

Water Distribution System Construction Standards and Specifications

General Provisions for Water Systems

The water distribution within the corporate limits or under the jurisdiction of the Village of Tinley Park shall be constructed in accordance with latest edition of the provisions listed below and provided to serve each property in the subdivision or development, and connect to the public water main supply system, as directed by the Master Water Plan of the Village.

The design of all water systems shall meet the following criteria:

- Current Federal and State Codes and Regulations
- > Illinois Environmental Protection Agency Regulations
- Cook or Will County Health Department
- Standard Specifications for Water and Sewer Main Construction in Illinois
- Village of Tinley Park Subdivision and Development Regulations
- Village of Tinley Park Design Standards and Village Code of Ordinances.

In addition, the following specifications, requirements and standards shall apply:

- Water mains shall not be less than eight (8") inches in diameter.
- Hydrants and shutoff valves shall be included system design.
- > New water main systems shall be designed and constructed in complete loops.
- > Water main shall have hydrants located at high points.
- Maximum hydrant spacing shall be 300', unless ordered otherwise by Village Engineer and/or Fire Chief.
- Should field conditions require a valve, manhole, b-box, etc. to be installed in concrete: Approval by the Village Engineer is required; and structures located in concrete shall be boxed out per the Standard Details.
- Water mains may be required to be a minimum of twelve (12") inches when they are located along the perimeter of a development or are within an Industrial or Commercial Development.
- Water mains shall be a minimum of ten (10') feet clear from any sanitary sewers or sewer services and meet all other Standard Specifications for Water and Sewer Construction in Illinois requirements.
- All water main shall be buried a minimum of five and a half (5-1/2') feet and a maximum of eight (8') feet below grade.
- Construction of water main shall be staged to maintain service to all properties. All temporary shut-downs cannot occur without written permission from the Director of Public Works or Public Works Appointee and shall be of short duration.

- All water main shall be located in public Right of Way or Drainage and Utility Easements. Water mains not located as such shall be considered private and the full responsibility of the property owner. A valve shall be installed to separate public and private ownership.
- Private water mains shall have a valve in the Right of Way or easement that allows the Village to shut off the service should damage occur to the water main or service. Repairs are the responsibility of the property owner.
- > All changes in direction shall be restrained and thrust blocked.

Permit Requirements

An Illinois Environmental Protection Agency (IEPA) permit shall be prepared, submitted for review to the Village Engineer and signed off by the Village, Design Engineer and issued by the permit authorities authorizing the construction of the water mains in the Village before construction begins. A copy of each of the approved permits shall be provided to the Village Engineer prior to the start of construction.

Submittal Requirements

All required submittal requirements entail:

- ➢ Plats
- > Permits
- Easement Requests
- Licensing Agreements, etc.
- > Other Agencies (ACOE, MWRD, IEPA, IDOT, Will and/or Cook County, etc.)

All of these finalized, signed and approved items must be submitted to the Village Engineer to allow for review within two (2) weeks of construction. Any initial review requirements by the Village Engineer shall be submitted during the preliminary stages of the project allowing sufficient time for comments, revisions and final approval.

Coordination and Staging

All water main work by the Contractor shall be approved by the Village Board then coordinated with the Village, County, State, Railroad and other authorities having jurisdiction. Owner/Contractor is responsible for maintenance of improvements for one (1) year following acceptance by the Village.

Watermain construction coordination shall be done through the Public Works Department. Construction shall be staged to service the adjacent properties. An Erosion Control Plan shall be submitted.

All newly constructed water mains that have not yet been accepted by the Village shall be plugged at the end of each working day and kept clean.

Upon completion of construction, As-Builts shall be prepared, submitted and approved by the Village Engineer showing the exact location of all services, water mains, valve vaults, shut-off valves and similar facilities. See Village Record Drawing Requirement Section.

Water Main Material and Fittings

- Water mains shall be constructed of bituminous coated, cement lined ductile iron pipe (DIP), Class 52 and poly-wrapped, except where unstable foundation conditions or aggressive soil conditions indicate to the Village Engineer that pipe of another material would be more satisfactory.
- > All ductile iron water main and fittings shall be polyethylene tube encased.
- > Joints shall be push-on compression gasket joints.
- Shall conform to ANSI A-21.51 (AWWA C-151) or AWWA C-900 for eight (8") inch through twelve (12") inch main and C-905 for fourteen (14") through twenty-four (24") main with tracer wire for all PVC water main. Tracer wire shall be accessible through valve boxes or valve vaults. PVC water main shall be poly-wrapped. All PVC water main shall be approved by the Village prior to installation.
- Cement mortar lining shall conform to ANSI A-21.4 (AWWA C-104).
- Water mains located in Industrial and Commercial Developments shall include shutoff valves and fire hydrants.
- Meg a Lug Series 1100 or approved equal shall be used to restrain all mechanical joint fittings, valves, hydrants, etc.
- All pipe shall be furnished with a depth mark to assure that the spigot end is inserted to the full depth of the joint.

Water Services

- Individual services shall be connected to the mainline and serve each adjoining lot, tract or building site.
- Each service shall extend from the main to a point at least eight (8') feet beyond the outside curb line. Connection shall be a one-foot (1') clamp with a full circle c-clamp closure (i.e. Power Seal Clamp).
- Water services shall be a minimum of one (1") inch, Type K copper with no couplings and terminated at a shut-off valve and B-Box for each Single-family Residence.
- Water services larger than two (2") inches shall be constructed of cement lined ductile iron pipe, Class 52, unless approved by the Village Engineer and agreed to be private.
- All water services shall be of the size and materials specified by the Public Works Department and sized based on the plumbing requirements and fixture needs.
- All service taps shall be supported by a saddle or full sleeve clamp. Service taps over 1" shall be epoxy-coated and supported by stainless steel straps. A c-clamp is acceptable.
- Services larger than two (2") inches shall be made with a stainless-steel tapping tee (split tee) with epoxy-coated, stainless steel bands (1-1/2" or 2") to connect to Village water main or as approved by the Village Engineer. Shut off valve shall be no further than two (2') feet from the main. These shall enter the building with a riser spool and piece and threaded rod.
- B-Boxes shall not be located in sidewalks or driveways or buried underground. To be located 18" in front of sidewalk. If sidewalk doesn't exist, it shall be 7-1/2' from the

front lot line. A precast base shall be provided to ensure stability. Services shall not be backfilled until inspected by the Village.

- As-Builts shall be prepared and submitted to the Village Engineer showing the exact location of all services, water mains, manhole, shut-off valves and similar facilities. See Village Record Drawing Requirement Section.
- At all re-development locations, all undersized water services and lead services must be abandoned at the main and replaced back to the water meter. Lead services and contaminated soils shall be removed and shipped to an appropriate landfill for disposal.
- Water services are the property owner's responsibility from the facility to the B-Box or service valve.
- Service couplings will only be permitted if the service line exceeds one hundred (100') feet for a one (1") inch line or sixty (60') feet for a one and a half (1-1/2") inch or two (2") line. No couplings shall be permitted under any paved surface, including sidewalks, driveways, driveway aprons and roadways.
- Domestic water services that tap off a fire service line require the main to be sized to satisfy the demand for fire and domestic water flows with a separate shut off for the domestic water. Tap on fees should be discussed with Community Development personnel.

Water Meters

- > Village is sole owner of all water meters used for tracking consumption for billing purposes.
- Water meter type shall be approved by Public Works Director per Ordinance 50.050.
- > Only Sensus[©] meters are allowed to be installed in the Village.
- > Meters must be purchased through Community Development or Public Works Department.
- > Water Superintendent shall determine the Sensus[©] model type that is acceptable to the Village.
- New Construction is responsible for the installation of the meter(s).
- Inspection shall be scheduled with the Public Works Department to verify proper meter installation and wire components.

Fire Hydrants

- > Hydrants shall be East Jordan Iron Works Watermaster© 5BR250.
- > Hydrant system shall include a resilient seated gate valve and tested to 300 psi.
- Hydrants shall have a six (6") inch barrel along with two (2), two and one-half (2-1/2") inch hose connections and one, four and one-half (4-1/2") inch pumper nozzle.
- > Hydrant shall connect to main with six (6") inch valve and include a valve box stabilizer.
- Hydrants shall be installed at intervals of three hundred (300') feet. All spacing shall be approved by the Village Engineer and Village Fire Prevention.
- Hydrants shall be located a minimum of three (3') from the back of curb, two (2') from the edge of a bike path or sidewalk and five (5') from a driveway.
- Hydrant shall be constructed facing toward the curb over a washed gravel base of 3/4" stone and covered by a membrane. Laterals shall be less than five (5') in length.
- Hydrant shall have a six (6') foot bury and the center of the pumper nozzle a minimum of two (2') feet above finished grade.
- Hydrant shall have a breakaway flange and connections. Hydrant breakaway shall be six (6") inches above finished grade.
- > Hydrants shall be painted yellow.

- Four (4) Meg a Lug restraints shall be provided at each joint from the mainline tee to the auxiliary valve and between the auxiliary valve and hydrant barrel. Any hydrant repairs or replacement require replacement of all the bonnet bolts and packing bolts. Replacement bolts shall be stainless steel.
- No water shall flow from a Village hydrant unless an authorized Village_representative is present. Maintenance is property owner's responsibility. Hydrant meter with RPZ is required and shall be obtained from the Public Works Department.

<u>Valves</u>

- Water valves shall be provided at each branch main connection and elsewhere as required to permit adequate sectionalizing for maintenance purposes.
- Gate valves shall be used on water main 12" and smaller. Valves shall open turning counter-clockwise. Located a maximum of eight hundred (800') feet apart.
- Butterfly valves shall be used for water main 16" and larger, except tapping valves. Each butterfly valve shall be furnished with a manual operator with a two (2") inch square operating nut. The operator shall open the valve counter-clockwise.
- Valves shall be iron body resilient wedge gate valves with bronze mounted seats and non-rising stems conforming to AWWA C-509 and tested to 300 psi.
- Valves shall have mechanical joints.
- > Valves shall be Clow, Mueller or approved equal.
- > Valves shall not be located in driveways or sidewalks without prior permission.
- > Valve shall align with center of frame opening.
- > All nuts and bolts shall be stainless steel.
- No valves shall be turned unless a Public Works or authorized Village representative is present.

Valve Vaults

- > All shut off valves are required to be in a vault, unless approved by the Village Engineer.
- Valve vault shall be a minimum of five (5') foot diameter precast, reinforced concrete. Five (5') foot diameter vaults for ten (10") inch main and under; six (6') foot diameter vault for twelve (12") mains and larger meeting ASTM C-478 specifications,
- > All holes and joints shall be tuck-pointed.
- > The operating nuts of the valve shall be accessible through the frame and lid.
- Steel Reinforced Plastic steps shall be provided and be sixteen (16") inches on center.
- Shall sit on a minimum of four (4") inches of compacted gravel
- > Pipe opening shall be precast with resilient rubber water tight pipe sleeves.
- > Pick holes shall not create openings through the vault cover.

Frame and Lids

- Frames shall be Heavy Duty East Jordan Iron Works (EJIW) 1020A
- Lids shall be Type A with closed pick holes
- > WATER and VILLAGE OF TINLEY PARK shall be cast on the lid
- > Frames shall be set on a mastic material to prevent inflow as well.

Pressure Taps

- Connections to all Village water mains shall be pressure connections unless otherwise approved by the Village Engineer.
- > Any cutting-in-sleeves shall be coordinated with Public Works Department.
- Pressure tap materials shall be ductile iron with stainless steel tapping sleeves and stainless-steel bolts.
- > All new materials and exposed pipe shall be disinfected prior to connection.
- Cut-In sleeves shall be Romac or approved equal.

Steel Plate Requirements for Roadway Excavations

- The use of steel plates is required for all projects requiring the cutting of roadway pavement. These standards ensure that the Village pavements are left in the same, if not better, condition than they were found before the project. This will reduce congestion and roadway hazards, as well as increase safety in and out of the construction limits.
- The use of steel plates by Contractors and Utility Companies as a temporary cover over an excavated area in the roadway can present safety hazards and other problems if allowed to remain in place for extended periods and not properly secured or maintained.
- When backfill operations of an excavated area in the traveled way cannot be properly completed within a work day, steel plate bridging will be required.
- See Construction Standards for Roadway section for more detail.

Inspection, Testing and Approval

- A Pre-Construction Meeting shall be scheduled with the Public Works and/or Building Department to discuss the following:
 - Project Contacts
 - Start and Completion Dates
 - Project Timeline (i.e. Village Holidays)
 - Required access for local residents, school buses, garbage trucks, etc...
 - Potential Detour Routes
 - Material Storage Locations
 - Traffic Control and Protection
- Full time inspection may be required by the Village/Consultants while the water system and services are being constructed. For new developments, it is the Developer's responsibility to cover the cost of the inspection services.
- All water main shall be pressure tested as per Standard Specifications for Water and Sewer Main Construction in Illinois, latest edition and thoroughly disinfected as per AWWA Standard C851-92.
- All new water main shall be subject to a hydrostatic pressure test of no less than onehundred and fifty (150 psi) pounds per square inch (PSI) for a period of two (2) hours with no loss. The Village has the right to extend the duration of the test up to six (6) hours.

- Water samples and pressure testing shall be coordinated and observed by Village Representative or Licensed Village Water Operator. After three (3) failed tests, a site coordination meeting may be necessary and an additional re-inspection fee charged.
- The newly installed water main system shall be tested by a Certified IEPA laboratory. Samples shall be collected by a representative with or hired by the Contractor. The testing shall ensure the mains are not bacteriologically contaminated. Two (2) consecutive tests where samples are collected twenty-four (24) hours apart shall pass the laboratory tests. The Village has the right to collect a sample as well and have it tested to ensure the samples submitted to the laboratory are from the same location. This testing procedure shall be paid for by the Contractor.
- One failed sample may require an additional sample to be taken; two failed samples may require a re-chlorination of the main.
- Flushing of the mains prior to sampling and pressure tests shall be coordinated with Public Works Department a minimum of forty-eight (48) hours in advance to remove contaminated materials and solids that may have occurred during construction.
- Cautions shall be followed to ensure testing materials and non-approved water do not flow into active mains.
- All valve vaults shall be sealed and tuck-pointed to the satisfaction of the Village so infiltration cannot and will not occur and may be subject to a vacuum test at the Contractor's expense.

Chlorination Standards

All Contractors disinfecting water system components using gas chlorine shall abide with the following requirements:

- Procedure
 - 1. Minimum of twenty-four (24) hour notice before chlorinating. Call 708-444-5500 to schedule chlorination.
 - 2. Only authorized Village employees shall operate water system valves and turn on/off sampling whips while samples are being collected.
- > Equipment
 - 1. All chlorination and safety equipment must meet or exceed the standards and recommendations set by The Chlorine Institute, Inc.
- Requirement for Chlorinating Contractors
 - 1. Chlorinator must be a licensed plumber or certified Illinois water operator with a minimum of five (5) years of experience and a minimum of five (5) years of experience working with chlorine disinfection of water supply systems.
 - 2. Chlorination contractor must be bonded and insured, and have proof of both on file with the Village.
 - 3. Chlorination contractor must have updated emergency phone numbers on file with the Village.
 - 4. Chlorination contractor must comply with State and Federal regulations regarding transportation and handling of chlorine cylinders.
 - a. Shipping and emergency papers for every job location
 - b. Proof of Insurance for hauling and handling chlorine gas
 - C. Commercial Driver's License with Hazmat endorsement and medical

card

- d. Copy of Emergency Response Guidebook in vehicle
- e. Hazmat Certificate of Registration
- f. Hazardous material placards displayed on vehicle
- Under no circumstances shall 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.
- Prior to work, the Chlorinator must provide a detailed written chlorination and flushing plan to the Village for review and approval.
- At any time, the Village, or its authorized representative, may ask for proof of any or all of the above information. If you have any questions please feel free to contact the Village of Tinley Park Public Works Department.