SECTION 5.O

ENGINEERING SPECIFICATIONS

Unit 8, 75 MacDonald Avenue, Dartmouth, NS B3B 1T8 Tel: (902) 481-2532 Fax: (902) 468-8540 Toll Free: (800) 981-2532

Bulk Tank Farm Secondary Containment System

Dimensions – 40' wide x 65' long x 3'-2" high
Materials of Construction – Precast Concrete forms complete with a synthetic liner.
Total liquid capacity – 234,000 liters
Drawing – See attached for details

Work to be performed on the containment system exists of the following,

1. Prepare area for new berm, grade level, and install granular material. Compact in place.
2. Install precast concrete berm complete with synthetic liner material.
3. Place 6" of crushed stone material inside berm area and compact.

Products to be stored in this containment system include the following products and estimated volumes,

Tank 1 – Methyl Diethanolamine – 36,320 liters
Tank 2 - Spare – 36,320 liters
Tank 3 - Methanol – 90,000 liters
Tank 4 - Ethylene Glycol – 90,000 liters
Tank 5 - Printing Ink Solvent– 90,000 liters
Tank 6 - Future – 90,000 liters

The bulk containment system will be designed for the total capacity of six (6) 90,000-liter upright tanks.

Unit 8, 75 MacDonald Avenue, Dartmouth, NS B3B 1T8 Tel: (902) 481-2532 Fax: (902) 468-8540 Toll Free: (800) 981-2532

Rail Car and Truck loading/offloading secondary containment pad

Dimensions – 12' wide x 40' long x 8" high
Materials of Construction – 8" thick steel reinforced 5,000 psi concrete
Total liquid capacity – 9,063 liters
Drawing – See attached details

Work to be performed on the loading and offloading system exist of the following,

1. Excavation and Grading of work area.
2. Construction of forms for pad and containment sides.
3. Placement of steel throughout forms.
4. Placement and finishing of 5000 psi concrete.

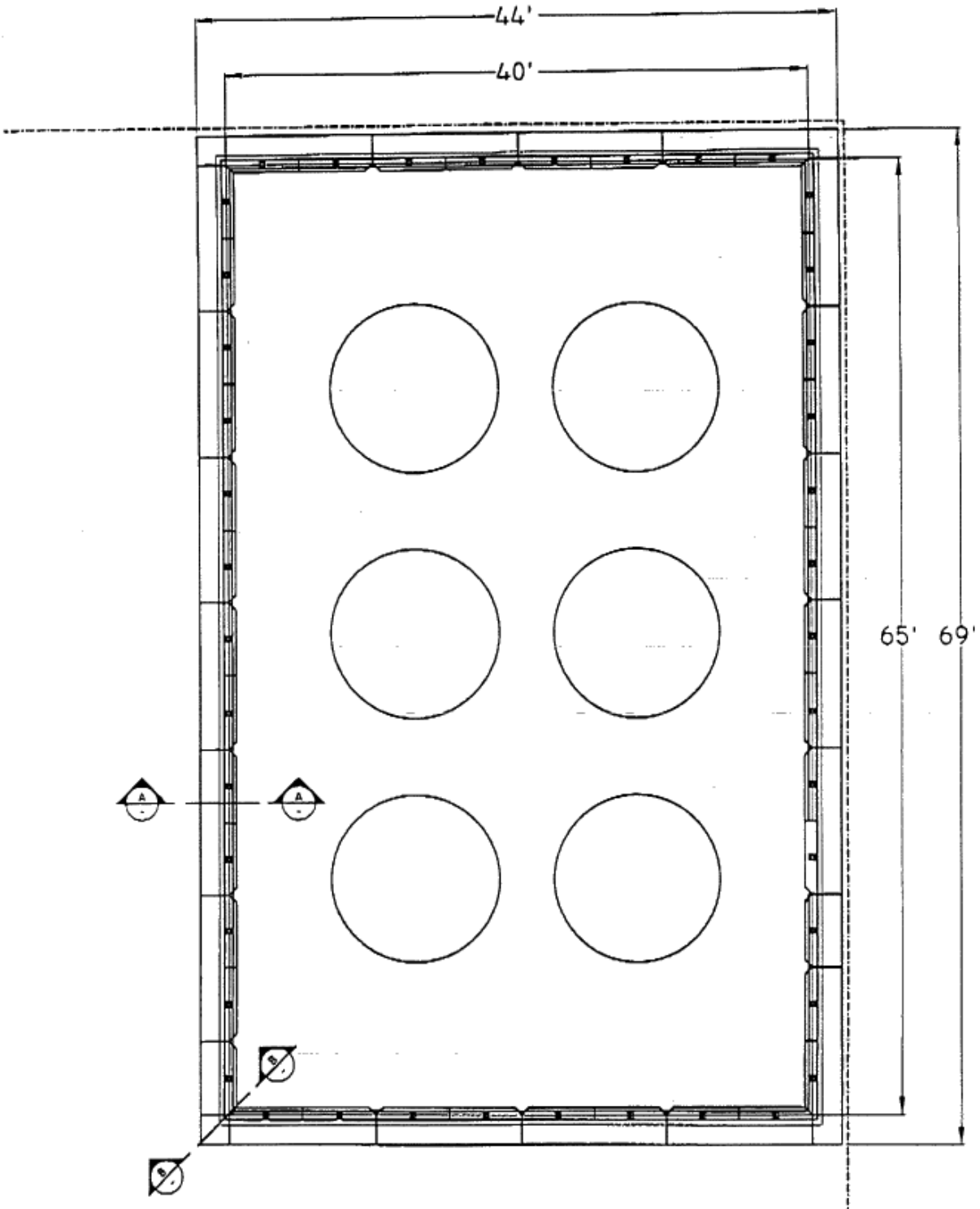
The loading and offloading secondary containment pad will be designed to contain the accidental release of hazardous products during bulk transfers from rail car to tanker and bulk tank to tanker. Under the rail car we will use a mobil drip tray to contain any small leaks during rail car transfers.

Blending, Packaging and Storage Structure complete with secondary containment

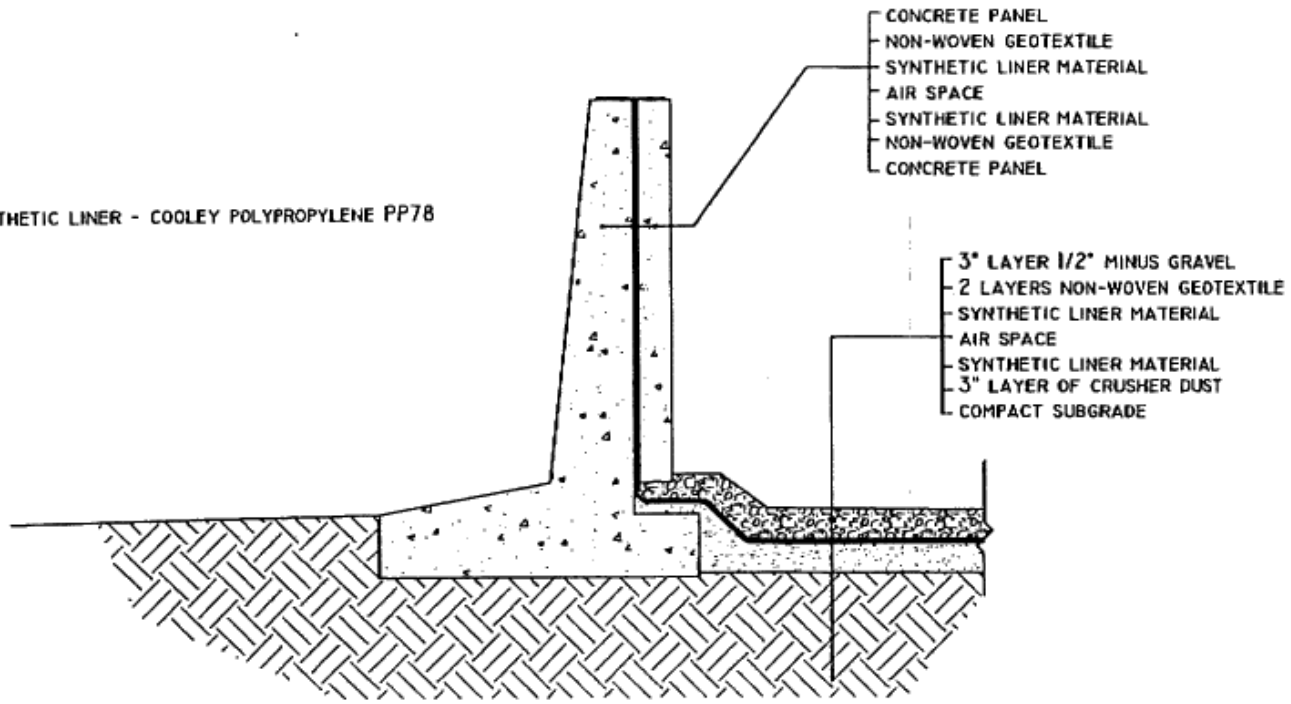
Structure Dimensions – 25' wide x 50' long x 18' high eve
Foundation - 8" thick steel reinforced 5,000 psi concrete complete with a
Total liquid capacity – 23,600 liters

Work to be performed on the loading and offloading system exist of the following,

1. Excavation and Grading of work area.
2. Construction of forms for pad and containment sides.
3. Placement of steel throughout forms.
4. Placement and finishing of 5000 psi concrete.

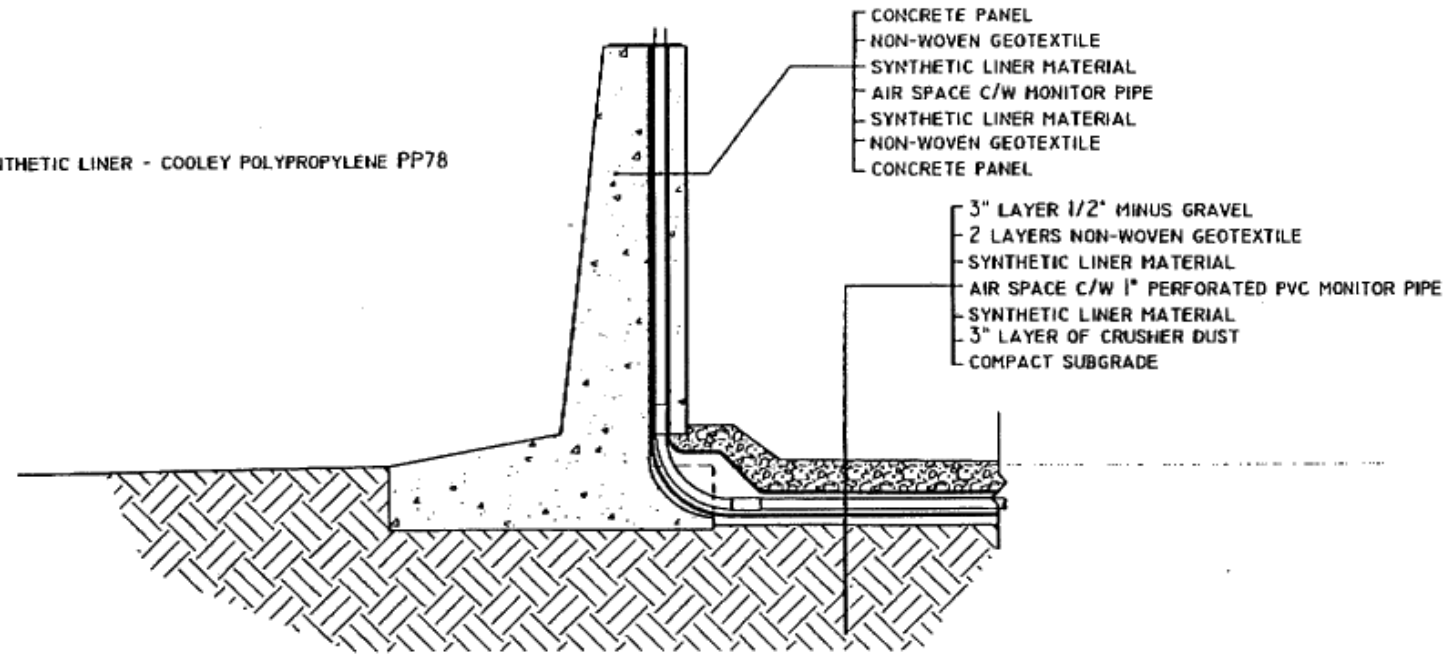


TOTAL DYKE CAPACITY = 234,000 LITRES



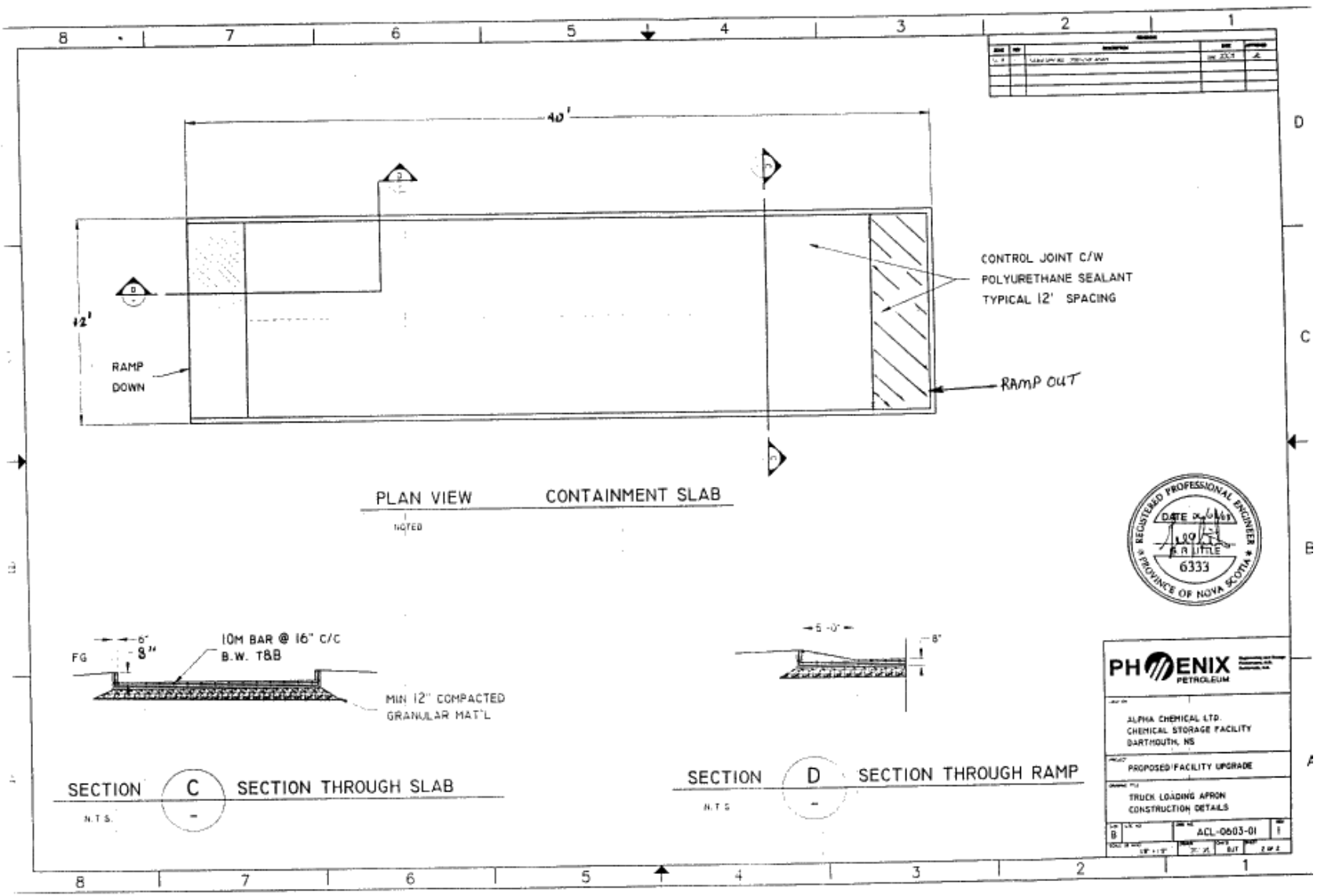
SECTION A SECTION THROUGH DYKE

N.T.S.



SECTION B SECTION THROUGH DYKE CORNER

N.T.S.


40'
12'
CONTROL JOINT C/W
POLYURETHANE SEALANT
TYPICAL 12' SPACING
RAMP
DOWN
RAMP OUT
PLAN VIEW CONTAINMENT SLAB
NOTED
6"
8"
FG
10M BAR @ 16" C/C
B.W. T&B
MIN 12" COMPACTED
GRANULAR MAT'L
SECTION C SECTION THROUGH SLAB
N.T.S.
5'-0"
8"
SECTION D SECTION THROUGH RAMP
N.T.S.
REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF NOVA SCOTIA
DATE
S. R. LITTLE
6333
PHOENIX PETROLEUM
ALPHA CHEMICAL LTD.
CHEMICAL STORAGE FACILITY
DARTMOUTH, NS
PROPOSED FACILITY UPGRADE
TRUCK LOADING APRON
CONSTRUCTION DETAILS
ACL-0603-01

Cooley | *Engineered Membranes*
WHERE CHEMISTRY MAKES THE DIFFERENCE

February 20, 2003

Mr. Dale Cox
Tarp Rite
327 Lockhart Mill Road
Jacksonville, NB E7M 3S5 Canada

Dear Mr. Cox

This letter is to confirm that Cooley's reinforced polypropylene geomembrane material has a "A" rating, "fluid has little to minor effect" as per Cooley's polypropylene chemical resistance guideline, when exposed to the following chemicals.

- N-METHYLDIETHANOLAMINE (MDEA)
- Triethylene Glycol
- Methanol 33%
- Ethylene Glycol

If you have any further questions regarding our products, please feel free to contact me at (800) 333-3048, ext. 6210.

Best Regards,

Jim Ellis
Vice President / Business Manager – Cooley Engineered Membrane

FX:(401) 726-8799 PH:(800) 333-3048

50 Esten Avenue, Pawtucket, RI 02860 USA • (401) 724-9000 •
A Cooley Group

Polypropylene PP78™

Cooley's reinforced polypropylene liner developed in conjunction with Montell Polymers offers the most versatile flexible geomembrane liner available today. The unique combination of custom fabric reinforcement encapsulated by extruded high performance polypropylene proves a strong, highly chemical resistant liner. A chemically inert polymer is modified by a Catalloy® process technology. With this process, the molecular structure of the polymer is modified to provide many specialized properties. These properties include excellent flexibility, low thermal coefficient of expansion and contraction, outstanding dimensional stability, wide temperature range for excellent seaming, good chemical resistance. All this performance without Environmental Stress Cracking (ESC). Used for the containment of the most aggressive chemicals to potable water and aquaculture services highlights the broad uses of the product. Thermally seamed and highly flexible, the liner can be supplied in large panels for minimum field seaming and simple installation.

PROPERTY	TEST METHOD	VALUE				
Gauge, nominal (mils)		60	45	36	30	20
Plies, reinforcing 9 x 9 1000d polyester scrim		1	1	1	1	1
Breaking Strength - Fabric, minimum (lbs.)	ASTM D751 Method A	275 x 225	275 x 225	275 x 225	275 x 225	200 x 200
Low Temperature Flexibility 1/8 in Mandrel (°F)	ASTM D2136, 4 hrs.	-65				
Puncture Resistance, minimum (lbs.)	FTMS 101C	275	250	250	250	250
Tear Strength, minimum (lbs.)	ASTM D751 Tongue Tear	100	100	100	100	75
Dimensional Stability (% change, maximum)	ASTM D1204 180°F/1 hour	±1.0				
Hydrostatic Resistance minimum (psi)	ASTM D751 Method A, Procedure 1	350	350	350	350	300
Ply Adhesion, minimum (lbs./in.)	ASTM D413	20	20	20	20	20
Water Absorption (% wt. chge, max)	ASTM D471	<1%				
UV Resistance	ASTM G26 Xenon Arc	>12,000 hrs.				
Resistance to Soil Burial (% Tensile Retention)	ASTM D3083 (Part 9.5)	90% min.				

TYPICAL FACTORY SEAM PROPERTIES:

PROPERTY	TEST METHOD	VALUE
Bonded Seam Strength (lbs./width)	ASTM D751	160 min
Peel Adhesion, minimum (lbs./inch)	ASTM D413	20 or FTB

POLYPROPYLENE PP78™
CHEMICAL RESISTANCE GUIDELINE

Cooley Engineered Membranes offers a wide variety of geomembranes to fit your liner needs. Because each containment application is unique, this list is offered only as a guide in choosing the correct Cooley Geomembrane to fit your containment needs.

The following list of chemicals has been tested at ambient temperatures under static conditions. The effect of these chemicals on the geomembrane are subject to change based on variables such as but not limited to: exposure to additional chemicals, temperature, dilution of the chemical, stronger concentrations, time of exposure, etc.

It is always recommended that you contact Cooley Engineered Membranes prior to choosing your geomembrane and/or that you test a sample of the geomembrane under actual or simulated jobsite conditions.

RATINGS:
A = FLUID HAS LITTLE TO MINOR EFFECT
B = FLUID HAS MINOR TO MODERATE EFFECT
C = FLUID HAS SEVERE EFFECT
T = NO TEST DATA-LIKELY TO HAVE MINOR EFFECT
X = NO TEST DATA-LIKELY TO HAVE SEVERE EFFECT

	Concentration	
A		
Acetic Acid	5%	A
Acetic Acid	50%	T
Acetic Acid	Glacial	A
Acetic Anhydride		T
Acetone		C
Alkyl Alcohol		T
Alkyl Chloride		X
Aluminum Chloride		T
Aluminum Fluoride		T
Aluminum Sulfate		T
Ammonia Carbonate		T
Ammonium Chloride		T
Ammonium Fluoride	20%	T
Ammonium Hydroxide	30%	A
Ammonium Nitrate		A
Ammonium Phosphate		T
Ammonium Sulfate		T
Ammonium Sulfide		T

	Concentration	
Amyl Acetate		C
Amyl Alcohol		T
Amyl Chloride		A
Aniline		A
Animal Oil		T
Antimony Chloride		A
Aqua Regia		X
ASTM Fuel A		C
ASTM Fuel B		C
ASTM Fuel C		C
ASTM Oil #1		A
ASTM Oil #2		A
ASTM Oil #3		A
Asphalt		A
B		
Barium Carbonate		T
Barium Hydroxide		T

	Concentration	
Barium Sulfate		T
Benzene	<1%	T
Benzene	25%	X
Benzene	100%	C
Benzoic Acid		T
Bismuth Carbonate		T
Borax Solutions		T
Boric Acid	10%	T
Bromic Acid		T
Bromine Anhydrous		X
Butyl Acetate		T
Butyl Alcohol		A
Butyl Phenol		T
Butyric Acid		T
C		
Calcium Bisulfate		T
Calcium Carbonate		A
Calcium Chloride		T
Calcium Hydroxide		T
Calcium Hypochlorate		T
Calcium Nitrate	50%	T
Calcium Sulfate		T
Calcium Disulfide		C
Carbon Tetrachloride		C
Carbonic Acid		C
Castor Oil		T
Chlorine Gas		X
Chloracetic Acid		X
Chlorobenzene		X
Chloroform		X
Chlorosulfonic Acid		X
Chrome Aluminum		T
Chromic Acid	30%	X
Chromium Trioxide		X
Citric Acid		T
Copper Chloride		T
Copper Nitrate		T
Copper Sulfate		T
Corn Oil		T
Cottonseed Oil		T
Crude Oil		A
Cyclohexane		X

	Concentration	
Cyclohexanol		T
Cyclohexanone		T
D		
Dextrine		T
Dibutyl Phthalate		A
Diesel Fuel		B
Diethyl Ether		X
Diethyl Sebacate		A
Dimethylamine		X
Diethyl Keytone		X
Disodium Phosphate		T
E		
Epichlorohydrine		B
Ethyl Acetate		C
Ethyl Alcohol		T
Ethyl Bromide		X
Ethyl Chloride		X
Ethylene Dichloride		T
Ethylene Glycol		A
Ethylene Oxide		T
F		
Ferric Chloride		T
Ferric Nitrate		T
Ferrous Chloride		T
Ferrous Sulfate		T
Fluosilic Acid		T
Formaldehyde	40%	A
Formic Acid		A
Furfural		X

RATINGS:

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X = NO TEST DATA-LIKELY TO HAVE SEVERE EFFECT

	Concentration	
G		
Gallic Acid		C
Gasoline	<25% BTX	C
Gasoline	>25% BTX	C
Glucose		T
Glycerine		A
H		
Hexane		C
Hydraulic Fluid		A
Hydrazine		A
Hydrobromic Acid		A
Hydrochloric Acid	20%	A
Hydrochloric Acid	37%	T
Hydrocyanic Acid		T
Hydrofluoric Acid	20%	A
Hydrofluoric Acid	75%	A
Hydrofluosilic Acid	30%	A
Hydrogen Peroxide	3%	T
Hydrogen Peroxide	10%	T
Hydrogen Sulfide		T
Hydroquinone		C
I		
Iso-Octane		A
Isopropyl Alcohol		T
J		
JP-4 Jet Fuel		C
Jet A		X
Jet B		X
K		
Kerosene		X

	Concentration	
L		
Lactic Acid		T
Lead Acetate		T
Linseed Oil		A
Lubricating Oils		A
M		
Magnesium Carbonate		T
Magnesium Chloride		T
Magnesium Hydroxide		A
Magnesium Nitrate		T
Magnesium Sulfate		T
Malic Acid		T
Mercuric Chloride		T
Methyl-Ethyl Keytone		X
Mineral Oil		A
Mineral Spirits		A
N		
Naptha		C
Napthalene		X
Nitric Acid	10%	T
Nitric Acid	50%	A
Nitric Acid	70%	X
Nitrobenzene		X
O		
Oleic Acid		T
Oleum	25%	C
Oxalic Acid		T
P		
Palmitic Acid		T
Perchlorethylene	<1%	X
Perchloroethylene	100%	X
Phenol		T
Phenol Formaldehyde		T
Phosphoric Acid	50%	T
Phosphoric Acid	75%	T
Phosphorous Yellow		T
Phosphorous Pentoxide		T
Photographic Solutions		A

RATINGS

A = FLUID HAS LITTLE TO MINOR EFFECT
B = FLUID HAS MINOR TO MODERATE EFFECT
C = FLUID HAS SEVERE EFFECT
T = NO TEST DATA-LIKELY TO HAVE MINOR EFFECT
X = NO TEST DATA-LIKELY TO HAVE SEVERE EFFECT

	Concentration	
Phthalate Plasticizer		A
Pickling Solutions		A
Potassium Bicarbonate		T
Potassium Carbonate		T
Potassium Chromate	40%	T
Potassium Cyanide		T
Potassium Dichromate		T
Potassium Hydroxide		A
Potassium Nitrate		T
Potassium Perchlorate	10%	T
Potassium Permanganate		T
Potassium Sulfate		T
Pyridine		X
S		
Salt Water		A
Silicon Grease		T
Silver Nitrate		T
Skydrol Hydraulic Fluid		A
Soap Solutions		A
Sodium Acetate		T
Sodium Bicarbonate		T
Sodium Bisulfate		T
Sodium Borate		T
Sodium Carbonate		T
Sodium Chlorate		T
Sodium Chloride		T
Sodium Dichromate	20%	T
Sodium Dichromate	100%	T
Sodium Ferrocyanide		T
Sodium Fluoride		T
Sodium Hydroxide	25%	T
Sodium Hydroxide	60%	T
Sodium Hypochlorite		T
Sodium Nitrate		T
Sodium Sulfate		A
Soybean Oil		A
Stannous Chloride		T
Stearic Acid		T
Styrene		X
Sulfuric Acid	10%	T
Sulfuric Acid	40%	A
Sulfuric Acid	98%	X

	Concentration	
T		
Tannic Acid		T
Tartaric Acid		T
Tetrahydrofuran		X
Toluene	<1%	C
Toluene	25%	X
Toluene	100%	X
Transformer Oil		C
Triethanolamine		A
Trisodium Phosphate		T
Tung Oil		T
Turpentine		C
U		
Urea		T
V		
Vegetable Oil		A
W		
Water		A
X		
Xylene	<1%	T
Xylene	25%	X
Xylene	100%	X
Z		
Zinc Chloride		T
Zinc Oxide		T

The data shown are the result of laboratory tests and are intended only as a guide. No performance warranty is intended or implied. Ratings were determined by visual experimentation of coated fabric samples after contact with test fluid for 28 days at room temperature.

When considering Cooley Engineered Membranes for a specific application, it is important to study other requirements such as permeability, service temperature, concentration, size to be contained, etc. A sample of material should be tested in actual service before specification. When impractical, tests should be devised which simulate actual service conditions as closely as possible. The Cooley Engineered Membranes Technical Department should be consulted for further recommendation. This table is presented and accepted at user's risk.

EASCAN BUILDING PRODUCT LINE

EASCAN BUILDINGS FULFILL YOUR BUSINESS NEEDS --- PERFECTLY

Whether you need a building 20' x 20' or 360' x 10,000' Eascan can be your building solution. Eascan buildings are an attractive, economical, time-proven investment with many satisfied customers to attest to their success.

Eascan building systems offer you a full range of quality components that are designed to meet your needs.

STANDARD BUILDINGS

SM (Span Master): Available in clear-span widths from 20' to 50', and eave heights form 10' to 20'. Roof slope is 1 to 12. The standard increments of length are 15', 20' and 25'. Columns are available with a uniform section that makes it possible to install a flush wall throughout the interior.

RF (Rigid Frame): This line is available in clear-span width of 30' to 120'. The eave heights range from 10' to 24'. The 4 to 12 roof slope offers additional peak height for storage or ventilation where required.

LR (Low Roof): This versatile series is available in standard clear-span widths of 40' to 120' and modular widths (**LRM**) of 60' to 300'. The eave heights range from 10' to 24'. LR buildings offer considerable economies where wide clear-span spaces are required. This feature combined with the architecturally pleasing profile makes LR buildings ideal for a wide range of business and industrial applications. Interior columns are available in several standard spacing arrangements to provide maximum economy and to fit your business needs exactly.

SPECIAL BUILDINGS

Eascan has the trained engineers, designers and manufacturing know how to produce a large variety of "special" building systems on regular basis. These structures are termed "special" only because they are not covered under our standard descriptions set forth in this booklet.

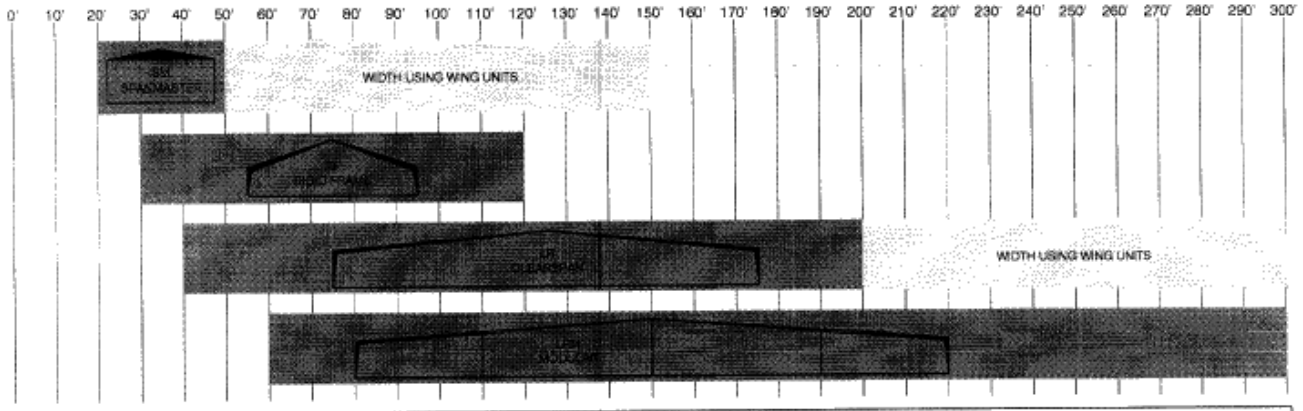
These "special" building systems cover a wide range of applications including: heavy structures (usually in connection with multiple crane systems), clear span structures much wider than our standards, (up to 210') multi-story buildings, circular-shaped structures with straight sidewalls, grand stands, and steel clear-span systems for masonry walls. In addition to the above, structural steel, ducting, miscellaneous metals etc. are produced at our Truro plant. Our Small Jobs Department and Machine Shop can meet your specialty needs.

Wing Units:

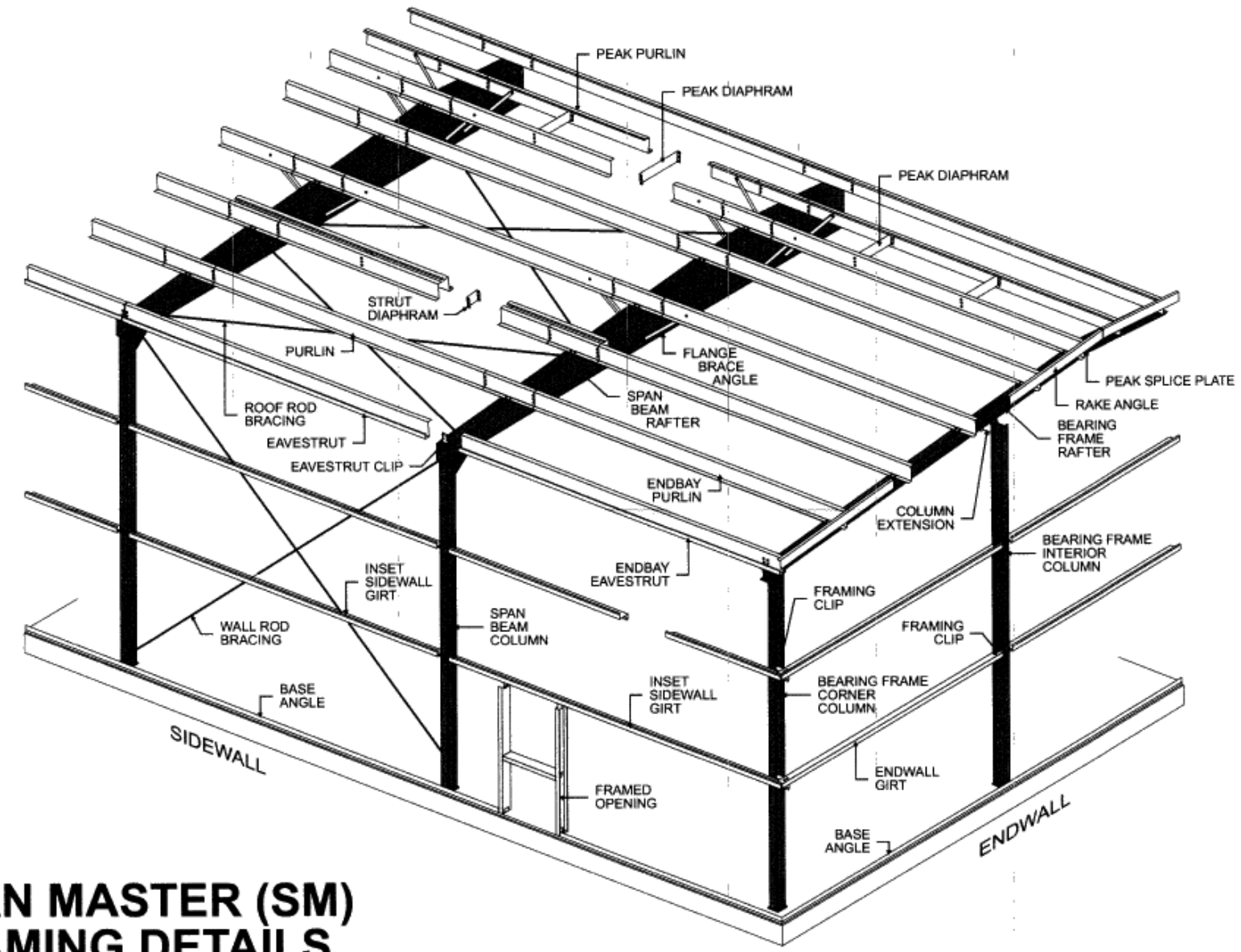
Wing units for Eascan buildings are available in spans of 20', 30', 40', and 50' for flexible design and economy.

Wing units may be attached to either or both sides.

BUILDING SIZE AVAILABILITY



OTHER SERVICES AVAILABLE
-Structural Steel
-Miscellaneous Metal, Mezzanine Floors, Stairs, etc...
-Ductwork, Platework, Conveyors



SPAN MASTER (SM) FRAMING DETAILS

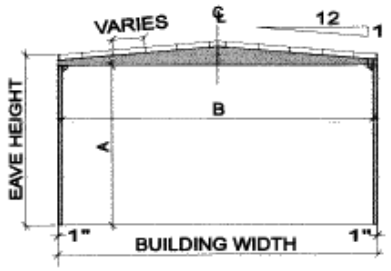
EASCAN-8.06.99

FRAME TYPE - SPAN MASTER FRAME (SM)

Available in clear-span widths from 20' to 50', and eave heights form 10' to 20'. Roof slope is 1 to 12. The standard increments of length are 15', 20' and 25'. Columns are available with a uniform section that makes it possible to install a flush wall throughout the interior making it ideal for office, service industries or warehouses.

LOAD TYPE CHART

BAY (FT)		SNOW ROOF LOAD			
		40 psf	50 psf	60 psf	70 psf
ft-in	mm	1.915 kPa	2.394 kPa	2.873 kPa	3.352 kPa
15'-0"	4572		1	2	3
20'-0"	6096	1	2	3	4
25'-0"	7620	2	3	4	



WIDTH	EAVE HEIGHT		ROOF LOAD 1 (See Load Type Chart)				ROOF LOAD 2 (See Load Type Chart)				ROOF LOAD 3 (See Load Type Chart)				ROOF LOAD 4 (See Load Type Chart)			
			A		B		A		B		A		B		A		B	
	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm	ft-in	mm
20'-0" 6096	10'-0"	3048	8'-3"	2515	18'-2"	5537	8'-3"	2515	18'-2"	5537	8'-3"	2515	18'-2"	5537	8'-3"	2515	18'-2"	5537
	12'-0"	3658	10'-3"	3124	18'-2"	5537	10'-3"	3124	18'-2"	5537	10'-3"	3124	18'-2"	5537	10'-3"	3124	18'-2"	5537
	14'-0"	4267	12'-3"	3734	18'-2"	5537	12'-3"	3734	18'-2"	5537	12'-3"	3734	18'-2"	5537	12'-3"	3734	18'-2"	5537
	16'-0"	4877	14'-3"	4343	18'-2"	5537	14'-3"	4343	18'-2"	5537	14'-3"	4343	18'-2"	5537	14'-3"	4343	18'-2"	5537
	18'-0"	5486	16'-3"	4953	18'-2"	5537	16'-3"	4953	18'-2"	5537	16'-3"	4953	18'-2"	5537	16'-3"	4953	18'-2"	5537
	20'-0"	6096	18'-3"	5563	18'-2"	5537	18'-3"	5563	18'-2"	5537	18'-3"	5563	18'-2"	5537	18'-3"	5563	18'-2"	5537
30'-0" 9144	10'-0"	3048	8'-3"	2515	28'-2"	8585	8'-3"	2515	28'-2"	8585	8'-3"	2515	28'-2"	8585	8'-3"	2515	28'-2"	8585
	12'-0"	3658	10'-3"	3124	28'-2"	8585	10'-3"	3124	28'-2"	8585	10'-3"	3124	28'-2"	8585	10'-3"	3124	28'-2"	8585
	14'-0"	4267	12'-3"	3734	28'-2"	8585	12'-3"	3734	28'-2"	8585	12'-3"	3734	28'-2"	8585	12'-3"	3734	28'-2"	8585
	16'-0"	4877	14'-3"	4343	28'-2"	8585	14'-3"	4343	28'-2"	8585	14'-3"	4343	28'-2"	8585	14'-3"	4343	28'-2"	8585
	18'-0"	5486	16'-3"	4953	28'-2"	8585	16'-3"	4953	28'-2"	8585	16'-3"	4953	28'-2"	8585	16'-3"	4953	28'-2"	8585
	20'-0"	6096	18'-3"	5563	28'-2"	8585	18'-3"	5563	28'-2"	8585	18'-3"	5563	28'-2"	8585	18'-3"	5563	28'-2"	8585
40'-0" 12192	10'-0"	3048	8'-3"	2515	38'-2"	11633	8'-3"	2515	38'-2"	11633	8'-1"	2464	38'-2"	11633	8'-1"	2464	38'-2"	11633
	12'-0"	3658	10'-3"	3124	38'-2"	11633	10'-3"	3124	38'-2"	11633	10'-1"	3073	38'-2"	11633	10'-1"	3073	38'-2"	11633
	14'-0"	4267	12'-3"	3734	38'-2"	11633	12'-3"	3734	38'-2"	11633	12'-1"	3683	38'-2"	11633	12'-1"	3683	38'-2"	11633
	16'-0"	4877	14'-3"	4343	38'-2"	11633	14'-3"	4343	38'-2"	11633	14'-1"	4293	38'-2"	11633	14'-1"	4293	38'-2"	11633
	18'-0"	5486	16'-3"	4953	38'-2"	11633	16'-3"	4953	38'-2"	11633	16'-1"	4902	38'-2"	11633	16'-1"	4902	38'-2"	11633
	20'-0"	6096	18'-3"	5563	38'-2"	11633	18'-3"	5563	38'-2"	11633	18'-1"	5512	38'-2"	11633	18'-1"	5512	38'-2"	11633
50'-0" 15240	10'-0"	3048	8'-1"	2464	48'-2"	14681	7'-11"	2413	48'-2"	14681	7'-1"	2413	48'-2"	14681	7'-1"	2413	48'-2"	14681
	12'-0"	3658	10'-1"	3073	48'-2"	14681	9'-11"	3023	48'-2"	14681	9'-1"	3023	48'-2"	14681	9'-1"	3023	48'-2"	14681
	14'-0"	4267	12'-1"	3683	48'-2"	14681	11'-11"	3632	48'-2"	14681	11'-1"	3632	48'-2"	14681	11'-1"	3632	48'-2"	14681
	16'-0"	4877	14'-1"	4293	48'-2"	14681	13'-11"	4242	48'-2"	14681	13'-1"	4242	48'-2"	14681	13'-1"	4242	48'-2"	14681
	18'-0"	5486	16'-1"	4902	48'-2"	14681	15'-11"	4851	48'-2"	14681	15'-1"	4851	48'-2"	14681	15'-1"	4851	48'-2"	14681
	20'-0"	6096	18'-1"	5512	48'-2"	14681	17'-11"	5461	48'-2"	14681	17'-1"	5461	48'-2"	14681	17'-1"	5461	48'-2"	14681