

Title: **Rose Garden Entrance Border Redesign**

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Abstract:

The Rose Garden Entrance Border is located on the left side of the path running from the Widener Education Center and the parking lot. It means that most of the visitors of the Morris Arboretum walk by the border. It is the main path and the only direct way from the parking lot into the garden. It is also suitable for visitors with disabilities. All of the above factors make the area a high priority.

The project goal is to develop a new design for the border that will provide year-round interest and create a more welcoming area for visitors. At the present time, the project area is too steep making mowing difficult and unsafe. The new design will enlarge the current size of the bed and solve this maintenance problem.

To provide year-round interest, evergreen shrubs will be combined with deciduous shrubs that have multi-season interest. Perennials with interesting textures and spring-blooming bulbs will also be added to the bed for a bright color effect. Ornamental grasses will crown the final look and act as a transition element linking the bed with other ornamental beds in the Arboretum.

TABLE OF CONTENTS

INTRODUCTION, THE HISTORY OF THE SITE.....	3
THE NEED TO REDESIGN THE CURRENT FLOWER BED	3
INITIAL SITE ANALYSIS.....	4
THE SOIL CONDITIONS	4
THE LIGHT CONDITIONS	5
THE TERMS OF MOISTURE.....	5
THE DEER PROBLEM	5
THE NEW DESIGN	5
THE MAINTENANCE PROBLEM SOLUTION.....	6
ALL-SEASON INTEREST & WELCOMING AREA FOR THE	
VISITORS.....	6
CONCLUSION.....	9
ACKNOWLEDGEMENTS	9
REFERENCES	10
APPENDICES	12
A. ROSE GARDEN ENTRANCE BORDER – PLANT LIST.....	12
B. ROSE GARDEN ENTRANCE BORDER – SPACING & NUMBER OF	
PLANTS	13
FIGURES (SEE LIBRARY)	
1. FINAL DESIGN - BLACK & WHITE	
2. FINAL DESIGN - SPRING COLOR SCHEME	
3. FINAL DESIGN - SUMMER COLOR SCHEME	
4. FINAL DESIGN - FALL COLOR SCHEME	
5. FINAL DESIGN – WINTER INTEREST - COLORED	

INTRODUCTION, THE HISTORY OF THE SITE

Based on the map of the Arboretum from the year 1909 there was only one path that led from the Morris Mansion to the Rose Garden. The Mansion, taken down in the 1960's, stood on the top of the hill where the Two Lines Sculpture currently is located.

Around the year 1983 the main entrance to the Arboretum was changed from the entrance at the Hillcrest Building to the entrance at Northwestern Avenue. The Widener Building was then changed to the Visitor Center with parking at the top of the hill.

Currently there are two paths around which the project area is located. The first path runs from the parking lot and connects with the second path just above the Rose Garden. Part of this path originally connected the Mansion with the Rose Garden. The change of the first path's direction in the lower part and the addition of the steps were both done in 1994. The second path leads from the Widener Education Center and is suitable for disabled visitors to the Morris Arboretum as well as for baby carriages. After they join the path it continues into the Arboretum. These two paths are typically where walks and tours through the Arboretum begin.

Before the current bed was created there was just lawn around the paths. The whole area was much more open and it was easier to see the view from the Mansion to the Rose Garden.

THE NEED TO REDESIGN THE CURRENT FLOWER BED

There are two objectives for this project. The first one is to develop a new design for a mixed border to provide all-season interest and to solve maintenance problems. The second is to create a more welcoming area for the visitors.

The issue of year-round interest is one of the main problems of the current bed. In the past, a few roses (*Rosa* 'Knock Out'), conifers (*Cephalotaxus sinensis*, *Juniperus conferta* 'Blue Lagoon') and deciduous shrubs (*Jasminum floridum* ssp. *giraldii*) were planted in the bed. Tropical plants (*Brugmansia* sp., *Musa* sp.), perennials (*Monarda* sp., *Nepeta faassenii*, *Phlox paniculata*) and annuals (*Verbena bonariensis*) filled the empty spaces among the woody plants.

Although the visitors really liked and admired the tropical plants, the bed provided mostly summer interest. The annuals began to overwhelm the bed in late summer blocking the view and appearing unkempt and untended. After removing the annuals and tropical plants in October there was nothing interesting left for winter and spring display. The few shrubs that remained were not enough to provide interest for the rest of the year. This path is used year-round and is one of the main paths into the Arboretum. Because of this it is essential to choose plant material that will be interesting throughout the year so there will always be something for visitors to admire and to interact with.

One of the main problems associated with the area is the difficulty in mowing the slope. The slope is too steep for using a riding mower so it has to be mowed with a push mower. Using the push mower is hard, the space between the shrubs (*Jasminum* sp.) is hardly accessible and it represents danger both for the working horticulturist and staff or visitors to the Arboretum.

When visitors start their walk through the Arboretum they usually choose either the path from the parking lot or the one from the Widener Education Center. No matter which

path is chosen this bed is one of the first designs they see. The idea of the new design is to catch the eye of the visitor, to invite him or her to discover more of the garden and to offer interest no matter what season of the year.

INITIAL SITE ANALYSIS

Solutions to the problems of the project area could not have been found without previous analysis of the site conditions. These conditions are the soil, light, moisture and the possibility of deer browsing. Addressing these site requirements and choosing the right plants will help in establishment of the garden.

Appropriate plants that tolerate the conditions of the site will be used in the bed. This can be used as an educational tool for visitors to the Morris Arboretum. By seeing plants successfully growing in this particular situation, it will help students think about what to use in their own gardens.

THE SOIL CONDITIONS

The plants will stay in the place for many years. It is therefore important to think about the soil preparations carefully.

Separate soil samples were taken from two different zones in September 2004. The first soil test was taken from the current bed. It was important not to take the soil sample from around the tropical plants because they were fertilized richly and this fact could influence the final result of the test. The second soil test was taken from the area where the lawn is now.

The soil samples were sent to Penn State Agricultural Analytical Services Laboratory for an analysis.

Tab. 1

SOIL NUTRIENT LEVELS	THE CURRENT BED	THE LAWN AREA
Soil pH	Optimum (7.3)	Below optimum (6.8)
Phosphate (P ₂ O ₅)	Above average	Optimum
Potash (KO)	Light optimum	Below optimum
Magnesium (MgO)	Highly above average	Slightly above average
Calcium (CaO)	Highly above average	Highly above average

The recommendation for the current bed is to apply 0.5 lbs per 100 square feet of UREA.

The recommendation for the area previously in turf is to apply 1.5 lbs per 100 square feet of 10-10-10 plus 5 lb/100 square feet of limestone.

THE LIGHT CONDITIONS

Light is one of the essentials for plants. It is the factor that determines the character of the garden and the plants that can be chosen for it. The amount of sunlight on the area is influenced by exposure and also by trees in this location. Shade patterns change as the sun moves during the day.

Plants that are used can be divided into groups according to their light requirements. These are plants for full sun, partial shade and full shade conditions.

In the project area there are three individual beds. Plants for full sun can be used for the two beds that get more than four hours of direct sunlight during the day. During the summer season the area is exposed to direct sunlight from about 8 am until noon and then again later in the afternoon.

The last bed is shaded by evergreens planted behind the deer fence. In this bed it is possible to use plants that grow best in partial shade.

THE TERMS OF MOISTURE

The spring and fall in the Philadelphia area get larger amounts of rainfall and the summer is very hot and dry with high humidity. Because the bed is located on a slope and is exposed to the sun, the soil will dry out faster. There is no irrigation planned for this bed. The selected plants were chosen to be able to grow under these conditions.

THE DEER PROBLEM

The only part of the Arboretum that is protected from deer by a fence is the Rose Garden. The new border will be easily accessible to deer. This means that it is important to choose deer resistant plants. In the case of plants that are more desirable for deer, the location that they are planted in the bed is essential. Desirable deer plants should be planted in the middle of the bed, so the other plants will act as a “fence” around them.

THE NEW DESIGN

The project area offers an interesting site to work with. The slope together with the steps and the intersection of the two paths allows one to think about different “height points” with planting. As the visitor is coming from the parking lot, the bed starts at the same level as the path and begins to slope down on the right side. On the left side, the rock wall begins. Coming to the steps, the bed on the right side starts to be below your eye level while the bed on the left continues to get higher. The visitor is able to be in direct contact with the plants on the rock wall.

There are other possibilities for a successful design - plants right behind the rock wall are elevated closer to the eye level and can be therefore closely admired by visitors to the Arboretum.

The border will not only be visually appealing, it will also appeal to the sense of smell. Lots of plants used in the design are primarily chosen for their fragrance. There are plants that bloom and smell good early in the spring, which is especially welcome and there are aromatic plants that release scent throughout the hot and humid summer days.

There is a bench located at the end of the rock wall. The bed goes down to the same level as the newly joined paths.

The project area contains three individual beds marked as A, B and C on the map. (Fig. 1) In beds A and B plants for full sun may be used. Part C offers the possibility of using plants that can accept partially shady conditions.

During consultations about the height of the bed it was decided that the plants in the two beds, marked as A and B, are not supposed to be more than about 5 to 6 feet tall. It is important to keep the view beyond the bed open, with the Canada hemlock as the focal point. In bed C taller shrubs can be used to hide the deer fence.

The other requirements on the new border design result from the project objectives, which are to:

- develop a new design for a mixed border to provide all-season interest and to solve maintenance problems
- create a more welcoming area for the visitors

THE MAINTENANCE PROBLEM SOLUTION

The observation of the whole area together with practical experiences of the previous mowing of the slope led to a new bed outline therefore the bed was enlarged. The most difficult spots for mowing will now be planted. This allows us to reduce the mowing.

ALL-SEASON INTEREST & WELCOMING AREA FOR THE VISITORS

The key to a successfully designed all-season mixed border is to:

- use a variety of evergreens
- use colored foliage plants
- use different plant forms, textures, leaf shapes etc.
- combine evergreens with deciduous shrubs, bulbs, perennials and ornamental grasses
- provide some flowering plants for every month if possible

Bed A is the largest bed. Beginning on the western side, blue and lavender colors are used. These turn slowly into white followed by yellow. Red dominates the east side of the bed A.

Blue flowering plants are used on the southern side of the steps in bed B making a connection with bed A. Red and yellow also appear in bed B, mostly on the south side close to the main path and are repeated in bed C as a transition between all three parts of the whole border.

The evergreen shrubs selected for bed A are *Cryptomeria japonica* 'Elegans Compacta', with needles that turn purplish in winter and *Ilex x meserveae* 'Heckenfee' and 'Heckenstar' with pyramidal growth form. Female holly, holding red berries, grows in the red section of the bed. The male holly, pollinator for the 'Heckenfee' is placed in the white section. Groundcover *Juniperus horizontalis* 'Wiltonii', low, but wide spreading, creeps a little bit over the rock wall.

Abelia x grandiflora 'John Creech' was chosen because of its white, fragrant flowers. They open in May. The texture of the shrub is fine, the color of flowers and leaves of *Lavandula* sp. looks nice in front of it.

Chaenomeles japonica var. *alpina* is a low shrub with orange-red flowers and blooms in April before the leaves start to grow. Yellow fruit persists on the twigs into late fall. *Chaenomeles* was chosen as a transition element between the yellow and red section.

The *Cotoneaster horizontalis* at the beginning of the rock wall is one of the plants with an absolute all-year interest. It is well known for its branches that grow in an interesting fishbone pattern. This looks beautiful through the whole year and in winter the texture of the shrub is even more apparent. *Cotoneaster* blooms in May/June with abundant small white-pink flowers followed by small bright red fruit in late August through October.

Cotoneaster adpressus, 'Little Gem', is a low growing, 1 ½ foot tall shrub with white, rose-tipped flowers and very fine texture. This one needs attention and gets it, because of the close location next to the bench.

Deutzia gracilis 'Nikko' flowers in May with white flowers. It creates a nice background for *Lavandula* and the foliage turns orange-red in the fall.

Hypericum frondosum 'Sunburst' flowers from May until September. The bark exfoliates during winter. The same cultivar will be planted in bed B. *Hypericum* also appears in the bed C as one of the currently existing plants. The other winter interest is the bright red color of the twigs of *Cornus sericea* 'Cardinal' planted in red section of bed A.

Hydrangea quercifolia 'Pee Wee' is another shrub with multi-seasonal interest. *Hydrangea* has white flowers that persist on the plant, the leaves are nicely shaped, have wonderful fall color and the bark is distinctive in wintertime.

Jasminum floridum ssp. *giraldii* was collected during the expedition to China in 1996. It already grows in the bed and will be moved within the bed. It is a semi-evergreen shrub with fine foliage and black fruit.

Lavandula intermedia 'Provence' grows next to the *Cotoneaster*. It's silvery, fine textured foliage contrasts with the glossy, round leaves of the shrub. *Lavandula* blooms in summer with violet-blue flowers. The whole plant is extremely fragrant and during warm days it's scent is released and fills the air. Located next to the rock wall, this sunny position suits the plant well. Violet-blue flowering *Lavandula intermedia* 'Provence' is joined by white flowering *Lavandula angustifolia* 'Alba'.

Perovskia atriplicifolia has fine textured leaves and flowers. The whole plant is aromatic and its color contrasts with the *Cotoneaster* leaves.

Spiraea japonica 'Golden Princess' is a summer blooming shrub. This one makes a gentle transition between the yellow and red section of the bed. The foliage is golden yellow and the flowers are pink. To repeat the species *Spiraea japonica* 'Little Princess' will be planted in bed C.

Weigela florida 'Rumba' flowers in May in the red section of bed A. It's flowers are dark red with a yellow throat and foliage is purple edged throughout the season.

Ajuga reptans 'Purple Torch' was chosen for the "pink-red" side of the border, blue flowering *Ajuga pyramidalis* for the opposite side. *Allium* 'Purple Sensation' flowers in mid-May with purple-red flowers that will be a focal point.

Artemisia stelleriana 'Silver Brocade' was chosen for its superb, silvery-gray foliage. *Iberis sempervirens* 'Purity' is a white flowering perennial with fine evergreen foliage and scented flowers, excellent for using on the top of the rock wall. It blooms in April together with flowering *Cotoneaster horizontalis* and *Cotoneaster adpressus*.

Behind *Abelia*, two different cultivars of *Iris sibirica* are growing. On the west side is the navy blue cultivar 'Ann Dasch', on the east side bright butter yellow 'Butter and Sugar'. They both bloom in May and define the soft division line between blue and yellow within the bed. The *Iris*' vertical leaves contrast with rounded *Abelia* foliage.

Rudbeckia fulgida 'Goldsturm' looks interesting not only in late summer and early fall when it is flowering but the seed heads persist through the winter.

Sedum 'Autumn Joy' is a long-flowering perennial. The flowers slowly change color from green to light pink and finally dark red. If the seed heads are left in the fall, they will add winter interest to the bed.

Thymus citriodorus 'Aureus Variegatus' is another low perennial with fragrant evergreen foliage. It is a great groundcover with golden-green leaves and fragrant pink flowers appearing in May.

Yucca filamentosa 'Bright Edge' has variegated leaves with fine filaments at their margins. *Yucca* bears spikes of large creamy bell-shaped flowers in July and the leaves look interesting through the whole year.

Two cultivars of *Pennisetum alupecuroides* - 'Hameln' and 'Cassian' are added to the design to achieve a more naturalistic look and graceful habit to the border. Their height also helps add structure in the bed. They look decorative and interesting until late winter.

Bulbs are used for their bright spring color when the other plants, except conifers, are still dormant. Both *Iris reticulata* 'Pixie' and *Narcissus* cvs. (*N. jonquilla simplex*, *N. canalicatus* and *N. tazetta* 'Golden Dawn') are pleasantly fragrant. Miniature *Iris* and *Narcissus* are planted on the top of the rock wall.

The second bed, labeled as bed B, is located between the steps and the path from Widener Education Center. Some of the plants in this bed are also used in bed A to link these two together. These are *Hydrangea quercifolia* 'Pee Wee', *Hypericum frondosum* 'Sunburst', *Lavandula* cvs., *Ajuga reptans* 'Purple Torch', *Artemisia stelleriana* 'Silver Brocade', *Sedum* 'Autumn Joy', *Rudbeckia fulgida* 'Goldsturm' and *Pennisetum alupecuroides* 'Cassian'.

Lavandula is planted next to the steps to connect the two beds and create a fragrant walk during its blooming season.

Evergreens in bed B are represented by *Buxus sinica* var. *insularis* 'Justin Brouwers' and *Sciadopytis verticillata* 'Jim Cross', a unique Japanese umbrella tree cultivar named in honor of the late Long Island nurseryman. This slowly growing dense cultivar will be the only one planted in the Morris Arboretum.

Syringa 'Tinkerbelle', cross between *S. meyeri* 'Pallida' and *S. microphylla* 'Superba', has wine/red spicy fragrant flowers and thick dark green leaves. *Salvia sylvestris* 'May Night' is one of the dark purple flowering perennials. It will flower together with the *Syringa*.

Stephanandra incise 'Crispa' is a shrub with an interesting texture together with fine nicely shaped leaves and small white flowers. It is a slow grower and great groundcover.

In bed C, next to the deer fence, three *Ilex aquipernyi* trees are present together with *Buxus* cvs. One of the *Buxus* shrubs will be moved to bed B, the other two stay in the bed C. *Picea glehnii* is of the existing plants in bed C. It forms a narrow cone-shaped crown covered with blue-green foliage and terminates the bed at the south side.

Two tall *Viburnum* shrubs are used to help hide the deer fence. They are *Viburnum x pragense*, an evergreen *Viburnum* with glossy foliage and creamy white flowers and *Viburnum cassinioides*, a native *Viburnum* with June flowers and late summer fruits. The fruits mature from a green color that changes to pink, blue and finally turns black. This is especially lovely when all the colors are displayed simultaneously on clusters.

Osmunda cinnamomea is a fern planted in the shade of *Picea* tree and *Viburnum* shrubs. *Pennisetum alupecuroides* 'Hameln' grows behind *Ajuga pyramidalis*. Flowering *Geranium sanguineum* 'Alpenglow' and *Epimedium warleyense* catch the eyes of the visitors during the season. *Spiraea japonica* 'Little Princess' is similar to the *Spiraea* used in bed A but without colored foliage. *Sedum* 'Autumn Joy' is repeated in the bed A and bed B.

CONCLUSION

The new design for a multi-seasonal mixed border will solve problems connected with this area. The Rose Garden Entrance Border needed a change. The prominent location of the bed called for multiple-season interest and the steep slope caused maintenance problems. The new outline enlarges the current bed and eliminates the maintenance difficulties of mowing.

A variety of evergreen shrubs and multi-season interest deciduous shrubs are chosen to provide year round interest. Bulbs are added for early spring effect and perennials provide both bright colors and foliage with interesting textures. Ornamental grasses used in the design act as a transition element and link the border with other gardens in the Arboretum. There will be interesting plants to look at throughout the year and visitors will have a chance to enjoy the all-year design located close to the Widener Education Center on the main path into the Arboretum.

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CATALOGUES

Babikow 2003

Beauty from Bulbs, Fall 2004

Blue Sterling Nursery 2003

Fairweather Gardens, Spring 2005

Roots & Rhizomes 2005

Russell 2005

Star Plants 2005

White Flower Farm, Spring 1998

APPENDICES

A - Rose Garden Entrance Border Plant List

B - Rose Garden Entrance Spacing and Number of Plants

LATIN NAME		CULTIVAR	SPACING	NUMBER OF PLANTS	
1	<i>Abelia</i>	<i>x grandiflora</i>	'John Creech'	36"	4
2	<i>Buxus</i>	<i>sinica</i> var. <i>insularis</i>	'Justin Brouwers'	-	1
3	<i>Buxus</i>	<i>microphylla</i> var. <i>japonica</i>	'Green Beauty'	30"	2
4	<i>Caryopteris</i>	<i>x clandonensis</i>	'Snow Fairy'	30"	3
5	<i>Chaenomeles</i>	<i>japonica</i>	var. <i>alpina</i>	24"	2
6	<i>Cornus</i>	<i>sericea</i>	'Cardinal'	36"	4
7	<i>Cotoneaster</i>	<i>horizontalis</i>		36"	3
8	<i>Cotoneaster</i>	<i>adpressus</i>	'Little Gem'	24"	2
9	<i>Cryptomeria</i>	<i>japonica</i>	'Elegans Compacta'	-	1
10	<i>Deutzia</i>	<i>gracilis</i>	'Nikko'	30"	3
11	<i>Hydrangea</i>	<i>quercifolia</i>	'Pee Wee'	36"	10
12	<i>Hypericum</i>	<i>frondosum</i>	'Sunburst'	24"	12
13	<i>Ilex</i>	<i>x meserveae</i>	'Heckenfee'	-	1
14	<i>Ilex</i>	<i>x meserveae</i>	'Heckenstar'	-	1
15	<i>Jasminum</i>	<i>floridum</i>	ssp. <i>giraldii</i>	30"	4
16	<i>Juniperus</i>	<i>horizontalis</i>	'Wiltonii'	24"	3
17	<i>Sciadopytis</i>	<i>verticillata</i>	'Jim Cross'	-	1
18	<i>Spiraea</i>	<i>japonica</i>	'Golden Princess'	24"	6
19	<i>Spiraea</i>	<i>japonica</i>	'Little Princess'	24"	7
20	<i>Stephanandra</i>	<i>incisa</i>	'Crispa'	36"	3
21	<i>Syringa</i>	<i>x</i>	'Tinkerbelle'	4'	3
22	<i>Viburnum</i>	<i>cassinoides</i>		4'	3
23	<i>Viburnum</i>	<i>x pragense</i>		6'	3
24	<i>Weigela</i>	<i>florida</i>	'Rumba'	36"	5
25	<i>Ajuga</i>	<i>reptans</i>	'Purple Torch'	12"	14
25a	<i>Ajuga</i>	<i>pyramidalis</i>		12"	16
26	<i>Allium</i>		'Purple Sensation'	12"	4
27	<i>Artemisia</i>	<i>stelleriana</i>	'Silver Brocade'	12"	13
28	<i>Gaillardia</i>	<i>aristata</i>	'Burgunder'	18"	13
29	<i>Geranium</i>	<i>sanguineum</i>	'Alpenglow'	12-18"	9
30	<i>Epimedium</i>	<i>warleyense</i>		18"	15
31	<i>Iberis</i>	<i>sempervirens</i>	'Purity'	12"	7
32	<i>Iris</i>	<i>sibirica</i>	'Ann Dasch'	18"	7
33	<i>Iris</i>	<i>sibirica</i>	'Butter and Sugar'	18"	7
34	<i>Lavandula</i>	<i>intermedia</i>	'Provence'	12"	15
35	<i>Lavandula</i>	<i>angustifolia</i>	'Alba'	12"	5

36	<i>Perovskia</i>	<i>atriplicifolia</i>	'Little Spire'	24"	4
37	<i>Rudbeckia</i>	<i>fulgida</i>	'Goldsturm'	18"	17
38	<i>Salvia</i>	<i>x sylvestris</i>	'May Night'	18"	9
39	<i>Sedum</i>		'Autumn Joy'	18"	19
40	<i>Thymus</i>	<i>citriodorus</i>	'Auerus Variegatus'	12"	8
41	<i>Yucca</i>	<i>filamentosa</i>	'Bright Edge'	30"	3
43	<i>Muehlenbergia</i>	<i>capillaris</i>		24"	5
44	<i>Osmunda</i>	<i>cinnamomea</i>		24"	12
45	<i>Pennisetum</i>	<i>alupecuroides</i>	'Hameln'	24"	15
46	<i>Pennisetum</i>	<i>alupecuroides</i>	'Cassian'	24"	11