



City of Placentia

DEPARTMENT OF PUBLIC WORKS

SUBJECT: HYDROLOGY AND HYDRAULICS DESIGN GUIDELINES

The County of Orange Local Drainage Manual (COLDM) is the governing manual for hydraulic analysis and drainage design within the City of Placentia. The Hydrology and water quality reports shall include a summary of the proposed project conditions, a general overview of key opportunities and constraints associated with the drainage conditions within the project area in accordance with the City's drainage master plan. The following are the minimum requirements that the City and the County Flood Control has established for storm drain and local drainage structures to be constructed and dedicated to the City of Placentia:

STORM DRAIN IMPROVEMENT PLAN CHECKLIST

	1 ST Check	2 nd Check	3 rd Check	Mylars	Comments
I. ALL SHEETS					
A. Medium					
1. 24"x36" size Mylar film conforming to City format					
2. No "sticky back", glued or taped on sections					
3. Drawn with waterproof ink or reproduced on photographic emulsion Mylar film, no Diazo or Zerographic copies					
B. Signed by the Engineer-of-Work, date of expiration of registration adjacent to signature					
C. Marked with the name, address and telephone number of the firm preparing the plans and date of preparation					

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D. Consecutively numbered & the total number of sheets					
E. Lettered in a neat and legible style, no hand lettering, machine lettering sizes per agency standard.					
F. Name and phase of development					
G. City benchmark identification, location and elevation noted					
H. Basis of bearing provided					
I. Prepared to appropriate scale(s)					
J. Scale noted. North arrow & bar scale					
K. Use standard plans and details to maximum extent					
L. Clearly designate between existing conditions and work proposed					
M. No duplication of any section or detail designation					
II. TITLE SHEET					
A. General Notes provided					
B. Additional notes are designated as "Special Notes"					
C. Index Map					
1. Scale is between 1" = 100' or 1" = 500'					
2. Sheet coverage shown					

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3. Located on Title Sheet					
4. Street Names shown					
5. Q's called out at key locations					
6. Show Storm Drain lines					
7. Show Catch Basins					
D. Vicinity Map					
1. Orient north as on index map					
2. Arterial streets shown					
3. Project location shown					
E. Legend					
1. Symbols per City standards					
2. Non-standard symbols and abbreviations used are listed and described					
F. Approval block for City Engineer					
G. Standard Title block					
H. Owners/Developers name and address shown					
I. Separate written justification for deviations provided					
J. Quantity estimates provided and broken out between public and private and per Tract if multi-Tract project.					
K. Underground service alert					

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III. HYDROLOGY AND HYDRAULICS STUDY					
A. Hydrology Map					
1. Existing and proposed contours shown.					
2. Drainage Boundaries shown.					
3. Drainage boundaries do not conflict with contours.					
4. Scale and north arrow shown.					
5. Improvements shown (streets, storm drains and grading).					
6. Flow arrows and drainage paths shown.					
7. Q called out at points of concentration.					
8. Soil type shown.					
9. Existing condition and proposed condition maps included.					
B. Hydrology Study					
1. Study shows that overall design perpetuates the existing natural drainage.					
2. Diversion within jurisdiction's tolerance.					

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3. Outlet condition of flows the same or permission gained from downstream owner.					
4. Follows jurisdiction methodology or manual.					
5. Appropriate computer program used.					
6. Supporting graphs/charts provided.					
7. Lengths and elevations agree with map.					
8. Area sizes agree with maps.					
9. Appropriate development condition used.					
10. No areas omitted.					
11. Bulking factor added if required by agency.					
12. Depths of flow for agency's storm events meet agency's requirement.					
C. Hydraulics Calcs					
1. Catch basin, street capacity and storm drain calculations submitted.					

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2. Appropriate hydraulic calculations and design aids used.					
3. Calculations meet jurisdiction requirements.					
4. Open channel calculations indicate non-erosive velocities or protection provided.					
5. Sizes in calculations match plans.					
C. Detention Basin Routing					
1. Appropriate hydrograph program used.					
2. Stage/storage calculations agree with plans.					
3. Outlet flows calculated correctly.					
4. Stage/outlet calculations agree with plans.					
5. Secondary emergency outflows provided.					
6. Outflow non-erosive or protection provided.					

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IV. IMPROVEMENT PLANS					
A. Plan View					
1. Appropriate scale.					
2. North arrow and bar scale.					
3. Horizontal controls provided:					
a. Bearings					
b. Curve data;					
c. BC, EC, PCC, PRC, and angle points called out.					
4. Minimum radii.					
5. Name of street.					
6. Existing or proposed improvements shown and identified.					
7. Utilities shown for information.					
8. If more than one sheet, matchline provided and sheet referenced.					
9. Notes for connection to existing with reference plan called out.					

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10. Construction notes provided on all sheets.					
11. Standard drawings used to maximum extent.					
12. Non-standard items detailed.					
13. Standard drawings correctly applied.					
14. Public storm drain within Right-of-way or easement:					
a. Easements mentioned;					
b. Easement called out on final map;					
c. If outside of final map, separate document recorded and called out on plan.					
15. Appropriate energy dissipator for outlet point .					
16. Appropriate pipe material used.					
17. Manhole spacing.					
18. Appropriate lining used for open channels.					
19. Cutoff depths for lining.					

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20. Restricted access for open channels.					
21. Maintenance access for open channels and storm drain outlets/inlets.					
22. Existing or proposed topo shown at storm drain outlets.					
23. Minimum size of storm drain meets agencies allowance.					
24. Outletting into existing drainage course.					
25. No manholes in walkways.					
26. Local depression detail shown, if not shown on Street Plans.					
27. Street Station for centerline of CB with width and depth.					
28. Dimension storm drain from center line.					
29. Lot numbers and lot lines shown.					
30. Disposition notes of existing facilities.					
31. Use of collar is prohibited for horizontal change of angle.					
B. Profile					

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1. Adequate depths to top of storm drains.					
2. Correct pipe material used as allowed by agency.					
3. If non-standard storm drain, structural calculations provided.					
4. Stations and elevations grids.					
5. Vertical scale.					
6. Station and elevation called out at:					
a. Beginning and end of storm drains;					
b. Change in grade;					
c. Connection to existing;					
d. Matchlines;					
7. Slopes of storm drains.					
8. Lengths and size called out.					
9. Utilities required as by agency.					

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10. Minimum slopes.					
11. Q, V, and HGL/WS called out if required by the agency.					
12. Maximum velocities met.					
13. Slope anchors per agency requirements.					
14. Proposed and existing surface shown over centerline of storm drain.					
15. Existing surface shown beyond outlet.					
16. Water tight joints called out if under pressure(as required by the agency).					
17. Lateral inlets and elevations shown.					
18. Manhole and centerline shown.					
19. Beginning water surface elevation at outlet correct.					
20. D-Load called out for RCP					
21. Additional cover over or reinforcing velocity reducing rings shown for					

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excessive velocities.					
22. Design HGL 6" below local depression basin Lip					
V. DETENTION BASINS					
A. Adequate side slopes.					
B. Adequate widths at top of berm.					
C. Elevation at top of berm called out.					
D. Protection such as fencing called out.					
E. Length to width ratio adequate.					
F. All weather access to outlet structure with turnaround.					
G. Overland escape provided and detailed.					
H. Outlet structure detailed and matches calculations.					
I. Elevations provided for all outlets and overland escape.					
J. Adequate energy dissipator provided at outlet structure and overland escape.					
K. Maintenance mechanism provided.					

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L. Max water surface called out.					
M. Basin floor elevation called out and slope provided.					
N. Cut off wall detail provided.					