CODES OF PRACTICE

Design, detailing and workmanship shall be according to BS8110

DIMENSIONS

All Dimensions are in millimeters, or otherwise stated.

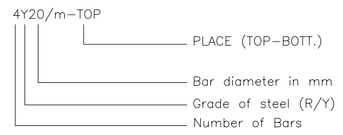
DRAWINGS

1–Structural drawings shall be read in conjunction with Architectural, Mechanical and Electrical drawings.

2–Drawings are not necessarily to scale.

NOTATION

B = Bottom Bars
BOF = Bottom Level of Footing
BU = Bent Up Bars
EF = Each Face
EW = Each Way
H = Horizontal Bars
L = L shaped Top Bars
M = Lacer bars at side faces
R = Mild Steel Bars
S = Stirrups
SOG = Slab on Grade
T = Top Bars
TGB = Top Level of Grade Beams
TOF = Top Level of Footing
TSS = Top Level of Structural Slab
U = U shaped Bars
V = Vertical Bars
Y = High Yield Bars



SYMBOLS

= Structural Wall Below Slab Level.
= Structural Wall Above Slab Level (No Structural Wall Below)
= Inverted Beam or Parapet Above Slab Level.
= Drop Beam.
= Column Below Slab Level.
= Column above Slab Level.
= Hardcore.
= Stone.
= Polystyrene.
= Block wall.
= Plain Concrete Wall Below Slab level.
= Plain Concrete
= Waterproofing.
200 = Thickness of Slab.
= Level.
C1 = Column Mark.
13 S.O.G. = Thickness Of Slab On Grade.

REINFORCED CONCRETE

The following types of reinforced concrete shall be employed:

C40 – Grade 40 [FOR ALL STRUCTURAL ELEMENTS]
Characteristic Strength as defined by a 150 mm cube at age of 28 days shall be: 40MPa

C21 – Grade 21 [FOR THE ONGRADE SLAB]
Characteristic Strength as defined by a 150 mm cube at age of 28 days shall be: 21MPa

PLAIN CONCRETE

Plain concrete shall be employed for blinding under foundations.

The characteristic strength at age of 28 days shall be 15 MPa.

Cement content should not be less than 250 kilograms/m

Maximum water–cement ratio shall be:
0.60

CEMENT

Ordinary Portland Cement (OPC)

COVER

Clear concrete cover to reinforcement shall be:
75 mm for foundations
30 mm for stairs,beams
40 mm for columns

AGGREGATES

Maximum aggregate size shall be 20 mm.

REINFORCEMENT

1– All reinforcing bars of a deformed high strength steel bars of characteristic strength equal to: Fy=420 MPa.
2– Bars and stirrups of 8mm diameter only shall be of smooth mild steel of characteristic strength equal to: Fy=235 MPa.
3– Reinforcement shall comply with BS4449
4– Reinforcement shall be placed as shown on the drawings and in the lengths specified.
5– Where bar length is not specified, longest practicable bar length shall be employed with staggered lap splices. Lap length shall be 60 times bar diameter.
6– Bar crank shall not exceed 1:12.

MINIMUM SPLICING LENGTH, DEFORMED BARS, mm

BAR DIAMETER (mm)	BARS IN TENSION	BARS IN COMPRESSION
10	600	600
12	750	750
14	850	850
16	1000	1000
18	1100	1100
20	1200	1200
22	1350	1350
25	1500	1500
32	2000	2000

FOUNDATIONS

The Foundations are designed for bearing capacity equal to 200 KPa

It is the responsibility of the Contractor to ensure that this bearing capacity is achieved at site with respect to the location of foundation.

Soil lab technicians should be informed after finishing the excavations to confirm what has been stated in the soil test report.

FOUNDATION DEPTH

Foundation depth should be minimum of 2.0m below the natural ground level .

Contractor should take into consideration the recommendations stated in the soil report concerning the foundations depth .

CONCRETE PROTECTION

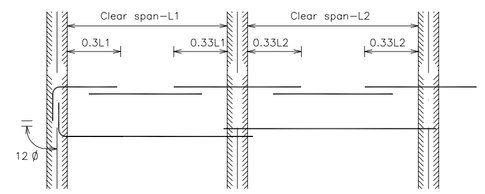
All underground concrete including bottom of foundations shall be coated as spesified

EXCAVATION & BACK FILLING

Back filling should be compacted on layers not more than 20cm thick to not less than 95% compaction ratio of the max. dry density of the Modified Proctor test.

Back filling should extend 1.0m beyond the perimeter of the building

PLACEMENT RULES FOR BEAM REINFORCEMENT



Placement of bars shall be as follows, unless indicated otherwise:

① Top bars in spans shall be placed to lap equal lengths with support top bars at both left and right.

② Bottom bars in interior spans shall be placed to extend equal lengths beyond support centerlines at both left and right and not less then 15cm.

③ Bottom bars in exterior spans shall be placed such that they extend a length equal to 12 times bar size beyond the centerline of the exterior support. This length may include a 90 degree bend if sufficient room does not exist.

④ L bars as top reinforcement at exterior supports shall extend 30 times the bar size beyond the bend.

⑤ Equal spans top bars at interior supports shall be placed centrally on the support axis lines unless otherwise is mentioned.

⑥ Spans are approximately equal, with longer of two adjacent spans not greater than the shorter by more than 20 percent. Or otherwise must be justified by calculations

LINTELS

SCHEDULE OF LINTELS REINFORCEMENT

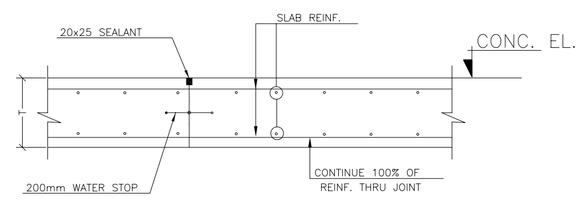
CLEAR SPAN \ LINTEL WIDTH (b)	b=100mm. TOP REINF.	b=100mm. BOTTOM REINF.	b=150mm. TOP REINF.	b=150mm. BOTTOM REINF.	b=200mm TOP REINF.	b=200mm BOTTOM REINF.	b=300mm TOP REINF.	b=300mm BOTTOM REINF.	DEPTH= d
< 2000	1Y10	1Y12	2Y10	2Y12	2Y10	2Y12	3Y10	3Y12	200

CONSTRUCTION JOINTS:

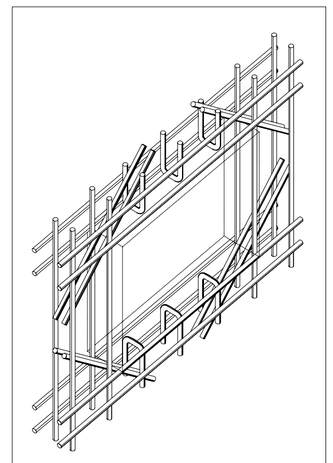
Construction joints should be done in locations specified on the drawings or where the contractor decide to stop construction.

Contractor should submitt detailed shopdrawings, (according to ACI318 chapter 6) showing locations and details of construction joints for engineer approval before construction.

Construction joints should be done in proper way by:
– making rough surface and exposing the aggregate.
– adding dowels bars as per structural details

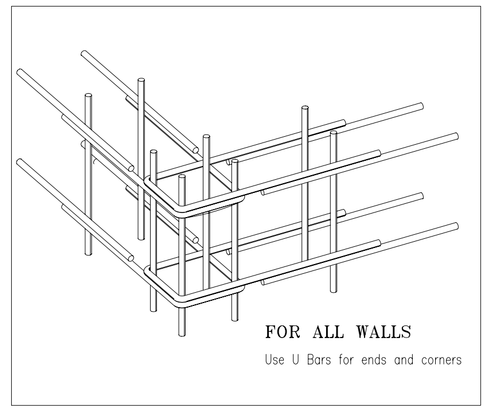


CONSTRUCTION JOINT IN TOP SLAB



FOR ALL WALL OPENINGS

Fix diagonal 2Y14X150 bars in both faces, at each corner.

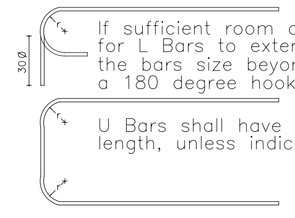


FOR ALL WALLS

Use U Bars for ends and corners

RADII OF BENDING

Minimum Radius of Bend for L Bars and U Bars shall be as follows. For other bars, minimum radius of bend shall equal to 2 times bar size for Mild Steel and 3 times bar size for High–yield Steel.



If sufficient room does not exist for L Bars to extend 25 times the bars size beyond the bend, a 180 degree hook shall be made.

U Bars shall have legs of equal length, unless indicated otherwise.

BAR DIAMETER (mm)	MINIMUM r (mm)
8	55
10	70
12	85
14	100
16	120
18	140
20	160
22	180
25	215
32	300

REV.	DATE	DRAWN	CHKD	REMARKS

DESIGNED:	CHECKED:	SCALE:
S.N.	A.O.	N.T.S
DRAWN:	APPROVED:	DATE:
S.N.	A.O.	JULY-2007

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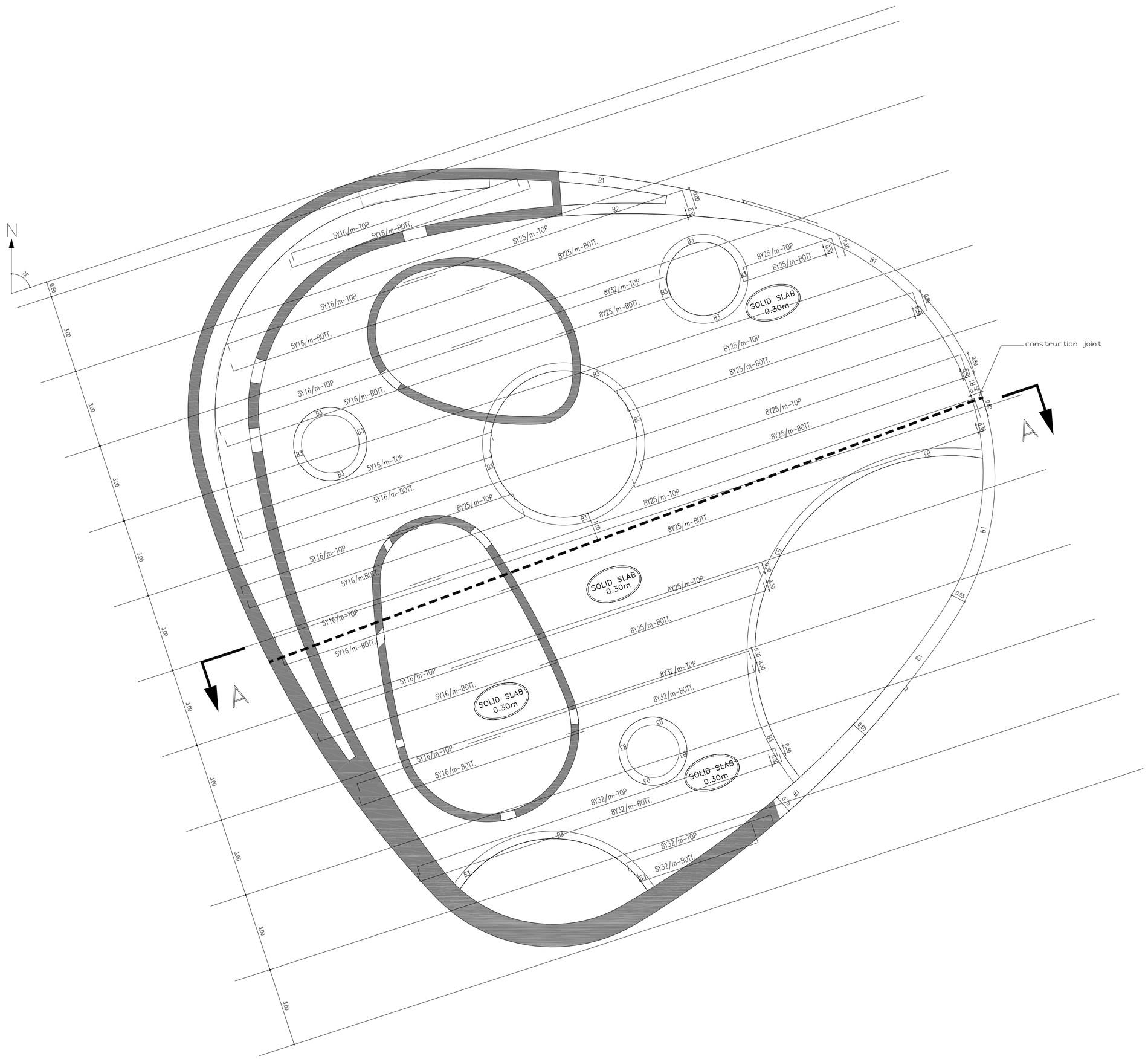
GENERAL STRUCTRAL NOTES

PROJECT NO. : 3029-43137

DRAWING NO. : S-00



NOTES

ALL DIMENSIONS, LEVELS AND COORDINATES ARE IN METERS.

REV.	DATE	DRAWN	CHKD	REMARKS

DESIGNED:	CHECKED:	SCALE: 1/100
DRAWN:	APPROVED:	DATE: JULY-2007

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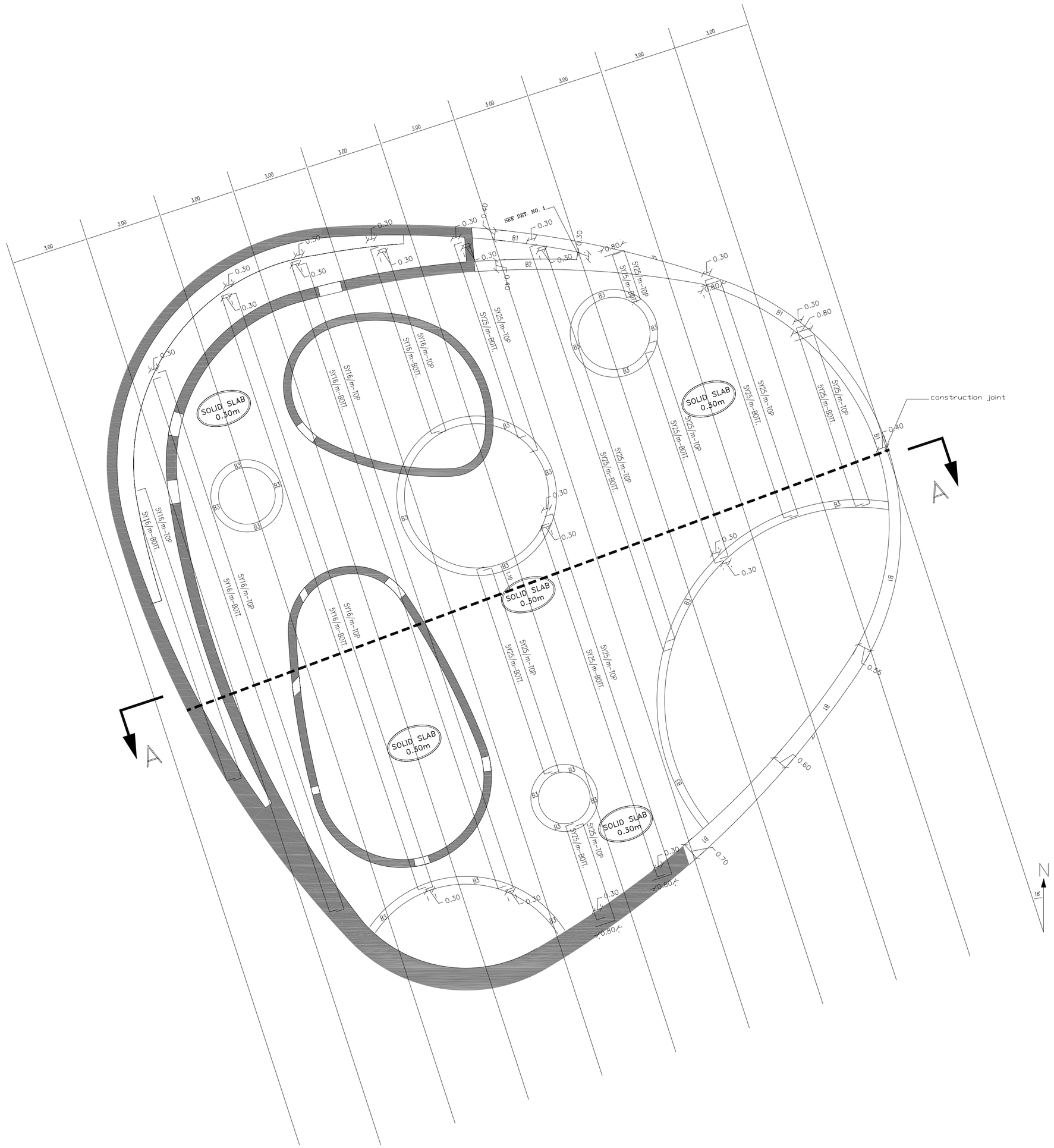
REINFORCEMENT IN X-DIRECTION (1)

PROJECT NO. : 3029-43137

DRAWING NO. : S-01



NOTES

ALL DIMENSIONS, LEVELS AND COORDINATES ARE IN METERS.

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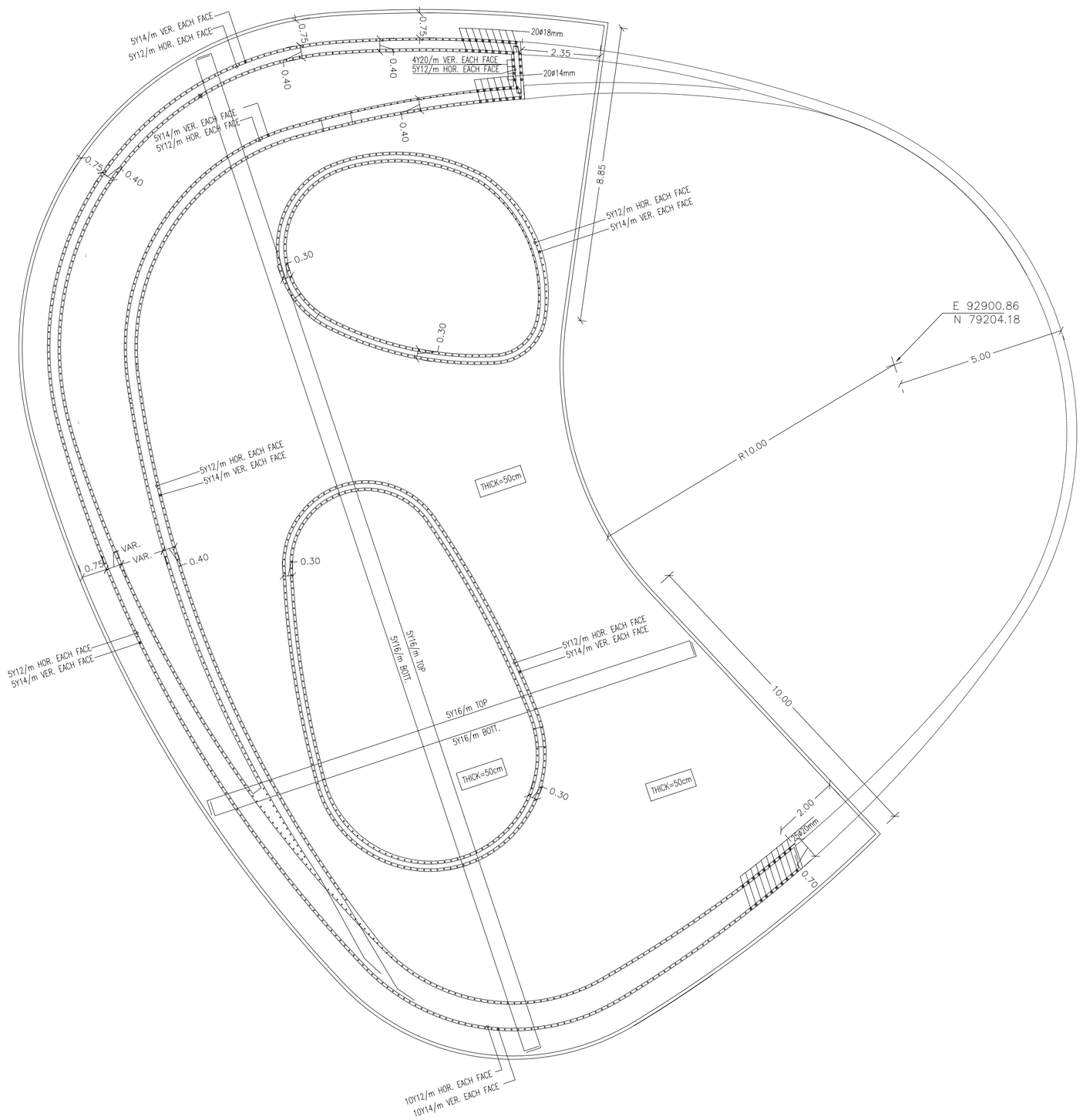
REINFORCEMENT IN Y-DIRECTION (2)

PROJECT NO. : 3029-43137

DRAWING NO. : S-02



NOTES

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FOUNDATION REINFORCEMENT

PROJECT NO. : 3029-43137

DRAWING NO. : S-03

NOTES

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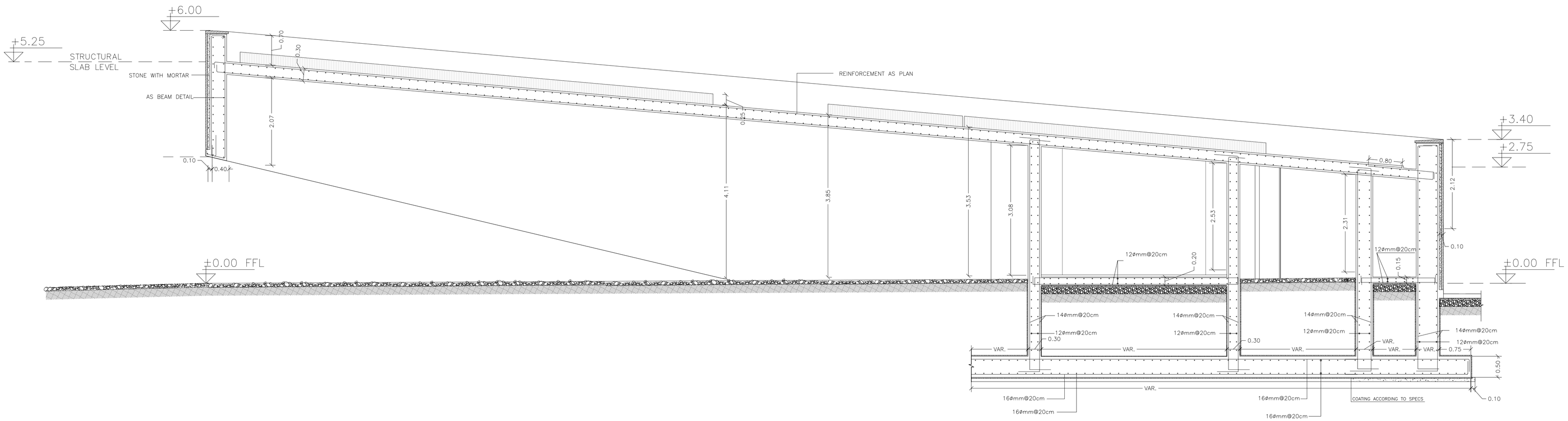

SECTION
1:50

SEC-A
A-05

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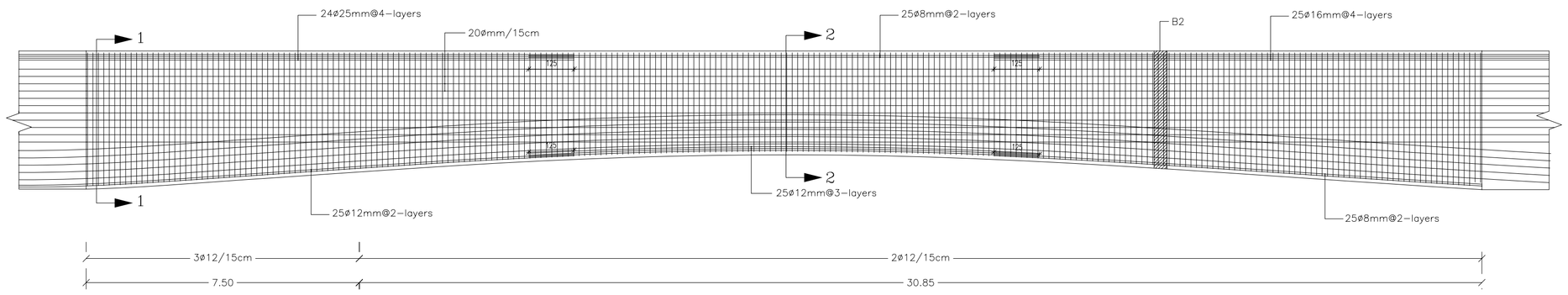
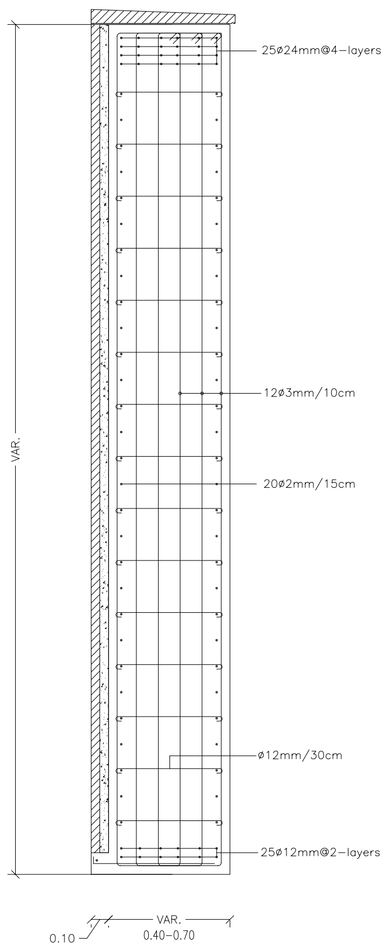
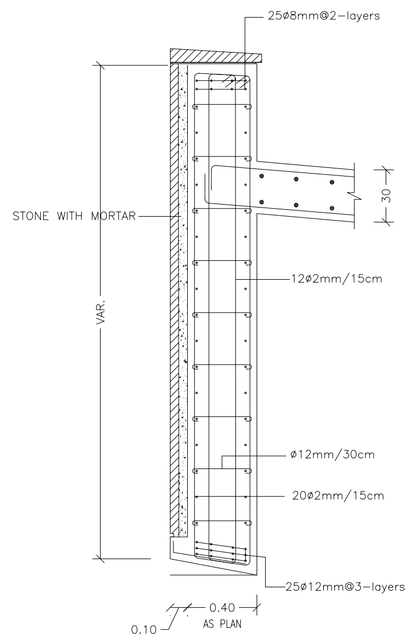
					DRAWN:	APPROVED:	DATE: JULY-2007				SECTION (A - A) REINFORCEMENT	DRAWING NO. : S-04



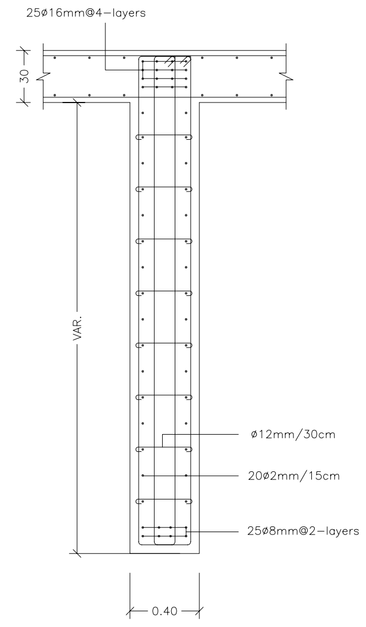
LONGITUDINAL SEC. IN BEAM B1
1:100



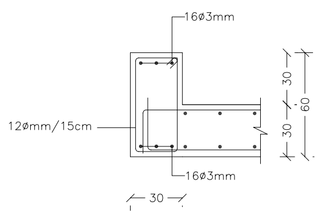
SEC. 1-1 IN B1
1:25



SEC. 2-2 IN B1
1:25



BEAM B2
1:25



BEAM B3
1:25

NOTES

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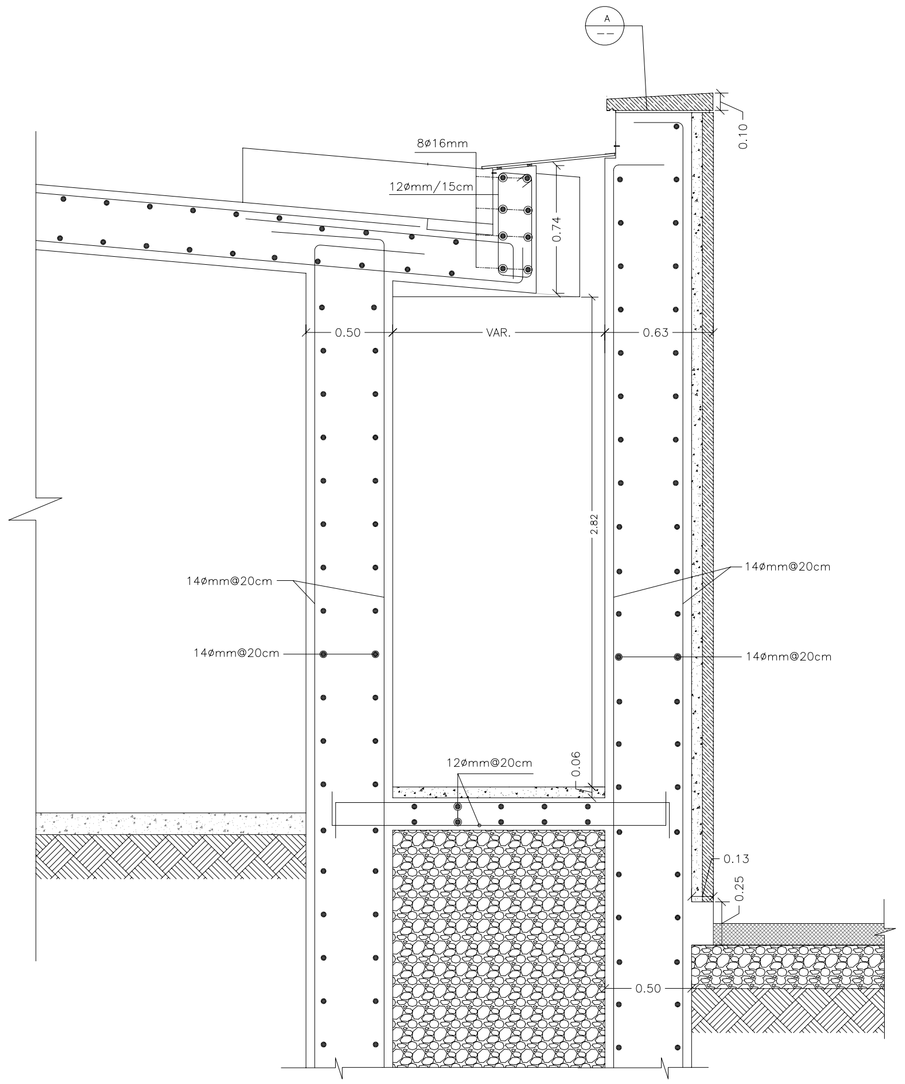
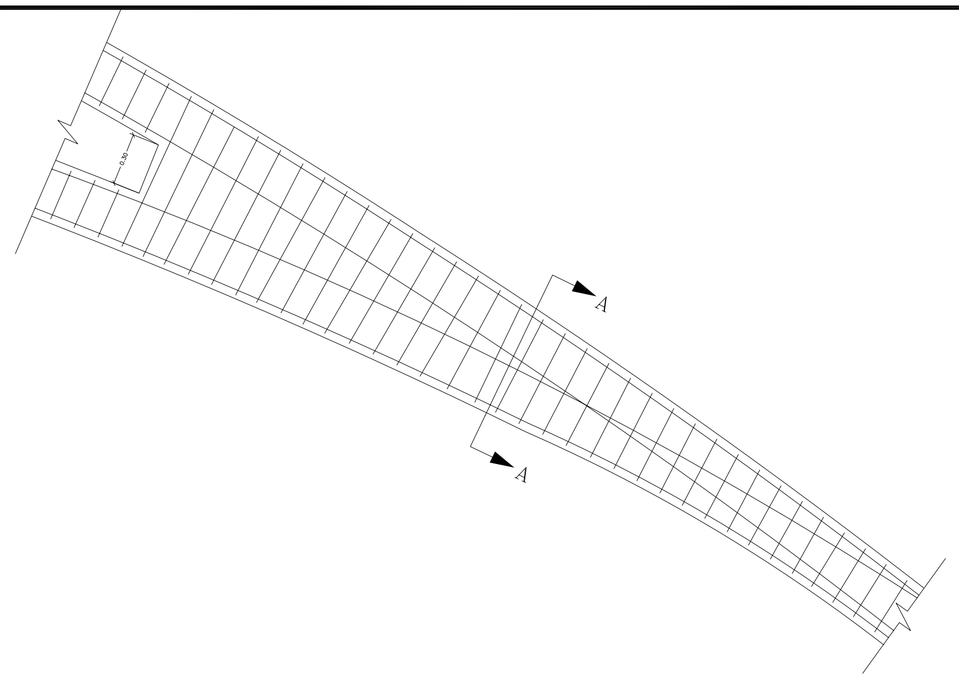
LONGITUDINAL SEC. IN BEAM B1

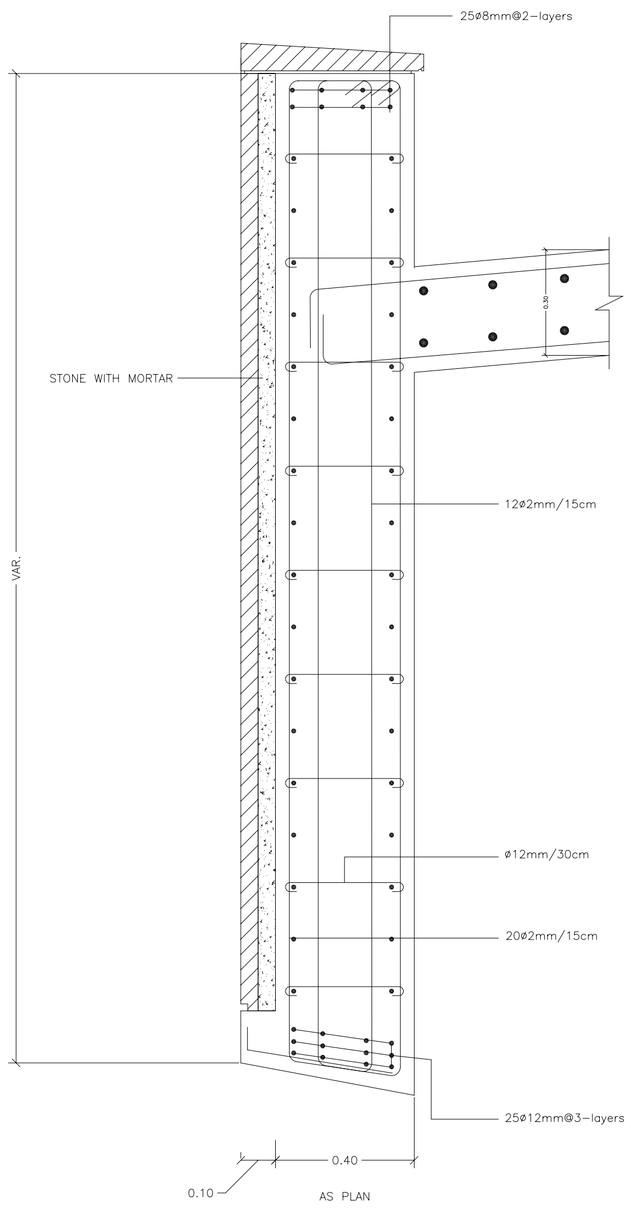
PROJECT NO. : 3029-43137

DRAWING NO. : S-05

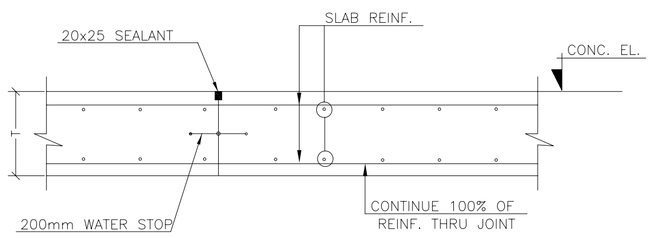


WALL DETAIL (WS-1 / S-06)
1:25





SECTION (A / –)
1:50



CONSTRUCTION JOINT
IN TOP SLAB

NOTES

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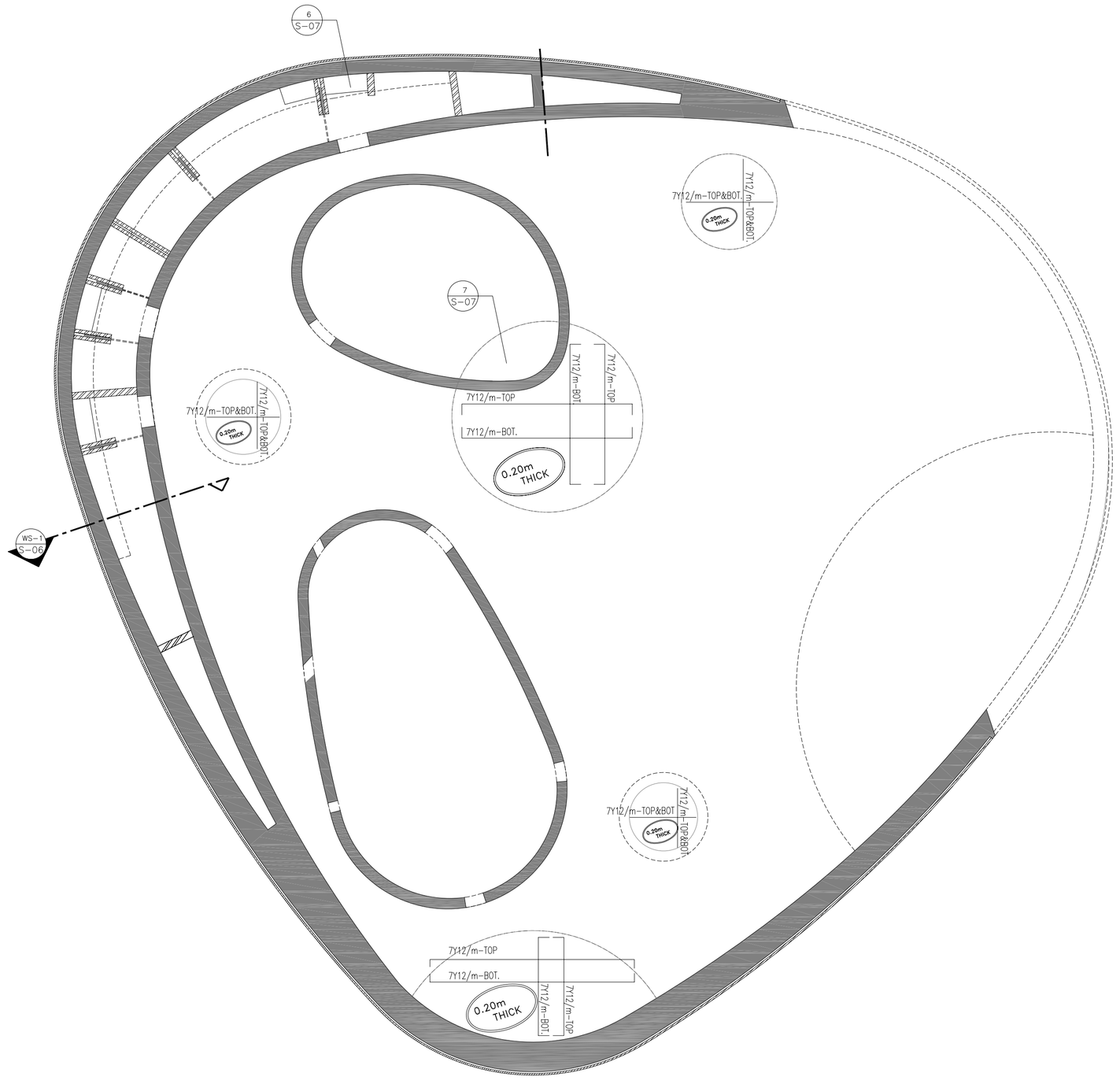

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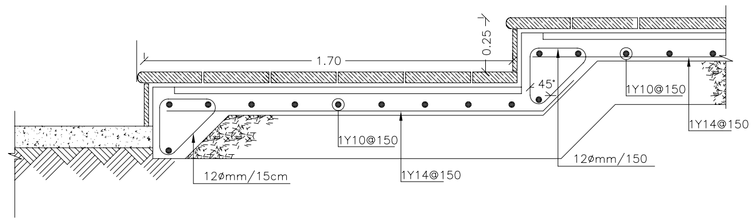
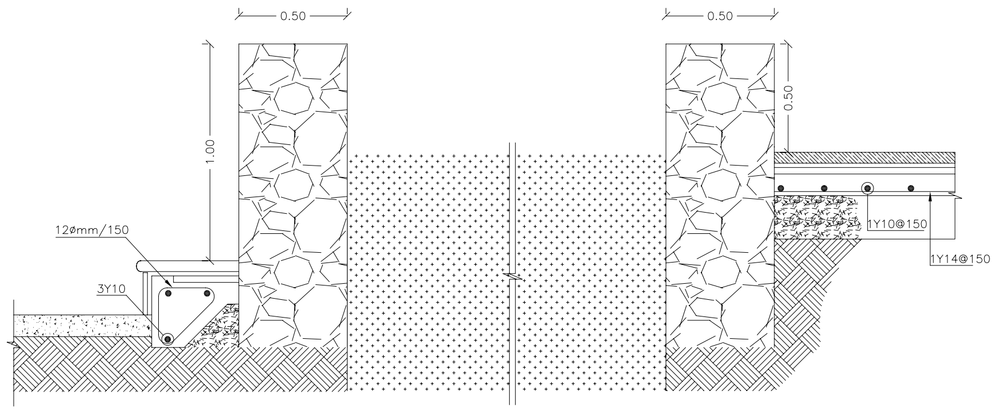
DETAILS-02

PROJECT NO. : 3029-43137

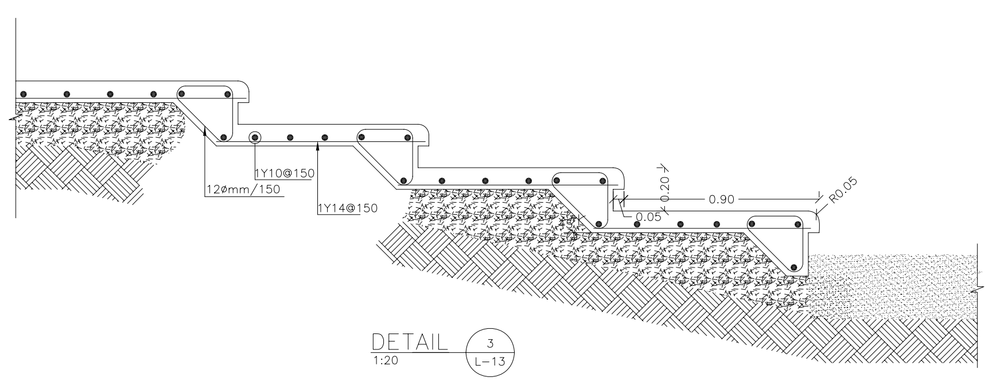
DRAWING NO. : S - 07



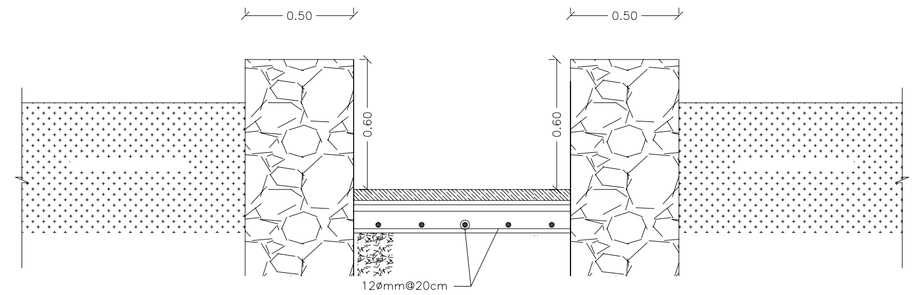
DETAIL 1:20 (1 / L-13)



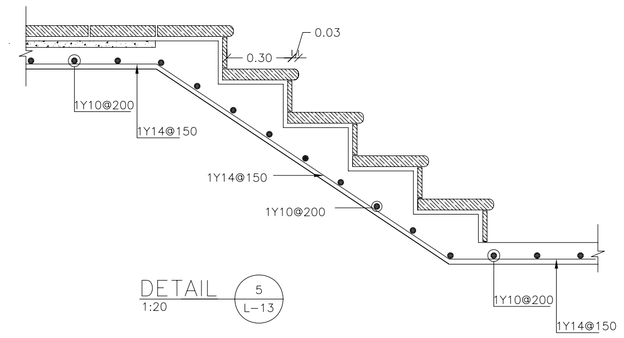
DETAIL 1:20 (2 / L-13)



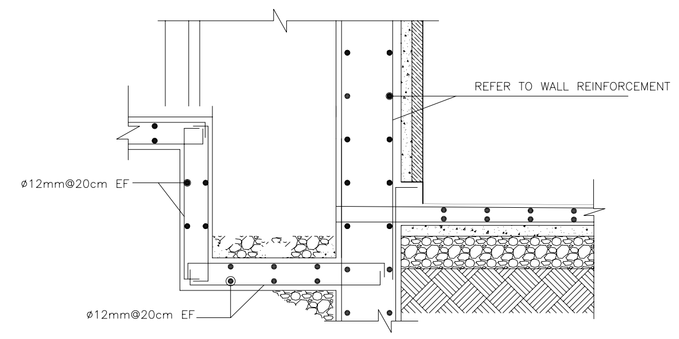
DETAIL 1:20 (3 / L-13)



DETAIL 1:20 (4 / L-13)

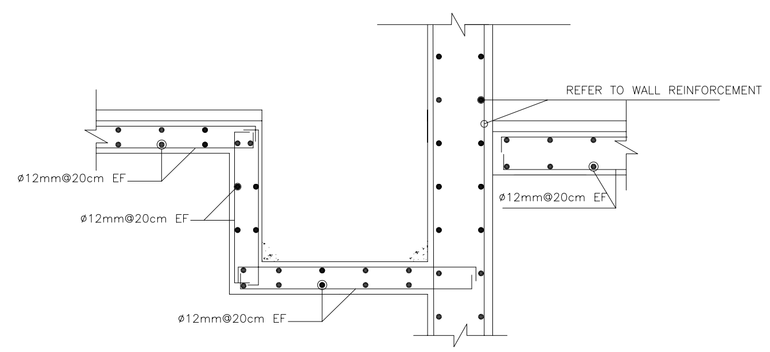


DETAIL 1:20 (5 / L-13)



PLANTER DETAIL

DETAIL 1:20 (6 / S-07)



GRAVEL BOX DETAIL

DETAIL 1:20 (7 / S-07)

NOTES

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DETAILS-03

PROJECT NO. : 3029-43137

DRAWING NO. : S-08