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## 1. Preface

This document is a guide for public water distribution system design and improvement. These guidelines are not comprehensive and do not replace sound engineering judgement. Deviations from guidelines shall be approved by the City of Westerville. All technical details are the responsibility of the Design Engineer preparing the plans.

**The City of Westerville reserves the right to modify design guidelines on a project by project basis.**

## 2. Submission, Review and Approval

### A. General

a. All additions, extensions, demolitions, and modifications of a new or existing water main shall require a Water Main, Site Improvement and/or Roadway Plans submission and approval as required by the City Engineer.

b. Any property owner and/or developer building/developing a lot, tract, subdivision or parcel of land is required to connect to the public water system. The property owner and/or developer shall bear all costs of survey, design, construction, installation, permitting, capacity fees, inspection fees, etc. as required by the City. The property owner and/or developer shall extend water main(s) as required by the City Engineer.

c. The City does NOT guarantee water pressure/capacity for any property owner, development and/or for any specific use (residential, commercial or industrial/manufacturing, etc.). The property owner and/or developer shall be responsible for determining adequate pressure/capacity and making necessary on-site and/or off-site improvements as well as providing water line analysis/calculations as required by the City Engineer.

d. The design of public water main systems shall conform to provisions of the following publications or agencies except as such provisions are modified or amended herein. Where a conflict exists between provisions of reference publications, the publication providing the most stringent requirement shall govern.
    i. Recommended Standards for Water Works (or “Ten State Standards”)
    ii. Ohio Environmental Protection Agency Requirements
    iii. City of Westerville Standard Drawings
    iv. City of Westerville General Notes
    v. City of Columbus Construction and Material Specifications
    vi. City of Columbus Division of Power and Water Standard Drawings
    vii. Ohio Building Code/Plumbing Code/Ohio Fire Code/International Fire Code

e. All new/proposed fire hydrants shall be public and all new/proposed water mains servicing fire hydrant(s) shall be public water mains.

## B. Plans

a. All plans submitted for approval to the City of Westerville shall be prepared, signed and sealed by a Professional Engineer licensed in the State of Ohio.

b. All plans shall be prepared and submitted on 22”x 34” ANSI D size PDFs. Title sheets and title blocks shall be per City of Westerville standard templates. Plans shall be submitted electronically through the City of Westerville Online Plan Review Portal.

c. After review comments have been addressed and necessary/required revisions completed (including but not limited to the Ohio EPA and the City of Westerville), the City will route the title sheet electronically to City staff for signatures. The Design Engineer shall be responsible for obtaining required signatures/approvals from the Ohio EPA.

d. The Design Engineer should submit a cost estimate for the public improvements with each submission.

e. Calculations, cost estimates, easements and exhibits shall be submitted electronically through the City of Westerville On-Line Plan Review Portal.

f. All proposed text shall be capitalized and a minimum height of L100 or 0.10 x (scale).

g. Plan approval occurs after Planning Commission approval (where applicable).

## C. Easements and Recorded Documents

a. Locate public water mains and appurtenances (including fire hydrants, valves, service valves, curb stop, etc.) within rights of way and/or public easements. Necessary public easements must be granted prior to City signing the title sheet/approving the plans.

b. All public easements shall be a minimum width of 15-ft or 5-ft beyond minimum trench limits on either side of trenches as specified in COC SCD AA-S149, AA-S151 and AA-S153, whichever is greater. Actual easement widths depends upon utility depths and other factors. Public water mains shall be centered within easements.

c. All existing easements shall be labeled on plans as platted or deeded. All existing easements shall be identified by plat books and page numbers or official record numbers of deeds.

d. The property owner and/or developer shall provide legal descriptions and exhibits for all easements. Documents shall be signed and sealed by a Professional Surveyor licensed in the State of Ohio. Documents shall be prepared on legal size paper. Easement and legal description title shall match the official name of the easement. Easements are expected to be donated to the City at no cost to the City.

e. Easement legal descriptions and exhibits (metes and bounds) shall be submitted electronically through the City of Westerville Online Plan Review Portal.

f. The City will record public easements once the City receives original executed easements. It is the responsibility of the property owner(s)/developer to record private easements. A copy of all recorded private easements shall be provided to the City.

## 3. Minimum Plan Requirements

### A. Title Sheet

The title shall contain the following items:

a. Project Title - for public water main plans only, plans shall be titled "PUBLIC WATERLINE IMPROVEMENTS FOR <PROJECT NAME>". For public water mains as a part of site improvement plans, the plans shall be titled "SITE IMPROVEMENT PLANS FOR <PROJECT NAME>". For public water mains as part of roadway projects, the plans shall be titled "<PROJECT NAME> ROADWAY IMPROVEMENTS".

b. Location Map - This map shall show the location of the project relative to major roadways, corporate boundaries and common landmarks. The map shall be located in the upper right corner and have no scale.

c. Index Map/Tributary Area Map - This map shall be of sufficient common scale to be legible. The entire on-site and off-site storm sewer tributary and sub-area shall be clearly delineated for each pick-up point if applicable. Breaklines in dimensioning a sub-area are not acceptable unless otherwise approved by the City. All roadways, 100 year flood plains (FEMA), corporation lines, adjacent land

ownerships, railroads, and other significant land features shall be shown. Locate this map at the center of the title sheet.

d. Benchmarks - A minimum of two (2) suitable benchmarks shall be provided every 1,000 lineal feet. Benchmarks shall be established through a bench circuit with elevations based on the most recent North American Vertical Datum (NAVD) determination. Where a benchmark has a determination differing from the most recent NAVD, show the earlier elevation in parentheses following the present elevation i.e. 730.05 (729.98-1929). Benchmark location(s) shall be shown and labeled on the Index Map.

e. Horizontal Datum - Provide horizontal control in Ohio South State Plane Coordinates. Horizontal control locations shall be shown on the Index Map.

f. Vertical Datum - Provide vertical control in North American Vertical Datum (NAVD) 1988. Vertical control locations shall be shown on the Index Map.

g. Standard Drawings - The title sheet shall include a list of applicable Standard Construction Drawings which apply to proposed work. All standard drawings shall be included on project detail sheets. The minimum height of L100 (0.10 x scale) does not apply to these standard detail sheets. Consultants are asked to populate detail sheets with as many legible details as is possible.

h. Signature Block - The signature block shall include applicable signatures for City of Westerville officials and contain the following note: "SIGNATURES BELOW SIGNIFY ONLY CONCURRENCE WITH THE GENERAL PURPOSE AND LOCATION OF THE PROJECT. ALL TECHNICAL DETAILS REMAIN THE RESPONSIBILITY OF THE ENGINEER PREPARING THE PLANS." The Design Engineer is responsible for acquiring necessary signatures from officials outside the City of Westerville.

**B. Plan**

a. Text - All proposed text shall be capitalized and a minimum height of L100 or 0.10 x (scale).

b. North Arrow - Orient plans so north arrows are located toward the top or left margins of each sheet with North being up or to the right.

c. General Notes - Current City of Westerville Capital Improvement or Private Development General Notes shall be reviewed for applicability and included in the same order as provided. Additional construction notes required to construct

improvements shall be included after the City of Westerville General Notes. “ITEM SPECIAL” quantities shall include a note explaining the requirements of that item. If a specification item is noted “AS PER PLAN”, include the necessity note and/or detail.

d. Detail Sheets - All standard drawings shall be included on project detail sheets. The minimum height of L100 (0.10 x scale) does not apply to these standard detail sheets. Consultants are asked to populate detail sheets with as many legible details as is possible.

e. Survey Coordinate Chart & Layout Information - Provide

f. Estimate of Quantities - An accurate estimate of items being constructed shall be included. The descriptions of items shall be the same as that under ‘Item Descriptions’ in the *Construction Material Specifications*, current edition. If an item is “AS PER PLAN”, include any necessary note and/or detail. For private development projects, title public improvement quantities as “ESTIMATE OF QUANTITIES FOR PUBLIC IMPROVEMENTS” and shall only include public improvement quantities that are in Rights of Way and/or public easements.

g. Stationing - Establish a centerline of the proposed water main with marks at 50-ft intervals and station labels at 100-ft intervals. Water main stationing shall run south to north and west to east. Provide unique stationing for non-continuous runs of water mains. All text shall read from left to right and all stationing shall increase from left to right. The north arrow shall be oriented up or to the right.

   Station equations and/or negative stations on water main centerlines are not acceptable.

   Place match lines at 50-ft station intervals.

h. Scale - Horizontal scales of 1"=60', 1”=50’, 1”=40”, 1”=30’ and 1”=20’ are acceptable if legible as determined by the City. Details shall be of an appropriate scale.

i. Line Weights - Use appropriately differing line weights. All items shall be labeled and clearly distinguishable. Existing linework, structures and associated texts shall be faded and/or thinner while proposed linework, structures and associated texts shall be dark and/or bold. Proposed water mains with detailed design information shown on different sheets shall be labeled “PROPOSED <X>” W.M.

SEE SHEET <Y>", where 'X' is the water main diameter and 'Y' is the sheet number.

j. Property Crossings - Label both onsite and offsite properties through which water lines pass with each property owner's name, parcel acreage and parcel I.D. number. Additionally, include both deed book and page numbers of title instruments.

k. Utilities - Existing and proposed utilities within or adjacent to the project shall be clearly identified as to types, sizes, locations, and ownerships. Construction plan numbers (CC, RP, MM, etc.) of all existing sewers shall be labeled. Label all drainage swales, ditches, creeks, etc. All existing utilities greater than 24-in and utility crossings shall be shown to scale as double lines.

l. Water Services - Show proposed water tap locations. Label services as either long (L) or short (S). Each property label shall only list the address number and the size of the water service line being transferred.

m. Miscellaneous - it is the Design Engineer's responsibility to show and/or reference all details required to construct project improvements on plans beyond standard drawings.

**C. Profile**

a. Text - All proposed text shall be capitalized and a minimum height of L100 or 0.10 x (scale).

b. Scale - The horizontal scale shall correspond to the plan scale. The vertical scale shall be 1"=5' or 1"=10' according to which is most legible.

c. Slopes - Water line profile slopes shall read from left to right or right to left, but shall be consistent throughout.

d. Utility and Other Crossings - All existing (based on existing records or field observations) and proposed utility crossings shall be shown accurately with their types and sizes labelled. Features such as streets, alleys, driveways, streams, ditches, etc. shall be shown and identified by names, centerlines, edges of pavement, etc.

e. Backfill -Label types and limits of backfill above water lines where desired backfill differs from specifications.

f. Ground Surfaces -Clearly show and label existing and proposed ground surfaces. Existing surfaces shall be represented as lighter, dashed lines. Proposed ground surfaces shall be shown as darker, solid lines. All elevations shown on plans shall be per the most recent N.A.V.D.

   Surface elevations, proposed water main centerline elevations and cut-to-invert depths shall be labeled every 50-ft. Proposed water main centerline elevations shall be labeled at all horizontal bends, deflections, vertical grade breaks, and at all other fittings.

g. Label the required 4.5' MIN. COVER for water mains.

## 4. Design Requirements and Criteria

### A. Water Main Design

a. Public water line piping shall be Zinc-Coated Ductile Iron Water Line Pipe and Fitting (WEST 12801), all exterior nuts and bolts on fittings and hydrants shall be stainless steel (Type 304).

b. All water line construction shall meet or exceed City of Westerville specification 12800.

c. Maintain consistent distances from rights-of-way and/or easements.

d. Minimize use of bends and/or deflections, both vertical and horizontal.

e. Show full widths of rights-of-way and/or easements in plan views, including a minimum distance of 25-ft outside rights-of-way and/or easements. Dimension centerlines of water mains from rights-of-way and/or easement lines on plan sheets and at horizontal alignment changes. This information shall be labeled a minimum of once per sheet. Label both plans and profiles with proposed water main sizes and material (Zinc-Coated DIP).

f. Design water mains to a minimum of 7.5-ft from edges of rights-of-way and/or public easements. Edges of trenches (D+2 ft) shall be a minimum of 3-ft from curbs or gutters (D+4 ft for water mains greater than or equal to 36-inches in diameter). If existing utility constraints require water mains to be installed within roadways, mains shall be installed with their centerline located 7-ft from the face of the curb.

g. Provide a minimum of 20-ft clear distance from water mains to all building structures and foundations unless otherwise approved by the City.

h. A minimum of 5-ft shall be maintained between fittings, including service taps and valves.

i. When water mains parallel curves that are too small to use standard deflections, the Design Engineer shall use limited numbers of bends to obtain satisfactory alignments.

j. When water mains are parallel to curves, provide curve data and callout beginnings and ending locations of proposed deflections.

k. Layouts shall provide information to easily field locate mains, bends, tees, deflections, etc.

l. The Design Engineer shall consider the following items when determining the layout at each end of the project and at connections:
    i. Age
    ii. Break History
    iii. Type of Road – Arterial vs. Local
    iv. Future Replacement
    v. Future Development / Construction
    vi. Residential vs. Business Users
    vii. Location of Existing Mains & Valves
    viii. Size of Existing Mains
    ix. Other Utility Impacts
    x. FDC Location(s)
    xi. Misc. Factors

    If future extensions or replacements are anticipated, the water main design may extend through an intersection with a valve placed near the right-of-way line and/or outside of the pavement. Use a cross connection where a proposed main crosses an existing main not being abandoned.

m. A minimum pipe size of 8-in is required unless the water main is serving one fire hydrant. Where no future extension is possible, a 6-in main is acceptable (i.e. cul-de-sac).

n. Minimize the impacts of construction on curb ramps. Curb ramps impacted by construction must be replaced in accordance with the guidelines proposed by the United States Access Board (Architectural and Transportation Barriers Compliance Board) as published in the "Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way" and the "Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way; Shared Use Paths". When a non-compliant curb ramp is disturbed at a public intersection, all other non-ADA compliant ramps at the same intersection must be removed and constructed in accordance with the guidelines proposed by the United States Access Board (Architectural and Transportation Barriers Compliance Board) as published in the "Proposed Guidelines for Pedestrian Facilities in the Public Right-of-Way" and the "Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way; Shared Use Paths".

o. The Design Engineer shall consult with the City regarding existing or future projects that may affect the locations or gradient of proposed water mains. Locate water main alignments to minimize damage by future construction or land uses.

p. The Design Engineer is responsible for locating utilities from record and/or existing drawings, field surveys, and/or other detectable methods.

q. Proposed water mains shall have minimum cover of four feet six inches (4'-6" ft) below existing or proposed grades unless approved by the City. In isolated cases, the City may not require a minimum cover of four feet six inches to avoid going under a utility making the water main too deep for the City to maintain it. The existing or proposed grade which provides the greatest amount of cover at the time of construction shall govern water line depth. Design water lines to the shallowest depths possible.

r. All water mains must have 10-ft horizontal and 18-in vertical separation from sanitary and storm sewers (outside diameter to outside diameter). Maintain 3-ft horizontal and 12-in vertical separation from all other utilities unless otherwise required by each applicable utility company and/or "Ten State Standards".

s. When designing water main depths beneath the minimum required cover of four feet six inches to avoid utility conflicts, layouts shall conform to City of Columbus Standard Drawing L-7401 (Typical Water Main Lowering).

t. Proposed water main grade breaks/vertical bends shall be kept to a minimum. Proposed water main may be deeper or shallower than minimum depth to avoid grade breaks/vertical bends with City approval. The Design Engineer shall confer with the City to verify that proposed grades are acceptable.

u. Design water mains to minimize locations where air may be trapped. Strategically space hydrants to facilitate air release.

v. No grade breaks, bends (horizontal or vertical), tees or other fittings shall be constructed to within 5' of the end of casing pipes.

w. Show required restrained joint lengths and flange isolation kit locations for 20-in or larger water mains. Access ports (tees with blind flanges) shall be shown on mains as directed by the City.

x. A geotechnical investigation shall be performed at locations where proposed 20-in or larger water mains are to be installed unless otherwise required by the City. Provide geotechnical reports to the City.

y. When a water main crosses a river or creek, the design shall follow the "Ten State Standards" regarding surface water crossings. This standard includes items such as providing a minimum 5-ft of cover, using flexible and restrained joints, installing valves at both ends, and leak detection capability.

z. All water mains, including those not designed to provide fire protection, shall be sized following an analysis based on flow demands and pressure requirements. The system shall be designed to maintain a minimum pressure of 20 psi at ground level at all points in the distribution system under all design flow conditions. Normal working pressure in the distribution system shall not be less than 35 psi.

**B. Valves**

a. All valves shall be located within public rights of way and/or public easements.

b. Generally, locate a valve series where water mains intersect with existing water mains or other proposed sections as required by the City.

c. Locate valves outside of concrete sidewalks and driveways. Valves shall not be placed in ADA ramps unless otherwise approved by the City.

d. Locate valves at a maximum depth of 5-ft and on 0% grade (2% max) unless otherwise approved by the City.

e. Use butterfly valves for all mains 20-in and greater. Note: The operator shall be set on either the south or east side of the proposed water main. The Design Engineer shall ensure adequate clearance to install and operate the valve.

f. Main line valves shall be used at each water main tee and or cross and be spaced a maximum of 800-ft apart for distribution mains unless otherwise directed by the City .

g. Additional valves may be required in areas where a high volume of customers could be affected by future maintenance and construction. The Design Engineer shall determine optimum locations of valves to reduce future disturbances to customers.

h. The Design Engineer shall consider the factors to determine whether to use a tapping sleeve & valve or to cut-in a tee at connections to existing mains. The City will determine if acceptable.

i. All public water valves are to be operated by City of Westerville personnel only per Chapter 931 of the City of Westerville Codified Ordinances. Requests for valve operation shall be made a minimum of 24 hours in advance of operations.

j. All “tee” connections require three (3) valves and all cross connections require four (4) valves.

k. Call out Heavy Duty Valve Boxes for water valves within pavement/vehicle travel areas (roads, streets, ally, parking lot, driveway, etc.)

l. Call out Standard Duty Valve Boxes for water valves outside of pavement/vehicle travel areas (grass, sidewalk, flower beds, etc.)

**C. Fire Hydrants**

a. The City prefers Type “A” fire hydrant settings per City of Columbus Standard Drawing L-6637A over Type “B” fire hydrant settings.

b. The following are examples of acceptable call-outs:
    i. FIRE HYDRANT, TYPE “A” SETTING
    ii. FIRE HYDRANT, TYPE “A” SETTING WITH SECOND 6” VALVE

c. In profile, anchoring tees shall be called out for Type “A” fire hydrants. Tees shall be called out for Type “B” fire hydrants.

d. All fire hydrants shall be self-draining, unless 10' of separation from SAS and/or STS including drains can not be maintained. This would require a plugged hydrant if approved.

e. Generally, spacing between fire hydrants shall be 300-ft and/or as approved by the City.

f. All fire hydrants within the City shall be public and be serviced from public water mains. No private fire hydrants are allowed within the City. Hydrants shall be located with public easements or rights-of-way.

g. Fire hydrants shall be within 100-ft of a Fire Department Connection (FDC).

h. Generally, Fire Hydrants shall be placed within 50-ft of intersections, dead ends, stub streets or cul-de-sacs.

i. A fire hydrant will be required if the distance from the nearest hydrant to the most remote portion of the building is greater than:
    i. 400-ft for non-sprinklered building
    ii. 600-ft for fully sprinklered building

j. All fire hydrants must have 10-ft horizontal and 18-in vertical separation from sanitary and storm sewer piping.

k. Generally, fire hydrants shall be located at high points on water mains to allow for air release.

l. Locate fire hydrants to minimize impacts on existing trees. Ideally, fire hydrants shall be placed a minimum of 6-ft away from driveway returns and a minimum of 10-ft away from commercial driveway returns. Fire hydrants shall not be placed on sharp curves in streets. Locate fire hydrants on property lines dividing two adjacent properties where feasible. Hydrants shall also be located on the same side of street as water mains.

m. Fire hydrant valves
    i. One (1) valve shall always be located at the anchoring tee for a Type “A” hydrant.

ii. If the fire hydrant lead is greater than 15-ft, a second valve is required. This valve shall be located within 2-ft of the fire hydrant.
iii. The maximum depth for a fire hydrant valve is 5-ft unless otherwise approved by the City

n. If a fire hydrant lead crosses existing utilities, vertical bends may be required. If vertical bends are required, a profile of the hydrant lead shall be provided from the main to the hydrant.

o. If fire hydrant extensions are required, quantities of fire hydrant extensions shall be calculated for each length based on the design depths of fire hydrants at each specific location. The quantities of extensions with applicable sizes shall be provided in the Estimated Quantities. The use of multiple extensions on a given hydrant is not permitted.

p. Quantity of hydrants (EA), 6-in water main (LF), and valves (EA) shall be included in the Estimated Quantities.

q. For proposed fire hydrants and leads, restoration quantities shall include pavement restoration (D+2 ft), curb restoration (D+2 ft), and sidewalk (5-ft x 5-ft) if applicable. (D+4 ft for water mains greater than or equal to 36-inches in diameter).

**D. Water Taps**

a. The Design Engineer is responsible for field locating and surveying all existing curb boxes. For water taps not found in the field, the City may provide record plans to aid in locating water taps as requested. Record plans shall be used to field locate and survey remaining taps. All existing water taps shall be shown on plans per field surveys.

b. If known, existing water tap material shall be noted for each tap, the private side and public side. The nomenclature shall be indicated in the legend. (i.e. WT (C,LE,G,P) C = COPPER, LE=LEAD, G=GALVANIZED, P=PLASTIC).

c. Provide a separate domestic water service and a separate fire line (if required) from the public water line to each building/dwelling/unit. Water meters and back-flow preventers (if required) shall be located inside a building(s).

d. All private fire lines/services (from valve to building) and private domestic water lines (from curb stop/valve to building) require separate permits and separate

inspections through the City of Westerville Building Division, (614) 901-6650.

e. For single-family residential properties, provide only one curb box per property unless existing conditions require more than one.

f. All curb boxes shall be located within rights-of-way and/or public easements.

g. All water services 2" and smaller in asphalt pavement areas shall have heavy duty frames and covers (General Foundries Inc. Item #11081, Sigma item VB2276 or approved equal) with concrete collars. Ferrule Valve Boxes are not permitted.

h. Taps shall be located to minimize impacts to existing trees.

i. Generally, curb box locations shall be shown per City of Columbus Standard Drawing L-9901. Situations may arise where curb box locations may be revised to facilitate construction and minimize disturbance/restoration limits. When feasible, proposed water taps shall connect to existing water service lines at points beyond existing curb stops. Curb boxes shall be located consistent distances from rights-of-way and/or public easements. The Design Engineer shall apply good engineering judgement when determining proposed curb box locations. Where inadequate room for a curb box to be located outside the limit of pavement and still remain inside the right-of-way and/or public easement, then the curb box may be located within the pavement with a heavy duty frame and concrete collared cover must be used. The City preferres new curb boxes be installed outside driveways and sidewalks.

j. In the Estimated Quantities, separate quantities shall be provided for both <X" INCH WATER LINE TRANSFER, SHORT" and X" INCH WATER SERVICE LINE TRANSFER, LONG> where 'X' is the water line diameter. All water service line transfers shall only be quantified in "EACH" units unless otherwise requested by the City.

k. Generally, the depth of proposed curb stops shall be 42" and a maximum depth of 5-ft unless otherwise approved by the City. The Design Engineer shall verify water taps are not in conflict with other utilities.

l. All water meters shall be installed in safe and accessible locations within buildings. The City does not allow water meter pits.

m. A master water meter is not permitted. Each building and/or user shall be metered separately as required by the City.

**E. Constructability**

a. The Design Engineer shall design and review plans for constructability and maintenance ease and ensure that tees, bends, crosses and valves are not located below existing utilities.

b. Verify blocking has sufficient space to be constructed at an applicable location. When calling for tees to be rotated, labels shall be provided at tees noting that the concrete blocking shall be installed per City of Columbus Standard Drawing L-6310 or L-6311 (depending on the direction of rotation), as the forces acting on tees are the same as on vertical bends.

c. Verify locations of fire hydrants relative to driveways, slopes of ground, guard rails, etc.

d. Review overhead, horizontal and vertical clearances. Add notes for those areas where the work will be hindered during construction or maintenance.

e. In no case shall a customer be without service more than two times during any project. The Design Engineer shall prepare a sequencing of construction. The sequence shall be provided to the City and minimize the number of shutdowns to customers. The lengths of time to construct improvements shall be held to a minimum. If a customer is expected to be without service longer than 8 hours, the design engineer shall design a method of providing temporary water service.

f. Verify the distance from the water main to the curb is adequate and can be installed without disturbing the curb and/or curb and gutter.

g. Verify that a trench limit be within one travel lane whenever possible. Avoid crossing lane lines or centerlines to minimize limits of pavement resurfacing.

h. Verify valves are not located under existing or proposed curbs. Review the distances of valves from curbs.

i. Verify valves are located on flat (0% - 2%) water main slopes.

j. Review construction methods during design to keep construction impacts on trees to a minimum. Place fire hydrants away from trees.

## F. Utilities

a. Label existing water mains with diameters and material types. Additionally, note the year of installation and associated plan numbers of existing water main construction whenever available. Dimension water main locations from rights-of way and/or easements and not physical features such as curbs or buildings. Label water mains a minimum of once per sheet.

b. Show all public and private existing and proposed utilities in plan and profile views. Label sizes and types of all utilities. Plans shall include information for all existing utilities. Label utilities a minimum of once per sheet.

c. The Design Engineer shall evaluate any brick sewers to ensure construction methods are not detrimental to sewer integrity. The Design Engineer shall note brick sewers and proposed methods of construction.

d. The Design Engineer shall ensure that construction of water mains and all other applicable construction be an adequate distance away from utility poles and other ground structures.

e. Existing utilities critical to horizontal and vertical alignment shall be located via non-destructive vacuum utility investigation (i.e. pothole) or other method approved by the City. Issues shall be identified by the Design Engineer and the City shall review and approve locations beforehand.

## G. Waterline Crossings and Parallel Installations

a. OEPA Guidelines and or 10 State Standards shall be followed for water lines in relation to sewer crossings and parallel installations. The City shall have final determination as to whether proposed water line installations are acceptable.

## H. Phasing of Plans

a. Whenever proposed plans are phased for construction, clearly defined phase lines shall be shown and the various phases indicated on all plan sheets. Phasing shall be indicated in profiles as well as plan views. Quantities shown on plans shall be separate for each phase.

## I. Inspections

a. All installations and/or connections to the City's public water system shall be inspected by the City of Westerville Engineering Division, (614) 901-6650 and/or Third Party Consultant.

**J. Water Capacity Fees**

a. Capacity fees may be obtained by contacting the City of Westerville Building Division, (614) 901-6650, or found on-line at Westerville.org.