Recommended Construction Material Sources for District Hattian Bala

Sr.No	District	Sand Sources		Coarse Aggregate Source		Stone for masonry		Clay deposits for Brick masonry		Stone soling of roads		Coarse aggregate for Asphalt/premix used in roads	
		Local sources have marginal use (<2000psi strength)	out of District	Local	out of district	Local	out of district	Local	out of district	Local	out of district	Local	Out of district
1	Hattian Bala	.....	Dulai river sand deposit (marginal use)	Sundari Bandi sandstone	Yadgar Batmang limestone Muzaffarabad	Sundari Bandi sandstone	.....	Nil	Rawalpindi Peshawar	Sundari Bandi sandstone	.....	Lamnian Dolorite	Bakot Nathia Gali road Sari locality (10km from Kohala)
2		.....										.....	Yadgar Batmang limestone Muzaffarabad
3		.....	Lawrencepur / Qibla bandi sand deposit									.....	
4		.....		Lamnian Dolorite		Lamnian Dolorite				Lamnian Dolorite	Eran sandstone	.....	
5		.....	Barsala river sand deposit (marginal use)	Chakhama metabasalt	Bakot limestone Nathia Gali road Sari locality (10km from Kohala)	Chakhama metabasalt	Bakot limestone Nathia Gali road Sari locality (10km from Kohala)			Chakhama metabasalt	Bakot limestone Nathia Gali road Sari locality (10km from Kohala)	.....	
6		.....		Lamnian metabasalt		Lamnian metabasalt				Lamnian metabasalt		.....	

Note:
1. Sandstone of murree formation is widely distributed in Jhelum valley and its adjoining area, its chracterstics may be correlated with Eran sandstone. It can be used with the consultation of Material Engineer or Geologist for mega projects.
2. Ordinary Portland Cement (OPC) available in local market consist of 0.5 to 0.8% alkalies.
3. To avoid the Alkali Silica Reaction (OPC) can be replaced with Pozolona, slag or low alkali cement which should meet the 10000psi strength (BS-12, ASTM C150).
4. (i). Steel testing on each consignment is required to meet the ASTM 615A where for grade 40 steel required yield strength is 40,000psi and for grade 60 required yield strength is 60,000psi.
   (ii) Chemical tests of the steel should meet the ASTM 706A.
5. Other local quarries material should be evaluated as per ranges provided in Table 4.1
6. Material of fine & coarse aggregate not fulfill the evaluation criteria mentioned in Table 4.1 should be treated as rejected.
7. For more detail visit our website www.pndajk.gov.pk

Geologist 24/7/2011.
Rate Analysis Section

22.7.2011
Chief Rate Analysis Section

Table 4.1

Criteria Used for Evaluating the Material Sources

PHYSICAL ENGINEERING PARAMETERS	CONCRETE COARSE AGGREGATES	ROAD AGGREGATE												FINE AGGREGATES				
		*Tentative Limits									AASHTO	TRL		ASTM LIMITS	BS			
		Heavy Traffic Roads†			Medium Traffic Roads†			Light Traffic Roads†							Mortar and Plaster			
	ASTM C-33 SPECIFICATION LIMITS	All Unbound	Wearing Course	Bituminous Base/Sub-base	All Unbound	Wearing Course	Bituminous Base/Sub-base	All Unbound	Wearing Course	Bituminous Base/Sub-base	All type of roads	Bituminous Mixes	Unbound Pavement	Fine Aggregate for Concrete and Mortar	Masonry Mortar	Floor Screed	External Rendering	Gypsum Plastering
Specific Gravity (not less than)	2.5																	
Water Absorption (not more than. %)	1																	
Sodium Sulfate Soundness (max. %)	12											12						
Los Angeles Abrasion Value (max. %)	50	25	25	35	30	30	35	35	30	35		30	35					
Materials Passing (No.200 sieve) (% by wt.)	3													3				
Shale (% by wt.)	1																	
Clay Lumps and Friable Particles (% by wt.)	2													3				
Other Deleterious Substances (% by wt.)	1																	
Impact Value (max.)		23	23	30	27	27	30	30	27	30		25						
Crushing Value (max.)		23	23	30	27	30	30	30	27	30		25						
10% Fine Value kN (min.) Dry		130	130	100	115	100	100	100	115	100	150		110					
10% Fine Value kN (min.) Soaked		80	65	50	65	65	50	50	65	50								
Flakiness (max.)												45	35					
Sand Grading														ASTM C-33	BS-1200	BS-112	BS-1199	BS-1198
Fineness Modulus														ASTM C-33				
Mortar Bar Expansion % (max.) at 14 days (ASTM 1260)	0.1													0.1				
Bitumen Adhesion (Not less than)											95	75						

Minimum Required Parameters for Brick Selection

S.No.	Class Of Brick	Weight Of Brick (lbs) (Bone Dry)	Size Of Brick (inch X inch X inch)	Water Absorption Ratio	Strength Of Brick (psi)
1	1st Class	7	9 X 4-1/2 X 3	1/6th of its dry Weight	1200 to 1500
2	2nd Class	7	9 X 4-1/2 X 3	1/4th of its dry Weight	900 to 1200
3	3rd Class	6.75	9 X 4-1/2 X 3	1/3rd of its dry Weight	500 to 900
4	4th Class	7.2	9 X 4-1/2 X 3	1/2.5 of its dry Weight	Less than 500

Chief Rate Analysis 22/7/2011

Planning And Dev. Deptt

Govt. Of AJK M.abad