

# REHAB TECHNOLOGY SELECTION GUIDE

## CURED-IN-PLACE-PIPE (CIPP)

| Company                          | Product/Type                                   | Mainline, Lateral Sectional                | Inversion/Cure Process                        | Pull In Diameter Range (in)             | Inversion Diameter Range (in) |
|----------------------------------|--|--|---|---|-------------------------------|
| Applied Felts                    | Felt and fiberglass-reinforced liners          | mainline, laterals, sectional              | steam, hot water, ambient                     | 4-120                                   | 4-120                         |
|                                  | Calibration Tubes                              | mainline, lateral                          | steam, water, UV, ambient                     | 4-36                                    | 4-36                          |
|                                  | EnviroCure Styrene Impermeable Liner           | mainline                                   | steam, water, UV, ambient                     | 4-120                                   | 4-120                         |
| C.I.P.P. Corp.                   | Felt Liner                                     | lateral                                    | steam, water cure                             | 4-108                                   | 4-108                         |
| Emagineered Solutions, Inc.      | The Shooter CIPP                               | mainline                                   | air/water inversion; steam, hot water, LED/UV |   | 4-24                          |
| Flow-Liner Systems               | CIPP System                                    | mainline, lateral, sectional               | air/steam, ambient                            |   | 2-12                          |
|                                  | Liners   | mainline, lateral, sectional               | air/steam, ambient                            |   | 2-12                          |
|                                  | Resins   | mainline, lateral, sectional               | air/steam, ambient                            |   | 2-12                          |
| Granite Inliner                  | CIPP   | mainline                                   | steam, water, uv cure                         | 4-120                                   | 4-120                         |
| HammerHead Trenchless            | HELIAM Scrim Liner                             | lateral                                    | bluelight LED, water, ambient                 | 4, 5.75 & 6                             | 4.5, 5.75 & 6                 |
|                                  | HH Bluelight LED Liner                         | lateral                                    | bluelight LED                                 | 5, 8-10                                 | 5, 8-10                       |
|                                  | HH Flex LED Liner                              | lateral                                    | bluelight LED                                 | 3-6                                     | 3-6                           |
|                                  | HH Flex Liner                                  | lateral                                    | steam, water, ambient                         | 4-8                                     | 4-8                           |
|                                  | Wovo/Brawoliner                                | lateral                                    | steam, water, ambient                         | 2-8                                     | 2-8                           |
|                                  | Wovo/Brawoliner                                | 3D lateral                                 | steam, water, ambient                         | 3-8                                     | 3-8                           |
|                                  | RS CityLiner                                   | mainline                                   | steam, water, ambient                         | 6-48                                    | 6-48                          |
|                                  | RS Blueline                                    | mainline                                   | steam, water, ambient                         | 6-48                                    | 6-48                          |
|                                  | RS CityMain                                    | mainline                                   | steam, water, ambient                         | 6-48                                    | 6-48                          |
| Infrastructure Repair Systems    | Point Repair                                   | sectional                                  | ambient                                       | 3-72                                    | 3-72                          |
|                                  | Point Repair                                   | sectional                                  |   | 3-100                                   |                               |
| Inland Pipe Rehabilitation (IPR) | Invert-a-Pipe                                  | mainline                                   | steam & water                                 | n/a                                     | 6-120                         |
| InnerCure Technologies           | Coated & uncoated fiberglass calibration tubes | mainline, laterals, connections, sectional | steam, hot water, UV, ambient                 | 3-18                                    | 3-24                          |
| Insituform Technologies          | CIPP   | lateral, mainline                          | air, water inversion steam, water cure        | 4-108                                   | 4-108                         |
| Interplastic Corporation         | CIPP resin                                     | mainline, lateral, sectional               | steam, water, ambient, UV                     | 4-120                                   | 4-120                         |
| LMK Technologies                 | Lap Liner                                      | main, lateral                              | ambient                                       |   | 4-24                          |
|                                  | T-Liner  | main, lateral                              | air/steam, ambient                            |   | 6-36                          |
|                                  | Shorty   | main, lateral                              | air/steam, ambient                            |   | 6-24                          |
|                                  | Stubby   | main, lateral                              | air/ambient                                   |   | 6-36                          |
|                                  | Performance Liner Lateral Liner                | lateral                                    | air/steam, ambient                            |   | 2-8                           |
|                                  | Push-In-Place Spot Repair                      | lateral                                    | air/steam, ambient                            |   | 4 & 6                         |
|                                  | Invert-In-Place Spot Repair                    | lateral                                    | air/steam, ambient                            |   | 4 & 6                         |
|                                  | Performance Liner Sectional Inversion          | sectional                                  | air/steam, ambient                            |   | 6-42                          |
|                                  | Liner Products                                 | Felt Liner                                 | lateral, mainline                             | air, water inversion, steam, water cure | 4-120                         |
| Masterliner                      | CIPP   | mainline, lateral, sectional               | steam, water, air cure                        | up to 75                                | up to 75                      |
| MaxLiner USA                     | CIPP   | lateral, vertical                          | steam, hot water, ambient                     | 2-10                                    | 2-10                          |
| Manufactured Technologies Corp.  | Felt liner                                     |  | air, water, inversion, steam cure             | 6-96                                    | 6-96                          |
| National Liner                   | CIPP   |  | air, water inversion water, steam cure        | 4-108                                   | 4-108                         |
| NuFlow                           | NuDrain Precision Push/Pull in Place           | lateral, sectional                         | ambient, steam, hot water                     | 1.5-12; custom to 96                    |                               |
|                                  | NuCure Cold Cure UV (CCUV)                     | lateral, sectional                         | UV/LED  | 3-6                                     |                               |
|                                  | NuTube (Inversion)                             | mainline, lateral                          | ambient, steam, hot water                     |   | 2-12                          |
| PALTEM                           | Super-HL                                       | mainline                                   | inversion/steam or ambient                    |   | 8 - 40                        |
| Perma-Liner Industries           | Perma-Liner Inversion                          | lateral                                    | inversion                                     |   | 2-8                           |
|                                  | Perma-Lateral Pull-in                          | lateral                                    |   | 2-8                                     |                               |
|                                  | Perma-Patch Lateral Spot                       | lateral                                    | spot  | 4                                       | 8                             |
|                                  | Perma-Main Continuous Lining                   | mainline                                   |   |   | 6-36                          |
|                                  | Mainline Spot Repair                           | mainline                                   |   | 6-24                                    |                               |
| Premier-Pipe USA                 | Felt Liner                                     | lateral                                    |   |   | 4-108                         |
| PrimeLine Products               | PrimeLiner                                     | mainline, lateral, sectional               | steam hot water, ambient                      | 3-6                                     | 2-120                         |
|                                  |  | point repair                               | ambient                                       | 2-36                                    |                               |
| Reline America                   | UV GRP CIPP                                    | mainline                                   | UV-cured                                      | 6-72                                    | 6-72                          |

## WET-OUT SERVICES

| Company            | Resin Type           | Liner Type                    | Mainline/Lateral | Diameter Range (in.) |
|--------------------|----------------------|-------------------------------|------------------|----------------------|
| Ferratex Solutions | polyester/vinylester | felt/fiberglass reinforcement | both             | 6-84                 |

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## SPRAYED-IN-PLACE-PIPE (SIPP)

| Company                          | Product  | Pipe Diameter (in) | Type Pipe  | Insitu/New Pipe                        |
|----------------------------------|--|--------------------|--|--|
| APM Permaform                    | Permacast PL-8000 (centrifugally-cast-concrete)      | 30-120             | metal, concrete, clay, brick culverts, sewer pipe      | insitu                                 |
| Epoxytec                         | CPP Sprayliner                                       | 32+                | metal, concrete, clay, brick culverts, sewer pipe      | insitu                                 |
| GeoTree Solutions                | GeoSpray/GeoSpray HCE/GeoSpray 61 Geopolymer Mortars | 30+                | CMP, concrete, brick, stone, storm, sewer, box         | fully structural - insitu pipe-in-pipe |
| Granite Inliner                  | GeoKrete   | 36+                | all  | fully structural pipe-in-pipe          |
| Inland Pipe Rehabilitation (IPR) | EcoCast  | 36+                | all  | insitu                                 |
| Madewell Products                | Mainstay ML-72-HP                                    | 24+                | concrete, metal, storm, brick, clay                    | insitu                                 |
| Quadex LLC                       | Quadex Lining System                                 | 30+                | CMP, concrete, brick, stone                            | fully structural pipe- in-pipe         |
| Sauereisen                       | SewerGard 210  | 48+                | concrete, brick, metal                                 |  |
| Sewper Coat by Imerys            | Sewper Coat PG<br>Sewper Coat 2000HS                 | 36+<br>36+         | concrete brick<br>concrete brick                       | insitu<br>insitu                       |
| SippTech                         | SippSteel  | 8 - 144            | all  | structurally independent - insitu      |
| Sprayroq                         | SprayWall  | 36+                | concrete, metal, culverts, storm drains, DOT, clay     | fully structural pipe-in-pipe          |
| The Strong Co.                   | Storm Seal   | 30-120             | brick, sewer, stormwater, metal, concrete, clay, brick | fully structural pipe-in-pipe          |
| Warren Environmental             | 301 & 501 epoxy series                               | 4+                 | all  | structural insitu                      |

## GROUT-IN-PLACE-PIPE

| Company        | Product   | Diameter Range (in) |
|----------------|-----------|---------------------|
| Danby          | Panel Lok | 36+                 |
| National Liner | 3 - 5     | 36+                 |
| PALTEM         | Flow Ring | 32+                 |

## SPIRAL WOUND TECHNOLOGY

| Company              | Product   | Diameter Range (in) |
|----------------------|-----------|---------------------|
| Danby                | Panel Lok | 36+                 |
| ISCO Industries Inc. | Spirolite | up to 120           |
| Sekisui SPR Americas | SPR EX    | 8 - 42              |
|                      | SPR TF    | 36 - 80             |
|                      | SPR TM    | 32 - 217            |

## LIGHT CURED-IN-PLACE-PIPE (CIPP)

| Company                               | Product                                 | Type   | Diameter Range (in.) |
|---------------------------------------|---|--------|----------------------|
| C.I.P.P.                              | BKP Berolina                            | UV     | up to 56             |
| Granite Inliner                       | Inliner STX                             | UV     | 6-48                 |
| HammerHead Trenchless                 | BlueLight LED                           | LED    | 4-10                 |
| InnerCure Technologies Inc.           | Coated & uncoated fiberglass            | UV/LED | 3-24                 |
| Insituform Technologies               | iPlus Infusion                          | UV     | 6-15                 |
| Interplastic Corporation              | UV Co-Rezyn-CIPP                        | UV     | 6-48                 |
| LightRay                              | LIR3                                    | UV     | 3-6                  |
| Manufactured Technologies Corporation | iPlus Infusion                          | UV     | 6-15                 |
| MaxLiner USA                          | MaxLight                                | LED    | 4-10                 |
| NuFlow                                | NuCure Cold UV (CCUV)                   | UV/LED | 3-6                  |
|                                       | NuCure CCUV Large-Diameter Point Repair | UV/LED | 8-12                 |
|                                       | NuCure CCUV 2"                          | UV/LED | 1-3                  |
| Pipeline Renewal Technologies         | SpeedyLight+                            | UV LED | 4-12                 |
|                                       | LEDRIg                                  | UV LED | 6-24                 |
| PrimeLine Products                    | PrimeLiner                              | UV     | 3-15                 |
| Reline America                        | Alphaliner                              | UV     | 6-60                 |
| SAERTEX multiCom                      | LINER Pressure                          | UV     | 8 - 48*              |
|                                       | LINER Premium                           | UV     | 6 - 63*              |
|                                       | LINER Type S+                           | UV     | 6 - 63*              |
|                                       | LINER Premium Type S+                   | UV     | 6 - 63*              |
|                                       | LINER H2O                               | UV     | 8 - 40*              |

\*Pull-in Diameter Range

## FOLDED PIPE

| Company                 | Product    | Pipe Type | Diameter Range (in) | Pre-Heating |
|-------------------------|------------|-----------|---------------------|-------------|
| IPEX USA LLC            | Liner      | PVC       | 6-30                | Yes         |
| Miller Pipeline         | EX Method  | PVC       | 6-12                | Yes         |
| United Pipeline Systems | Tite Liner | HDPE      | 4-48                | No          |

## SLIPLINING

| Company                         | Product                               | Diameter (in) | Pipe Material   | Available Lengths               |
|---------------------------------|---------------------------------------|---------------|---|---------------------------------|
| Advanced Drainage Systems (ADS) | N-12 HDPE                             | 4-60          | high density polyethylene                                       | 13', 20'                        |
|                                 | SaniTite HP                           | 12-60         | polypropylene   | 13', 20'                        |
|                                 | HP Storm                              | 12-60         | polypropylene   | 13', 20'                        |
| Contech Engineered Systems      | A2 Liner                              | 12-36         | PVC resin (12454)   | 10', 20'                        |
|                                 | DuroMaxx                              | 30-120        | Steel Reinforced Polyethylene                                   | 14', 24'                        |
|                                 | ULTRA FLO                             | 18-120        | ALT2 Corrugated Steel Pipe Polymer-Coated Steel Corrugated Pipe | 10' - 40'                       |
|                                 | HEL-COR                               | 6-144         | ALT2 Corrugated Steel Pipe Polymer-Coated Steel Corrugated Pipe | 10' - 40'                       |
|                                 | CORLIX                                | 6-120         | Aluminum  | 10' - 40'                       |
|                                 | ALSP                                  | 5' - 40'      | Aluminum Structural Plate                                       | 4.5' plate lengths              |
|                                 | Tunnel Liner Plate                    | 4' - 15'      | Steel or Aluminum   | 18' plate lengths               |
| HOBAS Pipe USA                  | CC-FRP                                | 18-126        | centrifugally cast, fiberglass-reinforced polymer mortar        | 20' standard, shorter available |
| ISCO                            | Snap-Tite                             | 6-63          | HDPE  | 2'-50'                          |
| Primus Line Inc.                | FFRP (flexible fiber-reinforced pipe) | 6-20          | PE/Kevlar   | up to 8,200' in one shot        |
| Thompson Pipe Group             | FRPM<br>Non-round FRPM                | 12-156        | filament-wound, fiberglass-reinforced polymer mortar            | 10'-40'                         |
| Underground Solutions Inc.      | Fusible PVC Pipe                      | 4-36          | PVC   | 20', 30', 40'                   |
| United Pipeline Systems         | Tite Liner                            | 4-54+         | HDPE  | 1,000'                          |

# Rehab Technology Selection Guide

| GROUT  |  |   |  |
|--|--|---|--|
| Company  | Product                                      | Viscosity   | Application  |
| Avanti Intl.   | AV-100® Chemical Grout (acrylamide)*         | 1-2 cP @ 72°F (22°C) in solution                                | Chemically activated grout designed to stop water infiltration and stabilize soils in mainlines, laterals, manholes, and various other underground structures: <ul style="list-style-type: none"> <li>• 50+ years of successful, documented use</li> <li>• 25-50+ year service life</li> <li>• Ultra low viscosity (like water)</li> <li>• Available as granular or liquid forms</li> <li>• Half-life of 362 years at 20% concentration determined by DOE</li> </ul> |
|  | AV-202® Multigrout Series                    | LV-650-800 cP<br>Standard*-3,200-6,000 cP<br>NTP-3,200-6,000 cP | Single-component grout designed to seal active water leaks in large cracks or joints in concrete structures and is often used in conjunction with Oakum: <ul style="list-style-type: none"> <li>• Applications where high viscosity chemistry is required</li> <li>• Manhole sealing and pipe penetrations</li> <li>• Excellent choice for moving cracks and joints</li> <li>• EGP technique with Oakum</li> </ul>   |
|  | AV-275 Soilgrout* with AV-276                | 30-55 cP  | Two-component grout that reacts quickly with moisture to bind together and water-proof loose granular soils: <ul style="list-style-type: none"> <li>• Fills voids on the exterior of below-grade structures</li> <li>• Stops high flows in below-grade structures</li> <li>• Stabilizes soil to prevent soil erosion, sink holes, sinking foundations</li> </ul>   |
|  | AV-290 Fast-Set                              | Part A: 200 cP<br>Part B: 600 cP                                | Dual-component hydrophobic grout that rapidly fills large voids on exterior of below-grade structures, where high-water flow is present. No water necessary: <ul style="list-style-type: none"> <li>• Fill large voids below-grade</li> <li>• Stops high-volume leaks</li> <li>• Free rise expands up to 2,600%</li> </ul>   |
|  | AV-330 Safeguard Series                      | Standard*-350-750 cP<br>NTP-350-750 cP                          | Single-component grout that seals active leaks in below-grade structure in various cracks and joints, and offers added safety in confined spaces or where there is poor ventilation; e.g. utility vaults, basements: <ul style="list-style-type: none"> <li>• Seals medium cracks or joints in concrete structures</li> <li>• Great for manholes and pipe penetrations</li> <li>• Can be used for underwater applications</li> </ul>                                 |
|  | Ultrafine Cements from US Grout - SD* and VX |   | Composed of a finely ground mixture of Portland cement, pumice pozzolan, and dispersant. Small particle size (average of 3 micron) penetrates small fractures and fine soils: <ul style="list-style-type: none"> <li>• BABA approved</li> <li>• Stable North America supply</li> <li>• Stabilizes weak soils</li> <li>• Seals seepage in mines, dams, and tunnels</li> <li>• Low permeability grout curtaining</li> </ul>  |
| <i>*NSF/ANSI/CAN 61 Drinking Water System Components</i> |  |   |  |
| Logiball Inc.  | PR-10 Chemical Grout                         | 1-2 CPS in solution   | Chemical grout to control groundwater infiltration in main-lines, joints, lateral connections & laterals with remotely operated packers.   |
|  | Logiscell+                                   | 3500-5000 cps   | Water activated Hydrophilic grout to seal active leaks in visitable structures (filling joints & cracks, sealing pipe penetrations, filling voids). Working with dry oakum.  |
| Prime Resins   | Prime Flex 900 XLV                           | 250-350 cps   | Sealing leaks in extremely tight hairline cracks.  |
|  | Prime Flex 910                               | 35-50 cps   | Soil stabilization; curtain wall grouting; sea wall leak sealing. Hydrophobic, forms watertight, rock hard mass.   |
|  | Prime Flex 920                               | 120 cps   | Soil stabilization, permeation grouting, void filling, gushing leak sealing, below-grade curtain grouting. Hydrophobic.  |
|  | Prime Flex 940                               | 450-600 csp   | Sealing active leaks in joints and cracks. Hydrophobic flexible foam.  |
|  | Hydro Gel SX                                 | 440-550 cps (20 cps at 8:1)                                     | Sealing leaks; point repair grouting. Hydrophilic; for wet, below-grade environments such as manholes  |
|  | Prime Flex 985 (LX20)                        | 270-280 cps   | Rigid polyurethane foam. Fills voids in/around structures; fills abandoned underground storage tanks and pipes.  |
|  | AR 800                                       | 1-15 cps in solution  | Soil stabilization, sealing joints and leaks in potable water pipes and waste water pipes. Hydrophilic, acrylate (acrylamide-free), elastomeric gel, primarily for geotech uses. Wide window of variable set time-field adjustable. Excellent penetration in sandy/silty soils. For void fill when expansive pressure is not desired.  |
|  | AR 870                                       | 2-7 cps in solution   | Sealing leaks in concrete; sealing wastewater lateral joints and leaks; controlling water in tunneling ops, elevator pits, below-grade structures.   |
|  | Precision Lift 4.0/4.75                      | 270-280 cps   | Compaction grouting, slab lifting. Hydro insensitive, polyurethane structural foam.  |
|  | PR10L ACLM                                   | 1-2 cP @ 72° F in solution                                      | Sealing leaks from infiltrating water or to deeply penetrate soils for stabilization. Thin as water for great penetration.   |
| Sealing Systems  | Aqua Seal                                    | 440 cps "B" side<br>200 cps "A"                                 | Aqua Seal is an extremely reactive two side component hydrophobic polyurethane water stop system that can be injected into flowing water.  |
| Spectrashield  | SpectraGrout®                                | 125cP   | Hydrophilic grout used for stopping leaks, filling joints and cracks, sealing pipe penetrations, filling voids and stabilizing soil in wastewater structures   |

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## GROUTING EQUIPMENT

### TEST & SEAL PACKERS

| Company       | Model                              | Pipe Diameter (in) | Type   |
|---------------|------------------------------------|--------------------|--|
| Logiball Inc. | 2001 J Series                      | 6-21               | round pipe (vcp, acp, concrete, pvc)   |
|               | CMP Series                         | 4-144              | round pipe collapsible mainline test & seal packers  |
|               | Elliptical series                  | (14 x 23+)         | test & seal grouting packers for elliptical concrete pipe                                      |
|               | Box Culvert series                 | up to 120          | custom made packers for box culverts   |
|               | Flexible Push/Pull                 | 4-10               | flexible packers w/3-5ft grouting span   |
|               | Log Span Flexible Grouting Packers | 8-24               | Flexible grouting packers with longitudinal spans up to 12 feet to grout longitudinal defects. |
| CUES          | Low Void                           | 6-18               | round  |
|               | Collapsible                        | 24-96              | round  |

### TEST & SEAL LATERAL PACKERS

| Company       | Model                    | Mainline Diameter (in) | Lateral Diameter (in) |
|---------------|--------------------------|------------------------|-----------------------|
| Logiball Inc. | 2001L series             | 6-30                   | 4-6; 30               |
|               | Man Entry Lateral Packer | 30-42                  | 4-8                   |
| CUES          | Logiball                 | 6-30                   | 3-8                   |

## STRUCTURAL POINT REPAIR

| Company                       | Model                   | Mainline Pipe Diameter (in.) | Lateral Diameter                               |
|-------------------------------|-------------------------|------------------------------|--|
| CUES                          | LOCK Stents             | 6-108                        | round  |
|                               | LOCK Sealer Sleeves     | 6-108                        | round  |
|                               | LOCK End Sealers        | 6-108                        | round  |
| Flow-Liner Systems            | Quick Lock Point Repair | 4-32                         | round  |
|                               | Quick Lock End Cap      | 8-32                         | round  |
| GeoTree Solutions             | RenewWrap               | 36+                          | CMP, concrete, brick, stone, storm, sewer, box |
| Pipeline Renewal Technologies | Quick-Lock Point Repair | 6-32                         | round  |

## INTERNAL JOINT SEALS

| Company                       | Product                                    | Seal Application Size (in) | Seal Operating Pressures (psi) |
|-------------------------------|--|----------------------------|--------------------------------|
| Cretex Specialty Products     | Internal Manhole Chimney Seal              | 20-48                      | 6 external                     |
|                               | Chimney Seal                               | 20-48                      | n/a                            |
|                               | Internal Pipe Joint Seal                   | 24-48                      | 6 external                     |
|                               | External Manhole Joint Seal                | 32-120                     | 13 external                    |
|                               | HydraTite Seal                             | 18-216                     | 150 external/300 internal      |
| InnerCure Technologies Inc.   | Internal joint seal                        | 3-24                       | 15 (external)                  |
| LMK Technologies              | CIPMH                                      | up to 36                   | 150 external                   |
| Miller Pipeline               | Weko-Seal                                  | 18-216                     | 300 internal                   |
| Pipeline Renewal Technologies | Quick-Lock End Caps                        | 6-32                       |                                |
| PrimeLine Products            | NPC-internal joint seals                   | 15-120                     | 30' of head pressure           |
|                               | NPC-external chimney seals                 | 32-42                      |                                |
|                               | NPC-internal chimney seals                 | 18-42                      |                                |
|                               | NPC-liner end seals                        | 7.25-36                    |                                |
| Sauereisen                    | Manhole Chimney Seal No. F-88              | 12-60                      | 35                             |
| Sealing Systems Inc.          | Flex-Seal 2.0 internal chimney seal        | n/a                        | 40                             |
|                               | Gator Wrap external joint wrap             | 20-72                      | 30' head pressure              |
|                               | Infi-Shield uni-band external chimney seal | 24-48                      |                                |

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## MANHOLES

| Company   | Coating | Inserts | Liners | Inverts |
|---|---------|---------|--------|---------|
| <b>APM Permaform</b>  | Yes     | Yes     | Yes    | Yes     |
| No-Dig manhole solutions since 1975 provided through world-wide network of highly trained applicators; PERMAFORM, PERMACAST, CONMICSHIELD and COR+GARD offer the "hole" solution.                             |         |         |        |         |
| <b>Cherne</b>   | Yes     | Yes     | Yes    | Yes     |
| Cherne Air-Loc Bladder Style Manhole Testers provide an efficient, cost-effective method of testing new, existing and rehabilitated manholes, per ASTM C 1244.  |         |         |        |         |
| <b>Cretex Specialty Products</b>  | No      | Yes     | No     | No      |
| Leading manufacturer of mechanical internal and external manhole frame-chimney seals, internal joint seals, PRO-RING, external joint wraps, lid plugs, gaskets and more.                                      |         |         |        |         |
| <b>Danby</b>  | No      | No      | Yes    | Yes     |
| Cast-in-place new and rehab manholes using corrosion-resistant PVC liner with cementitious grout for storm and wastewater structures for over 28 years.   |         |         |        |         |
| <b>Epoxytec</b>   | Yes     | No      | Yes    | No      |
| Epoxytec offers coating solutions since 1979 to repair, rehabilitate, coat and line wastewater and water infrastructure.  |         |         |        |         |
| <b>GeoTree Solutions</b>  | Yes     | No      | Yes    | Yes     |
| Leading manufacturer of geopolymer lining systems for spray or hand-applied (including GeoSpray and GeoSpray HCE mortar solutions).   |         |         |        |         |
| <b>Granite Inliner</b>  | Yes     | Yes     | Yes    | Yes     |
| Manholes renewal contractor with over 35,000 manhole restorations completed utilizing a portfolio of comprehensive technologies that include CIPMH and epoxy-based methods.                                   |         |         |        |         |
| <b>HOBAS Pipe USA</b>   | No      | Yes     | Yes    | No      |
| Segmental sections are utilized to rehabilitate manhole shafts. The corrosion resistance and high strength composite make liner insertion quick and easy. Manhole T-base systems are available.               |         |         |        |         |
| <b>Infrastructure Repair Systems</b>  | Yes     | No      | No     | No      |
| Infragard, a durable topcoat and Chim Coat; a flexible mastic, trowel-on 100% solid epoxy rehab material.   |         |         |        |         |
| <b>ISCO Industries Inc.</b>   | Yes     | Yes     | Yes    | Yes     |
| Spirolite: Custom-designed and -configured HDPE manholes offer lightweight strength and durability, versatility and long life - for a complete, cost-effective solution.                                      |         |         |        |         |
| <b>LMK Technologies</b>   | No      | No      | Yes    | No      |
| A stretchable, one-size fits most CIPP lining is designed to structurally renew manholes while eliminating inflow at its source. CIPMH can be installed as a chimney seal or full-depth manhole lining.       |         |         |        |         |
| <b>Madewell Products Corporation</b>  | Yes     | No      | Yes    | Yes     |
| The Mainstay-branded restoration mortars and epoxy liners provide corrosion protection and structural integrity through a unique process yielding single cure time.   |         |         |        |         |
| <b>McNeil Technologies Inc.</b>   | No      | No      | Yes    | Yes     |
| Triplex Liners stop infiltration & deterioration. Composed of fiberglass, a non-permeable membrane, and epoxy resin. Bonds to wet or dry surfaces. Manhole installation: 6 hours.                             |         |         |        |         |
| <b>Miller Pipeline</b>  | No      | Yes     | No     | No      |
| <b>NOV Fiber Glass Systems Manholes</b>   | No      | Yes     | Yes    | Yes     |
| Non-corrosive FRP structural rehabilitation inserts, and new manhole or wetwell structures, per ASTM-D 3753. One-piece construction stops I&I and H2S degradation. H-20 Traffic Load rated; maintenance free. |         |         |        |         |
| <b>OBIC, LLC</b>  | Yes     | No      | Yes    | Yes     |
| Structural, semi-structural or multilayer polymer liner systems for structures with damage from infiltration or corrosion.  |         |         |        |         |
| <b>PPG Industries</b>   | Yes     | No      | Yes    | Yes     |
| PPG RAVEN 405 ultra-high-build epoxy lining system is a solvent-free, 100-percent solids coating with broad chemical resistance for new and rehabilitated wastewater infrastructures.                         |         |         |        |         |
| <b>PrimeLine Products</b>   | Yes     | No      | No     | No      |
| Based on advanced anti-microbial epoxy mortar technology, the liner contains broad-spectrum anti-microbial material that protects from mold, mildew & bacterial growth, and is highly chemical-resistant.     |         |         |        |         |
| <b>Quadex LLC (member of the Vortex family)</b>   | Yes     | No      | Yes    | No      |
| Since 1991, Quadex has been manufacturing and delivering the highest-quality geopolymer, hybrid cements and patching materials for the manhole/sewer infrastructure rehab market.                             |         |         |        |         |
| <b>Sauereisen</b>   | Yes     | No      | Yes    | No      |
| Sauereisen manufactures an array of cements, calcium aluminate, 100% solids epoxies, urethanes and polyurethane grouts for stopping water inflow and preventing corrosion in wastewater manholes.             |         |         |        |         |
| <b>Sealing Systems</b>  | Yes     | Yes     | No     | No      |
| Sealing Systems manufactures a variety of manhole rehab products: manhole inserts, coatings (external & internal) and chemical grout.   |         |         |        |         |
| <b>SewperCoat by Imerys</b>   | Yes     | No      | Yes    | Yes     |
| SewperCoat has been providing owners challenged by biogenic corrosion with a long-lasting solution for 30 years.  |         |         |        |         |
| <b>Spectrashield® Liner Systems</b>   | Yes     | No      | Yes    | Yes     |
| Stops infiltration, prevents corrosion, and has a 10-year warranty.   |         |         |        |         |
| <b>Sprayroq Inc.</b>  | Yes     | No      | Yes    | Yes     |
| Structural polyurethane that is self-priming, and provides infiltration control and fast return to service.   |         |         |        |         |
| <b>Standard Cement Materials</b>  | Yes     | No      | Yes    | Yes     |
| Since 1990, Minority Business Enterprise manufactures cementitious, geopolymer and calcium aluminates for CMP pipes, concrete, brick and fiberglass manholes; and epoxy coatings for lift stations.           |         |         |        |         |
| <b>The Strong Company</b>   | Yes     | No      | Yes    | No      |
| Manhole rehab solution since 1989. The fast, cost-effective solution for stopping infiltration, restoring structural integrity and protecting against corrosion.  |         |         |        |         |
| <b>Warren Environmental</b>   | Yes     | No      | Yes    | Yes     |
| Warren Environmental is a manufacturer of environmentally safe, non-hazardous, 100% solids, structural epoxy systems used to protect or rehabilitate a variety of infrastructure in one, time-saving coat.    |         |         |        |         |

# Rehab Technology Selection Guide

## REMOTE INSPECTION SYSTEMS

| Company   | Model  | Pipe Size (in)                  | Pipe Length (ft)       | Video                          | Camera               | Adjust Focus      |     |
|---|--|---------------------------------|------------------------|--------------------------------|----------------------|-------------------|-----|
| Aries Industries  | Voyager High Definition HD400 WiperCam                                     | 6-70                            | 1,200                  | HD                             | mainline             | yes               |     |
|   | Voyager High Definition HD TR400 Steerable Transporter (power camera lift) | 6-72                            | 1,200                  | HD                             | mainline             | yes               |     |
|   | Voyager LP400 Laser Profiler   | 6-18                            | 1,200                  | HD                             | mainline             | yes               |     |
|   | Mobile Voyager High Definition System                                      | 6-72                            | 800                    | HD                             | mainline             | yes               |     |
|   | Pathfinder PE3430/PE3530 WiperCam  | 6-70                            | 1,200                  | color                          | mainline             | yes               |     |
|   | Pathfinder TR3300 Steerable Transporter (manual camera lift)               | 6-24                            | 1,200                  | color                          | mainline             | yes               |     |
|   | Pathfinder TR3320 Steerable Transporter (power camera lift)                | 6-48                            | 1,200                  | color                          | mainline             | yes               |     |
|   | Pathfinder TR3400 Steerable Transporter (power camera lift)                | 8-72                            | 1,200                  | color                          | mainline             | yes               |     |
|   | Pathfinder LP3300 Laser Profiler   | 6-36                            | 1,200                  | color                          | mainline             | yes               |     |
|   | Mobile Pathfinder System   | 6-72                            | 1,200                  | color                          | mainline             | yes               |     |
|   | Illumi-Zoom PE2620/PE2720 Pan & Tilt Camera                                | 6-100                           | 2,000                  | color                          | mainline             | yes               |     |
|   | Taurus TR2000 Track Transporter  | 6-24                            | 2,000                  | color                          | mainline             | yes               |     |
|   | Badger TR3001 Wheeled Transporter  | 8-48                            | 2,000                  | color                          | mainline             | yes               |     |
|   | Badger TR3030 Wheeled Transporter  | 8-48                            | 2,000                  | color                          | mainline             | yes               |     |
|   | Titan TR7000 Steerable Wheeled Transporter                                 | 18-100                          | 2,000                  | color                          | mainline             | yes               |     |
|   | Titan LP3300 Laser Profiler  | 18-96                           | 2,000                  | color                          | mainline             | yes               |     |
|   | RinnoVision Manhole Inspection System                                      | 15" wide                        | 100' deep              | color 4K                       | manhole              | auto              |     |
|   | High cube truck build with any systems listed above                        |                                 |                        |                                |                      |                   |     |
|   | Van build with any systems listed above                                    |                                 |                        |                                |                      |                   |     |
|   | Trailer build with any systems listed above                                |                                 |                        |                                |                      |                   |     |
| Grout truck builds  |  |                                 |                        |                                |                      |                   |     |
| TrailBlazer Mobile Enclosure with Mobile Voyager/Mobile Pathfinder  |  |                                 |                        |                                |                      |                   |     |
| Retrofit existing inspection vehicles with any systems listed above |  |                                 |                        |                                |                      |                   |     |
| CUES  | Digital Universal Camera DUC   | 6 - 60                          | 2,000                  | side scan color                | mainline             | virtual*          |     |
|   | SPIDER Manhole Scanner   | 15' wide                        | 100'deep               | color 3D                       | manhole              | yes*              |     |
|   | Q23 Advanced Camera  | 6 - 48                          | 300                    | HD PTZ                         | mainline             | yes*              |     |
|   | Evolution Mainline   | 2 - 200                         | 4,000                  | color                          | mini & mainline      | yes*              |     |
|   | Workhorse Mainline   | 2 - 200                         | 4,000                  | color                          | mini & mainline      | yes*              |     |
|   | LAMP II Lateral & Mainline Probe II  | 6 relined - 36                  | 1,500                  | color                          | mini & mainline      | no*               |     |
|   | OZ II Camera   | 6 - 200                         | n/a                    | color                          | mainline             | yes*              |     |
|   | Pipe Ranger Transporter  | 7 - 60                          | 2,000                  | n/a                            | mainline             | n/a               |     |
|   | Quickzoom III Camera   | 4 - 48                          | 100                    | color                          | pole                 | yes*              |     |
|   | Sonar  | 8 - 1,200                       | 2,800                  | color                          | mainline             | n/a               |     |
|   | Laser Profiler   | 6 - 90                          | n/a                    | n/a                            | mainline             | yes*              |     |
|   | Shorty Transporter   | 6 - 36                          | 1,500                  | n/a                            | mainline             | n/a               |     |
|   | OZ III / Compact Pipe Ranger   | 5 - 30                          | 1,500                  | color                          | mainline             | yes*              |     |
|   | OZ III / Ultra Shorty III  | 5 - 30                          | 1,500                  | color                          | mainline             | yes*              |     |
|   | OZ III Camera  | 5 - 72                          | n/a                    | color                          | mainline             | yes*              |     |
|   | OZ III-S Camera  | 6-72                            | N/A                    | Color                          | mainline             | yes               |     |
|   | OZ4-HD Camera  | 6-72                            | N/A                    | Color                          | mainline             | yes               |     |
|   | Ultra Shorty 21 Transporter  | 6 - 36                          | 1,500                  | n/a                            | mainline             | n/a               |     |
|   | WTR III Wheeled / Track Transporter  | 6 - 30                          | 1,500                  | n/a                            | mainline             | n/a               |     |
|   | K2 Series  | 6 - 200                         | 1,200                  | color                          | mainline             | yes*              |     |
|   | Ultra Shorty III Track Transporter   | 5 - 30                          | 1,500                  | n/a                            | mainline             | n/a               |     |
|   | Steerable Mudmaster  | 24 - 200                        | 2,000                  | n/a                            | mainline             | n/a               |     |
|   | C550c Flexitrac Portable Mainline System                                   | 6-60                            | 1,000                  | PTZ                            | mainline             | yes*              |     |
|   | C540c Flexiprobe Push Camera   | 2-12                            | 500                    | color                          | lateral              | no*               |     |
|   |  | <i>*Remote Adjustable Focus</i> |                        |                                |                      |                   |     |
|   | Envirosight  | ROVVER X 95                     | 4+                     | +1,650'                        | color pan/ tilt/zoom | lateral, mainline | yes |
|   |  | ROVVER X 130                    | 6+                     | +1,650'                        | color pan/tilt/zoom  | mainline          | yes |
| ROVVER X 400  |  | 24+                             | +1,650'                | color pan/tilt/zoom            | mainline             | yes               |     |
| ROVVER X Laser  |  | 8+                              | +1,650'                | color pan/tilt/zoom, side-scan | mainline             | yes               |     |
| ROVVER X Digisewer  |  | 8+                              | +1,650'                | color side-scan                | mainline             | yes               |     |
| QuickView   |  | 6+                              | +400'                  | color zoom                     | manhole, mainline    | yes               |     |
| VeriSight Pro   |  | 2+                              | +330'                  | color                          | drain, lateral       | yes               |     |
| VeriSight Pro 360   |  | 4+                              | +330'                  | color pan/tilt                 | drain, lateral       | yes               |     |
| JetScan HD Video Nozzle   |  | 6+                              | as long as jetter hose | color                          | mainline             | no                |     |
|   |  |                                 |                        |                                |                      |                   |     |
| Pearpoint   | C550c Flexitrac Portable Mainline System                                   | 6 - 60                          | 1,000                  | PTZ                            | mainline             | yes               |     |
|   | P540c Flexiprobe Push Camera   | 2 - 12                          | 500                    | color                          | lateral              | no                |     |
| Subsite Electronics   | Private Eye 2  | 6-200                           | 1,000                  | color                          | mainline             | yes               |     |
|   | Cube   | 6-200                           | 1,500                  | color                          | mainline             | yes               |     |
|   | High Cube VMS  | 4-200                           | 2,000                  | color                          | mainline             | yes               |     |
|   | Van VMS  | 4-200                           | 2,000                  | color                          | mainline             | yes               |     |
|   | Trailer VMS  | 4-200                           | 2,000                  | color                          | mainline             | yes               |     |
|   | Gen2 Lateral Launch  | 4-24                            | 500                    | color                          | mainline/lateral     | no/yes            |     |
|   | TrakStar Camera  | 6-60                            | n/a                    | color                          | mainline             | yes               |     |
|   | TrakStar II Camera   | 6-60                            | n/a                    | color                          | mainline             | yes               |     |
|   | TranStar Transporter   | 6-30                            | 2,000+                 | n/a                            | mainline             | n/a               |     |
|   | TranStar II Transporter  | 6-24                            | 2,000+                 | n/a                            | mainline             | n/a               |     |
|   | ProTrak Crawler  | 6-30                            | 2,000+                 | n/a                            | mainline             | n/a               |     |
|   | Steerable Storm Drain Tractor  | 24-200                          | 2,000+                 | n/a                            | mainline             | n/a               |     |
|   | Mighty Mini Tractor  | 4-12                            | 2,000                  | n/a                            | mini/mainline        | n/a               |     |
|   | Pontoon  | 24-1,200                        | 2,000                  | n/a                            | mainline             | n/a               |     |
|   | SPC Push System  | 2-12                            | 150-500                | color                          | drain/lateral        | no                |     |

# Rehab Technology Selection Guide

## LATERAL INSPECTION SYSTEMS

| Company             | Model   | Pipe Size (in) | Pipe Length (ft) | Air/Electric     | Material  | Motion  |
|---------------------|---|----------------|------------------|------------------|-----------|---|
| Aries Industries    | LETS 6.0 - ST930 Camera                                   | relined 6-48   | 1,500            | electric         | all pipes | launch 150' up lateral from mainline; self-leveling                   |
|                     | LETS 6.0 - PE3601 Mini Pan & Tilt Camera                  | relined 6-48   | 1,500            | electric         | all pipes | launch 150' up lateral from mainline; pan and tilt                    |
|                     | LETS 6.0 - LE3270 Transporter                             | relined 6-48   | 1,500            | electric         | all pipes | launch 150' up lateral from mainline                                  |
|                     | High cube truck build with LETS 6.0 system                | relined 6-48   | 1,500            | electric         | all pipes | launch 150' up lateral from mainline                                  |
|                     | Van build with LETS 6.0 system                            | relined 6-48   | 1,500            | electric         | all pipes | launch 150' up lateral from mainline                                  |
|                     | Retrofit existing inspection vehicle with LETS 6.0 system | relined 6-48   | 1,500            | electric         | all pipes | launch 150' up lateral from mainline                                  |
|                     | Trailer build with LETS 6.0 system                        | relined 6-48   | 1,500            | electric         | all pipes | launch 150' up lateral from mainline                                  |
| CUES                | LAMP II   | 6 relined-36   | 1,500            | electric         | all pipes | extend/retract into lateral from mainline                             |
|                     | <i>Note: Both units simultaneously inspect mainlines.</i> |                |                  |                  |           |   |
| Envirosight         | ROVVER X SAT II   | 6+             | 1,000            | electric         | all pipes | extends 150' into lateral from mainline; performs pan/tilt inspection |
| NuFlow              | MiniFlex  | 1-4            | 90               | electric/battery | any       | 90°   |
| Subsite Electronics | Gen2 Lateral Launch                                       | 4-24           | 500              | electric         | all       | extends/retracts into lateral from mainline up to 200'                |
|                     | SPC Push System   | 2-12           | 150-500          | Manual           | All       |   |

## CUTTERS

| Company                             | Model   | Pipe Size (in) | Pipe Length (ft) | Air/Electric     | Material  | Motion   |
|-------------------------------------|---|----------------|------------------|------------------|-----------|--|
| Aries Industries                    | Wolverine 2.0 - CT2750 Cutter/PE2750 Camera                           | relined 6-24   | 800              | electric         | all pipes | self-propelled; in/out-up/down-rotate; 4th axis tool pivot |
|                                     | High cube truck build with Wolverine 2.0 cutter system                | relined 6-24   | 800              | electric         | all pipes | self-propelled; in/out-up/down-rotate; 4th axis tool pivot |
|                                     | Van build with Wolverine 2.0 cutter system                            | relined 6-24   | 800              | electric         | all pipes | self-propelled; in/out-up/down-rotate; 4th axis tool pivot |
|                                     | Trailer build with Wolverine 2.0 cutter system                        | relined 6-24   | 800              | electric         | all pipes | self-propelled; in/out-up/down-rotate; 4th axis tool pivot |
|                                     | Retrofit existing inspection vehicle with Wolverine 2.0 cutter system | relined 6-24   | 800              | electric         | all pipes | self-propelled; in/out-up/down-rotate; 4th axis tool pivot |
| CUES                                | Kangaroo  | 6-15           | 1,000            | air/electric     | all pipes | in/out-up/down-rotate                                      |
|                                     | Giant Kangaroo  | 10-30          | 1,000            | air/electric     | all pipes | in/out-up/down-rotate                                      |
|                                     | Curahee Cutters   | 5.25-12        | 1500             | air/electric     | any       | In/out-Up/down-Rotate                                      |
| Flow-Liner Systems                  | STREICHER   | 3-5            | 41-123           | air/electric     | any       | in/out-up/down-rotate                                      |
| NuFlow                              | Micro S Light +   | 3-9            | 164              | air              | any       | 90°  |
|                                     | Climbolino E Cutter   | 2.5-12         | 100              | electric/battery | any       | 90°  |
| Perma-Liner Industries/IMS Robotics | MICRO S automatic   | 3-10           | 164              | air              | any       | 90°  |
|                                     | MICROlight  | 3-10           | 98               | air              | any       | 90°  |
|                                     | MICROlight plus   | 3-10           | 98               | air              | any       | 90°  |
|                                     | MICROautomatic plus   | 3-10           | 164-230          | air              | any       | 90°  |
|                                     | NANOeasy  | 3-6            | 49-82            | air              | any       | 90°  |
| Pipeline Renewal Technologies       | Micro   | 3-6            | 100'             | air              | any       | clamping, arm rotation, arm bend                           |
|                                     | Micro Pro   | 3-6            | 100'             | air              | any       | self-propelled, clamping, arm rotation, arm bend           |
|                                     | Micro Premium   | 3-6            | 100'             | air              | any       | self-propelled, clamping, arm rotation, arm bend           |
|                                     | PC200   | 8-28           | 300'             | air              | any       | self-propelled, arm rotation, arm bend, tool pivot         |
| Vortex/Schwalm                      | Talpa 1300  | 6-12           | 600'             | both             | all       | 360°   |
|                                     | Talpa 2060  | 8-24           | 600'             | both             | all       | 360°   |

# Rehab Technology Selection Guide

## TRENCHLESS PIPE REPLACEMENT

### LATERAL SYSTEMS

| Company                        | Model                                  | Type Drive               | Host Pipe Diameter (in) |
|--------------------------------|--|--------------------------|-------------------------|
| Fibrwrap Construction Services | Tyfo Fibrwrap systems                  | gas or pressure operated | 30+                     |
| HammerHead Trenchless          | PortaBurst PB30                        | hydraulic                | 2-6                     |
|                                | HydroBurst HB5058                      | hydraulic                | 2-12                    |
|                                | HydroBurst 100XTR                      | hydraulic                | 3-16                    |
|                                | 3" HammerHead Mole Pipe Bursting Tool  | pneumatic                | 4                       |
|                                | 5½" HammerHead Mole Pipe Bursting Tool | pneumatic                | 4-6                     |
| TT Technologies                | Grundotugger                           | hydraulic                | 4-6                     |
|                                | Grundoburst 30TX                       | hydraulic                | up to 6                 |
|                                | Grundoburst 50TX                       | hydraulic                | up to 10                |
|                                | Grundocrack PCG85                      | pneumatic                | 4                       |
|                                | Grundocrack PCG95                      | pneumatic                | 4-6                     |
|                                | Grundocrack Mini-Atlas                 | pneumatic                | 4                       |
|                                | Grundocrack PCG130                     | pneumatic                | 4-6                     |

### PNEUMATIC PIPE BURSTING

| Company   | Model       | Tool Length (in) | Tool Diameter (in) | Host Pipe Diameter (in) | Host Pipe Type                     |
|---|-------------|------------------|--------------------|-------------------------|------------------------------------|
| HammerHead Trenchless   | 3" SR       | 52               | 3                  | 4                       | ACP, VCP, RCP, concrete, cast iron |
|   | 5.125" SR   | 66               | 5.125              | 6                       | ACP, VCP, RCP, concrete, cast iron |
|   | 5.75" SR    | 79.5             | 5.75               | 6                       | ACP, VCP, RCP, concrete, cast iron |
|   | 7" AR       | 81               | 7                  | 6-10                    | ACP, VCP, RCP, concrete, cast iron |
|   | 8" AR       | 105              | 8                  | 8-12                    | ACP, VCP, RCP, concrete, cast iron |
|   | 12" AR      | 89.2             | 12                 | 10-18                   | ACP, VCP, RCP, concrete, cast iron |
|   | 16" AR      | 85.5             | 16                 | 12-24                   | ACP, VCP, RCP, concrete, cast iron |
|   | 20" AR      | 108.4            | 20                 | 18-26                   | ACP, VCP, RCP, concrete, cast iron |
|   | 26XPR       | 138              | 25.6               | 15-36                   | ACP, VCP, RCP, concrete, cast iron |
| <i>Note: SR = Screw Reverse; AR = Air Reverse; AI = Air Impactor</i>                  |             |                  |                    |                         |                                    |
| Inland Pipe Rehabilitation (IPR)  | all         | n/a              | n/a                | 6-42                    | all                                |
| <i>Note: IPR is a pipe-bursting contractor that uses all equipment manufacturers.</i> |             |                  |                    |                         |                                    |
| TT Technologies   | PCF 130     | 53.5             | 5                  | 6-7                     | ACP, VCP, RCP, concrete, cast iron |
|   | PCF 145     | 63               | 5.75               | 7-8                     | ACP, VCP, RCP, concrete, cast iron |
|   | PCF 180     | 66.5             | 7                  | 8-10                    | ACP, VCP, RCP, concrete, cast iron |
|   | PCF 220     | 77               | 8.5                | 10-12                   | ACP, VCP, RCP, concrete, cast iron |
|   | Mini-Atlas  | 36               | 5                  | 6-7                     | ACP, VCP, RCP, concrete, cast iron |
|   | Titan       | 61               | 5.75               | 6-7                     | ACP, VCP, RCP, concrete, cast iron |
|   | PCG 130     | 50.5             | 5                  | 6-7                     | ACP, VCP, RCP, concrete, cast iron |
|   | PCG 145     | 60               | 5.75               | 7-8                     | ACP, VCP, RCP, concrete, cast iron |
|   | Olympus     | 66.5             | 7                  | 6-8                     | ACP, VCP, RCP, concrete, cast iron |
|   | PCG 180*    | 66               | 7                  | 8-12                    | ACP, VCP, RCP, concrete, cast iron |
|   | Hercules    | 75               | 8.5                | 8-12                    | ACP, VCP, RCP, concrete, cast iron |
|   | HV 220*     | 79               | 9                  | 10-12                   | ACP, VCP, RCP, concrete, cast iron |
|   | Mini-Gigant | 49               | 10                 | 10-12                   | ACP, VCP, RCP, concrete, cast iron |
|   | Gigant      | 79               | 10                 | 12-16                   | ACP, VCP, RCP, concrete, cast iron |
|   | PCG 270*    | 84               | 11                 | 14-16                   | ACP, VCP, RCP, concrete, cast iron |
|   | Koloss      | 92               | 14                 | 16-24                   | ACP, VCP, RCP, concrete, cast iron |
|   | Goliath     | 112              | 18                 | 22-30                   | ACP, VCP, RCP, concrete, cast iron |
|   | Taurus      | 144              | 24                 | 32-42                   | ACP, VCP, RCP, concrete, cast iron |

\*Reversible

### PUSH TECHNOLOGY

| Company  | Model     | Pipe Diameter Range (in)     | Thrust (tons) | Pit Size (ft) | Host Pipe Types  |
|----------|-----------|------------------------------|---------------|---------------|--|
| Tenbusch | B-500     | Clay&DI 6-12; Steel 6-18     | 140           | 9 x 9         | AC, VCP, Cast Iron, DI, RCP, PVC, HDPE, Truss Pipe, Steel  |
|          | B-600     | Clay&DI 6-15; Steel 6-22     | 192           | 9 x 9         | AC, VCP, Cast Iron, DI, RCP, PVC, HDPE, Truss Pipe, Steel  |
|          | B-700     | Clay&DI 6-12; Steel 6-18     | 140           | 9 x 14        | AC, VCP, Cast Iron, DI, RCP, PVC, HDPE, Truss Pipe, Steel  |
|          | T-1000    | Long joints of DI to 12" DIA | 192           | varies        | AC, VCP, Cast Iron, DI, RCP, PVC, HDPE, Truss Pipe, Steel  |
|          | T-1500    | Long joints of DI to 16" DIA | 250           | varies        | AC, VCP, Cast Iron, DI, RCP, PVC, HDPE, Truss Pipe, Steel  |
|          | T-2000    | Long joints of DI to 24" DIA | 375           | varies        | AC, VCP, Cast Iron, DI, RCP, PVC, HDPE, Truss Pipe, Steel  |
|          | MB - 330  | Clay&DI 6-10; Steel 6-15     | 125           | 4 x 10        | AC, VCP, Cast Iron, DI, RCP, PVC, HDPE, Truss Pipe, Steel  |
|          | MB - 340  | Clay&DI 6-10; Steel 6-15     | 125           | 4 x 14        | AC, VCP, Cast Iron, DI, RCP, PVC, HDPE, Truss Pipe, Steel  |
|          | MB - 3040 | Clay&DI 6-27 S teel 6-36     | 375           | 9 x 14        | AC, VCP, Cast Iron, DI, RCP, PVC, HDPE, Truss Pipe, Steel  |
|          | MH - 100  | Clay&DI 6-8                  | 62            | in manhole    | AC, VCP, Cast Iron, DI, RCP, PVC, Pipe, Steel, HDPE, Truss |

### STATIC PIPE BURSTING SYSTEMS

| Company   | Model              | Type Drive | Thrust (ft/lbs) | Pullback (lbs) | Power Unit | Host Pipe Diameter (in) | Host Pipe Types   |
|---|--------------------|------------|-----------------|----------------|------------|-------------------------|---|
| HammerHead Trenchless   | HydroBurst HB5058  | hydraulic  | 100,000         | 100,000        | pack       | 2-8                     | ACP, VCP, RCP, concrete, cast iron, ductile iron, steel   |
|   | HydroBurst 100XTR  | hydraulic  | 20,000          | 200,000        | pack       | 3-16                    | ACP, VCP, RCP, concrete, cast iron, ductile iron, steel   |
|   | HydroBurst HB175XT | hydraulic  | 25,000          | 346,000        | pack       | 8-24                    | ACP, VCP, RC concrete, cast iron, ductile iron, steel     |
|   | PortaBurst PB30    | hydraulic  | N/A             | 60,000         | pack       | 2-6                     | ACP, VCP, RCP, concrete, cast iron                        |
| Inland Pipe Rehabilitation (IPR)  | all                | n/a        | n/a             | n/a            | all        | 6-42                    | all   |
| <i>Note: IPR is a pipe-bursting contractor that uses all equipment manufacturers.</i> |                    |            |                 |                |            |                         |   |
| TT Technologies/ Grundoburst  | 400S (manhole)     | hydraulic  | 80,000          | 90,000         |            | 4-8                     | Ductile iron, steel, RCP, VCP, cast iron, concrete & more |
|   | 400G               | hydraulic  | 80,000          | 90,000         | pack       | 4-8                     |   |
|   | 800G               | hydraulic  | 100,000         | 173,000        | pack       | 6-12                    |   |
|   | 1250G              | hydraulic  | 155,000         | 225,000        | pack       | 6-20                    |   |
|   | 1900G              | hydraulic  | 250,000         | 225,000        | pack       | 6-20                    |   |
|   | 2500G              | hydraulic  | 396,000         | 570,000        | pack       | 24-48                   |   |
|   | 30TX               | hydraulic  | 60,000          | 60,000         | pack       | 4-6                     |   |
|   | 50TX               | hydraulic  | 100,000         | 100,000        | pack       | 4-8                     |   |

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