**Detail estimate for the construction of (A) Sub-mergible Embankment at Nunnir Haor From km.7.366 to km. 17.749 = 10.383 km,(Part-A), (B) Constriction of KataKhali Khal Regulator 1-V (1.5m x 1.8m ) at km 23.846 (Part-A), of Nunnir Haor Sub -Project in C/W Haor flood Management and Livelihood Improvement project Under Kishoreganj W.D Division,BWDB,Kishoreganj during the Financial year 2016-17 & 2017-18.Package No. BWDB/Kish/HFMLIP/PW-03.**

1. Submergible Embankment

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| **SL No. & Item Code** | **Item Description** | | **Measurement** | **Quantity** |
| 1  16-100 | Erection of bamboo profile with full bamboo posts and pegs not less than 60mm in diameter and coir strings etc. complete as per direction of Engineer in charge | | Erection of Profile Length= 10383.00 m  Nos of profile = 10383.00÷50+10  = 209 nos | 209 nos |
| 2  Analysis Rate | Preparation and mobilization of the Site for Construction of Submersible Embankment or other Structural Components in c/w "Haor Flood Management and Livelihood Improved Improvement Project(BWDB Part) as per Technical Specifications, including land lease, rental charges, obtaining permissions for work, developing work area, preparation of platform for temporary semi pucca site office(40sqm), CI Sheet labour sheds(200sqm), CI Sheet Stores(200sqm), supply of wooden & cane seated furniture etc. as specified and as per Contractor's Method Statement and as per direction of Engineer in charge. | | 1 iten LS=Tk. 967050.850 | 967050.850 |
| 3  16-650-20 | Earth work by Mechanical Excavator (Long Boon) in constructing/ resectioning of embankment/canal bank/ road etc. compacted to 85%/90% maximum dry density at optimum moisture content, with reference to laboratory density test AAHSTO modified hammer, with clayey soil(minm 30% clay, 0-40% silt, 0-30% sand) within the initial lead of 30m and all lifts including throwing the spoils to profiles in layers not exceeding 230mm in thickness with clod breaking to a maximum size of 100mm, benching the side slopes, removing roots and stumps of trees of girth upto 200mm from the ground, stripping/ploughing the base of embankment and borrow pit area, dug bailing, rough dressing including 150mm cambering at the centre of crest etc. complete, including maintenance of the same for 6 months after completion, (compaction will be done by the contractor with approved equipment, including all ancillary charges for compaction and  testing) as per direction of Engineer in charge.  16-650-20, Embk. by Mech. Equipment; ht: 4 to 6m & above; 85% comp. | | Total earth calculation Sheet  Attached = 109104.81 cum  30% Earth cutting by mechanical  Excavator = 109104.81 cum x 30%  = 32731.44cum | 32731.44 cum |
| 4  16-410-10 | Earth work by carried earth (by truck/boat or any other means) supplied at contractor's own cost (including royalty) in constructing/ resectioning of the embankment/ canal bank/ road etc. compacted to 85%/90% maximum dry density at optimum moisture content with reference to laboratory density test AASHTO modified hammer, with clayey soil (minimum 30% clay, 0-40% silt and 0-30% sand) beyond initial lead of 300m including throwing the spoils to profiles in layer not exceeding 230mm in thickness with clod breaking to maximum size of 100mm, benching the side slopes, removing roots and stumps of trees of girth upto 200mm, stripping/ ploughing the base of embankment and borrow pit area, dug bailing, clearing jungles, bail out of water, rough dressing including 150mm cambering at the centre of crest with all leads and lifts complete (compaction will be done by the contractor with approved equipment including all ancillary charges for compaction and testing) as per direction of Engineer in charge  16-410-10, 300m to 1.00 km. (85% compaction) | | Total Earth = 109104.810 cum  Carried Earth = 40% of total earth  =109104.810 cum x 40%  = 43641.92 cum | 43641.92 cum |
| 5  16-120-10 | Earth work by manual labour in constructing/ resectioning of embankment/ canal bank/ road etc. compacted to 85%/90% maximum dry density at optimum moisture content, with reference to laboratory density test AAHSTO modified hammer, with clayey soil(minm 30% clay, 0-40% silt, 0-30% sand) within the initial lead of 30m and all lifts including throwing the spoils to profiles in layers not exceeding 230mm in thickness with clod breaking to a maximum size of 100mm, benching the side slopes, removing roots and stumps of trees of girth upto 200mm from the ground, stripping/ ploughing the base of embankment and borrow pit area, dug bailing, bail out of water, rough dressing including 150mm cambering at the centre of crest etc. complete, including maintenance of the same for 6 months after completion, (compaction will be done by the contractor with approved equipment, including all ancillary charges for compaction and testing) as per direction of Engineer in charge.  16-120-10: 0 m to 3 m height with 85% compaction | | Total Earth = 109104.810 cum  Earth work by manual  Labour = 30% of total earth  = 109104.810 x 30%  = 32731.44 cum | 32731.44  cum |
| 6  16-190 | Extra rate for every additional lead of 15m or part thereof beyond the initial lead of 30m upto a maximum of 19 leads (3m neglected) for all kinds of earth work | | Lead calculation  =(1/2 x top of borrowpit+1/2x filling +dead lead-15.00)/30.00  (1/2x12.50+1/2x12.50+90.00-15.00)/30.00  =(6.250+6.250+90.00-15.00)30.00  =2.916 sat=3.00 nos lead  Extra Rate for every additional lead  Total Earth same as item no -05 = 32731.44 cum | 32731.44 pldcum |
| 7  48-100 | Fine dressing and close turfing of the slopes and the crest of embankment with 75mm thick, good quality durba or charkanta sods of size 200mm x 200mm, with all leads and lifts, including ramming, watering until the turf grows properly, maintaining etc. complete (measurement will be given on well grown grass only). as per direction of Engineer in charge. | | Turfing = 10.383.00 x 2 x 5.50  =114213.00 sqm | 114213.00 sqm |
| 8  48-130 | Biological protection of bare earth surface by Dholkalmi with minimum 50cm long sapling, planting @ not more than 30 cm apart including supplying, sizing, taping and nursing etc. complete as per direction of the Engineer in charge. | | Dholkalmi = 2x3x10383 = 62298.00 m | 62298.00 m |
| Submergible block road | | | |  |
| 9  56-100 | Earth work in box cutting up to 1.00 m depth, in all kinds of soil with all leads, removing the spoils to a safe distance, including levelling and dressing, maintaining required cambering etc. complete, as per direction of Engineer in charge. | | Total Length = 10383.00m x allow 20%  = 2077.00m  Block rod Box cutting = 2077.00x3x0.750  =4673.250 cum | 4673.250 cum |
| 10  56-110 | Construction of improved road sub-grade of sand (FM>=0.8) in maximum 150mm thick layer including dressing, levelling, ramming, watering, cambering and compacting to attain minimum CBR-8% by manual labour using mallet/ vibro compactor including cost of all materials etc. complete as per design, drawing and direction of Engineer in charge (payment shall be made on compacted volume). | | Sand = 2077.00x3.00x0.150  = 934.650cum | 934.650  cum |
| 11  2-8-1  Analysis rate/ LGED | Preparetion of Bed by Cutting and filling including watering to bring moisture +- 2% of OMC & compacting by appropiate machanical meands etc to attain minimum compaction 98% oc MDD (standard) to obtain a minimum soaked CBR 4% etc all complete as per direction of the E-I-C. | | Sub grade = 2077.00x3.00= 6231.00 sqm | 6231.00 sqm |
| 12  Analysis rate | Manufacturing and supplying C.C. blocks in leanest mix. 1:2:4. withcement, sand (FM>=1.5) and Stone Chips (40mm down graded) to attain a28 days cylinder strength of 15 N/mm² including grading, washing stonechips, mixing, laying in forms, consolidation, curing for at least 21 days, including preparation of platform, shuttering and stacking in measurablestacks etc. complete including supply of all materials (steel shutter to be used) as per direction of Engineer in charge.Block size 30cmx30cmx30cm | | Nos of cc Block = 2077.00 x 9/0.300  = 62310.00 nos | 62310.00 nos |
| 13  Analysis rate | Manufacturing and supplying C.C. blocks in leanest mix. 1:2:4 with cement, sand (FM>=1.5) and Stone Chips (40mm downgraded) to attain a28 days cylinder strength of 15 N/mm² including grading, washing stone chips, mixing, laying in forms, consolidation, curing for at least 21 days, including preparation of platform, shuttering and stacking in measurable stacks etc. complete including supply of all materials (steel shutter to be used) as per direction of Engineer in charge. 100cm x 65cm x 125cm (Av:) | | Edging Block = 2077.00 x 2/1.00  = 4154.00 nos | 4154.00 nos |
| 14  24-310-10 | Manufacturing and supplying C.C. blocks in leanest mix. 1:2:4 withcement, sand (FM>=1.5) and Stone Chips (40mm down graded) to attain a28 days cylinder strength of 15 N/mm² including grading, washing stonechips, mixing, laying in forms, consolidation, curing for at least 21 days, including preparation of platform, shuttering and stacking in measurablestacks etc. complete including supply of all materials (steel shutter to beused) as per direction of Engineer in charge. Block size :100cm x 65cm x 10cm-15cm | | Flush Painting = 2077.00 x 3.00  = 6231.00 sqm | 6231.00 sqm |
| 15  40-120-20 | Labour charge for protective work in laying sand cement blocks of different sizes including preparation of base, ramming of base etc. complete as per direction of the Engineer in charge:  40-120-20: Beyond 200m. | | = 30cum x 30cum x30cum Block  = 6231.00 Nos  Volume of block  = 62310.00 x 0.300 x 0.300 x 0.300  = 1682.370 cum  Edging Block  = 100cum x 65 cum x 125 cum (av)  =4154.00 nos x 1.00 x 0.650 x 0.125  = 337.513 cum  = 2019.88 cum | 2019.88 cum  sqm |
| 16  36-150-10 | Formwork for centering and water tight shuttering as per drawing with 14 BWG M.S. sheet, fitted and fixed with 40mmx40mmx6mm M.S. angle frame and 25mmx6mm F.I. bar stiffener, with necessary fabrication, welding, making the forms including fitting, fixing of steel forms with necessary ties, battens, struts, nuts & bolts, props etc. as per desired shape and size including levelling and removing the forms after specified period including the cost of all materials as per direction of Engineer in charge.  36-150-10: Vertical and inclined walls, columns, piers with 60-80mm dia barrack bamboo props. | | Nos of km. post  = 10383.00/1000.00+1= 11.00 nos  Shuttering km. post =22/7x0.250=0.785 m  Area of km. post= 11.00x0.785x1.550  =13.38 sqm | 13.38  sqm |
| 17  76-120-10 | M.S. Work for reinforcement with deformed M.S. bar, fy=414 N/mm², (made from billet) in RCC works, including local handling, cutting, forging, bending, cleaning and fabrication with supply of deformed M.S. bar in different sizes and binding with 22 to 18 gages G.I. wire etc. complete including the cost of all materials as per direction of Engineer in charge.  76-120-10: 8mm dia to 30mm dia | | D-10=6 nos  Total length  = 11.00x6x1.500=x99.00mx0.62  =61.38 kg | 61.38  kg |
| 18  76-115-10 | M.S Work for reinforcement with Standard deformed bar fy=276 N/mm^2 in RCC works including local handling, cutting, forging, bending, cleaning and fabrication with supply of deformed M.S. bar in different sizes and bending with 22 to 18 gages G.I. wire etc. complete including the cost of all materials as per direction of Engineer in charge. 76-115-10: 6mm dia . | | D-6= Each ring length=0.688 m  Nos of ring= 8 nos  Total length  =11x8x.688=60.544 mx0.22=13.32 kg. | 13.32  kg |
| 19  28-200-10 | Reinforced cement concrete work in leanest mix. 1:1.5:3, with 20mm down graded coarse aggregates and sand of FM>2.0 to FM<=2.5, to attain a minimum 28 day cylinder strength of 22.0 N/mm², including breaking, screening, grading, washing aggregates with clean water, mixing, laying in forms, consolidation to levels, curing, including supply of all materials, excluding cost of M.S. work for reinforcements and formworks etc. complete and as per direction of Engineer in charge.  28-200-10: with stone chips . | | RCC work=11x22/7x0.250x1.550  =13.40 cum | 13.40 cum |
| 20  04-110 | Fixing in position, boundary pillars/bench mark pillars/K.M. post etc. of size 110cm height, bottom dia 25cm and top dia 20cm, embedded 45cm below G.L. including carriage, earth cutting, filling, ramming, etc. complete as per direction of Engineer in charge. | | Fixing km. post = 10383.00/1000.00+1  = 11.00 nos | 11.00 nos |
| **b)** **I-Vent Katakhali khal Regulator (Part-A) at km.23.846** | | | | |
| 21  04-120 | Construction of B.M. Pillars at site with first class bricks in cement mortar (1:4) of size 38cm x 38cm x 75cm on cement concrete (1:2:4) base of size 50cm x 50cm x 7.5cm with 12mm thick cement plastering (1:2) on exposed surfaces of pillar and cement morter on top (1:2), with inscription of "BWDB" with 25cm of the pillar balow ground level etc. complete including ramming the backfill and the cost of all materials as per direction of Engineer in charge. | | Main BM Pile at side = 4 Nos | 4 Nos |
| 22  04-180 | Site preparation by manually removing all miscellaneous objectionable materials from entire site and removing soil up to 15cm depth including uprooting stumps, jungle clearing, levelling dressing etc. complete as per direction of Engineer in charge. | | Site preparation =100.00 x 90.00  = 9000.00 sqm | 9000.00  sqm |
| 23  12-100 | Installation of pizeometer including supply of 40mm G.I. pipe, brass strainer, socket, labour, by wash boring, lowering, fixing the elevation and providing cover on the top of the well etc. complete as per direction of Engineer in charge. | | Barrel Portion = 2 nos  C/S portion = 2 nos  R/S portion = 2 nos  = 6 Nos | 6  Nos |
| 24  12-310-20 | Bailing out of water with all leads and lifts by manual labour or pump, with all arrangements for protection of ring bund and side slopes of foundation pit against erosion or washout etc. complete actual volume of work will be measured by sounding method before starting the work) as per direction of Engineer in charge.  **12-310-20**, by pump. | | Apron + Barrel = 8.50x64.440 x 1.5 x 30 times  = 24648.300 cum  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  = 24648.30 cum | 24648.30  cum |
| 25  16-150 | Earth work in excavation of foundation trenches in all kinds of soils including leveling, dressing, placing, removal of spoils to a safe distance with initial lead of 30m and lift of 1.5m as per direction of Engineer in charge. | | EGL = 5.10m(av) (PWD)  Design bed level = 1.075 m  Excavator from EL =5.10 – 1.075 = 4.025 m  C/S & R/S Loos Apron portion  =2x10.300+18.350 x (7.00+23.10)/2 x4.025  =2x14.325x15.050x4.025 = 1735.509 cum  C/S & R/S Return wall  = 2x21.200x(4.40+20.500)/2x4.025  = 2124.717 cum  C/S & R/S Apron  = 2x{(7.00+4.40)/2 x (23.10+20.500)/2 } x 6.60 x 4.025 = 2x(5.70+21.800)/2 x 6.600x4.025  = 730.537 cum  C/S & R/S Apron slop  Barrel = 5.10- (2.50+0.700+0.075) = 1.825cum  = 2x2.250x4.547x16.247x3.650 =1213.398 cum  Barrel = 1x7.300x(4.300+11.600)/2 x3.275  = 190.064 cum  **=5994.23 cum** | 5994.23  Cum |
| 26  16-200 | Extra rate for every additional lift of 1.0m or part thereof beyond the initial lift of 1.5m (30cm neglected) for all kinds of earth work. | | For foundation earth  Lift calculation=(1/2 cutting+1/2 filling +dead lift-0.300)/1.00m  =(1/2x4.025+1/2x2.500+0.00-0.300)/1.00  =(2.012+1.25-0.300)/1.00  =2.962 lift say=3.00 nos lift  Quantity of earth same as item no -5=5994.225 cumx50% of earth 3.00 nos lift=5994.225x50%=2997.11 | 2997.11 pldcum |
| 27  16-190 | Extra rate for every additional lead of 15m or part thereof beyond the initial lead of 30m up to a maximum of 19 leads (3m neglected) for all kinds of earth work | | Lead calculation  =(1/2 x top of borrowpit+1/2x filling +dead lead-15.00)/30.00  (1/2x12.50+1/2x12.50+50.00-15.00)/30.00  =(6.250+6.250+50.00-15.00)30.00  =1.583 sat=2.00 nos lead  Extra Rate for every additional lead  Total Earth same as item no -05 = 5994.225 cum | 5994.23  pt cum |
| 28  16-220 | Earth work by manual labour with clayey soil (minimum 30% clay, 0-40% silt and 0-30% sand) in construction of cross bundh/ring bundh as per design and specification with all leads and lifts, throwing the earth in layers not exceeding 150mm in thickness, including breaking clods, rough dressing, clearing the jungle, removing stumps, dug bailing and 75mm cambering etc. complete as per direction of Engineer in charge. | | Ring Bund= Diameter = 94.900 m  Length of ring Bund =  = 22 x 94.900 = 298.257m  7  Volume of Earth for Ring bund  =298.257 x (3.00 + 11.00) x 2.00  = 4175.598 Cum  Deduct earth available from  Foundation trenches (-) 2500.00 Cum  Total = 1675.598 cum | 1675.60 cum |
| 29  44-240-10 | Supplying at site U-shape hot rolled steel sheet pile of different sectionof Phosphorus=0.04%(Maximum), Sulphur = 0.04% (Maximum), Copper= 0.25% (Minimum), Tensile strength=> 490 N/mm2 , Yield strength =>296 N/mm2, Elongation =15% (Minimum) including all taxes, freights, incidental charges etc. complete as per direction of the Engineer -in- charge  **44-240-10,** U- Shape, hot rolled steel sheet pile: width=400 to 600 mm: height=>85mm, Th.=>8.0mm, wt per sqm. of pile wall=> 88.0 kg/m2 , Section modulus per one meter of pile width => 529 cm3/m | | Using 400 mm width U-type steel sheet pile  C/S & R/S U-shape steel sheet pile  Driving Length = 19.200m  C/S & R/S nos of pile = 2x19.200÷0.400 =96nos  Each sheet pile length = 3.00m  Area of sheet pile length  = 96.00 x 3.00 x 0.400 = 115.200sq  @88.00 p/sqm = 115.200x88.00  Say =10137.600kg/1000.00=10.137 mt | 10.14  mton |
| 30  44-320-10 | Cutting of steel sheet piles to design length and shape as per requirement in design and drawing and as per direction of Engineer in charge.  **44-320-10,** Up to 10mm thick. | | Each sheet pile length = 6.00m  Total length = 96.00x6.00 = 576.00  Nos of cutting = 576.00÷6.00-1.00 =95 nos  Effective length = 0.650m  Cutting length = 95.00x0.650  = 61.75m | 61.75  m |
| 31  72-180 | Painting of steel sheet piles, 2 coats of bitumen paint, including preparation of surface with sand paper, iron brush etc. including the cost of all materials and labour etc. complete as per direction of Engineer in charge. | | Painting sheet pile  C/S & R/S = 96 nos  Effective length = 0.650m E/sheet pile  = 96x3.00x0.650 = 187.200sqm | 187.200  sqm |
| 32  44-270-20 | Driving steel sheet piles of various sections and weights of any type of soil, by monkey hammer including handling and placing in position, staging and supplying of all equipments like monkey hammer, pully, rope, bamboo, bullah etc. including correcting leaning beyond tolerance & other defects and any other incidental cost etc. complete (measurement will be taken on projected width x height) as per direction of Engineer in charge.  **44-270-20,** U-type or any other type : Up to 4.50 m depth. | | Driving steel sheet piles  Effective length=0.650 m  Area of sheet pile = 2x48.00x3.00x0.650  =187.200 sqm | 187.20  sqm |
| 33  44-310 | Supplying and placing 20mm thick hessian cloth impregnated with bitumen in expansion joints or on top of sheet piles as per specification and direction of Engineer in charge. | | Placing 20mm thick hessian  Cloth = 2x2x48.00x0.650x0.300  = 37.440sqm | 37.44  sqm |
| 34  44-220-10 | Supplying and laying single layer polythene sheet in floor below cement concrete, RCC slab, on walls etc. complete in all respect as per direction of Engineer in charge.  **44-220-10,** Weighing minimum 1.0 kg per 6.50 sqm | | Sheet pile cap key = C/S & R/S  = 2x19.20x0.900 = 34.560sq  Slope = 2x19.20x0.300 = 11.520sqm  C/S & R/S Return wall  =2x19.20x1.20 = 46.080 sqm  C/S & R/S Apron  = 2x(5.60+2.30)/2 x 9.850 = 77.815 sqm  Barrel = 1x7.30x2.30 = 16.790 sqm  = 186.765sqm | 186.77  sqm |
| 35  28-120-20 | Cement concrete work in leanest mix. 1:3:6 with sand of FM>=1.5, in foundation or floor including breaking, screening, grading and washing aggregates with clear water, mixing, laying in position, consolidation to levels, curing, including supply of all materials, excluding the cost of formworks etc. complete as per direction of Engineer in charge.  **28-120-20,** With 25mm down graded stone chips | | Sheet pile cap key  = 2x19.200x0.9000.075 = 2.592 cum  Sheet pile cap slope  =2x19.200x0.300x0.075 = 0.864 cum  Return wall C/S & R/S  = 2x2x7.10x1.200x0.075 = 2.556 cum  C/S & R/S Apron  = 1x2x8.80x(2.799+2.30)/2x0.075  = 5.144 cum  Slope=2x2.664x(2.794+2.30)/2x0.075  =1.017cum  Barrel= 1x7.30x2.300x0.075 =1.259 cum  C.C work –section -M-M  Slope= 1x2x2x8.608x0.300x0.650 = 6.714 cum  Loose Apron end wall = 2x5.00x0.300x0.650  =1.950 cum  Loose Apron slope toe wall  =2x2x5.00x0.300x0.650 = 3.900 cum    Return wall  =2x2x1/2x0.670x0.268 =0.359 cum  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  = 26.356 cum | 26.36 cum |
| 36  28-100-20 | Cement concrete work in leanest mix. 1:4:8, with sand of FM>=1.5, in foundation or floor, including breaking, screening, grading and washing aggregates with clear water, mixing, laying in position, consolidation to levels, curing, including supply of all materials, excluding the cost of formworks etc. complete as per direction of Engineer in charge.  **28-100-20,** With 25mm down graded stone chips. | | C.C work –(1:4:8), section -M-M  Slope= 2x2x8.608x0.400x0.050 = 0.688 cum  Loose Apron end wall = 2x5.00x0.400x0.050  =0.200 cum  Loose Apron slope toe wall  =2x2x5.00x0.400x0.050 = 0.400 cum  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  = 1.288 cum | 1.29  Cum |
| 37  76-110-10 | M.S. Work for reinforcement with deformed M.S. bar, fy=276 N/mm², (made from billet) in RCC works, including local handling, cutting, forging, bending, cleaning and fabrication with supply of deformed M.S. bar in different sizes and binding with 22 to 18 gages G.I. wire etc. complete including the cost of all materials as per direction of Engineer in charge.  **76-110-10,** 8mm dia to 30mm dia. | | Apron slope, D-16, U-bar  Placing length = 2.356m  D-16 @ 200c/c  Nos of U-bar = 2.356÷0.200 = 12  Average each bar length  =(2.180+2x3.090)+(2.674+2x3.840)/2  =(8.360+10.354)/2 = 9.357m  C/S&R/S, Total Quantity  =2x12x9.357 =224.568 m  @1.58kg P/m =224.568x1.58 = 354.817 kg  Laping D-16=2x12x3x40x0.016=46.080x1.58  =72.806 kg  Apron C/S&R/S  [D-16@ 0.200](mailto:D-16@0.200) c/c  Placing length = 9.100m  Nos of U-bar= 9.100÷0.200+1 =47nos  Average each bar length  =2x (2.674+2x4.00)+(5.580+2x3.900)/2  =2x(10.674+13.380)/2 = 12.027m  Total quantity of bar  =2x47x12.027=1130.528mx1.58 =1786.250 kg  Lapping D-16= 2x5x47x40x0.016  =2x 150.400mx1.58 =475.264 kg  Slope C/S&R/S vertical W/F  Placing length = 2.356  D-16 @ 200c/c  Nos of bar = 2.356÷0.200+1 = 13nos  Average each bar length  = (3.090+2x10x0.016)+(3.840+2x10x0.016)/2  =(3.410+4.160)/2 = 3.785m  Total length = 2x2x13x3.785  =196.820m x 1.58 = 310.975 kg  D-16 Lapping = 2x2x13x40x0.016  = 33.280m x1.58 = 52.58 kg  Apron wing wall C/S&R/S vertical W/F  Placing length = 9.100  D-16 @ 0.200, c/c  Nos of bar = 9.100÷0.200+1 = 47nos  Each bar length  = (3.840m+2x10x0.016)+(3.640+2x10x0.016)/2  =(4.160+3.960)/2 = 4.060m  Total bar length = 2x2x47x4.060 =763.280  @ 1.58 kg P/m 763.280x1.58 =1205.982 kg  D-16 Lapping =2x 47x40x0.016  = 60.160m x1.58 = 95.052 kg  Apron C/S&R/S bottom binder long  Placing length = (2.30+5.60)/2=3.950m  D-12 @ 0.150, c/c  Nos of bar = 3.950÷0.150+1 = 27nos  Each bar length  = (2.356m+10.00)-0.110=12.246  Total bar length = 2x27x12.246 =661.284m  Bar weight= 661.284x0.89 = 588.542kg  Lapping D-12 = 2x27x4x40x0.012  = 103.080 x 0.89 = 92.275 kg  Top layer bottom long bar C/.S&R/S  Placing length=2.30+5.60/2=3.950 m  D-16 @0.200c/c  Nos of bar =3.950/0.200+1=21 nos  Each bar length=12.246 m  Total bar length  =2x21x12.246=514.332 mx1.58 =812.644 kg  Lapping D-16  =2x21x40x0.160=26.880mx1.58 =42.470 kg  Top layer top bar C/S&R/S  Placing length = (2.356+10.00) =12.356m  D-16 @ 0.200, c/c  Nos of rod = 12.356÷0.200+1 = 63nos  Each bar length  = 3.978-0.120=3.858m  Total bar length = 2x63x3.858  =486.108m x1.58 = 768.050kg  Sheet pile Cap Inner side C/S&R/S  Trapezium bar Apron portion  Placing length = 5.00m  D-12 @ 0.250, c/c  Nos of bar = 5.00÷0.250+1 = 21nos  Each bar length  = (1.131+0.450+0.800)-0.220 = 2.161m  Total bar length = 2x21x2.161  =90.762m x 0.89 = 80.778kg  Return wall side Trapezium bar C/S&R/S  Placing length = 7.10 m  D-12 @ 0.250, c/c  Nos of bar = 7.10÷0.250+1 = 30nos  Each bar length = 0.848m  Total each bar length = 0.848+0.450+0.600-0.220  =1.678m  Total length =1x2x2x30x1.678  =201.360m x+0.89 = 179.210kg  Apron Sheet pile Cap outside ring C/S&R/S  Placing length = 5.00m  D-12 @ 0.250, c/c  Nos of bar = 5.00÷0.250+1 = 21nos  Each bar length  = 2x0.690+2x0.340  =1.380+0.680  =2.060m  Total length = 2x21x2.060  =86.520 x 0.89 = 77.002 kg | 19785.88  kg |
|  |  | | Return wall Sheet pile Cap out side ring C/S&R/S  Placing length = 7.10m  D-12 @ 0.250, c/c  Nos of bar = 7.10÷0.250+1 = 30 nos  Each ring length  = 2x0.490+2x0.340  =1.980+0.680  =1.660m  Total ring length = 2x2x30x1.660  =199.200m x 0.89 kg/m = 177.288 kg  Return wall vertical bar W/F C/S&R/S  Placing length = 6.800m  D-12 @ 0.150, c/c  Nos of bar = 6.800÷0.150+1 = 46 nos  Each bar length= EL-5.00-EL1.450+2x10x0.012  = 3.550+0.240  =3.790m  Total length = 1x2x2x46x3.790  =697.360m x 0.89 = 620.650 kg  Lapping D-12 = 2x2x46x40x0.012  = 88.320m x 0.89 = 78.604 kg  Return wall vertical Earth face C/S&R/S  Placing length= 6.800m  D-16 @ 0.200, c/c  Nos of bar = 6.800÷0.200+1 = 35nos  Each bar length  = 5.00-1.450+2x10x0.016  =3.550+0.320  Total long = 2x2x35.00x3.870 =541.800m  =541.800m x1.58 = 856.044kg  Lapping D-16 = 2x2x35x40x0.016  = 89.600m x1.58 kg/m = 141.568 kg  Fillet Apron slop C/S & R/S  Placing length= 2.356m  D-12 @ 0.200, c/c  Nos of Fillet = 2.356÷0.200+1 = 13nos  Each Fillet length  = 1.414+2x0.150+2x10x0.012  =1..414+0.300+0.240  =1.954m  Total length = 2x2x13x1.954 =101.608m  =101.608x0.89 = 90.431 kg  Fillet Apron slop C/S & R/S  Placing length= 9.100m  D-12 @ 0.200, c/c  Nos of Fillet = 9.100÷0.200+1 = 47nos  Each Fillet length = 1.954 m  Total length  = 2x2x47x1.954 =367.352m  =367.352m x0.89 = 326.943 kg  Return wall bottom layer short bar Placing C/S&R/S  Placing length = 6.800m  D-12 @ 0.200, c/c  Nos of Fillet = 6.800÷0.150+1 = 46nos  Each bar length  = 2.400-0.120+2x10x0.012  =2.280+0.240 = 2.520m  Total length = 2x2x46x2.520  =463.680m  =463.680m x0.89 = 412.675 kg | 19785.88 kg |
| 38  76-115-10 | M.S Work for reinforcement with Standard deformed bar fy=276 N/mm^2 in RCC works including local handling, cutting, forging,bending,cleaning and fabrication with supply of deformed M.S. bar in different sizes and bending with 22 to 18 gages G.I. wire etc. complete including the cost of all materials as per direction of Engineer in charge.  76-115-10, 6mm dia | Return wall bottom layer Long bar C/S & R/S  Placing length = 2.400m  D-12 @ 0.250, c/c  Nos of long bar = 2.400÷0.250+1 = 11nos  Each bar length =6.800  Total length  = 2x2x11x6.800 =299.200 m  =299.200 x 0.89 = 266.288 kg  Lapping=D-12=2x2x11x2x2x10x0.012  =21.120mx0.89 =18.796 kg  Return wall bottom layer short bar Placing C/S&R/S  Placing length = 6.800m  D-12 @ 0.150, c/c  Nos of bar = 6.800÷0.150+1 = 46nos  Each bar length  = 2.400-0.120+2x10x0.012  =2.280+0.240 = 2.520m  Total length = 2x2x46x2.520 =463.680m  =463.680m x0.89 = 412.675 kg  Return wall bottom layer Long bar C/S & R/S  Placing length = 2.400m  D-12 @ 0.250, c/c  Nos of long bar = 2.400÷0.150+1 = 17nos  Each bar length =6.800  Total length = 2x2x17x6.800  =462.400 m  =462.400 x 0.89 = 411.536 kg  Lapping=D-12=2x2x11x2x2x10x0.012  =21.120mx0.89 =18.796 kg  Return wall fillet C/S & R/S  Placing length = 6.800m  D-12 @ 0.200, c/c  Nos of long bar = 6.800÷.200+1 = 35nos  Each bar length =0.720+2x0.150+10x0.012  =0.720+0.300+0.120 =1.140 m  Total length = 2x2x2x 35x1.140  =319.200m  @0.89kg P/m =319.200 x 0.89 =484.088 kg  Binder Apron Slope C/S & R/S  =(2.50x3.250+3.250) /3= 3.00  Placing length = 3.00m  D-16 @ 0.200, c/c  Nos of binder = 3.00÷ 0.200+1 = 16nos  Each binder length =2.356+9.10+2x10x0.016  =11.456+0.320 =11.776m  Total length  = 1x2x2x2x 16x11.776m  =1507.328mx1.58 = 2381.578 kg  Lapping D-16  = 2x2x2x16x3x2x40x0.016 = 491.520m  @1.58 kg P/m =491.520x1.58 =776.601 kg  Return Wall binder C/S & R/S  Placing Length = 3.250m  D-12@ 0.150 c/c  Nos of binder =3.250÷0.150+1 =23 nos  Each binder length = 6800 M  Total length = 2x2x2x 23x6.800  =1251.200m  @0.89kg P/m =1251.200 x 0.89  = 1113.568 kg  Lapping D-12  = 2x2x2x23x2x40x0.012 = 176.640m  @0.89kg P/m =176.640 x 0.89 =157.209 kg  Sheet pile cop bottom bar C/S & C/S= outside and inner side  Total length = 2x2x3x19.080= 228.960 m  @0.89kg P/m =228.960 x 0.89 = 203.774 kg  Wing wall correr fillet vertical rod D-16  =1x4x4.060  = 16.240 m x1.58 =25.659 kg  Wing wall Corner Fillet bar  Placing length = 3.250  [D-12@0.150](mailto:D-12@0.150) C/C  Nos of Corner fillet = 3.250÷0.150+1 =23 nos  Each Corner fillet length  = 0.900x0.100+2x10x0.012  = 0.800+0.240 =1.040m  Total fillet length  = 1x2x2x23x1.00 =95.680m  @ 0.89kg P/m = 95.680m x 0.89 = 85.155 kg  Apron slope chut block  3-D-12 Main Rod  Each bar Length = 1.400+0.750+0.300  = 2.450 m  Total length = 2x3x2.450  =14.700m  @ 0.89kg P/m = 14.700m x 0.89  = 13.083 kg  7-D-12,U-Bar  Each bar Length  = (2x0.750+0.250)+(2x0.300+0.250)  2  = (1.750+0.850)/2  =1.300m  Total length = 2x2x7x1.300 = 36.400m  @ 0.89kg P/m = 36.400m x 0.89  = 32.396 kg  7-D-12,U-Bar Horizontal  Each bar Length  = (2x0.070+0.250)+(20.642+0.250)  2  = (2.390+1.534)/2 =1.962m  Total length = 2x2x1.962 = 7.848m  @ 0.89kg P/m = 7.848m x 0.89 = 6.984 kg  Baffle block  3-D-12 main bar  Each bar length =1.131x2+0.250=2.512m  Total length=2x3x3x2.512=45.216  Weight=45.216mx089 =40.242 kg  2-D12 U bar horizontal  Each bar length (2x0.550+0.250)+(2x0.750+0.250)/2  =1.350+0.800/2=1.075 m  Total length=2x3x2x1.075  =12.900x0.89 =11.481 kg  End sill High  2-D-12- For end sill  Each bar Length= 0.300+0.670+0.050+0.600  =1.620m  Total length = 2x10x2x1.620  =64.800m x 0.89 = 57.672 kg  3-D-12 Vertical  Each bar Length  = (2x0.550+0.250)+(2x0.450+0.250)  2  = (1.350+1.150)/2  =1.250m  Total length = 2x10x3x1.250  = 75.00m  @ 0.89kg P/m = 75.00m x 0.89  = 66.750 kg  3-D-12 Horizantal  Each bar Length  = (2x0.650+0.250)+(2x0.450+0.250)  2  = (1.550+1.150)/2  =1.350m  Total length = 2x10x3x1.350  = 81.00m  @ 0.89kg P/m = 81.00m x 0.89  = 72.090 kg  End sill Low  2-D-12- per end sill  Each bar Length= 2x0.418+2x0.300  =0.836+0.600  =1.436m  Total length = 2x10x2x1.436  =57.440m x 0.89 = 51.121 kg  7-D-12 Continuous Through End sill  Each bar Length = 19.200-0.120  =19.080m  Total Length = 2x7x19.080m  =267.120m x0.89 = 237.736 kg  Lapping = D-12 = 2x7x6 x2x40 x 0.016  = 107.520m  @0.89kg P/m =107.520 x 0.89 =95.692 kg  Barrel R/S Trapezium bar  Placing Length = 2.300 m  D-12 @0.250 c/c  Nos of ber = 2.300÷0.250+1 = 10 nos  Each ber Length = 1.400+0.424+10x0.012  = 1.944m  Total Length = 1x10x1.944  =19.440mx0.89 = 17.301 kg  Barrel R/S Trapezium bar  Placing Length = 2.300 m  D-12 @0.250 c/c  Nos of ber = 2.300÷0.250+1 = 10 nos  Each ber Length = 0.800+0.424+10x0.012  = 1.344m  Total Length = 1x10x1.344  =13.440mx0.89 = 11.961 kg  Barrel Base bottom layer Top straight  Placing Length = 2.300 m  D-12 @0.250 C/C  Nos of ber = 2.300÷0.250+1 = 10 nos  Each ber Length = 4.30m+2x40x0.012  = 5.260m  Total Length = 1x10x5.260  =52.600m x0.89 = 46.814 kg  Lapping = D-12 = 1x10 x2x2x10 x 0.012  = 4.800x0.89m =4.272kg  Barrel Top layer bottom long bar  Placing Length = 2.300 m  D-12 @0.150 C/C  Nos of ber = 2.300÷0.150+1 = 16 nos  Each ber Length = 7.300-0.100+2x10x0.012  = 7.440m  Total Length = 1x16x7x7.440  =119.040m x0.89 = 105.945 kg  Lapping = D-12 = 1x16 x2x2x10 x 0.012  = 7.680x0.89m =6.835kg  Barrel Top layer Top bar  Placing Length = 7.300 m  D-12 @0.150 C/C  Nos of ber = 7.300÷0.150+1 = 50nos  Each ber Length = 2.300-0.1202  = 2.180m  Total Length = 1x50x2.180  =109.000m x0.89 = 97.010 kg  Barrel Fillet Pier both side Top + Bottom  Placing Length = 4.300 m  D-12 @0.150 C/C  Nos of Fillet = 4.300÷0.150+1 = 30nos  Each Fillet Length =1.441m  Total Length = 2x2x30x1.441  =172.920m x0.89 = 153.898 kg  Barrel Pier Section -2-2 –U-bar  Placing Length = 4.300 m  D-12 @0.150 C/C  Nos of Fillet = 4.300÷0.150+1 = 30nos  Each U-bar Length  =2.300-0.120+2x2.380-2x0.012  =2.180+4.520 = 6.700m  Total Length =1x30x6.700 =201.00m  =201.00m x0.89 = 178.890 kg  Lapping = D-12 = 1x30x2x40x0.012  = 28.800m x 0.89  @0.89kg P/m =53.760 x 0.89 =25.632 kg  Barrel Abutment Sec-33,U- bar  Placing Length = 1.500 m  D-12 @0.150 C/C  Nos of bar = 1.500÷0.150+1 = 11nos  Each U-bar Length  =2.180+2x4.54+0.2x0.100+2x0.300  =2.180+9.080+0.200+0.600  =12.060  Total Length =1x11x12.060 =132.660m  = 132.660x0.89 = 118.067 kg  Lapping = D-12 = 1x11x4x40x0.012  = 132.660m  @0.89kg P/m =132.660 x 0.89 =21.120 kg  Barrel Abutment C/S –U –bar  Placing Length = 0.900 m  D-12 @0.150 C/C  Nos of -U-bar = 0.900÷0.150+1 =7nos  Each U-bar Length  =EL-5.00-2.50+0.700-110+2x10x0.012  =2.50+0.590+0.240  =3.330m x 2+2.300-0.012 =8.840  Total Length =1x7x8.840  =61.880 m x 0.89  = 55.073 kg  Lapping  = D-12 = 1x7x3x2x10x0.012 = 5.040m  @0.89kg P/m =5.040m x 0.89 =4.485 kg  Barrel Per Vertical W/F  Placing Length = 4.300 m  D-12 @0.200 C/C  Nos of bar = 4.300÷0.200+1 = 23nos  Each bar Length  =0.400+1.80+0.300-0.120+2x10x0. 012  =2.380+0.240 = 2.620m  Total bar Length =2x23x2.620 =120.520m  =120.520m x0.89 = 107.262 kg  Barrel Abetment R/S W/F Vertical  Placing Length = 0.900  D-12 @0.150 C/C  Nos of bar = 0.900÷0.150+1 = 7nos  Each bar Length  =0.700+3.950-0.210+2x10x0. 012  =4.440+0.240 = 4.680m  Total bar Length =2x7x4.680  =65.520m x0.89 = 58.312 kg  Lapping = D-12 = 2x7x10x0.012 = 6.720m  @0.89kg P/m =6.720m x 0.89 = 5.980 kg  R/S & C/S Abutment fillet bar  Placing Length = 1.20+1.80 = 3.00m  D-12 @0.150 C/C  Nos of Fillet = 3.00÷0.150+1 =21 nos  Each Fillet Length =2.007m  Total Length =2x21x2.007  =84.294m x0.89 = 75.021 kg  R/S & C/S Expansion water stop side  Placing Length = 2.300m  D-12 @0.250 C/C  Nos of bar = 2.300÷0.250+1 =10 nos  Each bar Length  =0.700-0.110+2x10x0.012  =0.590+0.240 = 0.830m  Total bar Length =2x10x0.830  =16.600m x0.89 =14.774 kg  R/S column  D-16 Vertical  Total Length = 4x4x4.480 = 122.860 kg  Lapping = D-16 Vertical  Total Length = 4x4x40x0.160  = 10.240x1.58 =16.179kg  C/S column  D-16 vertical  Total length=2x4x3.410=27.280 m  @0.89kg P/m =27.280m x 1.58 = 43.102 kg  Lapping = D-16 =2x4x40x0.016  = 5.120x1.58 = 8.089 kg  Barrel C/S Abutment Inner  Side= vertical  Placing Length = 0.750  D-12 @0.150 C/C  Nos of Rod = 0.750÷0.150+1 =6 nos  Each bar Length=5.00÷2.50  =2.50+0.700-0.110+2x10x0.012 =3.330m  Total Length =2x6x3.330=39.960m  =39.960m x0.89 = 35.564 kg  Lapping = 2x6x40x0.016  = 7.68m x1.58 =12.134 kg  R/S channel & Fallboard Grove side  D-16 = 2x2x2x4.860  = 38.880m x1.58 = 61.430 kg  Lapping = 2x4x40x0.016  = 5.120m x1.58 =8.089 kg  Binder barrel pier below Deck Slab with R/S & C/S Inside + Outside  Placing Length = 2.100m  D-12 @0.150 C/C  Nos of Rod = 2.100÷0.150+1 = 15 nos  Each bar Length  =7.300-0.100+2x0.300+0.650+0.200+0.300  =8.950m  Total Length =2x15x8.950=268.500m  =268.500m x0.89 = 238.965 kg  Lapping = 2x15x2x10x0.012  = 7.200m x0.89 =6.408 kg  Barrel pier Inside Binder (Bellow Top side)  Placing Length = 2.100m  D-12 @0.200 C/C  Nos of Bar = 2.100÷0.200+1 = 15 nos  Each bar Length = 4.90m  Total Length =2x15x4.90m =147.000m  =147.000m x0.89 = 130.830 kg  Lapping = 2x15x2x10x0.012  = 7.200m x0.89 =6.408 kg  R/S Abutment Binder  Placing Length = 3.950m  D-12 @0.150 C/C  Nos of Bar = 3950÷0.150+1 = 27 nos  Each bar Length  =0.750+2x0.300 =1.350m  Total Length =2x27x1.350 =72.900m  =72.900m x0.89 = 64.881 kg  R/S column ring  Placing Length = 3.950m  D-12 @0.150 C/C  Nos of ring = 3950÷0.150+1 = 27 nos  Each ring Length  =2x0.200+2x0.300+2x10x0.012 =1.240m  Total ring Length =2x27x1.240 =66.960m  =66.960m x0.89 =59.594 kg  R/S column ring  Placing Length = 2.500m  D-12 @0.150 C/C  Nos of ring = 2.500÷0.150+1 = 18 nos  Each ring Length =1.240m  Total ring Length =2x18x1.240 =45.00m  =45.00m x0.89 =40.050 kg  R/S Abatement Extra bar  Placing Length = 3.950m  D-12 @0.150 C/C  Nos of bar = 3950÷0.150+1 = 27 nos  Each bar Length  =1.700m  Total bar Length =2x27x1.700 =91.800m  =91.800m x0.89 =81.702 kg  C/S Abatement Extra bar  Placing Length = 2.500m  D-12 @0.150 C/C  Nos of ring = 2.500÷0.150+1 = 18 nos  Each bar Length =1.100m  Total bar Length =2x18x1.100 =39.600m  =39.600m x0.89 =35.244kg  Deck slab bottom layer short binder  Placing Length = 4.900m  D-12 @0.200 C/C  Nos of ring = 4.900÷0.200+1 = 26 nos  Each bar Length =2.300-0.100=2.200m  Total bar Length =1x26x2.20 =57.200m  =57.200m x0.89 = 50.908kg  Deck slab bottom layer Long binder  Placing length =1.700m  D-12 @ 0.200 C/C  Nos of bar=1.700 /0.200+1=10 nos  Each bar length=4.800m  Total length =1x10x4.800  =48.00m x 0.89 =42.720kg  Dcck slab Top layer top short bar  placing length =4.900m  D-12@.150 C/C  Nos of bar =4.90÷0.150+1= 34nos  Each bar length=2.200m  Total bar length =1x34x2.200  =74.800m x0.89  =66.572 kg  Head wall vertical rod  Placing length=2.300m  D-D-12 @0.150C/C, both side.  Nos of rod=2.300÷0.150+1=16nos  Each bar length=2.150-0.100+2x10x0.012  =2.050+0.240  =2.290m  Total bar length =2x16x2.290  =73.280m x0.89  =65.219kg  Head wall binder both side  Placing length=1.850m  D-12 @ 0.150C/C .  Nos of bar=1.850÷0.150+1=13nos  Each bar length=2.300-0.100  =2.200x2x10x0.012  =2.200+0.240  =2.440m  Total bar length =2x13x2.440  =63.440m x0.89  =56.461kg  C/S short head wall vertical  Placing length =2.300m  [D-12@o.150](mailto:D-12@o.150) C/C  Nos of bar =2.300÷0.150+1=16 nos  Each bar length =2x0.750+0.125+2x10x0.012  =1.625+0.240=1.865m  Total length=1x16x1.865=29.840mx0.89  =26.557 kg  Short head wall binder  Placing length =0.850m  D-12@ 0.150 C/C  Nos of bar=0.850÷0.150+1 =7 nos  Each binder length=2.200  Total length =2x7x2.200  =30.800m x0.89  =27.412kg  Operating deek slab bellow  D-12=4 nos  length=1.900-0.100= 1.800  Total length =4x1.800=7.200mx0.89  =6.408 kg    Bellow ring  Placing length=1.900  D-12@0.150 C/C  Nos ring=1.900÷0.150+1=14 nos  Each ring length  =2x0.200+2x0.050+2x10x0.012  =0.40+0.100+0.240= 0.740m  Total ring length =1x14x0.740  =10.360m x0.89 =9.220kg    Operating slab short bar  Placing length=1.900m  D-12@ 0.200 C/C  Nos of bar =1.900÷0.200+1=11 nos  Each bar length=0.900-0.100=0.800m  Total length =1x11x0.800  =8.800mx0.89 =7.832 kg  Operating deck slab long bar  Placing length=0.900m  [D-12@0.150](mailto:D-12@0.150) C/C  Nos of rod=0.900÷0.150+1=7nos  each bar long=1.800m  total bar length=1x7x1.80  =12.600mx0.89 =11.214kg  Realign post R/S  D-16  Post – 9 nos  Each bar length  = 0.900+40x0.016+10x0.012 =1.660m  Total length =9x4x1.660  =59.760x0.89 =53.186kg    Railing Beam  D-16  Beam=6nos  Each bar leangth=2.200  Total length =6x4x2.20  =52.80x0.89 =46.992kg    Waing ball Rin  D-20@ o.300 C/C, C/S & R/S  Placing length = 3.300m  Nos of reang=3.300÷0.300+1=12 nos  Each ring length  =2x0.20+2x0.400+0.450 =1.650m  Total length  =2x12x1.650 = 39.600 x 2.46  =97.416kg  Abutment ring D-20@ 0.300 C/C, R/S side  placing length =1.450m  Nos of racing=1.450÷0.300+1  =4.833  Say = 5 nos  Each ring length=1.650m  Total length =1x5x1.650  =8.250m x 2.46  =20.295 kg  **Gross total = 19785.88 kg** | |  |
| 38  76-115-10 | M.S Work for reinforcement with Standard deformed bar fy=276 N/mm^2 in RCC works including local handling, cutting, forging,bending,cleaning and fabrication with supply of deformed M.S. bar in different sizes and bending with 22 to 18 gages G.I. wire etc. complete including the cost of all materials as per direction of Engineer in charge.  76-115-10, 6mm dia | Railing post ring  Placing length =0.900  D-6 @ 0.150 C/C  Nos of racing =0900÷0.150+1 =7 nos  Each ring length= 4x0.100+2x10x0.006  =0.520m  Total ring length=9x7x0.520  =32.760mx0.22  =7.207 kg  Bear ring  Placing length=1.400m  D-6 @ 0.150 C/C  Nos of ring =1.900÷0.150+1 =14 nos  Each ring length =0.520m  Total ring length=6x14x0.520  =43.680mx0.22  = 9.609kg  = 16.816 kg | | 16.82  kg |
| 39  (a)36-150-60 | Formwork for centering and water tight shuttering as per drawing with 14 BWG M.S. sheet, fitted and fixed with 40mmx40mmx6mm M.S. angle frame and 25mmx6mm F.I. bar stiffener, with necessary fabrication, welding, making the forms including fitting, fixing of steel forms with necessary ties, battens, struts, nuts & bolts, props etc. as per desired shape and size including levelling and removing the forms after specified period including the cost of all materials as per direction of Engineer in charge.  36-150-60, Footing, footing beams, grade beams, foundation slab with 60-80mm dia barrack bamboo props | Formwork for centering  C/S+R/S Apron length  =12.250-2.400 =9.850m  Area=2x2x9.850x0.075 =2.955sqm  C/S+R/S Return base long side  =2x2x6.50x0.075 =1.950sqm  C/S+R/S short side  =2x2x2.400x0.075= = 0.720sqm  C/S+R/S Apron End  1x2x19.20x 0.075 =2.880sqm  Boral =2x7.300x0.075 =1.095sqm  Grid wall – base  Slope C/S  =2x2x2x8.600x0.050 =3.440sqm  Bottom =2x2x5.00x0.050 =1.00sqm  Block side = 2x2x 2x6.00x0.050  = 2.400sqm  Gurd wall slope  =2x2x2x8.600x0.650 =44.720sqm  Bottom 2x2x5.00x0.650  = 13.00sqm  Block side =2x2x2x6.00x0.650  =31.200sqm  Foundation C/S+R/S Apron  =2x2x7.600x0.500 =18.240sqm  Return wall long side  =2x2x6.50x0.300 =7.800sqm  =141.250sqm  Return wall end  =2x2x1.200x0.300 =1.440sqm  =2x2x1.200x0.900+120 =5.040sqm  Apron End C/S+R/S  =1x2x5.00x0.800 =8.00sqm  Return wall side C/S+R/S  =2x2x7.10x0.600 =17.040sqm  Chate block C/S+R/S  Side=2x2x2x1/2 x1.500x0.500 =3.00sqm  End=2x2x0.350x0.500 =0.700sqm  Baffle block C/S+R/S Side=2x3x2x0.500x(0.150+0.650)/2  =2.400sqm  Slope =2x3x0.707x0.350 =1.484sqm  End=2x3x0.350x0.500 =1.050sqm  End seal high C/S+R/S  Slop portion all through end high+low  =1x2x5.00x0.425 =4.250sqm  End sill high slope C/S+R/S  =1x2x10x0.250x0.425 =2.125sqm  End sill low slop  =1x2x10x0.250x0.425 =2.125sqm  End sill high side C/S+R/S  =1x2x2x10x(0.150+0.425)/2 x0.300  =3.450sqm  End sill high vertical end  = 1x2x10x0.250x0.300 =1.500sqm  Total = 194.854sqm | | 194.85  sqm |
| (b)  36-150-10 | 36-150-10 **.** Vertical and inclined walls, columns, piers with 60-80mm dia barrack  bamboo props. | Wing wall slop C/S & R/S  =1x2x2x2x2x2.371x(2.50+3.250)/2 =54.533sqm  Wing wall C/S & R/S Earth face  = 2x2x8.800x3.250 =114.400sqm  Wing wall C/S & R/S water face  =2x2x9.10x3.250 =118.300sqm  Return wall C/S & R/S, E/F  =2x2x6.20x3.250 =80.600sqm  Return wall C/S & R/S water face  =2x2x6.50x3.250 =84.500sqm  Return wall end C/S & R/S =2x2x3.250x(0.300+0.350)/2 =4.225sqm  Return wall corner fillet  =2x2xx03.250x0.300 = 3.900sqm  Sub: total =460.458sqm  Barrel pear earth face  =1x2x7.300x2.10 =30.660sqm Barrel pear inner side  =2x2x4.00x1.800 =28.800sqm    Barrel peer fillet  =2x2x1.80x0.150 =1.080sqm  Barrel pear offset C/S & R/S  =2x2x1.800x0.300 =2.160sqm  R/S Abutment  =2x0.900x3.950 =7.110sqm  R/S Abetment  =2x0.300x3.950 =2.370sqm  R/s abutment above desk slab Out side.  =2x1.800x2.150 =7.740sqm  C/S abaut ment above desk slab Out side  =2x1.200x0.700 =1.680sqm  C/S abutment inner side  2x0.775x2.50 =1.680sqm  Sub: total = 83.280sqm      R/S head wall side  =1x2.300x1.850 =4.255sqm  R/s head wall out side  =1x2.300x2.150 =4.945sqm  Head wall end=2x0.300x1.850 =1.110sqm  C/S-Head wall short  Outside =2.300x0.850 =1.955sqm  In side=2.300x0.550 =1.265sqm  End=0.550x0.300 =0.165sqm  R/s fall board grove  =2x2x0.150x3.950 =2.370sqm  =2x2x2x0.100x3.950 =3.160sqm  C/S fall board grove.  =2x0.150x2.50 =0.750sqm  =2x2x0.100x2.50 =1.00sqm  Railing post  =1x9x4x0.900x0.150 =4.860sqm  Railing beam  Bottom=2x3x1.850x0.150 =1.665sqm  Side=2x3x2x2.300x0.150 =4.140sqm  =31.640sqm  Gross total =575.378 sqm | | 575.38  sqm |
| (C)  36-150-30 | 36-150-30 **.** Deck slab, operating deck slab, top slab of barrel above 3.5m upto 6.5m  height with 50mm dia GI pipe props. | Deck slab bottom  =1x4.300x1.700 =7.310sqm  Operating deck slab bottom  =1x1.500x0.900 =1.350sqm  Beam-bottom  =1x1.500x0.150 =0.225sqm  Beam long side-1.500x0.300 =0.450sqm  Beam short side=1.500x0.150 =0.225sqm Operating deck slab –out side  =2x0-900x0.150 = 0.270sqm  Fall board side  =1x1.500x0.150 =0.225sqm  = 10.055 sqm | | 10.06  sqm |

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| 40  16-520-20 | Supplying and filling sand in foundation of hydraulic structures, buildings and in protective works with selected sand, in 150mm thick layer, including levelling, dressing, ramming, watering etc. complete (compacted to 50% relative density by manual labour using mallet/ vibro compactor) as per direction of Engineer in charge. | Sand filling below expansion joint C/S&R/S base  =2x2.300x(0.600+0.900)/2+2x(0.635+0.424)/2x0.150  =4.600x(0.750+1.058)/2x0.150 =1.248 cum  C/S & R/S vertical  =2x2x3.275x1.808x0.150 =3.552 cum  Below block floor base C/S&R  =2x4.700x4.85x0.150 =6.838 cum  C/S & R/S slop=2x2x5.90x8.385x0.150 =29.682 cum  = 41.420 cum | 41.42 cum |
| 41  40-610-30 | Supplying and laying dry 1st class or pick jhama chips as filter in two layers  (top and bottom) as per specific size, range and gradation, including breaking chips, grading, preparation of surface, compacting each layer etc.  complete with supply of all materials and as per direction of Engineer in  charge:  (a)40-610-30 **.** Well graded between 20mm to 5mm size. (Combination of sub-item 10 & 30 or 20 & 30 shall be used) | Khoa filter  =2x2.300x(0.300+0.600)/2+(0.424+0.209)/2  =4.600x(0.450+0.316)x0.150 =0.528 cum  C/S&R/S vertical =2x2x3.275x0.766x0.150 =1.505 cum  Below block floor base C/S&R/S  =2x4.700x4.850x0.200 = 9.118 cum  Slope C/S&R/S= 2x2x5.900x8.385x0.200 =39.577 cum  =50.728 cum | 50.73 cum |
| 42  40-610-20 | 40-610-20 **.** Well graded between 40mm to 20mm size. | Below expansion  =2x2.300x(0.600+0.300)/2x0.150 =0.310 cum  C/S &R/S vertical 2x2x3.275x0.450x0.150 =0.884 cum  =1.194 cum | 1.19 cum |
| 43  44-220-10 | Supplying and laying single layer polythene sheet in floor below cement  concrete, RCC slab, on walls etc. complete in all respect as per direction of Engineer in charge.  44-220-10 **.** Weighing minimum 1.0 kg per 6.50 sqm. | Polytheen sheet C/S & R/S apron  =2x(2.300+5.00)/2x12.250 = 89.425 sqm  Return wall base  =2x2x7.100x2.400 =68.160 sqm  Barrel base=1x7.300x2.300 =16.790 sqm  =174.374 sqm | 174.37 sqm |
| 44  76-630 | Supply and fitting and fixing 23cm wide P.V.C water stops having  minimum strength of 13.80 N/mm² at 225% elongation and of approved  quality in cntraction and expansion joints with necessary arrangments for  modification in shuttering and kepping the water stop in position etc. complete as per design, specification and direction of Engineer in charge.  76-630-10 **.** 3 bulb type. | PVC water stop horizontal= 2x1.900 =3.800m  Vertical C/S&R/S =2x2x2.850 =11.40 m  =15.20m | 15.20 m |
| 45  28-200-10 | Reinforced cement concrete work in leanest mix. 1:1.5:3, with 20mm down  graded coarse aggregates and sand of FM>2.0 to FM<=2.5, to attain a minimum 28 day cylinder strength of 22.0 N/mm², including breaking, screening, grading, washing aggregates with clean water, mixing, laying in forms, consolidation to levels, curing, including supply of all materials, excluding cost of M.S. work for reinforcements and formworks etc. complete and as per direction of Engineer in charge.  28-200-10 **.** with stone chips | Sheet pile cap key R/S & C/S apron portion  =2x5.00x(0.900+1.324)/2x0.300 =3.736 cum  R/S&C/S apron=2x10.00x(5.600+2.286)/2x(0.700+0.500)/2  =20.00x3.943x0.600 =47.316 cum  Sheet pile cap key return wall C/S&R/S  =2x2x6.800x(0.900+1.324)/2x0.300 =9.073 cum  Return wall base C/S &R/S  =2x2x6.800x2.400x0.300 =19.584 cum  Barrel R/S bottom sec- details-K  1x2.300x(1.500+1.924)/2x0.300 =1.181 cum  Barrel base C/S bottom expansion key  =2.300x(0.900+1.324)/2x0.300 =0.767 cum  Barrel base 7.30x2.300x0.400 =6.716 cum  Return wall C/S & R/S  =2x2x6.80x(0.300+0.350)/2x3.250 =28.730 cum  Wing wall=2x2x9.100x(0.300+0.350)/2x3.250=38.447 cum  Wing wall slope=2x2x2.371x(0.300+0.350)/2x(2.250+3.250)/2  =9.484x0.325x2.750 =8.476 cum  Wing wall fillet=2x2x11.47x1/2x0.150x0.150 =0.516 cum  Return wall fillet both side  =2x2x2x6.800x1/2x0.150x0.150 =0.612 cum  Return wall corner fillet  =2x2x3.250x1/2x0.300x0.300x =0.585 cum  Chute block C/S &R/S  =2x2x0.350x1/2x1.500x0.500 =0.525 cum  Baffle block C/S &R/S =2x3x0.350x(0.150+0.3650)/2x0.500 =0.420 cum  End sill high  =2x10x0.250x(0.150+0.750)/2x0.300 =0.675 cum  End sill low  =2x10x0.250x1/2x0.375x0.1875x2 =6.351 cum  Barrel pier below deck slab  =2x4.30x0.300x1.800 =4.644 cum  R/S abutment=2x1.80x0.400x3.950 =5.688 cum  C/S abutment=2x1.200x0.400x2.500 =2.400cum  Deck slab=4.900x2.300x0.300 =3.381 cum  R/S head wall=1.500x0.300x1.8501 =0.832 cum  C/S head wall=1.500x0.300x0.900 =0.405 cum  Operating deck slab=1.900x0.750x0.150 =0.213 cum  Beam=1.900x0.150x0.300 =0.085 cum  Railing post=9x0.150x0.150x0.900 =0.182 cum  Railang beam=6x1.850x0.150x0.150 =0.249 cum  =193.340 cum | 193.34 cum |
| 46  04-600-20 | Providing cork sheet/polysterene sheet in expansion joints of concrete works  including supply of all materials etc. complete as per direction of Engineer  in charge.  04-600-20 **.** 20 mm thick sheet. | Cork sheet for expansion joint  Horizontal=2x2.300x0.700 =3.220 sqm  Vertical=2x2x2.500x(0.300+0.350)/2 =3.250 sqm  =6.470 sqm | 6.47 sqm |
| 47  76-170 | M.S. Work in plates, angles, channels, flat bars, Tees etc. including fabricating, machining, cutting, bending, welding, forging, drilling,  revetting, embedding anchor bars, staging and fitting, fixing, local handling etc. comlpete with energy consumption and supply of labours including the cost of materials as per design, specification and direction of Engineer in charge. | Detail-H sec A-A  Flate plate=3x1.80x0.150x0.010=0.0081 cum  @7800 kg p/cum=0.0081x7800 =63.180 kg  Anchor bolt=D-16 @225 mm long @0.200c/c  Placing length=1.800m  Nos of anchor bolt=1.800/0.200+1=10 nos  Total length=3x10x0.225=6.750 mx1.58 =10.664 kg  Detail K’ Gate groove chanel=2x3.950x0.550x0.010=0.0434 cum  @ 7800.00 kg p/cum =338.520 kg  Anchor bolt D-16 @0.200c/c  Placing length=3.950 m  Nos of bolt=3.950/0.200+1=27 nos  Total length 2x3x27x0.225=36.450x1.58 =57.591 kg  Deck slab corner anchor bolt  =2x2.30x0.175x0.010=0.0081 cum  @7800 kg p/cum =63.180 kg  Anchor bolt placing length=1.800m  D-16 @0.300c/c nos of bolt=1.800/0.300+1=7 nos  Total length=7x0.225=1.575x1.58 =2.488 kg  Angle 0.075+0.075x0.010x1.20x2=0.0036 cum  @7800 kb p/cum =28.08 kg  **= 563.704 kg** | 563.70 kg |
| 48  04-620 | Filling of expansion joints upto a depth of 40 mm with bitumen mixed with coarse sand (FM>=2.5) in concrete works including supply of all materials etc. complete as per specification and direction of Engineer in charge.  04-620-20 **.** 20 mm wide. | Filling up the expansion joint C/S&R/S=2x2.30=4.600m  C/S&R/S= vertical inside=2x2x2.5 =10.00m  C/S&R/S vertical out side=2x2x3.200 =12.800m  =27.400 m | 27.40 m |
| 49  40-140 | Manufacturing and supplying C.C. blocks in leanest mix. 1:3:6, with  cement, sand (FM>=1.5) and Stone Chips (40mm down graded), to attain a minimum 28 days cylinder strength of 9.0 N/mm² including grading,  washing stone chips, mixing, laying in forms, consolidation, curing for at  least 21 days, including preparation of platform, shuttering and stacking in  measurable stacks etc complete including supply of all materials (steel  shutter to be used) as per direction of Engineer in charge.  40-140-50 **.** block size 30cmx30cmx30cm. | Block size 30cmx30cmx30cm  R/S&C/S loose apron single layer  =2x4.700x4.850 =45.590sqm  R/S&C/S slope=2x2x5.900x7.938 =187.336sqm  R/S&C/S loose apron double layer  =2x2x5.00x5.00 = 100.0sqm  R/S&C/S slope=2x2x5.00x7.380 =158.760sqm  Top=2x2x11.20x0.600 =26.880sqm  =518.566 sqm  @0.090 sqm p/ block=518.566/0.090=5762.00 nos  Deduct 5% gap (-) 288.00  =5474.00 nos | 5474.00 nos |
| 50  40-220-10 | Labour charge for protective works in laying CC blocks of different sizes  including preparation of base, watering and ramming of base etc. complete as per direction of Engineer in charge. | Labour charge for CC block quantity same as item no-57=5474 nos  Volume of block=5474 x0.300x0.300x0.300=147.798 cum | 147.80 cum |
| 51  04-100 | Manufacturing and supplyimg R.C.C. boundary pillar, bench mark pillar  and kilometer post in proportion 1:2:4, as per approved drawing and  specifications, 110cm height, bottom dia 25cm and top dia 20cm, of which  15cm slanting and 5cm level; with 6 nos. 10mm dia vertical rod and 8 nos.  6mm dia binder excluding the cost of M.S. works for reinforcement but  including the cost of form works, plastering top, finishing surface, curing with inscription of "BWDB, R.L./K.M." mark, as per approved size and shape in exposed surface etc. complete, as per direction of Engineer in charge. | RCC piller approach road top = 28 nos  Aproach road top to return wall =36 nos  =64.00 nos | 64.00 nos |
| 52  04/110 | Fixing in position, boundary pillars/bench mark pillars/K.M. post etc. of size 110cm height, bottom dia 25cm and top dia 20cm, embedded 45cm below G.L. including carriage, earth cutting, filling, ramming, etc. complete as per direction of Engineer in charge. | Quantity same as item no-58 = 64 nos | 64.00 nos |
| 53  80-230-40 | Supplying, laying, fitting and fixing of different dia G.I. pipes with all  special fittings, such as bends, elbows, sockets, tees, unions, jamnuts etc.  including cutting foundation trenches upto required depth where necessary  and filling the same with earth duly compacted, making holes in floors and  walls and mending the damages, fixing in walls with holders and clips,  including cutting threads, making necessary connection etc. all complete, and as per direction of Engineer in charge: | D-40 GI pipe post=6 nos  Each pipe length=0.900+0.225+0.025=1.150 m  Total length of pipe=6.00x1.150m = 6.900m | 6.90 m |
| 54  16-130 | Earth work by manual labour in all kinds of soil in excavation or  Re-excavation of channels with the initial lead of 30m and lift of 1.5m  including leveling, dressing and throwing the spoils to profile with  breaking clods, rough dressing, clearing jungles including cutting trees upto 200mm girth, dug bailing etc. complete as per direction of Engineer in charge. | Diversion channel=R/s  =350.00x(5.00+14.750)/2x3.250=11232.812 cum  C/S=50.00x(5.00+14.75)/2x3.25=1604.687 cum  =12837.499 cum | 12837.50  cum |
| 55  16-200 | Extra rate for every additional lift of 1.0m or part thereof beyond the initial  lift of 1.5m (30cm neglected) for all kinds of earth work. | For foundation earth  Lift calculation=(1/2 cutting+1/2 filling +dead lift-0.300)/1.00m  =(1/2x3.250+1/2x2.00+0.00-0.300)/1.00  =(1.625+1.00-0.300)/1.00  =2.325 lift say=2.00 nos lift  Quantity of earth same as item no -5=12837.499 cum Allowed 50%=6418.749 cum | 6418.75  pld cum |
| 56  04-280-10 | Constructing at site, cement mortar gauge on masonry wall, including  engraving in meter, decimeter & centimeter, painting and figuring with  black and red water proof paint, etc. complete as per direction of Engineer  in charge. | Construction of cement morter gause C/S&R/S  =2x2.50=5.00m | 5.00 m |
| 57  16-240 | Earth work by manual labour, in all kinds of soil in removing the cross  bundh/ ring bundh, including all leads and lifts complete and placing the  spoils to a safe distance, (minimun 15m apart from the bank) as per  direction of Engineer in charge. | Removing bund only same as item no-=4175.598 cum  Allowed 80%= 3340.478 cum | 3340.48 cum |
| 58  16-540-20 | Back filling in hydraulic structures including all leads and lifts in 150mm  layer including watering, ramming, compacting to 30% relative density etc. complete by compactor or any other suitable method as per direction of Engineer in charge. | Barrel=2 x7.30x(1.00+7.40)/2x3.20=196.224 cum  Apron C/S&R/S  =2x2x8.325x(1.00+8.5)/2x3.75=593.156 cum  Return wall  =2x2x7.10x(4.40+19.40)/2x3.75=1267.350 cum  =2056.730 cum | 2056.73 cum |
| 59  68-130 | Supplying pressure treated wooden fall boards/stop logs of different sizes  (not less than 15cm in depth) of sal, sundari, garjan, shishu or equivalent  for regulator/ sluices, including fixing in position with eye hook etc.  complete as per direction of Engineer in charge. | Supplying wooden fall board C/S&R/S=2x1.900x0.150x2.5=1.425 cum | 1.43 cum |
| 60  76-240-40 | Manufacturing & Supplying of M.S. Vertical Lift Gate shutter of 8mm thick M.S. skin plate and stiffener with minimum 75mmx75mmx10mm M.S. angle as frame, horizontal & vertical beam, 75mmx25mmx12mm P-type rubber seal, fixed with 10mm dia x 63.5mm M.S. counter shank bolts with nuts and 40mmx10mm M.S. strip as clamp drilled spaces @ 150mm c/c, stem attachment with proper thread, nut, cotter pin and washer as per approved design including the cost of all materials of proper grade & brand new with a prime coat of redoxide where necessary as per specification and direction of Engineer in charge.  76-240-40: Size 1.95m x 1.65m. | Vertical lift gate-1 nos | 1.00  nos |
| 61  76-260-20 | Labour charge for fitting and fixing of M.S. vertical lift gate/ flap gate shutters of different size including making holes in concrete for hooking arrangements with supply of necessary materials, tools and other accessories required for fitting the same to regulator/sluice and mending the damages with CC (1:2:4), removing the spoils etc. complete including the cost of all materials as per direction of Engineer in charge.  76-260-20: Size 1.95m x 1.35m or 1.95m x 1.65m. | Labour charge vertical lift gate=1 nos | 1 nos |
| 62  76-190 | Manufacturing, supplying and Installation of Padestal type lifting device for slide gate with 63mm dia threaded steel shaft, 146mm outer dia bronze nut, thrust bearing, steel bevel gear etc. as per approved design including supply of all components, labours with a prime coat of redoxide where necessary etc. complete including the cost of all materials as per specification and direction of Engineer in charge. | Lifting device =1 nos | 1 nos |
| 63 3.1- Analysis Rate | Mobilize, strengthen required land based construction equipment such as excavator, dump truck, chain dozer, vibro-compactor, and plants such as generator for site electrification, digital camera for taking photographs and digital video camera for recording/Taking photograph all sequences of works etc for keeping records of the Works by providing following information including transfer to site, complete for the purposes stated in the Technical Specification and Contractor’s Method Statement and as per direction of Engineer in charge. | 1 item = 92026.550 | 92026.550 |
| 64 1.2- Analysis Rate | Provide and maintain 1 (one) no. Engine boat with boatmen having sun and rainproof cover to facilitate supervision by the Engineer/Engineer's Representative during whole construction period of the work as per Technical Specification, Contractor’s Method Statement and as per direction of Engineer in charge. | 1 item =149871.810 | 149871.810 |
| 65 2.1- Analysis Rate | Providing and maintaining adequate portable water supply by installing 6 Nos. of tube well and sanitation facilities by installing 6 Nos. of sanitary latrines for usage of labours,officials and others for prevailing the hygenic and healthy environment at allover the working site As per direction of the Engineer in charge. | 1 item =111148.950 | 111148.950 |
| 66 3.2- Analysis Rate | Operate , maintain of plant and equipment such as generator for site electrification, for the purpose stated in the Technical Specification and in the Contractor’s Method Statement and as per direction of Engineer in charge. | 1 item =111148.950 | 110909.920 |
| 67 1.3- Analysis Rate | Demobilization and clean-up of the site upon completion of the works, as per Specifications and Contractor's Method Statement and as per direction of Engineer in Charge | 1 item =111148.950 | 112344.100 |

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|  |  | (MD. Alauddin)  SAE/S.O  Bhairab WD. Section –1  BWDB, Bhairab, Kishoregonj. |