

**Town of Simsbury,  
Connecticut**

**Specifications**

for a

**Pipeline Television Inspection System  
Mounted in a 7-foot x 12-foot Trailer**

**Intent**

The Town of Simsbury Water Pollution Control (WPC) is seeking bids for the purchase of one (1) complete portable color television inspection system installed in a 7-foot x 12-foot dual axle trailer, ready for operation. The system shall be capable of inspecting relined 6-inch to 24-inch pipes and sewer lines. The system shall include a pan and tilt color television camera having infinite camera head axial rotation, 1000-feet of multi-conductor cable, and a tractor camera carriage. The system will be used for the inspection of underground infrastructure assets from a single access point. Software is to be provided that will record the video, document pipe condition, provide cataloging and search functions, and generate reports.

Sealed bids will be received at the office of the Director of Finance, Town of Simsbury, 933 Hopmeadow Street, P.O. Box 495, Simsbury, CT, 06070 until 10:00 a.m., Friday, January 27, 2012. Bid envelopes must be sealed and clearly marked "BID, TV INSPECTION SYSTEM, JANUARY 27, 2012." The bids will be opened in public, shortly after 10:00 a.m. on the closing day, in the Main Meeting Room at the Simsbury Town Hall.

This specification is not to be interpreted as restrictive, but rather as a measure of the safety, reliability, and performance against which all television inspection systems will be compared.

In comparing proposals, consideration will not be confined to price only. The successful bidder will be the one whose product is judged to best serve the interests of the Town when price, product, safety, and delivery are considered. The Town of Simsbury reserves the right to reject any or all bids or any part thereof, and to waive any minor technicalities. A contract will be awarded to the bidder submitting the lowest responsible bid meeting the requirements of this specification.

**Equivalent Product**

Bids will be accepted for consideration on any make or model that is equal or superior to the television inspection system specified. Decisions of equivalency will be at the sole interpretation of the Town of Simsbury. A blanket statement that equipment proposed will meet all requirements will not be sufficient to establish equivalence. Failure to divulge areas of non-compliance in vendors bid package will be grounds for rejection of system at time of delivery. Original manufacturer's brochures of the proposed unit are to be submitted with the proposal. All modifications made to the standard production unit described in the manufacturer's brochures must be certified to have been in prior successful use through the submission of a minimum of six references to be included in the proposal. Failure to submit references for non-standard units will deem the proposal "non-responsive" and will be rejected without further review. If requested by the Town, the bidder must be prepared to demonstrate a unit similar to the one proposed.

**Interpretations**

In order to be fair to all bidders, no oral interpretations will be given to any bidder as to the meaning of the specification documents or any part thereof. Any request for such consideration shall be made in writing to the Town of Simsbury. Based upon such inquiry, the Town may choose to issue an addendum to the specifications.

**Obtaining Bid Documents and Communication of Addenda**

The Town of Simsbury website will be the means of communicating any addendum. Bid documents and addenda are available on-line at [www.simsbury-ct.gov/Public\\_Documents/Departments/SimsburyCT\\_Finance/Public Bids and RFPs](http://www.simsbury-ct.gov/Public_Documents/Departments/SimsburyCT_Finance/Public_Bids_and_RFPs) . All bidders

obtaining these specifications must notify [jclifton@simsbury-ct.gov](mailto:jclifton@simsbury-ct.gov) by e-mail to obtain any addenda that may be required.

Hardcopies of the bid documents may be picked up at Simsbury Water Pollution Control, 36 Drake Hill Road, Simsbury, CT. Bids will be opened January 27, 2012 at 10:00 a.m. Please call 860-658-1380 if there are any questions.

### **General**

The specification herein states the minimum requirements of the Town. All bids must be regular in every aspect. Unauthorized conditions, limitations, or provisions shall be cause for rejection. The Town of Simsbury will consider as “irregular” or “non-responsive” and reject any bid not prepared and submitted in accordance with the specifications, or any bid lacking sufficient technical literature to enable the Town to make a reasonable determination of compliance to the specifications.

### **Deviations**

It shall be the bidder’s responsibility to carefully examine each item of the specification. Failure to offer a completed bid or failure to respond to each section of the technical specification (YES / NO) will cause the proposal to be rejected without further review as “non-responsive.” All exceptions and/or deviations shall be fully described in the appropriate section. Deceit in responding to the specification will be cause for automatic rejection.

The bidder must include a separate sheet where any and all deviations to the specifications are listed. The Town understands that manufacturers design systems with different features. This listing is therefore integral to the Town’s determination of an equivalent product. Each deviation must reference the listed specification, by number if necessary, and explain in full detail how the proposed system is different.

### **Experience and Longevity**

The equipment to be furnished shall be the product of a qualified firm that is regularly engaged in the manufacture and supply of this equipment. Bidder must supply a list of (6) users of the equipment specified. Of these references, 50% shall be private contractors and 50% shall be municipal customers.

### **Loan Equipment Program**

If the manufacturer’s service center is unable to repair and have ready to return any component of the system within 48 hours of receipt from the purchaser, the service center shall have available loaner equipment for immediate shipment.

### **Bid Validity**

Bid and prices must be valid for a minimum of 60 days after the bid submission date.

**Bid Submission**

Each bidder is required to submit the following information with their bid. Please initial each item to confirm compliance.

- A. Complete this bid specification package, checking “YES” to show compliance, or “NO” indicating a variance. Initial\_\_\_\_\_
  
- B. Submit the following technical information with the bid proposal:
  - a. Detailed component listing with quantities Initial\_\_\_\_\_
  - b. Detailed system specifications Initial\_\_\_\_\_
  - c. Drawing of trailer and equipment mounting Initial\_\_\_\_\_
  - d. Sample of report output Initial\_\_\_\_\_
  - e. Explanation of deviations, if necessary Initial\_\_\_\_\_
  - f. Complete supplier information sheet(s) Initial\_\_\_\_\_
  - g. User contact list Initial\_\_\_\_\_

**Bid Price Submittal Form**

BASE BID EQUIPMENT:

Bid Price = \$ \_\_\_\_\_ (price in words) \_\_\_\_\_

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OPTIONS

**Roof top air conditioner, 13,500 BTU with heat strip** \$ \_\_\_\_\_

**Roof top exhaust fan** \$ \_\_\_\_\_

Delivery of system within \_\_\_\_\_ days of bid award.

Prices quoted valid for \_\_\_\_\_ days

Company name: \_\_\_\_\_

Address: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Authorized bidder signature: \_\_\_\_\_

Date: \_\_\_\_\_

Name: \_\_\_\_\_

Title: \_\_\_\_\_

**1. Trailer**

- 1.1. A new 7-foot x 12-foot trailer shall be provided. The trailer shall conform to all of the following specifications:
  - 1.1.1. 7,000-lb gross vehicle weight rating
  - 1.1.2. Dual 3,500-lb rated axle, with ITS and radial tires
  - 1.1.3. Interior height of 78-inches minimum
  - 1.1.4. Interior walls and ceiling insulated and finished in seamless white vinyl
  - 1.1.5. Floor plywood construction
  - 1.1.6. Electric braking system with breakaway safety switch
  - 1.1.7. Extended triple tube tongue with 2-5/16-inch ball hitch
  - 1.1.8. Drop-down tongue jack, manually operated
  - 1.1.9. Dual safety chains for hitch
  - 1.1.10. Drop-down corner stabilizing posts, rear corners, 1000-lb rating each
  - 1.1.11. Exterior aluminum panels painted light blue
  - 1.1.12. Curb side lockable swing opening 32-inches wide door forward of axle
  - 1.1.13. Full opening rear swing doors with tie-down latches
- 1.2. The trailer shall contain all standard equipment and meet all current Federal DOT and State highway motor vehicle standards.
- 1.3. The vehicle shall be additionally equipped with the following aftermarket products:
  - 1.3.1. Roof mount amber strobe light, with controls in rear of vehicle
  - 1.3.2. (2) 12V rear facing floodlights
  - 1.3.3. Remote control LED traffic director warning bar with remote, Nova Electronics or equal.
- 1.4. A drawing(s) of the trailer, layout of all equipment, and finishes shall be included with the bid documents. Note: HVAC or roof exhaust fan as options.

**2. On-Board AC Power System, capable of supplying power for all wired loads and reasonably anticipated receptacle loads.**

- 2.1. The system shall include an on-board electrical power source rated for the installed AC power system current output.
- 2.2. All electrical fixtures shall be appropriate for the complete electrical requirements of the system and are installed to NEC codes and local requirements.
- 2.3. All wiring shall be run in protective conduits.
- 2.4. Generator will be wired for remote start/stop from the interior of the trailer. A digital engineering panel to display, voltage, hertz, and run hours.
- 2.5. A connection feature shall be provided for the on-board power supply. This will allow for the system to be powered by the commercial 120V AC house power supply through an exterior connection in the vehicle. There shall also be a house power cord with weatherproof plug and socket for attaching to house power or the generator.
- 2.6. The generator shall have the following features:

- 2.6.1. Gasoline powered, overhead valve engine
- 2.6.2. Spark arrest muffler
- 2.6.3. Low oil pressure indicator
- 2.6.4. Inverter technology for clean sine wave output, “contractor” model generators without inverter technology shall be deemed unacceptable
  
- 2.7. The generator mounting system shall include the following:
  - 2.7.1. Base pan for drip control
  - 2.7.2. Protective louvered metal enclosure mounted on the tongue of the trailer
  - 2.7.3. Hinged, lockable access cover, fabricated of aluminum diamond plate

**3. Trailer Outfitting**

- 3.1. The trailer shall be outfitted with the following features for storage and operation of the sewer inspection equipment.
- 3.2. The walls shall be insulated and finished with white non-porous laminate.
- 3.3. The ceiling shall be insulated and finished with a non-porous laminate.
- 3.4. The floor shall be covered with diamond plate flooring or acceptable alternate, with caulked protection at wall joints.
- 3.5. The room shall be lit by fluorescent lighting, with switch.
- 3.6. A desktop shall be included. The design and construction to be detailed in the drawing(s) specified in section 1.4.
- 3.7. An adjustable height, fabric covered, foam padded chair with 5-leg base and casters (minimum locking) shall be supplied. A securing cord shall also be supplied for in-transit storage.
- 3.8. There shall be a minimum of (2) quad electrical outlet boxes.
- 3.9. There shall be 2 (two) five-pound fire extinguishers securely mounted to a wall of the room in clear view of the operator. The fire extinguishers shall be one (1) dry chemical type, NFPA-Classified 3A-40BC and one (1) carbon dioxide type, NFPA 5-BC.
- 3.10. The TV cable reel system shall be mounted on an aluminum stand or acceptable alternate.
- 3.11. A bench to allow changing wheels and other maintenance tasks.
- 3.12. A tool chest designed for use in a trailer shall be provided to store tools required for self-contained operation and maintenance.

**4. Wash Down System**

- 4.1. A pressurized water system shall be supplied in order to rinse down equipment after an inspection. The wash down system shall conform to the following specifications:

- 4.1.1. The pump shall operate from 12 VDC with circuit breaker protection. The pump shall supply a minimum of 1.4 gpm at 60 psi.
- 4.1.2. The system shall include a reservoir with the following features:
  - 4.1.2.1. 12-gallon capacity, minimum
  - 4.1.2.2. Fill port
  - 4.1.2.3. Drain port
  - 4.1.2.4. Mounted along driver's side wall
- 4.1.3. The system shall include a control valve and spray nozzle.
- 4.1.4. The system shall include 25-feet of 90 psi-rated hose on a retractable reel.

**5. System Control Unit (SCU): Two alternate systems can be quoted. Final selection to be determined by the Town of Simsbury based on cost/benefit evaluation.**

5.1. System A: A system control unit (SCU) shall be provided to control and distribute power to the TV system equipment specified. The SCU shall include the following features at a minimum:

- 5.1.1. Non-glare 9-inch color TV monitor, with internal speaker and controls
- 5.1.2. Hardigg-style ATA-rated polypropylene case with side handles
- 5.1.3. Storage compartment in cover of case
- 5.1.4. Modular component design to simplify repair and troubleshooting
- 5.1.5. Approval through test spec UL1012 for power units
- 5.1.6. Isolation transformer for clean downhole power signal source
- 5.1.7. AC power cord with IEC connection and input breaker
- 5.1.8. Mil-spec reel connector, weatherproof
- 5.1.9. Connections for video recording device
- 5.1.10. Parallel port for PC devices such as a printer or laptop computer
- 5.1.11. Connections for desktop-style controllers
- 5.1.12. 120VAC duplex GFI-protected outlet for auxiliary electrical devices
- 5.1.13. Front face of unit shall include the following controls:
  - 5.1.13.1. Camera power switch
  - 5.1.13.2. Camera power breaker reset button
  - 5.1.13.3. Camera voltage adjustment dial, 0 to 150V DC
  - 5.1.13.4. Camera current adjustment dial
  - 5.1.13.5. Pan and tilt controller connection
  - 5.1.13.6. Auxiliary lighthouse switch
  - 5.1.13.7. Lighthouse power switch
  - 5.1.13.8. Lighthouse power breaker reset button
  - 5.1.13.9. Lighthouse lamp power selector
  - 5.1.13.10. Lighthouse intensity dial
  - 5.1.13.11. Lighthouse overcurrent warning light
  - 5.1.13.12. Auxiliary lighthouse controller connector
  - 5.1.13.13. Auxiliary tractor controller connector
  - 5.1.13.14. Diagnostic meters on front face of unit shall include:
    - 5.1.13.15. Camera module voltage
    - 5.1.13.16. Camera module current draw
    - 5.1.13.17. Lighthouse voltage
    - 5.1.13.18. Lighthouse current draw
- 5.1.14. Portable Video Capture Device
  - 5.1.14.1. A portable video capture and review system shall be provided with the system and include the following at a minimum:

- 5.1.14.2. Video capture device to compress video in MPEG4 format
- 5.1.14.3. 16GB SD card with USB adapter
- 5.1.14.4. Set of interconnect cabling to allow video capture and transfer to a PC
  - 5.1.14.4.1. The input to the unit shall be through a set of A/V cables from the camera system.
  - 5.1.14.4.2. The output shall be through an SD card, and a USB 2.0 port adapter.
- 5.1.14.5. The unit shall be powered by an internal rechargeable battery.
- 5.1.14.6. The unit shall have controls for review of the video on the system display.

**5.2. System B**

- 5.2.1. PCU Assembly [Rack Mount]
- 5.2.2. DV-1 Video transfer assembly kit with hardware, DV-1 Touch DVR with One Touch Recording to Include: Mounting Bracket, Video / Audio & Power Cables, 16GB Thumb Drive, Operations Manual (Located on Thumb Drive), Apple Quick Time Player Program (Located on Thumb Drive), Quick Start Guide
- 5.2.3. 19-inch Multimedia LCD monitor
- 5.2.4. CCU Assembly [Rack Mount] to include: Alpha Numeric Information Display, with Multi Paging and Defect Coding, Remote "QWERTY" Keyboard for Data Entry, On Screen Footage Display, WRC and PACP Codes
- 5.2.5. Wired USB Controller
  - 5.2.5.1. Joystick Control for Pan and Tilt Zoom Camera to Include: 360 Degree Rotate, 330 Degree Optical Pan
  - 5.2.5.2. Joystick Control for All Steering Functions & Forward / Reverse Directions for Transporter
  - 5.2.5.3. Camera Lift Control for Optional Electronic Camera Lift
  - 5.2.5.4. All Other Controls for Camera to Include: Camera Iris and Focus Override & Zoom, Camera Lights & Shutter Control for Light Enhancement, Camera Diagnostics & Auto Home
  - 5.2.5.5. Cruise Control to Set Speed of the Transporter for Hands Off Operation
  - 5.2.5.6. All Reel Controls to Include: Retrieve, Release, and Variable Speed [Excluding Dolly Systems]
- 5.2.6. Wireless Controller
  - 5.2.6.1. Joystick Control for Pan and Tilt Zoom Camera to Include: 360 Degree Rotate, 330 Degree Optical Pan
  - 5.2.6.2. Joystick Control for All Steering Functions & Forward / Reverse Directions for Transporter
  - 5.2.6.3. Camera Lift Control for Optional Electronic Camera Lift
  - 5.2.6.4. All Other Controls for Camera to Include: Camera Iris and Focus Override & Zoom, Camera Lights & Shutter Control for Light Enhancement, Camera Diagnostics & Auto Home
  - 5.2.6.5. Cruise Control to Set Speed of the Transporter for Hands Off Operation
  - 5.2.6.6. All Reel Controls to Include: Retrieve, Release, and Variable Speed [Excluding Dolly Systems]

**6. Input, Logging, and Report System**

- 6.1. The inspection system shall include a data display module and report writing system.
  - 6.1.1. This system is to place pipeline condition messages on the screen for recorded video.
  - 6.1.2. The system shall also be capable of writing simple inspection reports to a printer.
  - 6.1.3. An example of the "simple inspection report" must be provided with the bid submission.

- 6.2. System components shall include at a minimum:
  - 6.2.1. System control unit modular mount video character generator including:
    - 6.2.1.1. Power switch with indicator light
    - 6.2.1.2. Selection toggle switches for keyboard-free operation
    - 6.2.1.3. Microprocessor electronics and memory chip
    - 6.2.1.4. Industrial finish with permanent labels
    - 6.2.1.5. Keyed cable connections with locking devices
    - 6.2.1.6. LED cable footage display
    - 6.2.1.7. Incoming power of either 120VAC or 12VDC
  - 6.2.2. Interconnect cable for interface with any 10ppr encoder
  - 6.2.3. Full size QWERTY keyboard

- 6.3. The system shall have the following operational features at a minimum:
  - 6.3.1. Menu-driven on-screen instructions
  - 6.3.2. Minimum of 52 user-definable preset defect codes
  - 6.3.3. Stored memory shall not rely on battery backup
  - 6.3.4. Characters must be selectable in black or white text
  - 6.3.5. Footage must display in tenths of feet accuracy
  - 6.3.6. Basic screen display must include time, date, pull direction, (3) lines of user-definable text, and current footage. The characters must be movable to different on-screen user-preferred locations.

- 6.4. The reporting function shall include user-definable fields for the following header data:
  - 6.4.1. (3) lines of user-definable text
  - 6.4.2. Inspection date
  - 6.4.3. Area
  - 6.4.4. Location
  - 6.4.5. Upstream manhole
  - 6.4.6. Downstream manhole
  - 6.4.7. Supervisor
  - 6.4.8. Sewer type
  - 6.4.9. Surface
  - 6.4.10. Inspection length
  - 6.4.11. Pipe type
  - 6.4.12. Pipe size
  - 6.4.13. Pipe length
  - 6.4.14. Operator
  - 6.4.15. Inspection
  - 6.4.16. Work order

- 6.5. Defects can then be listed individually with footage & associated pre-programmed code.

**7. LCD Monitor(s)**

- 7.1. A 15-inch LCD monitor (minimum size) shall be supplied, facing rearward, for viewing the inspection at the rear of the vehicle.
- 7.2. The monitor(s) shall meet these minimum specifications:

- 7.2.1. Resolution = 1024 x 768
- 7.2.2. Brightness = 250 cd/m<sup>2</sup>
- 7.2.3. Viewing angle = 130° horizontal, 100° vertical
- 7.2.4. Contrast ratio = 600:1
- 7.2.5. Power signal = 100 to 240V AC at 50 to 60Hz
- 7.2.6. Video input from PC and component sources
- 7.2.7. Internal speakers, qty.2
- 7.2.8. Adjustments for H-position, V-position, contrast, tint, brightness, and color

**8. Pan and Tilt Zoom Camera**

- 8.1. A color pan and tilt view camera shall be supplied. The camera shall use directional long-life-rated LED light sources to provide adequate pipe wall illumination in sizes up to 36-inches.
- 8.2. The camera shall have the following operational features:
  - 8.2.1. Usable in 6-inch relined pipes and larger
  - 8.2.2. Transmits a color video signal through at least 1000-feet of multi-conductor cable
  - 8.2.3. Designed with solid-state circuitry to withstand shock and vibration
  - 8.2.4. Operates in climatic conditions from at least 0°C to 50°C with 100% RH
  - 8.2.5. Retains full functionality when connected directly to multi conductor mainline cable
  - 8.2.6. Mainline cable termination must include internal, mechanical strain relief to support this application
- 8.3. The camera module shall have the following electronic features:
  - 8.3.1. Color Super HAD CCD, 1/3-inch
  - 8.3.2. Collection matrix of 768h x 494v pixels, total of 379,392
  - 8.3.3. 480h TV lines of resolution
  - 8.3.4. NTSC color image scanning - 525 lines a 60Hz, 2:1 interlaced
  - 8.3.5. Minimum illumination sensitivity of 0.14lux, with (4) user-selectable preset shutter settings
  - 8.3.6. Automatic light-compensating iris, with manual override
  - 8.3.7. White balance optimization with minimum (4) user-selectable presets
  - 8.3.8. Regulated DC power input range of 18-36V
  - 8.3.9. Software resident on upgradeable EEPROM
  - 8.3.10. 4.2 ~ 42mm, f1.8 zoom lens, 10x optical, 4x digital, 40:1 total zoom
  - 8.3.11. Proportionally slowed camera movements when zooming
  - 8.3.12. 1/2-inch to ∞ automatic focus, with manual override

The following characteristics must be present in the camera electronics to be acceptable:  
Minimum light sensitivity of 0.1lux or better  
Camera software upgrades

- 8.4. The camera chassis shall have the following electromechanical features:
  - 8.4.1. Overall length of 8-inches or less
  - 8.4.2. Head diameter of 3/4-inches or less
  - 8.4.3. Stainless steel and anodized aluminum construction

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|  | <ul style="list-style-type: none"><li>8.4.4. Camera should have 360 degree rotation</li><li>8.4.5. Pan and tilt angle to view backward a minimum of 45°</li><li>8.4.6. Simultaneous pan/tilt and rotational motions</li><li>8.4.7. Scratchproof sapphire camera window</li><li>8.4.8. DC motors with planetary gears, ball bearings, power all camera motions, with clutches to protect from overloads and impacts</li><li>8.4.9. Redundant dirt and pressure seals at all moving joints</li><li>8.4.10. Automatic home feature to upright forward viewing, with forks above and below camera head</li><li>8.4.11. Qty.6 minimum user-selectable location presets</li><li>8.4.12. Qty.2 minimum user-selectable, 1 touch, joint scanning presets</li><li>8.4.13. Fast-check LED indicator for low camera head pressure</li><li>8.4.14. 1/8 turn locking collar to mount to tractor</li><li>8.4.15. Forks at top and bottom of camera head at home position, allowing quicker viewing of side-entry laterals</li></ul> <p>8.5. The camera lighting system shall have the following features:</p> <ul style="list-style-type: none"><li>8.5.1. Light emitting diode (LED) light sources, lifetime rated for 10,000 hours of use</li><li>8.5.2. Bulbs must be evenly distributed along circumference of camera to provide even light throughout the pipe diameter</li><li>8.5.3. A maintenance-free directional true color warm white LED module for operation up to 36-inch pipelines</li><li>8.5.4. Maintenance-free forward facing true color warm white LED modules, positioned in the arms of the camera</li><li>8.5.5. Field-replaceable polycarbonate LED windows</li><li>8.5.6. Field-replaceable LED lights</li></ul> <p>8.6. The camera shall be equipped with the following diagnostic and safety features:</p> <ul style="list-style-type: none"><li>8.6.1. Internally pressurized with dry nitrogen to a minimum of 15-psi</li><li>8.6.2. An EIA color bar test chart display</li><li>8.6.3. A set of diagnostic telemetry, including:<ul style="list-style-type: none"><li>8.6.3.1. Camera module regulated Voltage</li><li>8.6.3.2. Light head current</li><li>8.6.3.3. Camera model, serial number, and software revision level</li><li>8.6.3.4. Internal camera head pressure</li><li>8.6.3.5. Operating hours</li></ul></li></ul> <p>8.7. The camera shall include a field pressurization kit including:</p> <ul style="list-style-type: none"><li>8.7.1. Dry nitrogen pressurized container</li><li>8.7.2. Pressure delivery regulator</li><li>8.7.3. Pressure meter for system</li><li>8.7.4. Pressure delivery trigger</li><li>8.7.5. Enclosed valve port design</li></ul> <p>8.8. The camera controller shall have the following features:</p> <ul style="list-style-type: none"><li>8.8.1. Joystick controller for camera head pan/tilt and rotational movements</li><li>8.8.2. Switch for manual focus override (in/out)</li><li>8.8.3. Switch for manual iris override (open/close)</li><li>8.8.4. Switch for diagnostic telemetry display (on/off)</li><li>8.8.5. Switch for camera home position</li></ul> |
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8.8.6. Desktop model, with cable connection to rear of SCU

**9. Self-propelled Wheel Drive Transporter**

- 9.1. Indicate whether the camera transporter is steerable or non-steerable. Transporter must include wheel/trac kits for pipe up to 24-inches.
- 9.2. A remotely controlled wheeled transporter shall be supplied. The transporter system shall be able to propel an inspection camera through relined 6-inch to 24-inch pipes to a distance of up to 1000-feet from point of entry.
- 9.3. The transporter shall have the following operational features:
  - 9.3.1. Usable in 6-inch relined pipes and larger
  - 9.3.2. At least 1-inch of ground clearance in 6-inch relined pipes
  - 9.3.3. Capable of lifting the camera head a minimum of 4-inches
  - 9.3.4. Capable of free-wheeling, allowing retrieval by cable and reel combination
  - 9.3.5. Capable of driving around debris or other obstacles in a pipeline
  - 9.3.6. Capable of transporting a standard pan and tilt or mini-mainline camera
- 9.4. The transporter shall have the following electronic features:
  - 9.4.1. Continuous duty rated brushless drive motors
  - 9.4.2. Transporter shall accept controls from system power control unit transmitted through a minimum of 1000-feet of cable
  - 9.4.3. Complete solid-state design
  - 9.4.4. Articulated rear cable connector for added cable strain relief
  - 9.4.5. Rearward viewing color camera with LED lighting, useable in relined 6-inch configuration for viewing behind tractor during inspection
  - 9.4.6. Universal, quick connect port for lighthoods, locating beacons, etc.
  - 9.4.7. Quick connect auxiliary LED lighthouse has no exposed wires and requires no clamp for mounting
  - 9.4.8. Solenoid operated clutches release upon power loss, allowing tractor to be retrieved in freewheel mode. Tractors without clutches or with mechanical clutches that do not release upon power loss are not acceptable.
  - 9.4.9. Integral, LED lights below camera
  - 9.4.10. No exposed interconnect cables for camera or tractor control
- 9.5. The transporter shall have the following mechanical features:
  - 9.5.1. Forward attachment for mounting miniature pan and tilt camera
  - 9.5.2. Replaceable O-ring seals at all field-serviceable joint locations
  - 9.5.3. Internal nitrogen recharge valve, not automotive style Schrader valve
  - 9.5.4. Manually-operated camera lifting mechanism, 4-inch minimum rise
  - 9.5.5. Camera lift must collapse if resistance is encountered during retrieval. Lifts that are mechanically fixed in a raised position are not acceptable due the risk of becoming stuck in the pipe.
  - 9.5.6. A transmission that includes:
    - 9.5.6.1. Gears in oil bath for maximum cooling and lubrication
    - 9.5.6.2. Neutral position to freewheel during retrieval
    - 9.5.6.3. Heavy duty worm drive gear to absorb drive line shock
  - 9.5.7. An enclosed drive train that includes:
    - 9.5.7.1. (6) 3<sup>3</sup>/<sub>8</sub>-inch rubber wheels for relined 6-inch lines

- 9.5.7.2. (4) 4<sup>3</sup>/<sub>8</sub>-inch rubber wheels for 8-15-inch sewer lines
- 9.5.7.3. (4) 4<sup>3</sup>/<sub>8</sub>-inch extended hub rubber tires for 8-18-inch sewer lines
- 9.5.7.4. (4) 5-inch extended hub rubber tires for 12-24-inch sewer lines
- 9.5.7.5. (2) 4<sup>3</sup>/<sub>8</sub>-inch extended hub carbide impregnated high traction wheels
- 9.5.8. All wheels must be interchangeable with a single fastener
- 9.5.9. No more than 7-inches between front and rear axles
- 9.5.10. No wider than 4.75-inches in relined 6-inch configuration
- 9.5.11. Tractor with zoom camera shall not exceed 26 lbs in 8-inch pipe configuration
- 9.5.12. Tractor with zoom camera shall not exceed 18.5-inches in length in 8-inch pipe configuration
- 9.5.13. Mainline cable to mate directly to tractor via 1/8 turn locking collar

9.6. The transporter shall include a field pressurization kit including:

- 9.6.1. Dry nitrogen pressurized container
- 9.6.2. Pressure delivery regulator
- 9.6.3. Pressure meter for system
- 9.6.4. Pressure delivery trigger
- 9.6.5. Enclosed valve port design

9.7. The transporter controller shall have the following features:

- 9.7.1. Power supply unit, with the following features:
- 9.7.2. Power switch with lamp
- 9.7.3. Directional switch, 3-position toggle (F/N/R)
- 9.7.4. Speed control dial
- 9.7.5. Voltage and ammeter display for power draw to transporter
- 9.7.6. Overload breaker protection
- 9.7.7. Joystick controller for directional control

9.8. A spare parts kit shall be included with the unit that includes all parts that are expected to be replaced in the field. The kit shall also include any tools that are regularly needed in the servicing of the transporter.

9.9. The camera and transporter shall be shipped with a damage-resistant case. The case shall include a foam cradle, with solid exterior construction.

#### **10. Transmission Cable and Reel System**

10.1. A reel with multi-conductor cable shall be supplied. The cable shall be used for closed circuit video transmission as well as retrieval of the downhole equipment. The reel shall be capable of providing adequate force to the cable for equipment retrieval.

10.2. The reel shall have the following features:

- 10.2.1. Aluminum construction with anodized finish
- 10.2.2. Cable storage drum and frame handles
- 10.2.3. 120V AC motor
- 10.2.4. Maximum motorized retrieval speed of at least 180 fpm with tractor attached
- 10.2.5. Clutch system with freewheeling capability and manual override
- 10.2.6. Mechanical drive chain between clutch and drum
- 10.2.7. Low friction greased bearings to minimize drag

- 10.2.8. Cable level wind that automatically lays cable evenly across drum with manual override
- 10.2.9. Mechanical footage meter mounted on level wind
- 10.2.10. Footage encoder to send electronic footage data to display system, ±2% accuracy minimum
- 10.2.11. Corrosion proof and maintenance free
- 10.2.12. Control panel with speed and direction controls
- 10.2.13. Telescoping swivel cable guide with directional roller and locking positions
- 10.2.14. Mounting kit for securing reel in a vehicle application
- 10.2.15. A welded aluminum reel stand with PVC tractor storage tube shall be provided

The following characteristics must be present in the camera electronics to be acceptable:

- Gold contact slip rings
- All mechanical drive mechanism (drives with solenoids are deemed unacceptable)
- Enclosed drive assembly
- Freewheeling capability
- 180 feet per minute minimum retrieval speed

10.3. The cable shall have the following features:

- 10.3.1. Continuous length of 1000-feet minimum
- 10.3.2. Rated breaking strength of 1200 pounds minimum
- 10.3.3. Outer jacket of low-friction abrasion-resistant material
- 10.3.4. Continuous length terminated at resin-free connector
- 10.3.5. Construction of separate conductors of adequate gauge for delivering power and control signals to downhole equipment
- 10.3.6. Termination to field-replaceable resin-free sealed tapered connector. Cables that cannot be reterminated in the field are not acceptable.

10.4. The cable shall also include a repair kit for repairing the termination.

### **11. Downhole Guide System**

11.1. A downhole guide system shall be supplied for guiding and protecting the cable between the inspection system and the pipe. The system shall include the following devices at a minimum:

- 11.1.1. Topside roller with aluminum roller and steel frame
- 11.1.2. Durable plastic “tiger tail” ribbed downhole cable protector with tie rope
- 11.1.3. Downhole roller with aluminum rollers and steel frame, quick-lock detachable
- 11.1.4. (Qty. 30-feet) of fiberglass poles for attaching to downhole roller, quick-lock detachable sections
- 11.1.5. Hook for attaching to poles allowing for roller to be hung from manhole ring
- 11.1.6. Extraction pole assembly for lifting equipment from manhole or culvert, including:
  - 11.1.7. Tractor lifting eye with attachment hardware
  - 11.1.8. (Qty. 3) quick-lock detachable reinforced fiberglass poles

**12. Training**

12.1. Within 30 days of delivery, a qualified factory representative shall fully instruct appointed personnel in the operation and maintenance of the sewer inspection equipment specified. At a minimum, this instructional course shall be one (1) day in duration. Topics covered shall include operational procedures, maintenance procedures, and safety procedures. Data handling procedures shall also be discussed, tailored to the data system specified.

**13. Instructional Materials**

13.1. The following instructional materials must be delivered with the system in hardcopy (one set) and electronic format:

13.1.1. All equipment manuals for proper operation and maintenance, matched to specified system equipment, including any aftermarket equipment installed

13.1.2. All manufacturer's parts catalogs

**14. Maintenance Kit**

14.1. A maintenance kit shall be included with delivery of the system. This kit shall include all the necessary common tools, not provided in 9.8, needed in the normal course of maintenance of the TV system equipment specified. Tools should include at a minimum:

14.1.1. Adjustable wrench

14.1.2. Combination wrench set

14.1.3. Allen wrench set

14.1.4. Side cutter pliers

14.1.5. Long nose pliers

14.1.6. Channel lock pliers

14.1.7. Vise-Grip pliers

14.1.8. Screwdriver set including flat blade and Phillips

14.1.9. Nut driver set

14.1.10. Soldering iron

14.1.11. Roll of 60/40 resin core solder

14.1.12. Wire cutter with terminal crimper

14.1.13. Utility knife

14.1.14. Electrical tape

**15. Warranty**

15.1. The TV inspection system shall be warranted against manufacturing defects for period of (12) months from the date of delivery at a minimum. Any installed equipment warranties that extend beyond this period (e.g. a vehicle 36 month / 36000 mile warranty) shall be passed on to the Town of Simsbury by the TV system manufacturer.

**16. Certification**

Each camera, camera transporter, and external lighthead to be supplied on this specification must be labeled and listed as a minimum by a Nationally Recognized Testing Laboratory (NRTL) to the applicable Standard for Safety for Closed Circuit Television Equipment, UL 2044, 2nd edition, 11/9/01. A listing report must be supplied that certifies the aforementioned equipment is acceptable as defined by 29 CFR 1910.399 and required by 29 CFR 1910.303(a). Self-certification or certification by a laboratory that is not an NRTL will be deemed unacceptable. NRTL labeled and listed equipment shall be supplied as required by the FEDOSHA memorandum, dated September 25, 2002, page 3, Section on Compliance, prepared by John L Henshaw, Assistant Secretary of Occupational Safety and Health.

**17. Delivery**

The system shall be delivered to Simsbury Water Pollution Control, 36 Drake Hill Road, Simsbury, CT in first-class operating condition. Acceptance of the system shall be subject to inspection and approval by Town personnel.

**19. Optional Equipment to be selected upon award of bid.**

- 19.1. Roof top air conditioner, 13,500 BTU with heat strip
- 19.2. Roof top exhaust fan and appurtenances