

City of Troy
Bid Specifications for Sewer Inspection System

SECTION 1: NOTICE TO BIDDERS

The City of Troy, Illinois, will receive sealed bids for furnishing one new Sewer Inspection Camera, for the Public Works Department until 10:00 am, Thursday February 7, 2019, at City Hall, 116 E. Market St, Troy, Illinois, 62294. Bids will be publicly opened and read at that time.

Proposal forms and bid specifications are available on-line at www.troyil.us.

All proposals must be made on the forms furnished by the City, and the entire set of documents submitted intact.

The City of Troy reserves the right to not open a sole bid and to waive, or not to waive, any irregularities in the bids and to determine which the lowest and best bid for the work is.

Proposals shall be delivered prior to the time and at the place indicated above. Each proposal shall be placed in a sealed envelope endorsed "PUBLIC WORKS DEPARTMENT SEWER INSPECTION CAMERA". Only sealed proposals will be accepted.

SECTION 2: PROPOSAL

Submitted by: _____

TO: The City of Troy, Illinois

Gentlemen:

In submitting this proposal, the undersigned declares that the only persons or parties interested in the proposal as principals are those named herein and that the proposal is made without collusion with any other person, firm or corporation.

The undersigned understands and agrees that if this proposal is accepted, he is to furnish and deliver all the items specified herein in accordance with the requirements herein stipulated, completely assembled for use, and within the time frame indicated below by the bidder.

The undersigned herewith submits his Schedule of Prices for furnishing and delivering said equipment per the stated delivery schedule. He further understands that all information requested on the Schedule of Prices be furnished or be subject to possible bid rejection for irregularities.

I, the undersigned, agree to deliver the equipment herein specified within _____ days of the date of award by the City.

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Name of Bidder: _____

(Company Name)

By: _____ Title: _____

Address: _____

Phone: _____

SCHEDULE OF PRICES

PUBLIC WORKS DEPARTMENT SEWER INSPECTION CAMERA

Price for Sewer Inspection Camera Package = TOTAL BID: _____

Make: _____

Model & Year: _____

Warranty Periods:

Power Train: _____

Complete Unit: _____

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	Exception	
	Yes	No
System Basics Complete Inspection shall have:		
1. Three components:		
a. Automatic cable drum with cable		
b. Single hand held operator pendant with viewing, digital recording and system controls		
c. Crawler with zoom camera for 6" diameter and larger pipe inspection		
2. Can Bus communications protocol		
3. Ability to connect to a network via network cable port for lifetime remote firmware upgrades and/or diagnostic services.		
4. Camera and crawler operator functions to be able to work simultaneously.		
5. Electrical requirement not more than 575W, or 5 A at 115 Vac (220 Vac available)		
6. Complete package for retrofit to existing cargo van.		

	Exception	
	Yes	No
2. Operator Pendant and Wireless Controller <i>The system control pendant shall have:</i>		
1. 10.1" (257 mm) (horizontally measured), hand held color touch-screen monitor with 1280 x 800px display resolution for viewing, recording video and accessing control and configuration functions.		
2. Pendant total weight to be less than 4 pounds.		
3. Total control pendant dimensions to be no larger than 12" x 10.75" x 3" (W X H X D).		

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	Exception	
	Yes	No
2. Operator Pendant and Wireless Controller <i>The system control pendant shall have:</i>		
4. Wide screen display format with daylight readable display.		
5. Power on/off button.		
6. Integrated emergency stop button.		
7. Pendant to have integrated, foldable stand and recessed handle.		
8. Standard ability to connect to a network in order to access software update download for lifetime automatic performance and feature upgrades.		
9. Ability to connect to a network in order to work with repair studio software for remote diagnosis.		
10. WinCan Pro Touch software embedded with ability to wirelessly upload via Wi-Fi and share inspection data via WinCan Web.		
11. 4 GB Internal flash memory for operation system and catalogs.		
12. 32 GB internal memory for data storage.		
13. Touch screen operation with or without gloves, even under wet conditions.		
14. Dual joysticks for camera and crawler functions.		
15. Auto-upright display to allow joysticks to be positioned where they're most comfortable.		
16. Right multifunction joystick to control crawler's forward/reverse, left/right turning and speed.		
17. Left multifunction joystick to control camera's pan/tilt and home functions.		
18. Ability to toggle between icon and text display commands.		
19. Must include the following interfaces: 2 x USB 2.0 (Typ A), 1 x Ethernet (RJ45), 1 x HDMI, 1 x analog Video OUT (BNC), 1 x WLAN.		
20. Controls for manual and automatic focus of camera.		

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	Exception	
	Yes	No
2. Operator Pendant and Wireless Controller <i>The system control pendant shall have:</i>		
21. Ability to display component pressure, temperature, sonde status, pitch (inclination) and roll.		
22. Pressure to be listed onscreen and saved within system history for predictive maintenance.		
23. Pressurization status of individual components (camera, crawler, lift, auxiliary lighting, etc.) shall be listed separately.		
24. Controls for adjusting illumination intensity of camera and auxiliary lighting.		
25. Ability to control cable reel functions: auto, manual, speed, direction, torque of the cable reel.		
26. Master single button interface to regain control from wireless controller.		
27. Minimum 20' control cable that connects the automatic cable drum with the pendant via an emergency on/off switch box junction.		
28. Ability to record digital video.		
29. Video recording: mpeg4 or avi (selectable).		
30. Ability to capture digital stills.		
31. Still picture recording: jpg or png (selectable).		
32. On screen display (OSD); ability to generate text on video.		
33. OSD controls easily allow for turning various parameters and text on/off.		
34. OSD controls easily allow for manipulation of on-screen position of displayed parameters/text.		
35. OSD controls easily allow for manipulation of color of displayed parameters/text and background color.		
36. OSD controls allow addition of graphical images (agency or company logo, etc.).		
37. Ability to create multiple OSD profiles; customized OSD parameter/text configurations based on operator or application preferences.		
38. Graphical on-screen display of crawler roll status with respect to pipe sidewall.		
39. Ability to inform operator if one is getting close to flipping the crawler.		

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	Exception	
	Yes	No
2. Operator Pendant and Wireless Controller <i>The system control pendant shall have:</i>		
40. When critical tilt angle is reached, system will alert operator with highlighted red indicator AND will show operator proper direction of counter-steer in order to re-stabilize crawler position.		
41. Optional ability to engage anti-roll feature, which will automatically stop crawler movement when critical tilt angle is reached during use of cruise control.		
42. Ability to invert controls in the event of crawler roll, allowing for crawler and cable reel to continue synchronized movement.		
43. Graphical on-screen display of crawler inclination, including pitch degree or percentage (selectable).		
44. Ability to directly engage or disengage electronic clutch.		
45. Ability to capture, correlate and store still images with distance and observation information, all of which can be exported to various software reporting packages or viewed onscreen.		
46. Captured visual data can be printed directly from the pendant into an inspection report that has manhole to manhole schematic, observations, distances, asset information, operator details and PACP codes.		
47. Ability to generate a graphic inclination report to show pipe grade along inspection route.		
48. Ability to view a full schematic and observation inspection report, including pipe inclination report, on the pendant.		
49. Ability to operate crawler in cruise control mode where an operator does not need to touch the joystick for crawler speed.		
50. Ability to view system operational history and performance, including hours of operation, feet of pipe inspected, and recorded time system has run in any warning conditions (e.g. under pressurized).		
51. Ability to pause video when adding an observation as to not waste video file storage capacity.		
52. On/off control of digital zoom function.		
53. On/off control of auto shutter speed.		

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	Exception	
	Yes	No
2. Operator Pendant and Wireless Controller <i>The system control pendant shall have:</i>		
54. Ability to toggle front-view camera, integral rear view camera, and accessory rear view camera.		
55. On/off control for camera lasers.		
56. Ability to control laser intensity of increments of 25%.		
57. Control for remotely controlled motorized camera lift.		
58. Button to activate automated software routine (Macro) for viewing laterals on the left.		
59. Button to activate automated software routine (Macro) for viewing laterals on the right.		
60. Button to activate automated software routine (Macro) for performing a circumferential scan of a pipe joint.		
61. Controls for auto-return of crawler that stops the crawler within specified distance of the insertion manhole and alerts the operator of its return for final extraction when returning via cruise control.		
62. The ability to operate larger (10" minimum diameter) and smaller crawlers (minimum 4" diameter) with no need for additional control unit or cable upgrades.		
63. CAN-bus control architecture allowing for precision control, diagnostic monitoring and future upgradeability.		
64. Ability to measure cracks and other observations without the need for external software		
65. Ability to measure wall defects, obstructions, bends, branch angles, flow level and inclination via touch screen controls.		
66. Ability to run a macro to measure actual pipe diameter using built in camera lasers.		
67. Portable battery powered belt clip wireless remote controller with crawler, camera and cable reel functions for easy direct single person deployment and retrieval of the crawler at the access point (manhole/basin).		
68. Wireless remote controller to have 8 dual function buttons with clear labels as the function of each.		

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	Exception	
	Yes	No
2. Operator Pendant and Wireless Controller <i>The system control pendant shall have:</i>		
69. Wireless remote controller to have colored LED indicators to inform operator as to what functions the buttons are activated for.		
70. Wireless remote controller to be digitally encoded to the system with which it is delivered.		
71. Wireless remote control to have a range of at least 50' without radio frequency interference being able to compromise the signal. RF systems will not be accepted.		
72. Wireless remote controller must work with a single specific system in order to provide secure control when multiple systems are being operated in the same area. For operator safety and system protection, there can be no chance for operational interference.		

	Exception	
	Yes	No
3. Pan/Tilt Color Zoom Camera <i>The system camera shall have:</i>		
1. 10X optical zoom with 4X digital zoom multiplier for a total zoom of 40X.		
2. Ability to produce a high-quality color video image with a readable resolution of no less than 420 HTV lines.		
3. Pan and tilt motors with no exposed gears or wires.		
4. Ability to pan a full 360 degrees and tilt ± 135 degrees for full viewing of laterals and joints.		
5. Ability to view behind crawler to inspect upstream lateral rubber seal on gravity-flow PVC pipes.		
6. Option for dual lasers 50mm to gauge the size of pipeline pipe features and defects.		
7. Solid-state circuitry designed to withstand shock and vibration while being pushed, pulled or propelled through the pipe.		

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	Exception	
	Yes	No
3. Pan/Tilt Color Zoom Camera <i>The system camera shall have:</i>		
8. Ability to connect to crawler body via a 1.5" long, 5/8" diameter stainless-steel keyed connection plug with 10-pin internal female connection port. Connection must be waterproof.		
9. Front housing made of aluminum and stainless steel, with windshield made of impact-resistant, distortion-free material.		
10. Housing that is fully sealed and waterproof per IP68 to withstand external pressure up to 1 bar without damage or leaking.		
11. Ability to run off 12-volt DC solid-state power source.		
12. Encoders to measure pan and tilt position, allowing camera to be controlled using macros stored in the operator pendant.		
13. Ability to attach to the front of the crawler by a simple turn of a slotted locking mechanism atop the crawler that drives 4 stainless bearings into the rotate shaft of the camera, all while maintaining a 1-bar waterproof seal.		
14. Illumination provided by a minimum of 40 LEDs that deliver a 13,000-lux reading at 1' and a 3-lux reading at 25'. Lighting must illuminate targets beyond 10'.		
15. A valve for purge and pressurization of camera-body. (Pressurization helps prevent ingress of water and helps prevent internal condensation and fogging.)		
16. A total weight of no more than 3.75 lb.		
17. A maximum size of 7" x 3" x 3" (lwh) in order to fit within a diameter of 3.5" (88mm).		
18. Integral clutches to protect pan and tilt motors.		

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	Exception	
	Yes	No
4. Steerable Motorized Crawler The system shall have:		
1. 6-wheel drive (3 wheels per side) to generate traction necessary to crawl 1000' in wet and slippery pipes.		
2. In 8" configuration with the middle wheel remaining, the 4 larger wheels will overlap the middle ones to provide continuous traction to go over joints and debris and avoid high centering where 4 wheel crawlers can no longer move forward.		
3. The tractor shall have proportional left, right, forward and reverse capability via manual and automatic controls via a joystick and direct buttons amongst the operator pendant and wireless controller.		
4. Proportional steering means that the 3 wheels on the left and the right of the crawler will move proportionally at the same time to move the crawler in the intended left, right, forward, backward or combination direction. Crawlers that can only drive in a single direction to the left, right, forward or backward at a time (bump steering) will be deemed unacceptable.		
5. Maximum size of 12.2 x 4.3 x 3.5" (lwh), allowing proper clearance in 6" and lined pipes.		
6. A minimum of two powerful EC drive motors. Motors must maintain full power even at lower speeds without depending on drawing more current to do so.		
7. An electronic clutch that can be engaged and disengaged without needing to move the crawler. Systems that demand movement of the crawler to engage or disengage a mechanical clutch will be deemed unacceptable.		
8. System to be isolated in a way where major crawler electronic components will not be destroyed if there is a cut and connection between power and other wires within the cable.		
9. Can accept an option for a remotely operated lift that can raise the camera a minimum of 7" from its lowest position.		
10. When in 8" wheel configuration, crawler must insure that the bottom of the pan and tilt zoom camera is at least 1 3/8" from the bottom of a flat surface to enable crawling over obstacles.		
11. Full sensor package with inclination, roll, sonde, pressure, heat and motor readings.		

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	Exception	
	Yes	No
4. Steerable Motorized Crawler The system shall have:		
12. Integral rearview color camera with high-lux tri-LED lighting to be positioned at the top rear of the crawler body and not to have any visible increase in the diameter of the crawler body or be integrated with the rear connector.		
13. Ability to remotely toggle between rear- and forward-viewing cameras using the operator control pendant.		
14. Slotted locking mechanism, the simple turn of which drives 3 stainless bearings into the rotate shaft of the camera for secure, easy attachment with 1-bar waterproof rating.		
15. Keyway on camera rotation shaft to ensure damage-free mating of electrical pins between crawler and camera.		
16. Rear receptacle that allows cable attachment with 2 turns of the stainless-steel cable connector's outer barrel. Not tools required.		
17. A spring-loaded pin on the rear receptacle to lock the stainless-steel cable connector's outer barrel, ensuring a secure connection and delivering pull strength beyond the 1000-lb-rated break strength of the cable.		
18. Minimum weight of 18.5 lbs. (with small wheels).		
19. Length of no more than 12.2" (18" with camera and optional lift installed) for easy navigation through 90-degree inverts without rolling.		
20. Crawler body must be machined from a single continuous and complete piece of machined aluminum. Two piece bodies from top to bottom or front to rear crawlers will be deemed unacceptable.		
21. Single piece crawler body to have single top-plate access for control boards, single bottom-plate access for motors, and dual side-plate access for gears, ensuring maximum protection against leaks caused by bending stress. Tractor chassis of bronze, brass or other soft metals shall be deemed unacceptable.		
22. Tapered wheels that conform to pipe sidewall.		
23. Machined keyway on all 6 axles to ensure positive drive and facilitate quick wheel change-out. Spacers and wheels shall attach with a single screw; plates and spacer-bars shall be deemed unacceptable.		

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	Exception	
	Yes	No
4. Steerable Motorized Crawler The system shall have:		
24. Machined tight fitting axel to wheel keyway to assure wheel stays on the unit without turning if a bolt loosens. Systems that use bolts and washers as the only means to secure a wheel will be deemed unacceptable.		
25. CAN-bus control architecture allowing for precision control, diagnostic monitoring and future upgradeability.		
26. Compatibility with the following standard and optional wheels:		
a. Set of six (6) quick-change hubs that allow the changing of wheels with no tools.		
b. 3.34" (85mm) Small (S) quick-change rubber wheels (set of 6 supplied standard)		
c. 4.72" (120mm) Medium (M) quick-change rubber wheels (set of 4 supplied standard)		
d. 5.90" (150mm) Large (L) quick-change rubber wheels (set of 4 supplied standard)		
e. 6.88" (175 mm) (XL) quick-change rubber wheels (set of 4 supplied)		
f. 3.26 (83 mm) Climbing wheel to be used on each side of center axle when using medium rubber, abrasive or carbide/grit wheels (set of 2 supplied standard)		
g. 4.72" (120 mm) Medium quick-change carbide/grit wheel (set of 2 supplied)		
h. 5.90" (150 mm) Large quick-change carbide/grit wheel (set of 2 supplied)		
27. Ability to fit in 8" pipe with top mount auxiliary lighting attached.		
28. A tilting rear cable connector that points vertically to protect cable during deployment into manhole, but which tilts to horizontal position during operation. Rear connectors that integrate a rear camera will not be accepted.		
29. Strong stainless steel locking mechanism to augment the strain relief internal to the cable.		
30. Stainless cable connector shell to carry a lifetime warranty.		
31. 512 Hz integral sonde to facilitate locating crawler.		

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	Exception	
	Yes	No
5. Motorized Automatic Cable Drum <i>The system cable reel shall have:</i>		
1. Capacity for the systems 1000' cable.		
2. A hub equipped with a continuous-contact slip-ring assembly to allow the cable to be dispensed and retrieved while the camera and tractors are operational.		
3. An environmentally sealed slip ring whose contacts shall be of an alloy of gold.		
4. A motorized system with sensors that monitor cable tension in order to coordinate cable feed/retrieval with direction and exact speed of the crawler.		
5. Ability to perform all forward, backward and different speed functions without the operator having to control any cable reel functions directly.		
6. An emergency stop switch.		
7. Ability to operate in both automatic and manual modes.		
8. External cable reel chassis to be made of strong and lightweight aircraft grade aluminum.		
9. Work with pendant based speed and torque controls to adjust for different pipe conditions and user preferences.		
10. Weight of no more than 125 lb. (including 1000' of cable).		
11. CAN-bus control architecture allowing for precision control, diagnostic monitoring and future upgradeability.		
12. Work with a remote wireless pendant granting control of crawler and reel while away from the primary control pendant.		
13. Ability to operate manually, with direct control of speed, direction and torque.		
14. Large extension pulley arm option for extending the cable drop point 3' from the cable reel.		
15. Teflon coated integral drip tray at bottom beneath stored cable. Allows for liquids to drain and be collected in a specific area for health and safety reasons. Can be slid out the front without tools for emptying and cleaning.		
16. BNC video output for local video connection.		

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	Exception	
	Yes	No
5. Motorized Automatic Cable Drum <i>The system cable reel shall have:</i>		
17. Size of no larger than 21 x 14.5 x 24.5" (hwd) with standard cable roll bar that extends 15" from the front of the reel.		
18. Two handles to be at the top left and right of the cable reel for moving and transport.		
19. Extended roll bar to be able to be placed back against the reel for storage and shipment without the need for additional fasteners or tools.		
20. Pendant-based power/torque controls for winching back crawler in optional free-wheel mode.		
21. Ability to run automated software routines (Macros) in which the reel, crawler and camera function are automatically coordinated to accomplish a specific task without operator intervention.		
22. All moving hazardous components to be completely covered/enclosed to prevent injury – hand or clothing can't reach dangerous moving parts. Open access design of the front, top and sides where an operator can touch level-wind mechanism, gears, chains and belts will be deemed unacceptable.		
23. Cable protection accessories, including:		
a. Upper cable guide that uses Delrin (or similar) roller mounted to lightweight aluminum frame to protect cable from abrasion during operation, and to limit operator strain during setup.		
b. Lower roller assembly that uses Delrin (or similar) roller mounted to lightweight aluminum frame to protect cable from abrasion during operation, and to limit operator strain during setup. Designs requiring use of interlocking poles shall be deemed unacceptable.		

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	Exception	
	Yes	No
6. Lightweight Heavy Duty Transmission Cable <i>The system cable reel shall have:</i>		
1. 1000' of cable with maximum 6-wire continuous-length multi-conductor wires for lightweight and easy maintenance performance.		
2. Kevlar reinforcement to provide a minimum break strength of 1000 lbs.		
3. Diameter of no more than 0.255" (6.5mm).		
4. Weight of no more than 10.8 lb. per 328' (.03 lb. per ft.) to promote portability, long crawler runs and easy handling for multiple sized crawlers.		
5. Strain relief to be internal to the cable and cable connector. No external wires, pig tails or other visible external strain mechanisms will be accepted.		
6. Waterproof rating of at least 1 bar or 1 atmosphere.		
7. Tough outer jacket to resist tears and scrapes.		
8. Smooth outer jacket to reduce friction.		
9. Steel-armored jacket at crawler end to prevent cable damage around pipe bends.		
10. Solid stainless steel screw on connector at crawler end that locks with two turns, and which engages a locking spring-loaded pin on the rear of the crawler to secure the cable and provide strain relief. Connections that require <u>ANY</u> tools or screws will be deemed unacceptable.		
11. Crawler electrical connection with keyway to prevent damage to electrical pins when mating with camera or crawler.		
12. Ability to be re-terminated by soldering no more than 6 wires, then sealed and strain-relieved using a quick-dry epoxy. Procedure shall take no more than half an hour to complete. More than 6-wire wire solder repair and Scotch-cast style solutions that require longer cure times will be deemed unacceptable.		
13. Compatibility with fully automatic cable reel, manual cable reel.		
14. Cable to be only single connection regardless of use of optional items such as additional lighting, side scanning camera, rear camera, laser circle, laser dots, remotely operated lift or large pipe carriage.		
15. Ability to connect directly to the following without any modification or exterior wires, ability to be operated by system controls in this specification:		
a. New 4" minimum pipe ID crawler		

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	Exception	
	Yes	No
6. Lightweight Heavy Duty Transmission Cable <i>The system cable reel shall have:</i>		
b. New 6" minimum pipe ID crawler with integral motorized lift		
c. New 10" minimum pipe ID crawler		

Warranty, Training, Installation and Accessories:	Comply	
	Yes	No
Retrofit City of Troy Public Works Department existing van to accommodate the Sewer Inspection System		
Due to the importance of local training and service; the Sewer Inspection System supplier must have local representation within 50 miles from the City of Troy Public Works Department Facility		
(1) days of initial hardware training on the system to be performed by a factory trained specialist.		
One (1) complete set of manufacturers operation and maintenance manuals shall be provided		
The Warranty shall guarantee the product to be free from defects in materials and manufacturing. This Warranty shall be limited to the repair or exchange of any part or parts thereof which may prove to be defective under normal use and service within One (1) year from the date of completion of training and which our examination, at our facility, shall disclose, to our satisfaction, to be defective. This Warranty shall not apply to any equipment which has been subject to accident, negligence, alteration, abuse, unauthorized repair, improper storage, or other misuse. The warranty does not apply to expendable items or normal wear and tear or failure due to overheating or radiation exposure unless said overheating or exposure was the result of malfunction or defective equipment supplied by the bidder.		
The crawler connectors and the camera LED light ring carry a lifetime warranty; the terms of this Warranty shall not apply to any equipment which has been subject to accident, negligence, alteration, abuse, unauthorized repair, improper storage, or other misuse.		

EXCEPTIONS AND DEVIATIONS

