

Engineering Services and Equipment Cost Summary AECOM & Kisters (HSA)		
Product	Cost: Year 1	Cost: Year 2
Radar Level Sensors (\$995 each)	\$69,650.00	\$0
Mounting Brackets (\$92.00 each)	\$6,440.00	\$0
Data Loggers (\$1,140 each)	\$79,800.00	\$0
Equipment Enclosures (\$1,175 each)	\$82,250.00	\$0
Outdoor Cameras (\$695 each)	\$48,650.00	\$0
Solar Panels (\$250 each)	\$17,500.00	\$0
Site Visit and Inspection of 70 Sites	\$4,900.00	\$0
Installation of 70 Radar Water Level Stations on Light Poles	\$88,936.00	\$0
Testing and Commissioning of Radar Water Level Measurement Stations	\$0	\$0
Telemetry	\$21,000	\$21,000
Video Processing and Storage	\$8,600	\$8,600
Datasphere	\$12,000	\$12,000
Gridded and Raster Data Services	\$12,000	\$12,000
Public Web Portal	\$19,000	\$19,000
One-Time Labor and Implementation Costs	\$125,000	\$0
Total Cost for Kister Equipment & Services:	\$ 595,726	\$ 72,600
Approximate AECOM Cost :	\$ 80,000	\$ 22,000
Total Cost:	\$ 675,726	\$ 94,600

Note: Kisters estimate does not include maintenance of cameras,
AECOM Yearly estimate (Year 2) does not include Forever Warranty, Battery Cost & Replacement (about \$65K estimate),
AECOM's approximate engineering services based on CES engineering services cost.

www.kisters.net

Radar Water Level and Video Monitoring Equipment and Web Portal

**KISTERS &
Hydrologic Services America**

Water Resources
Equipment & Data
Management



Prepared for:

AECOM and the City of Miami Beach, FL

Submitted by
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WISKI helps you to develop a comprehensive understanding of your water data.

Table of Contents

Document Change Management.....	3
Introduction.....	3
Scope of Work	3
Assumptions and Constraints.....	3
Project Deliverables / Cost	4
Hardware / Sensors / Installation.....	4
Telemetry / Services / Labor	6
Software Service and Labor Cost Summary.....	11
Total Project Cost.....	11
Principal Contacts	12

Document Change Management

Person	Date	Version	Change Note
Matt Ables	Nov 9, 2020	V 1.0	Initial draft

Introduction

The purpose of this document is to outline the planned implementation and configuration of radar water level sensors and day/night video cameras with all data hosted in the KISTERS datasphere solution and presented in a series of private and public web portals for the City of Miami Beach, FL. Radar sensors and video cameras will be attached to standard KISTERS gauges which include data loggers, solar panels, and 4G communications. All data collected from the gauges will be stored and managed in KISTERS datasphere cloud solution where the data will be automatically verified, additional data products derived, alarming, warnings and information will be distributed. Web portals will present the map-based interfaces that allow the combination of radar sensor data with historic and current video data. Various raster products such as current and future weather radar will also be visible in the portals.

Scope of Work

The City of Miami Beach identified 70 locations to install radar level and video camera gauges across the City. KISTERS will supply all equipment, installation services, and data telemetry for each gauge. KISTERS will work with AECOM and the City to present the gauge data and other integrated sources of data (raster) in internal and external web portals.

Assumptions and Constraints

Below are a list of general assumptions and constraints for the project.

- City will provide articulated boom or other lift devices as required for installation of station equipment on light poles.
- Presence of City personnel on-site if required during equipment installation.
- City supplied lane or shoulder closures if required during installation.
- City of Miami, MOT, FPL or other permits as required for project completion.
- Scope modifications could negatively affect the scheduled delivery date.

Project Deliverables / Cost

Hardware / Sensors / Installation

Part Number & Description	Item Price	Quantity	Total Price
HYC215S5 RADAR LEVEL SENSOR WITH 80 GHz TECHNOLOGY, WATERPROOF, DUSTPROOF, IP66/IP68, OPERATING RANGE TEMPERATURE -40 F to +176 F (-40C to +80 C), MAINTENANCE FREE, WIRELESS BLUETOOTH ADJUSTMENT AND PROGRAMMING. * ± 2 MM ACCURACY * 49 FT (15 M) MEASURING RANGE * SDI-12 OUTPUT * 16 FT (5 M) INSULATED PUR CABLE	\$995.00	70	\$69,650.00
HYC/MB HIGH QUALITY AND ROBUST 8 INCH MOUNTING BRACKET, 316L STAINLESS STEEL. ADJUSTABLE SENSOR HOLDER ALLOWS EASY ALIGNMENT OF SENSOR.	\$92.00	70	\$6,440.00
IQ UC/SDI-12 IRIS UNDERCOVER PRO DATA LOGGER / SDI-12 WITH CELLULAR 3G/4G TELEMETRY AND WITH WIFI PROGRAMMING, INCLUDING 4G 6dB HIGH GAIN ANTENNA. • 2X ANALOG INPUTS (16 BIT RESOLUTION) • 2X DIGITAL INPUT/OUTPUT CHANNEL • 2X DIGITAL INPUT CHANNELS • 2X ANALOG EXCITATION OUTPUT • DIRECT FTP REPORTING (CSV/XML) OF LOGGED DATA TO ONE OR TWO DESTINATIONS • 3 X LED INDICATORS • SDI-12 • IP65 ENCLOSURE • 16MB FLASH MEMORY • INTEGRAL SOLAR CHARGER (10-30V DC INPUT) • 12VDC POWER SUPPLY REQUIRED • REAL TIME CLOCK • INCLUDES OPERATING ILINKSOFTWARE • LOGS SYSTEM TEMPERATURE, BATTERY VOLTAGES/CURRENT AND RSSI SIGNAL STRENGTH)	\$1,140.00	70	\$79,800.00
MISC. PARTS WEATHERPROOF COMPACT EQUIPMENT ENCLOSURE, POWDERCOATED STEEL. COMPLETE WITH; EQUIPMENT MOUNTING BACKPLATE, CRITEC LIGHTNING PROTECTION, TRANSIENT VOLTAGE SPIKE PROTECTION ON ANTENNA LINE, WATERTIGHT CABLE GLANDS, STAINLESS STEEL WEATHRPROOF VENTS WITH INSECT SCREENS, POLE MOUNTING HARDWARE AND LOCKABLE STAINLESS STEEL DOOR HARDWARE.	\$1,175.00	70	\$82,250.00

MISC. PARTS HIGH RESOLUTION 4G INFRARED WEATHERPROOF OUTDOOR CAMERA, WIDE ANGLE LENS FOR VIEWING PUBLIC AREAS, FTP CAPABLE, EVENT BASED IMAGE TRANSMISSION BASED ON WATER LEVEL CHANGES.	\$695.00	70	\$48,650.00
MISC. PARTS SOLAR PANEL WITH POLE MOUNTING HARDWARE AND 12V MAINTENANCE FREE SLA BATTERY FOR SYSTEM POWER. SOLAR PANEL WATTAGE TO BE DETERMINED BASED ON DESIRED CUSTOMER IMAGE TRANSMISSION RATE.	\$250.00	70	\$17,500.00
ENGINEERING SERVICES SITE VISIT AND INSPECTION OF 70 STATIONS THROUGHOUT THE CITY OF MIAMI, TO ENSURE STATION SUITABILITY. PRICE IS BASED ON 5 SITES PER DAY. TOTAL 1 PERSON 14 DAYS.	\$350.00	14	\$4,900.00
ENGINEERING SERVICES INSTALLATION OF 70 RADAR WATER LEVEL STATIONS ON CITY OF MIAMI LIGHT POLES. INCLUDES INSTALLATION OF EQUIPMENT ENCLOSURE, NON-CONTACT RADAR LEVEL SENSOR, IP CAMERA AND SOLAR PANEL. PRICE INCLUDES BASED ON 2 PEOPLE X 47 DAYS. THE FOLLOWING IS INCLUDED. PRICE INCLUDES HOTEL ACCOMODATION AND TRAVEL FOR 2 PEOPLE.	\$88,936.00	1	\$88,936.00
ENGINEERING SERVICES TESTING AND COMMISSIONING OF 70 RADAR WATER LEVEL MEASUREMENTS STATIONS. INCLUDES CUSTOMER TRAINING IN SYSTEM OPERATION.	\$0.00	1	\$0.00
TOTAL Hardware / Equipment			\$398,126

Telemetry / Services / Labor

Telemetry

All gauges will be configured with 4G modems capable of transmitting the radar data as well as the video for presentation and archiving. Data transmission costs from the radar are negligible in comparison to potential charges from video transmission. The gauges have the ability to transmit at different rates depending on the presence of water detected from the radar sensor. For example, during dry or non-flood conditions, the video could submit one image per hour for archive, and during a flood event stream multiple images per second. KISTERS will work with AECOM and the City to find the optimal balance and cost-benefit ratio for video transmission.

Estimated Costs: \$1,750 per month (\$21,000 / year) for 70 stations (AT&T)

Video Processing and Storage

With video cameras in public spaces and the intent to make the recorded videos and images available to the public, a certain amount of automated video post processing is necessary. For example, in the image below, the automated processing is able to identify people and blur their image in the final video. The process can also happen with license plates, etc.



Figure 1 Automated video processing to maintain public privacy.

The storage of video data in the cloud is roughly \$40 per terabyte and KISTERS will work with the City to determine video archive retention times.

Estimated Costs: \$716 per month (\$8,600 / year) for 70 stations

Datasphere

KISTERS datasphere cloud service will act as the internal data engine and data management core to the proposed solution. All data from gauges, videos, and raster products like precipitation forecasts and weather radar will be accessible and managed from this system. City staff will be able to manage alarm settings and thresholds, view raw and processed radar sensor data, as well as view the video archives.



Figure 2 Datasphere alarm threshold management with graph of radar data.

Estimated Costs: \$1,000 per month (\$12,000 / year) for 70 stations

Gridded and Raster Data Services

Products like current and future weather radar and total precipitation forecasts will also be integrated into the datasphere system and viewable by both City staff and the public web portal. All gridded and raster products will be stored and managed in the datasphere cloud solution.

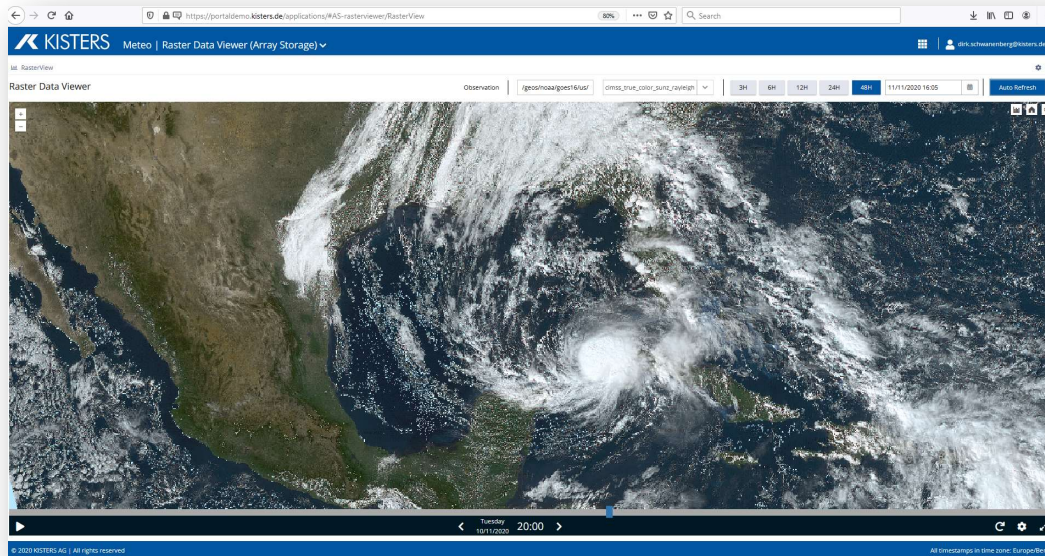


Figure 3 Gridded and raster data viewer. Allows browsing of historic, current, and forecast data sets.

Estimated Costs: \$1,000 per month (\$12,000 / year)

Public Web Portal

The most visible part of the project will be the public web portal. This portal will clearly present and illustrate the data and products provided by the City radar gauges to the public through a variety of views and interfaces. For example, in the image below, a 'digital twin' can be presented where the public can see radar gauges on a 3-D map of the city and view the radar water levels in a graph below. Critical levels (such as road or sidewalk level) could be color-coded or marked to help illustrate the impact of flooding.

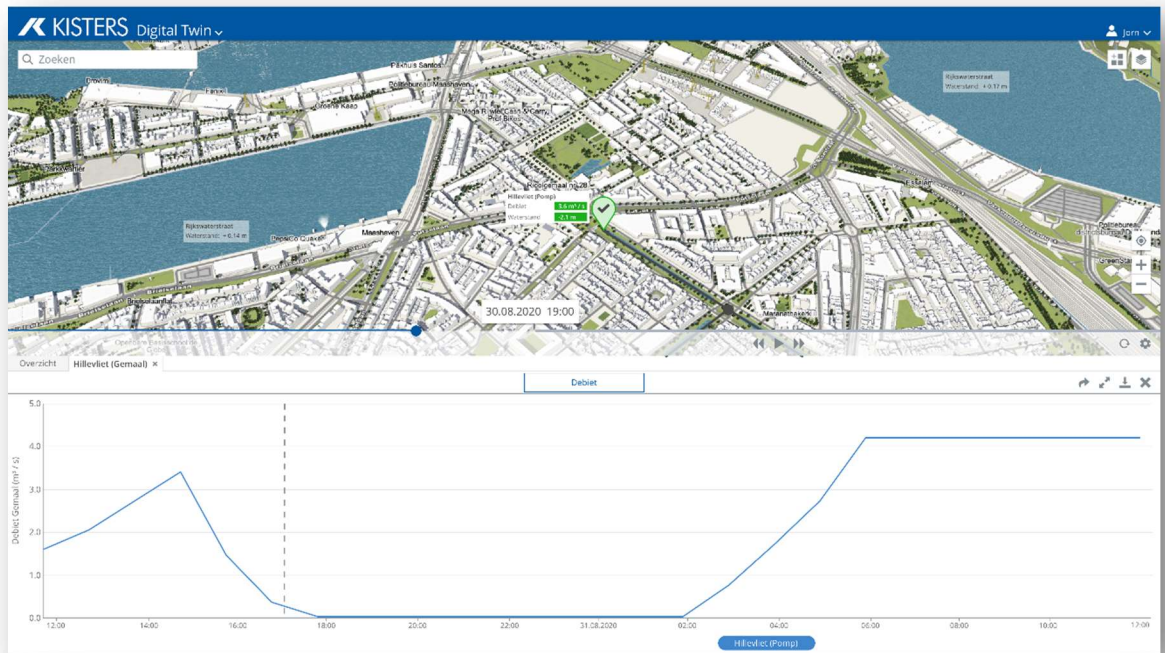


Figure 4 Digital twin showing gauge location and level data within the 3-D map.

While the radar sensor supplies an accurate water level directly below the gauge, the use of video cameras in the portal can help the public assess the impact and visually translate and interpret the data. In the images below, users of the public portal would be able to view current and historic video with the radar water level below in a graph all controlled by a convenient time slider.



Figure 5 Video and radar sensor data in a combined public view.



Figure 6 Video and radar data in combined view with specific reference images to the right.

Estimated Costs: \$1,584 per month (\$19,000 / year)

Software Service and Labor Cost Summary

#	Product	Cost (Monthly)	Annual (1 st year)	Annual (2nd year)	Annual (Nth year)
1	Telemetry	\$1750	\$21,000	\$21,000	\$21,000
2	Video Processing and Storage	\$716	\$8,600	\$8,600	\$8,600
3	Datasphere	\$1,000	\$12,000	\$12,000	\$12,000
4	Gridded and Raster Data Services	\$1,000	\$12,000	\$12,000	\$12,000
5	Public Web Portal	\$1,584	\$19,000	\$19,000	\$19,000
6	One-Time labor and implementation costs		\$125,000		
	TOTAL	\$6,050	\$197,600	\$72,600	\$72,600

Total Project Cost

Item	Cost	Annual Reoccurring Costs
Sensor and Equipment	\$398,126	n/a
Software Service and Labor Cost	\$197,600	\$72,600
TOTAL Project	\$595,726	\$72,600

Principal Contacts

KISTERS Primary Contacts
Name: Matt Ables (Software) or Peter Ward (radar equipment)
Phone Matt: 916-723-1441 Phone Peter: 561-252-1527
E-Mail: matt.ables@kisters.net peter@hydrologicalusa.com

PROPOSED EQUIPMENT

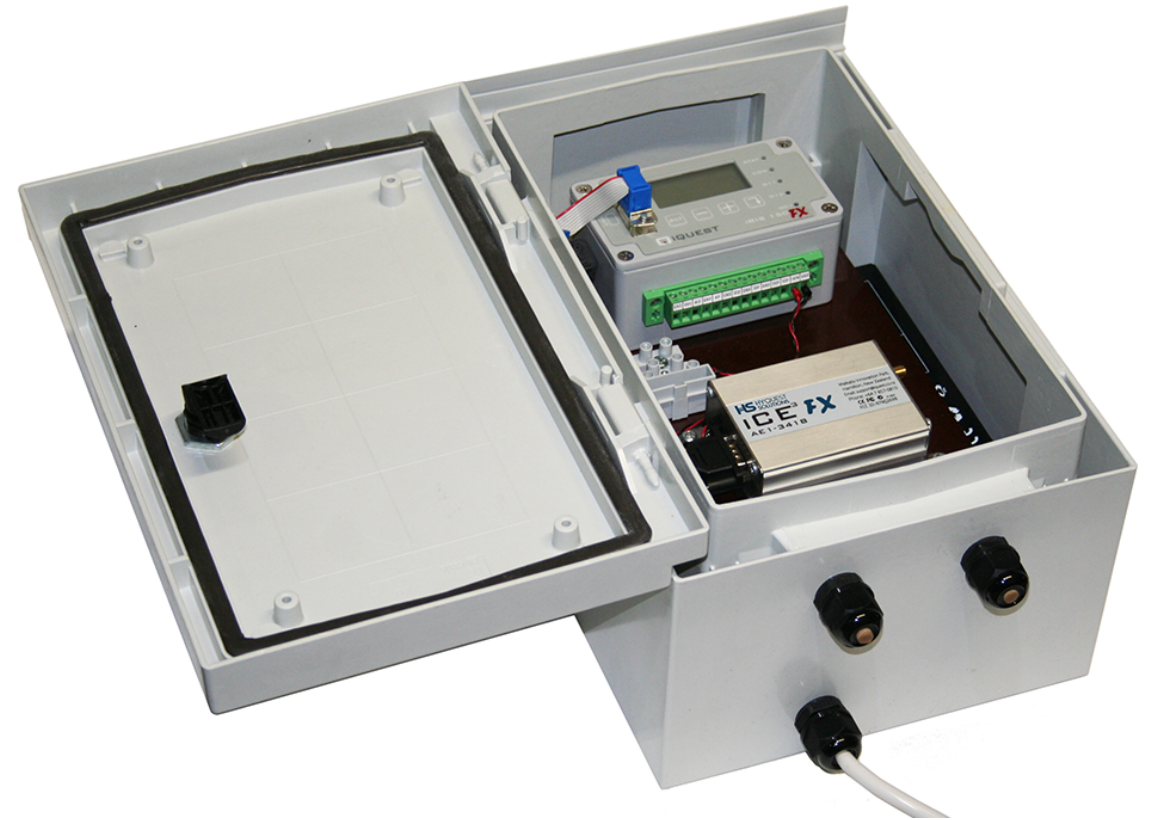
CITY OF MIAMI BEACH



HYDRA-PULSE 80 GHZ RADAR LEVEL SENSOR

TRANSFORMING THE WAY WE MEASURE LEVEL





Engineering Services and Equipment Cost Summary CES & SMARTCOVERS			
Task	Description	Cost: Year 1	Cost: Year 2
1	Scorecard Criteria Development	\$19,800	\$0
2	Develop Draft Scorecard	\$23,600	\$0
3	Sensor Location Recommendation (65 Sensors)	\$23,200	\$0
4	Furnish, Install, and maintain Flood Elevation Sensors (65 Sensors) 65 Sensor packages (control box, sensor, battery, and antenna) @ \$8,564 each	\$556,660	\$0
	Contractor will provide materials, construction concrete pad, and provide MOT where required for 65 locations (\$1200/location)	\$78,000	\$0
	Contractor will install the sensor assembly (harness, battery, ultrasonic sensor, antenna) into 65 traffic enclosures (120 hours @ \$95/hour)	\$11,400	\$0
	Yearly Active Site Management (\$365/unit, 65 units), Starting Year Two	\$0	\$23,725
	Forever Warranty (\$399/unit, 65 units), Starting Year Two	\$0	\$25,935
	Starting End of Year Two, Battery Cost is \$358/unit @ 65 units, Every Two years	\$0	\$23,270
	End of Year two, Contractor Replaces Batteries (65 units, 2 hours, \$95/hour)	\$0	\$12,350
	Field Survey Elevation of Each Concrete Pad, Street, Swale, Ditch, and Finished Floor Elevations as Needed, Provided by City Field Survey Contractor	TBA	TBA
5	Permitting: Public Works, Building Department, MOT, Homeowners Associations	TBA	TBA
6	Data Processing and Scorecard Submittal Year One: Complete Final Scorecard Incorporating Field Survey Data Year Two: Submit Updated Scorecard Two Times per Year	\$17,200	\$22,000
7	Scorecard Presentation Support to Elected Officials (Optional)	TBA	TBA
8	Furnish, Install, and Maintain Cameras and Photo Storage Option One Mobile StreamCam 4K (65 units) Solar Option (65 Units) Location and Installation (65 Units) Permitting (\$95-\$120/hour) Starting Year Two, Yearly Software Support and Photo/Video Archive Starting Year Two, Yearly Maintenance (\$95/hour): not included in total	\$421,850	\$155,220
	Furnish, Install, and Maintain Cameras and Photo Storage Option Two SecuriCam Lite (65 units) Solar Power Upgrade (65 Units) Location and Installation (65 Units) Permitting (\$95-\$120/hour) Starting Year Two, Yearly Video Hosting and Software Service Starting Year Two, Yearly Maintenance (\$95/hour): not included in total	\$560,300	\$136,500
Total Cost with Camera Option 1:		\$1,151,710	\$262,500
Total Cost with Camera Option 2:		\$1,290,160	\$243,780
Total Cost without Camera:		\$729,860	\$107,280

Note: Final cost does not include permitting, maintenance, scorecard presentation to elected officials, or field survey elevation

City of Miami Beach

Stormwater Flooding Improvement Validation Project

Equipment Purchase, Installation and Scorecard Scope of Work

11/18/20

OVERVIEW

The City of Miami Beach is making significant investments in stormwater improvements throughout the City and would like to develop a system to validate its progress in reducing flooding. To this end, the City intends to use historic data collected during past storm events and collect future flooding elevation data to compare to flood reduction target goals for its neighborhoods in a Scorecard system that is easily understood by its residents. The City also would like to collect video footage of neighborhood flooding to correlate with the Scorecard so that its citizens can easily validate the progress being made.

SCOPE OF WORK

Task 1 Scorecard Criteria Development

CONTRACTOR will meet with City staff to discuss the criteria to be used for development of a Scorecard system that correlates the flooding of streets during designated storm events to a Flood Protection Level of Service (LOS) Scorecard. The depth of stormwater over the centerline of the roadway may be used to determine the LOS designation A, B, C or D applied. However, like the recent West Avenue Stormwater Improvement Project, the lowest finished flood elevations of structures may also be an important consideration. CONTRACTOR will provide meeting minutes following each meeting, and a Draft and Final Memorandum describing the criteria chosen to designate the Levels of Service to be used in the Scorecard.

Most important will be establishing the specific criteria associated with designating LOS A, B, C or D and potentially a LOS Goal since different goals will have a related ultimate cost. For example, targeting one lane of the road to be dry during a 10-year, 24-hour storm event will cost more than a target of a dry centerline during the same event. The methodology used to designate flooding LOS of 2-lane, 4-lane or divided roadways must be also discussed. There are an infinite number of combinations of streets, finished flood elevation and storm event criteria that can be chosen to be the City's Target Flood Protection LOS. It is recommended that the chosen criteria be easily understood by all.

To limit this effort, the City may choose to aggregate the streets in a neighborhood into a "Neighborhood LOS" with various items weighing into the LOS designation. For example, the City may choose a criterion such as centerline flooding of a percentage of streets, or the street with the lowest elevation in a neighborhood to establish the LOS for the neighborhood. Further, the LOS target must be consistent across all neighborhoods in the City so that there is no perception that one neighborhood is favored over another.

Task 1 will be an iterative process with Task 2 because completion of the Draft Scorecard Map may reveal issues that cause the City to modify the LOS criteria. The submittal of the Final Memorandum of Task 1 will be following the completion of Task 2.

Deliverables:

- Basin Master Plan Information by others, Basin Boundaries, Streets and Drainage Information, flooding data collected during past storm events. (Provided by the City)
- Approximately 5-6 meetings (in person or ZOOM) with staff, with meeting minutes provided (via email) within five (5) working days following the meeting.
- Draft and Final Memorandum detailing the chosen criterion used to establish LOS for streets and neighborhoods.

Task 2 – Develop Draft Scorecard

CONTRACTOR will consider neighborhood boundaries, basin boundaries, streets and drainage information, Stormwater Master Plans (by others), and flooding information collected during past storm events in development of the Draft Scorecard Map. The map is envisioned to be a color-coded map (graphical figure) reflecting a LOS color corresponding to known flood depths documented and/or modeled in the City's 13 neighborhoods following a 10-year, 24-hour storm event (8.75 inches in 24 hours). The flood depths related to roadway centerline (and potentially structure finished floor elevations) will be correlated to a map/figure with one of five colors, four colors corresponding to criteria attached to Level of Service A, B, C, and D, and a fifth for unknown. Note that the City stormwater drainage basins do not always correspond to neighborhood boundaries. Thus, some of these basins and neighborhood may be split into different areas.

The development of the Draft Scorecard will be strictly limited by the existing data and information provided by the City. It is likely that there will be gaps in the information and therefore the Draft Scorecard will be incomplete showing the color associated with "unknown" for those areas. CONTRACTOR will provide a Memorandum listing the additional field survey data needed to fill some of the needed information. Other needed information will be provided by the sensors and cameras below.

Deliverables:

- Memorandum listing field survey information needed. (Field Surveying to be provided by the City surveying contractor)
- Draft Scorecard – Color-coded map of the City's 13 neighborhoods/drainage basins.

Task 3 – Sensors Location Recommendation

CONTRACTOR will review of Google Earth photography, elevation contours, City stormwater drainage system information, and Master Plan information and then will go into the field and recommend no less than 5 locations and 1 alternate location where installing Sensors will provide needed flood data for the criteria identified for Scorecard System developed in Tasks 1 and 2 above. These locations will be behind sidewalks or in swales and installed where the stormwater elevation will be recorded when flood waters are higher than street gutters. Photographs of the recommended locations will be taken of the locations recommended will be taken/submitted.

In addition, a memorandum will be prepared identifying field survey elevation data needed. This field surveying may include collecting finished floor elevations of some homes as well as, street, swale and ditch elevation data.

Deliverables:

- A Memorandum recommending 6 sensor locations in each neighborhood.
- Memorandum identifying field surveying of elevations needed.

Task 4 – Furnish, Install and Maintain Flood Elevation Sensors

The City will purchase five (5) sensor assemblies for each of 13 neighborhoods (65 total) to collect water level data following storm events. So that data can be collected during the worst storm events and potentially a hurricane, the specification is that this water level sensor assembly will be self-contained and not dependent on local power to operate, or cellular signal or internet for data transmission. This self-contained assembly proposed in this task will be a traffic control enclosure (see attached photo) modified to include a sensor, battery wiring harness installed inside, and an antenna to transmit flood level data via the Iridium Satellite system. These self-contained systems are able to transmit flood level data even when all local power and cellular signal has been lost. The traffic control enclosure, wiring harnesses, sensors, batteries and antenna will be shipped to the City and stored until they are collected by CONTRACTOR to be assembled and installed in the field. The proposed Traffic Control Enclosure in the photo is used by CALTRANS and is 66-in high X 24-in deep X 30-in Wide and when fully assembled will provide depth measurements of approximately 42 inches above the concrete pad.

The price of the total assembled package includes the first year of Active Site Management (ASM) and first year of warranty of all materials (excluding the battery). A description of the ASM in attached and includes transmitting the data to CONTRACTOR to process into the SCORECARD. The battery typically last 2 years and it is recommended that all batteries be replaced at one time after 2 years of service.

After the first year the City will be required to purchase an annual Active Site Management (ASM) package that covers all monitoring and data transmission. (see attached).

The City will also be required to purchase a yearly Forever Warranty for each unit covering wiring harness, e-box, ultrasonic sensor, antenna.

CONTRACTOR will construct the small concrete pads in the locations chosen (Task 3) and permitted (Task 5). This pad will be approximately 30-in x 36-in by 8-12 inches thick and may include an anchor to reduce the chances of the enclosure being washed or blown away during a large storm event.

CONTRACTOR will install the sensor assemblies (harness, sensor, battery, antennae) in the enclosure and mount the enclosure on the concrete pad.

The City will provide Field Surveying to establish a NAVD 88 datum elevation of each concrete pad.

The Sensor Assemblies will be owned by the City. CONTRACTOR will not be held responsible for vandalism, theft or damage caused by others.

Deliverables:

- 65 Sensor Assemblies – Traffic Box, Sensor, Wiring Harness, Battery, Antenna
- Yearly Active Site Management and Yearly Warranty to be purchased by City after first year from CONTRACTOR. CONTRACTOR will maintain the assemblies as long as the warranty is in effect.
- CONTRACTOR will assemble Sensor Assemblies, construct 36-in X 36-in concrete pad and mount 65 Sensor Assembly to Concrete Pad
- City will purchase replacement batteries at the end of Year 2/beginning of Year 3. CONTRACTOR will install these replacement batteries.
- Field Survey Data of Concrete Pad, roadways, swales, ditches and finished floor elevations as listed in Task #3 – To be provided separately by the City surveying contractor

Task 5 – Permitting

CONTRACTOR will attend preapplication meetings with the City Building Department and Public Works Department and if necessary, prepare and submit permit applications if required to install sensor assembly boxes and cameras in City ROW. CONTRACTOR will attempt to permit (if required) all locations in one application. However, if each location must be permitted separately, the effort will be significant. In addition, CONTRACTOR may be asked to submit applications to obtain permission by a Homeowner's Associations to install a Sensor Assembly or camera on private property. Further, MOT permits may be required during construction of the concrete pads for the enclosures as well installation. It is unclear how extensive preparing applications and obtaining all of these permits will be considering the large number of sensors assemblies (65). For this reason, this task budgeted as hourly until more understanding.

Deliverable:

- Preapplication meetings, Permit applications, and RFIs prepared and submitted.

Task 6 – Data Processing and Scorecard Submittal

Working with City staff, CONTRACTOR will keep abreast of stormwater projects being performed by the City and look for opportunities to validate the work being performed. For example, as projects are completed and large storm events occur, new flood elevation data can be used to update the Scorecard.

CONTRACTOR will update the Draft Scorecard when the required field surveying data identified in Tasks 3 and 4, is obtained to complete the Final Working Scorecard.

Following this, twice per year, CONTRACTOR will incorporate the data obtained in Task 4 together with rainfall information, and streets and stormwater improvements completed during the previous 6 months, to provide an updated Scorecard reflecting the performance of the City's drainage system in each neighborhood/basin.

When submitting the Scorecard every 6 months, CONTRACTOR will also provide a flood hydrograph for each neighborhood depicting the rise and fall of the floodwaters in the neighborhood for the largest storm event that occurred during the past 6 months.

Deliverable:

- Final working Scorecard
- Then Updated Scorecard submitted every 6 months for 3 years (6 submittals).
- Flood Hydrograph for each neighborhood every 6 months for 3 years (6 submittals).

ADDITIONAL SERVICES

Task 7 - Scorecard Presentation (optional)

CONTRACTOR will meet with City Officials to discuss the Draft Scorecard and provide presentation support at Workshops or City Commission meetings.

Deliverables:

- Meetings with City Officials
- Presentation Support at Workshop or City Commission Meeting (2 presentations)

Task 8 – Furnish, Install and Maintain Cameras and Photo Storage

Providing Cameras to provide a visual record of the flood stages in a neighborhood give the ultimate validation of flooding improvements together with the flood stage recorders above. However, there are challenges to using these devices. Solar panels used to power the camera batteries may not withstand the high winds of a large storm event. Further, because the file size of photos is large, cellular or Internet coverage is necessary because using the Iridium Satellite system would be cost prohibitive. Nevertheless, each camera will be required to have its own cellular number and the storage of the files in the Cloud will be expensive.

Two (2) options are given below and attached. There are other options but costs will be roughly the same to provide the same specifications.

CONTRACTOR will furnish and install cameras in each neighborhood with each sensor to provide a visual record of flooding in the neighborhoods in the vicinity of the installed flood sensors. Cameras shall be rugged outdoor, remote cameras that can be externally activated and transmit and store photo records in the CLOUD. CONTRACTOR will attempt to get approval to install the cameras on existing utility poles but if denied, may be required to use trees or other fixed structures to secure the cameras. The cameras will be installed in a way to validate the flood level information collected by the sensors.

The City shall own the cameras. CONTRACTOR will maintain the solar panel and cameras and photo information and submit representative photo information each time the Scorecard is updated. If a camera malfunctions, CONTRACTOR will remove the camera and send it back to the manufacturer for warranty maintenance. CONTRACTOR shall not be responsible for theft, vandalism or damage of cameras by others, or by damage caused by storms or other natural events.

Deliverables:

- Furnish 65 Cameras and Solar Panels
- Choose Camera Location and Permit Camera installation if required (Hourly by Contractor)
- Install 65 Cameras and Solar Panels
- Maintain Cameras for 36 months per camera warranty. Remove and return to manufacturer for warranty repair.
- Cloud storage of photo data
- Incorporate Representative Photos into the Scorecard that is updated and submitted to the City every 6 months.

City of Miami Beach
Stormwater Flooding Improvement Validation Project
Equipment Purchase, Installation and Scorecard Budget

Task 1 Scorecard Criteria Development

Principal Engineer	60 hrs @ \$250/hr	\$15,000
Project Engineer	40 hrs @ 120/hr	<u>\$4,800</u>
Total		\$19,800

Task 2 Develop Draft Scorecard

Principal Engineer	8 hrs @ \$250/hr	\$2,000
Project Engineer	80 hrs @ \$120/hr	\$9,600
Senior Technician	120 hrs @\$100/hr	<u>\$12,000</u>
Total		\$23,600

Task 3 Sensor Locations Recommendation (65 sensors)

Field Surveys of elevation information needed for Scorecard development, streets, swales, ditches, finished flood elevations to be provided by City surveying contractor.

Principal Engineer	16 hrs @ \$250/hr	\$4,000
Project Engineer	160 hrs @ \$120/hr	<u>\$19,200</u>
Total		\$23,200

Task 4 Furnish, Install and Maintain Flood Elevation Sensors (65 sensors)

65 Sensor Packages (control box, sensor, battery, and antenna) \$8,564 each = \$556,660

Year 2 - Yearly Active Site Management (ASM) is \$365 per unit X 65 units = \$23,725/ year

Year 2 - Forever Warranty is \$399 per unit = \$25,935/ year

End of Year 2 - Battery cost is \$358 per unit = \$23,270 every 2 years after.

Contractor replace the batteries end of Year 2 - 65 units X 2 hrs X \$95/hr = \$12,350

CONTRACTOR will provide materials, construction concrete pad and provide MOT where required for 65 locations \$1200 per location X 65 locations = \$78,000

CONTRACTOR will install the sensor assembly (harness, battery, ultrasonic sensor, antenna) into 65 traffic enclosures. 120 hrs @ \$95/hr = \$11,400

Field Survey elevation (NAVD 88 datum) of each concrete pad, streets, swales, ditches and finished floor elevations as needed – to be provided by City Field Survey Contractor

Task 5 Permitting – Public Works, Building Department, MOT, Homeowners Associations

Hourly

Project Engineer @ \$120/hr

Staff Engineer @ \$95/hr

Task 6 Data Processing and Scorecard Submittal

Complete Final Scorecard Incorporating Field Survey Data

Principal Engineer	4 hrs/yr @ \$250/hr	\$1,000
Project Engineer	40 hrs/yr @\$120/hr	\$4,800
Staff Engineer	120 hrs/yr @ \$95/hr	<u>\$11,400</u>
Total		\$17,200

Submit Updated Scorecard 2 times per year

Principal Engineer	2 hrs/yr @ \$250/hr	\$500
Project Engineer	40 hrs/yr @\$120/hr	\$4,800
Staff Engineer	60hrs/yr @ \$95/hr	<u>\$5,700</u>
Total		\$11,000 every 6 months or \$22,000/year

ADDITIONAL SERVICES**Task 7 Scorecard Presentation Support to Elected Officials (Optional)**

Principal Engineer	\$250/hr
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Task 8 Furnish, Install and Maintain Cameras and Photo Storage

Please see attached camera proposals as examples of a rugged outdoor camera powered by solar with separate cellular number per camera,. Location selection, installation, permitting & maintenance are added below. The City must make decisions regarding security, power requirements, solar panel needs, file sizes, continuous monitoring vs single photo, data transfer, cellular service, loss of cellular service, and cloud storage size, length of time data is stored etc.

Option 1	Mobile StreamCam 4K (65 Units)	\$214,175
	Solar Option (65 units)	\$129,675
	Location and Installation (65 units)	\$78,000
	Permitting (Hourly)	<u>\$95-120/hr</u>
Total		\$421,850/+Permitting
Yearly	Software Support and Photo/Video Archive	\$155,220/yr
	Maintenance (Hourly)	\$95/hr
Option 2	SecurityCam Lite (65 units)	\$222,625
	Solar Power Upgrade (65 units)	\$259,675
	Location and Installation	\$78,000
	Permitting (Hourly)	<u>\$95-120/hr</u>
Total		\$560,300/+Permitting
Yearly	Video Hosting and Software Service	\$136,500/yr
	Maintenance (Hourly)	\$95/hr

TOTAL COST SUMMARY

Task 1	Criteria Development	\$19,800
Task 2	Draft Scorecard	\$23,600
Task 3	Sensor Locations	\$23,200
Task 4	Furnish, Install and Maintain Sensors	\$658,410
Task 5	Permitting	Hourly
Task 6	Data Processing & Final Working Scorecard	\$17,200
Total		\$742,210 + Hourly Permitting (Task 5)

YEARLY COSTS

Task 4	ASM Sensor Monitoring Each Year Beginning Year 2	\$23,725/yr
	Warranty Each Sensor Assembly Beginning Year 2	\$25,935/yr
Task 6	Data Processing, Scorecard \$11,000 every 6 months	\$22,000/yr
Total Yearly beginning Year 2		\$71,660/yr
PLUS	Battery Replacement every 2 years (\$358/ea)	\$23,270 at the end of
	Year 2 and then every 2 years.	

ADDITIONAL SERVICES

Task 7	Elected Officials Presentations Hourly	\$250/hr
Task 8	Furnish, Install and Maintain Cameras	
Option 1	Mobile StreamCam 4K (65 Units)	\$214,175
	Solar Option (65 units)	\$129,675
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Total		\$560,300/+Permitting
Yearly	Video Hosting and Software Service	\$136,500/yr
	Maintenance (Hourly)	\$95/hr





Active Site Management (ASM) is a **comprehensive service** for the SmartCover® System™. It includes software assistance, satellite connectivity and ongoing technical support with these elements described below.

It is an annual, per site service provided by SmartCover® System™ (SCS). ASM includes but is not limited to:

- **Wireless Communications Connectivity** – Access to the two-way, wireless satellite network.
- **Website Hosting**- Set-up and ongoing hosting of all software and unlimited customer data. All data is owned by the customer, and can be downloaded directly from the customer website 24/7.
- **Website Maintenance** – SCS maintains the secure servers on which your website resides. This includes periodic upgrades to the website.
- **Website / Software Features**- SCS adds new features and tools at no charge including improved analytical tools, graphical tools and new reports.
- **Standard Reports** – SCS will assist each customer in the preparation of reports for management or regulators if requested.
- **Technical Telephone/Email Support** - The SCS Customer Service Team supplies support 7am to 5 pm PST. Additional assistance from local representatives is also available. After hours support is available on an as-needed basis. Contact SCS Escondido for details. 760-291-1980 or 855-291-1980.
- **Alarm Processing** – SCS maintains the infrastructure of the alarm contact system. SCS sends alarm notifications every 5 minutes during an event. The SmartCover includes high-level and low-level alarms that are set by the customer.
- **Management Oversight**
 - SCS sends automatic notifications for Alarms, Advisories and Alerts.
 - SCS automatically monitors the proper operation of all installed systems including battery voltage, the radio signal strength and the communication to and from the systems.
 - SCS coordinates the appropriate service to repair your system with you or your local service agent or dealer. Please call our main number below.
 - Please note: The customer is responsible for acknowledging and responding to all notifications (Alerts, Advisories, and Alarms).

Included Free of Charge

Product Improvements

The SmartCover® is continuously improving, adding new features and functions. SCS often uses customer input to add features. Product improvements are backwards compatible to existing hardware and software.

Blake Guillory
CES CONSULTANTS, INC.
1555 Palm Beach Lakes Blvd
West Palm Beach, FL 33401

561-401-1301

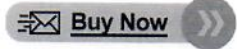
bguillory@cesconsult.com

Ship to:
 Blake Guillory
 CES CONSULTANTS, INC.
 1555 Palm Beach Lakes Blvd
 West Palm Beach, FL 33401

561-401-1301

bguillory@cesconsult.com

Project: Miami Cameras - Flood Sensor



CAMERA SYSTEMS	Quantity	Price	Total
Mobile StreamCam 4K (4G Wireless Data Service)	65	\$3995 \$3,295	\$214,175.00
Solar System - Mobile StreamCam 4K	65	\$1,995	\$129,675.00
	1		\$0.00

MANAGED SERVICES

Software Support and Archiving Service • Project Management Integration (Aconex, Autodesk, PlanGrid, Procore) • On-demand AI-edited time-lapse video with music & on-screen graphics	(12 months) 65	\$425 \$199	\$155220
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Full Service Support Package (Dedicated Customer Service & Technical Support, Unlimited Software Training)	1		Included
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Security Video Recording - 7 days • Fully encrypted end-to-end continuous recording • Timeline interface for easy access to download events • Smart motion detection events	65		Included
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Website Development and MP Image Integration	65		Included
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FedEx Standard Overnight Included
 Preferred Customer Discount: \$221,780

Total \$499,070

Available Options:

 Rentals
  Multi-project discounts
  Insured installation
  Solar power upgrades
  360° Photography
  Aerial Imagery

Your Account Manager:
Joseph Streko (201) 488-1111

Date Generated: 11/17/20. This proposal is confidential and valid for 15 days. All prices are quoted in US Dollars. While EarthCam, Inc. will endeavor to meet the customer's desired delivery date, no shipment date can be scheduled until after order is accepted by EarthCam, Inc. Payment in full must precede acceptance, which may be made by cash, cleared check, Fed wire, ACH or major credit card. All sales are final. All orders and services are subject to force majeure. All services shall automatically renew for successive one (1) month periods and continue until customer shall provide thirty (30) days written notice of termination to EarthCam, Inc. Any and all liability arising out of products or services included in this proposal, however or whenever arising, shall not, under any and all circumstances, exceed the actual payments received by EarthCam, Inc. in connection therewith or one month's service fee, whichever is less. In no event shall EarthCam, Inc. be liable for any special, incidental or consequential damages. Lifetime camera warranty for active software subscribers. Additional parts covered under standard 1 year manufacturer warranty.

Mobile StreamCam 4K - All-in-one portable 4K video solution

Ideal for interiors and jobsites that require a portable solution easily moved around the site.



To Download Specifications, [click here](#)

Our All-Inclusive Services Include:

aconex **B** AUTODESK® BIM 360® PlanGrid **PROCORE** RUBICON triax

- | | |
|-----------------------------|----------------------------|
| Multi-Project Dashboard | Continuous Video Recording |
| Live Streaming Video | Instant Live Snapshot |
| Wide Angle of View | Cross Platform Flexibility |
| AI-Edited Time-Lapse Videos | Hassle-free Upgrades |
| Data Dashboard | Secure HTTPS Compliant |
| Email, Save and Share | Markup and Filtering Tools |

Click to Buy Now



and we'll send a confirmation email to get started with your order.



Your camera will be shipped via ground for free within 24 business hours of your order acceptance by EarthCam. Expedited shipping is available.

Customer Service and Technical Support

Our reliable and dedicated team will provide you with responsive customer service from start to finish.



24/7 Full-Service
Support



EarthCam University
Unlimited Training



Live Chat
Online Help Desk



Highly Rated &
Accountable



Certified &
Trusted



Satisfaction
Guaranteed

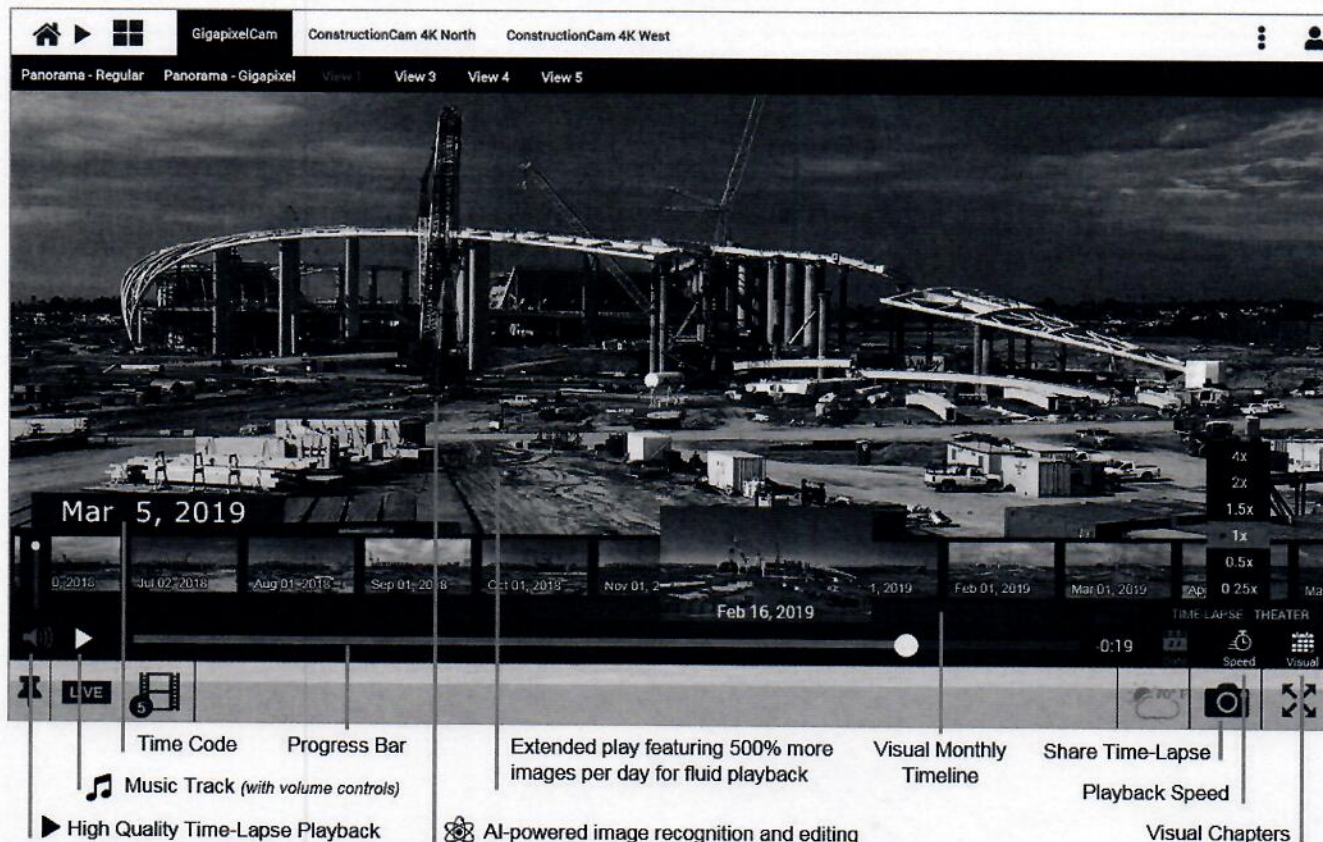


Our advanced Trouble Ticket System enables our technicians to respond even quicker and more effectively to your inquiry. You can also utilize the Live Chat feature to connect with a support specialist online and discuss any questions you have about your camera.

Broadway Media Player with Time-Lapse Theater

Embeddable camera interface with instant access to presentation-ready AI-edited time-lapse video

Enjoy instant access to presentation-ready movies, complete with royalty-free music and on-screen graphics, to present informative updates to stakeholders and share social media-ready content for public outreach on-demand.



End-of-Project Digital File

Royalty-free version of our software for all project images

Easy access to all of your project images and features the same smart, interactive tools you enjoyed during the construction process.



All Project Images



Interactive Tools



Lifetime Software



Thank you!

We appreciate your business and, more importantly, we want you to be a satisfied customer.
If you have any questions, please contact me at jstreko@earthcam.com.

To view our Frequently Asked Questions visit: www.earthcam.net/FAQ



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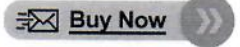
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Project: Miami Cameras - Flood Sensor



CAMERA SYSTEMS	Quantity	Price	Total
SecurityCam Lite (4G Wireless Data Service)	65	\$3,425	\$222,625.00
Solar Power Upgrade - Zone 3a - 24 hr (SecurityCam Lite)	65	\$3,995	\$259,675.00
Universal Wall/Pole mount	65		Included
MANAGED SERVICES			
Live Video Hosting and Lite Software Service • Project Management Integration (Aconex, Autodesk, PlanGrid, Procore) • On-demand AI-edited time-lapse video with music & on-screen graphics	(36 months) 65	\$295 \$175	\$409500
Security Video Recording Upgrade - 14 days • Fully encrypted end-to-end continuous recording • Timeline interface for easy access to download events • Smart motion detection events	65	\$0	\$0
Full Service Support Package (Dedicated Customer Service & Technical Support, Unlimited Software Training)	1		Included

Preferred Customer Discount: \$280,800

Total \$891,800

Available Options:



Your Account Manager:
Joseph Streko (201) 488-1111

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SecurityCam Lite - *Live streaming, time-lapse and surveillance*

Versatile exterior/interior day/night camera providing live video, time-lapse and security for all-in-one, easy cost-efficient installation.



Our All-Inclusive Services Include:

aconex | AUTODESK® BIM 360® | PlanGrid | PROCORE | triax®

- | | |
|---|--|
|  Multi-Project Dashboard |  Onboard Storage |
|  User-Controllable PTZ |  Instant Live Snapshot |
|  23x Optical Zoom |  Cross Platform Flexibility |
|  AI-Edited Time-Lapse Videos |  Hassle-free Upgrades |
|  Email, Save and Share |  Secure HTTPS Compliant |

To Download Specifications, [click here](#)

Click to Buy Now



and we'll send a confirmation email to get started with your order.



Your camera will be shipped via ground for free within 24 business hours of your order acceptance by EarthCam. Expedited shipping is available.

Customer Service and Technical Support

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24/7 Full-Service
Support



EarthCam University
Unlimited Training



Live Chat
Online Help Desk



Highly Rated &
Accountable



Certified &
Trusted



Satisfaction
Guaranteed

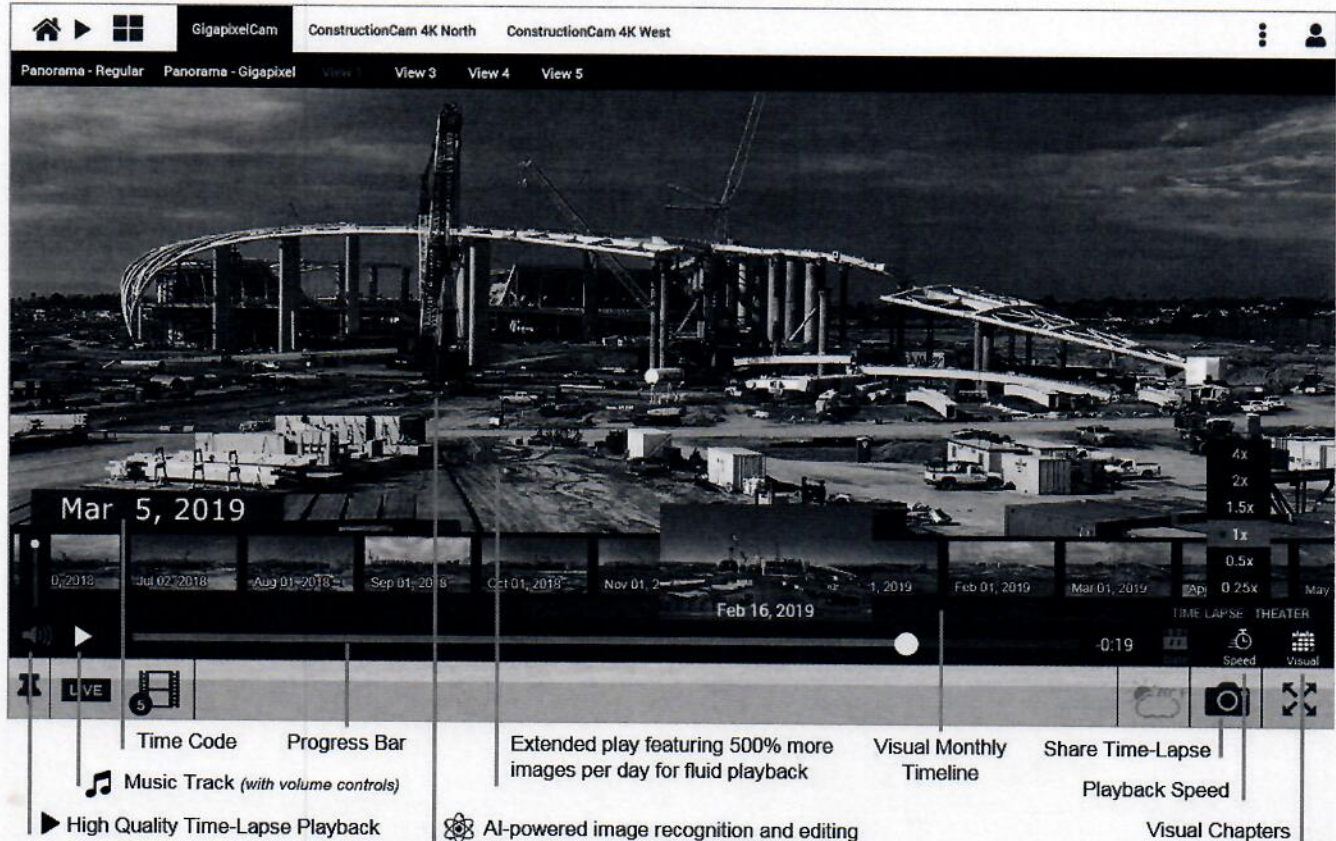


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