Water’s Edge Park

“The Smart Park for a Smart City”
What is a Smart Park?

- Fully automated and unmanned...to the greatest extent possible
- Safe and secure
- Digitally empowered
- Energy efficient
Water’s Edge Park …fully automated and unmanned

- Z-wave integration… to turn on/off remotely
  - Lighting
  - Splash pad
  - Restroom facility
  - Picnic shelters
  - Emergency / night lighting
Water’s Edge Park ...fully automated and unmanned

- WiFi-enabled HVAC control
  - Adjust and monitor remotely
- Access control
  - Lock / unlock doors remotely on a schedule
  - Open / close gate remotely on a schedule
Water’s Edge Park... fully automated and unmanned

- Bigbelly trash receptacles
  - Solar-powered
  - Remote monitoring and alerts
  - Trash compacting to reduce pickup frequency
Water’s Edge Park

- Cutting edge video surveillance
  - Restroom facility
  - Picnic areas
  - Playgrounds
  - Basketball and volleyball courts
  - Splash pad
  - Parking

...safe and secure
Water’s Edge Park

...safe and secure

- Access control
  - Lock / unlock restroom facility doors remotely
  - Open / close parking lot gate remotely
  - Remote monitoring and alerting
- Emergency phone at restroom facility
Water’s Edge Park... digitally empowered

- Video surveillance
  - Monitor park activity remotely
  - Count visitors remotely
- WiFi
  - Full WiFi coverage for visitors and events
Water’s Edge Park

- Digital kiosk
  - Dynamic content
  - Advertise city events and services
  - Update remotely
• Highspeed fiber connection for...
  – Video surveillance
  – WiFi
  – Access control
  – Digital kiosk
  – Remote equipment control
• Energy efficient LED lighting

• Smart response HVAC control
  – Learns heating and cooling times
  – Adjusts cycles to deliver the right temperature
Water’s Edge Park...energy efficient

- Dyson Airblade dB hand dryers
  - Fast
  - Hygienic
  - Energy efficient
  - Costs less to run
  - Better for the environment
• Rachio Smart Sprinkler Controller
  – Control remotely and receive real-time notifications
  – Adapts for weather
    • Checks local forecast via Internet
  – Saves water and money
    • Detailed water usage reporting
Attachment B
Technology Requirements

A. IT Data Closet

- The IT Data Closet shall be constructed as part of the Restroom Facility.
  - The IT Data Closet shall be a usable space that is at least 6’ wide by 8’ deep, with a dedicated temperature control, and be fully air conditioned.
  - The IT Data Closet shall have a commercial-grade, vinyl tile floor, with tiles at least 12” x 12” in size, and at least 1/8” in thickness.
  - All walls shall have fire-rated, 5/8” thick plywood panels – that have been painted with two (2) coats of fire-retardant paint – installed on all walls. All walls shall be completely covered by fire-retardant panels, unless as otherwise specified by the City.
  - A HID multiCLASS SE security card reader capable of reading both HID Prox cards and HID iClass Seos security cards, compatible with the City’s access control system, as approved by the City, shall be installed on the door to the IT Data Closet.
  - At minimum, the following conduits shall be provided:
    - One (1) conduit, at least 2” in diameter, to be used for Telephone Facilities (telephone service), shall originate from the curb in a location as designated by the local telephone company (telco) to provide facilities for connection of telephone services to the building.
      - An “in-ground” vault shall be provided near the curb in a location as designated by the local telephone company (telco), and as approved by the City.
    - Two (2) conduits, each at least 2” in diameter, to be used for Fiber Network Infrastructure Services (fiber cable), shall originate from the curb in a location as designated by the City to provide fiber data network connections to the building.
      - An “in-ground” shall be provided near the curb in a location as designated by the City.
    - One (1) conduit, at least 3” in diameter, shall be provided and originate from each Security pole, to be used for Fiber Network Infrastructure Facilities (fiber connection to each Security pole) and Video Surveillance System (video surveillance cameras), to provide facilities for connection video surveillance equipment to the building.
      - Additional conduits shall be provided as needed for electrical service, etc....
    - One (1) conduit, at least 3” in diameter, shall be provided and originate from each WiFi pole, to be used for Fiber Network Infrastructure Facilities (fiber connection to each WiFi pole) and Wireless Network Infrastructure Facilities (wireless networking, etc...), to provide facilities for connection of wireless infrastructure equipment to the building.
      - Additional conduits shall be provided as needed for electrical service, etc....
  - All conduits shall terminate within the IT Data Closet, in a location as specified by the City.
o All conduits terminating outside the building shall be appropriately “capped” or “sealed” to prevent water intrusion.

o At least one (1) pull string shall be left inside of each conduit after all wire pulls through the conduits have been completed.

o All conduits shall be numbered and labeled neatly and appropriately.

o A map / diagram (i.e. as-built plan) showing all conduit locations and physical paths shall be provided electronically in both Adobe Portable Document Format (PDF) and CAD file format.

- Two (2) 6U, flush mount, wall/equipment brackets, capable of supporting up to fifty (50) pounds, constructed of 1/8” thick aluminum, used to flush mount equipment vertically against a wall, with predrilled holes to accommodate 19” equipment and rails having 3” channels, with a black semi-gloss powder coat finish shall be installed on the fire-rated plywood on wall inside the IT Data Room, in a location as designated by the City (Black Box Item # RM052).

- A ladder rack, of sufficient length and size, with a width of at least 12”, used for cable management, shall be installed inside of the IT Data Closet and shall connect the Wall Brackets to the back wall, front wall and side walls.

- Both vertical and horizontal cable management shall be used and installed, as approved by the City.
  o Vertical cable management shall be installed on both above, below and on the sides of the Wall Bracket for any cabling/connections.
  o Horizontal cable management shall be provided both above and below each CAT6E network patch panel and, above and below each fiber patch panel.

B. Cabling

- All network wiring shall use blue, plenum-rated, unshielded twisted pair (UTP), category 6E (CAT6E) cable, and shall be encased in conduit where required by applicable Local, State and Federal laws and regulations, or Code Requirements, unless otherwise indicated, required, or as approved by the City.

- Any cable installed underground will be rated WET locations as defined in NEC codes.

- Wiring for all cardscan devices and Access Control System keypads, etc... shall use blue, plenum-rated, unshielded twisted pair (UTP), category 6E (CAT6E) cable, or other compatible equivalent approved by the City, and shall be encased in conduit where required by applicable Local, State and Federal laws and regulations, or Code Requirements, unless otherwise indicated, required, or as approved by the City.

- All cable supports above any drop ceilings, if and when present, shall be plenum-rated.

- Plenum-rated, Arlington loops, as opposed to standard J-Hooks, shall be used.

- All tie wraps shall be Velcro and plenum-rated.

- A quantity sufficient to connect all network drops and other relevant cables, of forty-eight (48) port, RJ45, category 6E (CAT6E), 2U network patch panels, shall be installed in the Wall Bracket inside the IT Data Closet, in a location as specified by the City. Only forty-eight (48) port patch panels shall be used.

- Any wiring located in an area exposed to the roofing system (i.e. no ceiling tiles) shall be concealed within conduit (i.e. NO EXPOSED WIRES).
Conduit shall be UL listed, meeting National Electrical Code (NEC) standards.

- All network wires for data ports shall be terminated at both ends to connect the network drops to the IT Data Closet:
  - All network wires shall be terminated to RJ45, category 6E (CAT6E) jacks within single-gang, two (2) port, flush mount faceplates, with blue female RJ45 jacks, unless otherwise indicated or specified by the City.
  - Inside the IT Data Closet, network wires shall be terminated to the network patch panels previously specified and shall have at least 8’ of slack spooled up neatly behind the patch panel using appropriate cable management hardware/techniques.
  - Network drops shall be provided on walls, in locations as designated by the City, for wall-mount telephones, wireless access points, network cameras, etc....
    - Restroom Facility
      - Four (4) network drops for network-based, video surveillance cameras.
      - One (1) network drop for an emergency phone.
- All data and telephone jacks and ports, both on their respective patch panels and on their respective faceplates, shall be numbered and labeled neatly and appropriately.
- A floor plan / diagram showing all network drop locations and their respective network patch panel port numbers shall be provided electronically in both Adobe Portable Document Format (PDF) and CAD file format.

C. Electrical

- All electrical outlets shall be flush mounted wall, ceiling or floor receptacles, unless otherwise indicated or specified by the City.
- Restroom Facility
  - A whole building surge protector and panel protectors shall be provided, including installation of a Transient Voltage Surge Suppressor (TVSS) device(s) connecting to all points of potential voltage threat going into the IT Data Closet, as identified and approved by the City.
  - All electrical receptacles / outlets shall be Z-wave enabled. Electrical receptacles/outlets shall be installed in IT Data Closet, storage room area, building exterior, and plumber’s chase area. Electrical receptacles/outlets shall not be located/installed within the men’s and women’s restroom areas.
- IT Data Closet
  - Two (2), separate, 20 Amp, grounded circuits, each with two (2) orange two-gang, receptacles, and flush mount faceplates matching the color used for all other areas, shall be installed on each wall, on the fire-rated plywood, inside of the IT Data Closet, in locations as specified by the City.
- Picnic Shelters
  - Electrical service connections to Picnic Shelters shall be connected to / through a Z-Wave Wireless Smart Lighting and Appliance Control Circuit Breaker(s) (i.e. GE 40 Amp Z-Wave Direct-Wire Indoor/Outdoor Smart Switch P/N 12726, or approved equivalent), installed in the Restroom Facility.
- Emergency / Night Lighting
o Electrical service connections for Emergency / Night Lighting shall be connected to / through a Z-Wave Wireless Smart Lighting and Appliance Control Circuit Breaker(s) (i.e. GE 40 Amp Z-Wave Direct-Wire Indoor/Outdoor Smart Switch P/N 12726, or approved equivalent), installed in the Restroom Facility.

- Splashpad
  o Electrical service connections and all applicable communications/operations system for Splashpad shall be connected to / through a Z-Wave Wireless Smart Lighting and Appliance Control Circuit Breaker(s) (i.e. GE 40 Amp Z-Wave Direct-Wire Indoor/Outdoor Smart Switch P/N 12726, or approved equivalent), installed in the Restroom Facility.

- Security Poles
  o Appropriate surge protection shall also be installed at each respective Security Pole.
  o Appropriately sized electrical service shall be provided to each respective Security Pole, capable of supporting all video surveillance equipment, network equipment, etc....
  o As necessary, additional conduits shall be provided to the actual video surveillance system equipment, network equipment, etc....
    ▪ At least one (1) pull string shall be left inside of each conduit after all wire pulls through the conduits have been completed.

- WiFi Poles
  o Appropriate surge protection shall also be installed at each respective WiFi Pole.
  o Appropriately sized electrical service shall be provided to each respective WiFi Pole, capable of supporting all network/wireless equipment, etc....
  o As necessary, additional conduits shall be provided to the actual network/wireless equipment, etc....
    ▪ At least one (1) pull string shall be left inside of each conduit after all wire pulls through the conduits have been completed.

D. Grounding

- One (1) copper, grounding bus bar, designed to accommodate up to at least fifteen (15) screwed-down, 4 AWG wire connections, shall be mounted on an isolator – so that it is not in direct contact with ignitable materials – on each wall, installed on the fire-rated plywood, inside the IT Data Closet, in locations as specified by the City, that of which itself shall be properly grounded using green, braided, 4 AWG, copper wire.
- The Wall Brackets, used for mounting patch panels and other equipment, shall be grounded to the grounding bus bar using green, braided, copper wire of the appropriate gauge (AWG) as specified in the Wall Bracket instructions (at a minimum of 4 AWG).
- The ladder rack, used for cable management, shall be grounded to the grounding bus bar using green, braided, copper wire of the appropriate gauge (AWG) as specified in the ladder rack instructions (at a minimum of 4 AWG).
- The network patch panel(s), used for the termination of all network connections, shall be grounded to the grounding bus bar using green, braided, copper wire of the appropriate gauge (AWG) as specified in the patch panel instructions (at a minimum of 10 AWG).
- All network-related junction boxes shall be appropriately grounded.
• All Telephone Facilities, Video Surveillance System equipment, Access Control System equipment, Fiber Network Infrastructure equipment, Wireless Network Infrastructure Facilities, etc... shall be appropriately grounded.
• The Digital Signage, Security Poles, WiFi Poles, etc... shall be appropriately grounded / bonded to the building ground.
• In addition to the above, all grounding and bonding shall be provided in accordance with all requirement of the National Electrical Code (NEC).

E. Telephone Facilities

• The City of Tamarac use a Cisco Voice over IP (VoIP) phone system – Cisco Unified Communications Manager (CUCM). The VoIP system utilizes the City’s existing data network for voice communications. The phone system does, however, use POTS lines for both 911 service and failover of the VoIP phone system. As such, telephone facilities up to the demarc are required.
• Contractor is required to ensure that in order to provide for at least six (6) POTS / telephone lines, a 25-pair telephone distribution line/wire (i.e. RJ21 cable), at minimum, shall be provided, if not already provided for by the local telephone company (telco), and shall be ran within the conduit from the curb to the IT Data Closet (dmarc), and then terminated to an RJ21X punch down block.
• The contractor shall be responsible for coordinating the installation of local telephone service facilities, infrastructure and wiring with the local telephone company (telco), to provide for Telephone Facilities up to the demarcation point (dmarc), which shall be located within the IT Data Closet.
• All necessary 25-pair or 50-pair telephone distribution lines/wires, as specified by the City in relation to the number of telephone lines needed, to be ran within the conduit from the curb to the IT Data Closet as previously specified, shall be provided by the contractor, if not already provided for by the local telephone company (telco).
• An RJ21X interface punch-down block (66 block) shall be installed on the fire-rated plywood on a wall inside the IT Data Closet, in a location as specified by the City, to be used as the demarcation point (dmarc) for the local telephone company (telco).
• If and when applicable, telephone lines shall be connected from the RJ21X interface punch-down block (66 block) to the appropriate panels or other system(s) by the contractor.
• Any telephone wiring coming in from the street going up/down any poles shall be encased in conduit to provide protection and prevent tampering.

F. Access Control System

• An appropriately sized Access Control System / panels / equipment, of the same make and model used throughout other City facilities, or other compatible equivalent approved by the City, shall be installed.
• The Access Control System shall be connected and integrated to the City’s current Access Control System, as specified by the City.
• All Access Control System panels / equipment shall be installed inside of the IT Data Closet, in a location as specified by the City.

• The cabinet / panel doors shall be integrated and compatible with the City’s metal key system / layers.
  o The City’s master cabinet / panel door key shall be capable of opening the Access Control System panel(s).
  o A site metal key shall be created that can open all panel doors at the site.
  o An individual metal key shall be provided for each Access Control System panel door at the site.
  o The contractor shall coordinate with the City’s Project Manager when creating all key access systems.

• Wiring for all cardscan devices and keypads shall be provided, in locations as specified by the City.
• All Access Control System equipment shall be appropriately grounded.
• All exterior access doors identified as cardscan or keypad entry doors shall be wired with one (1) blue, plenum-rated, unshielded twisted pair (UTP), category 6E (CAT6E) cable, encased in conduit; and, if said doors require both a cardscan and keypad, both shall be wired with blue, plenum-rated, unshielded twisted pair (UTP), category 6E (CAT6E) cables encased in conduit.
• All card readers shall be HID multiCLASS SE card readers, capable of reading both HID Prox Cards and HID iClass Seos cards.
• All exterior doors (including, but not limited to, utility closets, storage closets, mechanical rooms, electrical rooms, restroom facilities, etc...) shall have a card reader installed.
• All NEMA enclosures shall be integrated with / connected to the Access Control System such that an alarm will be triggered whenever opened.
• Additional card readers shall be provided for the following (if and when present):
  o IT Data Closet.
  o Mechanical Room.
  o Electrical Room.
  o Utility Room.
  o General Storage Rooms.
  o Restroom Facilities.
  o Please note that additional doors may be identified during the design stage.

• All doors with card access shall use electric strikes, unless otherwise specified and approved by the City, and if/where/when required, entry/exit devices and sensors shall be provided.
• One (1) video intercom capable of reading security badges, also with two (2) buttons, shall be installed / flush-mounted at the Restroom Facility.
  o The video intercom and card reader shall be integrated as one device. The device shall be a 2N Helios IP Force IP intercom, or equivalent as approved by the City.
  o The integrated security card reader shall be capable of reading both HID Prox cards and HID iClass Seos security cards, compatible with the City’s access control system.
  o The video intercom shall be integrated with the City’s Cisco Unified Communications Manager (CUCM) phone system and access control system by the contractor, so that a visitor when pressing the intercom button, essentially places a video phone call to internal Cisco video IP Phones, allowing City staff to see and talk
with the visitor, and allowing City staff to open/close the main entrance door using the phone.
  o A blue “emergency” light shall be installed on the wall above the video intercom.
• In order to provide emergency personnel with access to the facility in case of an emergency, Knox Boxes shall be installed.
  o A Knox Box shall be installed at the Restroom Facility.
• Instruction shall be provided to the City on the operation of the Access Control System.
• The building shall also have a Master Key System, with further details (including key schedule) as specified and as approved by the City.

G. Video Surveillance System

• The City of Tamarac utilizes a centralized, network video surveillance system. Network cameras shall be purchased and installed by the contractor in locations designated by the City.
• Restroom Facility
  o The Restroom Facility shall have external junction boxes in four (4) locations (one in each corner of the building), with minimum 1” conduit, connecting from each junction box back to the IT Data Closet.
  o For Restroom Facility exterior locations, at least one (1) pull string shall be left inside of each conduit after all wire pulls through the conduits have been completed.
  o External junction boxes shall use at minimum 1” conduit, connecting from each junction box to the inside of the building.
  o All device locations require a back-box and concealed conduit routed within wall to ceiling area.
  o Continuous conduits sections shall be provided at all areas exposed to public view or areas with routings across inaccessible ceilings.
  o Conduit sleeves shall be provided thru walls.
  o Network wires / drops shall be provided in all locations as designated by the City, and shall be wired with (1) blue, plenum-rated, unshielded twisted pair (UTP), category 6E (CAT6E) cable.
• For exterior locations at the park (away from the Restroom Facility), a Security Pole shall be provided.
  o At minimum, seven (7) Security Poles are required for video surveillance.
    ▪ For each Security Pole, the contractor shall provide necessary electrical service, and a fiber connection, further detailed in respective sections.
  o Security Poles for video surveillance shall be at minimum ten feet (10’) tall (above finished grade), unless otherwise approved by the City.
  o Security Poles shall blend into surrounding environment and made to be aesthetically pleasing (i.e. black, round, power-coated finish).
    ▪ Wiring / cabling shall all be contained within each Security pole, and not visible.
    ▪ Associated NEMA enclosures shall blend into surrounding environment and made to be aesthetically pleasing.
- Wiring / cabling shall all be contained within each NEMA enclosure, and not visible.
- Any conduits protruding to / from each NEMA enclosure shall be underground or appropriately screened from public view.
- NEMA enclosures shall be appropriately screened from public view by shrubbery or other landscaping.

- The following quantities of cameras shall be provided:
  - Qty 2  Panasonic WV-S2531LN
  - Qty 9  Arecont Vision AV12276DN

- Camera make / models shall be as specified above unless a more current make / model is available from Panasonic and Arecont respectively, whereas in such instance, the most current make / model shall be provided, as identified by the City.

- All appropriate ceiling mount, wall mount, pendant caps and other necessary parts shall be provided by the contractor.

- The contractor shall install all network cameras in locations identified by the City, appropriately configure said network cameras, assist with pointing network cameras and add / configure in the City’s video surveillance system.

H. Fiber Network Infrastructure Facilities

- Fiber connections shall be provided by the contractor to the following locations:
  - City of Tamarac Water Treatment Plant.
  - Kiosk.
  - Security Poles
  - WiFi Poles

- Fiber connection to City of Tamarac Water Treatment Plant.
  - A single-mode (SM), indoor/outdoor rated, plenum-rated, armored, 9/125 micron, fiber cable with at least twelve (12) strands shall be provided, connected and terminated, to provide a network connection from the new Restroom Facility to the City of Tamarac Water Treatment Plant (7803 NW 61st Street, Tamarac, FL 33321).
  - A fiber optic vault, “in-ground”, along with all necessary conduits, shall be provided by the contractor for the facility at the curb / near the street, as well as at the curb / near the street for the City of Tamarac Water Treatment Plant. Additional fiber optic vaults shall be provided by the contractor as needed to complete the connection.
  - Both ends of the fiber network connection shall be terminated to fiber patch panels using LC connectors.
  - The end terminating in the new Restroom Facility shall be terminated in the IT Data Closet.
  - The end terminating in the existing City of Tamarac Water Treatment Plant shall be terminated in the existing IT Data Closet on the first floor of the building.

- Kiosk.
  - A multi-mode (MM), indoor/outdoor rated, plenum-rated, armored, 50/125 micron, OM3 or greater, fiber cable with at least six (6) strands shall be provided, connected
and terminated, using one (1) of the two (2) conduits, to provide a network connection from the new Restroom Facility to the kiosk location.

- A NEMA 4 enclosure, at least 24” x 24” x 12” in size, or larger and of sufficient size to fit all necessary equipment (if adequate space or connection locations are not available within the digital sign itself), shall be provided at the kiosk location wherein fiber cable terminations shall be made for the kiosk location.
  - NEMA enclosures shall blend into surrounding environment and made to be aesthetically pleasing.
  - Wiring / cabling shall all be contained within each NEMA enclosure, and not visible.
  - Any conduits protruding to / from each NEMA enclosure shall be underground or appropriately screened from public view.
  - NEMA enclosures shall be appropriately screened from public view by shrubbery or other landscaping.

- The end terminating in the new Restroom Facility shall be terminated in the IT Data Closet.

- A fiber optic vault (or vaults), “in-ground”, along with all necessary conduits, shall be provided by the contractor for the fiber connection as needed.

- Both ends of the fiber network connection shall be terminated to fiber patch panels using LC connectors.

- Additional details are provided in the Digital Signage section.

- Security Poles
  - A multi-mode (MM), indoor/outdoor rated, plenum-rated, armored, 50/125 micron, OM3 or greater, fiber cable with at least six (6) strands shall be provided, connected and terminated, using one (1) of the two (2) conduits, to provide a network connection from the new Restroom Facility to each Security Pole.

- A NEMA 4 enclosure, at least 24” x 24” x 12” in size, or larger and of sufficient size to fit all necessary equipment, shall be provided at each Security Pole location wherein fiber cable terminations shall be made for each Security Pole location.
  - NEMA enclosures shall blend into surrounding environment and made to be aesthetically pleasing.
  - Wiring / cabling shall all be contained within each NEMA enclosure, and not visible.
  - Any conduits protruding to / from each NEMA enclosure shall be underground or appropriately screened from public view.
  - NEMA enclosures shall be appropriately screened from public view by shrubbery or other landscaping.

- The end terminating in the new Restroom Facility shall be terminated in the IT Data Closet.

- A fiber optic vault (or vaults), “in-ground”, along with all necessary conduits, shall be provided by the contractor for the fiber connection as needed.

- Both ends of the fiber network connection shall be terminated to fiber patch panels using LC connectors.

- For Security Poles where only one (1) network connection is required:
▪ A hardened fiber converter shall be provided by the contractor and utilized to convert from the fiber connection to an Ethernet connection, needed by the wireless network equipment and video surveillance equipment.

  o For Security Poles where two (2) or more network connections are required:
    ▪ A Signamax industrial / hardened switch shall be provided and installed, along with all necessary parts, mounting equipment, accessories and connectors:
      • One (1) Signamax 8-Port 10/100/1000BaseT/TX Unmanaged Industrial PoE+ Switch plus 2-100/1000Base SFP ports (Signamax P/N 065-7410GPOEP).
      • One (1) Signamax 48 Volt Industrial Power Supply (Signamax P/N DC-1848-240W)
      • Two (2) Signamax Small Form-factor Pluggable (SFP) Gigabit Interface Modules (Signamax P/N 065-79SXMG-H)
      • Two (2) Emerson SolaHD SRC-DRS Series, DIN Rail Protection (Surge Protectors) (Catalog Number STC-DRS-036) (one surge protector for the switch and one spare to keep on hand).

  ▪ WiFi Poles

    o A multi-mode (MM), indoor/outdoor rated, plenum-rated, armored, 50/125 micron, OM3 or greater, fiber cable with at least six (6) strands shall be provided, connected and terminated, using one (1) of the two (2) conduits, to provide a network connection from the new Restroom Facility to each WiFi Pole.
    o A NEMA 4 enclosure, at least 24” x 24” x 12” in size, or larger and of sufficient size to fit all necessary equipment, shall be provided at each WiFi Pole location wherein fiber cable terminations shall be made for each WiFi Pole location.
      ▪ NEMA enclosures shall blend into surrounding environment and made to be aesthetically pleasing.
      ▪ Wiring / cabling shall all be contained within each NEMA enclosure, and not visible.
      ▪ Any conduits protruding to / from each NEMA enclosure shall be underground or appropriately screened from public view.
      ▪ NEMA enclosures shall be appropriately screened from public view by shrubbery or other landscaping.
    o The end terminating in the new Restroom Facility shall be terminated in the IT Data Closet.
    o A fiber optic vault (or vaults), “in-ground”, along with all necessary conduits, shall be provided by the contractor for the fiber connection as needed.
    o Both ends of the fiber network connection shall be terminated to fiber patch panels using LC connectors.
    o For WiFi Poles where only one (1) network connection is required:
      ▪ A hardened fiber converter shall be provided by the contractor and utilized to convert from the fiber connection to an Ethernet connection, needed by the wireless network equipment and video surveillance equipment.
    o For WiFi Poles where two (2) or more network connections are required:
A Signamax industrial / hardened switch shall be provided and installed, along with all necessary parts, mounting equipment, accessories and connectors:

- One (1) Signamax 8-Port 10/100/1000BaseT/TX Unmanaged Industrial PoE+ Switch plus 2-100/1000Base SFP ports (Signamax P/N 065-7410GPOEP).
- One (1) Signamax 48 Volt Industrial Power Supply (Signamax P/N DC-1848-240W)
- Two (2) Signamax Small Form-factor Pluggable (SFP) Gigabit Interface Modules (Signamax P/N 065-79XMG-H)
- Two (2) Emerson SolaHD SRC-DRS Series, DIN Rail Protection (Surge Protectors) (Catalog Number STC-DRS-036) (one surge protector for the switch and one spare to keep on hand).

- All fiber connections shall be underground.
- All fiber connection strands shall be fully tested, certified and labeled / numbered appropriately.
- A network map (showing physical fiber location(s)), shall be provided electronically in both Adobe Portable Document Format (PDF) and CAD file format upon completion.

I. Wireless Network Infrastructure Facilities

- All wireless network equipment such as Wireless Access Points (WAPs), antennas, mounting brackets, etc... shall be provided by the contractor.
- The contractor shall install a Cisco Meraki wireless networking solution, which shall provide full 2.4 GHz and 5 GHz, 802.11ac WiFi coverage of the entire park.
  - The design shall include minimum quantities of equipment, as listed below:
    - Qty 8 Cisco Meraki MR84 Cloud Managed AP (MR84)
    - Qty 8 Cisco Meraki license for MR84-HW (LIC-ENT-5YR)
    - Qty 6 Cisco Meraki Dual-band Omni Antenna (MA-ANT-20)
    - Qty 6 Cisco Meraki Dual-band Patch Antenna (MA-ANT-25)
  - The design / solution shall include five (5) years of 24x7 Cisco maintenance and support (aka Cisco SMARTnet).
  - The contractor shall engage and utilize services of a Cisco partner (rated gold or above) to engineer, design, install and configure the Cisco Meraki wireless network infrastructure based on the final proposed layout of the park.
    - The engineered design shall account for trees and other obstructions, and adjust / position WiFi Poles appropriately, and in sufficient quantities to provide full WiFi coverage at the park.
  - The following is an example heatmap (diagram), provided by Cisco Meraki, showing suggested placement for WiFi Poles.
    - Note: This example diagram is based on the “Waters Edge Park Proposed Features” map only. It does not account for addition, removal or moving of trees, features or other obstructions. The final, engineered design is expected to be based on the final, accepted park design / layout.
At minimum, five (5) WiFi Poles are required for wireless networking.

- For each WiFi Pole, the contractor shall provide necessary electrical service, and a fiber connection, further detailed in respective sections.

- The Restroom Facility may be used to mount wireless equipment; however, equipment shall be mounted at heights identified by the final, engineered design (at minimum, ten feet (10’) above the restroom roof, unless otherwise approved by the City). If sufficient space or mounting methods are unavailable on / for the Restroom Facility, then additional WiFi Poles shall be installed and utilized.

- WiFi Poles shall maintain un-obstructive clear line of sight between poles and keep ten (10) feet clearances (minimum) from tree canopy. Design builder shall coordinate all efforts of surrounding landscape design to integrate WiFi poles and maintain vertical clearances while accommodating/ taking into consideration vegetative growth (tree canopies) within a 10-year span.

- WiFi Poles shall blend into surrounding environment and made to be aesthetically pleasing (i.e. black, round, power-coated finish).
  - Wiring / cabling shall all be contained within each WiFi pole, and not visible.
  - Associated NEMA enclosures shall blend into surrounding environment and made to be aesthetically pleasing.
  - Wiring / cabling shall all be contained within each NEMA enclosure, and not visible.
  - Any conduits protruding to / from each NEMA enclosure shall be underground or appropriately screened from public view.
  - NEMA enclosures shall be appropriately screened from public view by shrubbery or other landscaping.

- Interior Wireless Network Infrastructure
In order to provide network connectivity to interior wireless network equipment, a total of one (1) network drop (wire runs) shall be installed in the ceiling within the IT Data Closet, in location(s) as designated by the City.

- For interior locations within the Restroom Facility, as designated by the City as network drops for wireless equipment:
  - All network wiring shall adhere to the Cabling standards set forth above.
  - All network wires shall be terminated to RJ45, category 6E (CAT6E) jacks within single-gang, one (1) port, flush mount faceplates, or "biscuit boxes", mounted in the ceiling in said location (above the ceiling tiles), unless otherwise indicated or specified by the City.

- For each exterior location at the Restroom Facility, designated by the City as network drops for wireless equipment:
  - All network wiring shall adhere to the Cabling standards set forth above.
  - All network drops shall adhere to Grounding standards set forth above.
  - All network wires shall be terminated to outdoor-rated, RJ45, category 6E (CAT6E) jacks within single-gang, one (1) port, flush mount faceplates, or shall be terminated to RJ45, category 6E (CAT6E) modular connectors/plugs, as specified by the City.
  - Grounding facilities shall be provided to allow the connection of wireless equipment to ground.

- For each exterior location on a WiFi Pole, designated by the City as network drops for wireless equipment:
  - Applicable to the short network runs from the network equipment or fiber converter at each WiFi Pole, going to the respective WiFi equipment. Fiber connections shall be provided to each WiFi Pole, as further details in the Fiber Network Infrastructure Facilities section.
    - All network wiring shall adhere to the Cabling standards set forth above.
    - All network drops shall adhere to Grounding standards set forth above.
    - All network wires shall be terminated to outdoor-rated, RJ45, category 6E (CAT6E) jacks within single-gang, one (1) port, flush mount faceplates, or shall be terminated to RJ45, category 6E (CAT6E) modular connectors/plugs, as specified by the City.
    - Grounding facilities shall be provided to allow the connection of wireless equipment to ground.
    - Cabling shall connect from said wireless equipment to the NEMA enclosure patch panel at the respective WiFi Pole.

J. Lightning Protection System

- A complete and adequate class 1 Lightning Protection System in strict compliance with all applicable Local, State and Federal laws and regulations, Code Requirements as set forth by Underwriters' Laboratories, Inc. (UL) 96 and 96A standards (latest edition), Lightning Protection Institute LPI-175, National Fire Protection Association (NFPA) No. 780 standards (latest edition), and all other applicable standards, as specified and approved by the City, shall be furnished and installed.
• The Lightning Protection System shall protect the building, Digital Signage, Security Poles, WiFi Poles, all light poles, security gates, perimeter fencing and all other equipment / structures.
• The lightning protection system is to include a Transient Voltage Surge Suppressor (TVSS) so to eliminate or reduce potential damage to devices from electrical surges and spikes.
• All Lightning Protection System equipment shall be appropriately grounded.
• Upon completion of installation, the City shall be furnished with a UL Letter of Certification for the Lightning Protection System.
• A diagram showing all Lightning Protection System equipment locations and wiring shall be provided electronically in both Adobe Portable Document Format (PDF) and CAD file format.

K. Irrigation Control

• A Rain Bird controlled irrigation system, equipped with the Rain Bird LNK WiFi Module, shall be provided, installed and configured, in order to provide for remote control, monitoring and alerting via network connection (http://wifi-pro.rainbird.com), and shall be located within the Restroom Facility.

L. Heating, Ventilation and Air Conditioning (HVAC)

• The IT Data Closet shall have a dedicated climate control system (e.g. split air conditioning unit).
• A Honeywell Wi-Fi 9000 Color Touchscreen Thermostat, or approved equivalent, shall be provided for the IT Data Closet.

M. Digital Signage

• A new Keewin Display Public Transport Station Display (75") (2500 nits BRIGHTNESS) (Black), Outdoor Air-Cooled Kiosk (http://www.keewindisplay.com), or approved equivalent, along with any relevant/necessary warranties, service/maintenance plans and other services for at least three (3) years, shall be provided for the Kiosk.
• The new sign shall be connected to the City’s network for remote management.
• The new sign, as well as all equipment located here or nearby, shall be appropriately grounded, and also have lightning protection installed.
• A fiber connection shall be provided to a NEMA 4 enclosure (if adequate space or connection locations are not available within the digital sign itself), which shall house the signage equipment.
  o NEMA enclosures shall blend into surrounding environment and made to be aesthetically pleasing.
  o Wiring / cabling shall all be contained within each NEMA enclosure, and not visible.
  o Any conduits protruding to / from each NEMA enclosure shall be underground or appropriately screened from public view.
- NEMA enclosures shall be appropriately screened from public view by shrubbery or other landscaping.
- A Signamax industrial / hardened switch shall be provided and installed, along with all necessary parts, mounting equipment, accessories and connectors:
  - One (1) Signamax 8-Port 10/100/1000BaseT/TX Unmanaged Industrial PoE+ Switch plus 2-100/1000Base SFP ports (Signamax P/N 065-7410GPOEP).
  - One (1) Signamax 48 Volt Industrial Power Supply (Signamax P/N DC-1848-240W)
  - Two (2) Signamax Small Form-factor Pluggable (SFP) Gigabit Interface Modules (Signamax P/N 065-79SXMG-H)
  - Two (2) Emerson SolaHD SRC-DRS Series, DIN Rail Protection (Surge Protectors) (Catalog Number STC-DRS-036) (one surge protector for the switch and one spare to keep on hand).
- Appropriately sized electrical service shall be provided to the new sign, capable of supporting all electronic control equipment for the sign, network equipment, etc....
- Additional conduits shall be provided as necessary to reach the signage equipment.
  - At least one (1) pull string shall be left inside of each conduit after all wire pulls through the conduits have been completed.
- One (1) black, plenum-rated, shielded, twisted pair (STP), Category 6E (CAT6E) network wire shall be provided and ran to the digital signage equipment in order to provide a network connection.

N. Bathroom / Washroom Technology

- Automatic, hand dryers shall be provided in all locations where requested (i.e. bathrooms), as approved by the City.
  - Dyson Airblade dB hand dryers shall be used.
  - The hand dryers shall be electric powered, and not battery operated, wherein appropriate electrical service shall be provided.
  - In larger bathrooms, providing multiple sinks, at least two (2) automatic, hand dryers shall be provided.
- Automatic soap dispensers shall be provided in all locations where requested (i.e. bathrooms), as approved by the City.
  - The soap dispensers shall be electric powered, and not battery operated, wherein appropriate electrical service shall be provided.
  - Said soap dispensers shall be wall-mounted, unless otherwise approved by the City.
  - In larger bathrooms, providing multiple sinks, one (1) automatic soap dispenser shall be provided for each sink.
- Automatic flushing systems shall be provided in all bathrooms for both toilets and urinals, as approved by the City.
  - Standard electrical service (or as appropriate/required) shall be provided to power said toilet flushing equipment, unless otherwise approved by the City.
  - The sensor shall be located at the appropriate height so to ensure that the toilet seat does not cover the sensor when raised.