Steel Sourcing Policy

There are 2 categories of Steel manufacturers:

1. Primary Steel Producers: These are key Steel manufacturers, having an integrated steel manufacturing

setup including raw material (billets) and final extrusion. They make billets using basic raw materials like iron ore, coke etc. Examples of these manufacturers TATA Steel, JSW, Jindal, SAIL, RINL, Arcelor Mittal, Imported (Ukraine, Turkey). These manufactures are approved for government Infra Projects.

Secondary Steel Producers: These are local steel manufacturers who produce steel billets mainly produced using scrap and Thermo Mechanical treatment Technology (Quenching and tempering). These billets are either manufactured in-house or procured commercially.

Criteria for classification of production sources:

	Primary Steel	Secondary Steel
Background	Large scale companies have their integrated production facilities and supplying to industries other that real estate/construction eg. SAIL, Tata, Arcelor Mittal, JSW	Medium size setups using billets for production of steel bars and having good quality control setup; all bars are TMT.
Production Facility visits	Once every 2 years by QE and Procurement	Once a quarter by QE*; Once every year by Procurement*
Metallurgical History Report ***format shown below	Records Required to be maintained at the supplier end for random audit.	Records Required to be maintained at the supplier end for random audit.
Testing and acceptance Criteria	IS 1786	IS 1786,additional criteria -Elongation to be maintained at 14.5 %
Testing frequency**	Once every 500 ton	Once every 100 ton per dia per supplier.

* Surprise visit/random basis

** Random basis in 'Lodha Qualified labs' only as per list below.

Mumbai /Thane / Dombivali Projects	Pune Projects	Hyderabad Projects
METALLURGICAL SERVICES	DUROCRETE ENG. SERVICES	Test well
TCR ENG. SERVICES	STRUCTWELL	
DUROCRETE ENG. SERVICES		
Lab - Spectro SS		

Any changes to the above list needs to be approved by COO.

Testing Guidelines :-All supplied steel should be tested and accepted based on the acceptance criteria mentioned as per IS 1786:2008.
In case of failure, second sample to be taken in presence of steel manufacturer representative. Advance notice of min 24 hours to be given for the joint sample drawing and testing exercise. If the steel supplier representative does not remains present after 48 hours of notice issuance, Lodha QC will be allowed to draw samples and conduct second testing independently. If results of 1st and 2nd test do not match, 3rd test will be undertaken after selecting sample in presence of manufacturer representative (if he/she remains present after 48 hours notice) and results of this 3rd test shall be taken as conclusive.

Metallurgical History data sheet ***

Bar Dia	Reinforcement Lot Identification.	Cast/Heat No.	Billet Identification	Chemical composition			
				Carbon	Sulphur	Phosphorus	Sulphur + Phosphorus

Steel Usage Guidelines for Lodha Projects:

Usage	Structures > 100 m height	Structures <= 100 m height
Foundations / raft	Primary Steel	Secondary Steel
8 mm – 25 mm dia steel bars	Secondary Steel #	Secondary Steel
32 mm and higher dia steel bars	Primary Steel	Secondary Steel

Any changes to the above can be made with written approval of COO on recommendation of Level 1 – Structural Design.

Special quality monitoring for building > 100 meter above ground

1. Steel 8 – 25 mm to be supplied only from the identified and approved secondary steel producers which
   exhibits consistent quality control as per IS 1786:2008.
2. As per IS1786:2008, elongation acceptance criteria is at 12%. We shall insist with the secondary steel suppliers to maintain the same at 14.5% (for all projects). We will prefer secondary steel suppliers who are exhibiting consistent maintenance of the same.

3. IS1786:2008 does not have any specification for the inclusion content acceptance. However based on the study, it is preferred to source steel form the secondary steel suppliers who are maintaining the same size 2.0 or less. Random Inclusion test to be conducted fortnightly on 25 & 32 mm samples from the secondary Steel producers. Inclusion test will be conducted internally by QA/QC to understand the quality performance and consistency of secondary steel supplier. Ideal permissible inclusions will be size 2.0 or less.

4. Based on the study and recommendation by the steel experts, following chemical properties of the steel to be monitored internally (through statistical analysis taking in account data of last 3 to 4 months third party test report)to differentiate the consistent quality record of secondary steel supplier.

Chemical element	Specs as per IS1786:2008	Preferred specs
Carbon	Max 0.30 %	Between 0.17 to 0.24%
Sulphur	0.055 % Max	0.055 % Max
Phosphorus	0.055 % Max	0.045 % Max
Sulphur & Phosphorus	0.105 % Max	0.09 % Max
Nitrogen	Not specified	100 ppm max (0.01 %)

It is preferred to source steel from the suppliers who are maintaining the above values as per our preferred specs.

5. After 3 months of usage, if all the testing results are found consistently satisfactory, based on COO approval (based on recommendation from Level 1 – Structure Design) company to decide on using 32 mm from secondary manufacturers.

<u>Acceptance criteria for Rolling Margin:</u>

The rolling margin on any consignment should not exceed the permissible rolling margin as per IS code:

1. 8mm to 10mm dia ± 7%
2. 12mm to 16mm dia ± 5%
3. 20mm dia and above ± 3%

In the event that the actual rolling margin is higher than the aforesaid limits, the value of the difference amount shall be debited to the vendor. Further, the rolling margin for each vendor will be analysed and compiled (across projects) on annual basis and if cumulative rolling margin is > 0.2%, the difference of value between the actual rolling margin and 0.2% shall be debited to the vendor. This should form part of the order terms of the every vendor. Procurement to give regular feedback to each supplier about their rolling margin performance and accordingly adjust business share subject to price remaining competitive.

Notes:
Usage of imported steel will be permissible, in case of cost savings (taking into account all ancillary costs like double transportation, storage, interest etc.) provided Procurement is able to effectively ensure:

a. Material is purchased directly from manufacturer.
b. The said material is of equivalent quality to the norms stated above for primary Steel or Secondary Steel producer (through pre-shipment test and inspection report (should be mandatory part of LC) and reference checks about manufacturer).