



CITY AND COUNTY OF DENVER

DEPARTMENT OF PUBLIC WORKS
Development Engineering Services

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DES Storm and Sanitary General Requirements

Authority:	Revised Municipal Code, Chapter 56 "Utilities", and Public Works Rules & Regulations Governing Sewerage Charges & Fees & Management of Wastewater"
Purpose:	The developer/owner must make provision of adequate storm and sanitary sewer services to the development site. This may entail the preparation and submittal of engineered studies and construction plans for the purpose of ensuring that the development's drainage and sanitary sewer systems meet established City of Denver criteria. The "General Requirements" listed below provide the guidance necessary to accomplish this goal.
Document Date:	May 13, 2005, Version 1.6
Customer Interface:	Public Works Plan Review Services 201 W. Colfax Avenue, Room 2.H.10, Department 202 Denver, CO 80202 Phone: 720-865-2782 Fax: 720-865-3281 www.denvergov.org/pwprs
Affiliated Departments & Agencies, and Roles:	<p>Development Engineering Services (DES) www.denvergov.org/DES</p> <p>Business Management</p> <ul style="list-style-type: none"> • Public Works Permit Operations 2000 W. 3rd Avenue, Room 107 Denver, CO 80223 www.denvergov.org/pwpermits • Public Works Plans Review Services 201 W. Colfax Avenue, Room 2.H.10, Department 202 Denver, CO 80202 www.denvergov.org/pwprs <p>Construction Engineering, 2000 W. 3rd Avenue, Room 107, Denver, CO 80223. www.denvergov.org/DESConstruction</p> <p>Engineering and Survey, 201 W Colfax Avenue, Room 2.H.10, Department 202, Denver, CO 80202 www.denvergov.org/DES</p>
General Review Process:	<ul style="list-style-type: none"> ➤ Two (2) sets of preliminary sanitary studies (if applicable) or drainage reports and plans are submitted to begin the review process. (4), (6) or (7) sets of plans to be submitted in the end of the review process. See Checklist for DES Storm and Sanitary for process and required submittals. ➤ All plans and questions regarding projects should be directed to Public Works Plans Review Services (PWPRS) at 720-865-2782. ➤ <i>Original</i> Letter of Certification (See Attachment #1) is required with the final submittal as a minimum. The letter must be on Company letterhead signed and stamped by a Professional Engineer who prepared the final set of construction plans. <i>NOTE:</i> Plans will be rejected with no review if the Letter Of Certification is not submitted. In that case, a <i>total</i> resubmission of plans, with the Letter of Certification, is required. ➤ If the Review Engineer determines a Pre-Construction Conference (Pre-Con) is necessary, final plan submittal will require either (4), (6) or (7) sets of drawings. The drawings must be 24" x 36", wet stamped and signed on each sheet by a Colorado-registered P.E.. ➤ Pre-construction conferences are arranged prior to the start of construction. Once the plans are approved by the DES section, PWPRS will inform you that you may contact Public Works, DES Construction Engineering at 303-446-3722 for Pre-Con scheduling. ➤ A Sewer Use and Drainage Permit (SUDP) must be obtained for each building associated with a project prior to any building construction and can be obtained at Public Works Permit Operations, 2000 W. 3rd Ave., Room 107, Denver, CO 80223-1027.

Additional Documentation:	<p>Prior to plans being approved for construction, the following items must be submitted and/or approved:</p> <ul style="list-style-type: none"> ➤ Application to construct a <i>Private System</i> (if On-Site System): <ul style="list-style-type: none"> ▪ This must be filled out by the owner and have proper notary or corporate seal. ▪ The project number shall be referenced in the description of proposed work. ➤ Application to construct a <i>Public System</i> (if Public System): <ul style="list-style-type: none"> ▪ Submit only after the cost estimate is approved. ▪ This must be filled out by the owner and have proper notary or corporate seal. ▪ The project number shall be referenced in the description of proposed work. ➤ Surety (if Public System): <ul style="list-style-type: none"> ▪ Irrevocable Letter of Credit (See Attachment #2) (submit a blank form from a LOCAL lending institution for approval of form prior to issuance) or a Public Works Performance and Payment Bond completed by the Owner as it appears on the original Application to Construct a Public/Private System. <p style="text-align: center;">*The Cost Estimate must be submitted and approved by DES before the bonding is submitted.*</p> <ul style="list-style-type: none"> ➤ Engineering Cost Estimate: <ul style="list-style-type: none"> ▪ This cost estimate is for the storm or sanitary system construction with cost provisions for submittal of the required As-Built information and field observation and must be on company letterhead and signed by the engineer. ▪ A preliminary engineering cost estimate is due before the plans can be logged in and reviewed. ▪ The final engineering cost estimate will be due prior to final approval of the plans and that figure will be entered on the Application to Construct a Public/Private System.
Fees:	<p>See <u>Schedule of Fees</u> as published on the DES website at www.denvergov.org/DES</p> <ul style="list-style-type: none"> ➤ Review Fees are 75% of 2.5% of the <i>preliminary</i> construction cost estimate, or 1.875% of the <i>preliminary</i> construction cost estimate. ➤ The final portion of the review fee will be 25% of 2.5% of the <i>final</i> construction cost estimate, less the initial review fee previously paid.
AS Builts:	<p>Once construction is complete As-Builts are required prior to Certificate of Occupancy (CO)</p> <p>**At a minimum, the following items must be submitted as a complete package to PWPRS prior to review for a Temporary Certificate of Occupancy (TCO):</p> <ul style="list-style-type: none"> ➤ Two (2) sets of prints <ul style="list-style-type: none"> ▪ Every sheet signed and stamped by a Professional Engineer. ➤ One (1) set of field notes <ul style="list-style-type: none"> ▪ Include pond volume calculations ▪ Signed and stamped by a Professional Land Surveyor ➤ One (1) original Engineer's Certificate of Inspection (See Attachment #3) <ul style="list-style-type: none"> ▪ Signed and stamped by a Professional Engineer. ➤ Contact Public Works Permit Operations at 303-446-3759 for additional TCO requirements. <p>**In addition to the above required As-Built items, the following are required for a CO:</p> <ul style="list-style-type: none"> ➤ One (1) set of mylars <ul style="list-style-type: none"> ▪ Prints and/or mylars must be signed and stamped by a Professional Engineer. ➤ Approval of final inspection of the project by PW, DES Construction Engineering ➤ If applicable, <u>Recorded Deed Of Easements</u> (for Public Systems) or <u>Recorded Easement Indemnity Agreements</u> (for Private Systems). <p><i>Please note the following:</i></p> <p>The process to release a bond or Letter of Credit will <u>not</u> begin until the "As-Builts" provisions (as stated below) have been <u>submitted and accepted</u> by DES. Final release of a bond or Letter of Credit will not occur until the project construction is accepted in writing by the Project Engineer and all project related fees and charges have been paid.</p> <p>Owner/applicant should read the application. The owner/applicant is responsible for meeting the application requirements including payment of all associated fees.</p> <p>Per City Attorney's Office, contractors on an "SP" project must pay prevailing wages. Questions regarding this matter should be directed to the City Attorney's office.</p>
Plan/Profile Drawings:	<p>Minimum requirements must include the following on plan/profile drawings:</p> <ol style="list-style-type: none"> 1. Include ties from sewer lines and utilities to property lines. 2. Benchmark must be NAV-88 with location of bench noted. All elevations are to be NAV-88. 3. Minimum drop through manholes to be 0.2 foot.

	<ol style="list-style-type: none"> 4. Show all utilities, street names, ROW lines, property lines and easements. 5. Include the engineer's logo. 6. Show deflection angles at manholes (maximum 90 degrees). 7. All drawings must be submitted on 24" x 36" plan/profile format. 8. Include a vicinity map. 9. Label pipe material used. 10. Pipe slopes to be calculated in percent. 11. Show all invert elevations on sewers, including existing upstream/downstream manholes from new manholes. 12. Include distances from new manholes to existing upstream/downstream manholes. 13. Include a north arrow. 14. Include a PE stamp/signature/date on plans on each sheet of the engineered drawings. 15. With the final plan submittal, the project design engineer must submit a (stamped and signed letter of certification to PW DES 16. Include the Title/Approval Block on the first plan sheet (Attachment #4) Delete the inappropriate wording (Sanitary/Storm – Public/Private – Right Of Way Improvements) as necessary 17. Include and sign the Engineer's Certification Block (Attachment #1) on the first plan sheet.
<p>PW Storm and Sanitary Standard Notes:</p>	<ol style="list-style-type: none"> 1. Public Works, Wastewater Management Division's <i>Standard Details And Technical Specifications For Sanitary & Storm Sewers</i> apply to this work. Public Works, Wastewater Management Division's <i>Standard Details</i> (drawings), most recent edition, shall be used as a minimum. This booklet is available in a reduced size booklet form and is available at the Public Works Permit Operations (PWPO) during normal business hours. The technical specifications are available from PW DES. Both sets must be in possession of the contractor at the pre-construction conference and must remain on the job site at all times during construction. The standard details can be viewed at the following website address: www.denvergov.org/DES 2. Contractor shall conform to all federal, state and local health and safety rules and regulations. 3. One set of the approved sewer construction drawings must be on-site at all times of construction. 4. All sewer pipes shall be installed with Class B Bedding as a minimum. 5. Any modifications, adjustments, construction or reconstruction of Public Works, Wastewater Division facilities must be inspected by a PW DES Construction Engineering Inspector. Please schedule an appointment at 303-446-3722 a minimum of 48 hours in advance of the work to schedule an inspector. 6. Pipe material, fittings, trenching, bedding, connections, and sewer installation must be inspected by a PW DES Construction Engineering Inspector prior to any trench backfill. Please schedule an appointment at 303-446-3722 a minimum of 48 hours in advance of the work to schedule an inspector. Monitoring of the project by PW DES shall be for the purpose of assuring general compliance with the approved plans, standards, details, and specifications as well as the <i>Rules & Regulations</i>. Storm and Sanitary inspections shall not take the place of construction inspection and materials testing, which is the owner's responsibility. 7. Sanitary sewer pipes shall be PVC and conform to: ASTM D3034 SDR 35 for sizes 8 inches to 15 inches in diameter (solid wall), ASTM F789 for 18 inches (solid wall), ASTM F679 for sizes 18 to 36 inches (solid wall), ASTM F949 for sizes 8 to 36 inches (PVC profile wall), ASTM F794 for sizes 8 to 48 inches (profile wall), or ASTM F1803 for sizes 18 to 60 inches (closed profile gravity pipe). 8. Any questions regarding Public Works storm or sanitary facilities that arise during construction should be brought to the attention of PW DES Construction Engineering Inspection at (303) 446-3722. 9. Backfill in public right of way must meet the requirements of Denver Public Works Department. A Street Cut Permit and inspection of a backfill and pavement repair by Public Works is required for all work in the public right of way. The contractor and/or developer is advised to contact Construction Engineering ROW Inspection at 303-446-3469 or PWPO at 303-446-3759 to obtain information regarding fees and procedures for obtaining the required permit(s). Contractor must obtain a street cut permit and notify the district inspector at (303) 446-3469, 48-hours prior to start of job. Compaction testing is required. 10. The contractor performing work on any public or private storm sewer facility or appurtenance must be properly trade licensed as a company and have a licensed plumber or certified journeyman drainlayer on site during the work. 11. Access must be maintained for all sewer manholes during construction. Any design changes to new or existing public storm or sanitary sewer must include permanent access to the public storm and sanitary sewer manholes and could require roll-over curb, commercial drive, reinforced concrete sidewalk, ritter rings or concrete pad. Minimum access to each manhole is a 20' wide lane from the nearest public right of way, centered at the manhole including a 10' radius around the manhole and 22.0' vertical clearance.

12. The connection of a new sanitary/storm sewer to an existing manhole may require manhole reconstruction at the discretion of the PW DES Construction Engineering field inspector or the PW DES Construction Engineering engineer.
13. Changes in the elevation of an existing brick manhole may require the use of a pre-cast concrete manhole or manhole reconstruction at the discretion of the PW DES Construction Engineering field inspector and/or PW DES Construction Engineering engineer.
14. Changes in elevation or modification to existing inlets may require reconstruction at the discretion of the PW DES Construction Engineering inspector or DES Engineer.
15. The contractor shall be aware that when debris is dropped into public manholes and other public structures, the contractor is to immediately remove this to eliminate the possibility of property damage due to the debris causing backup into private properties. If it is determined that debris caused a backup, the contractor shall be held responsible for damages.
16. The contractor shall make sure that all manholes and other structures are built to finished grade.
17. No trees shall be planted within any sewer easement or within ten (10) feet of any public manholes, pipes or inlets.
18. "As-Built" mylar drawings and prints are to be submitted to PWPRS at completion of the project. "As-Built" mylar drawings are to be reproducible copies (or originals) of the Approved Construction Drawings. Any field changes are to be noted. The drawings will state "As-Built" in large block letters. The "As-Built" mylars and/or prints are to be signed, dated and stamped by a Colorado Registered Engineer.
19. As-Built field notes, from which the As-Built drawings are prepared, are to be provided and stamped/signed and dated by the Colorado Registered Professional Land Surveyor. These notes will include the stationing of any building sewer stubs installed.
20. Upon completion of site grading and sewer construction, the owner or developer shall be responsible for furnishing the PWPRS a Certificate of Inspection prepared by the Colorado Registered Engineer who performed or supervised construction inspection, certifying that:
 - a) A construction inspector was on the job site at all times sewer or drainage facility work was performed,
 - b) All storm and sanitary sewer facilities, site grading, detention pond grading and outlet works (if any) were constructed in compliance with plans and specifications approved by The Department of Public Works
 - c) The As-Built drawings included accurately depict the final installation of the storm drainage and/or sewer system.

This certification shall be required for all storm and sanitary sewer facilities in addition to any inspections made by the division or the department of public works.

21. Denver Water Department Note

All persons and entities involved in this project shall have the responsibility to take whatever steps necessary to protect all water facilities. If any water facility cannot be adequately protected, then said water facilities shall be relocated or removed in accordance with Denver Water Department requirements.

Standard Notes For Water Quality/NPDES Erosion & Sediment Control

1. The owner, site developer, contractor and/or their authorized agents shall remove all sediment, mud, construction debris, or other potential pollutants that may have been discharged to or, accumulate in, the flowlines and public rights of ways of the City and County of Denver as a result of construction activities associated with this site development or construction project. Said removal shall be conducted in a timely manner.
2. This Construction Activities Stormwater Management Plan has been submitted as part of an Application for a Construction Activities Stormwater Discharge Permit filed with the Department of Public Works, Wastewater Management Division of the City and County of Denver. I understand that additional erosion and sediment control measures may be required of the owner and his or her agents due to unforeseen erosion problems or if the submitted plan does not function as intended. The requirements of this plan shall be the obligation of the land owner and/or his successors or heirs; until such time as the plan is properly completed, modified, or voided.
3. The contractor shall prevent sediment, debris and all other pollutants from entering the storm sewer system during all demolition, excavation, trenching, boring, grading or other construction operations that are part of this project. The contractor shall be held responsible for remediation of any adverse impacts to adjacent waterways, wetlands, etc., resulting from work done as part of this project.

4. A layer of suitable mulch shall be applied to all disturbed portions of the site within 14 days of the completion of overlot grading. Said mulch shall be applied at a rate of 2 tons per acre and shall be tacked or fastened by an approved method suitable for the type of mulch used. Rough-cut streets shall be mulched unless a layer of aggregate road base or asphalt paving is to be applied to said rough-cut streets within the 14-day period after completion of overlot grading.
5. The contractor shall locate, install, and maintain all erosion control and water quality "Best Management Practices" as indicated in the Approved Construction Activities Stormwater Management Plan (Chapter 10, City And County Of Denver, Department Of Public Works, *Rules and Regulations Governing Sewerage Charges and Fees and Management of Wastewater*).
6. The developer, general contractor, grading contractor and/or their authorized agents shall insure that all loads of cut and fill material imported to or exported from this site shall be properly covered to prevent loss of the material during transport on public rights of ways (Sec. 49-552; Revised Municipal Code).
7. The use of rebar, steel stakes, or steel fence posts to stake down straw or hay bales; or to support silt fencing used as an erosion control measure; is prohibited. The use of OSHA approved colored warning caps on rebar or fence posts used with erosion control measures is not acceptable.
8. Soils that will be stockpiled for more than 30 days shall be protected from wind and water erosion within 14 days of stockpile construction. Stabilization and protection of the stockpile may be accomplished by any of the following: mulching, temporary/permanent revegetation operations, chemical soil stabilizer application (requires PW WMD approval), or erosion control matting/geotextiles. If stockpiles are located within 100 feet of a drainageway, additional sediment controls such as temporary dikes or silt fence shall be required.
9. Approved erosion and sediment control "Best Management Practices" (BMP) shall be maintained and kept in good repair for the duration of this project. At a minimum, the contractor or his agent shall inspect all BMPs weekly and after significant precipitation events. All necessary maintenance and repair shall be completed in a timely manner. Accumulated sediment and debris shall be removed from a BMP when the sediment level reaches one half the height of the BMP or, at any time that sediment or debris adversely impacts the functioning of the BMP.
10. Modification of an active Construction Activities Stormwater Discharge Permit by the developer, contractor or their authorized agents shall require timely notification of and approval by Public Works, Wastewater Management Division. Termination of an active Construction Activities Stormwater Discharge Permit upon completion of the project requires notification of and approval by Public Works, Wastewater Management Division.
11. Water used in the cleaning of cement truck delivery chutes shall be discharged into a predefined, bermed containment area on the job site. The required containment area is to be bermed so that wash water is totally contained. Wash water discharged into the containment area shall be allowed to infiltrate or evaporate. Dried cement waste is removed from the containment area and properly disposed of. Should a predefined bermed containment area not be available due to the project size, or lack of an area with a suitable ground surface for establishing a containment area, proper disposal of ready mix washout and rinse off water at the job site shall conform to the approved techniques and practices identified in the Colorado Department of Public Health & Environment's training video entitled "*Building for a Cleaner Environment, Ready Mix Washout Training*", and its accompanying manual entitled, "*Ready Mix Washout Guidebook, Vehicle and Equipment Washout at Construction Sites.*" The direct or indirect discharge of water containing waste cement to the storm sewer system is prohibited (Sec. 56-102 (a)(c); Revised Municipal Code, City and County of Denver). Information about, or copies of the video and training manual are available from the Water Quality Control Division, Colorado Department of Public Health & Environment, 4300 Cherry Creek Drive South, Denver, Colorado 80222-1530, 303-692-3555
12. The contractor shall protect all storm sewer facilities adjacent to any location where pavement cutting operations involving wheel cutting, saw cutting or abrasive water jet cutting are to take place. The contractor shall remove and properly dispose of all waste products generated by said cutting operations on a daily basis. The discharge of any water contaminated by waste products from cutting operations to the storm sewer system is prohibited.
13. Paved surfaces which are adjacent to construction sites be swept in a timely manner when sediment and other materials are tracked or discharged on to them. Either sweeping by hand or use of street sweepers is acceptable. Street sweepers using water while sweeping is preferred in order to minimize dust. Flushing off paved surfaces with water is prohibited (Sec. 56-102 (a)(c); Revised Municipal Code, City and County of Denver)

Document Location:

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