X. **WATER AND SEWER PLANS CHECKLIST**

**A. Title Page**

1. ______ Project Name and/or Subdivision Name on Cover Sheet
2. ______ Engineer's Seal and Signature
3. ______ Vicinity Sketch
4. ______ Title Block
5. ______ Tax Map And Parcel Numbers
6. ______ Name, Address & Phone Number of Developer/Owner
7. ______ Legend of Sanitary sewer and water lines, other utilities and structures, existing and proposed ground and pavement profile.
8. ______ Certification statement of lot numbers, block letters/numbers and road names.
9. ______ Sheet Index

**B. General**

1. ______ Special notes as appropriate
2. ______ Vertical Scale 1”= 4’ and horizontal scale 1”= 40’ or as approved by CMUD.
3. ______ All designs conform to the latest city, state and federal regulations or standards.
4. ______ Plan and Profile sheets on 24” x 36” paper with CMUD format and title block.
5. ______ An overall plan of the water and/or sewer layout, indexed to sheet numbers and a vicinity map showing project location.
6. ______ A subdivision plat indexed to sheet numbers.
7. ______ Existing water and/or sewer lines labeled with size and reference distances, and show the nearest existing valve to be used for cut-off purposes.
8. ________ Bench marks every 1000' for water and at every manhole for sewer. Elevations are tied to NGS, NCGS or established CMUD vertical control.

9. ________ Horizontal and vertical scale shown on each sheet.

10. ________ All existing or proposed rights-of-way and construction easements are accurately located and are shown on plans. Separate rights-of-way maps conforming to CMUD standards are attached. Right-of-way parcel numbers are shown and right-of-way and construction easement widths are shown.

11. ________ All existing and proposed storm sewer lines, gas, telephone, power and other utility lines, which cross or run parallel to the sewer or water lines, are shown with exact horizontal alignment. Subsurface exploration must be performed where potential conflicts exist and field changes are not practical.

12. ________ Proposed road and drainage projects are shown.

13. ________ Road names, state route numbers, and right-of-way widths are shown.

14. ________ Plan and Profile are drawn in the same direction. Stations increase from left to right.

15. ________ Proposed future water/sewer projects are shown.

16. ________ Proposed water/sewer lines are shown with reference distances from right-of-way, property boundary, buildings, other utilities, etc.

17. ________ All property corners are shown.

18. ________ Location of existing houses, buildings, fences, wells and other structures are shown on plans. Sewer lines less than 100' from wells are DIP and sewer lines are not within 25 feet of any well.

19. ________ All designs conform to the latest City and State erosion control and sedimentation ordinances, rules and regulations.

20. ________ Locations of special features are shown.

21. ________ Detail drawings of all stream crossings and storm drainage outlets with elevations of the stream bed and current water level and elevations of storm drains and catch basins are shown.

22. ________ Adjacent property owner name(s) are shown on plans.

July 27, 1995

Checklist for Water/Sewer Plans
23. ________ Cut and fill areas are shown.

24. ________ North arrow on all sheets.

25. ________ Where a line is to be bored or tunnelled, indicate location and length of bore or tunnel and type of pipe and casing or tunnel liner.

C. Water Plans

(1) ________ Plans show all fittings, fire hydrants, and valves including sizes. Each appurtenance properly labeled.

(2) ________ Fire Hydrant locations comply with design guidelines.

(3) ________ All conflicts with storm sewers and other utility lines are shown with appropriate design changes shown.

(4) ________ The specified vertical clearance has been designed and obtained at all crossings of other utilities.

(5) ________ All water lines have a minimum of 3.0’ of cover, or are protected as required.

(6) ________ Fire hydrants and air relief valves are shown on plans and profile.

(7) ________ Hydrants or blow-off valves are designed at major low places in the line where possible and air release valves are designed at the high points.

(8) ________ Blowoffs or hydrants are designed at the end of all lines. Location of hydrants comply with guidelines outlined in design standards.

(9) ________ All water services are shown in accordance with the design standards.

(10) ________ Plans show all connections to the existing mains.

(11) ________ Water system is designed in accordance with available pressures and fire flow and pressure calculations are included.

(12) ________ Line location is shown relative to back of curb or edge of pavement.
Approximate material quantities are listed on each sheet.
Pipe sizes noted on plans.
Where pipe size is not determined by Utility Department, calculations are provided with the plans.
Ditch lines are shown on the plan and depth of ditches are shown on the profile at fire hydrant and large service lines.
Water line stubs for future extensions are to be installed beyond the edge of proposed pavement. Horizontal alignment and profile, if applicable, are to be shown on the construction plans.

D. Sewer Plans

Manholes and structures are labeled and standard detail reference is included if applicable.
Special structures are detailed.
All conflicts with water mains are shown with changes to DIP as required.
VCP or PVC pipe is replaced with Ductile Iron where there is less than 3.0 feet of cover.
Bearings and distances between manholes are shown on plan view.
Proposed pipes and manholes are shaded on profile view.
Aerial creek crossings or inverted siphons are properly detailed.

E. Water and Sewer Contract Maps for Donated Projects

Size: 8 1/2" x 11" or 8 1/2" x 14" (CMUD Title Block)
Project Name and Job number
Streets with street names
Lots with lot numbers
North Arrow
Sewer:

(6) ________ Summary of total number of manholes, total length of pipe and number of lots served

(7) ________ Proposed and existing sewer lines with flow directions

(8) ________ Manholes and manhole numbers

(9) ________ Bearings on any off-street sewer mains

(10) ________ Distances between manholes for gravity lines

(11) ________ Force mains and distances, low-pressure mains and distances (if applicable)

(12) ________ Pump station locations (if applicable) and access road

(13) ________ Proposed and existing sewer right-of-ways

(14) ________ Right-of-ways dedicated for future use

(15) ________ Size of sewer mains (if larger than 8-inch)

Water:

(16) ________ Summary of total length of water main, hydrants and number of lots served

(17) ________ Proposed and existing water lines and sizes

(18) ________ Lengths of proposed water lines

(19) ________ Fire Hydrant locations

NOTE: These maps may also be used as existing facilities maps for dedication of roads to the state by changing any wording of proposed to existing.

F. As-Built Checklist

(1) ________ Mark through changed stations, bearings, distances, etc. and print actual as-built station, bearing, distance, etc.

(2) ________ Mark through "proposed" for items that were actually installed.

(3) ________ NCPE and/or NCRLS seal and signature required on each plan sheet.

(4) ________ Drafter’s initials and date of as-built is required on each sheet.
As-builts completed in ink.

On each sheet, label the type and class of pipe installed.

Label bores and tunnels to show steel casing/tunnel liner type, size, and thickness. Show beginning and ending stations.

Mark through and redraw manholes, valves, fire hydrants, etc. when the as-built location is more than one inch (plan or profile on any scale) from the proposed location.

Temporary erosion control measures shall not be as-built.

Permit number shall be recorded on the cover sheet of each set of plans.

Sewer

Show all manhole depths and rim elevations.

Show as-built bearings and distances between manholes on the plan view.

Show distances between manholes on the profile.

Show location of all sewer laterals by station and as measured from the nearest downstream manhole along the centerline of the sewer.

Water

All valves, hydrants, fittings, air releases, etc. shall be stationed.

At offset fire hydrants, show station for tee, valve, and hydrant.

Show location of all water services by station and as measured from the nearest valve along the centerline of the water main.

Show details for concrete blocking.

Show location and type of restrained joint pipe and/or fittings.

G. Activation/Project Final Checklist

Sewer:

Construction must be complete including but not limited to pipe, backfill, manholes (including inverts, frame and cover, vents), laterals, etc.
(2) ________ On-site right-of-way in a condition that sewer maintenance division can access the site as needed.

(3) ________ Off-site right-of-way must be completely restored (seed, mulch, rip-rap, etc)

(4) ________ Airtest passed

(5) ________ Mandrell test passed

(6) ________ Manhole test passed

(7) ________ Step pull-out test passed

(8) ________ Infiltration test passed

(9) ________________  Mains and manholes flashed

(10) ________ ALL problems resolved

(11) ________ EXISTING road right-of-way restoration must be complete (seed, mulch, pavement, concrete, etc.)

(12) ________ Original plans as-built by NCRLS with seal and signature of PE and RLS.

(13) ________ Copies of recorded Plat Maps

(14) ________ Original right-of-way maps with NCRLS seal and signature

(15) ________ Right-of-way agreement for any off-site right-of-way

(16) ________ Original encroachment map for NCDOT takeover, if applicable

Water:

(17) ________ Construction must be complete including but not limited to pipe, valves, backfill, valve boxes, fire hydrants, services, etc.

(18) ________ Road right-of-way, valves, fire hydrants, services, blow-offs, etc. in a condition that water distribution division can access as needed.

(19) ________ Hydrostatic test passed
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<td>Chlorination completed</td>
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<td>Bacteria test approved by lab</td>
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<td>Verify certificate of accuracy for developer installed meters</td>
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<td>Curb and gutter and stone base complete</td>
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<td><strong>EXISTING</strong> road right-of-way restoration must be complete (seed, mulch, pavement, concrete, etc.)</td>
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<td>Original plans as-built by engineer with seal and signature</td>
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<td>Original encroachment map for NCDOT takeover, if applicable</td>
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<td>Butterfly valve factory test certificates for each valve, if applicable.</td>
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