

SUBSURFACE EXPLORATION LOG FIELD DATA

| | | | | | | | | | | | | | |
|--|--|--|--|---------------------------|--|-------------------------|--|------------------|--|------------------------------|--|------------------------|--|
| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2753716 | | Ground Water: 3.40m | | Borehole No: KCR/BH#44 | |
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Lahore | | E: 42R295432 | | Geologist: JAWAD | | Date Started: July-26-2012 | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +9.29 | | Driller: Misbah | | Date Completed: July-28-2012 | | | |

| Depth (m) | Sample No. | Thickness of Layer (m) | Lithology | Stratum Description | 65 | | | | | CORE RUN | | | | | Remarks | | | | | | |
|-----------|----------------|------------------------|-----------|--|---------|---------|---------|---------|--------------|---------------|----|----|----|----|---------|-----------|--------------------|-----------|----------------------------|------|-------------------|
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | | Depth (m) | Core Recovery (Cm) | R.Q.D (%) | Core Waxed for Testing (m) | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | | | | | From | To | From |
| 0.00 | | | ■■■■ | Brown, loose, medium to coarse, Sandy SILT, | | | | | | | | | | | | | | | | | Dry Coring |
| 1.00 | CRS-1 SPT-1 | 2.0 | ■■■■ | | 1 | 2 | 3 | 4 | 9 | 0 | | | | | 0.00 | 1.00 | 80 | NA | | | |
| 2.00 | CRS-2 SPT-2 | | ■■■■ | Yellowish Brown, Stiff, Silty CLAY, trace to little Sand | 2 | 3 | 4 | 5 | 12 | 0 | | | | | 1.00 | 2.00 | 80 | NA | | | Dry Coring |
| 3.00 | CRS-3 SPT-3 | 2.0 | ■■■■ | | 3 | 2 | 5 | 6 | 13 | 0 | | | | | 2.00 | 3.00 | 80 | NA | | | |
| 4.00 | CRS-4 SPT-4 | | ■■■■ | | 45/8cm | | | | | R | | | | | | 3.00 | 4.00 | 75 | NA | | |
| 5.00 | CRS-5 | | ■■■■ | Brown, moderately fractured, poor, medium hard to hard, MUDSTONE | | | | | | | | | | | 4.00 | 5.00 | 70 | NA | 4.20 | 4.40 | Sample Waxed 20cm |
| 6.00 | CRS-6 | 3.0 | ■■■■ | | | | | | | | | | | | 5.00 | 6.00 | 60 | 40 | 5.27 | 5.40 | Sample Waxed 13cm |
| 7.00 | CRS-7 | | ■■■■ | | | | | | | | | | | | 6.00 | 7.00 | 70 | 35 | 6.85 | 7.0 | Sample Waxed 15cm |
| 8.00 | CRS-8 | | ■■■■ | Brown, moderately fractured, poor, medium hard, SILTSTONE. | | | | | | | | | | | 7.00 | 8.00 | 90 | 85 | 5.59 | 5.75 | Sample Waxed 16cm |
| 9.00 | CRS-9 | 3.0 | ■■■■ | | | | | | | | | | | | 8.00 | 9.00 | 90 | 60 | 8.63 | 8.75 | Sample Waxed 12cm |
| 10.00 | CRS-10 | | ■■■■ | | | | | | | | | | | | 9.00 | 10.00 | 90 | 25 | 9.82 | 9.95 | Sample Waxed 13cm |

APP-2-2-00

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 2 of 2

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2753716 | | Ground Water: 3.40m | | Borehole No: KCR/BH#44 | | | | | | | | | | | | | | |
|--|------------|-------------------------|-----------|---|---------|-------------------------|---------|------------------|--------------|------------------------------|----|------------------------|----|----|-----------|----|---------------------|-----------|---------|----------------------------|-------|----|-------|-------|--------------------|-------------------|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Lahore | | E: 42R295432 | | Geologist: JAWAD | | Date Started: July-26-2012 | | | | | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +9.29 | | Driller: Misbah | | Date Completed: July-28-2012 | | | | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thicknness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | | | | | CORE RUN | | | | Remarks | | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | | Core Recovery (C,m) | R.Q.D (%) | | Core Waxed for Testing (m) | | | | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | From | To | | | | From | to | | | | | |
| 10.00 | | 1.0 | | Brown to yellowish brown, highly fractured, very poor, moderately weathered (oxidized), medium hard, MUDSTONE | | | | | | | | | | | | | | | 10.00 | 11.00 | 60 | 14 | 10.81 | 10.95 | Sample Waxed 14cm | |
| 11.00 | CRS-11 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12.00 | CRS-12 | 2.6 | | Dark Brown, highly to moderately fractured, poor to fair, medium hard, SILTSTONE | | | | | | | | | | | | | | | 11.00 | 12.00 | 70 | 50 | 11.15 | 11.35 | Sample Waxed 20cm | |
| 13.00 | CRS-13 | | | | | | | | | | | | | | | | | | | 12.00 | 13.00 | 70 | Nil | - | - | |
| 14.00 | CRS-14 | 1.4 | | Reddish brown, highly fractured, very poor, closely horizontally jointed, medium hard, MUDSTONE, with interbedded of Siltstone. | | | | | | | | | | | | | | | 13.00 | 14.00 | 55 | 15 | 13.83 | 13.95 | Sample Waxed 12 cm | |
| 15.00 | CRS-15 | | | | | | | | | | | | | | | | | | | 14.00 | 15.00 | 65 | 13 | 15.59 | 15.72 | Sample Waxed 13cm |
| 16.00 | CRS-16 | 1.0 | | Brown, slightly fractured, good, medium hard, SILTSTONE | | | | | | | | | | | | | | | 15.00 | 16.00 | 90 | 85 | 16.10 | 16.22 | Sample Waxed 12cm | |
| | | 0.5 | | Brown, highly fractured, very poor, MUDSTONE | | | | | | | | | | | | | | | 16.00 | 17.00 | 80 | 20 | 16.82 | 16.92 | Sample Waxed 10cm | |
| 17.00 | CRS-17 | 0.5 | | Light brown, moderately fractured, poor, hard, LIMESTONE | | | | | | | | | | | | | | | 16.00 | 17.00 | 80 | 20 | 16.82 | 16.92 | Sample Waxed 10cm | |
| 18.00 | CRS-18 | 3.0 | | Gray, slightly fractured, good, medium hard, SILTSTONE. | | | | | | | | | | | | | | | 17.00 | 18.00 | 82 | 75 | 17.24 | 17.40 | Sample Waxed 16cm | |
| 19.00 | CRS-19 | | | | | | | | | | | | | | | | | | | 18.00 | 19.00 | 80 | 70 | 18.22 | 18.40 | Sample Waxed 18cm |
| 20.00 | CRS-20 | | | | | | | | | | | | | | | | | | | 19.00 | 20.00 | 90 | 85 | 19.31 | 19.55 | Sample Waxed 24cm |
| END OF BOREHOLE AT 20.0m Depth | | | | | | | | | | | | | | | | | | | | | | | | | | |

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

16-2-2-01

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 2 of 2

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2753480 | | Ground Water: 1.20m | | Borehole No: KCR/BH#45 | | | | | | | | | | | | |
|--|------------|-------------------------|-----------|--|---------|-------------------------|---------|------------------|--------------|------------------------------|----|------------------------|----|----|-----------|-------|--------------------|-----------|---------|----------------------------|-------|-------|-----------------|-----------------|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R295137 | | Geologist: Jawad | | Date Started: July-23-2012 | | | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +8.77 | | Driller: Misba | | Date Completed: july-25-2012 | | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thicknness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | | | | | CORE RUN | | | | Remarks | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | | Core Recovery (Cm) | R.Q.D (%) | | Core Waxed for Testing (m) | | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | From | To | | | | From | to | | | |
| 10.00 | | 3.0 | | Brown, moderately to slightly fractured, poor to fair, hard, MUDSTONE, with lenses of Silt | | | | | | | | | | | | | | | | | | | | |
| 11.00 | CRS-11 | | | | | | | | | | | | | | | | | 10.00 | 11.00 | 70 | 25 | - | - | |
| 12.00 | CRS-12 | | | | | | | | | | | | | | | | | 11.00 | 12.00 | 65 | 63 | 11.37 | 11.51 | Sample wax 14cm |
| 13.00 | CRS-13 | | | | | | | | | | | | | | | | | 12.00 | 13.00 | 76 | 28 | - | - | |
| 14.00 | CRS-14 | 4.0 | | Brown, slightly fractured, good, medium Hard, SILTSTONE | | | | | | | | | | | | | | | | | | | | |
| 15.00 | CRS-15 | | | | | | | | | | | | | | | | 13.00 | 14.00 | 70 | 68 | 13.00 | 13.14 | Sample wax 14cm | |
| 16.00 | CRS-16 | | | | | | | | | | | | | | | | | 14.00 | 15.00 | 90 | 69 | 14.76 | 14.87 | Sample wax 11cm |
| 17.00 | CRS-17 | | | | | | | | | | | | | | | | | 15.00 | 16.00 | 85 | 53 | 15.25 | 15.38 | Sample wax 13cm |
| 18.00 | CRS-18 | 3.0 | | Grey, moderately fractured, good, hard, SILTSTONE | | | | | | | | | | | | | | | | | | | | |
| 19.00 | CRS-19 | | | | | | | | | | | | | | | | 16.00 | 17.00 | 90 | 85 | 16.00 | 16.13 | Sample wax 13cm | |
| 20.00 | CRS-20 | | | | | | | | | | | | | | | | | 17.00 | 18.00 | 75 | 40 | 17.50 | 17.70 | Sample wax 20cm |
| | | | | | | | | | | | | | | | | | | 18.00 | 19.00 | 75 | 73 | - | - | |
| | | | | | | | | | | | | | | | 19.00 | 20.00 | 78 | 75 | - | - | | | | |
| END OF BOREHOLE AT 20.0m Depth | | | | | | | | | | | | | | | | | | | | | | | | |

APP-2-2-03

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 1 of 2

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2753183 | | Ground Water: 2.10m | | Borehole No: KCR/BH#46 | | | | | | | | |
|--|------------|-------------------------|-----------|---|---------|-------------------------|---------|------------------------|--------------|-----------------------------|----------|------------------------|----|----|---------|-----------|---------------------------------|-----------|----------------------------|------|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R294763 | | Geologist: Efaz Danish | | Date Started: Apr-13-2012 | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +6.84 | | Driller: Misba | | Date Completed: Apr-15-2012 | | | | | | | | | | |
| Depth (m) | Sample No. | Thick-ness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | CORE RUN | | | | Remarks | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | | Depth (m) | Core Recovery (C _m) | R.Q.D (%) | Core Waxed for Testing (m) | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | | | | | From | To |
| 0.00 | | 1.0 | | Brown, Silty SAND, some Gravels, as filled material | | | | | | | | | | | | | | | | |
| 1.00 | CRS-1 | | | | | | | | | | | | | | | | | | | |
| | SPT-1 | 1.0 | | Brown, very stiff, Silty CLAY, little Sand | 7 | 5 | 5 | 7 | 17 | | | | | | 0.00 | 1.00 | 85 | NA | - | - |
| 2.00 | CRS-2 | | | | | | | | | | | | | | | | | | | |
| | SPT-2 | 1.0 | | Yellowish brown, medium dense, medium to coarse, Clayey SAND. | 12 | 7 | 6 | 6 | 19 | | | | | | 1.00 | 2.00 | 75 | NA | - | - |
| 3.00 | CRS-3 | | | | | | | | | | | | | | | | | | | |
| | SPT-3 | 1.0 | | Brown, medium dense, Sandy SILT | 7 | 3 | 4 | 9 | 16 | | | | | | 2.00 | 3.00 | 75 | NA | - | - |
| 4.00 | CRS-4 | | | | | | | | | | | | | | | | | | | |
| | SPT-4 | 1.0 | | Brown, very hard, Silty CLAY, trace Sand | 20 | 30 | 45/8cm | - | R | | | | | | 3.00 | 4.00 | 80 | NA | 3.85 | 4.0 |
| 5.00 | CRS-5 | | | | | | | | | | | | | | | | | | | |
| | | 0.6 | | Reddish brown, moderately fractured, poor, very hard, MUDSTONE. | | | | | | | | | | | 4.00 | 5.00 | 75 | NA | 4.78 | 5.0 |
| 6.00 | CRS-6 | | | | | | | | | | | | | | | | | | | |
| | | 4.4 | | Brown, moderately fractured, fair, closely horizontally jointed, friable SANDSTONE. | | | | | | | | | | | 5.00 | 6.00 | 70 | 35 | 5.75 | 5.85 |
| 7.00 | CRS-7 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 6.00 | 7.00 | 85 | 50 | 6.69 | 6.8 |
| 8.00 | CRS-8 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 7.00 | 8.00 | 90 | 43 | 7.20 | 7.35 |
| 9.00 | CRS-9 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 8.00 | 9.00 | 70 | Nil | - | - |
| 10.00 | CRS-10 | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 9.00 | 10.00 | 80 | 37 | 9.43 | 9.55 |

#6-2-2-94

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 2 of 2

| Client: The JICA Study Team | | Type of Boring: Rotary | | Co-ordinate: | | N: 2753183 | | Ground Water: 2.10m | | Borehole No: KCR/BH#46 | | | | | | | | | | | | |
|--|------------|---------------------------|-----------|--|---------|------------------------|---------|---------------------------|--------------|-----------------------------|----|----|----|----|-----------|-------|--------------------|-----------|---------|----------------------------|-------|-----------------|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | Machine Make: Russian | | E: 42R294763 | | Geologist: Efaz Danish | | Date Started: Apr-13-2012 | | Date Completed: Apr-15-2012 | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | Drilling Fluid: Bentonite | | Ground Elevation: +6.84 | | Driller: Misba | | | | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thickness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | | | | | CORE RUN | | | | Remarks | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | | Core Recovery (Cm) | R.Q.D (%) | | Core Waxed for Testing (m) | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | From | To | | | | From | to | |
| 10.00 | | | 10.0 | Brown, highly to moderately fractured, poor to good, closely vertically and horizontally jointed, friable SANDSTONE. | | | | | | | | | | | | | | | | | | |
| 11.00 | CRS-11 | | | | | | | | | | | | | | | 10.00 | 11.00 | 90 | 27 | 10.68 | 10.85 | Sample wax 17cm |
| 12.00 | CRS-12 | | | | | | | | | | | | | | | 11.00 | 12.00 | 80 | Nil | - | - | |
| 13.00 | CRS-13 | | | | | | | | | | | | | | | 12.00 | 13.00 | 75 | 32 | 12.23 | 12.35 | Sample wax 12cm |
| 14.00 | CRS-14 | | | | | | | | | | | | | | | 13.00 | 14.00 | 75 | 22 | 13.68 | 13.80 | Sample wax 12cm |
| 15.00 | CRS-15 | | | | | | | | | | | | | | | 14.00 | 15.00 | 70 | 10 | 14.55 | 14.65 | Sample wax 10cm |
| 16.00 | CRS-16 | | | | | | | | | | | | | | | 15.00 | 16.00 | 85 | 65 | 15.47 | 15.60 | Sample wax 13cm |
| 17.00 | CRS-17 | | | | | | | | | | | | | | | 16.00 | 17.00 | 70 | 60 | 16.45 | 16.65 | Sample wax 20cm |
| 18.00 | CRS-18 | | | | | | | | | | | | | | | 17.00 | 18.00 | 80 | 75 | 17.60 | 17.80 | Sample wax 20cm |
| 19.00 | CRS-19 | | | | | | | | | | | | | | | 18.00 | 19.00 | 90 | 55 | 18.54 | 18.68 | Sample wax 14cm |
| 20.00 | CRS-20 | | | | | | | | | | | | | | | 19.00 | 20.00 | 70 | 30 | 19.45 | 19.65 | Sample wax 20cm |
| END OF BOREHOLE AT 20.0m Depth | | | | | | | | | | | | | | | | | | | | | | |

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

APP-2-2-05

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 1 of 2

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2752822 | | Ground Water: 0.75m | | Borehole No: KCR/BH#47 | | | | | | | | | | | | |
|--|------------|------------------------|-----------|---|---------|-------------------------|---------|------------------------|--------------|------------------------------|----------|------------------------|----|----|---------|-----------|--------------------|-----------|----------------------------|------|------|----|--|-------------------|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R294589 | | Geologist: Efaz Danish | | Date Started: July-23-2012 | | | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +5.80 | | Driller: Jamali | | Date Completed: July-25-2012 | | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thickness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | CORE RUN | | | | Remarks | | | | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | | Depth (m) | Core Recovery (Cm) | R.Q.D (%) | Core Waxed for Testing (m) | | | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | | | | | From | To | From | to | | |
| 0.00 | | | | Brown, medium dense, medium to coarse, Silty SAND, little to some Gravels. | | | | | | | | | | | | | | | | | | | | |
| 1.00 | CRS-1 | 3.0 | | | 4 | 5 | 6 | 7 | 18 | | | | | | | 0.00 | 1.00 | 80 | NA | - | - | | | Dry Coring |
| 2.00 | CRS-2 | | | | 5 | 6 | 6 | 7 | 19 | | | | | | | 1.00 | 2.00 | 80 | NA | - | - | | | Dry Coring |
| 3.00 | CRS-3 | | | | 12 | 13 | 14 | 15 | 42 | | | | | | | 2.00 | 3.00 | 70 | NA | - | - | | | |
| 4.00 | CRS-4 | 2.0 | | Brown, hard, Silty CLAY, some Sand | 10 | 11 | 12 | 14 | 37 | | | | | | | 3.00 | 4.00 | 60 | NA | - | - | | | |
| 5.00 | CRS-5 | | | 19 | 21 | 20 | 35 | 76 | | | | | | | 4.00 | 5.00 | 70 | NA | - | - | | | | |
| 6.00 | CRS-6 | 1.0 | | Brown, very hard, Non Plastic, SILT | 50/10cm | | | | R | | | | | | | 5.00 | 6.00 | 80 | NA | 5.40 | 5.52 | | | Sample Waxed 12cm |
| 7.00 | CRS-7 | | | Brown, slightly fractured, good, slightly jointed, SILTSTONE, with interlayered CLAY. | | | | | | 6.00 | 7.00 | 75 | 70 | - | - | | | | | | | | | |
| 8.00 | CRS-8 | 3.0 | | Brown, moderately fractured, good, moderately jointed, medium hard, SILTSTONE. | | | | | | | | | | | | 7.00 | 8.00 | 80 | 70 | 7.65 | 7.9 | | | Sample Waxed 25cm |
| 9.00 | CRS-9 | | | | 8.00 | 9.00 | 85 | 62 | 8.45 | 8.65 | | | | | | | | | | | | | | |
| 10.00 | CRS-10 | | | | 9.00 | 10.00 | 84 | 60 | 9.55 | 9.75 | | | | | | | | | | | | | | |

APP-2-2-06

SPT: Standard Penetration Test CRS : Core Sample CR: Core Recovery RQD: Rock Quality Designation, DS: Disturb Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 1 of 3

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: N: 2752674 | | Ground Water: 1.50m | | Borehole No: KCR/BH#48 | | | | | | | | | | | | |
|--|------------|------------------------|-----------|--|---------|--|---------|------------------------|--------------|------------------------------|----|----|----|------|---------|-----------|--------------------|-----------|----------------------------|-------------------|------|------------|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R294656 | | Geologist: Efaz Danish | | Date Started: July-13-2012 | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +5.90 | | Driller: Jamali | | Date Completed: July-16-2012 | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thickness of Layer (m) | Lithology | Stratum Description | SPT | | | | | CORE RUN | | | | | Remarks | | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | | Depth (m) | Core Recovery (Cm) | R.Q.D (%) | Core Waxed for Testing (m) | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | | | | | From | To | From | to |
| 0.00 | | | | Brown, medium dense, fine to medium, Silty SAND, little to some Gravels (as filled material) | | | | | | | | | | | | | | | | | | |
| 1.00 | CRS-1 | 3.5 | | | | | | | | | | | | | | | | | | | | Dry Coring |
| | SPT-1 | | | | 5 | 6 | 6 | 7 | 19 | | | | | | 0.00 | 1.00 | 90 | NA | - | - | | |
| 2.00 | CRS-2 | | | | 10 | 6 | 7 | 8 | 21 | | | | | | 1.00 | 2.00 | 90 | NA | - | - | | |
| | SPT-2 | | | | | | | | | | | | | | | | | | | | | |
| 3.00 | CRS-3 | | | | | | | | | | | | | | | | | | | | | |
| | SPT-3 | 11 | | | 4 | 3 | 5 | 12 | | | | | | 2.00 | 3.00 | 50 | NA | - | - | | | |
| 4.00 | CRS-4 | | | | | Brown, very hard, Silty CLAY, trace Sand | | | | | | | | | | | | | | | | |
| | SPT-4 | 17 | 21 | 16 | | | 17 | 54 | | | | | | 3.00 | 4.00 | 70 | NA | 3.45 | 3.65 | Sample Waxed 20cm | | |
| 5.00 | CRS-5 | | | | | | | | | | | | | | | | | | | | | |
| | SPT-5 | 17 | | | 15 | 25 | 22 | 62 | | | | | | 4.00 | 5.00 | 70 | NA | 4.25 | 4.45 | Sample Waxed 20cm | | |
| 6.00 | CRS-6 | | | | | | | | | | | | | | | | | | | | | |
| | SPT-6 | 24 | 27 | 30 | | | 40 | 97 | | | | | | 5.00 | 6.00 | 80 | NA | 5.5 | 5.68 | Sample Waxed 18cm | | |
| 7.00 | CRS-7 | | | Brown, moderately fractured, fair, closely to moderately jointed, medium hard, SHALE, with bands of fine grained SANDSTONE b/w 7-8m) | | | | | | | | | | | | | | | | | | |
| | SPT-7 | 25 | | | 30 | 31 | 38 | 99 | | | | | | 6.00 | 7.00 | 75 | NA | - | - | | | |
| 8.00 | CRS-8 | | | | | | | | | | | | | | | | | | | | | |
| | SPT-8 | 36 | 40 | 20/3cm | | | | R | | | | | | 7.00 | 8.00 | 75 | 40 | - | - | | | |
| 9.00 | CRS-9 | | | | | | | | | | | | | | | | | | | | | |
| | SPT-9 | 20 | | | 33 | 20/5cm | | R | | | | | | 8.00 | 9.00 | 80 | 38 | 8.53 | 8.7 | Sample Waxed 17cm | | |
| 10.00 | CRS-10 | | | | | | | | | | | | | | | | | | | | | |
| | SPT-10 | | | | | | | | | | | | | 9.00 | 10.00 | 70 | 50 | 9.45 | 9.65 | Sample Waxed 20cm | | |

APP-2-2-08

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 3 of 3

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: N: 2752674 | | Ground Water: 1.50m | | Borehole No: KCR/BH#48 | | | | | | | | | | | |
|--|------------|------------------------|-----------|--|---------|-------------------------|---------|------------------------|--------------|------------------------------|----|----|----|---------|-----------|--------------------|-----------|----------------------------|-------|-------|------|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R294656 | | Geologist: Efaz Danish | | Date Started: July-13-2012 | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +5.90 | | Driller: Jamali | | Date Completed: July-16-2012 | | | | | | | | | | | |
| Depth (m) | Sample No. | Thickness of Layer (m) | Lithology | Stratum Description | SPT | | | | | CORE RUN | | | | Remarks | | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | Core Recovery (Cm) | R.Q.D (%) | Core Waxed for Testing (m) | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | | | | | 50 | From | To | From |
| 20.00 | SPT-20 | 0.8 | [Pattern] | Brown, highly fractured, very poor, medium hard, SANDSTONE | | | | | | | | | | | | | | | | | |
| 21.00 | CRS-21 | 0.2 | [Pattern] | Brown, highly fractured, very poor, MUDSTONE | | | | | | | | | | | 20.00 | 21.00 | 70 | 24 | - | - | |
| 22.00 | CRS-22 | 1.0 | [Pattern] | Brown, moderately fractured, fair, medium hard, Sandy SHALE, interbedded with brownish grey, MUDSTONE | | | | | | | | | | | 21.00 | 22.00 | 65 | 40 | 21.40 | 21.60 | |
| 23.00 | CRS-23 | 1.0 | [Pattern] | Brown, Slightly fractured, good, hard, CLAYSTONE | | | | | | | | | | | 22.00 | 23.00 | 70 | 68 | 22.32 | 22.47 | |
| 24.00 | CRS-24 | 2.0 | [Pattern] | Grey to brownish grey, Slightly to moderately fractured, good to fair, moderately vertically & horizontally jointed, medium hard, SILTSTONE (lenses of MUDSTONE at bottom) | | | | | | | | | | | 23.00 | 24.00 | 60 | 58 | 23.30 | 23.50 | |
| 25.00 | CRS-25 | | [Pattern] | | | | | | | | | | | | 24.00 | 25.00 | 70 | 35 | 24.60 | 24.80 | |
| 26.00 | CRS-26 | 2.0 | [Pattern] | Grey, highly to moderately fractured, poor to fair, moderately horizontal joints, medium hard, SANDSTONE with lenses of MUDSTONE & CLAYSTONE | | | | | | | | | | | 25.00 | 26.00 | 80 | 20 | - | - | |
| 27.00 | CRS-27 | | [Pattern] | | | | | | | | | | | | 26.00 | 27.00 | 85 | 50 | 26.75 | 26.90 | |
| 28.00 | CRS-28 | 2.0 | [Pattern] | Grey, moderately to highly fractured, poor, closely jointed, medium hard, SILTSTONE | | | | | | | | | | | 27.00 | 28.00 | 75 | 30 | 27.35 | 27.55 | |
| 29.00 | CRS-29 | | [Pattern] | | | | | | | | | | | | 28.00 | 29.00 | 75 | 16 | - | - | |
| 30.00 | CRS-30 | 1.0 | [Pattern] | Grey, moderately fractured, good, medium hard, Silty CLAYSTONE | | | | | | | | | | | 29.00 | 30.00 | 80 | 56 | - | - | |
| END OF BOREHOLE AT 30.0m Depth | | | | | | | | | | | | | | | | | | | | | |

APP-2-2-100

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 2 of 3

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2752592 | | Ground Water: 3.75m | | Borehole No: KCR/BH#49 | | | | | | | | | | | |
|--|------------|------------------------|-----------|--|---------|-------------------------|---------|-----------------|--------------|------------------------------|----|------------------------|----|-------|-----------|-------|--------------------|-----------|---------|----------------------------|-------------------|--|--|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R294825 | | Geologist: Efaz | | Date Started: July-17-2012 | | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +6.71 | | Driller: Jamali | | Date Completed: July-21-2012 | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thickness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | | | | | CORE RUN | | | | Remarks | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | | Core Recovery (Cm) | R.Q.D (%) | | Core Waxed for Testing (m) | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | From | To | | | | From | to | | |
| 10.00 | | | | Brown, moderately fractured, fair, moderately jointed, medium hard, SILTSTONE | | | | | | | | | | | | | | | | | | | |
| 11.00 | CRS-11 | 3.0 | | | | | | | | | | | | | 10.00 | 11.00 | 75 | 40 | 10.50 | 10.65 | Sample Waxed 15cm | | |
| 12.00 | CRS-12 | | | | | | | | | | | | | | | 11.00 | 12.00 | 75 | 44 | - | - | | |
| 13.00 | CRS-13 | | | Brown, moderately fractured, fair, closely jointed, friable SANDSTONE. | | | | | | | | | | | | | | | | | | | |
| 14.00 | CRS-14 | 0.7 | | | | | | | | | | | | | 12.00 | 13.00 | 70 | 42 | 12.57 | 12.75 | Sample Waxed 18cm | | |
| 15.00 | CRS-15 | 1.3 | | Dark Brown, Slightly fractured, good, horzanal jointed, medium hard, MUDSTONE. | | | | | | | | | | | | | | | | | | | |
| 16.00 | CRS-16 | | | | | | | | | | | | | | 13.00 | 14.00 | 60 | 27 | 13.70 | 13.84 | Sample Waxed 14cm | | |
| 17.00 | CRS-17 | | | Brown, moderately fractured, poor to fair, moderately to closely jointed, medium hard, SILTSTONE | | | | | | | | | | | | | | | | | | | |
| 18.00 | CRS-18 | 5.0 | | | | | | | | | | | | | 14.00 | 15.00 | 65 | 60 | 14.28 | 14.50 | Sample Waxed 22cm | | |
| 19.00 | CRS-19 | | | | | | | | | | | | | | 15.00 | 16.00 | 65 | 35 | 15.33 | 15.50 | Sample Waxed 17cm | | |
| 20.00 | CRS-20 | | | | | | | | | | | | | | 16.00 | 17.00 | 65 | 30 | - | - | | | |
| | | | | Brown, highly fractured, poor, medium hard, SILTSTONE | | | | | | | | | | | | | | | | | | | |
| 18.00 | CRS-18 | | | | | | | | | | | | | | 17.00 | 18.00 | 70 | 40 | 17.30 | 17.50 | Sample Waxed 15cm | | |
| | | | | Brown, moderately fractured, poor, moderately jointed, medium hard, SILTSTONE | | | | | | | | | | | | | | | | | | | |
| 19.00 | CRS-19 | | | | | | | | | | | | | | 18.00 | 19.00 | 65 | 20 | - | - | | | |
| 20.00 | CRS-20 | | | | | | | | | | | | | 19.00 | 20.00 | 60 | 25 | 19.35 | 19.60 | Sample Waxed 15cm | | | |

SPT: Standard Penetration Test CRS : Core Sample CR: Core Recovery RQD: Rock Quality Designation, DS: Disturb Sample, SL: Sample Length

APP-2-2-102

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 1 of 3






| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2752245 | | Ground Water: 0.20m | | Borehole No: KCR/BH#50 | | | | | | | | | | |
|--|----------------|-------------------------|-----------|---|---------|-------------------------|---------|------------------|--------------|------------------------------|----|------------------------|----|------|-----------|---------|--------------------|-----------|----------------------------|------------------|------|----|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R295377 | | Geologist: Jawad | | Date Started: July-13-2012 | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +2.05 | | Driller: Misba | | Date Completed: July-17-2012 | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thicknness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | | CORE RUN | | | | Remarks | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | | Core Recovery (Cm) | R.Q.D (%) | Core Waxed for Testing (m) | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | | | | | From | To | From | to |
| 0.00 | | | | Brownish black to Grey, soft to firm, Sandy CLAY, little Gravels, (as filled material) | | | | | | | | | | | | | | | | | | |
| 1.00 | CRS-1 SPT-1 | 3.0 | | | 2 | 1 | 1 | 2 | 4 | | | | | | 0.00 | 1.00 | 60 | NA | | | | |
| 2.00 | CRS-2 SPT-2 | | | | 2 | 2 | 2 | 2 | 6 | | | | | | 1.00 | 2.00 | 60 | NA | | | | |
| 3.00 | CRS-3 SPT-3 | | | | 3 | 2 | 2 | 3 | 7 | | | | | 2.00 | 3.00 | 70 | NA | | | | | |
| 4.00 | CRS-4 SPT-4 | 2.0 | | Blackish grey, firm to stiff, Silty CLAY, little Sand, with organic material | 2 | 3 | 3 | 4 | 10 | | | | | 3.00 | 4.00 | 70 | NA | 3.19 | 3.35 | Samle Waxed 16cm | | |
| 5.00 | CRS-5 SPT-5 | | | | | 19 | 10 | 8 | 7 | 25 | | | | | 4.00 | 5.00 | 70 | NA | | | | |
| 6.00 | CRS-6 SPT-6 | 5.0 | | Brown, medium dense to dense, medium to coarse, Silty Clayey SAND, little to some Gravels | 19 | 15 | 14 | 8 | 37 | | | | | 5.00 | 6.00 | 70 | NA | | | | | |
| 7.00 | CRS-7 SPT-7 | | | | 12 | 11 | 15 | 18 | 44 | | | | | 6.00 | 7.00 | 65 | NA | | | | | |
| 8.00 | CRS-8 SPT-8 | | | | 18 | 15 | 18 | 12 | 45 | | | | | 7.00 | 8.00 | 85 | NA | | | | | |
| 9.00 | CRS-9 SPT-9 | | | | 23 | 23 | 19 | 28 | 70 | | | | | 8.00 | 9.00 | 65 | NA | | | | | |
| 10.00 | CRS-10 | | | | | | | | | | | | | | 9.00 | 10.00 | 70 | NA | | | | |

APP-2-2-104

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 2 of 3

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2752245 | | Ground Water: 0.20m | | Borehole No: KCR/BH#50 | | | | | | | | | | | | | | | |
|--|------------|---------------------------|--|--|---------|--|---------|------------------|--------------|------------------------------|----|------------------------|----|----|-----------|----|--------------------|-----------|---------|----------------------------|----|--|--|--|-------------------|--|--|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R295377 | | Geologist: Jawad | | Date Started: July-13-2012 | | | | | | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +2.05 | | Driller: Misba | | Date Completed: July-17-2012 | | | | | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thick. kness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | | | | | CORE RUN | | | | Remarks | | | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | | Core Recovery (Cm) | R.Q.D (%) | | Core Waxed for Testing (m) | | | | | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | From | To | | | | From | to | | | | | | |
| 10.00 | SPT-10 | 0.8 |  | Brown, very dense, medium to coarse, Silty SAND, little Gravels | 26 | 25 | 20 | 35 | 80 | | | | | | | | | | | | | | | | | | |
| 11.00 | CRS-11 | 1.2 |  | Brown, very hard, Silty CLAY, trace Gravels | 30 | 30 | 25 | 30 | 85 | | | | | | | | | | | | | | | | Sample Waxed 15cm | | |
| 12.00 | SPT-11 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12.00 | CRS-12 | 0.8 |  | Brown, very, dense, medium to coarse, Silty SAND, some Gravels | 35 | 40 | 30 | 20 | 90 | | | | | | | | | | | | | | | | Sample Waxed 12cm | | |
| 13.00 | SPT-12 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13.00 | CRS-13 | 0.2 |  | Redish brown, highly fracured, very poor, SILTSTONE | | | | | | | | | | | | | | | | | | | | | | | |
| 14.00 | CRS-14 | 7.0 |  | Greyish brown, highly fracuted, very poor, fine to medium, graind, closely jointed, friable SANDSTONE, | | | | | | | | | | | | | | | | | | | | | | | |
| 15.00 | CRS-15 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 16.00 | CRS-16 | | | | | Greyish brown, slightly fracuted, good fine to medium, graind, moderately jointed, friable SANDSTONE, | | | | | | | | | | | | | | | | | | | | | |
| 17.00 | CRS-17 | | | | | Greyish brown, highly fracuted, very poor, fine to medium, graind, closely jointed, friable SANDSTONE, | | | | | | | | | | | | | | | | | | | | | |
| 18.00 | CRS-18 | | | | | Greyish brown, slightly fracuted, good fine to medium, graind, moderately jointed, friable SANDSTONE, | | | | | | | | | | | | | | | | | | | | | |
| 19.00 | CRS-19 | | | | | Greyish brown, highly fracuted, very poor, fine to medium, graind, closely jointed, friable SANDSTONE, | | | | | | | | | | | | | | | | | | | | | |
| 20.00 | CRS-20 | | | | | Greyish brown, highly fracuted, very poor, fine to medium, graind, closely jointed, friable SANDSTONE, | | | | | | | | | | | | | | | | | | | | | |

APP-2-2-105

SPT: Standard Penetration Test CRS : Core Sample CR: Core Recovery RQD: Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 1 of 3

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2751854 | | Ground Water: 3.90m | | Borehole No: KCR/BH#51 | | | | | | | | | |
|--|----------------|---------------------------|-----------|---|---------|-------------------------|---------|------------------|--------------|------------------------------|----|------------------------|----|------|-----------|--------------------|-----------|----------------------------|---------|-------------------|-------------------|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R295932 | | Geologist: Jawad | | Date Started: July-01-2012 | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +3.55 | | Driller: Misbah | | Date Completed: June-05-2012 | | | | | | | | | | | |
| Depth (m) | Sample No. | Thick. kness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | | | | | CORE RUN | | | | Remarks | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | Core Recovery (Cm) | R.Q.D (%) | Core Waxed for Testing (m) | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | | | | From | | To | From |
| 0.00 | | | ▽ | Greyish Brown, very loose, Sandy GRAVELS, trace Silt (Filled Material) | | | | | | | | | | | | | | | | | |
| 1.00 | CRS-1 SPT-1 | 2.0 | ▽ | | 2 | 2 | 1 | 1 | 4 | | | | | | | 0.00 | 1.00 | 85 | NA | - | - |
| 2.00 | CRS-2 SPT-2 | | ▽ | Greyish Brown, loose, Gravely SAND, trace to little Silt (Filled Material) | 2 | 1 | 2 | 2 | 5 | | | | | | 1.00 | 2.00 | 85 | NA | - | - | |
| 3.00 | CRS-3 SPT-3 | 1.0 | ▽ | | 3 | 5 | 7 | 7 | 19 | | | | | | 2.00 | 3.00 | 80 | NA | - | - | |
| 4.00 | CRS-4 SPT-4 | 3.0 | ▽ | Brown, medium dense, fine to coarse, SAND, little Silt, trace to little Gravels | 5 | 5 | 7 | 9 | 21 | | | | | | 3.00 | 4.00 | 72 | NA | - | - | |
| 5.00 | CRS-5 SPT-5 | | ▽ | | 5 | 7 | 3 | 7 | 17 | | | | | | 4.00 | 5.00 | 80 | NA | - | - | |
| 6.00 | CRS-6 SPT-6 | | ▽ | | 8 | 6 | 14 | 19 | 39 | | | | | | 5.00 | 6.00 | 80 | NA | 5.25 | 5.43 | Sample Waxed 18cm |
| 7.00 | CRS-7 SPT-7 | 0.8 | ▽ | Brown, very dense to dense, fine to coarse, Clayey SAND, little Silt, trace to little fine, Gravels | 18 | 22 | 20 | 12 | 54 | | | | | | 6.00 | 7.00 | 84 | NA | 6.0 | 6.2 | Sample Waxed 20cm |
| 8.00 | CRS-8 SPT-8 | 3.2 | ▽ | | 16 | 8 | 14 | 12 | 34 | | | | | | 7.00 | 8.00 | 82 | NA | 7.0 | 7.2 | Sample Waxed 20cm |
| 9.00 | CRS-9 SPT-9 | | ▽ | 19 | 14 | 14 | 12 | 40 | | | | | | 8.00 | 9.00 | 85 | NA | 8.0 | 8.16 | Sample Waxed 16cm | |
| 10.00 | CRS-10 | | ▽ | | | | | | | | | | | | 9.00 | 10.00 | 70 | NA | - | - | |

APP-2-2-107

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 2 of 3

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2751854 | | Ground Water: 3.90m | | Borehole No: KCR/BH#51 | | | | | | | | | | | | | |
|--|------------|---------------------------|-----------|---|---------|-------------------------|---------|------------------|--------------|------------------------------|-------------------|------------------------|----|----|-----------|-------|--------------------|-----------|---------|----------------------------|----|--|--|--|--|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R295932 | | Geologist: Jawad | | Date Started: July-01-2012 | | | | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +3.55 | | Driller: Misbah | | Date Completed: June-05-2012 | | | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thick. kness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | | | | | CORE RUN | | | | Remarks | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | | Core Recovery (Cm) | R.Q.D (%) | | Core Waxed for Testing (m) | | | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | From | To | | | | From | to | | | | |
| 10.00 | SPT-10 | 2.0 | | Brown, very dense, fine to coarse, SAND, little fine to medium Gravels, some Clay & Silt | 18 | 20 | 25 | 20 | 65 | | | | | | | 0 | | | | | | | | | |
| 11.00 | CRS-11 | | | | 25 | 35 | 28 | 25 | 88 | | | | | | | 10.00 | 11.00 | 76 | NA | - | - | | | | |
| 12.00 | SPT-11 | 1.0 | | Brown, very hard, Silty CLAY, | 30 | 30 | 35 | 22 | 87 | | | | | | 0 | | | | | | | | | | |
| 13.00 | CRS-12 | | | | 11.00 | 12.00 | 80 | NA | 11.10 | 11.25 | Sample Waxed 15cm | | | | | | | | | | | | | | |
| 13.00 | SPT-12 | 5.0 | | Brown, very dense, medium to coarse, Clayey SAND, little to some, fine to coarse, Gravels | 28 | 25 | 22 | 18 | 65 | | | | | | 0 | | | | | | | | | | |
| 14.00 | CRS-13 | | | | 12.00 | 13.00 | 75 | NA | 12.20 | 12.40 | Sample Waxed 20cm | | | | | | | | | | | | | | |
| 14.00 | SPT-13 | 5.0 | | | 23 | 29 | 33 | 33 | 95 | | | | | | 0 | | | | | | | | | | |
| 15.00 | CRS-14 | | | | 13.00 | 14.00 | 70 | NA | - | - | | | | | | | | | | | | | | | |
| 15.00 | SPT-14 | 5.0 | | | 30/9cm | | | | R | | | | | | 0 | | | | | | | | | | |
| 16.00 | CRS-15 | | | | 14.00 | 15.00 | 75 | NA | - | - | | | | | | | | | | | | | | | |
| 16.00 | SPT-15 | 5.0 | | | 28/13cm | | | | R | | | | | | 0 | | | | | | | | | | |
| 17.00 | CRS-16 | | | | 15.00 | 16.00 | 75 | NA | 15.46 | 15.61 | Sample Waxed 15cm | | | | | | | | | | | | | | |
| 17.00 | SPT-16 | 5.0 | | | 35/15cm | | | | R | | | | | | 0 | | | | | | | | | | |
| 18.00 | CRS-17 | | | | 16.00 | 17.00 | 65 | NA | - | - | | | | | | | | | | | | | | | |
| 18.00 | SPT-17 | 2.0 | | Brown, highly to moderately fractured, poor, hard, CONGLOMERATE, trace Clacarious nodules and Sand matrix | 35/13cm | | | | R | | | | | | 0 | | | | | | | | | | |
| 19.00 | CRS-18 | | | | 17.00 | 18.00 | 45 | NA | - | - | | | | | | | | | | | | | | | |
| 19.00 | SPT-18 | 2.0 | | | | | | | | | | | | | 0 | | | | | | | | | | |
| 20.00 | CRS-19 | | | | 18.00 | 19.00 | 50 | 25 | - | - | | | | | | | | | | | | | | | |
| 20.00 | SPT-19 | 2.0 | | | | | | | | | | | | | 0 | | | | | | | | | | |
| 20.00 | CRS-20 | | | | 19.00 | 20.00 | 50 | 30 | 19.13 | 19.31 | Sample Waxed 18cm | | | | | | | | | | | | | | |

APP-2-2-108

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 3 of 3

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2751854 | | Ground Water: 3.90m | | Borehole No: KCR/BH#51 | | | | | | | | | | | | | | | | |
|--|------------|------------------------|--------------------------------|---|---------|-------------------------|--|------------------|--------------|------------------------------|----|------------------------|----|----|-----------|----|--------------------|-----------|---------|----------------------------|----|--|--|--|-------------------|--|-------------------|--|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R295932 | | Geologist: Jawad | | Date Started: July-01-2012 | | | | | | | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +3.55 | | Driller: Misbah | | Date Completed: June-05-2012 | | | | | | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thickness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | | | | | CORE RUN | | | | Remarks | | | | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | | Core Recovery (Cm) | R.Q.D (%) | | Core Waxed for Testing (m) | | | | | | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | From | To | | | | From | To | | | | | | | |
| 20.00 | | 5.0 | | Ligh Brown, highly fractured, poor, Hard, CONGLOMERATE trace Calcareous nodules and Sand matrix | | | | | | | | | | | | | | | | | | | | | | | | |
| 21.00 | CRS-21 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22.00 | CRS-22 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 23.00 | CRS-23 | | | | | | Ligh Brown, slightly fractured, good, Hard, CONGLOMERATE | | | | | | | | | | | | | | | | | | | | | |
| 24.00 | CRS-24 | | | | | | Ligh Brown, highly fractured to moderately fractured, poor, hard, CONGLOMERATE | | | | | | | | | | | | | | | | | | | | | |
| 25.00 | CRS-25 | | | Brown, moderately fractured to slightly fractured, good, closely jointed, medium hard, SHALE | | | | | | | | | | | | | | | | | | | | | | | | |
| 26.00 | CRS-26 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 27.00 | CRS-27 | | | | | | | | | | | | | | | | | | | | | | | | | | Sample Waxed 14cm | |
| 28.00 | CRS-28 | | | | | | | | | | | | | | | | | | | | | | | | | | Sample Waxed 22cm | |
| 29.00 | CRS-29 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30.00 | CRS-30 | | END OF BOREHOLE AT 30.0m Depth | | | | | | | | | | | | | | | | | | | | | | Sample Waxed 20cm | | | |

APP-2-2-109

SPT: Standard Penetration Test CRS : Core Sample CR: Core Recovery RQD: Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 2 of 3

| Client: The JICA Study Team | | Type of Boring: Rotary | | Co-ordinate: | | N: 2751669 | | Ground Water: 4.60m | | Borehole No: KCR/BH#52 | | | | | | | | | | | | | |
|--|------------|---------------------------|-----------|--|---------|------------------------|---------|-----------------------------|--------------|------------------------|----|----|----|---------|-----------|--------------------|-----------|----------------------------|-------|-------------------|-------------------|----|--|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | Machine Make: Russian | | E: 42R296216 | | Geologist: Efaz Danish | | Date Started: June-30-2012 | | | | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | Drilling Fluid: Bentonite | | Ground Elevation: +3.74 | | Driller: Jamali | | Date Completed: July-7-2012 | | | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thick kness of Layer (m) | Lithology | Stratum Description | SPT | | | | | CORE RUN | | | | Remarks | | | | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | Core Recovery (Cm) | R.Q.D (%) | Core Waxed for Testing (m) | | | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | | | | | 50 | From | To | From | to | |
| 10.00 | SPT-10 | 3.0 | | Brown, very dense, medium to coarse, Gravely SAND, little Silt | 24 | 30 | 31 | 25/5cm | R | | | | | | | 0 | | | | | | | |
| 11.00 | CRS-11 | | | | 40 | 45 | 30/5cm | R | | | | | | | 10.0 | 11.0 | 83 | NA | - | - | | | |
| 12.00 | CRS-12 | | | | 26 | 24 | 41 | 20/3cm | R | | | | | | | 11.0 | 12.0 | 90 | NA | - | - | | |
| 13.00 | CRS-13 | | | | 20 | 26 | 21 | 38 | 85 | | | | | | | 12.0 | 13.0 | 85 | NA | - | - | | |
| 14.00 | SPT-13 | 0.6 | | Brown, very hard, Silty CLAY, little Sand | 33 | 50/8cm | | R | | | | | | 13.0 | 14.0 | 88 | NA | 13.72 | 13.85 | Sample Waxed 14cm | | | |
| 15.00 | CRS-14 | | | | 20 | 27 | 29 | 41 | 97 | | | | | | 14.0 | 15.0 | 86 | NA | 14.65 | 14.80 | Sample Waxed 13cm | | |
| 16.00 | SPT-14 | 2.4 | | Brown, very hard, Silty CLAY, trace to little Sand | 25 | 32 | 34 | 30/5cm | R | | | | | | 15.0 | 16.0 | 90 | NA | 15.30 | 15.50 | Sample Waxed 20cm | | |
| 17.00 | CRS-15 | | | | 45 | 30/3cm | | R | | | | | | | 16.0 | 17.0 | 82 | NA | - | - | | | |
| 18.00 | SPT-15 | 1.0 | | Brown, very dense, Gravely SAND, little Clayey SILT | 30/10cm | | | R | | | | | | 17.0 | 18.0 | 82 | NA | - | - | | | | |
| 19.00 | CRS-16 | | | | 40/10cm | | | R | | | | | | | 18.0 | 19.0 | 85 | Nil | - | - | | | |
| 20.00 | SPT-16 | 1.4 | | Brown, highly fractured, very poor, hard, CONGLOMERATE, with Sand matrix | | | | | | | | | | | | | | | | | | | |
| 19.00 | CRS-17 | | | | | | | | | | | | | | | | | | | | | | |
| 20.00 | SPT-17 | 0.6 | | Brown, highly fractured, very poor, fine to medium grained, medium hard, SANDSTONE | | | | | | | | | | | | | | | | | | | |
| 20.00 | CRS-18 | | | | | | | | | | | | | | | | 19.0 | 20.0 | 80 | Nil | - | - | |

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

APP-2-2-111

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 3 of 3

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2751201 | | Ground Water: 4.15m | | Borehole No: KCR/BH#53 | | | | | | | | | | | | | |
|--|------------|------------------------|-----------|--|---------|-------------------------|---|------------------|--------------|------------------------------|----|------------------------|----|-------|-----------|-------|--------------------|-----------|---------|----------------------------|-------------------|-------|-------------------|-------------------|--|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R296573 | | Geologist: Jawad | | Date Started: June-27-2012 | | | | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +2.89 | | Driller: Misba | | Date Completed: June-30-2012 | | | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thickness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | | | | | CORE RUN | | | | Remarks | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | | Core Recovery (Cm) | R.Q.D (%) | | Core Waxed for Testing (m) | | | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | From | To | | | | From | To | | | | |
| 20.00 | | | | Brown, highly fractured, very poor, loosely Cemented, CONGLOMERATE | | | | | | | | | | | | | | | | | | | | | |
| 21.00 | CRS-21 | 3.4 | | | | | | | | | | | | | | | 20.00 | 21.00 | 60 | Nil | | | | | |
| 22.00 | CRS-22 | | | | | | | | | | | | | | | | | 21.00 | 22.00 | 70 | Nil | | | | |
| 23.00 | CRS-23 | | | | | | | | | | | | | | | | | 22.00 | 23.00 | 75 | 13 | | | | |
| 24.00 | CRS-24 | | | | 0.6 | | Brown, highly fractured, very poor, medium hard, MUDSTONE | | | | | | | | | | | 23.00 | 24.00 | 75 | 15 | 22.55 | 22.72 | Sample Waxed 17cm | |
| 25.00 | CRS-25 | 1.0 | | Brown, moderately fractured, poor, medium hard, Closely jointed, SANDSTONE | | | | | | | | | | | 24.00 | 25.00 | 70 | 30 | 24.36 | 24.51 | Sample Waxed 15cm | | | | |
| 26.00 | CRS-26 | 3.0 | | Brown, moderately to slightly fractured, fair to good, closely jointed, medium hard, CLAYSTONE | | | | | | | | | | | 25.00 | 26.00 | 84 | 52 | 25.50 | 25.65 | Sample Waxed 15cm | | | | |
| 27.00 | CRS-27 | | | | | | | | | | | | | | | | 26.00 | 27.00 | 85 | 75 | - | - | | | |
| 28.00 | CRS-28 | | | | | | | | | | | | | | | | 27.00 | 28.00 | 88 | 40 | 27.53 | 27.68 | Sample Waxed 15cm | | |
| 29.00 | CRS-29 | 1.0 | | Brown, highly fractured, poor, closely jointed, medium hard, CLAYSTONE | | | | | | | | | | 28.00 | 29.00 | 86 | 18 | 28.54 | 28.70 | Sample Waxed 16cm | | | | | |
| 30.00 | CRS-30 | 1.0 | | Brown, moderately fractured, fair, closely jointed, medium hard, CLAYSTONE | | | | | | | | | | 29.00 | 30.00 | 85 | 50 | 29.66 | 29.81 | Sample Waxed 15cm | | | | | |
| END OF BOREHOLE AT 30.0m Depth | | | | | | | | | | | | | | | | | | | | | | | | | |

APP-2-2-115

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 2 of 3

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2750760 | | Ground Water: 3.50m | | Borehole No: KCR/BH#54 | | | | | | | | | | | |
|--|------------|-------------------------|-----------|---|---------|-------------------------|---------|------------------------|--------------|------------------------------|----------|------------------------|----|----|---------|-----------|--------------------|-----------|----------------------------|-------|-------|-------|--|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R296534 | | Geologist: Efaz Danish | | Date Started: June-26-2012 | | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +2.74 | | Driller: M.Murad | | Date Completed: June-29-2012 | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thicknness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | CORE RUN | | | | Remarks | | | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | | Depth (m) | Core Recovery (Cm) | R.Q.D (%) | Core Waxed for Testing (m) | | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | | | | | From | To | From | to | |
| 10.00 | SPT-10 | 1.0 | ■■■■■ | Brown, very dense, medium to coarse, Silty SAND, little Gravels. | 32 | 23 | 24 | 35 | 82 | | | | | | | | | | | | | | |
| 11.00 | CRS-11 | | ■■■■■ | Brown, very dense, medium to coarse, Clayey SAND, little Gravels. | 23 | 26 | 35 | 39 | 100 | | | | | | 10.00 | 11.00 | 72 | NA | | | | | |
| 12.00 | SPT-11 | 0.7 | ■■■■■ | | | 40/10cm | | | | R | | | | | | 11.00 | 12.00 | 80 | NA | | | | |
| 13.00 | CRS-12 | | ■■■■■ | Greyish brown, very hard to hard, Silty CLAY, little Sand & Gravels, trace fossils, trace calcarious nodules. | 12 | 14 | 12 | 15 | 41 | | | | | | 12.00 | 13.00 | 90 | NA | 12.20 | 12.45 | 12.55 | 12.75 | Sample Waxed 25cm Sample Waxed 20cm |
| 14.00 | SPT-12 | 1.8 | ■■■■■ | | | 12 | 14 | 12 | 15 | 41 | | | | | | 13.00 | 14.00 | 78 | NA | | | | |
| 15.00 | CRS-13 | | ■■■■■ | Brown, very dense, Clayey SAND, trace Gravels. | 14 | 30 | 17/5cm | | R | | | | | | 14.00 | 15.00 | 80 | NA | 14.70 | 14.90 | | | Sample Waxed 20cm |
| 16.00 | SPT-13 | 1.1 | ■■■■■ | | | 19 | 22 | 35 | 10/2cm | R | | | | | | 15.00 | 16.00 | 78 | NA | 15.70 | 15.90 | | |
| 17.00 | CRS-14 | | ■■■■■ | Brown, very hard, Silty CLAY, trace Gravels trace to little Sand. | 33 | 12/2cm | | | R | | | | | | 16.00 | 17.00 | 70 | NA | 16.52 | 16.70 | | | Sample Waxed 18cm |
| 18.00 | SPT-14 | 2.3 | ■■■■■ | | | 45 | 20/5cm | | | R | | | | | | 17.00 | 18.00 | 80 | NA | 17.20 | 17.40 | | |
| 19.00 | CRS-15 | | ■■■■■ | Brown, very hard, Sandy Clayey SILT. | 20/5cm | | | | R | | | | | | 18.00 | 19.00 | 70 | NA | 18.70 | 18.90 | | | Sample Waxed 20cm |
| 20.00 | SPT-15 | 1.1 | ■■■■■ | | | 20/5cm | | | | R | | | | | | 19.00 | 20.00 | 78 | NA | | | | |
| 19.00 | CRS-16 | | ■■■■■ | Brown, very dense, medium to coarse, Clayey SAND, trace Gravels, trace calcarious nodules at bottom of unit. | | | | | | | | | | | | | | | | | | | |
| 20.00 | SPT-16 | 2.0 | ■■■■■ | | | | | | | | | | | | | | | | | | | | |
| 19.00 | CRS-17 | | ■■■■■ | Brown, very dense, medium to coarse, Clayey SAND, trace Gravels, trace calcarious nodules at bottom of unit. | | | | | | | | | | | | | | | | | | | |
| 20.00 | SPT-17 | 1.1 | ■■■■■ | | | | | | | | | | | | | | | | | | | | |
| 19.00 | CRS-18 | | ■■■■■ | Brown, very dense, medium to coarse, Clayey SAND, trace Gravels, trace calcarious nodules at bottom of unit. | | | | | | | | | | | | | | | | | | | |
| 20.00 | SPT-18 | 2.0 | ■■■■■ | | | | | | | | | | | | | | | | | | | | |

APP-2-2-117

SPT: Standard Penetration Test CRS : Core Sample CR: Core Recovery RQD: Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 3 of 3

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2750760 | | Ground Water: 3.50m | | Borehole No: KCR/BH#54 | | | | | | | | | | | | | | |
|--|------------|------------------------|-----------|--|---------|-------------------------|---------|------------------------|--------------|------------------------------|-------------------|------------------------|----|----|-----------|----|--------------------|-----------|---------|----------------------------|----|--|--|--|--|--|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R296534 | | Geologist: Efaz Danish | | Date Started: June-26-2012 | | | | | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +2.74 | | Driller: M.Murad | | Date Completed: June-29-2012 | | | | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thickness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | | | | | CORE RUN | | | | Remarks | | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | | Core Recovery (Cm) | R.Q.D (%) | | Core Waxed for Testing (m) | | | | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | From | To | | | | From | To | | | | | |
| 20.00 | SPT-20 | 1.7 | | Brown, highly fractured, very poor, loosely cemented, CONGLOMERATE | 20/5cm | | | | | | | | | | | | | | | | | | | | | |
| 21.00 | CRS-21 | | | | 20.00 | 21.00 | 70 | Nil | | | | | | | | | | | | | | | | | | |
| 22.00 | CRS-22 | 2.3 | | Brown, highly fractured, very poor, closely jointed, medium hard, SANDSTONE, with lenses of CONGLOMERATE | | | | | | | | | | | | | | | | | | | | | | |
| 23.00 | CRS-23 | | | | 21.00 | 22.00 | 70 | Nil | | | | | | | | | | | | | | | | | | |
| 24.00 | CRS-24 | 3.4 | | Greyish brown, highly fractured, very poor, loosely cemented, CONGLOMERATE | | | | | | | | | | | | | | | | | | | | | | |
| 25.00 | CRS-25 | | | | 23.00 | 24.00 | 65 | 10 | 23.50 | 23.60 | Sample Waxed 10cm | | | | | | | | | | | | | | | |
| 26.00 | CRS-26 | | | | 24.00 | 25.00 | 60 | Nil | | | | | | | | | | | | | | | | | | |
| 27.00 | CRS-27 | | | | 25.00 | 26.00 | 60 | Nil | | | | | | | | | | | | | | | | | | |
| 28.00 | CRS-28 | 2.6 | | Brown, moderately fractured, fair, moderately jointed, medium hard, CLAYSTONE | | | | | | | | | | | | | | | | | | | | | | |
| 29.00 | CRS-29 | | | | 27.00 | 28.00 | 60 | 48 | 27.60 | 27.78 | Sample Waxed 18cm | | | | | | | | | | | | | | | |
| 30.00 | CRS-30 | | | | 28.00 | 29.00 | 78 | 40 | 28.70 | 28.90 | Sample Waxed 20cm | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | END OF BOREHOLE AT 30.0m Depth | | | | | | | | | | | | | | | | | | | | | | |

SPT: Standard Penetration Test CRS : Core Sample CR:Core Recovery RQD:Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length

APP-2-2-118

SUBSURFACE EXPLORATION LOG FIELD DATA

Sheet 1 of 3

| Client: The JICA Study Team | | | | Type of Boring: Rotary | | Co-ordinate: | | N: 2750337 | Ground Water: 3.05m | | Borehole No: KCR/BH#55 | | | | | | | | | | | | | |
|--|----------------|------------------------|-----------|---|---------|-------------------------|---------|------------------------|---------------------|------------------------------|------------------------|----------|----|------|-----------|---------|--------------------|-----------|----------------------------|-----|------|----|-------------------|------------|
| Project: Preparatory Survey(II) on Karachi Circular Railway Revival Project in Karachi | | | | Machine Make: Russian | | E: 42R296549 | | Geologist: Efaz Danish | | Date Started: July-06-2012 | | | | | | | | | | | | | | |
| Contractor: Consolidated Engineering Services (Pvt) Ltd | | | | Drilling Fluid: Bentonite | | Ground Elevation: +2.33 | | Driller: Murad Jamali | | Date Completed: July-11-2012 | | | | | | | | | | | | | | |
| Depth (m) | Sample No. | Thickness of Layer (m) | Lithology | Stratum Description | SPT | | | | | | | CORE RUN | | | | Remarks | | | | | | | | |
| | | | | | 15 (cm) | 10 (cm) | 10 (cm) | 10 (cm) | N Blows 30cm | Graph N/30 cm | | | | | Depth (m) | | Core Recovery (Cm) | R.Q.D (%) | Core Waxed for Testing (m) | | | | | |
| | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | | | | | From | To | From | to | | |
| 0.00 | | | | Greysih brown, medium dense, fine to medium, Silty SAND, trace Gravels, (Filled Material) | | | | | | | | | | | | | | | | | | | | |
| 1.00 | CRS-1 SPT-1 | 2.5 | | | 4 | 5 | 6 | 7 | 18 | | | | | | | 0.00 | 1.00 | 85 | NA | | | | | Dry Coring |
| 2.00 | CRS-2 SPT-2 | | | | | | | | | | | | | | | | | | | | | | | |
| 3.00 | CRS-3 SPT-3 | 1.2 | | Grey, soft, Silty CLAY, little Sand. | 5 | 6 | 8 | 9 | 23 | | | | | | 1.00 | 2.00 | 90 | NA | | | | | Dry Coring | |
| 4.00 | CRS-4 SPT-4 | 1.3 | | Grey, loose, medium to coarse, SAND, little Clay, little Gravels | 2 | 1 | 1 | 1 | 3 | | | | | | 2.00 | 3.00 | 80 | NA | | | | | Dry Coring | |
| 5.00 | CRS-5 SPT-5 | | | | 2 | 2 | 1 | 2 | 5 | | | | | | 3.00 | 4.00 | 80 | NA | | | | | Dry Coring | |
| 6.00 | CRS-6 SPT-6 | 1.0 | | Grey, firm, Sandy CLAY, trace Gravels. | 2 | 2 | 1 | 2 | 5 | | | | | | 4.00 | 5.00 | 70 | NA | | | | | | |
| 7.00 | CRS-7 SPT-7 | 2.0 | | Brown, very dense, medium to caorse, Sandy Clayey SILT, little Gravels. | 7 | 7 | 17 | 27 | 51 | | | | | | 5.00 | 6.00 | 84 | NA | 5.6 | 5.8 | | | Sample Waxed 20cm | |
| 8.00 | CRS-8 | | | | 33/10 | | | | R | | | | | | 6.00 | 7.00 | 58 | NA | | | | | | |
| 9.00 | CRS-9 | 2.0 | | Brown, very dense, medium to coarse, Silty SAND, trace to little Gravels. | | | | | | | | | | | 7.00 | 8.00 | 55 | NA | | | | | | |
| 10.00 | CRS-10 | | | | | | | | | | | | | | 8.00 | 9.00 | 40 | NA | | | | | | |
| | | | | | | | | | | | | | | 9.00 | 10.00 | 65 | NA | | | | | | | |

APP-2-119

SPT: Standard Penetration Test CRS : Core Sample CR: Core Recovery RQD: Rock Quality Designation, DS: Disturbe Sample, SL: Sample Length