Session Title Landscape Forensics: Why things fail

Plants die, pavements cracks, finishes peel off. Sometimes things fail. This session will look at examples of failures both small and large to examine the root causes of those failures. We will examine the interactive roles design, documentation, construction, and maintenance play in the process.

Learning Objectives:
1) Learn the causes of failure.
2) Examine the changes projects endure that contribute to failure.
3) Know how to apply techniques for deterring failure.
4) Examine case studies of common failures in the field.

Presenters:

Thomas Ryan, FASLA
Presenter
Ryan Associates
Waltham, MA

Tom Ryan FASLA is president of Ryan Associates and also teaches at the Harvard Graduate School of Design. He holds degrees from the University of Wisconsin and Harvard GSD. Tom has also taught courses at Penn and SUNY. He is the co-author of Detailing for Landscape Architects and is a contributor to Timesavers Standards for Landscape Architects. He has lectured widely on issues of design, detailing, documentation and construction. Tom also consults with other Landscape Architects on construction, management and documentation. Tom has contributed many award winning landscapes including the Highline with Field Operations, Mesa Arts Center with Martha Schwartz, and the Sydney Olympics with Hargreaves

Publications:
John Wiley & Sons, Inc, Hoboken, New Jersey

Niall Kirkwood, FASLA
Moderator
Graduate School of Design, Harvard University
Cambridge, MA
United States

Niall Kirkwood DSc. FASLA is Professor of Landscape Architecture and Technology at the Harvard Graduate School of Design where he has taught since 1993. He is also the founder and director of the Center for Environment and Technology, a research, advisory, and executive education initiative at GSD. He holds the Dr Gerard O'Hare Visiting Chair at the University of Ulster, Northern Ireland, and holds faculty positions at Tsinghua University, Beijing, Korea University, Seoul and is on the Advisory Council and external examiner for the Landscape Architecture Program, University of Hongkong. Publications include Principles of Brownfield Regeneration (2010). Prior to joining the GSD he worked sixteen years in private practice as a registered landscape architect and architect carrying out projects in Europe, the Middle East, and the U.S.A. The focus of Kirkwood's work emphasizes a broader understanding of construction technologies and techniques, and how this understanding can result in more creative and progressive work in landscape architecture.

Publications:
John Wiley & Sons, Inc, Hoboken, New Jersey
James Dudley, ASLA
Presenter
SiteWorks
New York, NY
United States

James Dudley is a Landscape Designer at SiteWorks Landscape Architecture and Construction Management. He has 15 years of experience in documentation, construction administration and contracting. He has worked on a vast array of projects which include; streetscapes, university campuses, theme parks, casinos, and residential landscapes. James is a key member of construction management teams for several large scale public infrastructure projects in New York City including Hunters Point South and Governors Island.
Session Title  
**Landscape Forensics: Why things fail**

**Presentation Outline**

*Niall Kirkwood*

I. Introduction

II. Place subject of Forensics/ Failure within Field of Landscape Architecture

- 3 key questions:
  - Why should Landscape Architects care about failure and durability?
  - How should this inform their daily design and detail practice?
  - What should professional organizations, design companies and academic institutions do to address the lack of knowledge about the subject?

III. Overview: Origins of Research and Study of Why things Fail

  Henry Petroski- civil engineer specializing in Failure analysis
  Weathering and Durability in Landscape Architecture (2001)- Kirkwood
  Detailing for Landscape Architects- Aesthetics, Function, Constructability (2011)- Ryan

IV. The causes of failure (review)

1. Design phase failure
2. Construction phase failure
3. Human actions
4. Force Majeure
5. Climate and weathering

V. Changes that contribute to failure

6. Material change
7. Structural change
8. Environmental change
9. Mechanical change
10. Aesthetic change

*Tom Ryan*

VI. Techniques for deterring failure

1. Design Phase failure
   a. All details need to work aesthetically and contribute to the design
      i. Active vs. recessive details
      ii. Continuous vs. discontinuous details
      iii. Intensification vs. ornamentation
      iv. Dated detailing
      v. Functional elements support the design intent
2. Construction phase failure
   a. Make it as easy to build as possible while not compromising the design
      vi. Work with modular units and use parts that are easy to handle
      vii. Make sure your connections are accessible, that there is enough clearance to install elements and that your systems don’t conflict
      viii. Simulated assemblies
   b. Develop forgiving details
      ix. Understand dimensional tolerances
      x. Utilize sliding fit and adjustable fit in your joints
      xi. Hide inconsistencies with reveals, butt joins and clean edges
      xii. Utilize progressive finishes and use forgiving surfaces

3. Human Actions
   a. Providing for the project’s seasonal cycles, and life cycles while the materials durability and expected life
   b. Utilize surfaces that age gracefully and are repairable

4. Force Majeure
   a. Detail to withstand or accommodate repair in areas potential natural disaster

5. Climate and Weathering
   a. Controlling water movement
      i. Design for overtaxed systems with drainage diversions and redundant Systems
      ii. Utilize wash, overlap, capillary Break and overhang and drip
      iii. Cavity wall drain and weep
   b. Accommodating movement
      i. Joints and gaskets
         1. Abutment Joint
         2. Expansion Joint
         3. Control Joint
         4. Sliding Joint
         5. Hinge joint
         6. Staggered Joints
      ii. Edge restraint for flexible systems
      iii. Foundation below frost
   c. Accommodating growth
      i. Plant growth in the Root Zone, Trunk and Branches
      ii. Succession
      iii. Maintenance Practices
James Dudley

VII. Case Studies
   1. Design Phase failures
   2. Construction Phase Failures
   3. Human Actions
   4. Force Majeure
   5. Climate and Weathering

Niall Kirkwood

VIII. 3 key questions: (review)
   ▪ Why should Landscape Architects care about failure and durability?
   ▪ How should this inform their daily design and detail practice?
   ▪ What should professional organizations, design companies and academic institutions do to address the lack of knowledge about the subject?

IX. Questions