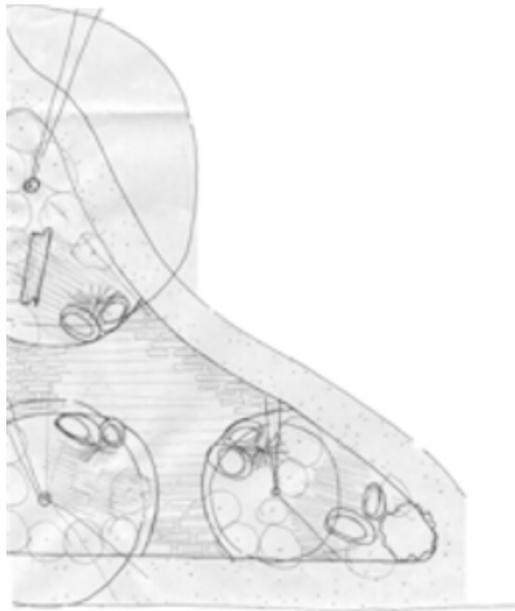


# Garfield High School Plant Installation and Management Project Spring 1999



## The Triangle Site

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# **Management Plan for the Triangle Site at Garfield High School**

## The Site

The triangle site is a small planting area on the southeast side of Garfield High School. The site is surrounded by sidewalks and is adjacent to the Garfield track, a street, and a driveway leading to a parking lot. The street, which is positioned on the triangle's southern side, is most heavily used before and after school when students pass through on their way to and from school buses. The driveway is regularly used by both pedestrians and cars. Large deliveries and dumpster exchanges occur here, as well.

Before the renovation of the site, the landscape consisted of three trees and a few scattered shrubs. The space had patches of sickly turf in-between these plantings, indicating grass likely was planted there at some point. No seating, lighting, or paving existed before construction. An old irrigation system was found, indicating the site's intended value as a green space.

Unlike the intended function of the triangle site, the current use is primarily for circulation. The first visit to the space revealed three main social paths. These paths indicated the main flow and direction of the site's circulation. Before the triangle site redesign, the area had extremely compacted soil, poorly pruned shrubs, weeds, and turf grass. Due to heavy foot traffic, much of the site's topsoil eroded away, resulting in exposed tree roots. Trash littered the surface of the area and collected in and around the few existing shrubs.

## State of Existing Plants and Soil

### Trees

There are two tree species on the triangle site, a cultivar of *Acer platanoides* (Norway maple) in the southeast corner and two *Quercus coccinea* (scarlet oak) on the west side. All three specimens are valuable in providing established vegetation. Aesthetically they add an attractive vertical dimension to the triangle and help to create a sense of space by blocking out some of the buildings and streetscape. Functionally, they will compete with the new plantings for water and nutrients, but plants were selected with this in mind. On the other hand, the trees do provide filtered light, which should serve to reduce water loss, yet still allow adequate sunlight to reach plants below the trees. Additionally, the trees' seasonal leaf drop will act as natural mulch for the landscape.

In order to maximize health, longevity and safety, the oak trees need some corrective pruning. They have moderate problems that could soon develop into hazards. Essentially, the two specimens are plagued by the same symptoms. Thus, one could reasonably assume that the problems are due to the site and species. The harsh site conditions probably compromised the vigor of the trees, increasing their susceptibility to breaks and injury.

The Norway maple is in better condition than the oaks, and the site conditions should be improved enough by our intervention to prevent it from being permanently harmed. The only signs of damage were some exposed surface roots and fairly prominent trunk cankers. The foliage and scaffolding are very healthy, and it does not seem that tree vigor has been impaired yet. The tree has co-dominant leaders, but the attachments are good. The best course of action for this tree is to improve its health

through better site conditions. Since this species is said to be very adaptable, tolerating many soil and environmental conditions and having a “voracious root system deep down” (Sunset 95), it should continue to do well here.

### Shrubs

The shrubs on the triangle site are *Cotoneaster* species. Their health is fairly strong and they have value as large established vegetation. Their form was a bit wild with a fountain of branches sticking out crookedly, so some selective thinning cuts were made to improve their shape and provide more space for planting beneath them. Any dead wood was also removed. The cotoneasters are well suited for the site because of their ability to withstand very tough conditions (Sunset 95), including drought, neglect and compaction.

### Soil Condition

The soil in the triangle area is extremely compacted for several reasons. First, the site is next to a sidewalk and small path. People tend not to take the long way around the southwest corner of the triangle, preferring to take short cuts through the site between the trees and shrubs. In addition to the foot traffic, the limited street parking sometime propels people to park on or drive through the area.

The site’s soil was so compacted that water had a hard time filtering into even the top layer of the soil. A slight slope further contributed to drainage problems, causing water to run off the site rather than infiltrate the soil. Non-functioning sprinkler heads were found on the site, indicating it may have received regular irrigation in the past, but doesn’t now.

## Climate Factors

The triangle site is southeast facing with a tall building on the west side. Therefore, the site may not be exposed to late afternoon sun. Since the site faces south to a road and north to an open play field, wind might become a problem for plants in the site, especially during winter storms. With the potential wind stress, the site might be slightly cooler than surrounding areas. The site is drier than some nearby areas because bare, compacted soil has a limited ability to trap and hold water.

## Site Preparation

### Removing Grass

On the less trampled sections of the triangle, much grass still existed. Prior to mulching, we removed as much of the grass as possible. Since we couldn't remove all the turf, continued weeding will be required.

### Soil Aeration

Due to the severe compaction of the soil in the triangle area it was necessary to try to alleviate compaction where possible. Tilling or cultivating the soil were not good options because these practices would cause extensive damage to the roots of the existing trees and shrubs while also bringing weed seeds to the soil surface. Two methods of aeration were attempted in this area: spike shoes that had small nails on the bottom, and a hand tool that had two spikes on the end which were stuck into the ground and turned to slightly break up the soil. Unfortunately, these attempts were unsuccessful because of the soil's extreme compaction. The application of mulch should help alleviate the soil compaction over time.

## Restoration Pruning

It was determined that the three existing cotoneasters were worth keeping and incorporating into the design. These shrubs needed pruning in order to improve their health, structural strength, and aesthetics. Leggy, structurally unsound and mal-pruned branches were removed from all three of the shrubs.

## Mulching and Designation of Pathways

After grass removal and aeration were attempted it was necessary to mulch the designated pathways. The design plan called for mulch paths that would span the triangle. In order to achieve the desired effect it was necessary to lower the soil level around the site's perimeter. This allowed us to place a thick layer of mulch flush with the surrounding sidewalks, while also minimizing spillage onto the sidewalks. This lowering was accomplished by removing the top three inches of soil from the outer five-inch perimeter of the triangle. The soil that was removed was used to mound around the existing sprinkler heads to insure that they would not emerge through the mulch and prove to be a hazard. Mulch was then spread to a depth of five-inches throughout the site. No mulch was placed within six inches of existing tree trunks or where plants were to be installed.

## Addition of Soil

Due to the compacted nature of the existing soil and to the fact that the design plan called for bermed plantings, it was necessary to add soil to the designated planting areas. Eight yards of soil were added to the five designated planting areas to an approximate six-inch thickness. Bermed areas were mounded to a depth of 10-inches using the soil donated by Seattle Public Schools.

## Laying Boulders

To provide seating, twenty boulders were placed throughout the site, positioned in accordance with the design scheme. Boulders that were large enough to seat one person and which had flat tops were chosen. Three inches of gravel were placed under each boulder to hold it in place and to prevent the possibility of rodents burrowing underneath.

## Plant Selection

When selecting plants for the site, many factors were taken into consideration. The most important factors were existing site conditions. Given the high foot traffic and low maintenance hours, the site requires plants that are extremely tough and that can grow well in an area with minimal care. The amount of sunlight, rainfall, and irrigation are other factors that were taken into consideration when we chose plants. Since the area receives partial morning sunlight but moderate afternoon shade, we chose plants that could tolerate at least partial shade. Since the site experiences dry summers and receives minimal irrigation, drought-tolerant plants were installed.

After hearing the concerns of the school district representatives and conferring among the group members, we felt that using a mix of native and non-native plants would suit the design theme of the area. While we considered using only natives, we realized this wasn't the best choice given the highly modified conditions present at this site.

Most of the plants chosen were evergreen so that the plant effect could be maintained all year around. Selected plants include Oregon grape (*Berberis nervosa*), sword fern (*Polystichum munitum*), salal (*Gaultheria shallon*), and many ornamental grasses. *Berberis nervosa* was chosen because it is a native plant that can tolerate both sun and shade and is drought tolerant. *Polystichum munitum* is another native plant that

can withstand both shady and dry conditions, is extremely tough, and can tolerate neglect once established. Grasses chosen included American dune grass (*Elymus glaucus*), a tall plant that prefers full sun, Japanese sweet grass (*Acorus gramineus*), a variegated plant that can tolerate drier conditions; blue fescue (*Festuca glauca*), a gray-blue plant that can tolerate compacted soil; and the drought-tolerant blue-eyed grass (*Sisyrinchium bellum*).

### Installation

Plants were first laid on top of their prospective planting locations. For each plant, a hole slightly wider, but no deeper, than the container was dug. Plants were removed from their pots and the root balls were examined for root problems. Dead or diseased roots were removed and circling roots were broken up. The plants were then placed in their holes, which were backfilled with unamended soil. Each plant was thoroughly watered immediately after planting. After all of the plants were in a given bed, mulch was placed around the plants to a depth of about one and a half inches.

### Long-term Site Management

In order to ensure the continued success of the plants, the site must be well-managed and maintained. Proper management practices, as outlined in Table 1, will help to keep the site safe, healthy, and aesthetically pleasing for years to come.

**Table 1: Management Activities**

ACTIVITY	YEAR 1	YEARS 2-3	YEARS 4-5
WATER	Every other day	Twice a week	As needed
PRUNE*	Only dead, damaged, or diseased branches	As needed for plant health and safety	As needed for plant health and safety
FERTILIZE	As needed-apply only limiting nutrients	As needed	As needed
WEED REMOVAL	Weekly	2 times/month	Monthly
INSPECT FOR PEST/DISEASE DAMAGE	Quarterly; professional should treat as needed	Quarterly; treat as needed	Quarterly; treat as needed
MULCH	Apply 2-3" layer	Maintain 2-3" layer	Maintain 2-3" layer
GENERAL MAINTENANCE	Annual site inspection; remove trash; sweep mulch from sidewalk	Annual site inspection; remove trash; sweep mulch from sidewalk	Annual site inspection; remove trash; sweep mulch from sidewalk
PLANT REMOVAL OR REPLACEMENT	As needed; plant in fall	As needed; plant in fall	As needed; plant in fall

\*A trained professional should perform any pruning to ensure that the timing is correct and the plants are not harmed; no more than 25% of the canopy should be removed in one year.

## REFERENCES

A to Z Encyclopedia of Gardening Plants. The American Horticultural Society, 1997

Encyclopedia of Gardening. The American Horticultural Society, 1993

Western Garden Book. Sunset Publishing, 1995