



Division of Water Reclamation Sewer System Engineering Section Drawing Submission Standards



Drawing Submission Standards

City of Columbus, Ohio Columbus Water & Power Division of Water Reclamation

Introduction

This document provides details on the requirements for design plan review submittals for Capital Improvement Projects (CIPs) for the Sewer System Engineering Section (SSES) within DWR. It provides a general overview of plan development and identifies the information which is to be included in each design phase review submission. It does not detail design standards nor provide guidance on how to address any particular design component or environmental issue. Design and environmental requirements are provided in various design and technical manuals as well as policies and executive orders listed on the City's website (www.Columbus.gov).

Plan Classifications

The plan development process consists of a series of review submissions at various stages of the design process. For most CIP projects it is broken into four (4) different stages: 30%, 60%, 90% and Final. In some instances, such as Blueprint Columbus CIPs, an additional stage for a 75% review may be required. In those instances, the detailed scope of services for that project shall provide any additional details that may be unique to that particular CIP.

Submission Process

Unless otherwise indicated in the design scope of services, all review submittals are made directly to the City of Columbus, SSES office. The SSES Project Manager is the first point of contact for all review questions and submissions. The SSES Project Manager will direct the 30%, 60%, 90% and Final submissions to the Plan Review Coordinator for citywide distribution. At the City's discretion, the 30% plan submission may only be reviewed by the SSES Project Manager, except for Blueprint Columbus projects. Any associated documents, correspondence, design calculations, reports or permits shall accompany the submissions based on the requirements for each phase detailed below. All plans shall follow the City's CAD Digital Submission Standards (<https://www.columbus.gov/Services/Public-Utilities/Information-for-Customers/Public-Utility-Contractors/CAD-Digital-Submission-Standards>).

Local Governments: In some instances, a project may overlap with other local governmental agencies (i.e. Counties, other municipalities or development districts) which will require a separate plan submission to said agency. In those cases, the submissions to the local agencies shall be completed at the same time as the submission to the City. The SSES Project Manager shall be copied on any such submissions.

Other Governmental Agencies: Approval from the Federal Aviation Administration (FAA), U.S. Army Corps of Engineers (USACE), Federal Emergency Management Agency (FEMA), U.S. Fish and Wildlife Service, Ohio Department of Natural Resources (ODNR), State Historic Preservation

Office (SHPO) and Ohio Environmental Protection Agency (OEPA) may be required. Any reviews and approvals for these agencies shall be coordinated and copied to the SSES Project Manager.

Railroad Involvement: Railroad/Railway companies must be informed at an early stage of plan development whenever their facilities may be affected in any manner. When railroad property falls within the work limits of a proposed project, the possibility of railroad involvement exists. Some examples include: work on structures that pass over a rail line, work on streets under existing rail structures, sanitary sewer installation (trenchless or open-cut) across active rails or railroad property, drainage work, etc. In addition, projects within an intersection in the project limits located within 400 feet of an at-grade rail crossing require coordination with the Ohio Rail Development Commission to determine the need for preemption.

All projects with rail involvement must be coordinated with the SSES Project Manager and City Real Estate Division. The Real Estate Division coordinates, prepares and processes any Railroad/Railway construction agreements. The construction agreement process is initiated at the beginning of the easement acquisition stage and is finalized at the Final plan submission. The Consultant is to send a copy of the final plans to the Railroad/Railway Company.

For projects involving acquisition of rail right-of-way or rail easements, the involved railroad/railway company will be allowed an opportunity to comment on the plans and legal descriptions associated with acquisition of their property. The Real Estate Division in the Office of the City Attorney will handle all acquisitions from railroads.

Design Review Submittal General Requirements

The following sections define the requirements for each design review submission. No attempt has been made to either detail design standards or to provide guidance on how to evaluate any particular design component or issue. Care should be taken to ensure that each submission includes all information required to process the review. Review submissions that lack required information or contain inaccuracies that preclude meaningful review will be rejected and must be resubmitted.

All submissions must include the following in the letter of transmittal:

1. Project identification: City Division, project title and 6+6 CIP number
2. Identification of the type of review submission (i.e. 30%, 60%, etc.)
3. Indication of any local government, agencies or railroads involvement; along with any comments the local government may have regarding the submission.
4. Disposition of previous review comments (if applicable).
5. A current cost estimate factored up to the year the project will be awarded and indicating reasons for any significant increase or decrease in project cost. (Cost estimates are not required for 30% submissions.)

Submission Format: All CIP plans and documents shall be submitted digitally in PDF format. All plans shall be full sized (22"x34") sheets. The 60% plan and the Final plan submissions shall also include the project CAD files for integration into GIS and record systems.

Design Review Submission Stages

30% Drawing Submission

General: 30% plans are developed to a sufficient level of design detail to ensure that the 60% detailed design development may begin immediately after completion and acceptance of this stage. Construction limits should be accurate; with little or no changes anticipated due at 60% plan development. Any design aspects creating environmental impacts should be identified during the 30% stage.

Design Activities: The following design activities should be incorporated into the 30% Design plan submittal:

1. Submission of the draft Preliminary Design Report.
2. A summary of any and all information, notifications or correspondence sent to the residents, private utilities and/or regulatory agencies.
3. Any relevant data obtained from the review of existing information, private utility information and/or DWR records. Contact the CWP map room (DPU_GIS_Mapping@Columbus.gov) for any record plans, reports, calculations etc.
4. Any relevant data obtained from the field investigations which includes Piping Ambiguity Records (PARs) and Manhole/Structure Inventory Update Sheets (MSIUSs).
5. Hydraulic analysis and design for all affected drainage and sewer systems. This includes any outlet grading or outlet protection.
6. Initial geotechnical exploration information (if needed).
7. Identification of any deviations from the Division of Water (DOW) water main separation policy. Approval of any deviations shall require the completion of a separation deviation memo which should be included with the 30% submittal and must be approved by DOW.
8. Complete flow calculations. All sanitary sewers shall utilize the parameters described in the City of Columbus Sanitary Sewer Design Manual.
9. An evaluation for all water course involvements/impacts which can include but not be limited to; work within the Stream Corridor Protection Zone (SCPZ), excavation or addition of fill within the Flood Plain or Flood Way and any HEC-RAS evaluations required due to water course impacts.
10. Design of ditch invert elevations.
11. Initial Stormwater Pollution Prevention Program (SWPPP) notes, and Best Management Practices (BMP) design.
12. Plan view layout and design of all Green Infrastructure (GI) practices including underdrains.
13. Submission for approval from Local Flood Plain Coordinator for all flood zone encroachments.
14. Defined construction limits. 30% construction limits should encompass all anticipated work. Easement acquisitions will be based off these limits.
15. Determination if any proposed infrastructure improvements will require right-of-way beyond what is available to complete the work.
16. Identification of all required easements (temporary and permanent).
17. Completion of the Construction Plan Surveying task which includes but is not limited to:
 - a. Location, size and depth of all utilities (e.g. water, sewer, storm, gas, etc.)
 - b. Location and size of all trees within the work limits.
 - c. Location and owner of all utility poles.
 - d. Location of property pins.
 - e. Identification of right-of-way encroachments.
 - f. Determination of existing property lines.

- g. Determination of existing right-of-way lines.
 - h. Identification of property owners.
 - i. Location and status of all ADA ramps within the work limits.
 - j. Identification of removal items that will have an impact within the right-of-way (e.g., trees, landscaping, steps, etc.)
18. Determination of potential utility depth conflicts using subsurface utility engineering through Quality Level "B", and at times Quality Level "A" in critical areas.
 19. Submission of copies of the 30% plans to all involved utilities to allow input on the proposed design. Their responses shall be considered during 60% design development.
 20. If necessary, submission of the 30% design plans to Railroad/Railway Company for information and comments.
 21. Verification that the selected maintenance of traffic plan will work based on the proposed improvements.

Design Review Plan Requirements: The 30% Design Review Plans shall follow the most current Digital Submission Standards and shall include:

Title Sheet:

1. City Department and Division name.
2. Project CIP Title including the 6+6 CIP number. Include phase number if applicable.
3. City issued CC number (shall be on all sheets).
 - a. Prior to this submission, the Consultant shall send the SSES Project Manager a 30% title sheet for submission to the Map Room and issuance of the CC number.
4. PE Stamp and Signature block.
5. City of Columbus Departmental signature block.
6. City of Columbus Signature Note – "City of Columbus 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. **Approval for Sanitary or Storm Sewers Only.**"
7. If the project is private, the private sewer note shall be added.
8. "Note to Permit Clerk" shall be added when sanitary service lines are added or extended with the project.
9. Location Map
10. Index Map 1"=200' (show clearly labeled corporation lines)
11. Benchmarks (1 for each 1,000 LF of pipe; show both 1988 & 1929 datums and provide source benchmark information).
12. List all applicable City standard construction drawings
13. Index of sheets (can be a separate sheet if necessary)
14. Existing and proposed item legend (may also be its own sheet)
15. Design Consultant and Project Manager Contact Information

Tributary Plan/Schematic Sheet:

1. North arrow (Shall be oriented up or to the left)
2. Site layout in 1"=200' maximum (add additional sheets as needed)
3. Tributary boundary clearly marked. (consultant shall verify that providing a 10' depth upstream far end of tributary area)
4. Show existing and proposed sanitary sewers.
5. Label existing and proposed flow densities.

General Notes/Quantities/Detail Sheets:

1. All applicable DWR general notes from the "Standard Construction Plan Notes" document.
2. Any applicable DOW notes.
3. Any applicable R&P notes (including tree protection details).

4. Any applicable railroad notes.
5. Estimated plan quantities matrix.
6. All as-per-plan details (include page number references).

Plan and Profile Sheets:

1. Plan View:
 - a. North arrow (Shall be oriented up or to the left)
 - b. Existing topography
 - c. Property lines
 - d. Right-of-Way lines
 - e. Street names
 - f. Buildings/houses
 - i. Include addresses for existing buildings or lot numbers for proposed structures.
 - g. Overhead and underground utilities
 - i. Dimension offset of proposed sewers from existing utilities.
 - h. Existing City of Columbus utilities (storm, sanitary, water, power, etc.)
 - i. Dimension offset of proposed sewers from existing utilities.
 - i. Proposed sanitary and/or storm sewer alignments
 - i. Manholes are to be numbered from lowest downstream to highest. Longest run numbered first. Numerically only, no alphabetical numbering (reserved for revisions).
 - ii. Bearing and stationing shown for all new sewers.
 - iii. Show any required service connections.
 - iv. State plan coordinates for each proposed manhole
 - j. Existing easement boundaries.
 - k. Proposed easement boundaries.
2. Profile View:
 - a. Station/Surface/Invert/Cut bar shall be at the bottom of the profile
 - b. Backfill requirements specified:
 - i. Compacted 912 granular within pavement.
 - ii. Compacted 911 in grassed areas.
 - c. Vertical datum and scale shown.
 - d. Show all necessary elevations:
 - i. Top of casting
 - ii. Invert
 - iii. Connecting pipe inverts
 - iv. Inside/outside drop inverts
 - v. Sump depth (if necessary)
 - e. Show any mainline blind taps (Tapped sewer must be 30" dia. Or larger)

60% Drawing Submission

General: 60% Detailed Design involves the detailing of the various portions of a plan. At the end of the 60% Detailed Design, all design issues of any significance should be resolved. 60% plans are developed to a sufficient level of design detail to ensure that the 90% detailed design development may begin immediately after completion and acceptance of this stage. Construction limits should be finalized; with no changes anticipated due at 90% plan development.

Design Activities: The following design activities should be incorporated into the 60% Design plan submittal:

1. Submit the draft detailed design report.
2. Submit the 60% plans in a TIF Group 4 format for inclusion into the City's GIS mapping systems.
3. Evaluate comments to the 30% plans. Revise plans to incorporate any changes, if warranted.
4. A summary of any and all information, notifications or correspondence sent to the residents, private utilities and/or regulatory agencies.
5. Revised flow calculations. All sanitary sewers shall utilize the parameters described in the City of Columbus Sanitary Sewer Design Manual.
6. Complete sanitary sewer, storm sewer and water line horizontal and vertical designs.
7. Complete rain garden, bio-basin or regional bio-basin design.
8. Develop landscaping plans.
9. Develop/complete mitigation plan design for stream and wetland impacts, if required.
10. Complete draft SWPPP notes, report and plans.
11. Evaluate utility responses to 30% plans. Revise plans to incorporate responses, if warranted.
12. Evaluate railroad/railway responses to 30% plans. Revise plans to incorporate responses, if warranted.
13. Prepare and submit pavement calculations along with the proposed permeable paver typical section(s).
14. Add pavement elevations to intersection and curb ramp details.
15. Environmental 404/401 permits submitted for approval.
16. Determine the disposition of all miscellaneous items (i.e., trees, landscaping, mailboxes) within the work limits.
17. Design tree protection and determine tree replacement quantities. (<https://columbusrecparcs.com/nature/urban-forestry/tree-technical-manual/>)
18. Send copy of 60% plans to utility companies to begin relocation plans in accordance with the "Guidelines to Utility Relocation Manual". Indicate known utility relocations. (<https://www.columbus.gov/files/sharedassets/city/v/1/building-and-zoning/document-library/utility-coordination-guidelines-for-utility-relocations.pdf>)
19. Send copy of 60% plans to railroad companies.
20. Develop preliminary quantities.
21. Develop a preliminary construction cost estimate utilizing the City's "Pay Item Master" formatting and descriptions. (<https://www.columbus.gov/Business-Development/Design-Construction> under section Design Documents)

Design Review Plan Requirements: The 60% Design Review Plans shall include:

Title Sheet: Include all information from the 30% plan submission with the addition of the following information:

1. A list of all applicable supplemental specifications.
2. Site Data Table with Earth disturbed areas, including:
 - a. Existing Impervious Area
 - b. Proposed Impervious Area
3. Summary of Post-Construction Stormwater Control Facilities
4. Ohio 811 note

Tributary/Schematic Sheet: Include all information from the 30% submission and any necessary updates.

1. Label all stream names, flood zones, flood way and stream corridor protection zones (SPCZ)

General Notes/Quantities/Detail Sheets: Include all information from the 30% submission and any necessary updates.

1. Include the pipe and manhole material specification lists for all sanitary plans in concurrence with OEPA PTI standards.
2. Preliminary quantity line items.

Stormwater Pollution Prevention Sheets: The sheets will also need to be submitted separately as a standalone set with the SWPPP report.

1. Include all information required per Section 7 of the City of Columbus Stormwater Drainage Manual. (<https://www.columbus.gov/Services/Public-Utilities/Information-for-Customers/Public-Utility-Contractors/Stormwater-Drainage-Manual>)

Sewer Plan and Profile Sheets: Include all information from the 30% plan submission with the addition of the following information:

1. Plan View
 - a. Proposed topography/contours
 - b. Pavement restoration/replacement boundaries
 - c. Impacted or proposed curb and its replacement/installation limits
 - d. Revised easement boundaries
 - e. Disposition of all impacted miscellaneous items (i.e., trees, landscaping, mailboxes) within the work limits
2. Profile View
 - a. Include proposed grading profile (if applicable)
 - b. Label any pipe materials and joints as needed.
 - c. Include and identify all private and public utility crossings
 - i. Label/dimension offset for those that are within 2'-0" of the proposed pipe alignments
 1. In these cases, the proposed utility profile shall show both the inside and outside diameters
 - ii. If an elevation of an existing utility is unknown and it could be either in conflict or near conflict, mark it as "Expose"
 1. Add an "Expose" note to the sheet which details when it is to be conducted and how the costs of the investigations are to be covered.
 - d. Show all stream crossings (if applicable)
 - i. Label the normal pool elevation
 - ii. Label the 100-year flood elevation
 - iii. Include the limits of the SCPZ
 - iv. Include and label the limits of the floodway or floodplain
 - e. Include any other unique features the project may have

Storm Sewer Profiles Sheets: Include all storm profiles for the shorter, tributary sewers from inlets, catch basins or manholes. The same level of information as detailed above and in the 30% submission section shall be included.

Culver Detail Sheets: Include the limits of the work and any headwall or endwall details.

Ditch or Channel Detail Sheets: Include the alignment and work limits.

Water Main Relocation Plan and Profile Sheets: Provide water line plan and profile sheets as detailed in the design scope and in accordance with the plan and profile details above.

Pavement Restoration Sheets: Include all pavement restoration limits as detailed in SCD 1441.

1. Show all full depth pavement replacement boundaries
2. Show all pavement planing boundaries

ADA Curb Ramp Details: Include plan view sheets of the impacted ramps. Detailed elevations and slopes are not required with this submission.

1. Show the proposed replacement limits of the walks and ramps
2. Label the proposed ramp type from SCD 2319

Drive Detail Sheets: Include plan view sheets of the impacted drives. Detailed elevations and slopes are not required with this submission.

1. Show the proposed replacement limits of the drive.
2. Label the type of drive in accordance with SCDs 2201 through 2213.

Detour Sheets (If applicable): Include plan view sheets showing the proposed detour routes for all minor arterial and above road closures.

1. Show all proposed signage

Landscaping Sheets (for Green Infrastructure Projects): Include planting plans for all GI features in accordance with the “Green Infrastructure Design & Implementation Guidelines” (https://www.columbus.gov/files/sharedassets/city/v/1/utilities/sustainability/blueprint/green-infrastructure-design-guidelines_022420.pdf) section DC 5.2—Planting Palettes. At this stage individual plant quantities are not required.

90% Drawing Submission

General: 90% Detailed Design involves the further development of the details and design of the various portions of a plan. At the end of the 90% Detailed Design, all design aspects should be resolved. 90% plans are developed to a sufficient level of design detail to ensure that the 100% or Final detailed design development may be completed immediately after completion and acceptance of this stage. Easement and construction limits should be finalized.

The 90% detailed design should complete the design and detailing of the project. These plans must contain all details and quantities required to bid and construct the proposed work. Plans should be numbered and submitted as a complete set.

It is recommended that a second 90% review be conducted if more than two years have elapsed since the first 90% review. The purpose of this review is to ensure that the plans reflect current field conditions as well as all current design standards, policies and specifications.

Design Activities: The following activities are usually part of 90% Detailed Design:

1. Evaluate comments to the 60% plans. Revise plans to incorporate any changes, if warranted

2. Prepare full plan set
3. Submit the final detailed design report.
4. Submit the final SWPPP plan and report.
5. Submit all temporary and permanent easement descriptions and plats in order to begin the acquisition process.
 - a. Attend Real Estate acquisition kickoff meeting with the City Attorney's Office.
6. Submit final mitigation plan design for stream and wetland impacts, if required.
7. Evaluate utility responses to 60% plans. Revise plans to incorporate responses, if warranted.
8. Evaluate railroad/railway responses to 60% plans. Revise plans to incorporate responses, if warranted.
9. Send copy of 90% plans to utility companies to begin relocation plans in accordance with the "Guidelines to Utility Relocation Manual". Indicate known utility relocations.
10. Determine all estimated quantities throughout the plan. This will include, but is not limited to:
 - a. Drainage quantities
 - b. Pavement quantities
 - c. Roadway quantities
 - d. Earthwork and seeding calculations
 - e. Maintenance of Traffic quantities
 - f. Pavement Marking subsummaries
 - g. Landscape subsummaries
11. Submit plans to involved railroad/railway companies for approvals. Obtain railroad agreement.
12. Submit for OEPA Permit-to-Install (PTI) (if necessary)
13. Submit for OEPA Notice-of-Intent (NOI) permit if there is more than 1 acre of disturbance
14. Submit plans to the SHPO for all projects involving work on or near sensitive sites.
15. Submit other required permit applications to regulatory agencies such as U.S. Army Corps of Engineers, etc.
16. Assemble the disposition of 60% Detailed Design Review comments.
17. Update the preliminary construction cost estimate utilizing the City's "Bid Item Master" formatting and descriptions.
18. A summary of any and all information, notifications or correspondence sent to the residents, private utilities and/or regulatory agencies.

Design Review Plan Requirements: The 90% plan submittal shall include:

Title Sheet: Include all information from the 60% plan submission with the addition of the following information:

1. PE Stamped and signed
2. Design Firm(s) logo

Tributary/Schematic Sheet: Include all information from the 60% submission and any necessary updates.

General Notes/Quantities/Detail Sheets: Include all information from the 60% submission and any necessary updates.

Stormwater Pollution Prevention Sheets: The sheets will also need to be submitted separately as a standalone set with the SWPPP report. They shall include all information from the 60% submission and any necessary updates.

1. Include the NOI Permit number

Sewer Plan and Profile Sheets: Include all information from the 60% submission and any necessary updates.

Storm Sewer Profiles Sheets: Include all information from the 60% submission and any necessary updates.

Culver Detail Sheets: Include all information from the 60% submission and any necessary updates.

Ditch or Channel Detail Sheets: Include all information from the 60% submission and any necessary updates.

Water Main Relocation Plan and Profile Sheets: Include all information from the 60% submission and any necessary updates.

Pavement Restoration Sheets: Include all information from the 60% submission and any necessary updates.

ADA Curb Ramp Details: Include all information from the 60% submission and any necessary updates.

Drive Detail Sheets: Include all information from the 60% submission and any necessary updates.

Detour Sheets (If applicable): Include all information from the 60% submission and any necessary updates.

Landscaping Sheets (for Green Infrastructure Projects): Include all information from the 60% submission, any necessary updates and full quantities.

Final Drawing Submission

General: The Final detailed design should provide all final documents of the project. These plans must address all previous comments and contain all details, permit approvals and quantities required to bid and construct the proposed work. This submission should be fully approved by all reviewing departments or receive a compliance eligible review approval for signatures.

In the event that one or more departments mark this submission as compliance review eligible, the consultant shall make the necessary changes and return the plans for their signature submittal.

Design Activities:

1. Evaluate comments to the 90% plans. Revise plans to incorporate any changes, if warranted.

2. Evaluate utility responses to 90% plans. Revise plans to incorporate responses, if warranted.
3. Evaluate railroad/railway responses to 90% plans. Revise plans to incorporate responses, if warranted.
4. Send copy of Final plans to utility companies to begin relocation in accordance with the "Guidelines to Utility Relocation Manual".
5. Finalize all estimated quantities throughout the plan.
6. Submit a Final construction cost estimate utilizing the City's "Bid Item Master" formatting and descriptions.
7. Provide a summary of any and all information, notifications or correspondence sent to the residents, private utilities and/or regulatory agencies.

Signature Submission

General: The Signature submission shall have been previously approved or marked compliance eligible by all City Departments. For projects that span multiple government jurisdictions, the Consultant shall obtain approval signatures from any said Local Government before submitting the plans to the SSES Project Manager for City signatures.

The Consultant shall also include the final plans in a TIF Group 4 format for inclusion into the City's GIS mapping systems.

Record Plan Submission

General: All record drawings shall be created conforming to Columbus Water & Power SOP GISS1032, "Creating Record Plan Drawings" and City of Columbus "Digital Submittal Standards". This SOP can be found in Appendix D for all DWR RFP advertisements.