumbers - MK
Ken Grams - Smith
file: H:\win\MKdye004.doc

MPC Containment Systems, Ltd.

May 23, 1996

**FROM: MPC CONTAINMENT SYSTEMS, LTD.
4834 S. Oakley
Chicago, IL 60609
312/927-4120
800/621-0146
312/650-6028**

**TO: Mr. Rob Tennyson
Smith Environmental
1110 Howard Drive
Deer Park, TX 77536**

Enclosed please find the following:

- 60 Mil Friction Seal Specification
- Bentofix GCL Specification
- 701 Geotextile
- 1291 Geotextile
- Drawing #961186

BY: Dean Flessas

NSC

60 mil FRICTION SEAL HD GEOMEMBRANE
PHYSICAL PROPERTIES

The properties on this page are not part of NSC's Manufacturing Quality Control program and are not included on the material certifications. Seam testing is the responsibility of the installer and/or CQC personnel.

PROPERTIES	METHOD	UNITS	MINIMUM ¹	TYPICAL
Multi-Axial Tensile Elongation	GRI, GM-4	percent	20.0	22.3
Critical Cone Height	GRI, GM-3, NSC mod.	cm	1.0	1.5
Wide Width Tensile	ASTM D 4885			
Stress at Yield		psi	2000	2110
Strain at Yield		%	15.0	20.0
Brittleness Temp. by Impact ²	ASTM D 746	°C	-75	< -90
Coef. of Linear Thermal Exp. ²	ASTM D 696	°C ⁻¹	1.5 x 10 ⁻⁴	1.2 x 10 ⁻⁴
ESCR, Bent Strip	ASTM D 1693	hours	1500	> 10,000
Hydrostatic Resistance	ASTM D 751	psi	450	550
Modulus of Elasticity	ASTM D 638	psi	80,000	116,000
Ozone Resistance ⁴	ASTM D 1149, 168 hrs	P/F	P	P
Permeability ^{2,4}	ASTM E 96	cm/sec · Pa	2.3x10 ⁻¹⁴	8.1 x 10 ⁻¹⁵
Puncture Resistance	FTMS 101, method 2065	ppi	1300	1570
		lbs	78	97
Soil Burial Resistance ²	ASTM D 3083, NSF mod.	% change	10	0
Tensile Impact	ASTM D 1822	ft lbs/in ²	130	160
Volatile Loss ²	ASTM D 1203, A	percent	0.10	0.08
Water Absorption ^{2,4}	ASTM D 570, 23°C	percent	0.10	0.04
Water Vapor Transmission ^{2,4}	ASTM E 96	g/day · m ²	0.024	0.009

SEAM PROPERTIES	METHOD	UNITS	MINIMUM ¹	TYPICAL
Shear Strength	ASTM D 4437, NSF mod.	psi	2000	2700
		ppi	120	166
Peel Strength (hot wedge fusion)	ASTM D 4437, NSF mod.	psi	1500	1870
		ppi	90	115
Peel Strength (fillet extrusion)	ASTM D 4437, NSF mod.	psi	1300	1590
		ppi	78	98

STANDARD ROLL DIMENSIONS

Length	850 feet	Area	12,750 ft ²
Width	15 feet	Weight	3,950 lbs

This information contained herein has been compiled by National Seal Company and is, to the best of our 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.

NSC reserves the right to update the information contained herein in accordance with technological advances in the material properties.

BENTOFIX® THERMAL LOCK TECHNICAL SPECIFICATIONS

GCL DATA

PROPERTY	TEST	STANDARD	UNITS	BENTOFIX NS
Physical				
-Mass Per Unit Area	ASTM D5261	minimum	lb/ft ² (g/m ²)	1.06 (5390)
-Thickness	ASTM D5199	typical	in (mm)	0.24 (6.0)
Mechanical				
-Grab Tensile ¹	ASTM D4632	typical	lb (N)	120 (530)
-Puncture	ASTM D4833	typical	lb (N)	130 (590)
-Friction Angle ²	ASTM D5321	minimum	degrees	25
-Peel Strength	ASTM D4632	minimum	lb (N)	15
Hydraulic				
-Water Permeability ³	GRI GCL-2	maximum	cm/s	1x10 ⁻⁹

COMPONENTS

COMPONENT	TEST	STANDARD	UNITS	BENTOFIX NS
Carrier Geotextile				
-Mass Per Unit Area	ASTM D5261	minimum	oz/yd ² (g/m ²)	woven 3.25 (110)
Cover Geotextile				
-Mass Per Unit Area	ASTM D5261	minimum	oz/yd ² (g/m ²)	nonwoven 6.0 (200)
Sodium Bentonite				
-Mass Per Unit Area		minimum	lb/ft ² (g/m ²)	1.0 (490)
-Montmorillonite Content	Methylene-Blue	typical	Meq	90
-Moisture Content	ASTM D4643	maximum	%	10
-Swell Index	USP NF XVII	minimum	ml	25
-Plate Water Absorption	ASTM E 946	minimum	%	840
-Fluid Loss	API 13B	maximum	ml	18
-Confined Swell	GRI-GCL 1	minimum	%	350

ROLL SIZE

DIMENSION	STANDARD	UNITS	BENTOFIX NS
-Width x Length ⁴	nominal	ft (m)	15.5 x 125 (4.7 x 38)
-Area per Roll	minimum	ft ² (m ²)	1938 (180)
-Packaged Weight	typical	lb (kg)	2150 (977)

NOTES:

1. Typical tensile values given for weakest principle direction.
2. Samples hydrated under an initial normal stress of 7.5 psi (50 kPa) and sheared internally.
3. Water permeability values given correspond to effective stress of 30 psi (206 kPa).
4. Nominal roll dimensions exclusive of protective edge area.

10/19/95

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701 Nonwoven Geotextile

701 is a polypropylene, staple fiber, needlepunched nonwoven geotextile manufactured at one of Synthetic Industries' facilities that has achieved ISO-9002 certification for its systematic approach to quality. The fibers are needled to form a stable net that retain dimensional stability relative to each other. The geotextile is resistant to ultraviolet degradation and to biological and chemical environments normally found in soils. 701 conforms to the property values listed below which have been derived from quality control testing performed by one of Synthetic Industries' GAI-LAP accredited laboratories:

<u>PROPERTY</u>	<u>TEST METHOD</u>	<u>MINIMUM AVERAGE ROLL VALUES¹</u>	
		<u>English</u>	<u>Metric</u>
<u>Mechanical</u>			
Grab Tensile Strength	ASTM D4632	180 lbs	800 N
Grab Elongation	ASTM D4632	50 %	50 %
Puncture Strength	ASTM D4833	110 lbs	485 N
Mullen Burst	ASTM D3786	350 psi	2410 kPa
Trapezoidal Tear	ASTM D4533	75 lbs	330 N
<u>Hydraulic</u>			
Apparent Opening Size (AOS)	ASTM D4751	70 US Std. Sieve	0.212 mm
Permittivity, ψ	ASTM D4491	1.50 sec ⁻¹	1.50 sec ⁻¹
Permeability, $k = \psi \cdot t$	ASTM D4491	0.34 cm/sec	0.34 cm/sec
Water Flow Rate	ASTM D4491	110 gpm/ft ²	4480 l/min/m ²
<u>Endurance</u>			
UV Resistance (% retained @ 500 hours)	ASTM D4355	70 %	70 %

Notes:

¹ Values shown are in weaker principal direction. Minimum average roll values are calculated as the typical minus two standard deviation. Statistically, it yields a 97.7% degree of confidence that any samples taken from quality assurance testing will exceed the value reported.

Standard Roll Size: 12.5 ft x 300 ft = 416.67 yd² (3.81 m x 91.5 m = 348.37 m²)

15.0 ft x 300 ft = 500 yd² (4.57 m x 91.5 m = 418.05 m²)

Seller makes no warranty, express or implied, concerning the product furnished hereunder other than it shall be of the quality and specifications stated herein. ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS EXPRESSLY EXCLUDED AND TO THE EXTENT THAT IT IS CONTRARY TO THE FOREGOING SENTENCE, ANY IMPLIED WARRANTY OR MERCHANTABILITY IS EXPRESSLY EXCLUDED. Any recommendations made by Seller concerning uses or applications of said product are believed reliable and Seller makes no warranty of results to be obtained. This Data Sheet supersedes all previous Data Sheets for this style and is subject to change without notice.

NW701.12.95

Synthetic Industries, Inc.

4019 Industry Drive • Post Office Box 22788 • Chattanooga, Tennessee • 37422 • USA
Telephone • 423-899-0444 • Fax • 423-899-7619 • 1-800-621-0444



1291 Nonwoven Geotextile

1291 is a polypropylene, staple fiber, needlepunched nonwoven geotextile manufactured at one of Synthetic Industries facilities that has achieved ISO-9002 certification for its systematic approach to quality. The fibers are needed to form a network that retain dimensional stability relative to each other. The geotextile is resistant to ultraviolet degradation and biological and chemical environments normally found in soils. 1291 conforms to the property values listed below which have been derived from quality control testing performed by one of Synthetic Industries' GAI-LAP accredited laboratories:

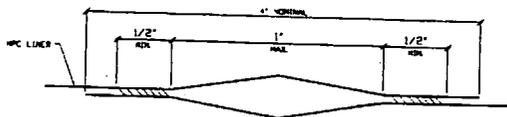
<u>PROPERTY</u>	<u>TEST METHOD</u>	<u>MINIMUM AVERAGE ROLL VALUE</u>	
		<u>English</u>	<u>Metric</u>
<u>Mechanical</u>			
Grab Tensile Strength	ASTM D4632	310 lbs	1375 N
Grab Elongation	ASTM D4632	50 %	50 %
Puncture Strength	ASTM D4833	210 lbs	930 N
Mullen Burst	ASTM D3786	620 psi	4270 kPa
Trapezoidal Tear	ASTM D4533	120 lbs	530 N
<u>Hydraulic</u>			
Apparent Opening Size (AOS)	ASTM D4751	100 US Std. Sieve	0.150 mm
Permittivity, Ψ	ASTM D4491	0.80 sec ⁻¹	0.80 sec ⁻¹
Permeability, $k = \Psi \cdot t$	ASTM D4491	0.29 cm/sec	0.29 cm/sec
Water Flow Rate	ASTM D4491	60 gpm/ft ²	244 m/r
<u>Physical</u>			
Mass Per Unit Area	ASTM D5261	12.0 oz/sy	405 gr/m ²
<u>Endurance</u>			
UV Resistance (% retained @ 500 hours)	ASTM D4355	70 %	70 %

Notes:

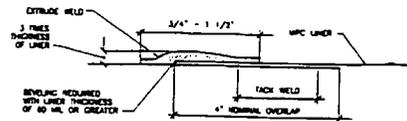
1 Values shown are in weaker principal direction. Minimum average roll values are calculated as the typical minus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any samples taken from quality assurance testing will exceed the value reported.

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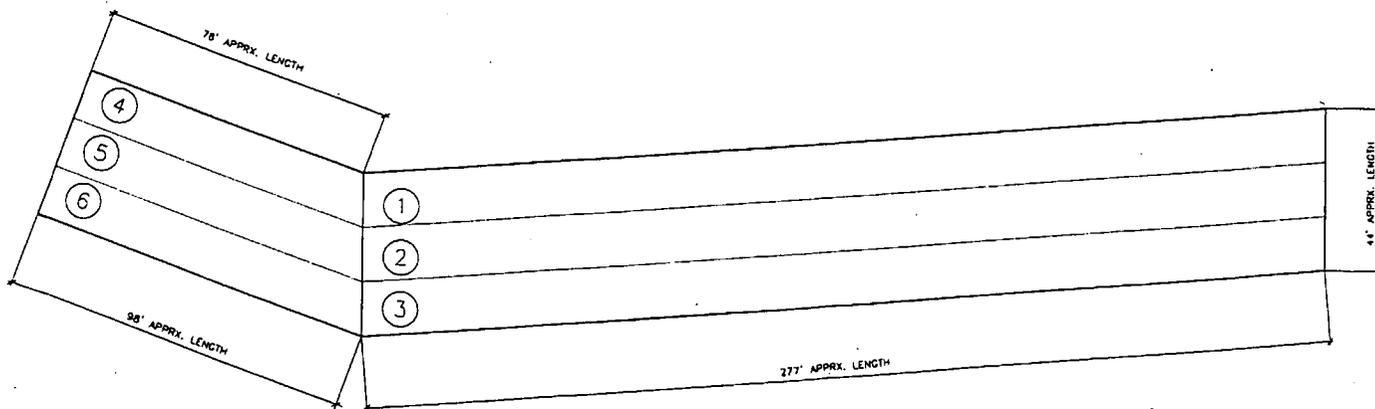
NW1291.12.95



DOUBLE FUSION WELD



EXTRUSION WELD



PLAN VIEW
PANEL LAYOUT

CUTTING LIST			
PANEL NO.	LENGTH	WIDTH	QTY.
1	277'-1"	15'	1
2	277'-1"	15'	1
3	277'-1"	15'	1
4	87'-11"	15'	1
5	93'-2"	15'	1
6	98'-5"	15'	1

ALL MATERIAL 60 MIL HOPE

BILL OF MATERIALS		
STAINLESS STEEL BATTERY		
ITEM	DESCRIPTION	QTY.
①	60 MIL HOPE DOUBLE-SIDED TEXTURED LINER (15' WIDE)	1 RCL
②	BENTOFIX GCL LINER (15'5" X 125' STD. ROLL)	3 RCLS
③	TYPE I NONWOVEN GEOTEXTILE (15' X 300' STD. ROLL) (SYNTHETIC INDUSTRIES 701)	3 RCLS
④	TYPE II NONWOVEN GEOTEXTILE (15' X 300' STD. ROLL) (SYNTHETIC INDUSTRIES 1291)	4 RCLS

MPC CONTAINMENT SYSTEMS, LTD.
4034 South County, Chicago, IL 60632

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DRAWING TITLE: **FABRICATION DETAILS**
SUBJECT: **DYE BURIAL CAP PANEL LAYOUT**

PROJECT DESCRIPTION:	F	DRAWING NO.
NAVAL SURFACE WEAPONS CENTER CRANE, INDIANA	C	961186
	D	SCALE:
	E	DATE:
	F	CHECKED:
	G	DATE:
	H	DATE:
	I	DATE:
	J	DATE:
RELEASE FOR APPROVAL:		DATE: 5/23/98
RELEASE FOR CONSTRUCTION:		

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



SIGNATURE

Public Works Officer

TITLE

6/6/96

DATE