DCL 01

ROADS AND TRANSPORT DEPARTMENT

File reference: V9/1/2/1-

Wayleave Number:

CHECKLIST FOR CONSTRUCTION DRAWINGS: ROADS AND STORMWATER DRAINAGE INFRASTRUCTURE

PROJECT DESCRIPTION:					
CONSULTANT NAME:		**Address:**			
Contact person:		**Fax:**		**e-mail:**	
		Tel:		**Cell:**	
Application letter reference:				**Date:**	
Reference numbers of all drawings issued:				**See attached list:**	

EXAMINERS: All designs for approval must be circulated to officials in this descending order and signed off in order before circulating to the next official.

Section/ Sub section within Roads and Transport Department		**Name of official Axaminers:**	**Room no.**	**Tel:**	**e-mail:**
Integrated Roads Planning (IRP)		Ben Molleman	B212	082 3723654	benmol@tshwane.gov.za
Integrated Stormwater Planning (ISP)		Chris Etsebeth	B206	082 7799274	chriset@tshwane.gov.za
Integrated Public Transport Planning (IPTP)	Public transport Facilities, Bus and Taxi Facilities	Lerato Seakamela	A503	074 7214732	leratosea@tshwane.gov.za
Traffic System Management (TSM)	Traffic Calming, None motorized transport, Pedestrian Facilities	Nomsa Sibanyoni	A309	083 5951283	nomsas@tshwane.gov.za
		Amo Mithala	A306	071 7889173	amom@tshwane.gov.za
Intelligent Transport Systems (ITS	Street names	Thubeni Ntakakaze	A320	012 3854835	ThubeniN@tshwane.gov.za
Infrastructure Asset Management (IAM)	Traffic Signs and Markings	Jaco Cronje	C206	082 5511577	jacocr2@tshwane.gov.za
	Stormwater and Bridge structures	Gerrit Lotter	C215	083 2564503	gerritl@tshwane.gov.za
Infrastructure Provision (IP)	Structural Engineering	Jill Hesse	B401	0123587794	jillh@tshwane.gov.za
	Roads and Stormwater	Werner Bruhns	B406	082 7867482	wernerbru@tshwane.gov.za

INTERNAL DISTRIBUTION LIST FOR CHECKING OF DRAWINGS:

DATE SENT	**BY** (Indicate IRP/ISP/IPTP/TSM/IAM/IP)	**TO** (Indicate IRP/ISP/IPTP/TSM/IAM/IP)	**DATE RECEIVED**	**DATE COMPLETED**	**Section**	**Initial if in order**	**Items not accepted**
	Registration	IRP			IRP		
	IRP	ISP			ISP		
	ISP	IPTP			IPTP		
	IPTP	TSM			TSM		
	TSM	ITS			ITS		
	ITS	IAM			IAM		
	IAM	IP			IP		

ACCEPTANCE:

THE SET OF DRAWINGS IS ACCEPTED FOR CONSTRUCTION PURPOSES.	

TAKE NOTE: Drawings will only be accepted as a complete set when all outstanding information has been provided and errors have been rectified. No construction work may commence unless the service agreement and all drawings are accepted, and Infrastructure Provision Section has been notified of the starting date and the person responsible for site supervision is approved. Two additional sets of the accepted drawings must also be provided to the Infrastructure Provision Section.

ITEMS TO BE CHECKED		Responsible section	Checked by Engineer	Accepted by CoT		COMMENTS The Engineer must comment if deviating from CoT's requirements
				YES	NO	
1. SETTING OUT WORKS						
1.1	A layout plan must be provided, with sufficient information for setting out the works, i.e. coordinates, offsets, reference pegs, benchmarks and dimensions.	IP				
1.2	Adjacent cadastral information must be shown.	IP				
1.3	Correct geodetic system.(WG84)	IP				
1.4	Erf numbers	IP				
1.5	There must be a clear distinction between existing and proposed works according to official notation. It should be clear what has to be built.	IP				
2. ROADS						
2.1	**GEOMETRICAL DESIGN (according to Guidelines for Human Settlement Planning and Design (2005) Volume 2, Chapter 7, UTG 7 part 3,7 & 8 as well as Standard Design Details for Roads and Stormwater Drainage Infrastructure (CoT))**					
2.1.1	A layout plan must be provided, showing the road classification (Classes 1 to 5f) as well as all other relevant information such as street names, erf numbers, cadastral information, dimensions etc.	IP				
2.1.2	Indicate position of all services exposed during wayleave crosscut stage on layout plan to scale.	IP				
2.1.3	Street widths must be indicated on layout plan and cross-sections and must correspond to the road reserve width in terms of the CoT's Standard Design Details.	IRP				
2.1.4	Reserve widths must be indicted on layout plan and cross-sections and must be in terms of the CoT's Standard Design Details.	IRP				
2.15	Position of streets in road reserves (on layout plan and cross-sections).	IP				
2.1.6	Evaluate proposed geometrical layout in terms of adjacent layouts.	IP				
2.1.7	Minimum center-line radii of bends.	IP				
2.1.8	Making bends wider on Class 4 roads where minimum radius of 150m is not possible.	IP				
2.1.9	Setting-out information for horizontal curves.	IP				
2.1.10	Radii of bell mouths according to standard detail drawings.	IP				
2.1.11	Turning circles at cul-de-sacs.	IP				
2.1.12	Chainages must be indicated at 20m intervals on longitudinal-sections (10m intervals in low points) and at 100m intervals on the layout plan.	IP				
2.1.13	The minimum gradient of streets is 0.67% (1:150).	IP				

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							YES	NO	
2.1.14	Maximum gradient:				IP				
	Class	**4**	**5a**	**5b-f**					
	Slope	1:10 max. (10%)	1:8 max. (12,5%)	1:5 max. (20%)					
	Length	100m max.	70m max.	50m max.					
2.1.15	The maximum gradient for a steep road to join a cross-road, is 6% for a distance of at least 20m.				IP				
2.1.16	K-values must be indicated. (Also check K-values at street intersections, specifically at intersections with cambered roads).				IP				
2.1.17	Super elevation for Class 4 roads.				IP				
2.1.18	Check sight distances (horizontal and vertical) especially for intersections where there is no stop street or traffic light in the higher order road.				IP				
2.1.19	In low points (Class 4 and 5 roads), a minimum difference in level of 30mm (0,3% effective) must be maintained over every 10 m chainage.				ISP				
2.1.20	Vertical alignment must be adapted to existing streets, and provision must be made for future street extension where applicable.				IP				
2.1.21	Check clearance between kerb edge and erf boundary on curves and bell mouths.				IP				
2.1.22	Taxi and bus bays at Class 3 and Class 4 roads.				IPTP				
2.1.23	Traffic calming measures.				TSM				
2.1.24	Traffic signs and road-markings.				TSM				
					IAM				
2.1.25	Road-markings.				TSM				
					IAM				
2.1.26	Street names: Check correct spelling in terms of approved Township Layout Plan				ITS				
2.1.27	Street name sign boards and poles: Check whether detail drawings are in accordance with CoT Standard Details STD018				TSM				
2.1.28	Temporary deviations and road works must be shown on the drawings. Indicate accommodation of traffic and pedestrians during construction.				TSM				
					IAM				
2.1.29	An approved plan from relevant provincial authority must be provided for all road intersections at provincial roads.				IRP				

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				YES	NO	
2.2	**CROSS-SECTIONS**					
2.2.1	Typical road cross-sections must be provided for each specific case indicating position and dimensions of all elements	IP				
2.2.2	Design cross-sections must be provided at 20 m intervals.	IP				
2.2.3	Location and sizes of existing services must be indicated on design cross-sections.	IP				
2.2.4	It must be possible for stormwater to flow into the street from the high side of the street.	IP				
2.2.5	Every erf must have access at a maximum gradient of 1:5.	IP				
2.2.6	The maximum gradient from the street to the erf boundary, excluding the erf access, is 1:3.	IP				
2.2.7	Correct kerb type according to SABS 927-1069 must be indicated for different road-widths on cross-sections and road layout plan.	IP				
2.2.8	The minimum cross-fall of roads is 3%.	IP				
2.2.9	Single cross-fall is acceptable for street widths less than 5m.	IP				
2.2.10	Single cross-fall must be against the natural slope.	IP				
2.3	**PAVEMENT DESIGN (according to Guidelines for Human Settlement Planning and Design (2005) Volume 2, Chapter 8 and TRH 4)**					
2.3.1	A layout plan must be provided, indicating the road category (UA, UB, UC or UD) and the traffic classification (ER, E0, E1, E3, E2 or E4) of all streets.	IP				
2.3.2	Indicate the position of centerline soil tests as well as test results (CBR at 90% of modified AASHTO density and PI) on plan.	IP				
2.3.3	Provide cross-sections for the alternative pavement designs, indicating pavement materials, abbreviated specifications and compaction requirements.	IP				
2.3.4	Where the gradient is steeper than 1:8 (12,5%), concrete paving is recommended.	IP				
2.3.5	Concrete block paving for streets and roadways: 80mm interlocking paving blocks (light grey). Type S-A	IP				
2.3.6	Concrete block paving for walking areas: 60mm oblong blocks (light grey) or 50mm cottage stone (200x150). (No Interlocking Pavers)	IP				
2.3.7	Cycle path surfacing to be confirmed with TSM and pavment design to be approved by IP	IP				

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				YES	NO	
3. STORMWATER (according to SANRAL Drainage Manual, 6th Ed.)						
3.1	**HYDROLOGY**					
3.1.1	A contour plan must be provided, showing sub-catchment areas, run-off, design rainfall frequency and the general stormwater layout.	ISP				
3.1.2	Design return periods for the minor and major systems must be shown on the plan and must be according to the policy.	ISP				
3.1.3	Design receiving capacity for the minor and major systems must be shown on the plan and must be according to the policy	ISP				
3.1.4	The 1-in-50-year flood line and 1-in-100-year flood line must be shown and certified according to the National Water Act.	ISP				
3.1.5	A copy of the WULA (for all proposed outlets and work below the flood line) from DWS must be provided.	ISP				
3.2	**LAYOUT**					
3.2.1	A detailed stormwater layout plan must be provided.	ISP				
3.2.2	The stormwater layout must correspond with stormwater master plan.	ISP				
3.2.3	Indicate stormwater servitudes. Are stormwater servitudes adequate?	ISP				
3.2.4	Are all low points drained?	ISP				
3.2.5	It must be indicated on the layout plan whether roads are camber or cross-fall. (Cross falls should always be against the natural slope).	ISP				
3.2.6	All erven except special residential and park erven must be provided with stormwater connections. Indicate exact position.	ISP				
3.2.7	Concentrated surface-runoff from undeveloped higher laying areas must be conveyed into the system by means of berms and field inlets.	ISP				
3.2.8	Stormwater systems from adjacent Provincial or National roads must be indicated. Surface-runoff as well as concentrated stormwater from adjacent roads must be catered for.	ISP				
3.2.9	The minor event must be drained before all road intersections.	ISP				
3.2.10	Reflect all existing services on stormwater layout to confirm position of crossings.	IP				
3.2.11	Position of stormwater pipe in road reserve according to standard drawings. Check that dimensions are indicated for stormwater systems in servitudes.	IP				
3.3	**PIPE, BOX CULVERTS AND CANALS**					
3.3.1	Provide longitudinal sections for all stormwater pipes, culverts and canals.	IP				
3.3.2	Location and sizes of existing services must be indicated on longitudinal sections.	IP				
3.3.3	The Hydraulic Grade Line (HGL) level must be indicated on the stormwater long-sections.	ISP				

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				YES	NO	
3.3.4	The Energy Grade Line (EGL) level must be indicated on the stormwater long-sections.	ISP				
3.3.5	Provide all hydraulic information, namely Q design, Q available, velocity, as well as recurrence interval.	IP				
3.3.6	Minimum gradient of stormwater pipe is 0,67% (1:150). Road Crossings, 1% (1:100)	ISP				
3.3.7	Minimum gradient for unlined canals at outlet structures is 0,5%.	IP				
3.3.8	Minimum diameter of stormwater pipes is 450 mm.	IP				
3.3.9	Pipe classes according to design tables.	IP				
3.3.10	Spigot and socket joint pipes in dolomitic and other problem areas.	IP				
3.3.11	The minimum cover in the road reserve and servitudes must be 1 m, otherwise apply special measures to be apporved by officials.	IP				
3.3.12	Stormwater pipes must be joined soffit to soffit.	IP				
3.3.13	Is the pipe capacity greater than the design flow?	IP				
3.3.14	Extension/enlargement of stormwater pipes to provide for existing or future developments.	ISP				
3.4	**JUNCTION BOXES, MANHOLES, CATCHPITS AND OUTLET STRUCTURES**					
3.4.1	All junction boxes, manholes, kerb inlets, grid inlets, field inlets and outlet structures must be indicated in the stormwater layout plan.	IP				
3.4.2	Detail drawings of non standard or deep junction boxes and manholes must be submitted.	IP				
3.4.3	Ensure that junction boxes, manholes, kerb inlets (KI's) and outlet structures are according to standard detail drawings.	IP				
3.4.4	Junction boxes must be built up to 300 mm below the final ground level.	IP				
3.4.5	Stormwater layout at intersections must be according to standard detail drawings.	IP				
3.4.6	The directional change of pipes at junction boxes must be less than 60º.	IP				
3.4.7	Manholes (MH) must be provided for all stormwater structures. If there is a special request not to provided and MH access for teh JB Strcutures it must be presented for approval.	IP				
3.4.8	Manholes must be in accordance with standard detail drawings and equipped with medium duty precast concrete covers and frames(SABS Type 4). Manholes in the carriage way must be equipped with heavy duty cast iron covers and frames (SABS Type 4).	IP				

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				YES	NO	
3.4.9	Distinguish between junction boxes and manholes. This must be indicated in the layout plan as well as longitudinal sections.	IP				
3.4.10	Are there catch pits at all low points and linked to road chainages? Compare position on the road longitudinal section.	IP				
3.4.11	The length of catch pits and transitions must be shown on the drawings.	IP				
3.4.12	Kerbs and transition sections according to detail drawings. Note on drawings that precast sections conform to SABS 927-1969 specifications.	IP				
3.4.13	Existing erf accesses must be shown. Catch pits and manholes must not obstruct erf accesses. In residential townships, catch pits must be placed in front of the northern portion of the erf, as garages are usually placed on the southern portion of the erf.	IP				
3.4.14	Check flow velocity for possible erosion or siltation at outlet structures.	ISP				
3.5	**CANALS AND SPRUIT CHANNEL IMPROVEMENT**					
3.5.1	The applicant must submit proof of authorization to undertake channel/ spruit improvements as contemplated in the National Environmental Management Act, 1998 (Act 107 of 1998) and the latest listing notice published in terms of the Act.	ISP				
3.5.2	Longitudinal sections of channel/spruit improvements must be provided.	ISP				
3.5.3	Minimum gradient of a channel is 0,67% (1:150).	ISP				
3.5.4	Typical cross-sections of channel/spruit improvements must be provided.	ISP				
3.5.5	Cross-sections of the channel/erosion improvements must be provided at least every 20 m.	ISP				
3.5.6	Details of channel lining: materials, weep holes, expansion and construction joints, compaction etc. must be shown on plan.	IP				
3.5.7	All hydraulic information, namely Qdesign, Qavailable, flow velocity, recurrence interval, etc. must be provided.	ISP				
3.5.8	Permissible flow velocity for specified lining/erosion protection.	ISP				
3.5.9	Is channel capacity greater than design flow?	ISP				
3.5.10	Is freeboard indicated and specified?	ISP				
3.5.11	Are there potential erosion problem areas?	ISP				
3.5.12	Side slope of grassed channels must be at least 1:3.	ISP				
3.5.13	Stormwater/culverts/channels over private land: A stormwater servitude must be registered in favor of CoT. A copy of the title deed must be provided.	ISP				

ITEMS TO BE CHECKED		Responsible section	Checked by Engineer	Accepted by CoT		COMMENTS The Engineer must comment if deviating from CoT's requirements
				YES	NO	
4. NON-MOTORISED TRANSPORT(NMT) (Detail design drawing must be submitted)						
4.1	Indicate all existing Pedestrian facilities. (Walkways, Ramps and cycle lanes)	TSM				
4.2	All development/s other than Residential 1 must provide walkways along their property boundaries or along all new road construction unless otherwise approved.	TSM				
4.3	Walkway width according to Table A of CoT Standards Details STD 008	TSM				
4.4	NMT detail pavement design.	TSM				
4.5	Position of Walkway. To be confirmed and implemented according to Tshwane standards. Adjacent to the kerb or positioned away from the Kerb line.	TSM				
4.6	Position of Pedestrian crossings at intersections and mid blocks.	TSM				
4.7	Correct Road markings for applicable scenario at crossings. (RTM / GM)	TSM				
4.8	Pedestrian ramps to be provided according to Table A of CoT Standard Details STD 009 to provide Universal Access.	TSM				
4.9	Incorporate all furniture in the road reserve that might impact on the implementation of the NMT facilities. (Manhole/s, poles, street furniture, electrical structures, Water meters, trees, etc.)	TSM				
4.10	Cycle Lanes	TSM				
5. OTHER REQUIREMENTS						
5.1	Provide new sleeves for future Electrical and Electronic communication services. A minimum of 2x110 sleeves per crossing or as per design requirements.	IP				
5.2	Details drawings for sleeves with end-caps, pull-wires and kerb markings, must also be provided. Sleeves must be adequately marked. See STD 007.	IP				
5.3	Work must be done in accordance with the Standard Specification for Municipal Civil Engineering Works (2005). This must be shown on the drawings by means of a note.	IP				
5.4	The latest Standard Construction Details and Design Standards for Roads and Stormwater Drainage Infrastructure of the City of Tshwane by means of a note.	IP				
5.5	Confirm whether bridge structural drawings have been approved. An approval letter must be provided as evidence.	IP				
5.6	Stormwater pipes/culvert/channels through park areas: Submit proof of consent from relevant department.	ISP				
5.7	A copy of the Environmental Authorization for the proposed township from GDARD must be provided.	ISP				
5.8	Confirm whether a service agreement has been approved. A signed copy of the services agreement (Signed by Developer and CoT) must be provided as evidence.	ISP				