



Nuraply 3PG Green Roof Membrane Installation Manual

Nuralite Waterproofing Limited
www.nuralite.co.nz

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NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

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NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

Nuralite roofing and waterproofing systems are intended for application by trained and approved installers. A listing of the current approved applicators are available at www.nuralite.co.nz/Applicators_By_Region/. These notes are a technical guide to the application of the Nuraply 3PG range. The Nuralite organisation also maintains a team of skilled technical representatives who are prepared to demonstrate the correct application of Nuraply 3PG on site or to discuss any problems which may arise regarding its use.

Please note that Nuraply has a long product defects warranty period and every precaution must be taken to avoid any possible installation faults. Application according to these guidelines must be insisted upon by the Applicator to ensure that full benefits of the warranty period are maintained.

TECHNICAL ADVICE

For advice on unusual or abnormal conditions or details, please contact Nuralite Waterproofing Ltd,
Auckland phone: 09 579 2046 fax: 09 579 5136
Email: info@nuralite.co.nz

OTHER REFERENCE DOCUMENTS

This manual forms one part of the full technical documentation for the Nuraply 3PG system. You must familiarize yourself with the following:

Technical literature (available at www.nuralite.co.nz)

- Nuraply 3PG detail drawings
- Material Safety Datasheets
- Technical Datasheets

Specifications

- Generic Nuraply 3PG specifications
- Project specific specification

Document Control

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The only person authorised to change this plan is the Managing Director, John Simmons.
BEAL must be copied into each version.

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

The Nuraply 3PG Green Roof Membrane System complies with the New Zealand Building Code.

As an explanation of compliance with Building Code criteria under s269 (1) of the Building Act 2004 –

Clause B1.3.2	Compliance has been established by testing to ensure that tensile strength, elongation, compression, and seam strength are adequate.
Clauses B1.3.3 (e) and (m)	Compliance has been established with testing to ensure resistance to water absorption, hydrostatic pressure, differential movement over substrate joints are adequate.
Clause B2.3.1 (a)	With normal maintenance the Nuraply 3PG membrane system is assessed for a 50 year durability period as part of the envelope building elements as it does not degrade when buried.
Clause B2.3.1 (b)	With normal maintenance the UV exposed Nuraply 3PM membrane system is assessed for a 15 year durability period as part of the envelope building elements based on in-service history in excess of this period.
Clause B2.3.2 (a)	The membrane is not installed over elements with lesser durability than 50 years.
Clause E2.3.1	The roof membrane system will repel water from entering building and drainage paths ensure it can shed precipitated moisture and melted snow.
Clause E2.3.2	The membrane system has been tested for water absorption, vapour transmission, hydrostatic pressure and joint seam strength to satisfy this requirement.
Clause E2.3.6	The membrane system provides for cross flow venting or for ceiling space ventilation.
Clause E2.3.7 due allowance has been given to;	
(a)	The consequences of failure have been considered through specified repair and maintenance requirements, multiple drainage paths and the ability of the system to tolerate ponding (standing water three days after cessation of flow)
(b)	Being a double layer system, the effects of any uncertainty in or from the sequence of construction can be accommodated.
(c)	Variation in the properties of materials and in the characteristics of the site are accommodated as the membrane as wide tolerance for materials and environmental factors
Clause F2.3.1	No gases liquid or particles are emitted by materials that could give rise to harmful concentrations on surface s or in atmosphere of any space.

Compliance with other clauses have been considered and found not applicable.

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1. Statement of Use & Limitations

Use

Nuraply 3PG double layer torch on membrane system provides a durable waterproofing system for installation by approved installers, on new roofs and decks of any size, where plants or stone ballast will be installed over the membrane.

Installation is in accord with this manual Nuralite 3PG Roofing membrane Installation manual 2016 Edition 3 available on the Nuralite website and the Nuralite Building Products Quality Plan 2016 v1 assessed by BEAL Certification Services Ltd

On a structure complying with the New Zealand Building Code, it may be installed directly onto the following substrates

- H3.2 treated plywood substrates complying to AS/NZ 2269 (2012) (directly or with Enertherm PIR Boards between) with treated timber* trim, battens and framing where timber is detailed and Nuralite product is directly applied or
- concrete substrates complying to NZS 3101 (2006) (directly or with Enertherm PIR Boards between) or
- NPM 900 metal tray decks with Enertherm PIR boards between.

Nuraply 3PG system is a tough, reinforced, bituminous waterproofing membrane suitable for light maintenance foot traffic. It may be installed on a cold roof with insulation installed (by others) below the substrate or as a warm roof (known as Nuratherm) with Enertherm insulation installed (by Nuralite applicator) above the substrate

The system may be installed in all NZS 3604 Wind Zones, up to and including Extra High.

Limitations

The design and construction of the substrate, framing timber, metal overflashing, cladding, fascia, control joints, junctions, soil composition and plant selection and allowances for ventilation, movement, condensation control, and fire safety provisions is specific to each building, and therefore is the responsibility of the building designer and building contractor. These matters are all outside the scope of this Codemark.

All projects designs must be certified by an independent engineer that the building structure can sustain the installed loads.

* All timber products must be treated but must not be treated with LOSP (light organic solvent preservative) nor CuN (copper nitrate).

Any construction details outside those listed in this manual are outside the scope of this Codemark.

When used on existing projects, it is the responsibility of the property owner to have the structure and substrate assessed by a suitably qualified person and to the satisfaction of Nuralite Waterproofing Ltd. For this Codemark to be applicable the substrate material is limited to only those approved within this manual.

The slopes allowable are clearly set out in the table on page 6. For low slope roofs the designer of the substrate should take into account the intended use of the roof or deck to ensure continued compliance with the Building Code.

Potable water must not be collected from Green Roof areas.

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Statement of Use & Limitations continued

A layer of heavy duty black polyethylene must be installed prior to installing drainage layers and plants or ballast. This protects the membrane from damage during installation of the Green Roof components.

The Nuraply 3PG membrane must be protected from pedestrian traffic and UV exposure. Where the membrane system is to be exposed to UV, a capsheet of Nuraply 3PM must be installed.

The membranes must be installed only by Nuralite Waterproofing Ltd approved installers.

Attention must be paid to application temperature ranges and the necessary requirements for storage of products.

2. Health and Safety



An applicator's wellbeing is paramount.

Do not enter a worksite, commence work or continue working if:

1. You have not been adequately trained by your employer
2. You have not been briefed about the workplace hazards by the site manager
3. You do not have proper clothing, footwear, safety & workplace equipment.
4. You witness unsafe practices or you believe the workplace is unsafe.
5. You see wet or rainy conditions

Use your commonsense and speak up if anything concerns you.



A few points of particular relevance to Applicators are:

1. Applicators must wear protective clothing including a hard hat and suitable footwear. In particular, heat resistant gloves must be worn to reduce the risk of torch flame and heated bitumen coming into contact with skin. Footwear should have soft, non-slip soles.
2. Working with a gas torch is hazardous and requires care both for the Applicator, other associated personnel, and other persons on the work site.
3. Daily checks of all gas equipment to ensure that it is in good working order and safe for use. All personnel who use this equipment should be trained in its proper use and maintenance.
4. As torch-work can create the risk of fires, including smouldering fires, the Applicator must be trained in fire prevention and the proper extinguishing of fires. On every job fire extinguishing equipment must be kept close to the Nuraply 3PG installation area and be in good working order.
5. First aid equipment must be provided on site and work personnel trained in first-aid procedures.
6. Experience and training for working at height is important, including understanding restraint procedures. Nuraply 3PG systems are normally applied to either roofs or decks, which are usually 2.5m or more above the ground. All work carried out in such situations require sufficient safety and protection to avoid falls.
7. All applicators must have a current Site Safe passport.

3. Project Administration/Supervision

Nuralite & you, the applicator, are in a partnership designed to achieve the installation of many high quality Nuraply 3PG systems.

Nuralite works hard to get jobs specified by Architects. The Applicator is responsible for the quality control and the installation of the Nuraply 3PG membrane systems and quotations.

All work will rapidly dry up if the application is not performed in a professional manner. Not only must the workmanship be high quality, but the service and support to the builder and project manager should equal that to ensure we all get repeat business.

Nuralite recommends a pre-inspection and/or a pre-job meeting of all parties involved with the Nuraply 3PG system to identify any areas of concern. It is important for a successful installation to resolve and clarify any issues or project requirements, work programme and issues with other trades, the project documentation required product storage, and site health and safety matters.

Before commencing work, the Applicator must determine:

- That all the building consents have been issued and the specifications and detailed drawings are workable and suitable for the project
- That there is nothing that will compromise the Applicator's required responsibility under the NZ Building Code or your ability to follow these instructions and thus issue a warranty on your workmanship
- That no existing conditions at the site prevent the Applicator from performing in a professional and safe manner
- That the product to be installed is as per the official consent documents.
- A substrate readiness checklist has been completed by the head contractor (see section 4)

If you have any concerns about the project, your working conditions or the substrate preparations then raise them with the site manager, your employer or a Nuralite representative.

All applicators have the right to refuse to commence work until they are satisfied they can complete the job safely and to the highest standards.

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4. Nuraply 3PG Products

The complete Nuraply 3PG system has a number of installation methods and base sheet options which are selected based on factors such as the substrate material and the possibility of moisture coming up through the substrate.

All projects are done with a double layer of membrane

Product Selection and Limitations

Substrate	Plywood (A)	Concrete (A)	Concrete with Tapered Boards or Flat Enertherm (Nuratherm)	Plywood with Enertherm (Nuratherm)	Hibond Metal tray with Enertherm (Nuratherm)
Design Fall (excluding gutters) (A)	1:40	1:60	1:60	1:40	1:40
Gutters	1:100	1:100	1:100	1:100	1:100
Substrate Comments	Using minimum 17mm plywood, rafters at 600 centers, nogs at 600 centers.	Option to create required slope with a screed. Wait for concrete and screed to cure.	Nuralite to assist with tapered board layout	Using minimum 17mm plywood, rafters at 600 centers, nogs at 600 centers.	
Due to weight constraints an Engineer must validate the substrate's structural design					
Adhesive/Primer					
Nurabond #10	Yes				
Nuraflux		Yes	Yes	Yes	Yes
Vapour Barrier					
Nuraply ALU			Yes	Yes	Yes
Insulation (B)					
Enertherm			Yes	Yes	Yes
Tapered Enertherm at 1:60			Yes		
Insulation fixing					
IKO Fix				Yes	Yes
Nurabond Hi Foam PU			Yes		
Basesheet					
Nuraply 3PB	Yes	Yes			
Nuraply 3PB-SA	Yes		Yes	Yes	Yes
Capsheets					
Nuraply 3PG	Yes	Yes	Yes	Yes	Yes

Notes

A) On Cold Roofs, no venting of the substrate is allowed through the Green Roof system. Use either a Nuratherm Warm Roof or cross flow ventilation

B) For the purpose of this Certificate roofs must have a minimum finished fall of 1:80.
For design purposes, a minimum 1:40 finished fall should be assumed for plywood and metal substrates or 1:60 for concrete.
If lower falls are required Nuralite will issue a Producer Statement following detailed analysis of the roof including its size, location, overall and local deflection, direction of falls, etc.

C) The entire system, vapour barrier, insulation and waterproofing membrane is known as Nuratherm

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Basesheets

NURAPLY 3PB - On Plywood or Concrete

A nominally 3mm thick 10m long x 1m wide polymer modified bitumen sheet, first layer in two layer applications on plywood. Cold adhesive glued with heat welded lap joints and a sand upper surface. (Labelled: *IKO Base P3 T/F 10m*)

Nuraply 3PB-SA - On Enertherm PIR panels

A nominally 3mm thick, 10m long x 1m wide polymer modified bitumen sheet, first layer waterproofing. Self adhering onto Enertherm PIR insulation panels substrate. With heat welded lap joints and a sand upper surface. (Labelled: *IKO Base Stick T/SA 15m*)

Capsheets

Nuraply 3PG

Nuraply 3PG Sheet is a nominally 4mm thick, 7.5m long x 1m wide, polymer modified bitumen sheet. Heat fused onto the basesheet underlay with heat welded lap joints, and a sand coated upper surface. A antirroot additive is incorporated in the membrane to prevent root attack. (Labelled: *IKO Roofgarden APP 4 T/F*)

Nuraply 3PM

Nuraply 3PM Sheet is a nominally 4mm thick, 7.5m long x 1m wide, polymer modified bitumen sheet. Heat fused onto the basesheet underlay with heat welded lap joints, and a prefinished mineral chip upper surface.

The chip surface on the Nuraply 3PM makes the membrane suitable for exposure to UV light. It should be used as the capsheet on all surface that is exposed to UV.

Additional Components Supplied by Nuralite

Nuraply ALU

Roofing membrane with glass fibre reinforcement, topside finished with polyester reinforced aluminium foil and under-side coated with self-adhesive SBS modified bitumen. Applicable as vapour barrier for roofing systems in buildings with high humidity conditions. (Labelled: *IKO Shield PRO ALU/SA 25m*)

Enertherm

Enertherm is a 100 % CFC, HCFC and HFC-free insulation board with a core in hard polyisocyanurate foam, coated on both sides with a multi-layer gastight aluminium complex. (Labelled: *IKO Enertherm*)

IKOFix

Polypropylene telescopic sleeves for fixing membrane and insulation. Screws supplied in lengths to suit the installed insulation.

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Nurabond High foaming PU Adhesive

A permanent elastic high performance moisture-cured single part polyurethane adhesive with light foaming capacity for bonding bituminous roofing membranes, vapour control layers and rigid insulation boards. For use on various substrates including profiled metal decking, existing bitumen membranes, concrete, timber etc. (*Labelled: IKOPro PU Adhesive*)

Nurabond No 10

Cold adhesive for Nuraply Products, mainly onto plywood substrate. 15L pails with coverage of 2m²/litre.

Nuraflux Primer

For specific priming to improve adhesion such as old dry bitumen, basement walls & concrete substrates. 25L pails with coverage of 5m²/litre (*Labelled: IKOPro QuickDry Primer*)

Accessories supplied by Nuralite

Profili Bitumen Filet

A 25mm triangle of bitumen that may be installed at internal corners instead of building a mortar filet.

Nuratrim

A metal edge that provides a mechanical fixing of the membrane and watercheck. Designed to be installed on roof edges, verges and parapets without a slope.

Metal Scuppers & Sumps and Gravel Guards

Fabricated for use with Nuraply 3PG. Available in 80, 100 and 150mm sizing with alternative dimensions available on request.

Termination Bar

20mm x 3mm metal strip predrilled to allow mechanical fixation of the Nuraply 3PG membrane.

MS Detail liquid flashing

MS Detail is a solvent-free, coloured, liquid, single-component waterproofing coating on the basis of MS Polymer technology.

Accessories supplied by Others

HiBond Metal Tray (Dimond)

A metal tray deck substrate with wide ridges to support the Enertherm sheets.

Sureflow outlets and overflows (Allproof)

The Sureflow series of roof outlets is robust means of connecting a roof system to an outlet drain. For use on flat roof applications for either commercial or residential buildings.

WABO Roofcover Expansion joints (BAS Expansion Joints)

Wabo RoofCover is an aluminum system engineered for flat and sloped roofs that are subject to thermal and seismic movement.

Holdfast FixAll 220 MS Sealant (Holdfast)

High performance MS sealant

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Heavy Duty Polyethylene (Permathene)

General purpose heavy weight black polyethylene. 250mu.

Plazadeck (Permathene)

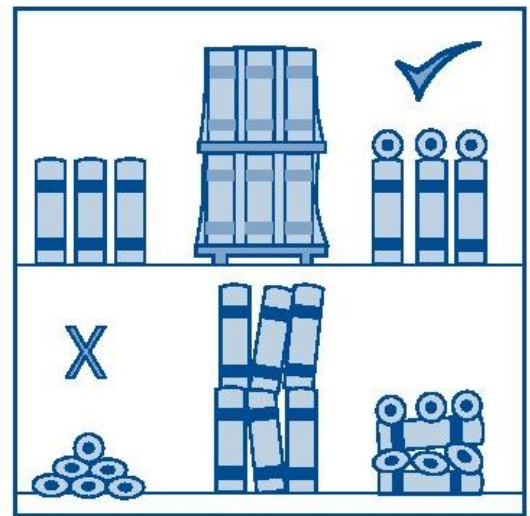
Plazadeck® Drain is a geocomposite drain having cusped HDPE core with a Bidim geotextile glued to one side to provide efficient drainage for roof top gardens.

LiveRoof (Stormwater360)

Pre-vegetated, modular hybrid green roof system developed by growers and specifically designed to grow plants on a rooftop environment.

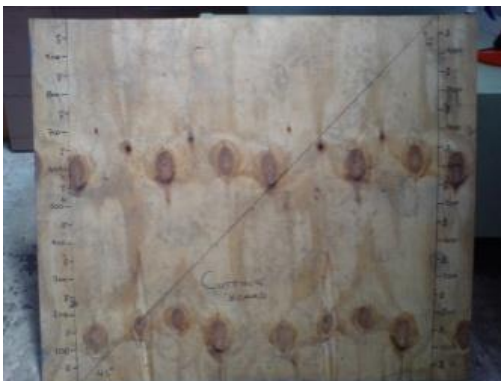
SITE STORAGE

- Store rolls on selvage end of roll and off the ground, with pails.
- Protect all products and equipment from sun, heat and frost.



Tools in General

String line, gas torch (small 20mm for detailing & 50mm for large areas), 2 x fire extinguishers suitable for Class A, B, and C fires, moisture meter to measure moisture content of substrates, water spray bottle, spirit level, 2 x craft knife (straight & hooked blade), tape measure, straight edge, cutting board, margin trowel, tool belt & or tray, seam/printers roller, paint brush & roller, knee pads and gas lighter (BBQ)



5. Substrate Readiness

Many poor jobs are found to result from membranes being laid on top of a badly constructed substrate.

Before commencing laying any Nuralite systems, the installer must be sure that the substrate is ready by receiving a completed Substrate Readiness Checklist from the head contractor. The installer should contact Nuralite in case of any concerns.

Be sure to store the completed forms and supply them to Nuralite when the Materials Defects Warranty is applied for.

If a project has two or more substrate types, separate checklists must be completed for each substrate and any interface between the substrates is a matter of specific design for each building.

An engineer's certificate is required to establish that deflection from the greenroof load has been considered (Note 2).

In particular,

1. SUBSTRATE – NEW PLYWOOD

- a. The top surface of the plywood should be sanded and plugged, to a minimum standard of C.
- b. Minimum plywood substrate must be 17mm thick and must be treated (CCA) H3.2 grade. Do not use LOSP-treated (light organic solvent preservative) or CuN treated (copper nitrate) plywood. An engineer may specify thicker plywood.
- c. All other timber products, ie, trim, battens and framing must be treated but must not be treated with LOSP (light organic solvent preservative) nor CuN (copper nitrate).
- d. Roofs and decks must be supported at 600mm centre maximum (including noggins & rafters), plywood sheets must be laid across supports and joints staggered (brick pattern), unless otherwise specified.
- e. Plywood and support timber dry, surface clean.
- f. Design Falls 1:40/1.5° for roofs or decks (Note 1)
 1:100/0.5° for gutters
- g. Sheets must be glued and then fixed with Grade 316 Stainless Steel 10 gauge countersunk screws.

Screw edges every	150mm}	about 20mm from the edges
Screw centres every	200mm}	throughout the plywood sheet
- h. Joints butted, upstands filleted, edges arrised.
- i. Drainage outflow details rebated.

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2. SUBSTRATE – NEW CONCRETE (TRUE IN PLANE, WOOD FLOAT SURFACE)

- a. Design Falls 1:60/1° for roofs or decks (Note 1)
 1:100/0.5° for gutters
- b. Concrete substrate contains less than 5% moisture content (measured with a calibrated concrete moisture meter) and curing membranes removed.
- c. Upstands filleted, edges arrised, drainage outflows rebated.
- d. Surface clean and dry.

3. SUBSTRATE – NEW HIBOND METAL TRAY SURFACE

This is the quickest and most cost effective substrate to install.

- a. Design Falls 1:40/1.5° for roofs or decks (Note 1)
 1:100/0.5° for gutters
- b. Supporting rafters spaced as per specification (varies depending on Hibond gauge).
- c. Enertherm sheets stagger lay (fully offset) with correct falls and no ponding.

Note 1: Roofs must have a minimum finished fall of 1:80. For design purposes, a minimum 1:40 finished fall should be assumed for plywood and metal substrates or 1:60 for concrete, unless a Nuralite Producer Statement is provided following detailed analysis of the roof, including overall and local deflection, direction of falls, etc.

Note 2: An engineer certificate must establish that deflection from the green roof is acceptable and a green roof load of 75-100 kg/m² (for a maximum soil depth of 150mm) has been allowed (refer BRANZ Bulletin 533 April 2005).

The owner is responsible for maintaining the greenroof and design assumptions.

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a. New Plywood Substrate Readiness Checksheet

(to be completed by the head contractor)

Project Name: _____

Form Completed by: _____

Company: _____

Area ready: _____

Applicator _____

Engineers certificate provided ☐

Structure complies to the New Zealand Building Code and plywood complies with AS/NZ 2269 ☐

H3.2 CCA treated plywood sheets 17mm thick minimum or greater as per engineer certificate. ☐

Plywood sheets supported at maximum 600mm centred rafters and nogs for roofs and decks. Unless otherwise specified. ☐

Sheets stagger lay (fully offset) with falls as per plan. ☐

5mm clearances from all abutments, 5mm radius to all exposed edges. ☐

All sheet edges supported, fixed 150mm on edges and 200mm through girth, edges butt-jointed with no gaps except at abutments. ☐

Sheets fixed by gluing and Stainless Steel countersunk screw fixing. ☐

Fillets installed to all internal junctions and neatly fitted. ☐

Mitres neatly formed. ☐

Rainwater outlets and overflow recesses formed to fit outlets rebated into the surface. ☐

Sharp edges and lips removed and cavities filleted. All joints flush. ☐

Plinths formed for any exterior ventilation, solar panels or fixtures. ☐

Substrate dry, clean, firm and suitable condition for laying . ☐

When substrate is ready complete this form and provide to the Nuralite applicator

Notes

Signed by head contractor

Date:

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b. New Concrete Substrate Readiness Checksheet

(to be completed by the head contractor)

Project Name: _____

Form Completed by: _____

Company: _____

Area ready: _____

Applicator _____

Engineers certificate provided ☐

Structure complies to the New Zealand Building Code and concrete complies with NZS 3101 (2006) ☐

Concrete cured with curing membranes removed. Concrete substrate contains less than 5% moisture content. ☐

Surface smooth and clean with falls as per plan. ☐

Cavities and cracks filled with repair mortar, flushed off and cured. ☐

Concrete surface firm with any soft concrete or laitance removed. ☐

Excessive ponding areas removed. ☐

Roof drains and overflow recesses formed to fit rebated outlets. ☐

Mortar or Profili Bitumen fillets to all upstands and smooth 5mm radius to all external edges ☐

If terminating into a chase, pre-form the chase and ensure it's Straight and 20mm deep. ☐

Plinths formed for any exterior ventilation, solar panels or fixtures. ☐

Construction joints incorporated in slab as per designer's specification. ☐

Substrate clean, firm and suitable condition for laying the Nuralite systems. ☐

When substrate ready complete this form and provide to the Nuralite applicator

Notes

Signed by head contractor

Date:

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c. New ENERTHERM Substrate Readiness Checksheet

(to be completed by the Head Contractor and Applicator)

Project Name: _____

Form Completed by: _____

Company: _____

Area ready: _____

Applicator _____

Engineers certificate provided ☐

Structure complies to the New Zealand Building Code ☐

Sheets stagger lay (fully offset). ☐

Confirm the substrate slope complies with plans. ☐

Rainwater outlets and overflow recesses formed to fit outlets rebated into the surface. ☐

Ensure only approved accessories to be used for drainage and venting. ☐

Review penetrations to minimize number and complexity. ☐

Any gaps in the insulation filled to prevent thermal bridging. ☐

Material fastened with the correct quantity of IKOfix Telescopic Fixing Plates and Fixing Screws (5 per sheet normally, 10 per sheet in Extra High wind zones). ☐

Edges of insulation supported by metal sheet ridges ☐

Plinths formed for any exterior ventilation, solar panels or fixtures. ☐

Substrate clean, firm and suitable condition for laying the Nuralite systems. ☐

When substrate ready complete this form and provide to the Nuralite applicator

Notes

Signed by head contractor

Date:

Signed by applicator

Date:

6. Installing the Enertherm system

a. Vapour Barrier

- i. The amount of condensation depends on the temperature in-balance and the humidity of the internal air. Vapour barriers prevent moist air from reaching the dew point and so prevent condensation forming
- ii. Before laying the membrane, prime the substrate with Nuraflux primer.
- iii. When installing the membrane, ensure the Nuraply ALU vapour barrier covers the entire area and wraps up and around the insulation so there is no opportunity for vapour to enter the roof system from below.
- iv. Seal all penetrations carefully and repair any damage to the membrane.
- v. Because no condensation will form within the ceiling cavity there is no need to vent the ceiling when installing a Nuratherm warm roof.

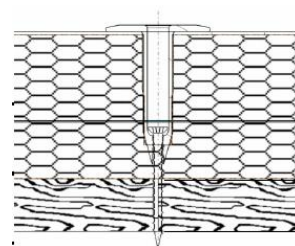
b. Enertherm Boards

- i. Lay the sheets in a brick bond fashion to prevent movement. The sheets can be cut with a knife or saw
- ii. Keep the sheets dry onsite and only install sheets that can be waterproof that day to prevent entrapping moisture.
- iii. It is desirable that no thermal breaks exist in the system.

c. Fixing on Plywood or Metal Traydeck

- i. IKO Fix fasteners are designed to penetrate the insulation and has the following advantages:

- Reduces thermal bridging
- Is cost effective because it uses shorter screws
- No risk of the screw penetrating the membrane if someone stands on the fixing.



- ii. Secure the sheets with 5 fixing per sheet (the sheets are 1.2 m², hence 4 fixings per m²). Increase fixings to 10 per sheet for Very High and above wind zones. The fixings should be inset by 200mm in each corner with at least one in the center.
- iii. If you notice the boards move when walking on them, use additional fixings to ensure the boards are stable and flat.

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d. Fixing on Concrete

- i. The Nurabond PU Adhesive is cold applied and has been specially developed to allow the safe, rapid partial bonding of roofing components.
- ii. It is moisture curing and tolerant of use in damp conditions. A degree of moisture is required, either in the atmosphere or on the surface, to allow the correct adhesive bond to be achieved. However, all liquid water should be removed from surfaces prior to use.
- iii. Curing time is dependent upon ambient temperature and humidity conditions however, curing will usually occur between 2 to 6 hours. The adhesive will take 24 hours to achieve full bond strength.
- iv. The minimum working temperature is 5°C. At low temperatures, warming the containers in hot water prior to use will improve handling characteristics. (N.B do not boil the product). Maximum working temperature 30°C.
- v. Surfaces to receive adhesive should be stable, clean and free of any liquid water (damp surfaces are acceptable). No priming is required.
- vi. Nurabond High Foaming PU Adhesive is applied straight from the container in strips. The maximum distance between the strips is 25cm. Use the spout on can for pouring lines of adhesive.
- vii. Weight the Enerthem boards once they are laid into the adhesive to ensure an good bond between the two surfaces.

7. Installing the Nuraply baselayer

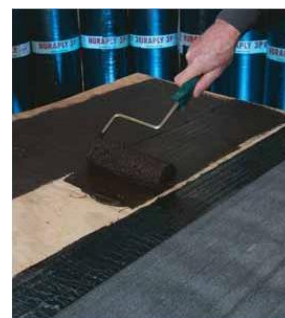
a. Layout

- i. All surfaces must be checked to ensure they are dry, clean, smooth and free from sharp edges, loose or foreign materials, oil grease or other deleterious material that may affect the adhesion of the membrane or may damage the membrane.
- ii. Plan Nuraply 3PB rolls layout for best drainage. Lay Nuraply 3PB from drainage outlets and gutters, low points and edges, up the roof /deck slopes. Nuraply is usually installed running down the slope to minimize water retention on the roof.
- iii. Be sure to run membrane down the length of the gutter – not across it. There should be no laps within 1m of the outlet.
- iv. Use chalk lines to ensure straight neat lines of the finished membrane.
- v. Double thickness application is a requirement at all internal and external corners, at upstands and turndowns. This will eliminate –
 - (a) The possibility of weakening the Nuraply 3PB when tooling to angles,
 - (b) The possibility of the sheet pulling out from the corner when not mechanically fixed,
 - (c) The double thickness increases the strength to withstand substrate movement and mechanical damage at these points.

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e. Adhesion of Nuraply 3PB Sheet to Plywood Substrate

- i. Install detailing (refer to g.) to all drainage outlets gutters and detailing in Nuraply 3PB, before laying the main roof. Ensure outlets are rebated to avoid build-up at outlets and to allow drainage outflow.
- ii. Use chalk lines to ensure straight neat lines of the finished membrane. Position the membrane roll to the chalk line, roll out to the required length and cut to size. Then roll back membrane half way point.
- iii. Apply the Nurabond No.10 Adhesive (using lambswool roller or notched trowel) to the area previously covered with membrane ensuring the correct coverage is used (one litre per two square meters)
- iv. On vertical surfaces, allow the Nurabond No.10 to tack off before fixing the Nuraply 3PB sheet. With gentle torch heat Nurabond No.10 becomes like a contact adhesive.
- v. Whilst unrolling the roll into the Nurabond No.10 use a correct size gas torch to lightly heat the membrane just enough to melt the protective film. Overlap previous rolls sides 80mm and ends 100mm ensuring all laps face downhill.
- vi. When using a full bed of Nurabond No. 10 adhesive, it is most important to ensure that no air or vapour is trapped under the Nuraply 3PB. Therefore it is recommended that a 500mm wide broom be used to eliminate air and vapour problems. Brushing across the Nuraply 3PB material and not along is the most effective way to achieve this.
- vii. After each two or three rolls are laid. Weld all lap joints carefully using Nuraply 3PG welding techniques, discussed below, and testing all joints progressively.
- viii. Welding and detailing with skill, creates carefully fused laps, with minimal exposed smooth bitumen, and neatly angle tooled joint edges. Stagger the roll lying to avoid four corners meeting in one place.



f. Adhesion of Nuraply 3PB Sheet to Concrete Substrate

- i. Install detailing (refer to g.) to all drainage outlets gutters and detailing in Nuraply 3PB, before laying the main roof. Ensure outlets are rebated to avoid build-up at outlets and to allow drainage outflow.
- ii. Use chalk lines to insure straight neat lines of the finished membrane. Position the membrane roll to the chalk line, roll out to the required length and cut to size. Then roll back membrane half way point.

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- iii. Apply the Nuraflux primer (using lambswool roller) to the area previously covered with membrane ensuring the correct coverage is used (one litre per five square meters).
- iv. Nuraflux is solvent based so allow to cure thoroughly before using gas torches nearby.
- v. Whilst unrolling the roll use a correct size gas torch to heat the membrane just enough to completely melt the protective film and start the base bitumen flowing. Overlap previous rolls sides 80mm and ends 100m ensuring all laps face downhill.
- vi. After each two or three rolls are laid. Weld all lap joints perfectly using Nuraply welding techniques, discussed below, and testing all joints progressively.
- vii. Welding and detailing with skill, creates perfectly fused laps, with minimal exposed smooth bitumen, and neatly angle tooled joint edges. Stagger the roll lying to avoid four corners meeting in one place.

g. Adhesion of Nuraply 3PB-SA Sheet to Enertherm Substrate

- i. Install detailing (refer to g.) to all drainage outlets gutters and detailing in Nuraply 3PB-SA, before laying the main roof. Ensure outlets are rebated to avoid build-up at outlets and to allow drainage outflow.
- ii. Use chalk lines to ensure straight neat lines of the finished membrane. Position the membrane roll to the chalk line, roll out to the required length and cut to size. Then roll back membrane half way point.
- iii. Whilst unrolling the roll, peel away the protective film and use a roller or stiff broom to press the self-adhesive membrane to the substrate. Overlap previous rolls sides 80mm and ends 100m ensuring all laps face downhill.
- iv. After each two or three rolls are laid. Weld all lap joints perfectly using Nuraply welding techniques, discussed below, and testing all joints progressively.
- v. Welding and detailing with skill, creates perfectly fused laps, with minimal exposed smooth bitumen, and neatly angle tooled joint edges. Stagger the roll lying to avoid four corners meeting in one place.

h. Making the Lap-Joint

- i. To weld lap-joints use the round edged finishing trowel and heat gently. Insert trowel between sheets and lift the edge of the top sheet high enough to allow the torch flame to liquefy both surfaces.
- ii. Both hands must work together, moving back and forth along the sheet a distance of approximately 350mm. When the surfaces are melted, remove trowel and torch flame from



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between lap-joint.

- iii. Position hot trowel blade firmly on top of joint approximately 50mm back from the open edge and weld the sheets together with pressure from the hot trowel. Then joggle the top sheet along the back edge of the under sheet to an angle of approximately 45°. Approximately 30mm from the back of the joint is now welded together.
- iv. Re-lift the edge of the upper sheet reheat under it and trowel weld the middle 25mm of the lap with pressure from the trowel. Once again, re-lift the edges of the upper sheet, reheat, and with pressure from the trowel, weld the remainder of the lap to within 5mm of the front edge. Lift the front edge, reduce heat and then apply flame between the sheet edges.
- v. Seal the front with pressure from the trowel, ensuring this time that the trowel follows closely behind the flame. The edge of the trowel is then run along the front edge of the top sheet at about 45° to ensure a good seal.
- vi. Finally, finish the front edge to give a similar appearance to the joggled edge by adjusting the trowel angle and dressing the front edge. Each section of jointing (i.e. approx 350mm length) should be completely welded before starting the next section.
- vii. Always keep the trowel hot and scraped free of carbon build-up, to prevent Nuraply surface from dragging. A properly made lap joint should not be capable of being pulled apart at normal temperatures.
- viii. Random test finished and cooled joints with the hot trowel edges, as work progresses.



REMEMBER: A SOUNDLY WELDED LAP-JOINT IS CRITICAL FOR THE SYSTEM TO REMAIN COMPLETELY WATERPROOF.

i. Installing Cap Sheet

- i. Before proceeding, ensure the first layer has been completed, is fully bonded to the substrate with No. 10 and that the welded joints are sound.
- ii. If practical floodtest vulnerable areas.
- iii. If there has been an extended period between installing the baselayer and the capsheet then ensure the base layer is clean and dry. It may be advisable to prime the baselayer with Nuraflux primer.
- iv. The laps of the cap sheet must be offset to the laps of the base sheet. Similarly with three or more layered systems.
- v. Weld the upper Capsheets so that they are fully bonded to the immediate under layer by applying heat to the top of the Basesheet and underside of the capsheet as you unroll the capsheet.
- vi. After each two or three rolls are laid. Weld all lap joints perfectly using Nuraply welding techniques, discussed in “5.c Making the Lap-joint”, testing all joints progressively.

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- i. Repeat steps iv and v so it is encased with two layers of membrane.
- ii. Fasten on the Nuravent cap using the three screws and washers provided.

j. Nuraply 3PM Application in UV exposed Gutters and Around Details

Check that the gutter is properly built and stable with falls and fillets, all joints supported and details complete, before starting work.

- i. Details

Complete the Nuraply 3PM details work first.

If particular details are provided for a project which you are unfamiliar or uncomfortable with, discuss the matter with a Nuralite technical advisor or the project architect.

- ii. Sumps/droppers



Must be rebated the depth of the flange thickness + 3mm or double rebated

Must be lined to a depth of at least 100mm down the dropper.

Example: Cut a piece of Nuraply 3PM 25mm longer than the depth required and 25mm wider than the circumference of the dropper.

Note: Rule of thumb measure to find circumference.

Measure diameter of pipe x 3 plus lap, e.g. 75mm diameter x 3½ = 260 + lap (50) = 310mm.

Precoat the inside of the dropper (pipe) with No. 10 using whatever tool suits and allow drying.

Soften the resulting piece of Nuraply 3PM and form in shape, and place into pipe.

With gentle heat, carefully placed, and either a small roller or wooden block, form the Nuraply 3PM into the warm No 10 on the pipe. When in place, heat and close the lap with a firm pressure.

The excess 25mm of material left standing above the sump floor is now heated and gently folded down cut on the sump floor into the outlet rebate. Now form a 100mm wide collar and turn the excess into the dropper to complete in readiness for the next stage.

- iii. Sump Base

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Normally the sump has four sides, but can vary in size and depth, but generally can be lined as follows:-

Measure sump base and add to each side 50mm all round, and cut a piece of Nuraply 3PM to this size. Pre-coat with No.10 and while wet, fold all sides up 50mm to form a tray. Fold the corners neatly flaps facing into the tray and not behind.

First define the dropper size and cut an opening in Nuraply 3PM 1/3 size of dropper hole and then warm the area over the dropper, cut the opening of the Nuraply 3PM and place heat beneath it to warm the top edge of the dropper and the underside of the tray, then trowel down into place and with a hot trowel, work the Nuraply 3PM down into the dropper side.

iv. Sump sides

Measure the four sides of the sump and cut four pieces of Nuraply 3PM 50mm larger all round (as for base). Pre-coat with No 10 and fold three sides into a tray.

Place the first side, heated between the side tray and the sump side, then block into position.

Heat the two side extensions and block or trowel into place, and then lift the bottom extension and heat and trowel down, ensuring that the corners are neatly placed and firmly down.

The extensions now left stand above the sump to/guttering base, are warmed and trowelled down onto pre coated No.10.

v. Droppers placed in Gutter Sole

Quite often gutters do not have sumps, but have the dropper/outlets leaving the gutter from the sole direct over through the gutter side. Overflows generally are similar, and either passes through the side or is pipes raised above sole level.

Where this occurs, it is treated as per above, and turned out onto the sole, then a square or circle of Nuraply 3PM (apron piece) is placed over this (similar to the sump base), approximate size equals three times the dropper diameter. This is placed onto dry Nuraflux primer and is also pre-coated and heated into place with a trowel. The centre is pressed through and worked down.

vi. Stop Ends

These are dealt with in the same manner as the sump. A base piece is measured wider than the gutter by 50mm each side, is cut to extend up the end by 50mm and out onto the gutter sole by 150mm to 200mm. All areas are pre-coated with No.10, plus the back of the base tray, which is pre-folded and placed with heat and a trowel or wooden block.

Another piece is cut for the stop end, again over large by 50mm all round, pre-coated, folded, then heated and trowelled down. The extension at the top is heated and turned out over the gutter side and can be fixed. The two side pieces are cut to suit, plus 50mm wide extensions, and placed into position.

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Other stop ends or intermediate stops or seismic stops are finished in the same way.

vii. Install the Nuraply 3PM lining

Insure that the gutter is clean and dry. Where practical, roll out the Nuraply 3PM and allow it to “relax” before installation into the gutter.

To minimise lap joints the gutter should be lined in one piece down the length of the gutter, covering the base and sides in one application, or in three pieces with a base installed extending up the sides 100mm then separate side pieces extending down and forming 100mm laps on the base.

Cut the Nuraply 3PM to the girth of the gutter, plus extras for turnovers etc, the top and lay it along the gutter. Do not stretch the Nuraply 3PM when forming into the gutter. This can cause hollows in the finished job.

Warm the Nuraply 3PM gently with the gas torch and mould it down into the gutter. Use a roller or broom as required and tool all small details carefully.

A smooth metal roller is often preferred as it can be cleaned easily, has less chance of small stones or objects sticking to it which can damage the Nuraply 3PM membrane.



REMEMBER: TAKE EXTRA CARE ON DETAIL WORK, “LOOK AFTER THE EDGES AND THE MIDDLE LOOKS AFTER ITSELF”.

k. Flood Testing

If possible floodtest vulnerable areas such as gutters and particularly outlets for 24 hours before signing off the job.

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8. Trouble Shooting Problems and Repairs

If bubbles occur in Nuraply 3PG – either

- a) Moisture has become vapour underneath the Nuraply 3PG, or
- b) Air is underneath the Nuraply 3PG, or
- c) Too much heat has been used in welding

With a) and b) the bubbles will be formed by the Nuraply 3PG lifting off the deck.

With c) the smaller “blisters” form only in the top layer of Nuraply 3PG.

- i. Check ventilation of plywood/timber decks.
- ii. Check for water entry somewhere.
 - a. When the moisture which causes the vapour-created bubbles has gone, or dried out, or stopped, the bubbles can be warmed and blocked down to remove the problem. It may also be necessary to cut open and torch down and overlay neatly with Nuraply 3PG to reseal bad areas.
 - b. Air trapped during laying can be removed by rolling or warming and blocking down. If this does not work, the bubbles can be cut and warmed and blocked down. After this an overlay piece will be required, welded onto the surface after priming with Nuraflux.
 - c. Blisters from welding can be warmed carefully and blocked down before recoating the surface.

Repairs to the Nuraply 3PG system are performed by welding pieces of Nuraply 3PG to the cleaned and Nuraflux primed damaged surfaces:-

- a. Minimum repair of one small hole is a lap to lap infill strip of Nuraply 3PG 100mm wide to look like a lap joint.
- b. Larger/wider spread damage requires lap to lap infill pieces of Nuraply 3PG long enough to cover all damage plus 100 mm minimum each side of the damage.
- c. Ensure that the repaired Nuraply 3PG roof remains neat and attractive in appearance.

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9. Project Sign-off Form

(to be completed by the Head Contractor and Applicator)

Project Name: _____
 Builder Firm: _____
 Applicator Firm: _____
 Area covered by QC Sheet _____

Roofing membrane installation item	Comply Y/N/Na	Comments
Substrate readiness form completed		
Underflashings installed to all corners and upstands (pay attention to parapets, gutters, junctions)		
Gutters correctly and neatly installed, particularly the internal corners		
Roof drains & overflows installed to specification and watertight		
Membrane adequately adhered to substrate with no evidence of bubbles or lifting. Correct quantities of primer or adhesive used as per specification.		
Cap sheet and basesheet fully bonded together, no areas of delamination.		
Cap sheet side laps 80mm and end laps 100mm fully welded and tidily seamed off.		
No sign of overheating/excessive bitumen bleed from laps (over 2-3mm).		
Cap sheet and base sheet laps offset satisfactorily. No three layer lap build-ups		
Overall installation free of wrinkles, creases and splits		
Nuraply 3PM installed where membrane is exposed to UV		
All penetration details completed to specification including under/overflashing		
Standard details used throughout including at upstands, parapets, construction joints		
All non standard details installed as per pre-approved specifications (attach approved drawing)		
Gutters and outlets have been floodtested		
Any damage to cap sheet repaired to specification.		

Note: Where an element identified in the above checklist is not applicable, please record N/A in the comply column.



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Project Sign-off Form cont.

Remedial action required:

Note of damaged areas repaired:

Signed Head Contractor

Date:

Signed Applicator

Date:

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10. Drainage, Soil Substrate & Plant Installation – By Others

Ensure a Membrane Project Sign-off form has been completed by the head contractor as a sign that the membrane has been correctly installed. The next trades installer will be responsible for damage once the Project Sign-off form has been completed.

The first layer above the waterproofing must always be a heavy duty polyethelene sheet, with edges taped together. This is designed to provide a demarcation with the Nuraply 3PG and will provide an element of protection from trades walking on the membrane.

Depending on the system selected, a roll of drainage mat or plant trays may then be installed on the polyethelene. Set soil or trays back 300mm from the building or upstands to allow complete drainage in case of a rain deluge. Outlets must also be kept clear so they may be regularly inspected.

The soil buildup must comply with specification. Uneven soil buildup must be avoided so that the building structure does not become overloaded in points.

Soil substrate and plants should be selected by an expert in the field to ensure they plants have the best chance of survival.

No aggressive chemicals or solvents to be used where they may affect the membrane system.

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11. Nuraply Maintenance Programme - Checklist

To get the longest life from a roof it must be regularly inspected & maintained.

When first installed there should be inspections each spring and autumn, to enable the effects of annual extremes of weather to be checked. Following that an annual program of roof inspection and cleaning should be established by the building owner as part of general building maintenance.

Roofs exposed to high levels of pollution or in close proximity to trees might require more frequent inspection.

Any inspection of a roof should include the interior of the building for signs of water penetration or condensation and for alterations, which may have affected the roof. Externally, abutting construction, which can affect the performance of the roof, should also be inspected.

Maintenance of the Green Roof soil and plant system is the responsibility of the owner. It is recommended that a maintenance contract with a qualified landscaper is arranged to care for the plants.

Annual Inspections & Cleaning

Inspections

The inspection should concentrate on "high risk" areas such as hatches, drains and around all roof top equipment, as well as a general inspection of the entire roof. Inspections should also include the examination of the roof deck if possible from the underside for evidence of leaks, deteriorated decking, structural cracks or movement and other deficiencies. Parapets and edging should also be examined for evidence of cracking, deterioration and moisture infiltration.

Damage

If damage is found on the roof surface it should be repaired immediately by an approved Nuralite Applicator. They will use NURAPLY 3PG component products and special techniques to achieve neat, unobtrusive reinstatement of the NURAPLY 3PG.

Five Year Authorised Service Checks

To maintain the material defects warranty, every five years the owner must engage an Approved Applicator to inspect the roof and ensure it remains in good condition. Failure to maintain the roof system will void the warranty.

The Applicator must thoroughly check the roof for signs of damage, water ingress or potential problems.

	Applicator	Date	Signed
Inspection 1			
Inspection 2			
Inspection 3			
Inspection 4			

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INSPECTION CHECKLIST

1) Surface:

- a) bare patches in solar reflective finish or chippings;
- b) accumulation of loose chippings;
- c) accumulation of silt or vegetation;
- d) loose, inadequately supported or broken paving slabs;
- e) exposed insulation (protected membrane roofs);
- f) areas of ponding.

2) Membrane:

- a) blistering, ripples, rucking, detachment;
- b) cracks, splits, tears, punctures, indentations;
- c) pimpling, pitting, crocodiling;
- d) pulled, unbonded laps;
- e) softening of surface.

3) Substrate:

- a) depressions in surface;
- b) lack of support/soft support to membrane.

4) Rainwater outlets:

- a) blocked;
- b) not bonded to membrane (if bonded type);
- c) clamping ring loose (if clamped type).

5) Upstands:

- a) damaged/detached flashings;
- b) sagging membrane;
- c) splits, cracks, tears;
- d) membrane unsupported at fillet;
- e) unbonded laps;
- f) blistering.

6) Eaves/verge:

- a) unbonded or peeling membrane;
- b) cracking/splitting or strain in membrane;
- c) displacement or signs of movement of edge trim.

7) Movement joints, upstand type:

- a) unsealed capping joints;
- b) dislodged flashing/capping;
- c) unbonded laps.

8) Movement joints, proprietary flush type:

- a) unbonded laps;
- b) splits, cracks, tears.

9) Abutting construction:

- a) parapet copings cracked, loose, unsealed;
- b) damaged damp-proof course, lack of continuity in damp-proofing;
- c) open joints, cracking in construction;
- d) loose/missing pointing.

10) Roof fixtures and penetrations:

- a) upstand defects as above;
- b) rooflight glazing defects;
- c) damaged/missing flashings;
- d) balustrade/vent pipe, loose or missing flashing or collar;
- e) plant plinth damaged/missing flashing;
- f) lightning conductor tape, fixing loose/detached

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12. Technical Datasheets

NURAFLUX PRIMER

IKO QuickDry Primer

TECHNICAL DATA SHEET

DESCRIPTION AND AREAS OF USE

Nuraflux Primer is a bitumen based adhesive solvent solution which is specifically formulated to provide excellent adhesion for Nuralite Waterproofing Membranes under many kinds of surface conditions. Nuraflux Primer is an integral part of the Nuralite Waterproofing System and sufficient primer must be used on dry surfaces to condition them to be dust free so that the substrate is suitable for the application of Nuralite Waterproofing Membranes.

Used to prime all structural concrete, masonry, or wood surfaces on which waterproofing membranes will be used.

Designed to be used on applications down to -4°C.

May be used on horizontal surfaces, but remains tacky, and precautions must be used in this application to prevent contamination of the Primer surface prior to installation of the membrane.

May be used on all concrete block and brick wall conditions.

APPLICATION

Nuraflux Primer may be applied with roller, brush or spray. A roller with a heavy nap should be used to carry sufficient material to the area being primed.

Apply all Nuraflux Primer to a clean, dry, dust free and frost free surface at a coverage of approximately 5 sqm/litre. The primer should be spread sufficiently to avoid areas of excess material. Areas of excess material will lengthen the drying time on the application of the primer.

Nuraflux Primer will dry in a minimum of one hour - may dry quicker due to drying conditions, such as wind and warmth.

This product is black in colour and will remain tacky when dry.

The application of primer should be limited to what can be covered with Waterproofing Membrane in one working day. Any areas not covered with membrane during the day must be reprimed - be sure to cover all open containers when not applying primer, as the primer is volatile.

SAFETY, STORAGE & HANDLING INFORMATION

Nuraflux Primer vapours are flammable. User should review Material Safety Data Sheet (MSDS) for this product and follow safety instructions listed therein.

TRANSPORT CLASSIFICATION

IMDG Class 3.1
UN No. 1294

NURABOND NO 10
TECHNICAL DATA SHEET

DESCRIPTION

Nurabond adhesive is a water based adhesive designed to bond Nuraply roofing membranes to concrete, plywood and timber. It features good initial grab with excellent exterior weathering resistance.

SPECIFICATION :

Type: Modified synthetic latex / bitumen emulsion.
Colour: Black.
Viscosity: Brushable or spreadable.
Solids: 55% approx.
Cleaner: Water while wet, Bostik Solvent No.2 or 3 when dry
Stability: Protect from frost. Not freeze-thaw stable.

APPLICATION :

All surfaces must be clean and free from grease, oil, release agents or dust etc. It can be applied using brush, roller.

NOTE: Concrete must be cured for a minimum of 27 days and have a moisture content of 18% or less. Plywood and timber must have a moisture content of 18% or less and be of the correct standards.

PACKAGING :

15 litres plastic pail

STORAGE :

Store in cool, dry conditions out of direct sunlight between 5° C and 25° C. This product **MUST** be protected from frost.

SHELF LIFE :

12 months under normal temperature conditions and in original containers.

VERSION :

Version 1 3rd October 2006

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Nuraply ALU Vapour Barrier

IKO Shield PRO ALU/SA 25m

TECHNICAL DATA SHEET

DESCRIPTION AND AREAS OF USE

Roofing membrane with glass fibre reinforcement, topside finished with polyester reinforced aluminium foil and under-side coated with self-adhesive SBS modified bitumen.

The combination of glass fibre reinforcement and aluminium finish layers ensures a dimension-stable, accessible roofing membrane, which facilitates stepping on metal deck during operation.

- The bottom side is coated with self-adhesive, SBS modified bitumen, which guarantees an immediate and high adhesion strength to the substrate surface.
- The top is finished with a polyester reinforced aluminium foil.
- The bottom side is finished with a removable silicon foil.

APPLICATION

Self-adhesive vapour barrier on metal deck, accessible during operation.

Also as vapour barrier on fully substrate substructures, if it is dry, dust and fat free.

Nuraply Aluminium Vapour Barrier is applicable as vapour barrier for roofing systems in buildings with high humidity conditions (Inner climate: class IV).

COMPOSITION

- Reinforcement: glass fibre, 60 g/m².
- Bitumen coating mass: self-adhesive SBS modified bitumen.

TECHNICAL DATA (EN 13707 et EN 13970)

- Tensile strength:
 - longitudinal: 525 N/50 mm
 - transversal: 350 N/50 mm
- Elongation @ break
 - longitudinal: 12 %
 - transversal: 12 %
- Dynamic indentation : Ø 20mm
 - Low temperature flexibility self-adhesive coating: -25°C
 - Dimensional stability: 0,1%
 - Watertightness (EN 1928/B): 200 kPa
 - Water vapour transmission (EN 1931): µd >1500m

See test report according EN 13970 (Bitumen water vapor control layers) from MPA Dresden (DU) nbr 2006-4-667/9.

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DIMENSIONS

- Thickness: 0.6 mm
- Length: 25 m
- Width: 1,08 m
- Weight: 25 kg
- Packaging: 24 rolls per pallet

APPLICATION

Nuraply ALU Vapour Barrier is applied as a vapour barrier in buildings with inner climates till class IV. The substrate should be smooth, dry, clean, fat- and dust free. All substrates, with exception of pre-coated metal deck, needs to be coated with bitumen primer IKOpro SAPrimer. In case of application on metal deck the membrane shall be placed parallel on to the corrugations, as to position the side laps supported on the metal deck, and have the ability to rightly pressure it.

The first membrane is unrolled and lined out and rolled up again till approximately half the length of the strip. The remove-able silicon foil should be cut in cross direction and pulled up in one time while unrolling the membrane. This way, the self-adhesive underside will get in direct contact with the substrate and stick immediately. The same procedure should be repeated for the other end of the roll. The next membrane Nuraply ALU Vapour Barrier is applied in the same way with a side lap of 8 cm and an end lap of minimum 10 cm. Overlaps are to be pressured with a medium hard pressure roller.

The isolation is applied by bonding with IKOpro PU-Roof Adhesive or hot bitumen direct on to the aluminium facing of the Nuraply Aluminium Vapour Barrier.

Insulation types admitted: Mineral wool, EPS without facing, glass fibre faced PUR, PIR and PF (NOT: with talc/sand finished bituminized facing at the underside).

Temperature in application $\geq 10^{\circ}$ C.

In case of application during colder periods the material should be stored at least 12 hours before application in an ambient temperature of $\geq 10^{\circ}$ C. Attention: Finish the roofing system every working day until at least 1 watertight layer on the insulation material in order to protect the aluminium foil of the Nuraply Aluminium Vapour Barrier against thermal shocks.

SAFETY, STORAGE & HANDLING INFORMATION

Do not pile pallets

Store indoors, preferably in dark room; avoid direct sunlight

Apply as quickly as possible after production

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

NURAPLY 3PB

IKO Base P3 T/F 10m

TECHNICAL DATA SHEET

DESCRIPTION AND AREAS OF USE

Waterproofing membrane consisting of straight run bitumen heavily modified with polymers (APP = Atactic Polypropylene) and reinforced with a non-woven polyester.

FINISHING

- Top surfaced finished with white calibrated sand
- Underside finished with a smooth thermofusible film

APPLICATIONS

- Underlay in multi layer waterproofing system

COMPOSITION

- Reinforcement : non-woven polyester 180 g/m²
- Coating mass : plastomer bitumen, consisting of ± 70 % bitumen and ± 30 % atactic polypropylene (APP).

TECHNICAL SPECIFICATIONS (average values)

- Tensile strength (U.E.A.t.c.)
 - longitudinal : 600 N
 - transversal : 550 N
- Elongation at break (U.E.A.t.c.)
 - longitudinal : 40 %
 - transversal : 40 %
- Resistance to heat (U.E.A.t.c.) : $> 140^{\circ}\text{C}$
- Low temperature flexibility (U.E.A.t.c.) : -5°C
- Dimensional stability : $< 0,5\%$
- Tear resistance (U.E.A.t.c.)
 - longitudinal : 160 N
 - transversal : 160 N

DIMENSIONS

- Thickness : 3 mm
- Length : 10 m
- Width : 1 m
- Surface : 10 m²
- Average weight : 41 kg

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

SAFETY, STORAGE & HANDLING INFORMATION

- Do not pile pallets
- Store indoors

TRANSPORT CLASSIFICATION

N/A

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

NURAPLY 3PB – SA

IKO Base Stick T/SA 15m

TECHNICAL DATA SHEET

DESCRIPTION AND AREAS OF USE

Roofing membrane with polyester fibre reinforcement for use on areas requiring quality waterproofing without the use of naked flames.

- The polyester reinforcement has high mechanical strength.
- The bottom side is coated with self-adhesive, SBS modified bitumen, which guarantees an immediate and high adhesion strength to the substrate.
- The topside is finished with quartz mineral and a removable silicon foil of 8 cm on the side lap area, which guarantees a fast and secure sealing.
- The bottom side is finished with a removable silicon foil.

COMPOSITION

- Reinforcement: polyester fibre, 160 g/m².
- Bitumen coating mass:
 - Topside: flexible bitumen.
 - Bottom side: self-adhesive SBS modified bitumen.

TECHNICAL SPECIFICATIONS (average values)

- Tensile strength: (UEAtc)
 - Longitudinal : 700 N
 - Transversal : 500 N
- Elongation at break (UEAtc)
 - Longitudinal : 35 %
 - Transversal : 35 %
- Low temperature flexibility self-adhering coating : -25°C

DIMENSIONS

- Thickness: 2.5 mm
- Length: 10 m
- Width: 1 m
- Weight: 32 kg

APPLICATION

The substrate should be smooth, dry, clean, fat- and dust free.

All non-insulated substrates, with exception of pre-coated metal deck, needs to be coated with Nuraflux bitumen primer. In case of application on metal deck the membrane shall be

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

placed parallel on to the corrugations, as to position the side laps supported on the metal deck, and have the ability to rightly pressure it.

The first membrane is unrolled and lined out and rolled up again till approximately half the length of the membrane. The removable silicon foil should be cut in cross direction and pulled up in one time while unrolling the membrane. This way, the self-adhesive underside will get in direct contact with the substrate and stick immediately.

The same procedure should be repeated for the other end of the roll.

The next membrane Nuraply 3PB – SA is applied in the same way with a side lap of 8 cm. Before unrolling it definitively, the silicon foil on the welding strip of the first membrane shall be removed.

Pressure shall be exerted with a medium hard pressure roller. The end laps should be sealed over a width of at least 10 cm with a smooth flame or hot air gun.

In multi layer roofing systems the top layer may be another layer of Nuraply 3PB-SA with a coating applied or Nuraply 3PG torched-applied onto the Nuraply 3PB–SA.

Temperature in application $\geq 10^{\circ}\text{C}$.

In case of application during colder periods the material should be stored at least 12 hours before application in an ambient temperature of $\geq 10^{\circ}\text{C}$.

SAFETY, STORAGE & HANDLING INFORMATION

- Do not pile pallets
- Store indoors, preferably in dark room; avoid direct sunlight
- Apply as quickly as possible after production
- Pot-life: depending on circumstances: ideally in dark room at 10 to 20°C, maximum 6 months.

TRANSPORT CLASSIFICATION

N/A

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

NURAPLY 3PG

IKO Roofgarden APP 4 T/F

TECHNICAL DATA SHEET

DESCRIPTION AND AREAS OF USE

Waterproofing root-resistant membrane, consisting of a non-woven polyester reinforcement, coated with plastomer bitumen. Root resistant top layer for waterproofing systems under green roofs with selected plants or in areas where there is the risk of membrane attack from plant roots.

FINISHING

- Top finished with sand
- Underside with a thermofusible film

APPLICATION

Lay the second NURAPLY 3PG layer by heat fusing over the cleaned repaired and NURAFLUX primed (if necessary) surface of the first layer. Joints in the second layer must not correspond with joints in the first layer. Second layer joints to be welded lap-joints, minimum 80mm wide down roll edges and minimum 100mm wide across roll ends, to the NURAPLY 3PG supplier's requirements. Roll junctions must be staggered to avoid 4 layer lap-weld build-up of NURAPLY 3P at corners. Ensure unobstructed drainage flow at outlets.

COMPOSITION

- carrier: non-woven polyester 180 g/m²
- plastomer bitumen, consisting of + 70% bitumen and + 30 % atactic polypropylene (APP), with addition of a root-rejecting element.

TECHNICAL SPECIFICATIONS (average values)

- Tensile strength: (UEAtc)
 - longitudinal: 700 N
 - transversal: 450 N
- Elongation at break (UEAtc)
 - longitudinal: 30 %
 - transversal: 40 %
- Low temperature flexibility: -8°C
- Heat resistance (EN 1110): 140 °C

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

- Dimensional stability (EN 1107-1): < 0,4%
- 4 year period FLL German root-test accomplished

DIMENSIONS

- | | |
|-------------|-----------|
| - Thickness | : 4 mm |
| - Length | : 7.5 m |
| - Width | : 1 m |
| - Weight | : 36.1 kg |

SAFETY, STORAGE & HANDLING INFORMATION

- Do not pile pallets and keep rolls upright
- Store indoors

TRANSPORT CLASSIFICATION

N/A

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

NURAPLY 3PM

IKO Turbo 7.5m

TECHNICAL DATA SHEET

DESCRIPTION AND AREAS OF USE

Waterproofing membrane consisting of non-woven polyester coated with plastomer bitu-men. With slate layer in either Charcoal, Slate, Pure White, Red or Green.

FINISHING

- Top surfaced finished with a mechanically rolled slate layer (colour red) offering excellent bonding with PP film on the 8 cm overlap.
- Underside finished with a thermofusible film

APPLICATION

- Cap sheet in multi layer waterproofing system

COMPOSITION

- Reinforcement: 180gm² non-woven polyester
- Coating mass: polymer modified bitumen.

TECHNICAL SPECIFICATIONS (average values)

- Tensile strength (EN 12311-1)
 - longitudinal : 650 N
 - transversal : 500 N
- Elongation at break (EN 12311-1)
 - longitudinal : 40 %
 - transversal : 40 %
- Resistance to heat (EN 1110): > 140°C
- Low temperature flexibility (EN 1109): -8°C
- Dimensional stability (EN 1107-1): ≤ 0,5 %

DIMENSIONS



- Thickness : 4 mm
- Length : 7.5 m
- Width : 1 m
- Surface : 7.5 m²
- Average weight : 43 kg
- Colour : Charcoal, Slate, Pure White, Red or Green

FIXING

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

Torching method with asphalt burner.

SAFETY, STORAGE & HANDLING INFORMATION

- Do not pile pallets
- Store indoors

TRANSPORT CLASSIFICATION

N/A

The information in this product data sheet is based on our experience and testing. It represents the latest information available at the time of printing, but no guarantee of its accuracy is made or implied, nor responsibility taken for use to which this information may be put. We reserve the right to alter or up-date information parameters and formulations at any time without notice.

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

ENERTHERM PIR INSULATION BOARD

TECHNICAL DATA SHEET

IKO enertherm ALU is a 100 % CFC-free insulation board with a rigid polyisocyanurate foam core, faced with aluminium tri-laminate foil on both sides.

The insulation board is designed for the application in mechanically fixed or loose laid roof waterproofing systems made of reinforced polymers modified bitumen membranes and single ply plastic sheets.

APPLICATIONS

Thermal insulation of flat roofs, floors and walls.

TECHNICAL CHARACTERISTICS

- Core density: 32 kg/m³
- Compression strength at 10% deformation: ≥ 120 kPa (EN 13165)
- Performance under the influence of an equally distributed load: class C
- λ d-value (EN 13165 – declared value) : 0,022 W/Mk
- Tensile strength perpendicular to surface: > 80 kPa (EN 1607)
- Facing: aluminium tri-laminated foil
- Fire reaction: Class E according to EN 13501 part 1
- Chemical resistance: only degraded by concentrated leach and acids. Most in practice used paintings and solvents have no influence on the foam.
- Fungus resisting: PIR insulation boards have no potential on growing micro organisms.

THERMAL PERFORMANCE

λ d value according EN 13165 = 0,022 W/mK

CERTIFICATION

Product homologation certificate from Intron bv in Holland registered under # CTG 485.

ACERMI CSTB France Certificate n° 06/103/434/2.

CE-key: PIR – EN – 13165 – T2-DS(TH)8-DLT(2)5-TR80-CS(10\Y)120.

FIXATION OF INSULATION

- Mechanical fixation to the substrate
- Nurabond High Foaming PU adhesive

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

DIMENSIONS

FLAT BOARDS

Board dimensions 1000 x 1200 mm

Thickness mm

30 40 50 60 70 80 100

INTEGRATED SLOPE 1:60

Dimensions 1200 x 1200 mm

Thickness mm

40-60

60-80

80-100

100-120

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

NURABOND HIGH FOAMING PU ADHESIVE

IKOPro PU Adhesive

TECHNICAL DATA SHEET

DESCRIPTION AND USE

Nurabond High Foaming PU Adhesive is a permanent elastic high performance moisture-cured single part polyurethane adhesive with light foaming capacity for bonding bituminous roofing membranes, vapour control layers and rigid insulation boards. For use on various substrates including profiled metal decking, existing bitumen membranes, concrete, timber etc.

The adhesive is cold applied and has been specially developed to allow the safe, rapid partial bonding of roofing components to a wide variety of substrates.

It is moisture curing and tolerant of use in damp conditions. A degree of moisture is required, either in the atmosphere or on the surface, to allow the correct adhesive bond to be achieved. However, all liquid water should be removed from surfaces prior to use.

CURING TIME

Curing time is dependent upon ambient temperature and humidity conditions however, curing will usually occur between 2 to 6 hours.

The adhesive will take 24 hours to achieve full bond strength.

APPLICATION

The minimum working temperature is 5°C. At low temperatures, warming the containers in hot water prior to use will improve handling characteristics. (N.B do not boil the product). Maximum working temperature 30°C.

Application time: max 20 minutes

Surfaces to receive adhesive should be stable, clean and free of any liquid water (damp surfaces are acceptable)

No priming is required.

Nurabond High Foaming PU Adhesive is applied straight from the container in strips. The maximum distance between the strips is 25cm. Use the spout on can for pouring lines of adhesive.

NURAPLY 3PG GREEN ROOF INSTALLATION MANUAL

Advised glue consumption:

<u>Average Consumption</u>	<u>Roofzone</u>	<u>per m²</u>
Metal Plates	Centre	300g
	Perimeter	500g
	Corner	700g
Full Substrates	Centre	250g
	Perimeter	400g
	Corner	500g

These glue consumption rates are minimum advised rates and are valid for buildings with a maximum height of 15 metres

The membrane or insulation should be applied and pressed into position before formation of a skin on the adhesive. It is recommended that the bond is checked from time to time, by lifting a corner of the insulation/membrane to ensure that the adhesive ridges have been squeezed flat. This is particularly important with uneven substrates.

CLEANING

Trichloroethane or methylene chloride

PACKAGING

Nurabond High Foaming PU Adhesive is supplied in 6kg containers

STORAGE

Keep containers tightly closed when not in use. Store in its sealed container, in dry conditions at a temperature between 5°C and 25°C.

To avoid the risk of spillage, always store and transport in a secure upright position.

HEALTH & SAFETY

Keep container tightly sealed and away from direct heat. Keep away from sources of ignition. No smoking. Avoid contact with skin and eyes. Should there be contact with skin, wash immediately with soap and water or a recognized skin cleaner. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. In the event of accidents, seek medical attention immediately. Do not empty into drains. Do not allow solvent vapour to enter the air intakes of ventilation systems of buildings.

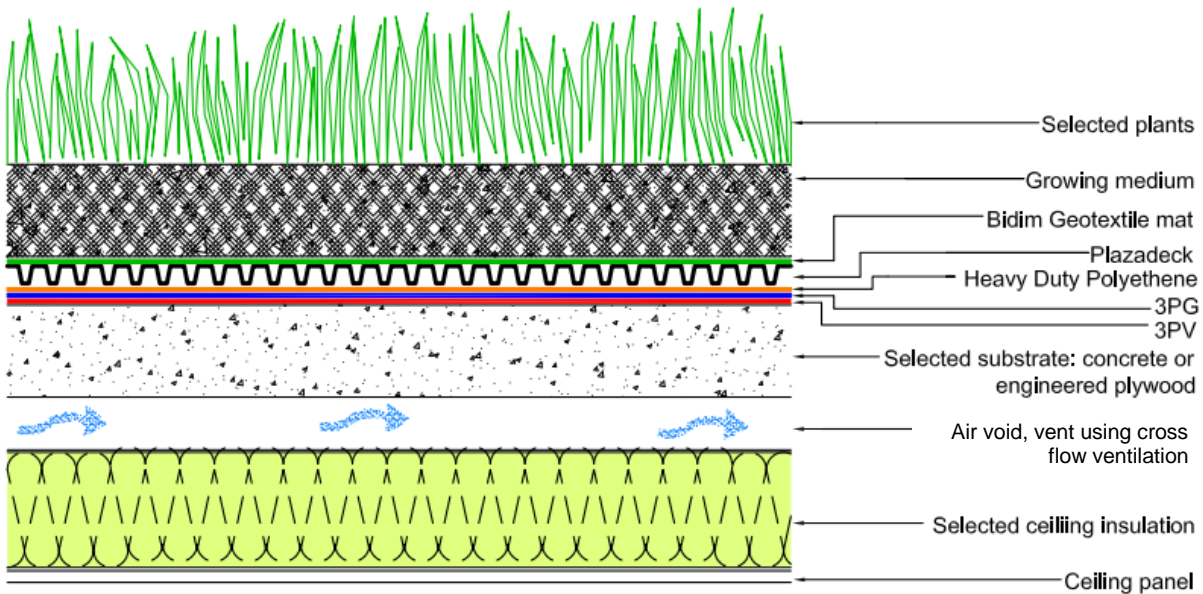
FIRE

In case of fire, use foam, dry powder, carbon dioxide or sand. Never use water jet.

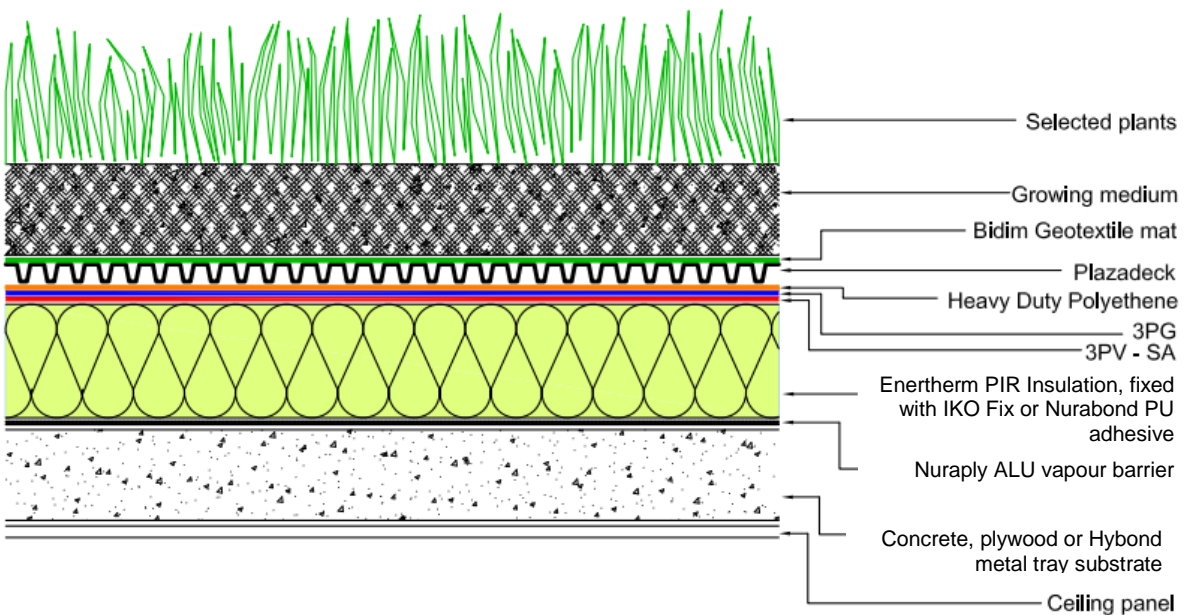
13. Installation Details

Cross Section of Green Roof System

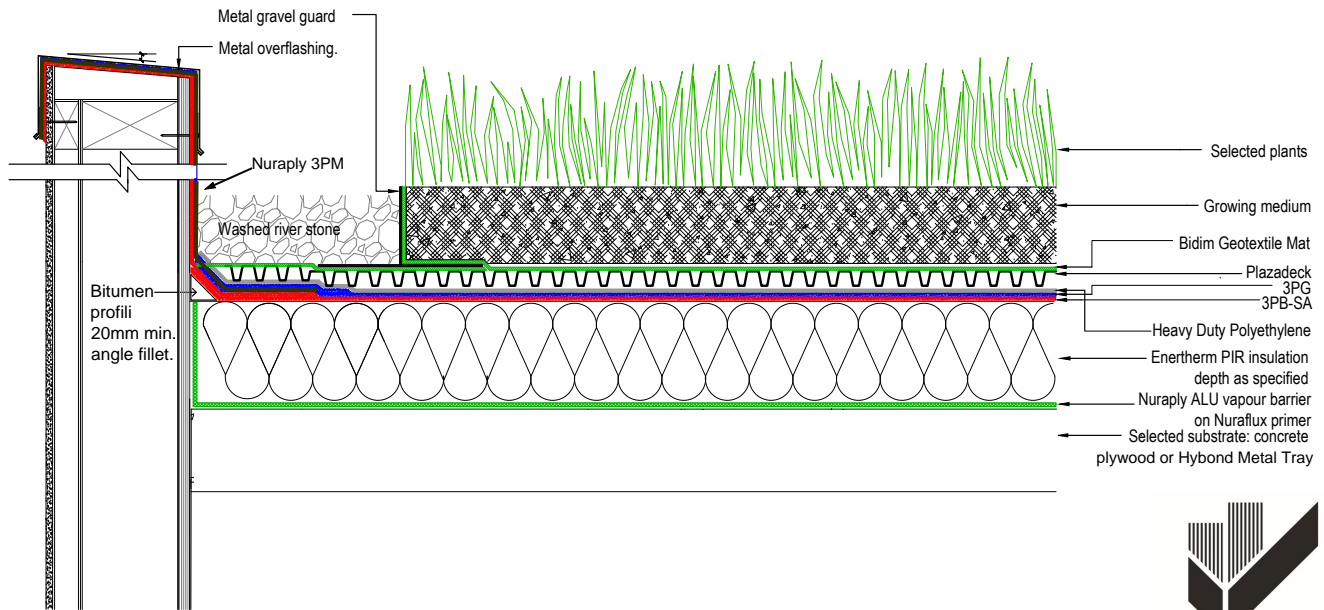
COLD ROOF SYSTEM



WARM ROOF SYSTEM



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NURALITE
THE FLAT ROOF EXPERTS

Nuralite Waterproofing Ltd.

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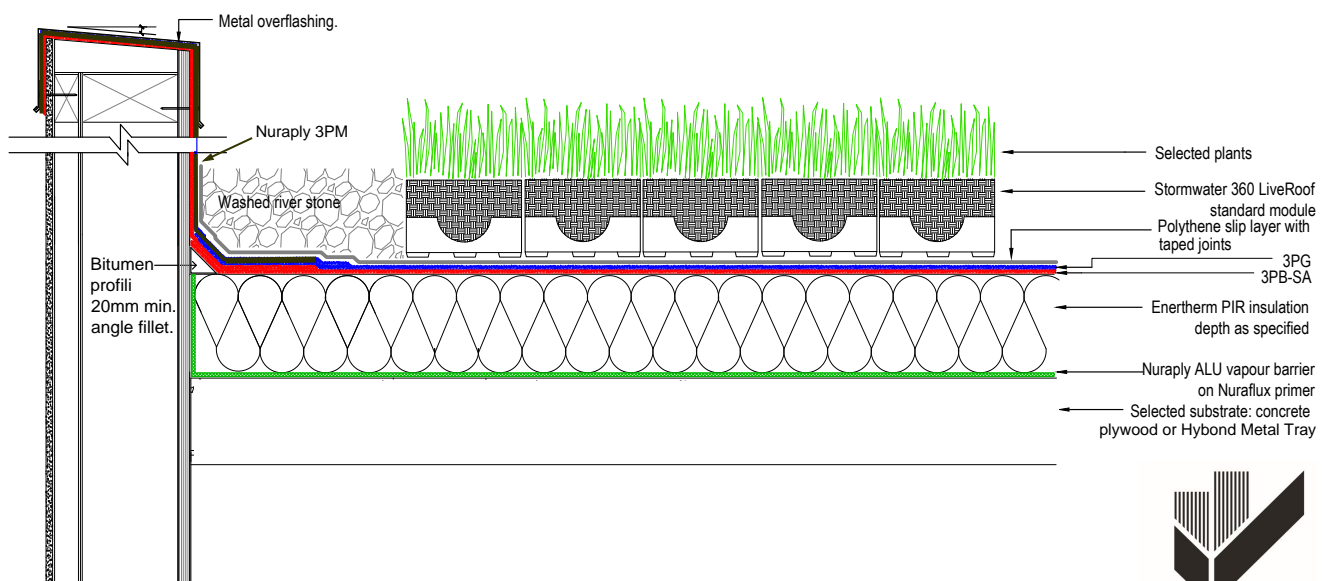
GREEN ROOF

DESCRIPTION:

PROTECTED MEMBRANE ROOF SYSTEM - UPSTAND

SCALE: NTS	PREVIOUS DWG No: New	DWG No: GCP-C2
REVISION: Rev E	DATE: NOV 12	

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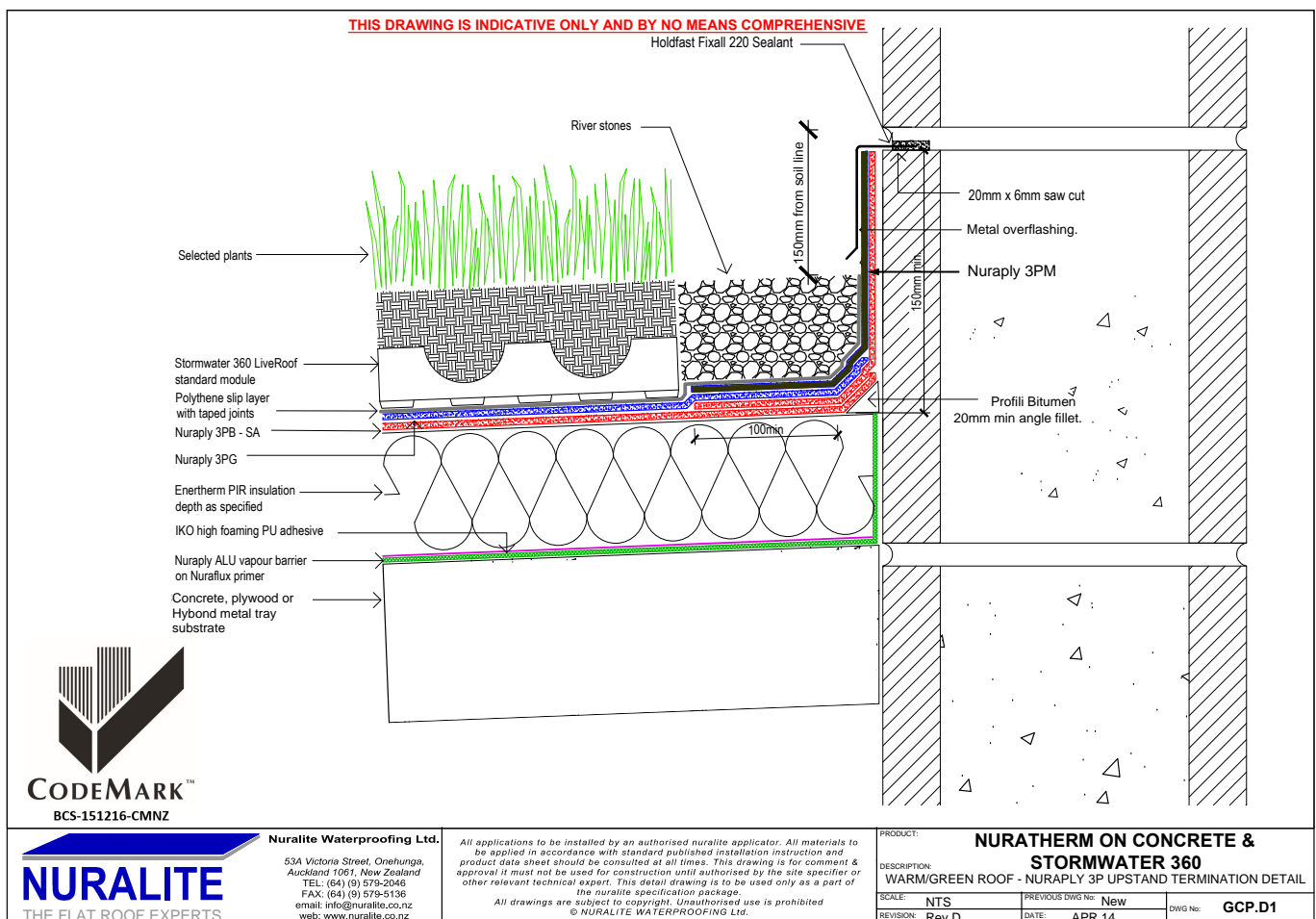
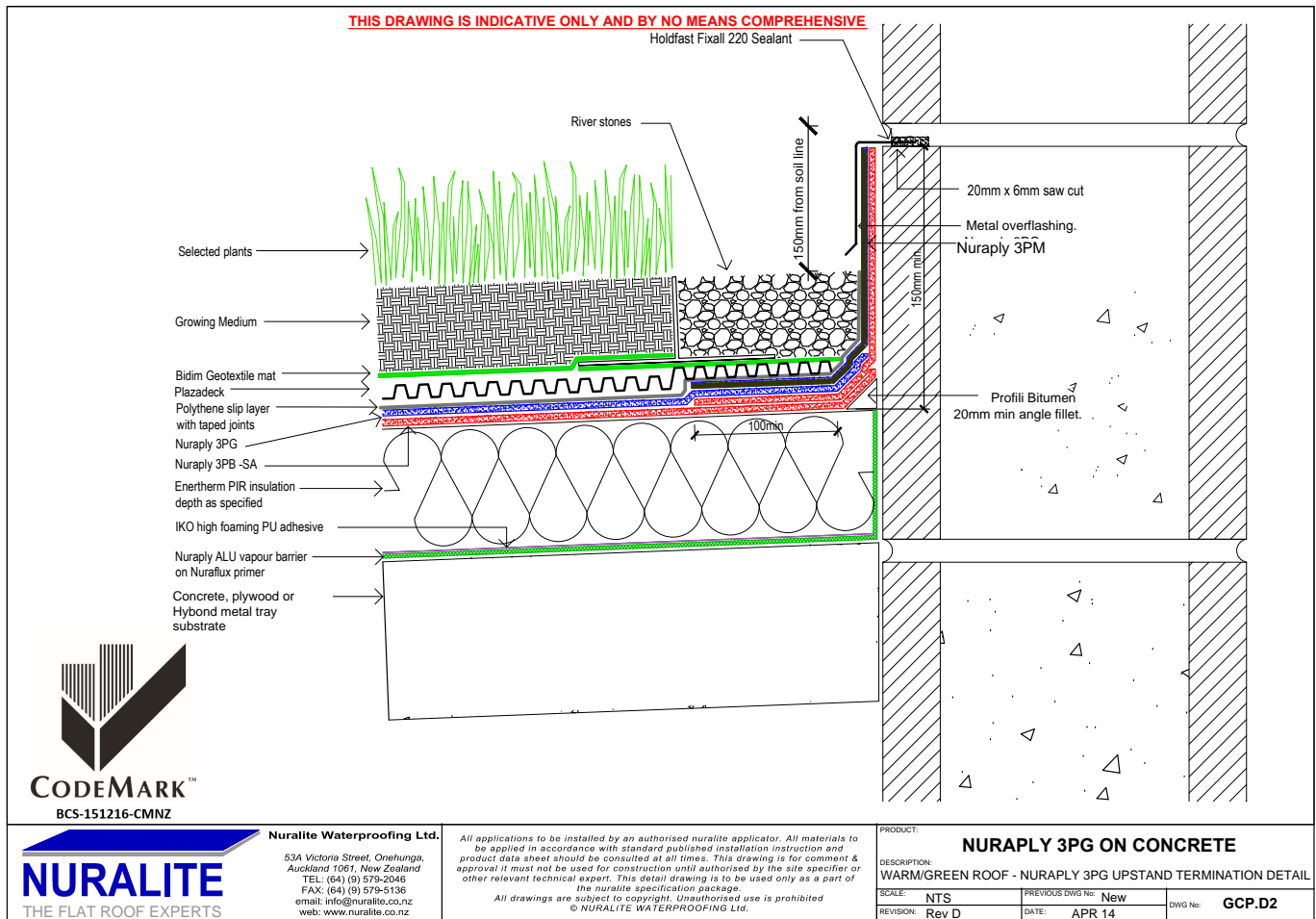
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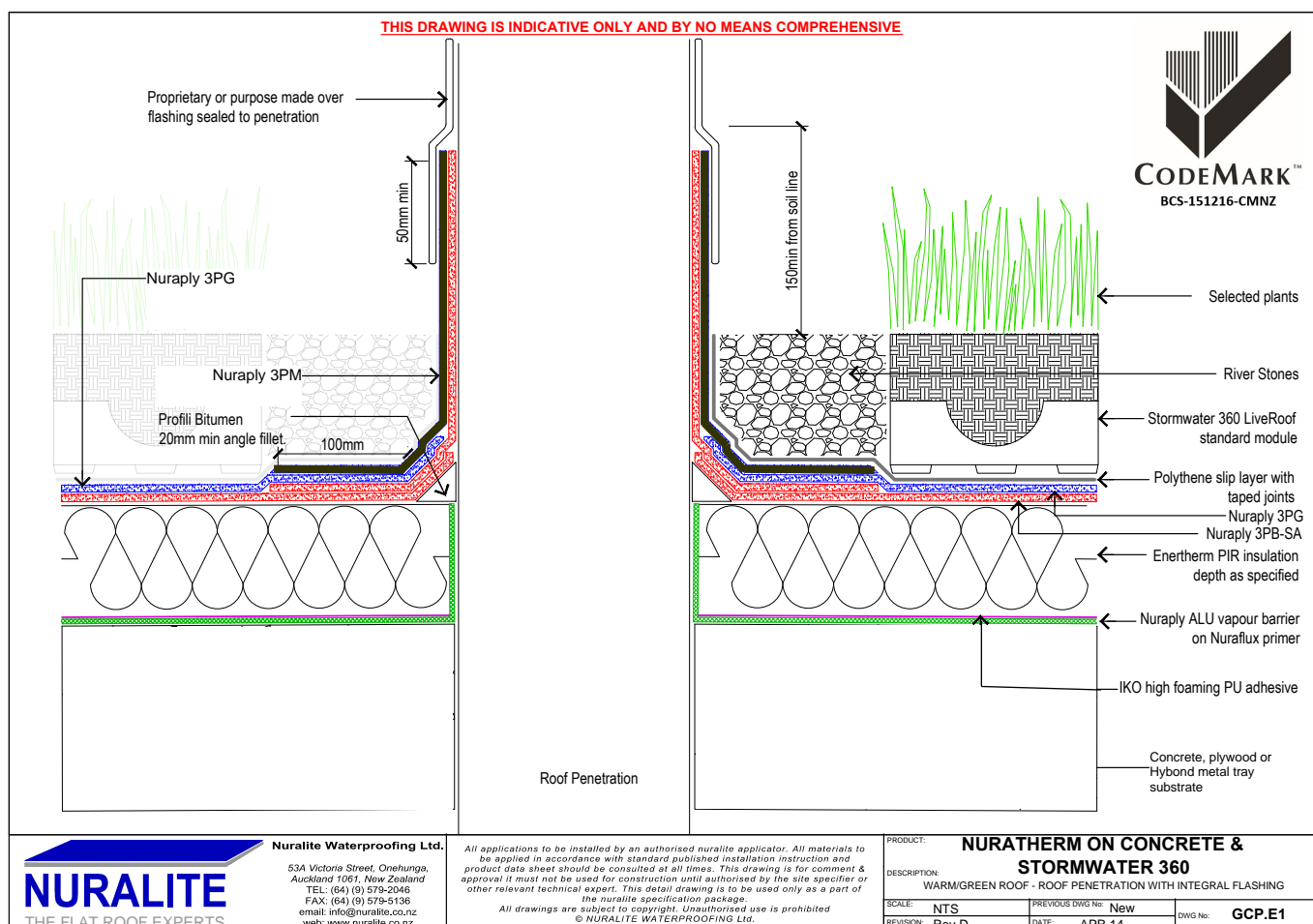
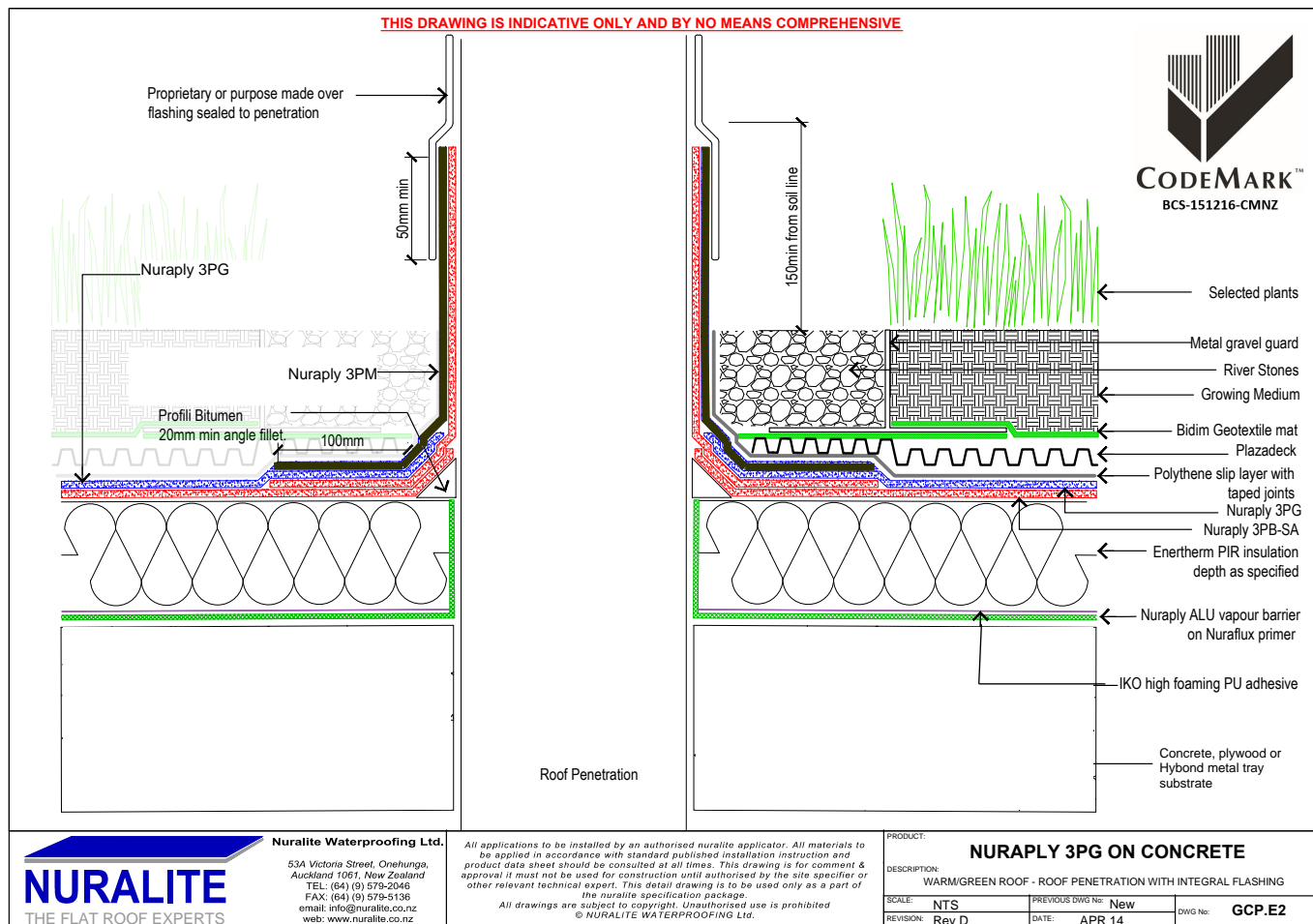
GREEN ROOF

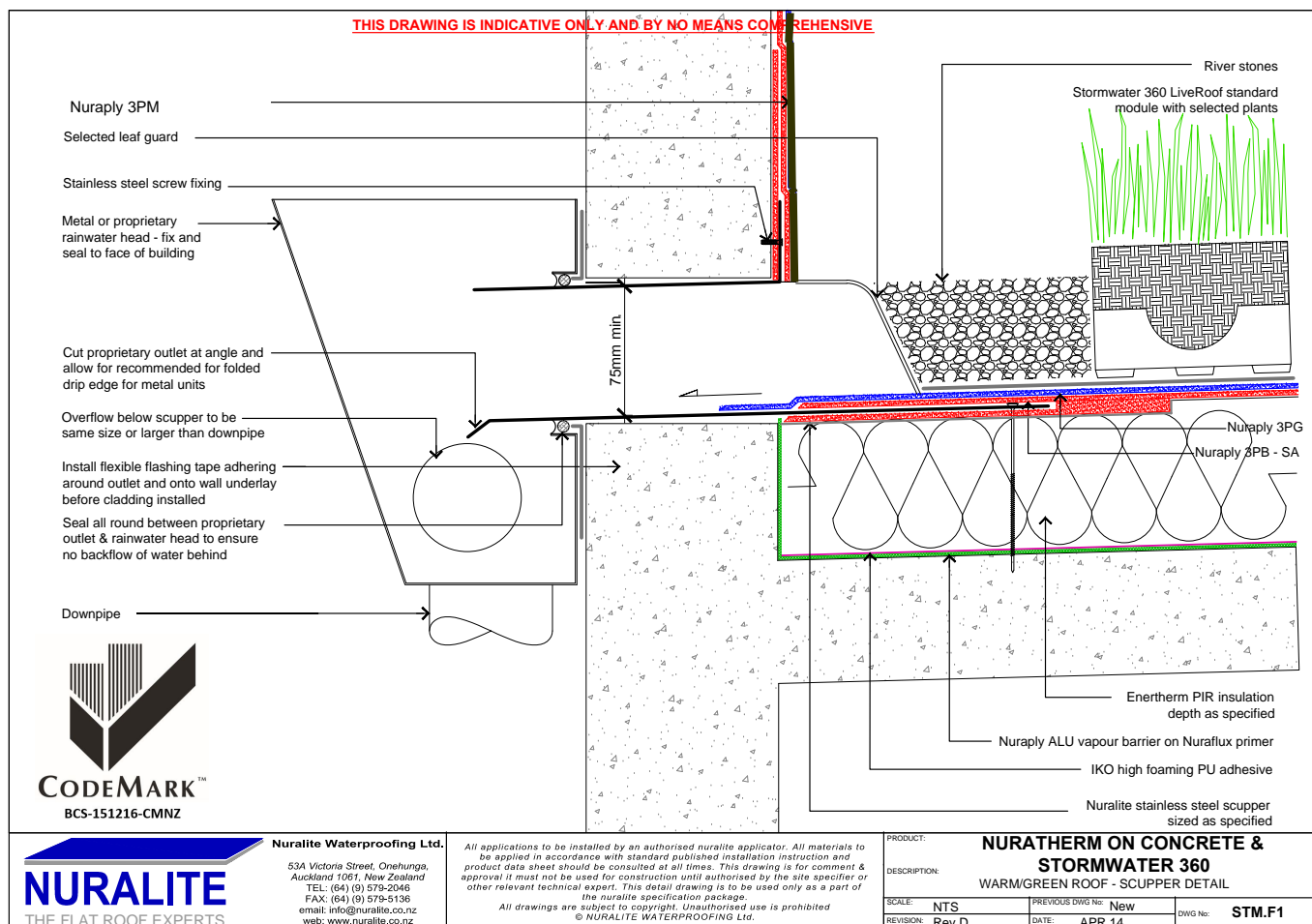
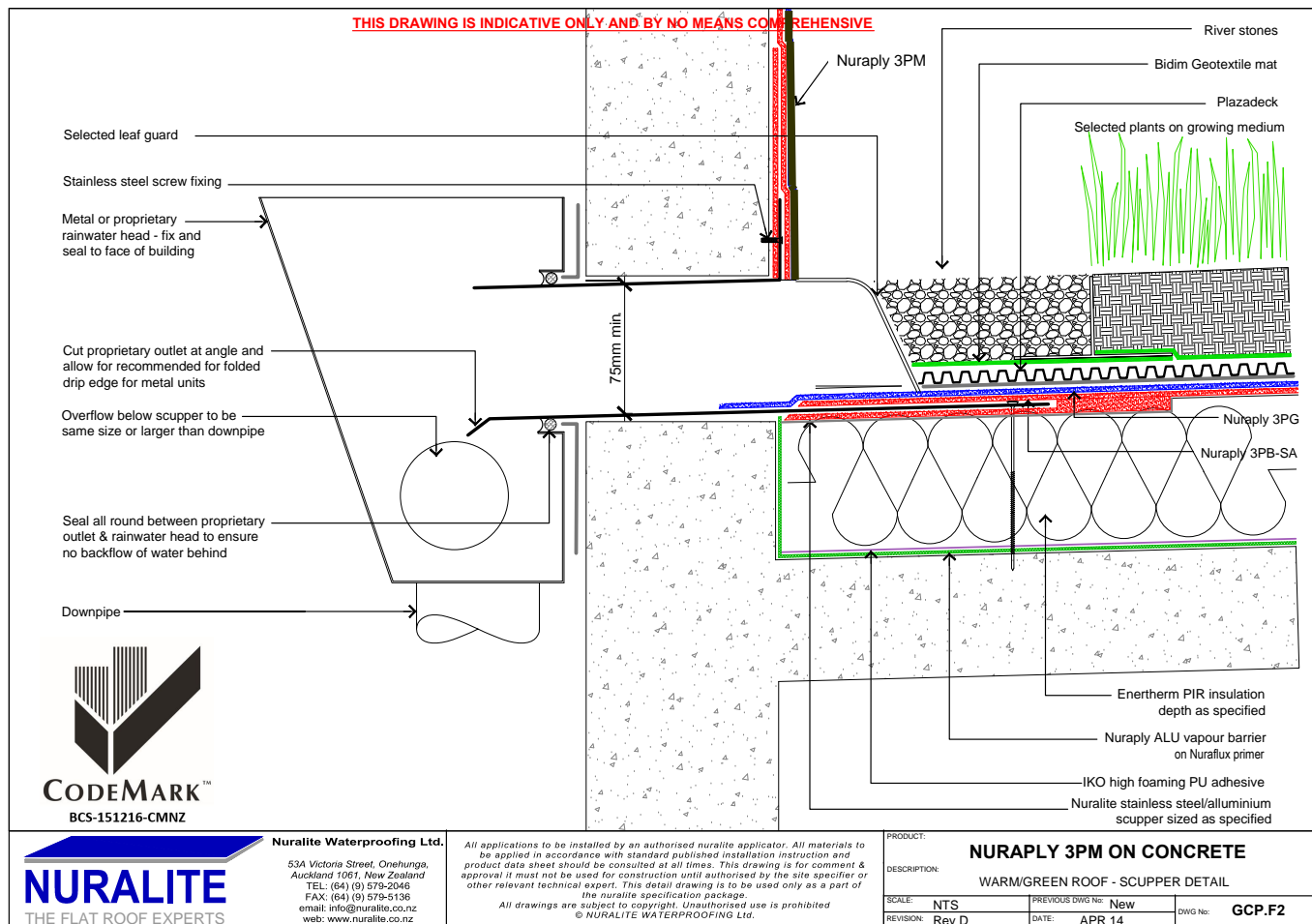
DESCRIPTION:

PROTECTED MEMBRANE ROOF SYSTEM - UPSTAND

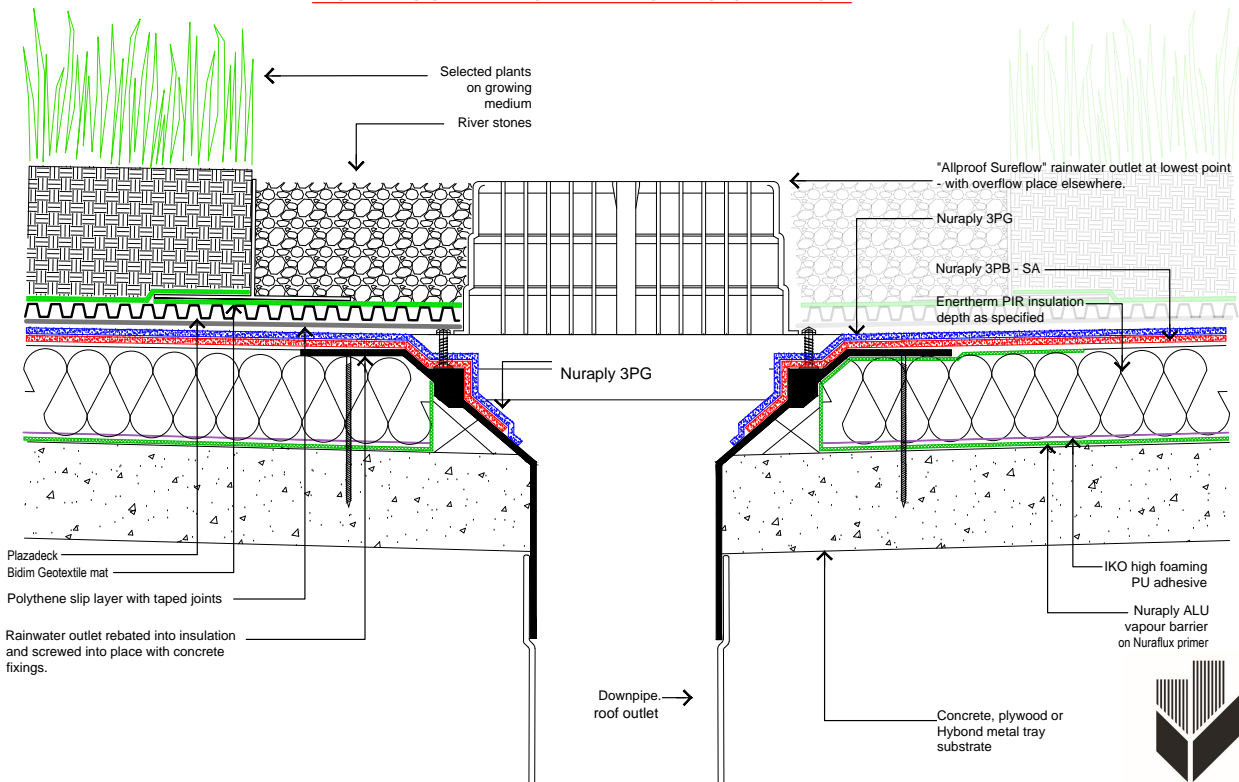
SCALE: NTS	PREVIOUS DWG No: New	DWG No: GCP-C1
REVISION: Rev E	DATE: NOV 12	







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PRODUCT:

NURAPLY 3PM ON CONCRETE

DESCRIPTION:

WARM/GREEN ROOF - LARGE ALLPROOF RAINWATER OUTLET

SCALE:

NTS

REVISION:

Rev D

PREVIOUS DWG No:

New

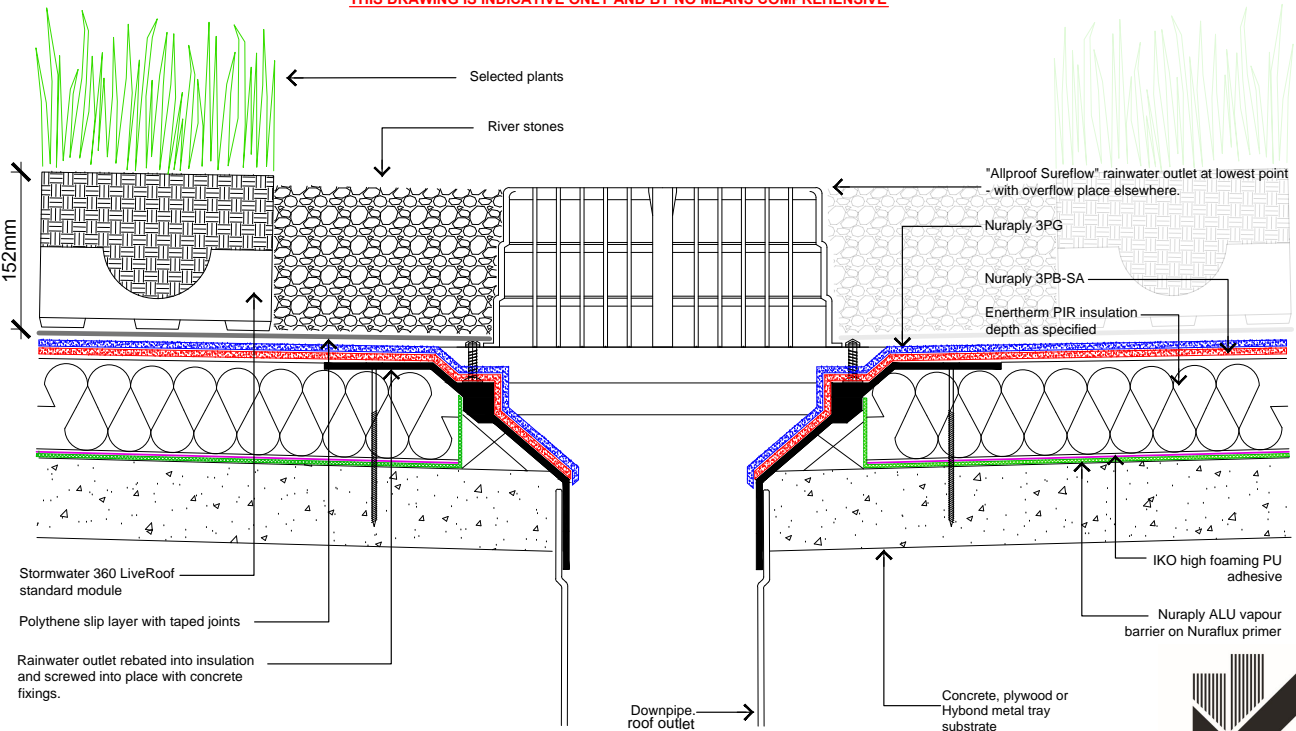
DATE:

APR 13

DWG No:

GWC.G1

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PRODUCT:

NURATHERM ON CONCRETE & STORMWATER 360

DESCRIPTION:

WARM/GREEN ROOF - LARGE ALLPROOF RAINWATER OUTLET

SCALE:

NTS

REVISION:

Rev D

PREVIOUS DWG No:

New

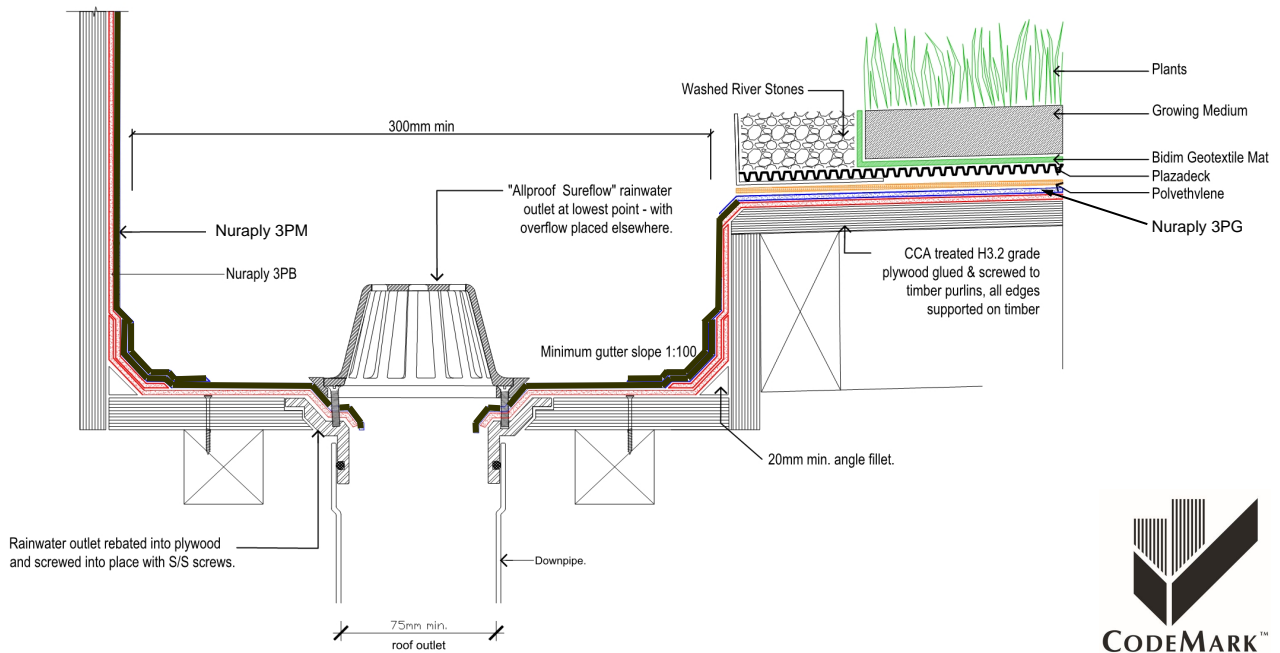
DATE:

APR 13

DWG No:

GCP.G1

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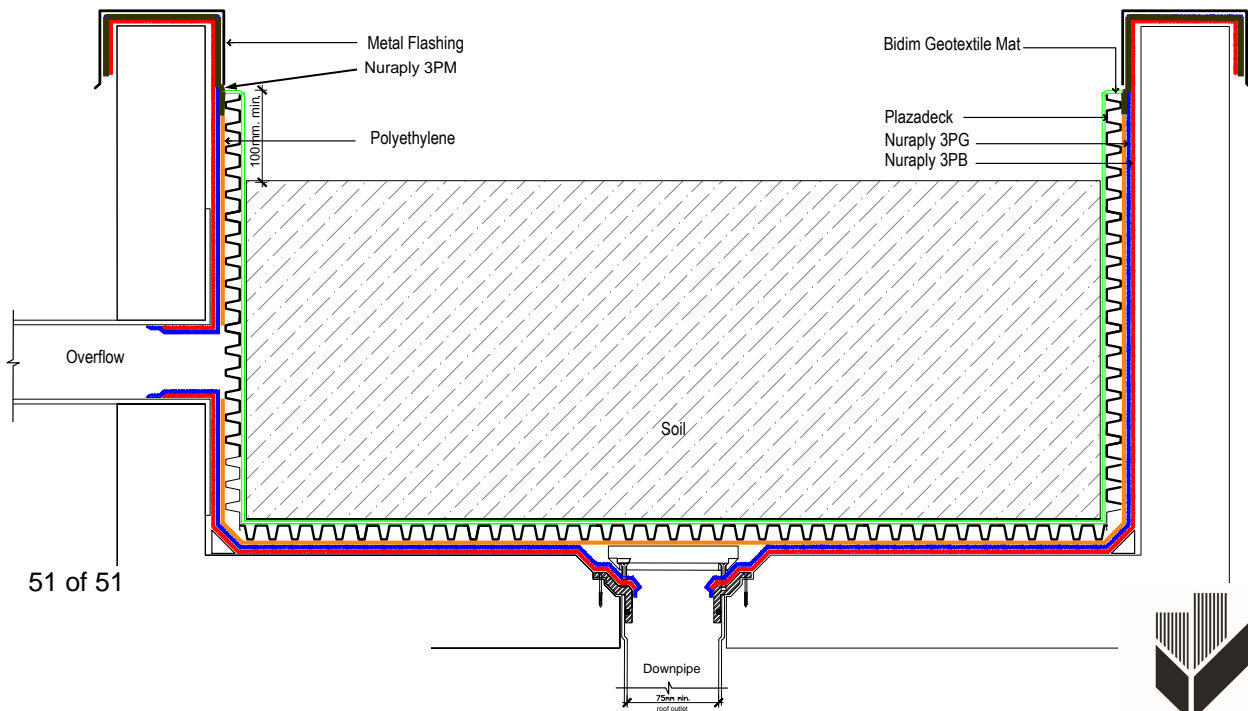
PRODUCT:

GREEN ROOF SYSTEMS

DESCRIPTION: COLD ROOF - LARGE RAINWATER OUTLET IN BOX GUTTER

SCALE: NTS	PREVIOUS DWG No: New	DWG No: GCP-B2
REVISION: Rev A	DATE: NOV 12	

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PRODUCT:

GREEN ROOF

DESCRIPTION: PLANTER DETAIL

SCALE: NTS	PREVIOUS DWG No: New	DWG No: GCP-H1
REVISION: Rev A	DATE: NOV 12	