



PUMP STATION DESIGN REVIEW CHECKLIST

PROJECT NAME:	
APPLICANT'S ENGINEER:	
ENGINEERING CONTACT:	DATE:

The Applicant's Engineer shall complete and submit this checklist along with other required items. If any required items deemed incomplete by Metro, it will be noted in the form below and returned to the Applicant's Engineer. Metro will not issue an acceptance letter until all required items have been received and deemed complete.

Check boxes to denote completion or write "N/A" if not applicable to project.

DESIGN CALCULATIONS – DESIGN FLOW & OPERATING POINT

<u>Required Items</u>	<u>Engineer</u>	<u>Metro</u>
	Complete	Complete
Initial Design Flow Calculations	<input type="checkbox"/>	<input type="checkbox"/>
Future Contribution Calculations	<input type="checkbox"/>	<input type="checkbox"/>
Total Dynamic Head (TDH) Calculation:	<input type="checkbox"/>	<input type="checkbox"/>
Static Head Calculations (Highest Pt. along FM – Pump Off Elev.)	<input type="checkbox"/>	<input type="checkbox"/>
Dynamic Head Calculation (Friction Head, Minor Head Losses, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
Operating Point – plot TDH vs. flow rate onto pump curve; include pump impellor size and operating point	<input type="checkbox"/>	<input type="checkbox"/>

DESIGN CALCULATIONS – WET WELL DESIGN

<u>Required Items</u>	<u>Engineer</u>	<u>Metro</u>
	Complete	Complete
Cycle Time:	<input type="checkbox"/>	<input type="checkbox"/>
Volume = (Pump On Elev. – Pump Off Elev.) * A_0 , where A_0 = wet well cross-sectional area	<input type="checkbox"/>	<input type="checkbox"/>
Fill time = Volume / ADF	<input type="checkbox"/>	<input type="checkbox"/>
Run time – Volume / (Q_{pump} – ADF), where Q_{pump} = design flow rate of pump	<input type="checkbox"/>	<input type="checkbox"/>
Dynamic Head Calculation (Friction Head, Minor Head Losses, etc.)	<input type="checkbox"/>	<input type="checkbox"/>
Uplift Check (Buoyancy), Factor of Safety (FS) ≥ 2.0	<input type="checkbox"/>	<input type="checkbox"/>

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FS = (wet well weight + soil overburden + soil resistance) / (uplift force)		
Operating Point – plot TDH vs. flow rate onto pump curve; include pump impellor size and operating point		

DESIGN CALCULATIONS – SURGE RELIEF CHECK

Required Items	<u>Engineer</u>	<u>Metro</u>
	Complete	Complete
Condition – all pumps running	<input type="checkbox"/>	<input type="checkbox"/>
Wave Velocity Calculations	<input type="checkbox"/>	<input type="checkbox"/>
Water Hammer Pressure Calculations	<input type="checkbox"/>	<input type="checkbox"/>
Total Pressure – equal to water hammer pressure plus static head (check total pressure against pressure ratings for valves & piping; i.e. provide class & thickness)	<input type="checkbox"/>	<input type="checkbox"/>

DESIGN CALCULATIONS – EMERGENCY STORAGE

Required Items	<u>Engineer</u>	<u>Metro</u>
	Complete	Complete
Storage between overflow elevation (lowest pipe RIM elev.) and lead pump on elevation	<input type="checkbox"/>	<input type="checkbox"/>
Storage Calculations:	<input type="checkbox"/>	<input type="checkbox"/>
Storage Time = Total Storage / ADF	<input type="checkbox"/>	<input type="checkbox"/>
Total Storage = (Wet Well Storage) + (Pipe Storage) + (Manhole Storage)	<input type="checkbox"/>	<input type="checkbox"/>
Verify Storage Time ≥ Maximum Power outage time over last 5 years	<input type="checkbox"/>	<input type="checkbox"/>
Total Storage > Volume in force main to 1st downstream	<input type="checkbox"/>	<input type="checkbox"/>



DESIGN CALCULATIONS – SUPPORTING DOCUMENTATION

Required Items	<u>Engineer</u>	<u>Metro</u>
	Complete	Complete
Basin Map Delineating Service Area	<input type="checkbox"/>	<input type="checkbox"/>
100-year flood map (FEMA) or high ground water elevation (SCS)	<input type="checkbox"/>	<input type="checkbox"/>
Provide cut sheets or product literature for the following:		
Pumps – include pump curves, motor data, electrical data, arrangement dimensions	<input type="checkbox"/>	<input type="checkbox"/>
Valves – include max. operating pressure info	<input type="checkbox"/>	<input type="checkbox"/>
Power Source (utility provider)	<input type="checkbox"/>	<input type="checkbox"/>
Hydraulic Calculations prepared by a Professional Engineer licensed in the State of South Carolina	<input type="checkbox"/>	<input type="checkbox"/>

SIGNATURES (SIGN AND DATE)

APPLICANT'S ENGINEER:	DATE:
METRO DEVELOPMENT PROJECT ENGINEER:	DATE: