QAS - Quality Assurance

Elastoseal EPDM Geomembrane

Manufacturing manual quality control and quality assurance system

1. Material specification

1.1 Overview

This manual constitute a general description of the principles for Quality Control and Quality Assurance of the production of Elastoseal EPDM Geomembrane at the plant of SealEco.
The production at SealEco´s plant in Sweden is focused on exacting quality control throught the entire process. The production is completely traceable from a specific panel on site back to individual product data compound properties of the actual rubber mix used in production. Our operations are conducted according to ISO 9001 and ISO 14001.

1.2 Material

Elastoseal EPDM Geomembrane is calandered in two plies in vulcanised, crosslinked EPDM (Ethylene-propylene-diene-monomer) or EPDM/TPE (Ethylene-propylene-diene-monomer/ Thermoplastic Elastomer of Olefine type). The crosslinked molecular structure of EPDM gives unique properties, a chemical stable product with negligiable aging over long periods of time despite exposure to the atmosphere, sunlight, UV radiation, chemical pollution, water or high- and low temeperatures. The product contains no plastizers or additives, which can evaporate or be washed out over the years. The strength and elasticity remains virtually unchanged over decades, without shrinkage, melting, hardening or cracking, and the membrane remains flexible and elastic even if the temperature varies from –50 to + 120° C.

1.3 Material Specification

Upon receipt of raw material random tests are made of the batches. Documentation of this testing is kept by SealEco.

1.4 Production Control

All test results are recorded and kept available at SealEco. Upon delivery to work site every panel is marked according to project specifications. Production Control include the following properties and are tested according to standard methods: Certificates are issued for deliveries of geomembranes for geotechnical projects: Form QM1, QM2.

Property	Test Method	Test Frequency
Thickness	EN 1849-2	5 roll
Width	EN 1848-2	5 roll
Labelling		5 roll
Hardness	SS ISO-48	every curing batch
Tensile strength	SS ISO-37	every curing batch
Elongation at break	SS ISO-37	every curing batch
Tear resistance	SS ISO-34	every curing batch
Seam test	EN 12316-2	every curing batch

SealEco must be informed about request for QAS - Quality Assurance at date of order.
QAS - Quality Assurance can not be implemented on Manufacturing and Prefabrication retrospectiverly.

SealEco
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QAS - Quality Assurance

Elastoseal EPDM Geomembrane

Prefabrication manual quality control and quality assurance system

1. Material specification

1. Overview

This manual constitute a general description of the principles for Quality Control and Quality Assurance of the prefabrication of Elastoseal EPDM Geomembrane.

2. Non Destructive Testing

All prefabricated splices shall be controlled using the air lance continuity test.

The air lance equipment and procedures are generally outlined in ASTM D 4437 and as follows:

1. Air lance test equipment consists of a compressed air source that can deliver a continuous air nozzle exit pressure of min 350 kPa/3,5 bar to a 4,75 mm diameter nozzle on the end of a hand held lance.
2. The nozzle opening shall be directed to the edge of the seam an held a maximum of 25 mm away from the edge.
3. The rate of travel along the edge of the seam shall not exceed 12 m/min.
4. Any defect that is identified by a distinct change in sound by the air passing through an opening or obvious de-bonding due to air pressure force shall be marked for repair. The panel as such shall also be controlled visually and approved before packaging.

3. Destructive Testing

A destructive seam testing shall be performed at the beginning of every working shift or when the seam conditions for some reason changes.

1. Cut a sample of minimum 300 x 300 mm at a suitable place. The seam shall be located in the centre of the sample.
2. Test the sample in a calibrated tensiometer at a strain of 500 mm/min.
3. The pass/fail criteria are:

Seam shear = min. 6 kN/m

Seam peel = min 2,0 kN/m.

Typical value for seam peel is 3,0 kN/m.

4. Marking, Delivery, Certificates

To avoid damages during handling and transport panels is transported, packed and stored according to SealEco specifications. Every panel delivered to site is marked with Manufacturer, Product Name, Thickness, Width, Length, Panel Number/ Identification and Production Date. Every delivery is also followed by certificate:

QF3 Panel Listing Report.

QF1 Non-Destructive Seam Control.

QF2 Destructive Seam Control.

QAS - Quality Assurance

Elastoseal EPDM Geomembrane

Installation manual quality control and quality assurance

1 Introduction

1.1 Overview

This manual constitute a general guide in delineating the basic construction related activities that define quality control and quality assurance for the installation of non-reinforced EPDM geomembranes. Construction Quality Control (CQC) is defined as a planned system of inspections that are used directly to monitor and control the quality of a construction project. Construction Quality Assurance (CQA), on the other hand, is a planned system of activities that provide assurance that the project is constructed as specified in the design.

1.2 Personnel

The following are the personnel that are referenced in this manual:

Owner

Project or Facility owner who is ultimatly responsible for the final install acceptance of the geomembrane installation.

Engineer

Design engineer who is responsible for the project design, planning and specifications. The engineer may also function as the project manager.

Contractor

The prime contractor for the project who is ultimately in charge and responsible for all subcontractors. The contractor may be the earthwork contractor or the geomembrane installation company.

Manufacturer

The manufacturer of the geomembrane roll goods or panels from raw materials, SealEco.

Fabricator

The Fabricator is a by SealEco approved company that fabricates the EPDM roll goods into large prefabricated panels, custom designed for a specific project application. The Manufacturer may also function as Fabricator.

Installer

The installer is a by SealEco approved subcontractor (or an approved prime contractor) for the complete installation, seaming and attachment of the EPDM panels in accordance with project specifications.

CQA Consultant

Independent third party who monitors, tests, inspects and or Inspector documents the geomembrane installation and associated geosynthetic materials. The CQA consultant usually reports directly to the Owner and is independant of the Contractor.

1.3 Geomembrane Delivery

1.3.1 Transportation and Handling

Transportation of the Geomembran is the responsibility of the Manufacturer and/or the Fabricator. The geomembrane rolls or panels are packaged and shipped in a manner that will protect them from damage. All handling on site is the responsibility of the Installer and the Installer and CQA Inspector shall verify that:

1. Only approved handling equipment is used on site that will not damage the geomembrane panels in any way.
2. The Installer´s personnel handle the geomembrane panels with care.
3. Upon delivery to the site, the Installer and CQA Inspector will conduct a thorough surface observation of all panels for defects or damage. This examination will be conducted without unrolling rolls or unfolding panels unless damage is suspected. The CQA Inspector will identify any panels which should be rejected and removed from site due to severe damage or any panels which will require minor repair.

1.3.2 Storage

The Installer and ultimately the Contractor will be responsible for the storage of the EPDM Geomembrane rolls and/or panels on site in a location that provides optimal on site transport and handling. Storage area should be protected from theft, vandalism, vehicular traffic, dirt, debris, UV exposure and other sources of damage. All panels must be placed on smooth, elevated surfaces.

2 Geomembrane installation

2.1 Earthworks

2.1.1 Surface preparations

The Contractor will be ultimately responsible for preparing the subgrade soils in accordance with the project specifications. Prior to any Geosynthetics installation, the Installer and the CQA Inspector shall verify the following:

1. The surveyor has defined and verfied all lines and grades.
2. The Contractor has provided all CQC documentation that the supporting soils meet the density specification.
3. The surface to be lined has been rolled and compacted

and that the Contractor has verified that the surface is free of irregularities, loose soil and abrupt changes in grade.

4. The Contractor has verified that the soil surface does not contain stones larger than 20 mm or debris that may be damaging to the EPDM geomembrane.

5. The Contractor has verified that there is no area of softened soils due to high water content and there is no standing water.

The Installer shall verify all of the above in writing that the surface on which the EPDM geomembrane is to be installed is acceptable. Under no circumstances shall the Installer deploy geomembrane panels in unacceptable areas. If the accepted surface becomes damaged or deteriorates, all liner installation work shall stop and the condition brought to the attention of the Contractor for repair.

2.1.2 Anchor Trenches

All anchor trenches, runouts or terminations shall be excavated by the Contractor to lines and grades shown on the drawings prior to geomembrane placement. The Installer and CQA Inspector shall inspect trench or termination construction to verify acceptability of construction in accordance with the project drawings.

Anchor trenches shall be prepared just in advance of geomembrane deployment to prevent damage to trenches.

The edges of the anchor trench in contact with the geomembrane shall be slightly rounded and free of loose soil, protrusions or debris that could damage the geomembrane.

Backfilling of the anchor trenches or runouts shall be accomplished as soon as practical after geomembrane installation and seaming. If backfilling cannot be completed at the end of each day, temporary ballast (sandbags) must be placed at the terminations.

2.2 Geomembrane Placement

2.2.1 Field Panel Identification

A field panel is the unit area of prefabricated EPDM geomembrane which will be placed and seamed in the field.

The Contractor shall ensure that each field panel is given a number or letter-number “identification code”. This identification code will be agreed upon by the Engineer, Installer and CQA Inspector. The field panel identification code should be as simple as possible for cross reference to panel numbers. It is the responsibility of the Installer to ensure that each field panel is marked and referenced with the original panel number as well as the identification code.

2.2.2 Location of panels in field

The Installer shall place each panel at the location indicated on the proposed panel layout plan, as approved and/or modified. The CQA Inspector shall observe that field panels are installed at the proper location.

Each panel shall be placed one at a time and each panel shall be seamed immediately after placement, or ballasted with sand bags if required to be left overnight.

Each panel shall be installed with overlaps shingled down gradient to allow for drainage in the event of precipitation. Orientation of overlaps will also be placed in the direction of prevailing winds if the wind conditions are over 7 m/sec.

The Installer shall record the location, identification code and date of installation for each field panel on an as-built drawing and shall submit this documentation to the CQA Inspector no later than the following day.

2.2.3 Weather Conditions

Geomembrane placement shall not proceed at ambient temperatures below -15° C or above +30° C unless approved by the Engineer. It should be noted that EPDM can be installed and seamed at temperatures down to -15° C if required due to location and construction schedule.

Geomembrane placement shall not be performed during any type of precipitation, in the presence of surface moisture or ponded water, in the presence of winds exceeding 11 m/sec.

The CQA Inspector shall observe that above conditions are not present during placement and that surface soils have not been damaged by weather conditions.

2.2.4 Placement Method

The Installer will ensure that the following procedures are followed:

1. Deployment equipment does not damage the geomembrane or the supporting soil.

2. Personnel working on the geomembrane do not smoke, wear damaging shoes or engage activities that could damage the geomembrane.

3. The method used for unroll/unfold the panels does not cause any damage to the geomembrane or soil surface.

4. Temporary ballast does not damage the geomembrane.

5. Adequate protection against wind uplift is provided and that there is no possibility of damage due to wind action.

The CQA Inspector will observe each panel after placement for damage and will advise the Contractor which panels should be rejected or repaired. Damaged panels that can not be repaired will be marked, recorded and removed from the site.

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Elastoseal EPDM Geomembrane

2.3 Geomembrane Field Seaming

2.3.1 Seam Layout

The Installer shall provide the Engineer with a seam layout drawing which is consistent with the proposed panel layout plan.

Seams shall be oriented parallel to the direction of maximum slope, i.e. oriented along, not across the slope.

Seams shall be minimized in corners and odd-shaped geometric locations.

Horizontal seams shall not be allowed on a panel less than 1,0 m from the toe of slopes greater than 10 %. For slopes less than 10 % this requirement does not apply.

A seam numbering system using adjacent panel numbers shall be used for identification and recording of each seam on CQA documentation and as-built drawing.

2.3.2 Seam Equipment and Products

Manufacturer approved processes for field seaming the Elastoseal EPDM and for repair are thermo-fusion welding. All welding equipment shall have accurate temperature monitoring devices to ensure proper measurement of the weld temperature at the point of surface fusion.

All field seam thermo-fusion welds shall be of the dual track type to allow for an air channel used in non-destructive air pressure testing.

All repair or small area welds shall be by hand held hot air or hot wedge and hand roller with silicone roll.

Only Manufacturer approved cleaning solutions or grinding methods shall be used to clean seam areas of dirt, debris or oxidation.

The Installer shall provide a calibrated field tensiometer for the field testing of completed trial welds and destructive samples.

2.3.3 Seam Preparation

The Installer shall verify the following:

1. Prior to seaming, the seam overlaps are a minimum of 100 mm, properly aligned and free of wrinkles.
2. The seam area is free of any moisture, dust, dirt, sand or debris of any nature.
3. The seam area is free of surface oxidation.
4. Ambient temperatures are between -15° C and + 30° C and wind velocity is below 7 m/sec.
5. The surface below the EPDM is smooth and non yielding. In the case of soft or rough surfaces, a roped seaming board (i.e. conveyor belt, wood- or plastic board) may be required below the seam area.

2.3.4 Trial Seam or Trial Welds

Prior to actual production seaming, the Installer shall make trial seams on pieces of EPDM to verify that seaming equipment and conditions are acceptable and will produce a field seam which meets project specifications. Each trial seam shall be assigned a number and the test results recorded in appropriate documentation and witnessed by the CQA Inspector.

Trial seams shall be performed for each welding machine to be used and by each operator.

A passing trial weld seam must be made prior to the beginning of each seaming period, typically at the start of the day and after lunch.

The trial seam sample shall be approximately 1,0 x 0,3 m with the seam centered lengthwise.

Six specimens, each 25 mm in width and 150 mm in length shall be cut from the trial seam using the 25 mm die coupon cutter. Three of the specimens shall be tested in shear and three shall be tested in peel on the field tensiometer. Both the inside and outside seams of a dual track shall be tested. All shear and peel test specimen shall either meet the project specifcations or give break in the membrane or exceed 300 % elongation of the membrane without break in the seam.

The CQA Inspector shall observe the trial seam procedures and shall verify field tensiometer results. Trial seam samples shall be marked with the seamers intials, identification, date and conditions and retained by the CQA Inspector.

2.3.5 Production Seaming of Panels

After approval of the Trial Weld Seams, production seaming on the deployed panels will commence. All production seams will be non-destructively tested and each completed seam shall be labeled with proper identification.

If required, a firm substrate will be provided by roping or placing a strip of conveyor belt material or wood/plastic board directly under the seam area.

Wrinkles or “fish mouths” at the seam overlap will be eliminated prior to seaming by pulling the EPDM smooth. Seaming will extend to the outside edge of panels to be placed in the anchor trench.

The CQA Inspector will observe the seaming process for complience with specifications.

2.3.6 Non-Destructive Seam Continuity Test

The Installer shall non-destructively test all field seams over their full length using an air pressure test (for dual track seams), an air lance test or other approved method. The purpose of the non-destructive test is to check the continuity of the seams. Continuity testing must be completed as the seaming progresses and not at the completion of all field seaming.

The CQA Inspector will observe the continuity testing to verify

proper equipment and method, review report documentation and observe outcome of all testing.

2.3.6.1 Air Pressure Testing for Dual Track Seams

The following procedure apply for all production seaming using the dual track thermo-fusion process. The proceedures described below shall be followed by the Installer and shall be verified by the CQA Inspector.

In general, follow the proceedures outlined in ASTM D 5820 – Pressurized Air Channel Evaluation of Dual Seamed Geomembranes and the following.

Equipment shall be comprised of the following

1. Manual or Motor Driven air pump capable of generating up to 350 kPa/3,5 bar pressure.
2. A hose with quick connects and valve to isolate pump from test once air pressure is achieved in seam.
3. Pressure gage capable of indicating pressure in 5 kPa/0,2 bar increments within the test range.
4. A sharp hollow needle, diameter 1,5-2,0 mm, that can be injected witout loose of pressure to one end of the air channel.
5. Hot Air Gun or mechanical clamps to seal both ends of the air channel.

The following procedures shall be followed.

1. Seal both ends of the air channel to be tested.
2. Insert the needle and connect the air pressure indicator to the needle assembly.
3. Connect the air pump to the air pressure gage with a flexible hose and quick connect.
4. Pressurize the air channel to 150 kPa/1,5 bar (min 1,4 – max 1,6 bar) and remove the flexible hose.
5. Allow the air pressure to stabilize and observe that the entire channel is inflated.
6. With a pressure of approx. 150 kPa/1,5 bar stabilized in the air channel, record the pressure. After 2 minutes, record the pressure again. If the differance between the two readings is more than 40 kPa/0,4 bar, the seam will require retesting.
7. If the pressure drop is greater than 40 kPa/0,4 bar (failure) check all seals for air leaks and retest.
8. If the pressure drop is still unacceptable after retest of the apparatus and checking for air leaks, locate the failed area and repair. Perform retesting.

2.3.6.2 Air Lance Continuity Testing

Air Lance testing will only be performed on seams that cannot be tested using the air pressure techniques outlined in 2.3.6.1 above. The proceedures shall be followed by the Installer and the CQA Inspector will observe the Installer´s work as needed to verify proper procedure and reporting. The air lance equipment and procedures are generally outlined in ASTM D 4437 and as follows:

1. Air lance test equipment consists of a compressed air source that can deliver a continuous air nozzle exit pressure of min 350 kPa/3,5 bar to a 4,75 mm diameter nozzle on the end of a hand held lance.
2. The nozzle opening shall be directed to the edge of the seam and held a maximum of 25 mm away from the edge.
3. The rate of travel along the edge of the seam shall not exceed 12 m/min.
4. Any defect that is identified by a distinct change in sound by the air passing through an opening or obvious debonding due to air presssure force shall be marked for repair.

2.3.7 Destructive Seam Testing

Destructive seam tests shall be performed at selected locations as appropriate to the project and at locations selected by the Engineer and the CQA Inspector. The purpose of these tests is to evaluate the mechanical bond strength of the seam area. Seam destructive testing shall be performed as the work progress and not at the completion of the project.

1. Location and Frequency: The location of seam cut outs will be randomly selected and at generally proposed intervals of between 150 and 300 m of seam length. The Installer will cut the samples and this will be observerd by the CQA Inspector.
2. Size of samples: A sample size of minimum 0,3 x 0,3 m shall be cut with the seam centered lengthwise. Additional samples may be required for third part independant lab testing and owner archives if required by the specifications and the CQA Inspector. Thus a total length of seam sample may be 1,0 m for destructive testing. Final determination of sample sizes will be determined at the beginning of the project and agreed by all parties.
3. Holes in the geomembrane resulting from destructive sampling will be immediately repaired and tested for continuity by air lance.
4. Sample identification: The destructive sample shall be marked as a D/S sample number with identification as to adjacent panels, seam number, date etc. as required on the QC form.
5. Field Testing: The sample collected for Installer testing shall be tested as follows: Ten specimens of 25 mm width will be cut with a coupon cutter die and press. Five alternate specimens will be tested in peel and shear. Testing will be accomplished on a calibrated field tensiometer at a strain rate of 500 mm/min.

6. Pass/Fail Criteria: The minimum acceptable strength values are as follows:

Seam Shear **min. 6,0 kN/m**
Seam Peel **min. 2,0 kN/m**

The seam test is approved if the above values have been fulfilled or if the parent material break or if elongation at break is min. 300 % without break in the seam.

Four out of five specimens meeting the above criteria will constitute a passing destructive test.

If the seam sample fails the test, the following procedure shall be followed: Take additional samples approximately 3,0 m on either side of the failed sample and test as above. Each of this samples must pass. Continue the procedure until a passing result is obtained and repair the seam length between passing destructive sample areas.

2.4 Defects and Repairs

All seams and non-seams areas of the EPDM Geomembrane shall be thoroughly examined by the Installer for obvious defects, holes, blisters or damage caused during installation. Identification of the defect or damaged area will be made by marking on the geomembrane panel or seam and indicating same on the CQA documents as to location, type of repair, date.

2.4.1 Repair Procedures

Several procedures exist for the repair of Elastoseal EPDM Geomembrane and the manufacturer directions must be adhered to for effective repair. The final decision as to appropriate repair procedure will be agreed upon between the Engineer, Installer and CQA Inspector.

1. Patching. Patching is used to repair large holes, tears, destructive cut-outs, fishmouth repair or any defects that are found to be suspect.
2. Cap Strip. Cap Strips of the EPDM material (Elastoseal or Thermobond strips) are usually 150 mm in width and are used to repair long lengths of defective seam area or suspected seam area.
3. All surfaces to be repaired must be clean, dry and free of oxidation.
4. All patches shall extend a minimum of 50 mm beyond the edge of the defect and shall have rounded corners. Small patches shall be round or oval in shape.
5. The repair procedures, materials and equipment shall be as recommended and approved by the manufacturer and as approved by the Engineer and CQA Inspector.

2.4.2 Repair Verifications

Each repair shall be non-destructively tested by the air lance method in accordance with section 2.3.6.2. Repairs that pass the air lance method will be considered passed and an indication of an adequate repair. Failed tests will require the repair to be redone and retested.

The Installer must document all repairs and submit the documentation as well as the as-built drawings indicating repair locations to the CQA Inspector. Each repair must be numbered, marked on the panel, logged on the panel or seam repair form and noted as to pass/fail results. The CQA Inspector will visually observe non-destructive tests as required to verify proper procedure and documentation.

3. Certifications

Certificates verifying the control, Form QI1: Non-destructive Seam Evaluation Report, QI2: Destructive Seam Evaluation Report,QI3: Panel Placement Report, shall be presented during or after installation. Additionally the installer shall also record the location and identification number of each panel on an “as-built” drawing.

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Elastoseal EPDM Geomembrane

Enclosure - Quality Documentation Forms

QM1	Test Records – Manufacturing, Physical Properties every 5 roll
QM2	Test Records – Manufacturing, Physical Properties every curing batch
QF1	Non - Destructive Seam Control
QF2	Destructive Seam Control
QF3	Panel Listing Report
QI1	Non-Destructive Seam Evaluation Report
QI2	Destructive Seam Evaluation Report
QI3	Panel Placement Report

SealEco

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Form QM 1

Elastoseal EPDM Geomembrane

Certificate Manufacturing Quality Control

Physical Properties – Test Frequency every fifth roll

Project		**Date**	
Number and date of delivery notes			
Product			
Product number			
Roll size, w x l, m		**Quantity**	

Roll number	Thickness mm	Width mm	Label	Roll number	Thickness mm	Width mm	Label

We hereby certify above test results

Date: ……………………...…………………………………...

Signature: ………………………………………...……………….
Quality Manager

SealEco
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Form QM 2

Elastoseal EPDM Geomembrane

Certificate – Manufacturing Quality Control

Physical Properties – Test Frequency every curing batch

Project		**Date:**
Number and date of delivery notes		
Product		
Roll size, w x l		**Quantity:**
Tested rollnumber		**Curing batch No:**

Test Results

Property	Unit	Test Method	Result
Hardness	IRH	SS ISO-48	
Tensile Strength	MPa	SS ISO-37	
Elongation at break	%	SS ISO-37	
Tear resistance	kN/m	SS ISO-34	
Seam Strength	N/mm	EN 12316-2	

We hereby certify above test results

Date: ……..……...

Signature: ……..……

Quality Manager

SealEco
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Form QF 1

Elastoseal EPDM Geomembrane

Certificate – Prefabrication Quality Control
Non-destructive Seam Control

Air lance continuity test according to ASTM D4437.
Test Frequency: every seam on every panel.

Project		**Date:**
Number and date of delivery notes		
Product		
Roll size, w x l		**Quantity:**
Tested rollnumber		**Curing batch No:**

We hereby declare that during the air lance continuity testing of all seams no defect was detected.
The panel was also controlled visually and approved before packaging.

We hereby certify above test results

Date: ……...……...

Signature: ……...……
Quality Manager

Prefabication Company
Name and address

SealEco
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Form QF 2

Elastoseal EPDM Geomembrane

Certificate – Prefabrication Quality Control
Destructive Seam Control

Destructive seam test according to ASTM D6392.
Test Frequency: beginning of every working shift or when the seam conditions changes.

Sample size 300 x 300 mm, Machine strain rate 500 mm/min
Pass/fail criteria: Seam peel min. 2,0 kN/m, Seam shear min. 6,0 kN/m
or Break in membrane
or 300 % elongation before break at shear test

Specimen number	Peel strength	Shear strength	Break in membrane in shear test	Elongation exceeding 300 % in shear test

We hereby certify above test results

Date: ……...……...

Signature: ……...……
Quality Manager

Prefabication Company
Name and address

SealEco
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Phone: +46 (0) 370 510 100, Fax: +46 (0) 370 510 101, Email: info@sealeco.com, www.sealeco.com

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Form QF 3

Elastoseal EPDM Geomembrane

Certificate – Prefabrication Quality Control
Panel Listing Report

Project		**Date**
Product		

Panel number	Roll numbers in this panel			
	Roll no.	Roll no.	Roll no.	Roll no.

We hereby certify above test results

Date: ……...……...

Signature: ……...……
Quality Manager

Prefabication Company
Name and address

SealEco
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Installer:

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Form QI 1

Elastoseal EPDM Geomembrane

Non - destructive seam evaluation report

Project name		
Contractor		
Seam type	**Dual track**	
	Single track	
Weather		
Temperature		
Seam Number		
Seam Length		
Date seamed		
Time seamed		
Installer		

Legend

Repair needed

Repair complete

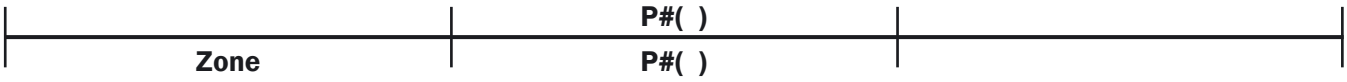
Repair tested

Repair Approved

Destructive sample

Cap Strip Repair

Quality Assurance Summary Seam Detail (Show Dimensions)



Air Pressure – Dual Track Seam							
Zone	Length	Pressure Start	Pressure End	Time Start	Time End	Pressure Loss	P/F

Air/Vacuum – Single Track Seam				
Zone	Length	Air Lance/Vacuum	P/F	Action

Seam Repairs					
Repair No	Defect Type	Repair Date	Repair Type	Approved by	Comments

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Installer:

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Form QI 2

Elastoseal EPDM Geomembrane

Destructive seam evaluation report

Project name	
Membrane type	
Date tested	
Machine type	
Seam Sample No	
Installer	
Date seamed	
Weather, Temperature	

Quality Assurance Summary

Peel Adhesion		
Specimen Number	Load N/m	Fail Mode
Average		

Bonded shear strength		
Specimen Number	Load N/m	Fail Mode
Average		

Seam Qualified ☐

Seam Disqualified ☐

Notes: _____

_____

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Installer:

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Form QI 3

Elastoseal EPDM Geomembrane

Panel placement report

Project name:_____

Date	Time	Panel Number	Repairs Yes/No	Repairs Number	Repairs Repaired	Repairs Tested	Size L x W	Area m²
Total area								

Comments: _____

_____

_____

Completed by: _____ Checked by: _____

(Signature) (Date) **(Signature) (Date)**

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