

Annex A – Basic Conditions & Technical Specification

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Infrastructure rehabilitation in Idlib countryside	Project Name
Road Rehabilitation	Activity name

- 1- Excavation work using suitable machines, whatever their type, rocky or earthy, to reveal the path of the road, in addition to moving the excavation outputs to the places determined by the supervision in coordination with the local authorities, taking into account all the requirements.**

Implementing excavation works using the necessary mechanical machines, regardless of the type of soil (earthen or rocky), with different widths and depths

according to the need and the instructions of the supervising engineer with the deportation of the excavation outputs outside the work site with the leveling and compaction of the bottom of the excavation.

The contractor shall be committed to any damages to public and private property during excavation, which shall be repaired by him (water line / sewage network, telephone cable, electricity cable, etc...)

Quantities get calculated in cubic meters using surveying devices, and the price includes all costs of materials, persons, tools used, transportation, and everything necessary to complete the work properly.

Any extra excavation depth shall be backfilled by the contractor with a layer of gravel and no amount shall be calculated for that.

- 2- Removing the old asphalt layer using appropriate mechanical machines with a width of 5 meters, including leveling, tamping and expansion up to 8 meters, while taking all necessary measures.**

- Determining the dimensions of the area to be skimmed.
- The cutting shall be done with the automatic cutter vertically from the beginning and end in the event that the entire width of the road is scraped, but in the event that a part of the road width is scraped, the longitudinal and transverse edges get cut.
- The scraping process gets carried out by means of automated scrapers and on straight paths with a thickness determined by the supervising engineer.
- The scraping process shall take into account the preservation of the flatness of the road.
- The contractor must set two threads to achieve straightness of the cut.
- Scraping places get cleaned with an air compressor, brooms or water. They shall be cleaned well and prepared for the asphalt process.
- The contractor shall be committed to any damages to public and private property during scraping, which shall be repaired by him (water line / sewage network, telephone cable, electricity cable, etc...).
- The contractor must transfer the outputs to a place to be agreed upon with the local councils, and the contractor must bear all expenses and administrative burdens to obtain the necessary approvals.
- If the correct cutting is not done and the road is damaged, the contractor will be responsible for the re-cutting and repair work without obtaining any compensation.

Quantities get calculated in cubic meters using surveying devices, and the price includes all costs of materials, persons, tools used, transportation, and everything necessary to complete the work properly.

- 3- Providing gravel of different diameters (0-15 cm) (layer thickness 30 cm), including transportation, loading, unloading, leveling and all that is needed.**

It includes backfilling with compaction using the remnants of quarries and is done using hard limestone preparations approved by the supervisory body, provided that the diameters of these

preparations range between (0-15 cm) to obtain a final layer with a thickness of 30 cm after compaction.

The works include the following:

- Providing and implementing a layer of hard limestone or natural graded materials, soft and bonding materials with a regular or well-graded grain gradient, and a smoothness rate not exceeding 30%, and it shall be executed with a thickness of 30 cm after compaction.
- These materials, after mixing them with the appropriate machinery, spreading them, adding water to them and compacting them, should form a coherent and homogeneous body.
- The materials used must be of tough types that are not affected by water and are free from muddy or foreign materials harmful to the road surface.
- The diameters shall not exceed half the thickness of the layer, and materials larger than that are excluded.
- The materials shall achieve the following criteria:

The liquidity limit is not more than 25

Plasticity index from 0 to 6

The sand equivalent is not less than 25

Los Angeles Abrasion Loss percentage is no more than 40%

- The materials get sprayed with water using sprinklers exclusively to reach the maximum density, and wetting is not allowed by means of a hose, but rather with tanks and perforated tubes of diameter 2, then they are spread, leveled and rolled using dynamic rollers (shaker) of good capacity.
- The tamping continues to obtain at least 95% of the maximum dry density according to the modified Proctor and the field density will be verified using appropriate measuring methods.

Quantities get calculated in cubic meters after tamping, using an appropriate measuring method, and the price includes all costs of materials, persons, tools used, transportation, tamping, wetting, and everything necessary to complete the work properly.

4- Providing gravel of different diameters (0-7 cm) (layer thickness 20 cm), including transportation, loading, unloading, leveling and all that is needed.

Backfilling works shall get carried out using hard limestone preparations approved by the supervisory body, provided that the diameters of these preparations range between (0-7 cm) with a regular or well-graded grain gradient and a smoothness rate that does not exceed 30% after compaction.

The works include the following:

- Providing and implementing a layer of hard limestone or natural graded materials, soft and bonding materials with a regular or well-graded grain gradient, and a smoothness rate not exceeding 30%, and it shall be executed with a thickness of 20 cm after compaction.
- These materials, after mixing them with the appropriate mechanism, spreading them, adding water to them, then wetting them again and rolling them into a coherent and homogeneous body. Wetting ratio should be achieved from 15-20% water to volume ratio of materials
- The materials used must be of tough types that are not affected by water and are free from muddy or foreign materials harmful to the road surface.
- The diameters shall not exceed half the thickness of the layer, and materials larger than that are excluded.
- The materials shall achieve the following criteria:

The liquidity limit is not more than 25

Plasticity index from 0 to 6

The sand equivalent is not less than 35

Los Angeles Abrasion Loss percentage shall be no more than 40%

- The materials get sprayed with water using sprinklers exclusively to reach the maximum density, and wetting is not allowed by means of a hose, but rather with tanks and perforated tubes of diameter 2, then they are spread, leveled and rolled using dynamic rollers (shaker) of good capacity.
- The tamping continues to obtain at least 98% of the maximum dry density according to the modified Proctor and the field density will be verified using appropriate measuring methods. Quantities get calculated in cubic meters after tamping, using an appropriate measuring method, and the price includes all costs of materials, persons, tools used, transportation, tamping, wetting, and everything necessary to complete the work properly.

5- Providing and spraying a MCO layer at a rate of 1.5 kg / m² in the specified places according to a schedule and in accordance with the supervision instructions, with all that is necessary:

- This includes spraying the MCO component of European origin, and it must be placed in a separate warehouse and at the contractor's own responsibility.
- Spraying shall be carried out using a container that is full of the materials by dividing the road into longitudinal parts with an overlap of 15 cm, and horizontal overlap is not allowed.
- The boiler speed shall not exceed 10 km/h.
- The materials temperature shall be between 60- 80 degrees.
- Spray pressure from 2-3 kg/cm².
- Spraying rate 1.5 kg / m² for single spraying.
- The layer to be sprayed must be completely dry.
- The layer to be sprayed must be cleaned of dust and foreign materials before spraying the impregnating materials.
- The layer should be sprayed with the same width as the gravel layer.
- The Contractor shall block the road and prevent traffic on it during the spraying of (MCO) and for a period of not less than 24 hours after spraying.

The quantities are calculated in m², as the boiler is weighed before and after spraying, and the price includes all costs of materials, persons, tools used, transportation, and everything necessary to complete the work properly.

6- Providing and spreading a layer of hot asphalt in the places specified in the table of quantities in accordance with the technical specifications in the book of conditions and according to the instructions of the supervisory body, with a thickness of 8 cm after rolling, and spraying an adhesive at a rate of 0.5 kg / m²:

Gravel materials:

- The gravel materials shall have a granular composition of 0-20 mm.
- The gravel materials are the result of grinding hard limestone rocks, and the materials have sharp edges and a rough texture.
- Gravel materials should be free from impurities, clay, flat and thin materials.
- The gravel materials must be very hard and the wear rate should not exceed 38% (according to the Los Angeles Abrasion loss test).
- The sand equivalent shall be not less than 45%, the plasticity limit is not more than 5%, and the liquidity limit is not more than 20%.

Asphalt / Bitumen /:

- It must be of the type 60/70 or 80/100 and give acceptable results when mixed with gravel materials to form a mixture that achieves durability, flexibility and workability.

- The percentage of asphalt in the mixture should be between 4.5 and 6.5% of the weight of the asphalt mixture.
- The stability of the asphalt mixture shall not be less than 2.4-6 mm.
- The flow of the asphalt mixture should be between 2.4-6 mm.
- The percentage of air voids should be between 3-7%.
- The percentage of voids filled is between 65-80%.

Mixing process:

- Gravel materials and asphalt get mixed in a central mixer.
- The percentage of asphalt should not be less than 110-120 kg / m³, or about 4.5-6.5% of the asphalt mixture, and the percentage of gravel materials should be between 43.5-95.5% of the asphalt mixture.
- Confirmation of the amount of asphalt material using the Marshall method or by theoretical inspection of the engineering committee and the quality of the gravel.
- The temperature of the gravel materials when mixing should not exceed 165 degrees Celsius.
- The temperature of the asphalt should not be less than 15 degrees Celsius of the temperature of the gravel materials.
- The temperature of the asphalt gravel when leaving the asphalt plant shall not be less than 170 degrees Celsius.
- The asphalt must be transported by metal trucks with a capacity of not less than 10 m³, and it must be coated with paraffin (or any suitable material) to prevent the asphalt from sticking to the surface of the car.
- The contractor shall secure a sufficient number of transport vehicles to prevent the suspension of supplying materials and to ensure the proper progression of work. The number of vehicles shall be determined in agreement with the supervising engineer
- The Corporation has the right to request the contractor to conduct the necessary tests to verify the quality of all materials used in the asphalt mixture.

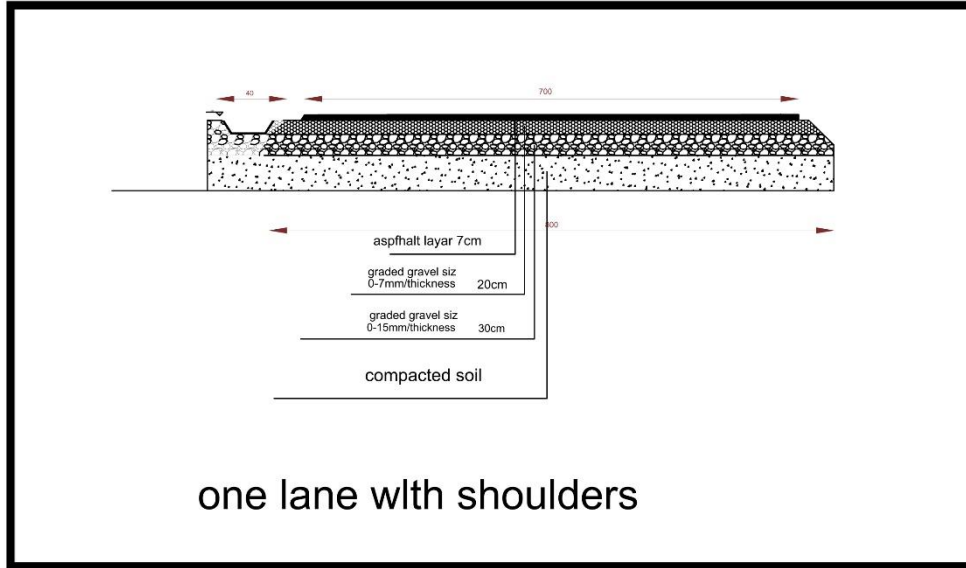
Laying and spreading the asphalt mixture:

- Cleaning the road well before starting the process of spraying impregnating and adhesive materials.
- The asphalt mixture gets spread using the mechanical (venture) paving machines. The contractor has to operate two paving machines at the same time if the road width is more than 5 m so that the asphalt layer is laid at the same time and with a distance not exceeding 50 m between the two paving machines.
- The laying method shall from the center and towards the sides, with a string being stretched on the side of the road to achieve straightness.
- The connection between the two ends of paving shall be made within a period not exceeding 24 hours in the event of laying with only one paving machine and with the approval of the supervisory body.
- The separator between asphalt paths must be smooth and achieve complete continuous bonding.
- The temperature of the asphalt must be between 130 and 150 degrees Celsius upon arrival.

- The temperature at the moment of laying on the road shall not be less than 130 degrees Celsius, and any mixture below that shall be rejected.
- The asphalt shall be spread to a thickness of 8 cm after tamping.
- Compensation of thicknesses more than required shall not be allowed.

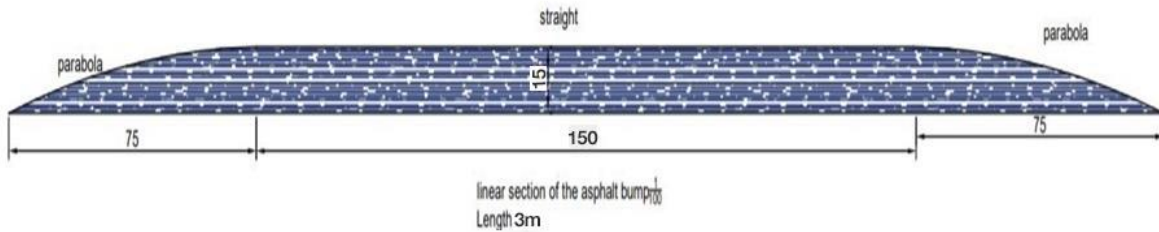
Tamping the asphalt:

- Tamping gets done using a rubber roller and using a metal roller, and the tamping shall be from the sides towards the axis.
- The Contractor shall provide the necessary materials for cleaning the wheels of the rollers during work.
- Tamping gets done from the sides towards the center with straight longitudinal lines, and the tamping continues in this manner until the lines resulting from the wheels of the roller are absent.
- The speed of the roller should not be more than 10 km / h to avoid the creep of the asphalt.
- Tamping shall not stop until the surface is completely straight in its longitudinal and transversal sections, free of ripples or any trace of longitudinal or transverse joints.
- The rubber rollers and all the equipment must be in good technical condition and the contractor must ensure that the wheels are pressured in an orderly manner.
- After the rolling process, the asphalt mixture must achieve results of not less than 97% of **the Marshall density**.
- The Contractor shall permanently secure 1 rubber roller, 2 metal rollers, 2 single wheels and 2 Bobcats at the site.
- The contractor must allocate a tank for the asphalt used in the asphalt mixes for the project, and the specifications of the supplied asphalt must be verified according to the source certificate.
- **Engineering measurement of asphalt:**
 - a- The engineering measurement is done in cubic meters, after checking the thickness by the supervision engineers, on average every 1 km, and a confirmation is made for each 1 km separately in case of shortage.
 - b- Quantities are counted by surveying devices, where levels of the road are taken every 50 meters, 3 intermediate points and 2 end points are taken 1 km from both ends of the road. **The required thickness is 7 cm after rolling**. An increase in the thickness of more than 7 cm is neglected. It is considered an acceptable thickness between 5.5-6 cm and is disbursed to the contractor according to reality.
 - c- The Contractor shall bear all damages and costs that may arise from the passage of his own cars on some roads or places, in the event of their occurrence.
 - d- The contractor shall bear the expenses that may arise as a result of the conversion to secondary roads.
 - e- The supervision team has the right to ask the contractor for additional procedures, such as weighing cars, to adjust quantities.
 - f- The supervision team has the right to request a visit to the supply sites



- 7- Constructing asphalt bumps in the form of an arc with a maximum height of 12 cm, a width of 3 meters, and a length equal to the width of the road

Covering the width of the road, and length of 3 m, and thickness of 12 cm on average, according to the diagram attached below:



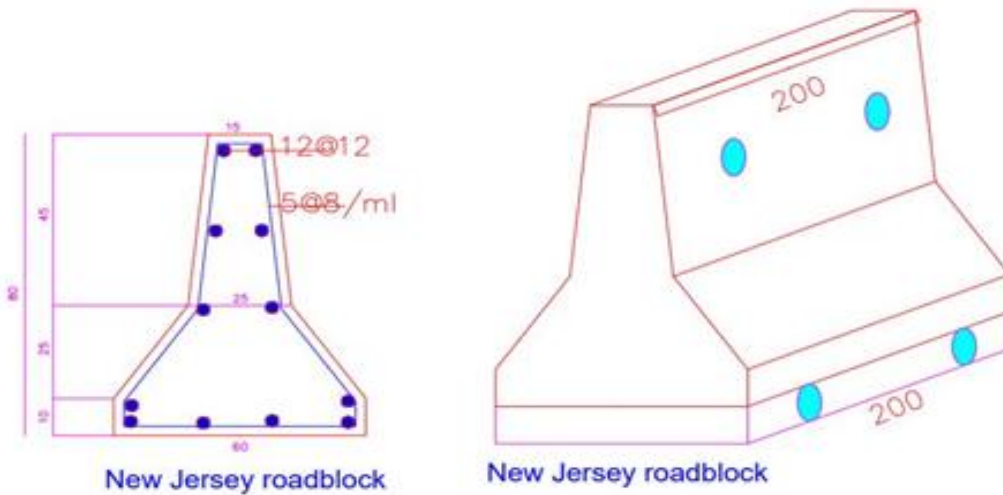
The locations are determined by the supervision team. The sides of the bump must be straight, as a string is pulled before starting to implement the bump.

- 8- Providing and installing standard concrete barriers with a length of two meters on the sides of the road, with the implementation of a concrete cushion of 10 cm thickness and all that is required

1. Supply and installation of cement barriers with a length of 2 m made of reinforced concrete with a caliber of 350 kg / m³, with the use of automatic vibration during casting to ensure that no Honeycombing occurs in the concrete, and the reinforcement shall be according to the attached scheme
2. Openings at the bottom of the barrier at a rate of 2 holes for each barrier shall be made, with dimensions of 5 * 5 cm, for water drainage, and 2 holes for loading and installation.
3. Phosphorescent reflectors shall get installed for each reflective barrier, one 6 * 6 * 12 cm, the thickness of the sheet is 2 mm, with installation and all that is required

4. Vertical reflectors shall be installed on the backs of the supports at the beginning and end of each continuous distance, at a distance of every 25 m. The dimensions of the reflector are 40 * 12 * 12 cm, fixed with three screws and everything needed
5. The bottom of the barriers is leveled, spread and rolled before the installation process, so that we get a good straightness and evenness of the supporters
6. During the installation, spacers are left between each specific distance and when needed to ensure the passage of rain water and the non-occurrence of a cliff for the materials under the supporters.

Quantities get calculated by number, and the price includes all costs of materials, persons, tools used, transportation, installation work, and everything necessary to complete the work properly.



- 9- Carrying out excavation works for the installation of pipelines of variable width and depth, and according to the instructions of the supervising engineer. The work is done manually or using mechanical machines, with tamping the sides and bottom / or refilling the excavation line as needed and according to the instructions of the site engineer

whatever the type of soil (normal or rocky) with the removal of excavation outputs outside the work site and compaction of the sides and bottom of the excavation / or backfilling of the excavation outputs according to the instructions of the supervising engineer

Quantities get calculated in cubic meters using surveying devices, and the price includes all costs of materials, persons, tools used, transportation, and everything necessary to complete the work properly.

- 10- Supply and installation of polyethylene pipes for sewage channels with a diameter of 300 mm, sn8, a thickness of 20 cm, with all the necessary and according to the directives of the supervising engineer.**

Supply and installation of corrugated polyethylene (HDPE) pipes. The pipes provided must comply with international specifications in terms of diameter ((300 mm)), thickness, permissible pressure, temperature and all technical specifications related to these pipes. Carrying out all the necessary operation and tests (pressure test of the network) to ensure the safety of the network and the pressure of the SN8 pipes. All necessary works (supply, installation, connection, connection with manholes, commissioning) must be carried out with all their parts and details. It is the contractor's responsibility to repair all faults and damages resulting from the installation process. All necessary works mentioned above are included in this item and the unit of measurement for this item is one linear meter. The slope ranges from 0.3%-6%, depending on the supervising engineer. This work includes backfilling below, above, and around the pipes with sand and using the appropriate machines that the contractor deems appropriate and according to the directives of the supervising engineer. The sand used must be free from cohesive lumps and harmful foreign materials. It must be a result of grinding limestone. The area must also be well backfilled without causing any harm to pipes and extensions. In the event of any damage, the contractor shall repair it at his own cost. Backfilling is done with sand above the pipes by 10 cm and below the pipes by at least 10 cm. The supervising engineer must be reviewed to determine the appropriate backfill thickness. The sand used must be free from cohesive lumps and harmful foreign materials. It must be a result of grinding limestone. The area must also be well backfilled without causing any harm to pipes and extensions. In the event of any damage, the contractor shall repair it at his own cost. The supply of sand and its spread shall be charged on the price of executing and extending the pipes and calculating the works per linear meter. All work shall be according to the plans and according to the directives of the supervising engineer.

- 11- Providing and implementing 350 kg/m³ reinforced concrete for the rehabilitation and extension of the road box according to the drawings and the instructions of the supervising engineer.**

This item is used in casting the floor, walls and ceiling of the bridge. This item is used in casting the guide walls and according to the directions of the supervising engineer. Ordinary Portland cement is used in concrete packed in tight, unshredded bags. The materials used in the concrete mixture must be (sand - sculptor - gravel - water) and they must be clean and free from impurities, dirt and mud. The grain gradation of the gravel must be suitable to give a resistance of not less than 250 kg / cm². Sand and gravel must be free from cohesive lumps and harmful foreign materials, and the water used must be clean of dirt, dirt, organic matter, and salts. The reinforcing steel shall be free of rust and shall not be installed in the form of joints. The thickness of the covering layer for any iron bar shall not be less than 3 cm.

In the event that ordinary concrete is poured directly over the stratum or gravel layer, the soil / gravel must be moist and compacted appropriately.

It is required to polish the concrete surface after pouring cement with a caliber of 3 kg / m² and well, while achieving a slope ratio towards the water drainage points. Watering works must be adhered to for five days after implementation as a minimum.

Concrete reinforced with molds, cast on site or ready, shall be used, and the cement caliber shall not be less than 350 kg / m³, with watering twice a day for a week. And the molds are installed technically according to the drawings delivered by the supervision team, and the molds are received by the supervision engineer before starting the forging work.

The wooden mold must be clean and free of cracks, approved by the supervising engineer.

The thickness of the walls shall be 25 cm, the reinforcement is two grids, each grid has vertical bars 6 @ 12 and horizontal bars 6 @ 10

The two nets shall be installed and tied well with tie wires, leaving a 2.5 cm concrete cover between the face of the mold and the iron bars.

12- Carrying out soil excavation works (to implement water drainage channels) with a width of 70 cm and a depth of 50 cm manually or using appropriate mechanical mechanisms.

Whatever the type of soil (normal or rocky) according to the course specified by the supervising engineer with the removal of the excavation output outside the work site and compacting the sides and bottom of the excavation or re-filling the excavation output and restoring the position as it was for the excavation and its surroundings with wetting and tamping in the case of excavation in compacted gravel layers only Instructions of the supervising engineer

Quantities get calculated in cubic meters using surveying devices, and the price includes all costs of materials, persons, tools used, transportation, and everything necessary to complete the work properly.

13- Providing and implementing reinforced concrete for the walls and floor of the rain drainage caliber 350 kg / m³ according to the required reinforcement and according to the required reinforcement 5 x 10 / ml in both directions, the wall thickness is 15 cm, the floor is 10 cm, the empty rain hole is 40 * 40 cm

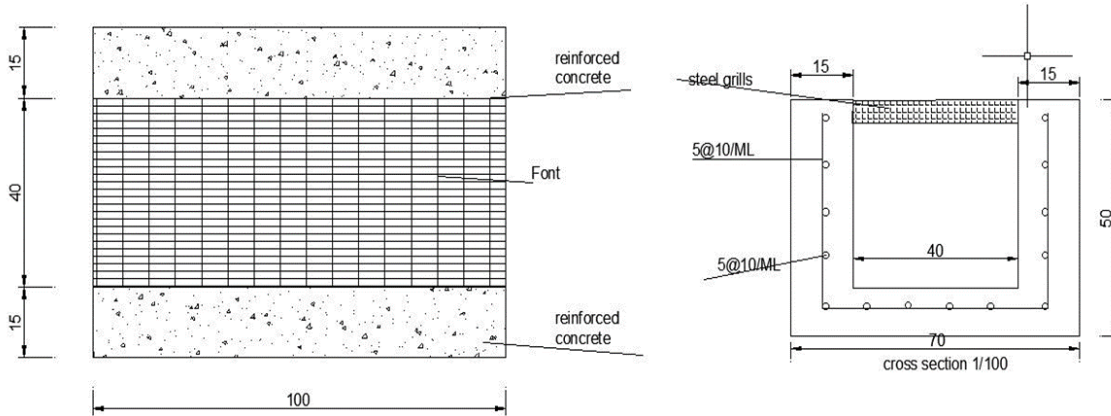
This item is used in casting the walls and floor of rain drains, according to the directions of the supervising engineer. Ordinary Portland cement is used in concrete, packed in tight, unshredded bags. The materials used in the concrete mixture (sand, sculptor, gravel, water) must be clean and free of impurities, dust, and mud. The grain gradation of the gravel must be suitable to give a resistance of not less than 150 kg / cm². Sand and gravel must be free from cohesive lumps and harmful foreign materials, and the water used must be clean of dirt, dirt, organic matter, and salts

Quantities get calculated in cubic meters using surveying devices, and the price includes all costs of materials, persons, tools used, transportation, and everything necessary to complete the work properly.

14- Providing the installation of iron grids from the font for the rainwater drainage system. Each piece is 1 meter long, 40 cm wide, and 5 cm thick. The weight of each piece is not less than 70 kg, fixed on iron angles 4 * 4 cm * 4 mm

The length of one piece is 1 m, the width is 40 cm, and the thickness is 5 cm. The weight of one piece is not less than 70 kg. The Pieces shall be installed on iron corners with the dimensions 4.4 cm * 4 mm

Quantities get calculated by linear meter using a measuring method, and the price constitutes all the costs of materials, persons, tools used, transportation, and everything necessary to complete the work properly.



Horizontal projection of a 1 m part of the rain Draining sc1/100

Materials for cash-for-work workers

1- Supply of coated Portland cement (50 kg):

Portland cement must comply with Syrian Standard No. 44 in all normal concrete works and all cement works of the project. Other types of Portland cement can be used according to a special study and prior approval of the project engineer. Turkish cement of the Adana brand or Al-Kabsh or similar to them may be accepted.

It must be within the validity period and be new, dry, not wet, with no trace of any agglomeration in it.

The test results of Ordinary Portland cement mortar samples prepared at a ratio of (1:3) shall not be less than those shown in the following table:

stress type	after the age of 7 days	after the age of 28 days
on screwing	20 kg / cm ²	25 kg / cm ²
on pressure	250 kg / cm ²	315 kg / cm ²

Quantities are supplied to the site according to the needs of the road paving workers and the installation of road signs on a daily basis, according to the supervision plan, including transportation, loading, and unloading expenses.

2- Providing well-graded gravel of hard type (up to 1 cm) to be used in leveling works, including transportation, loading and unloading expenses:

The gravels must be either from natural sources conforming to Syrian Standard Specifications No. (332) or from licensed hard limestone crushers, and the contractor must inform the administration representative of the source of the gravels before starting work.

The gravels must also meet the conditions and specifications stipulated in the Syrian Arab code, paragraph (4-2-1-1), and the contractor must submit to the representative of the Administration a

test certificate from one of the accredited laboratories in the country proving that the gravels intended to be used in the project conform to the required conditions and specifications.

The coarse stones (gravel) should be graded as close as possible to the approved regular gradations contained in the Syrian Arab Code 1995.

It must be hard and not contain soft or sticky materials.

The quantities are supplied to the site according to the needs of the road paving workers on a daily basis, according to the supervision plan, including transportation, loading, and unloading expenses.

3- Providing fine sand to mix with cement and use the mixture under stones, including transportation, loading and unloading expenses:

The sculptor (sand) should be graded as close as possible to the approved regular grades contained in the Syrian Arab Code 1995. It must be hard and not contain soft or sticky materials.

The proportion of sand passing through the sieve No. (200) aperture (75) microns should not exceed 1% by weight of gravel and 7% by weight of sand. If the proportion of fine dust adhering to the face of the pebbles is large, the pebbles must be washed well with approved clean water as requested by the management engineer.

The quantities are supplied to the site according to the needs of the road paving workers on a daily basis, including transportation, loading and unloading expenses.

4- Providing water tanks (capacity 4 cubic meters) for watering and concrete works, so that they accompany the workers on a daily basis and as needed, including transportation costs, loading, unloading / distribution hoses.

Tanks are supplied to all work sites according to the needs of road paving workers on a daily basis, including transportation, loading, and unloading expenses, and according to the supervisory body plan that will be shared with the contractor, which shows the daily number of tanks required for work sites.

5- Providing crushed stones in truck shells (5 cubic meter capacity) at road paving sites.

The item includes the price of crushed stone, labor wages necessary for loading and unloading, truck rent, fuel, maintenance and any necessary cost to complete the work.

The transfer supply period should not exceed two hours from the moment it was requested by the supervision team.

In the event that the contractor is late for a supply, a replacement car will be secured at the contractor's expense.

The Contractor shall secure at least one truck for each work group.

Trucks are supplied to all locations according to the needs of road paving workers on a daily basis and according to the number of teams and the work plan that will be shared by the supervision team.

6- Providing solid paving stones at road paving implementation sites.

Solid paving stone free from red veins, holes and distortions, with an area of not less than 200 cm² and a thickness of 5-10 cm, with a flat top and bottom

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Trucks are supplied to all locations according to the needs of road paving workers on a daily basis and according to the number of teams and the work plan that will be shared by the supervision team.