CITY OF WESTMINSTER
Development Design Criteria

I. GENERAL:

1) All Plans shall be 24" x 36" with 1/2" border on all sides.

2) Design Drawings shall be prepared in Plan at a scale of not less than 1" = 50' horizontal and 1" = 50' vertical. Generally in new subdivisions, the Plan and Profile shall be shown on the same sheet.

3) All Construction Drawings and related design documents must be signed and sealed by a Professional Engineer, Architect, or Landscape Architect, registered in the State of Maryland.

4) Construction Drawings must also have a signature and date block for the Zoning Administrator and the Director of Public Works.

5) All Plan views must have a north arrow and 3 coordinate ticks based on the Maryland State Grid System and labeled at intervals of 250 feet.

6) The Title Sheet shall contain the following information:

   a) Vicinity Map (Preferably in the upper right hand corner) showing approximate location and configuration of property at a scale no less than 1" = 2000'.
   b) Name and address of property owner and/or developer.
   c) List of drawings.
   d) General Notes.
   e) Bench Mark Information
   f) City Job Numbers
   g) Name & address of engineer
   h) Water Meter Size
   i) Size of Sprinkler Connection
   j) Amount of New Fire Hydrants

7) The boundary of the property should be clearly indicated by a heavy line.

8) All Plan views must show existing pertinent features, either natural or manmade, that may influence the design of the project, such as existing gas lines, telephone, electrical, and television cable, either underground or overhead, including guy poles and wires, existing buildings or structures including structures within 200' on adjoining properties, fire hydrants, water courses, wooded areas, water lines, sewer lines, storm drains and structures (including pipe sizes), all easements labeled with dimensions shown, the 100 Year Flood Plain if applicable, adjoining property owners, and title references. It shall be the responsibility of the design engineer to obtain the location of these features.

9) Show existing and proposed topography at 2' contour intervals. Include spot elevations at high and low points and other critical areas. Contours shall also be shown 200' beyond property boundary. Topography does not need to be shown on all plans but should be shown on plans where elevations are necessary and also on Grading Plan or as a combination if possible.

10) Show all lot numbers in numerical order.

11) Show setback requirements properly labeled and dimensioned. Also show any proposed easements labeled and dimensioned along with any other property proposed to be reserved or temporarily reserved for public use.

12) Show the layout of all proposed streets, alleys, sidewalks and path systems. All proposed street identification, right-of-way, and pavement widths will be indicated on the plan. Sidewalks will be provided and indicated where applicable.

13) Show the location and sizes of all proposed utilities making sure that they are all properly labeled.

14) List all General Notes which pertain to the contract.

15) Title Information shall be as follows:

    Located in lower right hand corner of the Plan and will contain the following:

    a) Proposed name of subdivision which shall not be a duplicate of any other subdivision or development name.
    b) Scale of Plan
    c) Date
    d) Sheet number
    e) Title of Plan

16) All elevations must be accurate to within one hundredth of a foot, field run from a bench mark established from USGS Datum. Bench marks must be permanent, immovable structures.

17) A Landscaping Plan is required for all projects within City Limits. It must be signed and sealed by a registered Landscape Architect.

18) A Traffic Control Plan is required for any construction activities which will disturb the existing flow of traffic, including work in shoulders. It must be detailed, site-specific, and in strict accord with the Manual on uniform Traffic Control Devices, supplemented by the SHA Book of Standards.

19) On projects which have City storm drains there should be included a single plan view, of the same scale as the construction drawings wherever practicable, and showing drainage areas for each inlet or structure, proposed grading, soil types, proposed land use (e.g. any impervious areas), and a basic layout of the storm drain system. In most cases it would be sufficient to add the necessary information to the grading (and sediment control) plan, or to create a separate storm drain and grading plan, distinct from the road construction plan.

20) For utilities in easements, 10' clear is required between centerlines of pipes, and edges of easement; thus, 1 pipeline = 20' wide easement, 2 lines = 30' easement; 3 lines = 40' easement.

21) For utilities (sewer & water, sometimes for SD) in roads, the centerline of a pipe which runs basically parallel to the road must maintain a minimum of 3 feet clear from the face of curb. Manholes must be a minimum of 5 feet from centerline to face of curb.

22) All utility crossings must be shown on pipe profiles and the invert of the crossing pipe at the point of crossing must be given. A minimum of 1 foot clear vertically must be maintained between outside walls of pipes. These calculations must take into account the wall thickness of both pipes involved. For RCCP class IV, wall C is to be used in computing outside diameter.

23) Any pipeline crossing a stream channel shall be encased in concrete 20 feet each way from the toes of the stream banks. Limits of encasement should be clearly shown and stationed on the plan and profile, and a detail of the encasement included.

24) In any cases where tunneling or boring and jacking are required the limits of that work shall be shown and stationed on plan and profile. Care must be taken to ensure that there is sufficient room for the jacking and receiving pits.

25) For boring and jacking applications sewer is to be MJ DIP cl 50, water is to be MJ DIP cl 52. Casing type is to be designed and specified by the engineer. Design data must be supplied.

26) The maximum permitted depth for standard 4 foot manholes is 20 feet. Manholes proposed to be deeper will require special design incorporating appropriate safety features.

27) For projects requiring sediment control, a copy of the Sediment Control Plan is to be included for informational purposes in the Construction Drawings Submitted to the City.

28) Panhandle lots having water and sewer available in the public right-of-way may be served in one of two basic manners:

    a) Private water and sewer connections for each lot, running from the fixtures (cleanout, curb stop/meter pit) at the right-of-way line, within the bounds of the panhandle, to the main portion of the lot. In this case each panhandle must have a minimum 15 feet

frontage on the right-of-way to provide the required 5 feet clear between service lines and between services and lot division lines.

b) Extension of public water and sewer mains within a 30 foot wide public easement, from which private services branch at points most convenient for each lot. Such mains should of course be subject to all of the appurtenant requirements contained herein. In this case the panhandle lots are to be configured as required by the appropriate (City/County) jurisdiction.

29) For panhandle lots within City limits the following criteria apply:

a) All use-in-common driveways are to be paved using minimum of 3 inches bituminous paving over 4 inches CR-6.
b) No more than four panhandle lots may be served by one use-in-common drive.
c) Where the presence of private utility services does not limit the minimum panhandle width to 15 feet, the following dimensions are to be used:

No. of Panhandles	Width of each Lot	Width of UIC Drive
1	15’	10’ paved
2	10’	14’ paved
3	10’	14’ paved
4	8’	14’ paved

II. ROADS:

1) Local subdivision roads should be designed in accord with a 25 mph design speed as set forth in the AASHTO "Policy on Geometric Design for Highways and Streets," except that stopping sigh distance should be in accord with a 35 mph design speed. Collector and through streets in subdivisions should be designed in all cases to meet or exceed minimums for 35 mph design speed, or 10 mph over the intended posted speed, whichever is greater.

2) The maximum acceptable street grade is 10%.

3) Include a Profile of each street either by centerline or top of curb and a typical section of each street or street type. Show vertical and horizontal geometric roadway information including bearings and distances, radii, etc. This information may be shown in tabular form.

4) Centerlines of intersecting traffic ways are to be shown and labeled, including an equation station.

5) The standard street cross-section is 30' wide with 2% crown in 50' right-of-way.

6) Cul-de-Sacs are to be paved on a 50' radius in a right-of-way of 60' radius.

7) The standard paving section in residential developments is 12½ inches. (1½ HMA super pave surface; 3" HMA super pave base; 2 courses 4" GAB; compacted subgrade) for commercial and industrial development; heavy duty paving is 15" (2" HMA super pave surface 5" HMA super pave base; 2 courses 4" GAB; compacted subgrade) standard curb HSHA Type A 8" depth to match paving depth.

8) All driveways must have a concrete apron for the full area from the R/W line to a depressed curb front. Concrete is to be 7 inches thick, 4 inch #57 stone graded aggregate base; compacted subgrade. Include a detail or reference SHA standards.

9) The City absolutely requires a 5' wide sidewalk on both sides of all streets, 5" thick, and set back 5' from face of curb. Sidewalk shall have control joints every 5', expansion joints between different thicknesses of concrete, continuation of existing expansion joints or control joints, grade brakes, retaining walls, and utility poles.

10) Concrete valley gutter is to be used wherever the flow-line is within the paving (e.g. parking bays adjacent to roadway).

11) Curb return at intersections are to have a minimum 25' radius; curb elevations should be given at PC, POC, and PT on curb returns.

12) Existing elevations must be called off at curb tie-ins, and nose-down shown at the ends of curbs.

13) Flow-arrows are to be shown at intersections wherever appropriate to clarify drainage problems.

14) Existing and proposed elevations are required at 50’ stations on profiles. Proposed elevations and stations are also required at changes in geometrics (e.g. PVC, PE, etc.) and at high and low points of vertical curves.

15) Proposed permanent traffic control devices (signs, lights, etc.) are to be shown on the road plan.

16) In residential developments no more than 15 parking spaces in a row shall be provided without be interrupted by landscaping.

17) Temporary turnarounds are to be provided at the ends of streets which will be extended in the future.

18) The City reserves the right to require design in excess of these standards including but not limited to wider roads and rights-of-way, heavier paving, increased turning radii, etc., based on any special considerations which may exist (e.g. collector streets, commercial/industrial development, etc.)

III. STORM DRAINS:

1) All storm drains are to be designed in accord with the SHA's Highway Drainage Manual. Completed copies of SHA forms 61.1-491 (based on 2 year storm), 61.1-492 (10 year), and 61.1-493 (25 year storm) are to be included in the plans, or submitted concurrently. In addition, the 25 year hydraulic gradient is to be shown on the Profiles, and the 10 year Q and V are to be noted on same.

2) All storm drain pipe is to be RCCP class IV. CMP is never to be used in any aspect of any system which will be maintained by the City.

3) Open drainage channels are not generally to be used in subdivisions except in unusual situations by special approval of the Department of Public Works.

4) Bend and junction structures are to have an access manhole. When using these structures provide all design curve data.

5) Large diameter precast manholes may be substituted for bend structures provided such a manhole is large enough to accommodate a bend designed in accord with the criteria on page I-4-A-2 of the drainage manual (formula 13 should be corrected to read $L = \frac{2\pi R\Delta}{360}$).

6) All structures should be referenced using SHA standard detail numbers. In the case of any structure which does not have a corresponding SHA number, a detail should be included in the Plans.

7) Special attention is to be given to the design and location of junction manholes so that the angle between two pipes entering a manhole is great enough to provide a minimum of 8 inches of manhole wall clear between the outsides of the two pipes at the inside face of the manhole. No influent pipe may enter a manhole at an angle less than 90 degrees from the effluent pipe.

8) Invert and top elevations must be indicated for all structures, either in a schedule or on the Profile.

9) Show the proposed and existing drainage systems including the types of structures, drainage easements, the 100 Year Flood Plain and any deviations from standards.

10) Absolute minimum grade allowable on Storm Drain is 0.5 percent. The desirable minimum is 1 percent wherever possible.

11) The inlet type of 1st choice shall be a combination grate and curb opening inlet (e.g. SHA Standard WR.374.04).

12) Field connections, cut-ins, or precast wye branch fittings may be used in storm drain systems at the junction of a trunk line with an inlet leader only under the following conditions:

    a) The connection must be the first structure downstream on a leader service only one inlet.
    b) The diameter of the trunk line must be at least double that of the leader line.
    c) The length of the leader line may not exceed 25 feet.

13) When COG or COS inlets are proposed they are to be drafted on Construction Drawings as they are proposed to be placed. Include MH locations in inlet.

14) Rip Rap is to be Carroll County Class 2 unless other proposed type is approved by the City.

IV. DESIGN OF WATER AND SEWER SYSTEMS

A. GENERAL:

1) All water and sewer designs shall be in accordance with the requirements of the State of Maryland Department of the Environment.

2) For the purpose of design of all water and sewerage systems, the estimated population for dwelling units shall not be less than 3.5 persons per single family dwelling unit and 3 persons per apartment dwelling.

3) Water and sewer designs may be shown on the same contract drawing. Existing and proposed storm drains (and other obstructions) must be included.

4) Show the locations and sizes of proposed water and sewer installation, or proposed additions to existing water and sewer installations, as well as any design features which are unusual or which deviate from normal design practice.

5) In new subdivisions, street grades shall be established by the developer with the approved street grade shown on the Profile. The ground line on the Profile shall represent the elevation along the centerline of the street. Where the established street grades differ from the existing grade, the established grade will be indicated by a solid line and the actual centerline grade by a dashed line.

6) The horizontal stations for profiles shall represent the centerline of the street and the location of the water and sewer shall be the projected location along the centerline of the street. This means that the horizontal distance cannot be scaled accurately on the profiles where they are located in curved streets and where they are not parallel. Stationing on water mains may be waterline stations or centerline stations. The stations of the sewer shall be the actual stations between manholes.

7) In existing subdivisions, the design drawings shall show the property owners, title reference, and street house number, if any, for each property abutting a water or sewer extension. In new subdivisions or open areas, the final drawings shall show the land owners abutting the proposed facilities.

8) Where water and sewer extensions are not located in streets or other public rights-of-way, plats for the obtaining of utility easements through privately owned property shall be prepared.

9) In any case where a storm drain trunk line runs parallel to the water and sewer mains, that storm drain must be shown in dashed lines on the Water and Sewer Profile. Special attention should be given to assure that house connections are provided with a minimum of 1 foot vertical clearance, measured from outside of pipe, where they cross other utility lines.

10) Pipes shown on Profiles should be depicted as whole pipes, that is, with the actual outside diameter of the pipe scaled onto the Profiles. A single line representing the invert is not sufficient.

11) When crossing a State Road, label the method of crossing along with the State Roads Permit Number.

12) House service connections shall conform to the City of Westminster Standard Detail Sheets.

13) Water and sewer service connections, where they cross the right-of-way or easement line, must be provided with a minimum 5 feet clearance from the lot division lines and from one another.

14) Show cleanouts or curb stops at property line, right-of-way line, or easement line for sewer and water service connections.

15) Include the City's Standard Detail Sheets for water and sewer.

16) Whenever a utility crosses a State R/W it must be encased with a sleeve for the entire width of the R/W. Where sanitary is used, manholes must be placed on each side of the R/W.

B. WATER MAINS AND SERVICES:

1) If requested by the City, a water system distribution analysis shall be submitted showing the hydraulic gradient at key points under conditions of design flow. Design data and computations may be required. This and other information may be used at the City's discretion to require changes in the design configuration and sizing of the proposed water system.

2) Water mains in new subdivisions generally shall be laid 7 feet off the centerline of the street toward the high side.

3) The absolute minimum acceptance cover over water line is 4 feet, measured from the actual crown of pipe to the actual road or ground surface. Thus, the height of curb must be accounted for in design of a water main in the street when top of curb is used as the PGL.

4) Minimum permitted size for water mains is 4 inches, and that only is to serve small groups of houses. However, the final decision on water main size rests with the Department of Public Works.

5) Where curved water main is used, the arc length, begin and end stations, and crimp radius of the curve are to be given on the Plan. Minimum permitted crimp radius is 205 feet.

6) Where horizontal bends are used in water mains care must be taken to ensure that buttresses and anchors bear against undisturbed earth, and not other utility trenches. Adequacy of thrust restraint system is to be determined by the engineer. Computations may be required.

7) Air release valves are required at all high points in water lines.

8) Water line valves are to be the same size as mains, installed adjacent to all tees, crosses, and at 500 foot intervals in-line.

9) Plan view must show any existing valves which must be closed in order to make tie-in.

10) Fire hydrants are to be connected to mains via 6 inch leads to which no other use may be attached.

11) Valves shall be installed on all fire hydrant leads with the valves located as close as possible to the water mains.

12) Hydrants shall be located at street intersections whenever possible. Hydrants not located at intersections shall be located in relation to property lines in order to avoid interference with future driveways. Location of hydrants on the outside of a street or road curve should be avoided.

13) Indicate fire hydrant bury line elevation on the Plan (bury line coincides with the elevation of proposed ground at the hydrant locations, and is the calculated, not scaled, from the roadway profile and cross section).

14) All water line fixtures are to be shown and stationed on the Plan view, and shown with stations and elevations on the Profile. In addition, water line profiles require stations and elevations every 50 feet. Elevations are to be to invert, not top of pipe.

15) All fittings on water mains such as tees, bends and caps shall be anchored or buttressed as shown in the Standard Details.

16) Building water service connections 3 inches and larger require specific design, including profiles, crossings, valve locations, etc.

17) WHC's (Water House Connections) exceeding 100' in length require water meter placement in approved meter pit at the property of right-of-way line instead of inside the residence.

C. SANITARY SEWER MAINS AND SERVICES:

1) Collector sewers shall be 8 inches minimum size. House connections are to be a minimum 6 inches. However, the final decision on sewer main size rests with the Department of Public Works.

2) Sewers must be designed at a depth sufficient to provide gravity flow service to the first floor of all existing and proposed buildings to be connected to each line. The City does not require gravity basement service, though it is recommended, and any house for which gravity service is not available to the basement must be so noted on the plans.

3) The standard grade for sanitary house connections is 2 percent, and that is the minimum. Maximum grade is 6 percent. Any SHC designed to be laid at a grade other than the standard 2 percent must have that grade noted on the plans, and the invert elevation at the right-of-way or easement line given.

4) Collector sewer design shall be based upon an allowance of 2 feet below cellar (or first floor if no cellar gravity service is planned) elevation plus 2 percent fall from the building to the main, if the building location is known. The setback line should be used if the building "footprint" location is not known.

5) Cellar or first floor elevations are to be shown on both the plan and profile for all buildings, existing or proposed, to be served. Tick marks are required on the sewer profile indicating the actual station of each sanitary house connection, and the basement or first floor elevation of the house to be served, along with its lot number. For house connections which enter the main at the manhole, the invert-in at the manhole should be shown and figured on the Profile.

6) Sewer house connections are to be drawn as straight lines <u>perpendicular to the main</u> from the wye at the main to the cleanout at the property line. The wye at the main is to be drafted accurately and to scale. Twin house connections may be thought of as serving a primary lot and a secondary lot. The primary connection is configured exactly like a single house connection, with the cleanout located on the right-of-way line no less than 5 feet from the lot division line. The secondary connection originates with a 45 degree wye located on the primary connection such that the secondary service runs straight, at a 45 degree deflection from the primary line, intersecting the right-of-way line with a cleanout no less than 5 feet on the other side of the lot division line. Thus the two cleanouts are a minimum of 10 feet apart. This is shown graphically on the standard Sewer and Water Detail Sheets.

7) Drop sanitary house connections are not to be used except by special approval of the Department of Public Works.

8) Manholes shall be constructed at all breaks in the grade of the sewer or changes in alignment and shall not exceed a spacing of 400 feet. A minimum drop of 0.10 feet shall be used in all line manholes.

9) Provisions for planned future connections to manholes shall be provided by extension of the manhole channel to be precast knockout in the manhole wall and/or a removable 1 foot stub. Blank stubs longer than 1 foot are not acceptable.

10) Manholes are to be designed and located such that the angle between two pipes entering a manhole is great enough to provide a minimum of 8 inches of manhole wall clear between the outsides of the two pipes at the inside face of the manhole. No influent pipe may enter a manhole at an angle less than 90 degrees from the effluent pipe.

11) Terminal manholes shall be designated at the end of sewers which will not be extended in the future.

12) All manholes are to be assigned coordinates within the Maryland State Grid System.

13) Maximum grades for vitrified clay, concrete, ductile iron and polyvinyl chloride pipe shall be 20 percent. Ductile iron pipe shall be used where steeper grades are required. In order to reduce grades the use of drop manholes shall be considered. Inside drop manholes shall be used wherever the drop across the manhole is greater than 2 feet. Inside drop manholes shall be minimum diameter 5' and shall utilize PVC drop piping minimum diameter 8".

14) For sewers having grades in excess of 20 percent, pipe anchors shall be provided as shown in the Standard Details.

15) Cleanouts are not permitted in City sewer mains.

16) Sewers in new subdivisions shall generally be laid 7 feet off the centerline of the street toward the low side.

17) Where sewers cross other utilities, there shall be a minimum clearance of 1 foot.

18) A minimum of 3 feet of cover is required over PVC, DIP, and VCPX sewer pipes.

19) Maximum depth for VCPX is 12 feet, 20 feet for PVC. Sewers below those depths are to be DIP. All pipe in any given "run" (between manholes) must be of uniform material (including laterals).

D. INTERCEPTING SEWERS:

1) Intercepting sewers are designed as those sewers which will convey the discharge from the collecting sewers to the treatment facilities to be provided. In general, intercepting sewers shall be located so as to best serve the drainage area for all present and future collecting sewers. This generally means that the interceptor is aligned with the topographic low of an area, usually a stream bottom.

2) Intercepting sewers shall be designed to carry the sewage flow from the ultimate population of the entire drainage basin, unless determined otherwise by the City. Design computations are to be provided.

3) Intercepting sewers shall, in general, meet the criteria for collecting sewers as established hereinbefore.