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INTRODUCTION

The design of site and landscape elements is very important in enhancing the campus environment and maintaining its distinctive character. These elements are the basis for creating a campus environment which is cohesive and preserves its sense of continuity.

Changes in technology, economic markets, and the composition of the ‘traditional student’ are creating new challenges for universities to provide state of the art facilities, while maintaining their distinctive campus character.

Part of the development process of providing state-of-the-art facilities includes implementation of campus planning and development standards. Standards which serve as the foundation for creating an aesthetic learning environment where achievements in teaching and research can continue. Standards which also have the flexibility to encourage creative solutions to future challenges.

The campus site and landscape standards which follow are intended to be used as basic design guidelines during the site design process and for the preparation of contract documents. They are also intended to be used as tools to aid the Design Consultant in making their planning and design decisions.
INTRODUCTION

This document has been prepared as a guide for Survey Firms in the preparation of documents for the design and construction of new structures and the remodeling of existing structures on the campuses of Indiana University.

Changing technology and changes in State or University policies will require continuing revisions of these standards. Surveyors are required to ensure that they are working with the latest version of the standards.

A surveyor registered in the state of Indiana is required to provide a site survey and inventory of existing site, landscape and utility conditions that include the following:

**DRAWING PREPARATIONS:**

At the beginning of each project, a new Base Map including Utilities and use of the established IU Control Network (for IU Bloomington) is required. The IU Control Network is referenced to Indiana State Plane Coordinate System (NAD 83) (2011) – feet units for Bloomington (IUB) campus. The Base Map and IU Control Network reference drawing with relevant data are available upon request. A Project or Team Leader and Project Number are required for any information to be released. To request information for your project, go to the VPCPF Consultants & Contractors page and use the University Site/Utilities Map Request link.

The west zone is used for Bloomington (IUB) and Gary (IUN). The east zone is used for Richmond (IUE), Kokomo (IUK), South Bend (IUSB), New Albany (IUSE), Columbus (IUPUC), and Indianapolis (IUPUI). A minimum of 3 IU control points are required to be referenced for each project or survey on the IUB campus. A minimum of 3 temporary benchmarks are required for all campuses except IUB.

State elevation datum on each drawing, using NAV88 (US survey feet) using Geoid 12A and reference location ID of each control point used, if applicable.

AutoCAD release 2011-2014 files on CD-ROM or DVD in .dwg format.

Drawing shall note all dimensions and elevations in English units at full scale.

Property boundaries, easements, rights-of-ways, deed restrictions and legal description.

Show North arrow including the direction of magnetic north.

Include Legend of Symbols and Abbreviations used on the drawing.

Seal: Affix seal of Indiana Registered Professional Surveyor.

**SITE & LANDSCAPE EXPECTATIONS:**

One foot contour intervals, with appropriate spot elevations on paving or other hard surfaces such as concrete pads, building corners, finished floor elevations, steps top and bottom of walls and curbs shall be to the nearest .01 foot. Existing site features such as walls, fences, asphalt pavement, gravel, sign, and outcroppings, trees indicating type, size, and canopy, shrubs and other significant vegetation shall be to the nearest 0.10 foot.

Mean elevation of water in any excavation, well, or nearby body of water.

Location of flood plain and flood level of streams or adjacent bodies of water.
UTILITY EXPECTATIONS:

The following information is to be included in the completed survey and based on record information from the IU Utility Information Group and surface evidence. Incomplete or unknown information requiring the surveyor to employ techniques of subsurface exploration to locate features or utilities will be an additional service subject to Owner approval. Surveyor must call for utility locates and coordinate a field meeting with IU Utilities as part of the survey procedure.

- **Domestic Water**: piping location and size; valve boxes, meter pits;

- **Fire Protection**: piping location and size including water main connection size; post indicator valves, fire hydrants and valves including ownership of each;

- **Sanitary Sewer**: piping location and size, direction of flow; manhole location, size, depth and invert pipes including size. Note if piping is combined sanitary and storm water sewer. Sanitary lift stations and septic fields are to be identified;

- **Storm water Sewer**: piping location and size, direction of flow; manholes, catch basins, inlets and outlets, and overflow structures including location and size; culvert pipes; rain gardens, retention and detention structures including underground tanks. Note if piping is combined sanitary and storm water sewer. Storm water lift stations are to be identified;

- **Electric**: underground cable and duct banks, include elevation, configuration and size of duct bank; overhead power poles and cable; configuration and size of manholes and vaults, transformers, traffic control signals, street lighting poles, ownership;

- **Natural Gas**: piping location and size, pressure; ownership; main valves and lateral shutoff valves, meter locations;

- **Telecommunications**: fiber optic, telephone, cable TV; underground cable and duct banks; overhead cable and poles; junction boxes and handholds;

- **Central Steam and Condensate Distribution**: underground piping location and size; system pressure, manhole size and depth. Include location and size of meters, traps and tunnels;

- **Central Chilled Water Distribution**: piping location and size, valves, vents and drains.
SITE CLEARING, DEMOLITION AND EROSION CONTROL

Site clearing and demolition plan will be developed to indicate site elements which are required to be removed, modified or relocated. Plan elements should include but not be limited to the following:

- Location of staging area, dumpster(s), site entrance and exit and construction limits fence.

- Plant materials which are designated to remain and protected, relocated, or removed. Plant material to remain will be protected by a construction fence which encompasses its drip line. No construction equipment, materials or debris shall be located within tree protection boundaries.

- Location of stockpiled site materials which are to be reused such as; topsoil, subsoil, gravel, etc.

- Concrete sidewalks and curbs to be removed will be saw cut at the nearest joint to the demolition limits, and requires removal of full sidewalk sections or panels.

- Demolition of utilities will include removal to the property line or source and capped.

- Protect existing storm drain inlets, drainage swales, streams, and water impoundments from sediment and pollutants resulting from construction operations. Provide Erosion Control Plan which satisfies section 108.03 of IDOT Standard Specifications.
SITE GRADING

A site grading plan will be developed which satisfies the project’s functional requirements, such as drainage and accessibility. It must also provide an aesthetic setting which complements the building’s architecture and respects the existing campus landscape features.

- Grading and excavations will not occur within the drip line of existing plant materials which have been identified to remain.

- To minimize storm water impacts on the existing watershed, post development discharges will not exceed present condition discharges. Storm water calculations are required to determine control or detention methods.

- Storm drainage systems will equal or exceed the requirements as specified in Section 715, 719, 720, 906 and 909 of the most recent edition of the Indiana Department of Highways Standard Specifications.
FINISH GRADING

Finish grading requirements will be included on the grading plan and in the project specifications.

- Landscape contractor will be pre-qualified with five years minimum experience in finish grading and lawn installation for similar size projects.

- Existing on site topsoil may be reused for lawns and plant beds, provided it meets the following topsoil requirements. Friable loam with minimal amounts of clay and free of subsoil, roots, grass, weeds, stones, debris, and foreign matter. A pH range of 5.9 to 7.0 and containing a minimum of 6% and a maximum of 25% organic matter.

- Topsoil mix for plant beds: 3/4 topsoil and 1/4 peat moss or composted organic material. For each 100 square feet of plant bed incorporate the following: 5 lbs. of slow release all-organic fertilizer such as plant-tore, 5 lbs. of green sand or sea sand, and 5 lbs. gypsum.

- Topsoil tests will be made by an independent agency before topsoil delivery and placement. Tests will also determine requirements for topsoil additives.
SEEDING AND SODDING

Seeding and sodding requirements will be included on the grading and/or landscape plans and in the project specifications. The decision to seed and/or sod will be based on site and climatic conditions and project schedule.

- Identify on landscape or grading plan, areas to be seeded or sodded. Seeding will include areas to receive shade seed mix and/or general seed mix.

- Sod will be either a blue grass blend or a turf-type tall fescue blend depending on site conditions such as lawn use, maintenance level, irrigation, and orientation.

- Seed mixes:

  General Mixture:
  15% Parade Kentucky Blue Grass
  15% Park Kentucky Blue Grass
  20% Delray Perennial Rye
  20% Pennant Perennial Rye
  30% Pennlawn Creeping Red Fescue

  Shade Mixture:
  25% Glade Kentucky Blue Grass
  15% Nugget Kentucky Blue Grass
  10% Delray Perennial Rye
  25% Ruby Creeping Red Fescue
  25% Scaldis Hard Fescue
PLANT MATERIALS AND INSTALLATION

Landscape contractor will be pre-qualified with five years minimum experience in landscape installation of similar size projects.

- All plant material will conform to the current issue of the American Standard for Nursery stock published by the American Association of Nurserymen.

- Plant material must be selected from nurseries which are located in hardiness zones similar to the project’s location. Nurseries must also be inspected and approved by state and federal agencies.

- Plant materials must be approved by the landscape architect prior to digging and delivery. Plant material inspections and approvals can be done at the nursery or by photographs. A minimum of two photographs per plant type with a front and side view is required. Photographs must indicate size, shape, color, and nursery growing conditions.

- Plant materials will have the following minimum sizes:

<table>
<thead>
<tr>
<th>Plant Type</th>
<th>Size</th>
</tr>
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<tbody>
<tr>
<td>Deciduous shade type trees</td>
<td>2 ½” caliper</td>
</tr>
<tr>
<td>Deciduous ornamental trees</td>
<td>1 ¾” caliper</td>
</tr>
<tr>
<td>Deciduous shrubs, dwarf &amp; semi-dwarf</td>
<td>15” - 18”</td>
</tr>
<tr>
<td>Deciduous shrubs, medium</td>
<td>18” - 24”</td>
</tr>
<tr>
<td>Deciduous shrubs, large</td>
<td>24” - 30”</td>
</tr>
<tr>
<td>Evergreen Trees</td>
<td>7’ - 8’ ht.</td>
</tr>
<tr>
<td>Evergreen shrubs, dwarf &amp; semi-dwarf</td>
<td>15” - 18”</td>
</tr>
<tr>
<td>Evergreen shrubs, medium</td>
<td>18” - 24”</td>
</tr>
<tr>
<td>Evergreen shrubs, large</td>
<td>24” - 30”</td>
</tr>
<tr>
<td>Perennials, 2 year plants</td>
<td>2 gal.</td>
</tr>
<tr>
<td>Roses, No. 1 grade</td>
<td>2 gal.</td>
</tr>
<tr>
<td>Ground Covers, 2 year plants</td>
<td>No. 1</td>
</tr>
<tr>
<td>Bulb</td>
<td>Top size</td>
</tr>
<tr>
<td>Annual flowers</td>
<td>18 pack flats</td>
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PARKING LOTS & DRIVES

New and renovated campus parking lots and drives for automobiles and light and medium duty trucks will be constructed of asphaltic concrete. Parking lots and drives used predominantly by buses, heavy duty trucks and equipment will be constructed of concrete. Gravel parking lots and drives may be constructed as temporary facilities, however, they will be removed or converted to permanent asphalt facilities within the next construction season. New and renovated parking lots and drives will include accessibility requirements, lighting, landscaping, emergency phones, and sidewalks, as required for access to and from the lot. Parking lots will not extend beyond the front building line.

- Parking facilities will equal or exceed the requirements as specified in the most recent edition of the Indiana Department of Highways standard specifications.

- Storm drainage calculations will be performed to determine requirements for storm water storage and/or detention.

- New or renovated parking facilities will be accessible by individuals with disabilities. Facilities will comply with the Uniform Federal Accessibility Standards (UFAS) and the Indiana Handicapped Accessibility Standards (IHAS). The access aisle shall become part of an accessible sidewalk route without requiring entry into a vehicular drive. Van accessible parking spaces will be 9 feet wide with a 9 feet wide access aisle. Parking lot emergency phones will be accessible.

- Material certificates will be provided during construction which will be signed by material producer and contractor, certifying that each material item complies with specifications.

- Parking facilities will be designed with the following minimum dimensions:

  - Parking spaces 9' x 18'
  - Parking drives 24'
  - Accessible parking spaces 9' x 18' with 5' access aisle
  - Van accessible parking spaces 9' x 18' with 9' access aisle
  - Compacted stone base 6'' - #53 stone
  - Asphalt base course 3'' - #5D
  - Asphalt surface course 1 ½'' - #11B
  - White striping 4''
  - Blue striping (Accessible spaces) 4'' plus ADA symbol and sign

- Landscaping requirements:

  The following landscaping requirements are intended to screen parking areas from the street, prevent large uninterrupted pavement areas, to shade paved areas, and provide storm water runoff and storage areas.

  1. Parking areas may not extend beyond the set-back line of the front/Main entrance of buildings unless required for accessible and or service parking.

  2. Provide a minimum 10' wide landscape buffer zone between parking lot edge and public right-of-ways. Minimum 6' wide between parking lot edge and campus drives, and sidewalks. Buffer zone will be planted with a minimum of one deciduous tree, and 10 shrubs, or a minimum of two ornamental or two evergreen trees per 35 linear feet. Shrubs will be evergreen or dense deciduous varieties and must reach a minimum height of 30'' within three years of installation and be at least 18'' tall when planted. Side slopes of buffer zones will not exceed 3:1.

  3. All rows of parking will include a 9'x18' minimum curbed terminal landscaped islands. A 9'x36'
minimum curbed landscaped mid-island is required for every 15 spaces or less. Islands should be evenly spaced throughout the parking lot and provided as required to control vehicular circulation and define drives. Islands will be backfilled with a 2’ minimum depth of topsoil. Lighting and communication conduits will extend along the backside of the island curb and not through the middle of landscaped islands. Islands will be planted with at least one deciduous tree and shrubs as described in item #2. Ground cover, grass or landscape mulch may be used in lieu of shrubs.
SIDEWALKS, RAMPS, STEPS AND CURBS

Sidewalks will have a minimum width of 6'-0" and be constructed of concrete, beige colored concrete, exposed aggregate concrete, brick, or interlocking concrete pavers. Special circumstances may require unique paving materials, such as decorative crushed stone for a garden path. Curbs will be 6" x 24" straight type poured in place concrete, and/or slip form curb and gutter. Beige colored concrete will be used for curbs to match or complement adjacent sidewalk types. Sidewalks and curbs will be designed with the following specifications:

- All sidewalks and curbs will have a 4,000 PSI minimum concrete strength with polypropylene fiber reinforcement. Welded wire mesh will not be specified. Expansion joints will be ½" resilient, closed cell polyurethane foam material with a one part self-leveling polyurethane sealant, and ½" dia. stainless steel dowel bars. Joint patterns for sidewalks and adjacent curbs will be consistent with each other.

- Concrete sidewalks will have a minimum concrete thickness of 4" with a 4" minimum compacted stone base, unless they are also used as service vehicle drives. Thickness and reinforcing will be designed to accommodate all uses.

- Ramps will comply with the Uniform Federal Accessibility Standards (UFAS) and the Indiana Handicapped Accessibility Standards (IHAS). Ramps six feet in length or greater will not exceed a 1:14 (7.14%) slope. Ramps shall be constructed of concrete, concrete with stone/brick veneers and temporary pressure treated wood, painted. Two types of concrete curb ramps, type A and type B, are shown in Appendix 1, Typical Details.

- Steps will be constructed of concrete, brick, limestone or temporary pressure treated wood, painted. Preferred riser and tread dimensions are 7" and 15" respectively. Concrete steps will incorporate an 8" wide cheek wall extending 4" above treads. See typical details in Appendix 1. Maximum number of risers without a landing shall be six. When a landing is required, total number of risers will be equally distributed, below and above the landing.

- Handrails will be 1 ½"dia., schedule 10, stainless steel, installed 36" above ramp or step tread. End returns, end posts and corners will have a 2 ½"center line radius. Protection railings will be installed 42" above grade and include ½" x 1" true bar, stainless steel pickets 4" O.C.

- Concrete curbs constructed along city and campus streets will include asphalt or concrete patching. The existing street edge will be saw cut a minimum of 2'-0" wide and removed for curb installation. Asphalt patching will include compacted stone base filler, a 9" minimum concrete base thickness and a 1 ½" minimum asphalt surface course. Local community standards may exceed these minimums and will be specified accordingly.


- Exposed Aggregate Concrete: Standard grey concrete with a fine and coarse aggregate content of #5L washed river gravel.

- Brick Pavers: Brick pavers shall comply with ASTM C216, ASTM C67, Type FBS, Grade SW and shall not show efflorescence. Manufacturers certification of test results shall be submitted. Two types of brick pavers are used on the Bloomington campus, one for major campus entrance facilities and the other for brick walkways. Campus entrance bricks will be Medium Ironspot #46 paver by Endicott. Walkway bricks will be Azalia, gas fired blend, paving brick by Glen Gary. Brick pavers will be
installed on a concrete base with a ¾”asphalt setting bed.

- Interlocking Concrete Pavers: Interlocking pavers shall comply with ASTM C936 and equal uni-stone pavers as manufactured by Inter-Pave Corp. of Cincinnati, OH and Hessit Works, Inc., Freedom, IN. Concrete pavers will be installed on a compacted stone base with a sand leveling course and edge restraints, or concrete base with a ¾”asphalt setting bed. Installation technique depends upon paver location and use.
WALLS

There are six major types of free standing and retaining walls. They are smooth random ashlar limestone, split face random limestone, limestone fieldrock, dry laid limestone fieldrock, Brown County stone and brick. Wall type and configuration shall be designed to reflect and compliment existing architecture and campus landscape features.

- Walls will be constructed with either a reinforced concrete or reinforced concrete block core and concrete footers, unless a dry laid type wall is specified.

- Dry laid stone walls will be constructed with a concrete or large stone footer with random stone, 2" - 7" thick, laid with a batter of 6" per foot. Capstone will be mortared.

- All retaining walls will include waterproofing, footer drains, and/or 1" min. dia. weep holes with clean #5 stone backfill.

- Whenever possible, walls shall be designed with heights between 18" - 30" to provide seating.
FENCES AND BARRIERS

These elements are placed to control pedestrian and vehicular movement and/or to screen an unsightly area or object. There are three types of fences and barriers; cedar wood fence, vinyl coated chain link fence, and steel post and chain barrier.

- Cedar wood fences are composed of 4 x 4 pressure treated wood posts, 2 x 4 pressure treated wood frame, 1 x 6 rough hewn cedar siding with ½" spaces, 2 x 10 rough hewn cedar cap and ½” x 1 ½”x 24” painted steel post mounting straps. Cedar wood fences which are used as dumpster screens, will also include a 2 x 6 pressure treated wood bumper rail installed at a height equal to the dumpsters lifting bars.

- Vinyl coated chain link fence varies in height from a 4’ playground fence to a 12’ tennis court fence. Vinyl coated chain link fencing will equal or exceed the Chain Link Fence Manufacturers Institute’s Standards, and ASTM A120, A123, A569, A570, and D1499. Vinyl coating shall be 10 mils minimum, meeting Federal Specifications RR-F-101/3A and inert to normal corrosive atmospheres. Vinyl coating color shall be black or brown. Fabric will be 2” diamond mesh, 1 ¾” for tennis courts, interwoven and 11 gauge minimum before vinyl coating.

- Steel post and chain barrier is composed of 5’ long x 2 ½” dia. steel post set in 8” dia. concrete base, 1 ½”x 3” threaded post cap and a general purpose low carbon steel chain with a minimum trade size of 3/16”. Chain height will not be less than 2’-4” and not exceed 2’-6”. Posts and chain will be painted with two coats of Pratt & Lambert colonial brown, rust proof, exterior enamel paint.

- Black vinyl coated pedestrian rail barrier (IUPUI). Black vinyl coated pipe and rail fence 42” high with double rails. 6’ long x 2” dia. Posts set in 8” dia. Concrete base, with 1 5/8” dia. Rails. All pipe to be schedule 40.
SITE FURNITURE

Site furniture shall be compatible with the environment into which it is placed. Textures, colors, and design should relate to materials and finishes of adjacent architecture. They should complement the buildings setting and not dominate it.

- Various types of site furniture have been placed within the campuses; such as; limestone benches, limestone and wood benches, wood garden type benches, metal benches and tables, pre-cast concrete trash receptacles and ash urns, limestone ash urns, fiberglass trash receptacles, pre-cast concrete and fiberglass planters, wood kiosks, and bus shelters.

- Manufacturers and suppliers who have provided campus site furniture include the following:
  
  Boruff Limestone - Bloomington, IN  
  D.M. Braun & Company - Santa Fe Springs, CA  
  Dave Hawkins Limestone - Spencer, IN  
  Forms + Surfaces – Carpinteria, CA  
  Gardenside, Ltd. - Walnut Creek, CA  
  Landscape Forms - Kalamazoo, MI  
  Smith & Hawken - Mill Valley, CA  
  Unit Step Inc. – Indianapolis, IN  
  Victor Stanley, Inc. - Dunkirk, MD  
  Wausau Tile - Wausau, WI

- IUB site furniture standards:

  Bench – Limestone bench, 5’ long, by Boruff Limestone. Limestone and wood bench, 6’ long, by IUB Physical Plant. See details.

  Trash receptacles – Pre-cast concrete model C #TF1090, WS sand, with Aluminum dome top and liner, by Wausau Tile Inc.

  Ash receptacle – Classic Buttler ash receptacle, medium and large, color aluminum, surface and pole mount, by Forms + Surfaces Site Form Company.

  Bicycle rack – The Bike Rib bike rack, model BR8, surface mount, color brown, by Function First Bike Security.

- IUPUI site furniture standards:

  Bench – Classic series, CS – 48, 6’ long, cast iron bench, color black, by Victor Stanley, Inc.

  Trash receptacle – Ironsites model S-42(36 gal.) and S-35(24 gal.), color black, by Victor
Stanley, Inc.

Ash receptacle – Classic Buttler ash receptacle, medium and large, color black, surface and pole mount, by Forms + Surfaces Site Form Company.

Bicycle rack – The Bike Rib bike rack, model BR8, surface mount, color black, by Function First Bike Security.

Walkway lights – Pole mounted high pressure sodium outdoor type spherical light fixture, model # VS 4409 contempo by Hadco or approved equal. Fully enclosed and gasketed; pole, matching pole top adapter, dark bronze anodized finish; one piece, seamless, transparent bronze tinted, high impact, 18” dia., acrylic diffuser with internal prismatic glass refractor for symmetric distribution; heat shield above lamp; ballast mounted pole; ballast tap for 120/208/240/277 volt; UL listed for wet location; one 100 watt high pressure sodium; one sphere per pole; 3-3/8” extruded aluminum, round, straight, 14’ high pole; pole base cover plate flush with sidewalk; cast aluminum pole tenon and pole base cover.
APPENDIX 1

TYPICAL DETAILS
APPENDIX 2

SAMPLE SPECIFICATIONS