SITE PLAN REVIEW CHECKLIST

PROJECT NAME: ____________________  ADDRESS: ____________________
DESIGN ENGINEER: ____________________  DATE: ____________________
COMPANY: ____________________  PHONE: ____________________

I. General Review Items, Including General Plan (if applicable)  YES  NO  N/A

1) Engineering plans match the approved site plan or preliminary plat.  ____  ____  ____
2) Original seal and signature by a PE on Plans (cover sheet only if indexed).  ____  ____  ____
3) Title block information filled in (i.e., project name, location, owner, etc.).  ____  ____  ____
4) Location sketch.  ____  ____  ____
5) North arrow and graphic scale. North shall be up or to the left.  ____  ____  ____
6) Provide location map  ____  ____  ____
7) Legal description of all properties involved in project provided.  ____  ____  ____
8) Two Bench Marks with labeled datum.  ____  ____  ____
9) Street names and R.O.W. widths (existing or proposed).  ____  ____  ____
10) All existing and proposed municipal and private utilities (including on-site services), maintaining adequate separation between all utilities.  ____  ____  ____
11) Existing easements shown.  ____  ____  ____
12) Location of proposed buildings on property.  ____  ____  ____
13) Location and elevations of ditches, culverts, natural waterways, and county drains.  ____  ____  ____
14) Lot numbers, Parcel number and dimensions or tract acreage shown.  ____  ____  ____
15) Adjacent flood plain area shown.  ____  ____  ____
16) Provide plans on 24” x 36” sheets of paper; *.pdf shall also be provided  ____  ____  ____
17) Provide location dimensions for all proposed utilities.  ____  ____  ____
18) Provide Topographic Survey showing adjacent buildings and structures (min. 50’ offsite) including: 50’ grid or closer if needed, adjoining parcel and lot numbers, utilities, and easements  ____  ____  ____
19) Identify approvals and/or permits required:
   a) Soil Erosion and Sedimentation Control  ____  ____  ____
   b) EGLE Water Permit  ____  ____  ____
   c) EGLE Sanitary Sewer Permit  ____  ____  ____
   d) Macomb County Public Works  ____  ____  ____
   e) Macomb County Department of Roads  ____  ____  ____
   f) MDOT  ____  ____  ____
   g) Red Run Drain  ____  ____  ____
   h) Other  ____  ____  ____
20) Location and elevation of 100 year Floodplain if applicable
   a) Certification that FIRM panel # has been checked.

21) Lot dimensions and information as to how boundary was located on the ground.
   a) Identify set irons, found irons, etc.

II. Sanitary Sewer

<table>
<thead>
<tr>
<th></th>
<th>YES</th>
<th>NO</th>
<th>N/A</th>
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<tbody>
<tr>
<td>1) Acceptable Pipes:</td>
<td>8” – 15” Truss</td>
<td>12” – 24” Sanatite HP</td>
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<td></td>
<td>4” – 15” SDR 26</td>
<td>12” – 24” RCP w/ Xypex</td>
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<td></td>
<td>&gt; 24” Special</td>
<td><strong>SDR35 not acceptable</strong></td>
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<td>2) Proposed Sewer Location:</td>
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<td></td>
<td>Show dimensional ties.</td>
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<td></td>
<td>Label pipe length, type, and slope on plan review.</td>
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<td>3) Manhole (assign number to each):</td>
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<td></td>
<td>Locations: at end of line and at all changes of grade, direction or pipe size.</td>
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<td>Size: minimum of 4’ diameter.</td>
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<td>Maximum spacing: 500’</td>
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<td></td>
<td>Provide drop connections when inverts are over 18” apart (5’ diam. MH)</td>
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<td>4) Minimum 8” diameter shown for public sanitary sewer.</td>
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<td>5) Depth: minimum of 9’ from T/C to top of pipe unless limited by receiving sewer.</td>
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<td>6) Slope: sufficient to provide at least 2 fps velocity such as:</td>
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<td></td>
<td>8” @ 0.40% (0.68 cfs)</td>
<td>15” @ 0.15% (2.60 cfs)</td>
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<td></td>
<td>10” @ 0.30% (1.10 cfs)</td>
<td>18” @ 0.12% (3.65 cfs)</td>
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<td></td>
<td>12” @ 0.22% (1.57 cfs)</td>
<td>21” @ 0.10% (5.00 cfs)</td>
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<td>7) Profiles</td>
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<td>Match sewer tops, 0.8 diameter points, or use interior drop connection; except drop invert additional 0.10 at 45° turn.</td>
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<td>All crossing underground utilities shown (existing or proposed).</td>
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<td>Show: size, slope, and type of pipe; sewer inverts and rim elevations.</td>
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<td>Show sump-manhole and temporary bulkhead for sewer test.</td>
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<td>Show building service connections.</td>
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<td></td>
<td>Label the stationing and terminus elevation for all proposed leads.</td>
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<td>Show compacted sand backfill where required.</td>
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<td>8) Building service connections show:</td>
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<td>Location and sizes shown.</td>
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<td>All connections (except industrial): min. 6” PVC SDR 23.5 lead.</td>
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<td>Areas Zoned Industrial: min 8” Truss Pipe lead with sampling point and cleanout.</td>
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<td>One lead shown for each unit to be served by public sewer.</td>
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<td>9) State Construction Permit Submittal:</td>
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<td>Quantities and description of improvements of public sanitary sewer.</td>
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<td>Basis of design provided with current and future service populations and flows shown separately.</td>
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<td>Service district map provided with current and future service areas labeled.</td>
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d) Peak flow calculated with the following formula:

\[ \text{Peak Flow} = \left( \frac{(18 + \sqrt{TP})}{(4 + \sqrt{TP})} \right) \times \text{Avg. Flow} \quad \text{where} \quad TP = \frac{(\text{pop.})}{1000} \]

10) Easement (pvt property) Approx: trench width + 2x depth over pipe; 12’ min.

11) Provide Warren Engineering’s standard detail sheet with construction notes.

12) Special backfill (compact to 95%) shown & labeled on plan and profile views where sanitary sewer is under the influence of pavement.

13) Provide recordable easement document to City of Warren for private property

### III. Water Main

1) Acceptable Water main materials
   a) CL 54 Ductile Iron, poly wrapped, 3” – 24”
   b) C900, 4”-12”; C905, 12”-24”; C909, 6”-16”; DR18 PVC with tracer wire
   c) >24” pipe, special review

2) Water main Location:
   a) Show dimensional ties
   b) Label pipe length, type and sand backfill areas on plan view

3) Hydrants:
   a) Spacing: maximum of 500' residential, 300’ everywhere else.
   b) Type: Mueller or East Jordan.
   c) Location: min. 5’ away from driveways, 30' away from buildings.
   d) Show finished grade for all hydrants.

4) Gate Valves and Wells:
   a) Spacing: 1250' maximum, not more than 30 units disconnected when closing sections, not more than 4 gate valves to close off section.
   b) Location: about 5’ from R.O.W. intersection and outside of pavement.
   c) Gate well size: minimum 5’ diameter.
   d) Show finish grade for gate well rims.

5) For dead-ends, provide hydrant and gate valve.

6) For cul-de-sacs:
   a) Water main must be located around cul-de-sac and adjacent to or in front of lots to be served.
   b) A bore for water service leads cannot be more than 28 feet.

7) Provide 45 degree bends or less for water main (no 90 degree bends).

8) One water service lead shown for each unit on site.

9) For river and county drain crossings, show detailed section with elevations below river and drain bottom.

10) Updated City water main standard detail sheet attached to plans.

11) 12’ minimum easement shown for all public water mains.

12) Quantities and description of improvements of public water main with Warren name, section number, and existing main roads near the project.

13) Special backfill (compacted to 95%) shown and labeled on plan and profile views where sanitary sewer is under the influence of pavement.
14) Provide two independent water services for hospitals, nursing homes or residential property having more than 30 living units.    
15) Provide City standard detail sheet with construction notes.    
16) Provide recordable easement document to City of Warren on private property.    
17) Provide completed EGLE Act 399 Water Main application.    
18) Provide profiles for water main > 16”.    
19) Design shall be in conformance with 10 States Standards.

IV. Storm Sewer

1) Provide catch basins (with 2’ min. sumps) at low points.  
2) All pavement catch basins shall have edge drain (6’ diam.) around their perimeter and/or along the back of curb (min. length: 40 LF total). 
3) Provide intercepting catch basins so there is not more than 150’ of drainage around curb returns.  
4) Provide plan showing drainage districts and furnish design calculations  
   - based on 10-year storm  
   - use the following imperviousness factors for zoning classification: 
     - Single family = 0.35  
     - Multiple family = 0.55  
     - Industrial = 0.80  
     - Commercial = 0.90
5) Detention  
   - If >1.0 Ac., review ordinance, provide treatment.  
   - If <1.0 Ac., provide as possible (2” over site or Oakland 10 yr design).  
   - discharge shall be = or < than pre-development. 
     a) Parking lot – 9” max. depth, low point to gutter line.  
     b) Pond 1 on 6 max. slope  
     c) Underground detention  
     d) Calculations shown.
6) Provide a maintenance agreement for all storm drainage facilities with the City of Warren (i.e. storm sewers, swales, detention basins, etc.).  
7) Storm sewer size and type:  
   a) Minimum 12” for surface drainage, 8” allowed if only serving roof or sump-pump connections.  
   b) Sized for upstream areas.  
   c) Use class of pipe necessary for depth  
   d) Roof leads under pavement:  
     - 6” or less – SDR 23.5  
     - 8” – truss pipe
8) Show sump pump connections to storm sewer (and connection detail)  
9) Profiles:  
   a) Provide at least 3’ of cover; drop inverts at least 0.1’ at sewer size changes or 90º turns. Show hydraulic gradient when it is above top of pipe; keep H.G. at least one foot below profile’s finish grade.  
   b) Show all crossing underground utilities (existing or proposed).
c) Provide sufficient slope to get at least 2.5 fps velocity
   12" @ .32%, 15" @ .24%, 18" @ .18%, 21" @ .14%

   __ ___ ___

d) Show: size, slope, pipe type, sewer inverts, and rim elevations at manholes. ___ ___ ___

e) Sanitary building-service connections clear storm sewer. ___ ___ ___

f) Show compacted sand backfill where required ___ ___ ___

10) Storm Sewer Location:
   a) Show dimensional ties ___ ___ ___
   b) Label pipe length, type and sand backfill areas on plan view ___ ___ ___

11) Storm sewer manholes (assign number to each):
   a) Location: end of line and at all changes of grade, direction, and/or pipe size. ___ ___ ___
   b) Size: minimum 4” diameter. ___ ___ ___
   c) Spacing: 500’ maximum. ___ ___ ___

12) No more than three catch basins shall drain into any one structure. ___ ___ ___

13) 12’ minimum easement shown for all public storm sewers. ___ ___ ___

14) City standard detail sheet attached to plans. ___ ___ ___

15) Special backfill (compacted to 95%) shown and labeled on plan and profile views where storm sewer is under the influence of pavement. ___ ___ ___

V. Paving and Grading

1) Topographic Survey Plan (show existing ground contour lines). ___ ___ ___

2) Offsite elevations (100’ beyond each property line). ___ ___ ___

3) Pavement cross sections shown:
   a) Parking areas. ___ ___ ___
   b) Drive lanes (deep strength required). ___ ___ ___
   c) Public and private roads. ___ ___ ___

4) Concrete pavement cross-sections:
   a) 6” concrete or 4” HMA on 8” aggregate base for parking areas ___ ___ ___
   b) 7” concrete for residential streets on 8” aggregate base ___ ___ ___
   c) 9” for industrial drives on 8” aggregate base ___ ___ ___

5) Curb detail shown 18” wide. (Straight faced and asphalt curbs not allowed). ___ ___ ___

6) Indicate in plan view where the standard curb and gutter and where the reverse curb and gutter will be used. ___ ___ ___

7) Integral sidewalk and curb detail shown if applicable. (18” footing). ___ ___ ___

8) Proposed elevations in boxes. ___ ___ ___

9) Pavement grades:
   a) Concrete: Minimum 0.5%, Maximum 7%. ___ ___ ___
   b) Asphalt: Minimum 1%, Maximum 7%. ___ ___ ___

10) Provide vertical curve, if grade change exceeds 2%. ___ ___ ___

11) Provide minimum of 0.30’ drop around curb returns. ___ ___ ___

12) Provide intersection and cul-de-sac details
   • (elevations, dimensions and drainage scheme). ___ ___ ___

13) Dead ends: use cul-de-sac or approved turn around: maximum length 600’. ___ ___ ___

14) Show centerline curve data (for roads only). ___ ___ ___

YES  NO  N/A
15) Show stationing left to right (for roads only).

16) Show top-of-curb elevations.

17) Sidewalks:
   a) Along existing public R.O.W.’s.
   b) Along both sides of all proposed R.O.W.’s
      (except along industrial roads or within subdivisions).
   c) Within a site, as necessary.
   d) Cross-section shown: 4” min, 8” for drive crossings.

18) On site (excluding R.O.W.) pavement quantities shown on plan
    (i.e. LF curb, pavement area, sidewalk area, etc.).

19) Show proposed pavement drainage slopes.

20) Proposed Sewer Location:
    a) Show dimensional ties
    b) Label pipe length, type and slope on plan view

21) Provide adequate access per ADA standards.
    • Max. 1:12 (8.33%) ramps   • 2.0 sidewalk cross slope   • 2.0% in parking areas
    • See MDOT R-28