

## DESIGN ENGINEER'S CHECKLIST #D2 – REQUEST FOR DETAILED DESIGN APPROVAL

DEVELOPMENT TITLE

STAGE

PLANNING PERMIT  
NUMBER

CONSULTANT'S  
REFERENCE

DEVELOPER'S  
REPRESENTATIVE

NUMBER OF  
PLANS IN SET

CHECKLIST #D2		
ITEM	Y / N / NA OR COMMENT	DESIGNER'S INITIALS
<b><u>General Design Requirements</u></b>		
Is the detailed design in accordance with the planning permit conditions and the endorsed plan, and has the physical design features been incorporated on construction plans.		
Has the Plan of Subdivision has been certified at the time of this submission?		
Is the detailed design in accordance with the plan for certification?		
Are the easement locations and widths in accordance with certified plan?		
Is the detailed design in accordance with Council's Infrastructure Design Manual?		
Has environmental protection during development construction been considered and requirements are documented (e.g. erosion protection, silt migration etc.)?		
Have revegetation requirements been considered and are documented?		
Has protection of water bodies and waterways been considered and requirements are documented?		
Have the necessary consents been obtained from other service authorities? List consents received below:		
<b><u>General Plan Requirements</u></b>		
Is the drawing list included?		
Are Council-nominated drawings numbers shown?		

CHECKLIST #D2		
ITEM	Y / N / NA OR COMMENT	DESIGNER'S INITIALS
Is there a locality plan included?		
Is the north arrow shown on all layout plans and detailed plans (should be shown up or to left).		
Do all plans have correct scales shown?		
Do all plans have comprehensive legends?		
Do plans include standard notes? Are they applicable and clear?		
Do plans clearly show allotment layout, numbered allotments, all dimensions, reserves and easements?		
Is the limit of works shown on all layout plans?		
Are all dams, wells, depressions and watercourses and fill requirements identified?		
Are existing fill areas shown?		
Are existing features and structures shown?		
Are existing service locations and poles shown?		
Are existing trees shown? Does the design attempt to retain trees?		
Is existing native vegetation shown and suitably specified? Does design attempt to retain significant native vegetation?		
<b><u>Road Layout Plans</u></b>		
Is the datum shown to AHD?		
Are scales in accordance with the Manual requirements?		
Are PSM's and TBM's marked on the plans?		
Are proposed service locations and offsets tabulated?		
Are all required service conduit locations are indicated on the plans?		
Are footpaths a minimum width of 1.5 m and located at correct offset?		
Are shared paths minimum width of 2.5 m, and is their location clearly shown?		
Are kerb crossings at appropriate locations and <u>fully</u> documented?		
Are vehicle crossings shown on plans?		

CHECKLIST #D2		
ITEM	Y / N / NA OR COMMENT	DESIGNER'S INITIALS
Do all vehicle crossings cater for a standard car?		
Are any crossings located over easements?		
Are any crossings located closer than 9m to the intersection?		
Have all turning movements been checked and intersections designed accordingly?		
Are street names acceptable to Council shown on plans?		
Are road widths between inverts of kerbs nominated?		
Are kerb profiles nominated?		
Are road chainages shown?		
<b><u>Street Name Signage, Linemarking, and Traffic Control Plans</u></b>		
Are the locations and type of all new signage complying with the Australian Standards shown on plans?.		
Is any existing signage to be removed or relocated shown on plans?		
Are the locations and type of all linemarking complying with Australian Standards shown on plans?		
Is any existing linemarking to be removed shown on plans?		
Are traffic calming devices designed and documented in accordance with Austroads " <i>Guide to Road Design</i> " and any VicRoads supplement to those guidelines, with the Manual, and with the accepted functional layout plan?		
Does the limit of works of roads include temporary turning area if required?		
Has the necessary 'No Road' signage or hazard markers been provided?		
<b><u>Road Longitudinal Sections</u></b>		
Are road names shown on longitudinal sections?		
Are scales in accordance with the Manual requirements?		
Is the Datum RL to AHD shown?		
Are natural surface profile and levels shown at crown?		
Are design surface profile and levels shown at crown?		

CHECKLIST #D2		
ITEM	Y / N / NA OR COMMENT	DESIGNER'S INITIALS
Have levels been checked by Design Engineer, do they comply with Manual, and match into existing surfaces?		
Is depth of cut/fill to crown shown?		
Are design surface profile and levels shown at left and right back of kerb (including high and low points)?		
Are grades as + or – percent to two (2) decimal places shown in direction of chainages?		
Have grades been checked by Design Engineer, and do they comply with Manual, and match into existing grades.  Min. grade = % Max. grade = % Match existing?		
Are all vertical curve lengths and I.P values shown?		
Are vertical curve levels shown at maximum intervals of 10 metres?		
Are minimum kerb grades achieved?		
Have levels and grades given on long sections been checked by the Design Engineer?		
Do levels and grades match into existing abutting roadworks?		
Is the minimum length of vertical curve for >1% grade change, 15 m (except on kerb returns).		
Does the external road grading for future stages extend a minimum of 100 metres beyond the limit of works?		
Does the vertical curves and longitudinal grades provide satisfactory sight distances for standard roads, particularly at intersections?		
Has the coordination of vertical and horizontal curves provided a desirable design outcome?		
<b><u>Road Cross-Sections</u></b>		
Has the Design Engineer checked that cross-sections agree with longitudinal sections?		

CHECKLIST #D2		
ITEM	Y / N / NA OR COMMENT	DESIGNER'S INITIALS
Is the datum is shown on every cross-section?		
Do scales comply with the Manual?		
Are road names and chainage references shown?		
Are natural and design levels given at: <ul style="list-style-type: none"> <li>• Back of kerb?</li> <li>• Lip of kerb?</li> <li>• Crown?</li> <li>• Property lines?</li> <li>• Front of footpath?</li> <li>• Table drain inverts (where applicable)?</li> <li>• Top and toe of batters (where applicable)?</li> </ul>		
Are all pavement, nature strip, footpath and batter crossfalls in accordance with the Manual?		
<b><u>Typical Cross-Sections and Traffic/Road Details</u></b>		
Are typical cross-sections presented in accordance with the 'Information to be Shown on Plans' requirements of the Manual?		
Are road name and chainage references noted, if applicable?		
Are profile and geometry of design surface grades shown as % or 1 in X and comply with Manual requirements?		
Are details of road pavement construction, including materials, compaction and type of seal shown?		
Are details of footpath construction, including materials, compaction and seal shown, or is the relevant standard drawing noted?		
Are typical alignment of services, subsoil drainage and landscaping shown?		
Are kerb and channel types are nominated?		
Is kerb and channel construction detailed or standard drawings noted?		

CHECKLIST #D2		
ITEM	Y / N / NA OR COMMENT	DESIGNER'S INITIALS
<b><u>Intersection, Court and Curve Details</u></b>		
Are road names shown?		
Are road chainages shown?		
Are intersection details shown at correct scales in accordance with Manual?		
Are at least four kerb levels given on every kerb radial?		
Do tangent point levels and chainages align with longitudinal and cross sections?		
Are set-out details shown including angle, radii and tangent points?		
Are design Surface contours shown to AHD at 50 mm maximum intervals?		
Are back of kerb levels shown to AHD?		
Are footpath levels shown?		
Are locations of low points shown?		
Are services (including drainage) shown in detail?		
Is landscaping shown in detail?		
Are footpath and kerb crossings shown in detail?		
<b><u>Drainage Layout Plans</u></b>		
Has the Design Engineer checked that drainage design in accordance with AR&R?		
Is the datum shown to AHD?		
Are scales in accordance with the Manual requirements?		
Are PSM's and TBM's marked on plans to AHD?		
Are finished surface levels shown where the natural surface is altered?		
Do plans clearly show allotment layout, numbered allotments, reserves and easements?		
Are 1 in 100 year flood levels shown?		
Are road names shown?		

CHECKLIST #D2		
ITEM	Y / N / NA OR COMMENT	DESIGNER'S INITIALS
Do plans show layout of proposed drainage systems with offset from property boundaries?		
Are pipe materials and diameters shown?		
Are all concrete pipes RRJ only?		
Do all non-concrete pipes have Council acceptance?		
For all non-concrete pipes is there a note on the plan stating that all bedding, laying, jointing and backfilling is to be in accordance with manufacturer's specifications?		
Is the overland flow path accepted by Council shown?		
Is the kerb and channel and footpath depressed where the overland flow path leaves the road pavement?		
Are subsurface drains, house drains and property inlets shown?		
Are pits at appropriate locations (e.g. away from kerb returns, vehicle crossings, kerb crossings etc.)?		
Is the maximum pit spacing 80m?		
Has the pit capacity checked by the Design Engineer?		
Are double SEP's confined to low points only?		
Are all changes in angle not greater than 90°?		
Are all pits/headwalls numbered?		
Is the set-out point of pits clearly shown on legend?		
Do footpath spoon drains have adequate outfall?		
Has back of kerb drainage (e.g. roundabout kerbs) adequate outfall?		
Are existing fences, buildings, trees and obstructions shown in path of overland flows?		
Are all proposed fences, buildings, trees and obstructions shown in path of overland flows?		
Are existing or proposed open earth drains, dams, watercourses, boreholes, sink holes, wells and springs within the area shown?		
Is the extent of required erosion protection at headwalls and other structures shown?		

CHECKLIST #D2		
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Are the details of all drop structures required shown?		
Do all properties have identified drainage discharge points (to underground drainage systems for industrial and commercial developments, and residential wherever possible)?		
<b><u>Drainage Longitudinal Sections</u></b>		
Have longitudinal sections been prepared for all legs of drainage, open drains, and nominated overland flow paths?		
Are scales in accordance with the Manual requirements?		
Is there a comprehensive legend shown?		
Is datum RL to AHD shown?		
Are drainage line numbers names shown on longitudinal sections?		
Are drainage line chainages shown on longitudinal sections?		
Do any lengths of drainage sections exceed the maximum permitted of 80 metres?		
Is the pipe diameter, class and grade shown for all legs of drainage?		
Have pipe classes been determined with consideration to construction loads and final cover?		
Has a cross-check with compaction requirements in documentation been carried out?		
Do pipes with steep grades include anchor blocks?		
Is pit number and pit type shown?		
Do pit type match capacity requirements?		
Are any special pits fully documented?		
Are internal pit dimensions shown?		
Are pit inlet and outlet levels shown?		
Are depths of pits to invert levels shown?		
Are finished top of pit levels and finished surface level adjacent to pits shown?		
Are pit lid type and class shown?		



CHECKLIST #D2		
ITEM	Y / N / NA OR COMMENT	DESIGNER'S INITIALS
Are origin/destination pits for inlet and outlets shown?		
Are junction line numbers noted?		
Are design pipes plotted on longitudinal section?		
Is the hydraulic grade line plotted and levels given?		
Is the depth x flow factor acceptable?		
Has the minimum 150mm freeboard to kerb invert been achieved for minor storms?		
Have all the energy losses in drainage system been accounted for?		
Has all crosses with other services been plotted and clearances nominated (street names should be referred to identify crossings)?		
Are design flows shown in litres/second?		
Are design velocities, complying with the manual shown (metres/second)?		
Is FCR backfill specified under road pavements, footpaths, crossovers and building lines?		
Has the location and type of special backfill requirements been noted (e.g. to prevent piping of backfill material)?		
Is the design in accordance with AS3725 and its commentary?		
<b><u>Open Drains</u></b>		
Is the shape of drain suitable for maintenance?		
Is the drain accessible from both sides and all-weather tracks provided?		
Is the depth of floodways shown on cross-sections? Is the depth less than 1.5 metres?		
Were scour velocities and siltation both checked in determining longitudinal grades?		
Are grade control / drop structures fully documented?		
Has the low-flow pipe been provided in accordance with the Manual?		
Are outfall structures energy dissipators provided as required?		
Has the 300mm minimum freeboard been achieved?		

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ITEM	Y / N / NA OR COMMENT	DESIGNER'S INITIALS
<u>Detail Plans</u>		
Non-standard drainage structures are fully detailed for construction - headwalls - drop structures - erosion protection at outlet structures - erosion protection for batters where needed.		
Non-standard pits are fully documented including reinforcement and pit lid details.		
Structural details of all retaining walls are shown, as well as details of natural surface levels and design surface levels, foundation requirements, drainage requirements, and type of finish.		
Details of street furniture.		
Drainage pump stations fully documented.		
Layout and details of power installation documented.		
Details of any estate entrance structures, including structural details, location details and method of finish.		
Traffic calming devices are fully detailed to ensure construction is in accordance with design requirements (e.g. splitter islands, chicanes, speed humps, roundabout construction).		
<u>Lotfilling Plans</u>		
Are natural surface contours shown with 50 mm maximum intervals?		
Are design surface contours shown with 50 mm maximum intervals?		
Are finished surface levels shown? Do all allotments have minimum 1 in 200 grade toward low point?		
Are 1%AEP flood levels shown on plans? Are all lots to be filled above this level?		
Is proposed fill in excess of 300mm clearly denoted on plans?		
Are material and compaction requirements, complying with the relevant Australian Standard, fully documented in the plans and specifications?		
Is the extent of lotfilling, top and toe of batters and retaining walls all noted?		
<u>Drainage Retardation and Treatment</u>		
Are computations provided to verify the volume of the basin?		

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Is erosion protection fully documented?		
Are inlet structures fully documented?		
Is the overflow identified and appropriate?		
Has the minimum freeboard been achieved?		
Do wetland plantings have alternative source of water for establishing plants and for periodic dry spells?		
<b><u>Master Services Plans</u></b>		
Do plans show numbered allotments, road reserves and road carriageways?		
Are street light types nominated for acceptance?		
<u>Are ALL</u> underground service alignments shown, including non-essential services such as gas, raw water and irrigation lines, fire hydrants, fire plugs and street trees?		
Are ALL major aboveground features shown such as street lights, power supply pillars, fencing, street trees, and landscaping etc?		
<b><u>Landscaping Plans</u></b>		
Is detailed irrigation layout plans provided showing valves, controllers, pipe material and sizes, alignments, nozzle details, and backflow devices?		
Is the planting schedule included, including size of plants?		
Is the location of major plantings clearly shown?		
Are planting requirements documented including dimension of hole, root barrier, backfill, mulch, stakes, tree grates, tree guards, and stakes?		
Is street furniture detailed including type, colour, location and installation?		
<b><u>Associated Documents</u></b>		
If required, was a TMAR prepared and accompanies this submission?		
If required, was a TIAR prepared and accompanies this submission?		
If required, was a Road Safety Audit Report prepared and accompanies this submission?		
Is there a note provided for any deviations between the proposed design and the recommendations within the Road Safety Audit report?		

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ITEM	Y / N / NA OR COMMENT	DESIGNER'S INITIALS
Are hydrological calculations provided for whole of catchment and partial areas if relevant, and 100yr ARI design flows calculated at critical points? (Method nominated and assumptions clearly stated ARI's in accordance with Manual.)		
Are hydraulic calculations provided for above and underground drainage, for major and minor storm events. (Method nominated and assumptions clearly stated. Roughness coefficients nominated)?		
Has there been a copy of geotechnical reports provided with the submission?		
Is the road pavement design provided with the submission?		
Are quality assurance sections included in the specification?		
Is a risk assessment report provided for drainage retardation and treatment Infrastructure?		
Are operation and maintenance (O&M) manuals provided with this submission?		
Are structural computations provided, where applicable, with this submission?		

The plans, specifications and associated documents provided with this submission for detailed design approval have been prepared in accordance with the relevant sections of Council's Manual. All of the above checklist items have been initialled as correct and complete, or marked N/A (not applicable) as appropriate.

Signed \_\_\_\_\_

Dated \_\_\_\_\_