CITY OF SUGAR HILL

ENGINEERING CHECKLIST FOR SITE DEVELOPMENT PLANS

Review #1: _____ Review #2: _____ Review #3: _____
Review Date: _____ Review Date: _____ Review Date: _____
Reviewer: _____ Reviewer: _____ Reviewer: _____

PROJECT NAME: _____

PROJECT LOCATION: _____

TAX PARCEL #(s): _____

✓ OK **X** Revision Required **N/A** Not Applicable **N/R** Not Required **?** Additional Information Required

ALL PLANS MUST INCLUDE:

Reviews 3rd	2nd	1st			Corrected on Page #
			1	**EXISTING CONDITIONS**	
			a.	Topographic map showing contour interval of no more than two (2) feet.	
			b.	Delineate land subject to flooding from past history of flooding or by hydrological calculation. (100-year). Must be shown on all sheets.	
			c.	Flood Study required to determine flood plain elevation.	
			d.	FFE of structures shall be shown (including basements) on plans for structures located in or adjacent to a flood plain. If more than one structure, indicate by lot or unit number.	
			e.	Location of utility lines, on or adjacent to property. Specify if lines are in easement or right-of-way. Show location of any transmission towers or poles.	
			f.	Provide utility company (GA Power, Gas company, etc.) approval for work within their utility easement	
			g.	Size and location of existing sewers, water mains, drains, culverts, etc. on or adjacent to property. Reflect inverts of all existing drainage and sanitary sewers structures.	
			h.	Site design elevations to be referenced to Mean Sea Level.	
			i.	Source of elevation datum. Show on site bench mark.	
			j.	Boundary information (bearing and distances, property tie-down).	
			k.	Buffers labeled on all sheets	

3rd	2nd	1st			Corrected on Page #
			2	**PROPOSED CONDITIONS**	
				STREETS	
			a.	Acceleration/deceleration lanes at entrance (200' length / 50' taper / 12' width)	
			b.	Proposed names or designations.	
			c.	Continuation of existing streets (where possible).	
			d.	Sidewalks (6.13.1) –2’ from curb, 5’ wide/4” thick, Class B,concrete 3000 psi - 28 days	
			e.	No half-streets.	
			f.	Angle between the centerlines at intersection shall be at right angles (85 deg. Min.)	
			g.	Cul-de-sac street design (less than 200' in length - eyebrows only at right-angle intersections)	
			h.	Minimum Centerline offsets and intersections separation: Local/Minor: 125' res. and 200' nonres. Major: 600'	
			i.	Minimum right-of-way and pavement widths:	

Principal Arterial	ROW	Min. Roadway
Urban	120'	6 thur lanes
Controlled access	150'	6 thru lanes
Major Arterial	100'	Undivided - 67'
	100'	Divided 2 X 29'
	100'	6 Lanes
Minor Arterial		
Non-residential area	100'	66'
Residential	80'	52'
Major Collector		
Non-residential area	80'	52'
Residential	80'	52'
Minor Collector		

Non-residential area	60'	32'
Residential	60'	28'
Local (non res.)	60'	32'
Local (non res. Cul-de-sac)	60'	50'
Residential area	50'	28'
Residential Cul-de-sac	50'	40'

j. Maximum Grades and Minimum Design Speeds:

Principal Arterial	6%	60 MPH
Major Arterial	8%	50 MPH
Minor Arterial	10%	50 MPH
Major Collector	10%	40 MPH
Minor Collector	10%	30 MPH
Local	15%	20 MPH
Cul-de-sac	6%	

* Grades between 12%-14% shall not exceed 150' (tangent length between curves)

* Grades through intersection 2% to 4% max.

k. Minimum grade in all roadways shall not be less than 1.5%.

l. Horizontal Curvatures:

	Min. Radius (ft)	Max. Super
Principal Arterial	1333	0.06
Major Arterial	833	0.06
Minor Arterial	560	0.06
Major Collector	560	0.04
Minor Collector	300	0.04 (0 for residentail internal)
Local	120	0.00

m. Min. K Values for Vertical Curves: (Desirable in ()):

	Crest	Sag
Principal Arterial	200 (320)	125 (155)
Major Arterial	100 (170)	80 (110)
Minor Arterial	55 (80)	55 (70)
Minor Arterial	55 (80)	55 (70)
Minor Collector	30	35
Local	10	20

n. Min. Tangent Lengths in ft: (Desirable in "( )"):

Principal Arterial	150 (180)
Major Arterial	125 (150)
Minor Arterial	100 (120)
Major Collector	100 (120)
Minor Collector	75 (90)
Local	50 (60)

o. Approaches at Major Intersections:

	Min. Approach Distance (ft)
Principal Arterial	100
Major Arterial	100
Minor Arterial	100
Major Collector	75
Minor Collector	75
Local	50

p. Intersection Radii

	Road Rad	ROW Rad
Arterial	40	20
Major Collector	40	20
Minor Collector – Res.	25	9
Minor Collector – NonRes.	40	20
Local – Res.	20	9
Local – Comm/Off	25	11
Local – Industrial	40	25

q. Driveway Standards

1. 32' Width, 25' Radius – Services stations, Commercial Sites (over 80,000sf), office/institutional (over 100,000 sf), apartment/condos (over 200 units), mobile homes (200 lots)

2. 28' Width, 25' Radius – Commercial Sites (under 80,000sf), office/institutional (100,000 sf or less), apartment/condos (200 units or fewer), mobile homes (200 lots or fewer)

3. 32' Width, 40' Radius – industrial sites

r. Driveway Spacing (does not apply to residential)

			1.	Intersection – 100’ from CL of driveway to nearest ROW	
			2.	Driveway – 100’ from centerlines	
			3.	Driveways shall match drives on the other side of the street	
			4.	1 drive for every 400’ of road frontage (not a spacing requirement)	
			s.	Minimum Sight Distances: 10 times the regulated speed (measured from the centerline along ROW)	
			t.	Maximum slope (2:1 cut and 3:1 fill) indicated on road cross section.	
			u.	Curb and gutter indicated and detail provided..	
			v.	Typical road section (6.9.1, 6.9.2, 6.10.1)	
				NEW LOCAL AND MINOR COLLECTOR STREETS	
				8” GAB, 2” type “B” binder, 1” type “E” or type “F” surface course.	
			w.	Profile or proposed street showing existing and finished grades.	
			x.	Minimum 11 foot shoulder for utility installation.	
			y.	Adequate stationing information shown (plan and profile).	
			z.	Street lighting (approximately 400 ft. apart, underground lines).	
			aa.	Additional ROW dedication required, provide documents to City.	

3rd	2nd	1st	**3 STORM DRAINAGE SYSTEM**	Corrected on Page #
			a. Site grading plans superimposed over existing topographic survey. Max cut or fill slope 2:1.	
			b. Location, size and of existing drainage structures. Drainage area that contributes to each existing drainage structure shall be specified or shown.	
			c. Construction details for storm drainage systems and appurtenant works shall comply with the latest standards approved and promulgated by the Georgia Department of Transportation in “Standard Specifications (for) Construction of Roads and Bridges “latest edition. Show details of drainage structures	

3rd	2nd	1st	**3.1 CULVERTS**	Corrected on Page #
			a. Culverts designed to pass 100-yr storm with minimum 1.5 ft of freeboard between 100-yr storm ponding elev and top of centerline of road.	
			b. Cannot raise 100-yr flood elevation on upstream properties	
			c. 100-yr ponding limits above the culvert shown on plans	
			d. Designed in accordance with Ga DOT most recent Standard Specifications.	
			e. Minimum allowable culvert diameter shall be 18 inches	
			f. Maximum allowable velocity in a culvert 15 fps	
			g. Outlet structures shall not be located closer to site's property line than a flow distance equal to 6 times the pipe diameters.	

3rd	2nd	1st	**3.2 PIPED COLLECTION SYSTEMS AND CHANNELS**	Corrected on Page #
			a. Minimum allowable pipe diameter shall be 15 inches	
			b. Designed for 25-yr storm and passes 100-yr storm	
			c. Maximum allowable velocity in a piped systen 15 fps	
			d. Catch basins designed and spaced so that spread in street for 10-yr design flow is less than 8ft for Minor Collector or Major Thoroughfare, or 16 feet at any given section	
			e. Provide Gutter spread calculations.	
			f. Provide complete storm drainage profiles for pipes and channels.	
			g. Channels designed to carry 25-yr storm with a freeboard equal to 20% of design flow.	
			h. Cross-sectional shape of channel conforms to Standard Drawings. “V” shaped cross-sections not permitted in grassed channels.	
			i. Provide drainage design chart on plans.	
			j. Design flood frequency and method of calculations of runoff indicated on drainage design chart.	
			k. Provide headwall or other end treatments.	
			j. Outlet structures shall not be located closer to site's property line than a flow distance equal to 6 times the pipe diameters.	

3rd	2nd	1st	**3.3 STORM DRAINAGE PROFILES**	Corrected on Page #
			a. Profiles required. Show inlet and outlet elevations, pipe slope, length and material of pipe, type of drainage structure, all sanitary sewer crossings, and HGL for 25-yr and 100-yr.	
			b. Storm drainage profiles must be prepared to a scale no smaller than 1” = 100’ horizontal x 1” = 10’ vertical.	

3rd	2nd	1st			Corrected on Page #
			c.	Each profile should be labeled consistent with the labeling scheme used on the drainage plan view.	
			d.	The profile should show the existing and proposed elevations along the length of the drainage system.	
			e.	Open channel design must show the grade of the flow line and include a typical ditch section that provides a non-erodible velocity at design flows.	
			f.	Channel lining (i.e. grass, concrete, etc.) must be specified along the profile.	
			g.	Pipe material and bedding shall be specified.	
			h.	Crown elevations must be matched at each junction structure or the upstream crown must be higher than the downstream crown.	
			i.	All profiles shall conform to the requirements as set forth in the City of Sugar Hill Development Regulations	
			j.	Contractor shall restore roadway shoulders to minimum City of Sugar Hill specifications.	
			k.	Roadway and driveway crossings to be bored and cased.	

3rd	2nd	1st	**3.4 OTHER**		Corrected on Page #
			a.	Minimum drainage pipe cover or clearance between utilities. Show clearance on SS profile.	
			b.	Concrete head walls or flared end sections on smaller diameter pipe on inlet and outlet drainage systems.	
			c.	Catch basins located at low points of streets.	
			d.	Provide On-site storm water detention design or Off-site master detention requirements.	
			e.	Structural detail and dimension of the detention pond including section through detention pond, dam or wall. Include section through dam showing required dimensions.	
			f.	Flood hazard areas created or defined within the subdivision area will subject certain lots the provisions of the Flood Damage and Prevention Ordinance. A site plan shall demonstrate that a structure can be built on each of these lots in accordance with the Flood Damage and Prevention Ordinance.	
			g.	Drainage easements along watercourses and for pipes and ditches out of road right-of-way.	
			h.	Drainage easement around detention facility, minimum 10 feet beyond 100-yr flooding limits. Access easement of 20' or 30' in width from public street to facility.	
			i.	Federal Emergency Management Agency (FEMA) flood plain reference. Use Gwinnett County Flood Insurance Study, Updated 2006.	
			j.	House location indicating the lowest footing elevation.	
			k.	Drainage flow pattern on plan sheets at high point and at intersections indicated by flow arrows.	
			l.	Dam breach zone shown if an existing or proposed permanent pond/lake is a part of the proposed subdivision.	
			m.	Grading details for steep downhill cul-de-sacs.	
			n.	100-year backwater analysis and profile required for stream.	
			o.	Show minimum first floor elevations on plans adjacent to 100-year flood plain. Minimum three foot above.	

3rd	2nd	1st	**3.5 STORMWATER REPORT**		Corrected on Page #
			a.	Storm water Management Report required. Maintain 2:1 or greater side slopes in detention pond.	
			b.	The SWM Report prepared by a Professional Engineer or Landscape Architect. The seal and signature must be on the cover.	
			c.	Narrative explaining the rationale and method used in design.	
			d.	Map showing all drainage basins and sub-basins.	
			e.	Direction of flow and acreage of drainage area for storm water entering and exiting the site.	
			f.	A summary showing pre-development, post-development flows for the 2, 10, 25 and 100 year storm.	
			g.	Detain the 1-yr storm for 24 hours. Use the SCS runoff equation to size the volume required.	
			h.	Allowable discharge downstream consideration. Explain impact on lower adjacent properties. Must include analysis of the 10% point (where drainage basin equals 10 times the project area).	
			i.	On site and off site drainage areas shall be clearly defined consistent with the Drainage Area Map.	
			j.	Show drainage areas that bypass detention in a developed state. Demonstrate how these flows are managed to a predevelopment rate.	
			k.	Runoff coefficients for Rational Method in accordance with Table 9-F of Dev. Regs. SCS Curve Numbers in accordance with the "Manual for Sediment and Erosion Control in Georgia" and/or the Gwinnet County Storm Water Design Manual.	
			l.	Composite "C" (Rational Method) or CN (SCS Method) used for analysis of pre-development conditions shall not exceed 0.25 or 55 respectively.	
			m.	Minimum time of concentration for predeveloped conditions shall be five (5) minutes. Post development runoff should be reduced accordingly, but not less than five (5) minutes. A five (5) minute concentration may be used for subdivisions of less than one acre.	

			n.	Stormwater must be managed to predevelopment rates regardless of amount of increase.	
			o.	Demonstrate discharge velocities are dissipated to non-erodible velocities at exits.	
			p.	Must provide Water Quality, Channel Protection and forebay as required.	
			q.	The modeled TSS load shall not exceed 850 lbs/ac/yr.	
			r.	See attached hydraulic and hydrology comments attached.	
			s.	Optional - Detention Facility fencing – min. 4', with 12' wide access gate; contained within 20 ft. easement.	
			t.	Detention facility cannot disturb buffer, landscape strip, or tree protection area	
			u.	100-yr limits cannot encroach on public R/W	
			v.	Complies with Metropolitan River Protection Act, if applicable	

3rd	2nd	1st	4 COMMENTS	Corrected on Page #
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NOTE:

The City's Engineer Review and coments are not all encompassing, additional approvals may be needed:
the City's Planning & Development, Gwinnett County Water/Sewer/DOT/Environmental Health, Georgia DOT,
Local Utility Companys (Power/Electric/Gas…), Fire Marshall, other.