

## F. Site, Civil, and Grounds Requirements

### 1. Introduction

This portion of the Facility Standards includes guidelines for site, civil and grounds components to be followed by the Consultant during a project at the University of Chicago. **Components covered in this document include:**

- a) Building Entrances and Plazas
- b) Parking Lots
- c) Streets and Drives
- d) Sidewalks and Pathways
- e) Fences and Gates
- f) Site Lighting
- g) Site Accessories
- h) Irrigation
- i) Landscape and Plantings
- j) Vines
- k) Storm Drainage
- l) Sanitary Sewers
- m) Site Electric Distribution
- n) Site Water Distribution
- o) Site Clearing and Erosion Control
- p) Earthwork
- q) Geotechnical Investigation
- r) Site Survey

This portion of the **(FS)**<sup>2</sup> document shall apply to the campus-wide site components listed above, from their point of origin or connection to the existing, to their entrances and terminations at buildings. This includes all exterior spaces on campus. The installation of campus-wide standards such as paving, benches, waste and recycle bins, and lighting will create and maintain a visual coherence and facilitate consistent long term maintenance.

Repair and renovation projects as well as new construction will provide ample opportunities for these campus-wide standards to be implemented and all efforts should be made to do so.

<sup>2</sup>The Facilities Services Facility Standards **(FS)**<sup>2</sup> is a living document which is subject to change. Please refer to the latest version of the document in accordance with Exhibit C of the contract agreements.

## 2. Guidelines

### a) Building Entrances and Plazas

#### 1. General

##### a. Locations

- i. All building entrances, exits and plazas shall be provided with a non-slip, hard surface that meets the requirements as described in this section.
- ii. All new buildings will be designed in a manner to have access from the level of surrounding grade.
- iii. New access to existing buildings shall be designed in a manner that minimizes the required use of ramps, steps or other elevation transitions unless pre-approved by Facilities Services.
- iv. Need to add something about designed in a way to facilitate snow removal (minimum width, etc.)

##### b. Types

- i. Primary Entrance-this is considered a building's main entrance that accommodates a majority of the building's pedestrian traffic and is generally designed as part of the campus main corridor. A higher level of finish is desired for these locations.
- ii. Secondary Entrance-this is considered a building's alternative access and can be considered an emergency, security or service entrance that is of a lesser use or other focus and is generally off the main campus corridor.
- iii. Emergency Exit-this is a required unobstructed access generally utilized to provide exiting for the building occupants.
- iv. Security Access-this is a building's access that is monitored in some fashion.
- v. Plazas-this is an area outside of a building's access area that is used to cue pedestrians for their next destination.

#### 2. Design Standards

##### a. Widths

- i. Maneuvering zones at building entrances and exits shall be such that full operation of door swings can be accomplished and other devices can be located in a manner that prevents obstruction of the intended direction of traffic.
- ii. Refer to Sidewalks and Pathways Standards for access width requirements.
- iii. Refer to FS2 Volume III Section D – Accessibility for additional requirements.

##### b. Thickness

- i. Refer to Sidewalks and Pathways Standards for access thickness requirements.

##### c. Slopes and Drainage

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- i. All Building Entrances and Exits shall slope away from the building to provide positive drainage to an adequate storm water collection device.
- ii. Accessible ramps (if approved) shall comply with the current Americans with Disability Act Accessibility Code (ADA), City, and University Accessibility Standards requirements.
- iii. Refer to FS2 Volume III Section D – Accessibility for additional requirements.

### 3. Construction Standards

- a. Building Entrance/Exit and Plaza surfaces shall be constructed of one or a combination of, the following materials:
  - i. Concrete
  - ii. Porous/Permeable Concrete Pavement
  - iii. Pavers
  - iv. Porous/Permeable Pavers
  - v. Stone
  - vi. Refer to FS2 Volume III Section D – Accessibility for additional requirements.
- b. All exterior concrete to be constructed with a concrete mix containing a water/cement ratio of .40 (w/c=.40), six percent (6%) air-entrainment and a twenty eight (28) day compressive strength of 4000 psi.
- c. All exterior concrete is to be reinforced as specified by the American Concrete Institute (ACI) and the Concrete Reinforcing Steel Institute (CRSI) requirements.
- d. Tooled control joints shall be provided in all concrete flatwork to meet the requirements of the American Concrete Institute (ACI). Under no circumstance shall sections of concrete be jointed in a manner that will create small sections of concrete less than eight inches (8”) in any one direction.
- e. Expansion joints shall be located to meet the requirements of the American Concrete Institute (ACI) and at the following intervals that will match tooled jointing patterns.
  - i. Flatwork up to eight (8) feet in width, no more than twenty-five (25) feet spacing in all directions.
  - ii. Flatwork of larger width, no more than twenty (20) feet spacing in all directions.
  - iii. Joints shall also be placed where sidewalks abut building walls, site walls, steps, around manhole and inlet structures and where indicated on the plans.

**b) Parking lots****1. General****a. Location**

- i. Parking lots shall be located and oriented in a manner that provides screening of vehicles from public and campus corridor ways.
- ii. Landscape islands shall be provided as determined by the City of Chicago and as directed by Facilities Services and shall be no less than eight (8) feet wide.
- iii. Landscape islands shall be organized to facilitate snow removal in the winter months and provide a means to slow and/or collect storm water runoff from the parking lot.
- iv. Parking lots shall be located such that access by designated vehicles can be accomplished without excessive maneuvering in a public Right-Of-Way or other pedestrian, drive, street, or roadways.
- v. Parking lots shall be provided with a non-slip, hard surface meeting the requirements as described in this section.
- vi. Provide rolled curb conditions at locations adjacent to designated snow-pile areas to allow for snow removal from lots.

**b. Types (this standard does **NOT** include Structured Garage Parking)**

- i. Regional Parking Lots
- ii. Service Parking Lots
- iii. Street Parking

**2. Design Standards****a. Parking Space Sizes**

- i. Parking layout shall utilize the most efficient orientation for the given site constraints and limits. In no case shall a parking space be less than nine (9) feet wide and contain no less than one hundred eighty (180) square feet in area.
- ii. Refer to the Americans with Disabilities Act (ADA) for accessible parking requirements.

**b. Access Aisles and Drives**

- i. Vehicle access aisles shall be of adequate width to allow for maneuvering and for safe traffic flow through the parking lot.
- ii. Parking lot access drives shall be located such that vehicle stacking does not impede access to available parking spaces.

**c. Thickness**

- i. Refer to the Geotechnical Investigation to determine pavement design thickness and composition of materials.

**d. Slopes and Drainage**

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- i. All Parking lot surfaces shall have a minimum slope of two percent (2%) and a maximum slope of three percent (3%) and be provided with positive drainage to an adequate storm water collection device.
  - ii. Maximize sheet flow to landscape islands as much as possible.
- e. Curbing and Pedestrian Access
  - i. All Parking lots shall be provided with a six inch (6”) tall by six inch (6”) wide concrete curb border and barrier around all planted islands. Refer to ADA requirements for curb ramps and accesses for accessible parking spaces.
  - ii. Pedestrian access shall be provided to a public way or as directed by Facilities Services.
  - iii. Refer to FS2 Volume III Section D – Accessibility for additional requirements.

### 3. Construction Standards

- a. Parking lot surfaces shall be constructed of one or a combination of, the following materials:
  - i. Hot Asphaltic Concrete Pavement
  - ii. Concrete Pavement
  - iii. Porous/Permeable Concrete Pavement
- b. Curbs / Curbs and Gutters shall be cast-in-place concrete.
  - i. Concrete curb surfaces shall have a dry rubbed finish on the exposed faces and be provided with expansion joints at the tangent points of all radii. No curb radius dimension shall be less than four feet (4’).
  - ii. Curb and Curb and Gutter profiles shall be as directed by the City of Chicago and Facilities Services.
- c. All exterior concrete shall be constructed with a concrete mix containing a water/cement ratio of .40 (w/c=.40), six percent (6%) air-entrainment and a twenty-eight (28) day compressive strength of 4000 psi.
- d. All exterior concrete shall be reinforced as specified by the American Concrete Institute (ACI) and the Concrete Reinforcing Steel Institute (CRSI) requirements.

## c) Streets and Drives

### 1. General

- a. Locations
  - i. In most cases, the Streets surrounding and within the Campus boundary are considered City Streets and are within a dedicated public Right-Of-Way (ROW) under the jurisdiction of the City of Chicago.
  - ii. Drives are considered private and shall follow these standards.

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- iii. Drives shall be routed in a manner that allows vehicular traffic to navigate through the Campus without causing a hazard or nuisance to surrounding properties or pedestrians and shall include landscaping.
- iv. Crosswalks shall be provided at all pedestrian crossings with accessible ramps per the Americans with Disabilities Act Accessibility Code (ADA).
- v. A sidewalk or other pedestrian way shall be provided on at least one (1) side of each street or drive. In most instances, a sidewalk shall be provided on both sides of the street or drive.

b. Types

- i. City Street: located within a dedicated public Right-Of-Way under the jurisdiction of the City of Chicago.
- ii. Private Drive: owned, maintained and operated by the University of Chicago.
- iii. Service Drive: a private drive that is focused on providing access to service areas and equipment. This includes Fire Truck access and Snow Route access.
- iv. Receiving Dock Drive: a private drive that is focused on providing access to a Receiving / Loading Dock area.
- v. Trash Container/Dumpster Access: a private drive that is focused on providing access and maneuvering to these devices.

## 2. Design Standards

a. Widths

- i. City Street: as directed by the City of Chicago.
- ii. Private Drive: twenty (20) feet minimum width for one way traffic and twenty four (24) feet minimum width for two way traffic without street parking and thirty six (36) feet maximum width for two way traffic with street parking on one (1) side. In no circumstance shall street parking be allowed on both sides of any Street or Drive without pre-approval by Facilities Services.
- iii. Service Drive, Receiving Dock Drive, and Trash Container/Dumpster Access: twenty (20) feet minimum width for one-way traffic and twenty-four (24) feet minimum width for two way traffic. Provide adequate turnaround area if clear exit is not attainable.

b. Loading Capacity

- i. City Street: as directed by the City of Chicago.
- ii. All other Drives shall be designed to accommodate the following loading criteria:
  - 1. AASHTO-H20 Loading
  - 2. As directed by Facilities Services

c. Thickness

- i. Refer to the Geotechnical Investigation to determine pavement design thickness and composition of materials.

d. Slopes and Drainage

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- i. All Streets and Drives shall be crowned with a two percent (2%) slope, have a minimum longitudinal slope of two percent (2%) and a maximum longitudinal slope of three percent (3%) and be provided with positive drainage to adequate storm water collection devices.
- e. Curbing
  - i. All Streets and Drives shall be provided with a minimum six inch (6") tall by six inch (6") wide concrete curb border unless within the public Right-Of-Way.
- f. Driveway accesses and Street intersections shall be designed such that cross-slope transitions are provided with positive drainage on each side of a crosswalk.
- g. Driveway access at drive aisle transitions shall utilize a vertical curve design such that vehicles will not "bottom out" when traversing.

### **3. Construction Standards**

- a. Street and Drive surfaces shall be constructed of one or a combination of the following materials:
  - i. Hot Asphaltic Concrete Pavement
  - ii. Concrete Pavement
  - iii. Porous/Permeable Concrete Pavement
- b. Service and Trash Dumpster support and access areas shall be paved with cast-in-place concrete pavement
- c. Curbs / Curb and Gutters shall be cast-in-place concrete.
  - i. Concrete curb surfaces shall have a dry rubbed finish on the exposed faces and be provided with expansion joints at the tangent points of all radii. No curb radius dimension shall be less than four feet (4').
  - ii. Curb and Curb and Gutter profiles shall be as directed by the City of Chicago and as directed by Facilities Services.
- d. All exterior concrete to be constructed with a concrete mix containing a water/cement ratio of .40 (w/c=.40), six percent (6%) air-entrainment and a twenty-eight (28) day compressive strength of 4000 psi.
- e. All exterior concrete to be reinforced as specified by the American Concrete Institute (ACI) and the Concrete Reinforcing Steel Institute (CRSI) requirements.

## **d) Sidewalks and Pathways**

### **1. General**

- a. Locations
  - i. Sidewalks shall be located along vehicular and public ways in a manner that connect campus corridors and building entrances to public ways.

- i. Sidewalks shall be accessible to pedestrians and shall comply with the current ADA Accessibility Code. **Refer to FS2 Volume III Section D – Accessibility for additional requirements.**
  - ii. Sidewalks shall be located as directed by Facilities Services.
  - iii. Sidewalks shall be located over steam tunnels or direct buried lines where possible.
- b. Types
  - i. Pedestrian sidewalks
  - ii. Major pedestrian sidewalks also designated to be used for fire truck access
  - iii. Heavy loaded sidewalks
  - iv. Pathways
  - v. Bicycle Paths
  - vi. Tunnel Tops
- c. Materials
  - i. Concrete
  - ii. Sandstone
  - iii. Limestone (Valders)
  - iv. Granite
  - v. Porous/Permeable Concrete Pavement
  - vi. Porous/Permeable Pavers
  - vii. Compacted Decomposed Granite

## 2. Design Standards

- a. Widths- sidewalks to be evaluated based on the anticipated traffic type and volume. (No sidewalk shall be less than eight (8) feet wide if determined to be a snow route.)
  - i. Pedestrian sidewalks- eight (8) feet minimum
  - ii. Major pedestrian sidewalks designated to be used for fire truck access- twelve (12) feet minimum
  - iii. Pathways- five (5) feet minimum width
  - iv. Bicycle Paths-five (5) feet minimum width
  - v. Tunnel Tops-to match tunnel widths.
- b. Thickness and Loading Capacity
  - i. Pedestrian sidewalks- five (5) inches minimum (up to 200psf loading)
  - ii. Major pedestrian sidewalks designated to be used for fire truck access-six (6) inches minimum (400 to 500psf), AASHTO-H20 Loading
  - iii. Heavy loaded sidewalks designated for lifting, trucks and major equipment-eight (8) inches minimum (up to 1500psf loading. Loads exceeding 1500psf to have subbase evaluation.)
  - iv. Pathways- four (4) inches minimum (up to 200psf loading)
  - v. Bicycle Paths- five (5) inches minimum (up to 200psf loading)
- c. Slopes and Drainage

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- i. All sidewalks and pathways shall be provided with positive drainage to an adequate storm water collection device.
- ii. All accessible paths and accessible ramps shall comply with the current Americans with Disability Act (ADA), City, and University Accessibility Standards requirements. **Refer to FS2 Volume III Section D – Accessibility for additional requirements.**

### 3. Construction Standards

- a. All exterior sidewalks to be constructed over a minimum 4” of compacted aggregate base on prepared subbase material unless noted otherwise.
  - i. Aggregate to be free of slag and deleterious materials and meet the gradation of Number 5 or Number 8 stone as classified by the State Department of Highway Specification.
- b. All exterior sidewalks that are concrete shall be constructed with a limestone mix consisting of a water/cement ratio of .40 (w/c=.40) and contain six percent (6%) air-entrainment with a twenty eight (28) day compressive strength of 4000 psi.
- c. All exterior sidewalks to be reinforced as specified by the American Concrete Institute (ACI) and the Concrete Reinforcing Steel Institute (CRSI) requirements.
- d. Sidewalks within the City Right-of-Way shall meet the requirements of the City of Chicago.
- e. Tooled control joints shall be provided in all concrete flatwork. Layout shall be as indicated on the plans.
- f. Expansion joints shall be located at the following intervals that match tooled jointing patterns.
  - i. Sidewalks up to eight (8) feet in width: no more than twenty-five (25) feet spacing in all directions.
  - ii. Sidewalks of larger width: no more than twenty (20) feet spacing in all directions.
  - iii. Joints shall also be placed where sidewalks abut building walls, site walls, steps, around manhole and inlet structures and where indicated on the plans.
- g. Exterior sidewalks to be finished with a transverse light broom finish.

## e) Fences and gates

### 1. General

- a. Locations
  - i. Fences and Gates shall be located as directed by Facilities Services.
  - ii. This standard does **NOT** include construction fencing.
- b. Types
  - i. Decorative/Historic Fence-black metal fence with gates.

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- ii. Security Fence-six (6) feet tall chain-link fence with gates.
- iii. Screening Fence-six (6) feet tall wood shadow box Cedar wood fence with gates.

## 2. Design Standards

- a. Existing Conditions
  - i. Where existing fencing is in place, reuse historic ornamental fences and gates wherever possible. If reuse is not possible, please salvage. **Refer to the demolition section within this document for additional information.** New fencing material is to match the existing fencing in height, color, design, profile and style.
  - ii. Transition new fencing into existing fencing in a manner that will provide a consistent fence line.
- b. New Conditions
  - i. Refer to Facilities Services for types of fencing to be provided. Design to relate to project scale and architecture.

## 3. Construction Standards

- a. All fencing shall be installed per manufacturer's recommendations.

## f) Site Lighting

### 1. General

- a. Locations
  - i. Site lighting shall be provided throughout the Campus as directed by Facilities Services.
  - ii. Lighting may consist of pole lights, wall mounted lights, street lights, etc...
  - iii. Parking lot lighting shall be located in islands or along perimeter to prevent damage by parked or moving vehicles.
- b. Types
  - i. **Outdoor Pedestrian Pole Lights**
    - 1. **Louis Poulsen Albertslund Mini Post**
      - a. Voltage frequency: 42W LED/4000K
      - b. Pole Height: 12' typical
      - c. Color: Graphite; Existing Albertslund poles requiring touch up paint are to use RAL-7022 for color matching purposes.
      - d. Distribution /Trim: BUG U3
      - e. Transition to Pole: T-DRA-5 IN-3 IN
      - f. Lighting Control: Dim 0-10v
      - g. Variant Number: 10000147969
      - h. All new poles shall include an electrical outlet

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- i. When applicable, the additional mount for security cameras shall be considered and approved by the Landscape Architect
  - 2. St. Louis Antique Lighting Company: Oxford Light: CD-7718
    - a. Pole Height: 12' typical
    - b. Color: Satin Black
    - c. New lights shall be shipped without the lamp and retrofitted by the University Facility Services Electric Shop with LED lamps with the following specifications: 3000K LED lamps, E26 base, 100-277V, 27watts. – This work must be coordinated prior to ordering the lamps with the Electric Shop.
    - d. All new poles shall include an electrical outlet
  - ii. Bollard Lighting – this is not a preferred type of lighting and is only to be used in instances where other lighting types will not work in the space. Use of bollard lighting must be approved by the campus Landscape Architect.

## 2. Design Standards

- a. Illumination Levels
  - i. A minimum lighting level of 0.5 footcandles shall be provided in all areas of the Campus. Light levels greatly exceeding this are generally not desired, the goal is to maintain a consistent level of footcandles that meets the minimum level requirements throughout campus.
  - ii. Street lighting shall comply with the City of Chicago standards.
- b. Heights
  - i. Lighting shall be consistent with the surrounding area unless directed by Facilities Services.
- c. Spacing
  - i. Locate the centerline of site lighting fixtures 18" off the curb or the edge of the sidewalk

## 3. Construction Standards

- a. Lighting shall be installed per manufacturer's recommendation.
- b. All new lighting shall be connected to the Building Automation System (BAS).

## g) Site Accessories

### 1. General

- a. Location

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- i. The proposed location and use of any site furnishings must be approved by Facilities Services prior to purchase and installation.
- b. Types
  - i. Benches
    - 1. Country Casual: Windermere Bench
      - a. 6' length
      - b. Color / Material: Unfinished teak
    - 2. Landscape Forms: FGP Bench
      - a. Backed, typical; Backless in select instances
      - b. 70" Length
      - c. Color / Material: Ipe Wood, Mercury Frame
      - d. Surface Mount, typical
      - e. Area of Use: Campus South
  - ii. Tables and Chairs
    - 1. Dining Tables and Chairs
      - a. Landscape Forms: Parc Centre Chair
        - i. Armless, typical
        - ii. Color / Material: Mercury
      - b. Landscape Forms: Parc Centre Table
        - i. 30" round
        - ii. Color / Material: Mercury
    - 2. Lounge Chairs and Tables
      - a. Landscape Forms: Cochran Side Table
        - i. Color / Material: Black Frame and Black Tabletop
      - b. Landscape Forms: Cochran Lounge Chair
        - i. Color / Material: Black
  - iii. Picnic Tables
    - 1. Landscape Forms: Charlie Table
      - a. 67" Table, No Umbrella Hole
      - b. Color: Mercury
      - c. Surface Mount, typical; Note that this table MUST be mounted
  - iv. Bicycle Racks
    - 1. Typical Standard: Saris Infrastructure:
      - a. Wave Rack
        - i. Length / Bike Capacity: Dependent upon space and capacity requirements
        - ii. Color: Powdercoated Black
      - b. Bike Dock
        - i. Color: Powdercoated Black
    - 2. Alternate Upgraded Standard: Reliance Foundry:
      - a. Wave Rack
        - i. Model Number: Dependent on space and capacity requirements. Options include five or seven-bike capacity: R-8239-SS, R-8240-SS
        - ii. Color/Material: 316 Stainless Steel

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- iii. Surface Mount
  - b. Bike Rack
    - i. Model Number: R-8212-SS
    - ii. Color/Material: 316 Stainless Steel
    - iii. Surface Mount
  - v. Smoking and Ash Urns
    - 1. Keystone Ridge: Penn Ash Tower
    - 2. Only to be provided in areas pre-approved by Facilities Services
  - vi. Trash and Recycling Receptacles
    - 1. Victor Stanley: Ironsites
      - a. Color: Powdercoated Black, Typical; Campus South: Powdercoated Gray
      - b. Where trash receptacles are provided recycling receptacles must also be provided.
      - c. Trash and Recycling receptacles shall be clearly labeled using University Standard Graphics.
    - 2. BigBelly Solar Intelligent Waste & Recycling Collection System
      - a. Color: Black, Typical
      - b. Use of BigBelly receptacles must be approved prior to specification as there are long term costs and specific operation requirements.
    - 3. All trash and recycling receptacles must be coordinated with Operations prior to specification and location.

## 2. Construction Standards

- a. General
  - i. Refer to manufacturer's recommendations for installation, warranty and maintenance requirements.

## h) Irrigation

### 1. General

- a. Locations
  - i. All lawn and planting areas shall be provided with a complete underground irrigation system.
  - ii. Irrigation system shall be tapped from an existing water supply and shall include RPZ device.
  - iii. Irrigation system shall be equipped with a Mini click rain sensor.
  - iv. Irrigation timers, clocks, etc., shall be mounted discretely on exterior of buildings or freestanding.
- b. Types
  - i. Broadcast system with rotor spray heads and fixed spray heads.
  - ii. Mist system
  - iii. **Drip irrigation shall not be used on campus.**
  - iv. Automatic systems and/or Manual systems
- c. Acceptable Manufacturer

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- i. Hunter Industries, Inc.

## 2. Design Standards

- a. The irrigation system shall use sprinklers, valves, piping, fittings, controllers, wiring, pumps, etc..., of sizes and types as required to provide one hundred percent (100%) coverage of the area.
- b. Irrigation water will not be permitted to spray on sides of buildings, sidewalks, paths or roadways.
- c. Controllers shall be located in the vicinity of the specific irrigated area and be accessible at all times.
- d. All valves and splices shall be installed in valve boxes and be accessible at all times.
- e. Shop drawings showing the complete layout of the irrigation system shall be submitted to Facilities Services for review prior to installation.
- f. A detectable warning tape, tone wire, or other device shall be provided in the trench to locate irrigation distribution lines below grade.

## 3. Construction Standards

- a. Pipe and Joints
  - i. Mainlines shall be SDR 21 or 26 PVC pipe with schedule 40 fittings.
  - ii. Section lines shall be 80 psi polyethylene pipe with two (2) Oteker clamps at each side of the fitting.
  - iii. Western Brass shall be used for 1" pipe quick connect valves (QCV) and be located in 10" valve boxes.
  - iv. Swing joints to be provided for 1" PVC QCV.
  - v. Minimum depth of all pipes shall be at least 12" below surface.
  - vi. All piping under paved surfaces and walks shall be sleeved.
- b. Heads
  - i. Turf and high pop mist heads to be Hunter Pro Series.
  - ii. Rotary heads to be Hunter PGP Ultra.
  - iii. Swing pipe and fittings will be used for all 1/2" and 3/4" heads.
- c. Wiring
  - i. Control wiring to be 16 gauge solid copper or 18/13 multi wire with #14 ground.
- d. Clocks
  - i. Clocks shall be Hunter ACC model and interface with the IMMS central control system by means of a LAN or radio and antenna unit.

## i) Landscape and Plantings

### 1. General

- a. Locations
  - i. Campus landscaping should be simple and clean in design, reinforce the scale and context of the area in which they are located, contribute to the University's Botanic garden initiative, and consider ease of maintenance for long term plant viability.
  - ii. **All existing trees are to be preserved wherever possible.**

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- iii. Building entrances and Plazas should have plantings with variety and interest whereas building plantings should soften the foundation areas.
- iv. Parking lot plantings should be shade trees in which canopies will cover the paved surface and provide thermal shading (heat island effect) as well as rainfall interception.
- v. Interior plazas and courtyard areas should be designed with extra consideration for maintenance access.
- vi. Plantings should be coordinated with site lighting to not diminish lighting levels for security reasons.
- vii. Planting areas shall be located and configured such that impacts to underground utilities from planting root systems are minimal.
- viii. Native / Naturalized durable and low maintenance plant species shall be used to the greatest extent possible to ensure long term plant viability and reduce irrigation requirements.
- ix. The use of annuals shall be minimal and constrained only to use where other permanent plantings is not appropriate.
- x. Where applicable, landscape material and placement shall meet the City of Chicago landscape standards.

b. Types

- i. Shade Trees
- ii. Ornamental Trees
- iii. Evergreen Trees
- iv. Shrubs
- v. Groundcovers
- vi. Perennials
- vii. Natives
- viii. Sod
- ix. Grass Seed
- x. Mulch

## 2. Design Standards

a. Selection Criteria

- i. Minimal and easy maintenance is desirable for all plantings.
- ii. Wherever possible and practical, plant material should be drought tolerant and require minimal irrigation.
- iii. Landscape design should consider seasonal changes and incorporate plant material with winter interest.
- iv. Ability to resist disease and insect infestation should be considered.
- v. Select plants with appropriate plant hardiness zones

b. Selection of Plantings

- i. All plantings will be specimen quality and shall be tagged at the nursery by the design Landscape Architect and a member of Facilities Services to assure the hardiest and most tolerant plant is selected.

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- ii. All lawn areas shall be seeded or sodded with the appropriate seed mixture as directed by Facilities Services.
- c. Warranty and Maintenance
  - i. Maintenance shall commence immediately after plant material is installed and continue for a minimum of 60 days after Substantial Completion.  
Maintenance consists of the following:
    - 1. Watering
    - 2. Fertilizing
    - 3. Weeding
    - 4. Trimming
    - 5. Replanting
    - 6. Other operations to provide a healthy landscape
  - ii. Warranty period will begin after Substantial Completion and continue for two (2) full years. This will consist of the following:
    - 1. Plant replacement due to death or unsatisfactory growth, except as a result from Campus abuse or neglect.
    - 2. Replacement plants under this warranty shall be granted for two (2) full years from the date of installations and acceptance.
    - 3. Establishment of a satisfactory lawn that is healthy, uniform, with a close stand of grass. The lawn shall be free of weeds and surface irregularities and have a coverage exceeding 90 percent over any 10 square foot area.

### 3. Construction Standards

- a. Materials
  - i. Material shall be the quality, size, genus, species, and variety of trees and shrubs indicated, complying with applicable requirements of ANSI Z60.1-“American Standard for Nursery Stock”.
  - ii. All planting material shall be certified by the State or Federal Department of Agriculture to be free of hazardous insects or apparent disease.
  - iii. All planting material shall have a certificate that states the material is the species specified.
- b. Seed Mixture:
  - i. General Seeding (full sun to partial shading)  
*Field of Dreams Gameday Grass Seed Mixture (National Seed)*
    - 1. 19.95% Freedom III KY Bluegrass
    - 2. 19.93% NuBlue Plus KY Bluegrass
    - 3. 19.85% Blue Chip Plus KY Bluegrass
    - 4. 14.72% Top Gun 2 Perennial Ryegrass
    - 5. 14.61% Accent Perennial Ryegrass
    - 6. 09.94% Diva KY Bluegrass

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ii. Shade

*Greenskeeper Premium Shady Grass Seed Mixture (National Seed)*

1. 40% Creeping Red Fescue
2. 30% Monterey 3 Perennial Ryegrass
3. 20% Culumbra 2 Chewings Fescue
4. 10% Nu Blue KY Bluegrass

iii. Parkways and Pavement Edges

*University of Chicago Maroon Mixture (National Seed)*

1. 20% Fults Distans Alkailigrass
2. 20% Palme V Perennial Ryegrass
3. 20% Freedom III KY Bluegrass
4. 20% Blue Chip Plus KY Bluegrass
5. 20% Creeping Red Fescue

iv. Athletic Fields

*Premium Athletic Mixture (John Deere Landscapes)*

1. 35% Excursion KY Bluegrass
2. 20% Award KY Bluegrass
3. 15% Gladstone KY Bluegrass
4. 15% Manhattan Perennial Ryegrass
5. 15% Prototype Perennial Ryegrass

v. Low-Mow (10-12" when left unmowed)

*Greenskeepers National Links Mix (National Seed)*

1. 25% Creeping Red Fescue
2. 25% Sheep Fescue
3. 25% Chewings Fescue
4. 25% Hard Fescue

c. Installation

- i. Only experienced installers who have completed similar landscaping work in type of material, design, and scale, shall be permitted to perform this work.
- ii. Installer shall provide documentation showing five (5) recorded "successful" years of experience with similar work.

d. Delivery and Storage

- i. Coordinate storage of plant material with Facilities Services prior to delivery if adequate room is not available within the construction limits.

e. Final Inspection and Acceptance

- i. Written request for final inspection and acceptance of the landscaping shall be submitted at least ten (10) days before the end of the warranty period.
- ii. If any plant materials are determined unacceptable, another request from either the University and/or Contractor shall be made for inspection after the next growing season.

**j) Vines**

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### 1. Description:

- a. The image of the University is enhanced by its ivy-covered buildings on the Main Quadrangles. The University encourages the protection of and continued planting of vines on or next to **appropriate** building walls. The benefits of the correct species of vines include:
  - i. Cooling of building in summer months
  - ii. Protection of building from UV rays
  - iii. Absorption of air impurities by plant material
  - iv. Increasing productivity and mood of building users
  - v. Reduced exterior noise

### 2. Protection and Techniques

- i. Considerations for protection of or introduction of vines on projects are to be outlined as part of the design phases with enough detail to describe species, protection techniques, planting techniques, maintenance considerations, integration with Bird Safe Building guidelines and integration with other landscaping.
- ii. **Vine species shall be selected to ensure they are non-invasive and their climbing style is appropriate for the structure they will be climbing.**

## k) Storm Drainage

### 1. General

- a. **ALL** development on the Campus shall be provided with an adequate storm water management system that is approved and permitted to discharge into the City of Chicago's storm water drainage system. This includes, but is not necessarily limited to, storm water inlets and catch basins, manholes, swales, storm sewers, detention basins, storm water quality best management practices (BMP), bioswales, rain gardens, etc.
- b. Locations
  - i. All Streets and Drives, Parking Lots, Building Entrances and Plazas, Outdoor Courtyards, Service areas, etc... shall be provided with storm water inlets, manholes, swales and piping properly spaced, sloped and sized to convey the designated storm frequency runoff to a positive outlet.
  - ii. Storm water drainage systems shall be designed utilizing gravity flow to their respective outlet. The use of storm water lift stations to convey runoff is discouraged and must be approved by Facilities Services prior to design.
  - iii. **Areas designated for storm water detention shall be approved by Facilities Services prior to design.** Due to the urban setting of this campus, it is encouraged that detention systems be placed below grade and the stored volume of water be considered for additional purposes, i.e. irrigation, other non-potable uses.

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- iv. Due to a relatively high water table in areas on campus, depth of detention areas may be limited; this must be an early design consideration.
  - 1. Any dewatering / sump pump water collected shall be considered for sustainable re-use including but not limited to irrigation or sustainable building equipment uses.
- v. Separation between sewers and water lines shall be maintained as described by all State and Local codes and ordinances.

## 2. Design Standards

- a. Regulatory Requirements
  - i. All design, material and installation, whether within a right-of-way or easement, or not, shall meet the requirements of such local government or other agency having jurisdiction over storm drainage.
    - 1. City of Chicago Department of Water Management
  - ii. All designs shall incorporate an adequate “flood route” to convey storm water from blocked inlets or pipes, excessive rainfall intensities, and combinations thereof, away from buildings. In no case, shall water be able to pond on surfaces deeper than seven (7) inches.

## 3. Construction Standards

- a. Storm water Inlets, Catch Basins and Manholes
  - i. Precast concrete structures with gray iron castings load rated for the appropriate conditions.
  - ii. Install per City standards
- b. Storm water Piping
  - i. Reinforced concrete pipe with soil tight joints.
  - ii. Install per City standards
  - iii. All piping shall be provided with detectible warning tape with tone wire. Tone wire shall be properly terminated at each end and accessible adjacent to pipe intersections for ease of locating.
- c. Drainage Swales
  - i. All drainage swales with slopes less than 2% shall be provided with an underdrain system with positive discharge and have a planted drainage bed.
- d. Detention Systems
  - i. Unless approved by Facilities Services, all storm water detention storage will be provided underground
  - ii. Install per City standards
- e. Storm water Best Management Practices (BMP)
  - i. Unless approved by Facilities Services, best management practices (BMP) shall be structured swirl type units.

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- ii. Install per City standards
- f. Bioswales and Rain Gardens
  - i. Unless approved by Facilities Services, bioswales and rain gardens shall be limited to courtyards and park area uses.
  - ii. Install per City standards

## **l) Sanitary Sewers**

### **1. General**

- a. **ALL** new building construction shall be provided with an approved and permitted sanitary lateral/sewer that discharges into the City of Chicago's sanitary sewer system.
- b. Locations
  - i. Sanitary laterals shall be located such that potential impacts from tree roots, heavy equipment and traffic or building foundations are not a concern.
  - ii. Separation between sewers and water lines shall be maintained as described by all State and Local codes and ordinances.
  - iii. Sanitary sewer systems shall be designed utilizing gravity flow to their respective outlet. The use of a sanitary lift station to convey runoff is discouraged and must be approved by Facilities Services prior to design.

### **2. Design Standards**

- a. Regulatory Requirements
  - i. All design, material and installation, whether within a right-of-way or easement, or not, shall meet the requirements of such local government or other agency having jurisdiction over sanitary waste.
    - 1. City of Chicago Department of Water Management
    - 2. Illinois Department of Public Health
    - 3. Illinois Plumbing Code
    - 4. Ten States Standards for Wastewater Facilities
    - 5. Illinois Environmental Protection Agency (IEPA)

### **3. Construction Standards**

- a. Sanitary Manholes
  - i. Precast concrete structures with gray iron castings load rated for the appropriate case.
  - ii. Install per City standards
- b. Sanitary Piping
  - i. Extra Strength Vitrified Clay Pipe (ESVCP), ASTM-C-700
  - ii. Ductile Iron Pipe (DIP), Class 52
  - iii. Cast Iron Pipe (CIP)
  - iv. Install per City standards

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- v. All piping shall be provided with detectible warning tape with tone wire. Tone wire shall be properly terminated at each end and accessible adjacent to pipe intersections for ease of locating.

## **m) Site Electric Distribution**

### **1. General**

- a. The intent of this section is to describe the basic requirements for locating and routing site electric distribution systems throughout the campus. Utility services and systems that are under the jurisdiction of others, shall be installed as required by those jurisdictions.
- b. Coordination with other utility jurisdictions and Facilities Services is required prior to locating and routing the site electric distribution systems on the campus.
- c. Locations
  - ii. Site electric distribution shall be placed in right of ways, easements or other designated ways that will prevent interference with other construction components, plantings and trees.
  - iii. All above and below ground splice boxes, pull boxes, manholes, transformers, etc. shall be located in a manner that protects the device from any vehicle damage and is accessible at all times.
  - iv. Do not locate electric wire ways immediately adjacent to communication or low voltage wire ways.

### **2. Design Standards**

- a. Regulatory Requirements
  - i. All design, material and installation, whether within a right-of-way or easement, or not, shall meet the requirements of such local government or other agency having jurisdiction over this utility service.
  - ii. Wire ways to be buried a minimum of 30" below finished grade and shall be provided with detectible warning tape with tone wire. Tone wire shall be properly terminated at each end and accessible adjacent to intersections for ease of locating.

### **3. Construction Standards**

- a. Wire Ways
  - i. Conduit shall be used for all electric wire ways throughout the Campus.
  - ii. Concrete duct banks shall be used for all primary and emergency electric distribution unless directed otherwise by regulating jurisdiction or Facility Services.
- b. Splice boxes, Pull boxes and Manholes
  - i. Precast concrete structures with gray iron castings load rated for the appropriate case. Size to be adequate for its function.

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- ii. Precast polymer concrete with lid load rated for the appropriate case. Size to be adequate for its function.

## **n) Site Water Distribution**

### **1. General**

- a. The intent of this section is to describe the basic requirements for locating and routing site water distribution systems throughout the campus. Utility services and systems that are under the jurisdiction of others, shall be installed as required by those jurisdictions.
- b. Coordination with other utility jurisdictions and Facilities Services is required prior to locating and routing the site water distribution systems on the campus.
- c. Locations
  - i. Site water distribution shall be placed in right of ways, easements or other designated ways that will prevent interference with other construction components, plantings and trees.
  - ii. All fire hydrants and valves shall be located in a manner that protects the device from any vehicle damage and is accessible at all times. Coordinate device types with the local water utility jurisdiction and fire department.
  - iii. Locate water lines to provide required clearances from other below grade utilities and sewers.

### **2. Design Standards**

- a. Regulatory Requirements
  - i. All design, material and installation, whether within a right-of-way or easement, or not, shall meet the requirements of such local government or other agency having jurisdiction over this utility service.
    - City of Chicago Department of Water Management
    - Chicago Fire Department
    - Illinois Department of Public Health
    - Illinois Plumbing Code
    - Illinois Environmental Protection Agency (IEPA)

### **3. Construction Standards**

- a. Water piping, valves, fittings, valve boxes, meters and hydrants to meet the requirements of the City of Chicago Department of Water Management.

## **o) Demolition, Site Clearing and Erosion Control**

### **1. General**

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- a. The necessary site clearing and demolition for the project site shall be shown on a plan to indicate which elements are required to be removed, modified, relocated or salvaged and turned-over to Facilities Services.
  - i. Existing site items to remain shall be protected to keep the item in their original state. (Photographing the item to remain before commencing work will be the basis of determining its original state.)
  - ii. Items to be salvaged and stored by the University shall be inventoried, confirmed for viability of future use, documented in current state (via photo), and adequate storage space confirmed / coordinated with Facilities Services.
- b. All projects that have any earthwork activity shall be provided with a Storm Water Pollution Prevention Plan (SWP3) to define the appropriate use, maintenance and monitoring requirements for erosion and sediment control measures necessary for the site. These items include but are not necessarily limited to the following:
  - i. Silt Fencing
  - ii. Inlet protection
  - iii. Sediment basins
  - iv. Check dams
  - v. Concrete washout areas
- c. Refer to Performance Standards for locations of staging areas, stockpiles, storage of materials and contractor parking.

## 2. Design Standards

- a. Regulatory Requirements
  - i. All erosion and sediment control design, material and installation shall meet the requirements of such local government or other agency having jurisdiction.
    - 1. Illinois Environmental Protection Agency (IEPA)
    - 2. Illinois Department of Natural Resources Conservation Services (NCRS)
    - 3. City of Chicago
- b. Monitoring
  - i. Erosion and sediment control measures shall be continuously monitored throughout their use for functional adequacy and performance in addition to the required monitoring necessary after each rainfall event.
- c. Vegetation Assessment and Protection
  - i. Tree Protection: Trees that are designated to remain shall be protected from the drip line to the trunk around the entire circumference of the tree and shall be maintained throughout construction.
    - 1. Access within the tree protection zone shall be minimal and limited to tree maintenance / watering.

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2. The tree protection zone is designed to protect the tree from damage related to construction activity. The following include but are not limited to activities that are restricted in the tree protection zone:
  - a. Removal of branches, general pruning, or root pruning
  - b. Trenching for utilities or other construction related activity
  - c. Chaining/locking equipment to trees
  - d. Laydown space for construction materials
  - e. Spoils from site excavation / demolition / construction
  - f. General foot traffic
3. Refer to the Facilities Services Tree Protection Detail for additional information.
- ii. Tree Pruning and Root Pruning: Any construction activity proposed near or within any tree canopy / dripline shall be assessed to determine whether said tree(s) shall be pruned and / or root pruned prior to construction activity. Pruning and root pruning is seasonal so this consideration must be made very early in project design so the appropriate timing for said activity is not missed.
- iii. General Planting Protection: Careful assessment and delineation of construction zones and associated fencing shall consider protection of existing vegetation beyond trees including shrubs, grasses and perennials. Particular attention shall be paid to protection of established hedges, shrubs and grasses that will be difficult to replace.

### 3. Construction Standards

- a. Silt Fencing
  - i. Mirafi 140N or equal
- b. Inlet protection
  - i. Prefabricated devices
  - ii. Field built devices
- c. Tree Protection
  - i. Utilize UV resistant plastic snow fence and framed structure to protect trees.

## p) Earthwork

### 1. General

- a. All projects that have any earthwork activity shall be provided with a Storm Water Pollution Prevention Plan (SWP3) that defines the appropriate use, maintenance and monitoring requirements for erosion and sediment control measures necessary for the site.
- b. Refer to General Design and Construction Standards for locations of staging areas, stockpiles, storage of materials and contractor parking.

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- c. Refer to the project Geo-Technical Report for design requirements related to earthwork activities which include the following:
  - i. Foundation bearing pressures
  - ii. Dewatering during and after construction
  - iii. Backfill material composition and placement
  - iv. Topsoil composition and placement
  - v. Soil Stabilization
  - vi. Testing and Inspection

## **2. Design Standards**

- a. Regulatory Requirements
  - i. All earthwork activity shall meet the requirements of such local government or other agency having jurisdiction.
    - IEPA
    - Illinois NRCS
    - City of Chicago
    - OSHA
- b. Shoring and Support
  - i. Utilize acceptable means for shoring and supporting existing conditions surrounding excavations.
- c. Trenching and Excavation
  - i. Refer to OSHA Standards for excavation slopes and trench width restrictions.
  - ii. Provide necessary barricades and barriers to protect open excavations at all times.
  - iii. Minimize having open trenches for extended periods of time. It is encouraged that excavations for piping, footings, etc... are backfilled the same day. Routing and placement of underground components shall be taken into account during design.
- d. Temporary Drainage of Excavations
  - i. Provide positive drainage away from the tops of excavations by utilizing berms, swales and pipes in order to keep surface water from entering the excavation or trench.
  - ii. Utilize sump areas and pumps as necessary to keep bottoms of excavations dry. Refer to the Geo-Technical Report for additional dewatering measures that may need to be included.

## **q) Geotechnical Investigation**

### **1. General**

- a. All projects that have any earthwork activity shall have a geotechnical investigation completed or have soils information from a previous project available for reference.

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- b. The Geo-Technical Report shall have information for design requirements related to earthwork activities which include the following:
  - i. Foundation bearing pressures
  - ii. Dewatering during and after construction
  - iii. Backfill material composition and placement
  - iv. Topsoil composition and placement
  - v. Soil Stabilization
  - vi. Testing and Inspection

## **2. Minimum Requirements**

- a. The Geotechnical Consultant shall state in their proposal the coverages of professional liability insurance maintained for protection against claims arising from the performance of the professional services described herein. Qualified personnel under the supervision of a Registered Professional Engineer shall perform all work. All reports shall bear the seal of the Registered Professional Engineer. The proposal shall state a guaranteed date for completion of the report.

## **3. Sampling**

- a. Benchmarks shall be established on the site and the boring elevations shall reference them. Alternately, boring elevations may be referenced to buildings referenced on the site plan if elevations are established for those buildings.
- b. Borings:
  - i. The location and depth of the borings proposed by the Geotechnical Consultant shall be shown on a sketch accompanying the Geotechnical Consultant's proposal. If the Geotechnical Consultant finds it necessary to change the location or depth of any of these proposed borings, the Consultant shall be notified and a new location or depth shall be agreed upon between them. If unusual conditions are encountered, including but not limited to unanticipated materials, which cannot be penetrated by standard sampling equipment, the Geotechnical Consultant shall immediately consult with the Consultant. The Geotechnical Consultant shall take such measures as are required to obtain the necessary information, subject to the Consultant's approval.
  - ii. The Geotechnical Consultant shall advise the Consultant as to any further exploration and testing required to obtain information that the Geotechnical Consultant requires for a professional interpretation of subsoil conditions at the building site, and shall perform such additional work as authorized by the University after consultation with the Consultant. The extent of exploration undertaken shall be consistent with the scope of the project indicated by the information given above and any drawings attached hereto. Sampling operations for both disturbed and undisturbed samples shall be in accordance with recommended American Society for Testing Materials (ASTM) Standards and other procedures, and as necessary to produce the information required for the Report(s).

## **4. Drilling and Sampling Methods**

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- a. Unless otherwise stipulated, drilling and sampling will be performed in accordance with current applicable ASTM Standards and other standards, including but not limited to ASTM Standards D1586, D1587 and D2113. Samples of soils shall be taken at the ground surface, at two feet below existing grade and at each identifiable change in condition, but not further apart than five feet in each of the borings unless otherwise specified on the boring drawing(s). Where clayey cohesive soils are encountered, thin-walled tube samples shall be taken of representative strata. Split-spoon samples shall be placed in sealed jars labeled with the following information: (1) boring numbers, (2) sample number, (3) sample depth, (4) blows per increment required to drive sample as per applicable standards, (5) date, (6) Project name, and (7) Geotechnical Consultant's name.
- b. Rock cores (if appropriate) shall be not less than 1-1/8 inches in diameter, and shall be placed in core boxes properly labeled as indicated above.
- c. The sample shall be preserved and field logs prepared either by a Geotechnical Consultant or by an experienced Soil Technician acting under the supervision of a Geotechnical Consultant.
- d. The Geotechnical Consultant shall notify the Consultant before drilling equipment is removed from the site and advise the Consultant as to the field description of soil conditions encountered. The Geotechnical Consultant shall perform such additional borings or other exploration as may be authorized by the University after consultation with the Consultant.

## **5. Protection of Property**

The Geotechnical Consultant shall contact the University and all utility companies for information regarding buried utilities and structures, and shall take all reasonable steps and precautions to restore the site to its existing condition prior to the Geotechnical Consultant's entry. This restoration shall include, but not be limited to, backfilling of borings, patching of slabs and pavements, and repair of lawns and plantings. Each boring should be plugged temporarily, pending additional groundwater readings. At the completion of the groundwater readings, the borings shall be permanently plugged, including patching of slabs and pavements.

## **6. Coordination of Utilities**

The Geotechnical Consultant is to include monies in his proposal to coordinate with the Surveyor and a location service for utilities to ensure that borings do not interfere with any existing utilities.

## **7. Field and Laboratory Report**

- a. Format:
  - i. All segments of the reports covering the investigation and analyses shall be made on white paper, 8-1/2 X 11 inches, suitable for photocopying and bound in booklet form. If larger drawings are absolutely necessary, they shall be folded and bound into the booklet. Written reports and analyses shall be on the Geotechnical Consultant's letterhead. Each drawing shall carry a title block which contains the Project name and location, the Geotechnical Consultant's name and address, the date of the subsurface investigation, the date of the drawings, the initials of the person in charge of the crew making the

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- investigation, the initials of the drafter, and the initials of the Professional Engineer who is responsible.
- ii. All data required to be recorded according to the ASTM Standards or other standard test methods employed, shall be obtained, recorded in the field and referenced to boring numbers. Soils shall be classified in the field logs in accordance with current applicable ASTM Standards and other standards, including, but not limited to, ASTM Standard D2488. The classification for final logs shall be based on the field information, plus results of tests plus further inspection of samples in the laboratory by the Geotechnical Consultant preparing the reports.
- b. Include with the report a chart illustrating the soil classification criteria and the terminology and symbols used on the boring logs.
- c. Identify the ASTM Standards or other recognized standard sampling and test methods utilized.
- d. Provide a plot plan giving graphical locations of test borings, with the proposed building footprint super imposed.
- e. Provide vertical sections for each boring plotted and graphically presented showing number of bores, sampling method used, date of start and finish, surface elevations, description of soil and thickness of each layer, depth of loss or gain of drilling fluid, hydraulic pressure required or number of blows per foot (N value) and, where applicable, depth to wet cave-in, depth to artesian head, groundwater elevation and time when water reading was made (repeat observation after 24 hours) and presence of gases. Note the location of strata containing organic materials, wet materials, or other inconsistencies that might affect engineering conclusions. Describe the existing surface conditions and summarize the subsurface conditions found to be present.
- f. Provide a profile and/or topographic map of rock or other bearing stratum. Analyze the probable variations in elevation and movements of subsurface water due to seasonal influences.
- g. Report all laboratory determinations of soil properties.
- h. Provide name of hydrologic soils group in accordance with Soil Conservation Service, Technical Release 55, dated June 1986, for each soil type found. Reports shall bear the seal and signature of a registered professional engineer.

## **8. Foundation Engineering and Recommendations**

- a. The Geotechnical Consultant shall analyze the information developed by investigation or otherwise available to the Geotechnical Consultant, including those aspects of the subsurface conditions which may affect design and construction of proposed structures, and shall consult with the Consultant on the design and engineering requirements of the Project. Based on such analysis and consultation, the Geotechnical Consultant shall submit a professional evaluation and recommendations for the necessary areas of considerations, including but not limited to the following:
  - i. A determination of site class “A” through “F” as required by Section 1615 of the current edition of the International Building Code. Describe in the proposal how this evaluation will be made. Note that an aggressive evaluation of this parameter is required.

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- ii. Site specific values of the Short Period Spectral Response Acceleration ( $S_s$ ) and the 1 Second Spectral Response Acceleration ( $S_1$ ) as shown in the current edition of the International Building Code.
- iii. Foundation support of the structure and slabs, including soil bearing pressures, bearing elevations, foundation design recommendations and anticipated settlement.
- iv. Anticipation of, and management of, groundwater for design of structures and pavements.
- v. Lateral earth pressures for design of walls below grade, including backfill, compaction and subdrainage, and their requirements.
- vi. Soil material and compaction requirements for site fill, construction backfill, and for the support of structures and pavements.
- vii. Pavement design.
- viii. Design criteria for temporary excavation and temporary protection such as excavation sheeting, underpinning and temporary dewatering systems.
- ix. Stability of slopes.
- x. Seismic activity.
- xi. Frost penetration depth and effect.
- xii. Analysis of the effect of weather and/or construction equipment on soil during construction.
- xiii. Analysis of soils to ascertain presence of potentially expansive, deleterious, chemically active or corrosive materials or conditions, or presence of gas.
- xiv. Evaluation of depth of material requiring rock excavation methods for removal.
- xv. Provide recommendations for the maximum safe slope from a new footing to another new or existing footing or structure, either higher or lower than the new footing.

## **r) Site Survey**

### **1. General**

- a. Due to the ever changing activities at the Campus, it is required that a site survey be performed for any project that will disrupt the existing ground.

### **2. Boundary Survey Requirements**

- a. Surveyor is required to retrace the boundary of the property and confirm Owner's recorded legal description of the property.
- b. Note identity, jurisdiction and width of adjoining streets and highways, width and type of pavement. Identify landmarks.
- c. Show recorded or otherwise known adjacent property lines, easements and rights-of-way; state the owner of right of each. Show lines per last deed of record. Surveyor is not required to set corner monuments.
- d. Provide a surveyor's report to depict evidence of possible prescriptive Rights of Way in favor of or against subject site. Provide summary as to the nature of possible prescriptive Rights of Way in separate document.
- e. Show zoning of property; if more than one zone, show the extent of each. Show zoning of adjacent properties and properties across adjacent street(s) or highway(s).

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- f. Show building line and setback requirements, if any.

### 3. Topographical and Situation Survey Requirements

The survey shall include all above ground improvements and natural features, as well as below grade improvements as described herein. The following are further descriptions and requirements:

- a. Plot location of buildings and structures within 0.10 feet. Dimension perimeters in feet and decimals to 0.01 foot. State the character and general materials of structures. State the number of stories and elevation for each floor. Dimension to property lines and other buildings. Show encroachments, including cornices, belt courses, etc. either way across property lines.
- b. All elevations shall be to the nearest 0.01 foot.
- c. State elevation of each floor for all buildings within survey limits.
- d. List coordinates on all building corners, utility structures (at or above existing grade) and property corners.
- e. Vacant parcels shall be noted VACANT.
- f. Describe fences and walls, including height and type of construction. Identify party walls and locate them with respect to property lines.
- g. Provide contours at 1 foot intervals; error shall not exceed one half contour interval. Provide index contours at 5 foot intervals.
- h. Provide spot elevations at an approximate 50 foot square grid covering the property. Decrease grid spacing where necessary. Show all grade breaks, tops of bank, toe slopes, etc.
- i. Spot elevations along streets, drive areas and intersections shall be at minimum 25 foot intervals. Decrease interval where necessary. Show all grade breaks. Indicate street crown if applicable, as well as top and bottom of curbs/gutters and edges of sidewalks.
- j. Show location, size, material (if available) and depth of all utilities, public and private. Utilize above ground information, underground utility markings, Owner record drawings, private locating services (if applicable) and other appropriate and available sources to obtain the most accurate information available, and incorporate data on survey. Note source of information on survey. Utilities include, but are not limited to, water, gas, electric, telephone, cable, fiber, steam, chilled water/hydronic, fuel oil and medical gases.
- k. Locate all on-site fire hydrants as well as off-site hydrants if within 300' of structures on the property. Indicate the size of the main serving each and the valve location. Locate post indicator valves and fire department connections whether free standing or attached to buildings.
- l. Locate power and communications systems above and below grade. Research Owner documents to verify most accurate information available and incorporate data on survey. Note source of information. Provide minimum clearance dimension from overhead lines to ground.

The Facilities Services Facility Standards (FS)<sup>2</sup> is a living document which is subject to change.

Please refer to the latest version of the document in accordance with Exhibit C of the contract agreements.

- m. Show location, size, depth, material and direction of flow of sanitary sewers, combination sewers, storm sewers and culverts serving, or on, the property; location of catch basins and manholes, and inverts of pipe at each. Research Owner documents to verify most accurate information available and incorporate data on survey.
- n. Show location of underground tanks and septic fields.
- o. Provide name and address of the operating authority of each utility as well as contact person and phone number.
- p. Show flood plain, and or flood level of streams of adjacent bodies of water and analysis of site for potential flooding. Utilize flood insurance rate maps (FIRM) and other FEMA information to confirm this information.
- q. Show boundary of storm watershed area flowing onto the property from adjacent property. Provide small scale map to delineate boundary watershed area. Utilize USGS quadrangle maps or local contour maps to confirm this information.
- r. Locate trees of 2" caliper and greater (3' above ground). Locate within 1' tolerance and give species in English and botanical terms. Show approximate dripline of trees. Outline edges of heavily wooded areas.
- s. Indicate areas of landscaping. Show outlines of areas where appropriate and describe nature of landscaping (i.e. mulch beds, ground cover, plantings, hedges, etc).
- t. Provide an adequate number of permanent benchmarks with descriptions and elevations to nearest 0.01'.

#### **4. Drawing Requirements**

- a. Drawing sheets shall be trim size 24" X 36" with 1 1/2" left binding edge and 1" borders.
- b. Drawings shall be at a scale of 1"=20' or 1"=30'. All drawings shall be at the same scale. If an alternate scale is proposed, Surveyor shall state reasons for alternate in the proposal. Contact Architect/Engineer prior to preparing survey to coordinate and verify drawing scale.
- c. When survey has multiple sheets, include matchlines and a keymap on each sheet.
- d. Include graphic scale with each drawing.
- e. Show NORTH arrow and locate North to the top of the sheet.
- f. Include legend of symbols and abbreviations used on drawing(s).
- g. Boundary and topographic information, where both are required, shall be on the same drawing unless otherwise requested by the Architect/Engineer.
- h. State elevation datum on each drawing. Use North American Vertical Datum (NAVD-88). Give location of benchmark used.
- i. Furnish one reproducible transparency of each drawing. The Licensed Land Surveyor shall sign and seal drawing and shall certify that, to the best of the Surveyor's knowledge, information and belief all information thereon is true and accurately shown.

### **3. References**

City of Chicago- Department of Water Management

The Facilities Services Facility Standards (FS)<sup>2</sup> is a living document which is subject to change.

Please refer to the latest version of the document in accordance with Exhibit C of the contract agreements.

- Stormwater Management Ordinance Manual-January 2011
- Chapter 11-18 Stormwater Management of the Municipal Code of Chicago
- Standard Details for Water main Installations- April 2009
- 2011 Regulations for Sewer Construction and Stormwater Management-January 2011

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