



STORM DRAIN IMPROVEMENT PLAN CHECKLIST

PROJECT NAME _____ PLAN CHECKER _____ DATE _____

	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 Xerographic 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					
D. Consecutively numbered & the total number of sheets					
E. Lettered in a neat and legible style, no hand lettering smaller than 1/8" & no machine lettering smaller than 1/10"					
F. Name and phase of development. Street name & construction limits					
G. City benchmark identification, location and elevation noted					
H. Prepared to appropriate scale(s)					
I. Scale noted. North arrow (oriented up or to right) & bar scale					
J. Use standard plans and details to maximum extent. Check drawing for dimensions shown on plans. Show detail for non-standard improvements					

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K. Note all reference drawings on plans					
L. Clearly designate between existing conditions (dashed) and work proposed (solid)					
M. No duplication of any section or detail designation					
N. Use City standard Title block per Std 6004					
O. Title block w/ "Storm Drain Improvement Plan & Profile" (top line), street name (2 nd line) & limits of construction "From <u>street intersection</u> to <u>XXX' N,S,E,W</u> " (3 rd line)					
P. Acceptance block for Asst. City Engineer recommendation and City Engineer acceptance (public facilities only) per 6004					
Q. All existing and proposed easements clearly shown. Clearly indicate public or private. (City min. width 15')					
R. Review Master Plan of Storm drains for location and size					
S. Compare to Conditions of Approval & approved Tentative Map or Site Plan					
II. TITLE SHEET					
A. Heading "Storm Drain Improvement Plans For ____ In City of Ontario"					
B. Consultant recommendation for acceptance block (public facilities only)					
C. Standard General Notes & construction notes provided. Construction notes match plans					
D. Additional notes are designated as "Special Notes"					
E. Add note stating stationing is per pipe centerline					
F. Basis of bearing provided					
G. 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. Identify areas in County					
6. Show Storm Drain lines, line numbers & size w/ MHs & MH #s					
7. Show catch basins and catch basin #s					
8. Show direction of flow arrows					
9. Identify areas in County					
H. Vicinity Map					
1. Orient north as on index map					
2. Arterial streets shown					
3. Project location shown					
I. Legend					
1. Symbols per City standards 6002-6003					
2. Non-standard symbols and abbreviations used are listed and described					
J. All reference drawings listed					
K. Owners/Developers name and address shown					
L. Separate written justification for deviations provided					
M. Quantity estimates provided and broken out between public and private and per tract if multi-tract project.					
N. Underground service alert					
O. Legal description shown matches title report					
III. HYDROLOGY AND HYDRAULICS STUDY					
A. Hydrology Map					
1. Existing and proposed contours shown.					

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2. Drainage Boundaries shown.					
3. Drainage boundaries do not conflict with contours.					
4. Scale and north arrow shown.					
5. Show area of ponding with water surface elevation to be 1' below FF of building					
6. Improvements shown (streets, storm drains and grading).					
7. Legible map with only necessary information shown					
8. Flow arrows and drainage paths shown.					
9. Show and call out length and area					
10. Q frequency, Tc, & A called out at points of concentration.					
11. Existing condition and proposed condition maps included.					
B. Hydrology Study					
1. Study shows that overall design perpetuates the existing natural drainage.					
2. Storm Q frequency to match existing on OMC. Use Q(100) within NMC					
3. On-site to be designed for Q(100) unless sumps or other retention facilities provided					
4. Diversion within jurisdiction's tolerance.					
5. Outlet condition of flows the same or permission from downstream owner.					
6. Follows jurisdiction methodology or manual.					
7. Appropriate computer program used.					
8. Supporting graphs/charts provided.					
9. Soil type shown.					
10. Lengths and elevations agree with map.					

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11. Area sizes agree with maps.					
12. Appropriate development condition used.					
13. No areas omitted.					
14. Bulking factor added if required by agency.					
15. 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.					
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.					
6. Min. size and spec. allowed for public mains: 24" RCP					
7. Min. CB width 5'. Std 3002-3007, APWA, or LACFCD					
D. 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.					
IV. STORM DRAIN IMPROVEMENT PLANS					
A. Plan View					
1. Horizontal Scale 1"=40'					

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	1 ST Check	2 nd Check	3 rd Check	Mylars	Comments
2. Lot lines, centerline, right-of-way lines, City limits adjacent to project match st imp & FM					
3. Bearings of all street centerlines shown					
4. Horizontal controls provided:					
a. Bearings					
b. Curve data;					
c. BC, EC, PCC, PRC, and angle points called out.					
d. Curve data;					
5. Minimum radii.					
6. Name of street.					
7. Lot lines, frontage distance, & lot numbers same as map. Legal property and map boundary					
8. Existing or proposed improvements shown, identified, & dimensioned (st lts, FH, underground utilities, etc).					
9. Utilities shown for information including water & sewer laterals.					
10. Show all existing pipelines, irrigation lines, structures, power poles, trees, or FH etc in ROW or immediately adjacent to ROW					
11. If more than one sheet, matchline provided and sheet referenced.					
12. At connection to existing, show FL & distance to MH with reference plan called out.					
13. Show only Construction notes used on sheet.					
14. Standard drawings used to maximum extent.					
15. Non-standard items detailed and drawn to scale.					
16. Standard drawings correctly applied and called out. Verify std for dimensions.					

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17. Show existing, proposed, & future ROW. Should conform to St Imp					
18. Public storm drain within Right-of-way or easement:					
a. Easements limits shown (min 15'). Easement not centered on lot line					
b. Easement called out on final map;					
c. If outside of final map, separate document recorded and called out on plan.					
19. Location of Storm Drain per std 1302					
20. Appropriate energy dissipater for outlet point per SBSD _____ .					
21. Appropriate pipe material used.					
22. Show all MH to be adjusted to grade per SBSD _____					
23. Manhole spacing per LACFCD hydraulic manual					
24. Show detail of re channelizing bottom of existing MH where required					
25. No vertical curve in storm drain. Grade break at MH only					
26. Where storm drain lateral connects to main of same size, use MH					
27. Appropriate lining used for open channels.					
28. Cutoff depths for open channel lining are calculated and appropriate.					
29. Restricted access for open channels.					
30. Maintenance access for open channels and storm drain outlets/inlets.					
31. Existing or proposed topo shown at storm drain outlets.					
32. All storm drains in public ROW to be RCP					

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33. Minimum size of SD public mains 24" min.					
34. Secondary outlet 1' below finished floor					
35. Outletting into existing drainage course.					
36. Manhole required at end of storm drain					
37. No manholes in walkways.					
38. Local depression detail shown Std 3004					
39. SD stationing to be independent of street stationing. Show all appurtenances (eg MH, laterals, etc). Begin at CL of lowest MH & increase upstream					
40. Stationing to conform to existing plans					
41. Street station for centerline of CB with width and depth.					
42. Identical station & elevation on consecutive sheets					
43. Station of structures & BC & EC of all curves					
44. Station @ begin & end of improvements & @ CL of driveways					
45. Dimension distance of storm drain from street center line.					
46. Storm drain laterals to be 18" RCP min					
47. Lateral stubs to be extended to PL & stationed					
48. Lot numbers and lot lines shown.					
49. Disposition notes of existing facilities.					
50. Use of collar is prohibited for horizontal change of angle. Must be in manhole					
51. No storm drain allowed under buildings					
B. Profile					
1. Adequate depths to top of storm drains.					

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2. Show minimum depth to top of storm drain					
3. Show 100' stationing @ bottom of profile					
4. If non-standard storm drain, structural calculations provided & app'd by SE					
5. RCB per CalTrans or LACFCD standards does not require SE approval					
6. Stations and elevations grids.					
7. Horizontal scale 1"=40' Vertical scale 1"=4'.					
8. Plan & profile to align					
9. All laterals stationing & profile shown					
10. Station and elevation called out at:					
a. Beginning & end of storm drains;					
b. Change in grade;					
c. Connection to existing;					
d. Matchlines;					
11. Name & CL stationing of intersecting streets					
12. Slopes of storm drains: min grade = 0.10% for mainline					
13. Lengths and size called out.					
14. All utilities & structures crossing shown. Existing structures per as-built drawings. Potholing may be req'd					
15. Minimum clearance or protection required per standard 4001					
16. Q, V, and HGL/WS and control elevations of design storm called out					
17. Maximum velocities met.					
18. Slope anchors per agency requirements.					

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19. Label & show connection to existing SD, existing elevation & grade. Denote existing in parenthesis. Add note to verify FL prior to construction					
20. Proposed and existing surface shown over centerline of storm drain.					
21. SD grade shown correctly					
22. Existing surface shown beyond outlet.					
23. Call out pressure manholes where necessary					
24. Lateral inlets and elevations shown.					
25. Manhole and centerline shown.					
26. Manholes & junction structures per std 30XX – 30XX or APWA std XXX					
27. Label & show station & elevation @ end of SD, rim & inverts of MH					
28. No min. drop between inlet and outlet required. Maintain slope (inlet or outlet) through manhole. No grade breaks within MH					
29. Beginning water surface elevation at outlet correct.					
30. D-Load called out for RCP per LACFCD					
31. Show location & bottom or top elevation of all crossings or parallel pipes or structures that might enter into design					
32. Additional cover over or reinforcing velocity reducing rings shown for excessive velocities.					
33. Design HGL 6" below local depression basin Lip					
34. Elevations in profile match plan					
V. DETENTION/RETENTION BASINS					
A. Designed to detain post development Q(100) flows above pre development condition. Provide sizing calcs & tables					

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B. Maximum side slopes 2:1.					
C. Side slopes stabilized from erosion					
D. Basin has single point of entry					
E. County of Orange desilting basin acceptable. Show detail.					
F. Basin shown per SWPPP & CASQA std ###					
G. Adequate widths at top of berm.					
H. Elevation at top of berm called out.					
I. Protection such as fencing called out.					
J. All weather access to outlet structure with turnaround.					
K. Overland escape provided and detailed.					
L. Outlet structure detailed and matches calculations.					
M. Elevations provided for all outlets and overland escape.					
N. Adequate energy dissipator provided at outlet structure and overland escape.					
O. Maintenance mechanism provided.					
P. Max water surface called out.					
Q. Basin floor elevation called out and slope provided.					
R. Cut off wall detail provided.					

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