



## STOTHERM MASONRY INSULATION CONSTRUCTION STOTHERM INSULATION ON CONCRETE BLOCK SPECIFICATION

BRANZ Appraisal No 604 (2008) - CCANZ CP 01: 2011 - ACAD Details [www.sto.co.nz](http://www.sto.co.nz) building with Sto

### Project:

### Prepared for:

#### **StoTherm Masonry Insulation System for concrete blocks**

This specification details the application of the **StoTherm Masonry Insulation System** incorporating; **Selected StoTherm 50, 80, 100mm Insulation Panels** (600 x 1200 panels) adhesively and mechanically fixed over masonry with **Gluecoat mortar** and **StoTherm Anchors** the panels are then plastered in **Multiscreed** basecoat, **StoArmat Classic meshed** reinforcement plaster and finished in selected **Stolit K** coloured finishing render coated in **StoColor Maxicryl** façade paint.

The **StoTherm Masonry Insulation System** mirrors the historical European methodology of overlaying masonry construction to provide thermal insulation (50mm, RV 1.25 – 80mm, RV 2.0 & 100mm RV 2.5) minimizing heating costs and maintaining energy efficiency during seasonal changes.

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## 1. CONSTRUCTION AND DETAILING

### **Responsibility**

All work in this section shall be the responsibility of the Main Contractor. All concrete block construction must be in accordance with the project drawings, specifications and block manufactures technical data. The Main Contractor is to ensure they are fully conversant with all Sto standard installation and fixing details (Sto ACAD details [www.sto.co.nz](http://www.sto.co.nz)) and their responsibilities before the block works commences. The Main Contractor is also responsible for all liaison with the various sub contractors to ensure that all items or elements affecting the Sto plaster system are correctly detailed before installing the StoArmat Miral Plaster System.

### **Concrete Blocks**

The concrete block installation including reinforcement and concrete infill shall be made in strict accordance with the project drawings, specifications and the block manufactures technical data. In particular the blocks shall be laid true in both vertical and horizontal planes with all joinery and service openings correctly formed and waterproofed in accordance with StoTherm Masonry details. Control joints must be installed as per the projects structural drawings or manufactures details to manage shrinkage and structural stress. All Maximum Tolerances shall be in strict accordance with NZS 4210: 2001 2.7.1.4 Table 2.2, i.e. no more than 3mm surface alignment deviation over a 1200mm radius. At least 28 days shall be allowed after concrete placement as per AS/NZS 2311:2000, for curing and stabilization to take place before commencing the StoTherm Masonry System. The concrete blocks shall be clean, dry and free of all surface contaminants before commencing and the Main Contractor is to ensure that any areas or details adjacent to the StoTherm Masonry System have been adequately waterproofed or flashed to avoid any water migration behind the system.

## Wall Insulation Values

### StoTherm Insulation Panel R values - 50mm 1.25 - 80mm 2.0, - 100mm 2.5

The **Concrete Block construction** including linings and resistance equates to approx **RV : 0.3**

NZBC Acceptable Solution H1/AS1 or NZBC Verification Method H1/VM1 can be used for housing, communal residential, communal non-residential and commercial buildings. For buildings with a glazing area of 30% or less of the total wall area, the minimum wall R-values required for solid construction are: **Climate Zone 1 – R0.8** (Option 1a and 1b); **Climate Zone 2 – R1.0** (Option 2a) or R0.9 (Option 2b) and **Climate Zone 3 – R1.2** (Option 3a) or R1.0 (Option 3b). Refer to the BRANZ House Insulation Guide Third Edition for further information and construction R-values for concrete block construction with External Insulation. **Zone 1** Auckland & Nth + Coromandel – **Zone 2** Sth of Auckland excluding Taupo area **Zone 3** Taupo plateau & South Island.

**Note: H1 Insulation - Internally insulated masonry walls must meet the timber insulation code**

## Recessed Joinery Detailing

Such joinery shall be detailed in accordance with the Sto CAD details and be fixed over **StoFlexyl waterproofing** prior to plaster application. Before fixing joinery fill any holes in the rebates with plaster and then **StoFlexyl** shall be used to waterproof the rebates, mixed correctly and brushed onto the inside rebate of the blocks the Sill, Head & Jambs are then **StoFlexyl meshed waterproofed** from the bottom edge of the rebate out over the poly to reinforce the junction. Sealing the joinery perimeter with MS sealant at the **head & jambs** then forms the primary seal while the **sill** is left open with a 5mm drainage gap as required for solid masonry construction. To complete the waterproofing process **air seals** are then required to be installed around all interior joinery to rebate openings by the main contractor. **StoFlexyl meshed waterproofing** has been tested by BRANZ to meet **AS/NZS 4858** for a waterproof membrane as required by. **CCANZ : CP01 2011 & E2/AS3**.

**Note: The air seals and sealing of the windows is the responsibility of the window installer**

## Soffits

Shall be fixed before the StoTherm Insulation Panel is installed, with a 6/8mm finishing bead of MS Sealant placed after the panel work is completed. The main contractor is to ensure any weatherproofing required on the substrate or adjacent surfaces is carried out before the soffits are installed.

## Penetrations

Penetrations such as waste pipes and fixing brackets shall be adequately flashed prior to the insulation installation. All piping and electrical wiring penetrations through the EPS must be weatherproofed as per Sto standard and/or project specific details. All wiring must be sleeved in PVC conduit and the terminations sealed using MS Sealant.

## 2. STOTHERM PANEL INSULATION

### Responsibility

All work in this section shall be the responsibility of the **Sto Contractor**, unless otherwise expressly agreed. If others fix the polystyrene insulation, the Sto Contractor shall satisfy themselves that the surface is satisfactory before proceeding with any plastering work.

### Materials

#### StoTherm Insulation Panels

Shall be **selected** thickness **50, 80, 100mm StoTherm 600 x 1200 Panels S grade polystyrene** manufactured to AS1366.3. Ensure where possible the **StoTherm Panel** layout is arranged in a **brick pattern** to avoid continuous joint lines. If there are any voids between the panels joints due to variations in the edges **adhesive foam** shall be used to foam fill them before proceeding with plastering.

The information contained in this Specification is based on our experience and testing and represents the latest information available at the date of production. No responsibility is taken for uses to which this information may be put, but we advise that where application of products and processes is in complete conformity with this specification an appropriate warranty is available. We reserve the right to alter or update information parameters and formulations at any time without prior notice.

## Fixing StoTherm Insulation Panels

### GlueCoat Adhesive Mortar

**StoTherm Panels** shall be trued from the base; brick patterned and incorporate a StoTherm foundation detail. **StoTherm Panels** shall be fixed tile like with a minimum 150mm wide notched continuous band of **Gluecoat Mortar** applied to the blocks at the perimeter of the panels (75mm both ways) with three 150mm spots through the middle. All panels are initially tight butted, fixed and then levelled on the **Gluecoat Mortar** the panels are then left to set before being mechanically fixed. Panel joints shall be checked and voids and gaps foam fused filled as required after fixing and the panels rasped as necessary to obtain a straight surface plane.

### StoTherm anchors (place & fix in accordance with Sto CAD details allow 7anchors sqm)

Once the **Gluecoat Mortar** has set **StoTherm Panels** are mechanically fixed by drilling holes at the four panel corners covering all panel junctions with one additional hole in the middle of each panel. The position is marked and drilled using a rotary impact hammer with an 8mm masonry bit. Then the **StoTherm Anchors** are placed in the holes with the 60mm washer covering the adjacent panel edges and countersunk using the **ST fixing tool** attached to an electric drill with the **ST tool plate** stopping flush to ensure correct panel compression and security. All fixings are then plugged with the supplied **poly insulation caps** to fit flush and eliminate thermal bridging. Panels require a PVC cap when edges are exposed or for installation against dissimilar materials, junctions and transitions.

**Note:** Detailing shall be in accordance with Sto ACAD details (see panel installation STCB 3 & 4) external corners panel are staggered and fixed at 300mm centres, Soffits and base at 600mm centres.

**Note:** **StoTherm 95mm Impact Fixings** are used for **face fixed or counter sunk fixing 50mm panels** using a **Sto Router tool** then using a **StoTherm Impact fixing** capped with **poly insulation caps** to fit flush.

### Control Joints

All existing control joints must be brought through the StoTherm Insulation System with a gap using **Sto 8.0 or 12mm uPVC control joints** incorporated in the **StoArmat Mesh** coat. The cleaning tab is then removed and the joint is either left as a negative detail painted in two coats or sealant filled. All sealant work associated with the system is to be carried out with a MS Sealant applied in accordance with the manufactures instructions.

### Architectural Profiles

Any Architectural profiles used to create detailing shall be correctly cut to size and fitted using **Gluecoat Mortar** applied to the back of the shape with a notch trowel prior to placing. Fixings can be used to position shapes correctly whilst the adhesive cures or for mechanically securing large profiles. Profiles shall be premeshed or receive a StoArmat mesh coat. Profiles are placed after the reinforcement mesh coat and are meshed on to the surface at the perimeter junction. If used to cover an interstorey joint ensure lower wall remains free with a 5.0mm gap at the underside edge.

## 3. STOTHERM MASONRY PLASTER SYSTEM

### Responsibility

All work in this section shall be the responsibility of the **Sto Contractor** who must assure themselves that the surfaces to be plastered are dry, free of contamination, satisfactory and all dissimilar material and adjacent surfaces are adequately masked prior to commencing.

### General

Installation shall be carried out in stages after the fixing of the **StoTherm Panel** incorporating; **Multiscreed** basecoat plaster, **StoArmat meshed** reinforcement plaster, selected **Stolit K or Stolit**

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**MP** coloured finishing render coated with **StoColor Maxicryl** facade paint or **StoProtect SC** easy clean sealer for **Stolit MP**.

## Materials

Stoanz Ltd supplies all the following materials

**Multiscreed** basecoat plaster  
**Stolit K or MP** coloured finishing renders  
**StoColor Maxicryl** façade paint  
**Sto Premeshed Angles**  
**Sto Adhesive Foam**  
**Sto Spiral Fixings/ Quader Blocks**

**StoArmat Classic meshed** plaster  
**StoTherm uPVC** flashings & trays  
**StoFlexyl meshed** waterproofing  
**Gluecoat Mortar** adhesive plaster  
**StoTherm Panels 50, 80, 100mm**  
**StoTherm Anchors**

## Control Joints

All control joints must be brought through the system. Control joints must be installed in the **StoArmat Classic meshed** plaster using the **Sto uPVC 8.0 or 12mm control joint** ensuring the mesh coat does not overlay the “V” joint. Either coat in **Sto Maxicryl** façade paint and leave as a negative detail or fill with MS Sealant, concave tooled.

## Installed StoTherm Panels

Check the surface and adhesive foam fill any voids to avoid thermal bridging, rasp to straighten the surface as necessary, install any sealant work required and ensure all detailing flashings and trays are in place before commencing plastering.

## Multiscreed basecoat plaster

To clean dry prepared surfaces apply a levelling basecoat coat of **Multiscreed** by hawk and trowel or pump at approximate thickness of 4 - 5.0mm as a solid basecoat. Float or screed the surface with an h rule to achieve an even plane surface free of hollows and deviations allow to set green and remove any ridging or bumps in **Multiscreed** with a Sto feathered straight edge or Grid Plane to achieve a minimum dry film thickness 4.0mm. Allow plaster to dry and apply **StoFlexyl waterproofing** as required before subsequent plaster coats are applied.

## Plastered Parapet, Balustrade & Wall Caps - Foundations

All plastered horizontal surfaces must have a minimum 10° fall. On **parapets, balustrade and wall caps** after the Multiscreed basecoat apply **StoFlexyl** correctly mixed (drill mix 1/1- with **fresh** cement) and install using a trowel embedding a layer of Sto mesh into the **StoFlexyl** to achieve a minimum thickness of 1.5mm extending the membrane 75mm up & down adjacent vertical surfaces. At ground level the foundation is to be treated with **StoFlexyl** and an anti capillary **StoFlexyl** meshed break is to be installed in the StoTherm overlay as per StoTherm masonry ACAD details - STCB06. All exposed **StoFlexyl meshed waterproofing** is to be over coated in **StoArmat Classic** reinforcement plaster. For waterproofing interior walls below ground level install a certified exterior 50 year tanking membrane and run it up behind the StoTherm panels a minimum 150mm above ground level.

**Note: StoFlexyl waterproofing** has been evaluated by BRANZ to meet the **AS/NZS 4858** waterproof membrane standard as required by **CCANZ : CP01 2011 & E2/AS3**.

## StoArmat Classic meshed reinforcement plaster

To clean dry **Multiscreed** plastered surfaces apply an even coat of **StoArmat Classic** plaster by hawk and trowel at approximately 2.0mm and while the **StoArmat Classic** is still wet lightly apply **Sto mesh** ensuring adjacent drops of mesh are overlapped by a minimum 75mm and float the surface to ensure the mesh has been embedded in and allow to dry.

Once dry apply a further coat of **StoArmat Classic** at approximately 1.0mm thick by hawk and trowel to cover the mesh and leave a plane even surface free of voids or deviations.

Before applying the selected finishing render remove any slight ridging etc with a Sto rasp ready for subsequent top coating. All application procedures for the **StoArmat Classic** must be in accordance with the Sto TDS sheets and Stoanz Limited's recommendations. Always install **Sto pre meshed uPVC Drip Edges** on concrete block lintels and **Sto pre meshed or Stainless Steel** corners on external corners.

### Sealant Installation

After the mesh coat has dried any joints or detailing between the plaster mesh coat and dissimilar materials shall be sealed with MS Sealant in accordance with the TDS sheets.

## Finishing Section – as selected

### Stolit K coloured finishing render

**Stolit K texture is available in a close 1.0mm , 1.5mm or courser 2.0mm coloured render**

To all exterior plastered surfaces apply selected finishing render **Stolit K** tinted to the selected colour, applied with a stainless steel trowel gauging to the thickness of the aggregate size and finished with a plastic trowel to the requisite pattern and allow to dry normally overnight. The spreading rate shall be approximately 12sqm/1.0mm, 9sqm/1.5mm, 7sqm/2.0mm -/per pail.

### StoColor Maxicryl façade paint

All **Stolit K** surfaces shall receive one (1) full coat of **StoColor Maxicryl** façade paint tinted to the selected colour and applied by brush and roller at approximately 6/7 m<sup>2</sup> per litre. **Note:** Always maintain wet edges between cutting in and rolling in tight to ensure an even film build is maintained.

## ALTERNATIVE SELECTION

### Stolit MP or MP Natural coloured finishing render

**Stolit MP or MP Natural** are fine pre coloured sponge finishes applied in two (2) tight coats.

A basecoat of **Stolit MP or MP Natural** or alternatively depending on finish **Stolit K 1.0 or 1.5mm** tinted to the selected colour is applied and allowed to dry before the finishing coat of **Stolit MP or MP Natural** is applied and float finished or randomly lightly sponged to the selected pattern. The spreading rate of the Stolit MP is approximately 12 – 16sqm -per pail.

### S-Protect SC easy clean sealer

To **Stolit MP** Apply an even coat of **S-Protect SC easy clean** Silane sealer ( clear invisible sealer) in a flood coat using a low pressure garden sprayer and Sto block brush to work the product into the Stolit plaster wiping off any lingering drips etc. Surfaces must be well coated and work in a pattern preferably out of the sun to ensure that there are no misses as the sealer is invisible once dry.

**Note: S-Protect SC easy clean** all joinery and glazing must be completely masked off to prevent the glazing being damage and any excess product must be removed or polished into the surface during application to avoid a surface film forming.

## 4. GENERAL NOTES

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**Colour**

As selected by the Architect or Client. Stoanz Limited recommends that the minimum LRV (Light Reflectance Value) of the selected colour is 25%. If a colour is selected outside this recommendation, the warranty may be affected as darker colours can subject the cladding system to thermal stress.

**5. MAINTENANCE****Refer; Sto Maintenance Schedule for comprehensive guide**

The Sto Plaster System must be cleaned annually by low pressure washing to remove all existing surface contaminants with special attention to non-rain washed areas. When recoating is required at the 7/8-year period to maintain long-term integrity and a pristine condition this can be carried out using a Sto façade paint or sealer over a cleaned surface. Where a colour change is required, Stoanz Limited should be consulted for a specific specification.

Annual inspections are to be implemented after completion to clearly identify any faults in the cladding, sealant beads, flashings and any other connections. A repair process must be implemented immediately to address any faults so the long-term warranty is not compromised.

**6. WARRANTY**

The **StoTherm Masonry Insulation System** described in this specification is warranted for a period of fifteen (15) years from the date of practical completion to comply with the relevant clauses in the New Zealand Building Code, B1 Structural, B2 Durability, E2 External Moisture and F2 Hazardous Building Material for this type of building element provided normal maintenance requirements as set out in the Sto Maintenance Schedule are followed

The warranty is supplied by the Sto Contractor on completion with a five (5) year workmanship warranty signed off by the Sto Applicator carrying out the work. The warranty document including the material warranty is issued by Stoanz Limited provided that;

- (a) All specified work is carried out by the approved Sto Applicator who must complete and sign the Sto QA Compliance Procedure Forms and a PS3 Workmanship Warranty
- (b) All work is carried out in accordance with this Specification or any written amendments issued by the Manufacturers.
- (c) The warranty does not cover situations where the plaster system is subjected to physical disturbance, chemical spillage or interference.

