	Title: YALE OFFICE OF FACILITIES PROCEDURE MANUAL Chapter: 01 - Yale Design Standard Division: 32 01 01 Exterior Improvements Landscape Design	Section: 32 01 01 Exterior Improvements Landscape Design
		Date: 03/25/2020
		Author: University Planning

PART 1 - INTRODUCTION TO YALE CAMPUS LANDSCAPE DESIGN


1.1 PURPOSE

- A. To provide durable, low maintenance landscapes that unify Yale campuses and are respectful of Yale’s landscape design history. Landscape design is to align to the distinctive campus character, adapt to urban conditions, encourage ecosystem health, reinforce sense of place and produce harmony and integration across various campus areas. With reference to historical precedent, Yale campus buildings and landscapes went through a period of significant expansion between 1920-1940, under the expertise and guidance of notable architects with Beatrix Farrand, landscape architect as Yale’s consulting landscape gardener. This work shaped the Yale landscape character and defined the distinctive contributing features of the campus. Subsequent landscape design has been site specific with a practice to promote and evolve the Farrand intent and to create new landscape compositions.

As interventions are made through project design and construction, these standards for landscape design indicate requirements to be considered for Yale’s landscapes, of all sizes. The standards direct change that will reinforce and perpetuate an overall campus landscape vocabulary, that is both rooted in historical features and adapted to present conditions for functional needs and aesthetic quality. The standards direct shaping landscapes to support an urban, ecosystem services approach, emphasize the interconnectivity of all systems, and address the health of – soil, water, air, plants, animals, microbes – that are integral to the ecological health of campus and the university community. This approach supports an environmentally responsible infrastructure for resiliency, integrity and longevity. Campus landscapes are intended to contribute to continued supply and regulation of clean air and water, decomposition of waste, regulation of microclimates, stormwater management via water detention and infiltration, erosion control, and habitat value and connectivity.

PART 2 - GENERAL DESIGN AND CONSTRUCTION REQUIREMENTS

- 2.1 Each landscape project, regardless of scale or scope, is required to refer to the following reference guideline documents, found on the [Office of Facilities Contractor and Consultants website](#) : “A Framework for Campus Planning, 2000”, the 2013 “Sustainability Supplement” to the Framework for Campus Planning, and the “Sustainable Stormwater Management Plan, 2018”. The “Farrand Cultural Landscape Study, 2019, Executive Summary” describes this period of Yale’s landscape design history, findings and proposes treatment recommendations overall and by campus area. Additional Farrand Cultural Landscape Study report materials are available per request to Yale planning. (*The “Yale Tree Management Plan, 2020” directs the approach to campus trees and Yale Design Standard, Division 01 – Tree and Plant Protection Specification – pending completion*). These reference documents are to be consulted and their findings incorporated into landscape project work. In addition, all projects shall complete the Yale Basis of Design (BoD), Landscape and Civil Systems as required reporting.
- 2.2 The overall design of Yale’s landscape will support the University’s traditional needs and values, recognizing outdoor spaces as critically important components of the campus daily experience and overall perception.

	Title: YALE OFFICE OF FACILITIES PROCEDURE MANUAL Chapter: 01 - Yale Design Standard Division: 32 01 01 Exterior Improvements Landscape Design	Section: 32 01 01 Exterior Improvements Landscape Design
		Date: 03/25/2020
		Author: University Planning

2.3 In order to maximize the short- and long-term sustainability of the site, the design process will include the following:

- A. Site Evaluation for Sustainability
- B. Site Design Intent and Campus Integration
- C. Special Requirements – Landscape Character Definition
- D. Submittals – Site Maintenance Plan
- E. Site Protection from Construction Activity

PART 3 - MINIMUM DESIGN AND CONSTRUCTION REQUIREMENTS

3.1 New and Renovation Projects

A. Site Evaluation and Sustainability Assessment


Conduct a site evaluation to explore opportunities for sustainability. Use LEED V4 Sustainable Sites, Environmental Site Assessment, Site Assessment and Rainwater Management credits as a basis for evaluation, (and as required per “Yale Design Standard 01 35 63 Requirements for Sustainability”).

Site assessments for all projects are to include at a minimum:


1. Hydrology – gain an understanding of the site hydrology including water runoff and opportunities for reducing potable water usage for irrigation. Study slopes, surface and subsurface drainage systems on the site and nearby context to determine suitable design integration of site hydrology.
2. Soil – conduct soil tests to determine soil fertility and composition and to ensure hazardous chemicals are not found in site soils.
3. Vegetation Protection – determine the impact of construction to existing vegetation and the feasibility of protecting all vegetation and transplanting and replanting existing small-scale vegetation for post-construction use. Tree evaluation should be in coordination with the “Yale Tree Management Plan, 2020”.
4. Site Features - document existing site features that may be incorporated into new design concepts per “Section C. Special Requirements - Landscape Character Definition”, below.
5. When historic documentation is available, study those documents to gain an understanding of landscape character and features. Apply that understanding as the design progresses.

B. Site Design Intent and Campus Integration

1. Concept – develop a concept for the site landscape design that is in response to the influences and needs present on the site, addresses visual and spatial connections, and integrates the site into the campus overall.
2. Intended Uses – develop the site design based on a complete understanding of how the site will be used. Diverse uses of campus landscapes include meeting, conversation, rest, study, pick-up games and movements through and to destinations. Plan for universal access, pedestrian and bicycle safety, high quality visual, tactile, and scent experience of campus landscape.

	Title: YALE OFFICE OF FACILITIES PROCEDURE MANUAL Chapter: 01 - Yale Design Standard Division: 32 01 01 Exterior Improvements Landscape Design	Section: 32 01 01 Exterior Improvements Landscape Design
		Date: 03/25/2020
		Author: University Planning

3. Materials Selection- employ a consistent vocabulary of landscape materials that will aid unifying campus landscape character. Refer to “Yale Design Standard 32 14 40 Stone Paving” for details of walks to employ in site design.
4. Vegetation selection – develop plant selection based on historic precedent, intended character and aesthetic quality, ecological potential and habitat goals and attention to safety. All invasive species are to be avoided. Desirable vegetation traits include a low burden to maintain aesthetics, high durability, vigorous dense growth (competitive against weeds), and meet physiological requirements of the urban site. Native plant material is preferred, unless the desirable traits are not achieved. Plantings that do not need irrigation once established are preferable to those that need long term irrigation. Refer to vegetation types described below, “Section C.5”, which are typically bulbs and ground covers, climbing vines, lawns, shrubs and trees.
5. Tree Selection - note that the dominant campus trees are tall shade trees with open forms and long-lived species. Preferred flowering trees for campus are readily trained with open forms, flowering in early spring, and/or hold persistent fruits through fall and winter. Occasional large evergreen trees are also used on the campus.
6. Visibility- consider heights of plantings for safety and security, lines of sight to destinations should be maintained, and hedges along sightlines and pedestrian walks should grow to or be readily (but infrequently) trimmed to under 42 inches in height. Individual shrubs may grow taller within a limited width and height to be determined based on retaining open sight lines and avoiding large, dense vegetation massing.
7. Irrigation – during the design process, plan for limited water use. If needed, develop an irrigation system that recognizes and accounts for the water requirements of plantings. Place plants with similar water requirements together. Wherever possible, reduce potable water use for irrigation and explore opportunities for rain water capture and reuse.
8. Hardscape – review current site conditions to determine the pervious to impervious ratio for the site as found. Consider the pervious ratio required as a minimum per local zoning regulations. Select paving materials from the campus vocabulary for harmony. Plan for adequate but not extensive hardscape.
9. Soil – determine preferred levels of off-site fill soil, on-site soil, mulch, and soil amendments including fertilizer, compost, and compost tea.
10. Public Art – all proposals for art installation on Yale grounds must be managed through the planning office that will liaison with the Public Art Review Committee. Placement of art features must be well integrated and not detract from overall landscape composition.
11. Operations and Maintenance considerations:
 - a. Landscape design should consider:
 - i. Bed depth and configuration for ease of maintenance access
 - ii. Turf size, layout and grading for ease for mowing
 - iii. Tree and shrub placement for ease of care
 - b. Provide accessible hardware and automatic door openers at gate entries
 - c. Provide card access at gate entries
 - d. Trash and Recycling
 - i. Provide distinct path of travel for waste stream – to include trash, recycling, and compost, as present on site
 - ii. Container sizes – refer to “Yale Design Standard 32 01 02 Exterior Improvements Site

	Title: YALE OFFICE OF FACILITIES PROCEDURE MANUAL Chapter: 01 - Yale Design Standard Division: 32 01 01 Exterior Improvements Landscape Design	Section: 32 01 01 Exterior Improvements Landscape Design
		Date: 03/25/2020
		Author: University Planning

Maintenance Plan”

- iii. At loading docks and bays provide trench drain and water source for all surfaces cleaning
- iv. Consider impact resistant wall wainscoting (i.e. stainless-steel panels) at areas of truck loading, heavy trash and recycling use
- v. Enclosures – exterior freestanding waste stream enclosures are to be partial height walls with clearances for containers, access and gate operability. Enclosure design and material selections to be in context with landscape and architecture of the site.
- d. Tent Anchors
 - i. When designing for event space consider need for event tent size and anchoring for stability and safety.
 - ii. If event tent need is affirmed, install permanent fixed anchor locations in open areas unless restrictions on site dictate

C. Special Requirements - Landscape Character Definition

Yale’s landscape character defining features are found in legacy landscapes and serve as campus wide design principles to inform new landscape projects. With reference to the “Farrand Cultural Landscape Study, 2019”, confirm the legibility of historic features and review recommendations for treatment. Yale’s landscape character defining features shall be referenced in the design concept, as appropriate for the project site, and for the surrounding context with the intent of campus harmony, unity, visual and spatial connectivity.

1. Spatial Organization


- a. Courtyards with an open center and enclosed perimeter – enclosing elements such as landscape walls, architecture, or vegetation around an open central space typically of turf or paving
- b. Gradient of light and shadow with sunlit open space and dappled shade from canopy trees
- c. Planted moats – well-defined stone masonry moats that match adjacent building materials, planted to open-trained flowering trees and large flowering shrubs, placed in continuous ground cover, with steppingstones for maintenance
- d. Community linking gathering space – physical connections of open spaces between public and semi-private

2. Views and Visual Relationships

- a. Visual connection between spaces that encourages movement and perceived safety with unencumbered views
- b. Individually recognizable spaces
- c. Bright entries and archways
- d. Framed views that capture landscape character
- e. Contiguous visual spaces leading to illuminated destinations, with both natural and artificial light

3. Topography

- a. Apparent level interior courtyards
- b. Steps, retaining walls and terracing to negotiate grade changes
- c. Vegetated hillsides – maintainable and sustainable vegetation cover where space requirements do

	Title: YALE OFFICE OF FACILITIES PROCEDURE MANUAL Chapter: 01 - Yale Design Standard Division: 32 01 01 Exterior Improvements Landscape Design	Section: 32 01 01 Exterior Improvements Landscape Design
		Date: 03/25/2020
		Author: University Planning


not necessitate the use of retaining walls and terracing, with leveling of grades at the top and bottom of slopes for access and integration

4. Circulation


- a. Generously and appropriately scaled walks and steps that respond to the landscape space and anticipated pedestrian traffic
- b. Bluestone walks, terraces, steps
- c. Linear walks with cut radial curves at walk intersections
- d. Arcing walk for graceful and efficient alignment along a large radius, and/or to address desire lines that connect destinations
- e. Contrasting courtyard paving using bluestone walks with granite setts at side uses to widen walks, bluestone or granite setts under bicycle racks and at bench pads
- f. Granite planter edges – approximately 4” above grade and 3-4” wide
- g. Driveways with bluestone curb – bluestone curbs set approximately 6” above grade

5. Vegetation

- a. Plant material for fall and spring interest, flowering and fruiting tree and shrubs, spring bulbs and perennials.
- b. Native plant material preferred and non-native species considered for easier maintenance
- c. Height of plantings to enhance architectural features, climbing vines, punctuating evergreen, low shrubs aligned to masonry details, etc.
- d. Bulbs and Ground Covers
 - i. Species preferences for bulbs, examples – tulip’s for annual display replanted each fall, daffodils, chionodoxa, and scilla to naturalize or replant every 3 years if required to improve vigor and display
 - ii. Species preference groundcovers, examples - German bearded iris older forms, lily of the valley, tiarella, native pachysandra
 - iii. Planting locations
 - (a) Beds along building perimeters and walks as suited to the space and align to historic landscape documentation
- e. Climbing vines - see also (*“Yale Standard Detail – Vine Supports” pending upload*)
 - i. Species preferences, examples – twining vines clematis, native wisteria, trumpet vine
 - ii. Selectively placed vines on building facades and stone walls located to highlight and not obscure architectural detail
 - iii. Planting locations
 - (a) Vines trained on vine supports, with forms that are vertical, horizontal or a custom shape
 - (b) Some supports remain and others can be rediscovered through careful observation of stone surfaces where former vine support anchors may be observed
 - (c) Vine support locations may include - building openings, below window sill, stone trim at building corners, buttress piers or from grade to specific points on façades
- f. Lawns
 - i. Species Preferences, examples – Kentucky blue grass, fescue grass,
 - ii. Planting locations

	Title: YALE OFFICE OF FACILITIES PROCEDURE MANUAL Chapter: 01 - Yale Design Standard Division: 32 01 01 Exterior Improvements Landscape Design	Section: 32 01 01 Exterior Improvements Landscape Design
		Date: 03/25/2020
		Author: University Planning

- (a) Open courtyards- durable turf that withstands foot traffic
 - (b) Building perimeter- sustainable turf species, low water requirements
 - (c) Along walkways- durable turf that withstands foot traffic, or sustainable turf if protected from foot traffic
 - g. Shrubs and hedges
 - i. Species preferences, examples –
 - (a) for tall deciduous flowering shrubs- witch hazel, viburnum, red twig dogwood, Cornelian cherry dogwood,
 - (b) for low evergreen shrubs- azalea, yew, deciduous holly
 - (c) for hedges- yew, Japanese holly
 - ii. Planting locations
 - (a) Beds at perimeter building edge – planting of shrubs with understory trees and/or canopy trees supporting spatial organization of open center with vegetation enclosure
 - (b) Hedges lining walks – evergreen hedges to reinforce architectural and circulation geometries
 - (c) Shrubs in masses – group deciduous and mixed shrubs for proportionate scale against open courts and building facades
 - (d) Soften architectural edges – clusters of plants at building corners or lining a building foundation
 - h. Trees – see (*“Yale Tree Management Plan, 2020”*, and *“Division 01 – Tree and Plant Protection Specification”*, pending upload)
 - i. Species preferences –
 - (a) canopy trees: elm, oak, maple, linden, etc.
 - (b) understory trees: eastern dogwood, amelanchier, fringe tree, etc.
 - ii. Preserve existing trees
 - iii. Planting locations
 - (a) Refer to historic documentation for tree placement, replace by location when required. Employ historic tree planting organization as a guide for new work.
 - (a) Lawn- canopy trees irregularly spaced in open lawn for park like setting, no tree pits
 - (b) Beds at perimeter building edge – trees may line one or all sides of the lawn to support spatial organization of an open, sunlit center
 - (c) Open pit –at sidewalks with sufficient soil volume
6. Landscape Structures and Systems
- a. Walls – Stone walls assembled of cut stone with stone caps, wall base stone to be salt tolerant and high compressive strength, preferably granite
 - b. Entry Piers – Square piers of similar stone as adjacent wall and building to mark entry
 - c. Buildings – as a reference for scale, texture and materials compatibility
 - d. Irrigation – as required for plantings
7. Water Features – very limited use
- a. Geometric pool – geometric edges design to appear intentional, example Sterling Library courtyard

	Title: YALE OFFICE OF FACILITIES PROCEDURE MANUAL Chapter: 01 - Yale Design Standard Division: 32 01 01 Exterior Improvements Landscape Design	Section: 32 01 01 Exterior Improvements Landscape Design
		Date: 03/25/2020
		Author: University Planning

b. Naturalistic pool – local materials and informal forms, purposefully designed to appear natural, example stream and rock garden at Marsh Botanical Garden

8. Furnishings and Small Objects- in specific areas throughout the campus, standards to be applied for new furnishings

- a. Benches – “Yale Design Standard 32 33 43 Site Seating and Tables”
- b. Bicycle Racks – “Yale Design Standard 32 33 13 Bicycle Racks”
- c. Light Poles, Blue Light Phone – “Yale Design Standard 26 56 00 Exterior Lighting”
- d. Mounted light fixtures – black metal light fixtures mounted to walls over doorways or hanging from ironwork archways
- e. Decorative metal gate – iron gate in ornamental scroll pattern or painted black steel to limit access to internal landscape spaces
- f. Decorative metal fence – iron or painted steel fence mounted to top of site walls, typically picketed
- g. Handrails - bronze or wrought iron, single rail with single narrow posts, terminated into stone pier or simple volute, anchor set with lead, conforming to accessible railing requirements
- h. Wood fence – freestanding with square posts and caps and two round rails
 - i. Location – at Old Campus only
 - i. Trash and Recycling – see Section 3.1.B.11.d., above

D. Submittals

- 1. Submit the Site Maintenance Plan at each project phase deliverable, (see “Yale Design Standard 32 01 02 Exterior Improvements – Site Maintenance Plan”)

E. Site Protection from Construction Activity.

1. Use LEED V4 Sustainable Sites, Construction Activity Pollution Prevention, as a basis for evaluating minimal impact from construction on a project’s site, (and as required per “Yale Design Standard 01 35 63 Requirements for Sustainability”). Site protection from construction activity for all projects are to include at a minimum:

- a. Pollutants – Monitor and manage construction pollutants.
- b. Soil – Prepare soil erosion and sedimentation control plan, monitor/enforcement for protection, reuse, amendment and restoration of site soil.
- c. Vegetation/Trees – Ensure the protection and reuse of site trees and plants to the extent feasible per the project design, see Yale Design Standard, “Tree and Plant Protection Specification”
- d. Habitat – preserve existing habitat in the project design. Enhance habitat when feasible for birds, and pollinators. Avoid creating habitat for undesirable small mammals.
- e. Ensure pest free plants for University plantings particularly noting the presence of soilborne and plant borne pests in potted and ball and burlap plants.

Date	Description of Change	Pages / Sections Modified	ID
03/25/20	Entire document	All	kc