



POLYSTYRENE BLOCK CONSTRUCTION

STOARMAT MIRAL PLASTER SYSTEM ON ICF / EPS BLOCK CONSTRUCTION

BRANZ Appraisal No 515 (2007) - ACAD Details www.sto.co.nz building with Sto

Project:

Prepared for:

StoArmat Miral Plaster System on polystyrene (ICF / EPS)block construction

This specification details the application of the **StoArmat Miral Plaster System** incorporating;
A basecoat of **Multiscreed** plaster to straighten the blocks, **StoFlexyl Waterproofing** as required followed by **StoArmat Classic meshed** reinforcement plaster finished in the selected **Stolit** coloured finishing render coated in **StoColor Maxicryl** façade paint or **S-Protect** on ICF/EPS block construction.

StoArmat Classic Plaster from Germany with its adhesive strength, flexibility and high impact resistance has up to 10 times more flexibility and impact resistance compared to cement based plasters that when combined with the **Stolit** range of finishing render is our only recommended plaster system for reinforcing ICF block construction.

1. CONSTRUCTION

Responsibility

All work in this section shall be the responsibility of the Main Contractor. All 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) 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.

Insulated Concrete Formwork (ICF) Construction

All blocks shall be laid, reinforced and filled in strict accordance with the project drawings, specifications and the applicable ICF manufactures instillation manual. In particular the blocks shall be laid true in both vertical and horizontal planes with joinery and services openings correctly formed with 20-25mm masonry revel rebates for the joinery see Sto ACAD details for forming concrete revel rebates. The concrete pour shall be undertaken in strict accordance with the manufacturer's instructions and care must be exercised with any pours over 1200mm in height, grout expansion products, water retention areas and voids in the cells, as these may weaken the structure and cause cracking. Surface planar alignment must in accordance NZS standards being no more than 3.0mm per 1200.0mm to avoid additional straightening coats. At least twenty eight (28) days shall be allowed after concrete placement, for curing and stabilization to take place. The plaster details must be in accordance with the current Sto details (www.sto.co.nz) and any contamination, yellowed polystyrene or poly skin must be rasped off so the block polystyrene surfaces are clean dry and ready to accept the plaster system. The Main Contractor is to ensure that any elements or details adjacent to the plaster system have been adequately waterproofed or flashed to avoid any water migration behind the plaster.

Block Construction

- A rebate is recommended in slab foundations.
- StoFlexyl waterproofing is required where blocks are in the ground.
- Joinery openings should be formed with waterproof rebates.
- Control joints are placed in accordance with project drawings or manufactures details
- Interstorey control joint required on top at interstorey concrete slab junction
- Ensure there is no impediment to grout flow to prevent air pockets
- Blocks should be filled in 1.2 lifts and mechanically vibrated to avoid air voids.
- Remove any grout slurry from block faces before it sets.
- Drying times vary according to block thickness and weather a minimum 28 days is required for settlement and curing – the block grout should be dry before plastering.
- Where interior walls are back filled a 50 year tanking membrane is required.
- Always waterproof blocks behind or adjacent to any overlays or abutments such as concrete staircases, separate adjoining walls, soffits, porches etc.
- Exposed tops of walls require a minimum 10 degrees fall.
- The block fill should be detailed to the surface (cut block shell) for structural fixing points.
- Concrete decks should be detailed with a concrete plinth to avoid internal seepage.

Wall insulation

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 insulated concrete formwork.

Surface mounted fixings

All surface mounted fixings for such items as rain water heads, downpipes, pergolas, taps, lights, security items, etc shall be supported by infill blocks of concrete or Sto Quader blocks depending on weight other items can be mounted using suitably sized S/S metal bushes over the fixings to prevent the EPS shell being crushed. Sto Quader blocking can be used suitably sized as required and fully adhered to the EPS using Sto foam fused to the surrounding EPS surface. These 'infill blocked' areas are to be fully coordinated with the various sub contractors prior to plaster system application. It is the responsibility of the Main Contractor to coordinate the placement of any items requiring blocking with the various Sub Contractors. **Note:** down pipe saddles etc can be fixed over the Sto plaster system using **Sto 40mm Spiral fixings**.

2. SURFACE PREPARATION

Responsibility

All work in this section shall be the responsibility of both the Main Contractor & Sto Contractor.

Recessed Aluminium Joinery

Such joinery shall be fixed prior to the plaster application by the main contractor on 25mm formed concrete rebates (similar to concrete block detail). Before fixing the concrete rebate shall be squared off neat with the sill raked at 15 degrees then **Sto Flexyl** shall be correctly mixed and applied over the internal block rebate with **StoFlexyl Meshed waterproofing** applied from the edge of the rebate out over the external EPS block. Installing MS Sealant at the head & jambs then forms the primary seal while the sill is left with a 5mm drainage gap in accordance with E2/AS1 principals. A continuous air seal around the internal perimeter of the joinery completes the installation. Always refer to www.sto.co.nz for current Sto ACAD details

Note: The air seals and sealant work to the joinery is the responsibility of the window installer.

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.

Parapet, Balustrade Caps and Foundation Zones

All plastered horizontal surfaces must have a minimum 10° fall and have **StoFlexyl meshed waterproofing** installed. On **parapets** and **balustrade caps** after the basecoat embed a layer of Sto glass mesh into the correctly mixed **StoFlexyl waterproofing** and float to a level plane surface. StoFlexyl must be drill mixed 1/1 with fresh Portland cement and applied strictly in accordance with the TDS sheet extending the waterproofing 75 mm up or down adjacent vertical surfaces with a minimum film thickness of 1.5mm. Any concrete slabs brought through the blocks must have **StoFlexyl meshed waterproofing** applied and a Sto control joint detailed at the upper side of the floor slab before the plaster system commences, foundation are to have **StoFlexyl meshed waterproofing** applied from 150mm above ground level to 50mm below the plaster termination point.

Note: StoFlexyl meshed waterproofing has been evaluated and tested by BRANZ to meet AS/NZS 4858 waterproof membrane requirements as required by E2/AS1

System Details

As required details shall be Sto PVC accessories, Sto pre-meshed corner beads or Stainless angles, Sto flexible control joints and finishing edges, installed in accordance with Sto typical details.

Sealant

All sealant junctions between the plaster and adjacent surfaces or dissimilar materials shall be jointed with **MS Sealant** applied strictly in accordance with the manufactures TDS sheet.

Penetrations

Penetrations such as waste pipes and fixtures shall be adequately flashed and waterproofed prior to the plaster installation. Note: All penetrations through the Sto Plaster System shall be adequately sealed with MS Sealant applied as a minimum 6.0mm joint after the mesh coat. PEF rod should be used as a backer material as required depending on the width of the joint. Any electrical wiring that penetrates the Sto plaster system shall be in cased in appropriate sized uPVC conduit sheathing acting as an insulator installed @ a minimum 5° down wards rake. The conduit and any plumbing piping etc must then be sealed using M S Sealant once the base meshed coat has been applied.

Architectural Shapes

Any Architectural shapes 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 may be used to position shapes correctly or for mechanically securing large profiles. The profiles shall be premeshed or receive a **StoArmat mesh** coat. Profiles are placed after the reinforcement mesh coat and are edge meshed on to the surface at the perimeter junction.

3. STOARMAT MIRAL PLASTER

Responsibility

All work in this section shall be the responsibility of the Sto Contractor who shall satisfy themselves that the surfaces are satisfactory and that adequate protection of all adjacent surfaces has been under taken before plastering commences.

Rasping of the Surface

All ICF - EPS block surfaces to receive the **StoArmat Miral Plaster System** shall be rasped to open or remove any surface skin, degraded polystyrene bead or any nibs on the EPS block surface The surface must then be cleaned down to remove all dust and any contaminates prior to commencement of the plaster system.

General

Plaster installation shall be carried out in stages incorporating; **Multiscreed** basecoat plaster, **StoFlexyl waterproofing** as required, **StoArmat Classic meshed** reinforcement plaster that is finished in the selected **Stolit** coloured finishing render coated in **StoColor Maxicryl** facade paint.

Materials

Multiscreed basecoat plaster	Sto PVC Control Joints
StoArmat Classic meshed reinforcement plaster	Sto Mesh
Stolit K or MP coloured finishing renders	Sto uPVC Corners, Drip edges, etc
StoColor Maxicryl façade paint	Adhesive Foam
StoFlexyl waterproofing	Sto Spiral fixings

Detailing

Sto pre meshed corner beads or **Stainless corners** shall be installed on external corners and edges.

Control Joints

All existing control joints are to be brought through the StoArmat Miral Plaster System. See StoArmat Miral Plaster CAD details for control joints design details. **Sto 8 or 12mm PVC control joints** are available and are embedded in the **StoArmat Classic mesh** reinforcement coat as per the details.

Multiscreed basecoat plaster

To clean, dry and prepared EPS block surfaces apply one straightening coat of **Multiscreed** by hawk and trowel or pump at approximate thickness of 4.0 - 5.0mm (thickness dependent on surface minimum 4.0mm). Float or screed the surface with an **h** rule to achieve an even straight plane free of hollows and deviations and allow to set before removing any ridging or bumps in **Multiscreed** with a Sto feathered rule or Grid Plane to achieve a straight plane and leave to dry before applying any subsequent coats.

StoFlexyl waterproofing

As detailed previously ensure all necessary **StoFlexyl waterproofing** has been completed.

StoArmat Classic meshed reinforcement plaster

To clean dry base coated surface, apply one even coat of **StoArmat Classic** plaster by hawk and trowel at approximate thickness of 1.5/2.0mm. Whilst the **StoArmat Classic** is still wet, lightly embed **Sto mesh** ensuring adjacent drops of mesh are overlapped by a minimum of 75mm. Float the surface to ensure that the mesh has been embedded into the plaster coat allow to dry and apply one further coat of StoArmat at approximately 1.0 mm thick to leave a even straight surface free of voids or deviations. Once dry remove any slight ridging etc of finished **StoArmat Classic** with a Sto rasp ready for subsequent topcoat. All application procedures for the **StoArmat Classic** should be strictly in accordance with the Sto TDS sheets. As required install **Sto pre meshed uPVC Drip Edges** on joinery lintels and **Sto pre meshed corners** on all external corners (see Sto ACAD Details). Note: Any stress points are to be double mesh reinforced with butterflies.

Sealant Installation

All junctions between joinery and Sto Cladding, and around penetrations, flashings and dissimilar shall be sealed with **MS Sealant**.

Finishing Section - select finish

Stolit K 1.0, 1.5 or 2.0mm coloured finishing render as selected

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 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 m² 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**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 is to be cleaned annually by 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 StoColor Maxicryl façade paint over a cleaned surface. Where a colour change is required, Stoanz Limited should be consulted for a specific specification. Physical damage must be repaired using the appropriate Sto Plaster System.

Annual inspections must 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 **StoArmat Miral Plaster System** described in this specification is warranted for a period of fifteen (15) years from the date of practical completion. This is to comply with the relevant New Zealand Building Code clauses in B2 Durability, E2/AS1 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. A five (5) year workmanship warranty is issued by the Sto Contractor carrying out the work on completion, and is backed by the Manufacturer as to the suitability for use of the material supplied, provided that;

- (a) All specified work is carried out by the approved Sto Contractor 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.



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.