INTERIOR
PLANTSCAPE
ASSOCIATION

Interior Plantscaping Guidelines for Architects and Designers

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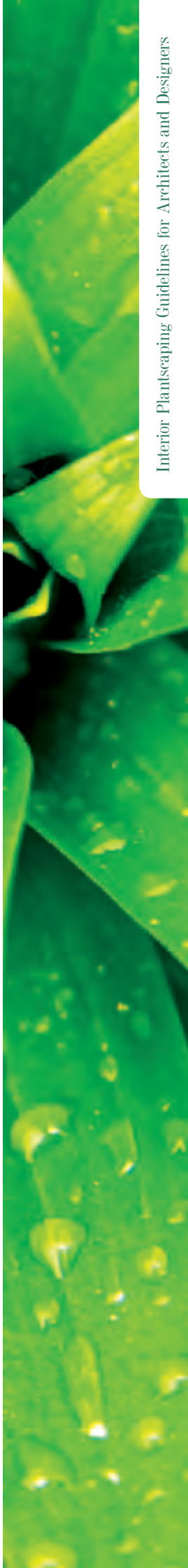


1 EXECUTIVE SUMMARY

1.1 Overview

The basis for this document is to offer some guidance to Architects and Designers who wish to include interior plantscaping in a building, fit out or refurbishment.

Over the last few years, indoor plants have become popular for several reasons:

- To improve indoor air quality
- For the psychological benefits
- For aesthetics, provided by the plants and containers
- To make a green statement; and,
- Green Star Points.

Many Architects and Designers tend to rely on familiar industries or businesses to specify interior plantscaping requirements. The problem with this approach is that these industries and businesses have limited knowledge in this area.

For Example:

1. A furniture manufacture may know how to manufacture a planter box as an extra feature to cabinetry but they most likely do not have any horticultural knowledge. The other important aspect is water security of planters, as water and cabinetry do not mix.

2. A landscape architect may know a lot about plants that grow outside but may not understand the requirements for indoor plants.

The growing popularity of interior plantscaping is forcing Architects and Designers to acquire increased knowledge of plants and their horticultural needs, knowledge not traditionally associated with their industry.

1.2 Guideline Objectives

The main objectives of this document are to:

- Provide awareness of all potential solutions when designing, building or procuring containers for interior plantscape.
- Encourage the integration of all specialist design elements involved in the design and construction of containers.
- Provide assistance to designers when checking feasibility of design solutions and to point them toward support information when doing so.
- Highlight recent and ongoing developments in interior plantscape container technology and design.
- Provide clients with a realistic understanding of the relative features of all systems.
- Assist Architects and Designers to make good decisions, both functionally and financially.
- Make designers aware of the horticultural requirements of plants including water and light.

2 INTERIOR PLANTSCAPE ASSOCIATION

2.1 About The Interior Plantscape Association

The role of the Interior Plantscape Association is to actively promote interior plantscaping, coordinate and increase membership and most importantly, to provide a forum for communication within the industry.

Interior Plantscape Association is a non-profit organisation aimed at promoting, developing and enhancing the use and appreciation of interior plants to benefit people in the workplace and home.

Interior Plantscape Association manages the following resources:

- Website
- Guidelines (this document)
- Accreditation
- Maintenance Standards
- Standard Contract Terms.

2.2 Interior Plantscape Association Accreditation

Interior Plantscape Association Accreditation (Australia and New Zealand) is a transparent system or process for providing public confidence and accountability through a mechanism utilised for improvement in the "Interior Plantscaping Industry". Accreditation provides differentiation and recognition based on achieved competency standards.

Why Have Accreditation?

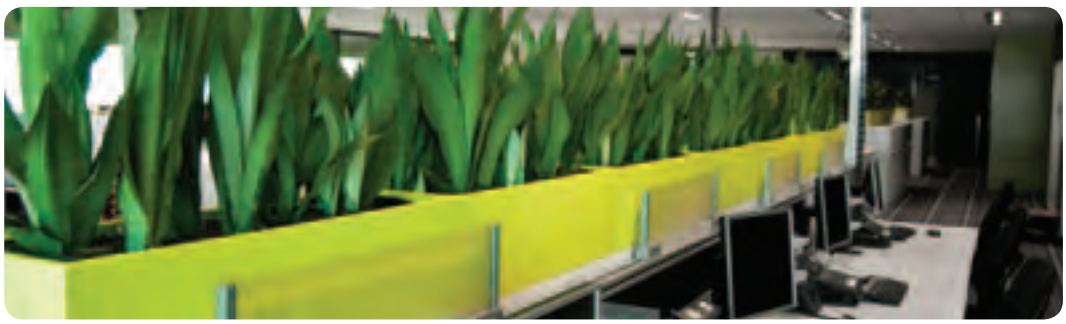
An Accredited Member has the following attributes:

- Full understanding of Green Star requirements
- Ability to develop specifications for plants and containers
- Ability to plan large installations
- Up to date knowledge on the latest containers, configurations and styles
- Full understanding of the horticultural needs of plants
- High-quality supply and maintenance.

An "Accreditation" MS Power Point Presentation was delivered at the Interior Plantscape Association Seminar held in Brisbane, Sydney and Melbourne. This presentation is available on the Interior Plantscape Association website.

Transparent Accreditation

These standards are accessible to anyone and can be viewed and downloaded from the Interior Plantscape Association Website.



2.3 Interior Plantscape Association Website

The Association has an established website that caters to four audiences:

- Members
- Customers
- Architects, Designers and,
- the Public.

The following can be found on the Interior Plantscape Association Website:

- List of Accredited Members by State
- An archive of all Interior Plantscape newsletters, in downloadable format
- Dr Margaret Burchett's papers and UTS Milestone Reports with associated papers
- Contact details for the Interior Plantscape Association President and other position holders; and,
- Green Star information for members.

2.4 Interior Plantscape Association Maintenance Standards

The Association has a published set of Maintenance Standards for Indoor Plants, Containers and Growing Media. Accredited members adhere to these as a minimum standard.

Transparent Standards

These standards are accessible to anyone via the Interior Plantscape Association Website and they are downloadable.

2.5 Interior Plantscape Association Standard Contracts - Terms and Conditions

The Association has a published set of Terms and Conditions that can be attached to a Plantscaping contract.

These terms and conditions designed to protect both the customer and the contractor are meant to be both fair and reasonable.

3 PLANNING

3.1 Overview

Planning for interior plantscaping is especially critical if the Project Management has had no previous experience in this area.

It is a mistake to think interior plantscaping is something that can be left to the end of a project.

Critical path tasks can include:

1. **Appointing an Accredited Interior Plantscaper to aid in the design. This is not necessarily the plant supplier.**
2. **Documenting the Design Specification. This includes plant location and density for Green Star projects.**
3. **Preparing and assessing the tender for installation and maintenance of plants and containers.**
4. **Final Design Specification and approval, during the tender process - new ideas might be presented that change the design.**
5. **Contract development and approval**
6. **Preparing the Maintenance Plan**
7. **Preparing the Installation Plan**
8. **Scheduling:**
   - **Container manufacture**
   - **Plant supply**
   - **Installation and related logistics**
9. **Actual Installation.**

If each of these critical tasks took one month, that is an elapsed time of 9 months. Of course, it is not that simple. Some tasks will take less time while others may take more time and then there may be impediments along the way.

Task 1 should be executed early in the design of the building or fit out. In this way a valuable relationship can be built between the designers and the plantscaper. Additionally, allowing the plantscaper to review the initial concept can save time and confusion.

Documents that may be required for best practice include:

- Request for Information (RFI) and budget estimates
- Tender Document
- Tender Responses
- Contract
- Design Specification
- Maintenance Plan (needed for Green Star)
- Installation Plan.

3.2 Timeframe / Planning

3.2.1 Overview

Planning should consider:

- Concepts stage
- Pricing
- Design
- Installation
- Maintenance
- Container manufacturing
- Plant supply

3.2.2 Concepts Stage

It is really important to get some idea of what is involved at the concept stage and to be able to answer questions such as:

- Are plants being used to achieve Green Star points, if so, how many?
- What style is required?
- Will there be enough light for the plants? Some buildings are so frugal with lighting power, there is not enough light to support plants, for example, time switching and dimly lit corridors.
- What is the cost of using plants?
- Who is buying the containers - the occupier or the interior plantscaper?
- Will the containers be used to add colour?
- Are plants to be placed on top of office furniture, ie. credenzas, file cupboards etc? If so, then the weight must be considered. If the furniture develops sagging, the doors may not open. The weight will depend on:
    - type of planter
    - type of plant
    - the number of plants per unit
    - the potting mix
    - the planter topping, and
    - the water.
- Green Walls – is a Green Wall being considered, if so why?

3.2.3 Pricing

If prices are required for budget estimates, specify what needs to be priced.

The cost of Interior Plantscaping is roughly divided into three expenses:

1. Containers – size, materials, styles, brand
2. Plants – size, species, availability, servicing requirements
3. Labour - this is dependant on the containers and plants.

If the interior plantscape is well designed, labour and plant costs can be kept to a minimum.

3.2.4 Design

If Green Star Points are required, do not underestimate the time taken to obtain a suitable plant density.

Green Star points are related to:

- the interior layout,
- the size of containers,
- the number of plants,
- the size of the plants; and,
- the number of Green Star points required.

This can be an iterative process, as the above factors are manipulated.

Other forces may make unwelcome changes that impact on the number of plants, so this is an ongoing process, until everything is signed off.

3.2.5 Installation

In a large building, the installation may take from several days to several weeks and should be considered and scheduled as a major task in the fit out. An Installation Plan should be prepared.

3.2.6 Maintenance

Green Star requires a two-year maintenance plan. It may take some time to have this specified and approved.

3.2.7 Containers

Containers for large jobs must be manufactured and someone must be responsible for specifying them. Lead time from order to production to delivery is a major consideration in forecasting installation.

Also, a signed contract would need to be in place to ensure a delivery commitment for thousands of dollars worth of decorative containers.

Containers fall into several categories:

- Insitu planters
- Cabinet planters
- Freestanding or portable containers
- Green Walls.

Insitu planters

These must be designed with due consideration to practicality and the horticultural requirements, (plant size, grow pot dimensions and water reservoir space) specified, approved and then built by a carpenter or metal worker. If insitu planters are large they may need to be built on-site.

Cabinet planters

These must be ordered with due consideration to the horticultural requirements and then manufactured. Some cabinet planters are manufactured overseas and this may introduce other timing risks and lead time increase.

There are basically two types of cabinet planters:

1. Polymer or GRP liners – these liners support the plant and also contain the water reservoir. There is little chance of leaking or overflow and corrosion is not possible. These are ideal for servicing.

2. Metal trays or tubs – the plants are supported by a plate and sit above a separate tray. The plate and tray should be manufactured to be inert from any reaction with water whether corrosion or swelling (if the plate is particle board).
   - Note: The tray should be considered as a reservoir to hold water and not a drip tray.
   - Servicing can be tricky, so as not to overflow the tray.

Freestanding or portable containers

These are a versatile product in that they can be moved and come in different materials:

- Polymers
- Stainless Steel
- Aluminium
- Fibreglass

These have the advantage with respect to changing uses or staff arrangements, and allow retro-installation into already-standing buildings technically easy to accomplish, and economical.

Manufacturing large quantities of containers needs to be scheduled, as it may take several weeks or even months. Some brands are imported so delivery may be an issue and should be considered.

Green Walls

These are available in many styles and range from small to extremely large.

Small Green Walls may be portable and easily installed whereas large ones will require proper infrastructure and are custom designed and built by professionals.

3.2.8 Plants

Plant availability can be affected by several factors:

1. Season – some plants do not grow in winter.
2. Fashion – when a plant is fashionable it may be in short supply simply due to demand.
3. Plant stock – some plants are grown from tissue culture which may not be available and sometimes copyright will limit production.

Sometimes nurseries need to know months in advance to successfully fill orders.

Again, a signed contract would need to be in place to ensure a delivery commitment for thousands of dollars worth of plants.

4 DESIGN, INSTALLATION AND MAINTENANCE

4.1 Overview

There will be a certain consistency if the Interior Plantscape designer is also the installer and the company that maintains the plants. However, this is not always possible or even prudent.

4.2 Design

During the design stage, the Interior Plantscaper will consider:

- Design feasibility - can it be maintained easily? The last thing the industry wants is jobs that are costly or impossible to maintain because usually the client cannot see the value in the cost.
- Light
- Water requirements of the chosen plants
- Available plant space, height, width
- Access to the plants. It is a good idea to keep plants out of areas that are not readily accessible.
- Possible damage caused by children or vandals. Some plants do better than others in these situations.
- Colour of decorative containers
- Style of decorative containers.

Design Specification

One major deliverable from the Design Phase is a Design Specification. This may not be important on small jobs, but if you are ordering $50,000 worth of containers, the documentation becomes critical.

The specification should be signed off and used for future communication and as an instrument in quoting the installation and maintenance. If this specification is written by the industry, it will be understood by the industry.

4.3 Installation

Best practice suggests a documented installation plan, certainly for large jobs. Installation although not rocket science, is the type of activity that grows in complexity the more one thinks about it.

If installation is planned and documented, it can be improved by simply having the installer and the client review it.

Large installations must consider:

- Hiring of temporary staff
- Hiring of temporary vans
- Service dock, marshalling space and site vehicle parking availability
- Lift trips possible per day and interaction with trades working on site
- Containers per trolley
- Rescheduling of regular run
- Scheduling arrival of plants
- Floor covering protection
- Scheduling arrival of containers
- Final cleaning (ie carpets, floors etc after trolleys have finished)
- First service.

4.4 Maintenance

Once again best practice suggests a documented maintenance plan and if it is a Green Star Project, a two-year plan is mandatory.

Large jobs must consider:

- Service frequency
- Service times
- Availability of potable water, away from food areas (ie kitchen)
- Water cartage - is a cart necessary?
- Storage space for equipment between servicing
- Security passes
- Service vehicle on site parking
- Contact details

5 CONTAINER SELECTION

5.1 Overview

There is a multitude of decorative containers available and some are designed specifically with interior design in mind as they add colour and style or can simply blend into the environment. The horticultural attributes of the container should be considered at the design stage to ensure cost savings in the maintenance program.

Note: Some brands are listed in green directories such as EcoSpecifier and GECA.

5.2 Cost

A well-designed container will save on servicing costs and plant replacement.

Container cost can be minimised by considering the container requirements when the furniture is being chosen. Large savings can be achieved by using an off the shelf product, for example:

- Matching the container dimensions to the furniture when the furniture is being chosen; and,
- Using standard sizes in growing pots.

If a custom made planter is being considered, ensure its horticultural design is suitable at the Design Specification stage.

5.3 Freestanding Planters

There are some freestanding planters made especially for indoor plants and come in an array of configurations, which allow flexibility of design. The planters can be considered as furniture and the following attributes should be considered, particularly for Green Star ratings:

- Weight and portability
- Durability
- Manufacturers guarantees
- Australian Design and Manufacture
- Horticultural suitability
- Volatile Organic Compound out gassing (VOCs)
- Water proof guarantee
- Standard growing pot size suitability
- Colours
- Maintainability.

5.4 Built In, Custom Built and Cabinet Planters (fixture)

Built in planters are there forever which may hamper future refurbishments.

Unless custom-built planters are designed with the horticultural and servicing needs in mind, they may:

1. Limit the type of plant. If there is not a big enough water reservoir, plant choices will be limited to using low water plants, such as Mother-in-law Tongues and Zanzibar Gems.

2. Increase servicing costs due to difficulties in:

    - watering the plant
    - maintaining the topping
    - supporting the plant
    - non-standard growing pot sizes.

5.5 Materials

Material problems generally relate to water problems, for example:

- Water is corrosive especially when it contains fertilisers; and,
- Some containers are hard to water proof, especially when made of folded metal, that is, joins, welds, corner joints, etc.

Tip: Ensure the manufacturer gives a “Water Proof” (will not leak) guarantee.

Common materials used for decorative indoor plant containers are:

- Stainless Steel
- Aluminium
- Polymers
- Fibre Glass
- Composites
- Ceramics.

Ceramic containers are included simply because a large proportion of the public consider these to be the only decorative container.

Indoor ceramic containers are usually glazed inside and out and as they are heavy they tend to be used only for tabletops.

Unless external pots are configured properly there will be problems, including:

- Leaking
- Under or over watering
- Disappearing topping
- Unstable plant
- Unit too heavy to move
- Scratches on flooring and table tops.

5.6 Growing Pot (Plant) Sizes

Grow pots come in the following standard sizes:

- 150mm
- 200mm (a good size for a desk plant)
- 250mm (a good floor plant size for some species)
- 300mm (a large floor plant)
- 330mm (only used by some companies)
- 400mm.

Grow pots vary in size and even style (eg Squat Pots). It is best to discuss with a plantscaper to confirm requirements.

If the containers are built to use non standard pot sizes, the cost may increase, as:

- The plants may be hard to source
- The plants may need repotting
- The pots may not fit the decorative container.

5.7 Colours

Containers can add colour and design flair, plants come in an array of greens, some have flowers and some are variegated. There are also new hybrids with leaves in amazing colours.

6 PLANT SELECTION

6.1 Indoor / Outdoor Plants

There is a difference between indoor and outdoor plants. Landscape gardeners are knowledgeable in the use and installation of outdoor plants whereas Interior Plantscapers are more knowledgeable in the use of indoor plants. Some Plantscapers do have some knowledge of outdoor plants with a few providing gardening servicing to their indoor plant hire clients.

6.2 Light Requirements

Different plants have different light requirements.

Most indoor plants that are suitable to low light environments are under story plants from rain forests. There are a few high light plants used indoors but they need to be positioned near a bright window.

Electric lights can be specified that will support plant growth. These may be ideal for concentrated planting under stairs or vertical walls.

Basically, if it is a good bright light that engenders wellbeing in people, it will be a good light for supporting plant growth.

Offices with low complexity, that are brightly lit, have cool colours, and have plants, are associated with high creativity potential. ***Canan Ceylan, Jan Dul and Serpil Aytac.***

6.3 Water Requirements

Different plants have different water requirements and this can change with location. The water available to an indoor plant depends on the container configuration and service frequency.

6.4 Concept

It is beneficial if the interior plantscaper has knowledge as to the overall design concept.

Is the building to be like a rainforest? The customer may be the Department of Forestry and want lots of lush greenery.

Does each floor have a theme? If so, what are they?

Discussing and communicating the concept will achieve a better solution and possibly save time.

6.5 Colour

Colour is a powerful element in design and coloured plants can be used to advantage. A splash of colour from a Bromeliad in a reception area may be just the thing to welcome and relax a customer.

Basically brightly coloured plants need bright sunlight. These plants will survive indoors for a short time but will finally deteriorate or their leaves will change to green.

Flowers add colour, but must be replaced more often than a “regular” green plant. However a potted flowering plant will last longer than a vase of flowers and is a healthier option than plastic.

To have healthy colourful plants in a building a regular replacement regime should be in place.

6.6 Plant Sizes

There are standard grow pot sizes used in the interior Plantscaping Industry. By specifying non-standard sizes, costs may increase, as the plants will need to be specially ordered or repotted.

Not all plants are readily available in every pot size.

7 PROCUREMENT OPTIONS

7.1 Overview

There are three main components to Interior Plantscaping.

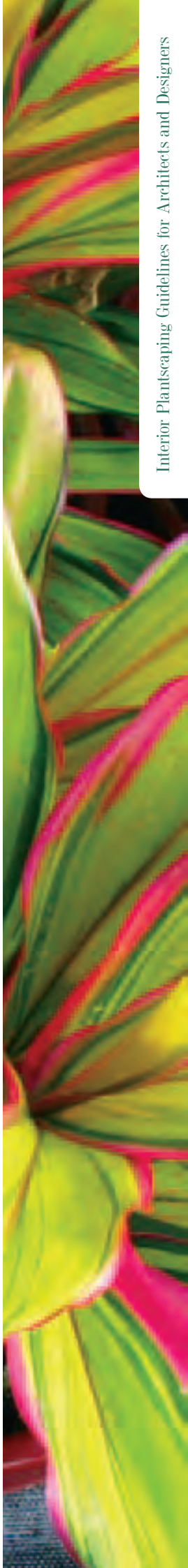
1. The planters
2. The plants
3. The servicing of the plants.

There are three main models for procuring indoor plants.

1. Service Only
2. Service with plant replacement
3. Hire and Service with replacement.

The following table might clarify these options.

	Service Only	Service with Replacement	Normal Hire Service
PLANTERS			
• Customer Owns	✔	✔	
• Customer Hires			✔
PLANTS			
• Customer Owns	✔		
• Customer Hires		✔	✔
REPLACEMENT			
• Customer	✔		
• Plantscaper		✔	✔
SERVICING			
• Plantscaper	✔	✔	✔



7.2 Service Only

If the customer owns the plants, who determines when they should be replaced? How does this work? Who buys the plants? If the Interior Plantscaper buys the plants does he charge separately for that service?

7.3 Service with Replacement

This model is used where planters may be purchased from a capital or furnishings budget or the planters are built in and part of the fittings.

- The customer owns the planters even when they are no longer fashionable.
- One common problem - the customer purchases planters that are not horticulturally suitable for interior plantscaping. They are then disappointed when they find:
    - The planters may not take the size plant they had in mind
    - It's difficult to find someone that will service the planters
    - They may need to outlay money to have the planters configured for Interior Plantscaping.

7.4 Normal Hire Service Agreement

This is the normal model in Australia.

Effectively the planters and the plants are hired with a service contract to maintain the plants and replace them as required.

- The customer does not need to do anything.
- Upon request and within reason, the plants can be replaced for another species.
- The planters can be upgraded

8 GREEN STAR

green star
environmental rating system for buildings

Green Star and the Green Building Council of Australia are all about sustainability and reducing the cost of human resources in the work place.

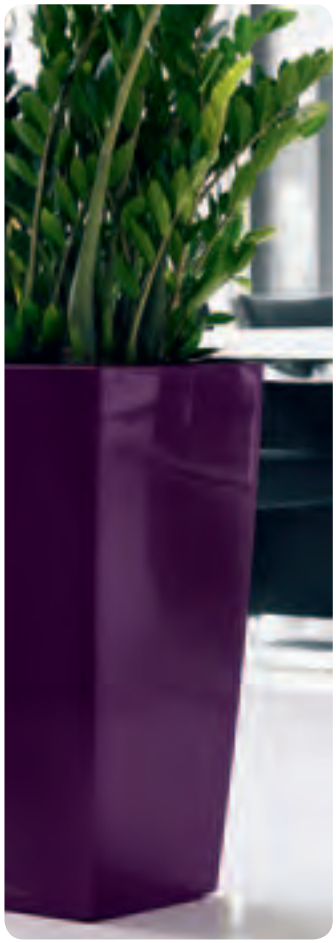
The Green Building Council of Australia grants up to two points for the use of indoor plants in the Office Interiors Green Star Rating. In Green Star Office Interiors Version 1.1 these points can be calculated in several ways.

A few Plantscapers who have taken the GBCA concept seriously have gained certification as Green Star Accredited Professionals to gain greater understanding for the requirements for a "green building" beyond just adding plants. They are listed in each state on the GBCA web site. Talk to your local GBCA Accredited Professional plantscaper as he understands the language and requirements of a green star project.

By contacting an Interior Plantscaper with Green Star experience, a lot of time and money may be saved. A plantscaper who is able to create/demonstrate a new innovation may be able to apply for an additional 2 green star points.

The Interior Plantscape Association was instrumental in working with The Green Building Council of Australia to include plants in IEQ15.

green building council australia



APPENDIX A - TENDER / QUOTATION CHECK LIST

Tender / Quotation Checklist for Interior Plantscaping

This list is intended to cover the information required to supply a worthwhile and detailed quotation for interior plantscaping.

1. Reason for Quotation

What is the reason for this tender/quotation; is it:

- A Request For Information (RFI) to test the feasibility of using interior plantscaping
- A budgeting exercise or
- An exercise that will result in a contract being awarded.

2. Floor Layout

This is probably the most important piece of information that can be supplied.
It should show:

- Dimensions
- Site orientation
- Work station positioning
- Conference Room, tables and chairs
- Area functionality
- Container location (if known)
- Plant size (if known)
- Key to container style
- Net Leasable Area (NLA)
- Colour schemes.

3. Contacts

It is preferable that one contact be appointed. A single point of contact is preferable for efficiency and clarity of communication.

4. Milestones

Expected dates for:

- Project briefing - this is usually of benefit to all parties
- Site inspection for Interior plantscapers - A site inspection is always beneficial to allow the Interior Plantscaper to gain a visual appreciation of the site and spaces.
- Quotation submission
- Notification of successful tenderer
- Installation dates.

5. Containers (if known)

Information about the containers should include:

- Are they water-tight?
- Do they include mulch trays?
- Style of containers
- Materials
- Dimensions
- Colours.

6. Constraints

Are there any constraints such as?

- A budget (honesty up front will save a lot of time, effort and disappointment)
- Green Star Points being claimed and method of calculation
- Type of plant
- Installation constraints – will this be night or weekend work, if so we must consider overtime.
- Qualifications – eg Interior Plantscape Association Accreditation
- Contract length – usually a longer contract will give better value.

7. Response Format

Is there a particular format or data requirement for the response, for example?

- Interior Plantscape specification tables
- Financial Figures.

Note: Some thought given to this area may simplify the work of the assessor in comparing the tender responses.

APPENDIX B - HORTICULTURAL REQUIREMENTS CHECKLIST

The primary horticultural requirement for interior plantscaping can be considered under the following headings:

1. Light
2. Water.

Secondary requirements are:

1. Topping
2. Weight
3. Growing Pot Size

The cost of interior Plantscaping is directly related to plant replacement and servicing labour. These two factors can be minimised if the horticultural needs of plants are met.

Requirement	Considerations	Solution
Light	If there is suitable light the plants will be replaced less often thus reducing the overall cost. There are low light plants but this reduces the possible selection to about 3 species.	Natural light from a Northerly facing window is the best source of light. Fluorescent lights directly above the plant can be sufficient. Plants on a cabinet maybe closer to a light source than those on the floor. Energy efficient switching can be a problem. Low lit areas such as corridors are a problem. Meeting rooms that are seldom used are a problem.
Water	If the available water is low, the number of usable plant species is reduced. If the available water is low but the species chosen requires a lot of water, more frequent servicing is required.	Sub-irrigation techniques can facilitate watering. Is there a water reservoir of suitable capacity? Is it possible to determine the level of the water in the reservoir? Is there a risk of water overflowing and spoiling floor or furniture?

Requirement	Considerations	Solution
Topping	Are the planters suitable for the type of topping that is required? Pebbles are expensive for two reasons. They are labour intensive to setup and maintain and are quite expensive to purchase. Pebbles are not always a green product; some pebbles are quarried in rivers overseas, polished using wax and heat and then shipped to Australia. Pebbles are heavy and can compress the potting medium that supports the plants.	If pebbles are to be used a platform of some description should support the pebbles. The platform minimises the volume of pebbles and the valuable water space they may use. By reducing the amount of pebbles the platform also minimises the labour cost.
Weight	The weight of the planter, plant, topping and water can quite considerable.	Has the weight been considered? If the planters are supported on cabinets; are the cabinets strong enough?
Growing Pot Size	Standard growing pot sizes for Australian nurseries are: 200mm, 250mm and 300mm. Some items are available in squat pots. Smaller sizes are sometimes available.	Has the growing pot size been considered? If repotting is required the cost will increase.

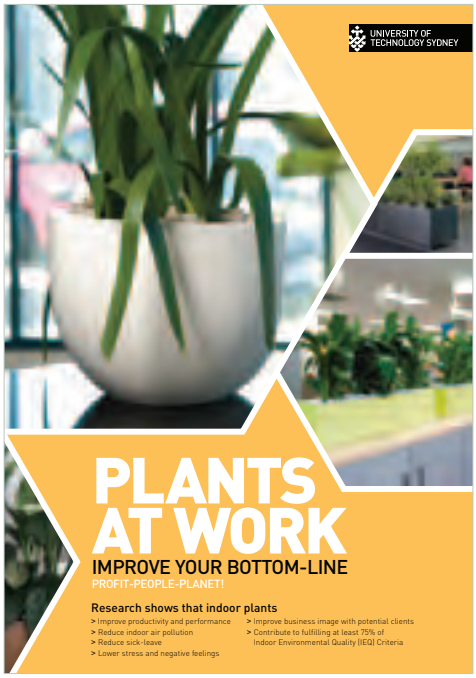
APPENDIX C
BENEFITS OF PLANTS

Plants contribute to 75% of the Indoor Environmental Quality (IEQ) criteria:

- Indoor plants reduce all types of urban air pollution, including.
- Plants at work directly increase productivity and performance.
- Indoor plants greatly reduce staff stress.
- Indoor plants improve business image with potential clients and customers.
- Plants improve job satisfaction.

The full report including Selected bibliography - can be found in the document – "PLANTS AT WORK Improve Your Bottom-Line" produced by University of Technology Sydney (UTS).

This document is available on the Interior Plantscape Association Website at www.ipa.asn.au or from the Interior Plantscape Association Administration Office.



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