

## Village of Romeoville – Village Engineering “Cheat Sheet”

### 1. Roadway

- a. Residential Driveways / Aprons
  - i. No residential driveway across public property nor curb cut shall exceed a width of 25 feet, unless otherwise allowed by the Director of Public Works. The curb cut may not exceed 25 feet.
  - ii. Min slope is 2% - Max. slope is 8%
  - iii. Only one driveway and curb cut are permitted on a residential property. The only exception is for horseshoe driveways on lots wider than 100 feet. If there are multiple driveways on the property, all driveways other than the proposed driveway must be closed. The areas where a driveway is removed must be replaced with seed or sod.
  - iv. The driveway must be at least 9 feet wide for the length of the driveway.
  - v. All aprons are to be returned as concrete even if they were asphalt prior to construction
    1. 6” inches of CA-6 stone sub-base shall be used
    2. 6”x6” #10 wire mesh shall be placed along the entire length of the driveway. If a fiberglass additive is used, the mesh can be eliminated.
    3. Concrete driveways shall be a minimum of 4” thick of 5-bag mix, minimum 4’ slump, with a compressive strength of 3500 psi (ACI 318)
- b. Curb radii are spelled out in ordinance based on street classifications.
- c. All exposed curb corners must be rounded with min. 1’ radius
- d. The Contractor shall saw to a full depth, a joint between the portion of the sidewalk, combination curb and gutter or asphalt/concrete pavement removed and that left in place unless otherwise directed by the Village. The sawing shall be accomplished with a concrete sawing machine to prevent the surface from spalling when the material is broken out.
- e. Detectable Warning Plates
  - i. East Jordan DURALAST Inserts, Heavy Duty Load Rating, Brick Red Powder Coating RAL3016 – two 30” x 24” plates required for 5’ walks.
  - ii. For village projects – Public Works has them – contractor needs only to install
- f. PW prefers Type 11 with open throat on curb head (East Jordan R-3281-A, or Series 7000)
- g. Depressed Curbs
  - i. PW does not allow cutting the head of the curb off to create depressed curbs.
  - ii. If the curb must be removed – second sawcut after new curb is installed is required 36” into pavement – remove and replace 36” swath in front of curb (36” is for proper compaction tool)
- h. Fire, Life, Safety Access
  - i. AASHTO B-40 simulates largest fire truck

- ii. 26' drive aisles –min SN = 3.0
- iii. Structure < 30,000 sf – access to 25% of building
- iv. Structure 30,001 to 80,000 sf, access to 50% of structure
- v. Structure > 80,001 sf, access to 100% of structure
- i. Parking Stalls
  - i. 18' by 9'-6". Note measurement (by ordinance) is specific to edge of pavement and cannot include gutter pan.
  - ii. ADA Stalls: Each accessible parking space shall be 16 feet wide, with an eight-foot wide diagonally striped access aisle. A high-quality yellow paint, manufactured especially for pavement striping, must be used. Two adjacent accessible parking spaces may share an access aisle except for angled parking spaces.
  - iii. Preferred color for non-ADA stall paint is a high-quality white paint, manufactured especially for pavement striping.
- j. Sidewalks
  - i. 5' minimum width - adjacent to the curb, look to extend it by 2' for snow and signage.
  - ii. Residential – 5" (6" at driveways) over 4" aggregate
  - iii. Commercial Industrial – 6" (8" at driveways) over 4" aggregate
- k. Parking Lots – Use B-40 to simulate largest Romeoville fire truck – there can be no encroachment over parking stalls or curbs
- l. "No Parking – Fire Lane" signs - spacing of such signs to be within 15 feet of each end of lane and spaced a maximum of 75 feet apart thereafter per Romeoville Fire Department
- m. Utility Coordination
  - i. Water – if the project crosses an old cast iron water main, we need to replace the existing water main with new ductile iron under the roadway – upsize 6" to min 8"
  - ii. Hydrants: Eddy hydrants are to be replaced. EJIW stay if they have break flanges. Waterous stay. All others are to be replaced.
  - iii. Consider adding new water valves if appropriate – Consult with Water Superintendent
  - iv. Replace old valves in boxes with new valves in vaults
  - v. Sanitary – if the project crosses an old clay sanitary sewer, we need to replace the existing sanitary with new PVC sanitary sewer unless it has been lined.

## 2. Water

- a. If the proposed roadway project has existing water that either runs parallel or perpendicular to the road, we need to replace the existing cast iron water main with new ductile iron under the roadway – upsize 6" to min 8". Coordinate early with Utilities Superintendent.
- b. The domestic and fire service lines should be split within a mechanical room inside the building, and a "knox-box" (Series 3200 or 4400) with an entrance key must be provided on the exterior of the building that would allow public works

staff to access the mechanical room. The location of the entrance to the mechanical room should be shown on the plans.

- c. Watermain Materials
  - i. Ductile Iron, Class 52 only with push-on joints and cement lining
    - 1. Wrap in V-Bio™ polyethylene encasement, Alternate Modified Method A: Wet Trench Conditions.
    - 2. Layer of arc-sprayed zinc per ISO 8179 is required on exterior of pipe.
  - ii. Pipe shall be laid with a five (5) foot minimum burial depth.
  - iii. Restrained joints shall be provided at all gate valves, crosses, tees, bends, hydrants, dead ends, etc. All fittings and valves shall be mechanical joint type with set screw type retainer glands with Thrust Restraint Wedge as produced by MEGALUG. Include table of restrained lengths on plans. NO CONCRETE THRUST BLOCKS. This shall apply to both the water main and force main.
  - iv. Brass wedges for locating water mains shall be installed per section 41-205C of the Standard Specifications for Water and Sewer Construction in Illinois, latest edition. Use two (2) wedges per joint for pipes 12" or smaller and four (4) wedges per joint for pipe sizes larger than 12 inches.
- d. Fire Hydrants
  - i. East Jordan 5BR250 with 6" plain-end shoe with attached 6" resilient wedge mechanical joint valve. All fire hydrants shall be new, manufactured either in the year that construction begins or the previous year.
  - ii. Hydrant intervals – not to exceed 300 feet.
  - iii. Hydrant leads shall be a minimum of 6" with 8" considered for longer leads. Design the length of the fire hydrant lead pipe between the fire hydrant tee and the fire hydrant as short as possible. Unused sections of water piping where piping can become stagnant is prohibited.
  - iv. Must include Storz pumper connection along with two 2-1/2" hose connections in commercial, school, and industrial areas (not residential)
  - v. Bollards are required around hydrants in industrial districts and truck courts in commercial districts.
- e. Siamese fittings (Fire Department Connection) on building must be within 75 of hydrant.
- f. Valve Boxes
  - i. Tyler screw-type C, cast iron, Series 6860 with No. 160 oval base
  - ii. East Jordan screw-type, Series 5860 with #160 base
  - iii. Lids must be marked with "WATER"
- g. Valve vaults
  - i. All valve vaults shall be a minimum of 5' diameter.
  - ii. Frame and cover shall be East Jordan #1022Z3 with embossed 1020A HD "Water" and Village of Romeoville".
  - iii. All external joint sealing bands shall conform to ASTM C-877. Approved products are Type II MacWrap or approved equal. External joint seals

- shall consist of a collar 9 inches wide with an outer layer of polyethylene, with a minimum tensile strength of 4000 psi and a minimum tear resistance of 1500 psi, and an under layer of rubberized mastic that is reinforced with the collar 3/4 inches from the edge.
- iv. Rubber gasketed boots are required for all penetrations through the manhole wall except for doghouse manholes (i.e., required for pressure connections) where brick/mortar with hydroplug cement is required on both the inside and outside of the penetration.
  - v. External chimney seals are to be installed on all new manholes and shall conform to ASTM C923. Acceptable external chimney seals include Infi-Shield Uni-Band.
  - vi. Minimum of two adjusting rings (min 6" adjusting height) and maximum of three rings (max 10" adjusting height). No 1" or 2" concrete rings are allowed. Under paved areas, top ring should be EJIW Infra-Riser rubber Composite Adjustment Risers (minimum 2" thick)
- h. Valves
- i. American Flow, East Jordan (Flowmaster), or Clow (C-515)
  - ii. Resilient-Seated Gate Valves for all sizes
  - iii. Maximum spacing of 500 feet on main runs.
- i. Tapping Sleeves / Pressure Connections
- i. Pressure connections are not allowed for same size pipes. For this type of situation, a tee must be used.
  - ii. Use 2-piece ductile iron bolted sleeve type with mechanical joints.
    - 1. Tyler Union Ductile Iron MJ Tapping Sleeve
  - iii. Use fully ported, resilient wedge gate valves: East Jordan Flowmaster or American Flow
  - iv. All pressure connections shall be contained within 5' diameter concrete vaults – no valve boxes.
- j. Tapping Saddles / Service Connections
- i. The following note should be added to private services: "The non-village (private) responsibility for maintenance and repair of the water service starts at the tap on the main, which includes the saddle and corporation stop."
  - ii. One-inch (1") taps made on ductile iron pipe shall be direct and shall not require saddles.
  - iii. Anything tap larger than 1" shall utilize a stainless steel service saddle equal to Cascade Model CDC2 or equivalent (Ford = FS303) with Water Superintendent's approval.
  - iv. All taps shall have a minimum of three feet (3') separation.
- k. Service lines
- i. No flared fittings for copper lines – only compression fittings
    - 1. AY McDonald "T" compression joint (mac-pack not accepted)
  - ii. All copper must be Type K (soft temper seamless complying with ASTM B-88) and be continuous (one piece) from the corporation stop to the curb stop and continuous (one piece) from the curb stop to the meter (inside the building). No intermediate unions are permitted.

- iii. All services must be 60 inches deep and meet IEPA separation requirements of a minimum of 18 inches of separation.
- iv. Minimum 1" (2" maximum) service lines unless directed by the Village of Romeoville.
- I. Insertion Valve / Line Stop
  - i. If required and approved by the Village, a line stop may be used. Special coordination will be required, but the general requirements are as follows:
    - 1. Insertion valve installer shall be trained by, or accepted by, the insertion valve manufacturer as a qualified installer; or installer shall have written proof and references of at least 3 years of experience and/or a minimum of 30 successful installations of the insertion valve type to be installed for this project.
    - 2. Insertion valves shall be designed with a ductile iron or stainless-steel body and using a resilient wedge to seat against the water main pipe interior surface, rated for 100 psi working pressure, 2-inch square operating nut, counter-clockwise opening, and non-rising stem. Acceptable valve manufacturers: Hydra-Stop Insta-Valve 250 Patriot Series, Advanced Valve Technologies EZ2 Valve, or approved equal.
  - m. Village has special notes for chlorination requirements (attached).

### 3. Sanitary

- a. Pipe Material
  - i. For depths up to 15 feet, provide SDR 26 PVC plastic sewer pipe.
    - 1. 4-inch through 15-inch: Comply with ASTM D3034, SDR 26. Use elastomeric gasket type (ASTM F477 and ASTM D3212). Gaskets for fittings and joints: provide minimum cross-sectional area of 0.20 square inches (ASTM F477).
    - 2. 18-inch through 36-inch: Comply with ASTM F679, SDR 26. Use integral bell gasketed type joints with elastomeric gaskets (ASTM F477 or ASTM D3212).
    - 3. Branch fittings: factory fabricated type with attached main line coupling. SDR 26. Risers and service pipe and fittings: SDR 26, solid wall type (ASTM D3034).
  - ii. For depths greater than 15 feet and less than 20 feet, provide SDR 21 PVC plastic sewer pipe. Comply with ASTM D2241, SDR 26. Use push-on bell and spigot type, or Certa-Lok spline-lock system, with rubber ring seal gasket (ASTM D3139). Branch fittings: Use factory fabricated type with attached main line coupling, with same rating as pipe. Risers and service pipe and fittings: ASTM D2241, 160 psi pressure pipe, DR 26. Adapters: use adapters specifically made for purpose of changing from PVC pressure to PVC gravity pipe. Harco or approved equal.
  - iii. For depths greater than 20 feet, provide ductile iron pipe. Comply with ANSI A21.51, thickness Class 50, with joints complying with ANSI A21.11. Use cement lining complying with ANSI A21.4, standard thickness. Joints

- complying with ANSI A21.10. Use Corten bolts and nuts. Use mechanical restrained joint plugs and caps. PVC SDR 18 may be considered for depths greater than 20 ft.
- iv. For water main crossings, provide pressure rated PVC plastic or ductile iron pipe.
    1. PVC plastic pressure pipe: Use Type I, Grade 1, PVC complying with ASTM D1784. Comply with ASTM D2241 for 160 psi pressure rated pipe, DR 26. Use push-on bell and spigot type, or Certa-Lok spline-lock system, with rubber ring seal gasket (ASTM D3139).
      - a. Branch fittings: Use factory fabricated type with attached main line coupling, with same rating as pipe.
      - b. Risers and service pipe and fittings: ASTM D2241, 160 psi pressure pipe, DR 26.
      - c. Adapters: use adapters specifically made for purpose of changing from PVC pressure to PVC gravity pipe. Harco or approved equal.
    2. Ductile iron pipe:
      - a. Comply with ANSI A21.51, thickness Class 50, with joints complying with ANSI A21.11.
      - b. Use cement lining complying with ANSI A21.4, standard thickness.
      - c. Joints complying with ANSI A21.10.
      - d. Use Corten bolts and nuts.
      - e. Use mechanical restrained joint plugs and caps.
  - v. For sewers greater than 15-inch, use ADS SaniTite HP pipe with City approval. Comply with ASTM D2412, pipe stiffness of 46 psi. Use integral bell and spigot type with rubber ring seal gasket meeting ASTM F477. Polypropylene compound for pipe and fitting production shall comply with ASTM FR2736. Fittings conform to ASTM F2736.
- b. Manholes
- i. Frame and cover shall be east Jordan 1022Z3 embossed with “Sanitary” and Village of Romeoville”
  - ii. All connections from building services (except for residential, single family) must be made in a manhole.
  - iii. All external joint sealing bands shall conform to ASTM C-877. Approved products are Type II MacWrap or approved equal. External joint seals shall consist of a collar 9 inches wide with an outer layer of polyethylene, with a minimum tensile strength of 4000 psi and a minimum tear resistance of 1500 psi, and an under layer of rubberized mastic that is reinforced with the collar 3/4 inches from the edge.
  - iv. Pipe Connections: Shall be made of flexible synthetic rubber boots meeting ASTM C-923 and shall be installed on all pipe connections. Both “cast-in” or “pressed-on” type boots are permitted. Cast-in type boot shall be installed in initial pouring of manhole section.

- v. External chimney seals are to be installed on all new manholes (and existing manholes being adjusted) and shall conform to ASTM C923. Acceptable external chimney seals include Infi-Shield Uni-Band.
- vi. Internal Chimney Seals are to be installed on all new manholes (and existing manholes being adjusted) and shall be Raven 581 - a Brush Grade, 100% solids, no VOC, fluid applied polyuria elastomer repair material (color required is "safety yellow") as applied per the following:

For surface preparation, surfaces should be thoroughly clean and dry. Concrete and mortar must be cured at least 7 days and no frost or wet conditions can be present during installation. Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement and hardeners. Fill bug holes, air pockets and other voids with Steel-Seam FT910. After ensuring that all surfaces are clean the chimney seal coating material shall be applied evenly by spraying over the entire chimney seal area including the frame joint area and the vertical riser of the manhole cone including all extensions to the chimney area. Application shall be made in accordance with manufacturer's recommendations and film shall be applied at a wet mils spreading rate of between 100 to 125 mils. The final internal chimney seal shall pass visual inspection and be completely free of pinholes or voids.

- c. Inspection Manholes are required for commercial/industrial buildings.
  - i. All commercial and industrial users are required to install and maintain at all times at the user's expense a 5'-diameter monitoring manhole which must be installed downstream of all confluences in the building sewer and prior to discharge into the public sewer. The user shall install one monitoring manhole for each connection to the public sewer. Each monitoring manhole shall be situated on the user's premises and be easily accessible to authorized representatives of the Village twenty-four (24) hours per day, seven (7) days per week and shall be located within dedicated easements. Monitoring manholes may not be installed in locations which may prevent the Village from accessing the manhole even temporarily. The monitoring manhole shall be located on the building sewer at a point where there are no changes in slope or alignment for at least 15 pipe diameters upstream and downstream from the manhole. The sanitary sewer and manhole shall be designed and constructed to give average velocities, when flowing full, of not less than 2.0 feet per second, based on Manning's formula using an "n" value of 0.013, though the manhole and for a distance of at least 15 pipe diameters upstream and downstream from the manhole. Please see 35 IAC 370.320(c)(1) for ideal sanitary sewer slopes. No other pipes may intersect the monitoring manhole. In addition, a minimum 15' wide utility easement must be provided to allow Village staff access to the monitoring manhole.
- d. Village has special notes for sanitary sewer/manhole testing
- e. Sizes
  - i. Public mains – min 8" with 0.4% slope
  - ii. Service lines – min 6" with 1% slope
- f. Min cover is 5' – but can use insulation if no other option
- g. Testing – see special requirements at end of this document

#### 4. Backfill of Utilities

- a. Granular trench backfill (meeting IDOT specifications) is required under all paved areas up to two feet outside of pavement or curb. The limits of the trench backfill should be shown graphically on the plan set for all applicable pipe runs and should be accounted for in cost estimates.
- b. Backfill under Village roads (or where required on the plans) shall be with flowable fill meeting IDOT CLSM standards for Mixture 1 or Mixture 2. Where flowable fill is used, granular trench backfill shall be installed and compacted to a minimum height of 18" above any water or sewer main, fitting, corporation, or service line. The flowable fill shall not come into contact with any component of the water or sewer system

#### 5. Grading

- a. Complete existing topographic and utility information must be shown on the plans extending at least 100-feet beyond the property lines.
- b. In general, spot elevations must be provided throughout the site to demonstrate that the Village's minimum requirements of 1.5% (desirable 2%) slope for all grassy areas and 0.5% slope for paved areas (0.4% can be considered in special circumstances) have been met.
- c. Maximum ponding depth is 9 inches in parking areas and 12 inches in grassy areas (with flexibility in bioswale designs).
- d. Rim elevations for all structures should be included on the grading plan.
- e. The longitudinal slope of regular pitch curb and gutter must be at least 0.5% (0.4% can be considered in special circumstances).
- f. Arrows to show emergency overland flood routes at all weir locations and where runoff leaves the site should be included on the grading plan.
- g. The proposed grading of any drive entrances cannot allow minor runoff from portions of the parking lot to drain onto the streets – these flows should be intercepted by the storm sewer.

#### 6. Storm

- a. Storm sewer material shall be Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe meeting ASTM specification C-76.
  - i. Alternate pipe materials will be allowed on private developments – See section 158.030(A)(5)(b) for specific requirements.
- b. The pipe joint shall meet ASTM Specifications C-361 for reinforced concrete low head pressure pipe and shall either be confined "O-Ring" or "Tylok" for the gasket material.
- c. Village requires submission of recorded video inspections of all public storm sewer.
  - i. A note should be added requiring the developer/contractor to submit all testing results (density, chlorination, vacuum, pressure, etc) to the



Village of Romeoville Public Works Department within 48 hours of any onsite testing.

- d. For closed lids - Frame and cover shall be east Jordan 1022Z3 embossed with "Storm" and Village of Romeoville"
- e. Ponding Depth = 9" over grate on roadways
- f. Roof Drains must be tied into storm sewer (include in calcs)
  - i. First segment can be less than 12" and alternate pipe materials
  - ii. Avoid blind connections – include cleanouts

#### **7. Restoration / Landscaping**

- a. Parkways are generally to be restored with seed/blanket
- b. Only in specific cases will we use sod
- c. A landscape plan should be prepared over a background including the site layout and proposed utility improvements, all proposed and existing utility lines and structures (sanitary manholes, fire hydrants, valve vaults, etc.) must be shown. All large landscaping items must be located a minimum of 10 feet from all utility structures and 5 feet from underground utility mains and services.

#### **8. Site Lighting**

- a. With the final engineering submittal, product catalog cuts and a Photometric Plan must be submitted showing the height, number and orientation of proposed luminaires. The Photometric Plan must also show the proposed lighting levels in foot-candles at ground level and include a summary table demonstrating that the lighting is in conformance with the levels included in the Village's ordinance 159.070(M)(3). Show light pole locations on the utility plan.

- 9. Weekly NPDES Inspection Reports (and those required after ½" of rainfall) should be sent via email to [npdes@Romeoville.org](mailto:npdes@Romeoville.org)

#### **10. Testing and Material Inspection**

- a. A note should be added requiring the developer/contractor to submit all testing results (construction materials, chlorination, vacuum, pressure, etc) to the Village of Romeoville Public Works Department within 48 hours of any onsite testing.
- b. All hot mix asphalt and Portland cement concrete materials that are part of this project shall be tested and inspected in accordance with the Illinois Department of Transportation's Project Procedures Guidelines (PPG) and the process and frequency of testing under the QC/QA specifications.
- c. The developer / Contractor shall provide documentation verifying that the mix designs to be used on the project for hot mix asphalt and Portland cement concrete meet IDOT specifications for the materials shown in the contract

documents. This documentation as well as the mix designs shall be provided at the pre-construction meeting for the project.

- d. If required, the Village's consultant will perform the City's QA testing of asphalt and concrete materials on-site and at the plant and act as the Village's QA Manager.

#### **11. Village Review Disclaimer**

- a. Engineering reviews are only for general conformance with the design criteria established by the Village and are subject to both the completeness of the information submitted by the developer's professional staff and also the actual ability of the plan to perform in accordance with its intent. Actual field conditions may vary and additional items may arise which are not readily apparent based on the submittal. The developer's design professionals are responsible for performing and checking all design computations, dimensions, and details relating to design, construction, compliance with all applicable codes and regulations, and obtaining all permits.
- b. Other bodies of government may have jurisdiction over various aspects of this development. The developer should be advised that additional measures may be required based on actual field conditions and formal approvals of the other agencies. Approval by the Village of Romeoville does not alleviate the responsibility to seek approvals from outside agencies.
- c. Compliance with all requirement of the Americans with Disability Act (ADA) is borne by the applicant and their design professional. The Village's review does not cover ADA compliance.
- d. Engineering reviews do not include all site & landscaping issues as per the zoning Ordinance such as building setbacks, lot coverage, parking dimensions, etc. and the applicant shall refer to the Community Development Department for a complete review of such issues.

**Village of Romeoville - Minimum chlorination standards:**

- a. Chlorine (gas or liquid) must be used for disinfection.
- b. The chlorination contractor must call 815-886-1870 a minimum of 24-hours in advance to schedule chlorination.
- c. Only Village of Romeoville employees shall operate water system valves and turn on/off sampling whips while samples are being collected.
- d. All chlorination and safety equipment must meet or exceed the standards and recommendations set by The Chlorine Institute, Inc.
- e. The chlorinator must be a licensed plumber or certified Illinois water operator with a minimum of 5 years experience working with chlorine disinfection of water supply lines.
- f. The chlorination contractor must have two people present to chlorinate. One to monitor the cylinder and one to monitor in the field.
- g. The chlorination contractor must be bonded and insured, and have proof of both on file with the Village.
- h. The chlorination contractor must have updated 24-hour emergency phone numbers on file with the Village.
- i. The chlorination contractor must comply with state and federal regulations regarding transportation and handling of chlorine cylinders:
  - Shipping and emergency papers for every job location
  - Proof of insurance for hauling and handling chlorine gas
  - Commercial driver's license with Hazmat endorsement and medical card
  - Copy of Emergency Response Guidebook in vehicle
  - Hazmat certificate of registration
  - Hazardous materials placard displayed on vehicle
  - Cylinder strapped upright in truck
- j. Under no circumstances will chlorine contractors be allowed to apply heat to the chlorine cylinder (i.e. hot baths, propane torches, etc.). While the cylinder is being used it must be in a vertical position, as well as being affixed to a solid object.
- k. Prior to chlorination, the chlorination contractor must provide a detailed written chlorination and flushing plan to the Village for review and written approval.
- l. At any time, the Village or its authorized representative may ask for proof of any or all of the above information. Please contact the Village of Romeoville Public Works Department (815-886-1870) with any questions.

#### **Final Acceptance and Testing of Sanitary Sewer**

Before final acceptance, the sanitary sewers shall be tested in accordance with Section 31-1.11 of the “Standard Specifications for Water and Sewer Main Construction in Illinois”. Specifically, all pipelines constructed of flexible materials shall be subject to air exfiltration tests, televising test, and deflection test. The deflection test shall be performed no sooner than thirty (30) days of the backfilling operation and shall consist of measuring the pipe for vertical ring deflection. Maximum ring deflection of the pipeline under load shall be limited to five (5) percent of the internal pipe diameter. All pipe exceeding this deflection shall be considered to have reached the limit of its serviceability and shall be re-laid or replaced by the developer. Deflection testing shall be accomplished by pulling a mandrel, sphere, or pin-type “go / no-go” device, with a diameter equal to ninety-five (95) percent of the undeflected inside diameter of the flexible pipe, through the pipeline. In addition, all sanitary sewer having a diameter of eight (8) inches or greater shall be televised. Copies of all video tapes must be submitted to the Village of Romeoville.

#### **Final Testing of Sanitary Sewer Manholes**

Vacuum Testing shall be carried out immediately after assembly and prior to backfilling of manholes that are up to seventy-two (72) inches in diameter. All lift holes shall be plugged with a non-shrink grout, or rubber plug. The manhole frame and adjusting rings and chimney seals shall be in place before testing. No grout shall be placed in the horizontal joints. All pipes entering the manhole shall be plugged, taking care to securely brace the plugs from being drawn into the manhole with the vacuum testing. Vacuum testing shall test all manholes for leakage. A vacuum of ten (10) inches of mercury shall be placed on the manhole and the time measured for the vacuum to drop to nine (9) inches of mercury. The vacuum drop shall not exceed the requirements shown in Table 1 of ASTM C1244-02. If testing fails, developer shall seal all leaks and retest until acceptable. The testing shall be completed prior to backfilling (whenever possible) so that any leaks can be found and fixed externally, and to give the horizontal manhole joints an opportunity to tighten.

#### **Flow Monitoring prior to Acceptance *(For significant developer projects)***

The developer will be required to monitor the flowrate from the site for a period of two months (encompassing at least two major storm events) to identify any excessive inflow/infiltration occurring in the system. The data must be submitted to the Village of Romeoville prior to acceptance of the public improvements.

#### **Sanitary Sewer Post Televising *(For significant developer projects)***

The Contractor shall provide the Department of Public Utilities a post construction PACP coded, color video record and a typed written transcription of the internal inspection of the newly constructed sewer system. This shall be submitted prior to final approval and acceptance of the system. Video inspection must be coded by a PACP certified technician. All public and private lines equal to and larger than 8” in diameter shall be televised. All cleaning or televising

operations must be coordinated prior to the commencement of the work with the Department of Public Utilities. The sewer pipe must be televised with 95% or more of the sanitary pipe visible. Any cleaning operations must be accompanied with a vactor at the downstream manhole to ensure no debris passes downstream. The contractor must rotate the lens of the camera to look at all services. All service connections, defects, and observations must be coded in the television report. When the proposed sanitary sewer system is to connect to an existing sanitary sewer system abutting the property, the existing sewer must also be televised and reported. The contractor shall coordinate the televising of existing contiguous sewers with the Director of Public Utilities. Costs associated with this work shall be borne by the contractor. Video inspection and database shall be fully compatible with PACP V 7.0.2 format with all header information filled out. Each video inspection shall be labeled with USMH-DSMH. The contractor must submit the PDF reports, video inspection, and Microsoft Access V07 database (dall data files and tables shall be linked to the pipe segment ID number) to the Village of Romeoville.