DRYWALL AND DRYLINING SYSTEM GUIDELINES

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DESIGN GUIDELINES

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1. QUALITY CONTROL

The installer should have experience and knowledge of the installation of ceiling systems or be a SABISA approved installer. Gypframe™ UltraSTEEL® metal framing and products should be inspected by a recognised site authority. Gyproc RhinoBoard® should be inspected after each installation and before finishing. All ducts services ducts and conduits should be installed before boarding. Manufacturer's specification should be properly interpreted and adhered to. It is the drywall contractor's responsibility to ensure that the specifications are properly adhered to.

2. DELIVERY, STORAGE, AND HANDLING

Store materials indoors, under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, and construction traffic.

Store Gyproc RhinoBoard®, Gyproc RhinoLite® on raised platforms.

Store flat to prevent damage.

Gyproc RhinoBoard® should be carried on edge. When the board is stacked, the long edge should be placed down before it's turned horizontally. When the board is installed, the long edge should be placed down before it's turned and placed into position.

Boards should not be slid over each other as this can scuff the surface.

3. SITE PREPARATION

Verify that site conditions are suitable for the commencement of work and that all labelled materials are as indicated in the Saint-Gobain Gyproc & Isover specification document or as instructed by the manufacturer. Ensure that there are no damaged materials. The building should be weather proof before the installation of the Gyproc Drywall System.

4. SERVICE INSTALLATIONS

Services can be incorporated in all Saint-Gobain Gyproc Drywall Systems. Gypframe™ UltraSTEEL® Studs are specified with service holes to accommodate routing of electrical services. Grommets or isolating strip must be installed in the service holes to prevent abrasion of the cables and plumbing pipes. Where heating pipes, particularly micro-bore systems, are to be located within the Gyproc dry walling system, it is recommended that only one pipe is passed through each aperture in the metal framework. If this cannot be accommodated for whatever reason, it may be necessary to incorporate proprietary pipe restraining clips, or other means of keeping the pipes apart, to prevent vibration noise.

5. SERVICE PENETRATIONS

Penetrations for services should be given careful consideration to ensure that the fire, thermal and sound performance of the wall is not compromised and also that services themselves do not act as pathways for the transmission of fire, thermal and sound. Fixing electrical socket boxes into Gyproc Drywall Systems can impair both fire and acoustic performance, but with careful detailing this can be minimised.

In particular, back-to-back services must be avoided. Gyproc plasterboards should always be neatly cut and a proprietary sealant should be applied where optimum acoustic performance is required. A proprietary fire resistant sealant (supplied by others) should be used on walls requiring a fire rating.

By designing service zones through which all services pass, the number of individual service penetrations can be minimized. Access to services can be achieved by installing access panels. The access panels should be designed not to compromise the sound, thermal and fire rating of the drywall system.

6. HEAD TRACK SUPPORT

Provisions to be made for top track to be fixed accurately to a securely fixed framing structural member. Additional transverse support shall be provided at maximum 600mm centres.

7. FIXTURES AND FITTINGS

Fittings can be fixed to the face of Gyproc Drywall Systems, using plywood/heavy-duty track noggins within the cavity of the drywall. A minimum stud spacing of 400mm is recommended. An alternative to this would be to install a structural metal or timber support framework within the cavity of the drywall. Provide or ensure provision of accurately positioned and securely fixed noggins to support fixtures, fittings and services for systems consisting of Gyproc RhinoBoard® / FireStop® / FireStop® dB/ MoistureResistant™ / DuraLine / Activ'Air® / SoundBloc® or X-Ray Protection. All fixtures and fittings subject to dynamic loading shall be securely fixed to noggins or specially designed structural frameworks.

Noggings are not required for fixtures and fitting mounted onto Gyproc Habito® High Performance Systems. Noggings are required for Fixtures and fittings mounted in the cavity of Habito® systems. Use RhinoBoard Habito® 12.5mm as noggings for selected fixtures and fittings.

8. INSULATION

Fit Isover Cavitybatt® / Cavitylite® / U Thermo Boards securely with closely butted joints, leaving no gaps. Unless the insulation is of a self-supporting batt type fitted between studs, fix at head of frame using 25mm x 25mm Gyproc Galvanised Steel Angle.

9. DOOR DETAILS

Where heavy semi-solid and solid core doors are fixed onto aluminium door frames, additional bracing and reinforcement of the frame will be required, otherwise the door opening will undergo too much deflection and damage if the door slams. To reinforce Gypframe™ UltraSTEEL® Studs use timber inserts.

For heavy duty and severe duty walls, the vertical framework at the door opening shall be formed using studs and tracks. The tracks shall be extended 300mm beyond the door opening on either side and the 300mm over run bent up through 90° to cover the bottom of the jamb stud and fixed twice either side using Gyproc Wafer-head Tek screws 13mm.

Door opening for fire rated doors shall be formed using steel square tubing framework fixed to the floor and soffit.

10.MAXIMUM HEIGHTS

Saint-Gobain Gyproc has adopted an internationally accepted methodology to determine maximum allowable wall heights, which is based on the level of lateral deflection under a given uniformly distributed load (UDL). The criterion is that the maximum lateral deflection of the drywall should not exceed L/250 (where L is the drywall height) when the drywall is uniformly loaded to 200Pa and L/125 at 200Pa where applicable.

11.SOCKET OUTLETS

Switch boxes and socket outlets can be supported on brackets formed from 102mm Gypframe™ UltraSTEEL® Track. Pipes or conduits should be fixed in position before lining work commences. Fixing electrical socket boxes into Gyproc Drywall Systems can impair both fire and acoustic performance, but with careful detailing this can be minimised. In particular, back-to-back services must be avoided.

12.ACCESS PANELS

Access panels should be designed to offer practical, cost effective solutions. Care should be taken that the acoustic, thermal and fire performance of the wall is not compromised by the access panels.

13.FIRE PERFORMANCE

Closely follow Saint-Gobain Gyproc specifications as deviations may negate fire resistance performance.

Cut boards to a neat fit, avoiding any gaps. If small gaps do occur, they must be backed by a framing member and filled with appropriate jointing material, or be skim plastered. Tape and fill joints, or skim

plaster plasterboard to achieve fire performance. Fire-stop joints, junctions, penetrations, etc. to maintain integrity. Keep penetrations to a minimum and avoid back-to-back sockets.

14.ACOUSTIC PERFORMANCE

Isover Soundlite / Cineplex / Glasswool tiles are designed to provide sound absorption. Where sound insulation room-to-room is required, sound attenuation (CAC) can be improved by the installation of Isover glasswool insulation onto the ceiling.

Alternatively, other design considerations should be adopted such as extending adjoining partitions into the plenum void or installing a plenum barrier. Consider the layout and structure of buildings at the design stage in order to separate quiet and noisy areas.

Plan properly to avoid retro-fitting of services and/or noggins. Control sound paths around walls and floors to reduce flanking sound transmission. Seal the base and top of the wall using non-hardening silicone sealant. Tape and fill, or skim plaster plasterboard joints to increase air tightness. Keep penetrations to a minimum and as small as possible. Use an acoustic sealant for optimum sound insulation. Seal penetrations, joints, junctions, etc. to avoid transmission of sound through leakage. It is good practice to seal all service holes/penetrations. Air conditioning ducts should be fitted with the appropriate proprietary dampers.

Avoid back-to-back sockets. Gaps on either side of the socket box should be sealed with an appropriate fire or acoustic sealant. The gap between the socket box and opposite side lining should be filled.

Closely follow manufacturers' fixing details as deviations may negate any acoustic benefit. Where the demising drywall meets the external wall/Gyproc drywall lining, appropriate detailing should be adopted to reduce leakage of sound and vibration transfer.

15.VERTICAL JOINTS

Lightly butt boards together. Centre joints on studs. Ensure that joints on opposite sides of studs are staggered. For double layer boarding, stagger joints between layers.

16.HORIZONTAL JOINTS

Horizontal joints are not recommended in walls up to a height of 3600mm. Horizontal joints may impinge on the aesthetics of a jointed wall. Consequently, the position of horizontal joints should be agreed upon with the Architect or Designer. For two-layer lining, stagger joints between layers by at least 600mm. Provide horizontal framing to support the horizontal edges of the face layer lining.

17.FIXING OF BOARDS

Stagger the boards along Gyproc RhinoBoard® butt joints. Fix working from the centre of each board.

Position screws not less than 13mm from cut edges and 10mm from bound edges of boards. Set heads in a depression; do not break paper or gypsum core. For single layer Gyproc High Performance Wall Systems with Habito®, Habito UltraSTEEL™ Studs and Habito® GTX-F High Performance Screws must be used.

For double layer lining use Habito® High GTX-F Performance Screws for securing the inner layer of Gyproc Habito® and Gyproc Sharp-point screws 42mm to secure the outer layer of Gyproc RhinoBoard® or RhinoBoard® FireStop®/ FireStop® dB.

18.DEFLECTION HEADS

Deflection allowance shall be specified by the project structural engineer when necessary. Studs shall be cut shy of the floor to soffit height in order to accommodate the specified deflection. Deflection heads, by definition, must be able to move and therefore achieving an airtight seal is very difficult without incorporating sophisticated components and techniques. Air leakage at the drywall heads will have a detrimental effect on the acoustic performance of any drywall.

19.LEVEL OF FINISHING

Level 1- Temporary constructions. No jointing or finishing at all

Level 2-Frequently used in plenum areas above ceilings and in areas that are generally concealed. All joints shall have the tape embedded in jointing compound. Surface shall be free of excess jointing compound but tool marks and ridges are acceptable

Level 3- This finish is suitable where moisture resistant boards are used as a substrate for tiling and may be used in garages or warehouse storage where surface appearance is not of primary importance. All joints, angles and accessories shall have one coat of jointing compound applied. All screw heads to be spotted.

Surface shall be free of excess jointing compound but tool marks and ridges are acceptable.

Level 4- This level is suitable for areas which are to receive heavy or medium textured paint finishes, or where heavy grade wall coverings are to be applied. Where lightweight vinyl is to be used all joints etc. should be carefully sanded to provide a smoother surface. All joints, angles and accessories shall have two separate coats of jointing compound applied. All screw heads to be spotted. All jointing compound

shall be smooth and free of tool marks and ridges. It is recommended that all the areas of jointing compound receive a coat of suitable base plaster primer.

Level 5- This level should be used where gloss, semi-gloss or matt non-textured paints are specified. Any drywall that is subjected to critical lighting shall be finished to this level. Apply Gyproc RhinoTape® to all joints. Cover Gyproc RhinoTape® with one layer of Gyproc RhinoLite® Multipurpose / RhinoLite CreteStone® / RhinoLite Natural Plus. Skim the surface using one layer of Gyproc RhinoLite® Multipurpose / RhinoLite CreteStone® / RhinoLite Natural Plus to a minimum thickness of 3mm. Finish the surface using rubber float and steel trowel or steel trowel only. The surface shall be completely smooth and free of any marks and surface blemishes. The entire surface of the drywall shall receive a coat of suitable plaster primer before final decoration.

20.CRITICAL LIGHT

Wall and ceiling areas abutting window mullions or skylights, long hallways, or atriums with large surface areas flooded with artificial and/or natural lighting are a few examples of critical lighting areas. Strong side lighting from windows or surface-mounted light fixtures may reveal even minor surface imperfections. Light striking the surface obliquely, at a very slight angle, greatly exaggerates surface irregularities. If critical lighting cannot be avoided, the effects can be minimized by creating a shadow-line joint or by decorating the surface with medium to heavy textures, or by the use of draperies and blinds which soften shadows.

In general: Paints with sheen levels other than flat, enamel and dark paint finishes highlight surface defects; textures hide minor imperfections.

21.CONTROL JOINTS

Control joints may be required in the partition to relieve stresses induced by expansion and contraction of the structure. Control joints are visible and may impinge on the aesthetics of the building. Consequently, the position of the control joints should be determined by the architect/designer. Control joints shall be specified where any of the conditions listed below exist.

Where excessive movement is likely to occur.

Where a drywall, or ceiling travers's movement joint within the surrounding structure. The width of the drywall control joint shall be equal to that of structure.

Where a drywall is exposed to variable or extreme temperatures and the wall runs in an uninterrupted straight plane exceeding 12m in length. NOTE: Full height door frames may be considered as a control joint.

Where the building/substrate structural system/material changes.

A control joint is desired or incorporated as a design accent or architectural feature.

Control Expansion Joints Guidelines

22.STUD SPACING

Reducing the centres of the metal studs within Gyproc & Isover Drywall Systems partition systems allows for greater heights to be achieved when considered within the framework of Saint-Gobain accepted methodology. Please note however that this can have a detrimental effect on the sound insulation performance of the system.

We have estimated the performance reductions for Gyproc & Isover Drywall Systems.

When there is no insulation in the cavity and the studs spacing is reduced to 300mm centres, this results in an estimated 3dB loss in the Rw compared to studs at 600mm centres without insulation.

When there is insulation in the cavity and the studs spacing is reduced to 300mm centres, this results in an estimated 2dB loss in the Rw compared to studs at 600mm centres with insulation in the cavity.

When there is no insulation in the cavity and the studs spacing is reduced to 400mm centres, this results in an estimated 2dB loss in the Rw compared to studs at 600mm centres without insulation.

When there is insulation in the cavity and the studs spacing is reduced to 400mm centres, this results in an estimated 0dB loss in the Rw compared to studs at 600mm centres with insulation in the cavity.

23.APPLICATION OF TILES

General

All control joints in the drywall or plasterboard must extend through the adhesive bed and tiles, and filled with a suitable flexible filler or expansion joint profile.

All expansion and movement joints in the substrate must extend through the adhesive bed and tiles, and filled with a suitable flexible filler or expansion joint profile.

Wall tile movement joints must also be allowed for in vertical corners, surface obstructions, pipes, fixed fittings and over all building material variances (brick and concrete beams).

We recommend the mechanical support of tiles where tiling heights are in excess of 2.5 meters.

This specification must be used in accordance with SANS 10107: THE DESIGN AND INSTALLATION OF CERAMIC TILING. For all South African National Standards (SANS) documentation see www.sabs.co.za.

Surface preparation:

- Tiling onto existing drywall: Make good any unsound areas and remove flaky or peeling layers before tiling.
- Tiling onto existing painted drywall: Sand plasterboard to remove PVA paint (100mm grit) and prime with a slurry coat using a mix of two volumes of weber.prim Plaskey and 1 volume of weber.ad Key-it. Apply to a thickness of approximately 2mm using a block-brush. Leave to dry for 24 hours.
- Tiles must have full contact with adhesive – leave no voids.
- Tiles must be clean and free of dust and contaminants.
- Use only dry tiles - do not soak tiles.
- Gyproc Rhinoboard® board must be primed as above prior to tiling.

24.IMPACT STRENGTH

The impact performance of the wall systems is established by testing the wall systems in accordance with the full requirements of BS 5234. This rating relates the strength and robustness characteristics of the partition system against specific end-use applications. The table below gives details of the four duty categories. From the test conducted by Saint-Gobain Gyproc and British Gypsum it can be established that in all cases a double layer lining achieves Severe Duty.

Duty rating	Category	Examples
Light	Adjacent space only accessible to persons with high incentive to exercise care. Small chance of accident occurring or of misuse.	Domestic accommodation
Medium	Adjacent space moderately used, primarily by persons with some incentive to exercise care. Some chance of accident occurring or of misuse.	Office accommodation
Heavy	Adjacent space frequently used by the public and others with little incentive to exercise care. Chances of accident occurring or of misuse.	Public circulation areas
Severe	Adjacent space intensively used by the public and others with little incentive to exercise care. Prone to vandalism and abnormal rough use.	Major circulation areas and industrial areas

25.WATER DAMAGE

Board exposed to moisture may need to be replaced depending on the source of moisture and the conditions of the boards. If the following conditions are observed or experienced, the boards should be replaced:

Gyproc RhinoBoard® is not structurally sound and there is evidence of rusting fasteners or physical damage that would diminish the physical properties of the ceiling system.

Gyproc RhinoBoard® cannot be dried thoroughly before mold growth begins (typically 24 to 48 hours depending on environmental conditions).

If Gyproc RhinoBoard® is exposed to contaminated water.

Ensure that the source of moisture is identified and eliminated.

IF EVER THERE IS ANY DOUBT WHETHER TO REPLACE THE BOARDS OR NOT - REPLACE THE BOARDS.

26.CURVED DRYWALL

Planning – key factors

The positioning of vertical board joints on exposed board layers at the apex of the curve should be avoided. The positioning of all studs, therefore, needs to be determined at the design stage. Where straight runs occur within curved partitions or linings, stud centres can be increased as determined by the specification, once 600mm off the curve.

Curved walls exert additional stresses onto the supporting studs and require that studs are spaced at a spacing of 300mm centers

Fire resistance

There is no specific standard against which to test curved walls and linings, but adhoc testing has been carried out which confirms that a similar performance can be achieved to that claimed for the straight partition.

Degree of curvature

In common with other sheet materials, board-ends have a tendency to remain straight. The minimum radius, therefore, will be influenced by the board characteristics, the length of curve, the support centres, and the occurrence of board joints.

Table 1 Minimum recommended board radiuses

Board type	Thicknesses (mm)	Stud Centers (mm)	Minimum Radius (mm)
FireStop®	12.5	300	4800
	15	300	5700
RhinoBoard®	12.5	300	3600
	9.0	300*	1800*
	6.4*	300*	1800*

***9.0mm and 6.4mm Rhinoboard® figures to be retested in RSA for compliance**

Sound insulation

Reducing the centres of the metal studs within Gyproc & Isover Drywall Systems curve can have a detrimental effect on sound insulation. Include Isover Cavitybatt® / Cavitylite® / U Thermo glasswool insulation in the cavity for optimised acoustic performance.

27.RECOMMENDED QUALITY CONTROL ON SITE

Gypframe™ Metal framing should be inspected by a recognized site authority.

All cavity services ducts and conduits should be installed before boarding. Plan the position of all service penetrations/fittings and provide the necessary framing.

Gyproc RhinoBoard® should be inspected after each installation and before finishing.

Manufacturers specification should be properly interpreted and adhered to. It is the drywall contractor's responsibility to ensure that the specifications are properly adhered to.

28.DAMPERS

Fire and smoke resisting dampers can be installed in Saint-Gobain Construction Products range of Gyproc Drywall Systems. As the performance of the complete assembly will depend on a number of elements, the actual details of the opening need to be determined in conjunction with the fire stopping and damper manufacturers.

Penetrations of dampers need careful consideration to ensure that the integrity of the element is not impaired, and also that the dampers do not act as the mechanism of fire spread. It is important to use

only those dampers and their installations which have been shown by fire test to be able to maintain the integrity of the construction.

Service zones can be sealed after installation of the services using a tested and substantiated fire stopping system. In most situations, the services will be installed by drywall contractors. It is important, therefore, that all relevant contractors should be advised as to where and how their service penetrations should be made and maintained.

The necessity to independently support of dampers will depend on their size and weight. Consult Saint-Gobain Construction Products Technical Solutions Centre further detailed information.

29.ACCESS TO SERVICES

Access Panels should be designed to offer practical, cost effective solutions. Care should be taken that the acoustic and fire performance of the wall is not compromised by the access panels.

30.HEALTH AND SAFETY

The advice and guidance referred to does not seek to replace the Health and Safety advice and systems of employers in relation to the use and installation of the Company's products but should be considered in addition. At all times all users of such products and installation techniques should ensure that they are familiar with, and adhere to, their employer's own Health and Safety procedures.

Saint-Gobain Construction Products systems have been developed for use in various sectors including Hospitality, Commercial, Retail, Healthcare, Affordable Housing, Education, Industrial, Recreational, and Residential. Guidance as to the correct installation and use of these products and systems is included in the installation sections. It is important to follow good site practice at all times and to ensure that appropriate safety precautions are taken (including the wearing of appropriate personal protection equipment and clothing) when working with Saint-Gobain Construction Products.