# OFFICE OF THE ENGINEER-IN-CHIEF
# P.W.D. NIRMAN BHAVAN, NORTH BLOCK, SECTOR-19
# NAWA RAIPUR, ATAL NAGAR (CHHATTISGARH)

## AMMENDMENT NO. 12

No. 65010/ 515 /SOR/ Nawa Raipur, Dated 14 /09/2023

The following ammendment are hereby issued in the item mentioned below in S.O.R. for Road Works (in effect from 01.01.2015)

**CHAPTER - 4 SUB-BASES, BASE COURSE (NON-BITUMINOUS) AND SHOULDERS**

1) Item No. 4.23, 4.24, 4.25, 4.26 & 4.27 are added as given below.

| | | | |
|---|---|---|---|
| 4.23 | **Cement Treated Soil Sub-Base/ Base** (Providing, laying and spreading soil on a prepared sub-grade, pulverising, adding the designed quantity of cement to the spread soil, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.),as per clause 403. | Cum | 654.00 |
| 4.24 | **Cement Treated Crushed Rock or combination as per clause 403 and table 400.4 in Sub base/ Base** (Providing, laying and spreading Material on a prepared sub grade, adding the designed quantity of cement to the spread Material, mixing in place with rotavator, grading with the motor grader and compacting with the road roller at OMC to achieve the desired unconfined compressive strength and to form a layer of sub-base/base.) | | |
| (i) | **For Sub-Base course** | Cum | 1627.00 |
| (ii) | **For Base course** | Cum | 1438.00 |
| 4.25 | **Cement Treated Crushed Stone Sub-base** (Construction of granular sub-base by providing graded Material, mixing with cement in a mechanical mix plant at OMC, carriage of mixed Material to work site, spreading in uniform layers with Mechanical Paver on prepared surface and compacting with vibratory power roller to achieve the desired density, complete as per clause 403 ). | | |
| A | **Plant Mix Method (Using by Mechanical Paver)** | | |
| (i) | **Cement Treated Crushed Stone Sub-base (Grading-III Material)** | Cum | 1885.00 |
| (ii) | **Cement Treated Crushed Stone Sub-base (Grading-IV Material)** | Cum | 1853.00 |
| 4.26 | **Cement Treated Crushed Stone Base (Plant Mix Method)** (Providing, laying, spreading and compacting graded stone aggregate to wet mix macadam specification including premixing the Material with water at OMC in mechanical mix plant carriage of mixed Material by tipper to site, laying in uniform layers with paver in sub- base / base course on well prepared surface and compacting with vibratory roller to achieve the desired density.) as per clause 406. | Cum | 2033.00 |
| 4.27 | **Granular Shoulders** (Construction of granular shoulder as per clause 408 at top 150mm of earthen shoulder shall be well graded mix of at least 30% of granular sub-base material of grading-III as per clause 401 and moorum/gravel or soil and combination having soaked CBR value of not less than 30%. The granular layer shall be compacted to at least 98% of mix dry density of material as determined as per IS:2720 (Part-B) | Cum | 442.00 |

14/9/23

## CHAPTER - 8 TRAFFIC SIGNS, MARKINGS & OTHER ROAD APPURTENANCES

1) Item No. 8.51, 8.52, 8.53, 8.54 & 8.55 are added as given below.

| | | | |
|---|---|---|---|
| 8.51 | **Bahu-Balli Bamboo Crash Barrier (Kooch Kavach)**<br>Providing and fixing of Bahu-Balli Bamboo Crash Barrier (Kooch Kavach) which comprising of bamboo beam clubbing of 4 bamboo beam rail having 3 beam rail of 80mm ( ± 10mm) external dia each in back and 1 beam rail of 100mm ( ± 10mm) external dia and wall thickness of 10mm to be fixed on the vertical post with a spacer of 110 mm external dia and 300 mm long to fix on clubbing of 3 bamboo poles having 90mm ( ± 10mm) external dia each and 0.85m above road/ground level, spacing of 1.80 m. height Bahu-Balli bamboo vertical post center to center or post to post at 1.60 m and 0.95 m below ground/road level including excavation, beam and post tied with 8mm (19*6 core) GI Wire rope with clamps and Aluminum ferul locking all steel parts and fitments with M10 Nuts & Bolts to be galvanised by hot dip process, all fittings conform to 4.8 grade steel, all nuts & bolts should be welded at the end. All bamboo poles, beams & spacer by using Bamboo spacies of Bambusa Balcoaa or Bambusa Bambos are well seasoned, treated with VPI and HDPE coating thickness 1.5 mm ( ± 0.5mm). End portion of bamboo crash barrier shall be flared outside by 1.25 m., department side shall be terminated by trailing terminal (TT) arrangement as shown in figure 9.13 of the IRC:SP:73-2018, end portion of bamboo crash barrier shall be flared outside by 0.35 m. distance of 6.4 m. in last section, fixing of white retro-reflective tape (made of Class-C Microprismetic Grade sheeting of Type-XI) 50mm wide on front member of beam and 100mm wide on front post etc. complete as per drawing annexed and as directed by Engineer-in-Charge. | RM | 3465.00 |
| 8.52 | **Bahu-Balli Bamboo Fence (Suraksha Kavach) 1.20 Meter Height on Divider:** Providing and fixing sustainable Bahu-Balli Fence (Suraksha Kavach), Economical Guard Railing of property, seasoned, creosote oil treated and High Density Poly-Ethylene (HDPE) 1mm coated bamboo post of 60mm external dia fixing in PCC M-15 Grade including excavation in circular size of 250mm dia or square size of 225x225 mm, 1200mm height above ground level and at least 300mm embedded on existing dividers, horizontal member of 40mm external dia & vertical members 25mm external dia fixing with GI nut, bolts & SDS (4.8 grade) bamboo fence by using bamboo species of B.Balcoaa/B.Bambos/ B.Pallida/ B.Tulsa/ B.Strictus/ B.Nutans to prevent trespassing of human & cattle, painting with 2 coats of approved yellow (for strips of yellow & black) paint, fixing of 50mm wide white retro-reflective tape (made of Class-C Microprismetic Grade Sheeting of Type-XI) on vertical members as per Typical Drawing-A1 annexed etc. complete and as directed by Engineer-in-Charge. | RM | 1699.00 |

| | | | |
|---|---|---|---|
| 8.53 | **Bahu-Balli Fence (Suraksha Kavach) 1.20 Meter Height above Ground:** Providing and fixing sustainable Bahu-Balli Fence (Suraksha Kavach), Economical Guard Railing of property, seasoned, creosote oil treated and High Density Poly-Ethylene (HDPE) 1mm coated bamboo post of 60mm external dia fixing in PCC M-15 Grade including excavation in circular size of 250mm dia, 1200mm height above ground level and at least 600mm embedded in ground, parallel to the road, horizontal member of 40mm external dia & vertical members 25mm external dia fixing with GI nut, bolts & SDS (4.8 grade) bamboo fence by using bamboo species of B.Balcoaa/B.Bambos/B.Pallida/ B.Tulsa/ B.Strictus/B.Nutans to prevent trespassing of human & cattle, painting with 2 coats of approved yellow (for strips of yellow & black) paint, fixing of 50mm wide white retro-reflective tape (made of Class-C Microprismetic Grade Sheeting of Type-XI) on vertical members as per Typical Drawing-A2 annexed etc. complete and as directed by Engineer-in-Charge. | RM | 1831.00 |
| 8.54 | **Bahu-Balli Bamboo Fence (Suraksha Kavach) 1.50 Meter Height above Ground:** Providing and fixing sustainable Bahu-Balli Fence (Suraksha Kavach), Economical Guard Railing of property, seasoned, creosote oil treated and High Density Poly-Ethylene (HDPE) 1mm coated bamboo post of 70mm external dia fixing in PCC M-15 Grade including excavation in circular size of 250mm dia, 1500mm height above ground level and at least 800mm embedded in ground, parallel to the existing road, horizontal member of 40mm external dia at top & bottom and 50mm external dia at mid & vertical members 25mm dia fixing with GI nut, bolts & SDS (4.8 grade), bamboo fence by using bamboo species of B.Balcoaa/B.Bambos/ B.Pallida/B.Tulsa/ B.Strictus/ B.Nutans to prevent trespassing of human & cattle, painting with 2 coats of approved yellow (for strips of yellow & black) paint, fixing of 50mm wide white retro-reflective tape (made of Class-C Microprismetic Grade Sheeting of Type-XI) on vertical members as per Typical Drawing-B annexed etc. complete and as directed by Engineer-in-Charge. | RM | 2256.00 |
| 8.55 | **Bahu-Balli Bamboo Fence (Suraksha Kavach) 1.80 Meter Height above Ground**: Providing and fixing sustainable Bahu-Balli Fence (Suraksha Kavach), Economical Guard Railing of property, seasoned, creosote oil treated and High Density Poly-Ethylene (HDPE) 1mm coated bamboo post of 80mm external dia fixing in PCC M-15 Grade including excavation in circular size of 250mm dia, 1800mm height above ground level and at least 800mm embedded in ground, parallel to the existing road, horizontal member of 40mm external dia at top & bottom and 50mm external dia at mid & vertical members 25mm dia fixing with GI nut, bolts & SDS (4.8 grade), bamboo fence by using bamboo species of B.Balcoaa/B.Bambos/B.Pallida/ B.Tulsa/B.Strictus/ B.Nutans to prevent trespassing of human & cattle, painting with 2 coats of approved yellow (for strips of yellow & black) paint, fixing of 50mm wide white retro-reflective tape (made of Class-C Microprismetic Grade Sheeting of Type-XI) on vertical members as per Typical Drawing-C annexed etc. complete and as directed by Engineer-in-Charge. | RM | 2576.00 |

This ammendment shall be applicable with immediate effect.

14/7/15

**Engineer-in-chief**
**Public Works Department**
**Nawa Raipur, Atal Nagar (C.G.)**

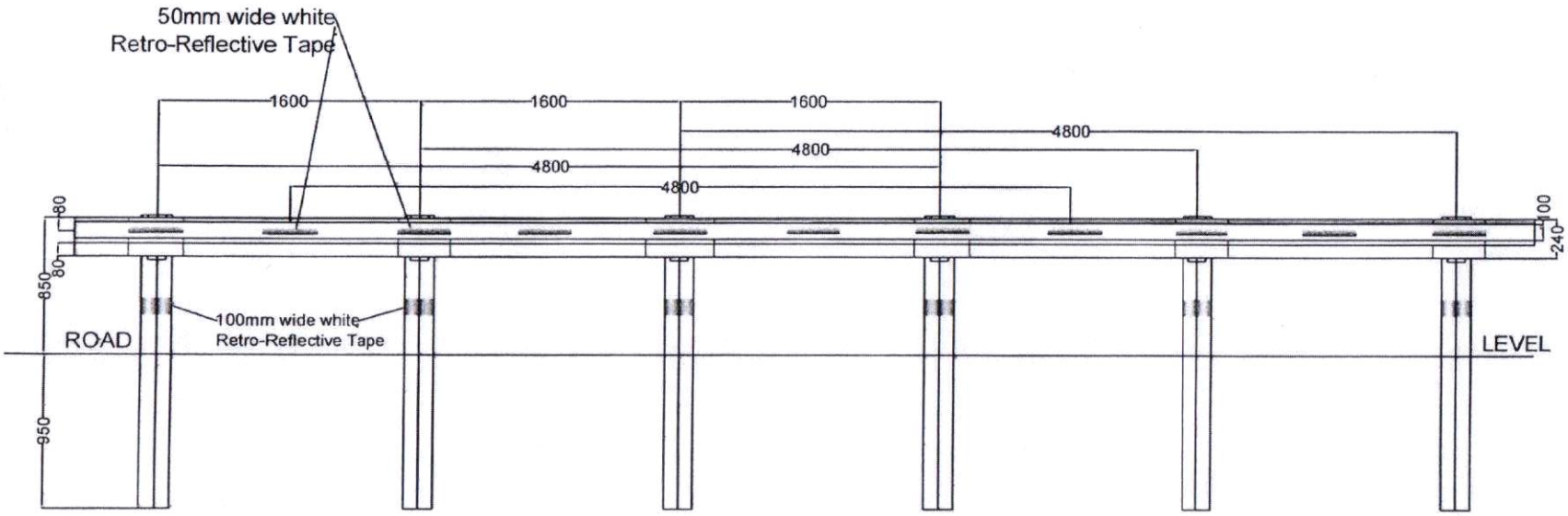
No. 65010/ 515 /SOR/ Nawa Raipur, Dated 14 /09/2023

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1. P.A. to honorable Minister of P.W.D.C.G. Govt. Raipur.
2. Secretary, C.G. Govt. P.W.D. Nawa Raipur.
3. Secretary, Finance Department C.G. Govt. Nawa Raipur.
4. All Chief Engineers. P.W.D. Chhattisgarh.
5. All Superintending Engineer, P.W.D. Chhattisgarh.
6. Chief Technical Examiner (V) C.G. Nawa Raipur.
7. Accountant General, C.G. Raipur.
8. All Collectors, Chhattisgarh.
9. All Executive Engineer, P.W.D. Chhattisgarh.
10. Website Public Works Department http://www.cg.nic.in/pwdraipur.

**Engineer-in-chief**
**Public Works Department**
**Nawa Raipur, Atal Nagar (C.G.)**

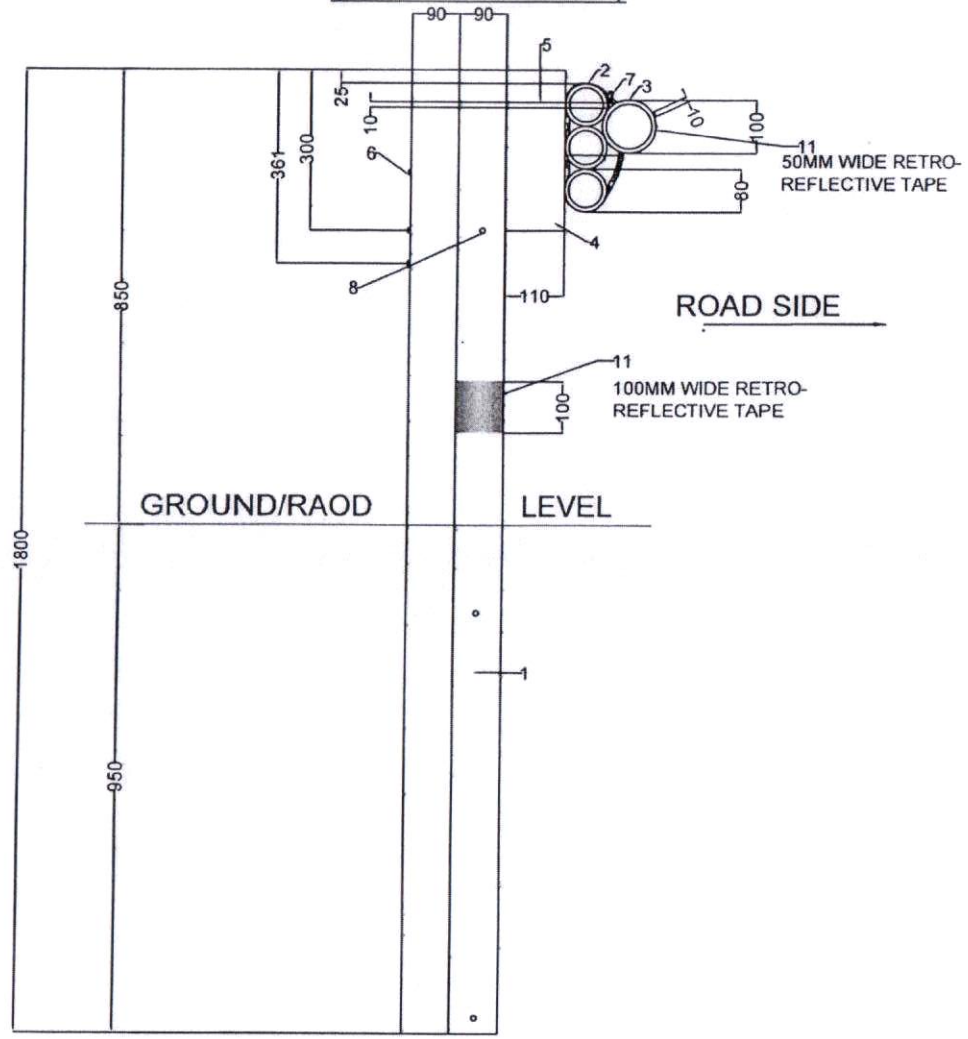
# TYPICAL DRAWING OF BAHU-BALLI BAMBOO CRASH BARRIER (KOOCH KAVACH)




## FRONT VIEW FROM ROAD SIDE

| | | NAME | DATE |
|---|---|---|---|
| BAHU-BALLI BAMBOO CRASH BARRIER | DRWN | | |
| | CHKD | | |
| | STRD | | |
| | APPD | | |
| SCALE 1:1 | DRAWING NO.: | | |
| Chief Engineer (R.D.D.) Public Works Department Nirman Bhawan, Naya Raipur | SHEET 1 OF 2 | | |

# TYPICAL DRAWING OF BAHU-BALLI BAMBOO CRASH BARRIER (KOOCH KAVACH)




## SIDE VIEW

| SECTIONAL LABEL | DESCRIPTION | DIA | LENGTH |
|---|---|---|---|
| 1 | POST ELEMENTS | 90 MM | 1800 MM |
| 2 | BEAM ELEMENTS | 80 MM | 4800 MM |
| 3 | FRONT CUSHIONING ELEMENT | 100 MM | 1422 MM |
| 4 | SPACER | 110 MM | 300 MM |
| 5 | BEAM- POST CONNECTOR | M10 | 360 MM |
| 6 | BEAM- SPACER- POST CONNECTOR | M10 | 280 MM |
| 7 | WIRE ROPE | 8 MM | 52000 MM |
| 8 | POST BOLTS | M10 | 190 MM |
| 9 | BEAM BOLTS | M10 | 250 MM |
| 10 | WASHER | 10 MM | 1.5 MM |
| 11 | WHITE RETRO-RFLECTIVE TAPE | - | 50MM WIDE & 200 MM LONG ON FRONT BEAM AND 100 MM WIDE & 285 MM LONG ON CIRCUMFERENCE OF FRONT POSTS |

BAHU-BALLI BAMBOO CRASH BARRIER

| | NAME | DATE |
|---|---|---|
| DRWN | | |
| CHKD | | |
| STRD | | |
| APPD | | |

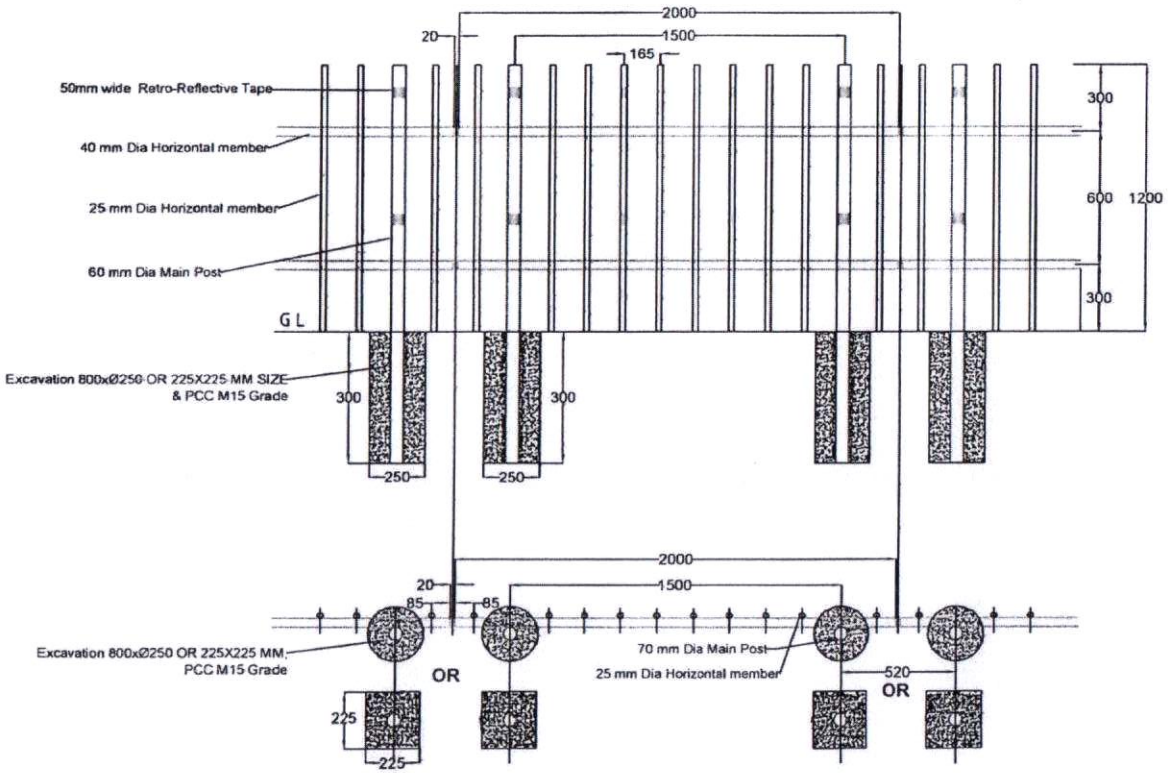
SCALE 1:1

Chief Engineer
(R.D.D.)
Public Works Department
Nirman Bhawan, Naya Raipur

DRAWING NO.:

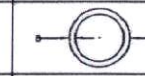
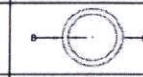
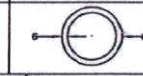
SHEET 2 OF 2

# TYPICAL DRAWING-A1: BAHU-BALLI BAMBOO FENCE 1200 MM HEIGHT FOR ROAD DIVIDER




NOTE:

1. ALL DIMENSIONS ARE IN MM.
2. KREOSOTE TREATED AND HDPE COATED BAMBOO SHALL BE USED ABOVE GROUND LEVEL.
3. DEPTH OF EMBEDMENT COLUMN IS 600 MM.
4. TOP END OF ALL EXPOSED BAMBOO SHALL BE PROVIDED WITH CAPS /HDPE COATED.
5. THICKNESS OF HDPE COATING AROUND BAMBOO SECTIONS SHALL BE 1.0MM GENERAL AND 0.5MM KNOTS.
6. ALLOWABLE TOLERANCE IN DIAMETER FOR BAMBOO SECTION
   60 MM = ±6.0 MM
   40 MM = ±5.0 MM
   25 MM = ±3.0 MM
7. ALL BAMBOO ELEMENTS CONNECTED AT POINT OF INTER SECTION USING 4.8MM CARBON STEEL BOLTS
8. AT ANY CHANGE IN LEVEL OR ALIGNMENT OF THE FENCE , THE SIZE OF EXCAVATION OR LEVEL OF THE POST MAY BE SUITABLE ADJUSTED. IN EXTREME CASES SEPARATE PITS MAY BE EXCAVATED TO INSTALL ADJACENT PANELS.
9. RETRO–REFLECTIVE TAPE– 50MM WIDE

| SECTIONAL LABEL | SECTION | | QUANTITY/BAY |
|---|---|---|---|
| ① |  | 60MM DIA 8MM THCK | 2NO. X1.8M |
| ② |  | 40MM DIA 8MM THCK | 2NO. X2.0M |
| ③ |  | 25MM DIA 6MM THCK | 10NO. X1.2M |

**BAHU-BALLI BAMBOO FENCE 1.2 M HEIGHT ON DIVIDER**

| | NAME | DATE |
|---|---|---|
| DRWN | | |
| CHKD | | |
| STRD | | |
| APPD | | |

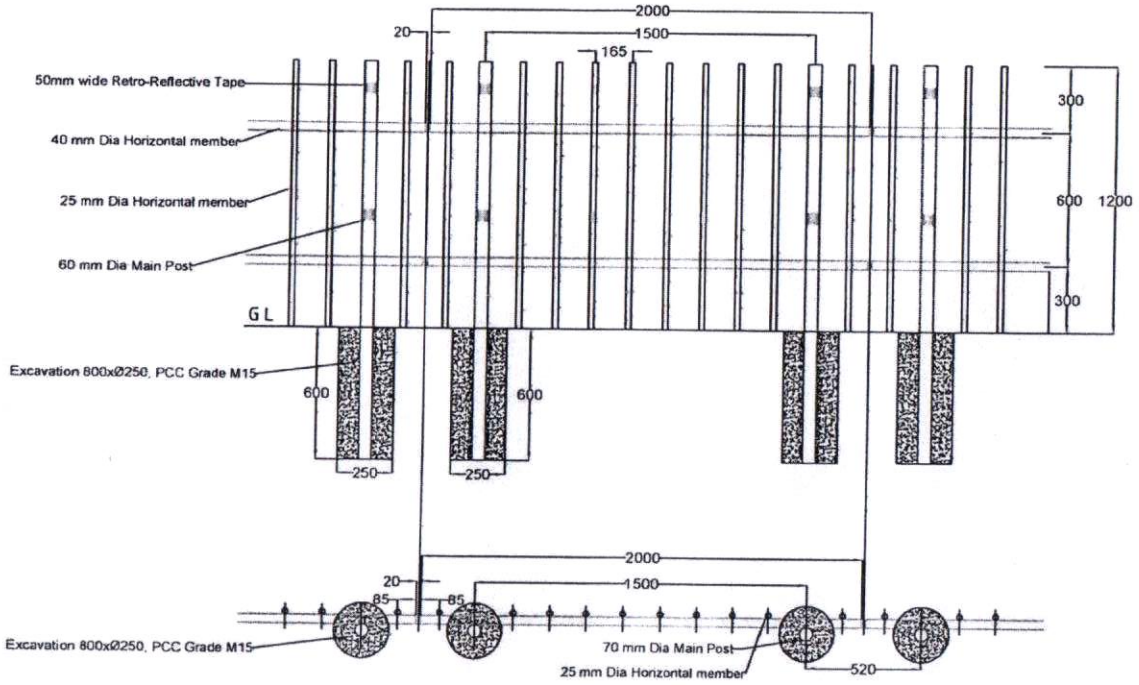
SCALE 1:1

Chief Engineer
(R.D.D.)
Public Works Department
Nirman Bhawan, Naya Raipur

DRAWING NO.: TYPICAL DRAWING-A1

SHEET 1 OF 1

# TYPICAL DRAWING-A2: BAHU-BALLI BAMBOO FENCE 1200 MM HEIGHT FOR ROAD FENCE




NOTE:

1. ALL DIMENSIONS ARE IN MM.
2. KREOSOTE TREATED AND HDPE COATED BAMBOO SHALL BE USED ABOVE GROUND LEVEL.
3. DEPTH OF EMBEDMENT COLUMN IS 600 MM.
4. TOP END OF ALL EXPOSED BAMBOO SHALL BE PROVIDED WITH CAPS /HDPE COATED.
5. THICKNESS OF HDPE COATING AROUND BAMBOO SECTIONS SHALL BE 1.0MM GENERAL AND 0.5MM KNOTS.
6. ALLOWABLE TOLERANCE IN DIAMETER FOR BAMBOO SECTION
   60 MM = ±6.0 MM
   40 MM = ±5.0 MM
   25 MM = ±3.0 MM
7. ALL BAMBOO ELEMENTS CONNECTED AT POINT OF INTER SECTION USING 4.8MM CARBON STEEL BOLTS
8. AT ANY CHANGE IN LEVEL OR ALIGNMENT OF THE FENCE , THE SIZE OF EXCAVATION OR LEVEL OF THE POST MAY BE SUITABLE ADJUSTED. IN EXTREME CASES SEPARATE PITS MAY BE EXCAVATED TO INSTALL ADJACENT PANELS.
9. RETRO–REFLECTIVE TAPE– 50MM WIDE

| SECTIONAL LABEL | SECTION | | QUANTITY/BAY |
|---|---|---|---|
| ① | Ø60 | 60MM DIA 8MM THCK | 2NO. X1.8M |
| ② | Ø40 | 40MM DIA 8MM THCK | 2NO. X2.0M |
| ③ | Ø25 | 25MM DIA 6MM THCK | 10NO. X1.2M |

**BAHU-BALLI BAMBOO FENCE 1.2 M HEIGHT ABOVE GROUND**

| | NAME | DATE |
|---|---|---|
| DRWN | | |
| CHKD | | |
| STRD | | |
| APPD | | |

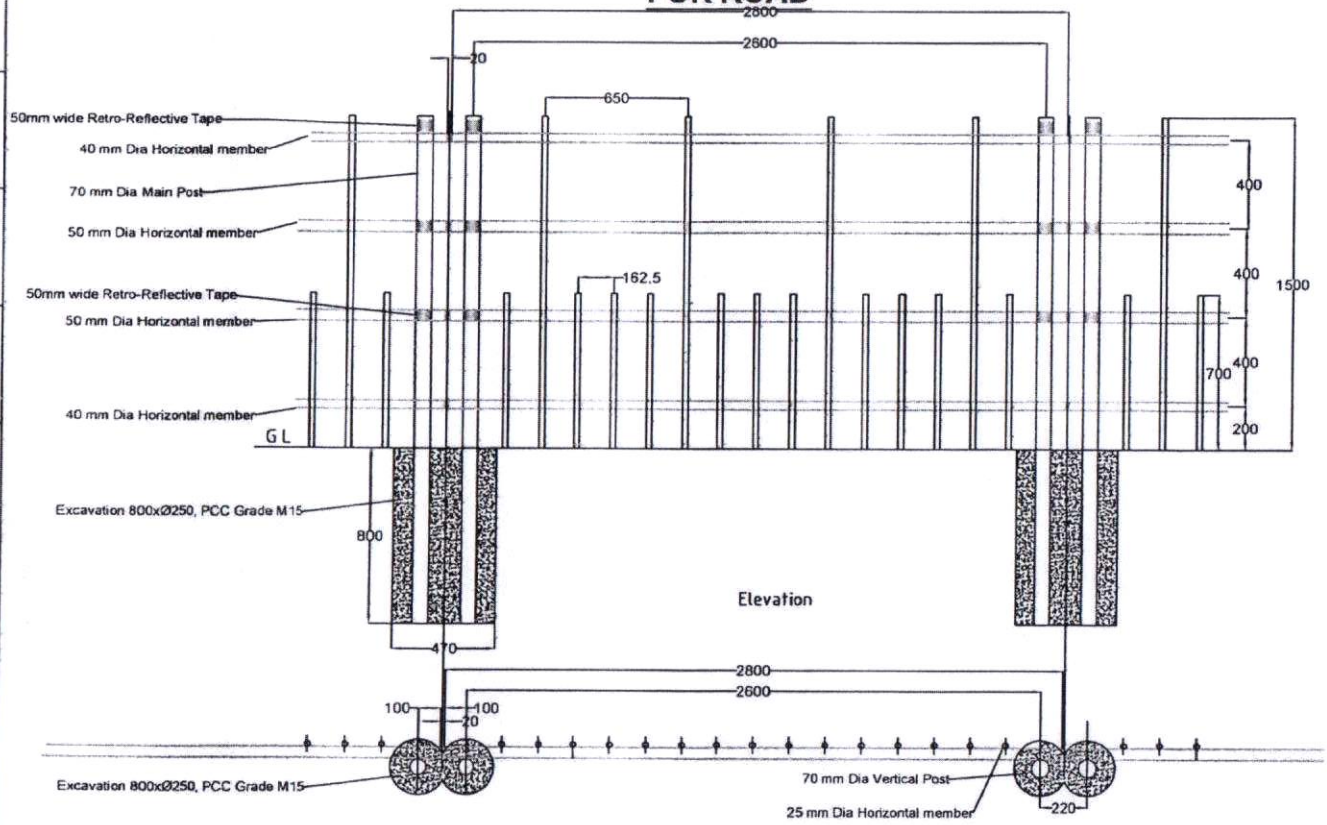
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Chief Engineer
(R.D.D.)
Public Works Department
Nirman Bhawan, Naya Raipur

DRAWING NO.: TYPICAL DRAWING-A2

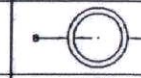
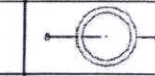
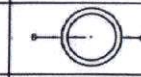
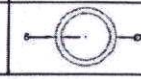
SHEET 1 OF 1

# TYPICAL DRAWING-B: BAHU-BALLI BAMBOO FENCE 1500 MM HEIGHT FOR ROAD




NOTE:

1. ALL DIMENSIONS ARE IN MM.
2. GRADE OF P.C.C. M15.
3. KREOSOTE TREATED AND HDPE COATED BAMBOO SHALL BE USED ABOVE GROUND LEVEL.
4. ONLY KREOSOTE TREATED BAMBOO SHALL BE USED BELOW GROUND LEVEL.
5. DEPTH OF EMBEDMENT COLUMN IS 800 MM.
6. TOP END OF ALL EXPOSED BAMBOO SHALL BE PROVIDED WITH CAPS /HDPE COATED.
7. THICKNESS OF HDPE COATING AROUND BAMBOO SECTIONS SHALL BE 1.0MM GENERAL AND 0.5MM KNOTS.
8. ALLOWABLE TOLERANCE IN DIAMETER FOR BAMBOO SECTION
   - 70 MM = ±8.0 MM
   - 50 MM = ±5.0 MM
   - 40 MM = ±4.0 MM
   - 25 MM = ±3.0 MM
9. ALL BAMBOO ELEMENTS CONNECTED AT POINT OF INTER SECTION USING 4.8MM CARBON STEEL BOLTS.
10. AT ANY CHANGE IN LEVEL OR ALIGNMENT OF THE FENCE , THE SIZE OF EXCAVATION OR LEVEL OF THE POST MAY BE SUITABLE ADJUSTED. IN EXTREME CASES SEPARATE PITS MAY BE EXCAVATED TO INSTALL ADJACENT PANELS.
11. RETRO–REFLECTIVE TAPE– 50 MM WIDE

| SECTIONAL LABEL | SECTION | | QUANTITY/BAY |
|---|---|---|---|
| ① |  | 70MM DIA 8MM THCK | 2NO. X2.3M |
| ② |  | 50MM DIA 8MM THCK | 2NO. X 2.8M |
| ③ |  | 25MM DIA 6MM THCK | 11NO. X0.7M, 4NO.X1.5M |
| ④ |  | 40MM DIA 6MM THCK | 2NO. X 2.8M |

**BAHU-BALLI BAMBOO FENCE 1.5 M HEIGHT ABOVE GROUND**

| | NAME | DATE |
|---|---|---|
| DRWN | | |
| CHKD | | |
| STRD | | |
| APPD | | |

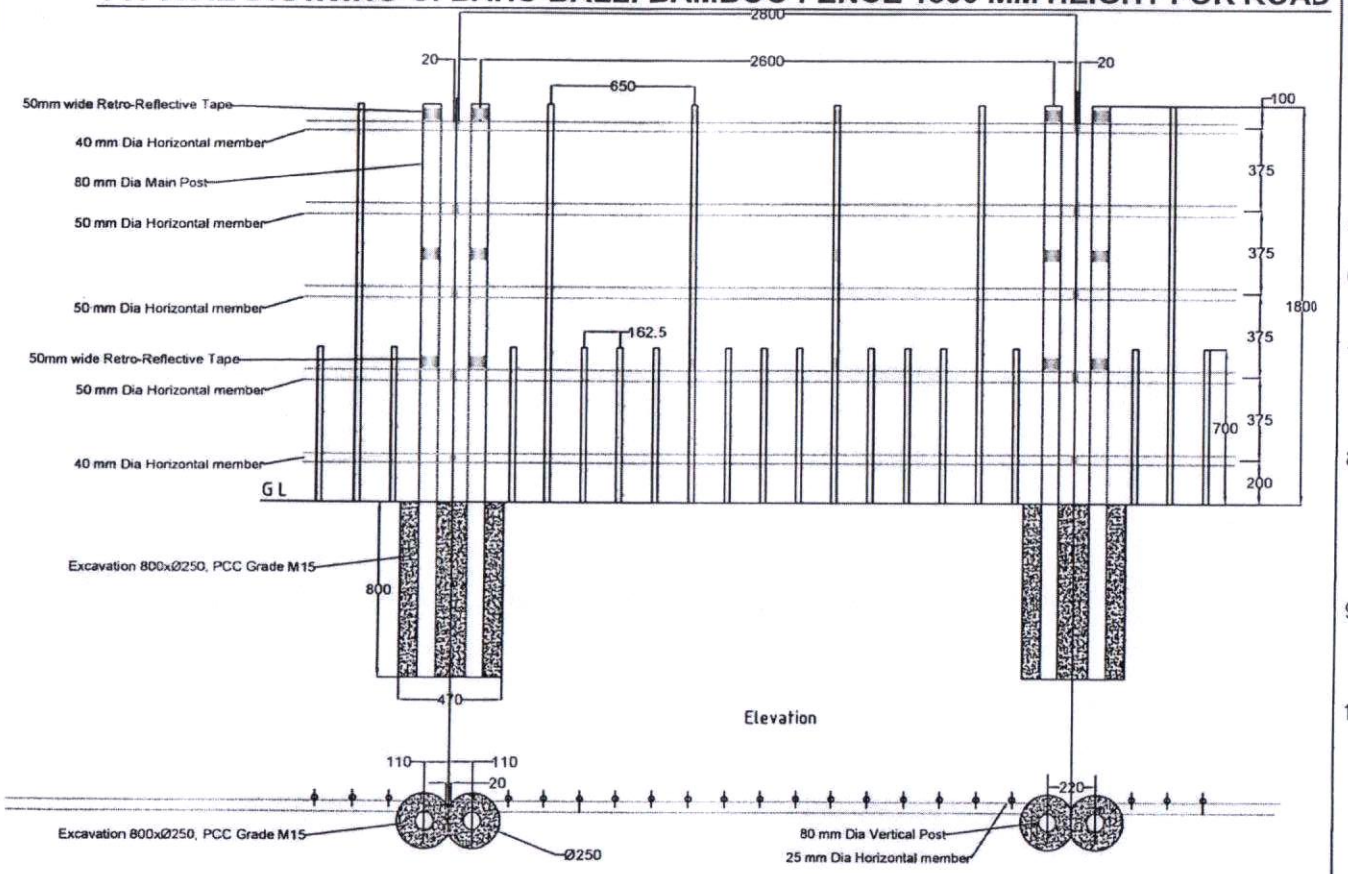
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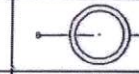
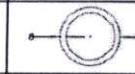
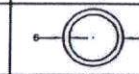
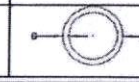
Chief Engineer
(R.D.D.)
Public Works Department
Nirman Bhawan, Naya Raipur

DRAWING NO.: TYPICAL DRAWING-B

SHEET 1 OF 1

# TYPICAL DRAWING-C: BAHU-BALLI BAMBOO FENCE 1800 MM HEIGHT FOR ROAD




| SECTIONAL LABEL | SECTION | | QUANTITY/BAY |
|---|---|---|---|
| ① |  | 80MM DIA 8MM THCK | 2NO. X 2.6M |
| ② |  | 50MM DIA 8MM THCK | 3NO. X 2.8M |
| ③ |  | 25MM DIA 6MM THCK | 11NO.X0.7M, 4NO.X1.8M |
| ④ |  | 40MM DIA 6MM THCK | 2NO. X 2.8M |

NOTE:

1. ALL DIMENSIONS ARE IN MM.
2. GRADE OF P.C.C. M15.
3. KREOSOTE TREATED AND HDPE COATED BAMBOO SHALL BE USED ABOVE GROUND LEVEL.
4. ONLY KREOSOTE TREATED BAMBOO SHALL BE USED BELOW GROUND LEVEL.
5. DEPTH OF EMBEDMENT COLUMN IS 800 MM.
6. TOP END OF ALL EXPOSED BAMBOO SHALL BE PROVIDED WITH CAPS /HDPE COATED.
7. THICKNESS OF HDPE COATING AROUND BAMBOO SECTIONS SHALL BE 1.0MM GENERAL AND 0.5MM KNOTS .
8. ALLOWABLE TOLERANCE IN DIAMETER FOR BAMBOO SECTION
   - 80 MM = ±8.0 MM
   - 50 MM = ±5.0 MM
   - 40 MM = ±5.0 MM
   - 25 MM = ±3.0 MM
9. ALL BAMBOO ELEMENTS CONNECTED AT POINT OF INTER SECTION USING 4.8MM CARBON STEEL BOLTS
10. AT ANY CHANGE IN LEVEL OR ALIGNMENT OF THE FENCE , THE SIZE OF EXCAVATION OR LEVEL OF THE POST MAY BE SUITABLE ADJUSTED. IN EXTREME CASES SEPARATE PITS MAY BE EXCAVATED TO INSTALL ADJACENT PANELS.
11. RETRO–REFLECTIVE TAPE– 50 MM WIDE

**BAHU-BALLI BAMBOO FENCE 1.8 M HEIGHT ABOVE GROUND**

| | NAME | DATE |
|---|---|---|
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SCALE 1:1

Chief Engineer
(R.D.D.)
Public Works Department
Nirman Bhawan, Naya Raipur

DRAWING NO.: TYPICAL DRAWING-C

SHEET 1 OF 1