### SANITARY SEWER COMPUTATIONS

#### LANDMARK MALL REDEVELOPMENT
#### PHASE II CONCEPT - BLOCK K

<table>
<thead>
<tr>
<th>Project</th>
<th>Landmark K</th>
<th>PROPOSED SANITARY SEWER DESIGN COMPUTATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Flow Factor</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Avg.</strong></td>
</tr>
<tr>
<td>W</td>
<td>2</td>
<td>0.15</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.50</td>
</tr>
</tbody>
</table>

### EXISTING SANITARY SEWER DESIGN COMPUTATIONS

<table>
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<tr>
<th>Project</th>
<th>Landmark K</th>
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<td>0.50</td>
</tr>
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### PROPOSED SANITARY SEWER DESIGN COMPUTATIONS

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</tr>
<tr>
<td></td>
<td>3</td>
<td>0.50</td>
</tr>
</tbody>
</table>
### SWM PRE - Study Point "1"

#### Curve Number Calculations

<table>
<thead>
<tr>
<th>Area (ac)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.880</td>
<td>Direct Entry</td>
</tr>
<tr>
<td>3.360</td>
<td>Direct Entry</td>
</tr>
<tr>
<td>8.240</td>
<td>2' DEC., 2021</td>
</tr>
</tbody>
</table>

#### Time of Concentration Calculations

1) **Length**: 10.00 ft  
   **Velocity**: 0.67 ft/sec  
   **Capacity**: 117,174 cf

2) **Length**: 12.09 ft  
   **Velocity**: 1.37 ft/sec  
   **Capacity**: 136,159 cf

3) **Length**: 12.50 ft  
   **Velocity**: 1.78 ft/sec  
   **Capacity**: 176,935 cf

### SWM PRE Offsite Undetained Runoff Calculations

<table>
<thead>
<tr>
<th>Curve Number Calculations</th>
<th>Area (ac)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.880</td>
<td>Direct Entry</td>
<td></td>
</tr>
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<td>Direct Entry</td>
<td></td>
</tr>
<tr>
<td>8.240</td>
<td>2' DEC., 2021</td>
<td></td>
</tr>
</tbody>
</table>

#### 1 Year Flow Calculations

- **Runoff**: 12.15 hrs  
  - Inflow Area: 45.22% Impervious Area
  - Volume: 116.006 cfs

#### 2 Year Flow Calculations

- **Runoff**: 12.10 hrs  
  - Inflow Area: 45.22% Impervious Area
  - Volume: 116.006 cfs

#### 10 Year Flow Calculations

- **Runoff**: 12.09 hrs  
  - Inflow Area: 45.22% Impervious Area
  - Volume: 116.006 cfs

### SWM PRE Onsite UNDETAINED Runoff Calculations

<table>
<thead>
<tr>
<th>Curve Number Calculations</th>
<th>Area (ac)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
</tr>
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  - Inflow Area: 45.22% Impervious Area
  - Volume: 116.006 cfs

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- **Runoff**: 12.10 hrs  
  - Inflow Area: 45.22% Impervious Area
  - Volume: 116.006 cfs

#### 10 Year Flow Calculations

- **Runoff**: 12.09 hrs  
  - Inflow Area: 45.22% Impervious Area
  - Volume: 116.006 cfs

### PRE-DEVELOPMENT HYDROCAD MODEL - Study Point "1"

#### Curve Number Calculations

<table>
<thead>
<tr>
<th>Area (ac)</th>
<th>Description</th>
</tr>
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<tr>
<td>4.880</td>
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   **Capacity**: 117,174 cf

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   **Capacity**: 136,159 cf

3) **Length**: 12.50 ft  
   **Velocity**: 1.78 ft/sec  
   **Capacity**: 176,935 cf
This document contains detailed information about hydrological calculations and flow estimations for Landmark Mall in Virginia. The calculations include:

- **10 Year Event Summary**
  - Inflow Area: 1,392,570 sf
  - Outflow: 351,094 sf
  - Storage: 30,290 cf
  - Peak Elev: 187.37'
  - Time Span: 0-20.00 hrs
  - Primary Culvert
  - Orifice/Grate
  - Orifice/Grate
  - Orifice/Grate
  - Orifice/Grate

- **1 Year Event Summary**
  - Inflow Area: 1,392,570 sf
  - Outflow: 351,094 sf
  - Storage: 30,290 cf
  - Peak Elev: 187.37'
  - Time Span: 0-20.00 hrs
  - Primary Culvert
  - Orifice/Grate
  - Orifice/Grate
  - Orifice/Grate
  - Orifice/Grate

- **2 Year Event Summary**
  - Inflow Area: 1,392,570 sf
  - Outflow: 351,094 sf
  - Storage: 30,290 cf
  - Peak Elev: 187.37'
  - Time Span: 0-20.00 hrs
  - Primary Culvert
  - Orifice/Grate
  - Orifice/Grate
  - Orifice/Grate
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  - Primary Culvert
  - Orifice/Grate
  - Orifice/Grate
  - Orifice/Grate
  - Orifice/Grate

The document also includes tables and diagrams for SWM POST - Study Point "1" and Vaul #4 with detailed flow calculations and peak elevations. The calculations are performed using the SCS TR-20 method with UH=SCS, Weighted-CN, and Time Span=0.00-20.00 hrs, dt=0.01 hrs.
### BMP COMPS & NARRATIVE

#### LANDMARK MALL REDEVELOPMENT
#### PHASE II CONCEPT - BLOCK K

- **CITY OF ALEXANDRIA, VIRGINIA**
- **PLAN DATE**
- **REVISIONS**

---

### Drainage Area A

- **Area Cover (acres)**
- **A Salts**
- **B Salts**
- **C Salts**
- **D Salts**
- **Total**
- **Land Cover %**

<table>
<thead>
<tr>
<th>Description</th>
<th>A Salts</th>
<th>B Salts</th>
<th>C Salts</th>
<th>D Salts</th>
<th>Total</th>
<th>Land Cover %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flow/Effluent Space</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td>Managed Full Coverage</td>
<td>3.52</td>
<td>3.52</td>
<td>3.52</td>
<td>3.52</td>
<td>14.08</td>
<td>53.6%</td>
</tr>
<tr>
<td>Managed Full Coverage (no soak)</td>
<td>47.75</td>
<td>47.75</td>
<td>47.75</td>
<td>47.75</td>
<td>190.98</td>
<td>75.6%</td>
</tr>
<tr>
<td>Total</td>
<td>47.75</td>
<td>47.75</td>
<td>47.75</td>
<td>47.75</td>
<td>190.98</td>
<td>75.6%</td>
</tr>
</tbody>
</table>

---

### Site Results (Water Quality Compliance)

- **Area Check**
- **S.B.A.**
- **S.B.C.**
- **D.S.**
- **F.A.E.**
- **Total**

<table>
<thead>
<tr>
<th>Description</th>
<th>S.B.A.</th>
<th>S.B.C.</th>
<th>D.S.</th>
<th>F.A.E.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>N.A.</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Nitrogen Load Reduction Achieved</td>
<td>271.08</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>271.08</td>
</tr>
<tr>
<td>N.A.</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
</tr>
</tbody>
</table>

---

### Nitrogen Loads (Informational Purposes Only)

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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</thead>
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<tr>
<td>Pre-Development</td>
<td>750.41</td>
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<tr>
<td>Post-Development</td>
<td>0.00</td>
</tr>
<tr>
<td>Total</td>
<td>750.41</td>
</tr>
</tbody>
</table>

---

**FOR INFORMATION ONLY**

- **APPROVED**
- **DEVELOPMENT SITE PLAN NO.**
- **ADMINISTRATIVE REVIEW**
- **APPROVAL DATE**
- **DRAWN BY**
- **PRINTED BY**
- **CHECKED BY**
- **REVISION**
### Proposed BMP Computations

**Project Description**

- Development or Redevelopment: Redevelopment

<table>
<thead>
<tr>
<th>Drainage Area</th>
<th>Impervious</th>
<th>Pervious</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site Area</td>
<td>47.75 ACRES</td>
<td>2.52 ACRES</td>
<td>50.27 ACRES</td>
</tr>
<tr>
<td>On-Site Treated</td>
<td>29.92 ACRES</td>
<td>0.00 ACRES</td>
<td>29.92 ACRES</td>
</tr>
<tr>
<td>Off-Site Treated</td>
<td>0 ACRES</td>
<td>0 ACRES</td>
<td>0 ACRES</td>
</tr>
<tr>
<td>Total Treated</td>
<td>29.92 ACRES</td>
<td>0 ACRES</td>
<td>29.92 ACRES</td>
</tr>
<tr>
<td>Any On-Site Disconnected by a Vegetated Buffer (25 ft)</td>
<td>0 ACRES</td>
<td>0 ACRES</td>
<td>0 ACRES</td>
</tr>
<tr>
<td>Total On-Site Treated or Disconnected</td>
<td>29.92 ACRES</td>
<td>0 ACRES</td>
<td>29.92 ACRES</td>
</tr>
</tbody>
</table>

**Water Treatment on Site**

<table>
<thead>
<tr>
<th>BMP Type</th>
<th>Area treated by BMP (acres)</th>
<th>Impervious area treated by BMP (acres)</th>
<th>BMP efficiency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAND FILTER</td>
<td>8.08 ACRES</td>
<td>8.08 ACRES</td>
<td>60%</td>
</tr>
<tr>
<td>TREEWELL</td>
<td>4.79 ACRES</td>
<td>4.79 ACRES</td>
<td>60%</td>
</tr>
<tr>
<td>GREEN ROOF</td>
<td>17.07 ACRES</td>
<td>17.07 ACRES</td>
<td>60%</td>
</tr>
</tbody>
</table>

**Miscellaneous**

- Total WQV treated: YES
- Detention on site: YES
- Project is within which watershed? HOLMES RUN WATERSHED
- Project discharges to which body of water? HOLMES RUN

### Actual BMP Computations

**Project Description**

- Development or Redevelopment: Redevelopment

<table>
<thead>
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<th>Total</th>
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<td>0.00 ACRES</td>
<td>29.92 ACRES</td>
</tr>
<tr>
<td>Off-Site Treated</td>
<td>0 ACRES</td>
<td>0 ACRES</td>
<td>0 ACRES</td>
</tr>
<tr>
<td>Total Treated</td>
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<td>0 ACRES</td>
<td>29.92 ACRES</td>
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<td>0 ACRES</td>
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<tr>
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<td>0 ACRES</td>
<td>29.92 ACRES</td>
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</tr>
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<td>TREEWELL</td>
<td>4.79 ACRES</td>
<td>4.79 ACRES</td>
<td>60%</td>
</tr>
<tr>
<td>GREEN ROOF</td>
<td>13.99 ACRES</td>
<td>13.99 ACRES</td>
<td>60%</td>
</tr>
<tr>
<td>BIOTREATMENT</td>
<td>2.49 ACRES</td>
<td>2.49 ACRES</td>
<td>50%</td>
</tr>
</tbody>
</table>

**Miscellaneous**

- Total WQV treated: YES
- Detention on site: YES
- Project is within which watershed? HOLMES RUN WATERSHED
- Project discharges to which body of water? HOLMES RUN

---

PROPOSED BMP COMPUTATIONS

ACTUAL BMP COMPUTATIONS

---
OPEN SPACE PLAN
LANDMARK MALL REDEVELOPMENT
PHASE II CONCEPT - BLOCK K
CITY OF ALEXANDRIA, VIRGINIA
1"=20'

OPEN SPACE CALCULATION:
BLOCK K SITE AREA: 2.27 AC.

AT-GRADE OPEN SPACE: 1,532 SF
ABOVE-GRADE OPEN SPACE: 24,246 SF
TOTAL OPEN SPACE PROVIDED: 25,778 SF (26.05%)

OPEN SPACE REQUIRED: 24,741 SF OR 0.57 AC. (25% OF DEVELOPMENT AREA)

FILE No. DSUP-13080
DATE 04-15-2022

C. I. = N/A
SCALE OF SHEET = N/A
PLAN DATE DEC., 2021

REVISIONS

Planners  Engineers  Landscape Architects  Land Surveyors

Urban, Ltd.
www.urban-ltd.com

4200 D TECHNOLOGY CT.
CHANTILLY, VA. 20151
TEL. 703.642.2306
FAX 703.378.7888

BLOCK H
BLOCK M

T.M #047.02-03-11
LOT 602
1,789,430 S.F.
41.0796 ACRES
T.M #047.02-03-11
LOT 602
1,789,430 S.F.
41.0796 ACRES

BLOCK H

BLOCK K

BLOCK M

T.M #047.02-03-11
LOT 602
1,789,430 S.F.
41.0796 ACRES

230' BUILDING COVERAGE LINE

269' BUILDING COVERAGE LINE

230' BUILDING COVERAGE LINE

T.M #047.02-03-11
LOT 602
1,789,430 S.F.
41.0796 ACRES

230' BUILDING COVERAGE LINE

269' BUILDING COVERAGE LINE

230' BUILDING COVERAGE LINE

TOTAL BUILDING K RESIDENTIAL BUILDING PERIMETER COVERED = 1,256 FT. BUILDING PERIMETER COVERED = 271 FT. (21.80%) BUILDING PERIMETER COVERED = 575 FT. (46.00%) FROM PRIVATE ROAD BUILDING PERIMETER COVERED = 269 FT. (21.42%) FROM PUBLIC ROAD BUILDING PERIMETER COVERED = 230 FT. (18.31%) FROM PRIVATE ROAD

TOTAL BUILDING K RESIDENTIAL COVERAGE = 1,151 FT. (91.64%)

GROUP CLASSIFICATION: CDD-2
LEGEND
TRUNK LOCATION
CRITICAL ROOT ZONE
TREE NUMBER
EXISTING TREE

SCALE: 1"=20'

MATCHLINE
SEE SHEET

FILE No.
DATE:
DEC., 2021

REVISIONS

Planners  Engineers  Landscape Architects  Land Surveyors

FOR INFORMATIONAL PURPOSES ONLY. NOT IN APPLICATION AREA.
1. PAVING PATTERNS ARE PRELIMINARY AND ARE INTENDED TO SHOW CHANGES IN MATERIALS. PATTERN DO NOT DEPICT FINAL PAVING PATTERN DETAIL.
2. PRELIMINARY LIGHT LOCATIONS SHOWN. FINAL LIGHT LOCATIONS MAY SHIFT WITH FINAL PHOTOMETRICS AND FINAL BLOCK ENGINEERING.
3. BMP TREE WELLS ARE PROPOSED AS PART OF THE INFRASTRUCTURE PLAN FOR THE SITE. SEE ENCLOSED 10029

NOT FOR CONSTRUCTION

CONCEPT II
SUBMISSION
04-15-2022
MATTHEW V. CLARK
Lic. No. 952
200 S. PEYTON STREET
ALEXANDRIA, VA 22314
703.549.7784
WWW.LANDDESIGN.COM

LANDESIGN PROJ.#
SCALE
PROJECT
NORTH
NO.
DESCRIPTION
DATE
REVISION / ISSUANCE

NOTES:
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3. BMP TREE WELLS ARE PROPOSED AS PART OF THE INFRASTRUCTURE PLAN FOR THE SITE. SEE ENCLOSED 10029

MATERIALS + PLANTING
PLAN
1" = 30'-0"
**DOWNSPOUT FEEDING**

**BIO PLANTER**

**BUILDING FACE**

**SPLASH BLOCKS**

**GROWING MEDIUM**

**PONDING DEPTH**

**CHOKER STONE COURSE**

**CLEAN WASHED GRAVEL**

**PERF. PIPE TO RUN LENGTH OF PLANTER**

**PIPE TO STORMDRAIN OR OUTFALL POINT**

**PARAPET WALL**

**VARIES APPROX. 6”**

**FREEBOARD**

**NOTES:**

1. ADDITIONAL DESIGN AND COORDINATION FOR THE FINAL NUMBER AND SPECIES OF PLANTINGS IS ONGOING AND WILL BE UPDATED TO MEET CROWN COVER AND DIVERSITY REQUIREMENTS WITH A FUTURE SUBMISSION.
PARKING SPACE DIMENSIONS PER CITY OF ALEXANDRIA ZONING ORDINANCE SECTION 8-200 (D)

<table>
<thead>
<tr>
<th>TYPE DESCRIPTION</th>
<th>18'-6&quot;</th>
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<tbody>
<tr>
<td>PARKING LEGEND</td>
<td></td>
</tr>
<tr>
<td>EVCS ELECTRIC VEHICLE CHARGING STATION</td>
<td></td>
</tr>
<tr>
<td>T TANDEM</td>
<td></td>
</tr>
<tr>
<td>STD STANDARD</td>
<td></td>
</tr>
<tr>
<td>LE/FE STANDARD</td>
<td></td>
</tr>
<tr>
<td>LOW EMMITTING/FUEL EFFICIENT</td>
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</tr>
<tr>
<td>HC VAN ACCESSIBLE VAN</td>
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</tr>
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<td>HC ACCESSIBLE</td>
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</tr>
<tr>
<td>NOT EXCEED 2% IN ANY DIRECTION</td>
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<tr>
<td>LE/FE COMPACT</td>
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<tr>
<td>LOW EMMITTING/FUEL EFFICIENT</td>
<td></td>
</tr>
</tbody>
</table>

1) SLOPE OF ACCESSIBLE PARKING SPACES AND ACCESS AISLES SHALL NOT EXCEED 2% IN ANY DIRECTION

NOTES:

LEVEL 1 PLAN

3/64" = 1'-0" A1.0 A2.2
### Level 1 Floor Area
- **Exclusions**: Balcony, 240 SF; Circulation, Shaft, Mechanical, 2147 SF; Lavatory, 650 SF; Loading Dock, 850 SF
- **Net Floor Area**: After Exclusions, 69530 SF
- **Total Gross Area**: 73418 SF

### Level 2 Floor Area
- **Exclusions**: Balcony, 51 SF; Circulation, Shaft, Mechanical, 1181 SF; Lavatory, 950 SF
- **Net Floor Area**: After Exclusions, 45563 SF
- **Total Gross Area**: 47744 SF

### Level 3 Floor Area
- **Exclusions**: Balcony, 224 SF; Circulation, Shaft, Mechanical, 2902 SF; Lavatory, 3399 SF
- **Net Floor Area**: After Exclusions, 54482 SF
- **Total Gross Area**: 61006 SF

### Level 4 Floor Area
- **Exclusions**: Balcony, 822 SF; Circulation, Shaft, Mechanical, 2983 SF; Lavatory, 3749 SF
- **Net Floor Area**: After Exclusions, 50964 SF
- **Total Gross Area**: 58518 SF

### Level 5 Floor Area
- **Exclusions**: Balcony, 532 SF; Circulation, Shaft, Mechanical, 3148 SF; Lavatory, 4049 SF
- **Net Floor Area**: After Exclusions, 54538 SF
- **Total Gross Area**: 62267 SF

### Block K Total Floor Area
- **Exclusions**: Balcony, 3966 SF; Circulation, Shaft, Mechanical, 22184 SF; Lavatory, 21492 SF; Loading Dock, 850 SF
- **Net Floor Area**: After Exclusions, 459686 SF
- **Total Gross Area**: 10115081 SF
LEVEL 6 FLOOR AREA

AREA EXCLUSION: Balcony 1050 SF
AREA EXCLUSION: Circulation, Shaft, Mechanical 3148 SF
AREA EXCLUSION: Lavatory 4049 SF
NET GROSS AREA: 54538 SF

LEVEL 7 FLOOR AREA

AREA EXCLUSION: Balcony 756 SF
AREA EXCLUSION: Circulation, Shaft, Mechanical 3139 SF
AREA EXCLUSION: Lavatory 3999 SF
NET GROSS AREA: 53429 SF

BLOCK K TOTAL FLOOR AREA

AREA EXCLUSION: Balcony 1706 SF
AREA EXCLUSION: Circulation, Shaft, Mechanical 2218 4 SF
AREA EXCLUSION: Lavatory 21492 SF
AREA EXCLUSION: Loading 850 SF
NET GROSS AREA: 459686 SF

TOTAL GROSS AREA: 62785 SF

TOTAL GROSS AREA: 61323 SF

TOTAL GROSS AREA: 1011 508180 SF

NOTE: Basement garage areas not counted towards GFA or Floor Area Ratio.
GREEN BUILDING APPROACH

LANDMARK MALL REDEVELOPMENT

PHASE II CONCEPT - BLOCK K

CITY OF ALEXANDRIA, VIRGINIA

Urban, Ltd.
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GREEN BUILDING APPROACH

The landmark mall redevelopment (UFD) project is pursuing LEED Neighborhood Development (ND) certification. The UFD Block K project is pursuing LEED ND NC.

The project will meet the 2019 Green Building Challenge requirements as accepted by the CCO conditions.

Energy

Suitability Building Performance is critical to achieve whole building energy modeling for the project. The effort will assess the impacts of the envelope, mechanical, plumbing, and electrical systems on the overall energy performance of the building. The effort is focused on continually monitoring and tracking (through the USGBC's BMS) all energy use associated with the project. This will be essential to demonstrate the overall performance of the building.

- Window-to-wall ratios
- Window performance
- Energy use inefficiencies
- Ventilation
- Heating and cooling efficiencies
- Weatherization and controls

The project will be designed to meet the U.S. energy cost savings, equivalent to a LEED NC energy credit, and improve the performance of the building. The project will be designed to meet the requirements of the GBCI's LEED NC energy credit. The project will also be designed to meet the requirements of the GBCI's LEED NC energy credit.

Water

The project will include the following strategies to conserve water:

- Irrigation system using drip irrigation, and incorporates on-site water harvesting, to reduce potable water use
- Low-flow fixtures and appliances to reduce potable water use

Low-flow fixtures and appliances will be used to reduce potable water use. A 40% water use reduction, at minimum, will be achieved for plumbing fixtures as required by the GBCI's LEED NC criteria. Potential future flow rates

- Use of high-efficiency toilets and fittings, 0.28 gpf (gallons per flush) water use. 1.5 gpf (gallons per flush)....