Introduction
This field session will visit some of Boston’s iconic and contemporary urban spaces to examine and assess different approaches to high performance tree plantings in challenging urban environments. Leading landscape architects and their collaborators will walk through the objectives, design concepts, and planting strategies employed at each site.

Session Description
There are a myriad of benefits, both aesthetic/psychological and physical/environmental, that trees provide in the urban landscape—spatial definition, cultural and symbolic links, therapeutic and restorative effects, carbon sequestration, reduction of heat island effects, stormwater infiltration and runoff reduction, oxygenation of the air, habitat and wildlife corridors, increased property values, etc. However, the growth and longevity of trees are often compromised by constraints in the urban environment. In order to maximize these values and benefits, the USDA Forest Service found that an urban tree must live for thirty years but the average lifespan of an urban tree is less than ten years. There are many factors that contribute to the failure of urban trees, most are related to soil issues, such as lack of viable soil, soil volume, and compaction. In his book, *Urban Soils in Landscape Design*, Phil Craul noted that the limiting factor in the growth of an urban tree is the lack of soil volume for root growth. James Urban and Nina Bassuk has also shown that there is a direct relationship between soil volume and tree caliper and canopy size.

Over the last 20 years, soils and pavement design has advanced radically with the development of structural soils, suspended pavement systems, porous pavements, etc. As new guidelines are being published—Boston’s Urban Street Tree Planting Symposium and Complete Streets, New York City’s High Performance Landscape Guidelines, Sustainable Sites, and others—landscape architects have been working with soil scientists, engineers, and arborists to design urban tree plantings techniques to meet specific horticultural, structural, drainage, and use requirements to achieve high perform in urban environments. While the Landscape Architecture Foundation has started to compile performance metrics, no science or consensus exists to support any of these different approaches.

This field session is divided into two parts: a presentation introducing different approaches to high performance urban tree planting techniques; then a tour of some of Boston’s iconic and contemporary urban landscapes to assess the different approaches and techniques first hand. The panel—comprised of landscape architects (the designers), a soils scientist, and an arborist—will engage in an open dialogue with the attendees to assess the project approach, specific planting techniques/specifications/details, the installation process, and the immediate and long-term management requirements for longevity, and highlight the successes and potential pitfalls.

Learning Objectives

1. Access, first-hand, the components and support systems required for successful tree planting techniques in complex urban environments.

2. Acquire an understanding of the innovative technologies and approaches that are producing sustainable, high performance results.

3. Gain knowledge of the challenges and successes through an on-site dialogue with the designers, soils scientist, and arborist.

4. Understand the immediate and long-term management requirements for trees in urban environments.
Bios

Chris Moyles ASLA is a Principal at Reed Hilderbrand with over twenty years of experience working on complex projects in the urban environment. He has developed a particular interest in the implementation of high-performance landscape systems, specifically soils design and sustainable construction practices. Chris’s projects include Long Dock Park, Parrish Art Museum, Boston Seaport District, the Poetry Foundation, the Chazen Museum, The Ohio State University, and Rosslyn Plaza. Chris received his Master in Landscape Architecture degree from the University of Virginia.

Bob Pine, FASLA, PE holds an MS in geotechnical engineering from Cornell University and an MLA from Harvard’s GSD. A Principal and founder of Pine & Swallow Environmental, he has over thirty years experience with soil, hydrologic and environmental design, sustainable practices and construction. Recent projects include: The Highline, Brooklyn Bridge Park and the Hudson River Parks in NYC; Cincinnati Riverfront Park; Shelby Farms Park in Memphis; and sustainable streetscape projects in Boston and throughout the country.

Kelby Fite is an Arboricultural Researcher for Bartlett Tree Research Laboratories in Charlotte, North Carolina, and focuses his research efforts on urban soils, tree root biology and integrated pest management. As the Plant Protection Specialist and Diagnostic Lab Manager, responsibilities also include diagnosing diseases, recommending treatment programs and developing technical support materials. He holds a Ph. D. in Plant and Environmental Sciences from Clemson University, a Master of Plant Protection and Pest Management and a BS in Horticulture from the University of Georgia. He is an ISA certified arborist and has co-authored Best Management Practices for Managing Trees During Construction.

Richard (Skip) Burck, FASLA, FAAR, is the principal and owner of Richard Burck Associates, Inc. A graduate of the Harvard University GSD and recipient of the Rome Prize Fellowship, Richard has over thirty years of experience as a landscape architect. He formed Richard Burck Associates as an institutional master planning and project design firm for public/private institutions, secondary schools, colleges and universities. Skip has taught or lectured at the GSD, Mount Holyoke College, University of Rhode Island, Rhode Island School of Design and the Boston Architectural Center.

Bob Uhlig, ASLA, is President of Halvorson Design Partnership, Inc., serving as Principal-in-Charge on many urban projects including: the ASLA honor-award-winning South Boston Maritime Park, Center City Park in Greensboro NC, the BAC Green Campus project and numerous other sustainable landscapes. He holds a Bachelor of Environmental Design in Landscape Architecture from NC State. He is a LEED® Accredited Professional, a Certified Construction specifier, and is a member of the Construction Specification Institute.
**BOSTON TREE PARTY**

**Agenda**

**Part 1 - Presentation**

1. **Background and History of Urban Tree Issues**
   - Brief history of public and regulatory awareness, 1995 Urban Street Tree Planting Symposium, Boston’s Complete Streets, LAF Performance Program, etc.
   - Development of new strategies as well as education and regulatory efforts

2. **Designing for Trees in the Urban Environment**
   - Context: street trees, plazas and courtyards, on-structure
   - Design approach, character
   - Tree selection - light, wind, heat, soils, drainage, anticipated maintenance
   - Tree needs: soil volume, aeration, irrigation
   - Tree planting techniques
   - Ground plane: traditional pavements, porous, suspended

3. **Creating Environments to Support Urban Trees**
   - Aeration, moisture, nutrients (soil biology), drainage, soil volumes
   - Planting medium: SBSS, Suspended Pavements, CU Soil
   - Moisture: irrigation, porous pavements, storm water harvesting
   - Regulatory requirements for Infiltration, green infrastructure

4. **Specification and Construction Challenges**
   - Specification of tree planting details
   - Need for qualified oversight, adequate budget, consultants
   - Squeeze on time and money at critical time
   - Tree selection at nursery
   - Placement and compaction

5. **Post-Construction Management**
   - Acclimation period
   - Monitoring health and vitality, pest and disease management
   - Ongoing maintenance needs
   - Collecting metrics and science to assess different approaches

6. **Overview of the tour**
   - Review of selected projects
   - Outline different planting approaches/techniques

**Part 2 - Tour itinerary**

1. Central Wharf Plaza, Reed Hilderbrand, 2005
2. Broad Street, Richard Burck Associates, 2012
3. Central Artery: City of Boston, various Landscape Architects
5. Federal Reserve Bank Building: Halvorson Design Partnership 2005
   - Lunch
7. Koch Center, MIT, Reed Hilderbrand, 2010
8. Vassar Street, MIT, Carol R. Johnson Associates, 2006-9
9. Christian Science Center, 1960’s
10. Four Seasons Hotel: Halvorson Design Partnership, 2005
11. Maritime Park: Halvorson Design Partnership, 2005

**Links to websites:**
- http://bostoncompletestreets.org/
BOSTON TREE PARTY

Tour Map

1 Central Wharf Plaza, Reed Hilderbrand
2 Broad Street, Richard Burck Associates
3 Central Artery: City of Boston, various Landscape Architects
4 Summer Street Plaza, Carol R. Johnson and Associates
5 Federal Reserve Bank Building: Halvorson Design Partnership
6 Boston Children’s Museum, Michael van Valkenburgh
7 Koch Center, MIT, Reed Hilderbrand
8 Vassar Street, MIT, Carol R. Johnson Associates
9 Christian Science Center, (1960’s)
10 Four Seasons Hotel: Halvorson Design Partnership
11 Maritime Park: Halvorson Design Partnership
12 Boston Convention Center, Richard Burck Associates
Notes:
- Sand-Based Structural Soil (SBSS) under entire site. Crushed stone and cobbles over SBSS in paved areas, planting soil over SBSS in planting beds.
- Storm water infiltration through sand between cobbles plus storm water harvesting and infiltration system
- 12-inch caliper trees with 12 foot diameter rootballs planted
- Setting cobbles over large rootballs created challenges
- Construction in constrained area required use of SBSS surface as staging area LAF’s Performance Assessment

Notes:
- Brick and perforated pavers over SBSS within sidewalks and bump-out areas
- Restoration of old urban streetscape; construction challenges due to limited space
- Use of direct storm water harvesting/aeration through perforated pavers, into sumps to collect grit, and then through distribution pipes
- Ongoing use in tight, heavily used area created construction challenges
3 Central Artery: City of Boston, various Landscape Architects

- Tree plantings over underground highway (former elevated highway)
- Manufactured soils used in over-structure conditions. Most trees in planting soils (planting bed soil over horticultural subsoil.)
- SBSS used in strategic locations under pavements where extra soil rooting volume required.

4 Summer Street Plaza, Carol R. Johnson and Associates, 2003

- Brick pavers over SBSS
- Small confined environment planted with honey locusts
- Challenging microclimate conditions due to wind and shade conditions
- Heavily used pedestrian area
- Oldest use of SBSS in Boston (2003)
BOSTON TREE PARTY

5 Federal Reserve Bank Building: Halvorson Design Partnership, 2005

Notes:
- Trees in pavements over SBSS and trees in planters have similar growth
- Side by side comparison of trees in SBSS and with Boston standard planting practices

6 Boston Children’s Museum, Michael van Valkenburgh, 2009

Notes:
- Waterfront planting issues including salty ground water, tidal fluctuations and storm surge
- Willows in plaza areas planted in encapsulated beds that prevent ground water from entering and to confine willow roots
- SBSS supports walls around beds and extends beneath pavement to create adequate rooting volume
Notes:

- Pavers over SBSS
- Significant existing utility issues. SBSS allowed installation around utilities
- Streetscape design including locating trees to limit conflicts with utilities
- Both permeable pavers and storm water harvesting and aeration

Notes:

- SBSS under bikeway and sidewalk
- Linear streetscape plantings
- Irrigation/aeration
- Work carried out in segments over several years
- SBSS placement consistent with established construction methods
9 Christian Science Center, 1960’s

Notes:
- Early suspended pavement system
- Tree management

10 Four Seasons Hotel: Halvorson Design Partnership, 2004

Notes:
- Trees in pavements and in planters
- Catch basin storm water harvesting and aeration system
BOSTON TREE PARTY


Notes:
- Trees in planters and in SBSS beneath stone dust paving

12 Boston Convention Center, Richard Burck Associates, 2005

Notes:
- Honey Locusts in plaza area planted in planting soils in trenches under suspended pavements
- SBSS used under pavements in other parts of site
- Infiltration/aeration/storm water harvesting system