ENGINEERING REVIEW CHECKLIST
City of Ecorse

(To be completed by the Developer's Engineer & Submitted with Engineering Plans)

DATE: _____

PROJECT NAME: _____

Site Plan Approved: _____
Date

DESIGN ENGINEERING COMPANY: _____

Engineering Company Contact Information:

Name: _____

Phone: _____

Email: _____

Owner Contact Information:

Name: _____

Phone: _____

Email: _____

The engineering should submit a detailed engineer's cost estimate for all site improvements, excluding the building, with the first engineer plan submittal. A separate estimate should also be provided to break out the costs for all work within the right of way and for public utilities.

Complete the following Review Items checklists and submit with engineering plans. Add a check mark in the Design Engineer column if information is provided. In some cases, depending on the development type the Review Item will not be applicable. In this case indicate N/A.

ENGINEERING REVIEW CHECKLIST
City of Ecorse

General Review Items		Design Engineer	AEW Reviewer
1.	AEW Job Number on the lower right-hand corner of the cover sheet (To be provided after first review)		
2.	Plans on 24” x 36” sheets		
3.	Engineering plans match the approved site plan or preliminary plat		
4.	Plans signed and sealed by a Professional Engineer (cover sheet)		
5.	Title block information filled in (i.e., project name, location etc.)		
6.	Project location map		
7.	North arrow on all plan sheets		
8.	Legal description of all properties involved in project provided		
9.	Detailed meets and bound description shown on parcel boundary		
10.	Parcel Identification Number		
11.	Two NAVD88 Bench Marks		
12.	Street names and R.O.W. widths (existing and/or proposed)		
13.	Location of existing and proposed buildings on property		
14.	Location and elevations of ditches, culverts, natural waterways, and county drains		
15.	All existing and proposed municipal and private utilities shown within influence of site and to connections off-site		
16.	Existing easements shown within influence of site		
17.	Existing and proposed floodplain boundaries (contour lines) with elevation, shown on grading plan, general plan and all other relevant plan sheets. Reference FEMA panel map and effective date		
18.	Topo plan to include existing spot grades and ground contour lines		
19.	Offsite topo information to extend 100’ beyond each property line		
20.	All Landscaping is contained within designated landscape areas and does not encroach upon utility easements or private property		
21.	Location of temporary construction access drive (if needed) shown on the plans.		
Sanitary Sewer Review Items		**Design Engineer**	**AEW Reviewer**
1.	Survey existing inverts at new connections		
2.	Building service connections – Show the following		
	a. Location and sizes		
	b. All except industrial: min. 6" PVC SCHD 40 or ABS SDR 23.5		
	c. Zoned Industrial: min 8” truss pipe lead w/ Inspection Manhole		
3.	City's Standard Detail Sheet attached to plans		
4.	Proposed Sewer Location		
	a. 10’ min. horizontal separation between adjacent utilities		
	b. 18” min. vertical clearance at storm sewer and water main crossings		
	c. Location dimensions shown		
5.	Manholes (assign number to each):		
	a. Size: minimum of 4' diameter		
	b. Max. spacing: 350’ for 8”- 21” pipe and 400’ for 24” pipe and larger		

Sanitary Sewer Review Items (Continued)		**Design Engineer**	**AEW Reviewer**
	c. Provide interior drop connections (in a 5' manhole) when inverts are over 18" apart		
	d. Manholes and stubs provided at phase lines.		
6.	Minimum 10" diameter pipe for public sanitary sewer		
7.	Types of Pipe: Up to 15" – ABS or PVC Truss Pipe; 18" and larger – C-76, CL IV concrete pipe		
8.	Depth: Minimum of 9' from T/C (or road centerline) to top of pipe unless limited by receiving sewer		
9.	Slope: Sufficient to provide at least 2 fps velocity such as: 8" @ 0.40% (0.68 cfs) 15" @ 0.15% (2.60 cfs) 10" @ 0.30% (1.10 cfs) 18" @ 0.12% (3.65 cfs) 12" @ 0.22% (1.57 cfs) 21" @ 0.10% (5.00 cfs)		
10.	For profile:		
	a. Match 0.8' diameter points and drop invert additional 0.10' at 45º turns or greater		
	b. All crossing underground utilities shown (existing or proposed)		
	c. Show: size, slope, and type of pipe; sewer invert and rim elevations		
11.	State Construction Permit Submittal (for public sewer):		
	a. Quantities and description of sewer improvements		
	b. Basis of design provided with current and future service populations and flows		
	c. Service district map provided with current and future service areas clearly defined and labeled with acreage		
	d. Peak flow calculated with the following formula: Peak Flow = $[(18+\sqrt{TP})/(4+\sqrt{TP})]$ x Avg. Flow where TP = (pop.)/1000		
	e. Permit application completed		
12.	20' minimum easements shown for all proposed public sanitary sewer (can be reduced to 12' if adjacent and parallel to a public street)		
Water Main Review Items		**Design Engineer**	**AEW Reviewer**
1.	Water Services:		
	a. Min. 3/4" Copper Service, Over 2" can be ductile iron		
	b. Location for each lot shown on plans		
	c. Min. 4' separation between water services at connection to public main		
	d. Stop box location shown		
	e. Fire suppression line shown with GV&W at connection to main The GV&W must be located within the public water main easement (Fire Marshal Approval Required, Submit Plans to Fire Marshal for Approval)		
2.	Water main stubbed at the end of all stub streets and a gate valve and hydrant provided		
3.	Connection to existing main with T.S.V. & Well unless otherwise previously approved		

Water Main Review Items (Continued)		**Design Engineer**	**AEW Reviewer**
4.	Proposed Water Main Location:		
	a. 10’ min. horizontal separation between adjacent utilities		
	b. Min. 18” clearance with storm and sanitary sewers at crossings		
	c. Location dimensions shown		
5.	Hydrants: (Locations are subject to Fire Marshal Approval, Submit Plans to Fire Marshal for Approval)		
	a. Spacing: Maximum of 500' residential, 300’ everywhere else		
	b. Location: Min. 5’ from driveways and intersections, 30' from buildings and at the lot line within subdivisions		
	c. Finish grade and location dimensions shown		
	d. Hydrant, gate valve, stub at all stub streets and phase lines 10’ spacing)		
6.	Gate Valves and Wells:		
	a. Spacing: 800' maximum, not more than 30 units disconnected when closing sections, not more than 3 gate valves to close off section		
	b. Gate well size: Minimum 4' diameter		
	c. Finish grade for gate well rims and size of valve shown		
7.	Public water main, other than hydrant leads, are 6” minimum diameter CL54 DI pipe. Hyd. leads longer than 100’ are 6” min. diameter. Size and material type listed		
8.	Water main serving Industrial sites are minimum 12” min. diameter		
9.	For all river and county drain crossings, a detailed section with elevations below river and drain bottom shown. Restrained joints shall be provided throughout crossing and for 2 pipe lengths each way of crossing.		
10.	City's 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 shown		
13.	Special backfill shown and labeled in the plan view where water main is under the influence of pavement		
14.	All bends are 45° or less (no 90° bends)		
Storm Sewer Review Items		**Design Engineer**	**AEW Reviewer**
1.	Invert at connection verified		
2.	Storm sewer design:		
	a. Design calculations provided based on 10-year storm (I = 175/ (25 + T)); used the following imperviousness factors for zoning classification: (a) Single family = 0.35; (b) Multiple family = 0.55; (c) Industrial = 0.80; (d) Commercial = 0.90		
	b. Drainage District map provided. If serving offsite areas, map must clearly show entire limits and acreage of offsite areas.		

Storm Sewer Review Items (Continued)		**Design Engineer**	**AEW Reviewer**
	c. Hydraulic table showing the following; from MH, to MH, incremental acres, “C” Coefficient, incremental equivalent area (CxA), cumulative equivalent area (CxA), time (min), intensity (in/hr), flow (cfs), pipe diameter, pipe slope, pipe length, velocity (ft/s), time of flow (min), sewer capacity (cfs), U/S hydraulic grade, D/S hydraulic grade, U/S ground, D/S ground, U/S invert, D/S invert		
3.	Sewer Profiles:		
	a. Provide min. of 3' of cover and a 0.1' drop at 90° turns		
	b. Hydraulic gradient shown		
	c. Show all crossing underground utilities (existing or proposed)		
	d. Provide sufficient slope to provide at least 2.5 fps velocity		
	e. Show: size, slope, and type of pipe, sewer inverts and rim elevations at manholes		
4.	Storm Sewer Location:		
	a. Location dimensions shown		
	b. Each lot within the sub has access to a rear yard structure		
5.	Storm sewer manholes (assign number to each)		
	a. Location: at end of line and at all changes of grade, direction, and/or pipe size		
	b. Size: Minimum 4’ diameter		
	c. Spacing: (12”- 30”) max 350’, (36”- 42”) max. 400’, (48”- 60”) max 500’, (66” and larger) max. 600’ spacing		
6.	2’ Diameter Storm sewer inlets: discharge into a structure with a sump that is less than 75’ away		
7.	No more than three catch basins shall drain into any one catch basin. Provide manholes with catch basin covers as necessary.		
8.	For subdivisions the easement width shall be 12’ min for sewers 21” and under, 20’ for sewers 24”- 48”, and 30’ for sewers over 48”		
9.	City's Standard Detail Sheet attached to plans		
10.	Storm Water Detention Basin Provided (see the City of Ecorse Stormwater Standards)		
Paving and Grading Review Items		**Design Engineer**	**AEW Reviewer**
1.	Existing and proposed floodplain boundaries (contour lines) with elevation, shown on grading plan. Reference FEMA panel map and effective date		
2.	Drainage from entire site is contained on-site.		
3.	Drainage from adjacent sites which flows onto subject site is provided for in site grading/drainage		

Paving and Grading Review Items (Continued)		**Design Engineer**	**AEW Reviewer**
4.	Existing grades are matched at the property lines of the site or off-site grading easements obtained		
5.	Edge/under drains provided along entire length of public and private roads and/or at low point catch basins in parking lots		
6.	Pavement Grading:		
	a. Concrete:		
	1) Cross slope: Minimum 0.5%, Maximum 7%		
	2) Gutter: Minimum 0.5%, Maximum 7%		
	b. Bituminous:		
	1) Cross slope: Minimum 1%, Maximum 7%		
	c. Drainage arrows provided		
7.	General grading:		
	a. Drainage arrows provided for all lawn areas		
	b. Min. 0.5%, max. 7% swale slopes provided		
	c. The fall of land away from a building is a min. 0.5’ in first 25’		
8.	City's Standard Detail Sheet attached to plans		