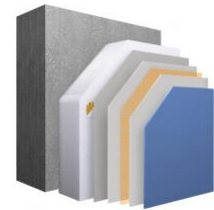
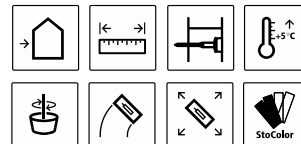


Sto Specification New Zealand

SS216F StoTherm Armat Insulated Masonry Foundation System

StoTherm Armat Insulated Masonry Foundation System

Using EPS or XPS insulation over masonry construction
Based on BRANZ Appraisal No. 604 / CCANZ CP 01:2014
CAD Details www.sto.co.nz



Sto Registration: To register your project with Stoanz Ltd please email the completed specification to info@sto.co.nz

1. PROJECT DETAILS

Specifier:

Project and Address:

Project Owner:

Sto Warranty: **StoTherm Armat Insulated Foundation System 10-year Warranty with StoService**

StoTherm Armat Render System on EPS or XPS insulation panels over insitu concrete / block foundations.

The **StoTherm Armat Masonry Insulated Foundation System** incorporates: **Selected StoTherm Insulation Panels** adhesively and mechanically fixed with **StoLevell Novo** or **StoFlexyl** adhesive and **StoTherm Anchors** over masonry or concrete construction, rendered in **StoLevell Novo basecoat**, **Stoplex W sealer**, **StoArmat Classic** meshed reinforced render, finished in selected **Stolit** coloured finishing render coated with selected **StoColor facade paint** or **S-Protect SC sealer** on selected **Stolit MP finishes**.

The **StoTherm Armat Render System** is built on 50 years of worldwide experience in insulating and refurbishing masonry buildings to achieve interior energy efficiency.

Select Insulation:

Insulation – White EPS, Graphite EPS, Rasped Extruded XPS

Select Finishing Render:

Select Facade Coating:

Sto Registration Number:
(Sto Use Only)

i.e. 24.01_StoReg tec_sales_SS216F_project address

Project Notes:

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2. CONSTRUCTION & DETAILING

2.1 Responsibility

All work in this section shall be the responsibility of the Main Contractor, unless previously agreed in writing. Stoanz Limited accepts no responsibility for defective workmanship in relation to the application of the Sto system, or for defects in the design, construction, or condition of the building, either as built or in relation to the works or site conditions.

The Main Contractor is to ensure that they are fully conversant with exterior legislation requirements, the project specifications and details, current Sto Specification and Sto CAD details (www.sto.co.nz) and any specific concrete block installation requirements relating to the Main Contractor's responsibilities before any works commence. The Main Contractor is also responsible for the various subcontractors to ensure that all items relating to weathertightness, penetrations and dissimilar material junctions affecting the construction system are strictly in accordance with project specific details, manufacturer's instructions and Sto CAD details i.e. items such as roofs, soffits, openings, lights and security fittings, electrical wiring, flashings, deck membranes, dissimilar junctions etc. that abut, flash or penetrate the system. The Main Contractor shall also ensure that all exterior licensed work is undertaken by LBP registered contractors and the joinery is installed in accordance with the project drawings, manufacturer's details and Sto CAD details.

A **Sto Quality Assurance Document** is to be filled out as a record of the work undertaken by the Sto Contractor and concrete block installer.

2.2 Concrete Blocks and Insitu Concrete - General

The concrete installation, including reinforcement and concrete infill, shall be undertaken in strict accordance with the project drawings, specifications, and the block manufacturer's technical data. 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 Sto details. Control joints must be installed as per the project's structural drawings or block manufacturer's details to manage shrinkage and structural stress. It is recommended that the ground floor slab to block junction should be rebated to provide a water stop and interstorey floors should be poured within the block structure leaving the outer block shell to continue to avoid cracking. At least 28 days shall be allowed after concrete placement as per CCANZ CP 01:2014, for curing and stabilisation to take place before commencing the StoTherm Armat Masonry Insulation System. The exterior surface 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 Sto Render System have been adequately waterproofed or flashed to avoid any water migration behind the insulation or render system. Building tolerances should be within MBIE Guide to tolerances.

2.3 Insulation

Thermal resistance requirements of the building envelope shall be determined using the Schedule or Calculation methods of NZBC Acceptable Solution H1/AS1 for all housing and buildings up to 300 m² and NZBC Acceptable Solution H1/AS2 for housing and buildings greater than 300 m², or the Modelling method in H1/VM1.

Note: H1/AS2 require –Vertical edge insulation with an R -value of 1.0 m² K/W, installed on all exterior vertical faces of the concrete slab / wall footings, extending from the outermost top edge down to bottom of wall footing.

Foundations: H1/AS2 require –Vertical edge insulation with an R -value of 1.0 m² K/W, installed on all exterior vertical faces of the concrete slab / wall footings, extending from the outermost top edge down to bottom of wall footing.

Rasped StoTherm XPS sheets can be used for vertical edge insulation with 30 mm providing the required RV 1.0.

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2.4 Insulation R Values

- **StoTherm Insulation EPS Panels:** 40 mm (R0.98), 50 mm (R1.22), 60 mm (R1.46), 80 mm (R1.95) and 100 mm (R2.43) based on a thermal conductivity (k-value) of 0.041 W/m °C.
- **StoTherm+ Graphite Infused Insulation Panels:** 40 mm (R1.25), 50 mm (R1.56), 60 mm (R1.88), 80 mm (R2.5) and 100 mm (R3.13) based on a thermal conductivity (k-value) of 0.032 W/m °C.
- **XPS Extruded Foam Boards:** 30 mm (R 1.0) and 40 mm (R 1.43) based on a thermal conductivity of 0.028 W/m °C.

2.5 Control of External Fire

The specified Sto renders have been tested to EN 13501-1 and have achieved an A2-s1, d0 rating. The StoTherm Armat Miral Render System has been tested to ISO 5660.1 and achieved a peak heat release rate of less than 100 kW/m² and total heat released of less than 25 MJ/m². The system is therefore suitable for use on buildings at any distance to the relevant boundary.

3. STOTHERM PANEL INSTALLATION

3.1 Responsibility

All work in this section shall be the responsibility of the **Sto Contractor**, unless otherwise expressly agreed. If others fix the insulation panel, a Sto QA document must be signed off and the Sto Contractor shall satisfy themselves that the panels are acceptable before proceeding. Adequate protection of all dissimilar materials and adjacent surfaces must be undertaken before commencing.

3.2 Foundations Waterproofing

The foundations should be waterproofed with **StoFlexyl waterproofing** or another proprietary system. StoTherm panels that are to be used in ground as foundation insulation must have a thinned down coat of **StoFlexyl** brushed/rolled onto all faces before being installed with **StoFlexyl** adhesive. Bituminous products should be sand/grit blinded or have a proprietary water based bituminous adhesive.

A **capillary break** is normally formed where the exterior cladding meets the insulated foundations. As required, the waterproofing is required from 150 mm above ground to 100 mm past the finished render line or down to the foundation insitu footing. See Sto CAD foundation details.

3.3 Penetrations

Penetrations such as waste pipes, fixing brackets and fixtures shall be installed on Sto EPS high density Power Bloc's. Power Bloc shall be installed at the same time as the insulation panel is installed. Sto EPS Zylinders, Sto EPS Spirals or Sto EPS masonry Iso Darts can be used after the panels are installed if Power Bloc has not been installed. All piping and electrical wiring penetrations through the insulation panels must be weatherproofed as per Sto and/or project specific details. All wiring must be sleeved in PVC conduit and the terminations sealed using a compatible MS Polymer Sealant.

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3.4 Insulation Panels

Note: Extruded XPS must be abraded on all sides to provide adhesion for the render.

Starting from the Sto plinth foundation detail or a starter track, ensure the StoTherm Insulation panel layout is installed true from the base in a brick pattern with no continuous vertical joints, using alternating panels on the external corners. Install Sto uPVC, trays, channels, and flashings as required at termination points.

Use 600 x 1200 mm sized panels to avoid pillowing especially on uneven substrates. All the EPS panels are manufactured from white S-grade or graphite grey EPS to AS 1366.3. XPS shall be manufactured in accordance with AS 1366.4. Ensure the **StoTherm Panel** layout is arranged in a brick pattern with no continuous vertical joints. Insulation panel joints shall be tight butted and sheet joints, gaps etc. flush filled with low expansion adhesive polyurethane foam as per the manufacturer's TDS sheets before the panels are rasped once cured for a flat surface.

Note: other thicknesses of insulation are available on request.

Note: The minimum sized insulation for countersunk fixings is 60 mm panel using **StoTherm impact anchors**. Ensure the substrate is suitable, i.e: sound, load bearing and straight as required before installing the insulation panels. Repair any defects.

3.5 Control Joints

All existing control joints in the blocks as designated by the project drawings must be brought through with a 10 mm gap in the panels. Control joints must be installed in the **StoLevell Novo mesh** coat using the **Sto uPVC Control Joints** ensuring the mesh coat does not overlay the "V" joint. Once dry remove the cleaning tab and sealant any joints and either apply two coats of the paint and leave as a negative detail or fill with a compatible **MS Sealant** applied in accordance with the manufacturer's Technical Data Sheets and priming requirements.

3.6 Adhering Insulation Panels

Note: Extruded XPS foam panels must be abraded before rendering.

The **selected Insulation panels** shall be trued from the base, laid in a horizontal brick pattern, and incorporate a StoTherm insulated foundation detail. **The Insulation Panels** shall be fixed using a 280 mm x 10 mm notched trowel or **StoTherm notched trowel** by applying a full coat of **StoLevell Novo** to the back of the 600 x 1200 mm **insulation panels**. All panels are installed immediately while the adhesive is wet, tight butted and levelled on the **StoLevell Novo**. **They shall be allowed to set** before being mechanically fixed. Insulation panel joints shall be checked after fixing and any gaps filled with adhesive foam before the panels are rasped once cured to obtain a flat surface.

Note: Always ensure the perimeter of the panel (not sides) is well coated with **StoLevell Novo**. Depending on the substrate the notch size may need to vary to compensate for irregularities in the surface. Always ensure there is enough adhesive applied to bond and bed the panels onto the surface - if required coat both surfaces.

3.7 StoTherm anchors (fix in accordance with Sto details – new work requires 3-4 anchors per m²)

Insulation panels are mechanically fixed in accordance with the **StoTherm anchor** pattern. Once the adhesive is set, use a rotary impact hammer drill with an 8 mm masonry bit at the designated fixing centres (note drill 5 mm extra). On 600 x 1200 mm panels that have been adhered with **StoLevell Novo**, use two (2) **StoTherm anchor** fixings per panel centred midway through the panel 300 mm in from the ends.

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Note: Detailing shall be in accordance with Sto CAD details. Panels at soffits and foundations (above the capillary line) are fixed at 600 mm centres, and external corner panels are staggered and fixed at 600 mm centres.

StoTherm Anchors are placed in the pre-drilled holes 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 **Sto EPS insulation caps** set flush to eliminate thermal bridging.

StoTherm 75 mm or 95 mm Impact Fixings can be used for 40, 50, 60 mm thick panels. They are face fixed flush with the surface or countersunk in 50, 60, 80 mm panels using a **Sto Router tool** to cut the fixing hole. The fixings are then covered with EPS insulation caps.

Sto Ecotwist Anchors are available for StoTherm 100 mm to 400 mm thick insulation panels. The fixings are placed in the pre-drilled hole and, using the Ecotwist MT fixing tool, are drilled below the surface with the 60 mm spiral head stopping on contact with the concrete wall. The small surface hole is plugged with a Sto VE EPS plug.

Note: For design wind pressures above 2.5 kPa refer to Stoanz Limited.

4. STOTHERM ARMAT MIRAL RENDER SYSTEM

4.1 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 and satisfactory before work commences. Adequate protection of all adjacent surfaces shall be undertaken prior to commencing.

4.2 Selection

The **StoTherm Armat Insulated Masonry Render System** shall be carried out in stages incorporating: **StoLevell Novo basecoat** render, **Stoplex W sealer**, **StoFlexyl waterproofing**, selected **StoArmat Classic meshed** reinforcement render, finished in the selected **Stolit** coloured finishing render coated in **StoColor** façade paint or sealed with **S-Protect SC** stay clean on selected MP finishes.

4.3 Materials

Stoanz Ltd supplies all the following materials:

StoLevell Novo basecoat render with Stoplex W sealer	Selected StoArmat Classic meshed reinforcement render
Selected Stolit coloured finishing render	Sto uPVC pre meshed corner angles, finishing edges and drip edges.
Selected StoColor facade paint or S-Protect SC stay clean on sponge finishes	Selected Insulation Panels
StoTherm PVC components	Adhesive Foam for EPS insulation
StoFlexyl waterproofing	Sto Power Bloc, Sto Zylinder blocs, Sto Spirals, Iso Darts

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4.4 Detailing

The foundations are to be detailed with **StoFlexyl meshed waterproofing** as per previous Clause 3.2. **Sto pre-meshed corners, reveal drip edges, finishing edges and control joints** are lightly embedded in the **StoLevell Novo basecoat render** before being encapsulated in the **StoArmat Classic meshed reinforcement render**.

4.5 Basecoat Render

To clean, dry and sound StoTherm insulation panels that been abraded to open the surface and level the joints, apply **StoLevell Novo** basecoat render by hawk and trowel at approximate thickness of 5-6 mm to leave an even, straight surface free of hollows and deviations. While the render is still wet, lightly embed **Sto uPVC pre meshed corners, drip edges and finishing edges** and reinforce any stress points with mesh butterflies. Once set remove any ridging or bumps in the basecoat with a Sto feathered straight edge, Grid Plane or Sto rasp and leave ready for the **StoArmat** reinforcing coat. Application procedures for the **StoLevell Novo** must be in accordance with the Sto Technical Data Sheets.

Note: Ensure the **StoFlexyl meshed waterproofing** over the **wall caps** and around the **joinery openings** is undertaken over the dry basecoat before the **StoArmat** meshed reinforcing coat.

4.6 Sealer

To clean, dry **StoLevell Novo** basecoat render that has been rasped flat, apply one coat of **Stoplex W** primer by brush and roller to seal the surface at approximately 8 m² per litre.

4.7 StoArmat Classic reinforcement render

Note: StoArmat Classic
StoArmat Classic HD with hardener for accelerated drying in cold damp weather are also available.

To clean, dry, base coated, sealed surfaces apply an even coat of the selected **StoArmat Classic** render by hawk and trowel at approximately 2 mm thick and while the **StoArmat Classic** is still wet, lightly apply **Sto mesh** ensuring adjacent drops of mesh are overlapped by a minimum 75 mm 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 1.5 mm (min DFT 2.5 mm) by hawk and trowel to cover the mesh and leave an even surface plane free of voids or deviations. Once dry, remove any slight ridges etc. with a Sto rasp ready for subsequent render.

StoArmat Classic must be installed in accordance with the Sto Technical Data Sheets. Always install **Sto pre-meshed uPVC drip edges** on lintels and joinery heads, **Sto pre-meshed** corner angles on external corners and **Sto pre-meshed finishing edges** as detailed.

4.8 Sealant

All junctions or detailing between the render mesh coat and dissimilar materials shall be sealed with compatible exterior MS Sealant in accordance with the manufacturer's Technical Data Sheets. Note some manufacturers require primers for PVC or dissimilar substrates.

Note: Where sealant is being applied directly over **StoFlexyl waterproofing**, the StoFlexyl must be primed to promote adhesion in accordance with the sealant manufacturer's instructions.

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4.9 Stolit Float Finish Renders (refer to header for selected finish)
Stolit K texture is available in a flat 1.0, - 1.5, 2.0, 3.0 mm aggregate as selected.

- **Stolit K coloured finishing render as selected**

Apply the selected **Stolit K** coloured finishing render to prepared rendered surfaces with a stainless-steel trowel, gauging to the thickness of the aggregate size. Finish with a plastic float to the requisite pattern and allow to dry (normally overnight). The spreading rate shall be approximately 12 m² per pail (1.0 mm), 9 m² per pail (1.5 mm), 7 m² per pail (2.0 mm) and 4 m² per pail (3.0 mm).

- **StoColor Façade Paint**

It is recommended that all **Stolit K** surfaces receive two (2) coats of **StoColor Maxicryl, or StoColor Dryonic iQ** façade paint tinted to the selected colour and applied by brush and roller at approximately 6-8 m² per litre (One (1) coat is acceptable though it will need recoating more frequently). Refer **Section 6 StoService** for recoating requirements.

Note: Always maintain wet edges between cutting in and roll in tight to ensure an even film build is maintained.

4.10 Selected Stolit MP Finished Renders (refer to front page for selected finish)
Stolit MP fine coloured finish, MP Natural salt & pepper sand, RMP Sponge coarser salt & pepper sand

- **Selected Stolit MP, MP Natural, and RMP Sponge coloured finishing render**

Stolit MP fine, MP Natural sandy and RMP Sponge sandy are coloured finishing renders applied in two (2) coats. A basecoat of the selected **Stolit MP** or alternatively, depending on the finish, **Stolit K 1.0 mm** tinted to the selected colour, is applied, and allowed to dry. The finishing coat of **Stolit MP, MP Natural, or RMP Sponge** is then applied, float finished and randomly lightly sponged. Alternatively, the finish can be float finished, sponged, or smooth finished with a S/S Marmorino trowel to the selected pattern. The spreading rate of the **Stolit MP, MP Natural or RMP Sponge** is approximately 12-14 m² per pail.

- **S-Protect SC Stay Clean Invisible Silane Sealer (clear sealer)**

To clean, dry, **Stolit MP** or **MP Natural**, apply an even coat of **S-Protect SC stay clean** hydrophobic sealer (clear invisible Silane sealer) in a flood coat using a low-pressure sprayer and Sto block brush to work the product into the Stolit render, avoiding runs and brushing in any lingering drips etc. so they do not show up. Surfaces must be well coated, and it is recommended to work in a pattern preferably out of the sun to ensure that there are no misses as the sealer is invisible once dry. Refer **Section StoService** for recoating requirements.

Note: All joinery, glazing, and adjacent surfaces must be masked off to prevent the **S-Protect SC Stay Clean** contaminating the surface. Any excess product must be removed after 15 minutes to avoid a surface film forming that can be difficult to remove.

- **StoColor façade paint (paint finish if selected)**

If selected it is recommended that all **Stolit MP** surfaces receive two (2) coats of **StoColor Maxicryl, or StoColor Dryonic iQ** façade paint tinted to the selected colour and applied by brush and roller at approximately 6-8 m² per litre (One (1) coat is acceptable though it will need recoating more frequently). Refer **Section 6 StoService** for recoating.

Note: Always maintain wet edges between cutting in and roll in tight to ensure an even film build is maintained.

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4.11 Stolit Smooth Finish Render

- **Stolit Milano coloured finishing render**

Stolit Milano is a smooth pre-coloured finish applied in two (2) or three (3) coats. A basecoat of **Stolit Milano** tinted to the selected colour is applied and allowed to dry before the finishing coats of **Stolit Milano** are applied and steel troweled, floated or lightly randomly burnished to the selected pattern. The spreading rate of the Stolit Milano is approximately 16-18 m² per pail.

- **S-Protect SC Stay Clean Invisible Silane Sealer (clear sealer)**

To clean, dry **Stolit Milano**, apply an even coat of **S-Protect SC stay clean** hydrophobic sealer (clear invisible Silane sealer) in a flood coat using a low-pressure sprayer and Sto block brush to work the product into the Stolit render, avoiding runs and brushing in any lingering drips etc. so they do not show up. Surfaces must be well coated, and it is recommended to work in a pattern preferably out of the sun to ensure that there are no misses as the sealer is invisible once dry.

Note: All joinery, glazing, and adjacent surfaces must be masked off to prevent the **S-Protect SC Stay Clean** contaminating the surface. Any excess product must be removed after 15 minutes to avoid a surface film forming that can be difficult to remove. Refer **Section StoService** for recoating requirements.

5. GENERAL NOTES

5.1 Colour

As selected by the client or specifier, Stoanz Limited recommends that the selected colour must have a minimum Light Reflectance Value (LRV) of 25%. Where a colour less than 25% LRV but above 4% is selected, the render system is finished with two coats of **StoColor Dryonic - a Sto iQ coating with X-Black technology additive** to avoid thermal stress.

StoColor Dryonic iQ façade paint with Sun blocker and fast dry film biomimetics. is available in the StoColor range, with other colours available depending on formulation.

6. STOSERVICE

6.1 StoService - Refer to StoService Document for a comprehensive guide

It is the owner's responsibility to clean the Sto System annually by low pressure washing or hosing down to remove surface contaminants with special attention to sheltered areas, as required, use a proprietary house wash sprayed on first with a low-pressure garden spray in accordance with the manufacturer's instructions. The owner is also responsible for organising the maintenance in accordance with the 3-yearly StoService Schedule available online at www.sto.co.nz.

After cleaning a visual inspection is to be undertaken by the person undertaking the annual maintenance to check for any physical damage or faults in the exterior building elements, to ensure any damage or defects are identified and repaired.

To assist the property owner in establishing a regular maintenance cycle, the property owners email address can be registered with service@sto.co.nz. Stoanz Limited will then provide 2½ yearly reminder notices that the property is due for the 3-yearly StoService.

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Depending on the prevailing environmental conditions and the service record, recoating of the paint finish is normally required at the 10 – 12½ -years where two coats were applied to maintain long-term integrity or 8 -year period where one coat of paint or S-Protect Silane was applied. This is carried out using a **StoColor Coating System** or **S-Protect System** applied in accordance with a Sto specification. Where a colour change is required, Stoanz Limited should be consulted.

7. WARRANTY

7.1 StoTherm Armat Masonry Foundation Insulation System 10-year Warranty

When the **StoTherm Armat Masonry Foundation Insulation System** is applied in accordance with the Sto specification, Sto details and Sto PS3 Quality Assurance schedule, a warranty is available for the Sto System for ten (10) years from the date of practical completion, provided maintenance requirements as set out in the StoService Schedule are followed.

This is to comply with the relevant clauses in the New Zealand Building Code being B2 Durability, E2 External Moisture and F2 Hazardous Building Materials for this type of building element.

The warranty is supplied by the Sto Contractor on completion of the project with the warranty issued and backed by Stoanz Limited as to the suitability of the material supplied provided that:

- (a) All specified work is carried out by a registered Sto Contractor who must complete the Sto QA Schedule and sign off the Sto Warranty Request and the five-year PS3 Workmanship Warranty.
- (b) All work is carried out in accordance with this Specification, or any written amendments issued by Stoanz Limited.
- (c) The warranty does not cover situations where the render system is subjected to physical disturbance, chemical contamination, structural stress, or interference.
- (d) The masonry substrate under the render must be structurally sound. Cracks in the substrate that reflect through the render are not covered by the StoWarranty.

8. DISCLAIMER

8.1 Disclaimer

The information contained in this specification is based on our findings, experience, testing and certification at the revision date. End users are still responsible for establishing the suitability of the specified products regarding their intended use. No liability is undertaken for use of this information outside of Stoanz Limited parameters or for the substrates, design, construction, and project site conditions that are outside of Stoanz Limited's control. Where a Sto registered contractor applies Stoanz purchased products in accordance with the Sto Specifications, Material Technical Data Sheets and Sto Details, a Sto Material Warranty document is available, but the installation of the materials remains the responsibility of the Sto Contractor who provides the PS3 Warranty. Any warranty is conditional on the system being maintained and serviced in accordance with the StoService documentation. Stoanz reserves the right to alter or update information and formulations at any time without prior notice.