PART (3): SUB-BASE AND BASE COURSES

SECTION 3.02 GRANULAR SUB-BASE COURSES

3.02.1 Scope

Add and amend as follows:

This work shall consist of furnishing, placing and compacting of Crushed Stone Sub-base Course (Class A) on top of an approved selected topping (if required) or compacted subgrade, in conformity with the lines, grades and dimensions shown on the drawings and in accordance with the technical specifications.

SECTION 3.03 AGGREGATE BASE COURSES

3.03.1 Scope

Add and amend as follows:

This work shall consist of furnishing, placing and compacting of crushed stone base course (Class A) on top of an approved sub-base in confirming with the lines, grades and dimensions shown on the drawings and in accordance with the technical specifications.

PART (4): BITUMINOUS CONSTRUCTION

SECTION 4.01 Materials

4.01.3 AGGREGATES FOR BITUMINOUS PAVING MIXES

Table 4.1
Delete Table 4.1 and replace by the following:

"Table 4.1: Gradation of Aggregates for Bituminous Mixes

Sieve Designation	Binder Course	Wearing Course
1 1/2" (37.5 mm)	-	-
1" (25.0 mm)	100	100
3/4" (19.0 mm)	70 - 100	90 - 100
1/2" (12.5 mm)	53 - 90	71 - 90
3/8" (9.5 mm)	40 - 80	56 - 80
No. 4 (4.75 mm)	30 - 56	35 - 56
No. 8 (2.36 mm)	23 - 38	23 - 38
No. 20 (1.18 mm)	13 - 27	13 - 27
No. 50 (0.300 mm)	5 - 17	5 - 17
No. 80 (0.150 mm)	4 - 14	4 - 14
No. 200 (0.075 mm)	2 - 8	2 - 8

Clause No. 12:
Amend the ratio of wear loss to be less than or equal 22%.

SECTION 4.02 BITUMINOUS PRIME AND TACK COATS

4.02.2 MATERIALS

Add and amend as follows:

1.1 The grade of asphalt to be used for priming shall be MC-70 conforming with AASHTO M82 and as specified in the General Specifications.

2.1 The grade of asphalt to be used for tack coat shall be rapid-curing cut-back Asphalt RC-250 conforming with AASHTO M81 and as specified in the General Specifications.

4.02.5 APPLICATION PROCEDURES

Add and amend as follows:

The Engineer's Representative will select the rate of application for the asphalt primer to be used within the limits stipulated in the general specifications. The contractor shall prepare and at his own expense the required no. of trial sections to help the Engineer in selecting the most appropriate rate of application.

SECTION 4.03 BITUMINOUS COURSES

4.03.3 JOB MIXES AND PROJECT MIXES

Table 4.10
Delete Table 4.10 and replace by the following:

"Table 4.10: Maximum Variations of Project Mix from Approved Job Mix"

Sieve Designation (Square Opening)		**Specified tolerances (%)**
9.5 mm	(3/8 in) and above	+ or - 5.0
4.75 mm	(No. 4)	+ or - 4.0
2.36 mm	(No. 8)	+ or - 3.0
1.18 mm	(No. 16)	+ or - 3.0
0.60 mm	(No. 30)	+ or - 3.0
0.30 mm	(No. 50)	+ or - 3.0
0.15 mm	(No. 100)	+ or - 3.0
0.075 mm	(No. 200)	+ or - 1.0
Bitumen Content		+ or - 0.30
Temperature of mix on discharge		+ or - 5 c° of the specified mixing Temperature

"

Add the following new clauses:

13. The initial mix design shall be called the laboratory design mix. Only after full-scale mixing, laying and compaction trials have been successfully completed is the contractor to propose and the Engineer to approve the mix as the basis of the Job Mix formula.

14. As production of bituminous mix proceeds, and based upon the daily dry aggregate and the daily Marshall specimens characteristics, the initial Job mix formula should be adjusted to meet the specifications requirements.

15. It is vital, and necessary to avoid variations in the Aggregates and bitumen properties so as to retain constant Job mix formula all the way through the bituminous pavement construction.

    However, at evidence of Mix property variations, new Job Mix formula has to be established by the contractor and approved by the Engineer.

    Variations in mix properties may result in lower stability value, excess of loss of stability percent, and variation by more than $\pm$ 0.05 in the bulk specific gravity of the Marshall specimens.

4.03.6 MIXING PROCEDURES

Clause No. 6:

Add the following at end of clause 6:

"Mixing time shall be the minimum possible, consistent with the production of a homogeneous distribution of Aggregate particles and uniform coating with bitumen".

4.03.8 DELIVERY, SPREADING AND FINISHING

Replace Clause 1.5 by:

1.5 The mix at delivery to the paver shall be not more than 10°C below discharge temperature at the mixing plant. The minimum temperature for the commencement of breakdown rolling is 120°C. The Engineer may lower the minimum acceptable delivery temperature if the Contractor demonstrates that the minimum temperature at the start of breakdown rolling (i.e. 120°C) can be ensured. Mix loads of temperature less than 120°C shall not be accepted, and the load shall be disposed of and another load used. If there is consistent failure to meet the temperature requirement, the Engineer shall order paving operations to stop until suitable measures are taken by the Contractor to ensure that temperature requirements are met.

Add the following new clauses as follows:

1.7 Rolling shall not continue after the temperature of the mix on the road has dropped below 120 c° without the express approval of the Engineer. Under any circumstances, no vibrating roller shall be used below that temperature. Finishing rolling is not allowed whatsoever when the mix temperature has dropped to 90c°.

1.8 Reference density for determination of degree of compaction shall be the daily marshal density provided that the daily Marshall density shall not vary by more than + 0.05 from the approval marshal design density.

Clause No. 5.7:
Amend the clause to read as follows:

"The minimum temperature of the mat at which rolling shall be allowed to start is 140 c°.

Clause No. 5.11:
Amend the clause to read as follows:

"The initial or breakdown rolling shall be followed by intermediate rolling involving at least 3 coverage with pneumatic - tired rollers.

4.03.9 SAMPLING AND TESTING

Clause No. 3:
Add the following at the end of clause 3:

"Bituminous cores should be taken at least 24 hours after laying, unless otherwise approved by the engineer".

SECTION 4.05 BITUMINOUS BINDER AND WEARING COURSES

4.05.3 JOB MIX AND PROJECT MIX

Table 4.15
Delete Table 4.15 and replace by new table 4.15 as follows:

"Table 4.15 Job Mix Requirements for Bituminous Binder and Wearing Courses

Property	Binder Course	Wearing Course
Marshall Stability		
at 60°C, Kg	900	1000
Flow (mms)	2 - 3.5	2 - 3.5
Voids in Mineral Aggregates (VMA)	13 (-1)	14 (-1)
Air Voids (%)	4 - 8	4 - 8
Stiffness (kg/mm)	500 (min.)	500 (min.)
* Loss of Stability	25 (max.)	25 (max.)

* This test is carried out in accordance with AASHTO T 165 - 82."

Add a new clause No. 5 as follows:

5. Air voids in the mix shall be at least 3% at refusal. Refusal is defined as the condition that shall be achieved in the Laboratory, by compacting samples with increasing number of blows following the Marshall Procedure until no further densification occurs. The sequence of blows that shall be followed to determine the refusal condition is as follows:

   a) 75 blows on each face
   b) 200 blows on each face
   c) 300 blows on each face

4.05.10 SURFACE TOLERANCES

Clause No. 2:
Amend the clause to read as follows:

"The tolerance on elevations of the final bituminous wearing and binder course surfaces shall not be greater than 10 mm".

Clause No. 3:
Amend the clause to read as follows:

"When the finished wearing and binder course surfaces are tested with a 3 m long straight edge, placed parallel to, or at right angles to the centerline, the maximum deviation of the surface from the testing edge between any 2 contact points shall not exceed 3 mm for the wearing course and 4 mm for the binder course".

PART (5): CONCRETE, STEEL & STRUCTURES

SECTION 5.01 CONCRETE AND CONCRETE MIXES AND TESTING

5.01.2 MATERIALS

1. Cement

Add the following to 1.1:

Unless otherwise instructed by the Engineer, Sulfate Resisting Cement shall be used for all structures including but not limited to bridges, culverts, retaining walls and channels. Table 5.6 of the General Specification shall be used as a guide for the requirement for durability of concrete exposed to Sulfate attacks. Portland cement or Jordanian Pozzolanic cement shall be used if decided by the Engineer.

5.01.4 CONCRETE STRENGTH REQUIREMENTS

Add the following:

Unless otherwise shown on the Drawings and Bill of Quantities:

a) Concrete class C15 shall be used in all plain concrete, such as mass concrete, blinding ... etc. It should have characteristic compressive strength of 15 N/mm^2 for cube or 11.55 N/mm^2 for cylinder.

b) Concrete class C25 or C30 shall be used in all reinforced concrete as specified on the drawings for the relevant reinforced structures, if not specified, C30 shall be used unless otherwise instructed by the Engineer. It should have a characteristic compressive strength of 25 N/mm^2 (cube), 21.75 N/mm^2 cylinder for C25 and 30 N/mm^2 (cube), 26.1 N/mm^2 for C30.

c) Concrete class C40 shall be used in pre-stressed concrete. It should have a characteristic strength of 40 N/mm^2 cube or 34.8 N/mm^2 for cylinder.

NB. The minimum cement content should also satisfy the durability requirement as shown on table 5.5 A, table 5.5 B, table 5.5 C and table 5.6 of the General Specifications.

5.01.8 MEASUREMENT

2. what to measure

Add and amend the following:

Concrete shall be measured for different structural elements as shown in the Bill of Quantities.

Measurement and Payment shall be based upon different classes of concrete as mentioned in Pay Items irrespective of type of form and/or false-work and irrespective of class of surface finish.

4. Inclusion in the rates

Add the following to 4.1:

1) Where Pay Items for any items are not provided in the Bills of Quantities, the works prescribed in respect of such items or the items shown in the drawings shall not be measured for direct payment but shall be considered as subsidiary works the cost of which shall be deemed to be included in the Contract Prices for pay items.

2) Retaining walls backfill drains, bituminous paint, and any other items shown in the drawings shall not be measured for direct payment, but shall be considered as subsidiary to the concrete, the cost of which shall be deemed to be included in the Contract prices for pay items.

3) The expansion joint between existing and new culverts as shown in the drawings and the removal of the existing inlet or outlet concrete structures, if any, shall not be measured for direct payment, but shall be considered subsidiary to the concrete, the cost of which shall be deemed to be included in the Contract prices for pay items.

4) The removal of concrete sections, and the utilization of the existing concrete elements – if any – which involves the exposure of reinforcement to provide the required lab length shall not be measured for direct payment, but shall be considered subsidiary to the concrete, the cost of which shall be deemed to be included in the Contract prices for pay items.

5) Inspection holes with service pipes, deflection and contraction joints used for concrete parapets, all types of joints (except the joints stated in 5.18.5), shear bars, epoxy (mortar, resin or adhesive paint) including any associated items shown in the drawings shall be considered subsidiary to the concrete, the cost of which shall be deemed to be included in the Contract prices for pay items.

6) Pre-cast concrete units, if used, for deck slabs casting, which includes concrete, reinforcement detailed design, casting, transportation, erection and handling shall be considered subsidiary to the concrete, the cost of which shall be deemed to be included in the contract prices for pay items.

SECTION 5.03 STEEL REINFORCEMENT AND FIXING

5.03.2 MATERIALS

1. Reinforcing bars and wires

Add and amend as follows:

1.1 Reinforcing steel bars shall be deformed bars of high tensile strength, Grade 60, conforming to JSS/441/1986 or AASHTO M31M (ASTM A615M).

SECTION 5.06 PLAIN AND REINFORCED CONCRETE STRUCTURES

6. Finishing

Add to 6.1.1:

Pre-stressed pre-cast concrete girders, bridge curb, parapet, wall copings, bottom face and vertical face of cantilever deck slab etc which architectural features shall have F1 finish.

All other finishes shall be as described in the General Specifications.

SECTION 5.07 PRESTRESSED CONCRETE CONSTRUCTION

5.07.2 MATERIALS

2. Prestressed Steel

Add and amend the following:-

a) The pre-stressing steel for the pre-stressed pre-cast concrete girders shown on the Tender Drawings shall be 1/2 inch cold drawn, low relaxation seven-wire stress-relieved strand, conforming to AASHTO M21 (A416) Grade 270k. The Engineer may approve an equivalent specification, but the required area of steel shall be adjusted to give equal pre-stressing force.

b) The minimum breaking tensile stress for the above strand shall be 1861 MPa.

c) Certified factory test result shall be submitted to the Engineer, showing all steel properties, and all test done by an approved quality control inspector.

3. Prestressing Components

Add and amend as follows:-

End blocks shall be used to distribute the concentrated prestressing forces of the anchorage, it should have a sufficient area so as not to cause crushing to the concrete.

The anchorage types and detailing shall be as per manufacturer recommendation.

5.07.8 MEASUREMENTS

Add and amend as follows:

3. Inclusion in the Rates

3.1.6 Reinforcing steel, recess box and anchorage reinforcement, and all required by the Drawings or specifications. Threaded inserts, anchorages end blocks, transport, handling, lifting and placing of girders.

The following pay item listed below shall be used in the B.Q. The price and payment shall be full compensation for furnishing and placing all materials, including all labour, equipment and incidentals necessary to complete the work prescribed in this section.

	Pay Item	Unit of Measurement
1)	Prestressing Girder (each span).	Number (No.)

SECTION 5.12 REINFORCED CONCRETE BOX CULVERTS

5.12.3 CONSTRUCTION

Add the following new clause:

7. Where existing box culverts are to be extended:

7.1 The Contractor shall break up the existing headwalls and wingwalls as required and with utmost care and in such a way so as not to damage the existing culverts. The Contractor shall break up the existing headwalls, deck and floor to expose the existing culverts for such a length as agreed with the Engineer to make the required connection.

7.2 Any undue damage caused by the Contractor while breaking such headwalls, wingwalls or structure shall be repaired by the Contractor at his own expense.

SECTION 5.13 PIPE CULVERS, STORM DRAINS, AND UTILITY DUCTS

5.13.4 MEASUREMENT

- Delete Clauses 1 and 2 and replace by:

1. Pipe Culverts, shall be measured by lin.m. of each pipe size and type furnished, installed or constructed, backfilled, completed, and accepted.

   Storm Drains and Utility Ducts shall be measured by lin.m. of each size and type furnished, installed or constructed, backfilled, completed, and accepted.

2. Measurement of pipes for pipe culvert shall be made by multiplying the number of pipe rows in each culvert by the centerline slope length of pipe culvert installation. The length measured shall extend from end to end of pipe in the absence of headwall or end wall, or shall extend between inside (highway) faces of headwall and end wall.

- Add the following new clauses:

12. The quantities, measured as provided above, shall be paid for at the contract price per unit of measurement, for the pay items listed below which price and payment shall be

full compensation for furnishing and placing all materials including all labor, tools, equipment and incidentals necessary to complete the work described in this section.

13. Pipes connected to Manholes or inlets shall be measured as storm drainpipes.

- Delete the Culverts Pay Items and replace by:

	Pay Item	Unit of Measurement
(1)	Pipe Culvert (each diameter and type)	Linear Meter (Lin.m)
(2)	Storm Drain R.C. Pipe (each diameter and type)	Linear Meter (Lin.m)

SECTION 5.14 DRAINAGE AND UTILITY STRUCTURES

5.14.1 scope

- Amend Clause No. 1 to read as follows:

1. This work shall consist of the construction of catch pits, manholes, and curb inlets and similar structures in connection with the drainage of groundwater from the surface and below the surface of land and paved surfaces.

5.14.4 MEASUREMENT

- Delete this sub-section and replace by:

1. Manholes, inlets, catchpits, and curb inlets shall be measured by the number of each type constructed, completed and accepted including furnishing and installation of all materials, frames, grates, covers and steps etc.

2. No separate measurement shall be made for any excavation, shorting, sheeting or backfilling, or for breaking into existing pipes or culverts in order to install new manholes, catchbasins, and curb inlets, all such work being considered subsidiary to the construciton of the manholes, catchbasins catchpits, and curb inlets, and for which no separate payments will be made.

3. No separate measurement shall be made for metal gratings and frames, manhole covers and frames as shown on the Drawings which shall be considered subsidiary to the relevant pay items of catch basin and manholes.

4. The amount of completed and accepted work, measured as provided for above, will be paid for at the unit prices bid per number for "Manholes", "Catchbasins" and "Curb Inlets" of various types as specified in the Bill of Quantities, which prices shall be full compensation for all excavation, shoring, sheeting, trimming, blinding and for furnishing and placing all materials, for all labour, backfilling, painting, equipment, forms tools and all other items necessary for the proper completion of the work.

- Replace pay items (1) and (2) by the following:

	Pay Item	Unit of Measurement
(1)	Manhole	Number (No.)
(2)	Inlet (each type)	Number (No.)

SECTION 5.15 WATERPROOFING FOR STRUCTURES

5.15.6 MEASUREMENT

Add and amend as follows:-

1) No part of this section is a Bid Item and no measurement shall be made.
2) The materials provided for this section will not be paid directly, but will be considered as subsidiary works, the cost of which shall be deemed to be included in the Contract prices for Pay Items.

SECTION 5.18 BRIDGE EXPANSION JOINTS

5.18.5 MEASUREMENT

Add and amend as follows:

Expansion joints and filled joints without steel angles shall not be measured for direct payment, but shall be considered as subsidiary to the concrete, the cost of which shall be deemed to be included in the Contract prices for pay items.

Delete pay items and substitute by the following:-

	Pay Item	Unit of Measurement
1)	Expansion Joint (size)	Linear meter (L.m)
2)	Filled Joint (size)	Linear meter (L.m)

SECTION 5.19 BRIDGE BEARINGS

5.19.8 MEASUREMENT

Amend pay item 2 to read as follows:

	Pay Item	Unit of Measurement
1)	Elastomeric Bearing (size and type)	Number (No.)

SECTION 5.20 BRIDGE PARAPETS AND RAILINGS

5.20.4 MEASUREMENT

Add and amend as follows:

Bridge parapets shall be measured as follows:

1) Concrete for parapets of whatever type on frame structures, bridges, retaining walls and approach slabs shall be measured by cu.m. and reinforcement shall be measured by Ton all as part of the structure supporting it.

2) The steel parapet railing shall be measured by linear meter.

3) Concrete and reinforcement for parapet transition sections shall be measured as part of the approach slab concrete and reinforcement as appropriate.

4) Concrete safety barrier in the bridge median shall be considered as discussed in Section 8.16.

	Pay Item	Unit of Measurement
1)	Steel parapet railing	Linear meter (L.m)

PART (7): LANDSCAPING AND STONE ASSEMBLIES

SECTION 7.01 PLANTING

GENERAL

1.1 SUMMARY

A. Section includes preparation of soil, placement of plant life and fertilizer.

1.2 QUALIFICATIONS

A. Nursery: Company specializing in growing and cultivating plant life specified in this section.

B. Maintenance Services: Performed by installer.

1.3 WARRANTY

A. Furnish one year warranty including one continuous growing, including coverage of plants from death or unhealthy conditions.

B. Replacements: Plants of same size and species as specified, planted in next growing season, with new warranty beginning on date of replacement.

1.4 MAINTENANCE SERVICE

A. Maintain plant life for three months from Date of Substantial Completion.

1.5 QUALITY ASSURANCE

A. If otherwise not mentioned perform work in accordance with The Specifications for Highway and Bridge Construction Part (7).

MATERIAL

1.6 SOIL AND SOIL MODIFICATION MATERIALS

A. Topsoil:

1. Soil shall be obtained from well-drained arable land approved by the Engineer before it use. It shall be free draining, non-toxic and capable of sustaining healthy plant growth. Soil shall not contain subsoil, refuse, roots, heavy clay, noxious weed, phytotoxic materials, coarse sand, rocks, sticks, brush, litter and other deleterious materials.

2. Agricultural soil brought on to the site without prior inspection and approval shall be at the risk of the contractor, who shall remove it at his own expenses unless otherwise instructed by the Engineer.

3. The Contractor shall arrange for physical and chemical analyses of representative samples of the soil to be made by an approved soil laboratory. Separate analyses shall be provided for each source of supply. The following parameters shall be determined and in the event that the soil does not conform to the following specified standards, it shall be liable to rejection by the Engineer:
   a. Stones : non bigger than 10mm in diameter
   b. Gravel (larger than 2mm diameter): 5% or less
   c. Sand (0.05-2.0mm diameter): 70% or more
   d. Silt and clay (less than 0.05 diameter): 25% or less
   e. Conductivity: less than 4mm mS(micron S)/cm at 25 degrees C in a saturated soil extract(=2,560ppm)
   f. pH: pH 6.0 – 8.5 in saturated soil extract
   g. Boron: less than 1ppm in a hot saturated soil extract
   h. Chlorine (CI): less than 175 ppm in saturated soil extract
   i. Exchangeable sodium percentage (ESP): less than 12%
   j. Sodium absorption ratio (SAR): less than 10%

4. A sample Load of agricultural soil of not less than 5cu. M, from each source, shall be submitted for the approval. This sample, shall be retained for comparison with subsequent loads.

B. Fertilizer:

1. Inorganic fertilizer shall be applied to the irrigation water by the use of injection equipment. Fertilizer shall be approved soluble NPK fertilizer in a suitable ratio applied at a dilution rate of one kg fertilizer to 1,000 ltr of water.

2. Proposals for use of any of the following alternative fertilizer types and composition where injection equipment is not specified for use, may be submitted for consideration:
   a. Compound fertilizers applied at the rate of 12 bags per hectare giving N=100 Kg/ha; P205=150 Kg/ha; and K2O=100 Kg/ha.
   b. Single superphosphate fertilizers with a minimum content of 18% P205 applied at the rate of 2.4 kg/cu.m of soil.
   c. Controlled release fertilizer with an NPK ratio of 16-17-5+Fe and a release longevity of 12+4 months at 21 degrees C soil temperature. Fertilizer planting tablets shall be tightly compressed fertilizer chips forming plant tablets, each weighting approximately 21 gm.
   d. Slow release fertilizer with an NPK ratio of 20-10-5 + traces (Fe, Mn and Zn) with a release longevity of 1-24 months.
   e. Nitrogen fertilizer in the form of urea pills containing 32% to 46% nitrogen.

   However, the suitable fertilizer type and grade shall be determined after testing the soil samples to suit the type of plantation desired.

C. Plants:

1. All plants shall be of the size specified. No plant shall be less than the minimum size and at least 50% shall be in the upper part of the specified range. Plants that

meet the measurements specified but do not possess the normal balance between height and spread will not be accepted.

2. All planting stock shall be well-balanced and well formed, sound vigorous, healthy and free from disease, sunscald, abrasion, harmful insects or insect eggs and with a healthy, unbroken root system. Unless otherwise specified, only nursery-grown plants shall be used.

3. Nomenclature of trees and plants shall conform to the scientific names given in the following books. Alternative names can be checked in these books to confirm that plants agree with the botanical description given:
   a. American Joint Committee on horticultural Nomenclature (AJCHEN) – "Standardized Plant Names".
   b. Royal Horticultural Society – "Directory of Gardening"
   c. Post, George E., "Flora of Syria, Palestine and Sinai", American University of Beirut.

4. All plants supplied shall have been grown from the Contractor's own nursery stock or obtained from a reputable nursery, and shall be subject to approval.

5. If specified plants are unobtainable, details of alternatives shall be submitted with the Tender, stating how they differ from the plants specified.

   Such substitutions shall be subject to approval.

D. Trees:

1. Trees shall be symmetrically developed their structure and habit of growth typical of their species or variety with straight stems and an intact central leader. Trees shall have a minimum height of 3m and as specified in drawings.

2, Palms shall have a minimum height of 3m and should satisfy the requirements of specifications for Highway and Bridge Construction section 7.01.03/8.

E. Shrubs

1. Shrubs shall have a minimum height of 0.75 m. The shrubs shall be of good form, well grown and bushy. Deciduous shrubs may be supplied bare-rooted, earth-balled and hessian covered or container-grown. Evergreen shrubs shall be either earth-balled or container-grown. Each shrub shall possess a structure and habit of growth typical of the species of variety.

2. Where shrubs of the specified height are not available, the Contractor may, if approved by the Engineer, use smaller substitutes.

EXECUTION

1.7 Soil Grading and Preparation

A. Subsoil shall be excavated to achieve tolerances specified for finished level of soil, and when reasonably dry and workable, graded to smooth, flowing contours with all

minor hollows and ridges removed. Non cohesive, light subsoils shall be loosened with a 3-tine ripper, 300 mm deep at one m centers.

All perennial weeds shall be treated with herbicides and the period of time recommended by the manufacturer shall be allowed to elapse before grading.

B. Finished ground levels shall be 30 mm below adjoining paved areas or curbs after settlement, except for any median strip where New Jersey barriers are specified, in which case the finished level shall be 100 mm below the top of the New Jersey barrier after settlement. Finished ground level adjoining buildings shall be kept 150 mm below the level of the dampproof course.

C. Areas be grassed shall be excavated to 150 mm below finished levels and shall be brought up to finished levels using agricultural soil. When reasonably dry and workable, the agricultural soil shall be graded to finished grade with all minor hollows and ridges removed.

D. Areas for shrubs shall be cultivated to a depth of 300 mm and brought up to within 100 mm below finished grade. Planting medium shall be spread evenly over planting areas to a depth of 100 mm prior to planting.

E. All weeds, rocks and other debris shall be removed and disposed of and the Contractor shall ensure that all planting positions are well drained.

1.8 Planting Procedures

A. The outline of soft landscaping areas shall be staked out for approval. Agricultural soil shall then be supplied and spread over seeded areas. Planting medium shall be prepared and spread over the planting areas.

B. Tree, shrub and other planting positions shall then be staked out for approval. Planting pits shall be excavated to the sizes specified and excavated subsoil removed from the Site. Each planting pit shall be filled with irrigation water to ensure that the water can drain away. Stakes shall be driven where specified, a layer of planting medium spread over the bottom of each pit and each plant positioned and surrounded with planting medium. Plants shall be tied to stakes and aggregate mulch spread as specified.

C. All plants shall be checked one week after planting for sins of windshake and loosening due to soil subsidence which shall be made good as necessary. All plants shall thereafter be checked at monthly intervals until the end of the Maintenance Period.

D. Re-seeding fertilizers shall then be applied and grass seeding/ stolon planting carried out to the areas shown on the Drawings.

E. Wrapping shall be removed from the buds of palm trees after completion of all the above mentioned operations.

1.9 Planting Shrubs and Ground Cover

A. Holes for plants, including shrubs and ground cover, shall be excavated to a depth of 0.5 m below finished grade and to a diameter of 0.5 m. Whenever the root-ball, container or root system is of such a dimension as to prevent proper backfilling being carried out, the diameter of the hole shall be broken up to an additional depth of 0.3 m.

B. Plants shall be set plumb and at such level that, after settlement, they will bear the same relationship to the level of the surrounding ground as they did in the nursery.

C. Earth-bailed hessian-covered plants shall have all cloth, ropes etc., removed from the tops of the earth-balls but no cloth shall be removed from under the earth-balls.

D. Disturbance of the root system or the balls of earth shall be avoided when removing plants from containers. Cutters shall be used on metal containers.

E. Bare-rooted plants and plants with broken root-balls that fall apart while being planted, will not be accepted.

F. Prepared planting medium shall be carefully packed around each root-ball in 150 mm layers and well heeled-in, to position the plant and eliminate air pockets.

G. Where 'long term' fertilization of shrubs is specified or required by the Engineer, 'slow release' tablets shall be placed, during shrub planting, in a similar manner to that specified for trees and palms, but at the rate of one tablet (21 gm) for each 300 mm of shrub height.

H. Each plant shall be thoroughly watered when the plant area has been backfilled with planting medium to the base of the root-ball. When the water has drained away completely, backfilling shall be completed and the plant rewatered.

I. Climbing plants shall have their leading shoots trained around the supporting wire mesh.

MEASUREMENT

All planting items shall be measured as shown in the Bills of Quantities. Pay items mentioned in the Bills of Quantities (other than concrete curbs and stone assemblies) shall cover for all works (including fertilizers) needed to fully implement the planting of the parkway facility as shown in the drawings and in the specifications.

SECTION 7.02 STONE ASSEMBLIES

GENERAL

1.10 SUMMARY

A. Section includes stone works for landscaping. Flush concrete curb (edge beam shall be executed in full accordance with Section 5.01 of the specifications)

1.11 SUBMITTALS

A. Samples:

1. 500-mm minimum square samples of each type of material proposed for use.

2. Submit samples in sufficient quantity to show extreme variation which may reasonably occur in each kind of stone, regarding color, texture and quality. Engineer reserves the right to approve more limited range of variation. Samples must be submitted by the contractor to the Engineer for approval within 30 days of the commencement of the contract.

B. Complete shop and setting Drawings.

QUALITY ASSURANCE

1.12 Perform work in accordance with The **General Specifications** issued by the "Ministry of Public Work and Housing".

PRODUCTS

1.13 Stone floor tiles shall be "Class-A" as and shall be of locally sources known as:

a. "Travertine" for yellow and "Karak Basalt" for black color stone.

1.14 Rough big stone and rough cut stone shall be "Class B" as locally source known as Ma'an stone.

1.15 Stone shall be as detailed in the drawings and in the BoQ which have and not restricted to the following properties:

A. Sound and free from defects that would materially impair strength, durability or appearance.

B. Uniform in texture, free from freak coloration's.

C. Non-absorbent, free from reads rifts, seams, spalls, chips and minerals which by weathering would tend to discolor, deteriorate, streak or stratify.

1.16 Product Delivery, Storage and Handling:

During transport and storage, separate units from one another by wood strips or wedges, rest units on wood or other approved types of material.
Stone are not allowed to be rest on earth at any time and should be handled carefully.
Store should be done in vertical position, so that markings corresponding to setting drawings are easily discernable.

Stone should be covered with waterproof covering and protect from weather and dirt.

EXCUTION:

1.17 Stone cutting, forming and fixing shall be as shown in the drawings.

1.18 Stone cutting and forming shall only be done at the mill using mechanical sawing conforming to the allowable dimensional tolerances.

1.19 Stone forming on site shall be limited to the making of stone face patterns, roughening of sawn surfaces and drilling of inserts holes and slots.

1.20 Dressing:

A. Stone shall be mechanically fine or rough bushammered (Mattabeh).

B. Make arises sharp and true with edges slightly eased.

C. Perform cutting, dressing, drilling, fitting and other preparations of stone.

D. Include work as required to accommodate or fit work of other trades, such as cutting and fitting for pipes, conduits, structural work, etc.

E. Do not cut stone until shop drawings are approved.

F. Completely cut and finish before delivery to site except as necessary for fitting.

G. Cut accurately to shape and dimensions with butt joint. Joints shall be straight, at right angles to face.

H. Do not impair strength of stone bearing capacity.

1.21 Stone Tiling:

(a) Stone used in floor tiling shall be classified as "Class A" as per clause 503.1 of the General Specifications and shall be of Karak Baselt dressed "Matabbeh" or "Travartine".

(b) Stone face pattern shall be type (a) MATABBEH as specified in Clause 504.2 of the General Specifications. The Matabbeh pattern shall be of the fine texture.

(c) The dimensions of stone tiles shall be as shown on the drawings and B.O.Q.

(d) Isolation joints shall be provided along the ends of tiled floor areas where tiles are discontinued at vertical surfaces of walls, parapets ... etc. Such isolation joints shall be 20 mm wide and shall be filled with clean sand for the full depth down to the gravel bedding and shall be sealed with a white colour polysuphide sealant to a depth of 15 mm from the top.

(e) Stone floor tiling shall be laid to the slopes shown on the drawings.

Isolation joints shall be provided along the ends of tiled floor areas where tiles are discontinued at vertical surfaces of walls parapets ... etc. Such isolation joints shall be 20 mm wide and shall be tiled with clean sand for full depth down to the gravel bedding and shall be sealed with a white color two-part polysulphide sealant to a depth of 15 mm from the top.

1.22 Mock-Up:

The Contractor shall following the Engineer's approval of Stone samples and source and at least (2) weeks prior to the start date of Stone fixing prepare for the approval of the Engineer a 2x2 meter mock-up flooring to be executed within the site.

The mock-up shall demonstrate the following work items and only approved Stone shall be used in the execution of the mock-up:

a. fixation method and accessories.

b. Stone face patterns.

c. Overall workmanship.

This mock-up once approved by the Engineer shall represent a reference for all stone work in the project.

MEASUREMENT

All stone items shall be measured as shown in the Bills of Quantities. Pay items mentioned in the Bills of Quantities (other than concrete curbs) shall cover for all stone works of the parkway facility as shown in the drawings and in the specifications. Flush concrete curb shall be measured as shown in the Bills of Quantities.

PART (8) : INCIDENTAL CONSTRUCTION

SECTION 8.01 CONCRETE CURBS, GUTTERS, SIDEWALKS AND PAVED MEDIANS

8.01.2 MATERIALS AND PRECAST MANUFACTURE

8. Bedding

Add and amend as follows:

Bedding materials shall be as shown in the drawings. The materials shall conform to the relevant requirements of the specifications.

8.01.4 MEASUREMENT

Add and amend the following to Clause No. 4:

- Bedding shall be replaced by mortar and sand
- Bedding materials shall be measured and paid as part of the pavement layers according to the type of material.

Add Clause No. 5:

5. The cast in place concrete for medians, side walks and curbs on bridges and approach slabs shall be measured by cu.m. and their reinforcement shall be measured by ton all as part of the structure supporting it.

Amend pay item (1) to read as follows:

Pay Item	Unit of Measurement
1. Edge beam	Linear Meter (L.m)

SECTION 8.03 DITCH LINING, ENERGY DISSIPATORS AND SLOPE DRAINS

8.03.2 MATERIALS

Add and amend 1.1 as follows:

Concrete for plain concrete blocks at entrances and outlets of culverts shall be C15.

8.03.4 MEASURMENT

Add and amend clause 2 as follows:

Energy dissipaters shall be measured by linear meter furnished as shown in design drawings, constructed and approved. The unit rate shall include but not be limited to reinforced concrete, steel reinforcement, plain concrete blocks, rocks for both the entrance of the culvert and the launching apron, inverted filter material and the expansion joints all to the dimensions and requirements shown in the drainage design drawings unless revised to suit site conditions and to the approval of the engineer.

SECTION 8.09 PAINTING OF STRUCTURES

8.09.1 SCOPE

Add the following:

All structural steel shown in the drawings such as pedestrian railing, and parapet railing should be painted with coats as following:

1. The first coat immediately after shop fabrication and before shipment to site. This shall be anti rust paint such as red iron oxide paint.

2. Where erection has been completed another coat of anti rust shall be applied.

3. Before the end of the project 2 coats of approved paint complying with the general specification shall be applied, the colour shall be as approved by the Engineer.

All cast iron work shall be painted by 2 coats of anti rust tar paint, one shop and one field all as General Specifications.

SECTION 8.10 MAINTENANCE OF TRAFFIC AND DETOURS

8.10.2 MAINTENANCE AND PROTECTION OF TRAFFIC

Add the following:

During the course of the work one of the difficult duties of the contractor is to provide and properly maintain all temporary roads, and other work required, including access to existing carriages, factories, shops, buildings and like. His duties include installing, operating and maintaining all required temporary signing, signals, traffic marking, barriers and other safety measures.

If it becomes necessary to close portions of the existing road to traffic during construction, then the contractor shall submit layout plans showing the detailed proposal of temporary detours and diversions to be carried out including the required plants and equipment and time required for the completion of his work, all subject to the approval of the Engineer and the Employer.

The Contractor shall allow in his prices for the construction and maintenance and operation of all temporary roads, detours, bridges, traffic control, warning signs, beacons, lighting, flagmen, watchmen, and all other things required for the normal safe control of traffic, or the guidance of construction or other traffic during the continuance of the contract. All traffic control provided shall be continuous day and night.

Failure of the Contractor to comply with the above requirements will render him liable to the cost of providing the diversion constructed by another party.
The Contractor shall take utmost care to prevent injury, damage or trespass on lands, fences, and other properties near and adjacent to the work, and must make all necessary arrangements and payments, if required, in this connection with the respective landowners and with the Employer.

The detour shall be of similar standard to the existing road in terms of width and safety measures.

8.10.3 DETOUR CONSTRUCTION

Delete clause 8.10.3-1, and add the following:

The Contractor shall submit his proposal 20 days before its implementation for approval by the different concerned parties.

The public shall be informed in the daily news papers and other information media (T.V. & Radio) of any instruction for using detour or closing roads.

If requested by the Engineer, the Contractor shall carry out and maintain properly the following works for the prepared temporary diversions until the completion of the works:

a) Supply and construction of 20 cms thick base course.
b) Provision and spraying of prime coat.
c) Supply and construction of 5 cms thick of Asphalt Wearing coat.

8.10.4 MEASUREMENT

Delete this subsection and substitute by the following:-

1. No direct measurement or payment shall be made for the work prescribed in this section.

SECTION 8.11 HIGHWAY SIGNING

8.11.3 CONSTRUCTION AND INSTALLATION

4. Fastening Signs to Posts

Add and amend as follows:

Signs fastened on bridge side shall be similar to signs fastened on sign post.

8.11.4 MEASUREMENT

Add and amend as follows:

Sign fastened on bridge side or sign post shall be measured by the number of such signs furnished and installed (excluding sign post support) and accepted.

SECTION 8.12 PAVEMENT MARKINGS FOR TRAFFIC

8.12.1 SCOPE

Add the following item:

1.3 Sprayed Thermoplastic, reflectorized paint (TRP) material shall be used for painted markings and lines in this Project.

1.4 Cateyes type reflective pavement studs (3-cluster type) with 1 reflective surface – red, green, Amber or other colors (as shown in the drawings)shall be used in this project.

8.12.5 MEASUREMENT

Add and amend as follows:

1. Painted Pavement Lines and Painted Pavement Markings shall be measured net by linear meters and square meters or numbers respectively as itemized in the Bill of Quantities of completed and accepted work.

2. Payment shall be made for the amount of completed and accepted work as measured by linear meters, square meters and number at the relevant Contract unit price, which shall be full compensation for furnishing all materials, for all labour, equipment and tools, supplies and all other items necessary for the proper completion of the work.

Pay Item		Unit of Measurement
1.	Painted Pavement Lines (each type of paint)	Linear Meter (L.m)
2.	Painted Pavement Markings for Hatching (each type of paint)	Square Meter (Sq.m)
3.	Direction Arrows	Number (No.)

SECTION 8.16 STEEL GUARDRAIL AND CONCRETE SAFETY BARRIER

8.16.5 MEASUREMENT

- Amend Clause No. 1 to read as follows:

  Steel, Guardrail, New Jersey concrete barrier shall be measured by the linear meter furnished, installed and accepted. Measurement shall be based on the dimensions as shown on Drawings or as directed, and shall include terminal sections and transition sections which shall be measured in linear meter and paid for at the same rate for Guardrail and New Jersey concrete Barrier, as appropriate.

- Delete Clause No. 2.

- Renumber Clauses 3 and 4 as 2 and 3.

- Add the following clause:

  Concrete and reinforcement for the cast in place or precast concrete barrier located in highway median over structures shall be measured by linear meter furnished, installed completed and accepted. It shall be paid for at the same rate for New Jersey Concrete Barrier. The rate shall include, but not limited to, joints and tie reinforcement.

- Delete Pay Items (3), (4), (5), (6), (7) and (8).

Add the following Section :

SECTION 8.17 EMERGENCY ESCAPE RAMPS

8.17.1 SCOPE

These works shall consist of furnishing and constructing emergency escape ramps full as shown in the drawings and as directed by the Engineer.

8.17.2 MATERIALS

1. Sand

Sand used shall be from an approved source and as directed by the Engineer.

Materials for all other construction items shown in the drawings including but not limited to guardrail, pipe drains, drop inlets,...,etc shall confirm with the relevant sections in the general and special specifications for this project.

8.17.3 CONSTRUCTION

The subgrade for the ramp and side ditches shall be excavated to an approved smooth surface and to the levels shown on drawings or as requested by the Engineer. Soft, unstable or unsuitable material shall be removed and replaced with suitable approved material. The subgrade shall be compacted to 95% AASHTO T180 maximum density prior to other construction works.

Sand shall be embedded with the shapes, dimensions and thicknesses as shown in the drawings or as instructed by the Engineer.

Construction for all other components of the emergency escape ramp as shown in the drawings shall comply with each component's specifications in relevant sections of both the general and special specifications for this project.

8.17.4 MEASUREMENT

Measurement for all components of the emergency escape ramps shall be carried out in full compliance with the items measurements in the relevant sections of both the general and special specifications for this project. Each item including unclassified highway excavation, drop inlets, pipe drains...etc shall be measured and paid separately as shown in the bills of quantities except

for sand which shall not be paid for directly but shall be considered subsidiary the cost of which shall be included in other pay items in the bills of quantities.