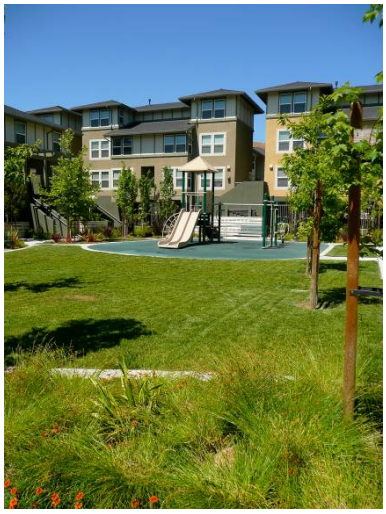
# Bay-Friendly
# RATING MANUAL
## For Civic and Commercial Landscapes

Version 1.0, March 2009



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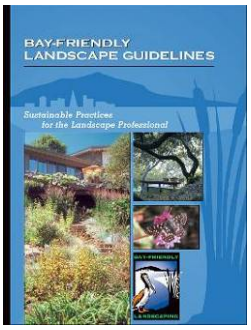
# INTRODUCTION

The Bay-Friendly Rating Manual is an essential tool to successfully implement the Bay-Friendly Scorecard for Civic and Commercial Landscapes. It is written for landscape design and construction professionals and Bay-Friendly Raters, as a guide in describing and verifying the practices in the Scorecard. The manual is geared to assist a Project Team in achieving a Bay-Friendly Rated Landscape.

Bay-Friendly Landscaping & Gardening is a whole systems approach to the design, construction and maintenance of landscapes that contributes to the health of the San Francisco Bay Watershed.

There are 7 Principles of Bay-Friendly Landscaping that provide the environmental lens that built landscapes intersect, these are:

1. Landscape Locally
2. Landscape for Less to the Landfill
3. Nurture the Soil
4. Conserve Water
5. Conserve Energy
6. Protect Water & Air Quality
7. Create Wildlife Habitat




The 7 Principles and practices of Bay-Friendly are fully defined in the companion publication, the Bay-Friendly Landscape Guidelines which can be downloaded at www.BayFriendly.org.

StopWaste.Org in Alameda County developed this manual and the Bay-Friendly Landscape Scorecard, and Guidelines as a method to create a common understanding, a standard for sustainable landscaping among landscape professional, home and property owners and public agencies.

Most cities in Alameda County require that new or renovated public landscapes be built to this standard using the Bay-Friendly Civic and Commercial Landscape Scorecard.

**BENEFIT OF A BAY-FRIENDLY RATED LANDSCAPE**

What if our built landscapes actually contributed to the health of our watershed and reduced green house gasses? What if they helped recharge the ground water, filter and break down pollutants through the action of healthy soil biota? What if they provided habitat for migrating birds and beneficial insects and reptiles? And what if they do all of this consuming a fraction of the water, energy, fertilizers and materials of a conventional landscape? That is what a Bay-Friendly Landscape sets out to do – to raise the bar, to provide guideposts and green our standard landscape practices.

**Environment --** First and foremost, a Bay-Friendly Landscape is a benefit to the environment. Bay-Friendly Rated Landscapes consume significantly less water by creating drought resistant soils, choosing low water using plants and using efficient irrigation systems. They reduce green house gasses by reducing the need for mowing, blowing and shearing and by reducing the amount of plant debris landfilled and the amount of synthetic chemicals consumed and through the used of recycled, local materials. They reduce stormwater runoff and pollution and use materials more efficiently. Most Bay-Friendly practices have multiple environmental benefits.

**Supports Compliance –** Bay-Friendly Rated landscapes can support compliance with other environmental rating systems or local, state or federal requirements. For example, Bay-Friendly Rated Landscape has been recognized as an innovation credit in LEED (Leadership in Energy and Environmental Design) projects, they have earned additional points for multi-family projects that are

Green Point Rated, they have some of the same practices mandated by some water agencies for new hook-ups or in the State of California's Model Water Efficiency Landscape Ordinance. In addition, other Bay-Friendly practices assist with the federally required stormwater measures and others with local requirement on construction and demolition debris recycling goals. Bay-Friendly's holistic approach means that your Project Team is often one step ahead with complying with a whole spectrum of environmental mandates.

**Recognition –** A Bay-Friendly Rated Landscape brings recognition to your project and Project Team that this landscape has met an established environmental standard.

**Consumer Assurance** -- A Bay-Friendly Rated landscape provides the consumer an assurance that a standard has been met because it has be verified by a third party. The Bay-Friendly Rated label is an important method to achieve consumer recognition.
Currently, StopWaste.Org is the certifying body in Alameda County for public projects however the Bay-Friendly Landscaping & Gardening Coalition is seeking funding and support to provide this service regionally.

**Competitive Edge –** A Bay-Friendly Rated Landscape can provide a competitive edge in the market place because it achieves a higher environmental standard, saving more resources and money over most conventional landscapes. You can market to your clients the benefits of a Bay-Friendly Rated Landscape such as reducing water bills, requiring less labor to mow or shear, and a healthier landscape through the use of less or non-toxic pest control and natural fertilizers.

**WHAT IS A BAY-FRIENDLY RATED LANDSCAPE?**

A Bay-Friendly Rated Landscape is one where the Project Team, including the developer, landscape design professional, general contractor and landscape contractor are all working together to achieve clearly understood Bay-Friendly goals, that were set early in the design process and that are verified by a third party, a "Bay-Friendly Rater".

The Bay-Friendly Scorecard for Civic and Commercial Landscapes has 9 required practices and has a total of 215 points. The 9 required practices do not contribute to earning points but all 9 must be met in order for the project to be Bay-Friendly. In addition, a minimum of 60 points must be earned to be considered a Bay-Friendly Rated Landscape. It is not possible to earn all 215 points in any given project as some points are conflicting such as points earned for no lawn and points earned for grasscycling.

| Low Score | Medium Score | High Score |
|---|---|---|
| **60-74** | **75-89** | **90+** |

In general, achieving a low score and all of the 9 required practices is quite readily done, especially if Bay-Friendly goals are set early in the project. It is recommended that if a low score is your goal, then set out to achieve at least 65 or 67 points to insure that even if several points are lost in the process, the landscape still qualifies as Bay-Friendly. Achieving a medium and especially a high score can be increasingly difficult depending upon the site constraints and opportunities, budget constraints, or functions of the landscape and the knowledge/experience of the Project Team in implementing Bay-Friendly practices.

## WHEN TO USE THE BAY-FRIENDLY RATING SYSTEM

Bay-Friendly Rated Landscapes have been successfully built in Alameda County on projects such as parks and street medians as well as landscapes around fire stations, senior centers, a college campus, a shopping center, libraries and other civic buildings. The Bay-Friendly Scorecard for Civic and Commercial Landscapes has also been used to rate multifamily projects. For a brief description of some of the landscapes that have been successfully designed and built to Bay-Friendly standards, visit www.bayfriendly.org.

Bay-Friendly practices have been successfully included in smaller projects such as in planters or projects under 2,500 square feet but achieving a Bay-Friendly Rated Landscape is often more difficult as a significant number of Bay-Friendly practices/points would not be applicable or cost-effective. However, for the vast majority of civic, commercial and multifamily residential projects of 2,500 square feet or greater, a Bay-Friendly Rated Landscape makes sense.

The adoption of as many Bay-Friendly practices as practical is encouraged in every new or renovated landscape project.

## COST OF THE BAY-FRIENDLY RATING SYSTEM

Initially, one of the greatest costs of the Bay-Friendly Rated Landscape can be the learning curve of the Project Team. This Rating Manual is designed to make this process transparent to the entire Project Team and to streamline communication both internally, within the team, and with the Bay-Friendly Rater and reduce the cost of the learning curve. Once landscape professionals have experience and/or training in Bay-Friendly that cost is greatly reduced as Bay-Friendly practices become the new standard for creating a landscape.

There are Bay-Friendly Training and Qualification opportunities for Design, Construction and Maintenance Landscape Professionals. A developer can cut costs by selecting professionals with Bay-Friendly Qualification and experience and by giving a priority for these attributes in a bid document.

As for costs of practices, the scorecard provides flexibility to meet any budget. The minimum requirements can be met with little or no additional costs. Selecting low-water using plants, for example, is no more expensive than water loving plants; compost can be specified at comparable prices of other types of soil amendments, etc. As a project tries to achieve a higher score, costs can go up as more expensive practices are implemented. Pervious concrete is more expensive than impervious but that expense can sometimes be off-set if it replaces other more expensive stormwater drain or filter systems. A Bay-Friendly Rated Landscape is cost competitive –especially when the long term savings of lower resources consumption over the life of the landscape is considered.

# WHAT YOU WILL FIND IN THE BFL RATING MANUAL

The Rating Manual follows the same organization and numbering as the BF Scorecard for Civic and Commercial Landscapes with practices grouped to mimic the design and construction process:

Section A: Site Planning
Section B: Stormwater and Site Drainage
Section C: Earthwork and Soil Health
Section D: Materials
Section E: Planting
Section F: Irrigation
Section G Maintenance
Section H: Innovation

Points are awarded according to the 7 Principles of Bay-Friendly Landscaping and are indicated in both the Scorecard and the Rater Verification Manual.

This graphic indicates 3 pieces of information:

- Which credit (practice) on the scorecard is being defined,
- What Bay-Friendly Principle the points are being earned under and the amount of points
- Where this practice can be found in the Bay-Friendly Landscape Guidelines

**Credit A.2**

| Possible Points: | | | | | | |
|---|---|---|---|---|---|---|
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| 5 | | | | | | |

**Corresponds to BFL Guidelines Practice 1.4**

In addition each practice usually contains the following segments: Practice description, Project Team. Recommendations, Verification, Synergies and Tradeoffs, Resources and Bay-Friendly Tools. Project Team Recommendations are best practices gleaned from implementing this practice in numerous landscape projects in Alameda County. Verification is described thoroughly, later in this section. Synergies and Trade-offs indicates how implementing this practice can contribute towards or compete with earning other Bay-Friendly credits. Resources and Bay-Friendly Tools refer to support information that is not in this manual but is available on our website www.BayFriendly.org or in the website indicated. This information includes:

- A Bay-Friendly plant template to track BF information such as water requirements of each plant, and plant spacing as well as mature size of plant.
- Or sample Bay-Friendly plant list for lawn alternatives, natural hedges or plants for swales.
- Sample specification language for many Bay-Friendly practices as well as a model maintenance specification,
- Case studies and more.

# HOW TO USE THIS MANUAL

The manual should be used by both the Project Team and the Bay-Friendly Rater. In the early stages of a landscape project, the Project Team should review the scorecard, select the likely Bay-Friendly practices to be met, insure that all required practices will be met. The team should think holistically, if a practice is not on the scorecard but would make sense to do, then implement it anyway. It could potentially earn credits under the Innovation Section. Conversely, if a practice is on the scorecard but does not make sense to do then, avoid it. For example, if the project does not need outdoor lighting, then don't install some just to earn Bay-Friendly points for efficient lighting.

As you select different practices, use this manual to fully understand the Bay-Friendly practice as the BF Scorecard does not have the space to fully define each practice. In order to earn the points for any given practice it must match the description and verification requirements that are defined in the Rating Manual. Once the Bay-Friendly practice is understood, evaluate whether or not it makes sense for your project.

**PROJECT TEAM** –There are notes to the Project Team in each Bay-Friendly credit. The information is focused on best practices on implementation of that measure and what you will need to supply the Bay-Friendly Rater in order to verify that it has been implemented. Be sure to bring your Bay-Friendly Rater on board early in the process and set up clear points in the project timeline when communication is essential.

**BAY-FRIENDLY RATER** – Both you and the Project Team should rely on the Rating Manual's definitions of each Bay-Friendly practice. Each practice earning points for this project will need to be verified according to this Rating Manual. Your role is to verify Bay-Friendly practice implementation. Depending on the experience of the Project Team you can also be source of support for implementation. Be sure to clear about goals, communication and documentation needs.

**VERFICATION BASICS**

The Bay-Friendly Rated program is designed to rely on the submittal and review of project plans, planting notes and specifications or worksheets required by the local cities such as those that conform to water efficient landscape ordinances. These documents should all be a part of the standard design process. For many of the credits, an appropriate signature on the "Accountability Form" is required and intended to be an easy to implement approach to ensure the practices have been implemented as per the Practice Description. For some of the credits, verification also requires a site visit and visual verification by the Bay-Friendly Rater. Additional documentation is required only on those measures where project plans or on-site observations are not sufficient to verify compliance with a measure.

The three verification procedures are:

1. Submittal Review
2. Inspection
3. Documentation

Many combinations of inspection, documentation and plan check are required for compliance. Some BFL practices will require physical inspection or on-site observance to verify compliance. Others require documentation in the form of product data sheets, invoices, receipts, calculation worksheets, a signed Accountability Form from a key member of the Project Team, photographs or other paperwork. Some areas of BFL such as site and structural elements can be verified during plan check. Recycled content of materials, requires a product sheet, where achieving water budget will need submittals of a worksheet. Finally, some areas such as application and depth of mulch will be typically verified by a site inspection. Every effort has been made to streamline the process, while at the same time safeguarding the integrity of the Bay-Friendly Rating. Each verification method is described below.

**SUBMITTAL REVIEW**

Reviewing a set of project plans can sometimes provide proof of compliance for a BFL practice. The term "plans" in this case is taken to represent plans (blueprints) along with other supporting documentation like specifications and planting notes. For measures that call for Plan Review, sets of drawings must be must be at least from the 100% Construction Documents (CDs) phase. Earlier sets of plans or specifications, such as Design Documents or 50% CDs are NOT eligible as proof of verifications since plans, since plans in these earlier phases tend to change, unless it is specifically stated in the Verification section for a practice that such plans are acceptable. "Plans" can also include worksheets that must be completed and submitted to the local agency to demonstrate that the project meets the adopted Water Efficient Landscape Ordinance.

However, even though earlier plans won't meet the compliance for verification, it can be prudent to share some of these early plans with the Bay-Friendly Rater. This insures that if changes need to occur in the plans in order to meet compliance, then it can happen before the bid process and can avoid costly "change orders". It is recommended that you designate your Bay-Friendly Rater early in the design process not at the end of CDs, and determine how to streamline this key communication. It is recommended that at least one meeting occurs with the Bay-Friendly Rater and the Project Team during the design phase.

**INSPECTION**

Usually one site inspection, at post construction, is necessary to prove compliance with numerous practices. However there may be times where an earlier visit during the "rough" phase may be valuable. An example of this was for an innovation credit where forms were being used under sidewalks instead of structural soil to allow for tree root growth. Examples of post-construction verification practices are: confirming that the weather based irrigation controller specified is installed, verifying that recycled content materials such as fencing or site furnishings were used, verifying that turf was installed as planned with no sprinkler heads in sections less than 8 feet wide, etc. For all site visits, take photographs of each practice being verified, they provide backup if the practice is audited.

**DOCUMENTATION**

In some cases the information needed to verify compliance cannot be found on project plans or through observation in the field. In such instances, documentation is necessary to claim compliance with the measure. Documentation ca take numerous forms, form copies of product literature, information sheets, (cut-sheets), to copies of Owners Manuals or other written procedural plans, to a signed "Accountability Form". An Accountability Form is intended to reduce the paperwork burden by allowing some responsible for the particular BF measure to sign-off that the measure has been followed or implemented. The individual signing the Accountability Form must be the person specified for each practice, such as the owner, landscape architect, developer, landscape construction contractor, or other designated professional. While an Accountability Form may streamline the verification process, the person signing the forms must be prepared to show proof of compliance if the measure is audited.

**AUDITS**

In case of a quality assurance audit, Raters must retain backup documentation or other means adequate to defend a position on any specific measure. In the case of Plan Review measures, this is likely to be selected sheets from a set of 100% CDs (or later) and specifications. For inspection measures (Rough and Final), the Rater must provide photographs of each measure. For Documentation keep a copy of any backup calculations, signed forms or other means of documentation that helps defend a measure.

# A NOTE ON CHANGES

Bay-Friendly Landscaping program at StopWaste.Org welcomes feedback and corrections in order to improve future editions of the document. Submit comments to Chavstad@stopwaste.org and or teade@stopwaste.org.

# DISCLAIMER

The Bay-Friendly practices and compliance protocols contained in this document are provided for consideration by landscape professionals in the course of designing, constructing and maintaining new civic, commercial and multi-family residential landscapes. The information is presented as a public service by StopWaste.Org, otherwise known as the Alameda County Waste Management Authority and Source Reduction and Recycling Board, to support environmental benefits and reduce costs. The practices and compliance protocols are strictly for use on a voluntary basis. They represent best practices for sustainable landscaping and are not a substitute for sound judgment. StopWaste.Org assumes no legal liability for the effects of proper or improper implementation of these measures.

# THE BAY-FRIENDLY LANDCAPING & GARDENING COALITION

The Bay-Friendly Landscaping & Gardening Coalition is an alliance of stakeholders representing public agencies, utilities, non-profits, landscape professionals and associations and businesses from around the San Francisco Bay Area. The Coalition allows for a consistent application of a regional Bay-Friendly standard in sustainable landscaping and gardening and provides a complete package of educational and outreach tools for home gardeners, landscape design and maintenance professionals, as well as local governments. Memberships and sponsorships in the Coalition are encouraged in order to leverage local resources and to receive recognition and discounts to Bay-Friendly trainings and events. Visit www.BayFriendlycoalition.org for more information.

# A. SITE PLANNING

## 1. SELECT AND EVALUATE THE SITE CAREFULLY

| Credit A.1 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| 11 | | | | | | |
| Corresponds to BFL Guidelines Practice 1.1 | | | | | | |

### a. Submit the completed Bay-Friendly Site Analysis Form before completion of 100% design development documents.

**POINTS: 5**

**PRACTICE DESCRIPTION**

Complete the Bay-Friendly Landscape Site Analysis to assess climate, vegetation, topography, hydrology and previous use. The site analysis form prompts fifteen key indicators to be included on a site map such as solar exposures, prevailing winds, micro climates, areas of seasonal flooding and how storm water moves across the site and more. Both the form and site map need to be submitted. This measure is meant to insure a through analysis is conducted early in the design process to document the natural site features that should inform the project design.

**PROJECT TEAM RECOMMENDATIONS**

- Maximum benefit to the planning process is gained by completing the site analysis before 100% design documents and using the site analysis to inform the building and landscape design such building orientation and placement, storm water measures, plant choice, tree and habitat protection, firescaping and more.
- Ideally, the entire PROJECT TEAM would have a copy of the site analysis to inform project decisions throughout the development of the project and during the maintenance once constructed. Construction and maintenance costs can be reduced if the site works in harmony with natural features instead of against them.

**VERIFICATION**

*PROJECT TEAM*

- Submit written Bay-Friendly site analysis form and site map before 100% design documents are completed.

*RATER*

- Verify Bay-Friendly site analysis form and site map (that indicates key natural features as indicated on the site analysis form) is completed.

***The site*** *is the area within the legal boundaries of a property and encompasses all areas of the property including constructed areas and non-constructed areas. It is the same as the property area. (*USGBC LEED, *New Construction & Major Renovation v2.2,* September 2006*)*

***Urban growth boundar****y is an officially adopted and mapped line dividing land to be developed from land to be protected for natural or rural uses. Urban growth boundaries (also called urban limit lines) are regulatory tools often designated for long periods of time (20 or more years) to provide greater certainty for both development and conservation goals. (*Governor's Office of Planning and Research, *State of California General Plan Guidelines,* 2003)

**SYNERGIES AND TRADE-OFFS**

- Sampling the soil for analysis and testing infiltration as part of the site analysis can contribute to earning points for Credit C.1 (Assess the soil and determine infiltration).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Guidelines, Practice 1.1
- The Bay-Friendly Site Analysis is available for download from: **http://www.stopwaste.org/home/index.asp?page=777**

## b. The site is located within an urban growth boundary and avoids environmentally sensitive sites

**POINTS: 3**

**PRACTICE DESCRIPTION**

Project is located within an urban growth boundary defined by a city or county General Plan AND project improvements are not located on wetlands or steep slopes, prime farmland or parkland (as defined by the U.S. Department of Agriculture), or within setback distances from wetlands prescribed in regional or local regulations, or in an area identified as habitat for any species on Federal or State threatened or endangered lists.

**VERIFICATION**

*PROJECT TEAM*

- Submit an Accountability Form signed by the Owner, Developer, Landscape Architect or Designer identifying the source of the urban growth boundary and confirming that the site avoids environmentally sensitive sites.

*RATER*

- Verify the Accountability Form has been signed by the Owner, Developer, Landscape Architect or Designer.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Guidelines, Practice 1.1

**REFERENCES**


- Governor's Office of Planning and Research, *State of California General Plan Guidelines,* 2003, p. 272, www.opr.ca.gov
- Green Point Rated, *Multi Family Green Point Rater Verification Manual,* July 2007.
- USGBC, LEED, *New Construction & Major Renovation, Reference Guide, v2.2,* September 2006, p. 29.

## c. The site development results in the clean up of a contaminated site (i.e. Brownfield) or is in a designated redevelopment area

**POINTS: 3**

### PRACTICE DESCRIPTION

Part or all of the site has been labeled a Brownfield by the California Department of Toxic Substance Control Hazardous Waste and Substances Site List – Site Cleanup (Cortese List) OR is designated a redevelopment area by the local jurisdiction, with the goal of reducing pressure on undeveloped land. The redevelopment of the site does not apply to this credit unless the redevelopment was part of a deliberate city or county redevelopment area plan.

***A Brownfield site** means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Partial definition excerpted from Public Law 107-118 (H.R. 2869) - "Small Business Liability Relief and Brownfields Revitalization Act" signed into law January 11, 2002. http://www.epa.gov/brownfields/glossary.htm*

### VERIFICATION

*PROJECT TEAM*

- Submit an Accountability Form signed by the Owner, Developer, Landscape Architect or Designer indicating that the site is located in a designated redevelopment site or on a Brownfield, in which case the report and author of the strategy for clean up is referenced in the design documents

*RATER*

- Verify the Accountability Form has been signed by the Owner, Developer, Landscape Architect or Designer.

### RESOURCES AND BAY-FRIENDLY TOOLS

Cortese List: www.dtsc.ca.gov/SiteCleanup/Cortese_List.cfm

### REFERENCES


- Governor's Office of Planning and Research, *State of California General Plan Guidelines,* 2003, p. 272, www.opr.ca.gov
- Green Point Rated, *Multi Family Green Point Rater Verification Manual,* July 2007.
- USGBC, LEED, *New Construction & Major Renovation, Reference Guide, v2.2,* September 2006, p. 29.
- www.epa/gov/brownfields
- www.brownfields.org

# 2. CONSIDER THE POTENTIAL FOR FIRE

| Credit A.2 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| 5 | | | | | | |
| Corresponds to BFL Guidelines Practice 1.4 | | | | | | |

## a. For sites adjacent to fire sensitive open space or wildlands only: Submit a Fire Mitigation Plan

**POINTS: 5**

**PRACTICE DESCRIPTION**

Determine if the site is in or adjacent to a fire sensitive open space or wildland and prepare a fire mitigation plan.

A typical fire mitigation plan may include: adjacent fire sensitive wildland or open space or developments; exposure to prevailing winds during the dry season; steep slopes, especially south and west facing that can increase wind speed and convey heat; vegetation type, particularly species that burn readily. It may also specify mitigations to the above identified fire vectors including the establishment of a defensible zone immediately surrounding the structure that uses one or more strategies for firescaping, such as:

- Emphasize plants with low fuel volume and/or high moisture content in planting plan. Avoid plants with high oil content or that tend to accumulate excessive dead wood or debris (pyrophites).
- Trees are well spaced and pruned to 6 feet minimum above ground; dense shrub plantings are separate from trees to minimize fuel ladders.
- Trees and tall shrubs planted where limbs and branches will not reach the building or grow under overhangs as they mature.
- Fine shredded bark mulch is avoided. (e.g. gorilla hair or shredded redwood mulch)
- Decks are faced and constructed out of fire resistant materials.

***Open space*** *is often defined by local zoning requirements. If local zoning requirements do not clearly define open space,*

*Open Space means land areas that are not build upon or substantially altered from their natural state. They provide important ecological functions, natural resources, or cultural resources that are worthy of conservation and protection. Such areas may contain, but are not limited to, forests, farmland, old fields, floodplains, wetlands, and shore lands. Open Space can also encompass scenic vistas, recreational areas, and historic sites.*

**PROJECT TEAM RECOMMENDATIONS**

- Identify all local fire safe development requirements

**VERIFICATION**

*PROJECT TEAM*

- Submit an Accountability Form signed by the Landscape Architect or Designer indicating that the design features and practices in the fire mitigation plan have been included in the constructed landscape.

*RATER*

- Verify Accountability Form has been signed by the Landscape Architect or Designer.

**SYNERGIES AND TRADE-OFFS**

- Specifying recycled content decking materials can contribute to earning points for Credit D.1.a (Non-plant landscape materials are salvaged or made from recycled content materials or FSC certified wood).
- Specifying locally produced green waste mulch instead of shredded bark mulch can contribute to earning points for Credit D.1.d (Purchased compost and/or mulch is recycled from local, organic materials such as plant or wood waste).

**BAY-FRIENDLY TOOLS AND RESOURCES**

- Bay-Friendly Landscape Guidelines Practice 1.4
- http://frap.cdf.ca.gov/data/frapgisdata/select.asp

## 3. KEEP PLANT DEBRIS ON SITE:

| Credit A.3 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | 5 | | | | | |
| Corresponds to BFL Guidelines Practice 2.2 | | | | | | |

### a. Produce mulch from plants debris

i. Design documents specify areas under tree & shrub canopies and at least 10 feet away from hard surfaces and storm drains, to be used as a leaf repository for mulch AND/OR

ii. Construction documents specify that of the trees identified for removal, some are chipped for use as mulch onsite

***Mulch** is any material spread evenly over the surface of the soil to enhance the growth of plants and the appearance of the landscape. (*StopWaste.Org*, A Bay-Friendly Landscape Guide to Mulch)*

**POINTS: 2**

**PRACTICE DESCRIPTION**

i. To conserve nutrients on-site and protect the soil surface, natural leaf drop shall be retained under one or more trees and/or in one or more shrub beds, except those trees or shrub beds that are within 10 feet of hard surfaces and storm drains (in order to keep leaf litter or mulch out of the storm water system).

ii. Construction documents shall specify that of the trees identified for removal, at least 10% are chipped and used as mulch onsite. Trees that are left on site as shelter for wildlife will also be counted.

**PROJECT TEAM RECOMMENDATIONS**

- Identify sites for leaf repositories in design documents.
- Note on clearing and grading plans and specifications if on-site trees are to be chipped for mulch.

**VERIFICATION**

*PROJECT TEAM*

i.

- Submit planting plans with natural leaf repositories clearly identified.

ii.

- Submit total number of trees to be removed and number of trees to be chipped on site for mulch or left as logs on site for wildlife habitat
- Submit specifications in construction documents for chipping removed trees, as well as instructions as to where the chipped material is to be used as mulch OR
- Submit photo documentation (in digital form) of chipping process.

*RATER*

i.

- Verify that planting plans indicate natural leaf repositories and that they are not within 10 feet of hard surfaces and/or storm drains.

ii.

- Verify that the number of trees to be chipped on site for mulch or left as logs for wildlife habitat is at least 25% of the total number of trees identified for removal.
- Verify that specifications for chipping removed trees, as well as instructions as to where the chipped material is to be used as mulch are submitted OR
- Verify photos have been submitted
- (Optional) Visually verify chipping of removed trees on site.

**SYNERGIES AND TRADE-OFFS**

- Using mulch made from removed trees can contribute to meeting the requirement of applying 3 inches of mulch for Credit C.6.a (Required planting specifications and plans indicate that after construction, all soil on site is protected with a minimum of 3 inches of mulch)
- If all mulch is supplied by chipping on-site trees identified for removal then points can not also be earned for Credit D.1.d (Purchased compost and/or mulch is recycled from local, organic materials such as plant or wood waste).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Guidelines, Practice 2.2
- Bay-Friendly Landscaping Guide to Mulch

## b. Produce compost from plant debris

i. A site for composting is included in landscape plans. Systems for composting up to and including 3 cubic yards at one time (1 point) OR

ii. Systems for composting more than 3 and up to 10 yards at one time (total 2 points) OR

iii. Systems 10 cubic yards or larger (total 3 points)

***Composting*** *is the controlled biological decomposition of organic materials*

**POINTS: 3**

**PRACTICE DESCRIPTION**

A site for composting plant debris and/or food waste shall be included in landscape plans and sized to compost the amount of feedstock that is generated on site, and as per local and state composting regulations.

**PROJECT TEAM RECOMMENDATIONS**

- Evaluate any CA Integrated Waste Management Board's regulations that may apply to an on-site composting system, depending on the size of the system and the type of feedstock.
- Compost site should be close to level and not exceed a 2% grade. Consideration should be given to providing access to water and allowing enough space not only for compost bins and systems but for easy access. Larger systems could benefit from allowing enough space and site access for a front end loader and providing a push wall and attention should be paid to stormwater flows. See materials listed under Resources for more comprehensive site considerations.

**VERIFICATION**

*PROJECT TEAM*

- Submit construction documents showing location, design and capacity of composting system

*RATER*

- Verify construction documents include composting system
- Visually verify constructed system and confirm size.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Guidelines, Practice 2.2c
- *Compost: A Bay-Friendly Garden Starts with Healthy Soil* https://www.stopwaste.org/AlamedaCommerce/ProductList.aspx
- California Integrated Waste Management Board Composting Regulations: www.ciwmb.ca.gov
- StopWaste.Org, *Compost at Work*, download from www.StopWaste.Org

# 4. REDUCE AND RECYCLE WASTE

| Credit A.4 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | 2 | | | | | |
| Corresponds to Bay-Friendly Landscape Guidelines Practice 2.7 | | | | | | |

**a. An easily accessible area(s) is dedicated to the collection and storage of materials for recycling.**

**POINTS: 2**

**PRACTICE DESCRIPTION**

To reduce waste that is generated both by building occupants and/or landscape/park visitors, receptacles for recycling are co-located with every outdoor trash receptacle. It is recommended that receptacles be made from recycled materials and that they are well marked.

AND, if there is a building on site, a centrally located area(s) that serves the building and site is dedicated to the collection and storage of non-hazardous materials for recycling, including, at a minimum, plant debris, glass, paper, metal, plastic and corrugated cardboard. The site should provide easy access to maintenance staff and hauler vehicles.

The number of recycling bins necessary in the storage area will vary based on the waste and recycling haulers in the area. Green waste should be kept separate from all other trash and recyclables. Single-stream recycling vendors allow most other recyclable items to be included in one mixed bin. Other haulers may require separate bins for each type of recyclable material.

**PROJECT TEAM RECOMMENDATIONS**

- Identify the location of trash/recycling receptacles and central collection/storage area in the design documents.

**VERIFICATION**

*PROJECT TEAM*

- Submit construction documents showing size and location of central collection/storage area and specifications for outdoor recycling receptacles.

*RATER*

- Visually verify size and location of central collection/storage area and outdoor recycling receptacles.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Guidelines Practice 2.7,
- Recycled Content Park and Recreation Products in Alameda County Fact Sheet, download from www.StopWaste.Org/buyrecycled.html
- Recycling Guidelines for Multifamily Housing, download from: http://www.stopwaste.org/home/index.asp?page=533

# 5. MINIMIZE SITE DISTURBANCE

| Credit A.5 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| 2 | | | | | 2 | 2 |

## a. On greenfield sites, limit site disturbance to protect topography, vegetation and hydrology.

**POINTS: 3**

**PRACTICE DESCRIPTION**

Clearing and grading is limited to the minimum area required for roads, utilities, building pads, other hardscapes and maneuvering equipment or to a maximum of:

- 40 feet beyond the building perimeter;
- 10 feet beyond the surface walkways, patios and parking;
- 10 feet beyond utilities less than 12 inches in diameter;
- 15 feet beyond primary roadway curbs and main utility branch trenches;
- 25 feet beyond constructed areas with permeable paving that require additional staging areas in order to limit compaction in constructed areas AND

The property is walked with equipment operators prior to clearing and grading to clarify these boundaries

***Greenfield site:*** *Sites that are not previously developed or graded and remain in a natural state. (* USGBC, LEED, *New Construction & Major Renovation,v2,2 Reference Guide,* September 2006*)*

***Previously developed sites*** *are those that contained buildings, roadways, parking lots or were graded or altered directly by human activities. (* USGBC, LEED, *New Construction & Major Renovation,v2,2 Reference Guide,* September 2006*)*

**PROJECT TEAM RECOMMENDATIONS**

- Meet and walk the property with the owner, engineers and others before project design to define goals for limiting clearing and grading.

**VERIFICATION**

*PROJECT TEAM*

- Submit grading/construction documents highlighting the disturbance boundaries and access road.
- Accountability Form signed by participants to confirm that the boundaries were walked and identified

*RATER*

- Verify grading/construction documents have highlighted the disturbance boundaries and access road.
- Verify that Accountability Form has been signed by participants.
- (Optional) Visually verify.

**SYNERGIES AND TRADE-OFFS**

- Limiting site disturbance to meet above requirements in such a way as to also provide water, and shelter for wildlife, can contribute to earning points for Credit A.6 (Provide water and/or shelter for wildlife).
- Limiting site disturbance to also protect trees can contribute to earning points from Credit A.7.a (The landscape is designed to preserve 80% of existing mature healthy trees and penalties for their destruction are included in the construction contract).
- Limiting site disturbance to meet above requirements in such a way as to also keep the open space on the site connected to open space on adjacent sites, can contribute to earning points for Credit A.7.b (The landscape is designed to increase open space compared to its previous use and/or to connect it to other open space or wildlife corridors).
- Protecting diverse plant buffers by limiting site disturbance to meet above requirements can also contribute to earning points for Credit A.7.c (Create or protect a diverse buffer of low maintenance vegetation along creeks, shorelines or monocultured landscaped areas).

**BAY-FRIENDLY TOOLS AND RESOURCES**

- USGBC LEED, *New Construction & Major Renovation, v.2.2 Reference Guide,* September 2006, p. 67
- Puget Sound Action Team, Low *Impact Design: Technical Guidance Manual for Puget Sound,* 2005, p 28, 62

## b. On previously developed sites, restore vegetation and hydrology.

**POINTS: 3**

**PRACTICE DESCRIPTION**

On previously developed or graded sites, a minimum of 20% of the site is restored to its native vegetation and/or hydrology.

Although restoring individual areas on the site is acceptable, designing and constructing the following are highly recommended:

- Large tracts of riparian areas that connect and create contiguous riparian areas or
- Large tracts of critical and wildlife habitat area that connect and create contiguous areas or
- Tracts that create common open space areas among and/or within developed sites or
- Areas on individual lots that connect to areas on adjacent lots or common protection areas.

**PROJECT TEAM RECOMMENDATIONS**

- Meet and walk the property with the owner, engineers and others before project design to define goals for restoring vegetation and hydrology.

**VERIFICATION**

*PROJECT TEAM*

- Submit design documents with restoration sites identified. Include total site square feet and the total square feet of restored areas.
- Accountability Form confirming restoration of vegetation and/or hydrology is signed by the Landscape Architect or Designer.

*RATER*

- Verify design documents identify restoration sites and that percentage of total site to be restored is equal to or greater than 20%.
- Verify that Accountability Form has been signed by the Landscape Architect or Designer.

**SYNERGIES AND TRADE-OFFS**

- Restoring vegetation and hydrology in such a way as to also provide water, and shelter for wildlife can contribute to earning points for A.6 (Provide water or shelter for wildlife).
- Restoring vegetation and hydrology in such a way as to also preserve 80% of existing mature, healthy trees can contribute to earning points for Credit A.7.a (The landscape is designed to preserve 80% of existing mature healthy trees and penalties for their destruction are included in the construction contract).
- .Restoring areas that connect to open space on adjacent properties can contribute to earning points for Credit A.7.b (The landscape is designed to increase open space compared to its previous use and/or to connect it to other open space or wildlife corridors).
- Restoring vegetation in riparian areas can also contribute to earning points for Credit A.7.c (Create or protect a diverse buffer of low maintenance vegetation along creeks, shorelines or monocultured landscaped areas).

**REFERENCES**


- LEED, *New Construction & Major Renovation*, V2.2 Reference Guide p. 67
- Sustainable Sites Initiative, *Preliminary report on the Standards & Guidelines*, p.35
- Puget Sound Action Team, *Low Impact Design: Technical Guidance Manual for Puget Sound*, 2005, p. 55

# 6. PROVIDE WATER AND/OR SHELTER FOR WILDLIFE

| Credit A.6 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | | | 1 |
| Corresponds to BFL Guidelines Practice 7.3 | | | | | | |

**POINTS: 1**

**PRACTICE DESCRIPTION**

Water and/or shelter for beneficial and desirable wildlife shall be provided in order to increase the diversity and numbers of natural enemies of landscape pests.

Examples of shelter include birdhouses, bat houses, boulders, logs, wood piles and multi storied plant canopies. Water must also be provided by bird bathes, ponds, creeks, wetlands.

***Wildlife*** *refers to undomesticated birds, mammals, reptiles, and amphibians.*

***Natural enemies*** *are organisms that kill, decrease the reproductive potential or otherwise reduce the numbers of another organism. Natural enemies that limit pests are key components of integrated pest management programs. Important natural enemies of insect and mite pests include predators, parasites, and pathogens.*

**PROJECT TEAM RECOMMENDATIONS**

- Providing shelter or habitat value can be integrated into a variety of landscapes, Logs and boulders create visual interest in the landscape and habitat for soil organisms and reptiles. Rock walls without mortar provide beauty and habitat for lizards. Even small water features benefit birds and insects -- be sure that water features have shallow ends of 1 to 2 inches preferred by birds, and consider the need for maintenance against mosquitoes by circulating water.
- Providing habitat for wildlife can be done in relatively small landscapes and helps to encourage beneficial birds, insects and reptiles to common landscape pests as well as enliven the landscape for the user. Thought should also be given to avoiding attracting unwanted creatures. Large open expanses of turf for example are preferred by Canadian Geese which in large numbers can be a pest problem in urban areas.

**VERIFICATION**

*PROJECT TEAM*

- Submit construction plan(s) showing water source and where shelter is provided and including specifications for birdhouse, bird bath, bat house etc. if applicable.
- (Optional) Submit photo documentation (in digital form) of constructed or installed water source and/or shelter.

*RATER*

- Verify construction plans include water source and shelter.
- (Optional) Verify photo documentation has been submitted.
- Visually verify after construction.

**SYNERGIES AND TRADE-OFFS**

- Leaving logs from trees that are identified for removal as shelter for wildlife can contribute to earning points for Credit A.3.a (Produce mulch from plant debris).
- Providing water and protecting native trees with developed understories as shelter for wildlife can also contribute to earning points for Credit A.7.b (The landscape is designed to preserve 80% of existing mature healthy trees)
- Providing water and selecting sites for wildlife shelter that connect to open space on adjacent areas can contribute to earning points for Credit A.7.b (The landscape is designed to increase open space and/or to connect it to other open space or wildlife corridors)
- Providing wildlife habitat and water by incorporating stormwater measures can contribute to earning points for Credit B.2.b (Incorporate landscape measures that are designed to capture and filter 85% of average annual stormwater runoff).
- A project receiving points for Credit A.7.c can not receive credit for A.6 and vice a versa.
- Creating a water feature can contribute to earning points for Credit D.5.a (Specify solar powered pump(s) for water features) and Credit F.1.a (Irrigation and/or all ornamental use of water are plumbed for recycled water).
- Using boulders on the site can contribute to earning points in D.6.a. 100% of any stone and non-concrete hardscapes materials are produced within 500 miles of the project site.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- *California Native Birds, Butterflies, Dragonflies*
- *Introduction to California Birdlife*, by Jules Evens
- *Raptors of California* by Hans Peeters and Pam Peeters
- *Field Guide to Owls of California and West* by Hans Peeters
- *Field Guide to Butterflies of the San Francisco Bay and Sacramento Valley Regions* by Arthur M. Shapiro and Tim Manolis or California Butterflies by John S. Garth and J.W. Tilden
- *Dragonflies and Damselflies of California* by Timothy D. Manolis

- Other **beneficial or desirable** creatures - bats, frogs, toads, salamanders, lizards, turtles, fish etc.
  - California Reptiles and Amphibians: http://www.californiaherps.com/
  - California Fish: http://calfish.ucdavis.edu/calfish/default.htm
  - California Bats: http://www.californiabats.com/

# 7. CONSERVE OR RESTORE NATURAL AREAS & WILDLIFE CORRIDORS

| Credit A.7 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | | | 6 |
| Corresponds to BFL Guidelines Practice 7.5 | | | | | | |

***Wildlife*** *refers to undomesticated birds, mammals, reptiles, and amphibians.*

**a. The landscape is designed to protect 80% of existing mature healthy trees and penalties for destruction of protected trees are included in construction contract.**

**POINTS: 2**

**PRACTICE DESCRIPTION**

As per a certified arborist, healthy, non-invasive trees, and their critical root zone, are identified and at least 80% are selected for protection. The trees to be conserved are prepared to withstand the stresses of construction by watering, fertilizing, pruning and mulching well in advance. Fencing is installed at or exceeding the critical root zone and provides a strong physical and visual barrier.

AND Penalties for destruction of protected trees are included in construction contract. The language should include:

Limit to an absolute minimum any excavation within the critical root zone. If excavation in this zone is unavoidable, recommendations from a certified arborist on how to excavate should also be included in the specifications.

Restrict trenching in the critical tree root zone areas, with specifications to bore under or dig a shallow trench through the roots with an air spade if trenching is unavoidable.

Prohibit stockpiling or disposal of excavated or construction materials in the critical root zone.

The following provides a prioritized list of native vegetation protection areas:

- Large tracts of riparian areas that connect and create contiguous riparian protection areas.
- Large tracts of critical and wildlife habitat area that connect and create contiguous protection areas.
- Tracts that create common open space areas among and/or within developed sites
- Protection areas on individual lots that connect to areas on adjacent lots or common protection areas.
- Protection areas on individual lots

**PROJECT TEAM RECOMMENDATIONS**

- Meet and walk the property with owner, engineer, architects and designers to identify priority trees to be protected.

**VERIFICATION**

*PROJECT TEAM*

- Submit specifications for preparing trees for construction and delineating their critical root zones.
- Submit contract language with penalties for damage to protected trees
- Submit construction plans with fencing details

*RATER*

- Verify specifications for preparing trees for construction and delineating their critical root zones have been submitted
- Verify construction contract includes penalties for damage to protected trees
- Verify construction plans include fencing details
- Visually verify fencing in installed as per plan details.

**SYNERGIES AND TRADE-OFFS**

- Selecting and protecting trees in areas that connect to open space on adjacent properties can contribute to earning points for Credit A.7.b (The landscape is designed to increase open space compared to its previous use and/or to connect it to other open space or wildlife corridors).
- Selecting and protecting trees in a buffer along creeks, shorelines or other monocultured landscaped areas can contribute to earning points for Credit A.7.c (Create or protect a diverse plant buffer of low maintenance vegetation along creeks, shorelines, or monocultured landscaped areas).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Matheny, Nelda and Jim Clark, *Trees and Development: A Technical Guide to Preservation of Trees During Land Development,* 1998.

**REFERENCES**

- *Low Impact Design*, Vegetations Protection, Reforestation and Maintenance, p. 55

## b. The landscape is designed to increase open space compared to its previous use and/or to connect it to other open space or wildlife corridors.

**POINTS: 2**

### PRACTICE DESCRIPTION

Open space is increased or is connected to open space on other properties because clearing and grading and the building footprint are minimized or located in order to protect and keep open space and wildlife corridors on the project site connected to open space or wildlife corridors on adjacent properties.

OR, on previously developed sites with no open space, native vegetation and streams are brought back to the surface, degraded stream banks or wetlands are restored and the restored open space is connected to open space or wildlife corridors in adjacent properties.

The credit is not applicable to project sites that are not adjacent to sites with open space and/or wildlife corridors.

**Open space** is often defined by local zoning requirements. If local zoning requirements do not clearly define open space, open space means land areas that are not build upon or substantially altered from their natural state. They provide important ecological functions, natural resources, or cultural resources that are worthy of conservation and protection. Such areas may contain, but are not limited to, forests, farmland, old fields, floodplains, wetlands, and shore lands. Open Space can also encompass scenic vistas, recreational areas, and historic sites.

### PROJECT TEAM RECOMMENDATIONS

- Meet and walk the property with the owner, engineers and others before project design to identify large un-fragmented areas of open space that are important as natural, scenic or cultural resources and a priority for protection and to identify linkages between open space areas that are possible for protection or can be restored to maintain an interconnected network of wildlife corridors
- Create a strategy for limiting disturbance, as early in design process as possible, that includes efficient road design and lot layout, and orientation of the long axis of the buildings along contours or staggering floor levels to adjust to gradient changes.
- Map protected areas on all plans

### VERIFICATION

*PROJECT TEAM*

- Submit a parcel map with the following clearly identified: pre and post development open space and/or wildlife corridors on the project site and open space and/or wildlife corridors on adjacent properties.
- Submit calculations of open space as a percentage of total site area pre and post project development.

*RATER*

- Verify the parcel map has been submitted with the following clearly identified: pre and post development open space and/or wildlife corridors on the project site and open space and/or wildlife corridors on adjacent properties.
- Verify the calculations of open space as a percentage of total site area pre and post project development are accurate
- Visually verify that open space on the project site is connected to open space on adjacent properties.

**SYNERGIES AND TRADE-OFFS**

- Restoring open space along creeks or shorelines (riparian) can contribute to earning points for Credit A.7.c (Create or protect a diverse plant buffer of low maintenance vegetation along creeks, shorelines or monocultured landscaped areas).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Washington State University, *Low Impact Technical Guidance Manual for Puget Sound,* January 2005



### c. Create or protect a diverse plant buffer of dense vegetation next to monocultures or along creeks, shorelines or monocultured landscaped areas.

**POINTS: 2**

**PRACTICE DESCRIPTION**

Create a diverse plant buffer at least 24 inches wide next to monocultured areas

AND/OR along creeks, streams and shorelines to trap and filter sediments, nutrients and chemicals from surface runoff. Diversity is defined as a minimum of 20 distinct plant species, as per Credit E.8.

**VERIFICATION**

*PROJECT TEAM*

- Submit construction plans with plant buffers or riparian corridors identified.
- Submit plant palette with buffer plant species identified.
- Submit Accountability Form signed by Landscape Architect, Designer or Contractor confirming the requirements for the credit have been met.

*RATER*

- Verify that the construction plans identify the plant buffers or riparian corridors and that the minimum width is 24 inches.
- Verify plant palette for buffer meets the diversity requirement (see Credit E.8)
- Submit Accountability Form has been signed by Landscape Architect, Designer or Contractor confirming the requirements for the credit have been met.

**SYNERGIES AND TRADE-OFFS**

- A project receiving points for Credit A.7.c can not receive credit for A.6 and vice a versa.
- Creating this plant buffer along creeks or shorelines and/or connecting it to open space and wildlife corridors in adjacent properties can contribute to earning credits for Credit A.5.b (On previously developed sites, restore vegetation and hydrology) or Credit A.7.b (The landscape is designed to increase open space compared to its previous use and/or to connect it to other open space or wildlife corridors).
- A diverse plant pallet of 20 or more distinct plant species can contribute to earning points in Credit E.8.a-c (Diversify) providing a minimum of 20 or more distinct plant species.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Washington State University, *Low Impact Technical Guidance Manual for Puget Sound*, January 2005

# B. STORMWATER AND SITE DRAINAGE

## 1. MINIMIZE IMPERVIOUS SURFACES

| Credit B.1 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | | 7 | |
| Corresponds to BFL Guidelines Practice 6.6 | | | | | | |

**a. Permeable paving, gravel or other porous surfaces are installed for :**

- **i. 25% OR**
- **ii. 33% (total 3 points) OR**
- **iii. 50% of the paved area (total 5 points)**

**POINTS: 5**

**PRACTICE DESCRIPTION**

Permeable paving such as gravel or other porous surfaces are installed for 25%, 33% or 50% of the paved area. Permeable paving materials shall have a runoff coefficient of .65 or less as calculated for stormwater treatment designs based on small, frequent storms. The following chart provides runoff coefficients for commonly used paving materials.

| Estimated Runoff Coefficients for Various Paving Surfaces During Small Storms | |
|---|---|
| Type of surface | Runoff Coefficients |
| Concrete | .80 |
| Asphalt | .70 |
| Pervious concrete | .65 |
| Pervious asphalt | .55 |
| Natural stone (without grout) | .25 |
| Turf block | .15 |
| Brick (without grout) | .13 |
| Unit pavers on sand | .10 |
| Crushed aggregate | .10 |
| Adapted from the Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance | |

***Paved Area*** *is the surface that accommodates pedestrian, bicycle or vehicular traffic. It includes sidewalks, patios, walkways, driveways, parking lots and other non-roof hardscapes, regardless of permeability*

***Permeable Paving*** *is hardscape or a paved surface that accommodates pedestrian, bicycle vehicular traffic while also allowing surface runoff to infiltrate into surface soil and/or permeable subbase. Examples include asphalt or concrete rendered porous by the aggregate structure.*

***Runoff Coefficient*** *is the ratio of the runoff rate to rainfall. For example, a runoff coefficient of 0.65 means that sixty five percent of the rainfall that falls on this type of surface will flow off as runoff. (Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance August 31, 2006 Version 1.0)*

**PROJECT TEAM RECOMMENDATIONS**

- Utilize LID strategies during the project planning and design phase to identify opportunities to minimize impervious surfaces and reduce stormwater runoff from the site. Specific recommendations include:
  - Consider reducing the size of parking lots, roadways and other impervious surfaces with more effective layout and reduced parking demand ratios
  - Slow runoff and encourage infiltration with bioretention planters and swales along the road and permeable paving with subbase storage capacity
  - Maximize open space connectivity and design roadways and paving areas to minimize disturbing the site and disrupting existing drainage patterns
- Consider permeable paving materials suitable for ADA accessibility including pervious concrete, pervious asphalt and aggregate fines such as decomposed granite that meet compaction test for accessibility.
- For additional stormwater retention consider permeable base material, such as Caltrans class 2 permeable subbase.
- When designing paving for vehicular traffic, work with the project engineer to establish the proper cross-section based upon underlying soil type and expected loading.
- Use deepened curbs to prevent migration of water from underneath the porous paving subbase to adjacent non-porous paving.

***Impervious Surface*** *is the total area of surfaces on a developed site that inhibit infiltration of stormwater. The surfaces include, but are not limited to, conventional asphalt or concrete roads, driveways, parking lots, sidewalks or alleys, and rooftops (Low impact development technical guidance manual for Puget sound January 2005)*

***Low impact development (LID****) is a stormwater management strategy that emphasizes conservation and use of existing natural site features integrated with distributed, small-scale stormwater controls to more closely mimic natural hydrologic patterns in residential, commercial and industrial settings. (Low impact development technical guidance manual for Puget Sound January 2005)*

**VERIFICATION**

*PROJECT TEAM*

- Submit scaled plan identifying all paved areas and surface materials.
- Submit:
  - Total square feet of impervious paving
  - Total square feet of permeable paving, gravel or other porous paving surfaces
  - Calculations of the percent of permeable paving, gravel or other porous paving surfaces

*RATER*

- Verify that the scaled plan identifies all paved surface materials and that the surface materials are permeable.
- Verify that square feet and calculations have been submitted and that percentage is correct and meets the criteria for the credit.

**SYNERGIES AND TRADE-OFFS**

- Preventing runoff from directly entering the storm drain by using permeable paving, gravel or other porous surfaces can contribute to earning points for Credit B.1.b (No impervious surfaces directly connect to the storm drain)
- Capturing and filtering 85% or 100% of average annual runoff by using permeable paving, gravel or other porous surfaces can contribute to earning points for Credit B.2.b.c ( Incorporate landscape measures, including vegetated swales, infiltration planters, detention basins and /or stormwater wetlands, that are designed to capture and filter 85% or 100% of average annual runoff)
- Installing recycled aggregate base under permeable paving, gravel or other porous surfaces can contribute to earning points for Credit D.1.b (A minimum 25% of recycled aggregate (crushed concrete) is specified for walkway, driveway, roadway base and other uses)
- Substituting flyash or slag for a percent of the Portland cement in permeable concrete can contribute to earning points for credit D.1.c (Replace Portland cement in concrete with flyash or slag)
- Installing light colored permeable paving, gravel or other porous surfaces can contribute to earning points for Credit D.3.a (at least 50% of the paved site area includes cool site techniques)
- Purchasing permeable materials that are produced within 500 miles of the project site can contribute to earning points for Credit D.6.a.(100% of any stone and non-concrete hardscapes materials are produced within 500 miles of the project site

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance http://www.cleanwaterprogram.org/uploads/ACCWP_C3_Technical_Guidance_090506-300dpi.pdf
- Asphalt Paving Alliance http://www.pavegreen.com/energy.asp
- Bay-Friendly Landscape Guidelines Practice 6.6 https://www.stopwaste.org/docs/bay-friendly_landscape_guidelines_-_all_chapters.pdf
- California Asphalt Pavement Association http://www.californiapavements.org/stormwater.html
- Concrete Promotion Council of Northern California http://www.cpcnc.org/
- EPA Stormwater Technology Fact Sheet Porous Pavement http://www.epa.gov/npdes/pubs/porouspa.pdf
- Ferguson, Bruce K., *Porous Pavements,* Boca Raton, FLA: CRC Press
- Interlocking Concrete Pavement Institute *http://www.icpi.org/*
- Low Impact Development Technical Guidance Manual for Puget Sound January 2005 pg 97-122 http://www.psp.wa.gov/downloads/LID/LID_manual2005.pdf

**b. No impervious surfaces directly connect to the storm drain**

**POINTS: 2**

**PRACTICE DESCRIPTION**

Impervious surfaces shall not directly connect to the storm drain system. All water that falls on the impervious surfaces on the site, including any roof areas, must first be directed into a landscape area or permeable paving or other porous surface before flowing into the storm drain. Driveway flares within the public right of way are excluded from this requirement.

**PROJECT TEAM RECOMMENDATIONS**

Work with architect/ civil engineer and/or developer of any buildings to ensure all downspouts are directed to landscape areas and not directly connected to the storm drain system.

**VERIFICATION**

*PROJECT TEAM*

- Submit Accountability Form signed by the Engineer, Designer or Landscape Architect that as installed the project meets this requirement.

*RATER*

- Verify that Accountability Form has been signed by Engineer, Designer or Landscape Architect.
- (Optional) Visually verify that as installed the project meets this requirement.

**SYNERGIES AND TRADE-OFFS**

- Installing permeable paving, gravel or other porous surfaces to prevent runoff from directly running off into the storm drain can contribute to earning points for Credit B.1.a (Permeable paving gravel or other porous surfaces are installed for 25%, 33% or 50% of paved area)
- Directing runoff from parking lots into landscape beds vegetated swales or other landscape stormwater bmps can contribute to earning points for Credit B.2.a ( Capture and filter runoff from parking lots into landscape beds, vegetated swales or other landscape stormwater bmps)
- Incorporating landscape measures including vegetated swales, infiltration planters, detention basins and/ or stormwater wetlands, that are designated to capture and filter 85% or 100% of average annual runoff can contribute to earning points for Credit B.2.b,c ( Incorporate landscape measures, including vegetated swales, infiltration planters, detention basins and /or stormwater wetlands, that are designed to capture and filter 85% or 100% of average annual runoff)
- Constructing bioswales with flat bottoms can contribute to earning points for Credit B.2.d (Bioswales specify flat bottoms of at least 18 inches across and/or rock cobble at points of concentrated flow.)
- Installing bioswales without turf can contribute to earning points for Credit B.2.e (Turf is not specified in bioswales)
- Using planters or landscape areas to capture rainwater from downspouts can contribute to earning points for Credit B.2.f (Direct rain water from all down spouts to planters, swales or landscaped areas

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Guidelines Practice 6.6
- Low Impact Development Technical Guidance Manual for Puget Sound January 2005 http://www.psp.wa.gov/downloads/LID/LID_manual2005.pdf

# 2. DESIGN A SYSTEM TO CAPTURE AND FILTER STORM WATER

| Credit B.2 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | | 9 | |
| Corresponds to BFL Guidelines Practice 6.9 | | | | | | |

**a. Capture and filter runoff from parking lots into landscape beds, vegetated swales or other landscape stormwater BMP's**

**POINTS: 2**

**PRACTICE DESCRIPTION**

Runoff from a minimum of 95% of all parking lot surfaces shall be captured and directed to landscape based BMP's. Treatments shall meet the post-construction stormwater requirements of the local jurisdiction and all required documents shall be submitted to the local permitting agency. All treatment measures shall be designed to drain completely within 72 hours or per the local Vector Control District's Guidelines.

**PROJECT TEAM RECOMMENDATIONS**

- Work with civil engineer, architect and/or developer early in the process to coordinate parking lot design and grading to ensure parking lots are designed to drain into planting areas and that planting areas are sufficient size.
- Consider soil type and drainage rate, appropriate plant selection for periods of inundation and required maintenance.
- Review local jurisdictional requirements for post-construction stormwater treatment measures if project exceeds area thresholds. Most jurisdictions will require post-construction stormwater treatment measures if project size adds or replaces 10,000 square feet or more of impervious surfaces, including roofs. In addition, projects adding or replacing more than one acre of impervious surfaces, including roofs, may be required to meet hydromodification management criteria.
- Local permitting agencies may also have specific requirements and possible exemptions. For example, the City of Oakland requires a site plan that incorporates measures to manage stormwater runoff after construction be approved prior to issuance of permits for projects that add or replace less than 10,000 square feet of impervious surface or involve construction of one single family home.
- Refer to Practice B.2.b, below, for additional recommendations regarding capturing and treating stormwater.

***Stormwater*** *is stormwater runoff, snow-melt runoff, surface runoff and drainage excluding infiltration and irrigation tail water. Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance*

***Landscape Based BMPs (Best Management Practices)*** *refers to any program, technology, process, sitting criteria, operational method or measure, or engineered system, which when implemented prevents, controls, removes, or reduces pollution. Some examples of landscape stormwater BMP's include bioretention areas, extended detention basins, flow through planter boxes, infiltration trenches, tree well filters, vegetated buffer strips and vegetated swales. Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance August 31, 2006 Version 1.0*

***Hydromodification management (HM)*** *techniques focus on retaining, detaining or infiltrating runoff and matching post-project flows and durations to pre-project patterns for a specified range of smaller, more frequent rain events, to prevent increases in channel erosion downstream. (Hydromodification Management Requirements Information for Developers, Builders and Project Applicants, Alameda Countywide Clean Water Program, November 2007)*

**VERIFICATION**

*PROJECT TEAM*

- Submit Accountability Form signed by the Engineer, Designer or Landscape Architect that as installed the project meets this requirement.
- If the project is required to submit specific documents for approval by the permitting agency submit the name and title of the individual approving the plans and the date approved.

*RATER*

- Verify that Accountability Form has been signed by Engineer, Designer or Landscape Architect
- Verify the name and title of the individual from the permitting agency has been submitted, along with the date of approval.

**SYNERGIES AND TRADE-OFFS**

- Preventing runoff from directly entering the storm drain by diverting runoff from the storm drain into landscape beds, vegetated swales or other landscape stormwater bmps can contribute to earning points for Credit B.1.b (No impervious surfaces directly connect to the storm drain)
- Capturing and filtering runoff from parking lots into landscape beds, vegetated swales or other landscape stormwater bmps can contribute to earning points for Credit B.2.b,c ( Incorporate landscape measures, including vegetated swales, infiltration planters, detention basins and /or stormwater wetlands, that are designed to capture and filter 85% or 100% of average annual runoff)
- Capturing and filtering runoff from parking lots into bioswales with flat bottoms can contribute to earning points for Credit B.2.d (Bioswales specify flat bottoms of at least 18 inches across and/or rock cobble at points of concentrated flow)
- Capturing and filtering runoff from parking lots into bioswales not planted with turf can contribute to earning points for Credit B.2.e (Turf is not specified in bioswales)
- Specifying a diverse palette of California native species for vegetated BMPs can contribute to earning points for Credit E.8 (Diversify) and E.9 (Choose CA natives first).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance http://www.cleanwaterprogram.org/uploads/ACCWP_C3_Technical_Guidance_090506-300dpi.pdf
- Alameda Countywide Clean Water Program. *Soil Specifications for Stormwater Treatment Measures*, http://www.cleanwaterprogram.org/uploads/Soil_Specifications_NDS_approved_May_8_2007_051407.pdf
- Contra Costa Clean Water Program Stormwater C.3 Guidebook http://www.cccleanwater.org/new-developmentc3/stormwater-c3-guidebook/
- City of Emeryville Stormwater Sizing Worksheet http://www.ci.emeryville.ca.us/planning/sizing_worksheet_v8.xls
- EPA: Low Impact Development (LID) and Other Green Design Strategies, http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=124Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp-w2k.com/default.htm
- Guidelines for the Standard Urban Storm Water Mitigation Plan Storm Water Best Management Practices for New Development and Redevelopment For the Santa Rosa Area and Unincorporated Areas around Petaluma and Sonoma, June 3, 2005 www.sonoma-county.org/prmd/sw/pdf/susmp.pdf

**b. Incorporate landscape measures, including vegetated swales, infiltration planters, detention basins and/or stormwater wetlands, that are designed to capture and filter 85% of average annual stormwater runoff (2 points) OR**

**c. Incorporate landscape measures, including vegetated swales, infiltration planters, detention basins and/or stormwater wetlands, that are designed to capture and filter 100% of average annual runoff (total 4 points)**

**POINTS: 4**

**PRACTICE DESCRIPTION**

Incorporate landscape based BMPs that are designed to capture and filter 85% or 100% of the average annual stormwater runoff. Landscape measures include vegetated swales (also referred to as bioswales), infiltration planters, detention basins, stormwater wetlands, dry wells and dry streambeds.

Test infiltration of soils under landscape based BMPs and amend to meet either Alameda County Clean Water Program Soil specifications 9 or other local agency specifications or Low Impact Development requirements (See definition under B.1). The addition of quality compost is highly recommended

**PROJECT TEAM RECOMMENDATIONS**

- Work with civil engineer, architect and/or developer early in the process to coordinate surface drainage of hardscape and retention and treatment of stormwater.
- Refer to the post-construction (C.3) stormwater handbook from the local jurisdiction for specific requirements and guidance on calculating the runoff and sizing the landscape treatment facilities. Verify submittal requirements by the local permitting agency. San Francisco Bay Area guidebooks are listed under resources.
- Pay particular attention to soil type and percolation rate. Per ACCWP soil specifications for post-construction stormwater treatment measures, sandy loam or loamy sand soils with a percolation rate of 2"-10" or 5" -10", respectively.
- The addition of quality compost to the existing and/or import soils will help create soil structure, improving the water holding capacity and ability to filter pollutants. A mulch layer of organic material that holds together when inundated will also filter and help with absorption and retention of runoff. Consider additional ways to improve filtering capacity of the soils and plants, such as inoculating the soil with mycorrhizae.
- Refer to additional recommendations under B.2.a, above.

***Vegetated swales (bioswales)-*** *are open shallow channels with thick vegetation covering the side slopes and bottom that collect and slowly convey runoff to downstream discharge points.*

***Infiltration planters*** *or flow through planters Structure designed to treat stormwater by intercepting rainfall and slowly draining it through filter media and out of planter.*

***Detention basins*** *are constructed basins with drainage outlets that are designed to detain runoff from a storm for some minimum time (e.g., 48 hours) to allow settling of sediment and pollutants.*

***Stormwater wetlands*** *are constructed detention basins that have a permanent pool of water throughout the year and capacity for temporary additional storage of runoff that is released via an outlet structure. They differ from wet ponds in that they are typically shallower and have greater vegetation coverage.*

Above definitions are from: Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance August 31, 2006 Version 1.0

**VERIFICATION**

*PROJECT TEAM*

- Submit Accountability Form signed by the Engineer, Designer or Landscape Architect that as installed the project meets this requirement.
- If the project is required to submit specific documents for approval by the permitting agency submit the name and title of the individual approving the plans and the date approved.
- Submit the results of the analysis or estimate of infiltration rate and recommendations for amending the soil, if required to meet Alameda Countywide Clean Water Program or other local or LID specifications.

*RATER*

- Verify that Accountability Form has been signed by Engineer, Designer or Landscape Architect
- Verify the name and title of the individual from the permitting agency has been submitted, along with the date of approval.
- Verify results of analysis or estimate of infiltration rate has been submitted, if required.

**SYNERGIES AND TRADE-OFFS**

- Preventing runoff from directly entering the storm drain by capturing 85% or 100% of average annual stormwater runoff can contribute to earning points for Credit B.1.b (No impervious surfaces directly connect to the storm drain)
- Designing landscape areas to capture runoff from parking lots can contribute to earning points for Credit B.2.a (Capture and filter runoff from parking lots into landscape beds, vegetated swales or other landscape stormwater bmps)
- Analyzing the soil and determining infiltration rate can contribute to earning points for Credit C. 1 (Assess the soil and test drainage).
- Incorporating quality compost into the soils under landscape based BMPs can contribute to meeting the requirements and earning points for Credit C.7 (Amend the soil with compost before planting).
- Specifying a diverse palette of California native species for vegetated BMPs can contribute to earning points for Credit E.8 (Diversify) and E.9 (Choose CA natives first).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance http://www.cleanwaterprogram.org/uploads/ACCWP_C3_Technical_Guidance_090506-300dpi.pdf
- Alameda Countywide Clean Water Program. *Soil Specifications for Stormwater Treatment Measures*, http://www.cleanwaterprogram.org/uploads/Soil_Specifications_NDS_approved_May_8_2007_051407.pdf
- Contra Costa Clean Water Program Stormwater C.3 Guidebook http://www.cccleanwater.org/new-developmentc3/stormwater-c3-guidebook/
- City of Emeryville Stormwater Sizing Worksheet http://www.ci.emeryville.ca.us/planning/sizing_worksheet_v8.xls
- EPA: Low Impact Development (LID) and Other Green Design Strategies, http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=124Santa Clara Valley Urban Runoff Pollution Prevention Program http://www.scvurppp-w2k.com/default.htm
- Guidelines for the Standard Urban Storm Water Mitigation Plan Storm Water Best Management Practices for New Development and Redevelopment For the Santa Rosa Area and Unincorporated Areas around Petaluma and Sonoma, June 3, 2005 www.sonoma-county.org/prmd/sw/pdf/susmp.pdf

**d. Bioswales specify flat bottoms of at least 18 inches across and/or rock cobble at points of concentrated flow**

**POINTS: 1**

**PRACTICE DESCRIPTION**

The bottom of any specified bioswales shall be flat for a minimum of 18 inches across to slow and increase filtration of the runoff. Rock cobble should be placed anywhere flows may concentrate and cause erosion, such as curb cuts from parking lots and roadways that direct runoff into planters.

**PROJECT TEAM RECOMMENDATIONS**

If site grading and details are prepared by civil engineer; coordinate swale cross-section and rock cobble placement.

**VERIFICATION**

*PROJECT TEAM*

- Submit plans that show where bioswales are located and location of rock cobble AND/OR
- Submit bioswale details that specify flat bottoms for a minimum of 18 inches across

*RATER*

- Verify that plans show where bioswales are located and location of rock cobble AND/OR
- Verify that bioswale details specify flat bottoms for a minimum of 18 inches across.
- Visually verify (by spot check) that as installed the project meets this requirement

**SYNERGIES AND TRADE-OFFS**

- Specifying bioswales without turf can contribute to earning points for Credit B.2.e (Turf is not specified in bioswales)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance http://www.cleanwaterprogram.org/uploads/ACCWP_C3_Technical_Guidance_090506-300dpi.pdf

### e. Turf is not specified in bioswales

*__Turf__ is defined as spreading or stoloniferous grasses that when regularly mowed form a dense growth of leaf blades and roots. Areas planted with lawn alternatives, such as Carex pansa and other tufted grass or sedge species are not considered turf.*

**POINTS: 1**

**PRACTICE DESCRIPTION**

Mowed turf, which requires ongoing mowing, water and possible chemical inputs, is not planted in bioswales.

**PROJECT TEAM RECOMMENDATIONS**

Select plants that will tolerate periods of inundation and drought, filter sediments and uptake pollutants. Refer to Resources and Bay-Friendly Tools and local jurisdiction's guidelines for bioswale planting recommendations.

**VERIFICATION**

*PROJECT TEAM*

- Submit planting plans verifying that no turf is specified in bioswales.

*RATER*

- Verify that plans show that turf is not specified in bioswales.
- Visually verify (by spot check) that as installed the project meets this requirement.

**SYNERGIES AND TRADE-OFFS**

- Specifying bioswales with flat bottoms can contribute to earning points for Credit B.2.d (Bioswales specify flat bottoms of at least 18 inches across and/or rock cobble at points of concentrated flow)
- Planting bioswales with California native, Mediterranean or other climate adapted plants that require occasional, little or no summer water for 75% of all non-turf plants can contribute to earning points for Credit E.3.a.i.
- Planting bioswales with native plants can contribute to earning points for Credit E.9.a

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance http://www.cleanwaterprogram.org/uploads/ACCWP_C3_Technical_Guidance_090506-300dpi.pdf

**f. Direct rain water from all down spouts to planters, swales or landscaped areas.**

**POINTS: 1**

**PRACTICE DESCRIPTION**

Down spouts are placed to empty directly into planters, swales or landscaped areas. Infiltration of soils receiving the water from the downspouts shall be tested and if required, amended to bring the percolation rate to meet Alameda Countywide Clean Water Program or other local agency or LID specifications.

**PROJECT TEAM RECOMMENDATIONS**

Work with architect/ civil engineer and/or developer of any buildings to ensure all downspouts are directed to landscape areas and not directly connected to the storm drain system.

**VERIFICATION**

*PROJECT TEAM*

- Submit Accountability Form signed by the Engineer, Designer or Landscape Architect that as installed the project meets this requirement

*RATER*

- Verify that Accountability Form has been signed by Engineer, Designer or Landscape Architect
- Visually verify (by spot check) that as installed the project meets this requirement

**SYNERGIES AND TRADE-OFFS**

- Capturing and filtering water from all impervious roof areas into planters, swales or landscaped areas can contribute to earning points for Credit B.2.b.c ( Incorporate landscape measures, including vegetated swales, infiltration planters, detention basins and /or stormwater wetlands, that are designed to capture and filter 85% or 100% of average annual runoff)
- Analyzing the soil and determining infiltration rate can contribute to earning points for Credit C. 1 (Assess the soil and test drainage).
- Incorporating quality compost into the soils under landscape based BMPs can contribute to meeting the requirements and earning points for Credit C.7 (Amend the soil with compost before planting).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance http://www.cleanwaterprogram.org/uploads/ACCWP_C3_Technical_Guidance_090506-300dpi.pdf

# C. EARTHWORK AND SOIL HEALTH

## 1. ASSESS THE SOIL AND TEST THE DRAINAGE

| Credit C.1 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| 2 | | 1 | | | | |
| Corresponds to BFL Guidelines Practice 1.2 | | | | | | |

### a. Submit laboratory soil analysis results and recommendations for compost and natural fertilizers.

**POINTS: 3**

**PRACTICE DESCRIPTION**

An analysis of one or more soil samples that are representative of the site conditions shall be completed by an accredited and approved testing laboratory. Sample collection procedures shall adhere to recommendations of the soil testing laboratory. Contractor shall request that the laboratory make recommendations based on amending with compost and an 'organic' approach to soil and landscape management, Analyses to be performed include:
pH, electrical conductivity, nitrate, ammonium, phosphorus, potassium, calcium, saturation percent, sodium, chloride, sodium adsorption ratio, boron, % sand-silt-clay, lime, % organic

It is also recommended that the infiltration rate and drainage characteristics be determined, particularly for soils in bioswales and other stormwater BMPs.

**PROJECT TEAM RECOMMENDATIONS**

- Sample problematic areas separately.
- Provide the laboratory with your target soil organic matter content, and the total landscape area to be amended upon which they can then make accurate recommendations for amending the soil.
- Provide soil lab with the types of plantings intended, turf, perennial bed, annual bed, swale, etc. so that they can customize their recommendations accordingly.
- Integrate soil analysis into a soil management plan.
- Consult a geotechnical engineer or soil scientist for initial assessment of infiltration for all beds but particularly for soils under stormwater BMPs such as bioswales.

**VERIFICATION**

*PROJECT TEAM*

- Submit soil analysis report and accompanying recommendations from the accredited soil laboratory.

*RATER*

- Verify soil analysis has been completed and that recommendations from the lab are based on an 'organic' approach.

**SYNERGIES AND TRADE-OFFS**

- Analyzing the soil and determining infiltration rates can contribute to earning points for Credit B.2 (Design a system to capture and filter storm water).
- Providing the laboratory with a target soil organic matter content of 3.5% or 5% can contribute to meeting the requirement or earning points for Credit C.7 (Amend the soil with compost before planting).
- Requesting recommendations for amending or fertilizing the soil be based on an organic approach can contribute to earning points for Credit C.5 (Feed soils naturally & avoid synthetic fertilizers).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- *Bay-Friendly Landscape Guidelines lists local soil laboratories, page 66.*
- State of California, Department of Water Resources, Model Water Efficient Landscape Ordinance, Appendix B, Sample Soil Management Plan.

## 2. Remove and store topsoil before grading

| Credit C.2 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | 2 | | | | |
| Corresponds to BFL Guidelines Practice 3.1 | | | | | | |

**a. The removal, temporary storage, and re-spreading of topsoil is specified in the landscape design documents AND specifications include a maximum topsoil pile height of 6 feet, as well as measures to protect the stored topsoil from erosion.**

**POINTS: 2**

***Horticulturally suitable topsoil*** *has soluble salts less than 0.5mmhos/cm, free of large roots, clots and stones larger than 1 inch, noxious weeds, sticks, lumber, brush, litter and undesirable disease-causing organisms, as evidenced by previous plant growth.*

**PRACTICE DESCRIPTION**

Specify the removal, during grading, the temporary storage, and the replacement of horticulturally suitable topsoil. If horticulturally suitable topsoil is greater than 6 inches in depth, a minimum of 6 inches shall be removed and stored for re-spreading. If suitable topsoil is less than 6 inches, then entire topsoil depth shall be removed. Specifications shall include a maximum topsoil pile height of 6 feet. Stockpiled soil shall be protected with blankets or socks, or seeded for erosion control if the soil will be stockpiled over the rainy season.

It is highly recommended that the soil below the removed topsoil be scarified or tilled before stored topsoil is re-spread, especially if the stored topsoil will amount to less than 8 inches after replacing.

**PROJECT TEAM RECOMMENDATIONS**

- Integrate this practice into a soil management plan.
- Review the specifications for removing and storing topsoil with the contractor before grading.

**VERIFICATION**

*PROJECT TEAM*

- Submit specifications for removal, storage and replacement of topsoil and details for protecting stored topsoil from erosion.

*RATER*

- Verify specifications and details have been submitted.
- (Optional) Visually verify stockpiling and protection of soil.

**SYNERGIES AND TRADE-OFFS**

- Amending stored topsoil with compost can contribute to meeting the requirement and earning points for Credit C.7 (Amend the soil with compost before planting).
- Ripping, scarifying or tilling the remaining soil before the removed topsoil is replaced can contribute to earning points for Credit C.4 (Aerate compacted soils)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Guidelines and Resources for Implementing Soil Quality and Depth BMPT5.13
  www.BuildingSoil.org/tools/Soil_BMP_text.pdf
- State of California, Department of Water Resources, Model Water Efficient Landscape Ordinance, Appendix B, Sample Soil Management Plan.

## 3. Protect soil from compaction

| Credit C.3 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | 3 | | | | |
| Corresponds to BFL Guidelines Practice 3.2 | | | | | | |

**a. Grading specifications or construction plans call for the installation and maintenance of fencing to prohibit parking or materials staging in areas identified for protection.**

**POINTS: 2**

**PRACTICE DESCRIPTION**

Areas that are to be planted, or areas with native vegetation to be protected are identified as off limits to parking of vehicles, equipment and other materials. This practice is implemented regardless of need for grading. Fencing shall provide a strong physical and visual barrier and be a minimum of 3-4 feet high. The site shall be walked with the contractor and equipment operators prior to beginning construction.

**PROJECT TEAM RECOMMENDATIONS**

- Integrate the protection of identified areas with the site's stormwater pollution prevention plan and soil management plan.
- Clearly identify limited areas for parking cars and equipment and for staging materials that are outside areas of protection and on the site where roads and utility corridors will be placed.
- Work with the contractor to identify appropriate equipment: axle loads exceeding 10 tons per axle can compact soils as deep as 3 feet and in many cases activities can be completed with mini-track loaders or other smaller scale equipment.

**VERIFICATION**

*PROJECT TEAM*

- Submit construction documents with location, type and height of all fencing identified.
- Submit an Accountability Form, signed by the Landscape Architect, Designer or Contractor indicating that the property has been walked with equipment operators prior to clearing and grading to clarify these boundaries

*RATER*

- Verify construction documents have been submitted with fencing identified.
- Verify Accountability Form has been signed by Landscape Architect, Designer or Contractor.
- Visually verify installed fencing before construction.

**SYNERGIES AND TRADE-OFFS**

- Integrating this practice with a plan to limit grading can contribute to earning points for Credit A. 5.a. (Minimize site disturbance).
- Preserving existing mature healthy trees in areas identified for protection can contribute to earning points from Practice A.7.a (The landscape is designed to preserve 80% of existing mature healthy trees and penalties are included).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- State of California, Department of Water Resources, Model Water Efficient Landscape Ordinance, Appendix B, Sample Soil Management Plan.
- www.BuildingSoil.org/tools/Soil_BMP_text.pdf

**REFERENCES**

- *Puget Sound Action Team, Washington State University, Low Impact Development*

## b. Design documents specify that soil is not worked when wet

**POINTS: 1**

**PRACTICE DESCRIPTION**

Design documents specify that clearing, grading and heavy construction is completed entirely during the dry season, usually April through October.

**PROJECT TEAM RECOMMENDATIONS**

- Integrate this practice into a soil management plan.

**VERIFICATION**

*PROJECT TEAM*

- Submit construction documents with instructions to begin and complete all soil activities during the dry season and to avoid all activities if the soil is wet.

*RATER*

- Verify construction documents include the appropriate instructions.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- State of California, Department of Water Resources, Model Water Efficient Landscape Ordinance, Appendix B, Sample Soil Management Plan.

## 4. Aerate compacted soils

| Credit C.4 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | 2 | | | | |
| Corresponds to BFL Guidelines Practice 3.7 | | | | | | |

**a. Design documents include specification to alleviate compacted soils to a depth of at least 8 inches, before planting, for all landscaped areas that can not be protected during construction. (1 point)**

**b. Design documents include specification to alleviate compacted soils to a depth of at least 12 inches, before planting, for all landscaped areas that can not be protected during construction. (1 point)**

**POINTS: 2**

**PRACTICE DESCRIPTION**

The optimal practice is to protect all planting areas from construction equipment and staging materials as equipment can compact soil to a depth of many inches. If the planting areas are not protected, then the soil should be ripped, scarified or tilled during soil preparation to a minimum depth of 8 or 12 inches.

**PROJECT TEAM RECOMMENDATIONS**

- Integrate the alleviation of compacted soils into a soil management plan.
- Incorporate compost into the soil at the same time it is being aerated for best results.

**VERIFICATION**

*PROJECT TEAM*

- Submit design documents and/or construction documents that include instructions for alleviating compaction.
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor indicating soil has been ripped or tilled to a depth of 8 or 12 inches or more.

*RATER*

- Verify design or construction documents include instructions for alleviating compaction.
- Verify Accountability Form has been signed by Landscape Architect, Designer or Contractor.
- (Optional) Visually verify by digging at least one 8 or 12 inch test hole per acre of turf and at least one per acre of planting bed. Test holes must be excavated using only a garden spade driven by the inspector's weight.

**SYNERGIES AND TRADE-OFFS**

- Incorporating compost at the time of tillage can contribute to meeting the requirement or earning points for Credit C.7 (Amend the soil with compost before planting).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Guidelines Practice 3.2
- www.BuildingSoil.org/tools/Soil_BMP_text.pdf
- State of California, Department of Water Resources, Model Water Efficient Landscape Ordinance, Appendix B, Sample Soil Management Plan.
- US Composting Council, *Field Guide to Compost Use.*

# 5. FEED SOILS NATURALLY & AVOID SYNTHETIC FERTILIZERS

| Credit C.5 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | 1 | | | | |
| Corresponds to BFL Guidelines Practice 3.8 & 3.9 | | | | | | |

**a. Fertilizers or soil amendment materials prohibited by OMRI in its generic materials list are prohibited in construction of the project.**

**POINTS: 1**

**PRACTICE DESCRIPTION**

Bay-Friendly Landscaping relies on compost and organic fertilizers from natural sources that release elements slowly.

Amendments and fertilizers that are not approved or are restricted for use in crop production by OMRI shall not be specified for use during the construction and establishment phases of the project.

***Organic Materials Research Institute (OMRI)*** *approves amendments and fertilizers for use in crop production. The OMRI Generic Materials List is a catalog of over 900 substances that are allowed, restricted, or prohibited for use in organic agriculture and food processing. Based on the National Organic Program, the list serves as a reference guide for organic farmers, handlers, processors, inspectors, certifiers, agricultural professionals, and all others with an interest in materials for use in organic production. Materials approved for use in organic production are appropriate for use in landscapes.* *http://omri.org/OMRI_generic_list.html*

**PROJECT TEAM RECOMMENDATIONS**

- Submit a soil sample for analysis and request recommendations for an organic approach to the management of the soil.

**VERIFICATION**

*PROJECT TEAM*

- Submit an Accountability Form signed by the Landscape Contractor indicating that no materials prohibited by OMRI have been used in the construction or establishment phases.
- Submit construction document that specify the use of organic amendments and fertilizers.

*RATER*

- Verify that construction documents require organic fertilizers and amendments.
- Verify Accountability Form has been signed by the Landscape Contractor.

**SYNERGIES AND TRADE-OFFS**

- Using compost as the soil amendment can contribute to meeting the requirement or earning points for Credit C.7 (Amend the soil with compost before planting).
- Using compost made from plant debris (recycled mulch) can also contribute to earning points for Credit D.1.d. (Purchased compost and/or mulch is recycled from local, organic materials such as plant or wood waste.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- *Bay-Friendly Landscape Guidelines* Practice
- www.BuildingSoil.org/tools/Soil_BMP_text.pdf
- *Field Guide to Compost Use*, US composting Council www.uscompostingcouncil.org

# 6. MULCH

**a. REQUIRED: Planting plans indicate that after construction, all soil on site is protected with a minimum of 3 inches of mulch.**

**POINTS:** This practice is required for all commercial& civic landscapes that are to be recognized as Bay-Friendly.

**PRACTICE DESCRIPTION**

A three-inch (3") layer of mulch is spread over the surface of all non-turf planting areas. It is highly recommended that trees identified for removal are chipped and used on-site as mulch or that recycled or green waste mulch be purchased. It is very important that root crowns be kept free of mulch. It is also recommended that landscape fabric not be used under the recycled mulch. All layers of sheet mulch, including cardboard, paper, compost, or other chipped materials if used, will count towards the 3 inches of mulch.

**PROJECT TEAM RECOMMENDATIONS**

- Specify a three-inch (3") layer of mulch planting notes, specifications, details and in cost estimate.
- If sheet mulching is specified, include a sheet mulching detail in planting plans.
- Include notes on clearing and demolition plans and specifications if on-site trees are to be chipped for mulch.
- Integrate this practice into a soil management plan.
- Be sure that grading instructions include a soil level at least 3 inches lower than the surrounding hardscapes to insure that the finished mulch is at grade or slightly lower to facilitate ease of maintenance and to keep mulch out of storm drains.

**VERIFICATION**

*PROJECT TEAM*

- Submit square footage of planting areas as well as cubic yards required to cover planting areas to a minimum three-inch (3") depth.
- Submit a delivery ticket or receipt of purchased mulch and/or
- Submit receipts for sheet mulching materials and/or
- (Optional) Submit photos of trees being chipped for mulch (if applicable).

*RATER*

- Verify delivery tickets/receipts for purchased materials reflect needed amounts of materials.
- Visually verify the type and depth of the mulch (depth can be spot checked with a ruler).
- If sheet mulch is specified, Rater visually verifies the layer of cardboard has been installed.

**SYNERGIES AND TRADE-OFFS**

- Using mulch made from plant debris (recycled mulch) can also contribute to earning points for Credit D.1.d. (Purchased compost and/or mulch is recycled from local, organic materials such as plant or wood waste.
- Chipping trees identified for removal, and using on-site as mulch can also contribute to earning points for A.3.a.ii (Construction documents specify that of the trees identified for removal, some are chipped for use as mulch on-site) and D.2 (Reduce and recycle landscape construction waste).
- Sheet mulching can also contribute to earning points for practice C.8.a (Sheet mulch is specified for weed control). See model sheet mulching specifications in Appendix A.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Available for download from http://www.stopwaste.org/home/index.asp?page=777
  - *A Bay-Friendly Landscaping Guide to Mulch: Save Money, Control Weeds and Create Healthy Landscapes*
  - *Bay-Friendly Landscape Guidelines* Practice 4.1
  - *Local Sources for Compost, Mulch and Recycled Cardboard for Sheetmulching*
  - Model mulch and sheetmulching specifications
- *Guidelines and Resources for Implementing Soil Quality & Depth BMP T5.13* can be downloaded from www.ecy.wa.gov/programs/wq/stormwater/manual.html
- State of California, Department of Water Resources, *Model Water Efficient Landscape Ordinance, Appendix B, Sample Soil Management Plan.*

Cubic Yard Calculation

1 Cubic Yard = 3ft x 3ft x 3ft = 27 Cubic Ft

1 Foot = 12 inches

A = Total planting area in square feet to cover

B = Total inches of amendment or mulch required for planting areas

Total Cubic Yards of amendment or mulch required = (A / 27) x (B/12)

| **Cubic Yards Required to Apply 3 Inches of Mulch** | |
|---|---|
| 1000 Square Feet | 9.25 cubic yards |
| One Acre | 403 cubic yards |

# 7. AMEND THE SOIL WITH COMPOST BEFORE PLANTING

| Credit C.7 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | R + 3 | | | | |
| Corresponds to BFL Guidelines Practice 4.1 | | | | | | |

**a. Compost is specified as the soil amendment, at the rates indicated by a soil analysis, to bring the soil organic matter content to a minimum of:**

**i. Required: 3.5% by dry weight OR 1" of quality compost OR**

**ii. 5% by dry weight (total 2 points) AND/OR**

**iii. Specify the use of compost from processors that participate in the US Composting Council's Standard Testing Assurance program.**

**POINTS:** The first part of this practice is required for all commercial & civic landscapes that are to be recognized as Bay-Friendly. Up to 3 additional points may be earned for going above and beyond the requirement.

**PRACTICE DESCRIPTION**

i. To meet the requirement, the amount of compost recommended by a professional soil laboratory to bring the soil organic matter content to 3.5% is incorporated into the planting area topsoil. Alternatively a minimum one-inch (1") of quality compost shall be incorporated into the planting area topsoil.

If imported or site soil meets the organic matter content of 3.5% or more, or if the plant palette primarily includes California native species that are adapted to soils with little or no organic matter, then the required practice of adding compost is waived.

ii. The amount of compost recommended by a professional soil laboratory to bring the soil organic matter content to 5% is incorporated into the planting area topsoil, with the same allowable waivers.

iii. The compost is purchased from a producer who participates in the U.S. Composting Council's Standard Testing Assurance Program.

***Compost*** *is the product of controlled biological decomposition of organic materials, often including urban plant debris and food waste. It is an organic matter resource that has the unique ability to improve the chemical, physical and biological characteristics of soils or growing media. It contains plant nutrients but is typically not characterized as a fertilizer. Excerpted from US Compost Council , Field Guide to Compost Use*

***Quality compost*** *is a well decomposed, stable, weed free organic matter source, derived from agricultural and/or food waste and/or plant trimmings, contain no substances toxic to plants, possess no objectionable odors. It does not resemble the feedstock (the original materials from which it was derived. It is highly recommended that it be produced in accordance with the U.S. Composting Council's Standard Testing Assurance Program.* [www.compostingcouncil.org](http://www.compostingcouncil.org)

**PROJECT TEAM RECOMMENDATIONS**

- Integrate this practice into a soil management plan.
- Specify a minimum of 1" of quality compost or as recommended in the soils report, as the soil amendment in plans, specifications and details.
- Request a soil analysis and amendment recommendations from a qualified soil laboratory. Ask that the recommendations be based on an organic approach to landscaping, and ask the lab to calculate the amount compost required for the square footage to which it is to be applied.

**VERIFICATION**

*PROJECT TEAM*

i. and ii.

If a waiver is requested based on soil organic matter content or the needs of plant palette,

- Submit a completed plant palette with species that need little/no soil organic matter identified, and include the source of information on their soil needs OR
- Submit a soils report that indicates the soil has an organic matter content of 3.5% or greater.

Under all other circumstances:

- Submit the site soil or imported topsoil analysis. No soils analysis is required if 1" of compost is used.
- Submit compost details from construction documents.
- Submit the receipt or delivery ticket for the compost, indicating the amount of the compost delivered/purchased.

iii.

- Submit documentation showing compost is purchased from a processor that participates in the US Composting Council's Standard Testing Assurance Program.

*RATER*

i. and ii.

- If a waiver is requested based on plant palette, verify plant palette and soil needs (spot check source by looking up soil needs in identified source).
- If a waiver is requested based on adequate soil organic matter content, confirm by reviewing soil analysis.
- Verify compost details have been included in construction documents.
- Verify receipts compost delivered or purchased matches.

iii.

- Verify from receipts that compost is USCC STA program certified.

**SYNERGIES AND TRADE-OFFS**

- Submitting soil analysis recommendations for quality compost can also contribute to earning points for Credit C.1.a. (Submit laboratory soil analysis results and recommendations for compost and natural fertilizers)
- Tilling quality compost to a depth of 8-12 inches can also contribute to earning points for Credit C.4 (Aerate compacted soils)
- Specifying compost from recycled local organic materials such as plant waste can also contribute to earning points for Credit D.1.d (Purchased compost and/or mulch is recycled from local, organic materials such as plant or wood waste.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Available for download from http://www.stopwaste.org/home/index.asp?page=777
  - *A Bay-Friendly Landscaping Guide to Mulch: Save Money, Control Weeds and Create Healthy Landscapes*
  - *Bay-Friendly Landscape Guidelines* Practice 4.1
  - *Local Sources for Compost, Mulch and Recycled Cardboard for Sheetmulching*
  - *Model Bay-Friendly Landscape Maintenance Specifications*
- Caldrons has an online compost calculator: http://www.dot.ca.gov/hq/LandArch/policy/compost_specs.htm
- *Field Guide to Compost Use*, US composting Council www.uscompostingcouncil.org
- State of California, Department of Water Resources, Model Water Efficient Landscape Ordinance, Appendix B, Sample Soil Management Plan.
- U.S. Composting Council Standard Testing Assurance program explanation and list of participating producers can be found at: **www.compostingcouncil.org**

Cubic Yard Calculation

1 Cubic Yard = 3ft x 3ft x 3ft = 27 Cubic Ft

1 Foot = 12 inches

A = Total planting area in square feet to cover

B = Total inches of amendment or mulch required for planting areas

Total Cubic Yards of amendment or mulch required = (A / 27) x (B/12)

| **Cubic Yards Required to Apply 3 Inches of Mulch** | |
|---|---|
| 1000 Square Feet | 9.25 cubic yards |
| One Acre | 403 cubic yards |

# 8. USE IPM DESIGN AND CONSTRUCTION PRACTICES TO PREVENT PEST PROBLEMS

| Credit C.8 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | 1 | | | 4 | |
| Corresponds to BFL Guidelines Practice 6.1.a | | | | | | |

***Sheet mulching*** *uses a layer of paper or cardboard underneath the mulch to enhance weed suppression and soil building benefits. This layered mulch system is often used during landscape construction to optimize mulch benefits and encourage plant establishment. (*StopWaste.Org, *A Bay-Friendly Landscaping Guide to Mulch)*

**a. Sheet mulch is specified for weed control**

**POINTS: 3**

**PRACTICE DESCRIPTION**

Sheet mulch shall be specified for weed control

**PROJECT TEAM RECOMMENDATIONS**

- Use the specifications included in *A Bay-Friendly Landscape Guide to Mulch*
- Cardboard can be bought in large rolls from paper supply companies to reduce labor and materials cost. Wet the cardboard immediately to prevent it from blowing away and to facilitate manipulating the material.
- If using drip irrigation, place irrigation on top of cardboard and below compost and mulch.
- Be sure that the finish grade of the sheet mulch is at the same height or slightly lower than the surrounding hardscape in order to keep mulch in place.

**VERIFICATION**

*PROJECT TEAM*

- Submit sheet mulching details included in construction documents.
- Submit tags or receipts for all layers, and/or photo documentation of weed barrier layer.

*RATER*

- Verify sheet mulching detail has been included in construction documents.
- Verify tags or receipts or photos for all layers.
- Visually verify weed barrier layer while verifying mulch layer.

**SYNERGIES AND TRADE-OFFS**

- Sheet mulch can contribute to meeting the requirements for Credit C6 (Mulch)
- Using compost and/or mulch made from plant debris (recycled mulch) can also contribute to earning points for Credit D.1.d. (Purchased compost and/or mulch is recycled from local, organic materials such as plant or wood waste.
- Chipping trees identified for removal, and using on-site as mulch can also contribute to earning points for A.3.a.ii (Construction documents specify that of the trees identified for removal, some are chipped for use as mulch on-site) and D.2 (Reduce and recycle landscape construction waste).

**b. Synthetic chemical pre-emergents are avoided**

**POINTS: 2**

**PRACTICE DESCRIPTION**

Synthetic pre-emergent herbicides that are listed as prohibited by OMRI shall be avoided. Alternative weed control measures shall be specified, such as sheet mulching, watering sites and tilling over a few cycles to exhaust weed seed banks or spot spraying.

**VERIFICATION**

*PROJECT TEAM*

- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor that the criteria for this credit have been met.

*RATER*

- Verify Accountability Form has been signed by the Landscape Architect, Designer or Contractor.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Available for download from http://www.stopwaste.org/home/index.asp?page=777
  - *A Bay-Friendly Landscaping Guide to Mulch: Save Money, Control Weeds and Create Healthy Landscapes*
  - *Bay-Friendly Landscape Guidelines* Practice 6.1
  - *Local Sources for Compost, Mulch and Recycled Cardboard for Sheetmulching*
  - *Model Bay-Friendly Landscape Maintenance Specifications*
- California Invasive Plant Council, *The Weed Worker's Handbook, A Guide to Techniques for removing Bay Area Invasive Plants,*
- *The Peaceful Valley Farm Supply for a source of alternative weed controls, www.groworganic.com*

# 9. KEEP SOIL AND ORGANIC MATTER WHERE IT BELONGS

| Credit C.9 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | 1 | | | 1 | |
| Corresponds to BFL Guidelines Practice 3.3 | | | | | | |

**a. Compost berms or blankets or socks are specified for controlling erosion**

**POINTS: 2**

**PRACTICE DESCRIPTION**

Compost blankets shall be specified for temporary erosion and sediment control during the construction of the project, and shall be a depth that is appropriate to the slope, as per the California Department of Transportation (Caldrons) Specifications. Compost blankets shall be stabilized with netting or other confinement systems and the compost particle size and compost depth shall be specially designed if applying to steeper slopes AND/OR Compost berms or socks shall be specified for all perimeter sediment controls. No silt fences or straw bales will be used.

Compost for any erosion control BMPs is specified as per the California Department of Transportation or the US EPA, and is produced by a participant in the US Composting Council's Standard Testing Assurance (STA) program.

**PROJECT TEAM RECOMMENDATIONS**

- Specify the compost used for compost blankets be tilled into the soil before planting.

**VERIFICATION**

*PROJECT TEAM*

- Submit calculations of area to be blanketed, and amount of compost required for targeted depth.
- Submit specifications for compost products and source of specifications (Caldrons or US EPA).
- Submit a delivery ticket or receipt of purchased compost, and/or socks indicating amounts and that the compost is supplied from a participant in the US Composting Council's STA program.

***Compost blankets*** *1-3 inch layers of compost that are blown onto slopes up to 2:1 or up to 1:1 with additional stabilization. The compost can also be spread on shallower slopes. The use of compost blankets is a USEPA approved BMP for construction sites. They make excellent surface contact, preventing rilling underneath and thereby controlling erosion. Compost blankets can be less expensive than other erosion BMPs because they do not need to be removed, hauled and landfilled.* www.BuildingSoil.org

***Compost berms and socks*** *are also US EPA approved for perimeter sediment and pollutant control, and are increasingly used instead of silt fences and straw bales. Berms can be blown in place or placed with a front end loader. Socks can be filled in place by compost suppliers or filled and delivered on pallets. They do not need to be trenched in and are highly effective at filtering out sediments, oil, grease and metals.* www.BuildingSoil.org

*RATER*

- Verify calculations are accurate.
- Verify receipts for compost and that the amount of compost purchased for use as a blanket will cover the area as calculated.
- Visually verify the depth of the compost blanket and/or installation of compost berms or socks.

**SYNERGIES AND TRADE-OFFS**

- Turning a compost blanket used for erosion control into the soil before planting can contribute to meeting the requirement or earning points for Credit C.7 (Amend the soil with compost)
- Using compost made from plant debris (recycled mulch) can also contribute to earning points for Credit D.1.d. (Purchased compost and/or mulch is recycled from local, organic materials such as plant or wood waste.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Available for download from http://www.stopwaste.org/home/index.asp?page=777
  - *A Bay-Friendly Landscaping Guide to Mulch: Save Money, Control Weeds and Create Healthy Landscapes*
  - *Bay-Friendly Landscape Guidelines* Practice 3.3
  - *Local Sources for Compost, Mulch and Recycled Cardboard for Sheetmulching*
  - *Model Bay-Friendly Landscape Maintenance Specifications*
- Caldrons Compost Specifications and compost calculator: http://www.dot.ca.gov/hq/LandArch/policy/compost_specs.htm
- www.BuildingSoil.org/tools/Soil_BMP_text.pdf

# D. MATERIALS

## 1. USE SALVAGED ITEMS & RECYCLED CONTENT MATERIALS

| Credit D.1 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | 16 | | | | | |
| Corresponds to BFL Guidelines Practice 2.6 | | | | | | |

**a. Non-plant landscape materials are salvaged or made from recycled content materials or FSC certified wood**

- **i. Decking (100% of non structural materials) (1 point)**
- **ii. Fencing (100% of non structural materials) (2 points)**
- **iii. Outdoor furniture such as bike racks, benches, tables and chairs (50% minimum) (2 points)**
- **iv. Planters or retaining walls (100% of either or both) (1 point)**
- **v. Parking stops or lighting/sign posts (100% of either or both) (1 point)**
- **vi. Play structures or surfaces (100% of either or both) (2 points)**
- **vii. Edging or decorative glass mulch (100% of either or both) (1 point)**

***Recycling*** *is the collection, reprocessing, marketing and use of materials that were diverted or recovered from the solid waste stream (LEED New Construction & Major Renovation Version 2.2 reference Guide)*

***Salvaged materials*** *are items that are put to a new use after their initial use, without being remanufactured between uses.*

***Recycled content products*** *are those made from materials derived from discarded goods. They are remanufactured between uses.*

***FSC certified wood*** *is certified in accordance with the Forest Stewardship Council's criteria*

**POINTS: 10**

**PRACTICE DESCRIPTION**

Non-plant landscape materials are salvaged or made from recycled content materials or FSC certified wood. The percentages are calculated per each category of item that qualifies. For example, all of the non structural decking on the entire project must be salvaged and/or recycled content and/or FSC certified. In addition, the recycled content must be:

- Plastic: 100% recycled content with 90-100% postconsumer content
- Plastic/Rubber: 90-100% total with 90-100% postconsumer content
- Plastic composites: 95-100% recycled content with 50-100% postconsumer content
- Aluminum: 25% recycled content with 25% postconsumer
- Steel from the Basic Oxygen Furnace (BOF) process: 25-30% recycled content with 16% postconsumer content
- Steel from the Electric Arc Furnace (EAF) process 100% total with 67% postconsumer content

.

**PROJECT TEAM RECOMMENDATIONS**

Assess which items can be salvaged from the site and reused early in the design process and include salvage of these items in the demolition plan.

**VERIFICATION**

*PROJECT TEAM*

- Submit tags and receipts for FSC wood and/or product literature indicating recycled content of plastic, rubber surfaces and/or composite lumber, or that furnishings have reclaimed lumber and/or metal components OR
- Submit specifications and an Accountability Form signed by the Landscape Architect, Designer or Contractor that as installed the project meets the criteria for this credit.

*RATER*

- Verify tags, receipts and manufacturer literature indicates content
- Verify that specifications have been submitted and an Accountability Form has been signed by Landscape Architect, Designer or Contractor.
- Visually verify compliance on site (spot check).

**SYNERGIES AND TRADE-OFFS**

- Salvaging materials onsite can contribute to meet the requirements for Credit D.2. (Reduce and recycle landscape construction waste)
- Specifying recycled lighting posts that also have low energy light fixtures can contribute to earning points for Credit D.4.a. (Low energy light fixtures are specified for all site lighting)
- Specifying recycled light posts that are also photovoltaic can contribute to earning points for Credit D.4.b. (Photovoltaic is specified for site lighting).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Guidelines Practice 2.6 https://www.stopwaste.org/docs/bay-friendly_landscape_guidelines_-_all_chapters.pdf
- Builders Guide to Reuse and Recycling http://www.stopwaste.org/docs/buildersguide-05.pdf
- Recycled Content Park & Recreation Products in Alameda County http://www.stopwaste.org/docs/parkandrec5.pdf
- Build it Green Green Product Directory http://accessgreen.builditgreen.org/
- EPA Wastes Resource Conservation - Comprehensive Procurement Guidelines http://www.epa.gov/epawaste/conserve/tools/cpg/products/
- The Forest Stewardship Council www.fsc.org

**REFERENCES**


- Build it Green, GreenPoint Rated Multifamily Rating Manual, V. 1.5, June 2008. Credit C3 (FSC Certified Wood for Framing Lumber), Credit E.12

**b. A minimum 25% of recycled aggregate (crushed concrete) is specified for walkway, driveway, roadway base and other uses**

***Recycled aggregate*** *is clean crushed concrete and crushed asphalt pavement.*

**POINTS: 2**

**PRACTICE DESCRIPTION**

A minimum 25% of recycled aggregate shall be specified for all areas where Caldrons Class II materials are specified. Purchased crushed concrete or asphalt as well as materials salvaged from the jobsite such as crushed concrete, crushed asphalt or existing aggregate will qualify as recycled aggregate to meet the criteria for this credit.

**PROJECT TEAM RECOMMENDATIONS**

Assess whether existing concrete or asphalt on site could be crushed for reuse early in the design process or if existing aggregate can be reused. Note salvaging this material on the demolition plan. Recycled aggregate can also be purchased and should be specified on the plans, details, and specifications and in the cost estimate.

**VERIFICATION**

*PROJECT TEAM*

- Submit tags or vendor receipts showing recycled aggregate percentage OR
- Submit specifications and an Accountability Form signed by the Owner, Developer, Landscape Architect, Designer or Contractor that as installed the project meets the criteria for this credit.

*RATER*

- Verify tags or receipts have been submitted and that percentage meets the standard OR
- Verify that specifications have been submitted and an Accountability Form has been signed by Owner, Developer, Landscape Architect, Designer or Contractor.
- Optional: field verification

**SYNERGIES AND TRADE-OFFS**

- Salvaging recycled aggregate from onsite could contribute to meeting the requirement for Credit D.2. (Reduce and recycle landscape construction waste)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Guidelines Practice 2.6 http://www.stopwaste.org/home/index.asp?page=431
- Builders Guide to Reuse and Recycling http://www.stopwaste.org/docs/buildersguide-05.pdf
- Build it Green Green Product Directory http://accessgreen.builditgreen.org/

**REFERENCES**

- Build it Green, GreenPoint Rated Multifamily Rating Manual, V. 1.5, June 2008. Credit C1 (Recycled aggregate)

**c. Replace Portland cement in concrete with flyash or slag.**
**i. 20% (1 point) OR**
**ii. 25% (2 points total)**

**POINTS: 2**

***Fly Ash*** *is a by product from coal combustion. It can be used as a substitute for Portland cement in concrete.*

***Slag*** *is a by product of metal smelting and can be used as a substitute for Portland cement in concrete.*

**PRACTICE DESCRIPTION**

Flyash AND/OR slag replaces Portland cement in concrete to the specified percentage on a per weight basis for all flatwork and poured in place concrete.

**VERIFICATION**

*PROJECT TEAM*

- Submit tags or receipts showing flyash or slag percentage in the concrete mix OR
- Submit specifications and an Accountability Form signed by the Engineer, Designer or Contractor stating percentage for compliance.

*RATER*

- Verify tags or receipts have been submitted and that percentage is meets the standard OR
- Verify that specifications have been submitted an Accountability Form has been signed by the Engineer, Landscape Architect, Designer or Contractor

**SYNERGIES AND TRADE-OFFS**

- Specifying permeable concrete paving could contribute to earning points for Credit B1 (Minimize impervious surfaces)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Guidelines Practice 2.6 https://www.stopwaste.org/docs/bay-friendly_landscape_guidelines_-_all_chapters.pdf

**REFERENCES**


- Build it Green, GreenPoint Rated Multifamily Rating Manual, V. 1.5, June 2008. Credit C2 (Recycled Flyash in Concrete)

**d. Purchased compost and/or mulch is recycled from local, organic materials such as plant or wood waste**

**i. 100% of compost OR 100% of mulch (1 point)**

**ii. 100% of both (2 points total)**

**POINTS: 1**

***Compost** is the product of controlled biological decomposition of organic materials, often including green waste and food waste*

***Mulch** is any material spread evenly over the surface of the soil to enhance the growth of plants and the appearance of the landscape.* (StopWaste.Org, *A Bay-Friendly Landscaping Guide to Mulch)*

***Recycled mulch** is chipped or shredded wood and green waste from used pallets or untreated lumber scraps, branches, leaves and tree trunks. Its use provides the benefits of mulch and keeps wood and green waste out of landfills.* (StopWaste.Org, *A Bay-Friendly Landscaping Guide to Mulch)*

**PRACTICE DESCRIPTION**

All purchased compost and/or mulch shall be produced from local, organic materials such as plant, food or wood waste.

**VERIFICATION**

*PROJECT TEAM*

- Submit tags or receipts showing quantity, supplier and feedstock of compost and/or mulch

*RATER*

- Verify that tags or receipts show quantity, supplier and feedstock of compost and/or mulch qualify

**SYNERGIES AND TRADE-OFFS**

- If mulch is supplied by chipping on-site trees identified for removal for Credit A.3.a.ii (Construction documents specify that of the trees identified for removal, some are chipped for use as mulch onsite), then points can not also be earned for this credit.
- Submitting soil analysis recommendations for quality compost can contribute to earning points for Credit C.1.a. (Assess the soil and test drainage)
- Specifying 3" of mulch will contribute to meeting the requirements for Credit C.6.a (Required planting specifications and plans indicate that after construction, all soil on site is protected with a minimum of 3 inches of mulch)
- Specifying Quality compost as the soil amendment could contribute to earning points for Credit D7 (Amend the soil with compost before planting)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- The *Bay-Friendly Landscape Guidelines* and other printed materials can be downloaded from: http://www.stopwaste.org/home/index.asp?page=777, including
  - *Bay-Friendly Landscape Guidelines* Practice 2.6
  - *A Bay-Friendly Landscaping Guide to Mulch: Save Money, Control Weeds and Create Healthy Landscapes*
- Guidelines and Resources for Implementing Soil Quality & Depth BMP T5.13 www.ecy.wa.gov/programs/wq/stormwater/manual.html
- US Composting Council www.compostingcouncil.org
- Local Sources of Compost, Mulch and Recycled Cardboard for Sheet Mulching http://www.stopwaste.org/home/index.asp?page=782.

# 2. REDUCE AND RECYCLE LANDSCAPE CONSTRUCTION WASTE

| Credit D.2 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | R + 5 | | | | | |
| Corresponds to BFL Guidelines Practice 2.7 | | | | | | |

a. REQUIRED: Required: Divert 50% of landscape construction and demolition waste.

**POINTS:** This practice is required for all commercial& civic landscapes that are to be recognized as Bay-Friendly.

**PRACTICE DESCRIPTION**

Identify the types and quantities of materials generated at the job site and reuse or recycle an average of at least fifty (50) percent, by weight, of all C&D debris from construction, demolition, and renovation projects.

Create and follow pre and post construction debris recovery plans that include

- allocating space for recycling bins and containers on the job site
- securing recycling bins against illegal dumping
- training workers before demolition or construction begins
- separating green waste from other materials
- If applicable, establishing and using a cut-pile to reduce waste from scrap pieces of wood.
- Documenting the results of the waste management efforts

Put waste recycling and reuse specifications into contract language and require contractors to review the waste management plan with subcontractors.

***Construction and Demolition Debris*** *means used or discarded materials removed from premises during construction or renovation of a structure resulting from construction, remodeling, repair, or demolition operations on any pavement, house, commercial building, or other structure. It generally consists of wood, drywall, metals, concrete, dirt, cardboard, plastic pots and more. StopWaste.Org Model C&D Policy*

***Green waste*** *consists of the plant debris from trees, shrubs, groundcover and turf that is generated during demolition, installation or maintenance phases of the project.*

**PROJECT TEAM RECOMMENDATIONS**

- Verify the local jurisdiction's minimum requirement and reporting procedures for C&D recycling.
- State the percent diversion goal in the design documents.
- List specific goals and recycling and reuse requirements in plans and specifications
- Require contractors to review the waste management plan with subcontractors and to include contract language requiring subcontractors comply with the plan.
- To facilitate this process occurring smoothly, plans should be submitted with the Build It Green Sample Debris Recovery Statement or equivalent form required by local jurisdictions or regularly used by the Builder.
- Hauler and gate tags may show that all materials were sent to a C&D Recycling facility. However, that does not mean that 100% of all of the materials were recycled, as not all C&D materials can be recycled. Most large C&D facilities have a calculated diversion rate and can provide you with documentation stating the percentage of materials recycled at that facility. (The diversion rates range from 50% to 90%).

**VERIFICATION**

*PROJECT TEAM*

- Submit the Pre Construction Debris Recovery Plan in the planning stages of construction,
- Submit Post Construction Debris Recovery Plan, and documentation of results (i.e. hauler or facility gate tags, builder's waste tabulation supplied by local waste authority).
- Submit the diversion rate from the C&D facility.

*RATER*

- Verify that Pre Construction Debris Recovery Plan and Post Construction Debris Recovery Plan were submitted and documentation confirms this has been accomplished by comparing hauler and gate tags to facility diversion rates.
- Conduct field observations to get a sense of waste diversion practices (optional). However, field observation can not be used as a judgment or verification method of the documented results as some builders have waste separated and recycled off site and it is not evident on site.

**SYNERGIES AND TRADE-OFFS**

- Chipping trees identified for removal, and using mulch on-site is highly recommended and can also contribute to earning points for Credit A.3.a.ii (Construction documents specify that of the trees identified for removal, some are chipped for use as mulch onsite), C.6.a (Required: Planting specifications and plans indicate that after construction, all soil on site is protected with a minimum of 3 inches of mulch) and Credit D.1.d. (Purchased compost and/or mulch is recycled from local, organic materials such as plant or wood waste)
- Reusing site materials can also contribute to earning points for Credit D.1. (use salvaged items and recycled content materials)
- Donating unused materials can also contribute to earning points for Credit D.2.d. (Donate unused materials)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Find out where to recycle C&D debris, including wood, drywall, metals, concrete, soil and cardboard from StopWaste.Org, *Builders' Guide to Reuse & Recycling: A Directory for Construction and Demolition Materials*, *www.*BuildGreenNow.Org
- StopWaste.Org also provides extensive information about C&D waste management, including a sample Waste Management Plan for recycling C&D materials. Visit www.BuildGreenNow.Org to download these documents electronically.
- Build It Green Sample Debris Recovery Statement www.builditgreen.org
- For information on recycling facilities in California, visit the California Integrated Waste Management Board at www.ciwmb.ca.gov/ConDemo
- Model Construction & Demolition specifications, can also be downloaded from: http://www.stopwaste.org/docs/c-d_waste_management.pdf

**REFERENCES**


- Build it Green, *GreenPoint Rated Multifamily Rating Manual, V. 1.5*, June 2008

**b. Divert 100% of asphalt concrete and Portland cement concrete and 65% of remaining materials (2 points) OR**

**c. Divert 100% of asphalt concrete and Portland cement concrete and 80% or more of remaining materials (Total 4 points)**

**POINTS: 4 points**

**PRACTICE DESCRIPTION**

Identify the types and quantities of heavy and inert materials generated at the job site and where local facilities are available for heavy and inert materials, divert at 100% (by weight) of the asphalt concrete and Portland cement concrete construction debris, AND 65% or 80% or more of all other waste, including green waste. If local facilities are not available for heavy and inert materials, the diversion of asphalt concrete and Portland cement concrete are exempt.

Create and follow pre and post construction debris recovery plans that include

- allocating space for recycling bins and containers on the job site
- securing recycling bins against illegal dumping
- training workers before demolition or construction begins
- separating green waste from other materials
- If applicable, establishing and using a cut-pile to reduce waste from scrap pieces of wood.
- Documenting the results of the waste management efforts

**PROJECT TEAM RECOMMENDATIONS**

- Determine that local facilities are available for diverting heavy and inert materials.
- Verify the local jurisdiction's minimum requirement and reporting procedures for C&D recycling.
- State the percent diversion goal in the design documents.
- List specific goals and recycling and reuse requirements in plans and specifications
- Require contractors to review the waste management plan with subcontractors and to include contract language requiring subcontractors comply with the plan.
- To facilitate this process occurring smoothly, plans should be submitted with the Build It Green Sample Debris Recovery Statement or equivalent form required by local jurisdictions or regularly used by the Builder.
- Hauler and gate tags may show that all materials were sent to a C&D Recycling facility. However, that does not mean that 100% of all of the materials were recycled, as not all C&D materials can be recycled. Most large C&D facilities have a calculated diversion rate and can provide you with documentation stating the percentage of materials recycled at that facility. (The diversion rates range from 50% to 90%).

**VERIFICATION**

*PROJECT TEAM*

- Submit the Pre Construction Debris Recovery Plan in the planning stages of construction,
- Submit Post Construction Debris Recovery Plan, and documentation of results (i.e. hauler or gate tags, builder's waste tabulation supplied by local waste authority).
- Submit the diversion rate from the C&D facility.

*RATER*

- Verify that Pre Construction Debris Recovery Plan and Post Construction Debris Recovery Plan were submitted and documentation confirms this has been accomplished.
- Conduct field observations to get a sense of waste diversion practices (optional). However, field observation can not be used as a judgment or verification method of the documented results as some builders have waste separated and recycled off site and it is not evident on site.

**SYNERGIES AND TRADE-OFFS**

- Chipping trees identified for removal, and using mulch on-site is highly recommended and can also contribute to earning points for Credit A.3.a.ii (Construction documents specify that of the trees identified for removal, some are chipped for use as mulch onsite), C.6.a (Required: Planting specifications and plans indicate that after construction, all soil on site is protected with a minimum of 3 inches of mulch) and Credit D.1.d. (Purchased compost and/or mulch is recycled from local, organic materials such as plant or wood waste)
- Reusing site materials can also contribute to earning points for Credit D.1. (use salvaged items and recycled content materials)
- Donating unused materials can also contribute to earning points for Credit D.2.d. (Donate unused materials)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Find out where to recycle C&D debris, including wood, drywall, metals, concrete, soil and cardboard from StopWaste.Org, *Builders' Guide to Reuse & Recycling: A Directory for Construction and Demolition Materials*, *www.*BuildGreenNow.Org
- StopWaste.Org also provides extensive information about C&D waste management, including a sample Waste Management Plan for recycling C&D materials. Visit www.BuildGreenNow.Org to download these documents electronically.
- Build It Green Sample Debris Recovery Statement www.builditgreen.org
- For information on recycling facilities in California, visit the California Integrated Waste Management Board at www.ciwmb.ca.gov/ConDemo
- Model Construction & Demolition specifications, can also be downloaded from: http://www.stopwaste.org/docs/c-d_waste_management.pdf

**REFERENCES**


- Build it Green, *GreenPoint Rated Multifamily Rating Manual, V. 1.5*, June 2008

### d. Donate unused materials

**PRACTICE DESCRIPTION**

Unused materials, such as benches, wood scraps, plants, planting pots, etc. is donated to a local school or community garden, or other entity(s), in order to minimize material sent to the landfill.

**PROJECT TEAM RECOMMENDATIONS**

- State the percent diversion goal in the design documents, including the intent to donate unused materials.
- Identify materials to be donated and method of delivery in plans and specifications.

**VERIFICATION**

*PROJECT TEAM*

- Submit letter or receipt from receiving organization for donated materials OR
- Submit an Accountability Form signed by the Designer or Contractor.

*RATER*

- Verify receipt or letter from receiving organization has been submitted OR
- Verify an Accountability Form signed by the Designer or Contractor has been submitted.

**SYNERGIES AND TRADE-OFFS**

- Donating unused materials can also contribute to meeting the requirement for Credit D.2.a (Divert 50% of landscape construction waste)

# 3. REDUCE THE HEAT ISLAND EFFECT WITH COOL SITE TECHNIQUES

| Credit D.3 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | 2 | | |
| Corresponds to BFL Guidelines Practice 5.2 | | | | | | |

## a. At least 50% of the paved site area includes cool site techniques

**POINTS: 2**

**PRACTICE DESCRIPTION**

Reduce heat islands by applying any combination of the following cool site techniques to a minimum of 50% of the paved site area.

Covered parking (underground parking garage or under overhangs/awnings/roof), roof or exposed podium patio must meet the criteria of solar reflectance greater than or equal to 0.3 or a reflectance index greater than or equal to 29%

White concrete, gray concrete or other light colored paving materials or pavers with an albedo of greater than or equal to .30 or a solar reflective index (SRI) of 29% or greater

Open grid paving system

Specifying trees, large stature shrubs and/or vegetated structures (such as trellises)

Locating paving to take advantage of shade from trees, and/or large stature shrubs on adjacent properties.

**PROJECT TEAM RECOMMENDATIONS**

Site plan identifies the goal for implementing cool site techniques.

- Identify all paved site areas (PA).
- Identify all paved site areas that have covered parking. (CP)
- Identify all paved site areas that will have an open grid paving system (OGP).
- Identify all paved site areas with light colored paving (LCP).
- Conduct a shade study to calculate the shaded area provided at noon on summer solstice (June 21) by trees, large stature shrubs and/or vegetated structures, assuming a mature height and width. Do not double count canopies that overlap. (VS).
- % cool site = (CP+ OCP + LCP +VS)/ (PA).

*The **Heat island effect** is the experience of warmer temperatures in urban landscapes compared to adjacent rural areas, resulting from the retention of solar energy on constructed surfaces. Principal surfaces that contribute to the heat island effect include streets, sidewalks, parking lots and buildings.* (USGBC, LEED New Home Construction & Major Renovation, v2.2 Reference Guide, September 2006.)

***Albedo** or **solar reflectance** is a measure of ability of a surface material to reflect sunlight- including the visible, infrared and ultraviolet wavelengths on a scale of 0 to 1. Solar reflectance is also called "albedo" Solar Reflectance is measured according to ASTM E 903, ASTM E 1918 or ASTM C 1549*

***Paved site area** includes sidewalks, patios, walkways, driveways, parking lots and other non-roof hardscapes, regardless of permeability.*

***Open-grid paving** is defined as having less than 50% imperviousness and containing vegetation in the open cells. (GreenPoint Rated MultiFamily Rating Manual, v1.2, July 2007)*

**VERIFICATION**

*PROJECT TEAM*

- Submit relevant site plan and calculations as defined in project recommendations.
- Submit an Accountability Form signed by the Landscape Architect or Designer that as installed the project meets the criteria for this credit.

*RATER*

- Verify that site plan has been submitted, calculations are complete
- Verify that an Accountability Form has been signed by the Landscape Architect or Designer.

***Large stature shrubs** are those that, under normal conditions, can reach a mature height of 12 feet or more. Examples include Arbutus 'Marina', some Arctostaphylus spp., some Ceanothus spp., Sambucus mexicana, Nerium oleander trained as a single or multistemmed tree*

**SYNERGIES AND TRADE-OFFS**

- Preserving mature healthy, large stature trees can also earn points for Credit A.7. (Conserve or restore natural areas and wildlife corridors).
- Using an open-grid system can contribute to earning points for Credit B.1 (Minimize impervious surfaces).
- Specifying that all stone and other non-concrete hardscape materials are produced within 500 miles of the project site can contribute to earning points for Credit D.6 (Specify low embodied energy products).
- Providing trees and vegetation with the space that each plant will require to reach its mature shape and size will contribute to earning points for credit E.1 (Select appropriate plants: choose & locate plans to grow to natural size and avoid shearing).
- Specifying drought tolerant large stature species can also earn points for Credit E.3 (Grow drought tolerant CA native, Mediterranean or climate adapted plants).
- Shading hardscapes with trees and other vegetation can contribute to earning points for Credit E.7 (Plant trees)
- Specifying a diversity of trees can contribute to earning points for Credit E.8 (Diversity)
- Specifying California native species can contribute to earning points for Credit E.9 (Choose California natives first)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Center for Urban Forest Research, Where are all the cool parking lots, http://cufr.ucdavis.edu
- Center for Urban Forest Research, Fact Sheet #3: Making Parking Lots More Tree Friendly, http://cufr.ucdavis.edu
- USGBC, LEED New Construction & Major Renovation v2.2 Reference Guide, September 2006

**REFERENCES**


- USGBC LEED for Homes Rating System, January 2008
- USGBC, LEED for Homes Verification & Submittal Guidelines
- Build It Green, GreenPoint Rated Multifamily Rating Manual, v1.2, July 2007 Credit 9a

# 4. DESIGN LIGHTING CAREFULLY

| Credit D.4 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | 9 | | |
| Corresponds to BFL Guidelines Practice 5.4 | | | | | | |

***Low energy fixtures*** *are light fixtures that are Energy Star qualified.*

**a. Low energy fixtures are specified for all site lighting.**

**POINTS: 2**

**PRACTICE DESCRIPTION**

High efficiency, low energy consuming fixtures shall be specified for all site lighting.

**VERIFICATION**

*PROJECT TEAM*

- Submit lighting plan and documentation indicating light fixtures are Energy Star Qualified fixtures.
- Submit an Accountability Form signed by the Lighting Designer and/or Contractor that as installed the project meets the criteria for this credit.

*RATER*

- Verify that lighting plan and documentation have been submitted and that fixtures are Energy Star Qualified.
- Verify that Accountability Form has been signed by Lighting Designer and/or Contractor

**SYNERGIES AND TRADE-OFFS**

- Specifying recycled lighting posts can contribute to earning points for Credit D.1. (Non-plant landscape materials are salvaged or made from recycled content materials or FSC certified wood)
- Installing photovoltaic panels to general a percentage of building/site energy needs can contribute to earning points for Credit D.4.b. (Photovoltaic is specified for site lighting)
- Specifying fixtures that are Dark Sky certified can contribute to earning points for credit D.4.c ( Reduce light pollution and trespass)
- Specifying fixtures that do not cast direct beam illumination onto adjacent properties or right of ways can contribute to earning points for Credit D.4.d

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Illuminating Engineering Society of No. America Lighting for Exterior Environments
- IDA the light pollution authority www.darksky.org
- The California Energy Commission http://www.energy.ca.gov/efficiency/lighting/outdoor_reduction.html
- California's Energy Efficiency Standards for Residential and Nonresidential buildings http://www.energy.ca.gov/title24/
- Energy Star http://www.energystar.gov/

**b. Photovoltaic is specified for site lighting.**

**i. All path lighting is solar powered (1 point))**

**ii. 50% of all other site lighting (2 points) OR**

**iii. 100% of all other site lighting (4 points total)**

**POINTS: 5**

**PRACTICE DESCRIPTION**

All path lighting is powered by solar cells within the light fixtures and/or, a percentage of all other site lighting is powered by onsite solar photovoltaics. It is to be assumed that if a PV system is installed to provide a percentage of the estimated annual electric energy demand for the site and/or building, that same percentage of the site lighting demand will also be met.

**VERIFICATION**

*PROJECT TEAM*

- Submit lighting plan and cut sheets showing that all path lighting is solar powered AND/OR
- Submit a copy of the CF-1R-PV or C-46 solar report (or other appropriate forms) based on what was actually built (system size, output and percentage of load served by PV system).

*RATER*

- Verify that lighting plan and cut sheets have been submitted and path lighting is solar powered OR
- Visually verify that photovoltaics have been installed and verify percentage of load served by the PV system.

**SYNERGIES AND TRADE-OFFS**

- Specifying recycled lighting posts could contribute to earning points for Credit D.1. (Non-plant landscape materials are salvaged or made from recycled content materials or FSC certified wood
- Specifying low energy fixtures may contribute to earning points for Credit D.4.a. (Low energy fixtures are specified for all site lighting)
- Specifying fixtures that are Dark Sky certified could contribute to earning points for credit D.4.c ( Reduce light pollution and trespass)
- Specifying fixtures that do not cast direct beam illumination onto adjacent properties or rights of way could contribute to earning points for Credit D.4.d

**RESOURCES AND BAY-FRIENDLY TOOLS**

- *Bay-Friendly Landscape Guidelines* Practice 5.4 https://www.stopwaste.org/docs/bay-friendly_landscape_guidelines_-_all_chapters.pdf
- Illuminating Engineering Society of No. America Lighting for Exterior Environments
- IDA the light pollution authority www.darksky.org
- The California Energy Commission http://www.energy.ca.gov/efficiency/lighting/outdoor_reduction.html

**c. Reduce light pollution and trespass: exterior luminaries emit no light above horizontal or are Dark Sky certified.**

**POINTS: 1**

**PRACTICE DESCRIPTION**

Full cut-off luminaries or Dark Sky certified fixtures are used for all exterior lighting that is installed by the builder. Landscape lighting that points upward shall not be allowed. Exceptions to this include lighting placed in areas where shielding is unnecessary to control light pollution (such as fixtures placed under overhangs) or where the builder does not install the lighting.

***Light pollution*** *occurs when outdoor fixtures let excess light escape into the night sky.*

***Light trespass*** *occurs when outdoor light fixtures spill light onto neighboring properties.*

***Full cut off luminaries*** *emit no light above horizontal.*

***Dark Sky Certified*** *means that a light is certified by the International Dark-Sky Association, a third party certification for luminaries that minimize glare, reduce light trespass, and don't pollute the night sky. http://www.darksky.org*

**VERIFICATION**

*PROJECT TEAM*

- Submit lighting plan showing lighting fixtures or schedules and/or cut sheets showing Dark Sky qualified luminaries OR
- Submit an Accountability Form signed by the Lighting Designer and/or Lighting Contractor that as installed the project meets the criteria for this credit.

*RATER*

- Verify that lighting plan and/or cut sheets are submitted showing qualified luminaries OR
- Verify that Accountability form is signed by the Lighting Designer and/or Lighting Contractor
- Visually verify compliance.

**SYNERGIES AND TRADE-OFFS**

- Specifying recycled lighting posts could contribute to earning points for Credit D.1 (Non-plant landscape materials are salvaged or made from recycled content materials or FSC certified wood)
- Specifying low energy fixtures may contribute to earning points for Credit D.4.a. (Low energy fixtures are specified for all site lighting)
- Specifying photovoltaic fixtures may contribute to earning points for Credit D.4.b. (Photovoltaic is specified for site lighting)
- Specifying fixtures that do not cast direct beam illumination onto adjacent properties or right of ways could contribute to earning points for Credit D.4.d

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Illuminating Engineering Society of No. America Lighting for Exterior Environments
- IDA the light pollution authority www.darksky.org
- The California Energy Commission http://www.energy.ca.gov/efficiency/lighting/outdoor_reduction.html

**REFERENCES**

- Build it Green, GreenPoint Rated Multifamily Rating Manual, V. 1.5, June 2008, Credit D.8.A (Exterior luminaries Emit No Light Above Horizontal OR Are Dark Sky certified)

**d. The site and exterior building lighting does not cast direct beam illumination onto adjacent properties or right of ways**

**POINTS: 1**

**PRACTICE DESCRIPTION**

For areas more than 15 feet away from the property line, the following values are not exceeded:

• For residential-only areas: 0.2 average foot-candles (FC).

• For mixed use areas: 0.6 average FC.

Alternatively, lamp must not be visible at the property line when viewed at a maximum elevation of 5 feet; OR more than fourteen feet (14') into adjacent property when viewed at ground level.

**VERIFICATION**

*PROJECT TEAM*

- Submit photometric site plan with analysis showing average foot-candles have not been exceeded OR
- Submit an Accountability Form signed by the Lighting Designer and/or Contractor that as installed the project meets the criteria for this credit.

*RATER*

- Verify that photometric site plan OR
- Verify that Accountability Form signed by the Lighting Designer and/or Contractor.
- Visually verify compliance.

**SYNERGIES AND TRADE-OFFS**

- Specifying recycled lighting posts can contribute to earning points for Credit D.1. (Non-plant landscape materials are salvaged or made from recycled content materials or FSC certified wood)
- Specifying low energy fixtures may contribute to earning points for Credit D.4.a. (Low energy fixtures are specified for all site lighting)
- Specifying photovoltaic fixtures may contribute to earning points for Credit D.4.b. (Photovoltaic is specified for site lighting)
- Specifying fixtures that are Dark Sky certified could contribute to earning points for credit D.4.c ( Reduce light pollution and trespass)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Guidelines Practice 5.4 https://www.stopwaste.org/docs/bay-friendly_landscape_guidelines_-_all_chapters.pdf

**REFERENCES**


- Build it Green, GreenPoint Rated Multifamily Rating Manual, V. 1.5, June 2008, Credit D.8.B (Control Light Trespass Onto neighboring Areas Through Appropriate Fixture Selection & Placement)

# 5. CHOOSE AND MAINTAIN EQUIPMENT FOR FUEL CONSERVATION

| Credit D.5 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | 1 | | |
| Corresponds to BFL Guidelines Practice 5.5 | | | | | | |

**a. Specify solar powered pump(s) for water features**

**POINTS: 1**

**PRACTICE DESCRIPTION**

Solar powered pump(s) shall be specified for water features

**PROJECT TEAM RECOMMENDATIONS**

Identify the solar powered pump on plans, specifications and in cost estimate. If designed as a custom system, verify the power generated is sufficient to operate the pump, especially if it is multi-phased.

**VERIFICATION**

*PROJECT TEAM*

- Submit the make and model of the solar powered pump that was installed
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor that as installed the project meets the criteria for this credit.

*RATER*

- Verify that the Accountability Form has been signed by the Landscape Architect, Designer or Contractor.

# 6. SPECIFY LOW EMBODIED ENERGY PRODUCTS.

| Credit D.6 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | 2 | | |
| Corresponds to BFL Guidelines Practice 5.6 | | | | | | |

***Embodied energy*** *is energy that is used during the entire life cycle of the commodity for manufacturing, transporting and disposing of the commodity as well as the inherent energy captured within the product itself. (LEED New Construction & Major Renovation Version 2.2 reference Guide)*

**a. 100% of any stone and non-concrete hardscape materials are produced within 500 miles of the project site**

**POINTS: 2**

**PRACTICE DESCRIPTION**

Stone must be mined and manufactured within the 500 mile radius. All other non-concrete hardscape materials must be produced within 500 miles of the project site. The origin of the source materials for all hardscape materials (except stone) is not considered.

**PROJECT TEAM RECOMMENDATIONS**

Identify potential products to be included during the design process and note on plans and in specifications.
Consult with local suppliers and manufacturers to locate products that meet the criteria for this credit. and support local industry.

**VERIFICATION**

*PROJECT TEAM*

- Submit cut sheets for all stone indicating sources and submit cut sheets for non hardscape materials indicating where they are produced.
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor that as installed the project meets the criteria for this credit.

*RATER*

- Verify that cut sheets were submitted and materials qualify.
- Verify that the Accountability Form has been signed by the Landscape Architect, Designer or Contractor.

**SYNERGIES AND TRADE-OFFS**

- Specifying stone and non concrete hardscape materials that are salvaged from the site is encouraged and can contribute to earning points for Credit D.2. (Reduce and recycle landscape construction waste)

# 7. USE INTEGRATED PEST MANAGEMENT

| Credit D.7 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | | 2 | |
| Corresponds to BFL Guidelines Practice 6.1a | | | | | | |

***Integrated Pest Management*** *is a holistic approach to mitigating insects, plant diseases, weeds, and other pests. It involves the use of many strategies for managing, but not eliminating pests. Integrated Pest Management (IPM) uses cultural, mechanical, physical, and biological control methods before using pesticides to control pests and diseases in the landscape.. Chemical controls are applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control is applied.*

**a. Design documents include construction specifications that require integrated pest management**

**POINTS: 2**

**PRACTICE DESCRIPTION**

Construction specifications call for integrated pest management. Pre-emergent herbicides are not used as a first and only weed control method.

**VERIFICATION**

*PROJECT TEAM*

- Submit final specifications that include integrated pest management
- Submit an Accountability Form signed by the Landscape Contractor that as installed the project meets the criteria for this credit.

*RATER*

- Verify that specifications include integrated pest management
- Verify an Accountability Form has been signed by the Landscape Contractor.

**SYNERGIES AND TRADE-OFFS**

- Specifying Organic pest management can contribute to earning points for Credit C8.a (Use organic pest management)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- University of California Agriculture and Natural Resources. US IPM Online Statewide Integrated Pest Management Program http://www.ipm.ucdavis.edu/
- Bio-Integral Resource Center BIRC The Integrated Pest Management Specialist http://www.birc.org/
- Our Water- Our World http://www.ourwaterourworld.org/
- Model Bay-Friendly Maintenance Specifications http://www.stopwaste.org/home/index.asp?page=782

# 8. USE ORGANIC PEST MANAGEMENT

| Credit D.8 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | | | 2 |
| Corresponds to BFL Guidelines Practice 7.4 | | | | | | |

**a. Design documents include construction specifications that prohibit the use of pesticides that are not allowed by OMRI in its generic materials list for the maintenance of the landscape.**

**POINTS: 2**

**PRACTICE DESCRIPTION**

Design documents shall include construction specifications that prohibit the use of pesticides that are not allowed by OMRI in its generic materials list for the maintenance establishment period of the landscape.

.

**VERIFICATION**

*PROJECT TEAM*

- Submit specifications that prohibit the use of pesticides that are not allowed by ORMI in its generic materials list for the maintenance establishment period of the landscape.
- Submit an Accountability Form signed by the Landscape Contractor that as installed the project meets the criteria for this credit.

*RATER*

- Verify that specifications prohibit the use of pesticides that are not allowed by ORMI in its generic materials list for the maintenance establishment period of the landscape.
- Verify an Accountability Form has been signed by the Landscape Contractor.

*The **Organic Materials Research Institute (OMRI)** is a national nonprofit organization founded in 1997 to support the organic community. OMRI reviews products to determine their suitability for producing, processing and handling organic food and fiber under the USDA National Organic Program Rule (OMRI General Materials List)*

**SYNERGIES AND TRADE-OFFS**

- Specifying Organic pest management will contribute to earning points for Credit C7.a (Use integrated pest management)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- OMRI Generic Materials List a directory of substances allowed and prohibited in organic production and handling http://omri.org/
- Model Bay-Friendly Maintenance Specifications http://www.stopwaste.org/home/index.asp?page=782

# E. PLANTING

## 1. SELECT APPROPRIATE PLANTS: CHOOSE & LOCATE PLANTS TO GROW TO NATURAL SIZE AND AVOID SHEARING

| Credit E.1 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | R +1 | | | | | |
| Corresponds to BFL Guidelines Practice 2.1 a-c | | | | | | |

***Shearing*** *is a method of pruning, used for forming and maintaining plants or hedges of uniform shape, by routinely cutting them back with hedge shears and resulting in a geometric growth habit.*

### a. REQUIRED: No species will require shearing

**POINTS:** This practice is required for all commercial& civic landscapes that are to be recognized as Bay-Friendly.

**PRACTICE DESCRIPTION**

Species will be selected and plants spaced to allow them to grow to their mature size and natural shape without shearing at any point in the lifespan of the plant. (Pruning for structural integrity and plant health is permitted.) In particular, plants located in a row or adjacent to buildings, sidewalks or in narrow strips/medians will be spaced at the mature plant spread, according to a published reference, to fit into their planting area without significant overhang onto walkways, streets or buildings. References can include:

- Bornstein, Carol, David Fross and Bart O'Brien, *California Native Plants for the Garden*
- East Bay Municipal Utility District's publication *Water Conserving Plants for the Bay Area*
- *Sunset Western Garden Book,*

**PROJECT TEAM RECOMMENDATIONS**

- Use of the Bay-Friendly Plant Legend template facilitates verification of the plant palette.
- Prepare plans to scale showing all species and spacing.

**VERIFICATION**

*PROJECT TEAM*

- Submit plant legend indicating plant species, spacing and mature spread of plant. Indicate the source of information on spacing and spread.
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor verifying that installed plants meet this requirement.

*RATER*

- Verify mature size of all plants in the plant legend and compare to spacing.
- Verify Accountability Form has been signed by the Landscape Architect, Designer or Contractor.

**SYNERGIES AND TRADE-OFFS**

- Selecting appropriate plants that will not require shearing can also contribute to earning points for credit E.1.b (Plants specified can grow to mature size within space allotted them)

**BAY-FRIENDLY TOOLS & RESOURCES**

- The following can be downloaded from: **http://www.stopwaste.org/home/index.asp?page=777**
  - *Bay-Friendly Landscape Guidelines* Practice 2.1
  - Bay-Friendly Plant Palette template,
  - Bay-Friendly Natural Hedges to Avoid Shearing plant list

### b. Plants specified can grow to mature size within space allotted them

**POINTS: 1**

**PRACTICE DESCRIPTION**

Trees, shrubs and groundcovers are selected and spaced to allow them to grow to mature size within the landscape area in which they are to be planted.

Even when formal hedging or shapes are not planned as elements of the landscape, species can be selected and specified for a space that is too small for them to reach their mature size and shape, or too many of the plants are specified for the space to allow all of them to reach their mature size and shape. Spacing of all plants must be within the minimum and maximum plant spread according to third party source, such as the following:

- Bornstein, Carol, David Fross and Bart O'Brien, *California Native Plants for the Garden*
- East Bay Municipal Utility District's publication *Plants and Landscapes for Summer Dry Climates*
- *Sunset Western Garden Book,*

**PROJECT TEAM RECOMMENDATIONS**

- Use of the Bay-Friendly Plant Legend template facilities the verification of the plant palette.
- Prepare plans to scale showing all species and spacing to avoid overcrowding.

**VERIFICATION**

*PROJECT TEAM*

- Submit plant legend indicating plant species, spacing, and mature spread of the plants. Indicate source of information on spacing & mature spread.
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor verifying that installed plants meet this requirement.

*RATER*

- Verify mature size and compare to spacing of all plants in the plant legend.
- Verify Accountability Form has been signed by the Landscape Architect, Designer or Contractor.

**SYNERGIES AND TRADE-OFFS**

- Plants specified can grow to mature size within space allotted them can also contribute to earning points for Credit E.1.a (Required: No species will require shearing)

**BAY-FRIENDLY TOOLS & RESOURCES**

- The following can be downloaded from: **http://www.stopwaste.org/home/index.asp?page=777**
  - *Bay-Friendly Landscape Guidelines* Practice 2.1
  - Bay-Friendly Plant Palette template,
  - Bay-Friendly Natural Hedges to Avoid Shearing plant list

## 2. SELECT APPROPRIATE PLANTS: DO NOT PLANT INVASIVE SPECIES

| Credit E.2 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | R | | | | | |
| Corresponds to BFL Guidelines Practice 2.1 d | | | | | | |

### a. REQUIRED: None of the species listed by Cal-IPC as invasive in the San Francisco Bay Area are included in the planting plan

**POINTS:** This practice is required for all commercial& civic landscapes that are to be recognized as Bay-Friendly.

***An invasive species*** *is defined as a species that is non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause economic or environmental harm or harm to human health. Federal Executive Order 13112*

**PRACTICE DESCRIPTION**

None of the species listed by Cal-IPC as invasive in the San Francisco Bay Area shall be included in the planting plan

**VERIFICATION**

*PROJECT TEAM*

- Compare the complete list of plants in the plant palette to the Cal-IPC list of plants that are invasive to the San Francisco Bay-Area
- Submit the complete plant palette
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor confirming that no invasive species were substituted for specified species

*RATER*

- Compare the Cal-IPC list of invasive species with the plant palette to confirm no invasive species have been specified.
- Verify Accountability Form has been signed by the Landscape Architect, Designer or Contractor.

**BAY-FRIENDLY TOOLS & RESOURCES**

- *Bay-Friendly Landscape Guidelines Practice 2.1d*
- http://www.cal-ipc.org/ip/inventory/weedlist.php
- *Don't Plant a Pest* brochures for plants & trees from www.cal-ipc.org

**REFERENCES**

- http://www.invasivespeciesinfo.gov/laws/execorder.shtml
- LEED for Homes, VERIFICATION, SS2.1

## 3. GROW DROUGHT TOLERANT CA NATIVE, MEDITERRANEAN OR CLIMATE ADAPTED PLANTS

| Credit E.3 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | R + 5 | | | |
| Corresponds to BFL Guidelines Practice 4.2 | | | | | | |

**a. Specify drought tolerant California native, Mediterranean or other climate adapted plants that require occasional, little or no summer water for**

**i. REQUIRED: 75% of all non-turf plants**

**ii. 100% of all non-turf plants (2 points)**

**POINTS:** The first part of this practice is required for all commercial, multifamily & civic landscapes that are to be recognized as Bay-Friendly. Up to 2 additional points may be earned for going above and beyond the requirement.

**PRACTICE DESCRIPTION**

A minimum of 75% of the total number of plants in non-turf areas must be species that require no or little summer watering. California native or Mediterranean species are strongly recommended.

All species should be adapted to the climate in which they will be planted, as indicated by a plant reference book. If plants are given a range of water needs from "occasional to moderate" for example, the landscape designer must determine if the plant will require either occasional or moderate watering based on site, soil, and climate conditions and categorize the plant appropriately. Sources used to determine climate adaptation and watering requirements include:

- Bornstein, Carol, David Fross and Bart O'Brien, *California Native Plants for the Garden*
  - Qualifying irrigation designation: "occasional", "infrequent", or "drought tolerant"
- East Bay Municipal Utility District's publication *Plants and Landscapes for Summer Dry Climates*
  - Qualifying irrigation designation: "occasional", "infrequent" or "no summer water".
- *Sunset Western Garden Book,*
  - Qualifying irrigation designation: "little or no water"
- University of California Cooperative Extension's *Guide to Estimating Irrigation Water Needs of Landscape Plantings in CA,* www.owue.water.ca.gov/docs/wucols00.pdf
  - Qualifying irrigation designation: "Low" or "Very Low"

**PROJECT TEAM RECOMMENDATIONS**

- Use of the Bay-Friendly Plant Legend template facilities the calculation of percent plants that meet this criteria and the verification of the plant palette.
- If hydroseeding or specifying plugs, include one plant per 2.25 square feet in the calculation of percent plants that meet these criteria, assuming the species in the hydroseed mix and plugs are drought tolerant.

**VERIFICATION**

*PROJECT TEAM*

- Submit a plant legend that identifies species, number of plants, irrigation requirements (and source of that requirement), total number of drought tolerant plants and total number of non-turf plants.
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor verifying that installed plants meet this requirement.

*RATER*

- Verify that a plant legend was submitted with 75% or more plants meeting the drought tolerant requirement and that the calculations are correct.
- Spot check the irrigation requirement identified in the Bay-Friendly Plant legend by comparing it to its source.
- Verify that an Accountability Form has been signed by the Landscape Architect, Designer or Contractor.

**SYNERGIES AND TRADE-OFFS**

- Grouping plants by water needs and exposure can also contribute to earning points for Credit E.5 (Implement hydrozoning).
- Specifying a diversity of plant species can also contribute to earning points from Practice E.8. (Diversify)
- Specifying 50% California native plant species to meet the requirements of this practice can also contribute to earning points from Practice E.9 (Choose CA natives first)

**BAY-FRIENDLY TOOLS & RESOURCES**

- The following can be downloaded from: **http://www.stopwaste.org/home/index.asp?page=777**
  - *Bay-Friendly Landscape Guidelines* Practice 2.1
  - Bay-Friendly Plant Palette template,
  - Bay-Friendly Natural Hedges to Avoid Shearing plant list

## b. 100% of the non-turf plant palette needs no irrigation once established.

**POINTS: 3**

**PRACTICE DESCRIPTION**

100% of the non-turf plant palette needs no summer irrigation once established.

California native or Mediterranean species are strongly recommended. All species should be adapted to the climate in which they will be planted. Sources used to determine climate adaptation and watering requirements include:

- Bornstein, Carol, David Fross and Bart O'Brien, *California Native Plants for the Garden*
  - Qualifying irrigation designation: "drought tolerant"
- East Bay Municipal Utility District's publication *Plants and Landscapes for Summer Dry Climates,* www.ebmud.com.
  - Qualifying irrigation designation: "no summer water".
- *Sunset Western Garden Book*
  - Qualifying irrigation designation: "no irrigation needed"
- University of California Cooperative Extension's *Guide to Estimating Irrigation Water Needs of Landscape Plantings in CA,* www.owue.water.ca.gov/docs/wucols00.pdf
  - Qualifying Irrigation Designation: "Very Low"

**PROJECT TEAM RECOMMENDATIONS**

- Use of the Bay-Friendly Plant Legend template facilities the calculation of percent plants that meet this criteria and the verification of the plant palette.

**VERIFICATION**

*PROJECT TEAM*

- Submit a plant legend that identifies species, number of plants, irrigation requirements (and source of that requirement), total number of drought tolerant plants and total number of non-turf plants.
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor verifying that installed plants meet this requirement.

*RATER*

- Verify that a plant legend was submitted with 100% of the plants qualifying.
- Spot check the irrigation requirement identified in the Bay-Friendly Plant legend by comparing it to its source.
- Verify that an Accountability Form has been signed by the Landscape Architect, Designer or Contractor.

**SYNERGIES AND TRADE-OFFS**

- Grouping plants by water needs and exposure can also contribute to earning points for Credit E.5 (Implement hydrozoning).
- Specifying a diversity of plant species can also contribute to earning points from Practice E.8. (Diversify)
- Specifying 50% California native plant species to meet the requirements of this practice can also contribute to earning points from Practice E.9 (Choose CA natives first)

**BAY-FRIENDLY TOOLS & RESOURCES**

- The following can be downloaded from: **http://www.stopwaste.org/home/index.asp?page=777**
  - *Bay-Friendly Landscape Guidelines* Practice 2.1
  - Bay-Friendly Plant Palette template,
  - Bay-Friendly Natural Hedges to Avoid Shearing plant list

## 4. MINIMIZE THE LAWN

| Credit E.4 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | R + 9 | | | |
| Corresponds to BFL Guidelines Practice 4.3 | | | | | | |

**a. Turf is not specified in areas less than 8 feet wide or in medians, unless irrigated with subsurface or low volume irrigation.**

**POINTS: 2**

**PRACTICE DESCRIPTION**

In order to minimize overspray and runoff, and to improve irrigation efficiency, turf shall not be utilized in medians or areas less than 8 feet wide in any direction, unless irrigated with subsurface or low volume irrigation.

**PROJECT TEAM RECOMMENDATIONS**

Planting concept includes a statement that turf will not be planted in areas less than 8 feet wide or in medians, if applicable.

**VERIFICATION**

*PROJECT TEAM*

- Submit planting plans that indicate no turf in medians or areas 8 feet wide or less OR
- Submit irrigation plans that indicate subsurface or low volume irrigation in medians or all areas less than 8 feet wide.
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor verifying that installation meets this requirement.

*RATER*

- Verify that planting plan shows no turf in medians or areas less than 8 feet wide OR
- Verify that irrigation plans indicate subsurface drip or low volume irrigation in medians or areas less than 8 feet wide
- Visually spot check areas less than 8 feet wide. If turf is found in such areas, confirm that it is watered by subsurface drip or low volume irrigation.
- Verify Accountability Form has been signed by the Landscape Architect, Designer or Contractor

***Turf*** *is defined as an area planted with spreading or stoloniferous grasses that require regular mowing to form a dense growth of leaf blades and roots. Areas planted with lawn alternatives, such as Carex pansa and other tufted grass or sedge species, are not included in the calculation of the turf area*

***Low-Volume Irrigation*** *refers to the use of equipment and devices specifically designed to both limit the volume of water being applied and to efficiently deliver that water within the root zone of the plant. It applies water at low pressure through a system of tubing or lateral lines and low volume emitters. It is also referred to as micro-irrigation and includes drip (or trickle), micro-spray jets, micro-sprinklers, or bubbler irrigation.*

***Subsurface irrigation*** *is a highly-efficient watering technique that reduces outdoor water use by 30 to 40 percent. The system consists of drip irrigation tubing installed 3-5 inches below the surface of the soil, or with a series of subsurface pans that transpire water through a sand bed. The water is applied directly to plant roots, eliminating runoff and overspray.*

**SYNERGIES AND TRADE-OFFS**

- Earning points for this practice can also contribute to meeting the requirement or earning points for Credit E.4.c (A maximum of 25% or more of total irrigated area is specified as turf, with sports and multiple use fields exempted) and meeting the requirement for Credit F.2.b (Sprinkler and spray heads are not specified for areas less than 8 feet wide).

**BAY-FRIENDLY TOOLS & RESOURCES**

- The following can be downloaded from: **http://www.stopwaste.org/home/index.asp?page=777**
  - *Bay-Friendly Landscape Guidelines* Practice 4.3
  - Bay-Friendly Plant Palette template,
  - Bay-Friendly Natural Hedges to Avoid Shearing plant list
  - Bay-Friendly *Lawn Alternatives* plant list
- *Easy Lawns, Low Maintenance Native Grasses for Gardeners Everywhere,* Brooklyn Botanic Garden Publications

## b. Turf shall not be installed on slopes exceeding 10%

**POINTS: 2**

**PRACTICE DESCRIPTION**

Turf is not permitted on slopes exceeding 10%.

**VERIFICATION**

*PROJECT TEAM*

- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor verifying that installation meets this requirement.

*RATER*

- Verify Accountability Form is submitted and signed by appropriate party.
- Visually verify that turf is not installed on slopes that obviously have a rise of more than 6 inches over 5 feet of run (i.e. slopes that are obviously greater than 10%)

**SYNERGIES AND TRADE-OFFS**

- Reducing the overall turf can also contribute to meeting the requirement or earning points for Credit E.4 (Minimize the lawn).

**c. Total irrigated area specified as turf is limited to:**

- **i. REQUIRED: A maximum of 25% of total irrigated area, with sports or multiple use fields exempted**
- **ii. A maximum of 15%, with sports or multiple use fields exempted (total 2 points)**
- **iii. No turf is specified (total 5 points)**

**POINTS:** The first part of this practice is required for all commercial, multifamily, & civic landscapes that are to be recognized as Bay-Friendly. Up to 5 additional points may be earned for going above and beyond the requirement.

**PRACTICE DESCRIPTION**

Turf shall not be included as a fill-in material or solely as a decorative feature but rather as a planned and functional element of the landscape. Multi-use fields such as an area for play, sports and other events are exempt for i. and ii. The total irrigated turf is limited to a maximum of 25%, 15% or 0% of total irrigated landscape area. Where turf is proposed, it is recommended that a drought tolerant Tall Fescue or variety with similar water requirement be specified.

**VERIFICATION**

*PROJECT TEAM*

- Submit calculations of square feet of turf, excluding sports and multiple use fields, and square feet of total irrigated area.
- Submit planting plans with sports and multiple use fields identified. Include a statement about the purpose of multiple use fields
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor that installed turf meets the requirements for this credit.

*RATER*

- Verify that all the calculations are submitted, compare them to the planting plan and confirm that the percentage of turf meets the criteria for this credit.
- Confirm that the use of sports and multiple use turf areas has been identified.
- Verify that the Accountability Form has been submitted and signed by the Landscape Architect, Designer or Contractor.

**SYNERGIES AND TRADE-OFFS**

Reducing turf by not including it on slopes greater than 10%, in medians, or in strips 8 feet wide or less or in medians can also contribute to earning points for Credit E.4.

***Irrigated area is equivalent to Landscape area*** *and is defined as all of the planting, turf areas and water features subject to the Maximum Applied Water Allowance (MAWA) calculation in a water budget. The following are not included as part of the landscape area: footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, pervious and non-pervious hardscapes,, open spaces and existing native vegetation..*

***Sports or multiple use field*** *is defined as the portion of the landscape area that is dedicated to active play such as parks, sports fields and golf courses, where turf provides a playing surface, and is equivalent to 'recreational area' as defined by CA Water Efficient Landscape Ordinance.*

***Special Landscape Area*** *is the portion of the landscape area that is dedicated to edible plants, areas irrigated with recycled water and recreational areas.*

## 5. Implement hydrozoning

| Credit E.6 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | 2 | | | |
| Corresponds to BFL Guidelines Practice 4.4 | | | | | | |

### a. Group plants by water requirements and sun exposure

**POINTS: 2**

**PRACTICE DESCRIPTION**

Create separate zones for different water requirements and sun exposure. Each hydrozone shall have plant materials with similar water use. Individual hydrozones that mix high and low water use plants shall not be permitted. Individual hydrozones that mix plants of moderate and low water use plants or moderate and high water use plants may be allowed if:
(i) the plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or
(ii) the plant factor of the higher water using plant is used for calculations..

***Hydrozone*** *means a portion of the landscaped area having plants with similar water. A hydrozone may be irrigated or non-irrigated*. CA Department Water Resources, Model Water Efficient Landscape Ordinance

The design of the irrigation system shall conform to the hydrozones of the landscape design plan. Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions and plant materials with similar water use. It is highly recommended that trees that need summer irrigation be valved separately from turf and groundcover/shrub areas

Identify the hydrozones, by number, letter or other designation on planting and irrigation plans and dedicate a separate irrigation valve(s) to each hydrozone.

**PROJECT TEAM RECOMMENDATIONS**

- Use of the Bay-Friendly Plant Legend template facilities the placing of plants in hydrozones.

**VERIFICATION**

*PROJECT TEAM*

- Submit the Hydrozone Table from the CA Landscape Water Efficient Landscape Ordinance AND
- Submit planting and irrigation plans with hydrozones delineated by number, letter, color or other method AND
- Identify factors such as sun exposure and microclimate that will influence water needs
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor that the landscape, as installed, meets the criteria for this credit.

*RATER*

- Verify Water Efficient Landscape Worksheet has been completed
- Verify hydrozones are identified on plans with appropriate details
- Verify that an Accountability Form is signed by the Landscape Architect, Designer or Contractor.

**RESOURCES AND BAY-FRIENDLY TOOLS**

CA Department of Water Resource, Model Water Efficient Landscape Ordinance, http://www.owue.water.ca.gov/docs/WaterOrdIndex.cfm

## 6. Provide shade to moderate building temperatures

| Credit E.6 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | 2 | | |
| Corresponds to BFL Guidelines Practice 5.1 | | | | | | |

### a. Protect existing shade and/or specify new trees such that 50% or more of west facing glazing and walls

**POINTS: 2**

**PRACTICE DESCRIPTION**

Existing trees are protected and/or new deciduous trees are planted to the west of the building in order to keep afternoon sun off the windows and walls in the summer. The amount of shade is calculated based on the mature height and spread of the species, for 4 pm in September. All trees must be deciduous in order to also maximize solar gain during the winter. It is also recommended that vegetation be placed to shade air conditioner units.

**PROJECT TEAM RECOMMENDATIONS**

- Identify the goal for shading buildings by trees and other vegetation in the site plan.
- Conduct a study of shade produced by existing trees on site or neighboring site.
- Build a model landscape and schedule use of a heliodon can demonstrate the shading effects of the landscape during different seasons.

**VERIFICATION**

*PROJECT TEAM*

- Submit total square feet of west facing building walls and windows.
- Submit shade study with calculations of square feet of shade produced by trees at full size in September at 4 pm.
- Do not double count for overlapping canopies. Calculate and submit the percentage.
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor that installed trees meet the requirements for this credit.

*RATER*

- Verify calculations were completed, that canopies are not double counted and that the total west facing wall and window square feet that is to be shaded by trees divided by the total square footage is .50 or greater.
- Verify that the Accountability Form is signed by the Landscape Architect, Designer or Contractor.

**SYNERGIES AND TRADE-OFFS**

- Preserving mature healthy trees that shade buildings can also earn points for Credit A.7. (Conserve or restore natural areas and wildlife corridors).
- Providing trees, large stature shrubs and/or other vegetation with the space that each will require to reach its mature shape and size will contribute to earning points for credit E.1 (Select appropriate plants: choose & locate plans to grow to natural size and avoid shearing).
- Specifying drought tolerant species that shade buildings can also earn points for Credit E.3 (Grow drought tolerant CA native, Mediterranean or climate adapted plants).
- Specifying a diversity of trees and other vegetation that shade buildings can contribute to earning points for Credit E.8 (Diversity)
- Specifying California native species can contribute to earning points for Credit E.9 (Choose California natives first)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- To schedule use of PGE's heliodon, contact www.pge.com/pec/heliodon

**REFERENCES**


- USGBC, *LEED for Homes Rating System*, January 2008
- USGBC, *LEED for Homes Verification & Submittal Guidelines*

## 7. Plant trees

| Credit E.6 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | 3 | | 1 |
| Corresponds to BFL Guidelines Practice 6.7 | | | | | | |

### a. At least 50% of the paved site area is shaded by trees or other vegetation

**POINTS: 2**

**PRACTICE DESCRIPTION**

Locate trees, large stature shrubs and/or vegetated structures (such as trellises) to provide shading for at least 50% of the paved site area. Trees and large stature shrubs that are designed to create a hedge must be provided with the space to form a hedge without shearing.

Shading from trees and vegetation not on the project site is eligible if a shade study is conducted.

Shading should be calculated for noon on June 21, when the sun is directly overhead and based on the mature canopy of the tree or shrub. Do not double count the area shaded by overlapping vegetation.

It is highly recommended that trees that require summer irrigation be on separate irrigation valves and that they be irrigated with drip or bubblers.

***Paved site area*** *includes sidewalks, patios, walkways, driveways, parking lots and other non-roof hardscapes, regardless of permeability.*

***Large stature shrubs*** *are those that, under normal conditions, can reach a mature height of 12 feet or more. Examples include Arbutus 'Marina', some Arctostaphylus spp., some Ceanothus spp., Sambucus mexicana, Nerium oleander trained as a single or multistemmed tree.*

**PROJECT TEAM RECOMMENDATIONS**

- Identify the goal for shading of paved areas by trees and other vegetation in the site plan.
- Conduct a study of shade produced by trees on neighboring sites and use to inform the layout of paved area.

**VERIFICATION**

*PROJECT TEAM*

- Submit calculations of all paved site areas that will be shaded by trees or large stature shrubs and the total paved area.
- If shade from trees on neighboring sites is included, submit the results of a shade study. Do not double count for overlapping canopies. Calculate and submit the percentage.
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor that plant substitutions do not impact the requirements for this credit.

*RATER*

- Verify calculations were completed, that canopies are not double counted and that the total paved area that is to be shaded by trees and large divided by the total paved site area is .50 or greater.
- Verify that statement is signed by the Landscape Architect, Designer or Contractor.

**SYNERGIES AND TRADE-OFFS**

- Preserving mature healthy trees that shade paved site areas can also earn points for Credit A.7. (Conserve or restore natural areas and wildlife corridors).
- Shading hardscapes with trees and other vegetation is one option for obtaining points for Credit D.3 (Reduce the heat island effect with cool site techniques); points will be cumulative (i.e. if the site earns 2 points for E.6, 2 points are also awarded for 3.a for a total of 4 points).
- Providing trees, large stature shrubs and/or other vegetation with the space that each will require to reach its mature shape and size will contribute to earning points for credit E.1 (Select appropriate plants: choose & locate plans to grow to natural size and avoid shearing).
- Specifying drought tolerant species that shade paved site areas can also earn points for Credit E.3 (Grow drought tolerant CA native, Mediterranean or climate adapted plants).
- Specifying a diversity of trees and other vegetation that shade paved site areas can contribute to earning points for Credit E.8 (Diversity)
- Specifying California native species can contribute to earning points for Credit E.9 (Choose California natives first)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Build It Green, *GreenPoint Rated Multifamily Rating Manual, v1.2,* July 2007
- Center for Urban Forest Research, *Where are all the cool parking lots,* http://cufr.ucdavis.edu
- Center for Urban Forest Research, *Fact Sheet #3: Making Parking Lots More Tree Friendly,* http://cufr.ucdavis.edu
- USGBC, *New Construction & Major Renovation, v 2.2 Reference Guide,* September 2006.

**REFERENCES**


- USGBC, *LEED for Homes Rating System*, January 2008
- USGBC, *LEED for Homes Verification & Submittal Guidelines*

## b. At least one tree species is a large stature species

***Large stature trees*** *are those that under normal conditions can support canopies of 50 feet or more in height and width. James Urban, Urban Trees & Soils*

**POINTS: 2**

**PRACTICE DESCRIPTION**

Specify at least one large stature tree species. Do not place the tree where it will grow to within 10 feet of high voltage powerlines at maturity.

**VERIFICATION**

*PROJECT TEAM*

- Identify large stature species in plant palette, and include its mature height and spread, and reference the source of this information.
- Submit an Accountability form signed by the Landscape Architect, Designer or Contractor that installed plants meet the requirements of this credit.

*RATER*

- Verify that Accountability Form is signed by the Landscape Architect, Designer or Contractor.
- Confirm the mature size and spread of the tree species by comparing the information provided in the plant palette to the reference.

**SYNERGIES AND TRADE-OFFS**

- Preserving mature healthy, large stature trees can also earn points for Credit A.7. (Conserve or restore natural areas and wildlife corridors).
- Shading hardscapes with trees and other vegetation is one option for obtaining points for Credit D.3 (Reduce the heat island effect with cool site techniques); points will be cumulative (i.e. if the site earns 2 points for E.6, 2 points are also awarded for 3.a for a total of 4 points).
- Providing every large stature trees with the space that each will require to reach its mature shape and size will contribute to earning points for credit E.1 (Select appropriate plants: choose & locate plans to grow to natural size and avoid shearing).
- Specifying drought tolerant large stature species can also earn points for Credit E.3 (Grow drought tolerant CA native, Mediterranean or climate adapted plants).
- Specifying a diversity of trees can contribute to earning points for Credit E.8 (Diversity)
- Specifying California native species can contribute to earning points for Credit E.9 (Choose California natives first)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- PG&E Safe Tree Planting checklist: http://www.pge.com/microsite/safety_esw_ngsw/esw/trees/plant_checklist.html

## 8. DIVERSIFY

| Credit E.8 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | | | 4 |
| Corresponds to BFL Guidelines Practice 7.1 | | | | | | |

**a. Landscapes less than 20,000 square feet shall have a minimum of:**
**20 distinct species (1 point) OR**
**30 distinct plant species (total 3 points)**

**b. Landscapes with 20,000 to 43,560 square feet (1 acre) shall include a minimum of**
**30 distinct species (1 point) OR**
**40 distinct species (total 2 points) OR**
**50 distinct plant species (total 4 points)**

**c. Landscapes of greater than 1 acre shall include a minimum of 40 distinct plant species AND**
**one additional species per acre over 1 acre (2 points) OR**
**two additional species per acre over 1 acre (total 4 points)**

**POINTS: 4**

**PRACTICE DESCRIPTION**

The numbers of distinct species increases with square footage of the landscape area. Hydroseed mixes and plugs count towards diversity. It is suggested the species flower or bear fruit at different times of the year and that the landscape is designed to include layers of vegetation: groundcovers, shrubs and trees that provide a variety of nesting sites.

**PROJECT TEAM RECOMMENDATIONS**

- Use of the Bay-Friendly Plant Legend template facilities the calculation of the numbers of species.

***The site*** *is the area within the legal boundaries of a property and encompasses all areas of the property including constructed areas and non-constructed areas. It is the same as the property area*. USGBC LEED, New Construction & Major Renovation v2.2, September 2006

***Landscape area is equivalent to Irrigated area*** *and is defined as all of the planting, turf areas and water features subject to the Maximum Applied Water Allowance (MAWA) calculation in a water budget. The following are not included as part of the landscape area: footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, pervious and non-pervious hardscapes,, open spaces and existing native vegetation . Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation*

**VERIFICATION**

*PROJECT TEAM*

- Submit the total square footage of landscaped area and number of distinct species in the plant palette.
- Submit Accountability Form signed by the Landscape Architect, Designer or Contractor that plantings meet diversity requirement.

*RATER*

- Verify the number of plant species in the plant palette as compared to the square feet of landscaped area.
- Verify Accountability Form has been signed by the Landscape Architect, Designer or Contractor.

**SYNERGIES AND TRADE-OFFS**

- Preserving mature healthy trees can also earn points for Credit A.7. (Conserve or restore natural areas and wildlife corridors).
- Using CA natives to create a plant buffer can also earn points towards Credit A.7.c (Create or protect a diverse plant buffer of low maintenance vegetation along creeks, shorelines or monocultured landscaped areas).
- Providing all species with the space that each will require to reach their mature shape and size will contribute to earning points for credit E.1 (Select appropriate plants: choose & locate plans to grow to natural size and avoid shearing).
- Specifying drought tolerant species can also earn points for Credit E.3 (Grow drought tolerant CA native, Mediterranean or climate adapted plants).
- Specifying California native species can contribute to earning points for Credit E.9 (Choose California natives first)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- The following can be downloaded from: **http://www.stopwaste.org/home/index.asp?page=777**
  - *Bay-Friendly Landscape Guidelines* Practice 7.1, including Tips for Success on Flowering Periods of Plants that Attract Beneficial Insects, page 51
  - Bay-Friendly Plant Palette template,

**REFERENCES**

- USGBC LEED, *New Construction & Major Renovation v2.2 Reference Guide,* September 2006

# 9. CHOOSE CALIFORNIA NATIVES FIRST

| Credit E.8 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Landscape Locally | Landscape Locally | Landscape Locally | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | | | 2 |
| Corresponds to BFL Guidelines Practice 7.2 | | | | | | |

**a. CA natives are specified for 50% of non-turf plants**

**PRACTICE DESCRIPTION**

California native species shall be specified for 50% of non-turf plants, by number. Sources used to identify CA native species include but are not limited to:

- Bornstein, Carol, David Fross and Bart O'Brien, *California Native Plants for the Garden*
- East Bay Municipal Utility District's publication *Water Conserving Plants for the Bay Area,* www.ebmud.com.
- Sunset Magazine's *Western Garden Book,*
- University of California Cooperative Extension's *Guide to Estimating Irrigation Water Needs of Landscape Plantings in CA,* www.owue.water.ca.gov/docs/wucols00.pdf

**PROJECT TEAM RECOMMENDATIONS**

- Use of the Bay-Friendly Plant Template facilities the calculation of percent plants that meet this criteria and the verification of the plant palette.

**VERIFICATION**

*PROJECT TEAM*

- Submit a completed plant palette that identifies California native species, number of plants, and total number of non-turf plants.
- Submit Accountability Form signed by the Landscape Architect, Designer or Contractor that all plantings conform to the requirements of this credit.

*RATER*

- Verify the calculation of 50% CA native plants as complete and accurate.
- Verify Accountability Form has been signed.

**SYNERGIES AND TRADE-OFFS**

- Preserving mature healthy California native trees can also earn points for Credit A.7. (Conserve or restore natural areas and wildlife corridors).
- Using CA natives to create a plant buffer can also earn points towards Credit A.7.c (Create or protect a diverse plant buffer of low maintenance vegetation along creeks, shorelines or monocultured landscaped areas).
- Grouping California native plants by water needs and exposure can also contribute to earning points for Credit D.5 (Implement hydrozoning).
- Specifying a diversity of plant species can contribute to earning points from Practice D.8. (Diversify)
- Specifying California native plant species that are low water using can also contribute to meeting the requirement or earning points from Practice D.3 (Grow drought tolerant CA native, Mediterranean or climate adapted plants).

- Providing all species with the space that each will require to reach their mature shape and size will contribute to earning points for credit E.1 (Select appropriate plants: choose & locate plans to grow to natural size and avoid shearing).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- The following can be downloaded from: **http://www.stopwaste.org/home/index.asp?page=777**
  - *Bay-Friendly Landscape Guidelines* Practice 7.2, including Tips for Success: Sources of California Natives, page 50.
  - Bay-Friendly Plant Palette template,
- Beidleman, Linda and Eugene N. Kozloff, *Plants of the San Francisco Bay Region,* UC Press 2003
- Bornstein, Carol, David Fross and Bart O'Brien, *California Native Plants for the Garden,* Cacuma Press, 2005
- Calflora: http://www.calflora.org/
- California Native Plant Society: http://www.cnps.org/
- California Native Plant library: http://www.theodorepayne.org/gallery/glossary.htm
- East Bay Municipal Utility District, *Plants and Landscape for Summer Dry Climates,* 2004

# F. IRRIGATION

## 1. DESIGN FOR ON-SITE RAINWATER COLLECTION, RECYCLED WATER AND/OR GRAYWATER USE

| Credit F.1 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | 8 | | | |
| Corresponds to BFL Guidelines Practice 4.5 | | | | | | |

### a. Irrigation systems and/or all ornamental uses of water (ponds, fountains, etc) are plumbed for delivering recycled water where it is available from a municipal source.

**POINTS: 3**

**CODE CONSIDERATIONS**

The use of stormwater, recycled water and graywater is subject to California State Law and California Building Code. California Water Code Section 13550-13556 states that using potable domestic water for nonpotable uses, including cemeteries, golf courses, parks, industrial and residential irrigation, and toilet flushing, is an unreasonable use of potable water if recycled water is available. In communities where recycled water is available, state law requires the installation of dual plumbing systems in new construction. To avoid confusion, the recycled water is carried in purple pipes.

Cities and counties that currently do not have a recycled water treatment system may also require dual plumbing systems in new construction and in buildings when they are substantially remodeled, in order to build the infrastructure for recycled water when it is available in the future.

**PRACTICE DESCRIPTION**

Design the plumbing such that irrigation system and ornamental uses of water are supplied (or can be supplied in the future) by municipal recycled water. Use purple pipes or wrap pipe with purple tape to indicate they carry recycled water.
Recirculation water systems shall be used for decorative water features. ) Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation

Design separate recycled water systems according to the California Department of Health Services Title 22 design requirements, which requires locating drinking fountains to avoid contamination from recycled water, designing good site drainage systems and designing grading to prevent ponding and overspray.

***Recycled water,*** *also called reclaimed water is defined in Title 22, Chapter 3 of the California Code of Regulations, refers to tertiary-treated water produced from the three-stage treatment of municipal wastewater. Recycled water is virtually colorless and odorless, and is allowable for fully body human contact but not for direct human consumption. The sensible use of recycled water affords an excellent choice for essentially all non-potable applications. Properly managed, recycled water is safe to use.* *http://www.owue.water.ca.gov/recycle/docs/Appendix_C_LawsRegs.pdf*

***Purple pipe*** *is a key component of dual plumbing systems that enable homeowners, businesses, industry and public facilities to use recycled water outside and potable drinking water indoors…Today, pipes and other materials carrying recycled water are clearly marked purple to eliminate any confusion.*
*Purple pipe is just like other PVC piping, except that it carries reclaimed water rather than fresh Water Recycling and Reuse, Local Government Commission, www.lgc.org*

**PROJECT TEAM RECOMMENDATIONS**

- Determine if the site currently has or is projected to have access to recycled water by contacting your water supplier.
- Determine if the municipality in which the landscape project is located requires purple pipe for supplying recycled water when it is available in the future.
- Evaluate the potential financial incentives from the water supplier such as a reduction in connection fees and/or water supply charges.
- Establish the use of recycled water as a project goal during programming.

**VERIFICATION**

*PROJECT TEAM*

- Provide evidence that a municipal recycled water system is currently in place or will be in the future.
- Identify ornamental water features on site plan and provide evidence, such as manufacturer's product description, that they re-circulate water.
- Submit irrigation plans showing recycled water use or plumbing for future use

*RATER*

- Verify that ornamental water features re-circulate water.
- Visually verify that the irrigation system and/or ornamental water feature, as identified on the submitted plans, are plumbed with purple pipe to receive recycled water.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- American Water Works Association's Dual Water Systems Manual, 800-926-7337, www.awwa.org.
- American Water Works Association, California-Nevada Section, *Guidelines for Distribution of Nonpotable Water*
- California Code of Regulations, Appendix J, Reclaimed Water Systems for Non-Residential Buildings, Uniform Plumbing Code, , www.bsc.ca.gov, Under heading California Building Standards Code, Select "Where do I purchase the 1998 codes?"
- California DWR's Office of Water Use Efficiency www.owue.water.ca.gov
- Dublin San Ramon Services District, www.dsrsd.com
- EBMUD Office of Water Recycling, 510.287.1691, www.ebmud.com.
- Guidelines for the Distribution of Nonpotable Water, American Water Works Association, California-Nevada Section, 909.291.2101.
- Public Technology, Inc., US Green Building Council, US DOE, and US EPA, *Sustainable Building Technical Manual*, Part 3, Chapter 6.
- Reclaimed Water Criteria, Chapter 3, California Administrative Code, Title 22, Division 4, State of California, Department of Health Services, Environmental Health, Mike Finn, 510.540.2430.
- Recycled Water Distributors in CA; http://www.scwa.ca.gov/about_your_water/documents/Calif-Recycled-Water-Calif.pdf
- WateReuse, www.watereuse.org
- Water Recycling 2030: Recommendations of California's Recycled Water Task Force: http://www.owue.water.ca.gov/recycle/docs/TaskForceReport.htm
- U.S. EPA's Water Recycling and Reuse Website www.epa.gov/region9/water/recycling
- Zone 7 Water District: www.zone7.com

**b. Design a system that can store and use rainwater or graywater to satisfy a percentage of the landscape irrigation**

**i. 10% (3 points) OR**

**ii. 50% (4 points total) OR**

**iii. 100% of dry season landscape water satisfied with harvested rainwater (5 points total)**

***Graywater*** *is waste water from sinks, showers, bathtubs and washing machine, that is not contaminated by human waste. Not suitable for drinking, it is an intelligent resources, when used for subsurface irrigation of trees and shrubs.*

**POINTS: 5**

**CODE CONSIDERATIONS**

Rainwater and graywater capture systems are subject to local codes and may require special permits.

**PRACTICE DESCRIPTION**

Design a system that can store and use rainwater to satisfy a percentage of the landscape irrigation and/or design and install a graywater reuse system for landscape irrigation (i.e. not a septic system). The system must include a tank or dosing basin that can be used as part of the irrigation system. Graywater must be collected from at least one of the following: showers, clothes washers, some combination of faucets and other sources estimated to exceed 5,000 gallons per year. It must be used for subsurface irrigation of trees and shrubs, and must not be applied to above ground plant matter. It is recommended that it be used for watering more than one area and not concentrated in one part of the landscape.

**VERIFICATION**

*PROJECT TEAM*

- Submit an Accountability Form signed by the Landscape Architect or Designer or Irrigation Contractor stating compliance with code and the criteria for this credit.
- Submit any system equipment literature

*RATER*

- Verify that the Accountability Form has been signed by the Landscape Architect or Designer or Irrigation contractor.
- Verify that graywater is delivered subsurface to trees and shrubs.
- Visually verify that the rainwater and/or graywater system has been installed (optional).

**SYNERGIES AND TRADE-OFFS**

- Calculations of the irrigation needs and percent supplied by greywater/rainwater can contribute to earning points for Credit F.2.e (Design and install an irrigation system that will be operated at 70% of reference ET)

**REFERENCES**

- Water Recycling and Reuse, Local Government Commission, www.lgc.org

## 2. Design and install high efficiency irrigation systems

| Credit F.2 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | R + 10 | | | |
| Corresponds to BFL Guidelines Practice 4.6 | | | | | | |

### a. REQUIRED: Specify weather based (automatic, self adjusting) irrigation controller(s) that includes a moisture and/or rain sensor shutoff

**POINTS:** The first part of this practice is required for all commercial& civic landscapes that are to be recognized as Bay-Friendly. Up to 10 additional points may be earned for going above and beyond the requirement.

**PRACTICE DESCRIPTION**

Weather-based irrigation controllers or soil moisture based controllers or other self-adjusting irrigation controllers, shall be required for all irrigation systems. The component for adjusting the system must also be installed (e.g. A weather station must be installed if the controller is adjusted based on signals from an on-site weather system). Sensors (rain, freeze, wind, etc) either integral or auxiliary, that suspend or alter irrigation operations during unfavorable weather conditions such as rain or a freeze, shall be required of all irrigation systems.

Additionally, the controller shall have at a minimum the following capabilities:

- Water budgeting feature (percent adjustment);
- multiple start time capability;
- runtimes able to support low volume applications;
- irrigation intervals for days of the week or same day intervals;
- 3 or more operating programs {A (turf)/ B(shrubs)/ C (water feature)}.

***Weather based (or "smart") irrigation controllers*** *are automatic timing devices that use evapo-transpiration or weather data to remotely control irrigation valves.*

***A self adjusting irrigation controller*** *is an automatic timing device that uses sensor data (e.g. soil moisture sensor) to remotely control valves. CA Model Water Efficient Landscape Ordinance.*

***Evapotranspiration*** *is the water lost from the soil through evaporation and transpiration.*

.

**VERIFICATION**

*PROJECT TEAM*

- Submit the make and model of the irrigation controller
- Provide an Accountability Form signed by the Landscape Architect, Designer or Contractor that the installed controller is a self-adjusting model and includes shut off capacity.

*RATER*

- Visually verify that the installed controlled is the make and model specified.
- Verify that the Accountability Form has been signed by the Landscape Architect, Designer or Contractor.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- *Bay-Friendly Landscape Guidelines,* Practice 4.6
- Irrigation Association and the Center for Irrigation Technology (CIT) at California State University, Fresno, provide performance reports on smart controllers visit: http://www.irrigation.org/SWAT/Industry/ia-tested.asp
- For a list of manufacturers of self-adjusting irrigation controllers, visit: http://www.ebmud.com/conserving_&_recycling/residential/WSIC/default.htm

**REFERENCES**

- EBMUD *Regulations Governing Water Service to Customers of the East Bay MUD, July 2007.*
- Metropolitan Water District of So. California*, California Friendly Model Home Pilot Program, Sample Specifications for California Friendly Landscapes*

## b. REQUIRED: Sprinkler and spray heads shall not be permitted in areas less than 8 feet wide

**PRACTICE DESCRIPTION**

The irrigation system is designed to prevent overspray and runoff. Sprinkler and spray heads are not specified in areas less than or equal to 8 feet wide. Acceptable alternatives include drip, subsurface drip, bubblers or no irrigation. Bubblers shall not exceed 1.5 gallons per minute per bubbler.

**VERIFICATION**

*PROJECT TEAM*

- Submit Accountability Form signed by the Landscape Architect, Designer or Contractor verifying that irrigation as installed meets these requirements.

*RATER*

- Verify that Accountability Form has been signed by Landscape Architect, Designer or Contractor.
- Spot check that no sprinkler or spray heads have been installed in planted areas less than or equal to 8 feet wide

**SYNERGIES AND TRADE-OFFS**

- Earning points for this practice can also contribute to earning points for Credit E.4.a (Turf is not specified in areas less than 8 feet wide or in medians, unless irrigated with subsurface or low volume irrigation) and for Credit F.2.c (Specify and install irrigation equipment with an operational distribution uniformity of 80% or greater, such as drip or bubblers.)

**REFERENCES**

- East Bay Municipal Utility District, *Regulations Governing Water Service to Customers of the EBMUD,* July 2007, Authority Resolution 33610-07

### c. Specify and install irrigation equipment with an operational distribution uniformity of 80% or greater, such as drip or bubblers for:

i. **75% or greater of non-turf irrigated areas (2 points) OR**

ii. **100% of non-turf irrigated areas (5 points total)**

**POINTS: 5**

**PRACTICE DESCRIPTION**

For 75% or greater of non-turf irrigated areas: specify and install irrigation equipment with an operational distribution uniformity of 80% or greater, such as low volume micro-spray or point application devices (drip) or bubblers.

Non-turf areas on slopes equal to or greater than 25% shall be included in the percentage of the landscape that is irrigated with low volume irrigation. Maximum flow rate for drip emitters shall be 2 gallons per hour. Bubblers shall not exceed 1.5 gallons per minute per bubbler.

**VERIFICATION**

*PROJECT TEAM*

- Submit Irrigation plans indicating the use of drip (including subsurface drip or microspray) and/or bubblers. Include manufacturer specified flow rate for bubblers and low volume micro-spray or drip AND
- Submit square feet of total non-turf area and calculations of percent of non-turf area that is irrigated by drip or bubblers OR
- Submit the Hydrozone Worksheet required by the local Water Efficient Landscape Ordinance
- Submit an Accountability Form signed by the Landscape Architect, Designer or Contractor that the installed irrigation system meets the criteria for this credit.

*RATER*

- Verify calculations are completed accurately.
- Verify irrigation plans OR Worksheet indicate use of drip or bubblers and that manufacturer specified flow rate does not exceed criteria.
- Verify Accountability Form has been signed by the Landscape Architect, Designer or Contractor.

**SYNERGIES AND TRADE-OFFS**

- Specifying and installing irrigation equipment to meet the efficiency standard of this credit in medians and strips less than 8 feet wide can contribute to meeting the requirement of Credit F.2.b (Sprinkler and spray heads shall not be permitted in areas less than 8 feet wide).

***Landscape area is equivalent to Irrigated area*** *and is defined as all of the planting, turf areas and water features subject to the Maximum Applied Water Allowance (MAWA) calculation in a water budget. The following are not included as part of the landscape area: footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, pervious and non-pervious hardscapes,, open spaces and existing native vegetation . Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation*

***Distribution uniformity*** *is a measure of how evenly irrigation water is being applied. It is expressed as a percentage between 0 and 100%. 100% DU is theoretically possible but virtually impossible in actual practice. There must be a good distribution uniformity before there can be a good irrigation efficiency.*
*www.wateright.org*

***Low-Volume Irrigation*** *refers to the use of equipment and devices specifically designed to both limit the volume of water being applied and to efficiently deliver that water within the root zone of the plant. It applies water at low pressure through a system of tubing or lateral lines and low volume emitters. It is also referred to as micro-irrigation and includes drip (or trickle), micro-spray jets, micro-sprinklers, or bubbler irrigation.*

***Stream rotator heads*** *or rotor type sprinkler heads apply water slower and in larger streams to avoid misting and drift, and allowing soils to better absorb it. Studies indicate that rotary sprinklers can result in significantly higher distribution uniformity (80% or greater), compared to fixed pattern spray heads*

### d. For all turf areas: Specify and install equipment with a precipitation rate of 1 inch or less per hour and an operational distribution uniformity of 70% or greater.

**POINTS: 2**

**PRACTICE DESCRIPTION**

For all turf areas: Specify and install equipment with a precipitation rate of 1 inch or less per hour and designed to achieve an operational distribution uniformity of 70% or greater. Stream rotator heads are encouraged, The use of standard spray heads shall be avoided. All sprinklers shall have matched precipitation rates within each control and valve circuit. Points shall also be awarded for use of subsurface drip irrigation in turf areas.

Also recommended:

- Specify an appropriate pressure regulating device at POC, valve or sprinkler, when
- pressure exceeds optimal manufacturer recommendation.
- Specify shorter radius, low angle sprinklers to prevent overspray and wind drift,
- Locate sprinklers a minimum of 2 inches and a maximum of 3 inches away from pavement or header edge to prevent damage or misalignment from routine maintenance.
- Separate top, bottom and middle of slopes on separate valves.

**VERIFICATION**

*PROJECT TEAM*

- Submit irrigation documents with sprinkler or subsurface drip irrigation specifications for turf areas OR the Hydrozone Worksheet required for the relevant Water Efficient Landscape Ordinance. Include manufacturer specified precipitation rate (in inches/hour) for all sprinkler heads (in turf areas).
- Submit an Accountability Form signed by the Landscape Architect, Designer or Irrigation Contractor that the installed irrigation equipment meets the criteria for this credit.

*RATER*

- Verify irrigation documents, and manufacturer specified precipitation rate.
- Verify the Accountability Form has been signed by the Landscape Architect, Designer or Irrigation Contractor.

**SYNERGIES AND TRADE-OFFS**

- Specifying and installing irrigation equipment in turf with a slightly higher efficiency (such as subsurface drip) can contribute to also earning points for Credit F.2.b (Specify and install irrigation equipment with an operational distribution uniformity of 80% or greater, such as drip or bubblers).

### e. Design and install irrigation system that will be operated at 70% of reference ET

**POINTS: 3**

**PRACTICE DESCRIPTION**

The irrigation system shall be designed and installed such that the Estimated Total Water Use (ETWA) is less than the budgeted water, i.e. the Maximum Applied Water Allowance (MAWA).

Stream rotator heads are required, use of standard spray heads is not allowed.

Use the formulas below to calculate:

- maximum applied water allowance (MAWA),
- estimated total water use (ETWU),

$$MAWA = (ETo)\ (0.62)\ (LA)(0.70) + (SLA)(0.3)]$$

$$ETWU = ETo\ (0.62)\ [\ \frac{(PF)(HA)}{(IE)} + SLA\ ]$$

ETo = Reference evapotranspiration (inches per year)
LA = Landscaped area (square feet)
SLA = Special Landscape Area (square feet)
PF = Plant factor (Ks per WUCOLS) for each hydrozone
HA = Hydrozone area (square feet)
(0.70) = ET adjustment factor
(0.62) = factor for converting to gallons per square foot
IE = irrigation efficiency

***Landscape area is equivalent to Irrigated area*** *and is defined as all of the planting, turf areas and water features subject to the Maximum Applied Water Allowance (MAWA) calculation in a water budget. The following are not included as part of the landscape area: footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, pervious and non-pervious hardscapes,, open spaces and existing native vegetation . Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation.*

***Sports or multiple use field is equivalent to recreational area*** *and is defined as the portion of the landscape area that is dedicated to active play such as parks, sports fields and golf courses, where turf provides a playing surface.*

***Special Landscape Area*** *is the portion of the landscape area that is dedicated to edible plants, areas irrigated with recycled water and recreational areas.*

***Reference ET ($ET_0$)*** *is the standard measurement of environmental parameters which affect the water use of plants. It is given in inches per day, month or year and is an estimate of the evapotranspiration of a large field of 4-7 inch tall cool season turf that is well watered.*

**VERIFICATION**

*PROJECT TEAM*

- Submit the Water Efficient Landscape Workbook Worksheet (Water Budget Calculation) from the local Model Water Efficient Landscape Ordinance, using 0.7 for the ET adjustment factor.
- Submit Accountability Form signed by Landscape Architect, Designer or Irrigation Contractor that no sprinkler heads are stream rotator heads.

*RATER*

- Verify Water Budget Calculation is completed and that math is accurate.
- Verify Accountability Form has been signed by Landscape Architect, Designer or Irrigation Contractor.

## SYNERGIES AND TRADE-OFFS

- Designing and installing a landscape that needs no supplemental irrigation, Credit E.3.c (100% of all non-turf plant palette needs no irrigation once established) can contribute to earning points for meeting this Credit.

## RESOURCES AND BAY-FRIENDLY TOOLS

- *CA Department of Water Resource, Model Water Efficient Landscape Ordinance, http://www.owue.water.ca.gov/docs/WaterOrdIndex.cfm*
- University of California Cooperative Extension's *Guide to Estimating Irrigation Water Needs of Landscape Plantings in CA (WUCOLS),* www.owue.water.ca.gov/docs/wucols00.pdf

# 3. INSTALL A DEDICATED METER FOR LANDSCAPE WATER USE OR INSTALL A SUBMETER

| Credit F.3 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | 2 | | | |
| Corresponds to BFL Guidelines Practice 4.7 | | | | | | |

## a. A dedicated irrigation meter or submeter is specified

**POINTS: 2**

**PRACTICE DESCRIPTION**

A dedicated irrigation meter shall be installed for all new projects with a landscape area greater than 5,000 square feet. If not a dedicated meter, sub-meters shall be installed on new landscapes less than 5,000 square feet or all renovated sites.

**VERIFICATION**

*PROJECT TEAM*

- Submit square feet of landscape area
- Submit documentation of installation: either a receipt from the water supplier OR manufacturer cut sheets OR an Accountability Form signed by the Landscape Architect, Designer or Irrigation Contractor verifying that the meter or submeter was installed.

*RATER*

- Verify square feet of landscape and specifications of dedicated meter or submeter as per appropriate to the size.
- Verify submittal of receipt OR cut sheets OR an Accountability Form signed by the Landscape Architect, Designer or Irrigation Contractor.

# G. MAINTENANCE

## 1. KEEP PLANT DEBRIS ON SITE:

| Credit G.1 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | 7 | | | | | |
| Corresponds to BFL Guidelines Practice 2.2 | | | | | | |

### a. Grasscycle

**POINTS: 2**

**PRACTICE DESCRIPTION**

Maintenance specifications and/or task list requires grasscycling for all lawns from April through October, or longer. Exceptions include

- Sports turf "in season" when clippings will interfere with play.
- Unseasonal rain, which may require temporarily halting of grasscycling because of excessive moisture.

In such cases, the clippings must be used as mulch or composted or transported to a plant debris recycling facility. Do not use grass clippings as mulch if an herbicide has been applied to the turf.

***Grasscycling*** *means leaving the clippings on the lawn after mowing, so they decompose and release their nutrients in the soil.*

**PROJECT TEAM RECOMMENDATIONS**

- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals

**VERIFICATION**

*PROJECT TEAM*

- Submit maintenance manual or task list that includes grasscycling
- Submit Accountability Form signed by Landscape contractor confirming grasscycling will be practiced as per the criteria for this credit.

*RATER*

- Verify manual or task list includes grasscycling.
- Verify Accountability Form has been signed by the Landscape Contractor.

**SYNERGIES AND TRADE-OFFS**

- Including a policy or specifications to compost grass clippings during the rainy season can contribute to earning points for Credit G.1.c (Compost plant debris).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page 18 or http://www.stopwaste.org/home/index.asp?page=777

## b. Produce mulch from plant debris

*__Mulch__ is any material spread evenly over the surface of the soil to enhance the growth of plants and the appearance of the landscape. (*StopWaste.Org, *A Bay-Friendly Landscaping Guide to Mulch)*

**POINTS: 2**

**PRACTICE DESCRIPTION**

Maintenance specifications and/or task list requires that grassclippings, leaves and/or seed free vegetative debris less than 4 inches (including cut or chipped woody prunings) be re-incorporated into the mulch layer of landscaped areas away from storm drain. Do not use grass clippings as mulch if an herbicide has been applied to the turf.

**PROJECT TEAM RECOMMENDATIONS**

- Identify areas away from hardscapes as leaf repositories.
- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals

**VERIFICATION**

*PROJECT TEAM*

- Submit maintenance specifications and/or task list that includes using plant debris on-site as mulch.
- Submit Accountability Form signed by Landscape Contractor confirming mulching of plant debris will be practiced as per the criteria for this credit.

*RATER*

- Verify specifications or task list includes required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

**SYNERGIES AND TRADE-OFFS**

- Including a policy or specifications to use plant debris as mulch can contribute to earning points for Credit 5 (Mulch regularly).

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page 16 or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified

## c. Produce compost from plant debris

***Compost** is the product of controlled biological decomposition of organic materials, often including urban plant debris and food waste.*

**POINTS: 3**

**PRACTICE DESCRIPTION**

Composting plant debris on site shall be included in maintenance specifications or task list.

**PROJECT TEAM RECOMMENDATIONS**

- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals
- Composting on site can range in scale from a backyard compost bin to a medium scale operation. A level site with access to water and adequate space to manage the materials is needed as well as a commitment for ongoing management of the system.

**VERIFICATION**

*PROJECT TEAM*

- Submit maintenance specifications and/or task list that includes composting plant debris on-site.
- Submit Accountability Form signed by Landscape Contractor confirming composting of plant debris will be practiced as per the criteria for this credit.

*RATER*

- Verify specifications or task list includes required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Compost At Work: **http://www.stopwaste.org/home/index.asp?page=108** is a useful document for setting up a compost system
- Bay-Friendly Landscape Model Maintenance Specifications, page [insert page number here] or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified
- Compost: A Bay-Friendly Garden Starts with Healthy Soil", available for download from http://www.stopwaste.org/home/index.asp?page=442 (large file, 7.5 mb).
- Do the Rot Thing, free how to movie for home and small scale compost systems at: https://www.stopwaste.org/AlamedaCommerce/ProductList.aspx
- The Rodale Book of Composting, Rodale Press, Emmaus, Pennsylvania
- On-Farm Composting Handbook, Cornell University, http://www.css.cornell.edu/compost/OnFarmHandbook/onfarm_TOC.html

## 2. SEPARATE PLANT DEBRIS FOR CLEAN GREEN DISCOUNTS

| Credit G.2 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | 3 | | | | | |
| Corresponds to BFL Guidelines Practice 2.8 | | | | | | |

**a. Ongoing maintenance requires all exported plant debris be separated from other refuse and taken to a facility where it will be used to produce compost or mulch**

**POINTS: 3**

**PRACTICE DESCRIPTION**

Maintenance specifications and/or task list shall require all exported plant debris be separated from other refuse and taken to a facility where it will be used to produce compost or mulch.

**PROJECT TEAM RECOMMENDATIONS**

- Identify vendor, closest landfill or transfer station that offers a clean green discount for plant debris that is free from any trash.
- If the vendor for a commercial site does not automatically offer such a clean green discount, one can often be negotiated.
- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals

**VERIFICATION**

*PROJECT TEAM*

- Submit maintenance specifications and/or task list that includes separating plant debris from all other refuse
- Submit an Accountability Form signed by the Landscape Contractor verifying that plant debris will be kept separated from other waste and taken to an appropriate facility to be made into compost or mulch.

*RATER*

- Verify specifications or task list includes required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page [insert page number here] or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified

## 3. PROTECT SOIL FROM COMPACTION

| Credit G.3 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | 1 | | | | |
| Corresponds to BFL Guidelines Practice 3.2 | | | | | | |

### a. Ongoing maintenance requires that soil is not worked when wet, generally between October and April

**POINTS: 1**

**PRACTICE DESCRIPTION**

Maintenance task list shall specify that soil is not worked when wet, generally between October and April. When temporary access is needed over non-paved areas, distribute the load over the soil with 6" thick coarse organic mulch or reusable planks.

**PROJECT TEAM RECOMMENDATIONS**

- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals

**VERIFICATION**

*PROJECT TEAM*

- Submit maintenance specifications and/or task list that includes using plant debris on-site as mulch.
- Submit an Accountability Form signed by the Landscape Contractor verifying that soil will not be worked when wet.

*RATER*

- Verify specifications or task list include the required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page 8 or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified

# 4. FEED SOILS NATURALLY & AVOID SYNTHETIC FERTILIZERS

| Credit G.4 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | 3 | | | | |
| Corresponds to BFL Guidelines Practice 3.8 & 3.9 | | | | | | |

## a. Ongoing maintenance includes topdressing turf with finely screened quality compost after aeration and/or 1-4 times per year

**POINTS: 1**

**PRACTICE DESCRIPTION**

Maintenance manual shall include specifications to topdress turf with finely screened quality compost after aeration and/or 1-4 times per year.

**PROJECT TEAM RECOMMENDATIONS**

- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals

**VERIFICATION**

*PROJECT TEAM*

- Submit maintenance specifications and/or task list that include topdressing turf with compost after aeration and/or on a regular basis, at least once a year.
- Submit an Accountability Form signed by the Landscape Contractor verifying that turf will be topdressed with compost after aeration 1-4 times per year.

*RATER*

- Verify specifications or task list include the required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page 8 &9 http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified
- *Field Guide to Compost Use*, US Composting Council, http://www.compostingcouncil.org/education/publications.php

***Topdressing*** *is a method of applying fertilizers, minerals or compost, by spreading a thin layer over the top of soil or directly to turf or other groundcovers.*

***Compost*** *is the product of controlled biological decomposition of organic materials, often including green waste and food waste.*

***Quality compost*** *is a well decomposed, stable, weed free organic matter source, derived from agricultural and/or food waste and/or yard trimmings, contain no substances toxic to plants, possess no objectionable odors. It does not resemble the feedstock (the original materials from which it was derived. It is highly recommended that it be produced in accordance with the U.S. Composting Council's Standard Testing Assurance Program. www.compostingcouncil.org*

## b. Ongoing maintenance uses compost, compost tea or other naturally occurring, non-synthetic fertilizers for all landscape areas

**POINTS: 1**

**PRACTICE DESCRIPTION**

Plant and soil amendments for maintenance shall be specified as compost, compost tea or other naturally occurring, non-synthetic fertilizers for all landscape areas

***Compost tea*** *is a liquid solution or suspension made by steeping compost in water. It is used as both a fertilizer and as part of a program for preventing plant disease.*

***Naturally occurring, non synthetic fertilizers*** *come from plants, animals and mined minerals. Examples include: sea kelp (seaweed), alfalfa meal, corn gluten meal and cottonseed meal; cover crop plants turned into the soil; blood meal, bone meal, fish meal, and mined limestone, soft rock phosphate and gypsum. The use is intended to feed soil organisms who then produce plant food in a plant available form. These materials can be applied in pelleted, powdered & granulated form or as liquid fertilizer via irrigation or foliar sprays.* Adapted from Peaceful Valley Farm Supply, www.groworganic.com

**PROJECT TEAM RECOMMENDATIONS**

- Submit a soil sample for analysis and request recommendations for an organic approach to the management of the soil.
- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals

**VERIFICATION**

*PROJECT TEAM*

- Submit maintenance specifications and/or task list that includes using compost, compost tea or other naturally occurring, non-synthetic fertilizers.
- Submit an Accountability Form signed by the Landscape Contractor verifying that ongoing maintenance uses compost, compost tea or other naturally occurring, non-synthetic fertilizers.

*RATER*

- Verify specifications or task list include the required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

**SYNERGIES AND TRADE-OFFS**

- Including compost, compost tea and other naturally occurring fertilizers for preventing plant disease in an Integrated Pest Management or an organic maintenance plan can contribute to earning points for Credit G.7 (Use IPM as part of maintenance practices)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page 8 or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified
- For more information on compost tea: www.composttea.org; www.attra.org; www.soilfoodweb.com

## c. Ongoing maintenance prohibits fertilizers that are not allowed by Organic Materials Research Institute.

**POINTS: 1**

### PRACTICE DESCRIPTION

Amendments and fertilizers that are prohibited or are restricted for use in crop production by OMRI are prohibited in the maintenance specifications, task list and/or agency policy.

***Organic Materials Research Institute (OMRI)*** *approves amendments and fertilizers for us in crop production. The OMRI Generic Materials List is a catalog of over 900 substances that are allowed, restricted, or prohibited for use in organic agriculture and food processing. Based on the National Organic Program, the list serves as a reference guide for organic farmers, handlers, processors, inspectors, certifiers, agricultural professionals, and all others with an interest in materials for use in organic production. Materials approved for use in organic production are appropriate for use in landscapes.* http://omri.org/OMRI_generic_list.html

### PROJECT TEAM RECOMMENDATIONS

- Submit a soil sample for analysis and request recommendations for an organic approach to the management of the soil.
- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals

### VERIFICATION

*PROJECT TEAM*

- Submit agency policy, maintenance specifications and/or task list prohibiting the use of fertilizers that are not allowed by OMRI.
- Submit an Accountability Form signed by the Landscape Contractor verifying that fertilizers that are not allowed by OMRI will not be used.

*RATER*

- Verify specifications or task list include the required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

### SYNERGIES AND TRADE-OFFS

- Prohibiting fertilizers that are not allowed by OMRI as part of an Integrated Pest Management or an organic maintenance plan can contribute to earning points for Credit G.7 (Use IPM as part of maintenance practices)

### RESOURCES AND BAY-FRIENDLY TOOLS

- Bay-Friendly Landscape Model Maintenance Specifications, page [insert page number here] or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified
- Peaceful Valley Farm Supply provides a comprehensive list of options at: www.groworganic.com

# 5. MULCH REGULARLY

| Credit G.5 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | 1 | 1 | | | |
| Corresponds to BFL Guidelines Practice 4.1 | | | | | | |

***Mulch** is any material spread evenly over the surface of the soil to enhance the growth of plants and the appearance of the landscape. (*StopWaste.Org, *A Bay-Friendly Landscaping Guide to Mulch)*

## a. Ongoing maintenance requires regular reapplication of organic mulch, to a minimum depth of 3 inches

**POINTS: 2**

**PRACTICE DESCRIPTION**

Regular reapplication of organic mulch, to a minimum depth of 3 inches for all exposed soil, shall be included in the maintenance specifications or task list. Minimizing the use of blowers in mulched beds and using, recycled, locally produced plant debris mulch are highly recommended.

**PROJECT TEAM RECOMMENDATIONS**

- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals
- Provide owner and/or property manager with the Bay-Friendly Landscape Guide to Mulch

**VERIFICATION**

*PROJECT TEAM*

- Submit maintenance specifications and/or task list that includes regular reapplication of mulch to all exposed soils.
- Submit an Accountability Form signed by the Landscape Contractor verifying that mulch will be maintained at 3 inches depth

*RATER*

- Verify specifications or task list include the required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

**SYNERGIES AND TRADE-OFFS**

- Using plant debris generated on site can contribute to earning points for Credit G.1.b (Produce mulch from plant debris)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page 10 or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified

# 6. MANAGE AND MAINTAIN IRRIGATION SYSTEM SO EVERY DROP COUNTS

| Credit G.6 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | 4 | | | |
| Corresponds to BFL Guidelines Practice 4.7-9 | | | | | | |

## a. Ongoing maintenance includes a schedule for reading the dedicated meter or submeter and reporting water use

**POINTS: 1**

**PRACTICE DESCRIPTION**

Maintenance task list shall include a schedule for reading the dedicated meter or submeter and reporting the landscape water use to the property owner or manager.

**PROJECT TEAM RECOMMENDATIONS**

- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals

**VERIFICATION**

*PROJECT TEAM*

- Submit maintenance specifications and/or task list that include reading the water meter and reporting water use to the property owner or manager.
- Submit an Accountability Form signed by the Landscape Contractor verifying that landscape water use reports based on landscape meters will be reported on a regular basis.

*RATER*

- Verify specifications or task list include the required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page 10 or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified

**b. At completion of the installation, the contractor shall provide the property owner with 1. precipitation rate for each valve zone, 2. area calculations for each irrigation zone and the irrigation plans which include the location of irrigation supply shut off, 3. internet address for watering index information**

**POINTS: 2**

**PRACTICE DESCRIPTION**

At completion of the installation, the contractor shall educate the property owner on the irrigation system by providing information on

- precipitation rate for each valve zone
- area calculations for each irrigation zone
- irrigation plans which include the location of irrigation supply shut off,
- internet address for watering index information

Irrigation plans should also include detailed information on irrigation controller and other components.

**PROJECT TEAM RECOMMENDATIONS**

- Provide maintenance personal or contractor with 'as built' irrigation plans.
- Provide property owner or manager with a list of Irrigation Association certified professional landscapers

**VERIFICATION**

*PROJECT TEAM*

- Submit Accountability Form signed by the Landscape or Irrigation contractor that the irrigation plans and required information has been provided to the property owner or his/her representative, such as the property manager.

*RATER*

- Verify Accountability Form has been signed by the Landscape or Irrigation Contractor

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page 10 or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified
- Irrigation Association www.irrigation.org

### c. Ongoing maintenance includes regular checking of irrigation equipment, and/or checking soil moisture content with soil probes before watering AND/OR immediate replacement of broken equipment with equal or superior materials

**POINTS: 1**

**PRACTICE DESCRIPTION**

Maintenance specifications and/or task list requires that maintenance personal or contractor monitor soil moisture within plant root zones using a soil probe, and to adjust irrigation schedules accordingly, if a soil moisture sensor is not signaling the irrigation controller.
Maintenance specifications and/or task list also requires

- assessment of the irrigation system, while it is in operation, at every visit during the watering season
- all malfunctioning equipment be repaired prior to the next scheduled irrigation
- all replacement parts be of the same manufacturer, type, and application rates as existing, or approved equals or upgrades
- that contractor submits monthly documentation of irrigation checks and notes any changes or adjustments to the system on 'as built' irrigation plans.

It is highly recommended that the maintenance specifications and/or task list include a bi-annual schedule for irrigation audits.

**PROJECT TEAM RECOMMENDATIONS**

- Provide property owner or manager with a list of Irrigation Association certified
- professional landscapers
- Provide maintenance personal or contractor with 'as built' irrigation plans.

**VERIFICATION**

*PROJECT TEAM*

- Submit maintenance specifications and/or task list that includes the regularly scheduled irrigation assessment for meeting the criteria of this credit.
- Submit an Accountability Form signed by the Landscape Contractor verifying that includes the regularly scheduled irrigation assessment for meeting the criteria of this credit.

*RATER*

- Verify specifications or task list include the required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page 10 or http://www.stopwaste.org/home/index.asp?page=777
- Irrigation Association, www.irrigation.org

# 7. USE IPM AS PART OF MAINTENANCE PRACTICES

| Credit G.7 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | | 4 | |
| Corresponds to BFL Guidelines Practice 6.1 B-F | | | | | | |

## a. Ongoing maintenance includes integrated pest management specifications

**POINTS: 2**

**PRACTICE DESCRIPTION**

An integrated pest management program shall be included in the maintenance specifications and/or task list. The main components of the IPM program will include:

- maintaining healthy, attractive plants, maximizing resistance to pests and out-compete weeds;
- monitoring for presence of pests and to evaluate pest impact to plant health and appearance, and nuisance to the public;
- providing control treatments that have minimal negative effects on all but the pest and that protect air and water quality with a priority given to mechanical, cultural, physical and biological controls. The least toxic pesticide is selected as a last resort and applied in the smallest effective quantities.

***Integrated Pest Management*** *is a holistic approach to mitigating insects, plant diseases, weeds, and other pests. It involves the use of many strategies for managing, but not eliminating pests. Integrated Pest Management (IPM) uses cultural, mechanical, physical, and biological control methods before using pesticides to control pests and diseases in the landscape.. Chemical controls are applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control is applied.*

**PROJECT TEAM RECOMMENDATIONS**

- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals
- Submit a proposal to property owner or manager to guide them in developing an Integrated Pest Management policy.

**VERIFICATION**

*PROJECT TEAM*

- Submit written agency Integrated Pest Management policy or
- Submit maintenance specifications and/or task list that relies on integrated pest management approach.
- Submit an Accountability Form signed by the Landscape Contractor verifying that integrated pest management will be used for pest and weed control.

*RATER*

- Verify policy or specifications or task list include the required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

**SYNERGIES AND TRADE-OFFS**

- Using mulch as part of an integrated pest management program to control weeds can contribute to earning points for Credit G.5 (Mulch regularly)

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page 12 or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified
- For a copy of the Regional IPM Resource Manual, contact Naresh Duggal at naresh.duggal@ceo.sccgov.org
- *Weed Workers Handbook* , Invasive Plant Council, http://www.cal-ipc.org/resources/index.php

## b. At least one landscaping staff member or contractor is trained in the use of IPM or is a Bay-Friendly Qualified Professional

**POINTS; 2**

**PRACTICE DESCRIPTION**

At least one landscaping staff member or contractor shall be trained in the use of IPM or is a Bay-Friendly Qualified Professional

**PROJECT TEAM RECOMMENDATIONS**

- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals

**VERIFICATION**

*PROJECT TEAM*

- Submit name and qualifications of trained staff member or contractor.

*RATER*

- Verify Bay-Friendly Qualified professional by visiting www.Bay-Friendly.org/bf-qualified or contacting aramirez@stopwaste.org

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page [insert page number here] or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified

## 8. CHOOSE AND MAINTAIN YOUR MATERIALS, EQUIPMENT & VEHICLES CAREFULLY

| Credit G.8 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | | 3 | |
| Corresponds to BFL Guidelines Practice 6.4 | | | | | | |

### a. Ongoing maintenance requires that all oil leaks are repaired immediately and that repairs are not done at the landscape site

**POINTS: 1**

**PRACTICE DESCRIPTION**

Maintenance specifications and/or task list specifies that all oil leaks are repaired immediately and that equipment repairs are not done at the landscape site.

**PROJECT TEAM RECOMMENDATIONS**

- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals

**VERIFICATION**

*PROJECT TEAM*

- Submit maintenance specifications and/or task list
- Submit an Accountability Form signed by the Landscape Contractor verifying that oil leaks are repaired immediately and done offsite.

*RATER*

- Verify maintenance specifications and/or task list include the required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page [insert page number here] or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified

## b. Landscape maintenance equipment uses biobased lubricants and/or alternative fuels

**POINTS: 2**

**PRACTICE DESCRIPTION**

Landscape maintenance contractor uses equipment that relies on biobased lubricants and/or alternative fuels.

**VERIFICATION**

*PROJECT TEAM*

- Submit equipment list that meets the criteria for this credit, including equipment type, manufacturer, model number and lubricant and/or fuel.
- Submit an Accountability Form signed by the Landscape Contractor verifying that Biobased lubricants will be used in equipment.

*RATER*

- Verify equipment list has been submitted.
- Verify Accountability Form has been signed by the Landscape Contractor.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Landscape Model Maintenance Specifications, page [insert page number here] or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified
- Office of the Federal Environmental Executive, Green Purchasing, Biobased Products, http://www.ofee.gov/gp/bioprod.asp

# 9. USE ORGANIC PEST MANAGEMENT

| Credit G.7 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | | | 2 |
| Corresponds to BFL Guidelines Practice 7.4 | | | | | | |

## a. Ongoing maintenance prohibits the use of pesticides that are not allowed by OMRI in its generic materials list

**POINTS: 2**

### PRACTICE DESCRIPTION

Maintenance specifications and/or task list prohibits the use of pesticides that are not allowed by OMRI in its generic materials list.

***Organic Materials Research Institute (OMRI)*** *approves amendments and fertilizers for us in crop production. The OMRI Generic Materials List is a catalog of over 900 substances that are allowed, restricted, or prohibited for use in organic agriculture and food processing. Based on the National Organic Program, the list serves as a reference guide for organic farmers, handlers, processors, inspectors, certifiers, agricultural professionals, and all others with an interest in materials for use in organic production. Materials approved for use in organic production are appropriate for use in landscapes.* http://omri.org/OMRI_generic_list.html

### PROJECT TEAM RECOMMENDATIONS

- Provide owner and/or property manager with a list of local Bay-Friendly Qualified Landscape Maintenance Professionals

### VERIFICATION

*PROJECT TEAM*

- Submit agency policy, maintenance specifications and/or task list prohibiting the use of pesticides that are not allowed by OMRI.
- Submit an Accountability Form signed by the Landscape Contractor prohibiting the use of pesticides that are not allowed by OMRI.

*RATER*

- Verify specifications or task list include the required instructions.
- Verify Accountability Form has been signed by the Landscape Contractor.

### SYNERGIES AND TRADE-OFFS

- Credit can not be given for both the above and Credit G.7 (Use IPM as part of maintenance practices)

### RESOURCES AND BAY-FRIENDLY TOOLS

- Bay-Friendly Landscape Model Maintenance Specifications, page 12 or http://www.stopwaste.org/home/index.asp?page=777
- Bay-Friendly Qualified Landscape Maintenance Professionals are listed at www.BayFriendly.org/bf-qualified
- Organic Materials Research Institute, http://www.omri.org/
- NOFA New England Organic Farming (landscape section) http://www.organiclandcare.net/

# H. INNOVATION

## 1. BAY-FRIENDLY LANDSCAPE GUIDELINES AND PRINCIPLES ARE DEFINED AND REFERENCED IN THE CONSTRUCTION BID DOCUMENTS

| Credit H.1 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| 3 | | | | | | |

**POINTS: 3**

**PRACTICE DESCRIPTION**

The document titled: *Bay-Friendly Landscape Guidelines: Sustainable Practices for the Landscape Professional* and the 7 principles described in the Guidelines shall be defined and referenced in the construction bid documents

**VERIFICATION**

*PROJECT TEAM*

- Submit construction bid documents with reference to the guidelines and principles highlighted.

*RATER*

- Verify references have been included in construction bid documents.

## 2. DESIGN & INSTALL EDUCATIONAL SIGNAGE

| Credit H.2 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| 4 | | | | | | |

### a. Provide instructional signs and other educational materials to describe the landscapes Bay-Friendly design, construction and maintenance practices

**POINTS: 4**

**PRACTICE DESCRIPTION**

Permanent instructional signs shall be installed to describe at least 6 of the Bay-Friendly practices implemented during the design and construction of the landscape. Signs for ongoing maintenance practices can also be included. It is highly recommended that a single sign identifying the landscape as a Bay-Friendly Rated landscape be designed and displayed where it will receive the greatest visibility. It is also highly recommended that the signs be made with recycled content materials.

**VERIFICATION**

*PROJECT TEAM*

- Submit site and/or construction documents plan showing location of signs and listing additional educational materials to be prepared.

*RATER*

- Visually verify installation of signs.

**SYNERGIES AND TRADEOFFS**

- Specifying that all signs be made from recycled content and/or salvaged materials can contribute to earning points for Credit D.1.v (Use salvaged and recycled content materials).

# 3. CREATE A BAY-FRIENDLY MAINTENANCE TASK LIST

| Credit H.3 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 |

**a. Provide a detailed Bay-Friendly maintenance task list and/or use the BF Maintenance Specification Guidelines as an official reference document in the landscape maintenance contract and/or with on site landscape staff**

**POINTS: 7**

**PRACTICE DESCRIPTION**

Provide a detailed maintenance task list that includes at least 7 of the practices listed in Section G of the BFL Scorecard, including

- Separating plant debris for clean green discounts and
- Mulch regularly.

Alternatively, officially reference the BF Maintenance Specification Guidelines in the landscape maintenance contract and/or in instructions to on site landscape staff.

**VERIFICATION**

*PROJECT TEAM*

- Submit a maintenance task list or maintenance contract or staff instructions with reference to Bay-Friendly Model Maintenance specifications identified.

*RATER*

- Verify that the maintenance task list includes the minimum practices and/or the reference to the model specifications is complete and accurate.

**RESOURCES AND BAY-FRIENDLY TOOLS**

- Bay-Friendly Model Landscape Maintenance Specifications

## 4. EMPLOY A HOLISTIC APPROACH

| Credit H.4 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 |

**a. Site analysis is submitted AND 65% of landscape construction waste is diverted AND planting plan includes a diverse palette AND 50% of non-turf plants are California native species AND none of the landscape area is in turf AND compost is specified for amending the soil during installation AND natural fertilizers are specified as the exclusive source of nutrients AND integrated OR organic pest management is specified**

**POINTS: 7**

**PRACTICE DESCRIPTION**

The following credits are earned elsewhere in the scorecard but together earn additional points because of their integration offers a holistic approach

- A Site analysis is submitted (Credit C.1) AND
- 65% of landscape construction waste is diverted (Credit D.2.b) AND
- The planting plan includes a diverse palette (Credit E.8) AND
- 50% of non-turf plants are California native species (Credit E.9) AND
- No turf is specified (Credit E.4.e) AND
- Compost is specified for amending the soil during installation (Credit C.7) AND
- natural fertilizers are specified as the exclusive source of nutrients (Credit C.5 or Credit G.4) AND
- integrated OR organic pest management is specified (Credit D.7 or Credit D.8 or Credit G.7 or G.9)

**VERIFICATION**

*PROJECT TEAM*

- No additional submittals are required.

*RATER*

- Verify submittals for above practices have met the criteria for the credits.

## 5. DESIGN YOUR OWN BAY-FRIENDLY INNOVATION.

| Credit H.4 | | | | | | |
|---|---|---|---|---|---|---|
| Possible Points: | | | | | | |
| Landscape Locally | Less to Landfill | Nurture the Soil | Conserve Water | Conserve Energy | Water & Air Quality | Wildlife Habitat |
| | | | | | | |

**POINTS: Up to 4**

**PRACTICE DESCRIPTION**

Design your own Bay-Friendly innovation. Enter a brief description into the scorecard. Submit additional information if necessary to fully communicate the innovation. Points will be evaluated by Bay-Friendly Rater.

**VERIFICATION**

*PROJECT TEAM*

- Submit innovation description.
- Submit Accountability Form signed by the Owner, Engineer, Landscape Architect, Designer or Contractor that as installed the project meets this requirement.

*RATER*

- Verify that innovation description is complete and accurate.
- Verify that Accountability Form has been signed by Owner, Engineer, Landscape Architect, Designer or Contractor.
- Submit for Bay-Friendly Team review.

# Glossary

**Albedo** or **solar reflectance** is a measure of ability of a surface material to reflect sunlight-including the visible, infrared and ultraviolet wavelengths on a scale of 0 to 1. Solar reflectance is also called “albedo” Solar Reflectance is measured according to ASTM E 903, ASTM E 1918 or ASTM C 1549

A **Brownfield site** means real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Partial definition excerpted from Public Law 107-118 (H.R. 2869) - "Small Business Liability Relief and Brownfields Revitalization Act" signed into law January 11, 2002. http://www.epa.gov/brownfields/glossary.htm

**Compost** is the product of controlled biological decomposition of organic materials, often including urban plant debris and food waste. It is an organic matter resource that has the unique ability to improve the chemical, physical and biological characteristics of soils or growing media. It contains plant nutrients but is typically not characterized as a fertilizer. Excerpted from US Compost Council , Field Guide to Compost Use

**Compost blankets** 1-3 inch layers of compost that are blown onto slopes up to 2:1 or up to 1:1 with additional stabilization. The compost can also be spread on shallower slopes. The use of compost blankets is a USEPA approved BMP for construction sites. They make excellent surface contact, preventing rilling underneath and thereby controlling erosion. Compost blankets can be less expensive than other erosion BMPs because they do not need to be removed, hauled and landfilled. www.BuildingSoil.org

**Compost berms and socks** are also US EPA approved for perimeter sediment and pollutant control, and are increasingly used instead of silt fences and straw bales. Berms can be blown in place or placed with a front end loader. Socks can be filled in place by compost suppliers or filled and delivered on pallets. They do not need to be trenched in and are highly effective at filtering out sediments, oil, grease and metals. www.BuildingSoil.org

**Compost tea** is a liquid solution or suspension made by steeping compost in water. It is used as both a fertilizer and as part of a program for preventing plant disease.

**Composting** is the controlled biological decomposition of organic materials

**Construction and Demolition Debris** means used or discarded materials removed from premises during construction or renovation of a structure resulting from construction, remodeling, repair, or demolition operations on any pavement, house, commercial building, or other structure. It generally consists of wood, drywall, metals, concrete, dirt, cardboard, plastic pots and more. StopWaste.Org Model C&D Policy

**Dark Sky Certified** means that a light is certified by the International Dark-Sky Association, a third party certification for luminaries that minimize glare, reduce light trespass, and don't pollute the night sky. http://www.darksky.org

**Detention basins** are constructed basins with drainage outlets that are designed to detain runoff from a storm for some minimum time (e.g., 48 hours) to allow settling of sediment and pollutants. Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance August 31, 2006 Version 1.0

**Distribution uniformity** is a measure of how evenly irrigation water is being applied. It is expressed as a percentage between 0 and 100%. 100% DU is theoretically possible but virtually impossible in actual practice. There must be a good distribution uniformity before there can be a good irrigation efficiency. www.wateright.org

**Embodied energy** is energy that is used during the entire life cycle of the commodity for manufacturing, transporting and disposing of the commodity as well as the inherent energy captured within the product itself. LEED New Construction & Major Renovation Version 2.2 reference Guide

**Evapotranspiration** is the water lost from the soil through evaporation and transpiration.

**Fly Ash** is a by product from coal combustion. It can be used as a substitute for Portland cement in concrete.

**FSC certified wood** is certified in accordance with the Forest Stewardship Council's criteria

**Full cut off luminaries** emit no light above horizontal.

**Grasscycling** means leaving the clippings on the lawn after mowing, so they decompose and release their nutrients in the soil.

**Graywater** is waste water from sinks, showers, bathtubs and washing machines that is not contaminated by human waste. Not suitable for drinking, it is an intelligent resources, when used for subsurface irrigation of trees and shrubs.

**Greenfield site:** Sites that are not previously developed or graded and remain in a natural state. USGBC, LEED, New Construction & Major Renovation,v2,2 Reference Guide, September 2006

**Green waste** consists of the plant debris from trees, shrubs, groundcover and turf that is generated during demolition, installation or maintenance phases of the project.

The **Heat island effect** is the experience of warmer temperatures in urban landscapes compared to adjacent rural areas, resulting from the retention of solar energy on constructed surfaces. Principal surfaces that contribute to the heat island effect include streets, sidewalks, parking lots and buildings. USGBC, LEED New Home Construction & Major Renovation, v2.2 Reference Guide, September 2006.

**Horticulturally suitable topsoil** has soluble salts less than 0.5mmhos/cm, free of large roots, clots and stones larger than 1 inch, noxious weeds, sticks, lumber, brush, litter and undesirable disease-causing organisms, as evidenced by previous plant growth.

**Hydromodification management (HM)** techniques focus on retaining, detaining or infiltrating runoff and matching post-project flows and durations to pre-project patterns for a specified range of smaller, more frequent rain events, to prevent increases in channel erosion downstream. Hydromodification Management Requirements Information for Developers, Builders and Project Applicants, Alameda Countywide Clean Water Program, November 2007

**Impervious Surface** is the total area of surfaces on a developed site that inhibit infiltration of stormwater. The surfaces include, but are not limited to, conventional asphalt or concrete roads, driveways, parking lots, sidewalks or alleys, and rooftops (Low impact development technical guidance manual for Puget sound January 2005)

**Infiltration planters** or flow through planters Structure designed to treat stormwater by intercepting rainfall and slowly draining it through filter media and out of planter. Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance August 31, 2006 Version 1.0

**Integrated Pest Management** is a holistic approach to mitigating insects, plant diseases, weeds, and other pests. It involves the use of many strategies for managing, but not eliminating pests. Integrated Pest Management (IPM) uses cultural, mechanical, physical, and biological control methods before using pesticides to control pests and diseases in the landscape.. Chemical controls are applied only when monitoring indicates that preventative and non-chemical methods are not keeping pests below acceptable levels. When pesticides are required, the least toxic and the least persistent pesticide that will provide adequate pest control is applied.

**Large stature shrubs** are those that, under normal conditions, can reach a mature height of 12 feet or more. Examples include Arbutus ‘Marina’, some Arctostaphylus spp., some Ceanothus spp., Sambucus mexicana, Nerium oleander trained as a single or multistemmed tree

**Landscape area is equivalent to Irrigated area** and is defined as all of the planting, turf areas and water features subject to the Maximum Applied Water Allowance (MAWA) calculation in a water budget. The following are not included as part of the landscape area: footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, pervious and non-pervious hardscapes,, open spaces and existing native vegetation . Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation

**Landscape Based BMPs (Best Management Practices)** refers to any program, technology, process, sitting criteria, operational method or measure, or engineered system, which when implemented prevents, controls, removes, or reduces pollution. Some examples of landscape stormwater BMP’s include bioretention areas, extended detention

basins, flow through planter boxes, infiltration trenches, tree well filters, vegetated buffer strips and vegetated swales. Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance August 31, 2006 Version 1.0

**Light pollution** occurs when outdoor fixtures let excess light escape into the night sky.

**Light trespass** occurs when outdoor light fixtures spill light onto neighboring properties.

**Low energy fixtures** are light fixtures that are Energy Star qualified.

**Low impact development (LID**) is a stormwater management strategy that emphasizes conservation and use of existing natural site features integrated with distributed, small-scale stormwater controls to more closely mimic natural hydrologic patterns in residential, commercial and industrial settings. Low impact development technical guidance manual for Puget Sound January 2005

**Low-Volume Irrigation** refers to the use of equipment and devices specifically designed to both limit the volume of water being applied and to efficiently deliver that water within the root zone of the plant. It applies water at low pressure through a system of tubing or lateral lines and low volume emitters. It is also referred to as micro-irrigation and includes drip (or trickle), micro-spray jets, micro-sprinklers, or bubbler irrigation.

**Mulch** is any material spread evenly over the surface of the soil to enhance the growth of plants and the appearance of the landscape.

**Natural enemies** are organisms that kill, decrease the reproductive potential or otherwise reduce the numbers of another organism. Natural enemies that limit pests are key components of integrated pest management programs. Important natural enemies of insect and mite pests include predators, parasites, and pathogens.

**Naturally occurring, non synthetic fertilizers** come from plants, animals and mined minerals. Examples include: sea kelp (seaweed), alfalfa meal, corn gluten meal and cottonseed meal; cover crop plants turned into the soil; blood meal, bone meal, fish meal, and mined limestone, soft rock phosphate and gypsum. The use is intended to feed soil organisms who then produce plant food in a plant available form. These materials can be applied in pelleted, powdered & granulated form or as liquid fertilizer via irrigation or foliar sprays. Adapted from Peaceful Valley Farm Supply, www.groworganic.com

**Open-grid paving** is defined as having less than 50% imperviousness and containing vegetation in the open cells. GreenPoint Rated MultiFamily Rating Manual, v1.2, July 2007

**Open space** is often defined by local zoning requirements. If local zoning requirements do not clearly define open space, open Space means land areas that are not build upon or substantially altered from their natural state. They provide important ecological functions, natural resources, or cultural resources that are worthy of conservation and protection. Such areas may contain, but are not limited to, forests, farmland, old fields, floodplains, wetlands, and shore lands. Open Space can also encompass scenic vistas, recreational areas, and historic sites.

**Organic Materials Research Institute (OMRI)** approves amendments and fertilizers for use in crop production. The OMRI Generic Materials List is a catalog of over 900 substances that are allowed, restricted, or prohibited for use in organic agriculture and food processing. Based on the National Organic Program, the list serves as a reference guide for organic farmers, handlers, processors, inspectors, certifiers, agricultural professionals, and all others with an interest in materials for use in organic production. Materials approved for use in organic production are appropriate for use in landscapes.
http://omri.org/OMRI_generic_list.html

**Paved Area** is the surface that accommodates pedestrian, bicycle or vehicular traffic. It includes sidewalks, patios, walkways, driveways, parking lots and other non-roof hardscapes, regardless of permeability

**Paved site area** includes sidewalks, patios, walkways, driveways, parking lots and other non-roof hardscapes, regardless of permeability.

**Permeable Paving** is hardscape or a paved surface that accommodates pedestrian, bicycle vehicular traffic while also allowing surface runoff to infiltrate into surface soil and/or permeable subbase. Examples include asphalt or concrete rendered porous by the aggregate structure.

**Purple pipe** is a key component of dual plumbing systems that enable homeowners, businesses, industry and public facilities to use recycled water outside and potable drinking water indoors…Today, pipes and other materials carrying recycled water are clearly marked purple to eliminate any confusion.
Purple pipe is just like other PVC piping, except that it carries reclaimed water rather than fresh Water Recycling and Reuse, Local Government Commission, www.lgc.org

**Previously developed sites** are those that contained buildings, roadways, parking lots or were graded or altered directly by human activities. USGBC, LEED, New Construction & Major Renovation,v2,2 Reference Guide, September 2006

**Quality compost** is a well decomposed, stable, weed free organic matter source, derived from agricultural and/or food waste and/or plant trimmings, contain no substances toxic to plants, possess no objectionable odors. It does not resemble the feedstock (the original materials from which it was derived. It is highly recommended that it be produced in accordance with the U.S. Composting Council's Standard Testing Assurance Program.
www.compostingcouncil.org

**Recycled aggregate** is clean crushed concrete and crushed asphalt pavement**.**

**Recycled content products** are those made from materials derived from discarded goods. They are remanufactured between uses.

**Recycled mulch** is chipped or shredded wood and green waste from used pallets or untreated lumber scraps, branches, leaves and tree trunks. Its use provides the benefits of mulch and keeps wood and green waste out of landfills.

**Recycled water,** also called reclaimed water is defined in Title 22, Chapter 3 of the California Code of Regulations, refers to tertiary-treated water produced from the three-stage treatment of municipal wastewater. Recycled water is virtually colorless and odorless, and is allowable for fully body human contact but not for direct human consumption. The sensible use of recycled water affords an excellent choice for essentially all non-potable applications. Properly managed, recycled water is safe to use.
http://www.owue.water.ca.gov/recycle/docs/Appendix_C_LawsRegs.pdf

**Recycling** is the collection, reprocessing, marketing and use of materials that were diverted or recovered from the solid waste stream (LEED New Construction & Major Renovation Version 2.2 reference Guide)

**Reference ET ($ET_0$)** is the standard measurement of environmental parameters which affect the water use of plants. It is given in inches per day, month or year and is an estimate of the evapotranspiration of a large field of 4-7 inch tall cool season turf that is well watered.

**Runoff Coefficient** is the ratio of the runoff rate to rainfall. For example, a runoff coefficient of 0.65 means that sixty five percent of the rainfall that falls on this type of surface will flow off as runoff. Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance August 31, 2006 Version 1.0

**Shearing** is a method of pruning, used for forming and maintaining plants or hedges of uniform shape, by routinely cutting them back with hedge shears and resulting in a geometric growth habit.

**Salvaged materials** are items that are put to a new use after their initial use, without being remanufactured between uses.

**A self adjusting irrigation controller** is an automatic timing device that uses sensor data (e.g. soil moisture sensor) to remotely control valves. CA Model Water Efficient Landscape Ordinance.

**Sheet mulching** uses a layer of paper or cardboard underneath the mulch to enhance weed suppression and soil building benefits. This layered mulch system is often used during landscape construction to optimize mulch benefits and encourage plant establishment.

**Stream rotator heads** or rotor type sprinkler heads apply water slower and in larger streams to avoid misting and drift, and allowing soils to better absorb it. Studies indicate that rotary sprinklers can result in significantly higher distribution uniformity (80% or greater), compared to fixed pattern spray heads

The **site** is the area within the legal boundaries of a property and encompasses all areas of the property including constructed areas and non-constructed areas. It is the same as the property area. USGBC LEED, New Construction & Major Renovation v2.2, September 2006

**Slag** is a by product of metal smelting and can be used as a substitute for Portland cement in concrete.

**Special Landscape Area** is the portion of the landscape area that is dedicated to edible plants, areas irrigated with recycled water and recreational areas.

**Sports or multiple use field is equivalent to recreational area** and is defined as the portion of the landscape area that is dedicated to active play such as parks, sports fields and golf courses, where turf provides a playing surface.

**Stormwater** is stormwater runoff, snow-melt runoff, surface runoff and drainage excluding infiltration and irrigation tail water. Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance

**Stormwater wetlands** are constructed detention basins that have a permanent pool of water throughout the year and capacity for temporary additional storage of runoff that is released via an outlet structure. They differ from wet ponds in that they are typically shallower and have greater vegetation coverage. Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance August 31, 2006 Version 1.0

**Topdressing** is a method of applying fertilizers, minerals or compost, by spreading a thin layer over the top of soil or directly to turf or other groundcovers.

**Turf** is defined as spreading or stoloniferous grasses that when regularly mowed form a dense growth of leaf blades and roots. Areas planted with lawn alternatives, such as Carex pansa and other tufted grass or sedge species are not considered turf.

**Urban growth boundar**y is an officially adopted and mapped line dividing land to be developed from land to be protected for natural or rural uses. Urban growth boundaries (also called urban limit lines) are regulatory tools often designated for long periods of time (20 or more years) to provide greater certainty for both development and conservation goals. (Governor's Office of Planning and Research, State of California General Plan Guidelines, 2003)

**Vegetated swales (bioswales)-** are open shallow channels with thick vegetation covering the side slopes and bottom that collect and slowly convey runoff to downstream discharge points. Alameda Countywide Clean Water Program c.3 Stormwater Technical Guidance August 31, 2006 Version 1.0

**Weather based (or "smart") irrigation controllers** are automatic timing devices that use evapo-transpiration or weather data to remotely control irrigation valves.

**Wildlife** refers to undomesticated birds, mammals, reptiles, and amphibians.