

# Sanitary Sewer Design Manual



City of Columbus

Division of Sewerage & Drainage

Route "A"  
Park



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# I

## **Submission, Review, and Approval of Plans and Easements**

### **1. General**

All additions, extensions, demolitions, and modifications of a new or existing City sanitary facility shall require a sanitary sewer plan submission and approval.

- a) The latest edition of the City of Columbus Construction and Material Specifications (CMSC) and the City of Columbus, Division of Sewerage and Drainage Standard Drawings are the general policy of the Division of Sewerage and Drainage (DOSD) and shall be followed. (Available at the Sewer Permit Office, DOSD.)

### **2. Plans**

- a) Prepared by Registered Engineer - All sanitary sewer plans submitted for approval by the City of Columbus shall be prepared, signed, and sealed by a Professional Engineer who is licensed in the State of Ohio.
- b) Tracings - All sanitary sewer plans shall be prepared and submitted on 22"x34" high quality 4 mil thickness mylar using ink especially adapted to mylar. High quality photographic or Xerox mylar reproductions will be accepted with prior approval. Title blocks shall be in accordance with DOSD standard. Stick on notes, signature block, and/or details will not be accepted. Approved tracing sheets may be purchased at the Permit Office at DOSD's cost.
- c) Check Prints - Eight sets of prints (check prints) shall be submitted to DOSD for review by the various City Divisions. The consultant will be notified when all check prints have been returned to DOSD.

- d) CC Drawing Number Application - A completed CC Drawing Number Application (Exhibit A) is to be included along with the submitted check prints.
- e) Additional Information to be Submitted - Hydraulic calculations, metes and bounds easement descriptions and exhibits and/or preliminary copies of the final plats, the final grading plan, and any information deemed necessary by DOSD to determine tributary areas, (Example: zoning maps, land usage, and topography), shall be included with the submitted check prints. A proposed master plan for the area may be required for large areas and should be included with the check print submittal.
- f) Plans Submitted for Signatures - After the review comments have been addressed and the necessary revisions performed, the tracings along with the check prints shall be submitted to DOSD for approval by the necessary City Divisions. The engineer preparing the plan will be notified by telephone when all signatures have been obtained. The tracings become the property of the City of Columbus, DOSD, upon approval of the drawings by the Director of the Department of Public Utilities. Copies of approved plans can be obtained from DOSD.
- g) Digital Submission of Plans - DOSD will require submission of plans in digital format when the requirements therefore have been established by the City GIS initiative.

### **3. Easements and Recorded Documents**

- a) General - All sanitary sewers are to be located outside of public right-of-way within easements granted to the City of Columbus, unless prior approval is obtained from the Street Design Section of the Division of Engineering and Construction and DOSD.

Easements shall be designated on the plan as platted or deeded, existing or proposed. All existing easements shall be identified by the plat book and page number, or official record number of the deed.

Preliminary plats and/or easement descriptions and exhibits shall be included with the submittal of check prints. They will be reviewed, commented on, and returned along with the reviewed check prints.

- b) Easement Description Requirements - All descriptions and drawings involving City owned property rights must meet the highest surveying standards.

When preparing easement documents for acceptance by DOSD of the City of Columbus, the following guidelines must be followed.

1. Legal Descriptions - Shall be the original typed document prepared on legal size paper, signed, sealed and dated by a registered surveyor. Metes and bounds descriptions are required; centerline descriptions will not be accepted.
2. Pictorial Exhibit - Shall be the original document prepared on legal size paper, signed, sealed and dated by a registered surveyor.
3. Documents are not to be labeled or referenced to as exhibit A, B, or so on.
4. Descriptions and/or pictorial exhibits shall not include: subject to covenants, exceptions, or restrictions of record.

For private sanitary development plans include the name, mailing address and phone number of the person who will sign or obtain the signatures on the easement document. Also, include a copy of the property owner's warranty deed.

- c) Easement Processing - When approved by DOSD, easement information will be sent to the Real Estate Division of the City Attorney's Office for Deed of Easement preparation. When the deed is prepared, the Real Estate Division will contact the designated contact person to obtain the signatures and return

the signed originals. The Real Estate Division will record the deeds and process them for City Council acceptance.

Signed Deeds of Easement must be returned to the Real Estate Division prior to the payment of construction inspection fees.

- d) Platted Easements - When sanitary sewer easements are platted, it will not be required that the plat be recorded prior to the plan being released for construction. However, an acceptable preliminary plat showing all proposed easements must be approved.
- e) Other Instruments of Record - When plans include private pump stations or temporary holding tanks (see Section III, 8) which the City will not be responsible for the operation and maintenance thereof, an acceptable recorded document stating this shall be required. The document shall specify who or what entity is responsible along with any other verbiage DOSD feels necessary.

#### **4. Revisions to Approved Plans**

All revisions to the tracing, after it has been signed by the Director of Public Utilities, shall be made in black ink. The original approved alignment, easement limits, manholes, structure numbers, etc., shall be revised as directed by DOSD with a numbered triangle box shown inserted next to the revised work. A numbered triangular box shall then be placed in the revision block of the drawing border with a brief and concise verbal description of the change.

Only three (3) relatively small revisions will be permitted on a tracing sheet. Any major revisions, or more than three (3) minor revisions, may require the submission of a new plan.

## II

# Minimum Plan Requirements

### 1. Title Sheet

The Title Sheet shall contain the following items:

- a) Location Map - This map shall show the relative location of the project to well known landmarks so as to determine the location of the project within the City at a quick glance. No scale is required on the Location Map.
  
- b) Index Map/Tributary Area Map - Unless otherwise agreed upon, this map shall be at a scale of 1"=200'. This map is to include the sewer alignment with structures numbered, and indicate on which sheet the various sections of sewer line may be found. The entire tributary area (including off-site areas) of the proposed sewer shall be clearly delineated with sub-areas and their acreage delineated for each pick-up point. Break lines in the dimensioning of the area will not be acceptable unless approved otherwise by DOSD. All roadways, 100 year flood plains (FEMA), corporation lines, adjacent land ownership, railroads, and other significant land features shall be shown on this map.
  
- c) Benchmarks - A suitable benchmark shall be provided for every 1,000 lineal feet of sewer shown on the plan, with a minimum of two (2) on each plan. The 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 previous determination which differs from the most recent, show the earlier elevation in parentheses following the present elevation i.e. 730.05 (729.98-1929).

Temporary benchmarks (TBM) established on a previous project may be utilized for extending the bench circuit to an adjacent project provided the bench circuit establishing those

TBM's on the previous project is submitted with the plans. Project TBM's must be established within the same bench circuit, and must begin and end on different TBM's established within a single bench circuit.

All project TBM's and centerline reference points shall be located away from the work limits and shall be preserved until the project is complete and accepted by the City. All TBM's within the project area shall be shown in the plan view.

- d) Estimate of Quantities - An accurate estimate of those items being constructed under the sanitary sewer plan shall be included. The description of the item shall be the same as that under the item description in the CMSC, current edition.
- e) Standard Drawings - All plans shall have a listing of the applicable Standard Construction Drawings which apply to the proposed work.
- f) General Notes - The general notes shown on Exhibit B shall be included on all plans. If space on title sheet is insufficient, general notes shall be continued on second sheet or moved in their entirety.
- g) Notes to Permit Clerk and Construction Inspector - If service lines are installed in conjunction with the mainline sewers this note shall be inserted on the title sheet near the title block and be enclosed in a heavy lined box that is easily seen. For additional information see Exhibit G and Section II, 2h.
- h) Special Notes - Any notes which the engineer preparing the plan feels may be required due to circumstances of the particular project should be included under these notes. (Example: Gas lines in the vicinity of the proposed sewer line should include a note to contact the Gas Company prior to construction in the vicinity of their line. Notes should include the company's name, address, contact person, telephone number, and any other pertinent information.)

Special notes should follow the general notes and be titled "Special Notes".

- i) Signature Block (See Exhibit C) - Along with the necessary signature and date lines, the signature block shall contain the following note:

"Signatures below signify only concurrence with the general purpose and general location of the project. All technical details remain the responsibility of the engineer preparing the plan."

Whenever a proposed sewer is located on or near (within 100 feet) City Park property, a signature line and date line for the Director of Recreation and Parks shall be provided in the signature block.

## 2. Plan

- a) North Arrow - Plans shall be so orientated that the north arrow is toward the top, or left margin, of the sheet. Slope of the sewer may be shown from either the left or the right side of the sheet but shall be consistent throughout the plan.
- b) Stationing - All sewer plans shall be submitted with continuous stationing along the centerline of the pipe from the downstream 0+00 station of the project through the longest length of sewer run. The manhole numbering shall conform to the stationing with the lowest manhole number being correlated to the lowest stationing number. The next longest continuous length of sewer shall be restarted at 0+00 station, but manhole and structure numbering shall continue in increasing numbers. This shall apply for each succeeding section of shorter sewer lengths.

Station Equations or negative stationing in the proposed sewer centerline will not be accepted except by written approval.

Match lines and break lines, in plan and profile views, shall be made at 100' stations, or at structures.

- c) Scale - Plan and profile views shall be prepared at a horizontal scale of 1"=60'. If the site is small enough to warrant a larger scale, 1"=30' may be used if approved by DOSD. Structure details shall use an appropriate scale.
- d) Line Weights - Appropriate line weights are to be used for the various items shown on the plan. All items shown on the plan are to be labeled and clearly distinguishable from each other. For ease of distinction, the proposed sewer should be the heaviest line weight used.
- e) Point of Reference - All plans shall show a distance from some point of the proposed sewer system to an existing reference point outside the project site, accurate to within 1'. (Example: Street Intersection)
- f) Property Crossings - All properties through which the sewer passes shall have indicated on the plans the property owner's name, parcel acreage, parcel I.D. number, and the deed book and page number of the title instrument. This includes on-site and off-site properties.
- g) Utilities - All existing and proposed utilities and sewer lines within, or adjacent to the project site shall be shown on the plan and clearly identified as to type, size, location, and ownership. The construction plan number (CC, RP, MM, etc.) of all existing sewers shall be shown. Storm utilities shall include all drainage swales, ditches, creeks, etc.
- h) Service lines - Generally, proposed service lines shall not be shown on the mainline sewer plans except where required to extend beyond pavement edges or cross existing or proposed

utilities. (Exception: Note to Permit Clerk and Construction Inspector - see Exhibit G. ) On some projects it may be beneficial to the City and the developer to install the laterals at the same time as the mainline sewer. If this option is chosen, the developer must pay all permit and capacity fees at the time the construction inspection deposit is paid. If the note is added and all fees are paid, the service laterals will be inspected by the Division of Construction Inspection along with the mainline sewer.

Cleanouts shall be provided a minimum of every 100 feet on service lines.

All wyes located within 15' of a manhole shall have a 10' minimum service extension.

Service lines are to be connected to the mainline sewer and not into manholes.

- i) Service Risers - All wyes shall have a two foot (2') minimum service riser or extension to avoid possible damage to the mainline sewer.

If the engineer or developer documents the need for a riser or extension to be more than ten feet (10') deep, the elevations of those termination points shall be shown on the plan. The riser or extension shall be marked with an asterisk ( \* ) so that the sewer tapper can be made aware of the fact that the service is deeper than normally required.

All long service extensions (across streets, etc.) shall show the end of the service extension elevation.

The length of the riser called out on the plan view shall be the distance from the pipe invert to a point  $\pm$  9' below the existing or proposed ground surface, whichever is higher. The quantity of 6" riser called out in the estimate of quantities does not have to equal the sum of the service risers called for on the plan view.

- j) Mainline Sewer - Mainline sewer shall be located within easements of 15' minimum width. The outside edge of the sewer shall be no less than five (5') feet from the edge of the easement. The actual easement width shall be dependent upon sewer depth and other factors.

All sewer centerlines shall be delineated and described by bearing and distance measurements. Distances shall be from center of manhole to center of manhole. Bearings and distances shall be based on the State Plane Coordinate System. Coordinates of all proposed manholes and existing manholes being tied into shall be shown on the plan in table format.

- k) Surveying and Layout - All iron pins encountered in the survey shall be shown on the plans as "found iron pin".

The point of intersection (P.I.) of a curved sewer centerline shall be staked and referenced in the field from outside the limits of work.

Angle deflection, curve information, and P.I. references shall be shown on the drawings for a curved sewer centerline.

The centerline station of all right-of-ways crossed by the sewer centerline shall be indicated in the profile view.

The sewer centerline station shall be indicated for all major property lines crossed on the plan view.

### 3. Profile

- a) Scale - The horizontal scale of the sewer profile shall always be the same as the scale of the corresponding plan view, and unless approved otherwise by DOSD, shall be 1"=60'.

Vertical scale for all sanitary sewer profiles, unless approved otherwise by DOSD, shall be 1"=10'.

- b) Stationing and Cut Information - Sewer centerline stationing, surface elevation above centerline of sewer, invert elevation, and required cut information shall be provided at the beginning and end of all profiles and all 100' station intervals below all profiles. (See Exhibit D for profile example.) Station equations or negative stationing on the plan will not be accepted except by written approval.
  
- c) Utility and Other Crossings - All utility crossings, whether existing or proposed, shall be shown as accurately as possible (based on existing available records) on the sewer profiles and identified as to their type and size. Other crossings such as streets, alleys, driveways, streams, ditches, etc. shall be shown and identified by name, centerline, edge of pavement, etc.
  
- d) Structures - All structures shall be labeled as to type, centerline station location, invert and top of casting elevations, and all other pertinent information such as size, slope, and distance. Existing structures shall be drawn using dash lines and proposed structures shall be drawn using solid lines.
  
- e) Backfill, Backing, and Encasement - If the proposed backfill for the proposed sewer line is to be different from that specified under Item 901 in the CMSC, the type of backfill, and the limits thereof, shall be identified in the profile. Concrete backing and concrete encasement, when used, shall also be shown in the profile with the limits specified. Concrete encasement of PVC pipe shall be provided from manhole to manhole.
  
- f) Ground Surfaces - Existing and proposed ground surfaces shall be shown and clearly marked. Existing surfaces shall be shown as a dashed line. Proposed ground surfaces shall be shown as a solid line.

All elevations shown on the plans shall be based on the most recent N.A.V.D, unless otherwise permitted by DOSD.

### III

## Design Requirements and Criteria

### 1. Tributary Area

- a) Tributary Area Map - The tributary area for a proposed mainline sanitary sewer shall be clearly defined and shown on the tributary area map on the first sheet of the plans. The engineer preparing the plan should research the existing sewer to which a connection is being made and review contour maps and any prior sanitary design information on the area to determine the correct tributary boundary for the proposed mainline sewer.

Changes in sanitary tributary design boundaries may be approved by the Administrator upon written request. The request should include a map showing the existing and proposed tributary boundaries and a copy of the original and proposed sewer design calculations. The map and the calculations must include any previous changes which have already been approved. The existing system must be analyzed to a point downstream determined by DOSD. Such changes typically will be minor and when combined with previous changes, must not have a detrimental effect on the sewer's capacity.

- b) Population Design Densities - The rate of sanitary flow from a given area shall be determined by the proposed population density based on the zoning of the area to be developed. For unzoned and/or undeveloped areas within a tributary area a population density agreed to by DOSD shall be utilized for design purposes. Exhibit E shows the various zonings along with population densities to be used in the design of sanitary sewers. For situations where the proposed development density varies from that shown for the given zoning, the engineer may elect to use the actual density after providing information and calculations to support his proposed variation from the design density chart.

- c) Sewer Depth - Sanitary sewers, and any future extensions thereof, within the tributary boundary, shall be a minimum depth of 10' from the proposed flowline of the sewer to the proposed ground surface elevation. This requirement shall be for commercial as well as residential development with or without basements. Certain circumstances may dictate this depth requirement is not possible, or practical, and in such cases, DOSD reserves the right to waive the requirement.

Sewers shall be designed to be no less than 10' deep when extended to the most distant point in the entire tributary area. A critical alignment and profile may be required to demonstrate compliance with this requirement.

- d) Extending Sewer through Development - For land areas of five (5) acres or less, it shall be required that the sewer be extended to surrounding properties to accommodate any upstream tributary area.

If the property being developed is greater than five (5) acres, it shall be required that the developer extend sewer through their site as the site is developed to provide for upstream tributary properties. Permanent and temporary easements, as required by DOSD, shall be provided in order that upstream properties can access the sewer to which they are tributary.

## 2. Hydraulic Requirements

- a) Pipe Type and Roughness - Allowable pipe materials are delineated in the CMSC Section 901.02. PVC pipe materials used shall require deflection testing as delineated in the Item 901.21 CMSC.

All hydraulic calculations shall be based on a pipe roughness coefficient of  $N=0.013$  (Mannings  $n$ ) regardless of pipe material. The sanitary sewer design sheet (Exhibit F) shall be used and submitted for all mainline sanitary sewer plans.

b) Pipe Grade - The following shall be the minimum design grades for the various pipe sizes:

<u>Size</u>	<u>Minimum Grade</u>
8"	0.45%
10"	0.25%
12"	0.20%
15"	0.15%
18"	0.12%

Maximum - Excessive velocities should be avoided where possible. When proposed design velocities exceed 15 feet per second, OEPA design requirements shall apply.

End of Sewer Run - Sewers that will not require future extensions shall have adequate grade to provide sufficient cleansing velocity to compensate for reduced flows.

c) Design Capacity- Design capacity shall not exceed the following percentages of pipe flowing full capacities.

8" through 15" diameter:	50%
18" through 27" diameter:	75%
30" and larger diameter:	92%

d) Average Sanitary Flow - A rate of 0.0002 CFS per capita (based on 130 gpcd) multiplied by the design density for the area under consideration shall determine the average sanitary flow.

e) Peak Sanitary Flow - To determine the peak sanitary flow, the average flow is multiplied by a peak factor of 3.5.

f) Infiltration - Shall be computed at a rate of 0.003 CFS per acre of total area tributary to the portion of the collection system under analysis.

g) Design Flow - The design flow is the sum of the peak sanitary flow and the total infiltration up to the point in question.

- h) Pipe Size - Mainline sanitary sewer shall be a minimum of eight inches (8") nominal inside diameter. Sanitary service lines shall be a minimum of six inches (6") nominal inside diameter. Reduction in pipe size in the downstream direction will not be permitted regardless of the slope of the pipe.

### 3. Manholes

- a) Required Locations - Manholes are to be constructed at the following locations:
- 1) At changes of pipe size.
  - 2) At changes of pipe slope.
  - 3) At changes of pipe alignment.
  - 4) At changes of pipe material. (Example: PVC to Concrete)
  - 5) At curves on sewers (PC or PT) 48" in diameter and larger
  - 6) At intermediate intervals not exceeding 300' on 8" through 27", and 500' on 30" and larger, or approved by DOSD.
  - 7) At the ends of sewer extensions where a service line is located between the manhole and the end of the sewer extension.
  - 8) At the ends of sewer extensions 50' or more in length, regardless of service line connections, or as approved by DOSD.

Manholes are to be located outside ponding areas, swales, flood routing routes, etc. or otherwise protected to the 100 year recurrence interval storm.

- b) Over Existing Sewers - When constructing a manhole over an existing flexible eight inch (8"), ten inch (10"), or twelve inch (12") sanitary sewer, a Type C (Standard Drawing AA-S102) manhole with flexible connections shall be installed. When building a manhole over an existing sewer, other than the above mentioned, a Type "E" (Standard Drawing AA-S104) cast in place base manhole shall be constructed unless another proposed alternative has been reviewed and accepted by DOSD.

- c) Precast Manholes - All manholes on a proposed sewer line are to be precast and of the appropriate type and size for the designed pipe sizes. (See Standard Drawings.)

Manhole bases shall provide a minimum 0.10' drop between the inlet and outlet pipes unless otherwise approved by DOSD.

- d) Drop Pipes - Proposed sewers entering proposed manholes two feet (2') or more above the invert of the manhole, shall have an outside drop constructed as per Standard Drawing AA-S110.

Proposed sewers entering existing manholes two feet (2') or more above the invert of the manhole, shall have an inside drop constructed as per Standard Drawing AA-S110.

There shall be no more than one inside drop permitted in a manhole.

- e) Cleanouts - Cleanouts on mainline sanitary sewers will not be permitted under any circumstances.

#### **4. Stream and Ditch Crossings; Sedimentation and Erosion Control**

- a) Alignment - Sewers crossing open channels shall be designed to cross as nearly perpendicular to the channel as possible. Whenever possible, the number of these crossings shall be minimized to mitigate the amount of sediment pollution produced by construction.
- b) Depth, Backfill, Encasement, and Watercourse Erosion Protection - Whenever possible, the depth from the channel bed to the crown of the pipe shall be a minimum of four feet

(4'). Trench backfill shall be in accordance with Item 911 of the CMSC. Watercourse erosion protection shall be placed over top of the backfilled trench in accordance with Item 919. When the four feet (4') minimum cover requirement cannot be met, six inch (6") concrete encasement on all sides of the pipe will be required for all pipe materials. For PVC pipe, encasement will extend between the manholes on each side of the channel. A detail for the encasement is to be provided on the plan.

- c) Sediment Pollution Concerns - Where a project crosses, requires equipment crossings, or is, in the opinion of DOSD, adjacent to a stream or other erodible surface, one or all requirements may apply:
- 1) Phase construction practices may be required.
  - 2) Construction stream crossings will be required.
  - 3) Temporary and/or Permanent erosion protection shall be constructed within fourteen (14) days of surface disturbance.
  - 4) All runoff generated off-site and on-site shall require sediment control, as approved by DOSD.
  - 5) All stock piles shall be protected from sediment generation as approved by DOSD.
  - 6) The applicable additional general notes found in the following list shall be included on the plans.

Notes to be added to all Applicable Sanitary Sewer Construction Plans:

- The Contractor is to minimize the amount of time disturbed land remains in an unstable condition. To accomplish this, the Contractor is required to mechanically or vegetatively stabilize all disturbed areas within fourteen (14) calendar days after initial clearing operations are begun.
- All final surface restoration operations required: Including final grading and topsoil spreading, shall be completed within fourteen (14) calendar days of utility placement. On long sewerage projects, this may require successive testing procedures to ensure compliance by each completed section.

- All fill material shall be kept well away from the stream channel throughout the construction operation.
- All concentrated water sources, including effluent produced by dewatering operations, shall discharge into a viable sediment trap, stilling basin, or stable vegetated area.
- All water sources shall discharge into a stream or storm sewer in a non-erosive manner.
- All soil stockpiles, including trench excavation stockpiles, shall be protected from erosion by perimeter control devices such as earth or straw bale dikes, or silt fences. And, these perimeter control devices shall be maintained throughout the life of the project.
- All storm sewer inlets shall be protected against the acceptance of excessive amounts of sediments using adequate filtering devices, approved by DOSD.

Notes to be added to all Sanitary Sewer Construction Plans  
Requiring either Temporary and/or Permanent Stream Crossings:

- All erosion control measures including, but not limited to, Item 919 - Watercourse Erosion Protection; Item 659 - Seeding and Mulching; and Item 207 - Temporary Soil Erosion and Sediment Control. Seeding and mulching shall be constructed within 48 hours after utility crossing is complete.
- d) Temporary Stream Crossings - Where streams or wetlands must be temporarily disturbed for construction access, a temporary stream crossing shall be constructed, maintained, and exclusively used. A temporary stream crossing may consist of a temporary bridge, culvert, or ford, as approved by DOSD.

## **5. Waterline Crossings and Parallel Installations**

OEPA Guidelines shall be followed for sanitary sewers in relation to waterline crossings and parallel installations.

The City of Columbus, Water Division, shall have the final determination as to whether or not the proposed sewer installation is acceptable.

## **6. Direct Taps**

Sewers may be permitted to direct tap an existing sewer line provided the existing sewer being tapped is 30" or larger. It shall be determined by DOSD as to whether or not the direct tap will be allowed.

When a direct tap is proposed, it shall meet the requirements shown in the DOSD Standard drawings.

## **7. Phasing of Plans**

Whenever a proposed plan is to be phased for construction, a clearly defined phase line shall be shown and the various phases indicated on the tributary area map and all plan sheets involved.

The phasing shown shall be for the construction phasing of the sewer line only and not for the development itself. Phases shall be indicated in the profiles as well as in the plan view.

Quantities shown on the plan shall be shown for each phase proposed.

## **8. Pump Stations, Force Mains and Temporary Holding Tanks**

- a) Pump Stations and Force Mains - Sanitary pump stations shall not be permitted without the written permission of the Director of the Department of Public Utilities in any area capable of being served by a gravity sanitary sewer system.

Regardless of when the extension of a gravity sewer system to the area in question may be constructed, the gravity sewer

extension shall be the preferred method for servicing an area with sanitary sewer.

In the event that an area cannot be sewerred by gravity, a written request must be submitted to the Director of the Department of Public Utilities outlining in detail what type of development is being proposed, the size of the development, why the area cannot be served by gravity, and any other information deemed necessary by the Director.

If, after review, it is determined by DOSD and the Director of Public Utilities that it is in the best interest of the City to allow a sanitary pump station, the pump station shall be constructed in accordance with the standards set forth by DOSD.

In the event that a pump station is permitted by the Director of Public Utilities, and the pump station will serve commercial, multi-family, or any other single entity ownership development, that pump station and all gravity sewers served by the pump station shall be maintained and operated by the owner/developer. The system shall be considered a private sanitary system with the City of Columbus assuming no responsibility for the operation and maintenance thereof. The City of Columbus and the owner/developer shall enter into an agreement detailing all requirements of the owner/developer associated with the proposed pump station.

In areas of proposed single family development or other multiple ownership type developments where it has been determined to be in the best interest of the City to construct a pump station to provide sanitary sewer service, the pump station will be constructed to the standards set forth by the City. The standards set forth for these City-owned facilities shall be significantly more stringent than those set forth above for privately-owned facilities. The City may participate in the cost

of these City-owned facilities if so warranted and accommodation for same can be made in the Capital Improvements Program. The completed pump station will be owned, operated and maintained by the City of Columbus.

- b) Temporary Holding Tanks - Temporary holding tanks will not be permitted in any area capable of being served by a gravity sewer.

If a temporary holding tank is needed to serve a property for a period while a sanitary sewer is being designed and constructed, the owner shall first obtain permission from the Administrator of DOSD and the Environmental Health Section of City of Columbus Health Department.

## **IV Sewer Agreements and Fees**

Prior to any mainline sanitary sewer plan being released for construction, two (2) Sewer Agreements (originals) must be executed by the owner/developer and submitted to DOSD prior to payment of the required standby Construction Inspection Deposit (CID). Agreements will be prepared by DOSD and sent to the owner/developer indicated on the CC # Application after the plan has been approved.

No fees will be accepted until the sewer plan has been approved by all the necessary divisions and all required easement instruments and agreements have been submitted.

Tap permit fees and system capacity charges can be obtained by contacting the DOSD Permit Office at (614) 645-7490.

## **V**

### **Additional Plan Requirements for Capital Improvement Projects**

In addition to the provisions required for private sanitary sewers, the following plan features shall be included:

All Capital Improvement Projects (CIP) shall have the survey field book and page numbers listed on the first sheet of the plans.

All angle manholes shall be referenced by a three point reference. The reference points shall be outside the work limits.

A signature and date line for the Administrator, Division of Construction Inspection, shall be added to the signature block. (See Exhibit C).

**DOSD DRAWING NUMBER APPLICATION FORM**

**CITY OF COLUMBUS DIVISION OF SEWERAGE AND DRAINAGE  
DRAWING NUMBER APPLICATION  
FOR SEWER CONSTRUCTION PLANS**

**Drawing Number** (assigned by DOSD): \_\_\_\_\_

**Drawing Type:** \_\_ Sanitary    \_\_ Storm    \_\_ Combined    \_\_ Other (            )

**Project Title:** \_\_\_\_\_

**Project Zoning Code Class:** Res. \_\_\_\_\_ Apt. \_\_\_\_\_ Comm. \_\_\_\_\_ Other \_\_\_\_\_

**Acreeage:** Project On-site \_\_\_\_\_ Above \_\_\_\_\_ Below \_\_\_\_\_

**Easements:** Number Required \_\_\_\_\_ On-site \_\_\_\_\_ Off-site \_\_\_\_\_ Platted \_\_\_\_\_

**Contact Information:**

**Property Owner Name:** \_\_\_\_\_

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

**Phone:** \_\_\_\_\_ **Email Address:** \_\_\_\_\_

**Contact (if other than property owner):** \_\_\_\_\_

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

**Phone:** \_\_\_\_\_ **Email Address:** \_\_\_\_\_

**Project Developer (organization name):** \_\_\_\_\_

**Primary Developer Contact Person:** \_\_\_\_\_

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

**Phone:** \_\_\_\_\_ **Email Address:** \_\_\_\_\_

**Plan Prepared by (organization name):** \_\_\_\_\_

**Primary Contact Person:** \_\_\_\_\_

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

**Phone:** \_\_\_\_\_ **Email Address:** \_\_\_\_\_

**Design Date:** \_\_\_\_\_

**Enclosed:** Design Area Map \_\_\_\_\_ Calculations \_\_\_\_\_ Prelim. Easement Description \_\_\_\_\_  
Other \_\_\_\_\_ (Describe: \_\_\_\_\_)

**Digital File Name(s) Submitted:**

## **EXHIBIT B General Notes**

- The City of Columbus Construction and Material Specifications, (current version) including all supplements thereto, shall govern all construction items that are a part of this plan unless otherwise noted.
- The Contractor shall notify the following Divisions at least 24 hours in advance of the anticipated start of construction.

Division of Sewerage and Drainage (614) 645-7102  
Division of Construction Inspection (614) 645-3182

- The Contractor is responsible for the investigation, location, support, protection, and restoration of all existing utilities and appurtenances whether shown on these plans or not. The Contractor shall expose all utilities or structures prior to construction to verify the vertical and horizontal effect on the proposed construction. The Contractor shall call, toll free, the Ohio Utilities Protection Service (1-800-362-2764) 72 hours prior to construction and shall notify all utility companies at least 48 hours prior to work in the vicinity of their underground lines.
- Construction of this project may not begin until the easements indicated have been recorded by the City.
- The Developer/Owner shall, prior to any construction operation, deposit with the City the total estimated costs for inspection and where required a repaving guarantee.
- Any modification to the work as shown on these drawings must have prior written approval by the Administrator, Division of Sewerage and Drainage.

- Roof drains, foundation drains, and other clean water connections to the sanitary sewer system are prohibited.
- Service risers, Item 914, shall be installed where depths from the wyes to the existing or proposed elevations exceed 10'. The tops of risers shall be no more than  $\pm 9'$  below the existing or proposed surface elevation, whichever is higher.
- All PVC sewer lines shall be deflection tested after installation in conformance with the requirements of Item 901 of the City of Columbus, Construction and Material Specifications, current version.
- All concrete pipe, storm and sanitary sewer structures will be stamped or have such identification noting that said pipe, storm and sanitary structures have been inspected by the City of Columbus and meets their specifications. Pipe and structures without proper identification will not be permitted for installation.
- Erosion and sediment control measures are required as part of this project. Erosion and Sediment Control measures specific to this site may be found on Drawing number: \_\_\_\_\_. Land-disturbing activities must comply with all provisions of the Division of Sewerage and Drainage EROSION AND SEDIMENT CONTROL REGULATION. All land-distributing activities shall be subject to inspection and site investigation by the City of Columbus and/or the Ohio EPA.
- The contractor shall ensure there is a surveyor's level and rod on the project for use in performing grade checks whenever sewer line structures or pipe are being installed. The contractor shall make this equipment available for use and assist the City inspector in performing grade checks when requested by the inspector. The inspector will make all reasonable attempts to confine requests for assistance in

performing grade checks to times convenient to the contractor.

These checks will be performed to ensure the following:

1. Proper placement of each structure.
2. Proper installation of initial runs of pipe from a structure.
3. Grade, after an overnight or longer shutdown.
4. Grade, at any other time the inspector has reason to question grade of installation.

Grade checks performed by the City inspector in no way relieve the contractor for the ultimate responsibility to ensure construction to the plan grade.

It is the responsibility of the site owner to notify the City of Columbus 2 working days prior to commencement of initial site land disturbance on any site of two or more acres. This includes site clearing, grubbing and any earth moving. Primary erosion and sediment control practices are mandated by regulation to be in place from the beginning of the construction activity. Please contact The Stormwater Management Office @ (614) 645-6700 or fax @ (614) 645-1840. Details of this requirement may be found in the EROSION AND SEDIMENT POLLUTION CONTROL REGULATION (adopted June 1, 1994). Failure to comply may result in enforcement action as detailed in the Columbus City Codes Section 1145.80.

**THIS NOTE SHALL BE ADDED TO ANY PLAN WHERE CITY OF COLUMBUS PARK PROPERTY MAY BE INVOLVED IN THE LIMITS OF CONSTRUCTION:**

*"The Contractor is hereby notified to contact the City Forester of the Recreation and Parks Department (Phone: (614) 645-3350) 24 hours prior to any construction in or near the park property."*

## EXHIBIT C Signature Block

APPROVALS: SIGNATURES BELOW SIGNIFY ONLY CONCURRENCE WITH THE GENERAL PURPOSES AND GENERAL LOCATION OF THE PROJECT. ALL TECHNICAL DETAILS REMAIN THE RESPONSIBILITY OF THE ENGINEER PREPARING THE PLANS.

SEWER SYSTEM ENGINEERING MANAGER DIVISION OF SEWERAGE & DRAINAGE	DATE	ADMINISTRATOR, DIVISION OF SEWERAGE & DRAINAGE	DATE
ADMINISTRATOR, DIVISION OF ELECTRICITY	DATE	DIRECTOR, DEPARTMENT OF PUBLIC UTILITIES	DATE
ADMINISTRATOR, DIVISION OF WATER	DATE	DIRECTOR, DEPARTMENT OF PUBLIC SERVICE	DATE
DESIGN AND PLAN SERVICES ENGINEER TRANSPORTATION DIVISION	DATE	CITY ENGINEER, TRANSPORTATION DIVISION	DATE

\* FOR CAPITAL IMPROVEMENT PROJECTS  
ADD TO SIGNATURE BLOCK:

ADMINISTRATOR, DIVISION OF  
CONSTRUCTION INSPECTION

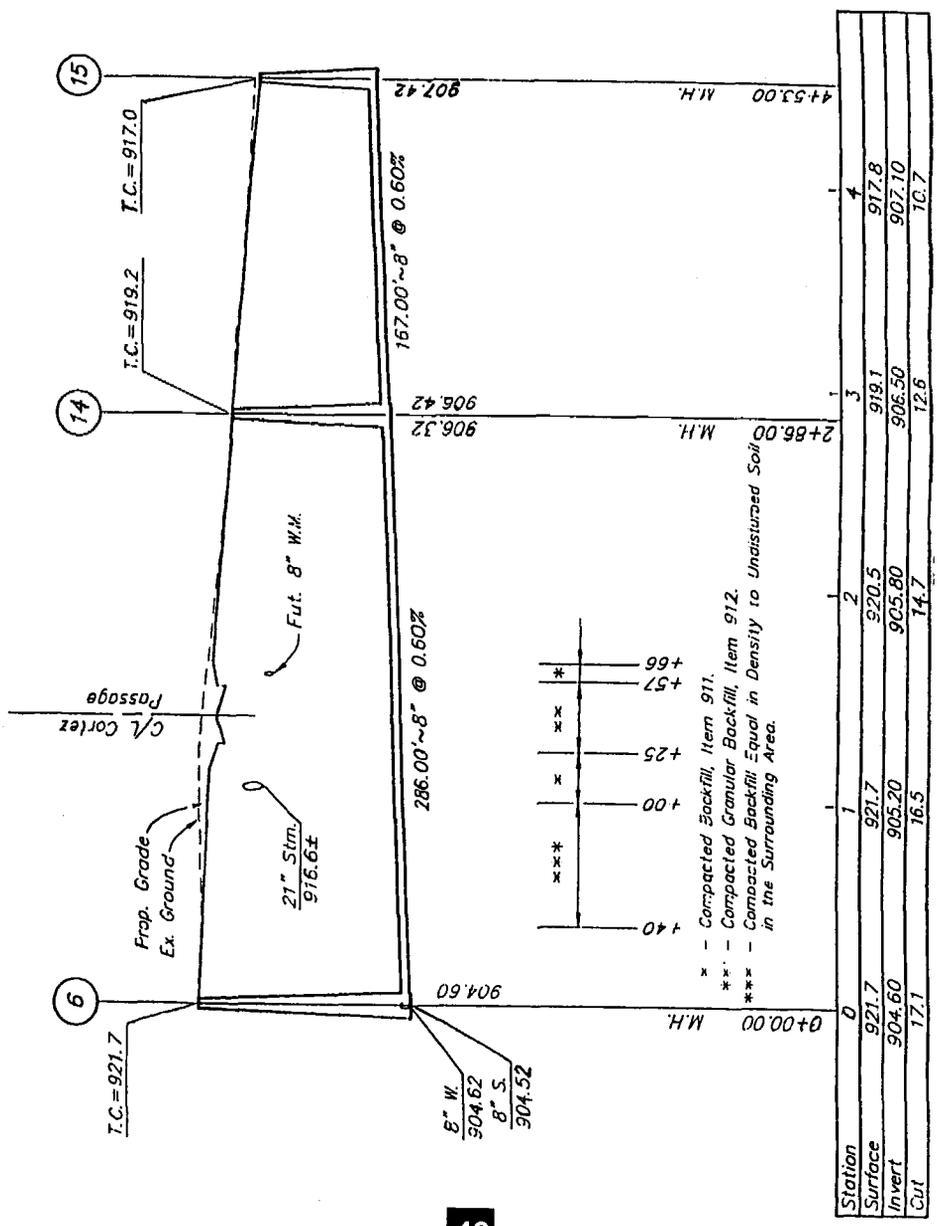
DATE

\* FOR PROJECTS NEAR PARK PROPERTY  
ADD TO SIGNATURE BLOCK:

DIRECTOR, DEPARTMENT OF  
RECREATION & PARKS

DATE

# EXHIBIT D Sample Sewer Profile



# EXHIBIT E

## Zoning Population Density Chart

D E N S I T Y				
ZONING	USE	UNITS/ACRE	PEOPLE/UNIT	PEOPLE/ACRE
LRR-Limited Rural Residential	Single Family	1	3.5	3.5
RRR-Restricted Rural Residential	Single Family	2	3.5	7
RR-Rural Residential	Single Family	4	3.5	14
SR-Suburban Residential	Single Family	5	3.5	17
R-1 Residential	Single Family	5	3.5	17
R-2 Residential	Single Family	6	3.5	21
R-3 Residential	Single Family	6	3.5	21
R-2F Residential	1-2 Family	12-14	2.7	32-38
R-4 Residential	1-4 Family	17.4	2.7	47
PUD-Planned Unit Development	Single and Multi-Family	2-8	3	6 to 24
AR 12 Apartment Residential	Apartments	12	2.7	32
AR-LD Apartment Residential - Low Density	Apartments	17.4	2.7	47
AR-1 Apartment Residential	Apartments	36.2	2.7	97
AR-2 Apartment Residential	Apartments	54.6	2.2	120
AR-3 Apartment Residential	Apartments and Institutions	Unlimited	2.7	"
AR-4 Apartment Residential	Apartments and Group Quarters	36.2	2.7	97
AR-O Apartment-Office	Apartments and Offices	Unlimited	—	"
MHP-Mobile Home Park	Mobile Homes	6	3	18
PC-Planned Community	Mixed	14	3	42
I-Institutional	Medical Buildings and Quasi-Public Uses	—	—	"
C-1 Commercial	Neighborhood Uses, Limited	—	—	10
C-2 Commercial	Offices	—	—	10
C-3 Commercial	General Commercial, Limited	—	—	10
C-4 Commercial	General Commercial	—	—	10
C-5 Commercial	Drive-in & Automobile Oriented	—	—	10
CB-Central Business	All Commercial	—	—	10
M-2 Manufacturing	Limited Industrial & Office Only	—	—	"
M Manufacturing	General Industrial Only	—	—	"
M Manufacturing	General Industrial & Commercial	—	—	"



## EXHIBIT G

Note to Permit Clerk, Contractor, and Construction Inspector

### **NOTE TO PERMIT CLERK CONTRACTOR and CONSTRUCTION INSPECTOR**

- 1. The service for buildings \_\_\_\_\_ thru \_\_\_\_\_ are to be installed in conjunction with the mainline sewer.**
- 2. All appropriate Permit and System Capacity Fees for these buildings must be paid with the standby inspection fees prior to installation**
- 3. No services may be connected to any buildings until the mainline and service line have been inspected, tested and approved for use.**
- 4. In the event the building is connected to the service before the mainline is approved for use , the developer shall be responsible for all costs to disconnect the service and have all affected lines thoroughly cleaned and disinfected before any further inspection or testing is conducted for Division of Construction Inspection approval of the project**
- 5. All building sign-off cards will be signed in the permit office after the mainline sewer has been tested and approved for use.**

## Notes