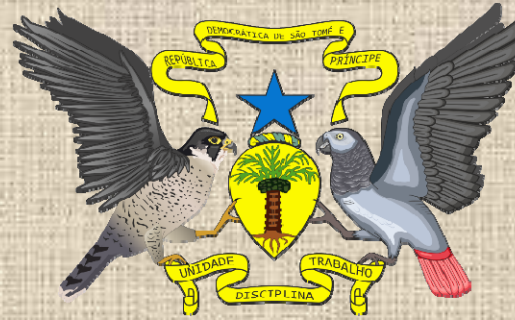


Fiduciary Agency For Project Administration (AFAP)



The National Institute of Roads (INAE)



DEMOCRATIC REPUBLIC OF SÃO TOMÉ AND PRÍNCIPE
UNITY - DISCIPLINE - WORK



PREPARATION OF PRELIMINARY DESIGN, ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND BIDDING DOCUMENTS FOR DESIGN-AND-BUILD CONTRACT FOR CONSTRUCTION OF BRIDGE OVER THE RIVER LEMBÁ AND A BRIDGE BRIGOMA



**FINAL REPORT
LOT 2 : BRIGOMA BRIDGE**

PLANS FOLDER

FUNDING : WORLD BANK (IDA)



ACI 2000
BP 5016
Bamako - Mali

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February 2024

DRAWING LIST

| DR. N° | NAME | SCALES |
|--------|--|--------------|
| | I - GENERAL PLANS | |
| I-1 | Location plan | Graphical |
| I-2 | General arrangement | 1/2500 |
| I-3 | Typical cross section | 1/50 |
| | II - LAYOUT | |
| II-1 | Brigoma bridge - Road plan, profile and drainage | 1/2000-1/400 |
| | III - BRIDGE | |
| III-1 | Overall Plan (1 to 2) | Various |
| III-2 | Deck - Formwork and details (1 to 3) | Various |
| III-3 | Piers - Formwork and details (1 to 2) | Various |
| III-4 | Abutments - Formwork and details (1 to 3) | Various |
| III-5 | Girder reinforcement (1 to 3) | Various |
| | IV - TYPICAL PLANS | |
| IV-1 | Embankment downspouts - Typical details (1 to 2) | Various |
| IV-2 | Crash barrier - Typical details | Various |
| IV-3 | Precast cornice - Typical details | 1/20 |
| IV-4 | Guard-rail type S8 - Typical details | Various |
| IV-5 | Gargoyles - Typical details | 1/25 |

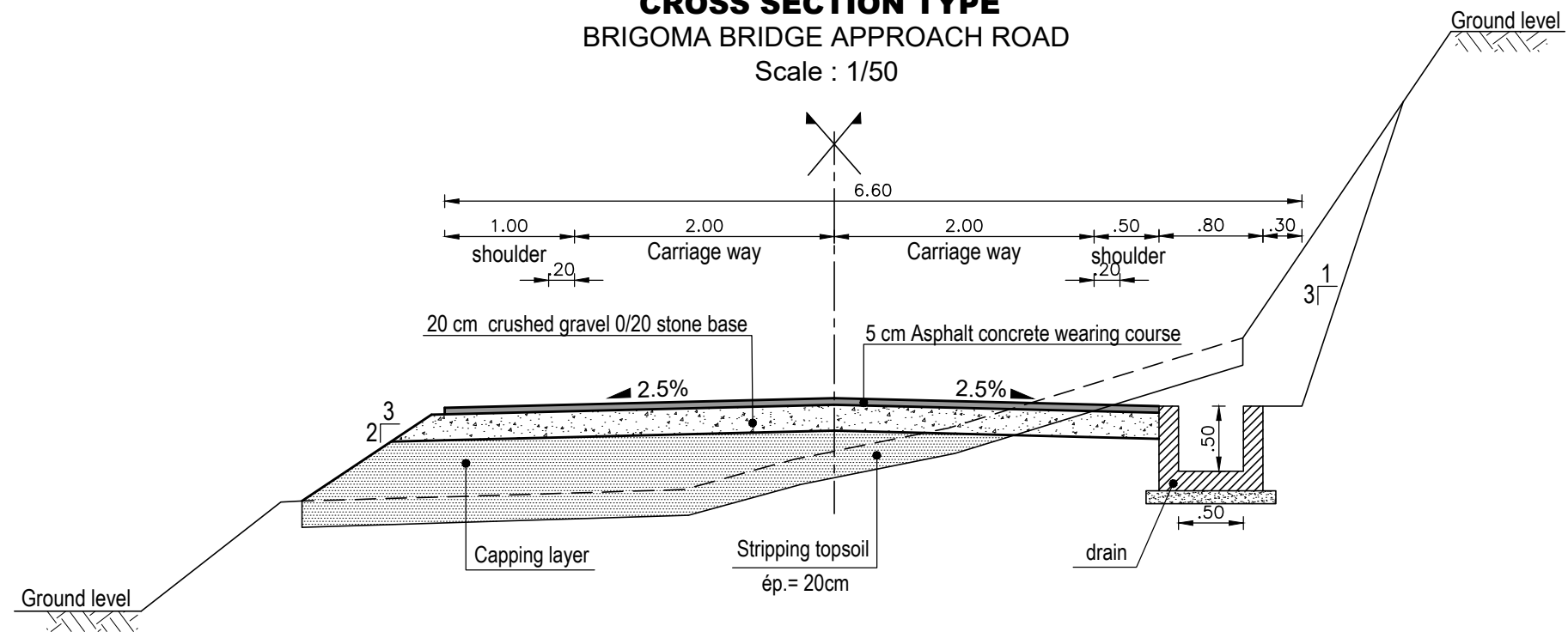
I - GENERAL PLANS



| Revision | Date | Modification | Drawn : | Checked : | Approved : |
|----------|-----------|------------------|---------|-----------|------------|
| A | Feb. 2024 | Original Edition | L.GASMI | L.MANI | R.KHEMIR |





CROSS SECTION TYPE
BRIGOMA BRIDGE APPROACH ROAD
 Scale : 1/50

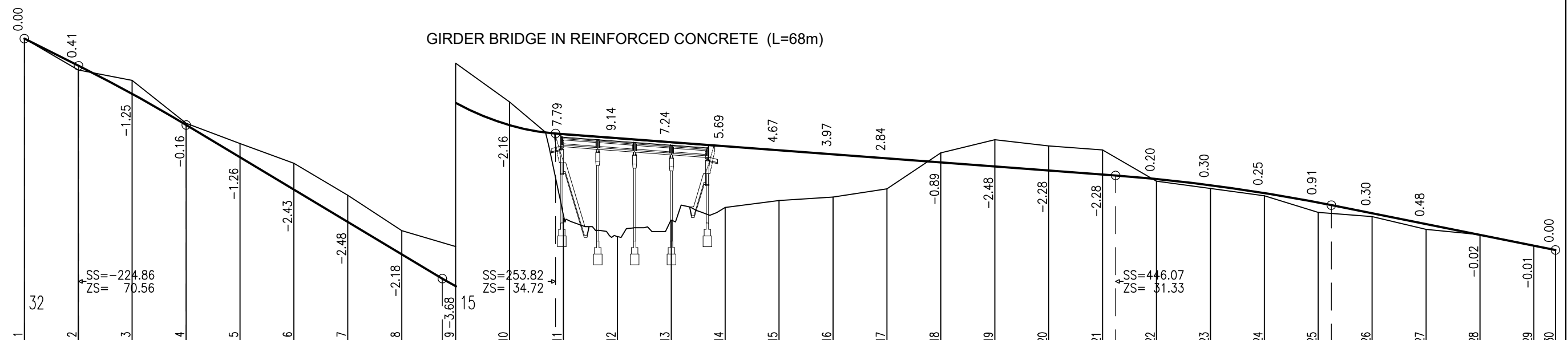
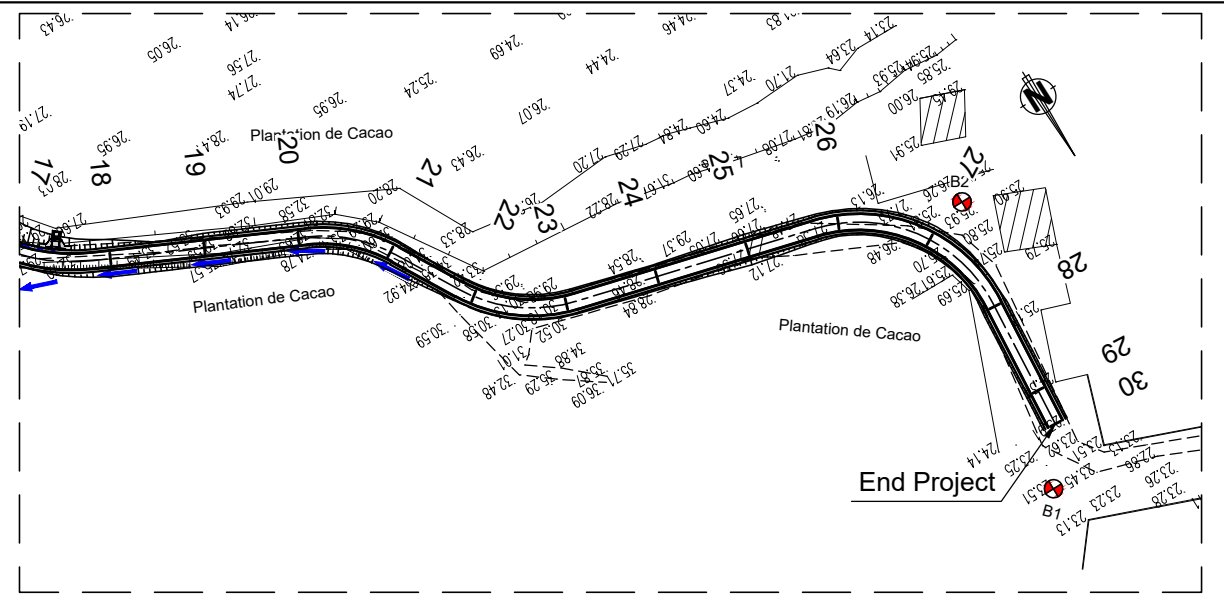
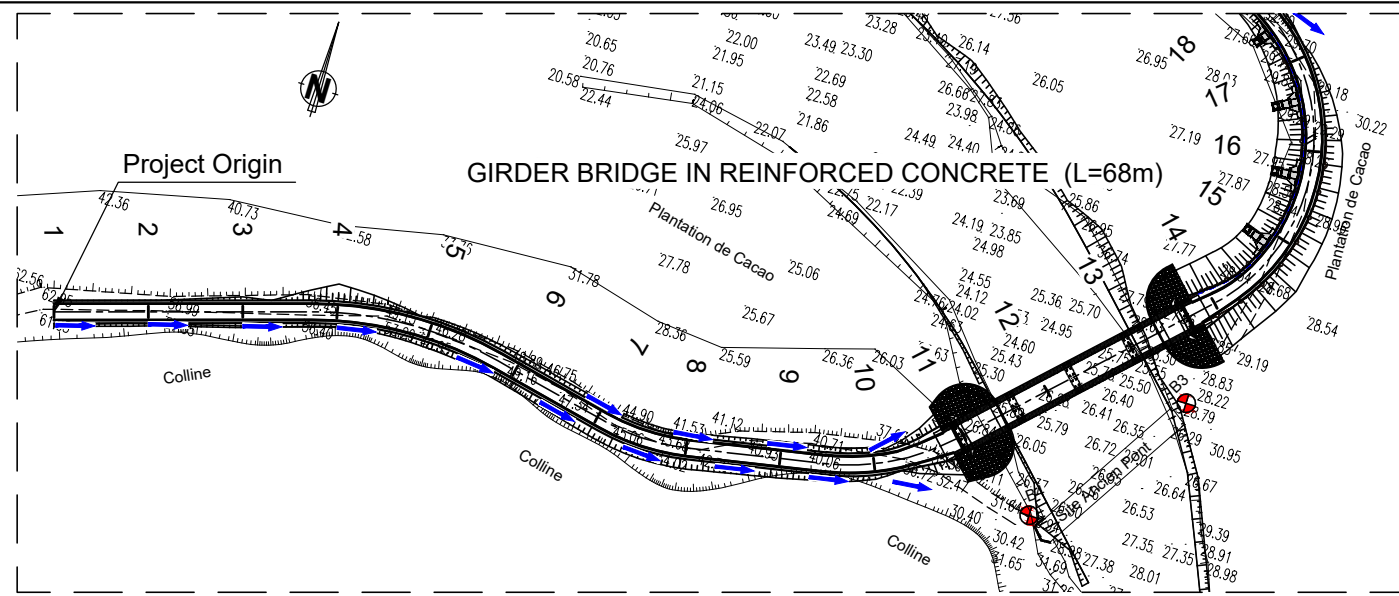


II - LAYOUT

ROAD PLAN, PROFILE AND DRAINAGE

LEGEND

| | |
|--|--------------------------------------|
| — † — | Project axis |
| 20 | SC 20 |
|  B1 | Base polygon point |
|  | Rectangular Concrete drain (0.5x0.5) |



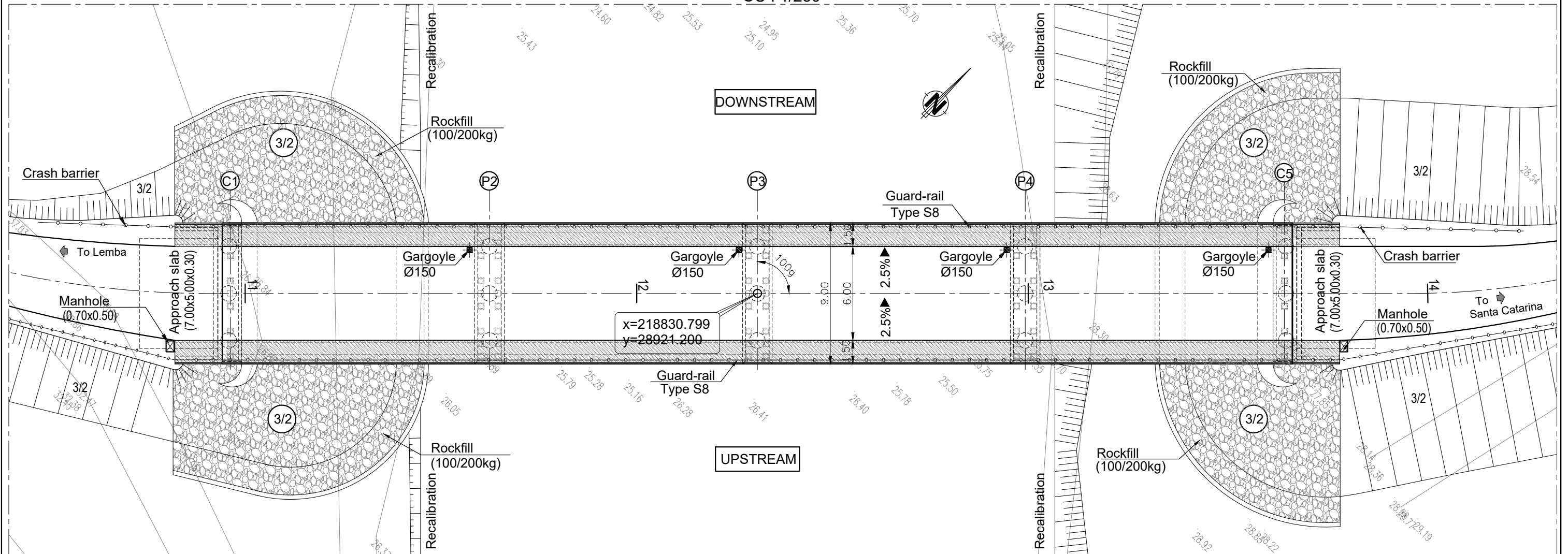
SCALE H : 1/2000
SCALE L : 1/400
COMPARISON PLAN

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|----------------------|-------|--------------------|-------|-----------|----------|-------|--------|--------|----------------------|--------|-----------------|--------|----------------------|--------|--------|------------------|--------|--------|-----------------------|--------|--------|--------|------------------|--------|-----------------------|--------|--------|------------------|--------|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|
| GROUND LEVELS | 60.57 | 57.66 | 57.66 | 56.70 | 53.82 | 52.73 | 52.73 | 50.84 | 49.01 | 46.06 | 45.85 | 42.76 | 42.71 | 41.66 | 41.30 | 39.59 | 37.71 | 26.93 | 25.21 | 25.21 | 26.73 | 27.91 | 28.55 | 28.88 | 29.64 | 32.99 | 34.20 | 33.62 | 33.59 | 33.25 | 32.55 | 30.35 | 29.68 | 29.61 | 29.01 | 27.46 | 27.37 | 27.18 | 27.08 | 25.89 | 25.40 | 24.39 | 23.98 | | | | |
| CHAINAGE | | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 25 | 10 | |
| CUMULATIVE CHAINAGE | 0.00 | 25.00 | 25.14 | 50.00 | 68.17 | 75.00 | 75.08 | 100.00 | 125.00 | 150.00 | 151.58 | 175.00 | 175.78 | 193.83 | 200.00 | 211.91 | 225.00 | 250.00 | 275.00 | 275.00 | 300.00 | 325.00 | 350.00 | 375.00 | 400.00 | 425.00 | 450.00 | 475.00 | 477.03 | 500.00 | 506.04 | 525.00 | 550.00 | 552.55 | 575.00 | 600.00 | 606.07 | 618.65 | 625.00 | 650.00 | 675.00 | 700.00 | 710.00 | | | | |
| ROAD LEVELS | 60.57 | 58.07 | 58.06 | 55.45 | 53.39 | 52.58 | 52.57 | 49.58 | 46.58 | 43.58 | 43.39 | 40.58 | 40.48 | 38.32 | 37.62 | 36.48 | 35.55 | 34.72 | 34.35 | 34.35 | 33.97 | 33.60 | 33.22 | 32.85 | 32.47 | 32.10 | 31.72 | 31.35 | 31.32 | 30.97 | 30.88 | 30.55 | 29.98 | 29.92 | 29.26 | 28.37 | 28.13 | 27.63 | 27.38 | 26.38 | 25.38 | 24.38 | 23.98 | | | | |
| VERTICAL ALIGNEMENT | R=10% | | R=2500 L=49.935 | | L=118.755 | | | P=12% | | R=500 L=52.492 | | L=259.715 | | | | | P=1.5% | | | R=4000 L=100.037 | | | | L=103.925 | | | P=4% | | | | | | | | | | | | | | | | | | | | |
| HORIZONTAL ALIGNEMENT | r=81.138 L=68.167 | | R=100 L=51.625 | | | L=31.792 | | R=60 | | r=88.325 L=36.124 | | R=60 L=35.67 | | r=50.478 L=76.919 | | | R=50 L=95.743 | | | r=328.575 L=56.793 | | R=40 | | R=40 L=31.847 | | r=316.816 L=66.104 | | | R=40 L=55.534 | | r=5.202 L=35.815 | | | | | | | | | | | | | | | | |
| SUPERELEVATION LEFT | 2.50 | 2.50 | 2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | 2.75 | 2.75 | 2.75 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | 2.50 | | |
| SUPERELEVATION RIGHT | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 | -2.50 |

III - BRIDGE

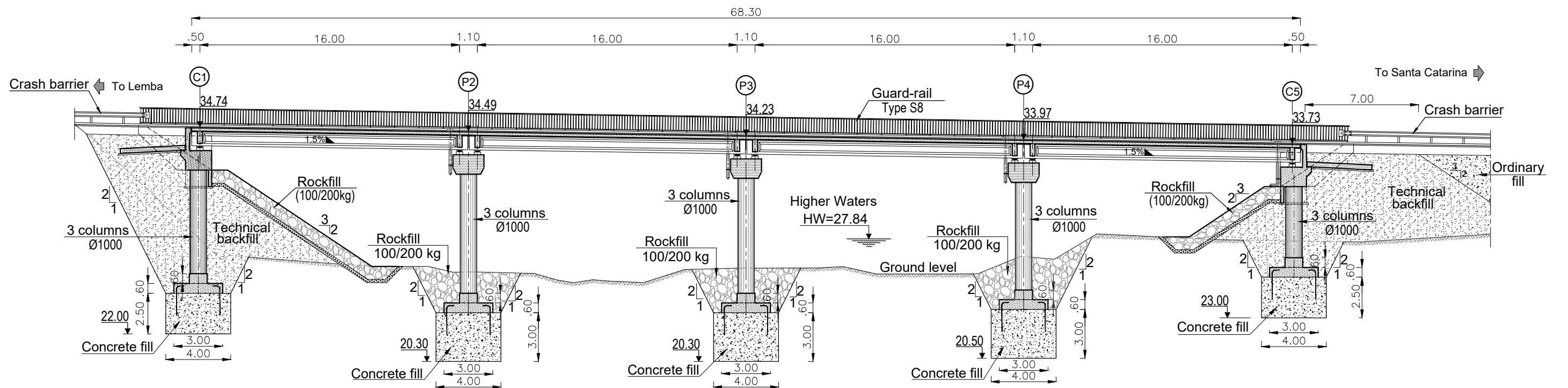
PLAN VIEW

SC : 1/250

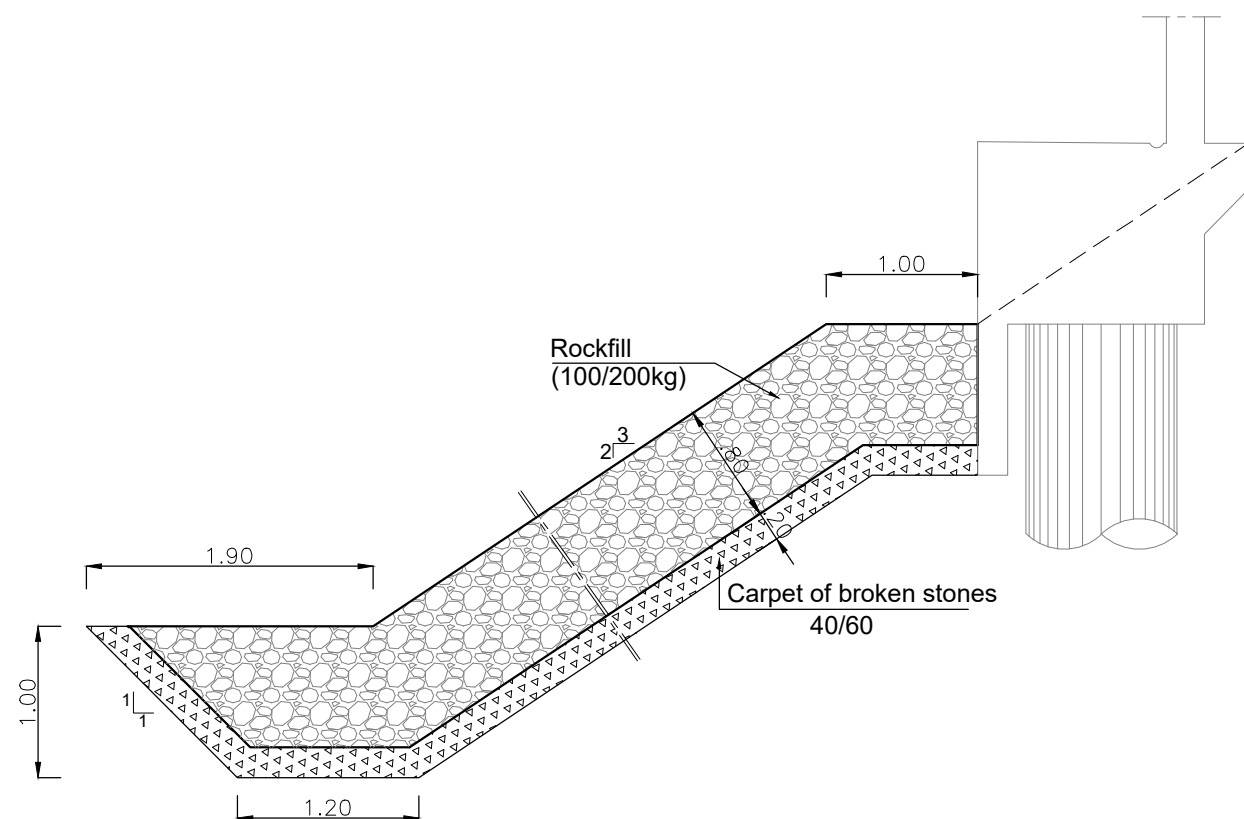


LONGITUDINAL SECTION

SC : 1/250



ROCKFILL DETAIL
SC : 1/50

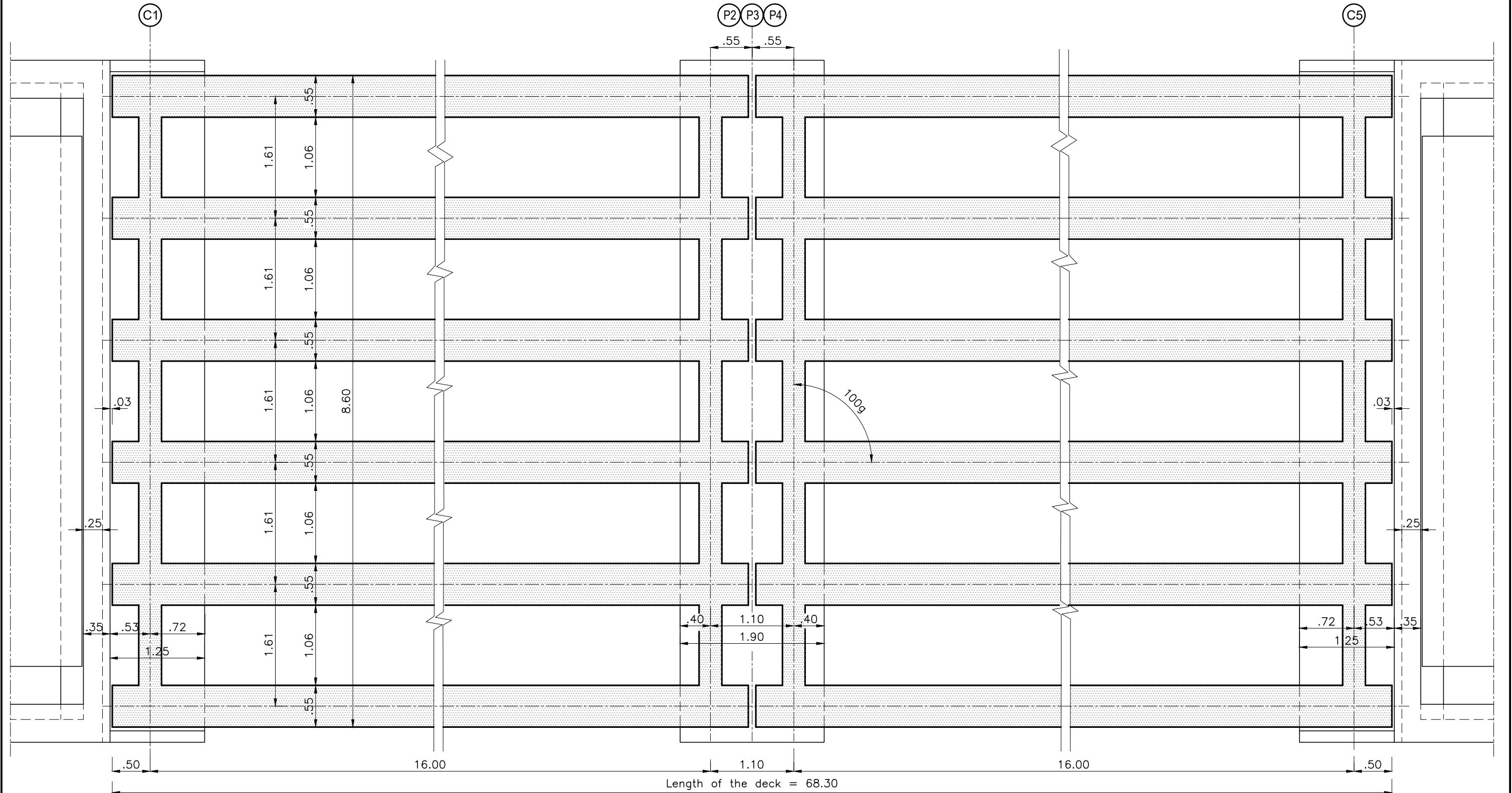


NOTE :

- the formwork of the visible facings will be carried out using fine formwork.
- the formwork of the hidden facings will be carried out using ordinary formwork.
- the facings in contact with the backfill will be painted in 3 crossed coats of bituminous paint.
- exposed edges will be chamfered 2.5x2.5cm.
- the concrete cast in-place will be of quality:
 - * C30/37 (B3) dosed at 400Kg of cement /m3 for the deck.
 - * C25/30 (B2) for the crosshead, columns, approach slabs, wing wal, stem wall, hide walls & cornice.
 - * C30/37 (B4), dosed at 400Kg of cement HRS/m3 for the footings & Ribs.
 - * C16/20 (B0), dosed at 150Kg of cement/m3 for bedding concrete.
 - * C16/20 (B1), dosed at 250Kg of cement/m3 for the concrete fill .

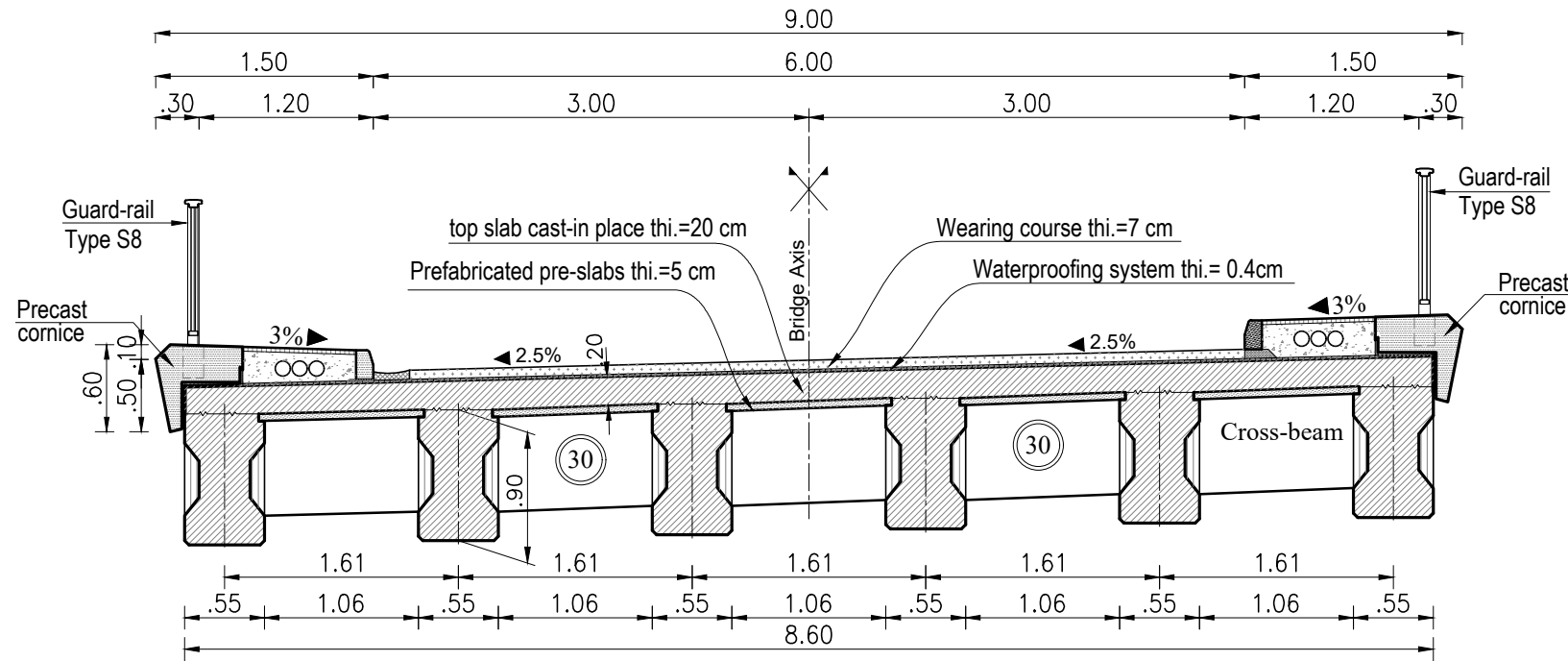
DECK PLAN VIEW

SC : 1/50



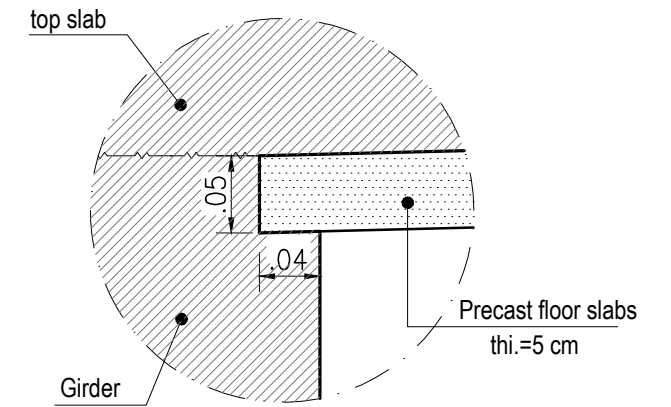
DECK CROSS SECTION

SC : 1/50



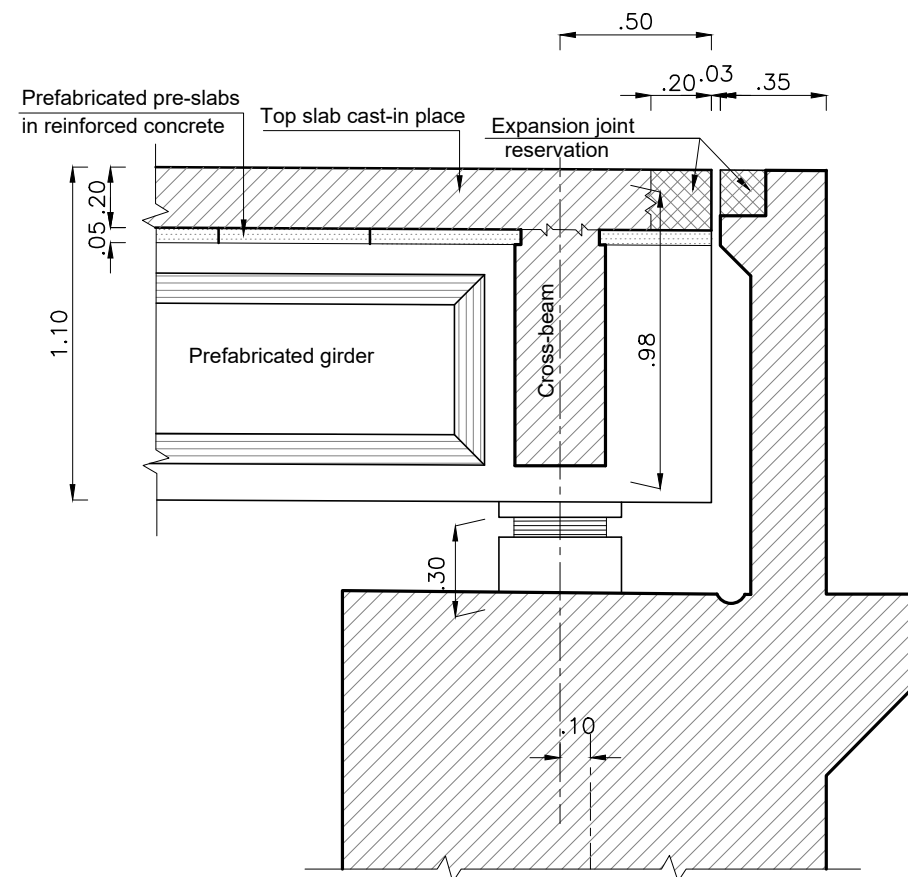
DETAIL 1

SC : 1/5



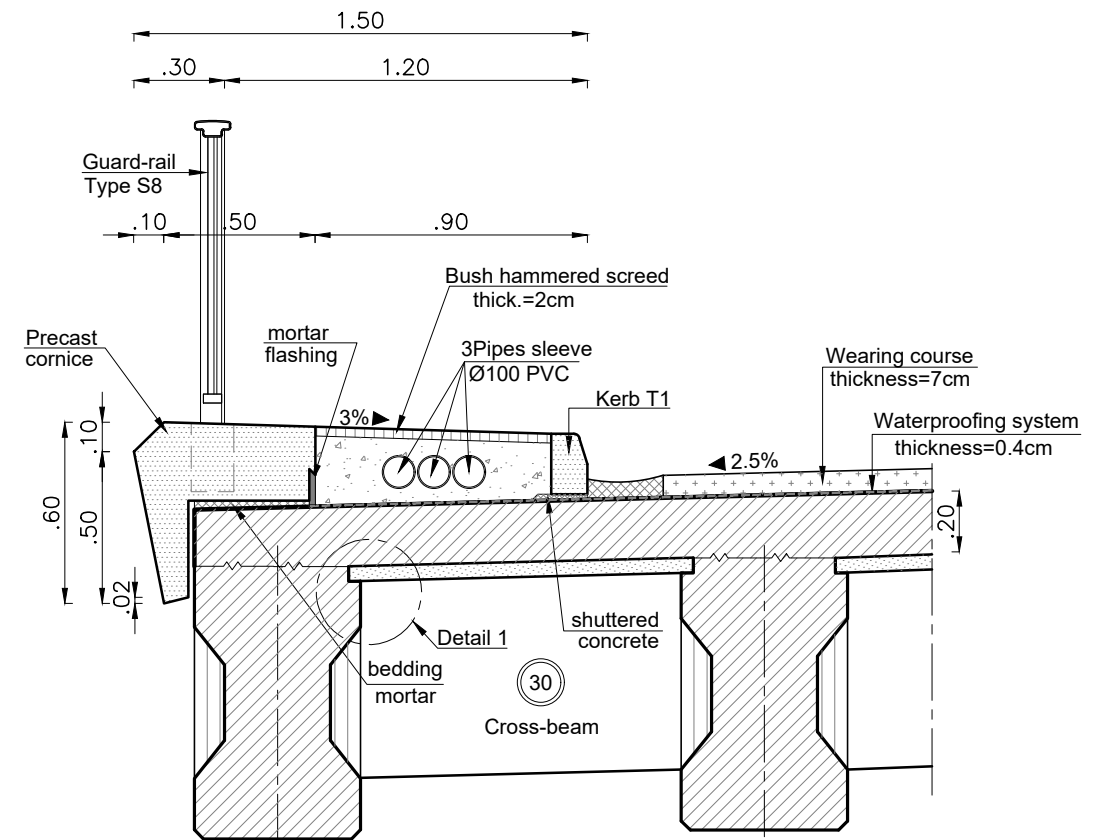
ABUTMENT DETAIL

SC : 1/25



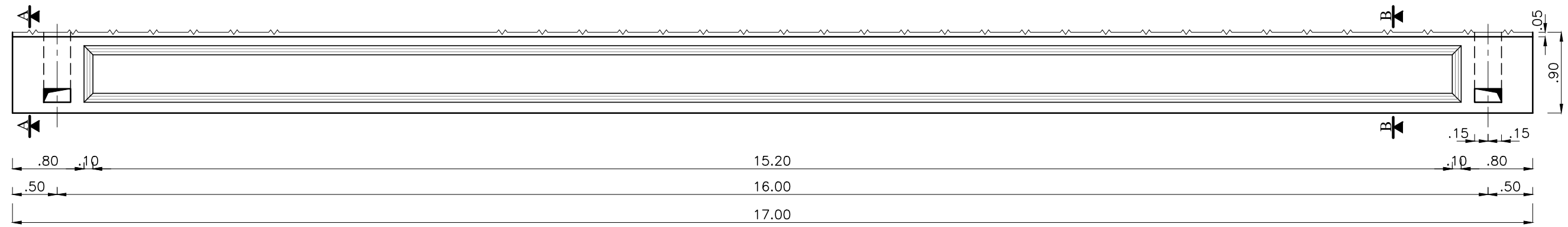
SIDEWALK AND CORNICE DETAIL

SC : 1/25



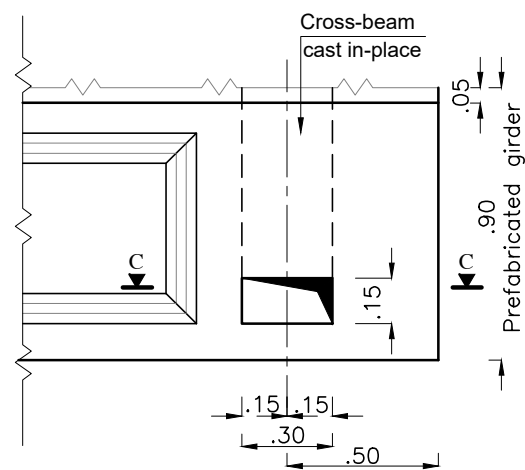
GIRDERS ELEVATION

SC : 1/50

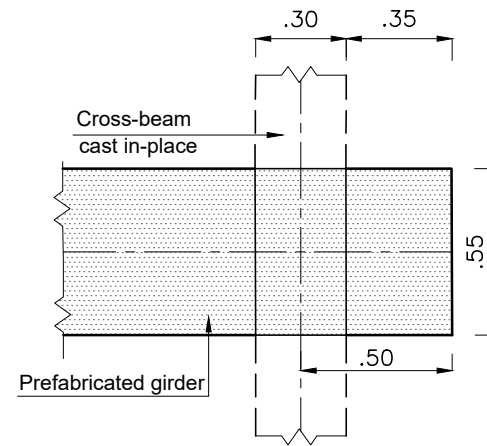


DETAIL RESERVATIONS FOR RIBBED STEEL OF CROSS-BEAM IN INTERMEDIATE GIRDER

ELEVATION
SC : 1/25

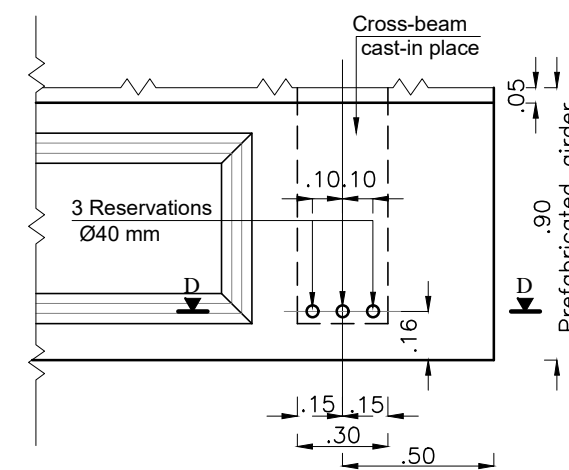


SECTION C-C
SC : 1/25

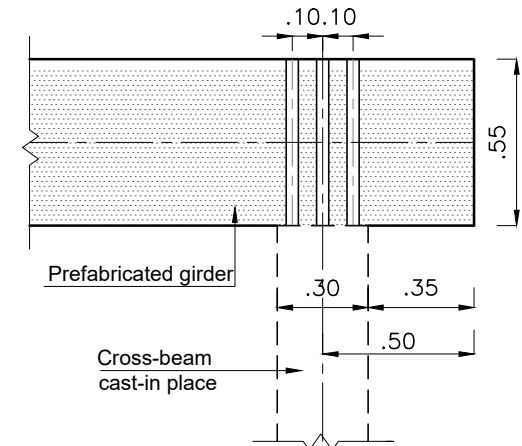


DETAIL RESERVATIONS FOR RIBBED STEEL OF CROSS-BEAM IN EDGE GIRDER

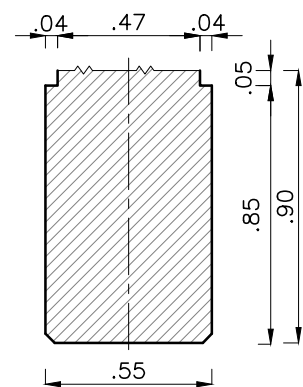
ELEVATION
SC : 1/25



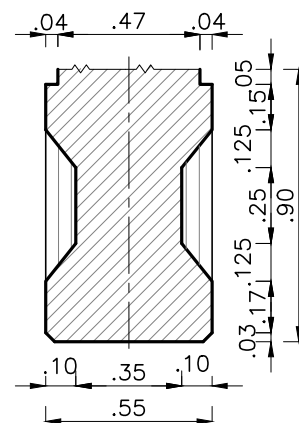
SECTION D-D
SC : 1/25



SECTION A-A
SC : 1/25



SECTION B-B
SC : 1/25

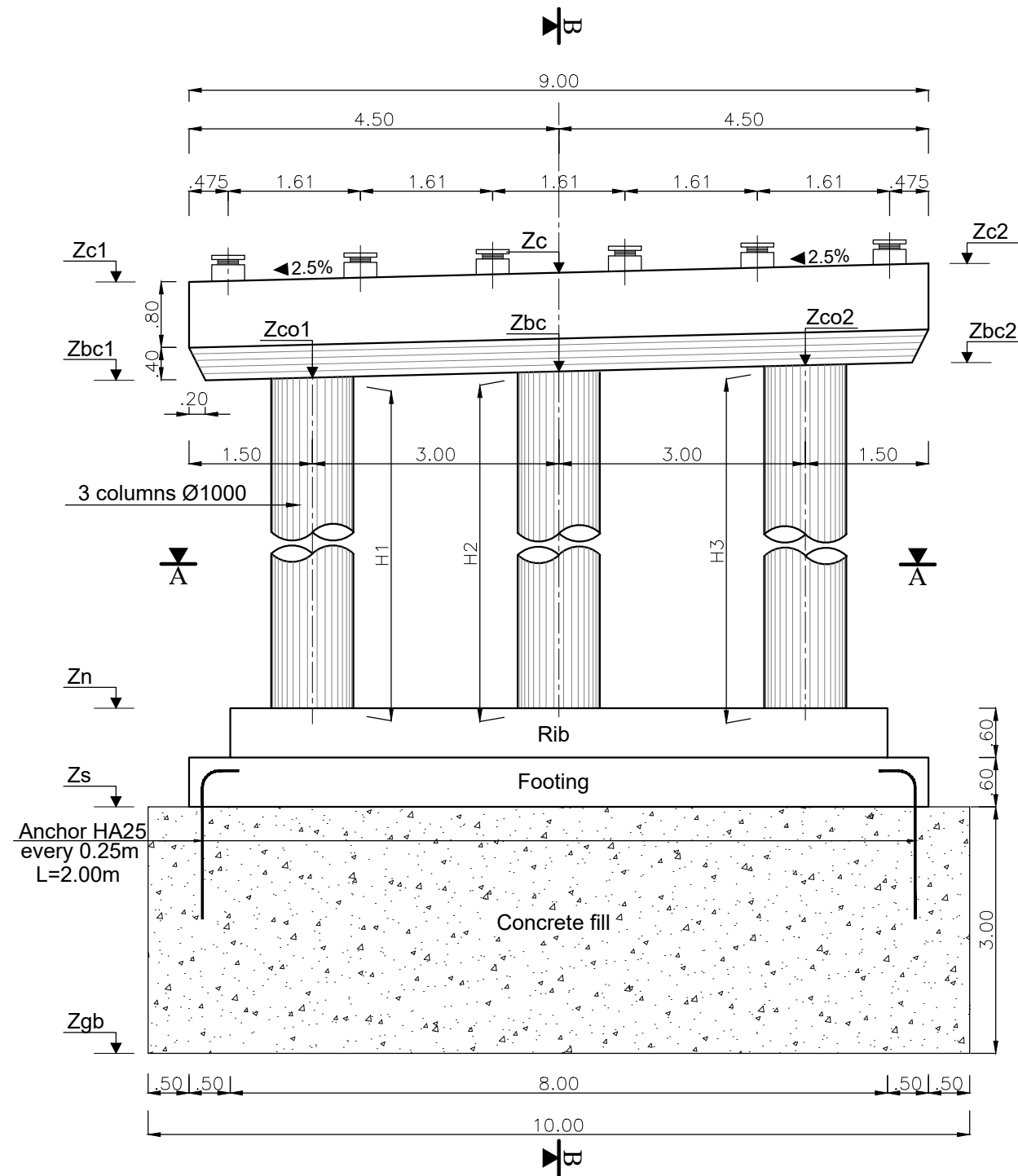


NOTE :

- the concrete will be of quality C30/37 (B3) for the deck
- $f_{ck} = 30\text{MPa}$

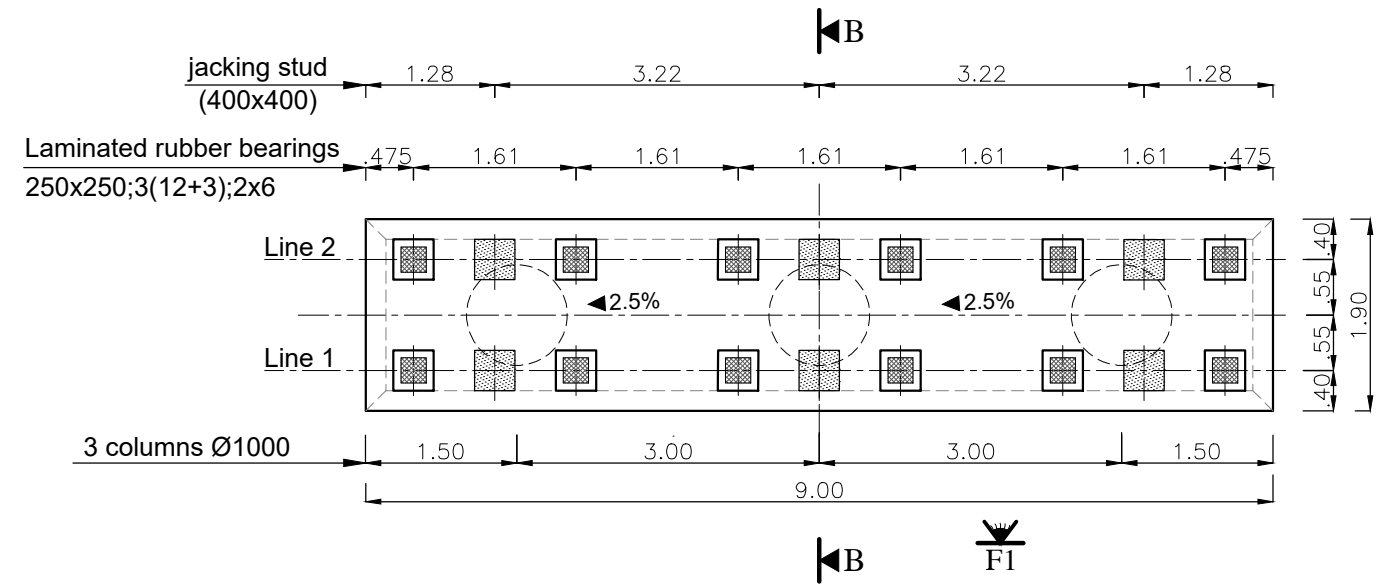
VIEW FOLLOWING F1

SC : 1/75



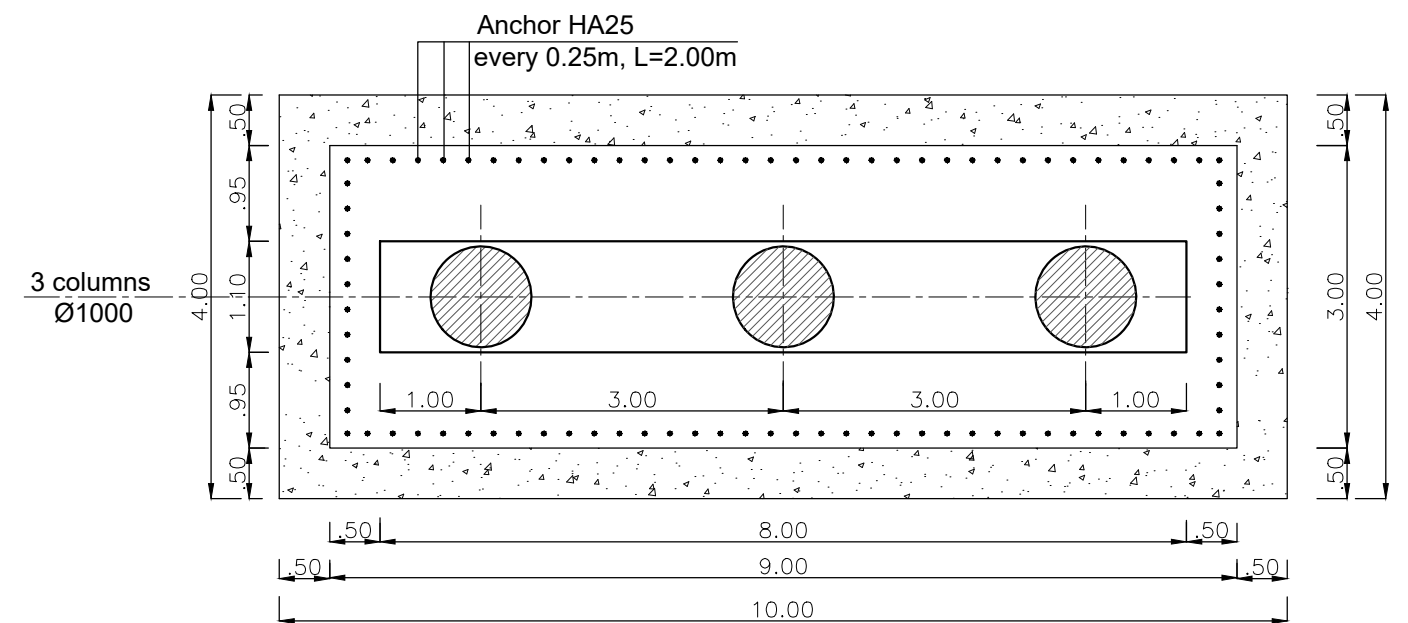
CROSSHEAD PLAN VIEW

SC : 1/75



SECTION A-A

SC : 1/75

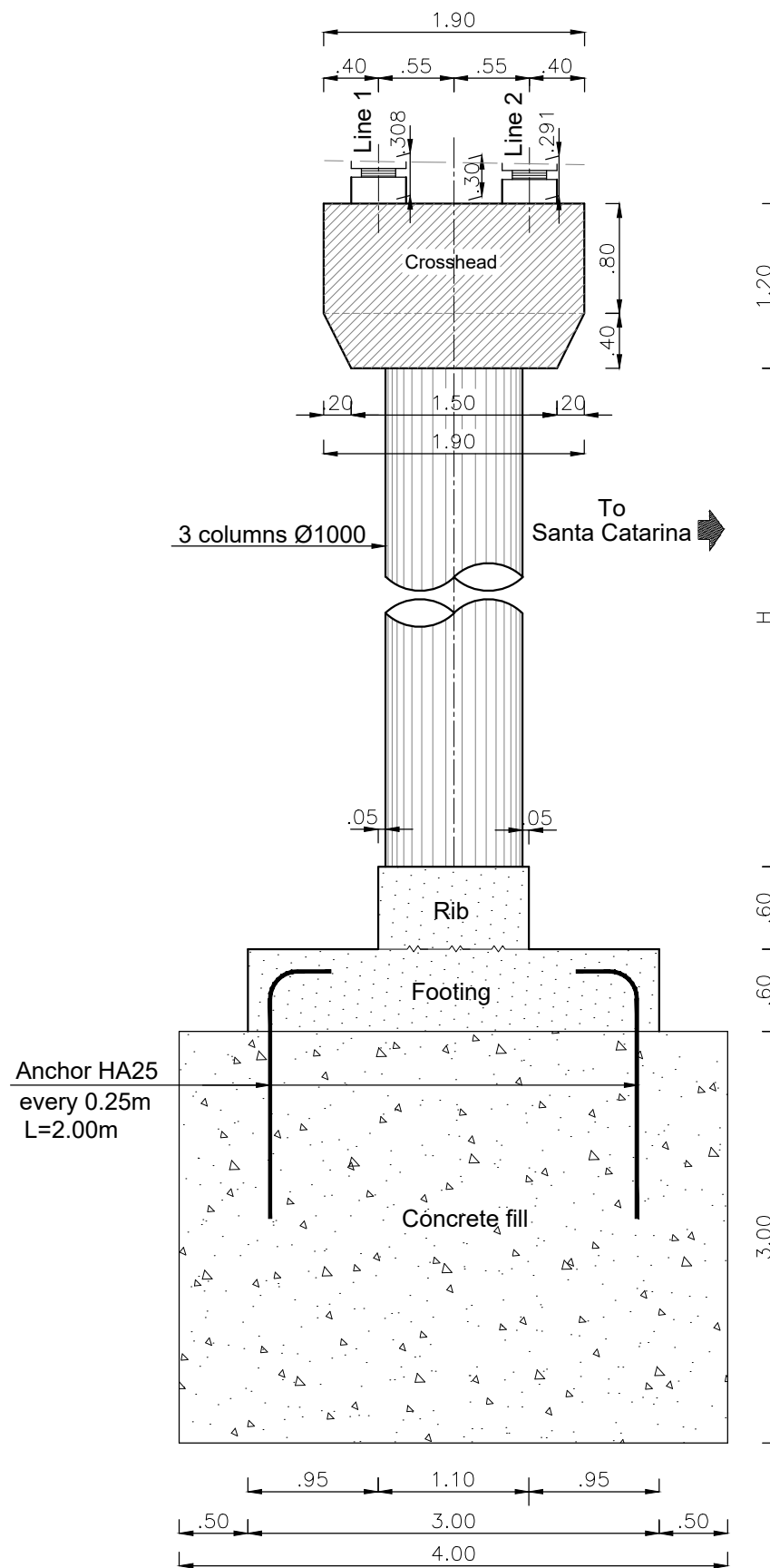


LEVELLING TABLE

| Pier | Zc | Zc1 | Zc2 | Zbc | Zbc1 | Zbc2 | Zco1 | Zco2 | H1 | H2 | H3 | Zn | Zs | Zgb |
|------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|
| P2 | 33.007 | 32.894 | 33.119 | 31.807 | 31.699 | 31.914 | 31.732 | 31.882 | 7.232 | 7.307 | 7.382 | 24.50 | 23.30 | 20.30 |
| P3 | 32.747 | 32.634 | 32.859 | 31.547 | 31.439 | 31.654 | 31.472 | 31.622 | 6.972 | 7.047 | 7.122 | 24.50 | 23.30 | 20.30 |
| P4 | 32.487 | 32.374 | 32.599 | 31.287 | 31.179 | 31.394 | 31.212 | 31.362 | 6.512 | 6.587 | 6.662 | 24.70 | 23.50 | 20.50 |

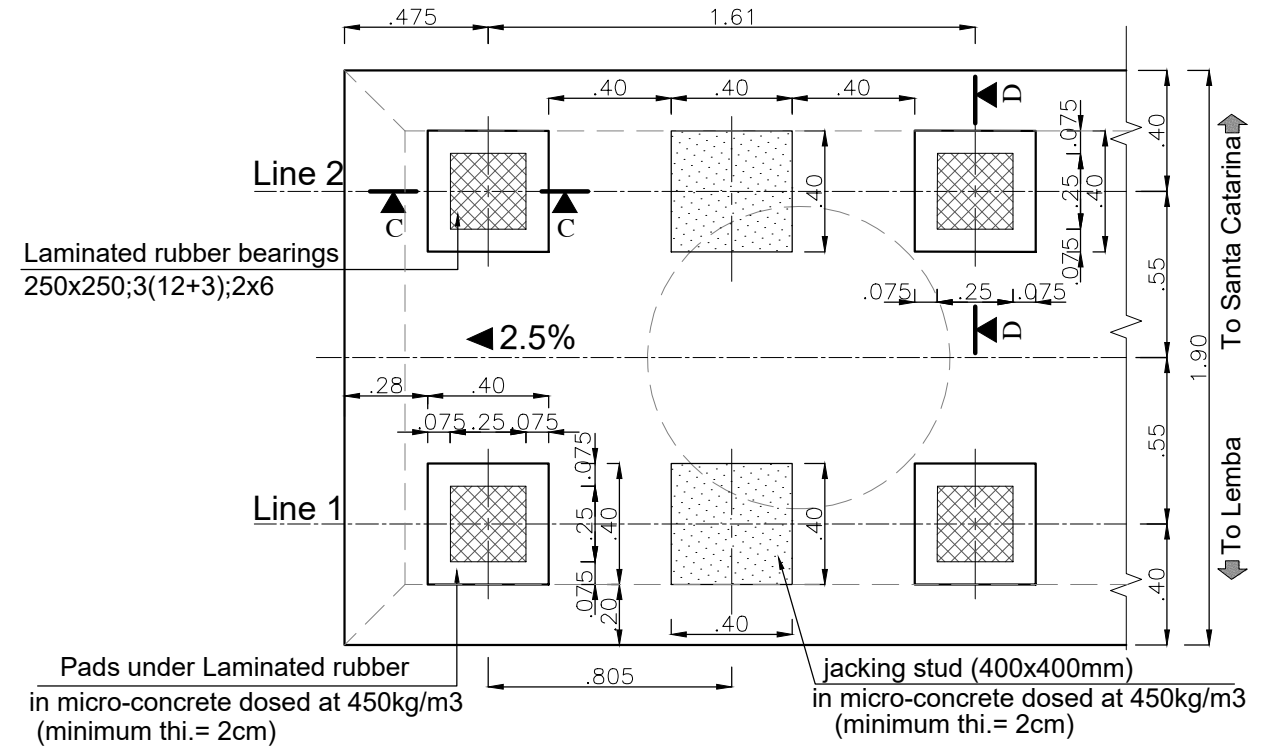
SECTION B-B

SC : 1/50



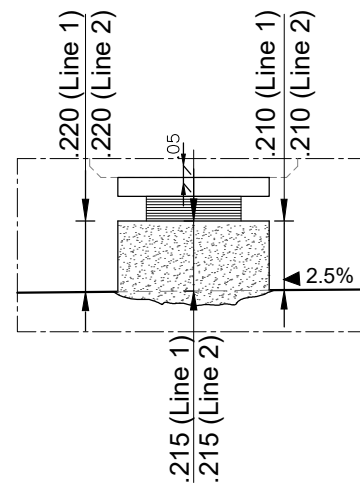
PADS DETAIL

SC : 1/25



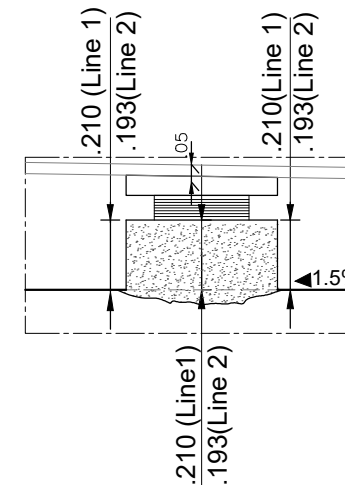
SECTION C-C

SC : 1/20



SECTION D-D

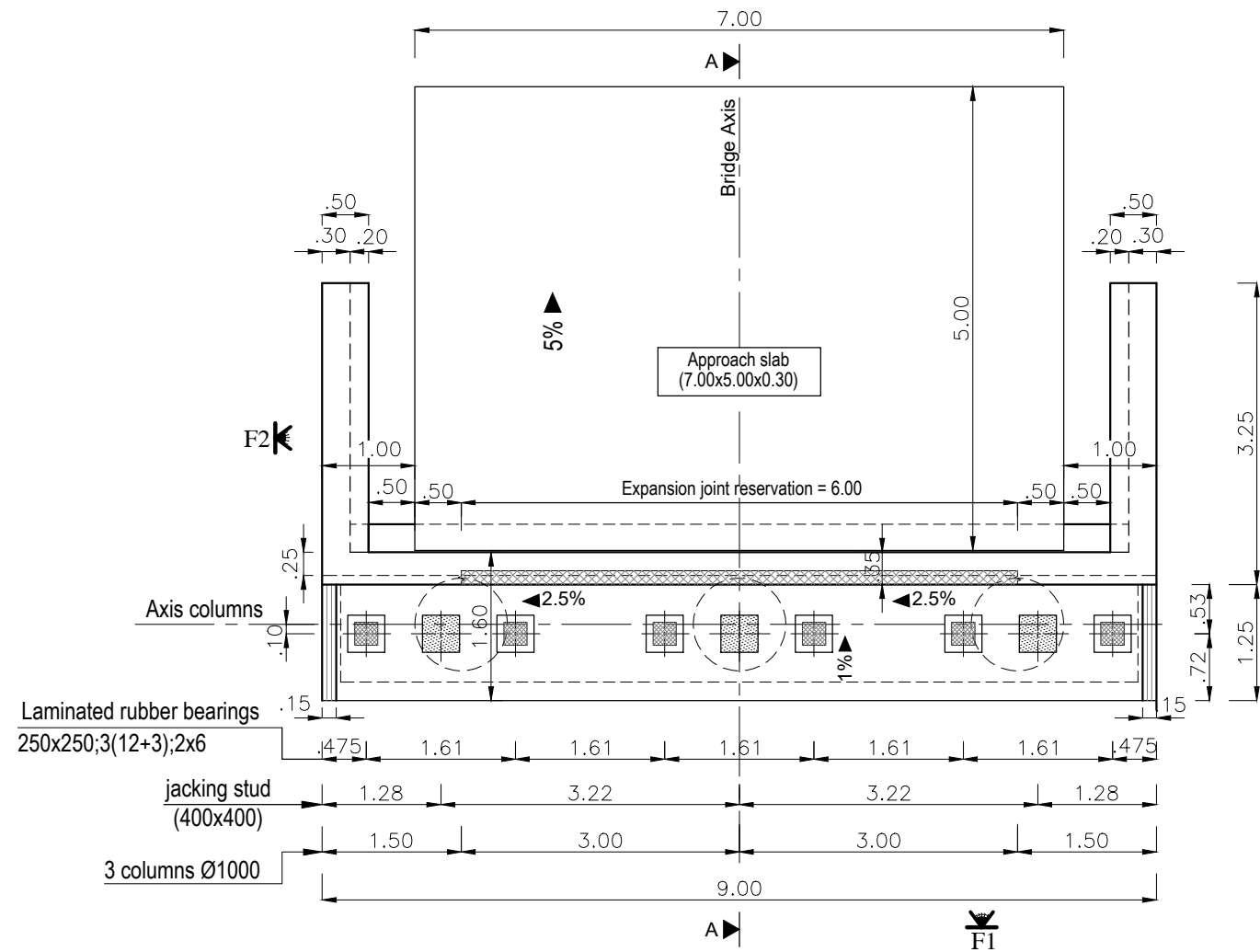
SC : 1/20



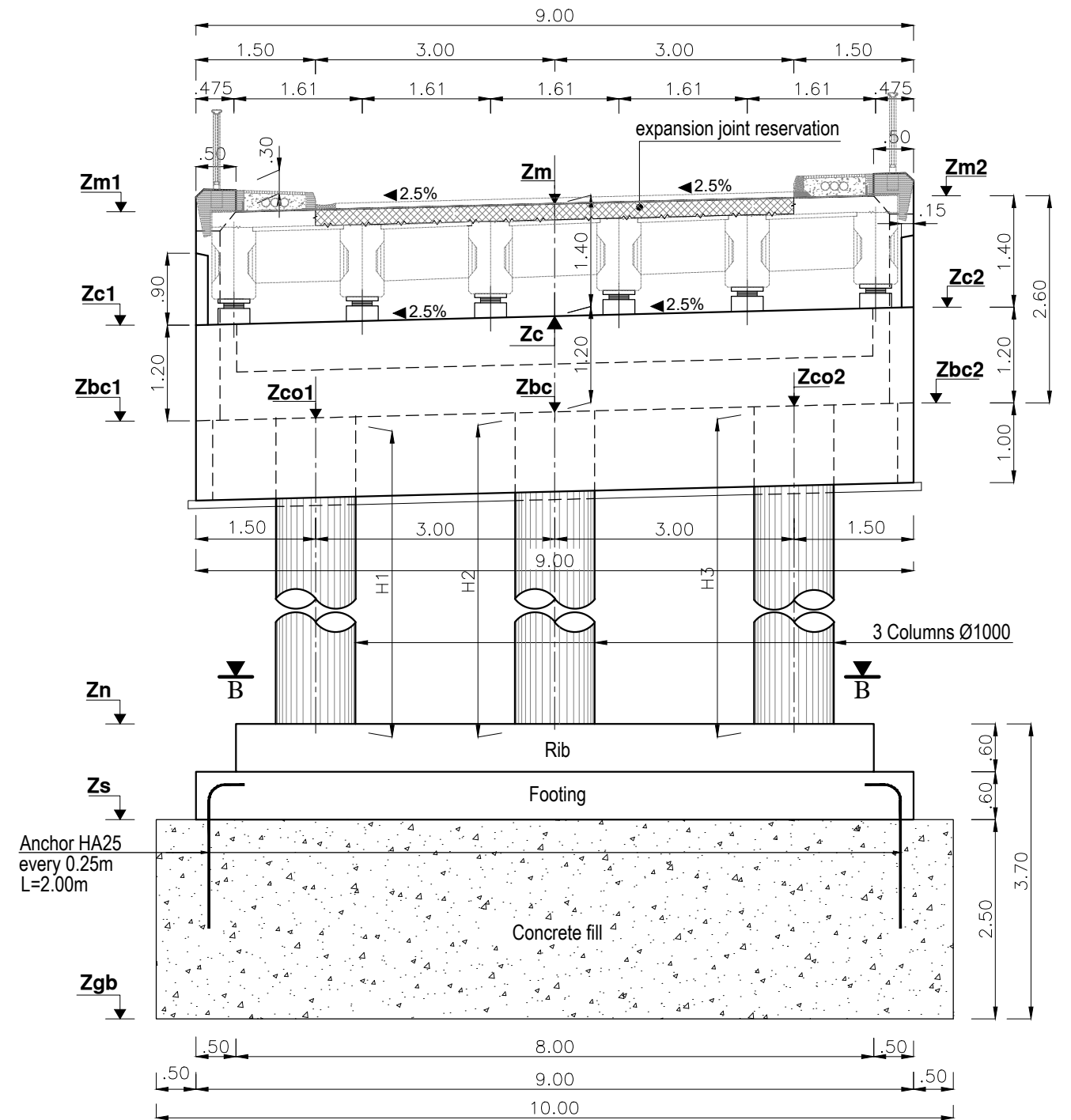
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- exposed edges will be chamfered 2.5x2.5cm.
- the concrete cast in-place will be of quality:
 - * C25/30 (B2) for the crosshead & columns.
 - * C30/37 (B4) dosed at 400Kg of cement HRS/m3 for the footings & Ribs.
 - * C16/20 (B1), dosed at 250Kg of cement/m3 for the concrete fill .
 - * Micro-concrete dosed at 450kg/m3 for the pads.

PLAN VIEW
SC : 1/75



VIEW FOLLOWING F1
SC : 1/75

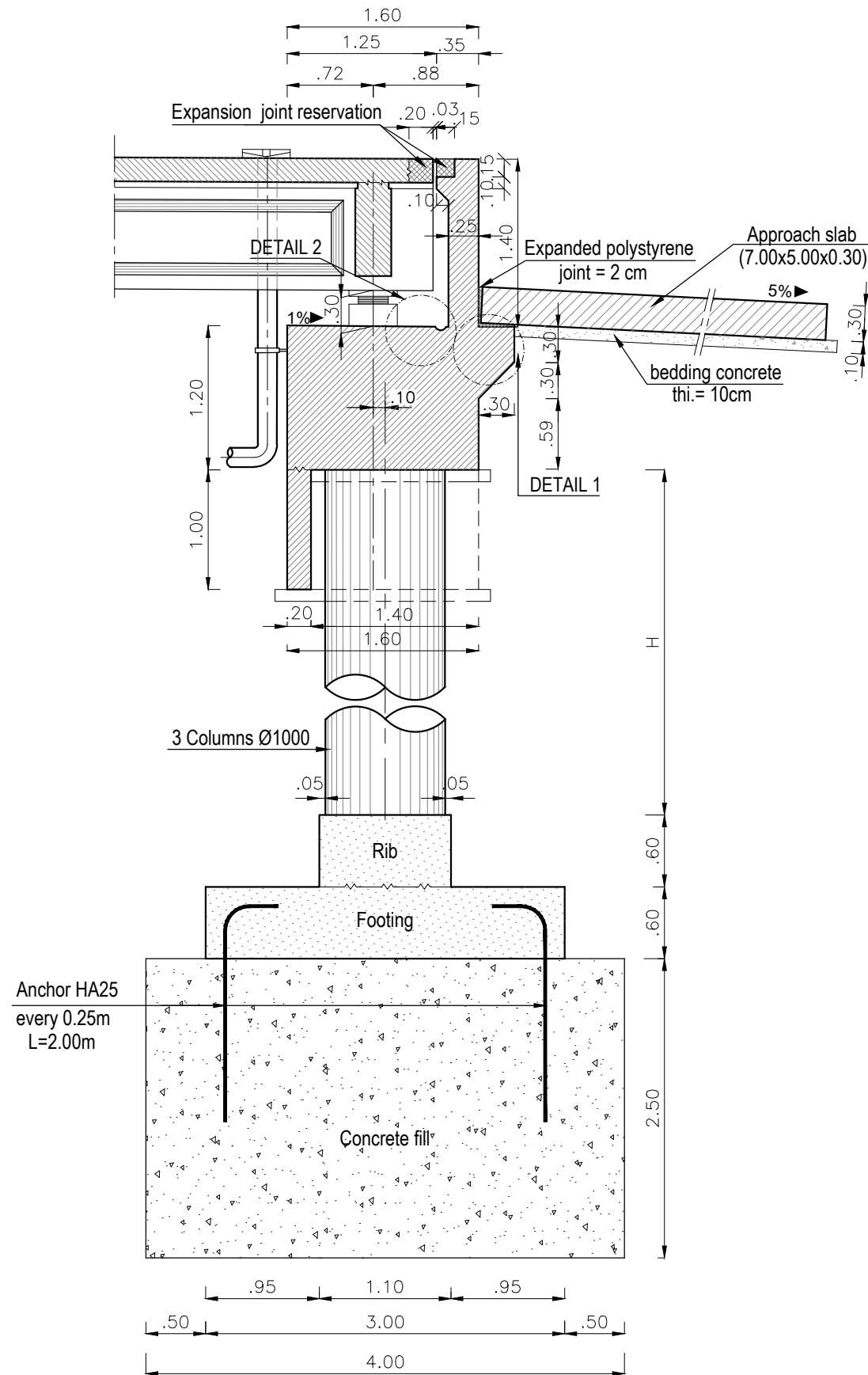


LEVELLING TABLE

| Abutment | Zm | Zm1 | Zm2 | Zc | Zc1 | Zc2 | Zbc | Zbc1 | Zbc2 | Zco1 | Zco2 | Zn | Zs | Zgb | H1 | H2 | H3 |
|----------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|-------|-------|-------|
| C1 | 34.666 | 34.566 | 34.778 | 33.266 | 33.153 | 33.378 | 32.066 | 31.953 | 32.178 | 31.991 | 32.141 | 25.70 | 24.50 | 22.00 | 6.291 | 6.366 | 6.441 |
| C5 | 33.656 | 33.556 | 33.768 | 32.256 | 32.143 | 32.368 | 31.056 | 30.943 | 31.168 | 30.981 | 31.131 | 26.70 | 25.50 | 23.00 | 4.281 | 4.356 | 4.431 |

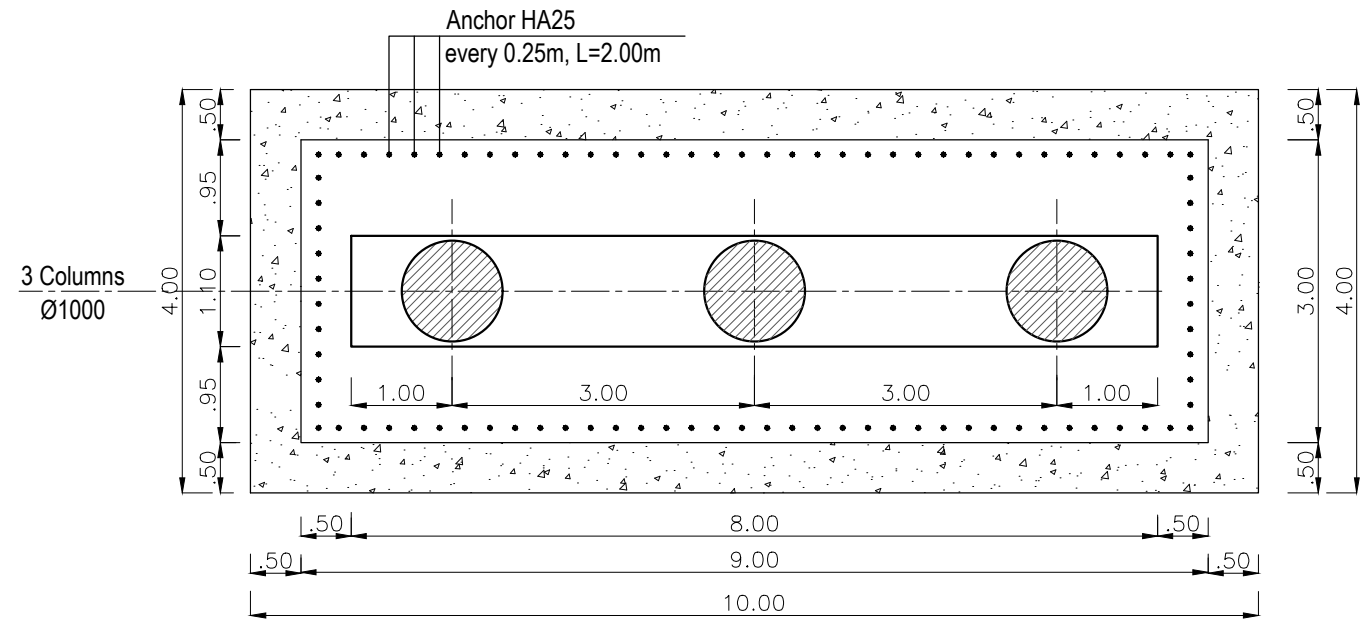
SECTION A-A

SC : 1/50



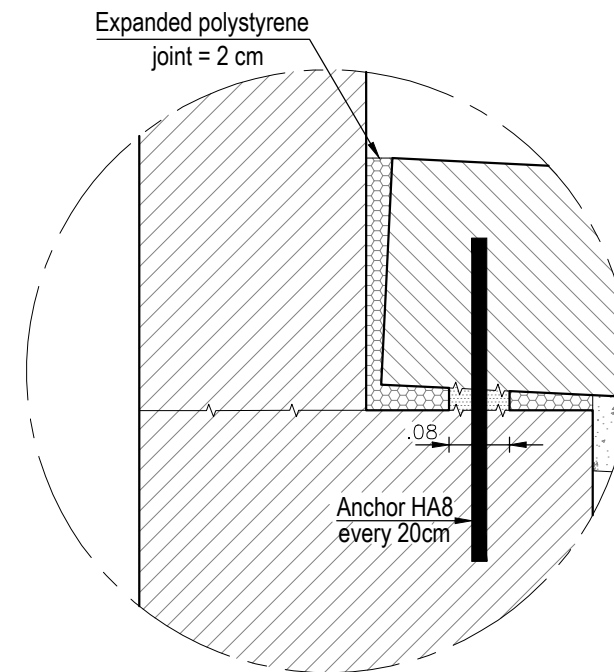
SECTION B-B

SC : 1/75



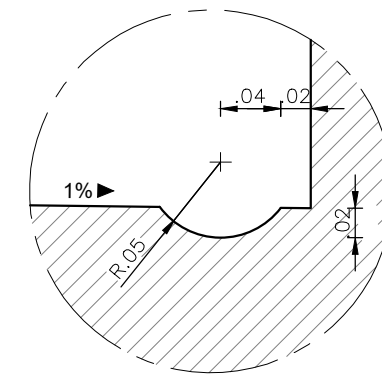
DETAIL 1

(Shrink section of concrete)
SC : 1/10



DETAIL 2

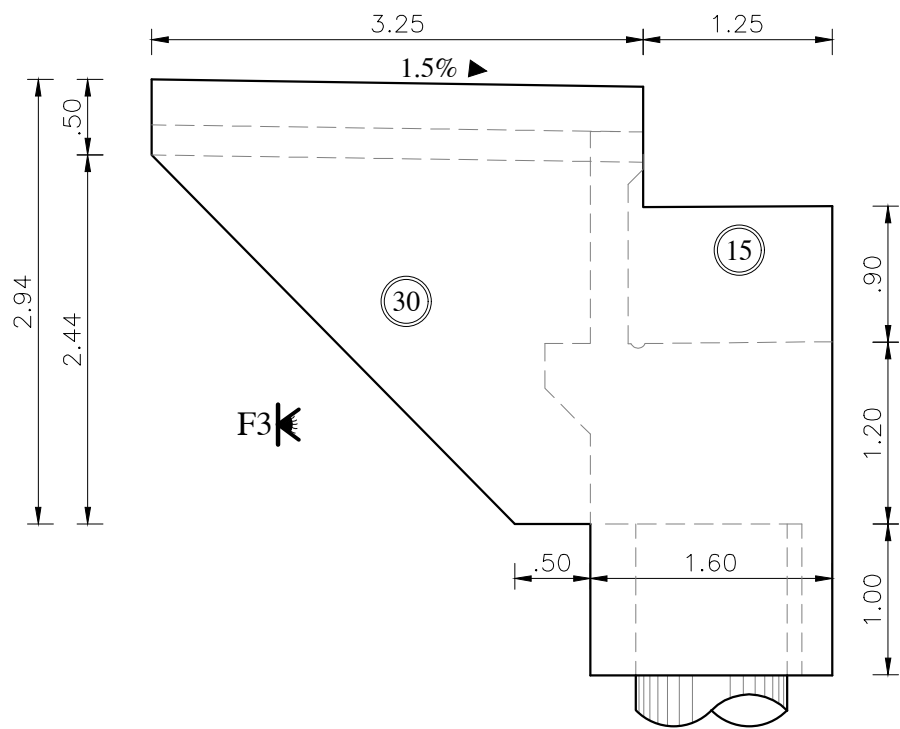
SC : 1/5



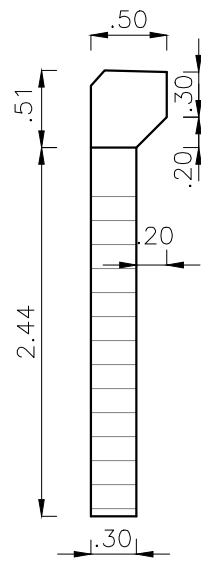
DETAIL SIDE WALL ABUTMENT C1

SC : 1/50

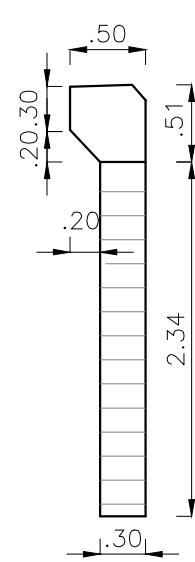
VIEW FOLLOWING F2



VIEW FOLLOWING F3



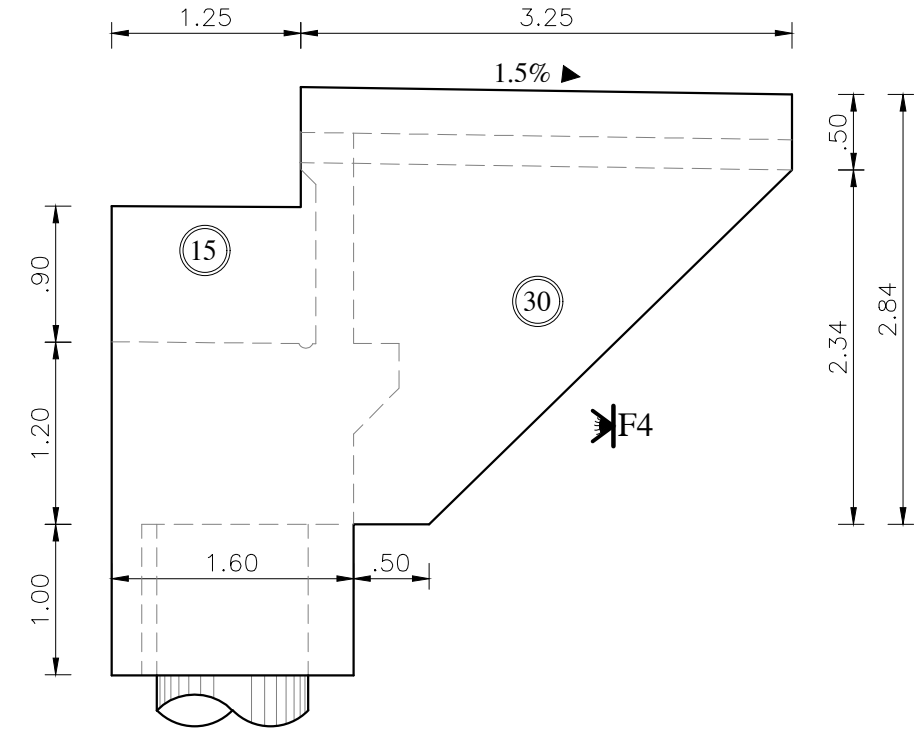
VIEW FOLLOWING F4



DETAIL SIDE WALL ABUTMENT C5

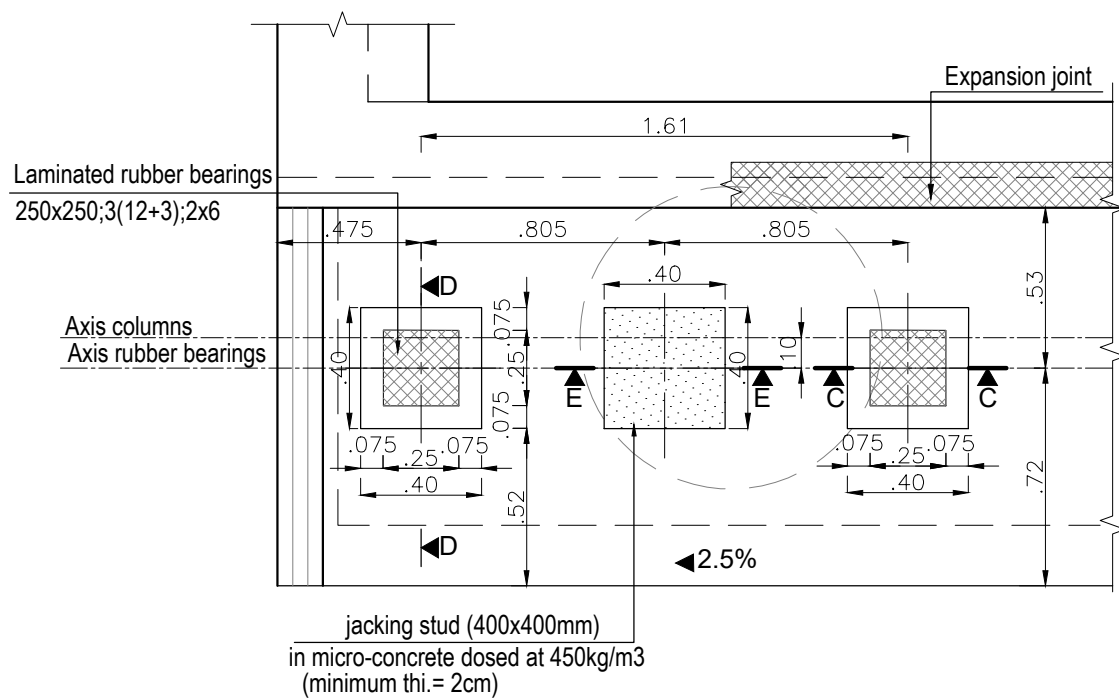
SC : 1/50

VIEW FOLLOWING F2



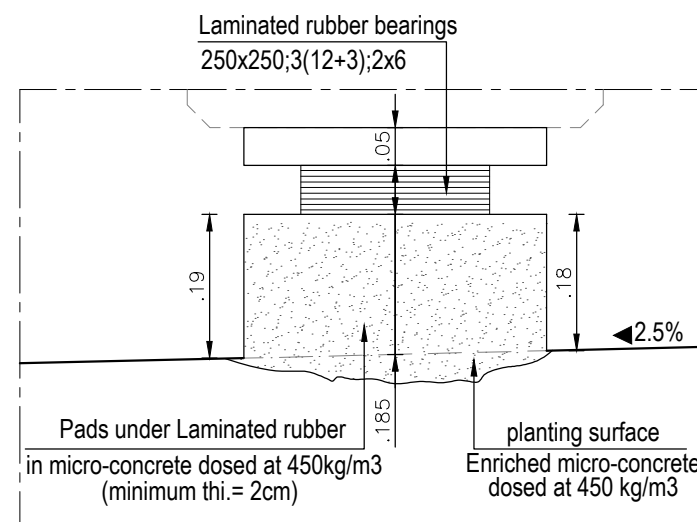
DETAIL PADS

SC : 1/25



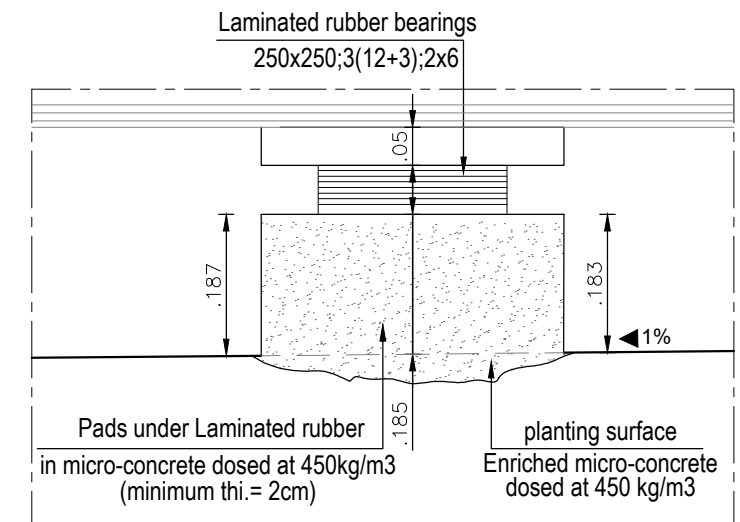
SECTION C-C

SC : 1/10



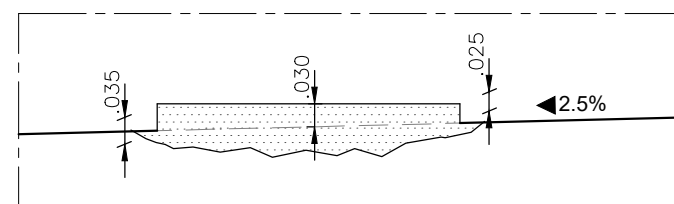
SECTION D-D

SC : 1/10



SECTION E-E

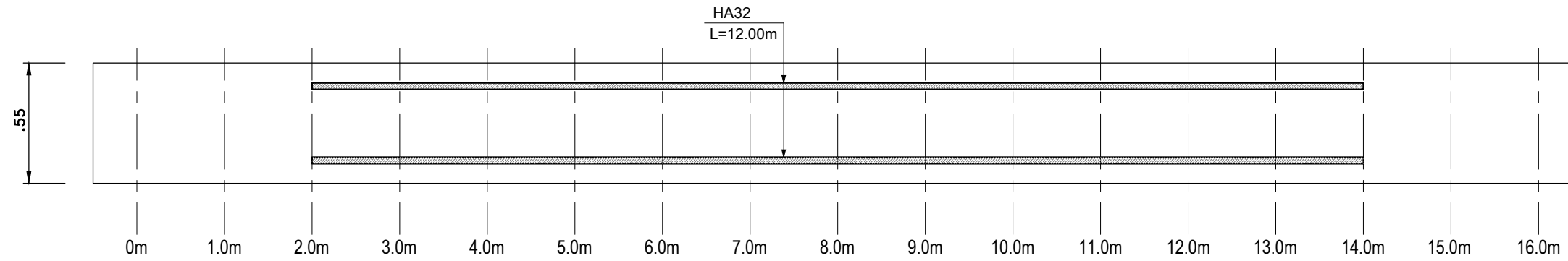
SC : 1/10



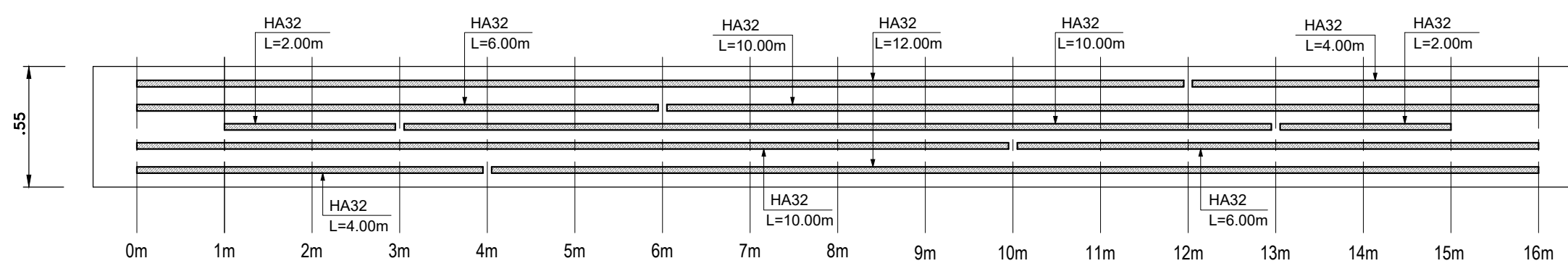
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 - * C16/20 (B0), dosed at 150Kg of cement/m3 for bedding concrete.
 - * C16/20 (B1), dosed at 250Kg of cement/m3 for the concrete fill .
 - * Micro-concrete dosed at 450kg/m3 for the pads.

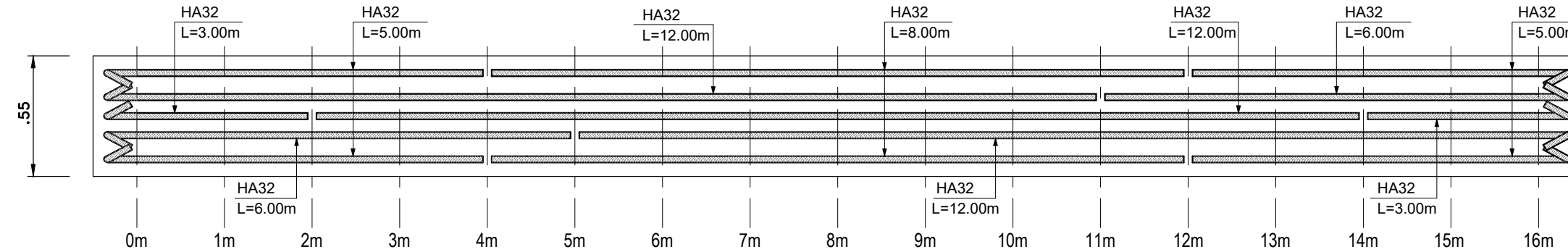
- 3rd layer -



- 2nd layer -

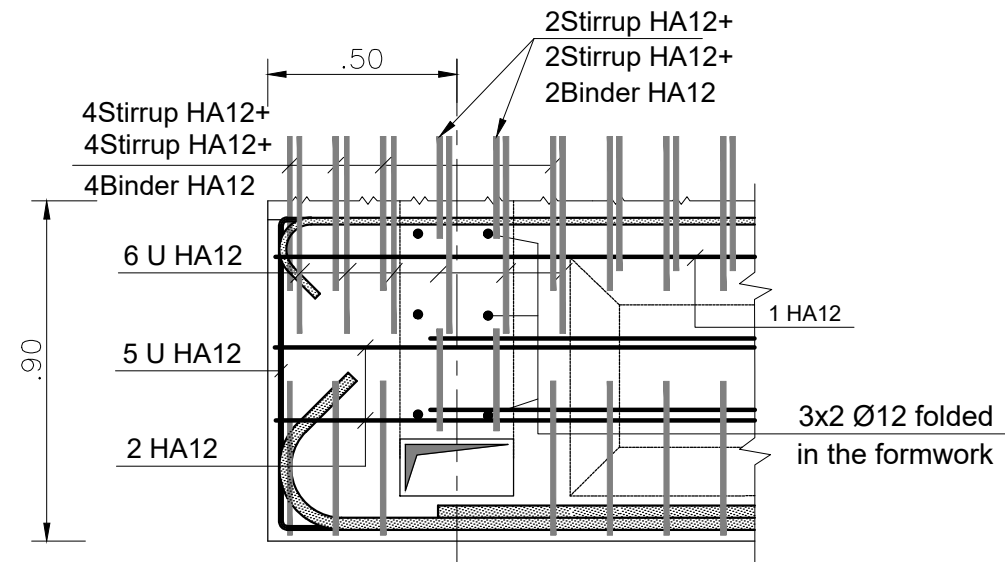


- 1st layer -



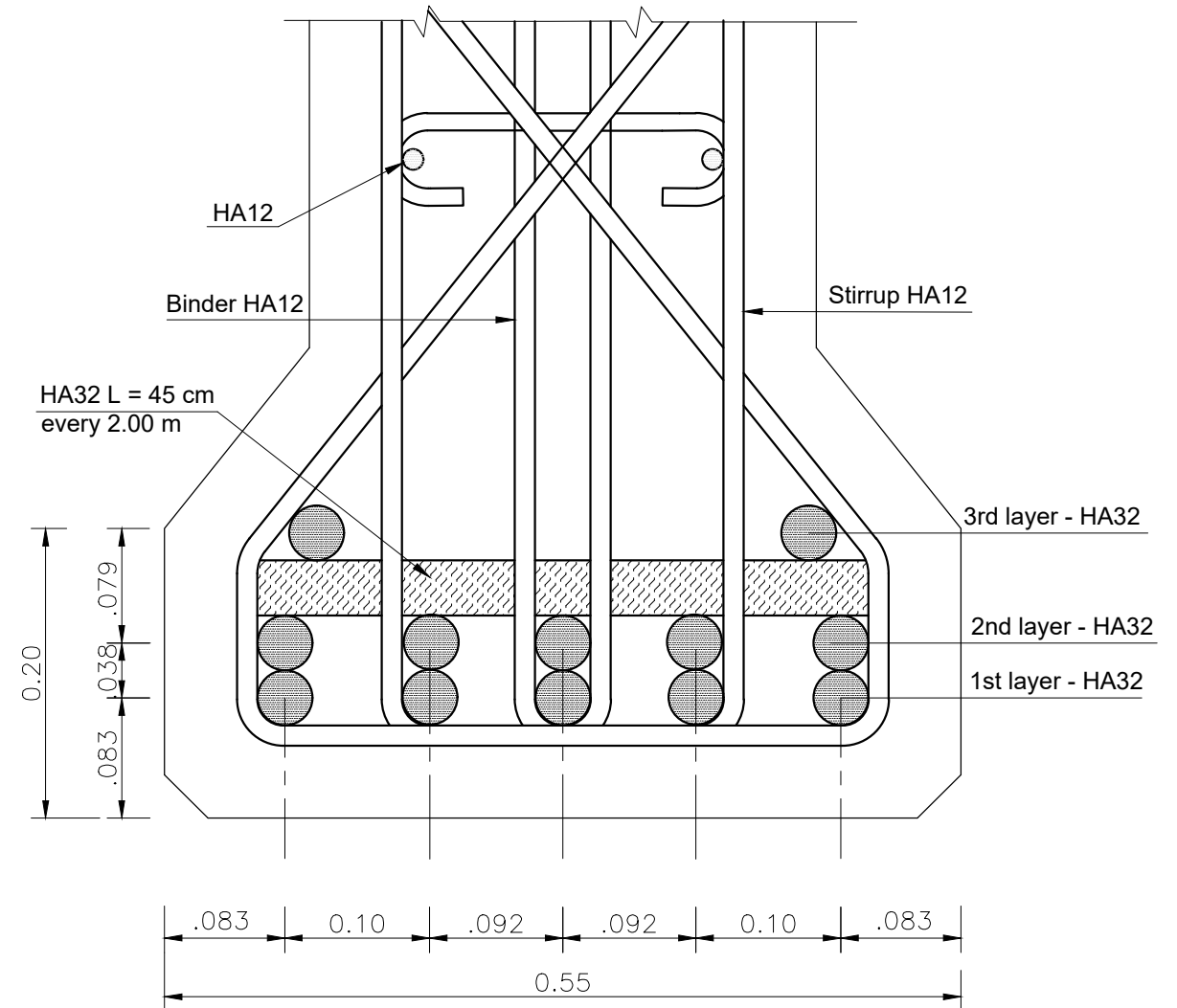
GIRDER BUTT DETAIL ON ABUTEMENT

SC : 1/20



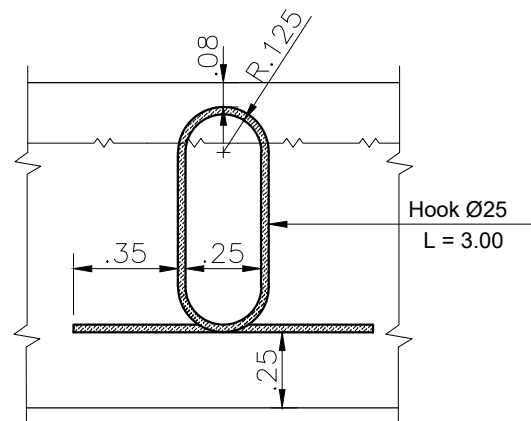
DETAIL OF LONGITUDINAL REINFORCEMENTS LAYOUT

SC : 1/5



LIFTING HOOK Ø25

SC : 1/20

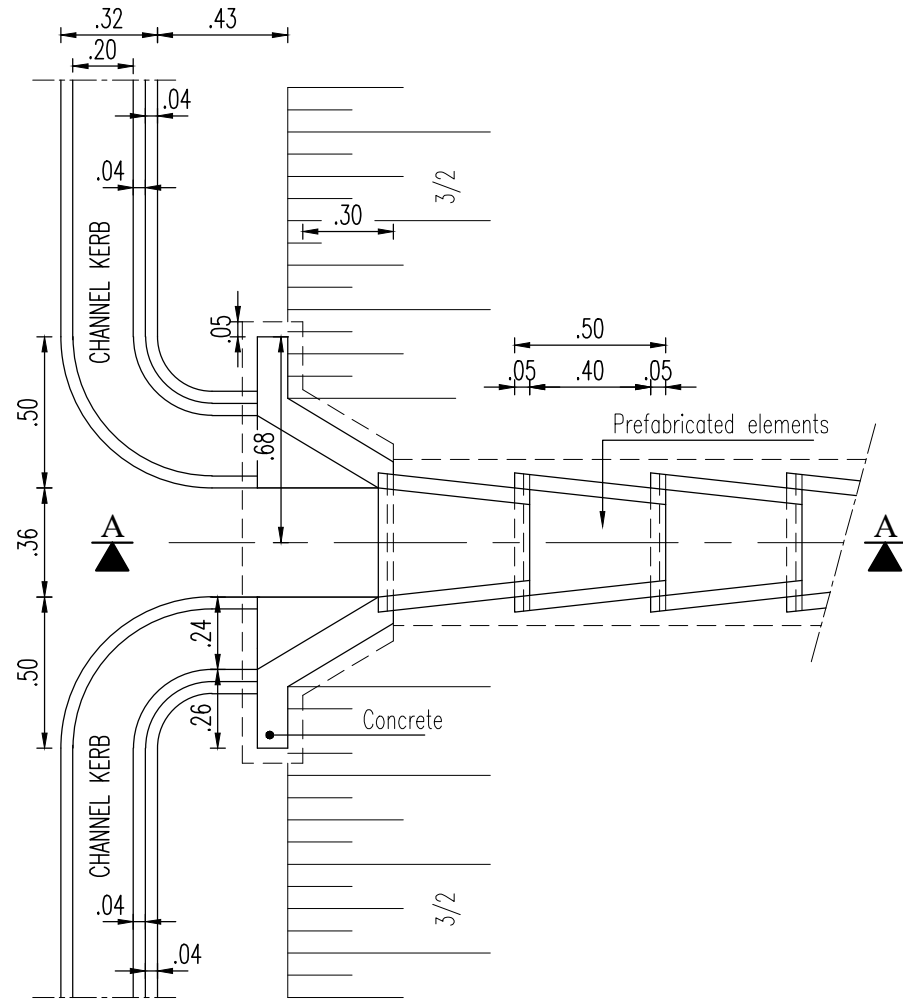


NOTE :

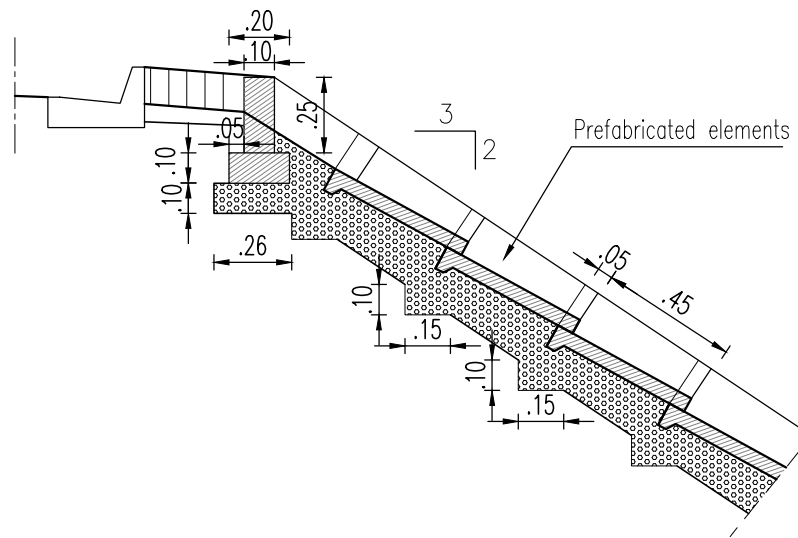
- The concrete will be of quality C30/37 (B3) dosed at 400Kg of cement /m3
- $f_{ck} = 30\text{MPa}$
- Ribbed steel $F_{yk} = 500\text{MPa}$
- Steel cover = 5 cm

IV - TYPICAL PLANS

WATER COLLECTION STRUCTURE AT THE TOP OF THE EMBANKMENT

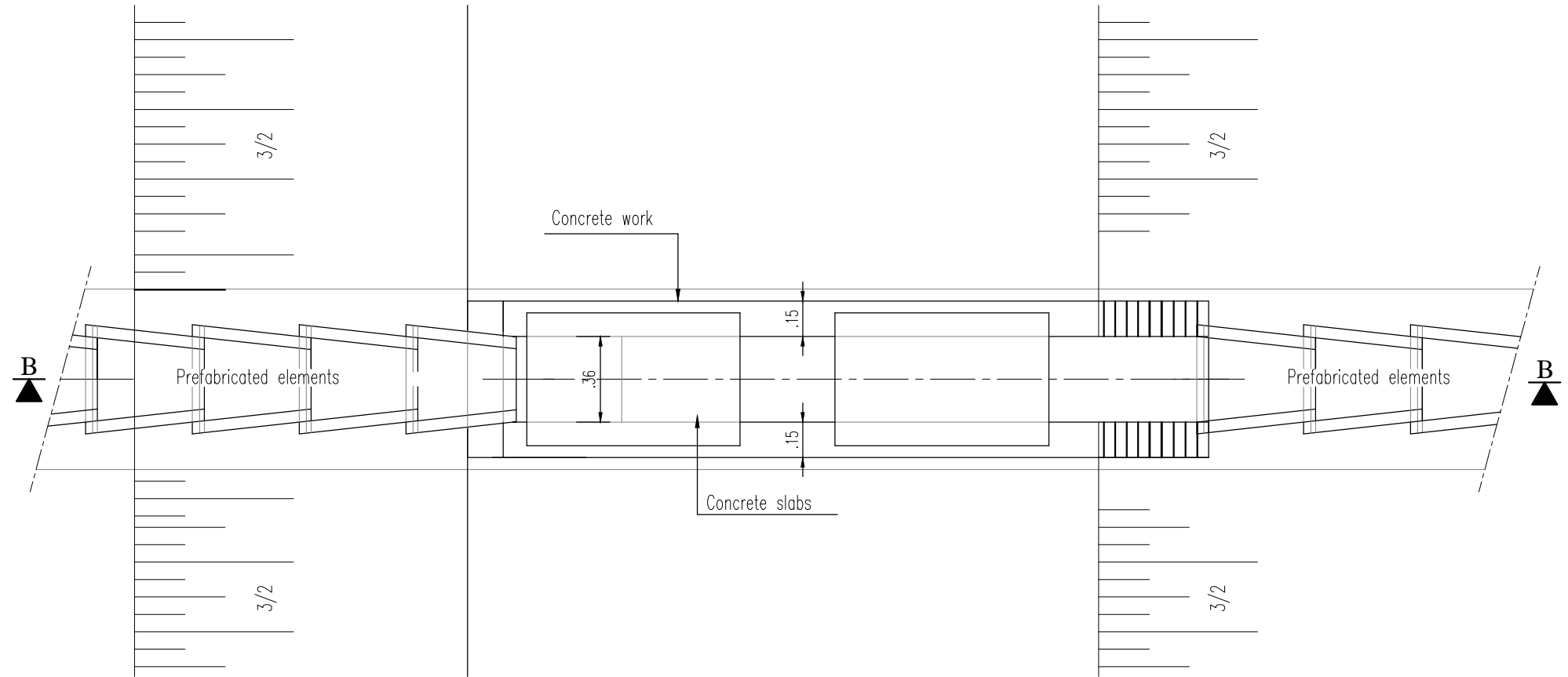


SECTION A-A

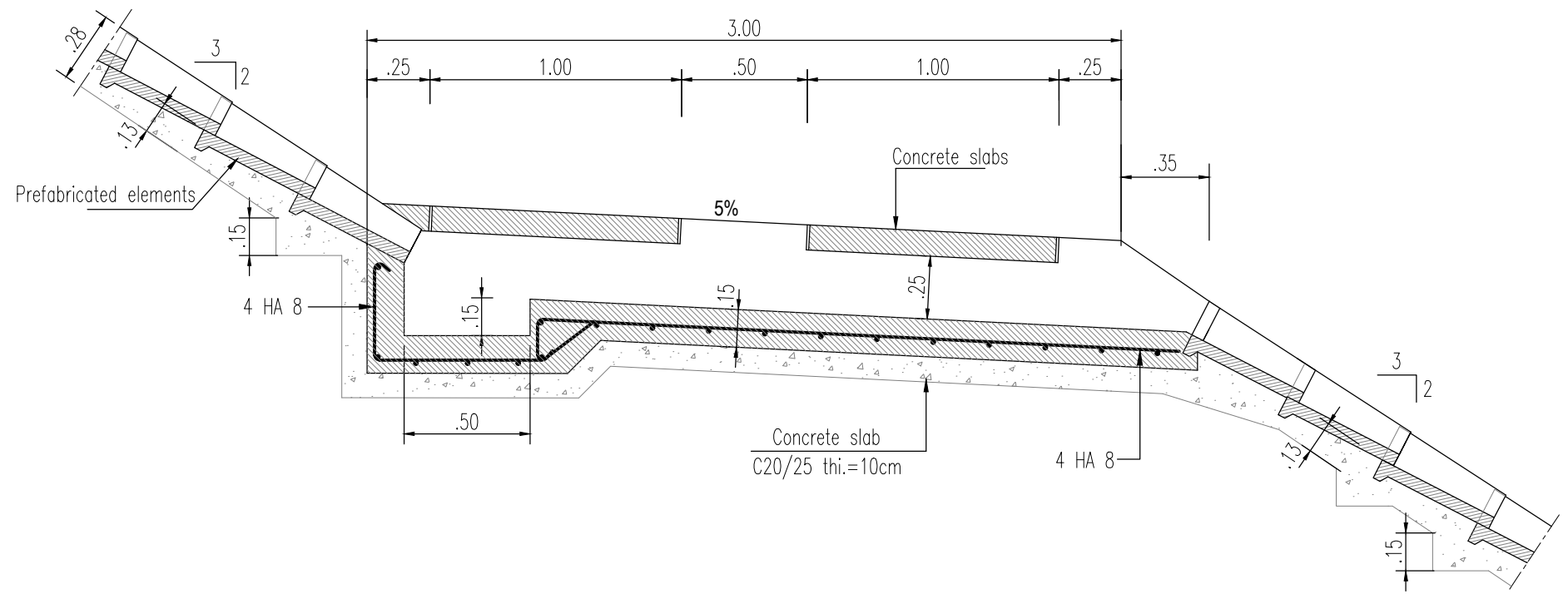


EMBANKMENT DOWNSPOUTS

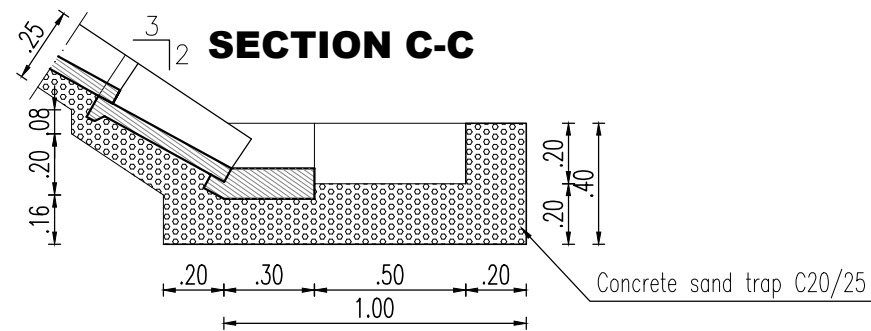
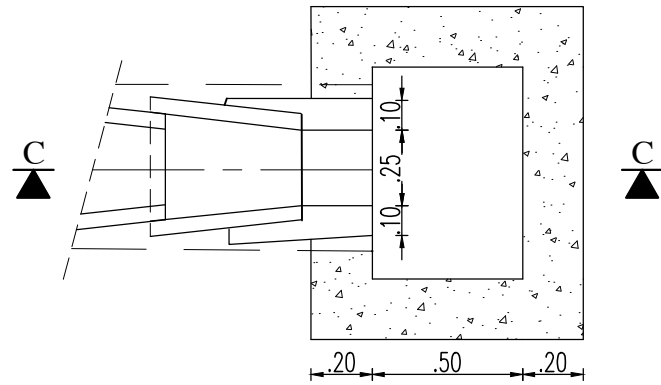
PLAN VIEW



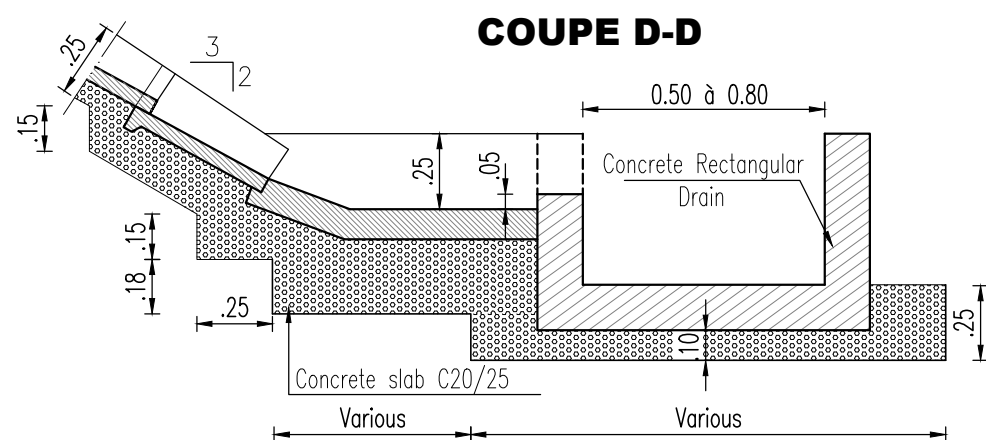
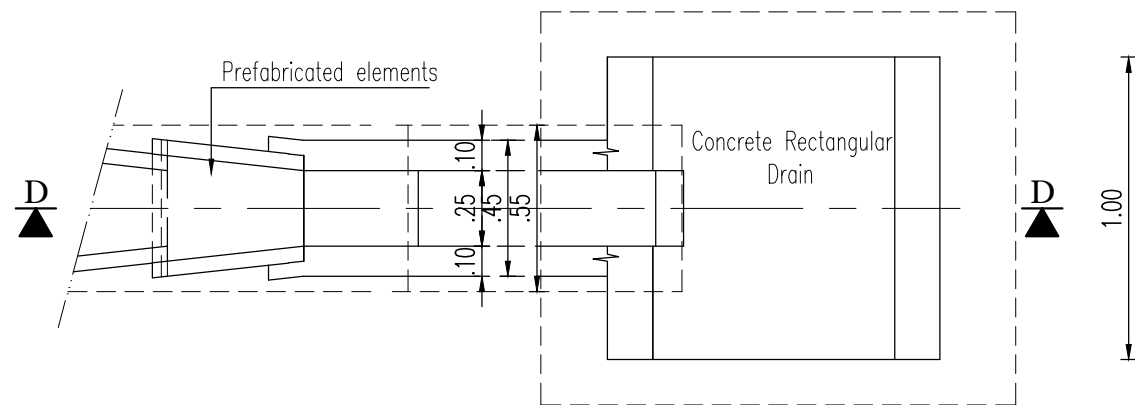
SECTION B-B



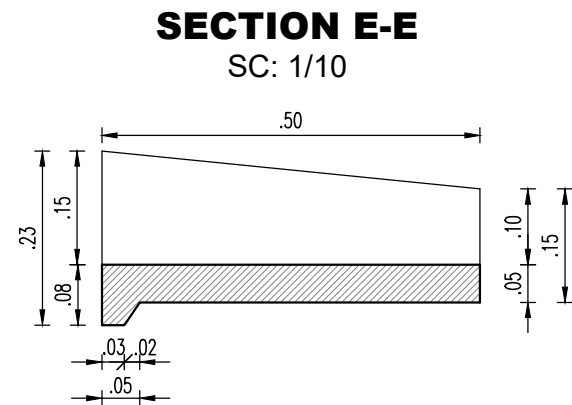
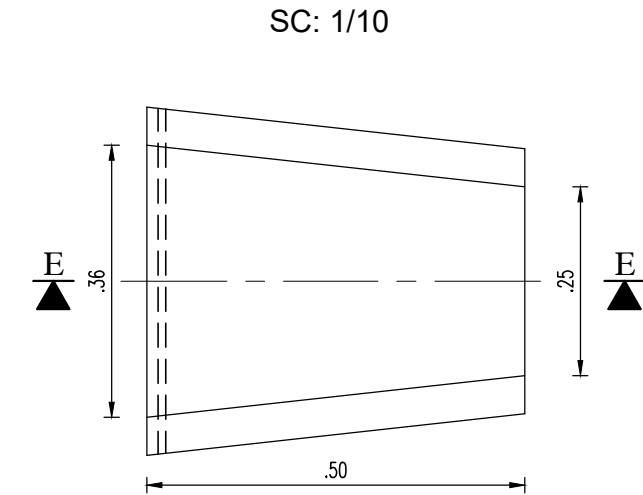
**WATER COLLECTION STRUCTURE AT THE BOTTOM OF THE EMBANKMENT (CASE WITHOUT DITCH)
PLAN VIEW**



**WATER COLLECTION STRUCTURE AT THE BOTTOM OF THE EMBANKMENT (CASE WITH DITCH)
PLAN VIEW**



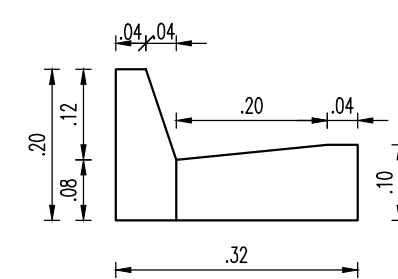
**EMBANKMENT DOWNSPOUTS
PLAN VIEW**



CONCRETE RECTANGULAR DRAIN



**CHANNEL KERB
SC: 1/10**



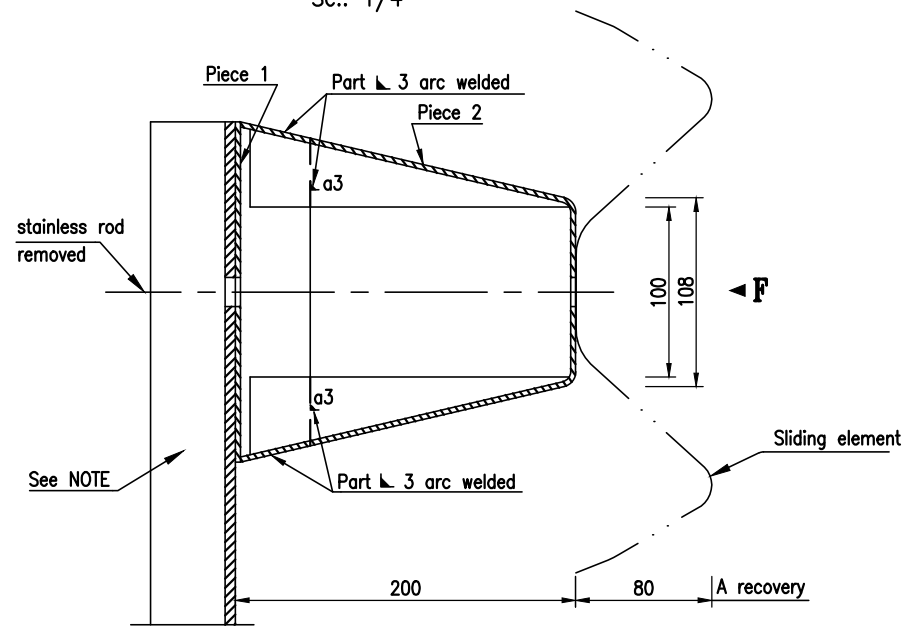
NOTE :

- The formwork of the facings seen will be made using fine formwork.
- The formwork for the hidden facings will be made using ordinary formwork.
- The facings in contact with the backfill will be painted in 3 crossed layers.
- The concrete poured on site will be of quality C25/30, dosed at 350kg of cement/m³ of concrete.
- The Concrete slab will be of quality C20/25, dosed at 250Kg of cement/m³.
- The cleaning concrete will be of C16/20 quality, dosed at 150Kg of cement/m³.

METAL SPACER DEVICE

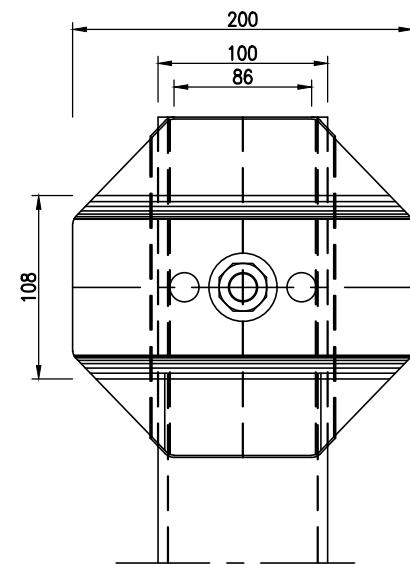
SECTION A-A

Sc.: 1/4

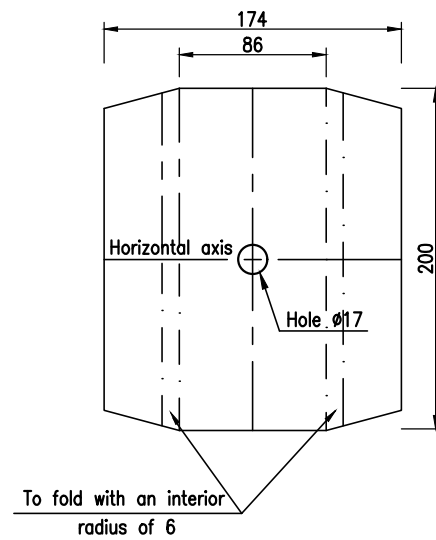


ELEVATION FROM -F- Piece 1 BEFORE FOLDING

Sc.: 1/4

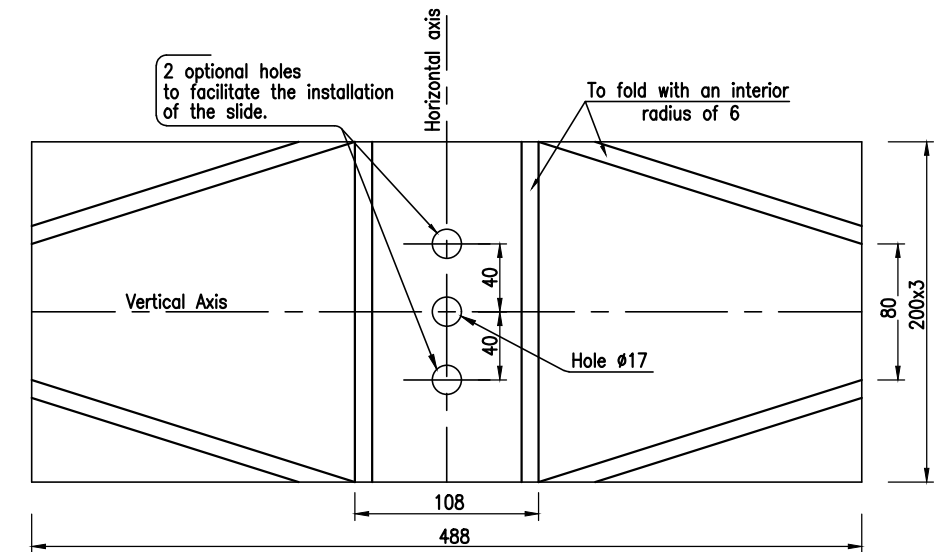


Sc.: 1/4



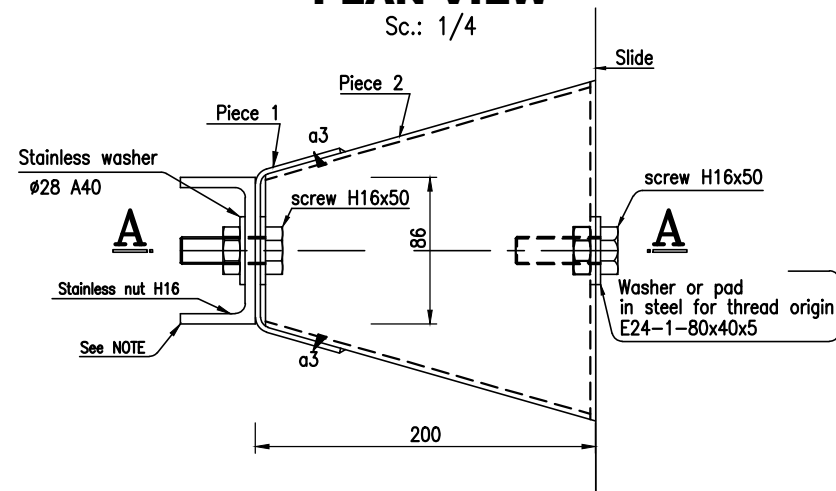
Piece 2 BEFORE FOLDING

Sc.: 1/4

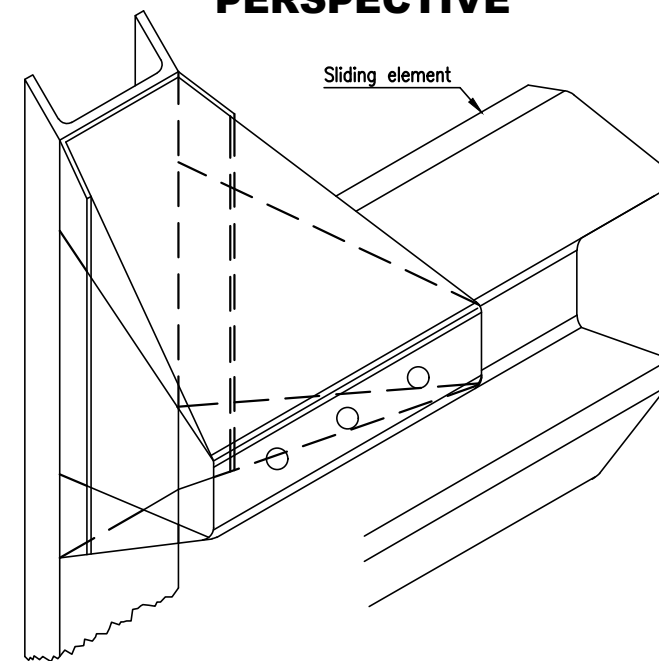


PLAN VIEW

Sc.: 1/4

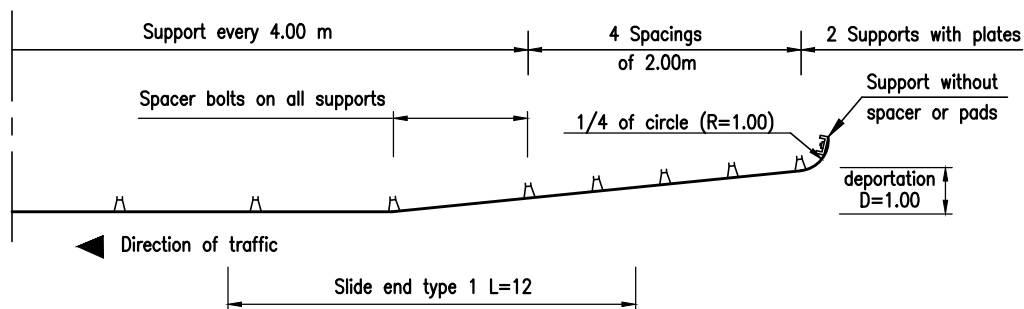


PERSPECTIVE



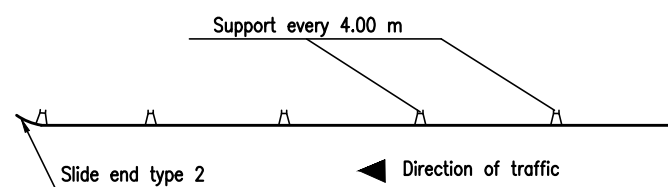
SLIDE END DETAIL TYPE 1

Sc.: 1/200



SLIDE END DETAIL TYPE 2

Sc.: 1/200



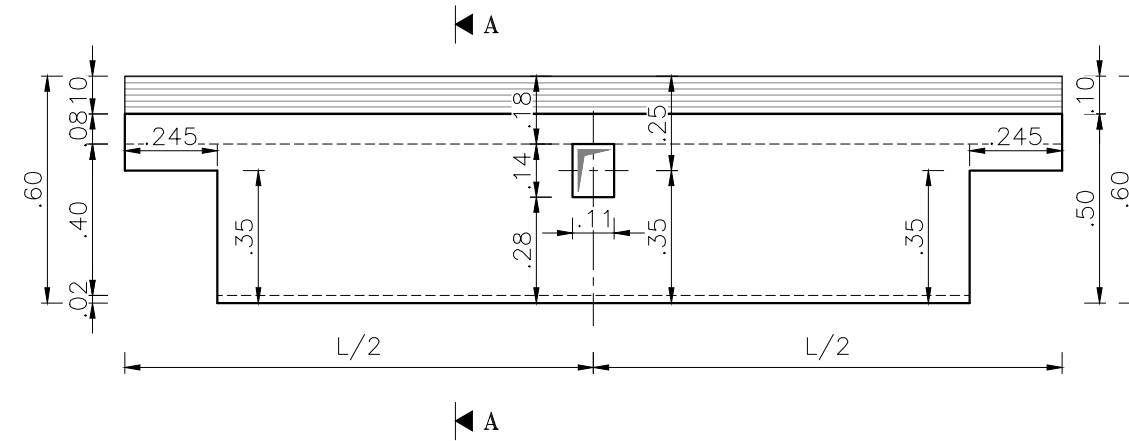
NOTA:

- Supports in UPN 100x50x6 in A33 laminated steel
- Spreading devices: E24-3 steel sheets
- Fixing plates: 80x40x5 mm in E24-1 steel
- The cutting edge of the barrier elements must be installed in the same direction as vehicle traffic

PRECAST CORNICE

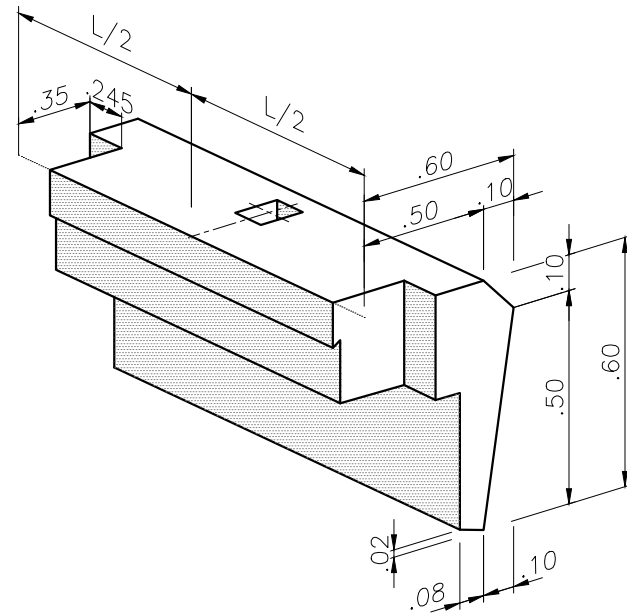
PLAN VIEW

SC : 1/20



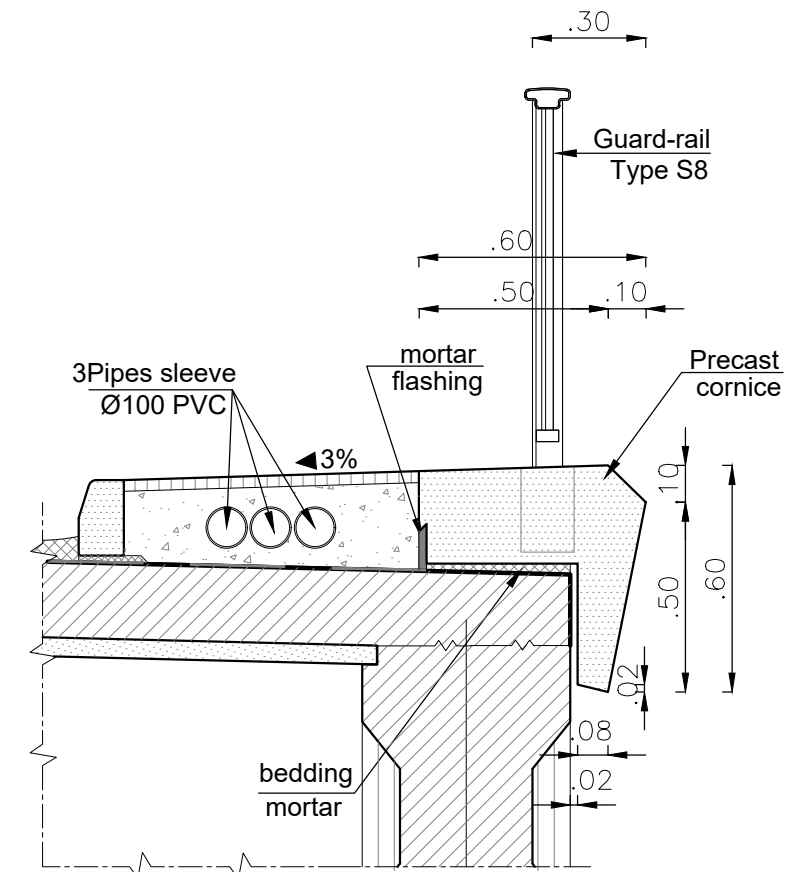
PERSPECTIVE

SC : 1/20



SECTION A-A

SC : 1/20

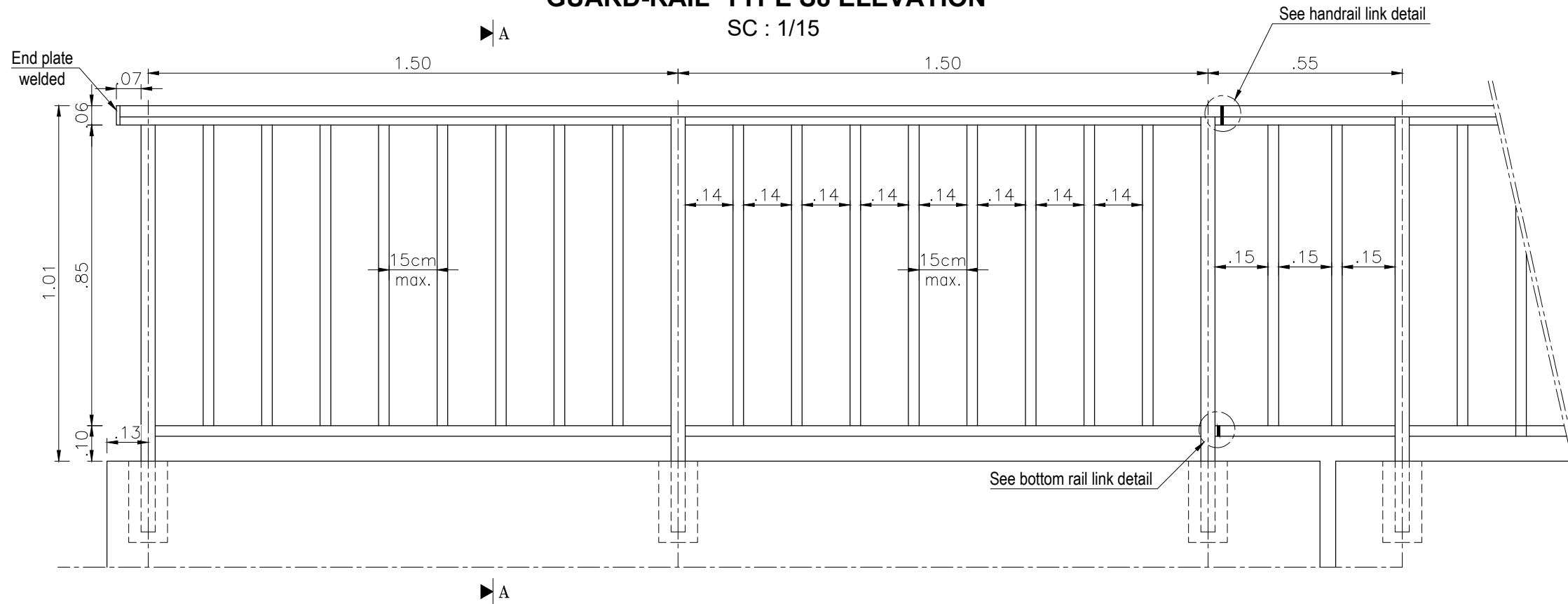


NOTE :

- * Cornice
- the concrete will be of quality : C25/30 (B2) dosed at 350kg of cement /m3
- Fck = 25MPa

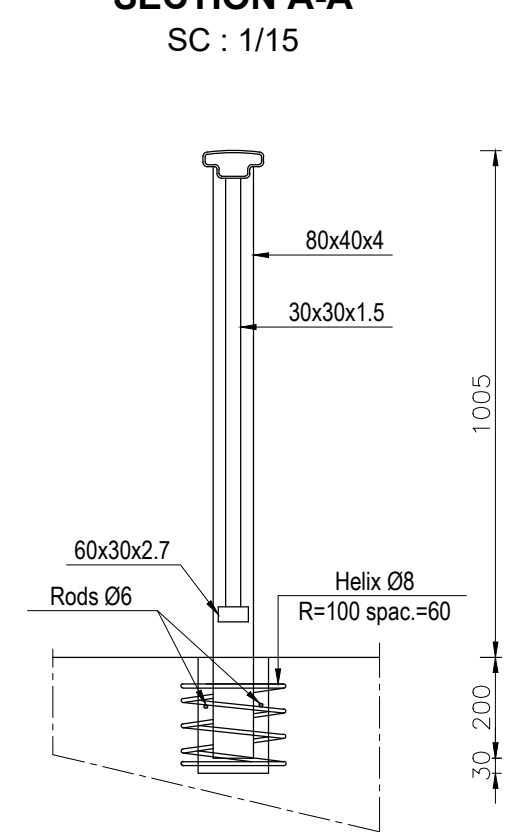
GUARD-RAIL TYPE S8 ELEVATION

SC : 1/15



SECTION A-A

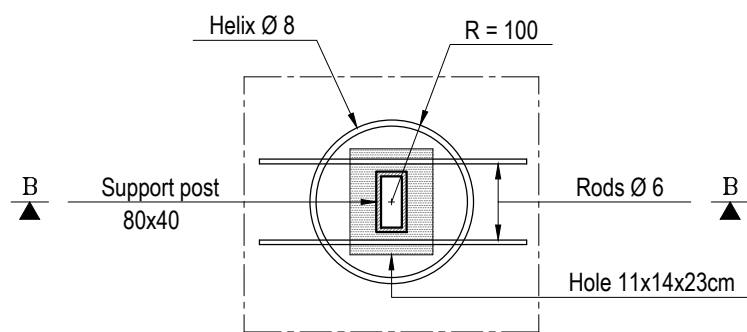
SC : 1/15



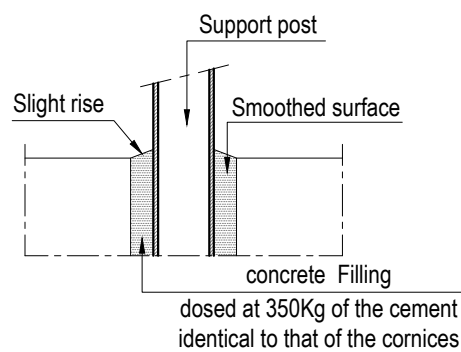
FIXING DETAIL

SC : 1/10 (cotes in mm)

PLAN VIEW

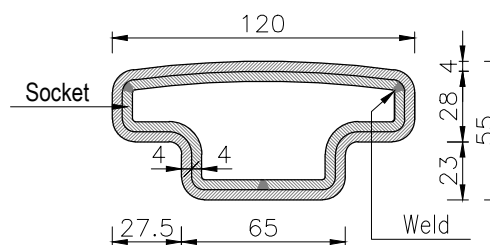
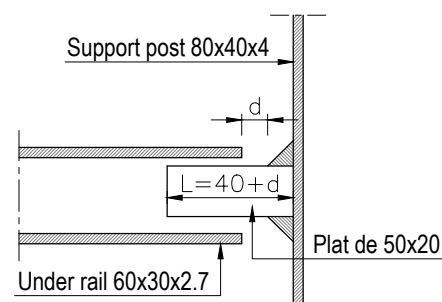
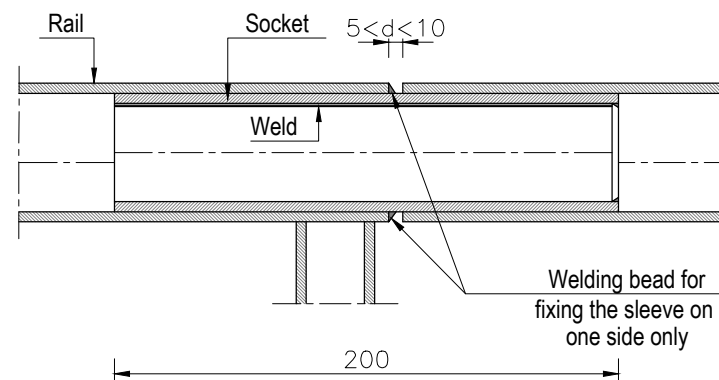


SECTION B-B



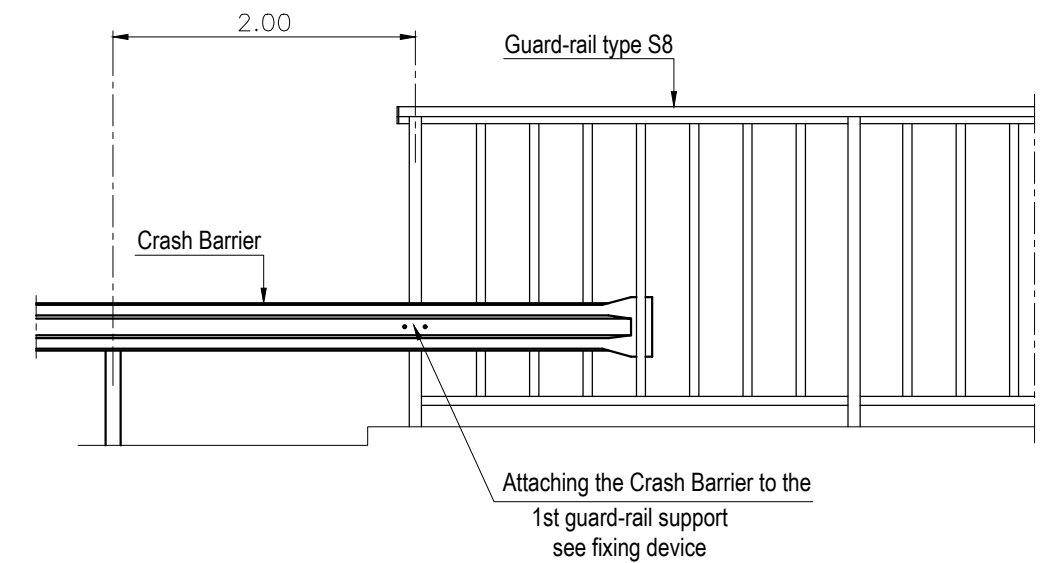
DETAIL HANDRAIL AND BOTTOM RAIL LINK AT THE SUPPORT POST

SC : 1/3 (cotes in mm)



CONNECTION CRASH BARRIER_GUARD-RAIL

SC : 1/50 (cotes in mm)



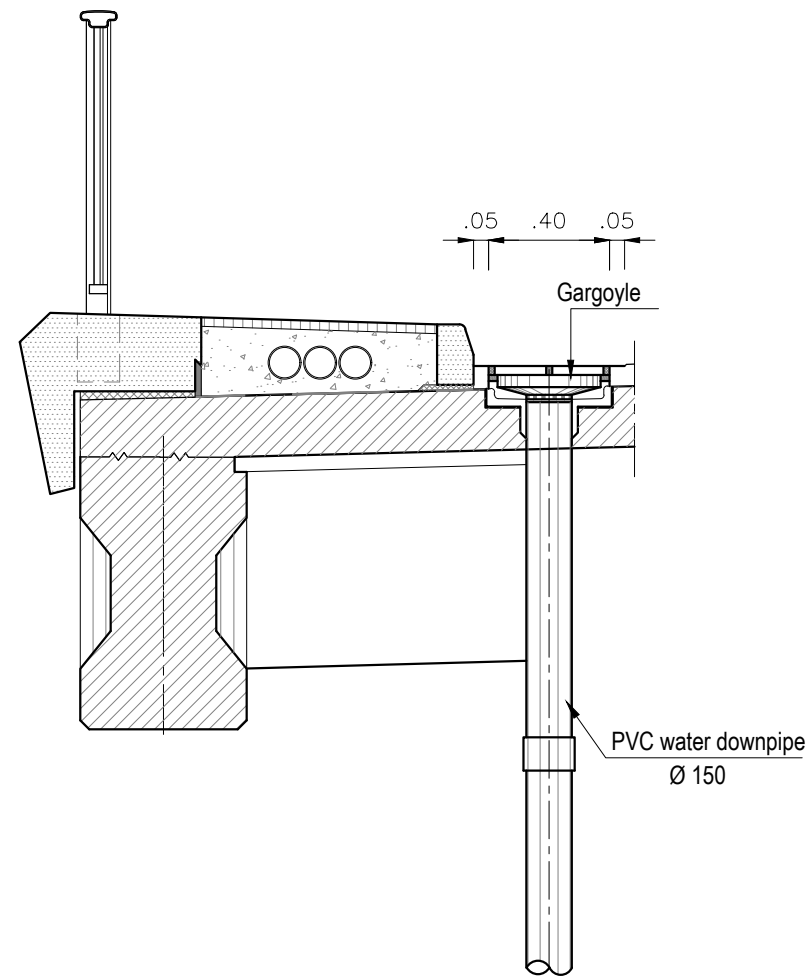
NOTE :

- A socket will be provided at every joint between guard-rail panels.
- Every pannel must have at least support posts without exceeding 6.00m in length.

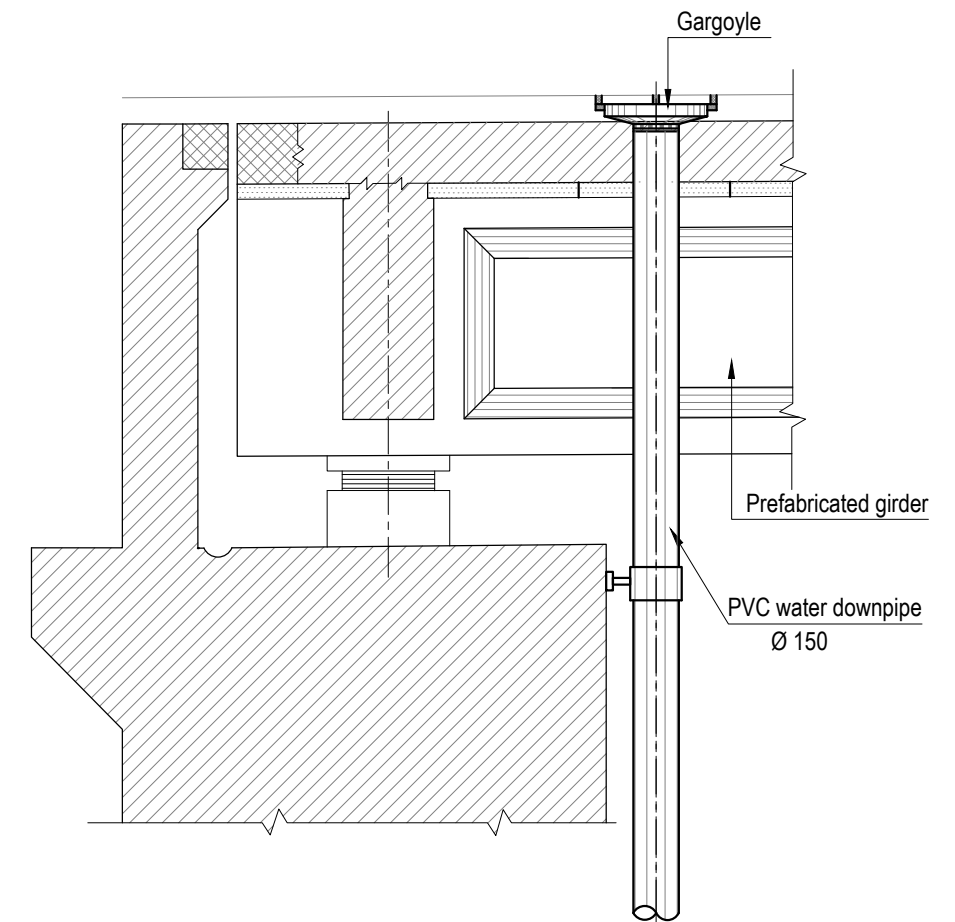
GARGOYLE

SC : 1/25

GARGOYLE SETTING AT SIDEWALK



CONNECTION AT ABUTEMENT



PLAN VIEW GRILLE

SC : 1/25

