GENERAL NOTES

1. STRUCTURE DESCRIPTION

1.1 THESE NOTES ARE APPLICABLE FOR THE REVAMPING OF GUJJAR NALA INCLUDING SERVICE ROAD.
THE STRUCTURE CONSIST OF RCC RETAING WALL FOR GUJJAR NALA.
THE NALA CONSIST OF 2 PEDESTRIAN AND VEHICLES BRIDGE CROSSING.

2. GENERAL

2.1 THESE NOTES SHOULD BE READ IN CONJUNCTION WITH RELEVANT CONTRACT CONDITIONS, TECHNICAL SPECIFICATIONS AND BILL OF QUANTITIES FOR THE PROJECT, WHEREVER MORE THAN ONE SET OF STANDARDS IS USED TO SPECIFY MATERIAL, TEST OR LEVEL OF WORKMANSHIP, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN UNLESS SPECIFICALLY OTHERWISE NOTED.

2.2 ALL MATERIALS USED AND WORKMANSHIP INVOLVED IN THE EXECUTION OF ALL WORK COVERED UNDER THIS CONTRACT SHALL BE IN STRICT CONFORMITY WITH DRAWINGS, SPECIFICATIONS & CONTRACT CONDITIONS.

2.3 ALL DIMENSIONS INDICATED ON THE DRAWING ARE IN MILLIMETERS. ALL ELEVATIONS AND LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.

2.4 WHERE REFERENCE STANDARDS FOR TESTING MATERIALS AND WORKMANSHIP ARE NOT EXPLICITLY-STATED ON THE DRAWINGS AND CONTRACT DOCUMENTS, LATEST RELEVANT STANDARDS OF AASHTO, ASTM OR BS SHALL BE APPLICABLE AS INSTRUCTED BY THE ENGINEER.

2.5 SURVEY : ALL SURVEY COORDINATES SHOWN ON SURVEY / LAYOUT PLANS REFER TO SURVEY OF PAKISTAN COORDINATES SURVEY MONUMENTS ALSO EXIST AT REGULAR INTERVALS ALONG THE PROPOSED HIGHWAY ALIGNMENT TO ASSIST THE BRIDGE CONTRACTOR IN LOCATING THE PROPOSED WORK ON GROUND.

2.6 SETTING OUT : FINAL RESPONSIBILITY FOR PRECISE & ACCURATE SETTING OUT OF THE PROPOSED BRIDGES & COORDINATION WITH PROPOSED HIGHWAY ALIGNMENT RESTS SOLELY WITH THE CONTRACTOR. IF NECESSARY, THE CONTRACTOR SHALL CARRY OUT A DETAILED CLOSED TRAVERSE SURVEY ALONG THE PROPOSED ALIGNMENT CROSS - REFERENCED TO SURVEY OF PAKISTAN COORDINATE GRID FOR THIS PURPOSE.

3. DESIGN CRITERIA

3.1 EXCEPT FOR TRAFFIC LIVE LOAD TO BE ADOPTED IN THE DESIGN, THE COMPLETE DESIGN OF HIGHWAY BRIDGES HAVE BEEN CARRIED OUT IN ACCORDANCE TO 'AASHTO-LRFD BRIDGE DESIGN SPECIFICATION-4TH EDITION 2007' (AASHTO-LRFD).

3.2 TRAFFIC LIVE LOADS HAVE BEEN ADOPTED IN ACCORDANCE TO 'WEST PAKISTAN HIGHWAY CODE-1967' (WPHC).

3.3 DESIGN LOADS :

3.3.1 DEAD LOADS AND UNIT WEIGHTS :

- CONCRETE UNIT WEIGHT..... 24kN/m³
- MINIMUM WEARING SURFACE (50mm ASPHALT)..... 1.2kN/m²
- FUTURE WEARING SURFACE (50mm ASPHALT)..... 1.2kN/m²
- UTILITIES AND SERVICES..... 0.75kN/m²
- SIDE WALK UNIT WEIGHT..... 23kN/m³
- SOIL UNIT WEIGHT..... 20kN/m³
- WATER UNIT WEIGHT..... 10kN/m³

3.3.2 LIVE LOADS :

- THE BRIDGE IS DESIGNED FOR MORE CRITICAL OF CLASS-A OR CLASS-AA LOADING AS PER WPHC.
- LIVE LOAD ON SIDE WALK..... 3.6kN/m²

3.3.3 SECONDARY LOADS :

- DESIGN WIND SPEED..... 160km/hr
- TEMPERATURE RANGE..... 60°C
- TEMPERATURE AT CONSTRUCTION..... 30°C
- TEMPERATURE RISE..... + 30°C
- TEMPERATURE FALL..... - 30°C
- TEMPERATURE GRADIENT..... ZONE-1 (AASHTO-LRFD)
- EARTH QUAKE ACCELERATION COEFF (A)..... 0.19 (AASHTO-LRFD)
- EARTH QUAKE ZONE..... ZONE-2 (AASHTO-LRFD)
- SOIL PROFILE (S)..... II (AASHTO-LRFD)

4. SOIL & FOUNDATION

SOIL INVESTIGATION REPORT FOR THE SITE SHALL BE MADE AVAILABLE BY THE CONTRACTOR.
THE CONTRACTOR SHALL READ AND FAMILIARIZE HIMSELF WITH THE GEOTECHNICAL INVESTIGATION REPORT AS WELL AS VISIT THE SITE AND BECOME THOROUGHLY FAMILIAR WITH THE SURFACE AND SUBSURFACE CONDITIONS.
LOOSE POCKETS OF SOIL WHICH ARE ENCOUNTERED SHALL BE REMOVED AND REPLACED WITH GOOD SOIL COMPACTED TO ACHIEVE THE DESIRED BEARING CAPACITY.
ANY ADJACENT FOOTING IN THE VICINITY OF THE WORK SHALL BE PROPERLY PROTECTED BEFORE EXECUTION OF WORK.
FOUNDATION STRICTLY BE PLACED ON WELL COMPACTED EARTH.

5. MATERIAL & WORKMANSHIP

ALL MATERIALS AND WORKMANSHIP SHALL MEET RELEVANT AASHTO AND ASTM STANDARDS AS DETAILED IN THE SPECIFICATIONS AND SUBJECT TO THE ENGINEER'S APPROVAL.

6. CEMENT

CEMENT USED SHALL BE FRESH, PAKISTAN-MANUFACTURED SULPHATE RESISTANT CEMENT CONFORMING TO PS-232 AND AS RECOMMENDED BY GEOTECHNICAL INVESTIGATION WHEN ITS DONE. UNLESS OTHERWISE NOTED ON INDIVIDUAL DRAWINGS.

7. CONCRETE

7.1 FOLLOWING TYPES OF CONCRETE SHALL BE USED FOR ALL STRUCTURAL/NON STRUCTURAL COMPONENTS.

STRUCTURAL / NON STRUCTURAL COMPONENTS	CONCRETE TYPE	MINIMUM CEMENT CONTENTS	MAXIMUM WATER* CEMENT RATIO	28 DAYS MINIMUM COMPRESSIVE STRENGTH (CYLINDRICAL)	
		kg/cu.m	W/C	kg/s.cm	Lbs/sq.In
LEAN CONCRETE	LEAN	175	0.49	100	1500
DECK SLAB & DIAPHRAGM	A3	400	0.49	280	4000
FOUNDATION, FOOTING, WALL AND RCC BEAM	A3	400	0.49	280	4000
APPROACH SLAB, BARRIER, KERB & FOOTPATH	A1	300	0.49	210	3000

NOTES: * TO INCREASE WORKABILITY OF THE CONCRETE, ENGINEER'S APPROVED PLASTICIZER / ADMIXTURE MAY USED AFTER DETERMINING THE QUANTITY AT DESIGN MIX STAGE.

* MAXIMUM SIZE OF AGGREGATE FOR ALL CLASSES OF CONCRETE IS 20 mm.

7.2 THE CONTRACTOR TO SUBMIT CONCRETE MIXED DESIGN PRIOR TO COMMENCEMENT OF WORK.

8. MINIMUM CONCRETE COVER TO REINFORCEMENT

FOUNDATION BOTTOM.....75mm TO THE NEAREST REINFORCEMENT
WALL..... 75mm TO STIRRUPS
DECK SLAB..... TOP MESH 40mm, SOFFIT MESH 30mm
RCC BEAM .....50mm TO STIRRUPS

9. CONCRETE FINISH

ALL EXPOSED CONCRETE SURFACES ABOVE GROUND SHALL HAVE "FAIR FACE" FINISH. ALL SHARP EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 25mm U.N.O. ALL FORM WORK SHALL BE OF SMOOTH STEEL PLATES PROPERLY STRENGTHENED & BRACED AGAINST WAVES WOBBLING OR BUCKLING.

10. REINFORCING STEEL

10.1 ALL REINFORCING STEEL BARS SHALL BE ROLLED FROM PRIME GRADE PAKISTAN STEEL BILLETS. REINFORCEMENT ROLLED FROM SCRAP STEEL, SHIP PLATES OR RE-ROLLED BILLETS SHALL NOT BE USED.

10.2 ALL REINFORCING BARS SHALL BE HIGH-YIELD, DEFORMED BARS WITH MINIMUM YIELD STRENGTH OF 415N/mm² (APPROX. 60,000 PSI) CONFORMING TO THE FOLLOWING STANDARDS.
ASTM-615 GRADE 60 HOT-ROLLED

10.3 UNLESS NOTED OTHERWISE, LAPS IN REINFORCING BARS SHALL BE STAGGERED.

10.4 THE CONTRACTOR SHALL PREPARE ALL BAR BENDING SCHEDULE ETC. AND SUBMIT THEM FOR APPROVAL OF THE ENGINEER'S REPRESENTATIVE BEFORE EXECUTION OF WORK.

10.5 ALL REINFORCING STEEL SHALL BE ACCURATELY LOCATED IN FORMWORK AND HELD FIRMLY IN PLACE BEFORE PLACING OF CONCRETE BY MEANS OF 16 GAUGE BLACK ANNEALED WIRE AND ADEQUATELY DESIGN SPACERS AND SUFFICIENT SPACER CHAIRS TO HOLD RE-BARS IN POSITION.

10.6 UNLESS NOTED ON DRAWING FOLLOWING LAP LENGTHS SHALL BE FOLLOWED.

CONCRETE GRADE	BAR DIA (mm)	12	16	20	25	32
	BAR AREA (mm²)	113	201	314	491	804
	COMPRESSIVE STRENGTH (CYLINDRICAL) kg/s.cm	TENSION LAP * SPLICES (mm)				
A1	210	400	525	750	1175	1925
A2	245	400	525	700	1100	1775
A3	280	400	525	650	1025	1675
D1	350	400	525	650	925	1500

* MODIFICATION FACTORS SHALL MULTIPLIED TO THE TABULATED SPLICES VALUES IF FOLLOWING CONDITIONS APPLIES:

MULTIPLY BY '1.4', FOR TOP HORIZONTAL BARS BELOW WHICH MORE THAN 300mm OF FRESH CONCRETE IS CAST.

MULTIPLY SPLICE LENGTH BY A FACTOR OF '1.3', IF LAPPING BARS ARE NOT STAGGERED.

11. BEARING PADS

ELASTOMERIC BEARING PADS SHOWN ON THE INDIVIDUAL DRAWINGS SHALL BE LAMINATED BEARINGS MADE FROM 100% VIRGIN, CRYSTALLIZATION RESISTANT, POLYCHLOROPRENE (NEOPRENE) OF 60(5 DURO HARDNESS MEETING THE REQUIREMENTS OF AASHTO M-251. INTERNAL STEEL PLATES SHALL BE ROLLED MILD STEEL CONFORMING TO ASTM A-366 OR ASTM A-283 GRADE "D".

12. STRUCTURAL STEEL

ALL STRUCTURAL STEEL INDICATED ON DRAWINGS INCLUDING PLATES, ANGLES, ETC., SHALL BE ROLLED FROM PRIME BILLETS CONFORMING TO ASTM A-36/A (AASHTO M-183/M).

13. MISCELLANEOUS

16.1 REINFORCING STEEL NOTATION :

THE FOLLOWING ARE EXAMPLES OF TYPICAL NOTATION USED TO CALL OUT DETAILS OF REINFORCING STEEL ON THESE DRAWING.

88 - T 20 - 101 - 150 - B

- 88 — TOTAL NUMBER OF BARS
- T — TYPE OF BAR (T- FOR TOR STEEL DEFORMED BAR; R- FOR MILD PLAIN ROUND BAR)
- 20 — DIAMETER OF BAR (mm)
- 101 — BAR MARK
- 150 — C/C SPACING BETWEEN BARS (mm)
- B — LAYOUT / LOCATION OF BAR

14. TENDER DOCUMENTS, DRAWINGS & CONSTRUCTION DRAWINGS

TENDER DRAWINGS ISSUED WITH TENDER DOCUMENTS ARE TO APPRAISE THE BIDDERS OF THE GENERAL NATURE & FAIR IDEA OF THE WORK TO PREPARE BOQ & TENDER DOCUMENTS. ENGINEER SHALL ISSUE THE DETAILED CONSTRUCTION DRAWINGS & SUCH FIELD SKETCHES FROM TIME TO TIME AS NECESSARY FOR THE EASE OF CONSTRUCTION.

15. SCAFFOLDING

ALL SCAFFOLDING SHALL BE DESIGNED BY THE CONTRACTOR, SCAFFOLDING SHALL BE DESIGNED IN A WAY THAT THE TRAFFIC MOVEMENT UNDERNEATH CAN BE FLOW UNOBSTRUCTED AS SPECIFIED IN DIVERSION PLAN.

16. WATER PROOFING

ALL SURFACES OF THE CONCRETE IN CONTRACT WITH EARTH SHOULD BE APPLIED WITH APPROVED WATER PROOFING SYSTEM.

LEGEND :

T — TOP	B.W — BOTH WAYS	VAR. — VARIES	
T1 — FIRST LAYER FROM TOP	N.F — NEAR FACE	LONG. — LONGITUDINAL BARS	
T2 — SECOND LAYER FROM TOP	F.F — FAR FACE	TRANS. — TRANSVERSE BARS	
T3 — THIRD LAYER FROM TOP	S.F — SIDE FACE	DIST — DISTRIBUTION BARS	
B — BOTTOM	STAG. — STAGGERED	F.G.L — FINISHED GROUND LEVEL	
B1 — FIRST LAYER FROM BOTTOM	ALT. — ALTERNATE	F.R.L — FINISHED ROAD LEVEL	
B2 — SECOND LAYER FROM BOTTOM	N.S.P — NOT SHOWN IN PLAN	N.G.L — NATURAL GROUND LEVEL	
B3 — THIRD LAYER FROM BOTTOM	N.S.E — NOT SHOWN IN ELEVATION	CH. — CHAINAGE	
E.F — EACH FACE	N.S.S — NOT SHOWN IN SECTION	S.O.P — SETTING-OUT POINT	
B.F — BOTH FACE	ABR. — ALTERNATE BARS REVERSED	S.O.L — SETTING-OUT LINE	

REV.	DESCRIPTION	DATE
0	ISSUED FOR TENDER	FEB 2018

CLIENT:
LOCAL GOVERNMENT DEPARTMENT
GOVERNMENT OF SINDH

CONSULTANT:
EA Consulting Pvt Ltd
Engineering, Architecture & Project Managment
Head Off: AL-9, 15th Lane, Kh-Hilal, Ph.VII, DHA, Karachi. Postal Code 75500, UAN: 111-111-584
Fax: +92-21-35841825. Web: www.eaworld.com

PROJECT:
REVAMPING OF GUJJAR NALA INCLUDING SERVICE ROAD

ORIGINAL DRAWING SHEET SIZE: A1

DRAWN	AJ	SCALE	AS SHOWN
DESIGN	HA	DATE	14-02-2018
CHECKED	MS	DESIGN STAGE	Tender
APPROVED	SAM	ISSUE	Tender
PROJ CODE	DRAWING NO.		REVISION
975	EA-975-S-0001		0

DRAWING TITLE:
GENERAL NOTES
(ZIAUDDIN CHOWRANGI TO LYARI RIVER)