PROJECT NAME: _____ PLAN SUBMITTAL DATE: _____

FILE NUMBER: _____

CITY OF ANN ARBOR
PUBLIC SERVICES
PLAN REVIEW CHECKLIST

NOTE: *This checklist shall be used only as a guide and not be used in lieu of the complete standards and specifications as found in the* **CITY OF ANN ARBOR PUBLIC SERVICES DEPARTMENT STANDARD SPECIFICATIONS.**

GENERAL

Yes No

☐ ☐ 1. Plans shall be signed and sealed by a Registered Engineer.

☐ ☐ 2. All plan preparation shall conform to the City of Ann Arbor Public Services Department Standard Specifications Division II.1A.

☐ ☐ 3. All non-standard details shall be shown on the plans. City standard details are discouraged from being shown. The following note is required to be shown on the plans if City standard details are shown: THE OMISSION OF ANY CURRENT STANDARD DETAIL DOES NOT RELIEVE THE CONTRACTOR FROM THIS REQUIREMENT. THE WORK SHALL BE PERFORMED IN COMPLETE CONFORMANCE WITH THE CURRENT PUBLIC SERVICES DEPARTMENT STANDARD SPECIFICATIONS AND DETAILS.

☐ ☐ 4. A cover sheet with an index of drawings is required if the plan set consist of two or more sheets.

☐ ☐ 5. All utility plans shall be 1”=40’ (horizontal) and 1”=4’ (vertical) scale. An alternate scale of 1”=20’ (h) and 1”=2’ may also be approved.

☐ ☐ 6. An additional 1”=100’ scale overall utility plan is required if an individual proposed public utility requires two or more sheets.

☐ ☐ 7. No more than two proposed utilities shall be shown on the same profile sheet (e.g., sanitary sewer and water main on one sheet, storm sewer and C/G on another). Utilities may not appear within the same profile view unless Sta. 0+00 is the same for both utilities.

☐ ☐ 8. Existing and proposed easements shall be shown on plans. Existing utility easements shall be labeled with the Liber and Page of the recorded easement.

☐ ☐ 9. Each plan sheet shall be orientated such that the north arrow shall point toward the top or left of the page.

☐ ☐ 10. Each utility and the roadway shall have its own separate stationing, along its respective centerline. Sidewalks shall be stationed at either the front or back edge of the sidewalk.

☐ ☐ 11. Stationing shall be to the nearest foot.

☐ ☐ 12. A minimum of two benchmark locations and elevations shall be indicated on the plans as well as listing the benchmark(s) used in establishing the vertical datum. Vertical datum shall be referenced to NAVD 88 datum.

☐ ☐ 13. Existing and proposed grade lines provided and labeled. Profile grade to match plan view.

☐ ☐ 14. Street names, lot lines, lot numbers and addresses shall be shown on all plan sheets. For special assessment projects, parcel addresses, tax code numbers, owners' names and addresses shall also be given.

☐ ☐ 15. A *City of Ann Arbor Geodetic Reference System (AAGRS)* form must be submitted with construction plans.

☐ ☐ 16. If street trees are impacted, City Forestry will review the plans. The diameter and species of the street trees shall be labeled and shown on the plans. If a street tree is removed, a Canopy Loss fee may be due.

Notes:

WATER MAINS

Yes No

- ☐ ☐ 1. Loop lengths and water main sizing shall conform to specifications stated in DIV II.5B.
- ☐ ☐ 2. Terminal dead-end water mains with water service connections will not be allowed without the written approval of the Public Services Administrator. All dead-end water mains shall terminate with a fire hydrant assembly.
- ☐ ☐ 3. All hydrant lead lengths and dead-end main lengths shall conform to chart DIV II.5I.
- ☐ ☐ 4. The maximum water service connection size shall be one standard size smaller than the water main to which it connects.
- ☐ ☐ 5. Provide a minimum 20' wide access pathway to hydrants.
- ☐ ☐ 6. All pipe shall be Pressure Class 350 (Table 50.5 ANSI/AWWA C150/A21.50), or Thickness Class 50 (Table 50.15, ANSI/AWWA C150/A2l.50), minimum, and be polyethylene wrapped per ANSI/AWWA Cl05/A21.5. Proposed pipe size, material and polywrap shall be noted along the pipe axis in the profile (e.g., 12" CL 50 DIP W/POLY).
- ☐ ☐ 7. Proper trench detail(s) shall be specified on plans within the profile with a dimension of the length each trench is applicable, per DIV X Standard Details.
- ☐ ☐ 8. Water main shall contain 5.5' of final grade earth cover (5'-6.5' allowable tolerance).
- ☐ ☐ 9. A minimum horizontal clearance of 10' for sanitary & storm sewers and 5' for all other utilities shall be maintained.
- ☐ ☐ 10. All utility crossings must be shown and stationed on the profile. A minimum vertical clearance of 18" between sewers and water is required, 12" clearance for all other utilities. Water main bell shall not be located at point of crossing.
- ☐ ☐ 11. All fittings (bends, valves, tees, reducers, etc.) shall be labeled and stationed on the plan and profile sheets.
- ☐ ☐ 12. The finished grade elevation shall be shown for all proposed fire hydrants. Proposed rim elevations shall be shown for all gate valve boxes and wells. Hydrants and valves shall be 5.5' deep to avoid the need for extensions.
- ☐ ☐ 13. Lengths between all fittings shall be labeled in the profile (e.g., 50 LF VALVE TO BEND).
- ☐ ☐ 14. Maximum hydrant spacing is 500'.
- ☐ ☐ 15. Hydrants shall be located such that all buildings and structures will be included in a 250-foot radius (350-foot for single- and two-family) drawn around each hydrant.
- ☐ ☐ 16. Hydrants shall be located such that the hose lay to any external portion of a structure via an approved fire route will not exceed 400 feet. This requirement is waived for single- and two-family.
- ☐ ☐ 17. Hydrants shall not be located closer than 4 feet or farther than 10 feet from the face of a curb or the edge of a paved area.
- ☐ ☐ 18. A hydrant shall be located within 100 feet of hose lay from a Fire Department Connection (FDC). This hose lay distance may increase to 150 feet for residential buildings three stories or less in height.
- ☐ ☐ 19. Check for vehicular access to fire lanes and to hydrants.
- ☐ ☐ 20. Hydrants shall be located a minimum of 20' from buildings, decks, carports, retaining walls (structures with foundations) and 15 feet from other structures (e.g., planters, light poles, dumpsters, trees, etc.) Only exception are protection posts no closer than 6' and positioned so that hydrant connections are not blocked.
- ☐ ☐ 21. Water main shall be centered in a 40' wide easement, including 20' around all sides of a fire hydrant, and be generally drawn in straight lines. Easement shall be free from all structures (e.g., buildings, decks, carports, retaining walls, refuse enclosures, underground storm detention). If the main must be next to structure with foundation, casing pipe, or river crossing pipe, is required. With casing pipe, a 15' minimum easement is required with main 5' offset from center.
- ☐ ☐ 22. Check for hydrant isolation in any case of an accident, breakage, or repair. Follow specifications listed in DIV II.5C.
- ☐ ☐ 23. In-line valves shall be installed so that in any single case of accident, breakage, or repair, no more than 1,000 feet of water main (1,600 feet for 16" and larger mains) will be removed from service.
- ☐ ☐ 24. Gate wells will be required where corporations will be installed for chlorination and testing purposes. Butterfly valves shall also be installed in gate wells.
- ☐ ☐ 25. In-line valves shall be spaced such that during a shutdown, a fire service lead will be isolated from the hydrant supporting the Fire Department Connection.
- ☐ ☐ 26. Valves shall be located on the extension of street right-of-way lines. If located mid-block or within an easement, valves shall be located five feet from main tees.
- ☐ ☐ 27. Check if air relief valve is needed, especially in areas of severe grade changes.
- ☐ ☐ 28. Resilient wedge valves shall be used on 4" to 12" mains and can be in a well or box. Butterfly valves or resilient wedge valves shall be used on 16" and larger mains.
- ☐ ☐ 29. Check for transmission main shutdowns. Water plant superintendent must approve shutdown, and requires minimum 48 hour notice prior to actual shutdown.
- ☐ ☐ 30. State permit is required for extensions of water main. Exception is short hydrant leads.
- ☐ ☐ 31. Check pipe deflection against allowable standards (DIV IV.3C)
- ☐ ☐ 32. Provide stub(s) for future extension(s). Extend to property line.
- ☐ ☐ 33. Refer to DIV II.5H for the specifications for tapping sleeves and valves.

☐ ☐ 34. Oversized gate wells are required for mains 16” and larger.
☐ ☐ 35. Vertical bend fittings require restrained push-on joints. Calculations showing minimum number of joints to be restrained shall be submitted with construction plans (but not on the plans) as a paper copy or as a PDF file. Restrained joint lengths shall be stationed and labeled within the water main profile.
☐ ☐ 36. Fire hydrants are to be located on lot lines or 10’ off of right-of-way lines. Verify the proposed valves are not located in the curb or gutter pan.
☐ ☐ 37. If the project is within high pressure area, a PRV may be required for services. Systems Planning Engineer to determine requirements.
☐ ☐ 38. Check if valve operation for main shutdown is near pressure boundary.
☐ ☐ 39. Check that connections to existing mains do not cross boundaries.

Notes:

SANITARY SEWERS

Yes No

- ☐ ☐ 1. Check run lengths versus sewer stationing.
- ☐ ☐ 2. Check sewer grades and invert elevations.
- ☐ ☐ 3. Check for 10’ minimum horizontal clearance between sanitary sewer and water main. Confirm depth of sewer will not undermine other utilities.
- ☐ ☐ 4. There shall be a minimum of 0.10 foot fall through a manhole where the sewer has a horizontal deflection of up to 30 degrees. For manholes where the sewer has a horizontal deflection from 30 degrees to 90 degrees, there shall be a minimum of 0.20 foot fall. There shall be no more than 90 degrees of horizontal deflection through a manhole.
- ☐ ☐ 5. Exterior drop manhole connections shall be used whenever a sewer enters a manhole at an invert elevation of more than 24 inches above the manhole invert elevation. Interior drop connections will not be permitted (includes sanitary sewer leads as well as main line connections).
- ☐ ☐ 6. Proper trench detail(s) shall be specified on plans within the profile with a dimension of the length each trench is applicable, per DIV X Standard Details.
- ☐ ☐ 7. Check for minimum depth (4’ minimum cover for sewer leads).
- ☐ ☐ 8. Check depth of sewer for special bedding requirements, i.e., Class X concrete encasement, crushed stone encasement, etc. (Worst case is class D trench, saturated clay backfill, approximately 16.0’ in depth is cut off point for special bedding for 8" pipe.)
- ☐ ☐ 9. The maximum distance between manholes shall be 400 feet for sewers 15 inches in diameter and smaller, and 500 feet for sewers 18 inches in diameter and larger.
- ☐ ☐ 10. Manholes shall be located such that they are no more than 10’ from edge of pavement/face of curb so they are directly accessible by vehicular maintenance equipment. All surfaces to be utilized for manhole access shall be designed to support a 16 kip dual wheel load (the weight of a fully loaded Vactor truck). Private streets to include pavement cross-section detail within the construction plans.
- ☐ ☐ 11. A State construction permit is required for all public sanitary sewer.
- ☐ ☐ 12. Stub(s) extended to property line required for future connections (verify sizing and depth).
- ☐ ☐ 13. Easement is required for all public sewers. Easement shall be free from all structures (i.e., buildings, decks, carports, retaining walls, underground storm detention). Width = 2(depth)+10’, 30’ minimum. Sewer shall be offset 5’ from centerline of easement.
- ☐ ☐ 14. Sanitary sewers serving only residential units may be SDR 35 (minimum wall thickness) PVC pipe (up to 15" in size) or vitrified clay pipe (up to 18" in size). Sanitary sewers up to 18", other than those allowed to be PVC pipe, shall be vitrified clay pipe. Sanitary sewers 21" and larger shall be RCP.
- ☐ ☐ 15. Show and station all utility crossings in profile. Invert of the crossed pipe shall be labeled in the profile. A minimum vertical clearance of 18” between water mains, and 12” for all other utilities.
- ☐ ☐ 16. Service lead required at all lots/buildings. Each building must have an independent lead to the public sewer main. Firewalls constructed within a building create separate buildings.
- ☐ ☐ 17. Check invert at main of lead (rolled tee).
- ☐ ☐ 18. Check length and grade of lead per DIV II.2F.
- ☐ ☐ 19. Check and verify invert of leads. (8-10’ below FF)
- ☐ ☐ 20. Cleanouts on leads every 100’ and at all other locations required by Plumbing Code.
- ☐ ☐ 21. Check lead material. Pipe shall be SDR-35 (minimum wall thickness) within public right-of-ways.
- ☐ ☐ 22. A casting schedule shall be provided including manhole/structure number corresponding to the plan, casting type, (manufacturer and catalog number), top-of-casting elevation, manhole invert(s) and depth. The riser height must be included in the casting schedule. Casting schedules shall be shown on each sheet for the structures on that sheet.
- ☐ ☐ 23. A lead schedule shall be provided on each plan and profile sheet where leads appear. The schedule shall include the lot/lead number, the mainline station of the lead, invert of the lead at the main, riser height (as needed), invert at the top of the riser (as needed), total length of lead from main to 5’ from building face, and invert of lead at the building face.
- ☐ ☐ 24. Maximum of three sewer service leads may be tapped into a terminal manhole. All other leads are to be at wyes or tees at the sewer main. Tees may only be used with risers.
- ☐ ☐ 25. Minimum grade for service lead is 1.0% for a 6" lead and 2.0% for a 4" lead.
- ☐ ☐ 26. A sampling manhole is required for sewers which carry industrial and research waste.
- ☐ ☐ 27. Sewer interceptor/separator may be required (Building Department) per DIV II.2G.
- ☐ ☐ 28. Manholes shall not be located in areas subject to flooding. If such locations cannot be avoided and are approved, watertight manhole covers and castings are required.
- ☐ ☐ 29. Minimum grade for sewer placed in casing pipe is 1%.

Notes:

STORM SEWERS

Yes No

- ☐ ☐ 1. Check run lengths versus sewer stationing.
- ☐ ☐ 2. Check sewer grades and invert elevations.
- ☐ ☐ 3. Rim elevations and structure are to be provided on the plans. Rim elevations and structure numbers shall be shown, stationed and labeled within the plan and profile views.
- ☐ ☐ 4. Check type of casting based on type of curb used. (rolled curb vs. barrier curb)
- ☐ ☐ 5. Check inlet locations per DIV II.3F.
- ☐ ☐ 6. All utility crossings must be shown on the profile. A minimum vertical clearance of 18" between water mains, and 12" for all other utilities. The crossed pipe shall be stationed and labeled in the profile view, including the crossing invert elevation.
- ☐ ☐ 7. Check type of drainage structures (diameter) in relation to sewer size per DIV X Standard Details.
- ☐ ☐ 8. All drainage structures shall have 2' sumps.
- ☐ ☐ 9. Minimum size for public storm sewers, including inlet/catch basin leads, shall be 12 inch diameter if the sewer is receiving surface storm water, or if the sewer main is located within a public right-of-way. Pipe size shall not change within a storm sewer run.
- ☐ ☐ 10. Rip-rap placed at end-sections.
- ☐ ☐ 11. Easement is required for all public storm sewers. Easement shall be free from all structures (i.e., buildings, decks, carports, retaining walls, underground storm detention). Width = 2(depth)+10', 30' minimum. Sewer shall be offset 5' from centerline of easement.
- ☐ ☐ 12. Check location of orifice plate. (Can line still be adequately cleaned/vactored? Is it the proper location for detention purposes?)
- ☐ ☐ 13. Check storm sewer pipe material per DIV II.3B.
- ☐ ☐ 14. Check standard details (manholes, trench details).
- ☐ ☐ 15. Manholes shall be located such that they are no more than 10' from edge of pavement/face of curb so they are directly accessible by vehicular maintenance equipment. All surfaces to be utilized for manhole access shall be designed to support a 16 kip dual wheel load (the weight of a fully loaded Vactor truck). Private streets to include pavement cross-section detail within the construction plans.
- ☐ ☐ 16. Low points shall not receive drainage from a combined total of more than 700 lineal feet of roadway pavement in both directions. Low points shall have double inlets.
- ☐ ☐ 17. Minimum depth of sewer shall be 3.5 feet from finish grade to the top of the pipe. The maximum depth to invert of any storm sewer shall not exceed that recommended by the manufacturer for each size and class of pipe.
- ☐ ☐ 18. The maximum depth between inverts within a manhole is 10'.
- ☐ ☐ 19. Check minimum/maximum grades for each size pipe per table shown in DIV II.3B.
- ☐ ☐ 20. Check service leads (see sanitary). Each lot must connect lead to storm sewer, or sump pump discharge to detention/retention area.

Notes:

ROADS

Yes No

- ☐ ☐ 1. Check longitudinal grade of roads (1.0% min.) and transverse grade (2.5% residential, 2.0% all others).
- ☐ ☐ 2. Check road section for proper pavement layer thickness. (Review calculations)
- ☐ ☐ 3. Check length of vertical curves (AASHTO Fig. III-41 (crest); III-43 (sag)).
- ☐ ☐ 4. Check joint type and spacing for rigid pavement.
- ☐ ☐ 5. All streets shall be designed to include 6 inch diameter, flexible, wrapped, perforated, PVC edge drains extending under curb line (or shoulder if no curb) to all inlets.
- ☐ ☐ 6. The curb and gutter in single and two-family developments shall be mountable roll curb. Top-of-curb spot elevations shall be provided at points of curvature, points of tangency, midpoint of horizontal curves, and along straight segments at 15' minimum intervals.
- ☐ ☐ 7. Check required right-of-way and street widths per DIV II.7C.
- ☐ ☐ 8. Check centerline elevations vs. proposed grade.
- ☐ ☐ 9. Check stopping sight distance per DIV II.7F
- ☐ ☐ 10. Check intersection sight distance per DIV II.7F
- ☐ ☐ 11. Check centerline radii/tangents per DIV II.7E. Does it meet design speed?
- ☐ ☐ 12. Intersections and cul-de-sac bulbs should have grading details.
    - Check for drainage (minimum 1% grades)
    - Provide top-of-curb (T/C) grade elevations. T/C elevations required at 15' intervals, minimum.
    - At intersections, crown of the major or higher class street carries through intersection; "wash-out" or "blend" crown of minor street into major street.
- ☐ ☐ 13. Cul-de-sacs
    - 600' max. length residential, 900' max. length industrial and commercial.
    - 66' stem right-of-way, 60' bulb right-of-way and 45' pavement radius
    - 70' stem right-of-way, 70' bulb right-of-way and 55' pavement radius
- ☐ ☐ 14. New streetlights along public streets must be reviewed by the Traffic Engineer for location.

Notes:

SIDEWALKS, BIKEPATHS AND DRIVE APPROACHES

Yes No

- ☐ ☐ 1. Sidewalk/Bikepath in standard location (back of walk/path is 6" from right-of-way line). Sidewalk may meander within the right-of-way or in an easement to avoid trees and other conflicts.
- ☐ ☐ 2. Generally, ramps at street intersections, but not at private drive approaches.
- ☐ ☐ 3. Inlets located to collect drainage before ramps, as needed.
- ☐ ☐ 4. Check lawn extension width (minimum 3' required for short stretches in residential areas).
- ☐ ☐ 5. Check sidewalk tie-in points with adjacent properties (e.g., concrete sidewalk transition to asphalt; proper alignment). Detailed grades of transitions must be provided.
- ☐ ☐ 6. Check all radii of sidewalks and bikepaths, - compare with specified minimums (DIV II.8).
- ☐ ☐ 7. Sidewalk/bike path ramps shall meet the current MDOT R-28-J detail (truncated domes at bottom of ramp).
- ☐ ☐ 8. Spot elevations are required at the front and back edges of sidewalk at 25' minimum intervals. Additional spot elevations are required at the front and back edge of sidewalk at points of curvature, points of tangency, midpoints of curves, and changes in direction of sidewalk at each deflection point or corner.
- ☐ ☐ 9. Spot elevations are required where private sidewalk intersects public sidewalk, on the front and back edge of the sidewalk. Where a private walk intersects the public sidewalk, a turning space (level landing) is required on the public walk. Spot elevations are required at all corners of a turning space.
- ☐ ☐ 10. Station all new sidewalks or replacement sidewalks of 50' or more. Stationing requirements per the PSSS.
- ☐ ☐ 11. Sidewalk longitudinal design slope should not exceed 4.8% and transverse grades should not exceed 1% to allow for construction tolerances.
- ☐ ☐ 12. Private streets are considered drive approaches and shall consist of a Type "M" opening.
- ☐ ☐ 13. For drive approaches:
    - Drive approach width at right-of-way: single- & two-family - 10'-24'; all other uses 24'-30'
    - Turning radii (5'-15')
    - Curb cut width (maximum of 60')
    - Must match approved site plan dimensions, if part of a site planned Private Development project.
    - Check number of drives allowed and spacing
    - Check length of drive drainage (inlets needed at right-of-way?)
    - Drive approach shall slope toward street with a minimum slope of 3%. Maximum slope from right-of-way to roadway is 13% on pavement, 2% (1.5% design) across sidewalk. Should drive approach slope toward private property, a letter authorizing and accepting right-of-way drainage from the property owner is required. Letter will be placed in project and land parcel files.
- ☐ ☐ 14. Drive approach location:
    - Compare with drive approach location across street for conflicts.
    - For residential, must be 15' off right-of-way line, otherwise 4.5' from property line.
- ☐ ☐ 15. Spot elevations are required on both sides of drive approaches at the right-of-way line, sidewalk ramp/sidewalk crossing, beginning of return curb, and end of return curb. Additional spot elevations are required at the midpoint of the drive approach for each location listed above.
- ☐ ☐ 16. Shared drive approaches must meet required geometry. Shared approaches generally require an easement for joint access for two site planned projects, or written agreement/authorization between both property owners.
- ☐ ☐ 17. Pedestrian signals must accommodate sidewalk ramps each direction and in proper location. These locations will be reviewed by the traffic engineer.

Notes:

Document1