

CHAPTER - XI
ITEM WISE DETAILED TECHNICAL SPECIFICATION

Item No.(1)

Supplying & Laying trap rubble stone 50 to 100 Kg .in weight for toe and core filling including conveying and stacking to required line level Slopes section including all leads and lifts. Conveying material from stacks and laying etc. complete.

Scope of Work:

- Supplying and laying trap rubble stone weighing 50 kg to 100 kg each for toe and core filling, including quarrying, conveying, unloading, stacking at site, and laying in required line, level, slopes, and sections, including all leads and lifts. The work shall also include conveying stones from stacks to the place of final deposition, proper hand placing, packing, dressing where required, and all incidental charges complete as directed by the Engineer-in-Charge.

Material Requirements:

- Stones weighing between 50 and 100 kg should be placed randomly to fill the gap between the proposed seawall coastal protection work and the existing wall, Filter layer shall consist of rocks from 50 kg to 100 kg. Not more than 50% of rock shall be less than 75 kg and all rocks shall within the range of 50 kg to 100 kg.
- The stones shall be of approved quality, hard, clean, tough and without quarry rubbish. The stones shall be supplied by the contractor.
- The stones shall be cubical as far as possible. Blasting shall be so arranged that large proportion of heavier stones as specified are obtained.

Length to thickness ratio:

- All rock grades except core rock shall not contain more than 50% by weight of stone with a length to thickness (L/d) ratio greater than 2. Not more than 5% of the rocks shall have a length to thickness (L/d) ratio greater than 3, where the length, L , is defined as the greatest distance between two points on the stone and the thickness, d , as the minimum distance between two enclosing parallel planes through which the stone can just pass. Testing for shape ratio determination shall be undertaken on samples of at least 50 pieces taken at random from stones of mass W_{15} or greater.

Density:

- The average rock density shall be greater than 2,630 kg/ m³ with 90% of the stones having a density of at least 2,600 kg/ m³ when sampled, tested and reported.

Resistance to Wear:

- The micro-Deval coefficient shall not be greater than 15 (MDE15, Clause 5.4, EN 13383-1:2002)

when tested in accordance with EN 1097-1:1996.

Water Absorption:

- The average water absorption shall be not more than 0.5% for all rock grades except core rock where average water absorption shall not be more than 2%. Each test shall use ten water-absorption determinations, each determination being carried out on a different randomly selected stone where such stone shall have a volume of between 50 and 150ml and if any stone is larger than 150ml, a representative part of between 50 and 150ml shall be taken.

Resistance to Weathering :

- Magnesium Sulphate Soundness for sampling testing and reporting in accordance with BS 812, Part 121: 1984 shall be less than 12%.

Impact Resistance:

- The aggregate impact value shall be less than 30% for the standard test fraction when tested in accordance with BS 812 Part 112: 1990.

Crushing Resistance:

- The force required to produce 10% fines shall not be less than 170kN when tested in accordance with BS 812 Part 111: 1990, and either (i) the Franklin Point Load Index (ISS0) (ISRM) shall not be less than 5 MPa for all rock grades. or (ii) the uniaxial compressive strength (ISRM) shall be greater than 90 MPa for all rock grades except core rock for which the uniaxial compressive strength shall be greater than 60 MPa.

Impurities:

- Rock shall not include any impurities in a quantity such that damage will occur to the structure or the environment in which it is to be used.

Frequency of Testing :

- Testing shall be carried out regularly by the Contractor throughout the Contract to monitor the quality of rock on samples selected by EIC. The Contractor shall carry out the testing promptly and shall report the results without delay. Visual inspection and impurities and measurement shall be carried out continuously on all rocks The other characteristics such as density, specific gravity, compressive strength and water absorption etc.

- **Workmanship:**

Stones weighing between 50 kg and 100 kg shall be carefully placed in position to the required line, level, slope, and section as shown in drawings or directed by the Engineer-in-Charge. The stones shall be properly packed and interlocked to obtain a stable and compact mass with minimum voids. Smaller stones/spalls shall be used where necessary for wedging and filling gaps.

- All conveying, handling, stacking, loading, unloading, and laying shall be carried out without causing damage or segregation. The finished surface shall be true to alignment and profile, and the

work shall be completed in a neat and workmanlike manner as per specifications and directions of the Engineer-in-Charge.

- The stones shall first be collected and stacked on actual site of work and than one after another selected stones as directed shall be lifted and placed where necessary, so as to have a good inter locking. For the purpose of placement and arranging the stones in require slope the contractor shall deploy all necessary equipment, machineries like Crane etc. at no extra cost.
- The dumping of stones in between existing wall and newly constructed anti sea erosion work shall be done in layers as directed by Executive Engineer. The side lope of the bund shall be strictly maintained as per the section shown in the drawing or as may be directed by Executive Engineer. The dumping of stone shall be done in side slope in proper way true to line and level as per entire satisfaction of Executive Engineer.
- To ensure that slopes as per drawing suitable arrangements shall be made for dumping of stones to the required slope with the help of cranes, gantries, buckets or such other suitable and approved means and suitable devices equipment and labour for checking these slopes shall be provided by the contractors at no extra cost as per the satisfaction of Executive Engineer.
- For defining the width in which stones are to be dumped or placed suitable marker buoys or such other satisfactory arrangements shall be made by the contractor at his cost required. The contractor is responsible to take proper measures to protect the work in progress in time before the monsoon or rough weather. Any damage during construction due to negligence of contractor shall be made good and rectified by the contractor at his own cost as decided by Executive Engineer. Similarly protective steps in slope of seaside shall be taken by the contractor by covering it with stones whenever rough or stormy weather and tidal condition is likely to occur.
- The department has assess the quantity of the stones required to complete the work as per drawing precisely. The bidder shall visit the site before tendering. All the labours, tools and plants required for above work shall be brought by contractor. Any accident occurs during execution of this item; shall be responsibility of contractor's. The department will not be responsible for the same.
- The contractor shall take all precautions against damage by floods cyclone, earthquake or from any other accidents. No compensation will be allowed to the contractor for his plants, machinery and materials lost or damaged by floods or from other cases, including necessary care & diversion.
- The department shall not be liable to pay any compensation to the contractor for correcting or repairing any damages caused to any part of the work during construction due to Damage by natural calamities such as flood and cyclone or from any other accidents.

MEASUREMENT:

- Measurement shall be carried out in cubic meters (Cum.) of completed work.
- Quantities shall be computed from the initial and final levels using the cross-section or grid method, as directed by the Engineer-in-Charge.

PAYMENT:

- Payment shall be made on a cubic meter (Cum.) basis for the completed work.
- The rate shall be deemed to include the cost of all materials, labour, conveyance, stacking, laying, packing, all leads and lifts, tools and plants, and all incidental charges necessary for satisfactory completion of the work.

Item No.(2)

Supplying & Laying trap rubble stone 20 to 100 Kg .in weight for toe and core filling including conveying and stacking to required line level Slopes section including all leads and lifts. Conveying material from stacks and laying etc. complete.

Scope of Work:

- Supplying and laying trap rubble stone weighing 20 kg to 100 kg each core filling, including quarrying, conveying, unloading, stacking at site, and laying in required line, level, slopes, and sections, including all leads and lifts. The work shall also include conveying stones from stacks to the place of final deposition, proper hand placing, packing, dressing where required, and all incidental charges complete as directed by the Engineer-in-Charge.

Material Requirements:

- Stones weighing between 20 and 100 kg should be placed. The core of the structure core layer shall consist of rocks from 20 kg to 100 kg. Not more than 50% of rock shall be less than 60 kg and all rocks shall be within the range of 20 kg to 100 kg.
- The stones shall be of approved quality, hard, clean, tough and without quarry rubbish. The stones shall be supplied by the contractor.
- The stones shall be cubical as far as possible. Blasting shall be so arranged that large proportion of heavier stones as specified are obtained.

Length to thickness ratio:

- All rock grades except core rock shall not contain more than 50% by weight of stone with a length to thickness (L/d) ratio greater than 2. Not more than 5% of the rocks shall have a length to thickness (L/d) ratio greater than 3, where the length, L , is defined as the greatest distance between two points on the stone and the thickness, d , as the minimum distance between two enclosing parallel planes through which the stone can just pass. Testing for shape ratio determination shall be undertaken on samples of at least 50 pieces taken at random from stones of mass W_{15} or greater.

Density:

- The average rock density shall be greater than 2,630 kg/ m³ with 90% of the stones having a density of at least 2,600 kg/ m³ when sampled, tested and reported.

Resistance to Wear:

- The micro-Deval coefficient shall not be greater than 15 (MDE15, Clause 5.4, EN 13383-1:2002) when tested in accordance with EN 1097-1:1996.

Water Absorption:

- The average water absorption shall be not more than 0.5% for all rock grades except core rock where average water absorption shall not be more than 2%. Each test shall use ten water-absorption determinations, each determination being carried out on a different randomly selected stone where such stone shall have a volume of between 50 and 150ml and if any stone is larger than 150ml, a representative part of between 50 and 150ml shall be taken.

Resistance to Weathering :

- Magnesium Sulphate Soundness for sampling testing and reporting in accordance with BS 812, Part 121: 1984 shall be less than 12%.

Impact Resistance:

- The aggregate impact value shall be less than 30% for the standard test fraction when tested in accordance with BS 812 Part 112: 1990.

Crushing Resistance:

- The force required to produce 10% fines shall not be less than 170kN when tested in accordance with BS 812 Part 111: 1990, and either (i) the Franklin Point Load Index (ISS0) (ISRM) shall not be less than 5 MPa for all rock grades. or (ii) the uniaxial compressive strength (ISRM) shall be greater than 90 MPa for all rock grades except core rock for which the uniaxial compressive strength shall be greater than 60 MPa.

Impurities:

- Rock shall not include any impurities in a quantity such that damage will occur to the structure or the environment in which it is to be used.

Frequency of Testing :

- Testing shall be carried out regularly by the Contractor throughout the Contract to monitor the quality of rock on samples selected by EIC. The Contractor shall carry out the testing promptly and shall report the results without delay. Visual inspection and impurities and measurement shall be carried out continuously on all rocks The other characteristics such as density, specific gravity, compressive strength and water absorption etc.

- **Workmanship:**

Stones weighing between 20 kg and 100 kg shall be carefully placed in position to the required line, level, slope, and section as shown in drawings or directed by the Engineer-in-Charge. The stones shall be properly packed and interlocked to obtain a stable and compact mass with minimum voids. Smaller stones/spalls shall be used where necessary for wedging and filling gaps.

- All conveying, handling, stacking, loading, unloading, and laying shall be carried out without causing damage or segregation. The finished surface shall be true to alignment and profile, and the work shall be completed in a neat and workmanlike manner as per specifications and directions of the Engineer-in-Charge.

- The stones shall first be collected and stacked on actual site of work and than one after another selected stones as directed shall be lifted and placed where necessary, so as to have a good inter locking. For the purpose of placement and arranging the stones in require slope the contractor shall deploy all necessary equipment, machineries like Crane etc. at no extra cost.
- The dumping of stones in between existing wall and newly constructed anti sea erosion work shall be done in layers as directed by Executive Engineer. The side lope of the bund shall be strictly maintained as per the section shown in the drawing or as may be directed by Executive Engineer. The dumping of stone shall be done in side slope in proper way true to line and level as per entire satisfaction of Executive Engineer.
- To ensure that slopes as per drawing suitable arrangements shall be made for dumping of stones to the required slope with the help of cranes, gantries, buckets or such other suitable and approved means and suitable devices equipment and labour for checking these slopes shall be provided by the contractors at no extra cost as per the satisfaction of Executive Engineer.
- For defining the width in which stones are to be dumped or placed suitable marker buoys or such other satisfactory arrangements shall be made by the contractor at his cost required. The contractor is responsible to take proper measures to protect the work in progress in time before the monsoon or rough weather. Any damage during construction due to negligence of contractor shall be made good and rectified by the contractor at his own cost as decided by Executive Engineer. Similarly protective steps in slope of seaside shall be taken by the contractor by covering it with stones whenever rough or stormy weather and tidal condition is likely to occur.
- The department has assess the quantity of the stones required to complete the work as per drawing precisely. The bidder shall visit the site before tendering. All the labours, tools and plants required for above work shall be brought by contractor. Any accident occurs during execution of this item; shall be responsibility of contractor's. The department will not be responsible for the same.
- The contractor shall take all precautions against damage by floods cyclone, earthquake or from any other accidents. No compensation will be allowed to the contractor for his plants, machinery and materials lost or damaged by floods or from other cases, including necessary care & diversion.
- The department shall not be liable to pay any compensation to the contractor for correcting or repairing any damages caused to any part of the work during construction due to Damage by natural calamities such as flood and cyclone or from any other accidents.

MEASUREMENT:

- Measurement shall be carried out in cubic meters (Cum.) of completed work.
- Quantities shall be computed from the initial and final levels using the cross-section or grid method, as directed by the Engineer-in-Charge.

PAYMENT:

- Payment shall be made on a cubic meter (Cum.) basis for the completed work. The rate shall be deemed to include the cost of all materials, labour, conveyance, stacking, laying, packing, all leads and lifts, tools and plants, and all incidental charges necessary for satisfactory completion of the work.

Signature of Contractor

**Executive Engineer
Gir Somnath Irrigation Division
Veraval**

Item No.(3)

Supplying & Laying trap rubble stone 500 to 1000 Kg. In weight for toe and core filling including conveying and stacking to required line level Slopes section including all leads and lifts. Conveying material from stacks and laying etc. complete.

Scope of Work:

- Supplying and laying trap rubble stone weighing 500 kg to 1000 kg each core filling, including quarrying, conveying, unloading, stacking at site, and laying in required line, level, slopes, and sections, including all leads and lifts. The work shall also include conveying stones from stacks to the place of final deposition, proper hand placing, packing, dressing where required, and all incidental charges complete as directed by the Engineer-in-Charge.

Material Requirements:

- Stones weighing between 0.5 to 1.0 t stones forming the armour on the lee side with a slope of 1:1.5. this layer shall consist of rocks from 500 kg to 1000 kg. Not more than 50% of rock shall be less than 750 kg and all rocks shall within the range of 500 kg to 1000 kg.
- The stones shall be of approved quality, hard, clean, tough and without quarry rubbish. The stones shall be supplied by the contractor.
- The stones shall be cubical as far as possible. Blasting shall be so arranged that large proportion of heavier stones as specified are obtained.

Length to thickness ratio:

- All rock grades except core rock shall not contain more than 50% by weight of stone with a length to thickness (L/ d) ratio greater than 2. Not more than 5% of the rocks shall have a length to thickness (L/ d) ratio greater than 3, where the length, L, is defined as the greatest distance between two points on the stone and the thickness, d, as the minimum distance between two enclosing parallel planes through which the stone can just pass. Testing for shape ratio determination shall be undertaken on samples of at least 50 pieces taken at random from stones of mass W15 or greater.

Density:

- The average rock density shall be greater than 2,630 kg/ m³ with 90% of the stones having a density of at least 2,600 kg/ m³ when sampled, tested and reported.

Resistance to Wear:

- The micro-Deval coefficient shall not be greater than 15 (MDE15, Clause 5.4, EN 13383-1:2002) when tested in accordance with EN 1097-1:1996.

Water Absorption:

- The average water absorption shall be not more than 0.5% for all rock grades except core rock where average water absorption shall not be more than 2%. Each test shall use ten water-absorption determinations, each determination being carried out on a different randomly selected stone where such stone shall have a volume of between 50 and 150ml and if any stone is larger than 150ml, a representative part of between 50 and 150ml shall be taken.

Resistance to Weathering :

- Magnesium Sulphate Soundness for sampling testing and reporting in accordance with BS 812, Part 121: 1984 shall be less than 12%.

Impact Resistance:

- The aggregate impact value shall be less than 30% for the standard test fraction when tested in accordance with BS 812 Part 112: 1990.

Crushing Resistance:

- The force required to produce 10% fines shall not be less than 170kN when tested in accordance with BS 812 Part 111: 1990, and either (i) the Franklin Point Load Index (ISS0) (ISRM) shall not be less than 5 MPa for all rock grades. or (ii) the uniaxial compressive strength (ISRM) shall be greater than 90 MPa for all rock grades except core rock for which the uniaxial compressive strength shall be greater than 60 MPa.

Impurities:

- Rock shall not include any impurities in a quantity such that damage will occur to the structure or the environment in which it is to be used.

Frequency of Testing :

- Testing shall be carried out regularly by the Contractor throughout the Contract to monitor the quality of rock on samples selected by EIC. The Contractor shall carry out the testing promptly and shall report the results without delay. Visual inspection and impurities and measurement shall be carried out continuously on all rocks The other characteristics such as density, specific gravity, compressive strength and water absorption etc.

- **Workmanship:**

Stones weighing between 500 kg to 1000 kg shall be carefully placed in position to the required line, level, slope, and section as shown in drawings or directed by the Engineer-in-Charge. The stones shall be properly packed and interlocked to obtain a stable and compact mass with minimum voids. Smaller stones/spalls shall be used where necessary for wedging and filling gaps.

- All conveying, handling, stacking, loading, unloading, and laying shall be carried out without causing damage or segregation. The finished surface shall be true to alignment and profile, and the

work shall be completed in a neat and workmanlike manner as per specifications and directions of the Engineer-in-Charge.

- The stones shall first be collected and stacked on actual site of work and than one after another selected stones as directed shall be lifted and placed where necessary, so as to have a good inter locking. For the purpose of placement and arranging the stones in require slope the contractor shall deploy all necessary equipment, machineries like Crane etc. at no extra cost.
- The dumping of stones in between existing wall and newly constructed anti sea erosion work shall be done in layers as directed by Executive Engineer. The side lope of the bund shall be strictly maintained as per the section shown in the drawing or as may be directed by Executive Engineer. The dumping of stone shall be done in side slope in proper way true to line and level as per entire satisfaction of Executive Engineer.
- To ensure that slopes as per drawing suitable arrangements shall be made for dumping of stones to the required slope with the help of cranes, gantries, buckets or such other suitable and approved means and suitable devices equipment and labour for checking these slopes shall be provided by the contractors at no extra cost as per the satisfaction of Executive Engineer.
- For defining the width in which stones are to be dumped or placed suitable marker buoys or such other satisfactory arrangements shall be made by the contractor at his cost required. The contractor is responsible to take proper measures to protect the work in progress in time before the monsoon or rough weather. Any damage during construction due to negligence of contractor shall be made good and rectified by the contractor at his own cost as decided by Executive Engineer. Similarly protective steps in slope of seaside shall be taken by the contractor by covering it with stones whenever rough or stormy weather and tidal condition is likely to occur.
- The department has assess the quantity of the stones required to complete the work as per drawing precisely. The bidder shall visit the site before tendering. All the labours, tools and plants required for above work shall be brought by contractor. Any accident occurs during execution of this item; shall be responsibility of contractor's. The department will not be responsible for the same.
- The contractor shall take all precautions against damage by floods cyclone, earthquake or from any other accidents. No compensation will be allowed to the contractor for his plants, machinery and materials lost or damaged by floods or from other cases, including necessary care & diversion.
- The department shall not be liable to pay any compensation to the contractor for correcting or repairing any damages caused to any part of the work during construction due to Damage by natural calamities such as flood and cyclone or from any other accidents.

MEASUREMENT:

- Measurement shall be carried out in cubic meters (Cum.) of completed work.
- Quantities shall be computed from the initial and final levels using the cross-section or grid method, as directed by the Engineer-in-Charge.

PAYMENT:

- Payment shall be made on a cubic meter (Cum.) basis for the completed work. The rate shall be deemed to include the cost of all materials, labour, conveyance, stacking, laying, packing, all leads and lifts, tools and plants, and all incidental charges necessary for satisfactory completion of the work.

Signature of Contractor

**Executive Engineer
Gir Somnath Irrigation Division
Veraval**

Item No.(4)

Supplying & Laying trap Rubble Stone 2.0 to 3.0 tone in weight for toe&core filling including conveying and stacking to required line, level, slope section including all leads & lifts conveying materials from stacks and laying etc. completely.

Scope of Work:

- Supplying and laying trap rubble stone weighing 2.0 to 3.0 Tone each toe burm, including quarrying, conveying, unloading, stacking at site, and laying in required line, level, slopes, and sections, including all leads and lifts. The work shall also include conveying stones from stacks to the place of final deposition, proper hand placing, packing, dressing where required, and all incidental charges complete as directed by the Engineer-in-Charge.

Material Requirements:

- 4.0 m wide toe-berm, consisting of 2 to 3 t stones, is provided at elevation +2.00 m with a seaward slope of 1:2. Not more than 50% of rock shall be less than 2.5 tone and all rocks shall within the range of 2 to 3 t stones.
- The stones shall be of approved quality, hard, clean, tough and without quarry rubbish. The stones shall be supplied by the contractor.
- The stones shall be cubical as far as possible. Blasting shall be so arranged that large proportion of heavier stones as specified are obtained.

Length to thickness ratio:

- All rock grades except core rock shall not contain more than 50% by weight of stone with a length to thickness (L/d) ratio greater than 2. Not more than 5% of the rocks shall have a length to thickness (L/d) ratio greater than 3, where the length, L , is defined as the greatest distance between two points on the stone and the thickness, d , as the minimum distance between two enclosing parallel planes through which the stone can just pass. Testing for shape ratio determination shall be undertaken on samples of at least 50 pieces taken at random from stones of mass W_{15} or greater.

Density:

- The average rock density shall be greater than 2,630 kg/ m³ with 90% of the stones having a density of at least 2,600 kg/ m³ when sampled, tested and reported.

Resistance to Wear:

- The micro-Deval coefficient shall not be greater than 15 (MDE15, Clause 5.4, EN 13383-1:2002) when tested in accordance with EN 1097-1:1996.

Water Absorption:

- The average water absorption shall be not more than 0.5% for all rock grades except core rock where average water absorption shall not be more than 2%. Each test shall use ten water-absorption determinations, each determination being carried out on a different randomly selected stone where such stone shall have a volume of between 50 and 150ml and if any stone is larger than 150ml, a representative part of between 50 and 150ml shall be taken.

Resistance to Weathering :

- Magnesium Sulphate Soundness for sampling testing and reporting in accordance with BS 812, Part 121: 1984 shall be less than 12%.

Impact Resistance:

- The aggregate impact value shall be less than 30% for the standard test fraction when tested in accordance with BS 812 Part 112: 1990.

Crushing Resistance:

- The force required to produce 10% fines shall not be less than 170kN when tested in accordance with BS 812 Part 111: 1990, and either (i) the Franklin Point Load Index (ISS0) (ISRM) shall not be less than 5 MPa for all rock grades. or (ii) the uniaxial compressive strength (ISRM) shall be greater than 90 MPa for all rock grades except core rock for which the uniaxial compressive strength shall be greater than 60 MPa.

Impurities:

- Rock shall not include any impurities in a quantity such that damage will occur to the structure or the environment in which it is to be used.

Frequency of Testing :

- Testing shall be carried out regularly by the Contractor throughout the Contract to monitor the quality of rock on samples selected by EIC. The Contractor shall carry out the testing promptly and shall report the results without delay. Visual inspection and impurities and measurement shall be carried out continuously on all rocks The other characteristics such as density, specific gravity, compressive strength and water absorption etc.

- **Workmanship:**

Stones weighing between 2.0 to 3.0 tone shall be carefully placed in position to the required line, level, slope, and section as shown in drawings or directed by the Engineer-in-Charge. The stones shall be properly packed and interlocked to obtain a stable and compact mass with minimum voids. Smaller stones/spalls shall be used where necessary for wedging and filling gaps.

- All conveying, handling, stacking, loading, unloading, and laying shall be carried out without causing damage or segregation. The finished surface shall be true to alignment and profile, and the work shall be completed in a neat and workmanlike manner as per specifications and directions of the Engineer-in-Charge.

- The stones shall first be collected and stacked on actual site of work and than one after another selected stones as directed shall be lifted and placed where necessary, so as to have a good inter locking. For the purpose of placement and arranging the stones in require slope the contractor shall deploy all necessary equipment, machineries like Crane etc. at no extra cost.
- The dumping of stones in between existing wall and newly constructed anti sea erosion work shall be done in layers as directed by Executive Engineer. The side lope of the bund shall be strictly maintained as per the section shown in the drawing or as may be directed by Executive Engineer. The dumping of stone shall be done in side slope in proper way true to line and level as per entire satisfaction of Executive Engineer.
- To ensure that slopes as per drawing suitable arrangements shall be made for dumping of stones to the required slope with the help of cranes, gantries, buckets or such other suitable and approved means and suitable devices equipment and labour for checking these slopes shall be provided by the contractors at no extra cost as per the satisfaction of Executive Engineer.
- For defining the width in which stones are to be dumped or placed suitable marker buoys or such other satisfactory arrangements shall be made by the contractor at his cost required. The contractor is responsible to take proper measures to protect the work in progress in time before the monsoon or rough weather. Any damage during construction due to negligence of contractor shall be made good and rectified by the contractor at his own cost as decided by Executive Engineer. Similarly protective steps in slope of seaside shall be taken by the contractor by covering it with stones whenever rough or stormy weather and tidal condition is likely to occur.
- The department has assess the quantity of the stones required to complete the work as per drawing precisely. The bidder shall visit the site before tendering. All the labours, tools and plants required for above work shall be brought by contractor. Any accident occurs during execution of this item; shall be responsibility of contractor's. The department will not be responsible for the same.
- The contractor shall take all precautions against damage by floods cyclone, earthquake or from any other accidents. No compensation will be allowed to the contractor for his plants, machinery and materials lost or damaged by floods or from other cases, including necessary care & diversion.
- The department shall not be liable to pay any compensation to the contractor for correcting or repairing any damages caused to any part of the work during construction due to Damage by natural calamities such as flood and cyclone or from any other accidents.

MEASUREMENT:

- Measurement shall be carried out in cubic meters (Cum.) of completed work.
- Quantities shall be computed from the initial and final levels using the cross-section or grid method, as directed by the Engineer-in-Charge.

PAYMENT:

- Payment shall be made on a cubic meter (Cum.) basis for the completed work. The rate shall be deemed to include the cost of all materials, labour, conveyance, stacking, laying, packing, all leads and lifts, tools and plants, and all incidental charges necessary for satisfactory completion of the work.

Signature of Contractor

**Executive Engineer
Gir Somnath Irrigation Division
Veraval**

Item No.(5)

Casting design mix M30 grade PCC tetrapods/dollose weighing upto 25 tonne using minimum cement 405 kg/cum and graded crushed stone aggregates 40mm nominal maximum size for laying in section of breakwater or such other structure including cost of formwork, admixture (superplasticizer) @ 0.4 % of weight of cement, vibrating, curing, finishing etc. Complete.

General :-

- The Items pertains to casting, curing, the cement concrete tetrapod as shown on the drawing or as directed. The tetrapod shall be of regular shape.
- The concrete to be used shall be of M-30 grade and shall conform to all the requirements and specification for controlled concrete as laid down in the relevant Indian Standards, as also the specifications attached elsewhere in this tender documents; as and where applicable.
- No reinforcement shall be used and tetrapod shall be cast in plain cement concrete only.
- The mix design shall be got done well in advance from approved Government laboratory and the trial mix design shall be conducted at site of work and got approved from Engineer in charge before actual concreting of work. It shall be ensured that the design mix satisfies all the necessary requirements in respect of minimum cement content, characteristic compressive strength etc. as laid down in the relevant Indian Standards. (IS : 12269-1987 latest amendments)
- The minimum cement content of Portland slag cement shall be 405 Kilogram per cubic meter or cement content required as per mix design, Whichever is maximum.
- The contractor shall make his own arrangement for water required for mixing and curing of concrete. In no case, sea water shall be used for mixing and curing.
- **MATERIALS:**
 - i) CEMENT: Specification M-6 of material section shall apply.
 - ii) WATER: Specification M-1 of material section shall apply.
 - iii) FINE AGGREGATE: Specification M-3 of material section shall apply.
 - iv) COARSE AGGREGATE: Specification M-4 of material section shall apply.

Form work / Mould for the concrete Tetrapod :-

- The size and shape of the mould/formwork for Tetrapod shall be of M.S. plate and shall be in accordance with drawings supplied. Initially, one mould shall be fabricated by the contractor strictly as directed and shall be get approved from the Engineer-in-charge of the work.
- After getting such approval from Engineer-in-charge, of the work further moulds shall be fabricated in sufficient numbers so as to ensure the required progress.

- If any of the moulds/formworks gets distorted or gets spoiled or damaged in any way during the progress of the work, the same shall not be allowed to be used for casting of tetrapod, until necessary, repairs have been carried out. If so directed by Engineer-in-charge of the work such distorted / damaged mould shall be totally discarded and replaced with new one. While casting. It shall be ensured that there is no leakage of slurry.
- In case of units protected by patent right, the contractor shall make all necessary applications and pay all royalties in connection with the used of the design.

Casting of Concrete Tetrapod :-

- Concrete shall be mixed by Automatic weigh batch plant in a such a way that no segregation takes place. The transportation and placing of concrete for tetrapod shall conform to the relevant specification. Consolidation shall be done with mechanical Table vibrator of sufficient of 4.0 t Tetrapod / Needle vibrator as directed by Engineer-In-charge.
- Minor surface defects, if any, shall be repaired / rectified by the contractor immediately upon the removal of formwork at no extra cost. The mortar used for such repairs/rectification shall be 1:3 proportion and shall include an additive shrinkage cracks and to ensure better adhesion
- Concrete Tetrapod shall be marked with the unit number and date of Casting. The marking shall be in white indelible paint with character sufficiently large enough to render the same easily legible.
- The rate for this item is arrived at by considering the cement consumption of 405 Kilogram. / cubic meter, the difference in current content shall be recovered from the contractor at the rate of Rs. 6200/- M.T. No extra payment shall be made to the contractor, if the consumption according to the approved mix design exceeds 405 kilogram / cubic meter.
- Casting shall be done on the site of work or in casting yard as per instruction of Engineer-in charge. The land of casting yard shall be select, near by the site in the vicinity of 5.0 km with easy approach by the bidder without any extra cost to the department.

Curing :-

- The curing of the concrete Tetrapod shall be done for 14 days the contractor shall make his own arrangement for water required for mixing of concrete and curing of Tetrapod shall be got approved from the Engineer-in-charge of the work. One such methods as described follows:-The curing of concrete Tetrapod shall be done with temporarily overhead tank and pipe lines and spout sprinklers arranged over cement concrete Tetrapod shall be covered with gunny cloth and it shall be ensured that Tetrapod are kept continuously wet by the above arrangements. The curing arrangement shall be completed in all respect before starting the work of casting of concrete Tetrapod.

Sampling and testing of samples :-

- Frequency of sampling of concrete shall be as stipulated in IS: 456-2000. For the purpose of testing machine of approved manufacture shall be provided by contractor at casing yard site. The testing of

cubes at site shall be carried out in presence of Engineer-in-charge of the work or his authorized representatives. At least one set of samples for seven days and twenty-eight days strength shall be got tested in approved Government laboratory, per week. All the necessary Record shall be kept and shall be jointly signed by the contractor and Engineer-in-charge of the work on their authorized representatives. All cost in connection with carrying out required tests shall be borne by the contractor. Acceptance criteria for concrete shall be as per IS: 456-2000. (As per latest amendments)

- The cubes shall be tested for 28 days strength. The minimum specified strength for the corresponding grade of concrete used specified strength for the corresponding grade of concrete used shall have to be achieved. However, if only one test gives strength not less than 90% of the specified strength, the same shall be acceptable.
- The collection of concrete for test cubes shall confirm to relevant provision as specification, so that the representatives samples are obtained.
- All the necessary record shall be jointly signed by the contractor and Engineer-in-charge of the work or their authorized representatives.
- All cost in connection record shall be kept and shall be jointly borne by the contractor.
- At the casting site, Engineer-in-charge of the work or his authorized representative shall record the details. The Engineer-in-charge of the work or his authorized representative shall receive the Tetrapods at site and on verification, shall record the date and time in taken of receipt. The permanent record in register form in the Performa shall be maintained at casting yard and at work site. The day to day record in the register shall be signed by the Engineer-in-charge of the work and the contractor or their authorized representative. The Chainage wise record of final placement of Tetrapods at the performa given. Both the parties shall sign the record in the register.

Transportation and placement of tetrapod :

- The tetrapod shall be conveyed to the site in approved manner and placed in positions as per drawing and as directed in line, level and in slope as specified. Lead soundings or soundings by any method approved by EIC shall therefore be carried out for determining actual line and level; the short comings, if any shall be attended and profile to be completed as per profile shown in drawing. The soundings as above will be carried out by the contractor, to the entire satisfaction of the Engineer-in-charge at no extra cost. The contractor shall take every precaution, to ensure that the tetrapod in position is not disturbed, while placing new tetrapod. In case any disturbance is caused to the tetrapod, the same shall be set right by the contractor at no extra cost. The rate included slinging, lifting and transporting from casting yard and placing on seaside with the help of required capacity of crane in the section of break water. If tetrapod is damaged during loading, unloading transportation and placing cost of tetrapod will be recovered from the contractor at the rate quoted by contractor per cum. Looking to the top level of the breakwater and slopping length of the breakwater provision

has been specially made for 100 MT capacity crane for placing of tetrapod. Therefore, the contractor shall have to arrange 100 MT capacity crane for placing tetrapod at his risk and cost. All tetrapods shall be laid in proper slope or as instruction of EIC. The rate is per cum and includes transporting of tetrapod lifting, loading, unloading and placing in position as per drawing in breakwater seaside portion or as directed etc. complete including all labour, tools, plants, equipment and machinery etc. complete.

MEASUREMENT:

- The quantity of Tetrapods shall be measured in Cubic Meter (Cum) based on actual geometrical dimensions of finished precast Tetrapods cast and placed at site as per approved drawing.
- The cubical content of one Tetrapod shall be 1.667 cubic meter as per detailed drawing attached.
- If during conveying lifting and placing operation, any of the tetrapods are broken or damaged in any way, rendering them to be useless or inefficient the their function, no payment for such tetrapods shall be made

PAYMENT:

- Payment shall be made on cubic meter (Cum.) basis for completed work.
- The rate shall include cost of materials, casting, conveying, stacking, laying, packing, all leads and lifts, tools, plants, and incidental charges.

Signature of Contractor

**Executive Engineer
Gir Somnath Irrigation Division
Veraval**

Item No.(6)

Labour charges for placing of CC Tetrapods/Dollose/blocks weighing upto 25 tonne in the section of breakwater or such other structure, laying in position as shown in the drawing or as directed including loading at casting yard, transporting, unloading at work site and all labour, machinery such as cranes, dumpers, trucks, trailers etc. Complete.

General :-

- The Items pertains to conveying to site of work and placing in position the cement concrete tetrapod in the armour layer, ensuring the correct profile as shown on the drawing or as directed. The tetrapod shall be of regular shape.
- The contractor shall make his own arrangement for transporting, laying and placing of tetrapod as per drawing.

Placing of Tetrapods :-

- The Tetrapod shall be conveyed to the site in approved manner and placed in position as per drawing and as directed in line and level and slope.
- Tetrapod shall be placed as armor layer on sub-armor layer as soon as possible after the sub-armor layer has been laid in the position and to the slopes indicated on the drawing.
- Tetrapod shall be placed in two layers. Each layer should consist of a equal number of Tetrapod. The Tetrapod in the first or bottom layer shall be placed with three legs resting on layer beneath them and one leg upward. The Tetrapod in the second or in the upper.
- layer shall be placed with one leg downwards to fit closely between the upright leg of the first layer.
- The number of Tetrapod placed per 100 square meters area shall be 74 numbers or as directed by the Engineer-in-charge of the work at the time of execution and the contractor shall be placed the same accordingly.
- For placing the Tetrapod in position, crane of adequate capacity and having requisite boom length shall be used. The Tetrapod shall placed after calculating crane hook position accurately. The position of the hook accurately be fixed accurately, prior to the placement of a load of Tetrapod.
- Concrete Tetrapod shall be placed directly in position in which they are to remain. The Tetrapod shall be placed gently and shall not be allowed to roll.
- During the conveying, lifting and placing in position, if any Tetrapod get damaged, the same shall be rejected and shall not be allowed be used.
- It shall be ensured that the Tetrapod are placed strictly in accordance with the drawings. The

contractor shall take all the precautions to ensure that the correct profile is achieved and that the Tetrapod placed in position are not disturbed, the same shall be set forthwith and correct profile shall be maintained.

- If so directed by the Engineer-in-charge, of the work Tetrapod shall be placed for temporary round head as per the working drawing, for temporary protection of the work during monsoons or when stormy weather is expected. Such Tetrapod shall be removed generally when directed to do so before restarting the work after monsoon period or after the stormy weather is over Tetrapod lying above the low water spring level and, as far as possible, also those lying below that level shall be removed these Tetrapod shall be refused in the regular section provided they conform to the requirements.
- The contractor shall provide all the necessary equipment for conveying, lifting and placing the Tetrapod including all labour required for those operations and nothing extra shall be paid on army account whatsoever
- The stacked material shall be laid to required place, in required line, level and slope and as per detailed drawing and as directed by the Engineer-in-charge of the work or his authorized representative.

Mode of Measurement :-

- The labour work for Tetrapod placing shall be measured in Cubic Meter (Cum) based on the actual volume of Tetrapods successfully placed in approved position.
- Measurements shall be as per actual number of Tetrapod cast and placed in position as specified. The cubical content of one Tetrapod shall be 1.667 cubic meter as per detailed drawing attached.
- The rate shall include cost of laying, packing, all leads and lifts, tools, plants, and incidental charges.

Payment:-

- Payment Shall Be Paid On Cubic Meter Base On Actual Volume Of Tetrapod Successfully Placed in Approved Position The rate shall include cost of laying, packing, all leads and lifts, tools, plants, and incidental charges.

Signature of Contractor

**Executive Engineer
Gir Somnath Irrigation Division
Veraval**

Item No.(7)

Provision for Mobilization and Demobilization of All Required Construction Machinery, Equipment, and Ancillary Facilities for harbour project works such as jetty, wharf, breakwater etc.

Scope of Work:

- The work shall consist of mobilization and demobilization of all required construction machinery, equipment, tools, plants, and ancillary facilities necessary for execution of harbour project works such as jetty, wharf, breakwater, and other associated structures. Mobilization shall include transportation of all construction equipment, establishment of site offices, storage yards, workshops, temporary utilities, labour camps, and all other infrastructure required for commencement of work at site. It shall also include assembling, installation, testing, and making all machinery and equipment operational.
- Demobilization shall include dismantling, removal, and shifting of all equipment, temporary structures, site offices, and facilities after completion of the work, and restoration of the site to original or specified condition. The contractor shall make all necessary arrangements for transportation, handling, loading, unloading, and all leads and lifts. The work shall be carried out as per project requirements and instructions of the Engineer-in-Charge.
- This item shall cover all incidental expenses required for proper execution of the work, including manpower, machinery, equipment, tools, plants, logistics, temporary arrangements, and compliance with safety and environmental requirements.

Mode of Measurement And Payment:

Measurement for this item shall be made on a Lump Sum (LS) basis as provided in the BOQ. Payment shall be released in two stages. An amount equal to 50% of the accepted LS value shall be paid after mobilization of the required manpower, machinery, equipment, and establishment of necessary site arrangements, subject to verification and certification by the Engineer-in-Charge. The remaining 50% of the accepted LS value shall be paid upon satisfactory completion of all works covered under this item, including demobilization of resources and clearance of the site, as certified by the Engineer-in-Charge and in accordance with the terms and conditions of the contract.

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Gir Somnath Irrigation Division
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Item No.(8)

Excavation in all sort of strata and formations including depositing the unuseful excavated stuff as and where directed including sorting and stacking useful materials as directed up to 200 Mt. lead and all lift etc. complete including dewatering. (a) In overburden including Hard Murrum.

GENERAL :

- Excavation in all types of overburden including hard murrum shall be carried out in accordance with the lines, levels, grades, slopes, and dimensions shown on the drawings or as directed by the Engineer-in-Charge for works including structures such as embankments, foundations, trenches, and allied works. The work shall include excavation in all kinds of soil, clay, silt, sand, gravel, filled-up ground, mixed strata, weathered formations, and hard murrum requiring mechanical means of excavation.

SCOPE OF WORK :

- The excavation shall be carried out by mechanical means such as hydraulic excavators, bulldozers equipped with rippers, loaders, or any other approved plant suitable for the prevailing site conditions. Manual excavation shall be adopted only where mechanical means are not feasible or as specifically directed by the Engineer-in-Charge. The contractor shall ensure that excavation is carried out in a controlled manner without causing disturbance to adjoining structures, slopes, utilities, or completed works, and shall take all necessary precautions to maintain stability of excavation faces during execution.

WORKMANSHIP :

- Workmanship of the work under this item of work shall be as describe in general tech. specification for excavation. The excavation shall be carried out in correct dimension such a depth and level as per drawing or as directed by the Engineer-in-charge. This shall include all excavation done in all strata such as soils, soft murrum, hard murrum. The trenches shall be excavated to exact width and depth as per drawing and the sides shall be made plumb and bottom shall be made level where the nature of the strata admits it. All foundation trenches shall be at one level unless otherwise directed by Engineer-in-charge, and shall be dressed perfectly in level before any concrete or masonry is put, it shall be well watered and thoroughly rammed. No filling will be allowed or bringing the foundation to be at proper level though out.
- The excavated materials shall be stacked up to 200 mt. lead as directed by the Engineer-in-charge without extra payment. Any extra excavation done by the contractor in the sides and depths shall have to be filled in with concrete or as directed by Engineer-in-charge without any extra cost.

MODE OF MEASUREMENT AND PAYMENT :

- Measurement and Payment shall be made on volumetric basis per cubic meter. No payment shall be made for the unauthorized extra excavation. The measurement shall be taken as specified in general Technical specification for excavation.

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Item No.(9)

Providing & Laying in position 'NOMINAL MIX' cement concrete using cement sand and crushed aggregate by machine mix incl. necessary formworks, centering, scaffolding compaction by mechanical vibrator curing as directed with all lead & lift etc D) Concrete grade 1:2:4 and MSA-40mm(Graded)

GENERAL:

General technical specifications for concrete works shall apply here also Concrete mix shall be proportion 1:2:4 (1 Cement : 2 Coarse Sand : 4 Graded Stone Aggregate) as decided by E.I.C. and is to be design by preliminary tests in the laboratory. The proportions for ingredients shall be by mass only except for water. The proportion of concrete mix proportion 1:2:4 (1 Cement : 2 Coarse Sand : 4 Graded Stone Aggregate) concrete with aggregate MSA-40 mm. (Graded)

MATERIALS:

- i) CEMENT: Specification M-2 of material section shall apply.
- ii) WATER: Specification M-1 of material section shall apply.
- iii) FINE AGGREGATE: Specification M-3 of material section shall apply.
- iv) COARSE AGGREGATE: Specification M-4 of material section shall apply.

SCOPE OF WORK. :

The scope of work under this item incl. doing C.C./R.C.C. at various work locations and compartments as classified under the item incl. providing & supplying all materials, labours and use of equipment's machinery with providing erecting and dismantling of necessary formwork and centring. The scope of work also including laying of concrete in position as directed by machinery or by manually with compaction by means of needle of surface vibrator together with finishing the expose surface of concrete work to obtain dense and compact surface, curing for a specified period etc.

WORKMANSHIP

Specifications for workmanship laid down in general technical specifications for concrete works shall apply here also. The workability of the concrete mix shall be controlled by maintaining a w/c ratio that is bound to give a concrete mix which is just sufficiently wet to be placed and compacted without difficulty with the means specified.

MODE OF MEASUREMENT AND PAYMENT :

The Measurement and payment shall be for a unit of cubic meter. The consolidated cubical contents of concrete work as specified in item shall be measured. The concrete laid in excess of section shown on drawing or as directed shall not be measured. No deduction shall be made for-

- i) Ends of beams, girders, joist, steps, posts, etc. of des-similar materials up to 500 sqcms in section.

ii) Opening up to 0.1 sq.mt.in area.

The rate includes cost of all materials, labour, tools and plants required for mixing, placing in position, vibrating and compacting, finishing, as directed, curing and other incidental expenses for producing concrete of specified strength. The rate includes cost of formwork

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Veraval**

Item No.(10)

Drilling 25mm dia holes at distance as specified and depth upto 3.0mt for check dam foundation & fixing anchor bars of specified diameter with cement grout incl cleaning holes as directed etc, (excluding cost of bars.)

GENERAL:

- The work shall consist of drilling holes of 25 mm diameter at specified locations and spacing, up to a depth of 3.0 meters, in the Existing wall or as directed by the Engineer-in-Charge. Drilling shall be carried out using suitable mechanical equipment to achieve the required diameter and depth without damaging the surrounding structure. After drilling, the holes shall be thoroughly cleaned of all dust, loose particles, water, and debris using air or water pressure to ensure proper bonding.
- Anchor bars of specified diameter (steel to be provided separately) shall then be inserted into the drilled holes and properly aligned. The holes shall be filled with cement grout of approved mix to ensure full bonding between the bar and surrounding material. Grouting shall be done carefully to avoid air voids and ensure complete filling. The bars shall be held firmly in position until the grout has set. The work includes all operations such as drilling, cleaning, positioning of bars, grouting, curing, and all leads and lifts complete, but excludes the cost of reinforcement steel.

Mode of Measurement:

- Measurement and payment shall be made on the basis of in running meter (RM) of completed hole depth, as specified in the schedule of items. The rate shall include drilling, cleaning, grouting, labour, tools and plants, and all incidental charges, but excludes the cost of anchor bars.

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Item No.(11)

Providing, cutting, bending, binding and fixing in position as per drawing. TMT BAR, reinforcement for R.C.C. works and anchor bars including cost of black annealed 16 to 18 BWG M.S. Wire etc. complete with all lead and lift. (b) Fe 500

GENERAL:

- Providing, cutting, bending, cranking, binding and fixing in position reinforcement steel conforming to Fe 500 grade Thermo Mechanically Treated (TMT) bars for all Reinforced Cement Concrete (R.C.C.) works in accordance with approved drawings, specifications, and instructions of the Engineer-in-Charge
- The work shall include supplying Fe 500 grade TMT reinforcement bars of approved manufacturer, quality, and size, including unloading, handling, storing at site in a manner preventing corrosion or deformation, cutting to required lengths, straightening, bending, shaping, cranking, hooking, lapping, splicing, and placing in position as per structural drawings. The reinforcement shall be accurately fixed and rigidly held in position using chairs, spacers, cover blocks, and supports to maintain the required cover, alignment, spacing, and stability during concreting operations.

MATERIALS:

- High strength deformed Thermo Mechanically Treated (T.M.T.) bars M-5 shall be as per IS: 1786(2008) of grade Fe 500.
- Other provision and requirements shall conform to specification M-5 of TMT Bars.
- Reinforcing steel shall not be stored directly on the ground. These shall be stored under cover and shall be protected from rusting, oil grease and distortions as directed by the Engineer in-charge.
- No re-rolled material will be accepted. Contractor shall submit the manufacturer's test certificate along
- with the gate pass no, lorry no with each truck load consignment.
- Frequency of tests shall be as per IS 1786, table-5. Steel not conforming the specifications shall be rejected and removed from the site immediately.
- Pitted and defective rods shall not be used. All the reinforcement shall be ISI marked.

BENDING REINFORMENT:

- Bonds, cranks or other shapes on reinforcement bars shall be carefully formed in exact accordance with the drawings. Otherwise, all bars shall be truly straight. Bends shall be made cold having a diameter of at least four times the bars. Seating of bars for any purpose shall not be

allowed.

- Splices or overlaps in reinforcement are required the bars shall be provided with such splices or overlaps as are shown on the drawing and in absence of any drawing, as indicated as:

FIXING REINFORCEMENT: -

- The number, size, form and position of all steel reinforcing bars, tiles, links, stirrups and other parts of the reinforcement shall be in exact accordance with the drawings and such parts shall be kept in the correct positions in the forms without displacement during the process of working the concrete into places. The minimum clearance between parallel round bars shall not be less than either 1.5 time the diameter or 1.5 times the maximum size of the aggregate whichever is more Mortar or concrete block, metallic bars, space bars etc, necessary for maintaining the reinforcement in the correct position shall be used as where shown on the drawing but should the contractor consider further bars and distance pieces etc , to the necessary be shall supply and fix the same without charges special care shall be exercises to prevent any disturbance of the reinforcement in concrete that has already been replaced.
- All straight bars shall be fixed parallel to each other and the side of the forms any ties links or stirrups connecting the bars all be tightened that the bar is properly braced inside of their served parts shall be in actual contact with the bars around which they are intended to fit.
- After placing the bars in position, they shall be tied together with black steel annealed wire 16 SWG (1-626mm). They shall be firm with ends of the wire turned into the main body of concrete bars shall be tied at all intersections.

MODE OF MEASUREMENT AND PAYMENT:

- After all the steel bars have been placed in position they shall be got approved and measured from the Engineer-in-Charge before starting the concrete work.
- The Measurement and payment for this item shall be on the basis MT.
- No payment shall be made for extra members or length's not included in the design and which in the opinion of the Engineer-In-Charge are not essential for the purpose of the item of the work even though provided by the contractor as supports and for other reasons and allowed to be embedded in the concrete by the Engineer-In-Charge.

Signature of Contractor

**Executive Engineer
Gir Somnath Irrigation Division
Veraval**

Item No.(12)

Back filling with appropriate excavated material behind the structures or refilling the trenches with excavated useful material including watering ramming, consolidation etc complete with all lead and lift.

SCOPE OF WORK :

- The work shall consist of backfilling behind structures or refilling trenches using suitable excavated material obtained from the site. The material used shall be free from organic matter, rubbish, large clods, and unsuitable debris. Backfilling shall be carried out in layers not exceeding 150 mm in thickness, or as directed by the Engineer-in-Charge. Each layer shall be properly spread, watered as required, and compacted by ramming or mechanical means to achieve proper consolidation and stability. Care shall be taken to avoid damage to structures, foundations, or underground services during filling operations. The work includes all operations such as conveying material from stock or excavation, placing, spreading, watering, ramming, and consolidation, complete with all leads and lifts as specified. The finished surface shall be properly leveled, dressed, and compacted to the required lines and grades.

Mode of Measurement:

- Measurement and payment shall be carried out in cubic meters (Cum.) of completed work. The quantity shall be calculated based on the difference between initial and final levels, measured by cross-section or grid method as directed. The rate shall include cost of all labour, materials, watering, ramming, compaction, tools and plants, and all leads and lifts involved in completing the work.

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Item No.(13)

Providing and fixing in position 100/110 mm dia PVC Pipe weep holes in the retaining walls/sidewall/abt etc.

SCOPE OF WORK :

- The scope of work includes providing and fixing specified dia. PVC Pipes of approved quality, in position in retaining wall as and where directed or as shown in drawing. Length of the pipe shall be exactly equal to the width of the wall. The pipe shall be fixed in position in the concrete during work in progress and as it proceeds. The socket end of the pipe shall be kept closed till the next length of pipe is fitted to prevent any chocking. The both end face of the pipe shall be finished with cement mortar and cement niru to have an even look.

MODE OF MEASUREMENT :-

- The item shall be measured and paid in running meter basis of completed work. Nothing extra to be payable for cement mortar/cement niru and fixtures like coupler etc. required for fixing of the pipe.

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