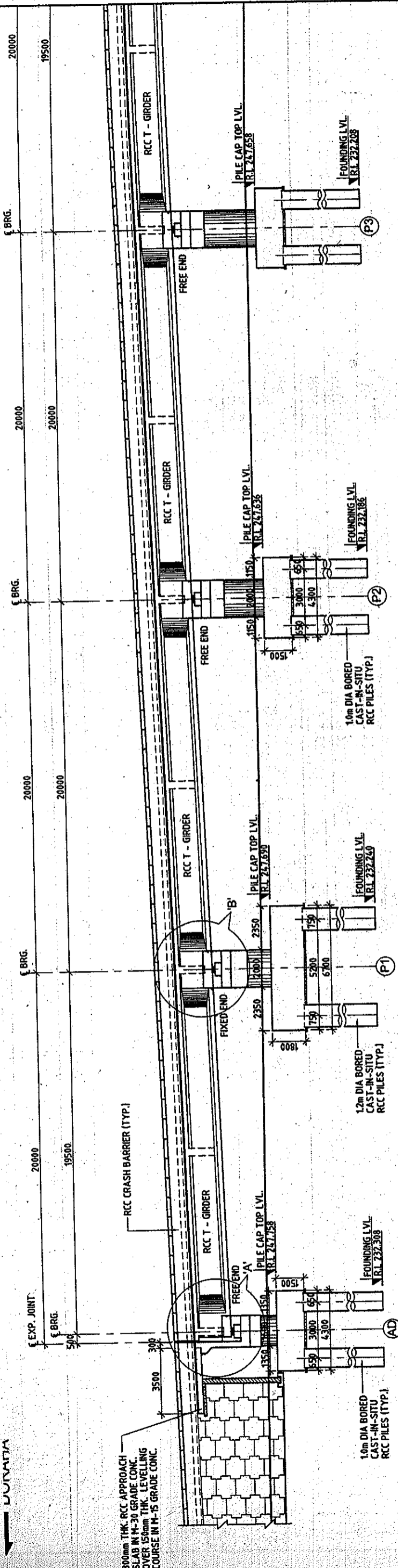
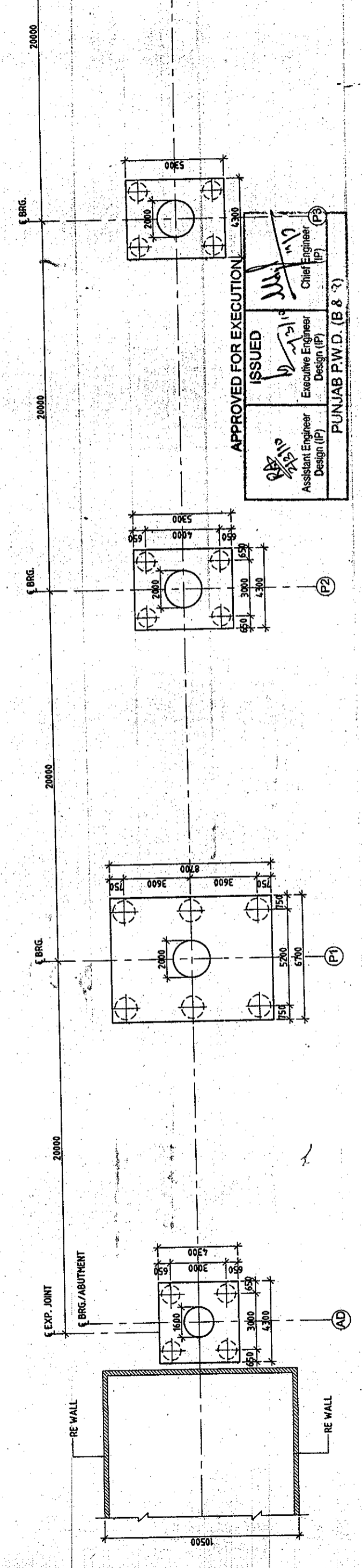


LUDHIANA



FORMATION LEVEL (m)	-100.000 -248.158 -253.660
GROUND LEVEL (m)	-120.000 -248.136 -253.200
CHAINAGE (m)	-140.000 -248.190 -252.540
	-159.500 -248.258 -251.897



**APPROVED FOR EXECUTION**

ISSUED: 01/12/20  
 Assistant Engineer Design (IP)  
 EXECUTIVE ENGINEER DESIGN (IP)  
 Chief Engineer (IP)  
 PUNJAB P.W.D. (B & T)

**DETAILS PROJECT REPORT**

**GENERAL ARRANGEMENT DRAWING FOR FLYOVER AT PROP. CH. 20+190 (SHEET 1 OF 7)**

SCALE: AS SHOWN  
 SHEET SIZE: A2  
 REVISED AS PER P.B. PWD COMMENTS  
 REVISED SPAN ARRANGEMENT  
 FIRST ISSUE  
 APPROVED  
 CHECKED  
 DESIGN  
 DRAWN  
 DATE

**PIDB**  
 PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD

**SMC**  
 SMC (INDIA) PVT. LTD.  
 DLF BUILDING 6C 5TH FLOOR,  
 CHANDIGARH, INDIA - 160022  
 TEL: 0174-430042, 431100

**CLIENT:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYPASS LUDHIANA

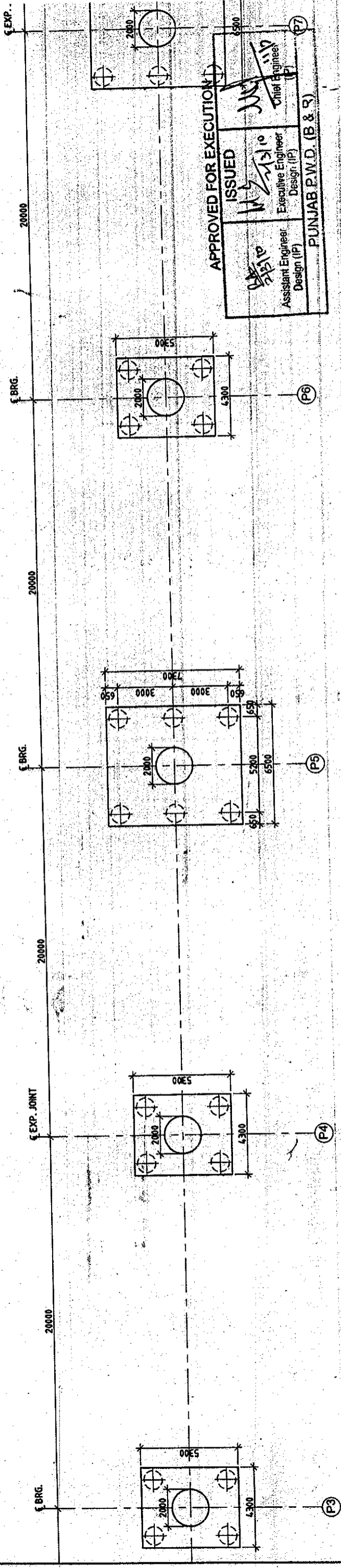
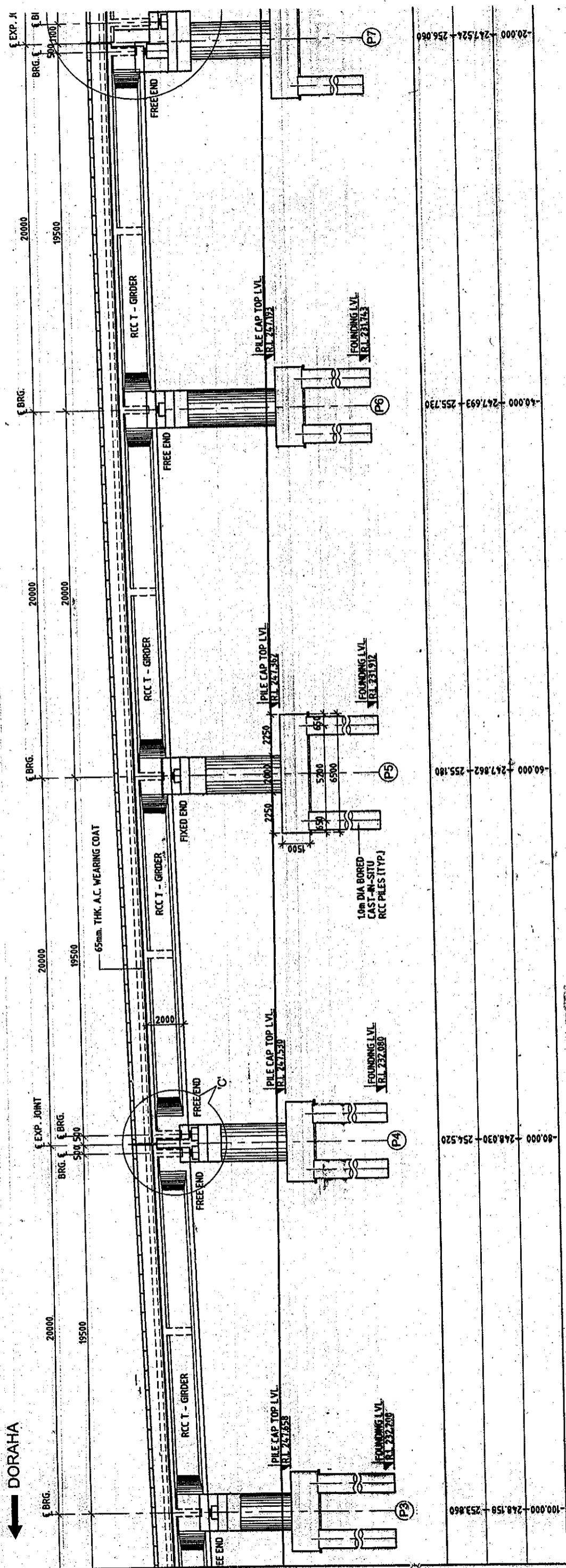
**PROJECT TITLE:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYPASS LUDHIANA

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CAD File Ref: H:\Structure\1235\FINAL DPR\Revised Drawings R2 (Feb. 01)\Bridge Ch. 20+190\Flyover Ch. 20+190 G-41.dwg

DORAHA ←

→ LUDHIANA



APPROVED FOR EXECUTION

ISSUED

Assistant Engineer Design (IP)

Executive Engineer Design (IP)

Chief Engineer

PUNJAB P.W.D. (B & R)

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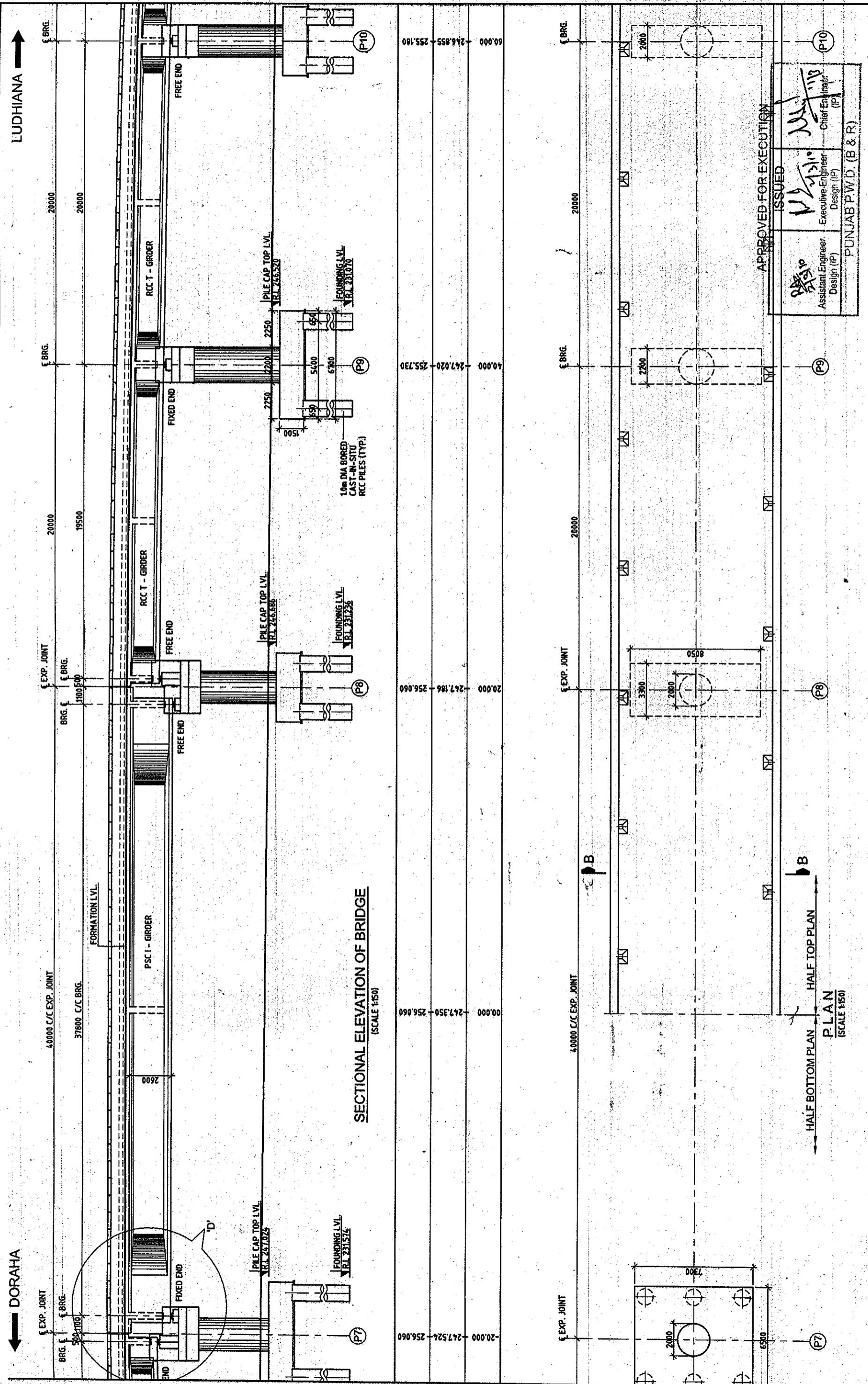
CLIENT:	PIDB PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD	CONSULTANT:	SMEC SMEC India Pvt. Ltd. G/F BUILDING No. 4, C.TOWER 2ND FLOOR, CHANDRYAN, WAZIRPUR, NEW DELHI, INDIA TEL: 011-26380042, 430100	PROJECT TITLE:	PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYE-PASS LUDHIANA	SCALE:	AS SHOWN	REVISIONS:	REV	DATE	DRAWN	DESIGN	CHECKED	APPROVED	REVISOR	REVISIONS COMMENTS
									R2	26/02/2009	MKS	PCK	LKT	S LAHRI	REVISOR	REVISED AS PER P.W. COMMENTS
									R1	20/02/2009	MKS	PCK	LKT	S LAHRI	REVISOR	REVISED SPAN ARRANGEMENT
									R0	03/02/2009	RAWAT	PCK	LKT	S LAHRI	REVISOR	FIRST ISSUE
																DETAILS OF REVISION

GENERAL ARRANGEMENT DRAWING FOR FLYOVER AT PROP. CH. 20+190 (SHEET 2 OF 11)

1213/SM/EC/LUDHIANA/20+190(G-0)

DPR | DRAW





SECTIONAL ELEVATION OF BRIDGE  
(SCALE 1:150)

PLAN  
(SCALE 1:150)

CLIENT: **PIDB**  
PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD

CONSULTANT: **SMEC**  
SMEC (INDIA) PVT. LTD. AND IS ISSUED TO THE PARTY FOR THE SPECIFIC PURPOSE AS STATED IN THE AGREEMENT AND IT SHALL NOT BE REPRODUCED, COPIED LEFT OR OTHERWISE DISPOSED OFF DIRECTLY OR INDIRECTLY, NOR USED FOR ANY OTHER PURPOSE OTHER THAN FOR WHICH IT IS FURNISHED.

PROJECT TITLE: **PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYE-PASS LUDHIANA**

REV	DATE	DRAWN	DESIGN	CHECKED	APPROVED	DETAILS OF REVISION
R2	26/02/2009	MKS	PCK	LKT	S LAHIRI	REVISED AS PER PR. PWD COMMENTS
R1	20/03/2009	MKS	PCK	LKT	S LAHIRI	REVISED SPAN ARRANGEMENT
R0	03/02/2009	PAWAT	PCK	LKT	S LAHIRI	FIRST ISSUE

SCALE: AS SHOWN

REVISIONS:

ASST. ENGINEER DESIGN (IP)	ISSUED	APPROVED FOR EXECUTION
EXECUTIVE ENGINEER DESIGN (IP)		
CHIEF ENGINEER (IP)		

PUNJAB P.W.D. (B & R)

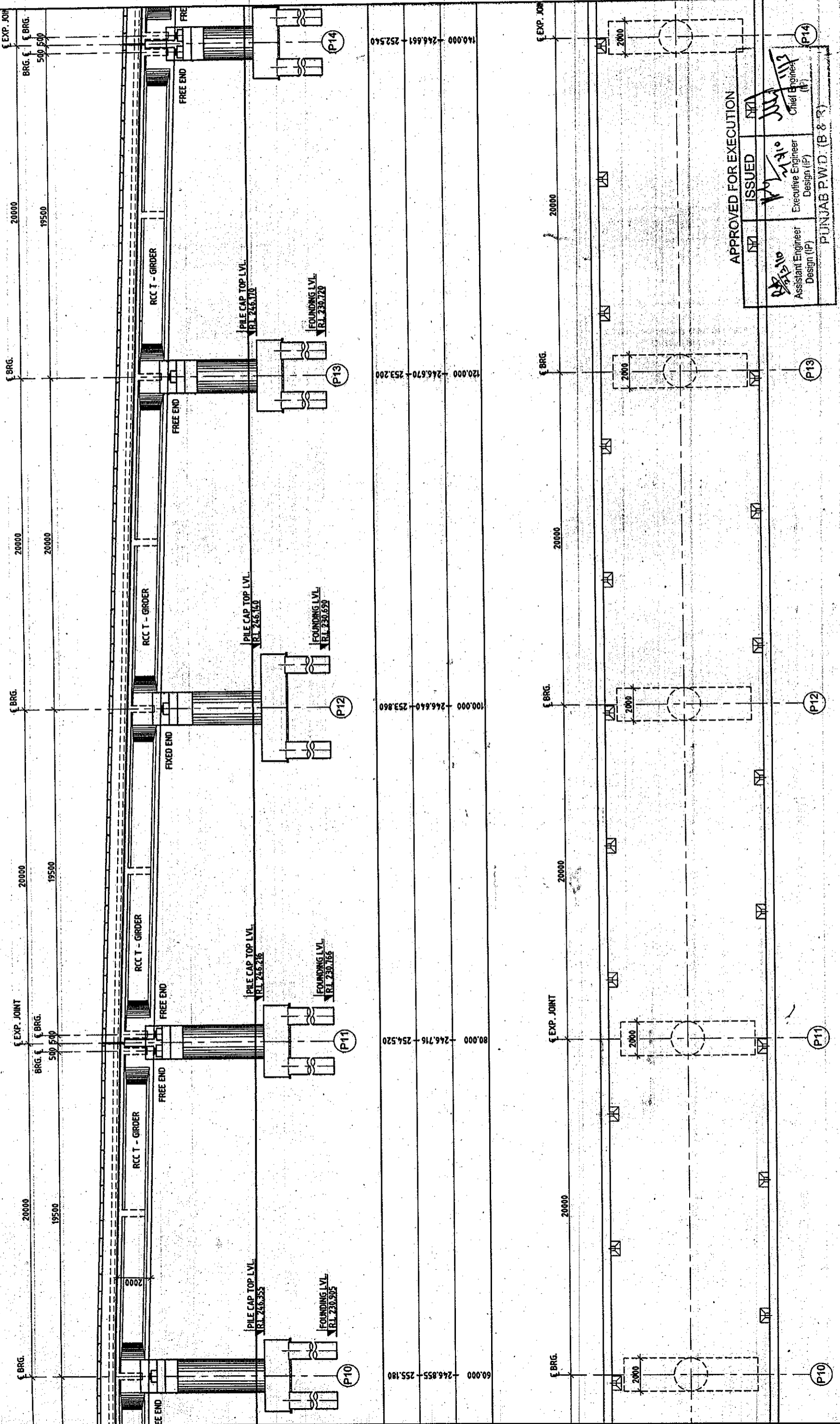
GENERAL ARRANGEMENT DRAWING FOR FLYOVER AT PROP. CH. 20+190 (SHEET 3 OF 7)

1213/SM/EC/LUDHIANA/20+190(G-01) R2



DORAHA ←

LUDHIANA →



APPROVED FOR EXECUTION

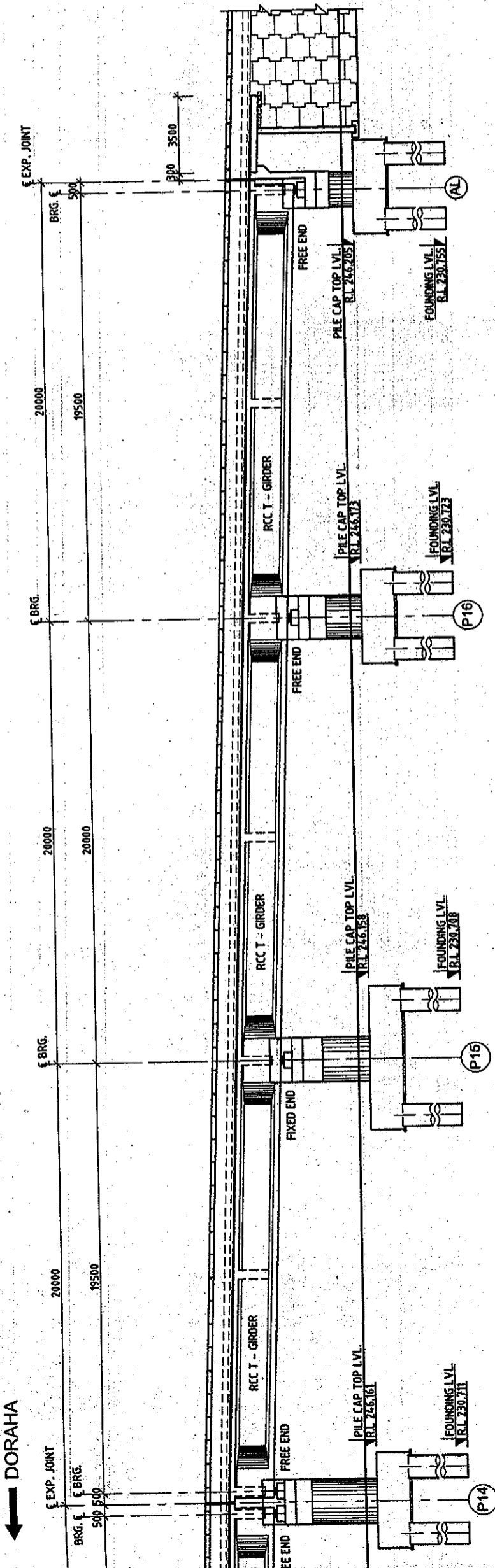
ISSUED	DATE	BY
24/10	24/10	Chief Engineer
24/10	24/10	Executive Engineer Design (P)
24/10	24/10	Assistant Engineer Design (P)

PUNJAB P.W.D. (B & R)

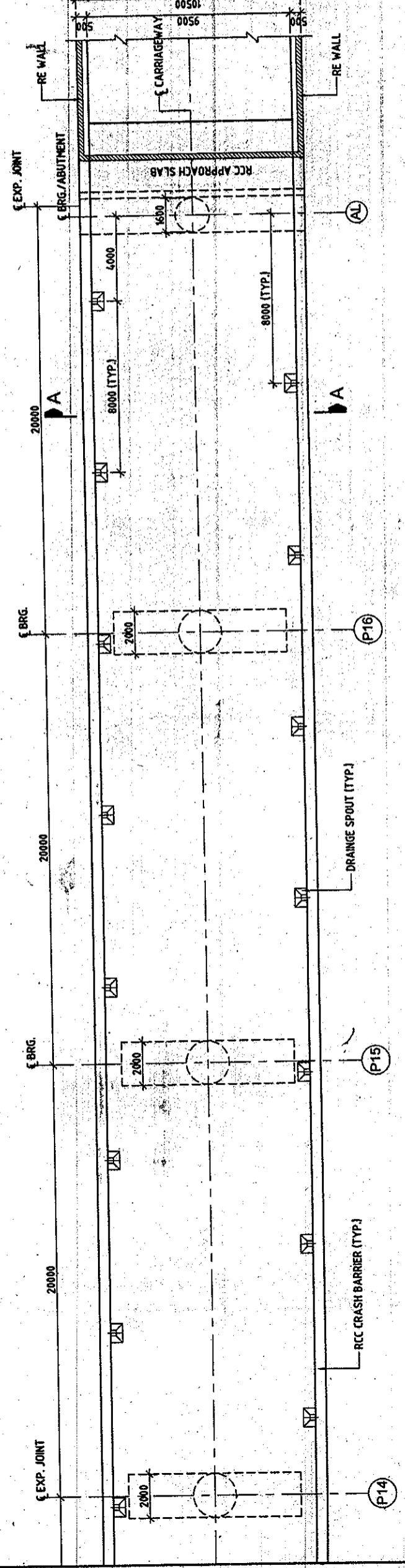
CLIENT:		CONSULTANT:		PROJECT TITLE:		DETAILS OF REVISION		SCALE:		GENERAL ARRANGEMENT DRAWING	
PIDB PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD		SMEC SMEC (INDIA) PVT. LTD. DLF BUILDING NO. 6 TOWER 26 FLOOR CYBER CITY, PHASE-II, GURGAON, HARYANA, INDIA - 122 002 Tel: 0122-430002, 430100		PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYE-PASS LUDHIANA		REV	DATE	DESIGN	APPROVED	AS SHOWN	FOR FLYOVER AT PROP.CH. 20+190 (SHEET 4 OF 7)
R1	26/02/2009	MKS	PKC	LKT	PKC	S L/WHI	S L/WHI	REVISD AS PER PR. PWD COMMENTS	SHEET SIZE:	DRW	R2
R2	26/02/2009	MKS	PKC	LKT	PKC	S L/WHI	S L/WHI	REVISED SPAN ARRANGEMENT	A2	DPR	1213/SM/EC/LUDHIANA/20+190/G.D/1
R3	03/02/2009	RAVAT	PKC	LKT	PKC	S L/WHI	S L/WHI	FIRST ISSUE			
REV	DATE	DRAWN	DESIGN	CHECKED	APPROVED	DETAILS OF REVISION					

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140.000	246.661	252.540
160.000	246.658	251.880
180.000	246.673	251.220
199.500	246.705	250.577



APPROVED FOR EXECUTION

ISSUED

Assistant Engineer Design (P)

Executive Engineer Design (P)

Chief Engineer

PUNJAB P.W.D. (B & R)

**CLIENT:** PUIDB  
PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD

**CONSULTANT:** SMEC  
SMEC PUNJAB  
D/F BUILDING TOWER 20 FLOOR  
CHANDLERY PHASE 2 GURGAON  
HARYANA, INDIA - 122 002  
TEL: 0124-430002, 430100

**PROJECT TITLE:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYE-PASS LUDHIANA

**REVISIONS:**

REV	DATE	DRAWN	DESIGN	CHECKED	APPROVED	DETAILS OF REVISION
R2	26/8/2009	MKS	PKK	PKK	S LAHRI	REVISED AS PER FB. PWD COMMENTS
R1	20/03/2009	MKS	PKK	LKT	S LAHRI	REVISED SPAN ARRANGEMENT
R0	03/02/2009	RAWAT	PKK	LKT	S LAHRI	FIRST ISSUE

**SCALE:** AS SHOWN

**SHEET SIZE:** A2

**DRW:** DPR

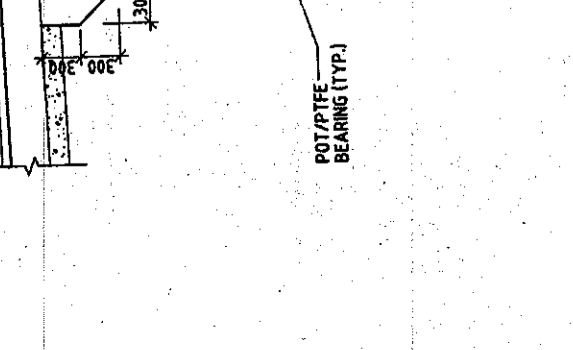
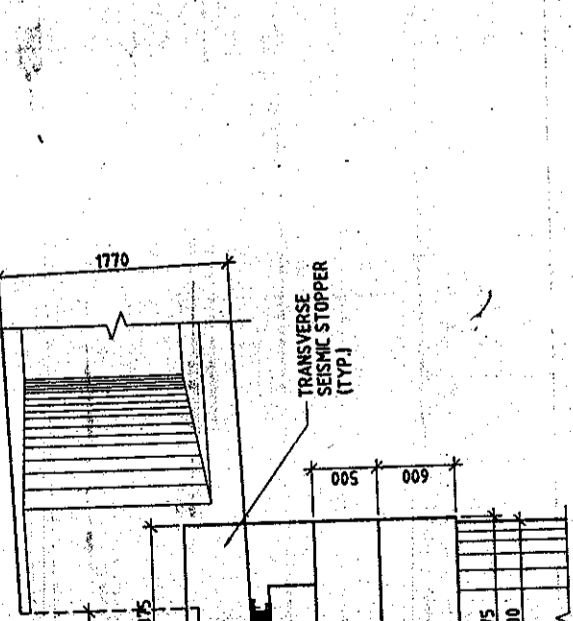
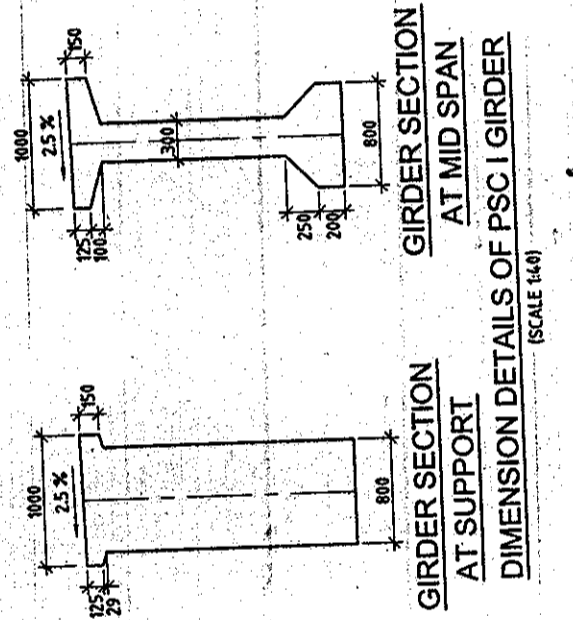
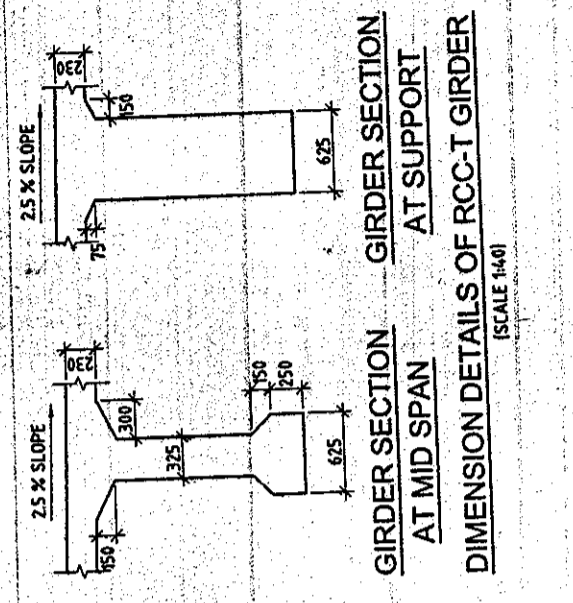
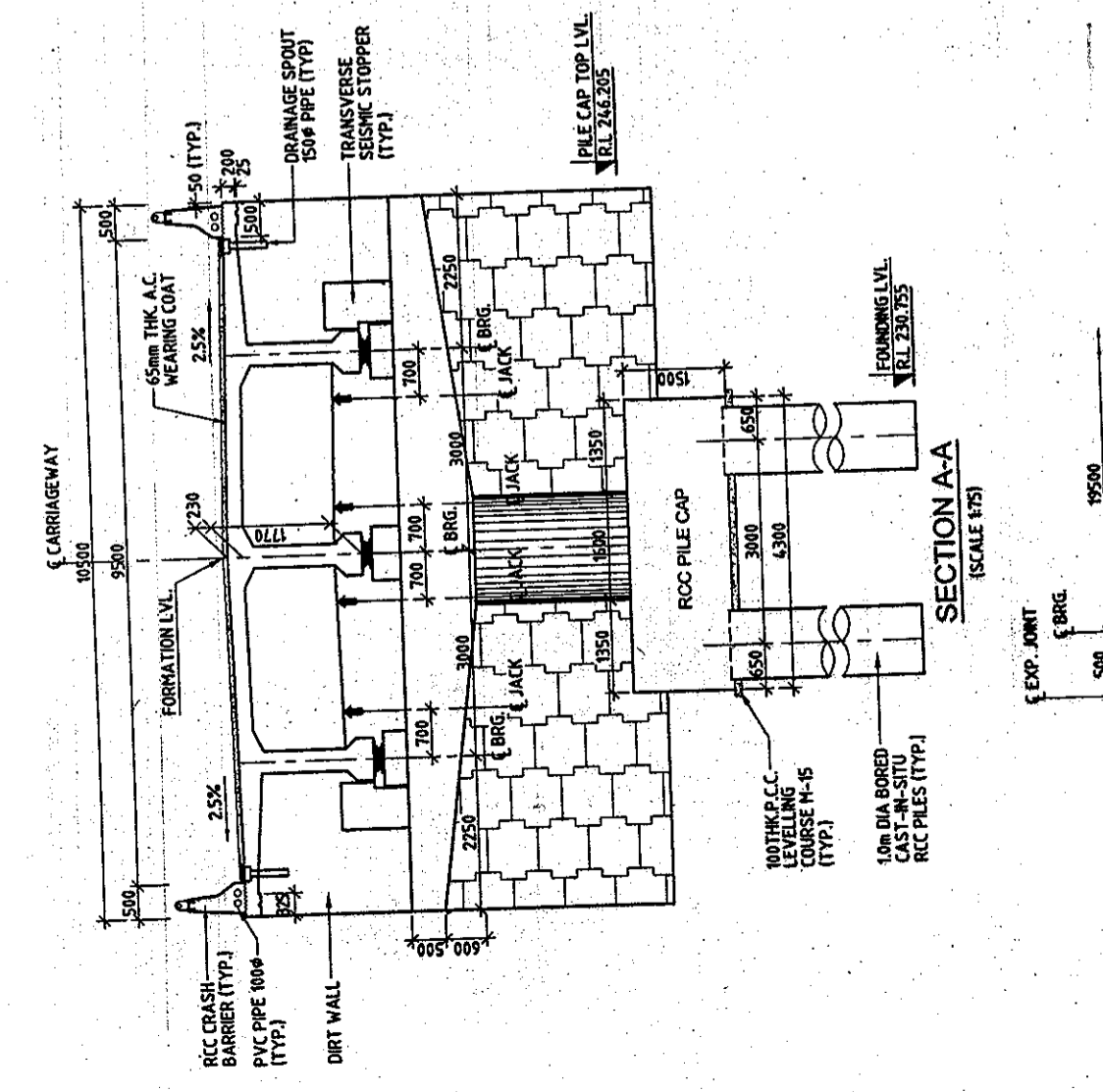
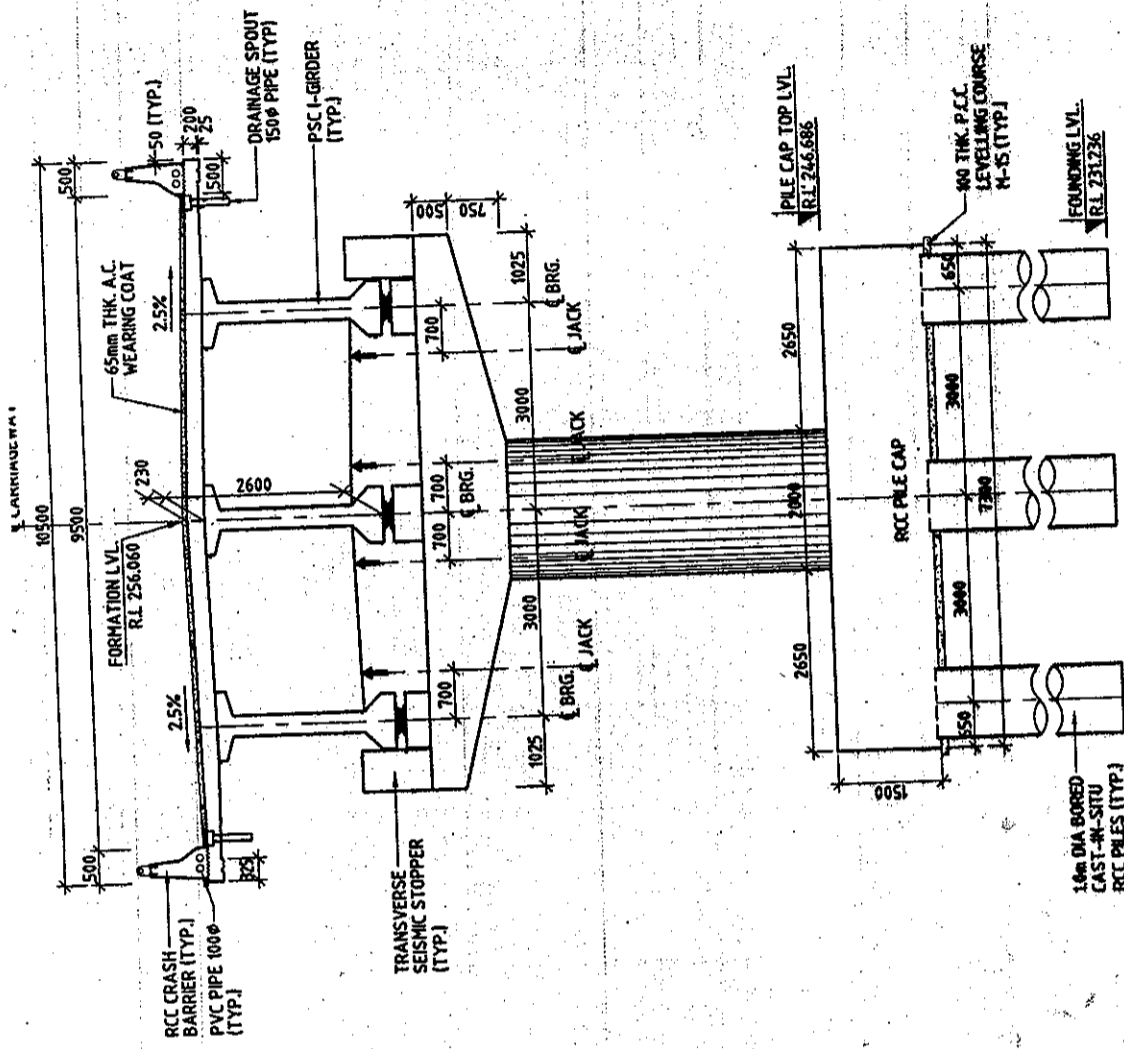
**DRW:** DRW

**GENERAL ARRANGEMENT DRAWING FOR FLYOVER AT PROP. CH. 20+190**

**1213/SMEC/LUDHIANA/20+190/G-01**

**SHEETS OF 71**

**R2**



APPROVED FOR EXECUTION

Assistant Engineer Design (IP)	Executive Engineer Design (IP)	Chief Engineer

PUNJAB P.W.D. (B & R)

PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYE-PASS LUDHIANA

PROJECT TITLE: PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYE-PASS LUDHIANA

CLIENT: PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD

CONSULTANT: S.M.E.C. (SPECIALIST PVT. LTD.)

CONTRACT NO: 1213/SMC/LUDHIANA/20+190/G-01

SCALE: AS SHOWN

SHEET SIZE: A2

REVISIONS:

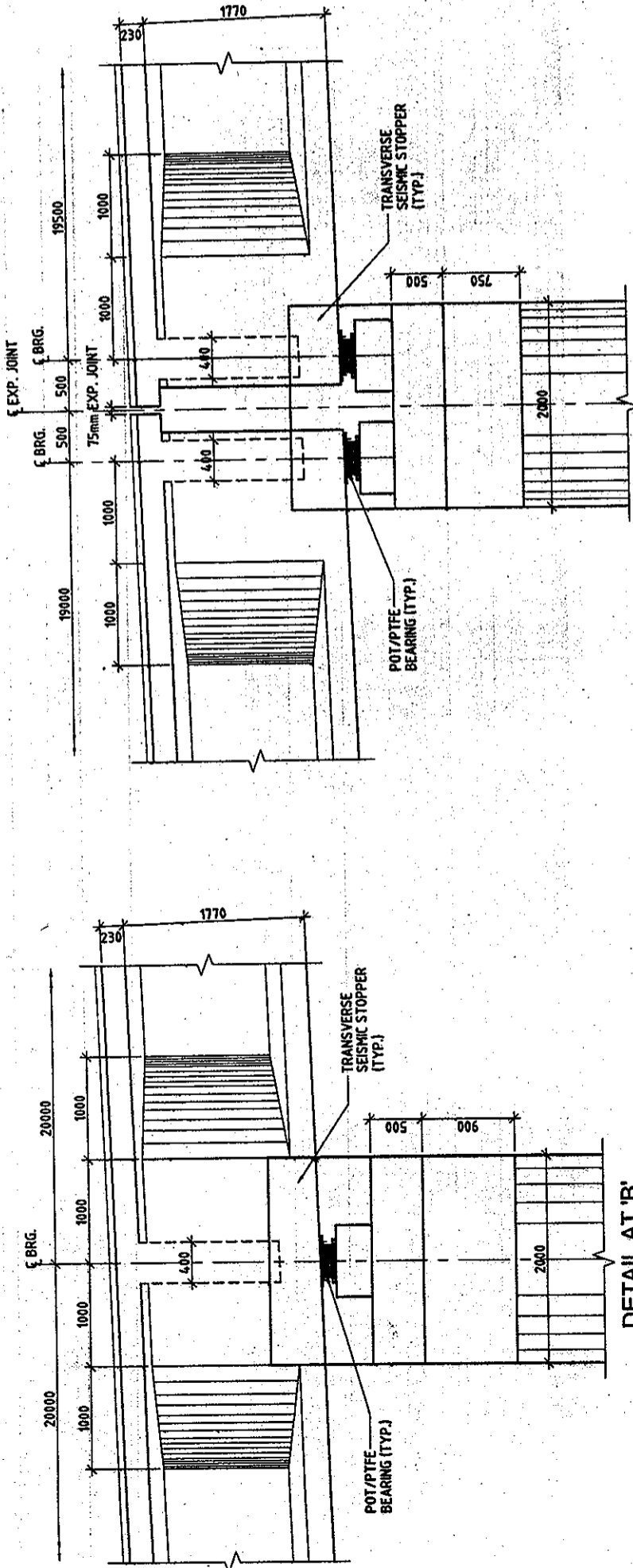
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R1	20/03/2009	MKS	PCK	LKT	REVISED SPAN ARRANGEMENT
R0	03/02/2009	RAWAT	PCK	LKT	FIRST ISSUE

DETAILED PROJECT REPORT

GENERAL ARRANGEMENT DRAWING FOR FLYOVER AT PROP. CH. 20+190 (SHEET 6 OF 7)

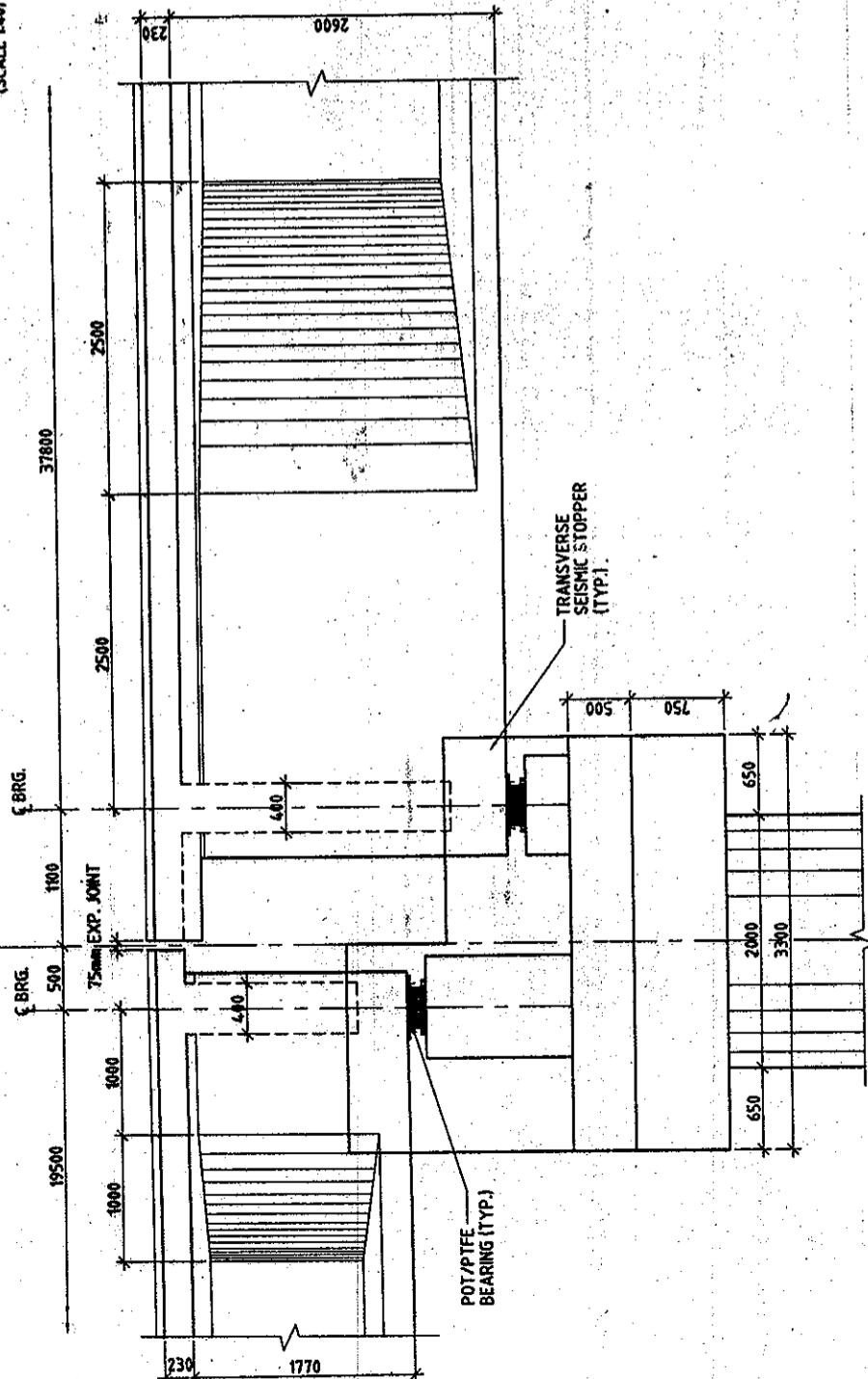
1213/SMC/LUDHIANA/20+190/G-01

R2



DETAIL AT 'A'  
(SCALE 1:40)

DETAIL AT 'C'  
(SCALE 1:40)



DETAIL AT 'D'  
(SCALE 1:40)

- NOTES:-**
- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - PROPOSED BRIDGE IS DESIGNED FOR ONE LANE OF IRC CLASS 70R OR 2 LANE OF CLASS 'A' LOADING WHICHEVER GOVERNS.
  - CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH ON 150mm CUBES AS:-
    - FOR RCC SUPERSTRUCTURE ----- 40MPa
    - FOR PSC SUPERSTRUCTURE ----- 45MPa
    - FOR CRASH BARRIER ----- 40MPa
    - FOR SUBSTRUCTURE ----- 35MPa
    - FOR PILE & PILE CAP ----- 35MPa
  - CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS.
    - FOR SUPERSTRUCTURE ----- 40mm
    - FOR SUBSTRUCTURE ----- 50mm
    - FOR PILE & PILE CAP ----- 75mm
  - THE HIGH YIELD STRENGTH DEFORMED BARS OF GRADE DESIGNATION, F<sub>y</sub>-415 CONFORMING TO IS:1786 SHALL ONLY BE USED.
  - BACK FILLING BEHIND ABUTMENTS & RETURN WALLS SHALL CONSIST OF GRANULAR MATERIAL.
  - 65mm THK. A.C. WEARING COAT SHALL CONSIST OF UNDER LAYER OF MASTIC ASPHALT 75mm THK AND ONE LAYER OF ASPHALTIC CONC. 40mm. AS PER NORTH SPECIFICATION SECTION 500.
  - STRIP SEAL TYPE EXPANSION JOINTS OF PROVEN QUALITY SHALL BE PROVIDED, IN TERMS OF MODIFIED INTERIM SPECIFICATIONS FOR EXPANSION JOINTS ISSUED VIDE "NORTH" CIRCULAR NO:R/7/01-3105/7/96-STAR DATED 30-11-2000 & 25-01-2001.
  - SLOPE/MEDIAN WIDTH AT THE STRUCTURE LOCATION SHALL BE PROVIDED AS PER RELEVANT HIGHWAY CROSS SECTION.
  - PILE CAP TOP AND FOUNDING LEVELS SHOWN IN THE DRAWINGS ARE TO BE VERIFIED AT SITE AND ANY SIGNIFICANT CHANGE IN THOSE SHALL BE BROUGHT INTO NOTICE OF DESIGNER BEFORE EXECUTION.
  - VERTICAL PILE CAPACITY 250 TONS FOR 1.0M DIA AND 1.2M DIA PILES. LATERAL LOAD CAPACITY 28 TONS FOR 1.0M DIA PILES. LATERAL LOAD CAPACITY 38 TONS FOR 1.2M DIA PILES. PILE CAPACITY TO BE CONFIRMED BY PILE LOAD TEST.

**REFERENCE DRAWINGS:-**

- 1213/SM/EC/LUDHIANA/20+190/G-01 (SHEET 1 OF 7 TO 6 OF 7)
- 1213/SM/EC/LUDHIANA/20+190/E-01 TO E-10 (SHEET 1 OF 2 & 2 OF 2)
- 1213/SM/EC/LUDHIANA/SUP-53 TO 63
- 1213/SM/EC/LUDHIANA/SUP-64 & 65 (SHEET 1 OF 2 & 2 OF 2)
- 1213/SM/EC/LUDHIANA/SUP-66 TO 69
- 1213/SM/EC/LUDHIANA/MSC-01 & 04

APPROVED FOR EXECUTION

Assistant Engineer Design (IP)	Executive Engineer Design (IP)	Chief Engineer (IP)
PUNJAB P.W.D. (B & R)		

SCALE: AS SHOWN		DETAILED PROJECT REPORT	
REVISED AS PER P.B. PWD COMMENTS		GENERAL ARRANGEMENT DRAWING	
SHEET SIZE: A2		FOR FLYOVER AT PROP. CH. 20+190	
REVISED SPAN ARRANGEMENT		(SHEET 7 OF 7)	
FIRST ISSUE		1213/SM/EC/LUDHIANA/20+190/G-01	
DETAILS OF REVISION		R2	
APPROVED	CHECKED	DPR	DRW
DESIGN	DESIGN		
DATE	DATE		
REV	DATE		
PROJECT TITLE: PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYPASS LUDHIANA			
CONSULTANT: SM/EC			
CLIENT: PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD			
THIS DRAWING HAS NOT BEEN PUBLISHED AND IS THE SOLE PROPERTY OF S/EC INDIA PVT. LTD. AND IS ISSUED TO THE PARTY FOR THE SPECIFIC PURPOSE AS STATED IN THE AGREEMENT AND IT SHALL NOT BE REPRODUCED, COPIED LEFT OR OTHERWISE DISPOSED OFF DIRECTLY OR INDIRECTLY, NOR USED FOR ANY OTHER PURPOSE OTHER THAN FOR WHICH IT IS FURNISHED.			

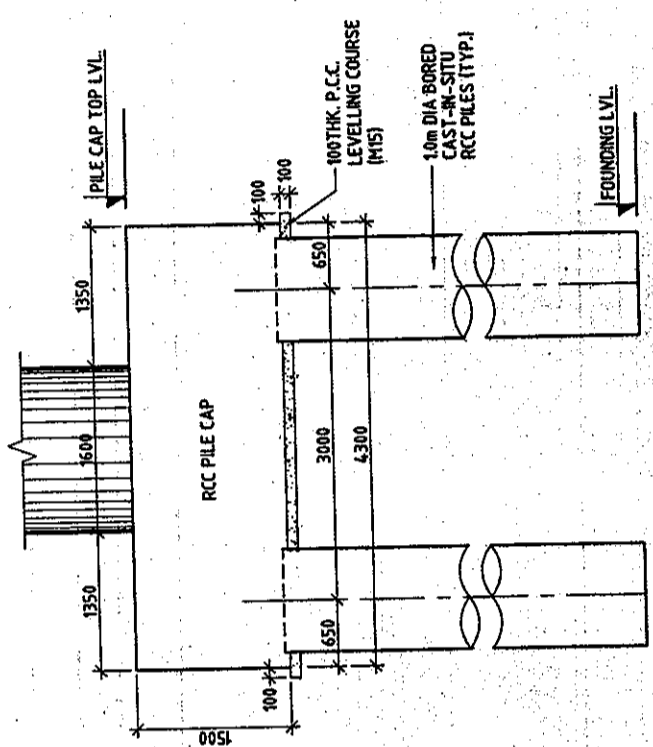


**NOTES:-**

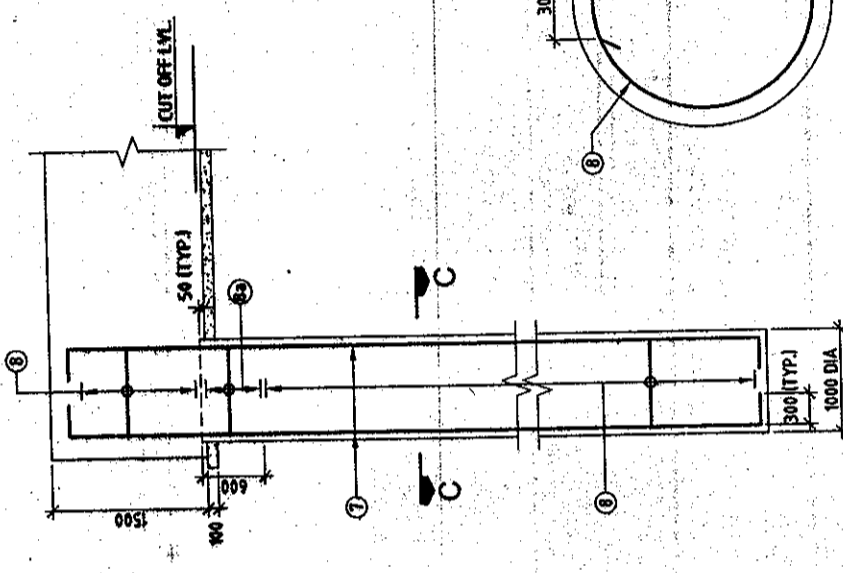
- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH OF 35MPa FOR BORED CAST-IN-SITU PILE AND PILE CAP.
- CLEAR COVER TO SHALL BE AS FOLLOWS.  
(i) FOR PILE ----- 75mm  
(ii) FOR PILE CAP ----- 75mm
- THE HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED.
- MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
- MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
- LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
- ACTUAL LOAD TEST SHALL BE CARRIED OUT ON A TEST PILE AS PER STANDARD SPECIFICATIONS TO DETERMINE VERTICAL AND LATERAL CAPACITY OF PILE. IT SHALL HOWEVER BE ENSURED THAT IT IS NOT LESS THAN DESIGN VALUES.

**REFERENCE DRAWINGS:-**

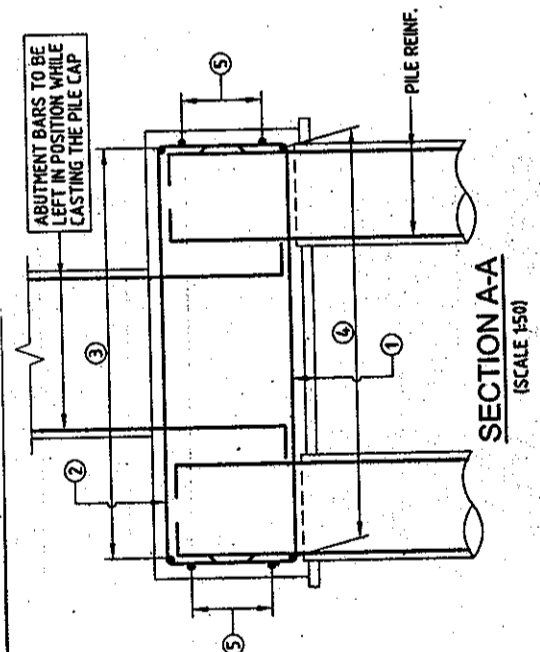
- 1213/SMEC/LUDHIANA/20-190/G-01 (SHEET 1 OF 7 TO 7 OF 7)
- 1213/SMEC/LUDHIANA/20-190/E-01 (SHEET 2 OF 2)



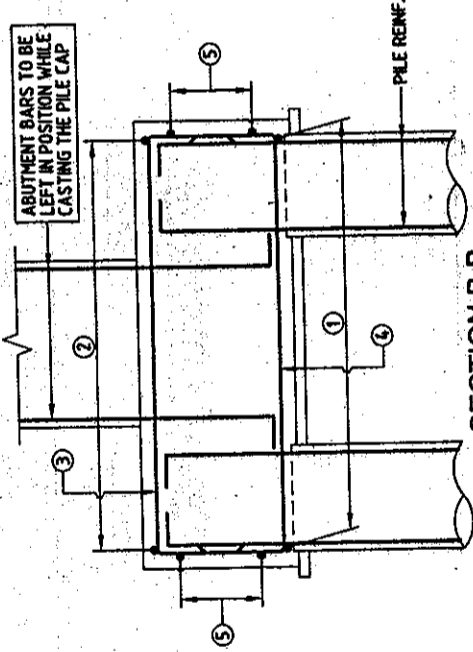
**ELEVATION ALONG T-T AXIS**  
(SCALE 1:50)



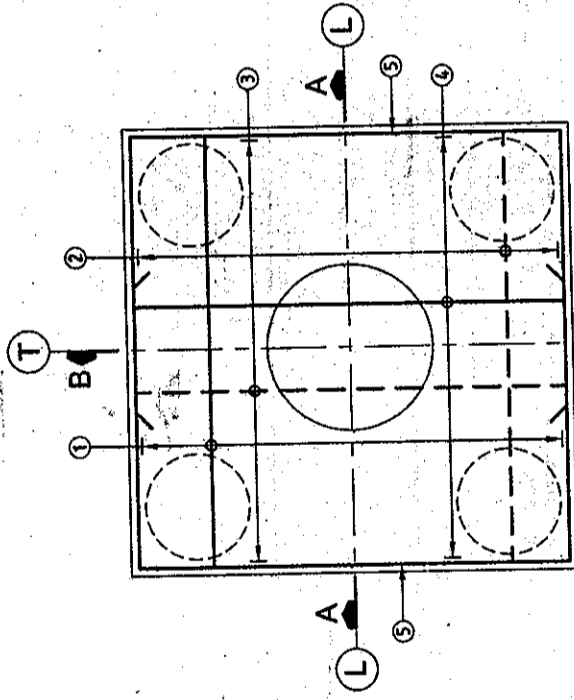
**R.C.C. DETAILS OF PILE**  
(SCALE 1:50)



**SECTION A-A**  
(SCALE 1:50)



**SECTION B-B**  
(SCALE 1:50)



**PLAN AT TOP OF PILE CAP**  
(SHOWING DIMENSIONS)  
(SCALE 1:50)

**LEVELS CHART FOR PILE CAP LAYOUT**

ABUTMENT DESIGNATION	BED LEVELS	TOP OF PILE CAP LEVELS	CUT OFF LEVELS	FOUNDING LEVELS
AD	246.258	247.750	246.308	232.308
AL	246.705	246.205	244.755	230.755

**REINFORCEMENT DETAIL:**

BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE
1	25	20 Nos.	┌
2	16	150	┌
3	16	150	┌
4	25	16 Nos.	┌
5	16	8 Nos.	┌
7	20	20 Nos.	┌
8	10	200	○
8a	10	100	○

**LEGENDS:**

APPROVED FOR EXECUTION  
BAR ON PROVIDED

25/10  
Assistant Engineer  
Design (P)

25/10  
Executive Engineer  
Design (P)

Chief Engineer  
Design (P)

PUNJAB P.W.D. (B & R)

**CLIENT:** PIDB  
PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD

**CONSULTANT:** SMEC  
SMEC (INDIA) PVT. LTD.  
D-6 BUILDING, 2ND FLOOR,  
CHANDI NAGAR, LUDHIANA,  
HARYANA, INDIA - 141002  
Tel: 0182-490062, 401100

**PROJECT TITLE:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BAY-PASS LUDHIANA

**SCALE:** AS SHOWN

**SHEET SIZE:** A2

**DPR:** DRW

**REVISIONS:**

REV	DATE	DRAWN	DESIGN	CHECKED	APPROVED	REVISIONS
R1	27/09/2009	MKS	VNM	VNM	S/AHRI	REVISED AS PER P&P/WD COMMENTS
R0	30/04/2009	MKS	VNM	VNM	S/AHRI	FIRST ISSUE

**DETAILED PROJECT REPORT**  
**DIMENSIONAL & REINFT. DETAILS OF PILE, PILE CAP, ABUTMENT SHAFT, ABUTMENT CAP & DIRT WALL**  
(SHEET 1 OF 2)

1213/SMEC/LUDHIANA/20-190/E-01

R1

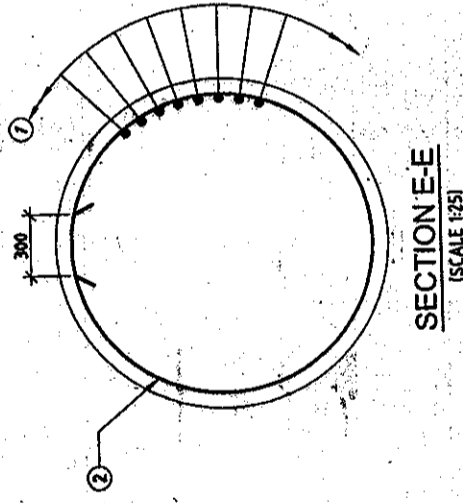
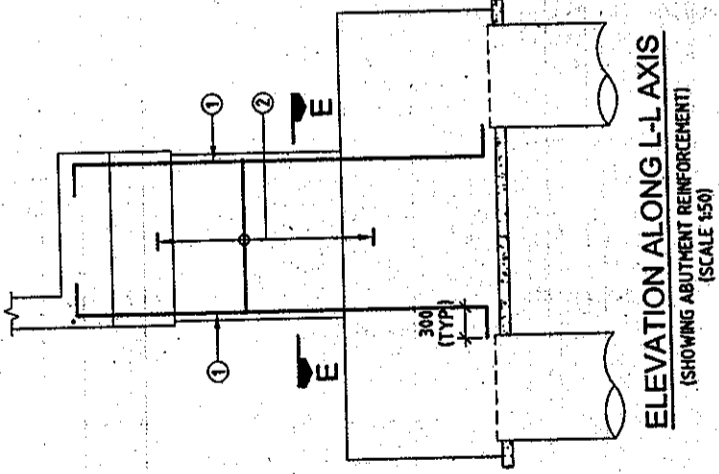
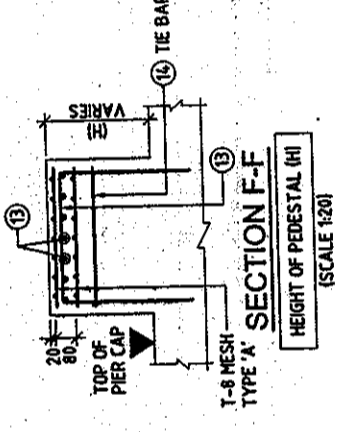
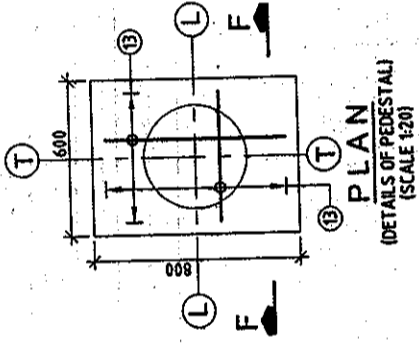
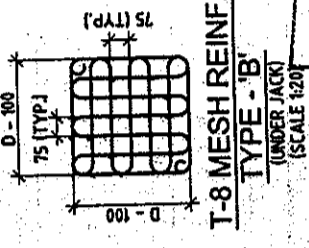
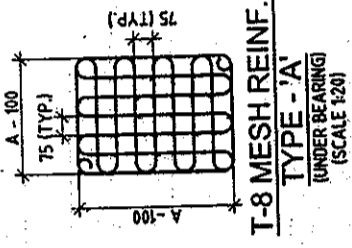


**NOTES:-**

- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH 150mm CUBES AS FOLLOWS:-  
ABUTMENT -----M35  
ABUTMENT CAP -----M35  
CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS.  
(i) FOR SUBSTRUCTURE ----- 50mm  
(ii) FOR FOUNDATION ----- 75mm
- THT HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED.
- MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
- MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
- IN ABUTMENT SHAFT T-10 OPEN LINKS (OR S LOOPS) WITH HOOK PLACED AROUND THE VERTICAL BARS ARE PLACED AT THE RATE OF 4 LINKS IN ONE SQUARE METER.
- LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
- A IS THE DIMENSIONS OF THE BEARINGS WHICH IS TO BE FURNISHED BY THE MANUFACTURER.
- D = DIA OF JACK.

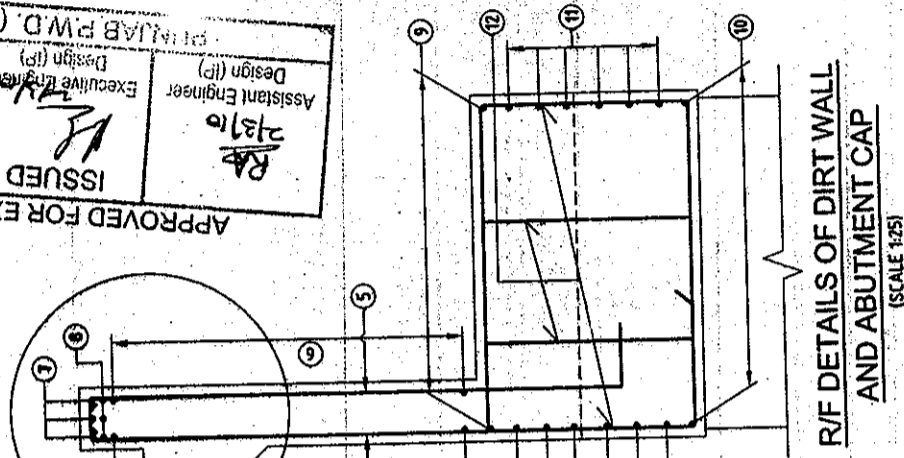
**REFERENCE DRAWINGS:-**

- 1213/SMEC/LUDHIANA/20+190/G-01 (SHEET 1 OF 7 OF 7)
- 1213/SMEC/LUDHIANA/20+190/E-01 (SHEET 1 OF 2)



**LEVELS CHART FOR ABUTMENT**

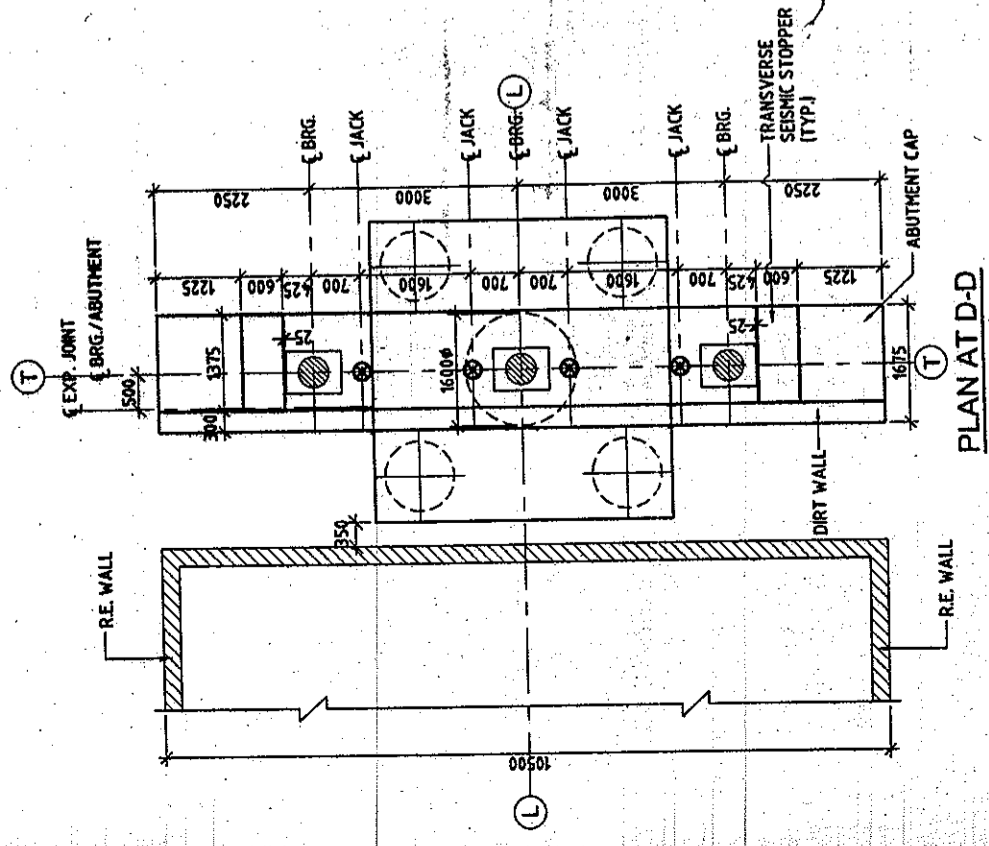
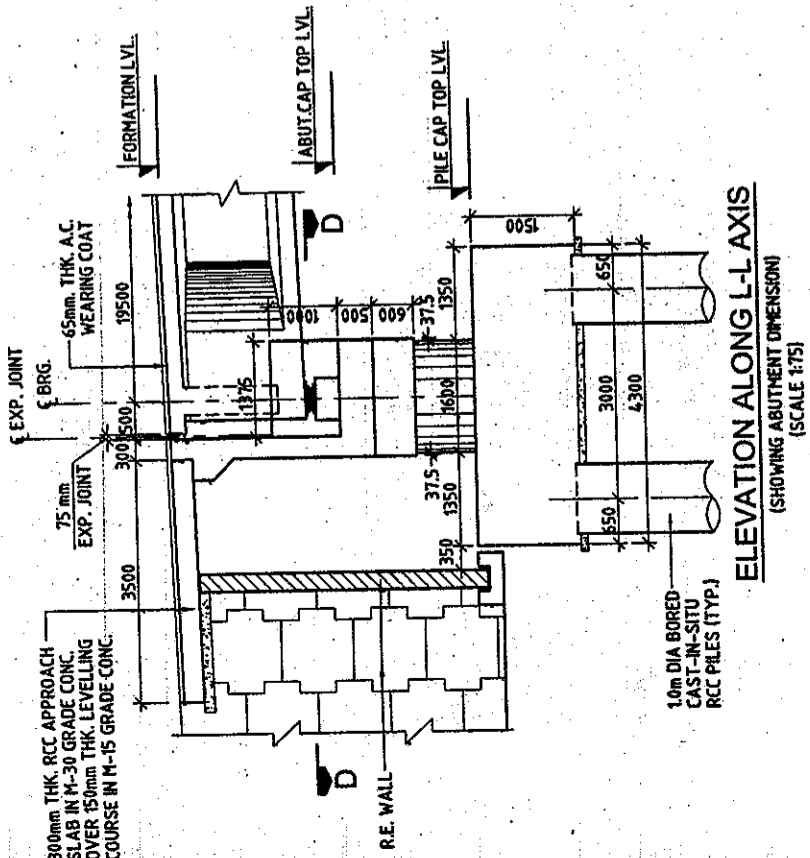
ABUTMENT DESIGNATION	FORMATION LEVELS	ABUTMENT CAP TOP LEVELS	BED LEVELS
AD	251.897	249.482	248.258
AL	250.577	248.162	246.705



**REINFORCEMENT DETAIL:**

BAR NO.	DIA (mm)	SPACING/Nos.	SHAPE
1	20	45 Nos.	U
2	12	125	U
3	16	150	U
4	12	150	U
5	16	150	U
6	12	150	U
7	16	3 Nos.	U
8	16	3 Nos.	U
9	32	21 Nos.	U
10	16	12 Nos.	U
11	16	12 Nos.	U
12	16	150	U
13	12	75	U
14	12	150	U

**LEGENDS:**  
 --- BAR ON TOP FACE  
 --- BAR ON BOTTOM FACE



APPROVED FOR EXECUTION  
 Chief Engineer  
 Executive Engineer  
 Assistant Engineer  
 Design (IP)  
 RAJ 2/3/10  
 PUNJAB P.W.D. (B & R)

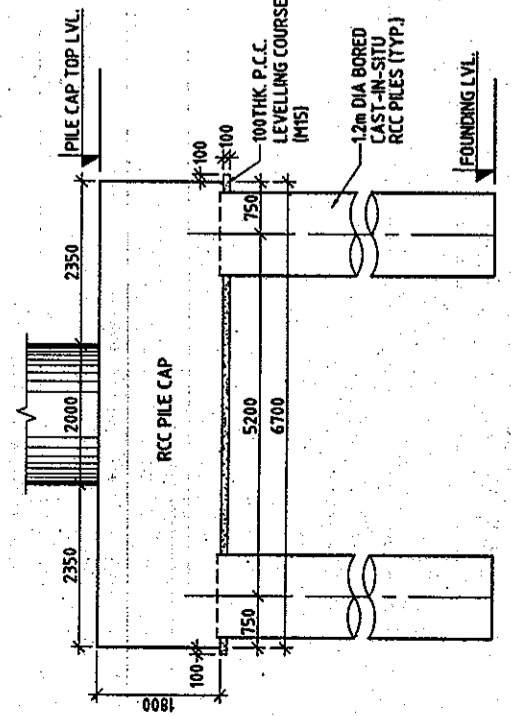
THIS DRAWING HAS NOT BEEN PUBLISHED AND IS THE SOLE PROPERTY OF S.M.E.C. LTD. AND IS ISSUED TO THE PARTY FOR THE SPECIFIC PURPOSE AS STATED IN THE AGREEMENT AND IT SHALL NOT BE REPRODUCED, COPIED, LENT OR OTHERWISE DISPOSED OFF DIRECTLY OR INDIRECTLY, NOR USED FOR ANY OTHER PURPOSE OTHER THAN FOR WHICH IT IS PREPARED.

**CLIENT:** PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD  
**CONSULTANT:** SMEC (INDIA) PVT. LTD.  
 D/F BUILDING NO. 8, C TOWER, 9th FLOOR,  
 CHANDI, PHASE-1, GURGAON,  
 HARYANA, INDIA-122002, 012000  
 TEL: 0122-433002, 433000

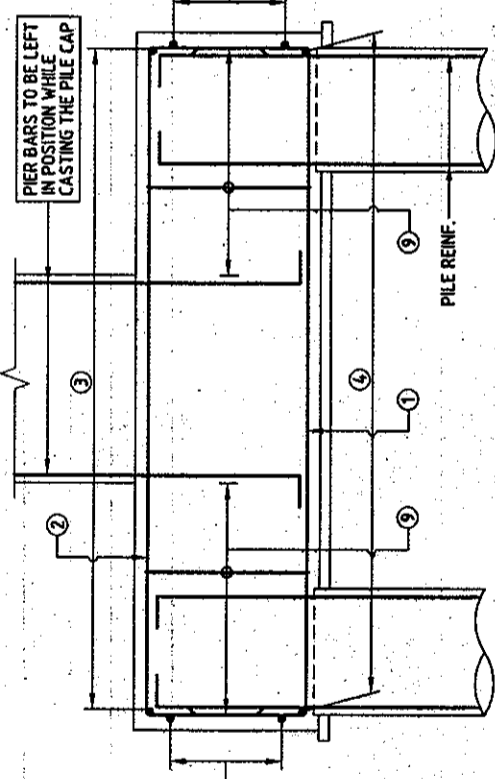
**PROJECT TITLE:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYPASS LUDHIANA

REV	DATE	DRAWN	DESIGN	CHECKED	APPROVED	DETAILS OF REVISION
RO	01/05/2009	MKS	VNM	VNM	SLAHRI	FIRST ISSUE

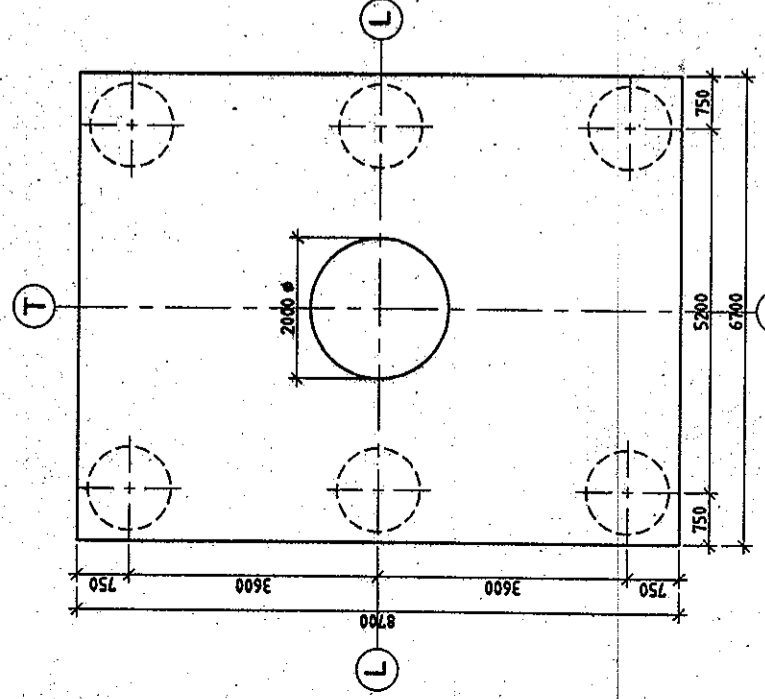
**SCALE:** AS SHOWN  
**SHEET SIZE:** A2  
**DPR:** DRW  
**1213/SMEC/LUDHIANA/20+190/E-01**  
**RO**



**ELEVATION ALONG L-L AXIS**  
(SCALE 1/75)



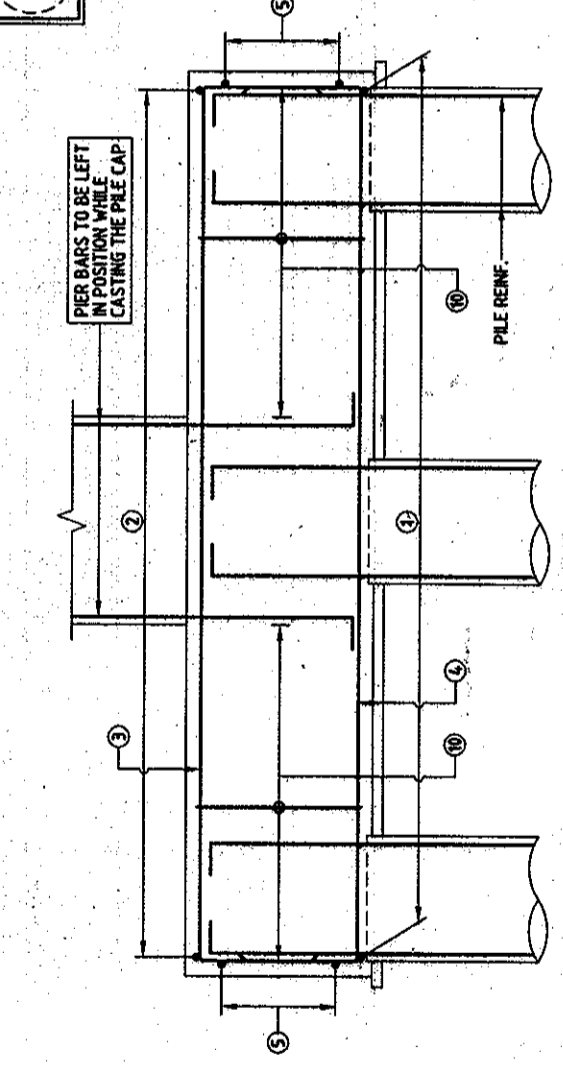
**SECTION A-A**  
(SCALE 1/50)



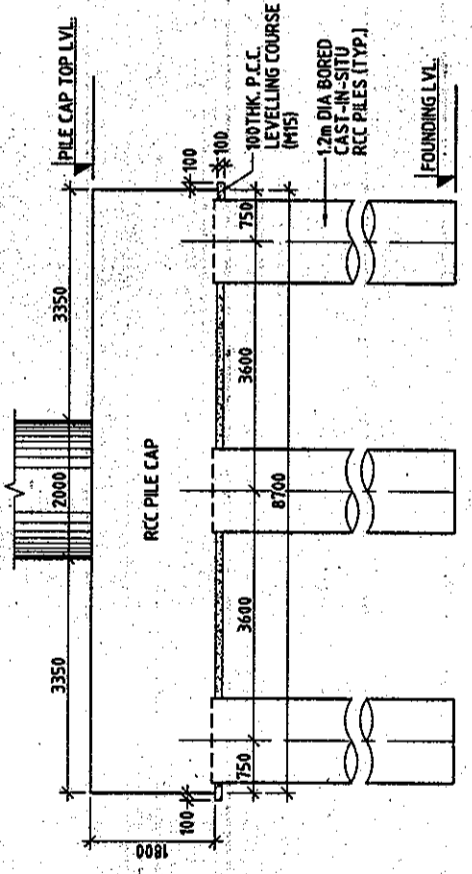
**PLAN AT TOP OF PILE CAP**  
(SHOWING DIMENSIONS)  
(SCALE 1/75)

PIER DESIGNATION	BED LEVEL	TOP OF PILE CAP LEVEL	CUT OFF LEVEL	FOUNDING LEVEL
P1	248.190	247.690	245.940	232.240

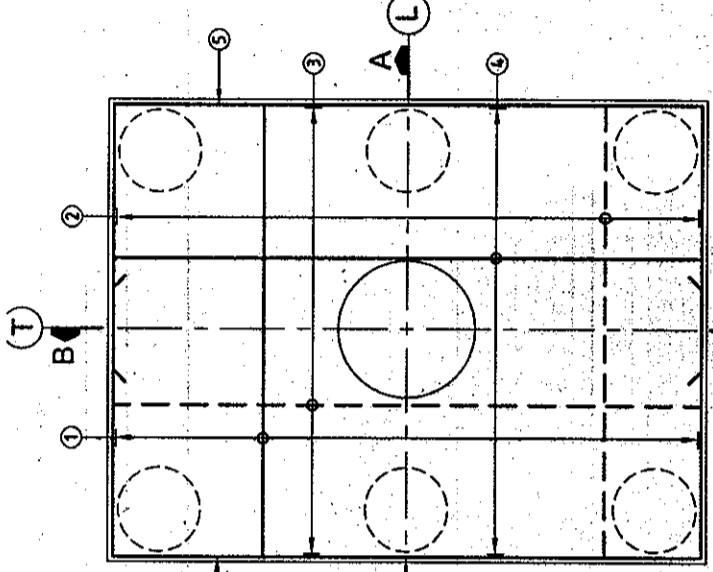
**LEVEL CHART FOR PILE CAP LAYOUT**



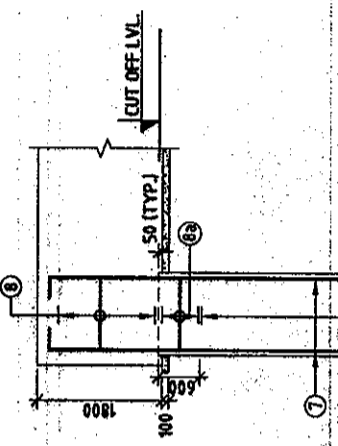
**SECTION B-B**  
(SCALE 1/50)



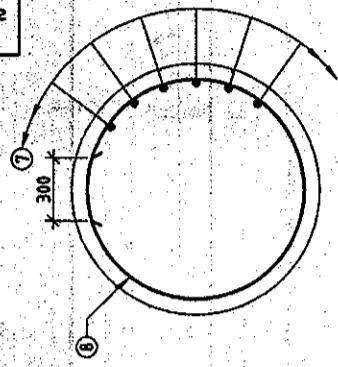
**ELEVATION ALONG T-T AXIS**  
(SCALE 1/75)



**PLAN**  
(SHOWING PILE CAP REINFORCEMENT)  
(SCALE 1/75)



**SECTION C-C**  
(SCALE 1/25)



**REINFORCEMENT DETAIL:**

BAR MKD.	DIA (mm)	SPACING/NOS.	SHAPE
1	25	27 Nos.	L
2	16	150	L
3	16	150	L
4	25	35 Nos.	L
5	16	8 Nos.	□
7	25	28 Nos.	L
8	10	200	○
8a	10	100	○
9	16	150	□ LEGGED
10	16	150	□ LEGGED

**LEGENDS:**

BAR ON TOP FACE  
**APPROVED FOR EXECUTION**  
ISSUED  
Assistant Engineer Design (EP)  
Executive Engineer Design (EP)  
PUNJAB P.W.D. (B & R)

- NOTES:-**
- ALL DIMENSIONS ARE IN MM AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH OF 35MPa FOR BORED CAST-IN-SITU PILE AND PILE CAP.
  - CLEAR COVER TO SHALL BE AS FOLLOWS.  
(i) FOR PILE --- 75mm  
(ii) FOR PILE CAP --- 75mm
  - TMT HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS-1786 SHALL ONLY BE USED.
  - MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
  - MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
  - LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
  - ACTUAL LOAD TEST SHALL BE CARRIED OUT ON A TEST PILE AS PER STANDARD SPECIFICATIONS TO DETERMINE VERTICAL AND LATERAL CAPACITY OF PILE. IT SHALL HOWEVER BE ENSURED THAT IT IS NOT LESS THAN DESIGN VALUES.

**REFERENCE DRAWINGS:-**

- 1213/SMEC/LUDHIANA/20-190/G-01 (SHEET 1 OF 7 TO 7 OF 7)
- 1213/SMEC/LUDHIANA/20-190/E-02 (SHEET 2 OF 2)

**CLIENT:** PIDB  
PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD

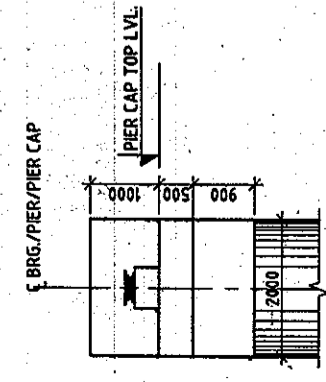
**CONSULTANT:** SMEC  
SMEC (INDIA) PVT. LTD.  
G/F BUILDING No. 6, Tower, 3rd Floor,  
HARYANA, NEW DELHI 110001  
Tel: 011-433002, 430180

**PROJECT TITLE:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYPASS LUDHIANA

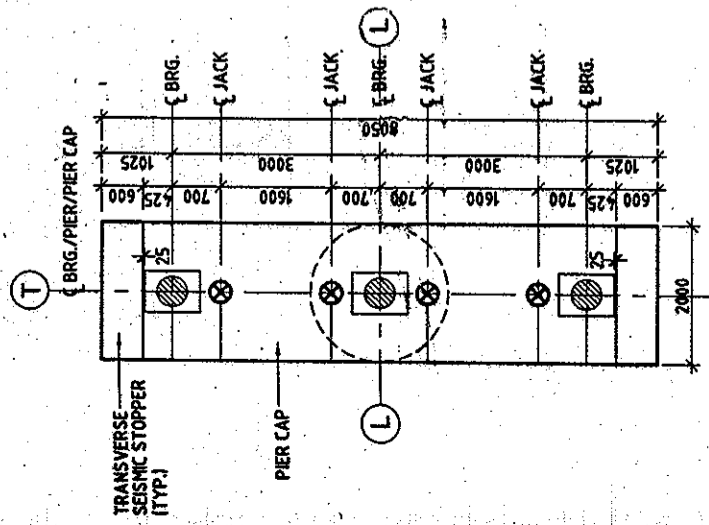
REV	DATE	DRAWN	DESIGN	CHECKED	APPROVED	DETAILS OF REVISION
R1	27/08/2009	MKS	VNM	VNM	S L/HR	REVISED AS PER FB PWD COMMENTS
R0	07/05/2009	MKS	VNM	VNM	S L/HR	FIRST ISSUE

**SCALE:** AS SHOWN  
**SHEET SIZE:** A2  
**SCALE:** 1213/SMEC/LUDHIANA/20-190/E-02  
**DRW:** R1  
**DPR:**

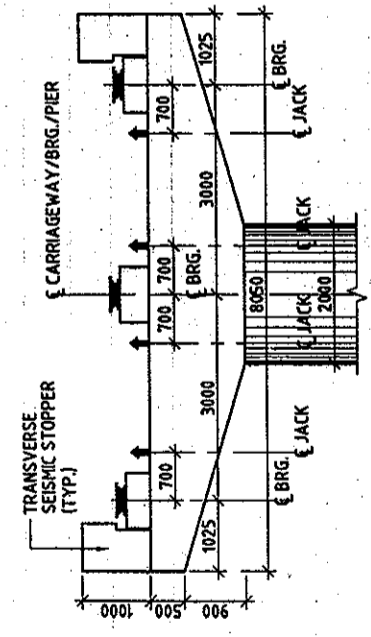
**DETAILED PROJECT REPORT**  
**DIMENSIONAL & REINFT. DETAILS OF PILE, PILE CAP, PIER & PIER CAP**  
SHEET 1 OF 2



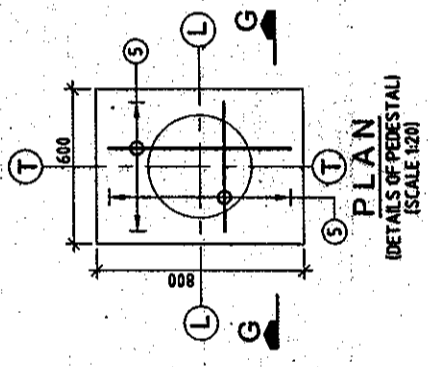
**ELEVATION ALONG L-L AXIS**  
(SHOWING PIER DIMENSIONS)  
(SCALE 1/75)



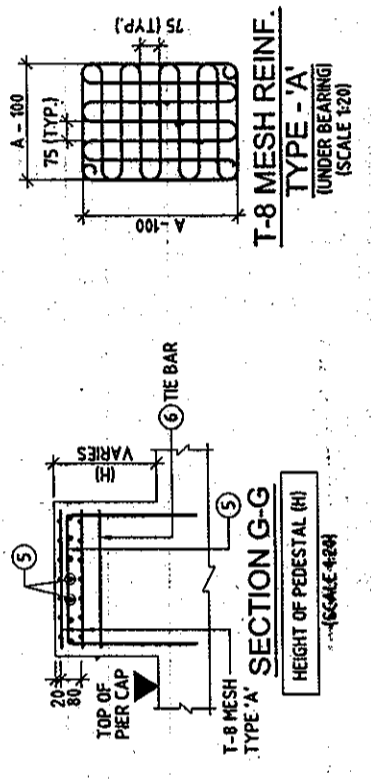
**PLAN AT PIER CAP TOP**  
(SHOWING DIMENSIONS)  
(SCALE 1/75)



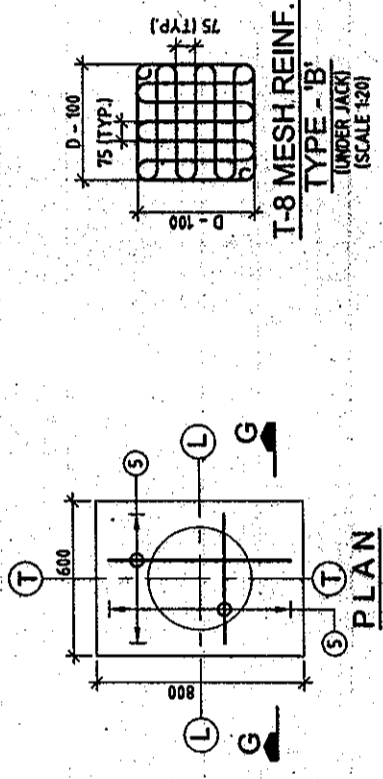
**ELEVATION ALONG T-T AXIS**  
(SHOWING PIER DIMENSIONS)  
(SCALE 1/75)



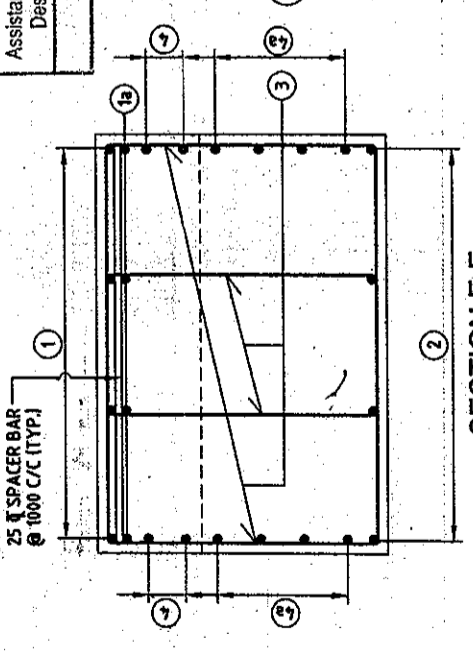
**PLAN**  
DETAILS OF PEDESTAL  
(SCALE 1/20)



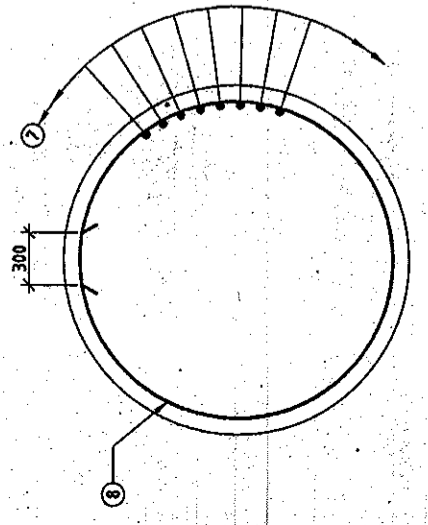
**SECTION G-G**  
HEIGHT OF PEDESTAL (H)  
(SCALE 1/20)



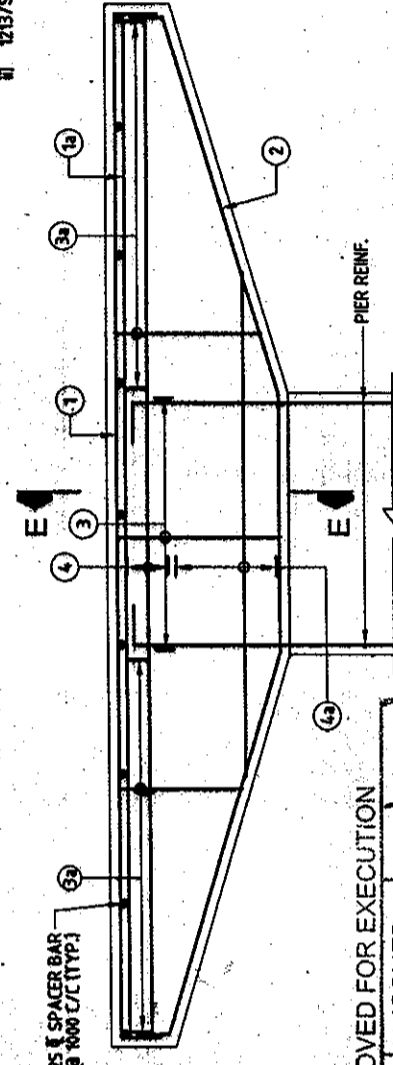
**SECTION D-D**  
(SCALE 1/40)



**SECTION E-E**  
(SCALE 1/25)



**SECTION F-F**  
(SCALE 1/30)



**PLAN SHOWING REINFORCEMENT IN PIER CAP**  
(SCALE 1/40)

**REINFORCEMENT DETAIL:**

BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE
1	32	17 Nos.	[Diagram]
1a	32	17 Nos.	[Diagram]
2	16	27 Nos.	[Diagram]
3	16	150	[Diagram]
3a	16	150	[Diagram]
4a	12	2 Nos.	[Diagram]
5	12	75	[Diagram]
6	12	150	[Diagram]
7	32	50 Nos.	[Diagram]
8	12	125	[Diagram]

**LEGENDS:**  
 --- BAR ON TOP FACE  
 --- BAR ON BOTTOM FACE

**LEVEL CHART FOR PIER**

PIER DESIGNATION	FORMATION LEVEL	PIER CAP TOP LEVEL	BED LEVEL
P1	252.540	250.125	248.190

**NOTES:-**

- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH 150mm CUBES AS FOLLOWS:-  
 PIER -----M35  
 PIER CAP -----M35
- CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS.  
 (i) FOR SUBSTRUCTURE ----- 50mm  
 (ii) FOR FOUNDATION ----- 75mm
- TMT HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED. MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
- MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
- IN PIER SHAFT T-10 OPEN LINKS (OR S LOOPS) WITH HOOK PLACED AROUND THE VERTICAL BARS ARE PLACED AT THE RATE OF 4 LINKS IN ONE SQUARE METER.
- LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
- A IS THE DIMENSIONS OF THE BEARINGS WHICH IS TO BE FURNISHED BY THE MANUFACTURER.
- D = DIA OF JACK.

**REFERENCE DRAWINGS:-**

- 1213/SHEC/LUDHIANA/20+199/G-01 (SHEET 1 OF 7 TO 7 OF 7)
- 1213/SHEC/LUDHIANA/20+199/E-02 (SHEET 1 OF 2)

**CLIENT:** PIDB  
**CONSULTANT:** SMEC  
**PROJECT TITLE:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYE-PASS LUDHIANA

**REVISIONS:**

REV	DATE	DESIGN	CHECKED	APPROVED	DETAILS OF REVISION
R1	27/08/2009	MKS	VNM	S LAYARI	REVISED AS PER PERMID COMMENTS
R0	01/05/2009	MKS	VNM	S LAYARI	FIRST ISSUE

**SCALE:** AS SHOWN  
**SHEET SIZE:** A2  
**DPR:** DRW  
**DRW:** R1

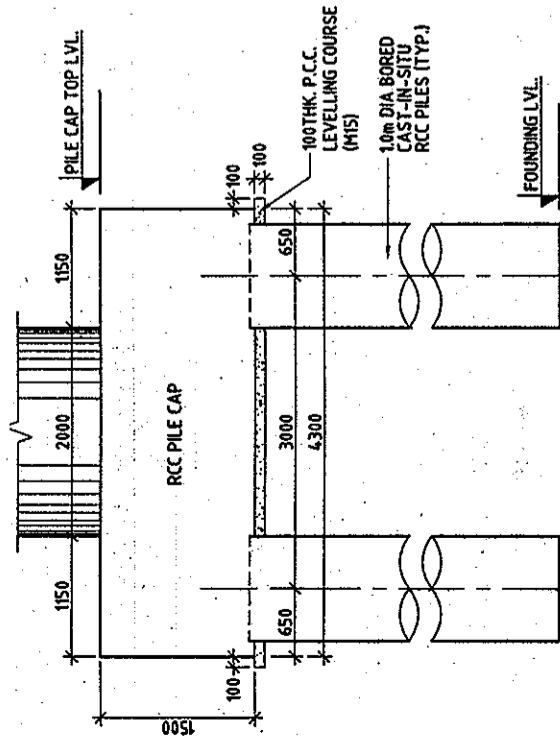
**DETAILED PROJECT REPORT**  
**DIMENSIONAL & REINFT. DETAILS OF**  
**PILE, PILE CAP, PIER & PIER CAP**  
 (SHEET 2 OF 2)  
 1213/SMEC/LUDHIANA/20+199/E-02  
 R1

**PREPARED BY:** MS  
**CHECKED BY:** VNM  
**DESIGNED BY:** VNM  
**DATE:** 27/08/2009  
**APPROVED BY:** S LAYARI

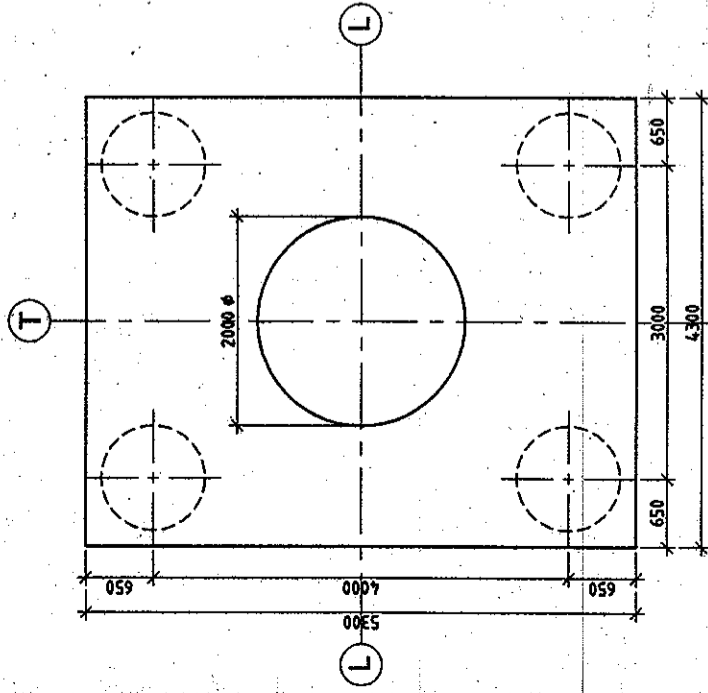
**APPROVED FOR EXECUTION**  
 ISSUED: [Signature]  
 Assistant Engineer Design (IP)  
 Executive Engineer Design (IP)  
 Chief Engineer Design (IP)  
 PUNJAB P.W.D. (B & R)

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**PIBIDB**  
 PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD  
 H-1 Structural Vertical DPR Revised Drawings R2 (for 40) Bridge Ch. 20+199/1 TO VER Ch. 20+190 E-02.dwg



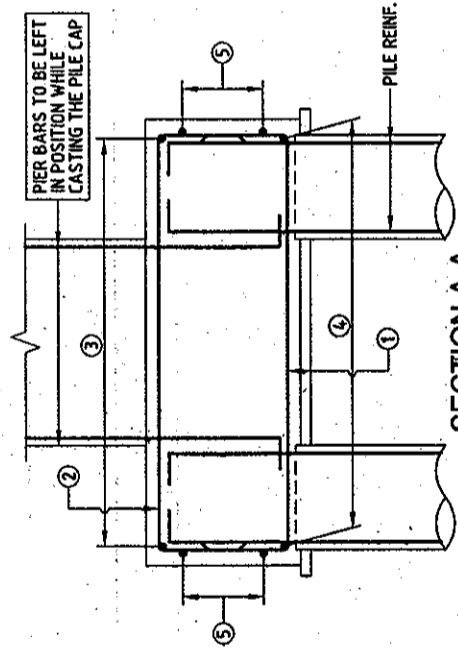
ELEVATION ALONG L-L AXIS  
(SCALE 1:50)



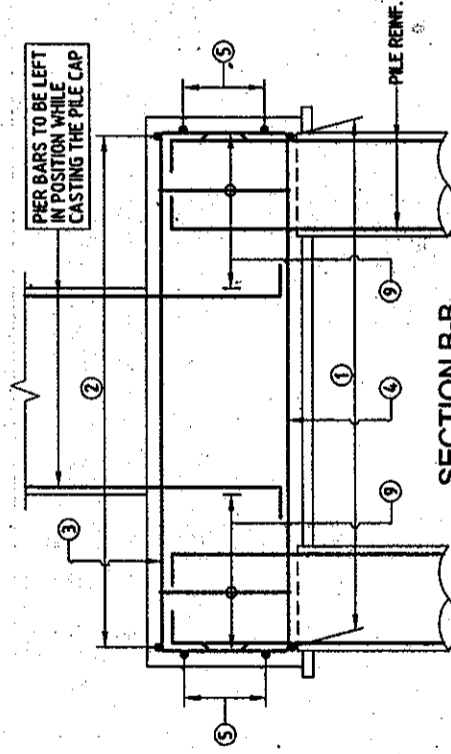
PLAN AT TOP OF PILE CAP  
(SHOWING DIMENSIONS)  
(SCALE 1:50)

LEVELS CHART FOR PILE CAP LAYOUT

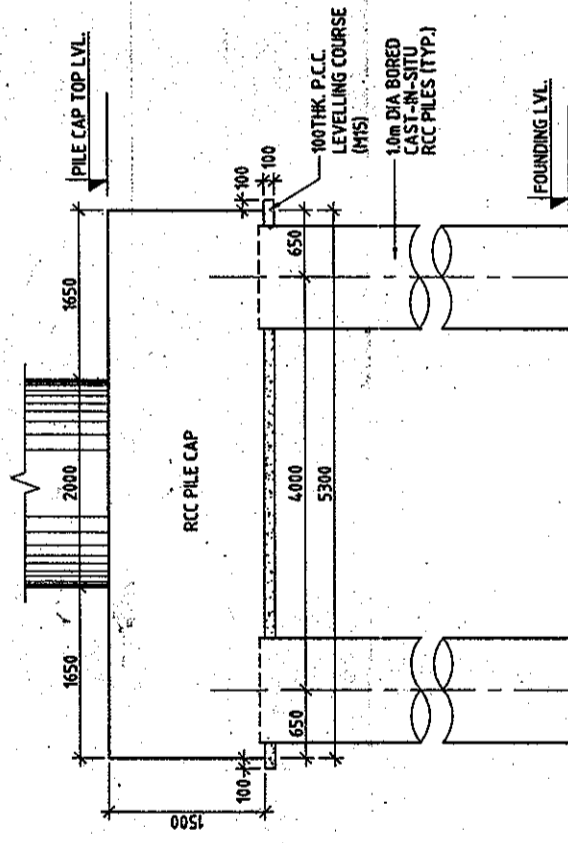
PIER DESIGNATION	BED LEVELS	TOP OF PILE CAP LEVELS	CUT OFF LEVELS	FOUNDING LEVELS
P2	248.136	247.636	246.186	232.186
P3	248.158	247.658	246.208	232.208
P6	247.693	247.193	245.743	231.743
P10	246.855	246.355	244.905	230.905
P13	246.670	246.170	244.720	230.720
P16	246.673	246.173	244.723	230.723



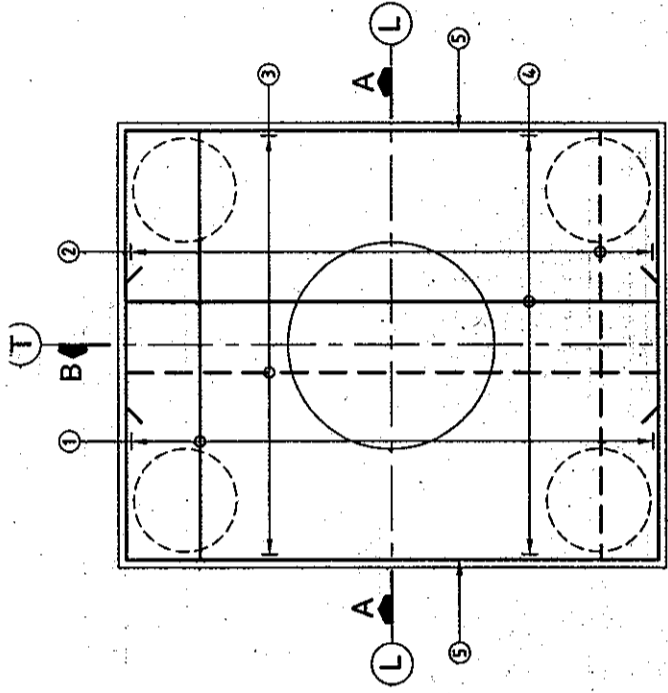
SECTION A-A  
(SCALE 1:50)



SECTION B-B  
(SCALE 1:50)



ELEVATION ALONG T-T AXIS  
(SCALE 1:50)

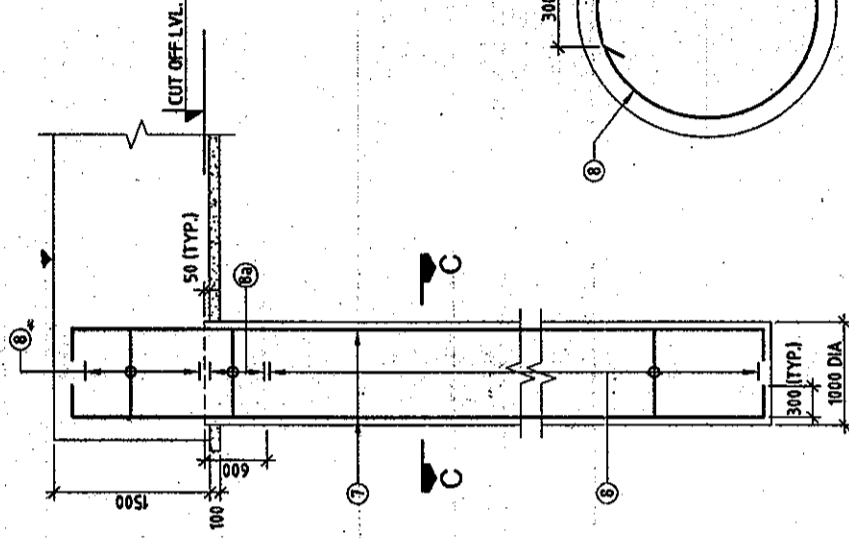


PLAN  
(SHOWING PILE CAP REINFORCEMENT)  
(SCALE 1:50)

REINFORCEMENT DETAIL:  
(SCALE 1:20)

BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE
1	25	27 Nos.	┌
2	16	150	┌
3	16	150	┌
4	25	35 Nos.	┌
5	16	8 Nos.	┌
7	25	15 Nos.	┌
8	10	200	○
8a	10	100	○
9	16	150	□ 4 LEGGED

SECTION C-C  
(SCALE 1:20)



SECTION C-C  
(SCALE 1:20)

NOTES:-

- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH OF 35Mpa FOR BORED CAST-IN-SITU PILE AND PILE CAP.
- CLEAR COVER TO SHALL BE AS FOLLOWS:  
(i) FOR PILE --- 75mm  
(ii) FOR PILE CAP --- 75mm
- TMT HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED.
- MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
- MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BARLAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
- LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
- ACTUAL LOAD TEST SHALL BE CARRIED OUT ON A TEST PILE AS PER STANDARD SPECIFICATIONS TO DETERMINE VERTICAL AND LATERAL CAPACITY OF PILE. IT SHALL HOWEVER BE ENSURED THAT IT IS NOT LESS THAN DESIGN VALUES.

REFERENCE DRAWINGS:-

- 1213/SMEC/LUDHIANA/20+190/G-01 (SHEET 1 OF 7 TO 7 OF 7)
- 1213/SMEC/LUDHIANA/20+190/E-03 (SHEET 2 OF 2)

LEGENDS:  
 APPROVED FOR EXECUTION  
 BAS SULTAN FATEH  
 Assistant Engineer Design (IP)  
 Executive Engineer Design (IP)  
 Chief Eng (IP)  
 PUNJAB P.W.D. (B & R)

CLIENT: PIDB  
 PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD  
 16/Structure 1213/FINAL DPR/Revised Drawings R2 (Feb '09) Bridge C/L 20+190 V/L TOWER C/L 20+190 E-03.dwg

CONSULTANT: SMEC  
 SMEC (India) Pvt. Ltd.  
 DAF BUILDING No. 8, C TOWER, 3RD FLOOR,  
 CYBER CITY, PUNJAB GARDENS,  
 HAUZ KHAS, NEW DELHI-110028

PROJECT TITLE: PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYPASS LUDHIANA

THIS DRAWING HAS NOT BEEN PUBLISHED AND IS THE SOLE PROPERTY OF SMEC INDIA PVT. LTD. AND IS ISSUED TO THE PARTY FOR THE SPECIFIC PURPOSE AS STATED IN THE AGREEMENT AND IT SHALL NOT BE REPRODUCED, COPIED, LOAN OR OTHERWISE DISPOSED OFF DIRECTLY OR INDIRECTLY, AND USED FOR ANY OTHER PURPOSE OTHER THAN FOR WHICH IT IS FORWARDED.

REVISIONS:

REV	DATE	DRAWN	DESIGN	CHECKED	APPROVED	DETAILS OF REVISION
R1	27/08/2009	MKS	VNM	VNM	S LAHIRI	REVISED AS PER P.B.PWD COMMENTS
R0	01/05/2009	MKS	VNM	VNM	S LAHIRI	FIRST ISSUE

SCALE: AS SHOWN  
 SHEET SIZE: A2  
 DIMENSIONAL & REINFT. DETAILS OF PILE, PILE CAP, PIER & PIER CAP  
 ISHEET 1 OF 2  
 1213/SMEC/LUDHIANA/20+190/E-03...R1



- NOTES:-**
- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH 150mm CUBES AS FOLLOWS:-  
PIER -----M35  
PIER CAP -----M35
  - CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS.  
(i) FOR SUBSTRUCTURE ----- 50mm  
(ii) FOR FOUNDATION ----- 75mm  
(iii) HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED.
  - MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
  - MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
  - IN PIER SHAFT T-10 OPEN LINKS (OR S LOOPS) WITH HOOK PLACED AROUND THE VERTICAL BARS ARE PLACED AT THE RATE OF 4 LINKS IN ONE SQUARE METER.
  - LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
  - A IS THE DIMENSIONS OF THE BEARINGS WHICH IS TO BE FURNISHED BY THE MANUFACTURER.
  - D = DIA OF JACK.

**REFERENCE DRAWINGS:-**

- 1213/SMEC/LUDHIANA/20+190/G-01 (SHEET 1 OF 7 TO 7 OF 7)
- 1213/SMEC/LUDHIANA/20+190/E-03 (SHEET 1 OF 2)

**REINFORCEMENT DETAIL:**

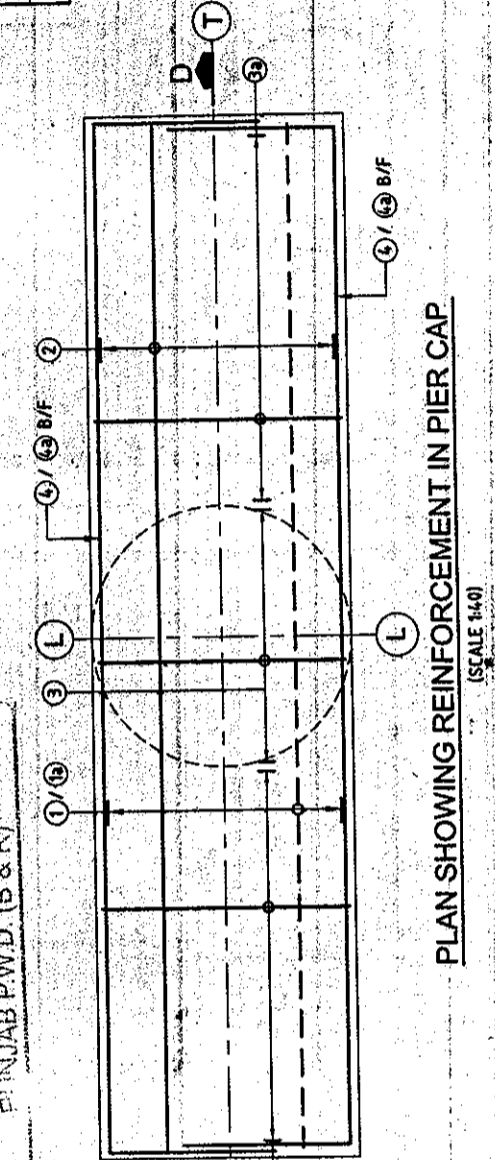
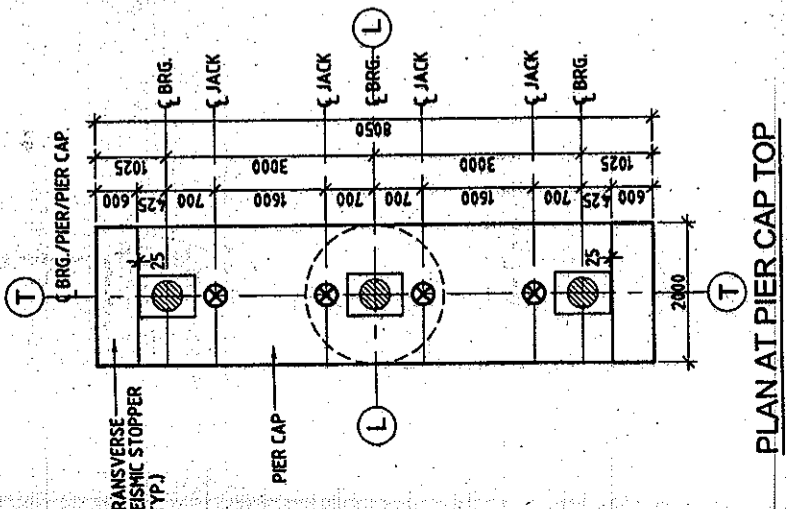
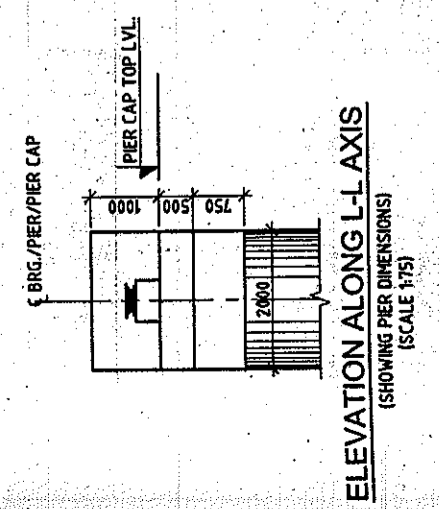
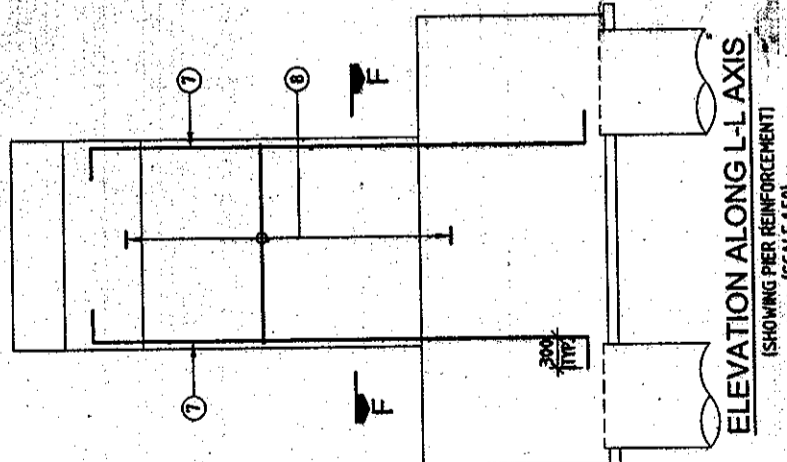
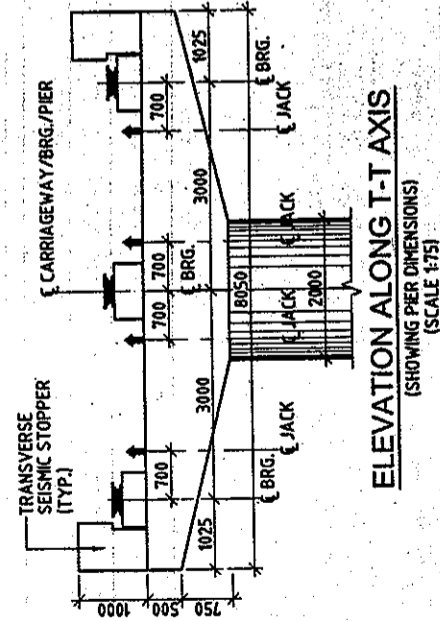
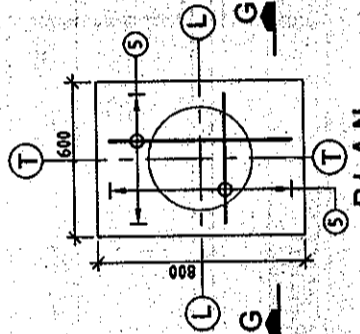
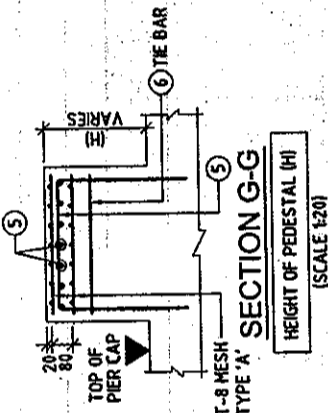
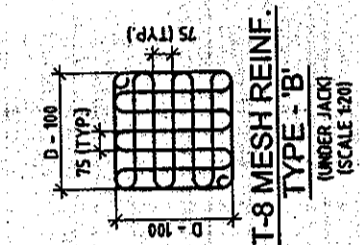
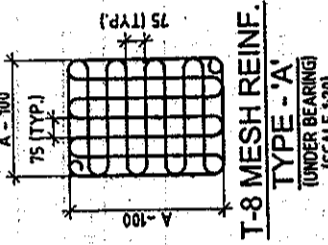
BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE
1	32	16 Nos.	[Diagram]
1a	32	16 Nos.	[Diagram]
2	16	27 Nos.	[Diagram]
3	16	150	[Diagram]
3a	16	150	[Diagram]
4	12	2Nos.	[Diagram]
4a	12	3Nos.	[Diagram]
5	12	75	[Diagram]
6	12	150	[Diagram]
7	25	50 Nos.	[Diagram]
8	12	125	[Diagram]

**LEGENDS:**

--- BAR ON TOP FACE  
--- BAR ON BOTTOM FACE

**LEVELS CHART FOR PIER**

PIER DESIGNATION	FORMATION LEVELS	PIER CAP TOP LEVELS	BED LEVELS
P2	253.200	250.785	248.136
P3	253.860	251.445	248.158
P6	255.730	253.315	247.693
P10	255.180	252.765	246.855
P13	253.200	250.785	246.670
P16	251.220	248.805	246.673



APPROVED FOR EXECUTION  
ISSUED  
Executive Engineer Design (P)  
Chief Engineer Design (P)  
PUNJAB P.W.D. (B & R)

**CLIENT:** PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD  
**CONSULTANT:** SMEC INDIA PVT. LTD. 20+190/Phase 02, 20+190/190/Rev.02, 20+190 E-03.dwg  
 04F, BUILDING 3, 5 FLOOR, CYBER CITY, PHASE-02, GURGAON, HARYANA, INDIA - 122002  
 Tel: 0122-4300042, 4301100

**PROJECT TITLE:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BAY-PASS LUDHIANA

**REVISIONS:**

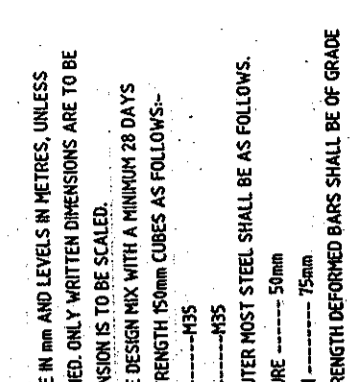
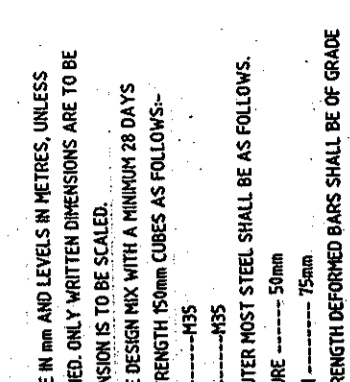
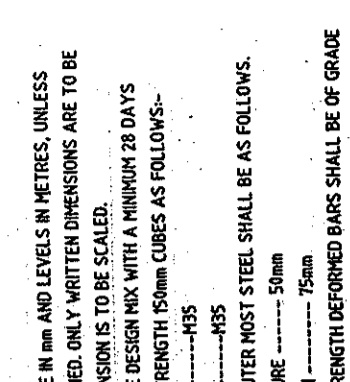
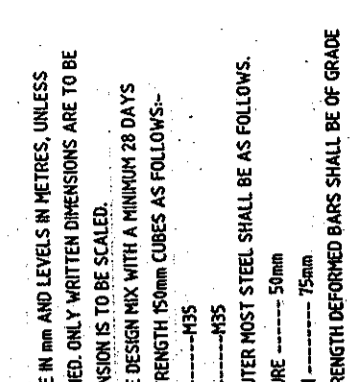
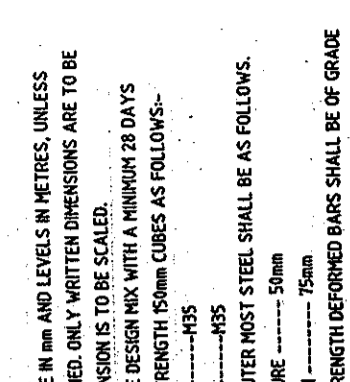
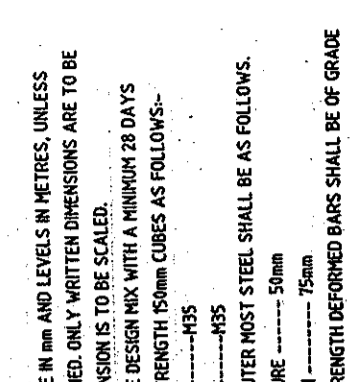
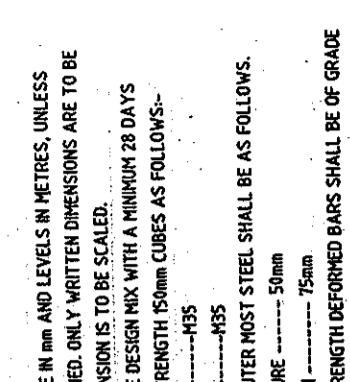
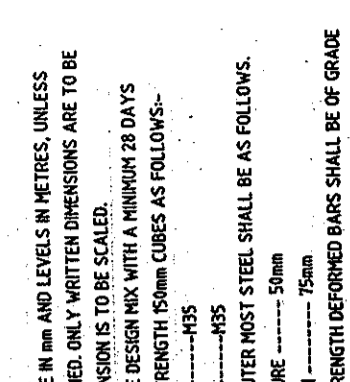
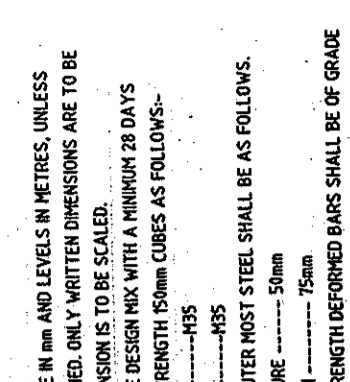
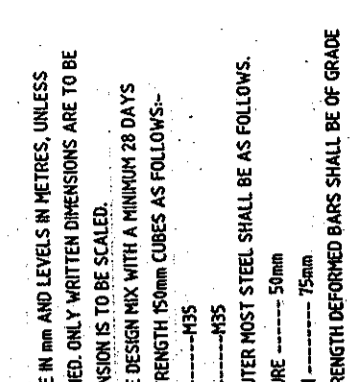
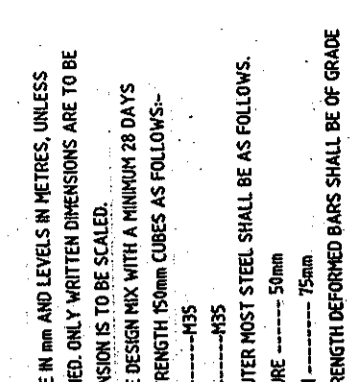
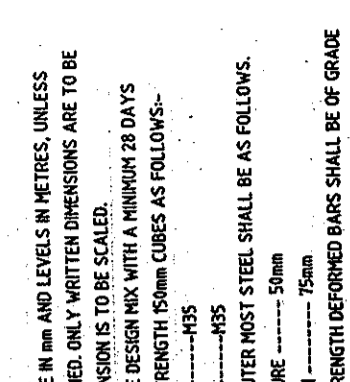
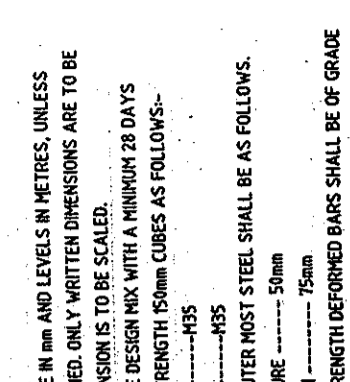
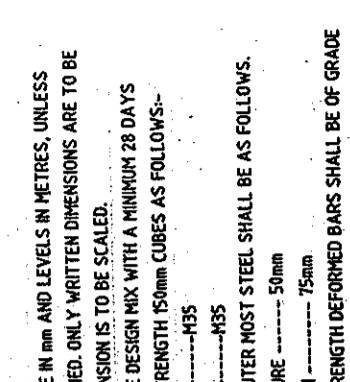
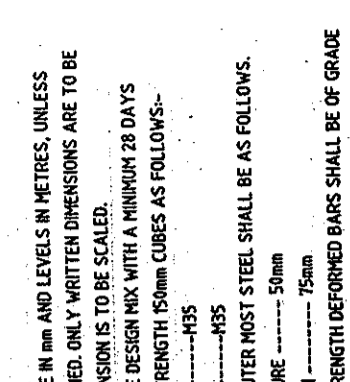
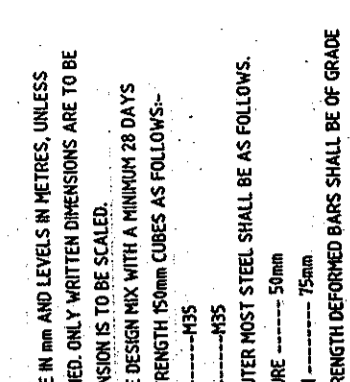
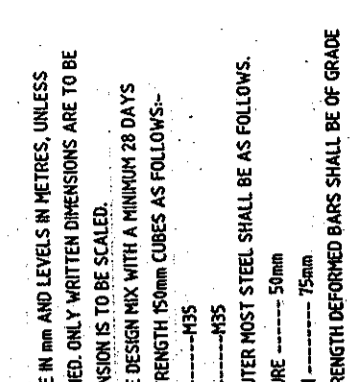
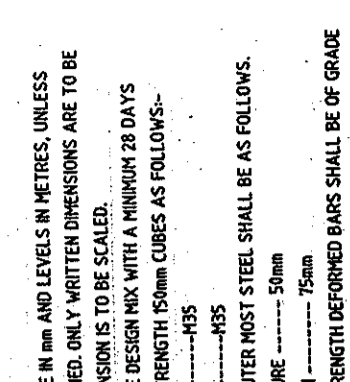
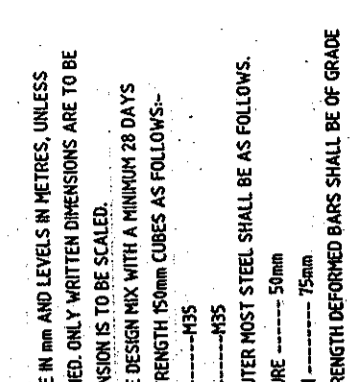
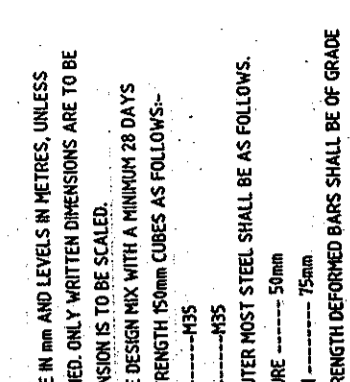
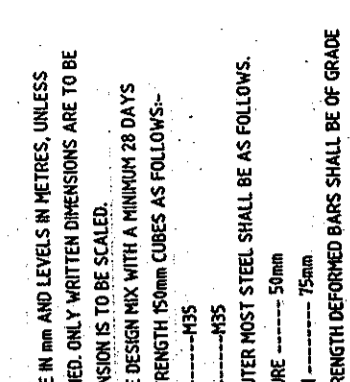
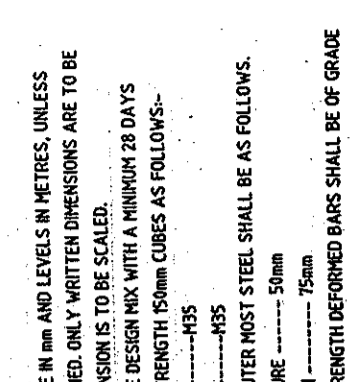
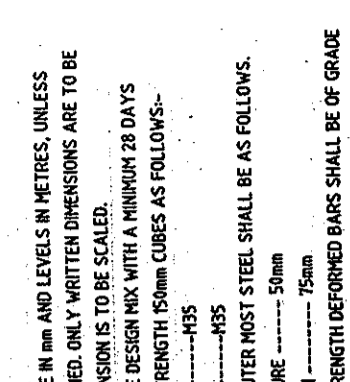
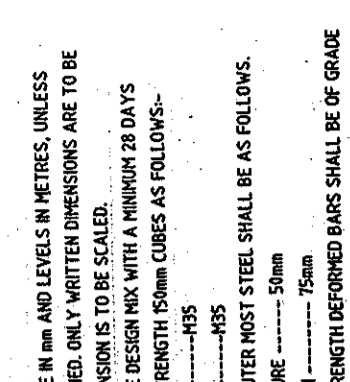
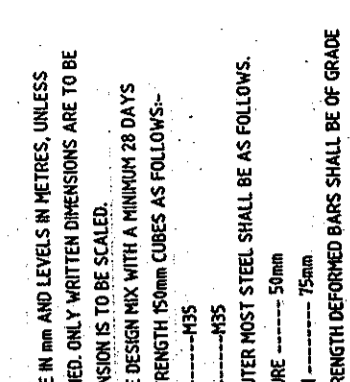
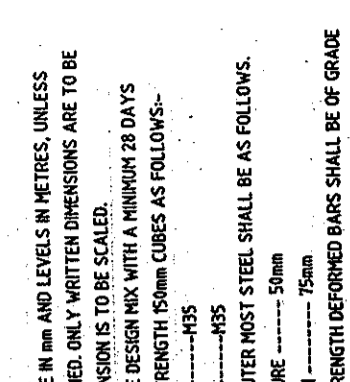
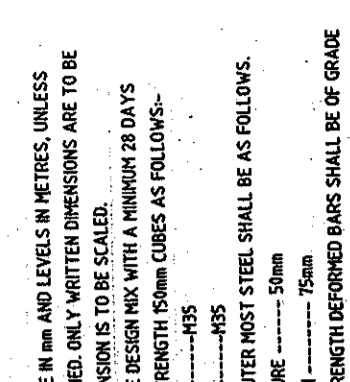
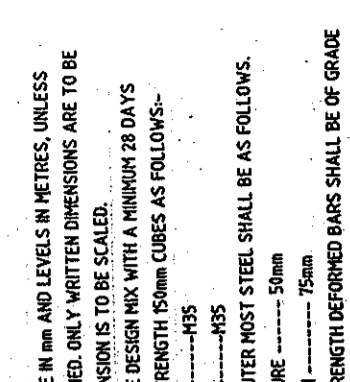
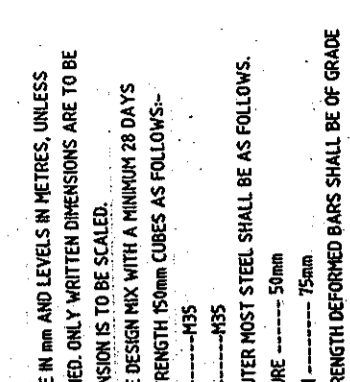
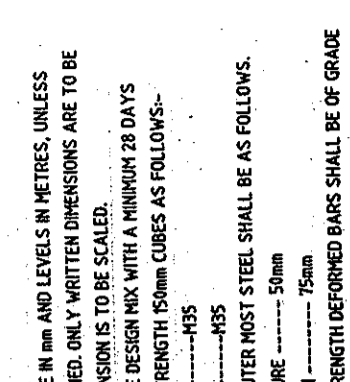
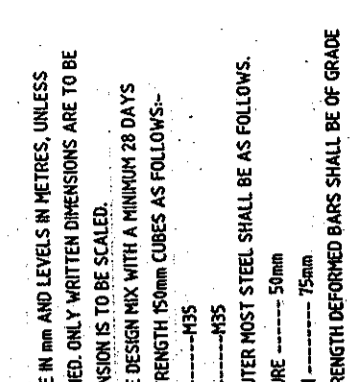
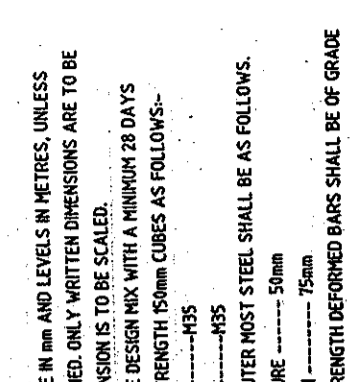
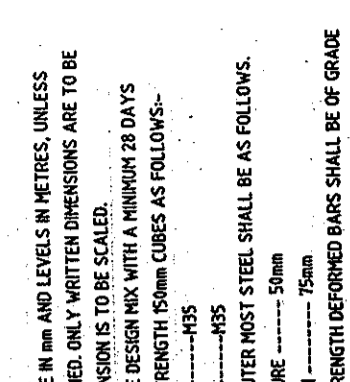
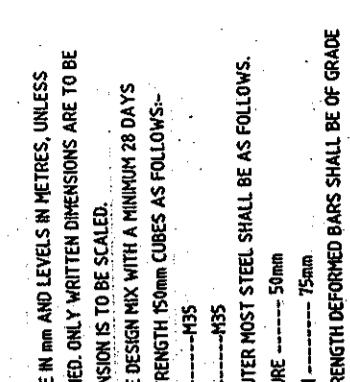
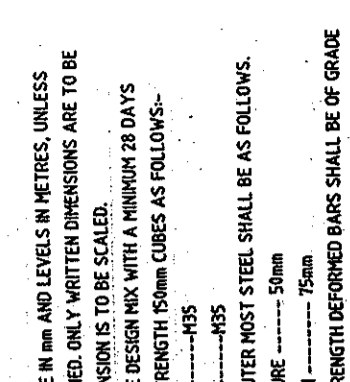
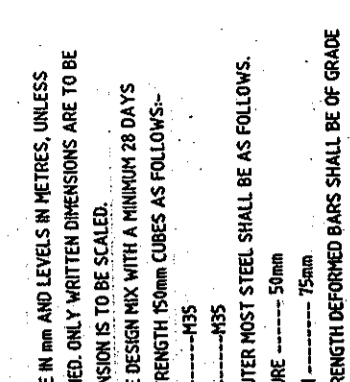
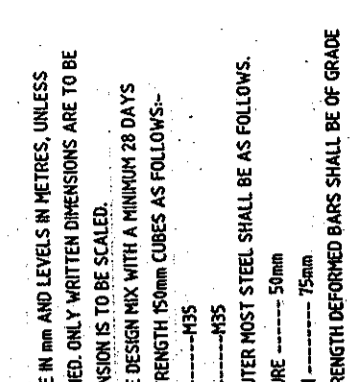
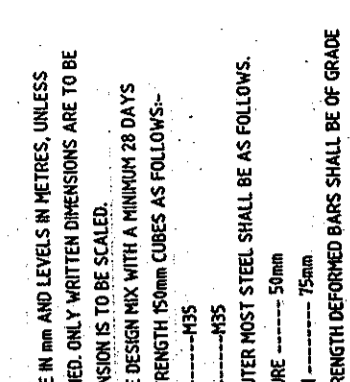
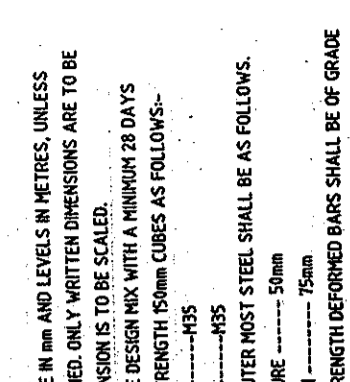
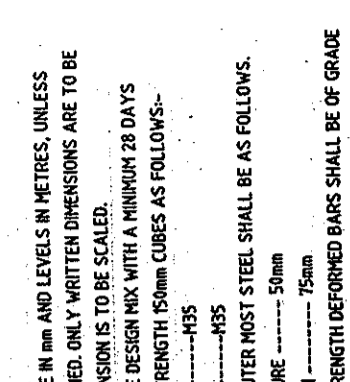
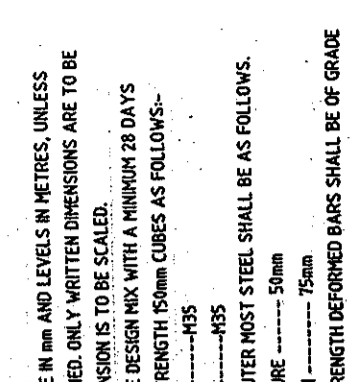
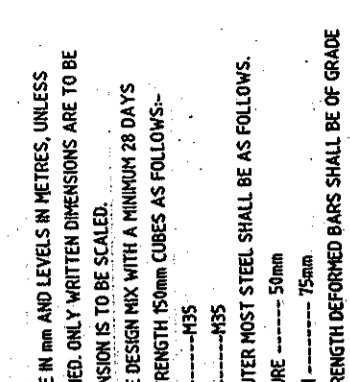
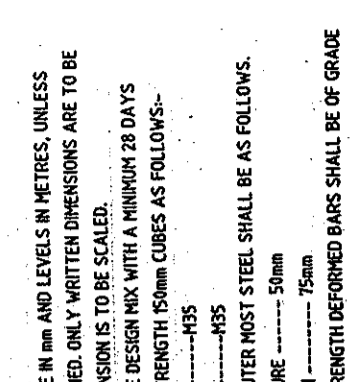
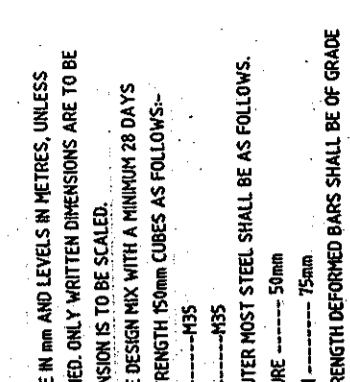
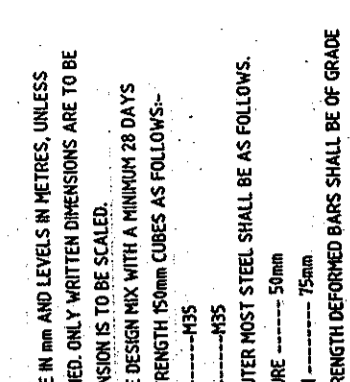
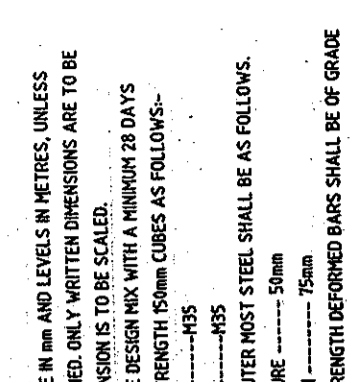
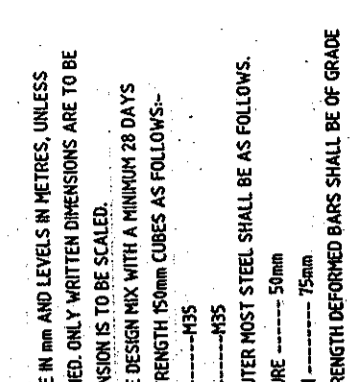
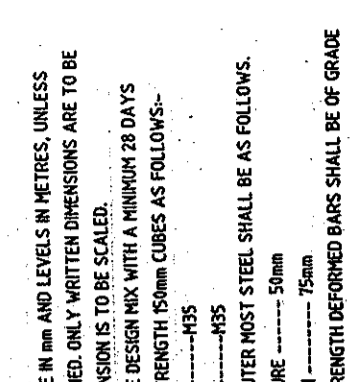
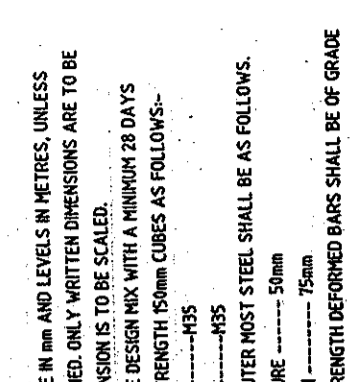
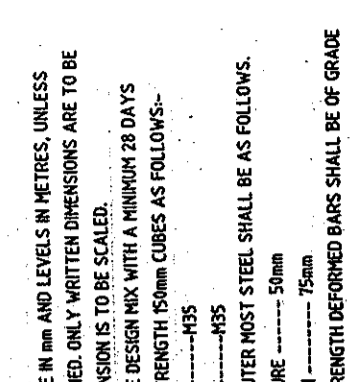
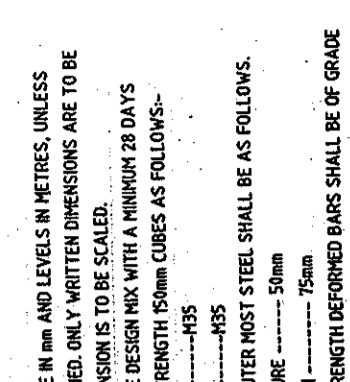
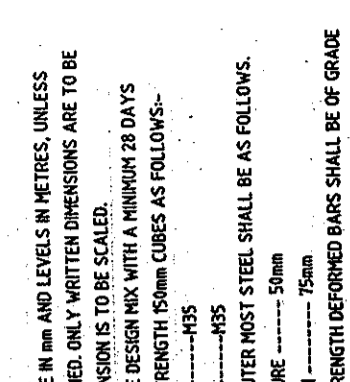
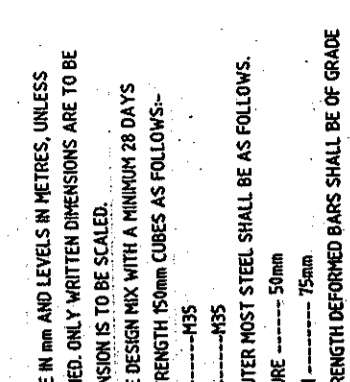
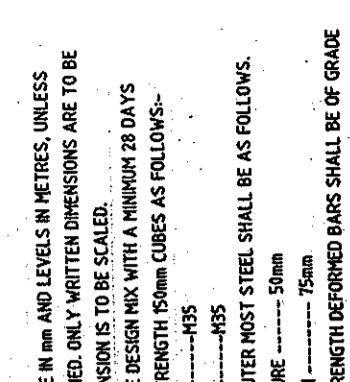
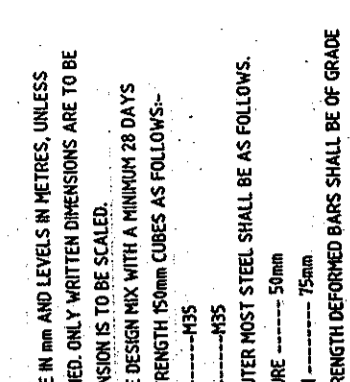
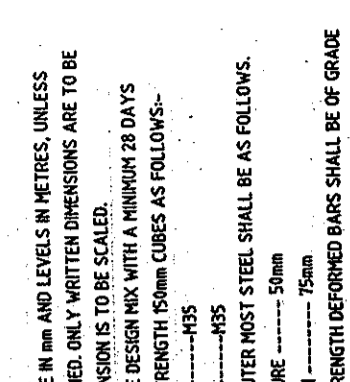
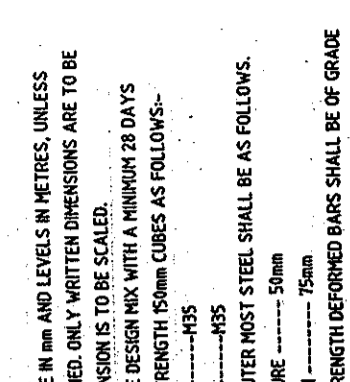
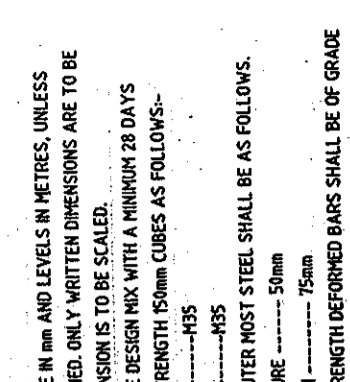
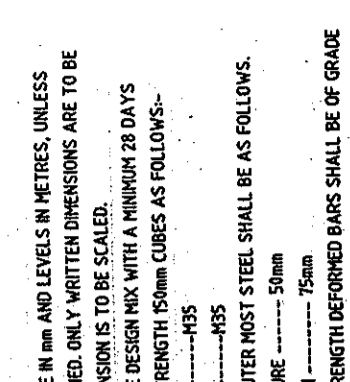
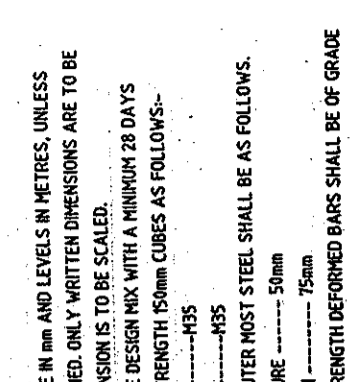
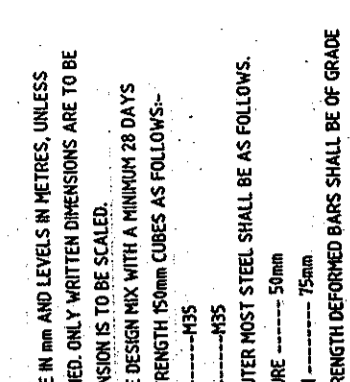
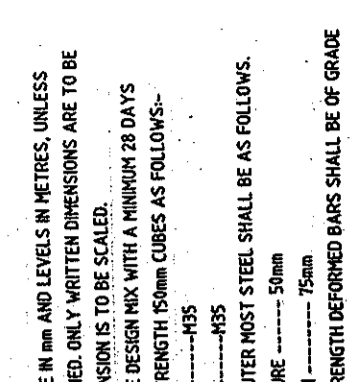
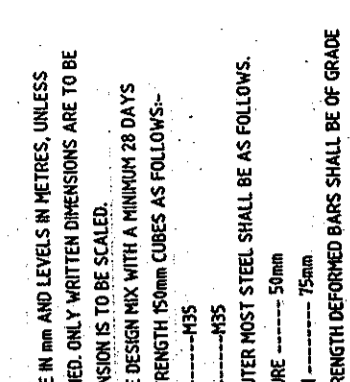
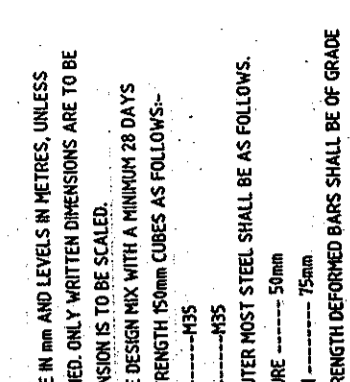
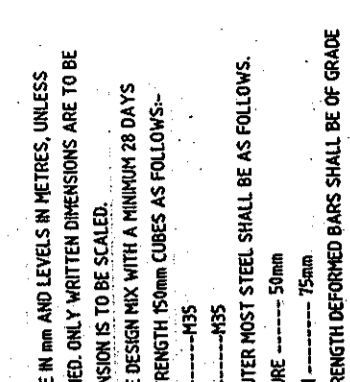
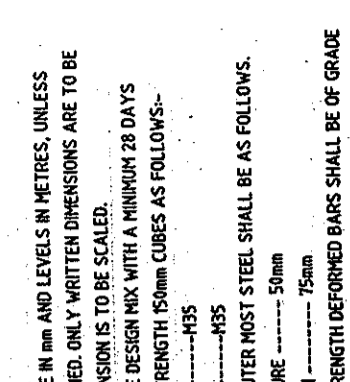
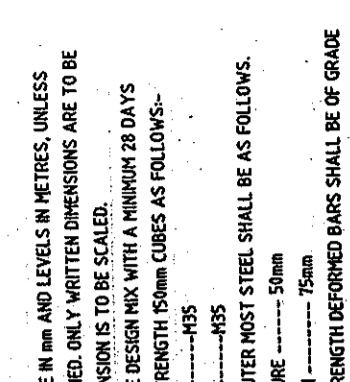
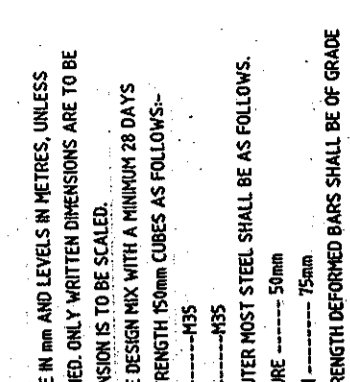
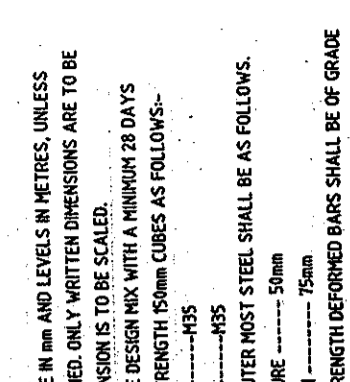
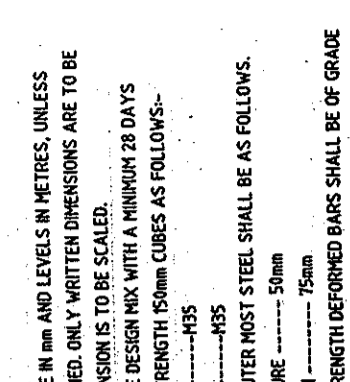
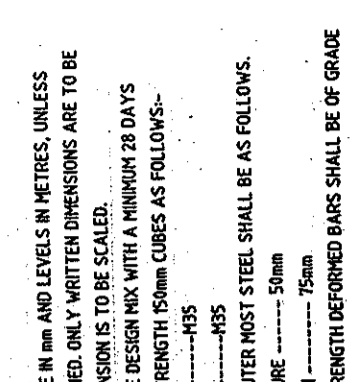
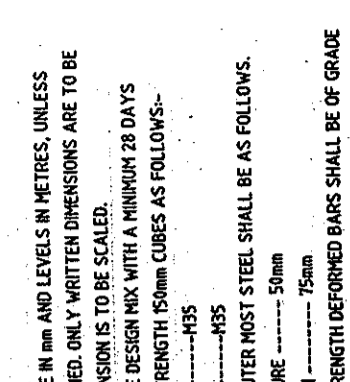
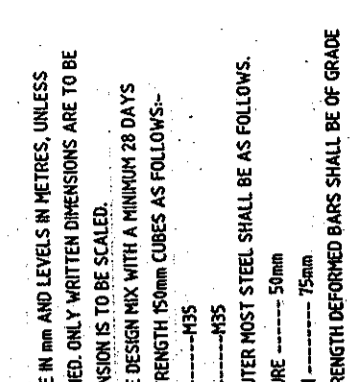
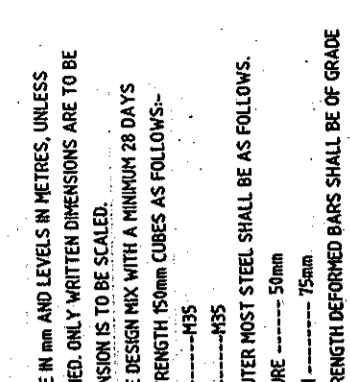
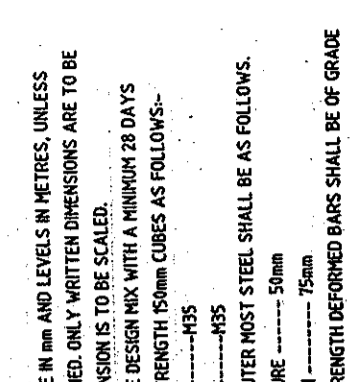
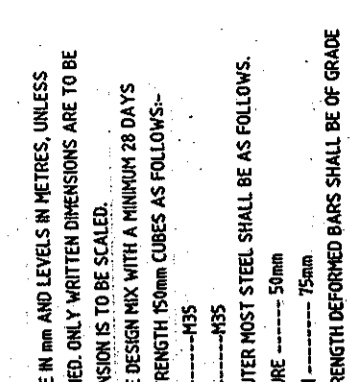
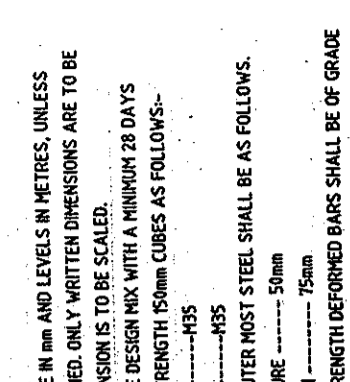
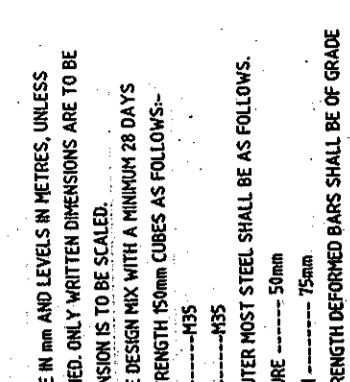
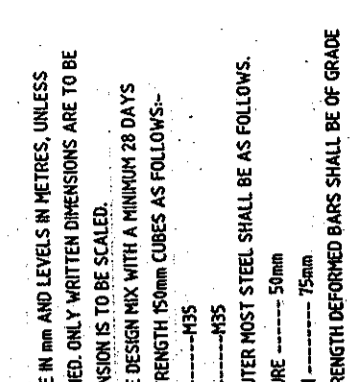
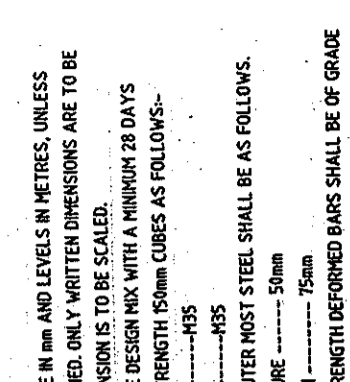
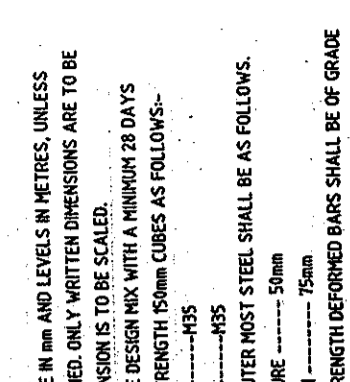
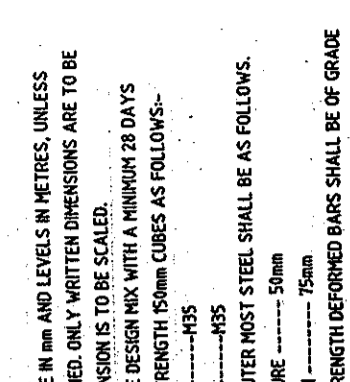
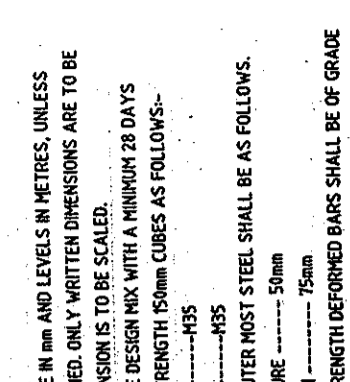
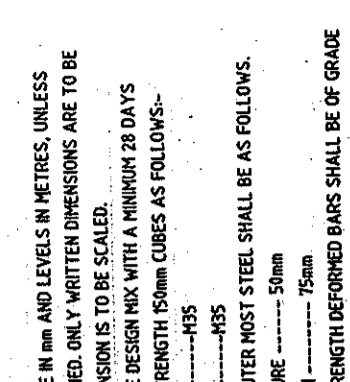
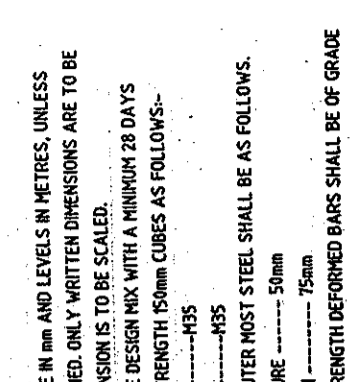
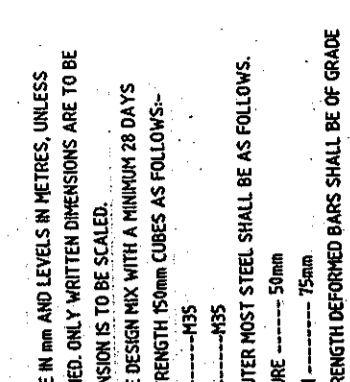
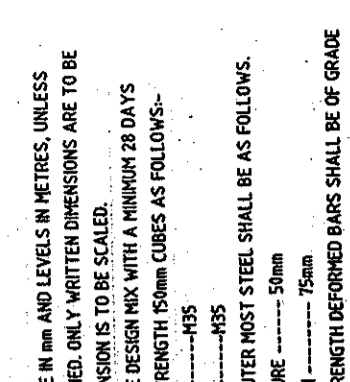
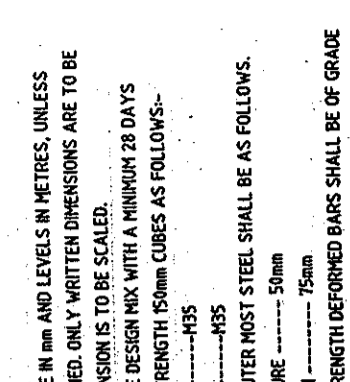
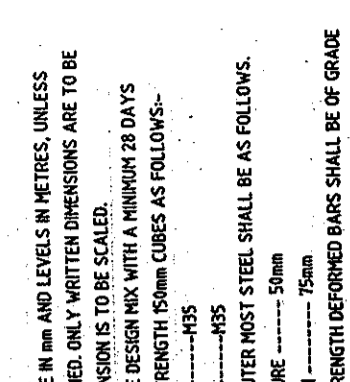
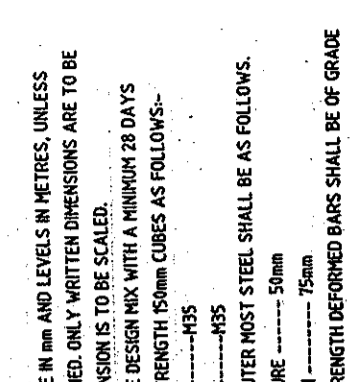
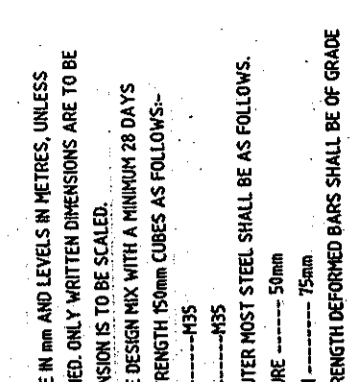
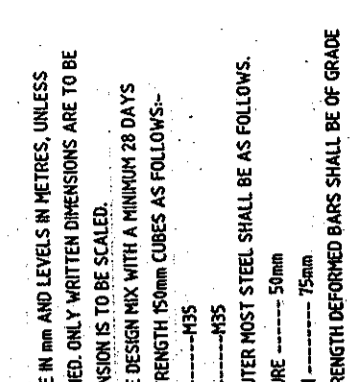
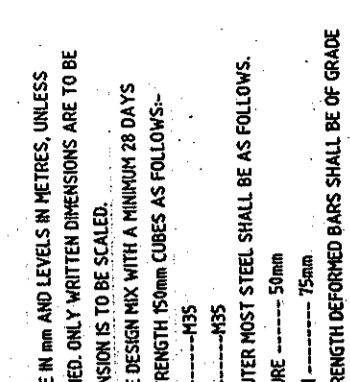
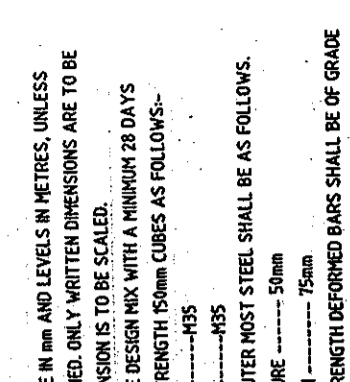
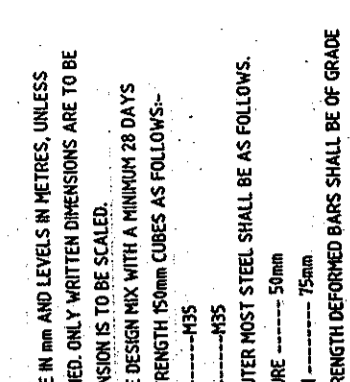
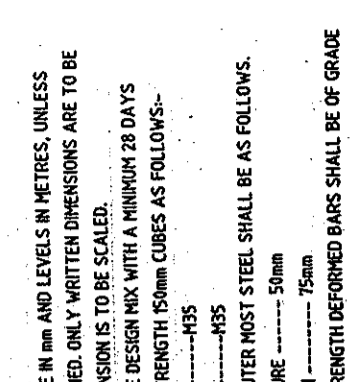
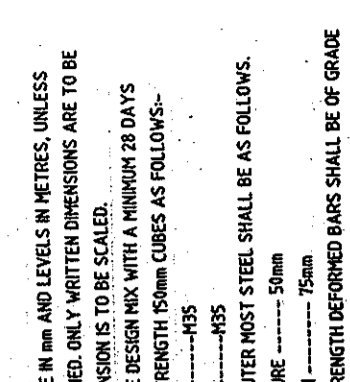
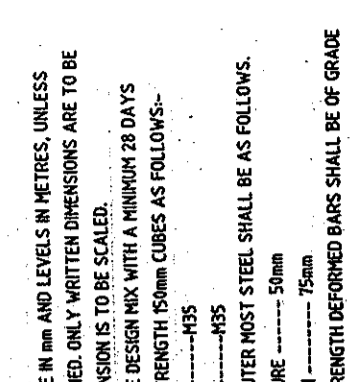
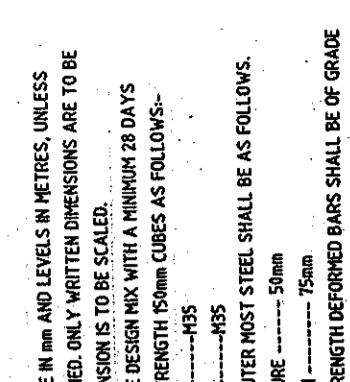
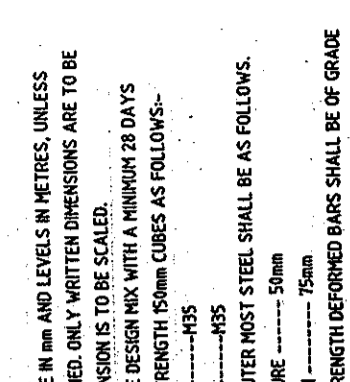
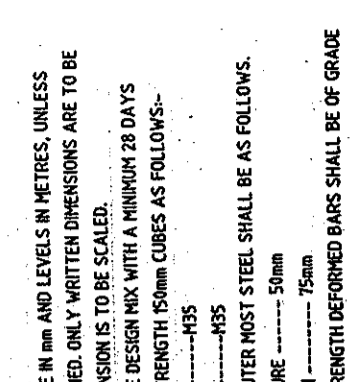
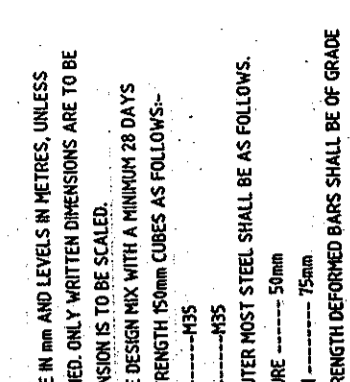
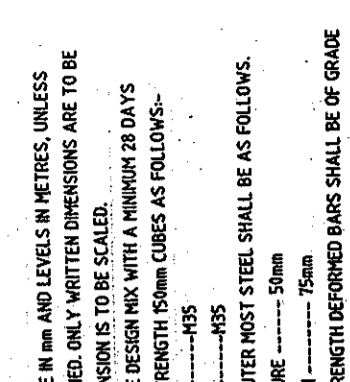
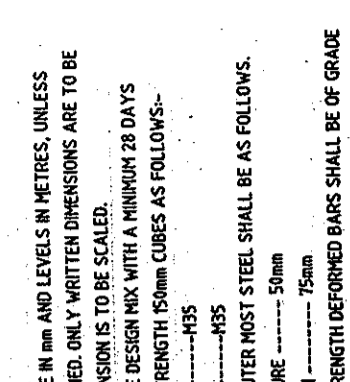
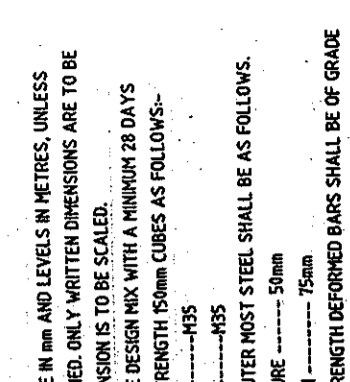
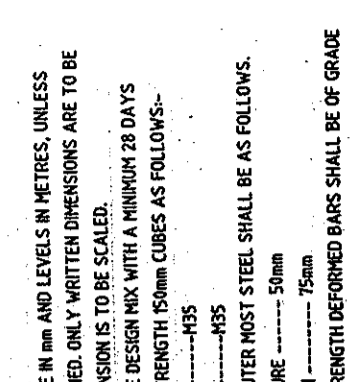
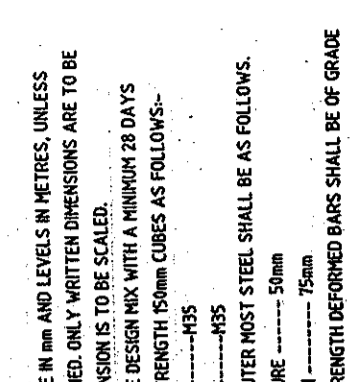
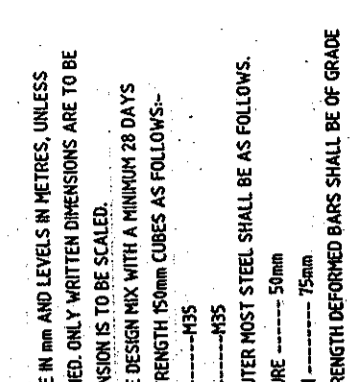
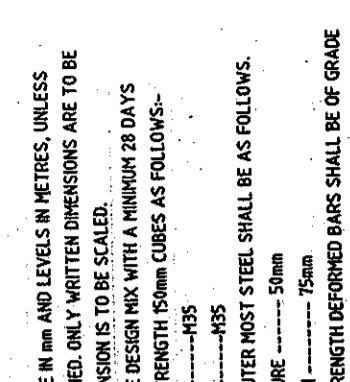
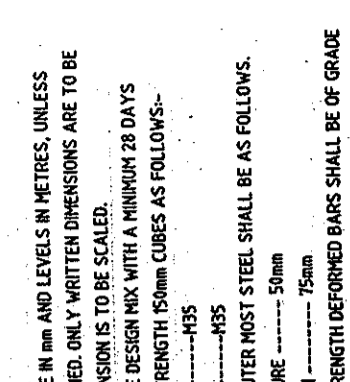
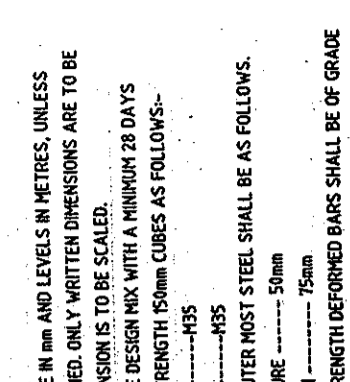
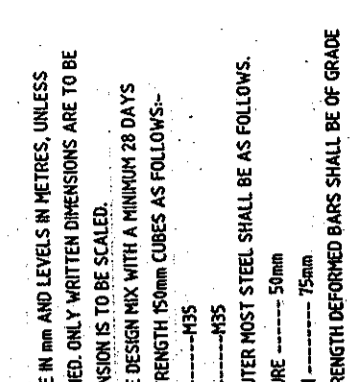
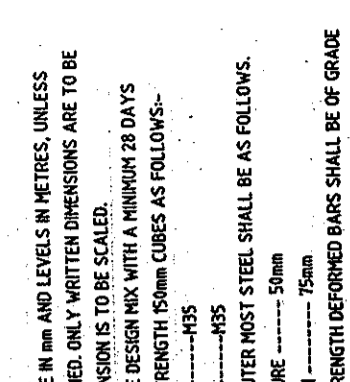
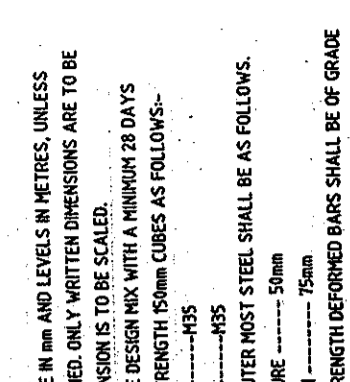
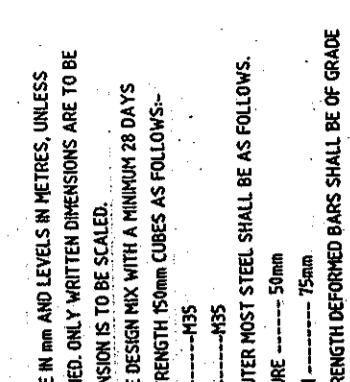
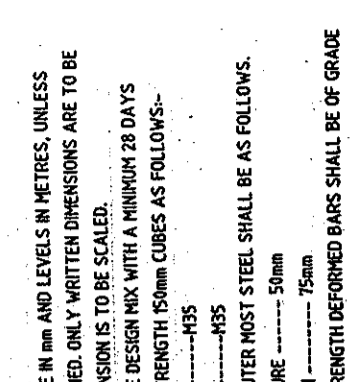
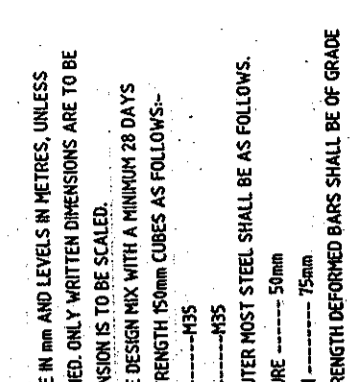
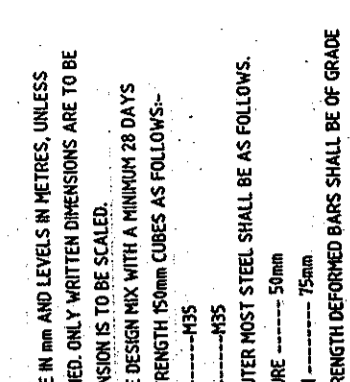
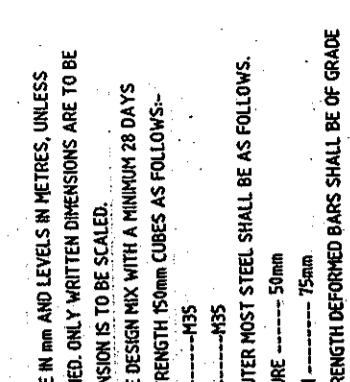
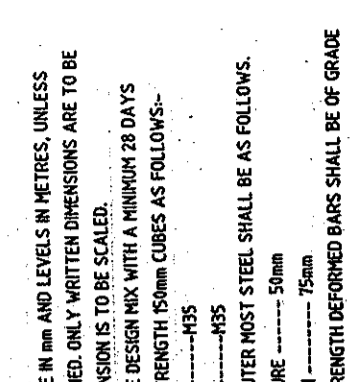
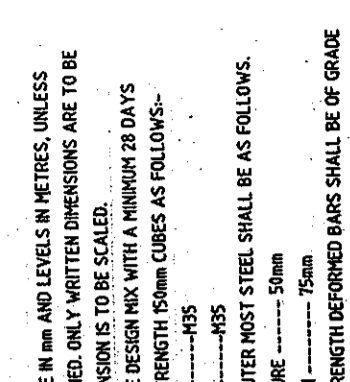
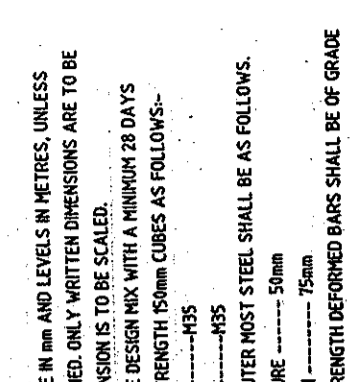
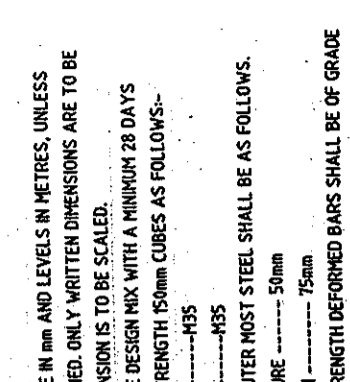
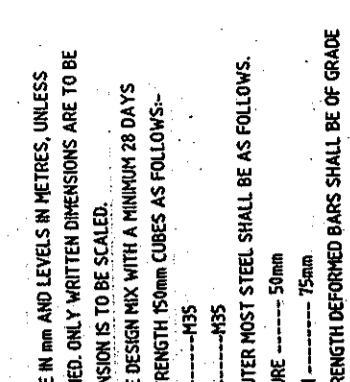
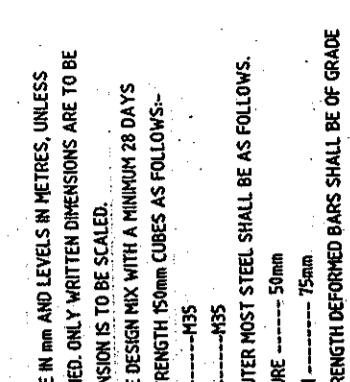
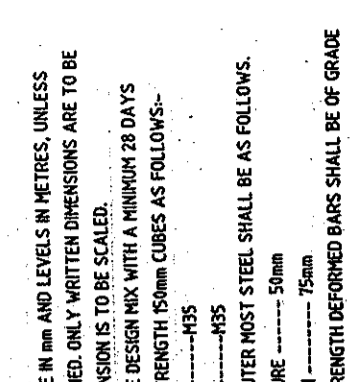
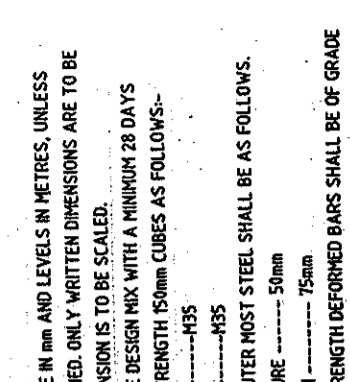
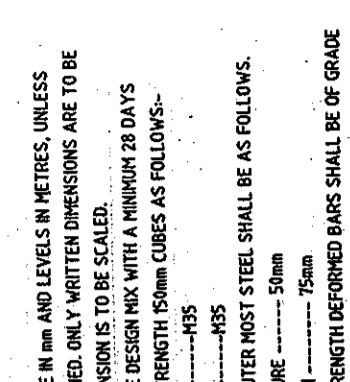
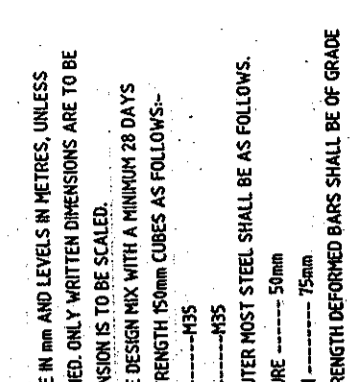
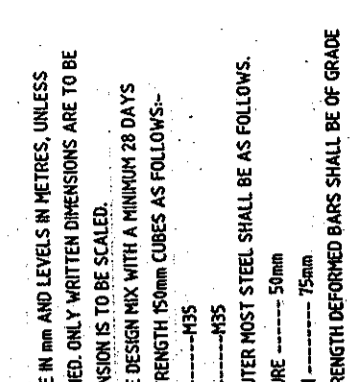
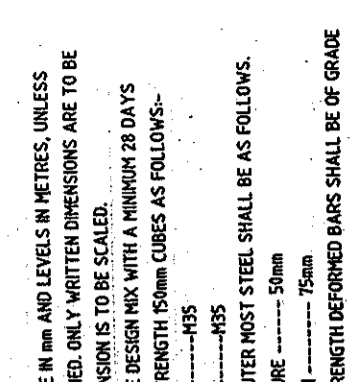
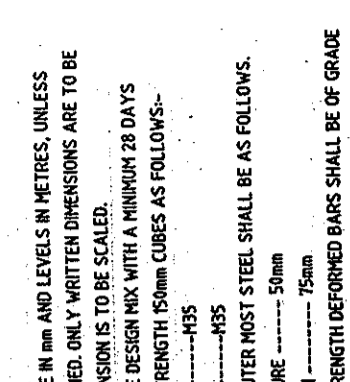
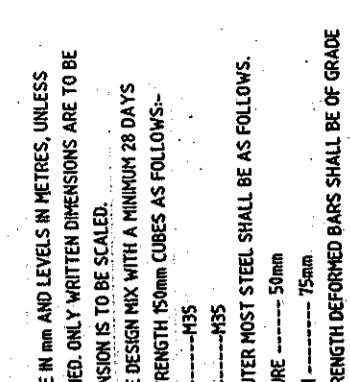
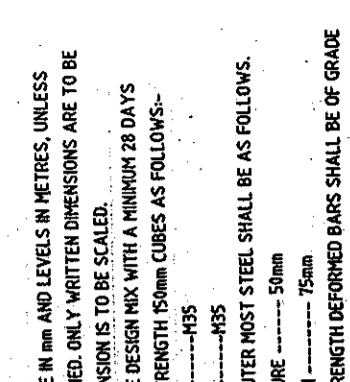
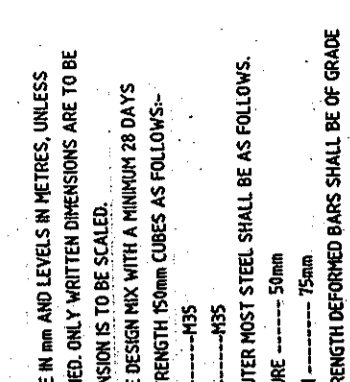
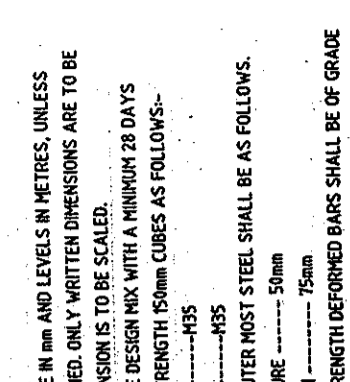
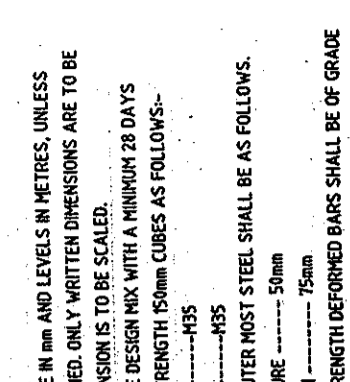
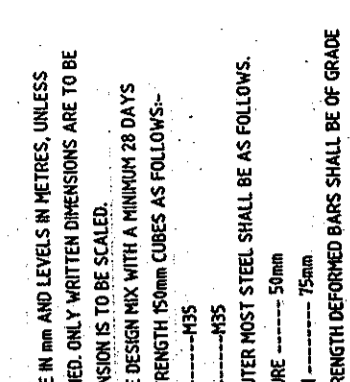
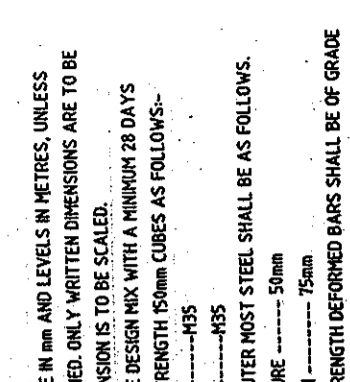
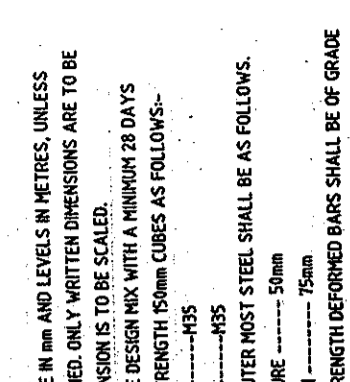
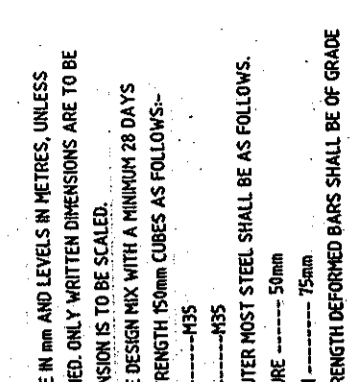
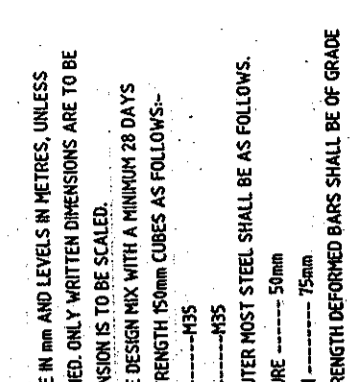
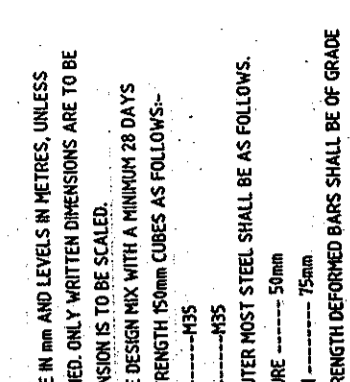
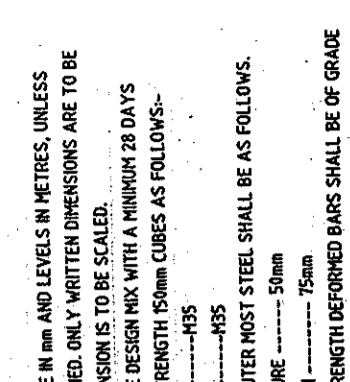
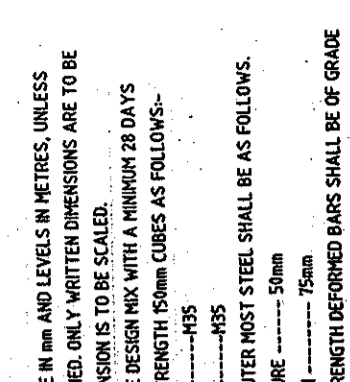
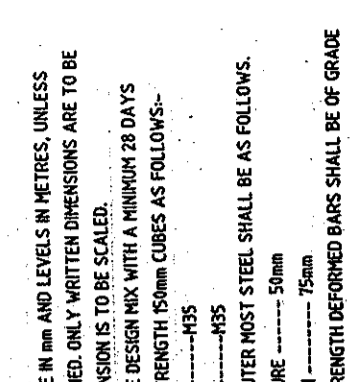
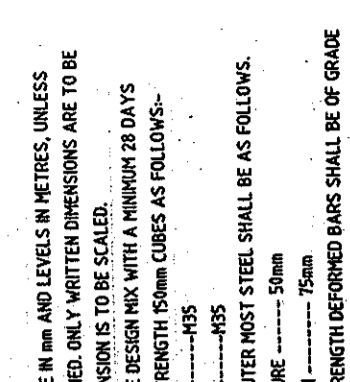
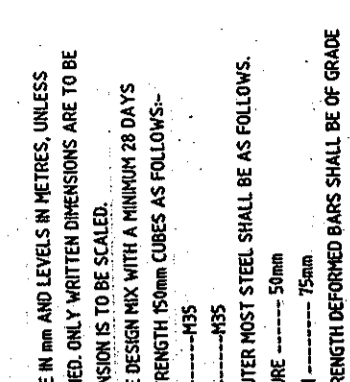
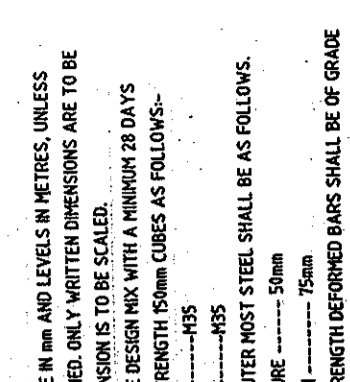
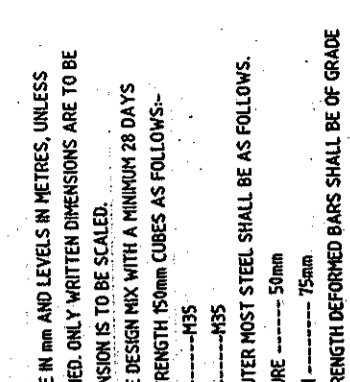
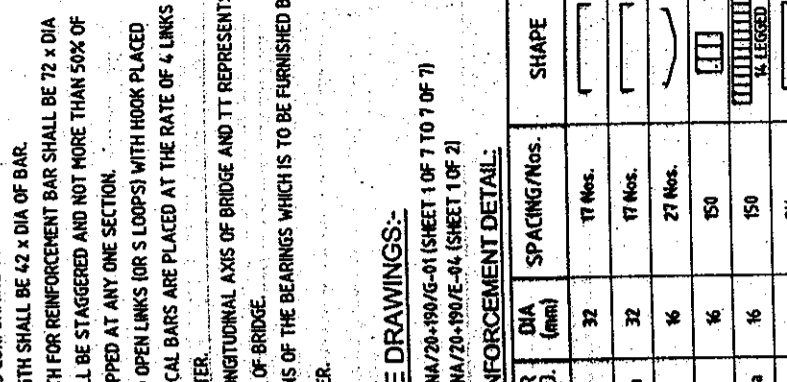
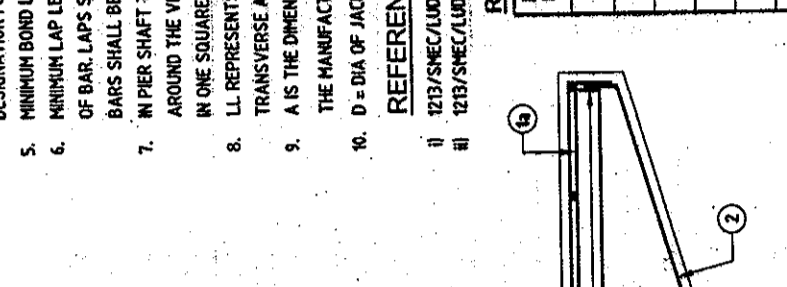
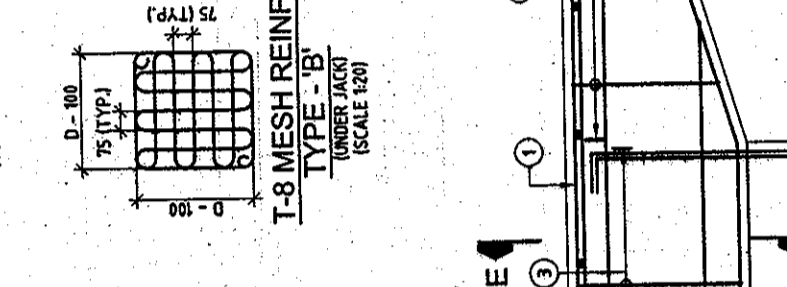
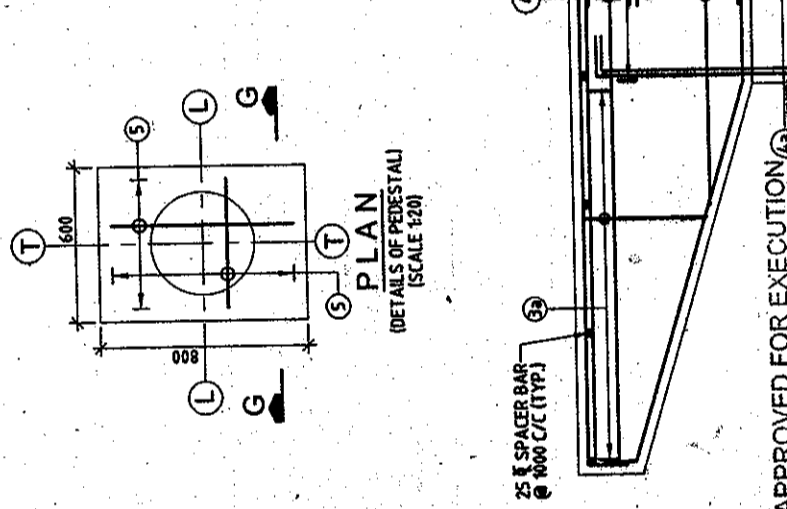
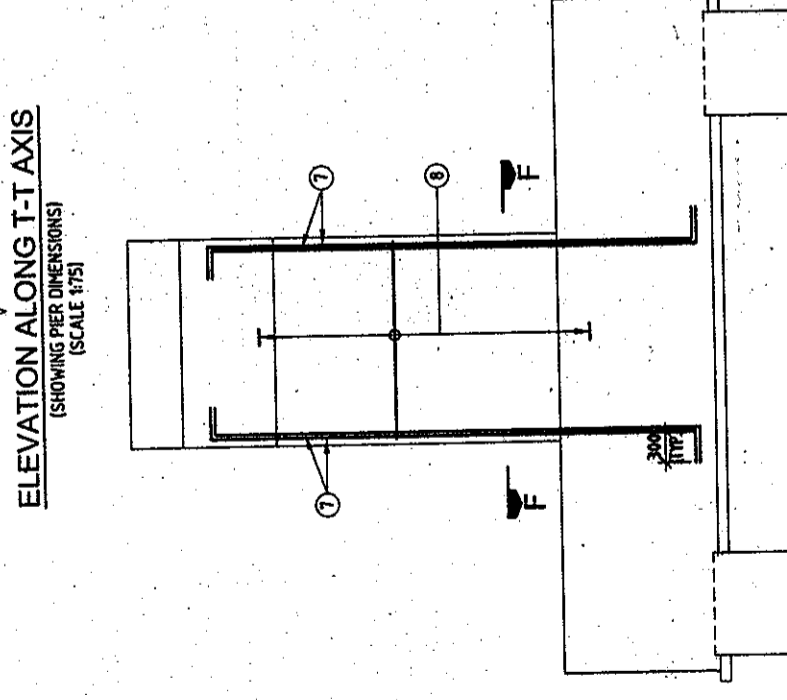
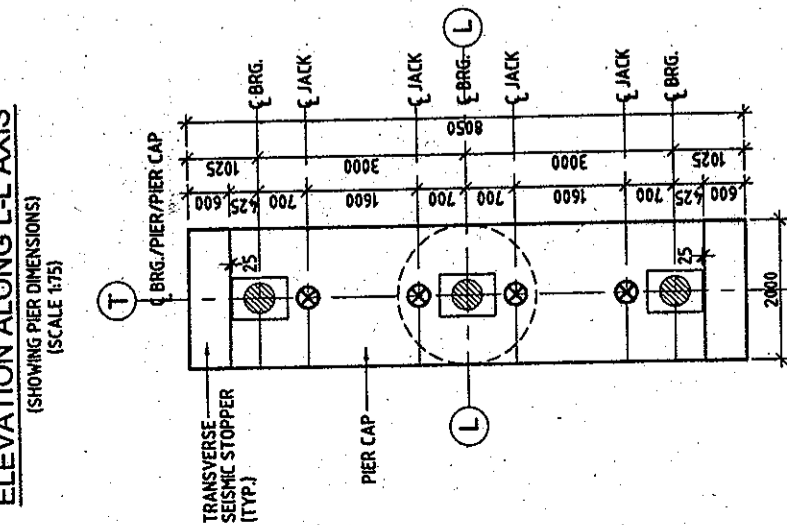
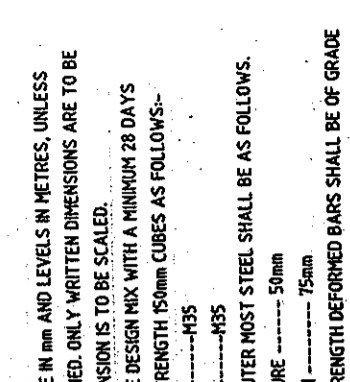
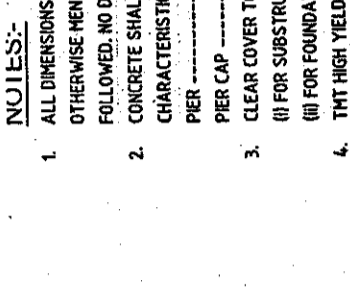
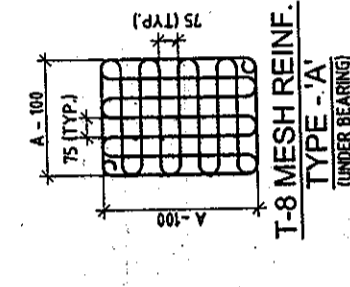
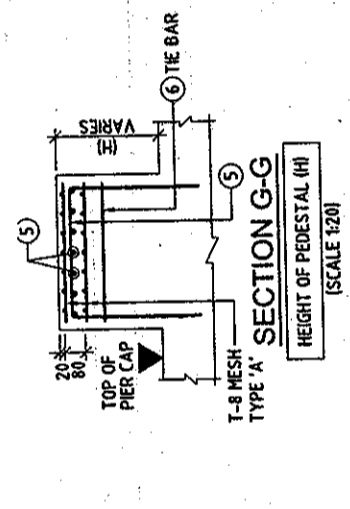
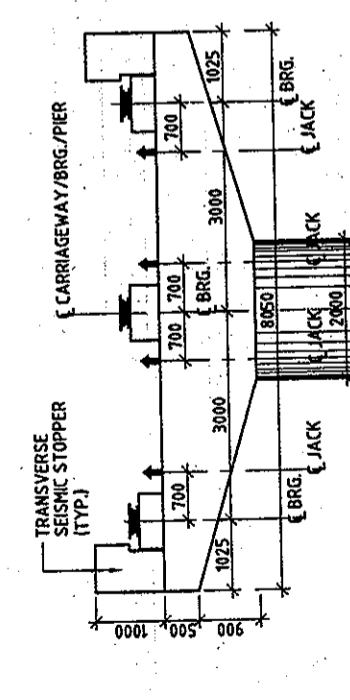
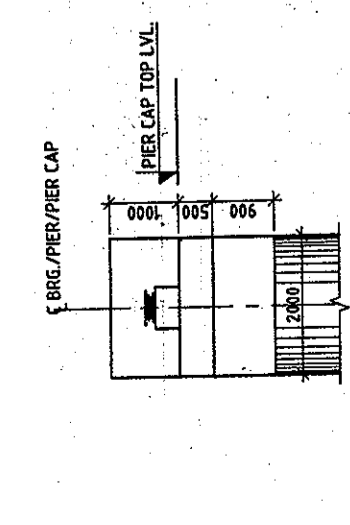
REV	DATE	DRAWN	DESIGN	CHECKED	APPROVED	DETAILS OF REVISION
R0	01/05/2009	MKS	VMM	VMM	S. SAHRI	FIRST ISSUE

**SCALE:** AS SHOWN  
**SHEET SIZE:** A2  
**DPR:** DRW  
**DRW:** R0

**DETAILED PROJECT REPORT DIMENSIONAL & REINFT. DETAILS OF PILE, PIER CAP, PIER & PIER CAP** (SHEET 2 OF 2)

1213/SMEC/LUDHIANA/20+190/E-03





- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH OF 35MPa FOR BORED CAST-IN-SITU PILE AND PILE CAP.
- CLEAR COVER TO SHALL BE AS FOLLOWS.
  - (i) FOR PILE --- 75mm
  - (ii) FOR PILE CAP --- 75mm
- THAT HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED.
- MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
- MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
- LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
- ACTUAL LOAD TEST SHALL BE CARRIED OUT ON A TEST PILE AS PER STANDARD SPECIFICATIONS TO DETERMINE VERTICAL AND LATERAL CAPACITY OF PILE. IT SHALL HOWEVER BE ENSURED THAT IT IS NOT LESS THAN DESIGN VALUES.

**REFERENCE DRAWINGS:-**

- 1213/SM/EC/LUDHIANA/20-190/G-01 (SHEET 1 OF 7 OF 7)
- 1213/SM/EC/LUDHIANA/20-190/E-05 (SHEET 2 OF 2)

**REINFORCEMENT DETAIL:-**

BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE
1	25	82 Nos.	┌
2	16	150	┌
3	16	150	┌
4	25	67 Nos.	┌
5	16	8 Nos.	○
7	25	20 Nos.	┌
8	10	200	○
8a	10	100	○
9	16	150	▤ LEGGED
10	16	150	▤ LEGGED

**LEGENDS:**  
 --- BAR ON TOP FACE  
 --- BAR ON BOTTOM FACE

**APPROVED FOR EXECUTION**

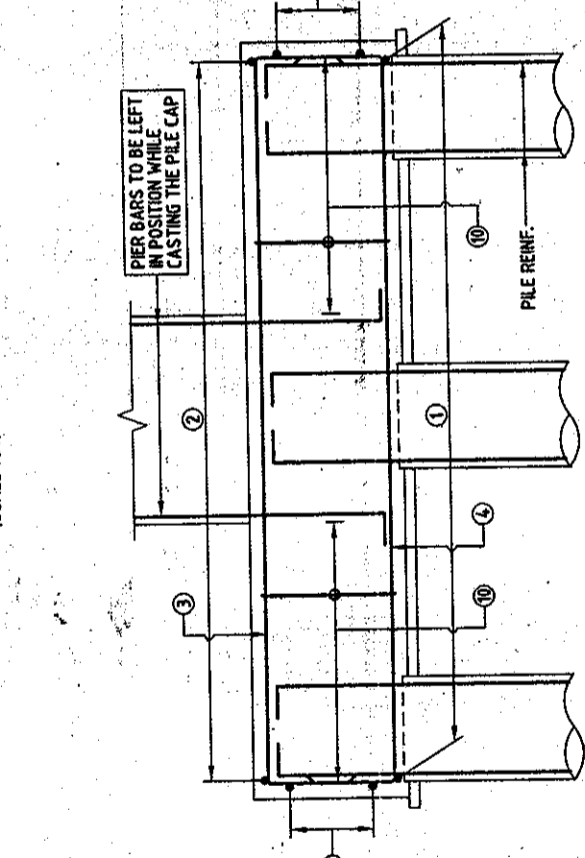
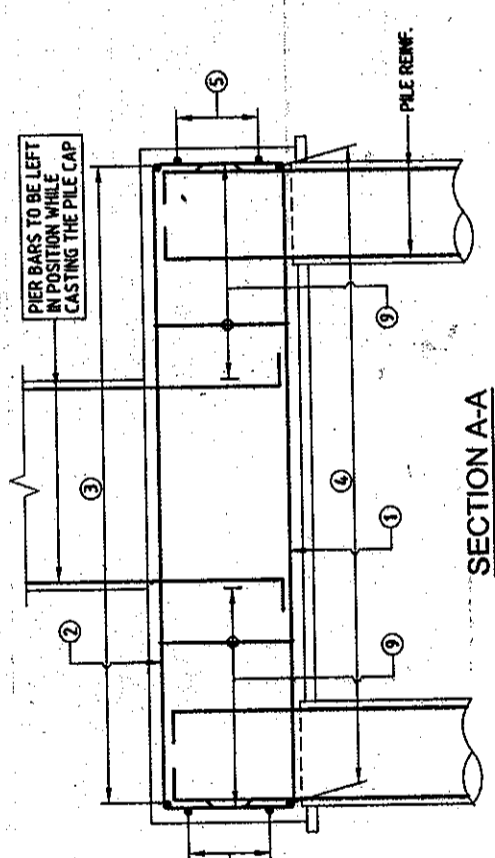
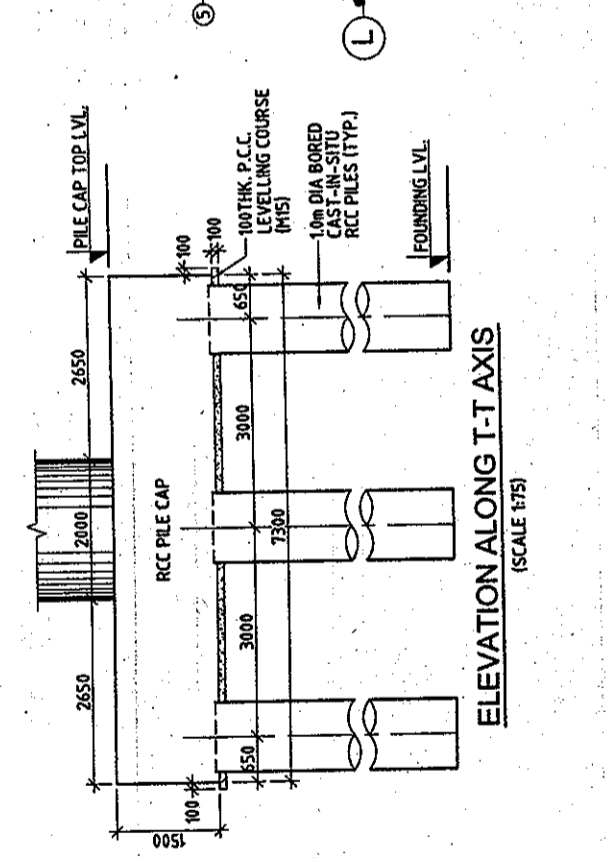
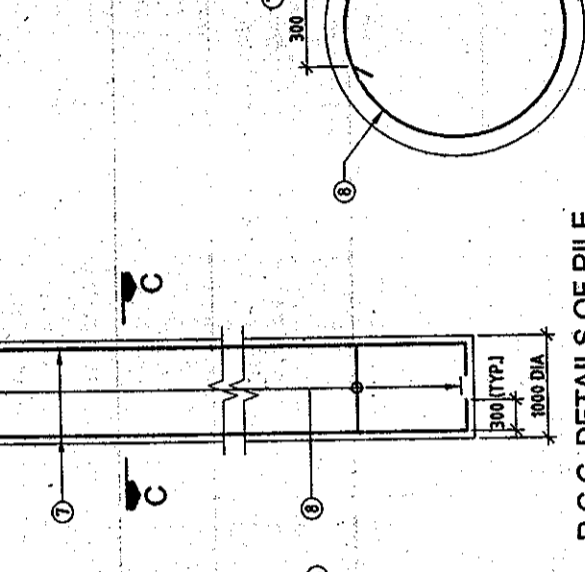
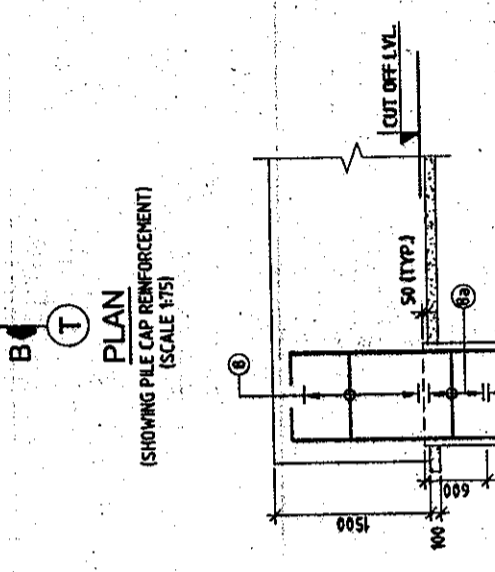
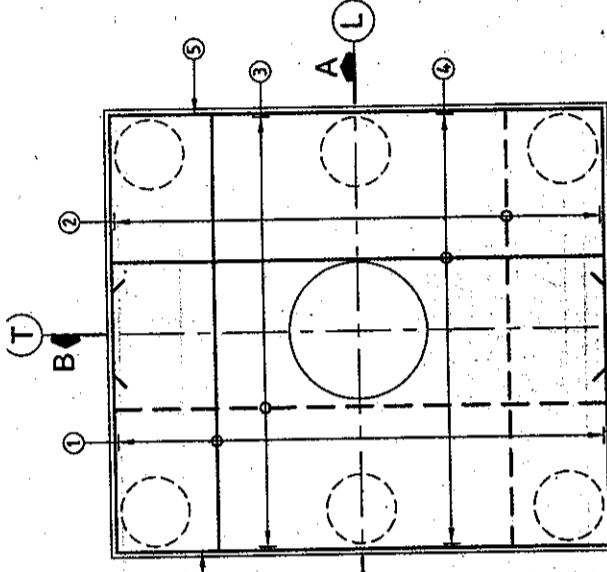
ISSUED

Assistant Engineer Design (IP)

Executive Engineer Design (IP)

Chief Engineer (IP)

PUNJAB P.W.D. (B & R)



**LEVEL CHART FOR PILE CAP LAYOUT**

PIER DESIGNATION	BED LEVEL	TOP OF PILE CAP LEVEL	CUT OFF LEVEL	FOUNDING LEVEL
P7	247.524	247.024	245.574	231.574

**PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BAY-PASS LUDHIANA**

CLIENT: **PIDB** PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD

CONSULTANT: **SM/EC** S.M. ENGINEERING CONSULTANTS

PROJECT TITLE: PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BAY-PASS LUDHIANA

SCALE: AS SHOWN

SHEET SIZE: A2

REVISED AS PER P.B.P.W.D. COMMENTS

REV	DATE	DRAWN	CHECKED	DESIGN	APPROVED	DETAILS OF REVISION
R1	27/08/2009	MKS	VNM	VNM	S SAHIRJI	REVISED AS PER P.B.P.W.D. COMMENTS
R0	04/05/2009	MKS	VNM	VNM	S SAHIRJI	FIRST ISSUE

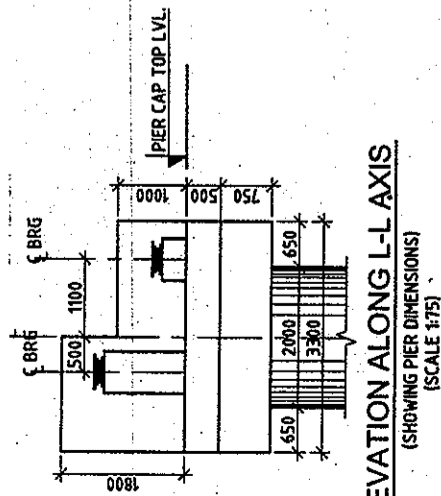
DPR DRAW

1213/SM/EC/LUDHIANA/20-190/E-05

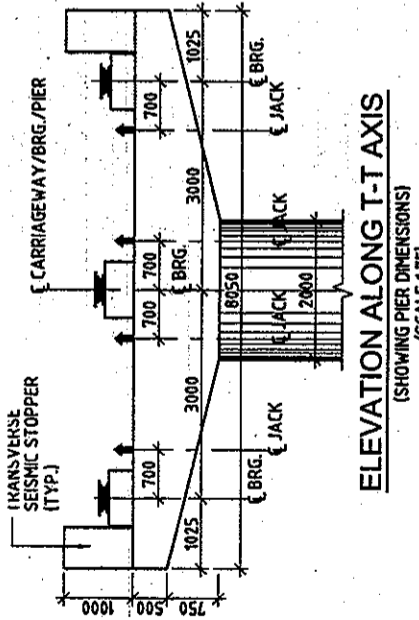
(SHEET 1 OF 2)

**53**

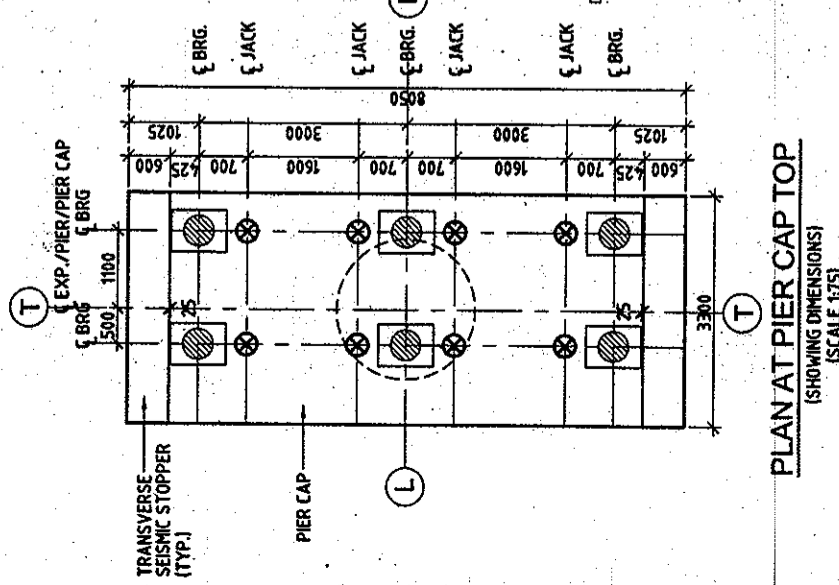




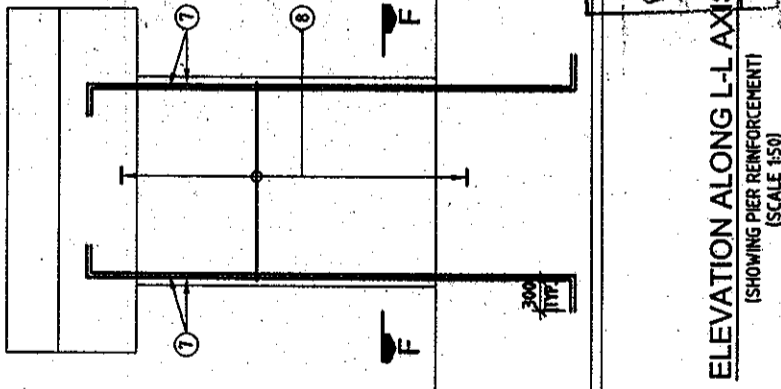
ELEVATION ALONG L-L AXIS  
(SHOWING PIER DIMENSIONS)  
(SCALE 1:75)



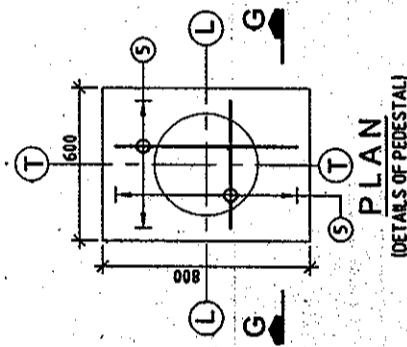
ELEVATION ALONG T-T AXIS  
(SHOWING PIER DIMENSIONS)  
(SCALE 1:75)



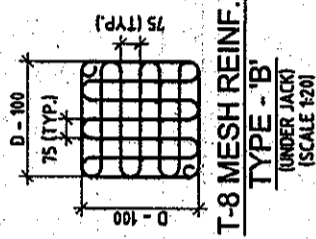
PLAN AT PIER CAP TOP  
(SHOWING DIMENSIONS)  
(SCALE 1:75)



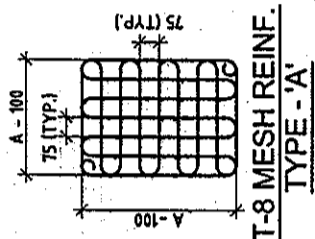
ELEVATION ALONG L-L AXIS  
(SHOWING PIER REINFORCEMENT)  
(SCALE 1:50)



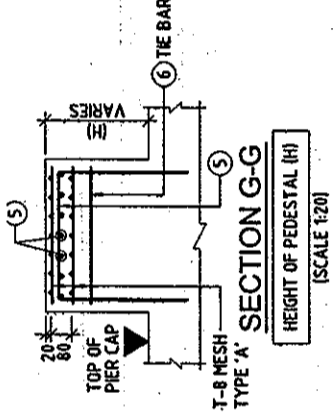
PLAN  
(DETAILS OF PEDESTAL)  
(SCALE 1:20)



T-8 MESH REINF.  
TYPE 'B'  
(UNDER JACK)  
(SCALE 1:20)



T-8 MESH REINF.  
TYPE 'A'  
(UNDER BEARING)  
(SCALE 1:20)



SECTION G-G  
TYPE 'A'  
HEIGHT OF PEDESTAL (H)  
(SCALE 1:20)

- NOTES:-**
- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH 150mm CUBES AS FOLLOWS:-  
PIER -----M35  
PIER CAP -----M35
  - CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS.  
(I) FOR SUBSTRUCTURE ----- 50mm  
(II) FOR FOUNDATION ----- 75mm
  - TMT HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED. MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
  - MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
  - IN PIER SHAFT T-10 OPEN LINKS (OR S LOOPS) WITH HOOK PLACED AROUND THE VERTICAL BARS ARE PLACED AT THE RATE OF 4 LINKS IN ONE SQUARE METER.
  - LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
  - A IS THE DIMENSIONS OF THE BEARINGS WHICH IS TO BE FURNISHED BY THE MANUFACTURER.
  - D = DIA OF JACK.

**REFERENCE DRAWINGS:-**

- 1213/SHEC/LUDHIANA/20+190/G-01 (SHEET 1 OF 7 TO 7 OF 7)
- 1213/SHEC/LUDHIANA/20+190/E-05 (SHEET 1 OF 2)

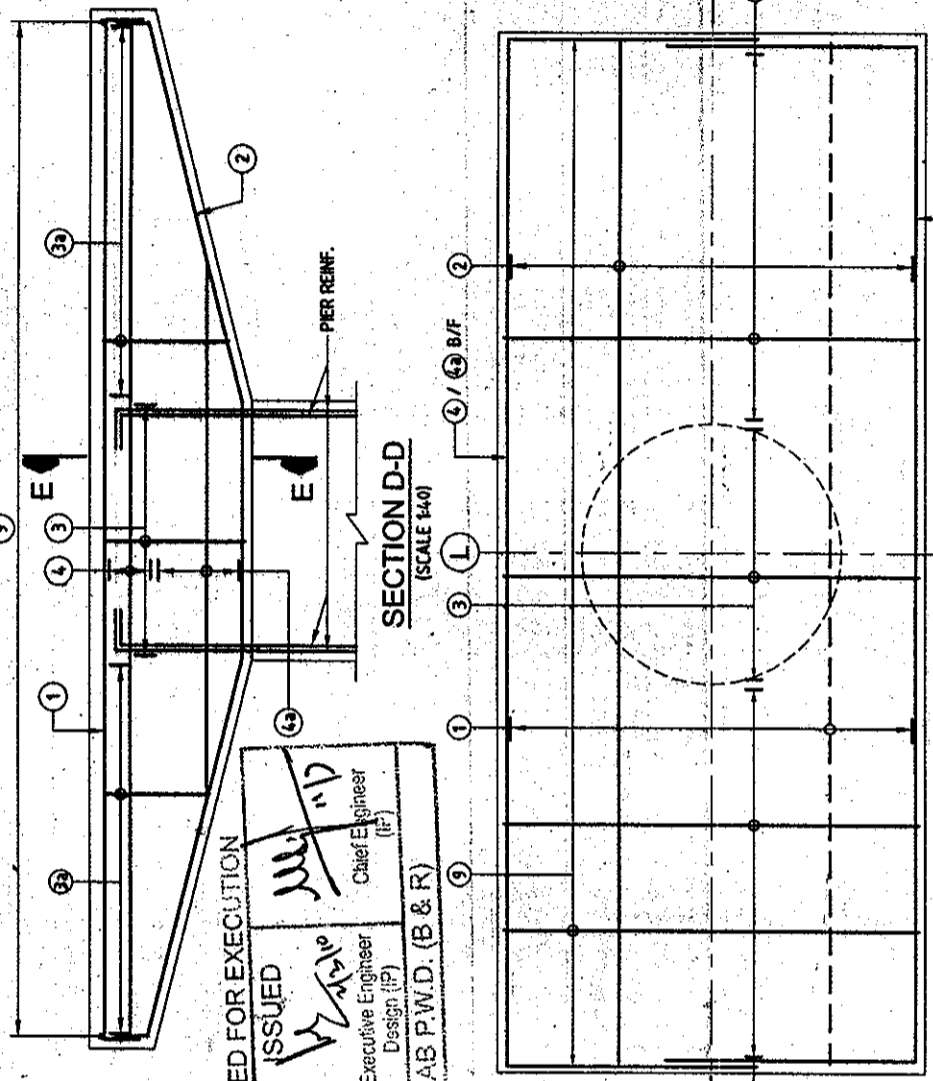
**REINFORCEMENT DETAIL:**

BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE
1	32	37 Nos.	[Diagram]
2	16	37 Nos.	[Diagram]
3	16	150	[Diagram]
3a	16	75	[Diagram]
4	20	2Nos.	[Diagram]
4a	20	3Nos.	[Diagram]
5	16	75	[Diagram]
6	16	150	[Diagram]
7	32	112 Nos. (2x56)	[Diagram]
8	12	125	[Diagram]
9	25	67 Nos.	[Diagram]
10	16	5 LAYER	[Diagram]

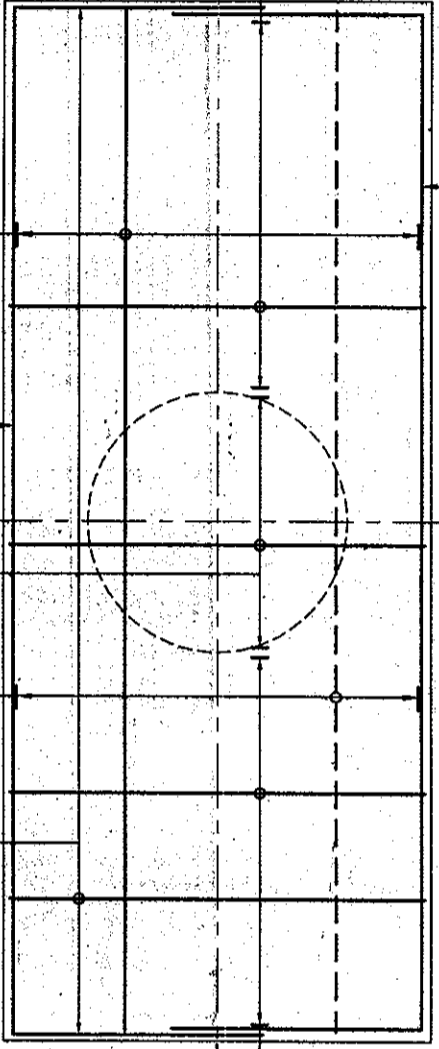
**LEGENDS:**  
 --- BAR ON TOP FACE  
 --- BAR ON BOTTOM FACE

**LEVEL CHART FOR PIER**

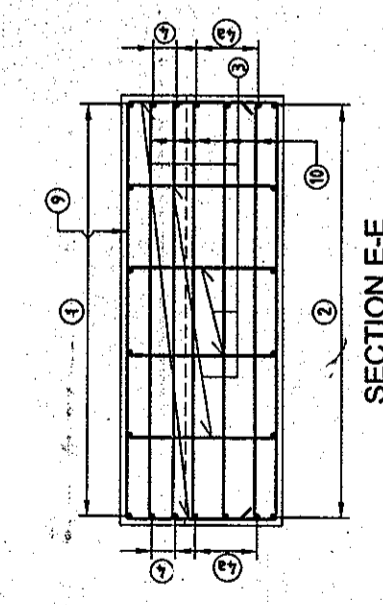
PIER DESIGNATION	FORMATION LEVEL	PIER CAP TOP LEVEL	BED LEVEL
P7	256.060	252.815	247.524



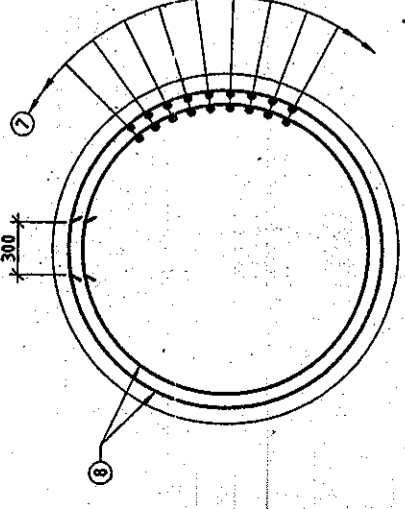
SECTION D-D  
(SCALE 1:40)



PLAN SHOWING REINFORCEMENT IN PIER CAP  
(SCALE 1:40)



SECTION E-E  
(SCALE 1:40)



SECTION F-F  
(SCALE 1:30)

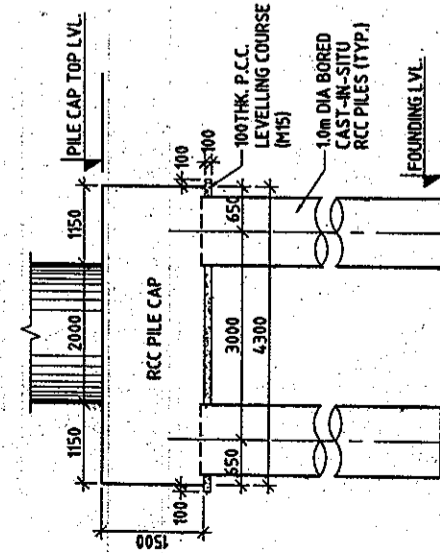
THIS DRAWING HAS NOT BEEN PUBLISHED AND IS THE SOLE PROPERTY OF SMEC INDIA PVT. LTD. AND IS ISSUED TO THE PARTY FOR THE SPECIFIC PURPOSE AS STATED IN THE AGREEMENT AND IT SHALL NOT BE REPRODUCED, COPIED, LENT OR OTHERWISE DISPOSED OFF DIRECTLY OR INDIRECTLY, NOR USED FOR ANY OTHER PURPOSE OTHER THAN FOR WHICH IT IS FURNISHED.

**CLIENT:** PIDB  
**CONSULTANT:** SMEC  
**PROJECT TITLE:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYE-PASS LUDHIANA  
**REVISIONS:**  
 R1 27/08/2009 MMS VNM VNM  
 R0 04/05/2009 MMS VNM VNM  
**DATE:** 04/05/2009  
**CHECKED:** VNM  
**DESIGN:** VNM  
**DRAWN:** VNM  
**APPROVED:** VNM  
**DETAILS OF REVISION:**  
 REVISED AS PER P8 PWD COMMENTS FIRST ISSUE

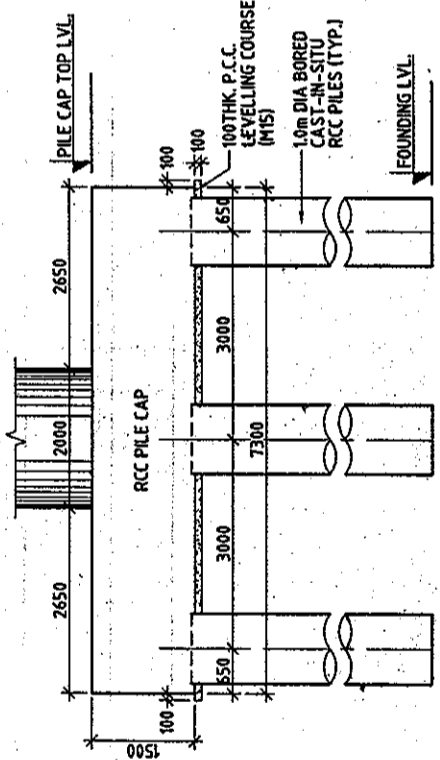
**SCALE:** AS SHOWN  
**SHEET SIZE:** A2  
**DRW:** DPR  
**PIER DESIGNATION:** P7  
**FORMATION LEVEL:** 256.060  
**PIER CAP TOP LEVEL:** 252.815  
**BED LEVEL:** 247.524

**DETAILED PROJECT REPORT**  
**DIMENSIONAL & REINF. DETAILS OF PILE, PIER CAP, PIER & PIER CAP**  
 SHEET 2 OF 2  
 1213/SMEC/LUDHIANA/20+190/E-05  
 R1

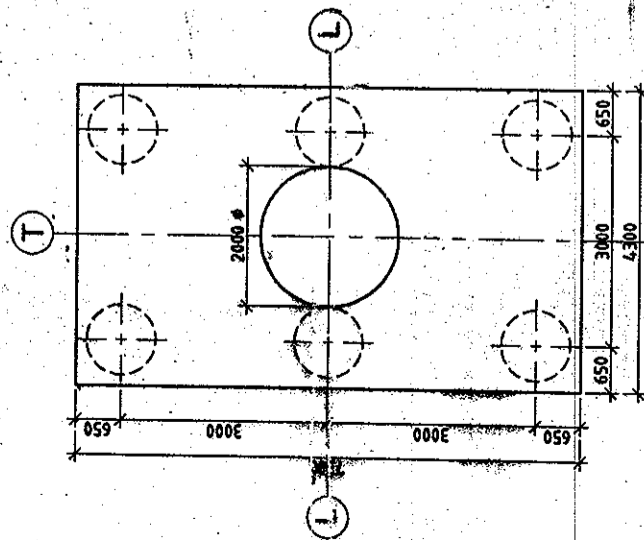
CAO File No: HA\Structure\1213\FINAL DPR\Revised Drawings P2 (Feb. 01)\Bridge Cl. 20+190\TOWER Cl. 20+190 E-05.dwg



**ELEVATION ALONG L-L AXIS**  
(SCALE 1/75)



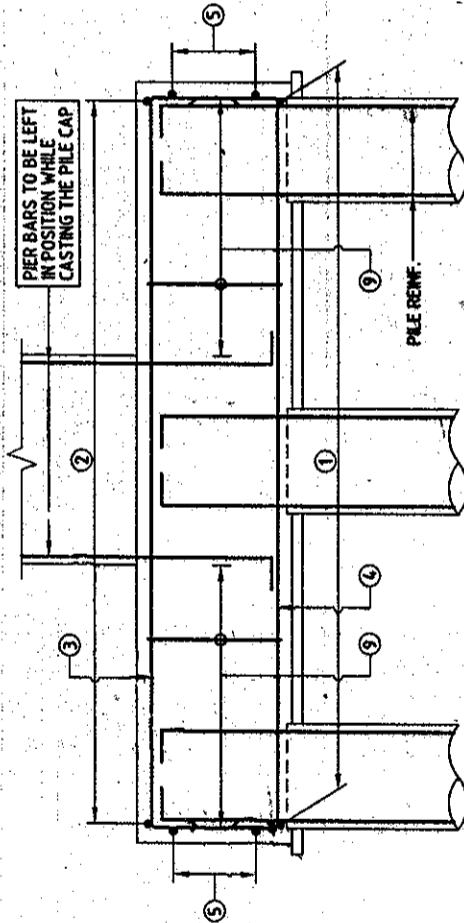
**ELEVATION ALONG T-T AXIS**  
(SCALE 1/75)



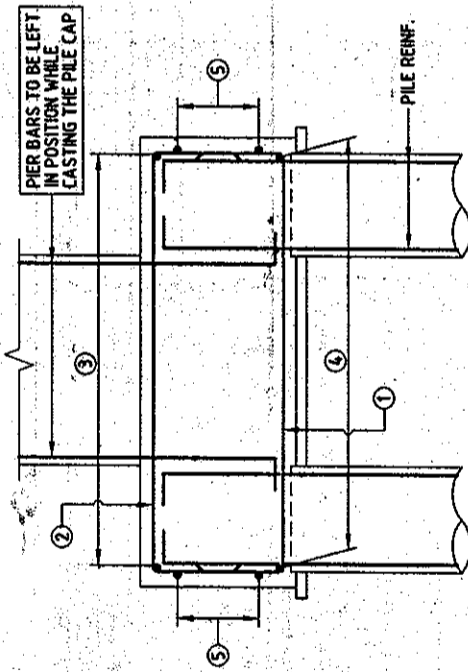
**PLAN AT TOP OF PILE CAP**  
(SHOWING DIMENSIONS)  
(SCALE 1/75)

**LEVEL CHART FOR PILE CAP LAYOUT**

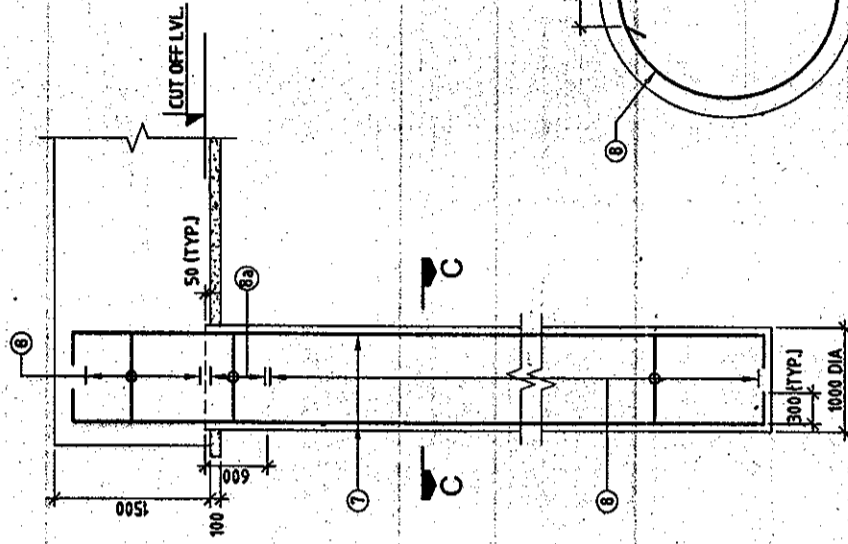
PIER DESIGNATION	BED LEVEL	TOP OF PILE CAP LEVEL	CUT OFF LEVEL	FOUNDING LEVEL
P8	247.186	246.686	245.236	231.236



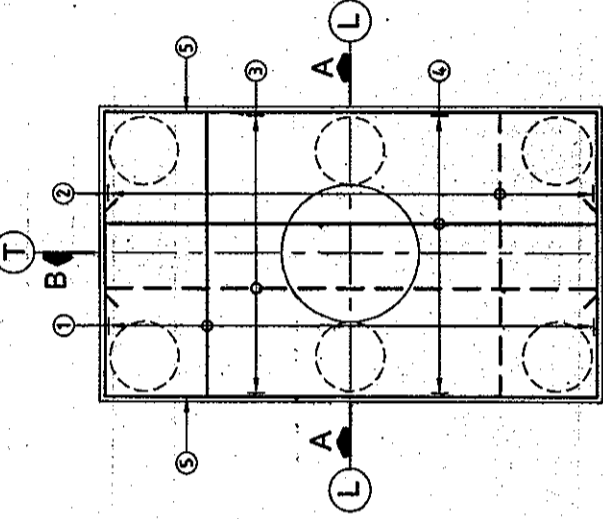
**SECTION B-B**  
(SCALE 1/50)



**SECTION A-A**  
(SCALE 1/50)



**R.C.C. DETAILS OF PILE**  
(SCALE 1/50)



**PLAN**  
(SHOWING PILE CAP REINFORCEMENT)  
(SCALE 1/75)

**REINFORCEMENT DETAIL:-**

BAR MKD.	DIA (mm)	SPACING/NOS.	SHAPE
1	25	23 Nos.	—
2	16	150	—
3	16	150	—
4	25	60 Nos.	—
5	16	8 Nos.	□
7	25	15 Nos.	—
8	10	200	○
8a	10	100	○
9	16	150	□

**REINFORCEMENT DETAIL:-**

LEGENDS:

— BAR ON TOP FACE

APPROVED FOR EXECUTION

ISSUED

Assistant Engineer Design (EP)  
Executive Engineer Design (EP)  
Chief Engineer

APPROVED FOR EXECUTION

APPROVED FOR EXECUTION

- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH OF 35Mpa FOR BORED CAST-IN-SITU PILE AND PILE CAP.
- CLEAR COVER TO SHALL BE AS FOLLOWS:  
(i) FOR PILE --- 75mm  
(ii) FOR PILE CAP --- 75mm
- TMT HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED.
- MINIMUM BOND LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
- LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
- ACTUAL LOAD TEST SHALL BE CARRIED OUT ON A TEST PILE AS PER STANDARD SPECIFICATIONS TO DETERMINE VERTICAL AND LATERAL CAPACITY OF PILE. IT SHALL HOWEVER BE ENSURED THAT IT IS NOT LESS THAN DESIGN VALUES.

**REFERENCE DRAWINGS:-**

- 1213/SMEC/LUDHIANA/20-190/G-01 (SHEET 1 OF 7 TO 7 OF 7)
- 1213/SMEC/LUDHIANA/20-190/E-06 (SHEET 2 OF 2)

**CLIENT:** PIDB  
PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD

**CONSULTANT:** SMEC  
SMEC (INDIA) PVT. LTD.  
D/F BUILDING IN B & C TOWER 2ND FLOOR  
CYBERCITY, PHASE-I, GURGAON,  
HARYANA, INDIA - 122002  
Tel: 0124-480042, 480100

**PROJECT TITLE:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADEATION OF SOUTHERN BYE-PASS LUDHIANA

**SCALE:** AS SHOWN

**SHEET SIZE:** A2

**REVISED AS PER P8 PWD COMMENTS:**  
R1 27/08/2009 VNM SVS  
R0 04/05/2009 MKS SJA

**APPROVED:** VNM SVS

**CHECKED:** VNM SJA

**DESIGN:** VNM SJA

**DRAWN:** MKS SJA

**DATE:** 04/05/2009

**DETAILS OF REVISION:**

**APPROVED FOR EXECUTION:** VNM SVS

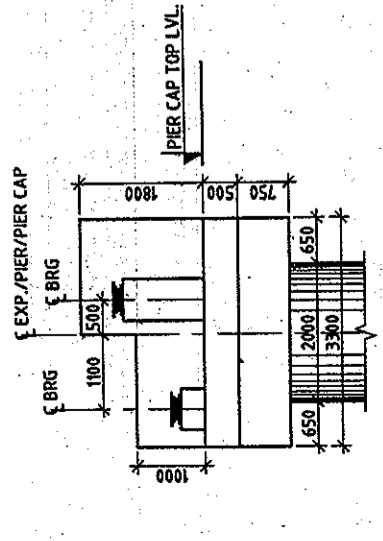
**ASSISTANT ENGINEER DESIGN (EP):** VNM SVS

**EXECUTIVE ENGINEER DESIGN (EP):** VNM SVS

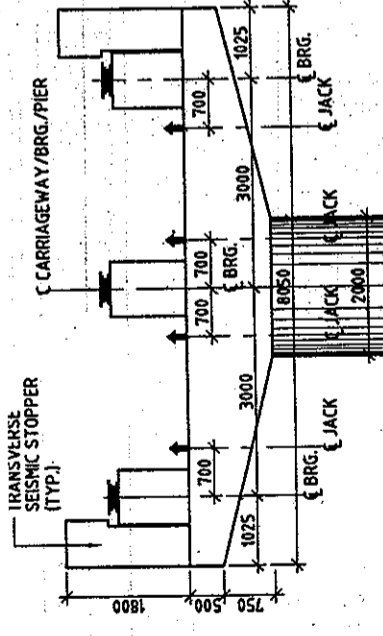
**CHIEF ENGINEER:** VNM SVS

**DETAILED PROJECT REPORT DIMENSIONAL & REINF. DETAILS OF PILE, PILE CAP, PIER & PIER CAP**  
(SHEET 1 OF 2)

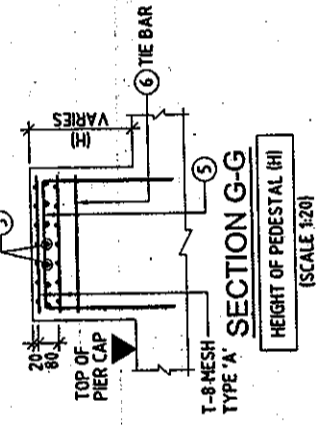
**1213/SMEC/LUDHIANA/20-190-E-06**  
R1



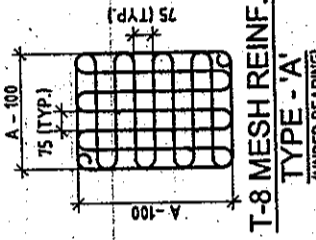
ELEVATION ALONG L-L AXIS  
(SHOWING PIER DIMENSIONS)  
(SCALE 1:75)



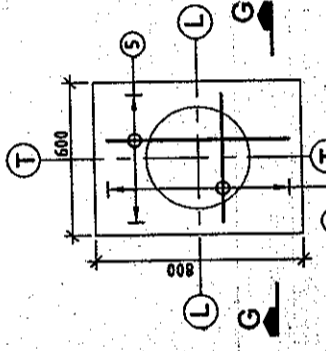
ELEVATION ALONG T-T AXIS  
(SHOWING PIER DIMENSIONS)  
(SCALE 1:75)



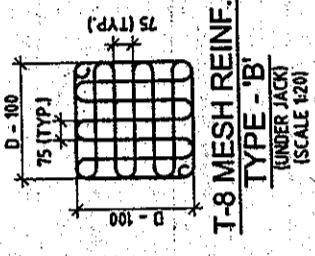
SECTION G-G  
(SCALE 1:20)



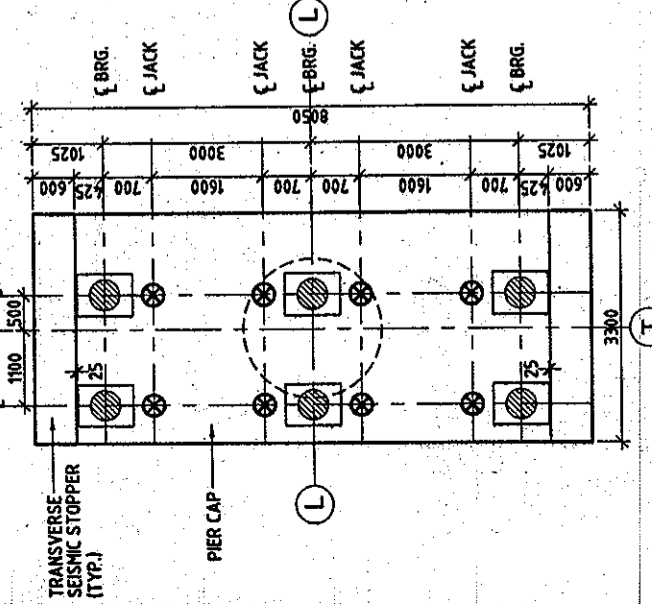
T-8 MESH REINF.  
TYPE 'A'  
(UNDER BEARING)  
(SCALE 1:20)



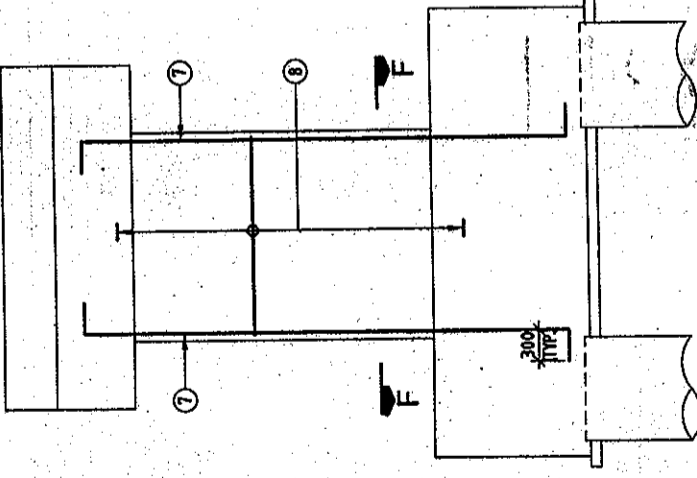
PLAN  
(DETAILS OF PEDESTAL)  
(SCALE 1:20)



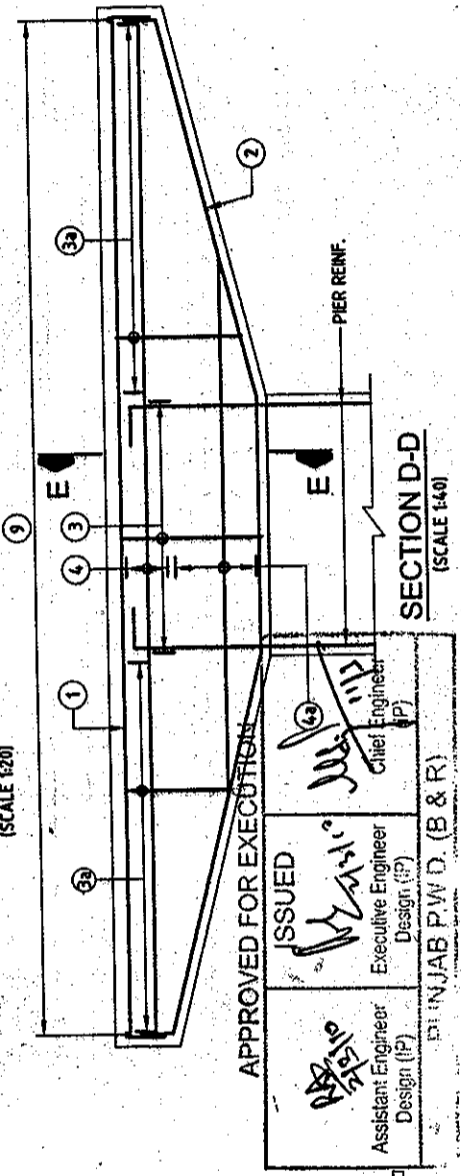
T-8 MESH REINF.  
TYPE 'B'  
(UNDER JACK)  
(SCALE 1:20)



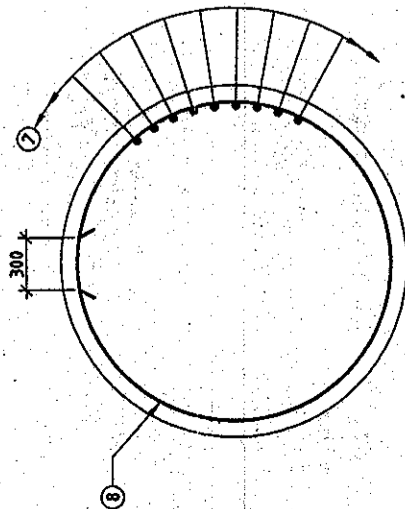
PLAN AT PIER CAP TOP  
(SHOWING DIMENSIONS)  
(SCALE 1:75)



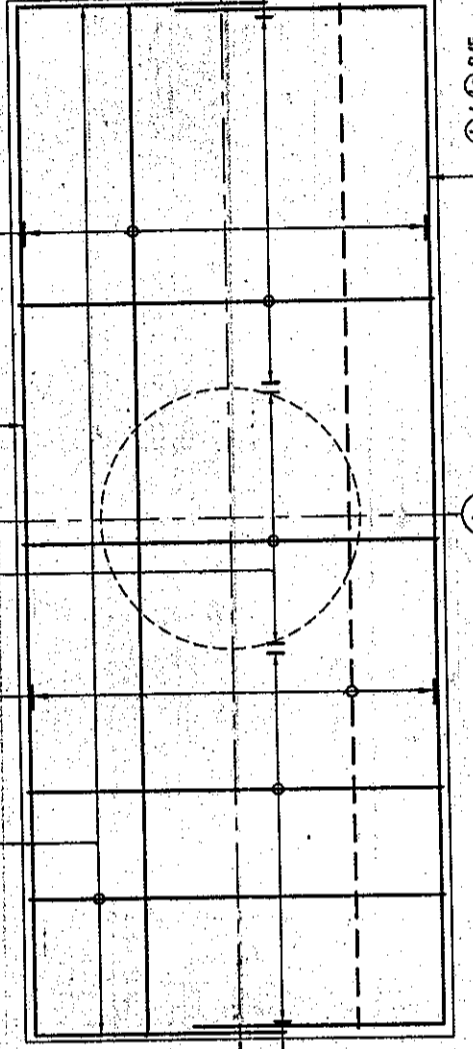
ELEVATION ALONG L-L AXIS  
(SHOWING PIER REINFORCEMENT)  
(SCALE 1:50)



SECTION D-D  
(SCALE 1:40)



SECTION E-E  
(SCALE 1:40)



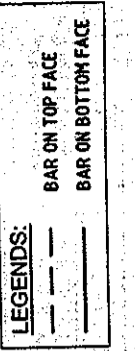
PLAN SHOWING REINFORCEMENT IN PIER CAP  
(SCALE 1:40)

- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH 150mm CUBES AS FOLLOWS:-  
PIER ----- M35  
PIER CAP ----- M35  
CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS.  
(i) FOR SUBSTRUCTURE ----- 50mm  
(ii) FOR FOUNDATION ----- 75mm
- TMT HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED. MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
- MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
- IN PIER SHAFT T-10 OPEN LINKS (OR S LOOPS) WITH HOOK PLACED AROUND THE VERTICAL BARS ARE PLACED AT THE RATE OF 4 LINKS IN ONE SQUARE METER.
- LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
- A IS THE DIMENSIONS OF THE BEARINGS WHICH IS TO BE FURNISHED BY THE MANUFACTURER.
- D = DIA OF JACK

REFERENCE DRAWINGS:-

- 1213/SMEC/LUDHIANA/20+190/JG-01 (SHEET 1 OF 7 TO 7 OF 7)
- 1213/SMEC/LUDHIANA/20+190/E-06 (SHEET 1 OF 2)

BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE
1	32	37 Nos.	[Symbol]
2	16	37 Nos.	[Symbol]
3	16	150	[Symbol]
3a	16	75	[Symbol]
4	20	2Nos.	[Symbol]
4a	20	3Nos.	[Symbol]
5	16	75	[Symbol]
6	16	150	[Symbol]
7	32	50 Nos.	[Symbol]
8	12	125	[Symbol]
9	25	67 Nos.	[Symbol]
10	16	5 LAYER	[Symbol]



LEVEL CHART FOR PIER

PIER DESIGNATION	FORMATION LEVEL	PIER CAP TOP LEVEL	BED LEVEL
P8	256.960	252.815	247.186

PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADEATION OF SOUTHERN BYE-PASS LUDHIANA

CONSULTANT: SMEC (SPECIALIST CONSULTANTS) PVT. LTD. 6/F BUILDING IN A CTOWER 3RD FLOOR CYBER CITY, PHASE-II GURGAON HARYANA, INDIA - 122 002 TEL: 0124-430052, 691100

CLIENT: PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD

PROJECT TITLE: PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADEATION OF SOUTHERN BYE-PASS LUDHIANA

REVISIONS:

REV	DATE	DRAWN	DESIGN	CHECKED	APPROVED	DETAILS OF REVISION
R0	04/05/2009	MKS	VNM	VNM	SUNIRU	FIRST ISSUE

SCALE: AS SHOWN  
SHEET SIZE: A2  
DPP: DRW

DETAILED PROJECT REPORT DIMENSIONAL & REINF. DETAILS OF PILE, PIER CAP, PIER & PIER CAP SHEET 2 OF 2

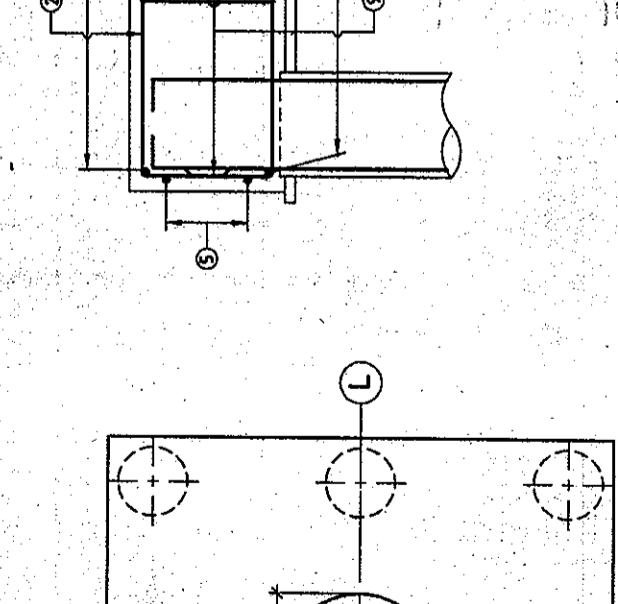
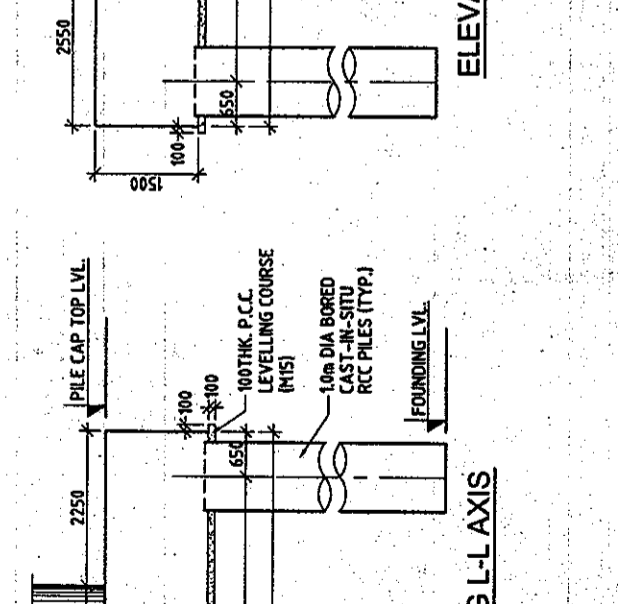
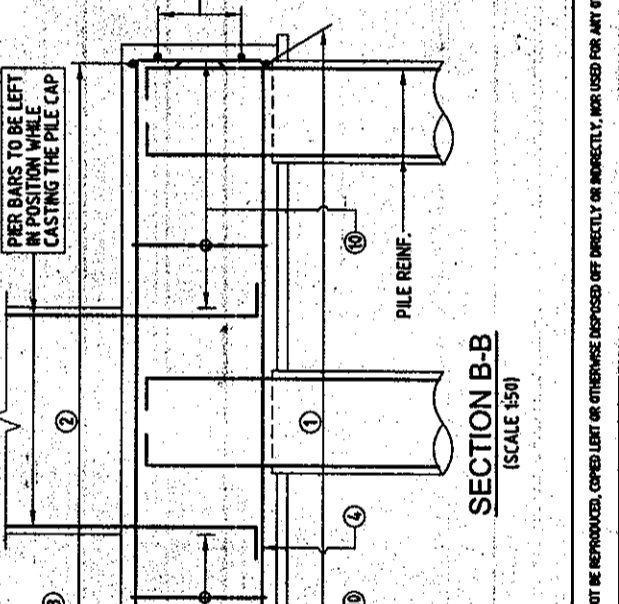
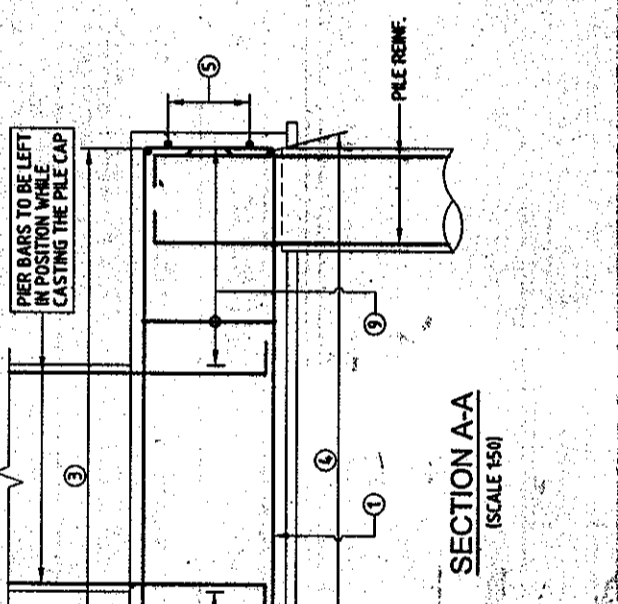
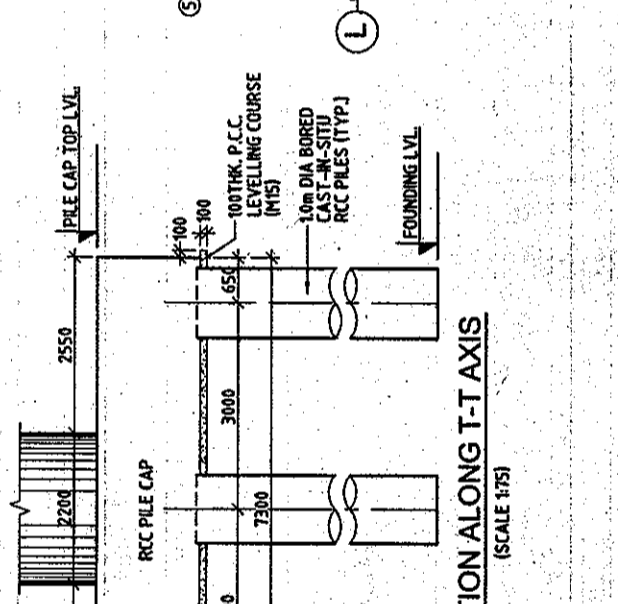
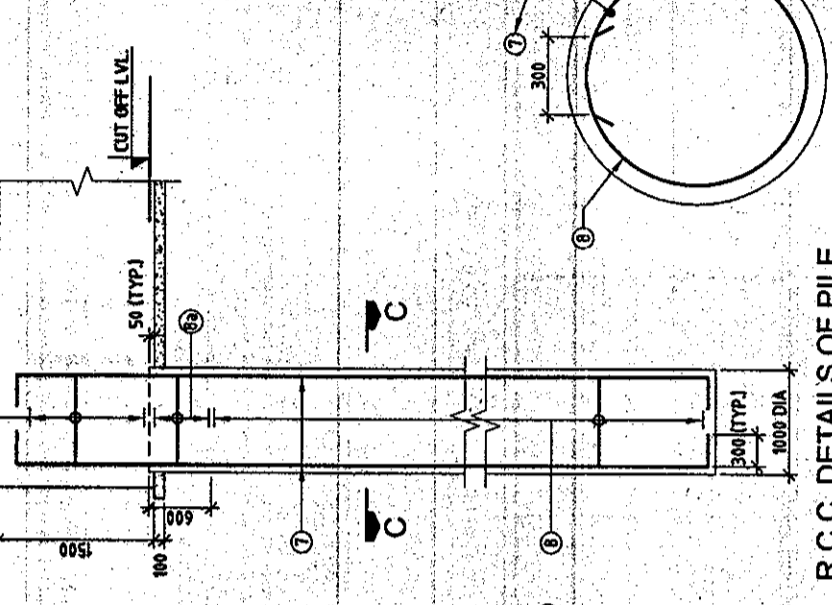
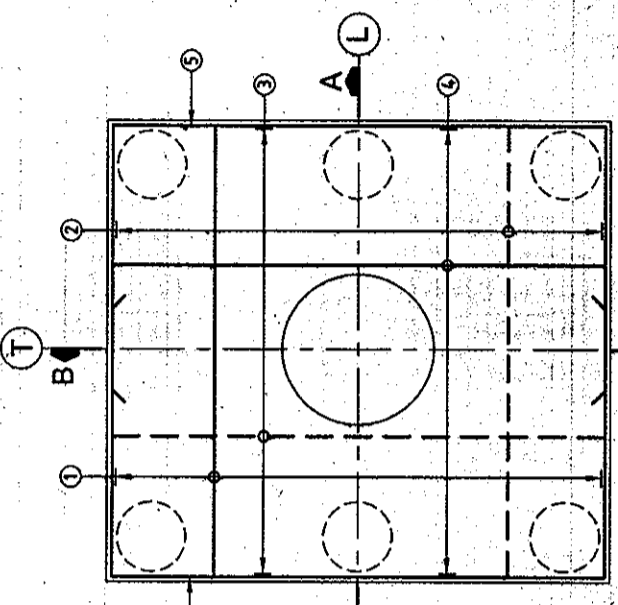
1213/SMEC/LUDHIANA/20+190/E-06 R0



- NOTES:-**
- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH OF 35MPa FOR BORED CAST-IN-SITU PILE AND PILE CAP.
  - CLEAR COVER TO SHALL BE AS FOLLOWS.  
 (i) FOR PILE ----- 75mm  
 (ii) FOR PILE CAP ----- 75mm
  - TMT HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED.
  - MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
  - MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BARS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
  - L.L. REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND T.T. REPRESENTS TRANSVERSE AXIS OF BRIDGE.
  - ACTUAL LOAD TEST SHALL BE CARRIED OUT ON A TEST PILE AS PER STANDARD SPECIFICATIONS TO DETERMINE VERTICAL AND LATERAL CAPACITY OF PILE. IT SHALL HOWEVER BE ENSURED THAT IT IS NOT LESS THAN DESIGN VALUES.

**REFERENCE DRAWINGS:-**

- 1213/SHEC/LUDHIANA/20-190/G-01 (SHEET 1 OF 7 OF 7)
- 1213/SHEC/LUDHIANA/20-190/E-07 (SHEET 2 OF 2)



**LEVEL CHART FOR PILE CAP LAYOUT**

PIER DESIGNATION	BED LEVEL	TOP OF PILE CAP LEVEL	CUT OFF LEVEL	FOUNDING LEVEL
P9	247.020	246.520	245.070	231.070

**REINFORCEMENT DETAIL:**

BAR MKD.	DIA (mm)	SPACING/NOS.	SHAPE
1	25	61 Nos.	┌
2	16	150	┌
3	16	150	┌
4	25	50 Nos.	┌
5	16	8 Nos.	┌
6	25	26 Nos.	┌
7	10	200	○
8a	10	100	○
9	16	150	□ LEGGED
10	16	150	□ LEGGED

**LEGEND APPROVED FOR EXECUTION**

BAR RESTRICTION BAR ON BOTTOM FACE

Assistant Engineer Design (IP)

Executive Engineer Design (IP)

Chief Engineer Design (IP)

PUNJAB P.W.D. (B & C)

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**PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADEATION OF SOUTHERN BAY-PASS LUDHIANA**

**PROJECT TITLE:**

**CONSULTANT:** S.M.E.C. INDIA PVT. LTD. (SHEC (INDIA) PVT. LTD. D/F BUILDING NO. 3, C/108B, 2ND FLOOR, KARTAR ROAD, LUDHIANA, INDIA - 141002. TEL: 0182-430002, 430100)

**CLIENT:** PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD (H/Structure/12/13/FINAL DPR/Revised Drawings R2 (Rev. 01)/S.No. Ch. 20-190/E-07/VER. Ch. 20-190 E-07.dwg)

**REVISIONS:**

REV	DATE	DRAWN	DESIGN	CHECKED	APPROVED	DETAILS OF REVISION
R1	27/08/2008	MKS	MKS	VNM	VNM	LAHRI
R0	06/05/2008	MKS	MKS	VNM	VNM	LAHRI

**REVISIONS AS PER PR. PID COMMENTS:** REVISED AS PER PR. PID COMMENTS FIRST ISSUE

**SCALE:** AS SHOWN

**SHEET SIZE:** A2

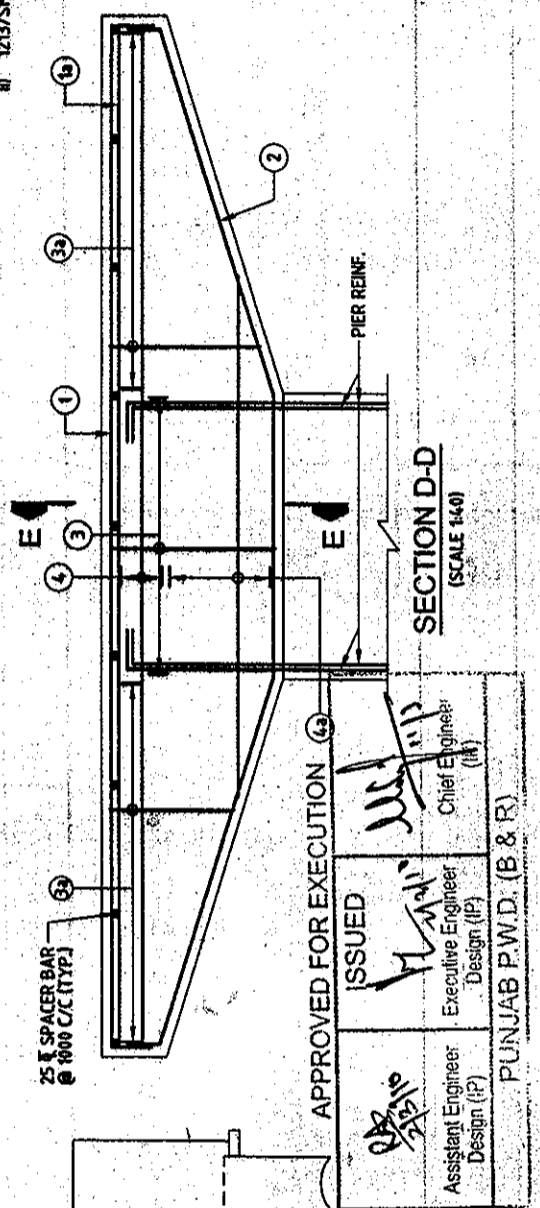
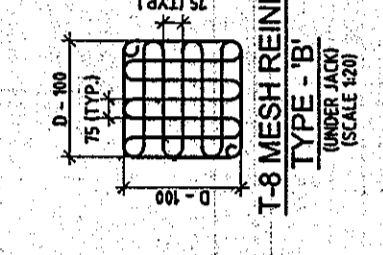
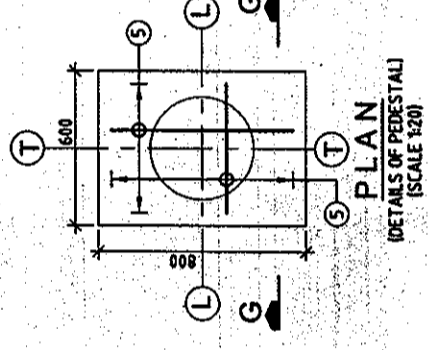
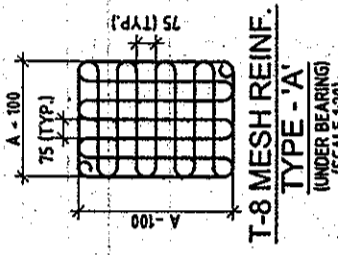
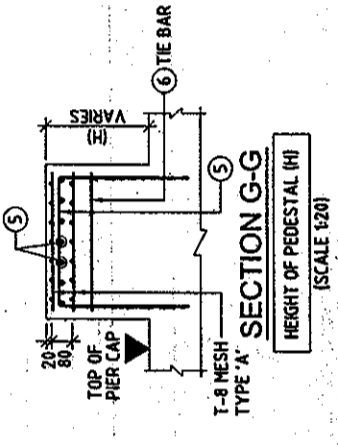
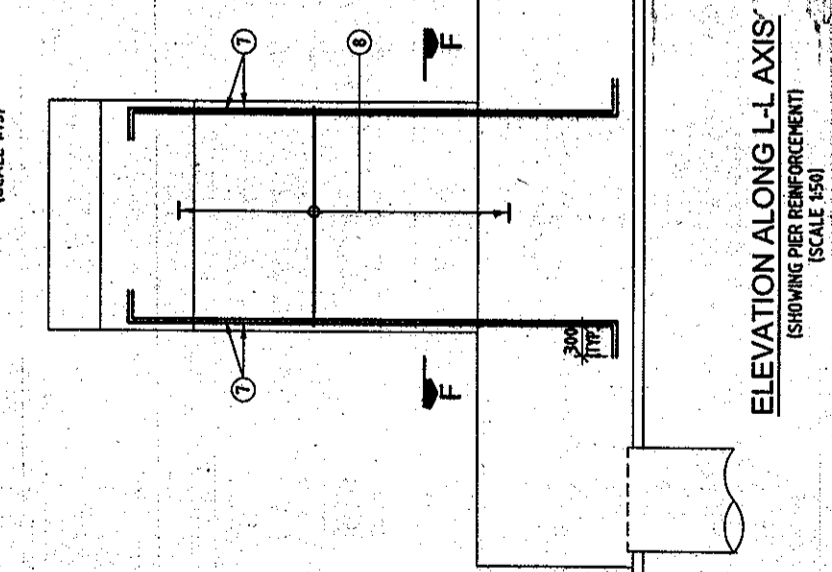
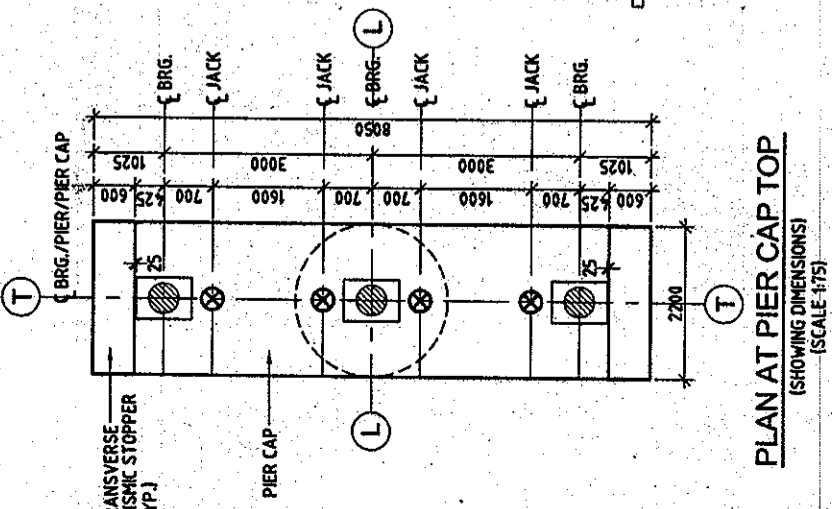
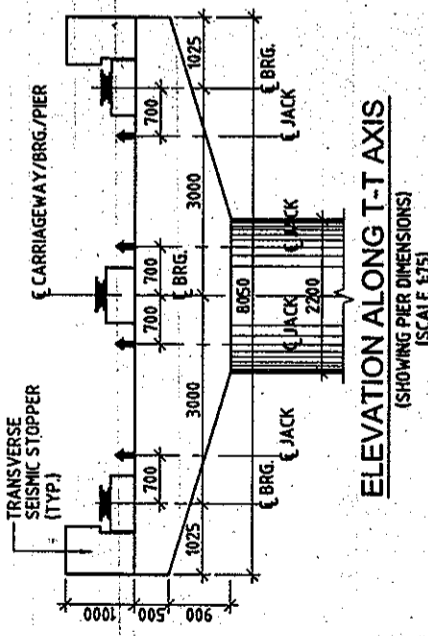
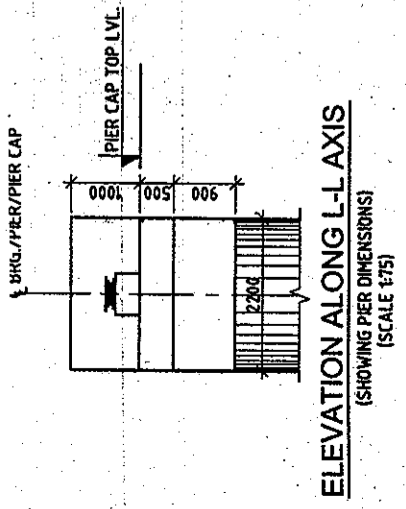
**DRW:** DPR

**PROJECT REPORT:** DIMENSIONAL & REINFT. DETAILS OF PILE, PILE CAP, PIER & PIER CAP (SHEET 1 OF 2)

**PROJECT REPORT:** DIMENSIONAL & REINFT. DETAILS OF PILE, PILE CAP, PIER & PIER CAP (SHEET 1 OF 2)

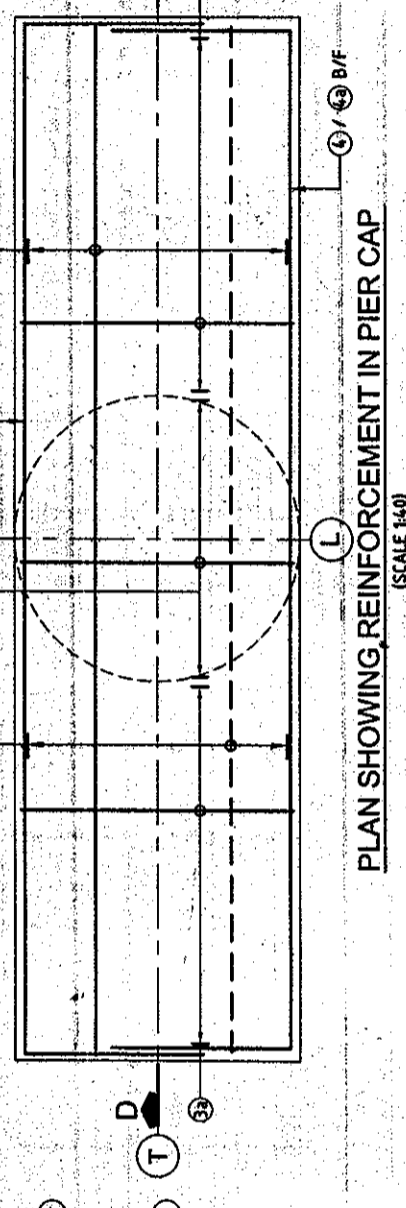
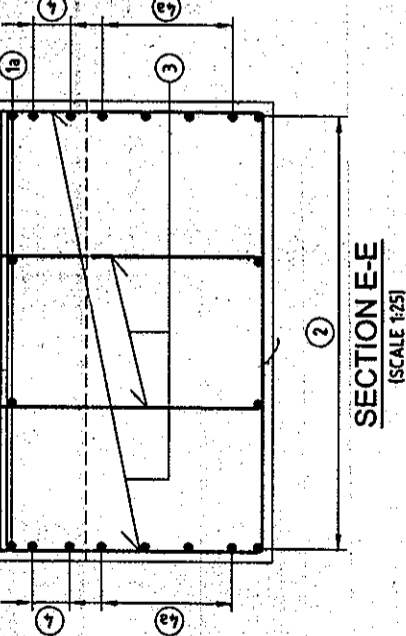
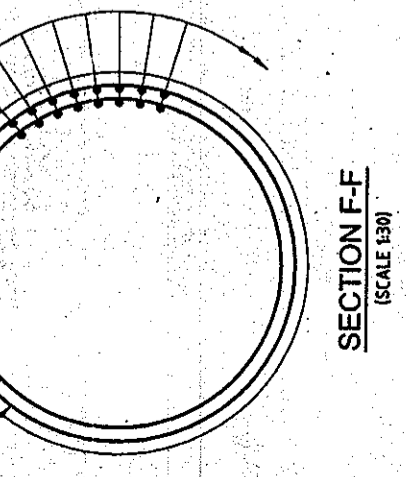
**PROJECT REPORT:** DIMENSIONAL & REINFT. DETAILS OF PILE, PILE CAP, PIER & PIER CAP (SHEET 1 OF 2)





**REINFORCEMENT DETAIL**

BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE
1	32	17 Nos.	[Diagram]
1a	32	17 Nos.	[Diagram]
2	16	27 Nos.	[Diagram]
3	16	150	[Diagram]
3a	16	150	[Diagram]
4	12	2Nos.	[Diagram]
4a	12	4Nos.	[Diagram]
5	12	75	[Diagram]
6	12	150	[Diagram]
7	32	100 Nos. (2x50)	[Diagram]
8	12	125	[Diagram]



**LEVEL CHART FOR PIER**

PIER DESIGNATION	FORMATION LEVEL	PER CAP TOP LEVEL	BED LEVEL
P9	253.730	253.375	247.020

**LEGENDS:**  
 --- BAR ON TOP FACE  
 --- BAR ON BOTTOM FACE

- NOTES:-**
- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH 150mm CUBES AS FOLLOWS:-  
 PIER -----M35  
 PIER CAP -----M35  
 CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS.  
 (i) FOR SUBSTRUCTURE ----- 50mm  
 (ii) FOR FOUNDATION ----- 75mm  
 (iii) HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED.  
 (iv) MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.  
 (v) MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.  
 (vi) IN PIER SHAFT T-10 OPEN LINKS (OR S LOOPS) WITH HOOK PLACED AROUND THE VERTICAL BARS ARE PLACED AT THE RATE OF 4 LINKS IN ONE SQUARE METER.  
 (vii) LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.  
 (viii) A IS THE DIMENSIONS OF THE BEARINGS WHICH IS TO BE FURNISHED BY THE MANUFACTURER.  
 (ix) D = DIA OF JACK.
  - REFERENCE DRAWINGS:-**  
 (i) 12/3/SMEC/LUDHIANA/20-190/G-01 (SHEET 1 OF 7 TO 7 OF 7)  
 (ii) 12/3/SMEC/LUDHIANA/20-190/FE-07 (SHEET 1 OF 2)

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**CLIENT:** PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD  
**CONSULTANT:** SMEC INDIA PVT. LTD.  
 SMEC (INDIA) PVT. LTD.  
 6/F BUILDING NO. 1, C TOWER ON FLOOR  
 RAJIV GANDHI AVENUE, NEW DELHI  
 INDIA. PIN - 110002  
 TEL: 011-26042100, 26042101

**PROJECT TITLE:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYPASS LUDHIANA

**REVISIONS:**

REV	DATE	DESIGN	CHECKED	APPROVED	DETAILS OF REVISION
R1	27/08/2009	MKS	VNM	S VAHRI	REVISED AS PER P.B. PWD COMMENTS
R0	06/05/2009	MKS	VNM	S VAHRI	FIRST ISSUE

**SCALE:** AS SHOWN  
**SHEET SIZE:** A2  
**DRW:** DPR  
**REV:** APPROVED

**DETAILED PROJECT REPORT**  
**DIMENSIONAL & REINF. DETAILS OF PILE, PIER CAP, PIER & PIER CAP**  
 (SHEET 2 OF 2)  
 12/3/SMEC/LUDHIANA/20-190/FE-07  
 R1

CAD File Ref: HAS\Structure\G3\FINAL DPR\Revised Drawings R2 (P) of 40\Bridges CH. 20-190\A1\VOYER CH. 20-190 E-07.dwg

- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
- CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH OF 35MPa FOR BORED CAST-IN-SITU PILE AND PILE CAP.
- CLEAR COVER TO SHALL BE AS FOLLOWS.  
 (i) FOR PILE --- 75mm  
 (ii) FOR PILE CAP --- 75mm
- THE HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED.
- MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
- MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BARLAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
- LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
- ACTUAL LOAD TEST SHALL BE CARRIED OUT ON A TEST PILE AS PER STANDARD SPECIFICATIONS TO DETERMINE VERTICAL AND LATERAL CAPACITY OF PILE. IT SHALL HOWEVER BE ENSURED THAT IT IS NOT LESS THAN DESIGN VALUES.

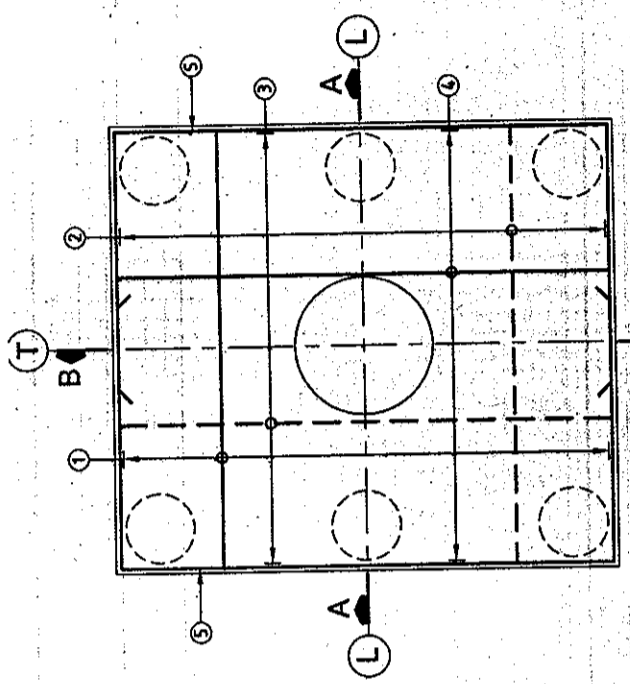
**REFERENCE DRAWINGS:-**

- 1213/SMEC/LUDHIANA/20-190/G-01 (SHEET 1 OF 7 TO 7 OF 7)
- 1213/SMEC/LUDHIANA/20-190/E-08 (SHEET 2 OF 2)

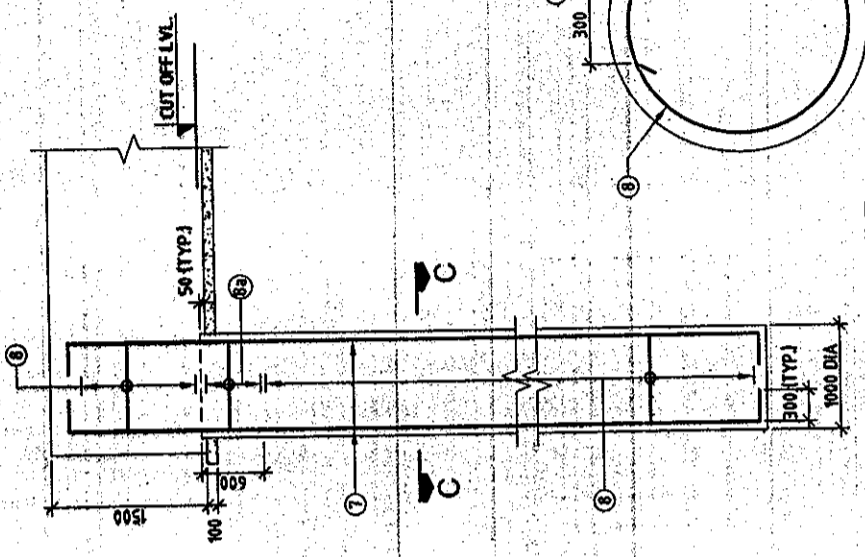
**REINFORCEMENT DETAIL:**

BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE
1	25	58 Nos.	L
2	16	150	L
3	16	150	L
4	25	47 Nos.	□
5	16	8 Nos.	L
7	25	26 Nos.	L
8	10	200	○
8a	10	100	○
9	16	150	□□□□ 6 LEGGED
10	16	150	□□□□ 6 LEGGED

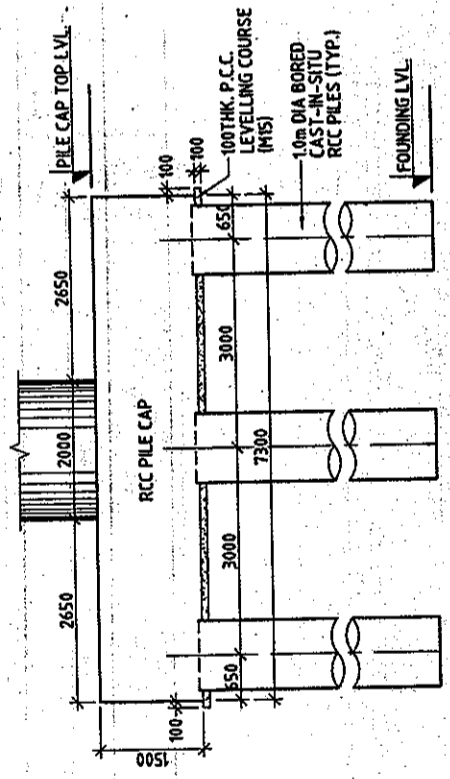
**LEGENDS:**  
**APPROVED FOR EXECUTION**  
 B.S. SAHRI  
 Assistant Engineer  
 Design (IP)  
 S. SAHRI  
 Executive Engineer  
 Design (IP)  
 Chief Engr  
 (P)  
 PUNJAB P.W.D. (B & R)



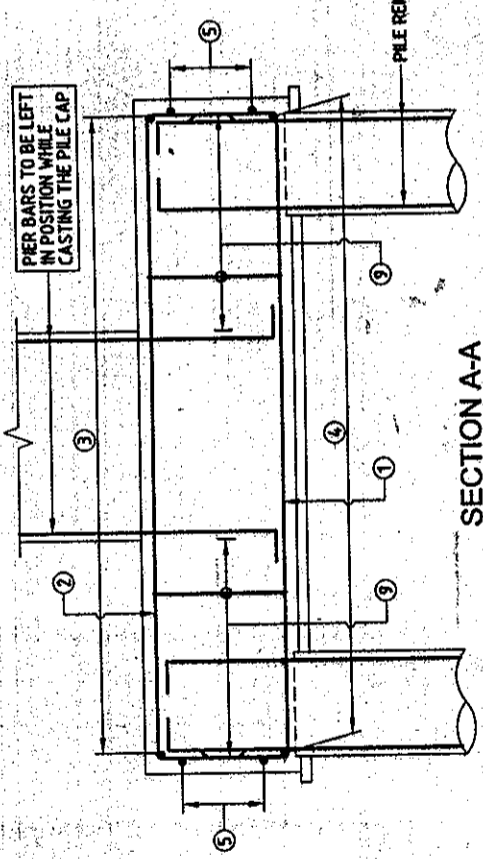
**PLAN**  
 (SHOWING PILE CAP REINFORCEMENT)  
 (SCALE 1:75)



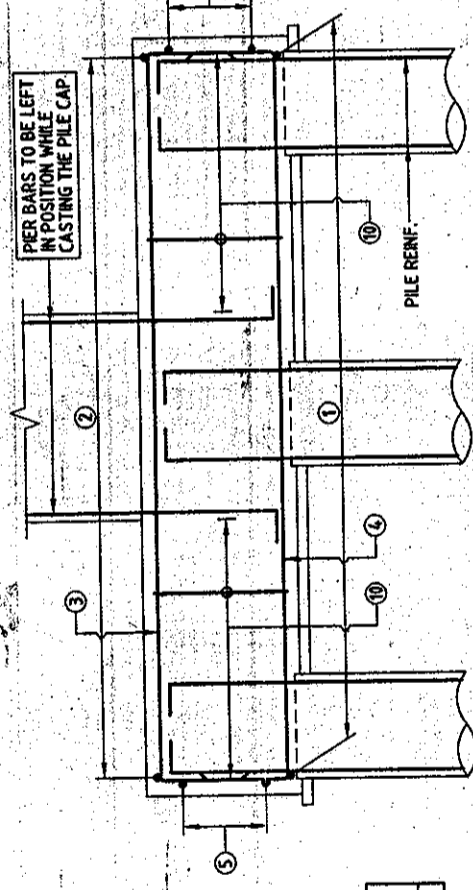
**SECTION C-C**  
 (SCALE 1:20)



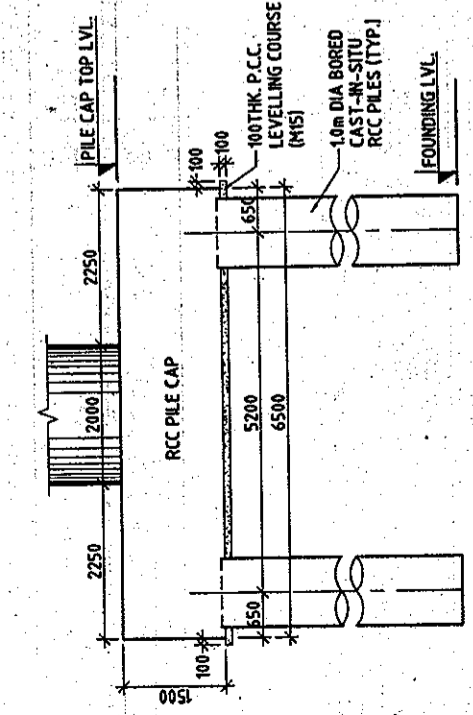
**ELEVATION ALONG T-T AXIS**  
 (SCALE 1:75)



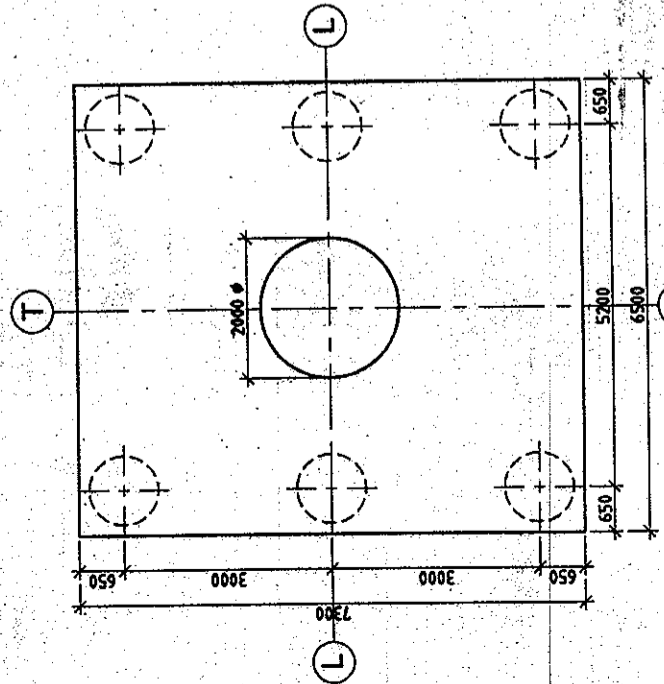
**SECTION A-A**  
 (SCALE 1:50)



**SECTION B-B**  
 (SCALE 1:50)



**ELEVATION ALONG L-L AXIS**  
 (SCALE 1:75)



**PLAN AT TOP OF PILE CAP**  
 (SHOWING DIMENSIONS)  
 (SCALE 1:75)

**LEVEL CHART FOR PILE CAP LAYOUT**

PIER DESIGNATION	BED LEVEL	TOP OF PILE CAP LEVEL	CUT OFF LEVEL	FOUNDING LEVEL
P12	246.640	246.140	244.650	230.690

**CLIENT:** PUIDB  
 PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD

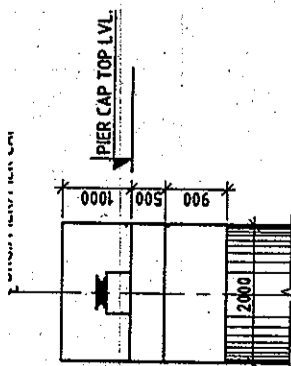
**CONSULTANT:** SMEC  
 S.M.E.C. (INDIA) PVT. LTD.  
 202, PHOENIX TOWER, 8th FLOOR,  
 CONVENT ROAD, GURGAON,  
 HARYANA, INDIA - 122 002  
 Tel: 0124-580042, 481100

**PROJECT TITLE:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADEATION OF SOUTHERN B.YE-PASS, LUDHIANA

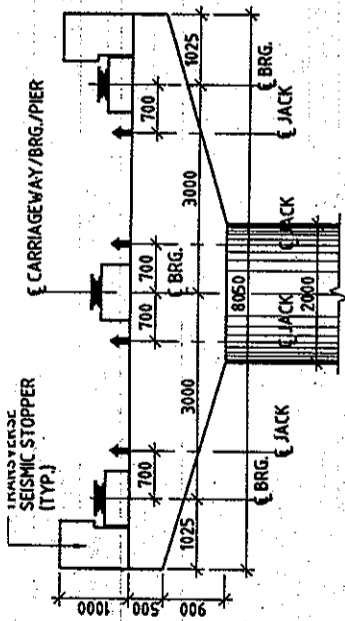
**REVISIONS:**

REV	DATE	DRAWN	CHECKED	APPROVED	DETAILS OF REVISION
R1	27/08/2009	MKS	VNM	S SAHRI	REVISED AS PER P.L.P.W.D COMMENTS
R0	04/05/2009	MKS	VNM	S SAHRI	FIRST ISSUE

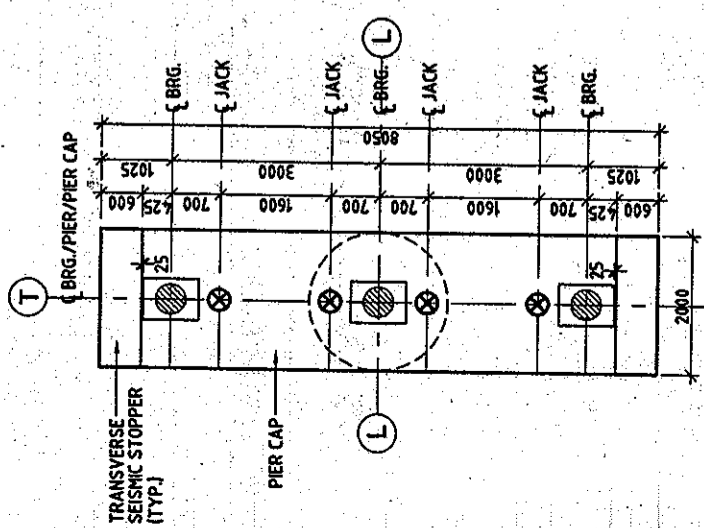
**SCALE:** AS SHOWN  
**SHEET SIZE:** A2  
**DPR:** DRW  
**DRW:** DRW  
**PROJECT REPORT:** DIMENSIONAL & REINFT. DETAILS OF PILE, PILE CAP, PIER & PIER CAP (SHEET 1 OF 2)  
 1213/SMEC/LUDHIANA/20-190/E-08 R1



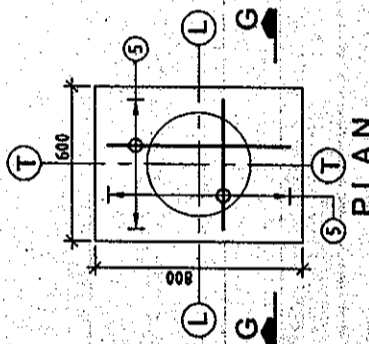
ELEVATION ALONG L-L AXIS  
(SHOWING PIER DIMENSIONS)  
(SCALE 1:75)



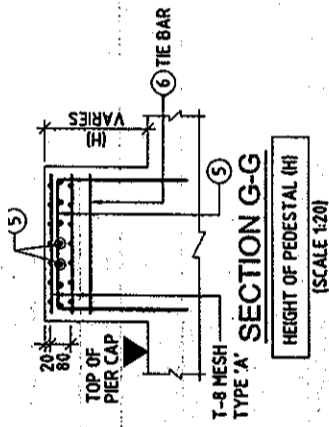
ELEVATION ALONG T-T AXIS  
(SHOWING PIER DIMENSIONS)  
(SCALE 1:75)



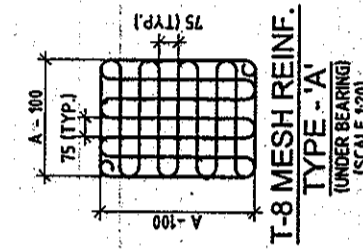
PLAN AT PIER CAP TOP  
(SHOWING DIMENSIONS)  
(SCALE 1:75)



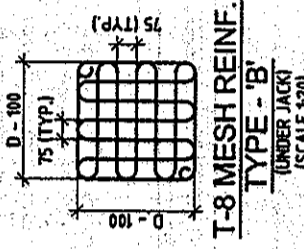
PLAN  
(DETAILS OF PIEDestal)  
(SCALE 1:20)



SECTION G-G  
(SCALE 1:20)



T-8 MESH REINF.  
TYPE - 'A'  
(UNDER BEARING)  
(SCALE 1:20)

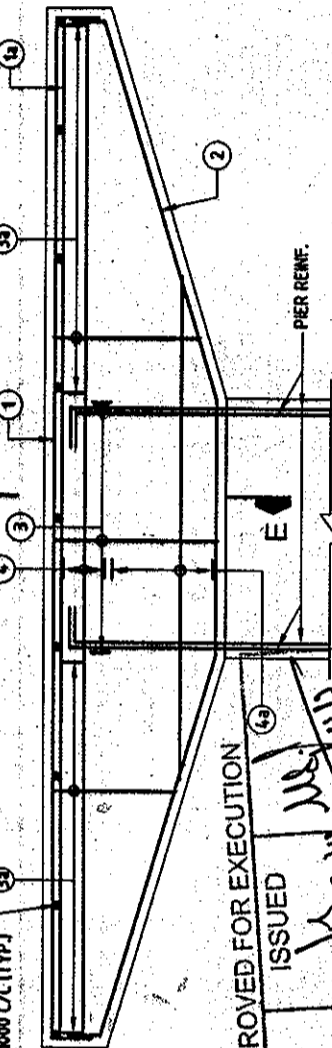


T-8 MESH REINF.  
TYPE - 'B'  
(UNDER JACK)  
(SCALE 1:20)

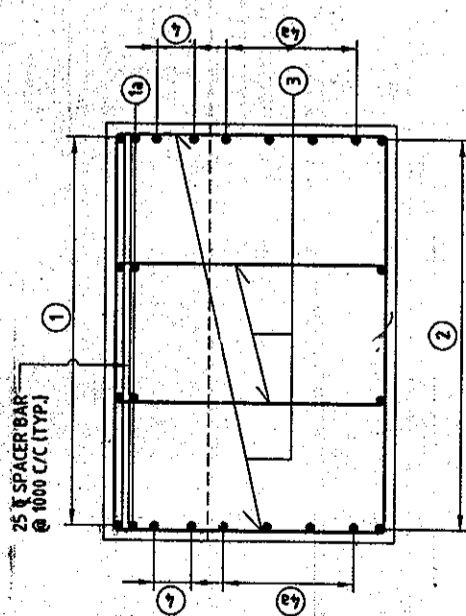
- NOTES:-**
- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH 50mm CUBES AS FOLLOWS:-  
PIER -----M35  
PIER CAP -----M35  
CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS.  
(i) FOR SUBSTRUCTURE ----- 50mm  
(ii) FOR FOUNDATION ----- 75mm
  - TMT HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-415 CONFORMING TO IS:1786 SHALL ONLY BE USED. MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
  - MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
  - IN PIER SHAFT T-10 OPEN LINKS (OR S LOOPS) WITH HOOK PLACED AROUND THE VERTICAL BARS ARE PLACED AT THE RATE OF 4 LINKS IN ONE SQUARE METER.
  - LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
  - A IS THE DIMENSIONS OF THE BEARINGS WHICH IS TO BE FURNISHED BY THE MANUFACTURER.
  - D = DIA OF JACK.

**REFERENCE DRAWINGS:-**

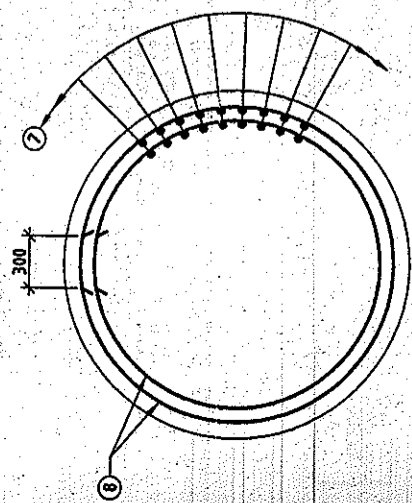
- 1213/SMEC/LUDHIANA/20-199/G-01 (SHEET 1 OF 7 TO 7 OF 7)
- 1213/SMEC/LUDHIANA/20-199/E-08 (SHEET 1 OF 2)



SECTION D-D  
(SCALE 1:40)



SECTION E-E  
(SCALE 1:25)



SECTION F-F  
(SCALE 1:30)

BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE
1	32	17 Nos.	[Diagram]
1a	32	17 Nos.	[Diagram]
2	16	27 Nos.	[Diagram]
3	16	150	[Diagram]
3a	16	150	[Diagram]
4	12	2Nos.	[Diagram]
4a	12	4Nos.	[Diagram]
5	12	75	[Diagram]
6	12	150	[Diagram]
7	32	90 Nos.(2x45)	[Diagram]
8	12	125	[Diagram]

**LEGENDS:**  
 --- BAR ON TOP FACE  
 --- BAR ON BOTTOM FACE

**LEVEL CHART FOR PIER**

PIER DESIGNATION	FORMATION LEVEL	PIER CAP TOP LEVEL	BED LEVEL
P12	253.860	251.445	246.640

PLAN SHOWING REINFORCEMENT IN PIER CAP  
(SCALE 1:40)

PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYE-PASS LUDHIANA

CONSULTANT: **SMEC**  
 SMEC (INDIA) PVT. LTD.  
 DEF BUILDING NO. 6, 7 FLOOR, 3RD FLOOR  
 CYBER CITY, PHASE-2, GURGAON,  
 HARYANA, INDIA - 122 002  
 TEL: 0122-430002, 430100

PROJECT TITLE: PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYE-PASS LUDHIANA

CLIENT: PWD, Ludhiana

SCALE: AS SHOWN

SHEET SIZE: A2

REVISED AS PER P.B. PWD COMMENTS

REV. DATE DESIGN CHECKED APPROVED

DETAILS OF REVISION

DRW: DPR

PROJECT NO: 1213/SMEC/LUDHIANA/20-199/E-08

SHEET 2 OF 2







1. ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
2. CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH 150mm CUBES AS FOLLOWS:-  
 PIER -----M35  
 PIER CAP -----M35  
 CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS.
3. (i) FOR SUBSTRUCTURE ----- 50mm  
 (ii) FOR FOUNDATION ----- 75mm  
 (iii) FOR HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-475 CONFORMING TO IS:1786 SHALL ONLY BE USED.
4. MINIMUM BOND LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR.
5. MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE MORE THAN 50% OF OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
6. IN PIER SHAFT T-10 OPEN LINKS (OR S LOOPS) WITH HOOK PLACED AROUND THE VERTICAL BARS ARE PLACED AT THE RATE OF 4 LINKS IN ONE SQUARE METER.
7. LL REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND TT REPRESENTS TRANSVERSE AXIS OF BRIDGE.
8. A IS THE DIMENSIONS OF THE BEARINGS WHICH IS TO BE FURNISHED BY THE MANUFACTURER.
9. D = DIA OF JACK.

10. REFERENCE DRAWINGS:-  
 (i) 1213/SMEC/LUDHIANA/20-190/G-01 (SHEET 1 OF 7 TO 7 OF 7)  
 (ii) 1213/SMEC/LUDHIANA/20-190/E-09 (SHEET 1 OF 2)

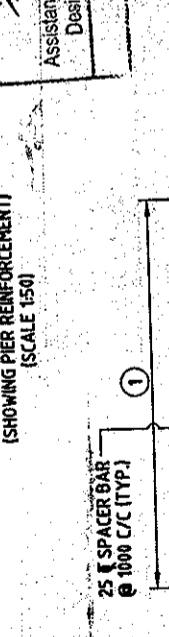
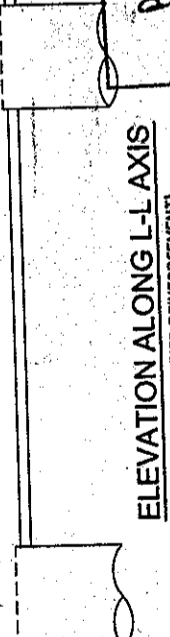
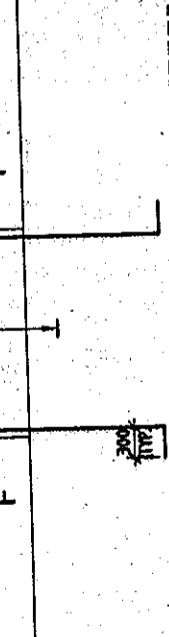
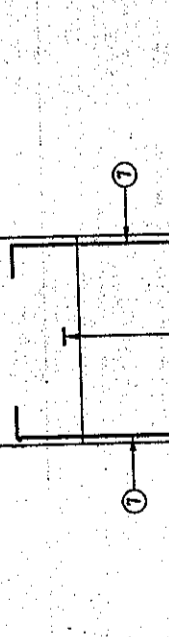
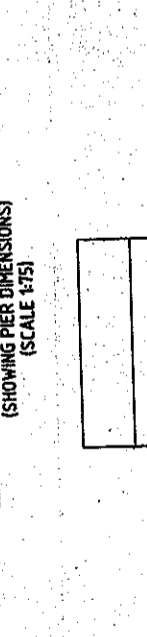
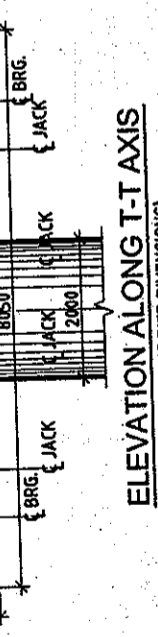
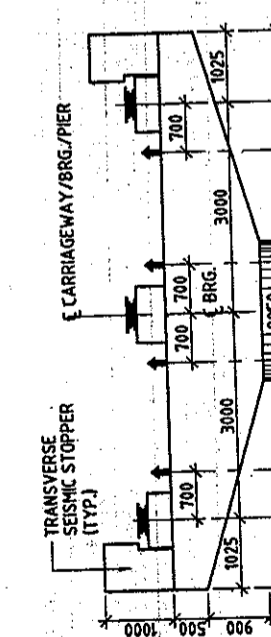
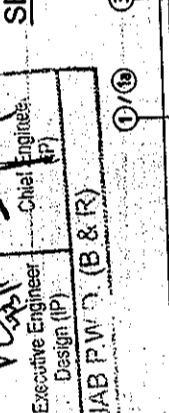
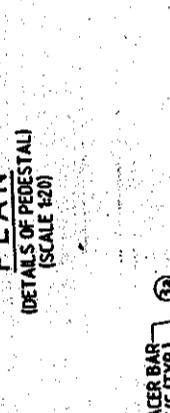
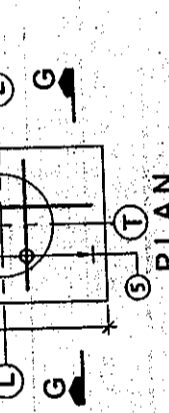
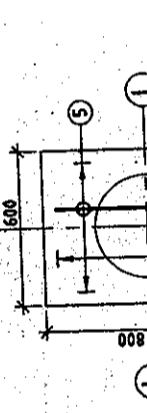
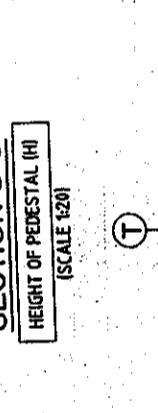
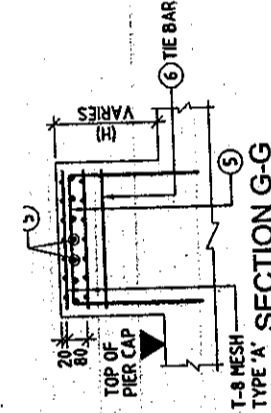
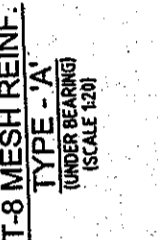
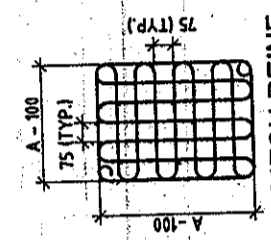
**REINFORCEMENT DETAIL:**

BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE
1	32	11 Nos.	[Symbol]
2	32	17 Nos.	[Symbol]
3	16	27 Nos.	[Symbol]
3a	16	150	[Symbol] 14-LEGGED
4	12	2Nos.	[Symbol]
5	12	4Nos.	[Symbol]
6	12	75	[Symbol]
7	32	50 Nos.	[Symbol]
8	12	125	[Symbol]

**LEVEL CHART FOR PIER**

PIER DESIGNATION	FORMATION LEVEL	PIER CAP TOP LEVEL	BED LEVEL
P15	251.880	249.465	246.658

**LEGENDS:**  
 --- BAR ON TOP FACE  
 --- BAR ON BOTTOM FACE



**APPROVED FOR EXECUTION**

**ISSUED**

Executive Engineer  
 Design (IP)  
 PUNJAB P.W.D. (B & R)

Assistant Engineer  
 Design (IP)  
 PUNJAB P.W.D. (B & R)

Chief Engineer  
 PUNJAB P.W.D. (B & R)

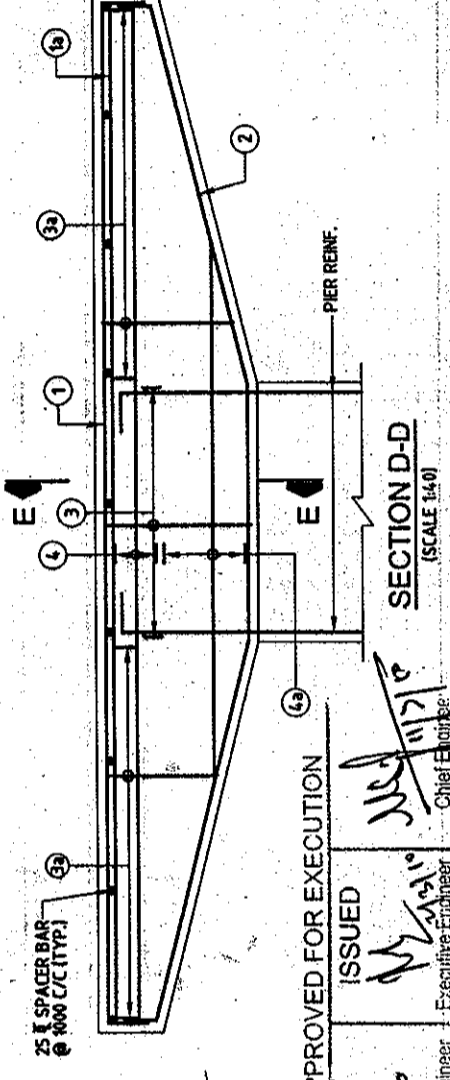
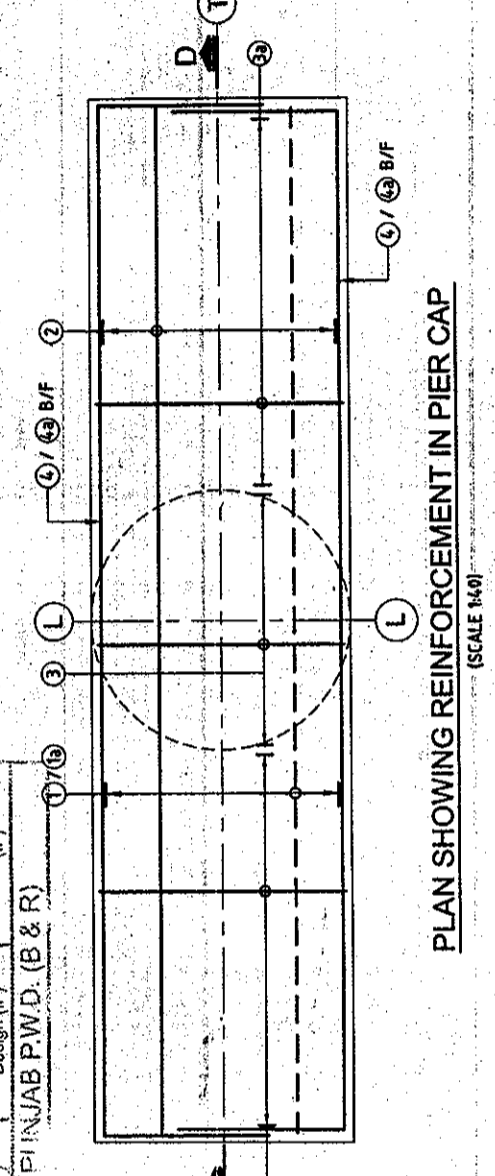
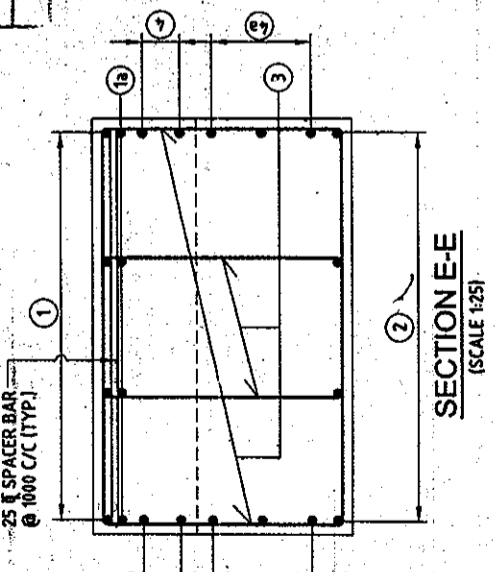
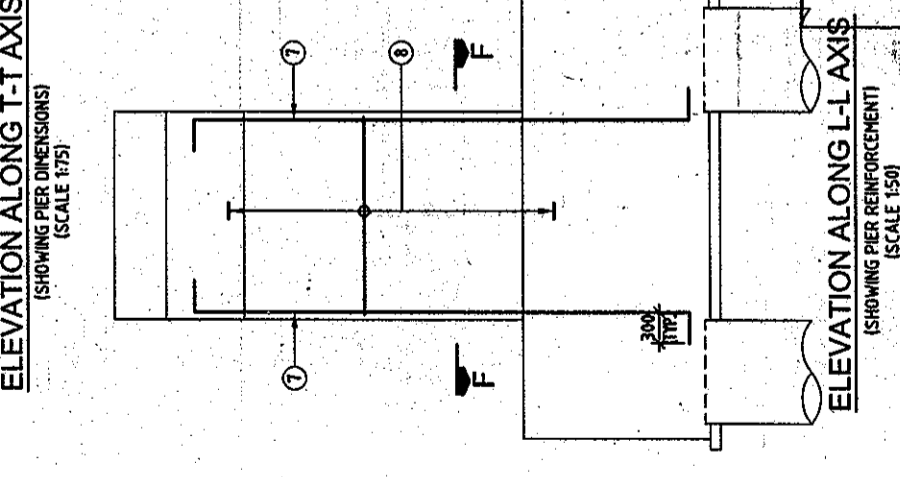
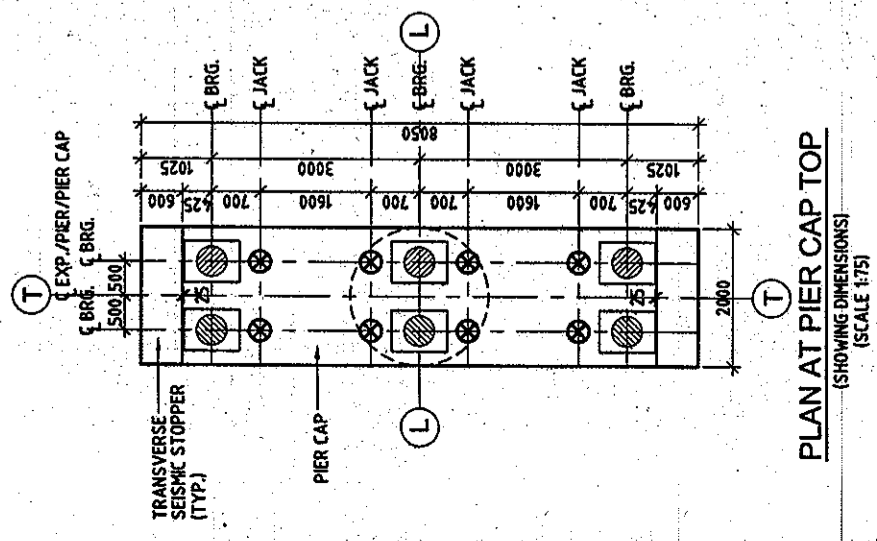
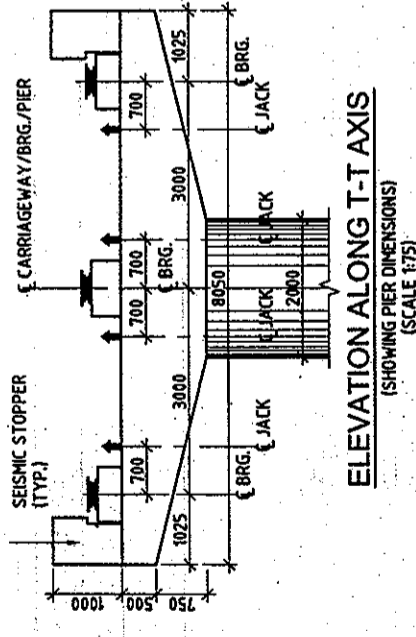
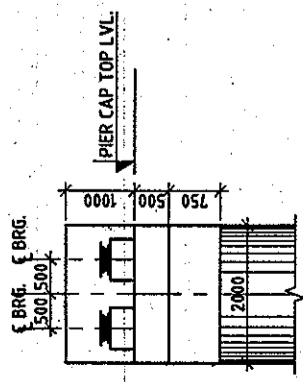
REV	DATE	DESIGN	CHECKED	APPROVED	DETAILS OF REVISION
R1	27/08/2008	VNM	VNM	S/AHRI	REVISED AS PER PERMID COMMENTS FIRST ISSUE
R0	04/05/2008	MKS	VNM	S/AHRI	DETAILS OF REVISION

PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYE-PASS LUDHIANA

CONSULTANT: **SMEC**  
 S.M. Engineering & Construction Pvt. Ltd.  
 D/F BUILDING 8, C TOWER ON FLOOR, CHANDIGARH, PHASE-4, INDIA.  
 TEL: 0172-2614200, 2614201

CLIENT: **PIDB**  
 PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD  
 W-13/STRUCTURE/1213/FINAL DPR/Revised Drawings R2 (Fab 01) Bridge Ch. 20-190-VL TOVER CH. 20-190 E-09.dwg





**REINFORCEMENT DETAIL:**

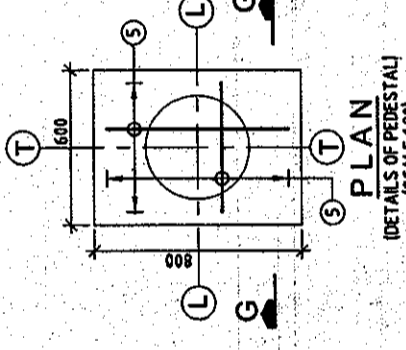
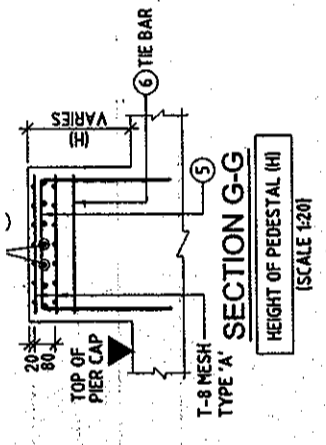
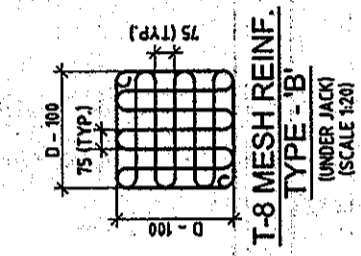
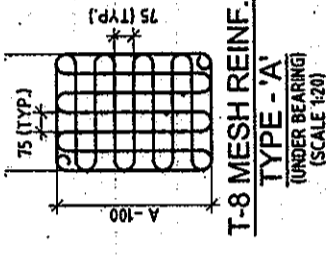
BAR MKD.	DIA (mm)	SPACING/Nos.	SHAPE
1	32	16 Nos.	[Diagram]
1a	32	16 Nos.	[Diagram]
2	16	27 Nos.	[Diagram]
3	16	150	[Diagram]
3a	16	150	[Diagram]
4	12	2Nos.	[Diagram]
4a	12	3Nos.	[Diagram]
5	12	75	[Diagram]
6	12	150	[Diagram]
7	25	50 Nos.	[Diagram]
8	12	175	[Diagram]

**LEGENDS:**  
 --- BAR ON TOP FACE  
 --- BAR ON BOTTOM FACE

**LEVELS CHART FOR PIER**

PIER DESIGNATION	FORMATION LEVELS	PIER CAP TOP LEVELS	BED LEVELS
P4	254.520	252.105	248.030
P11	254.520	252.105	248.716
P16	252.540	250.125	246.661

- ALL DIMENSIONS ARE IN mm AND LEVELS IN METRES, UNLESS OTHERWISE MENTIONED. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED. NO DIMENSION IS TO BE SCALED.
  - CONCRETE SHALL BE DESIGN MIX WITH A MINIMUM 28 DAYS CHARACTERISTIC STRENGTH 150mm CUBES AS FOLLOWS:-  
 PIER -----M35  
 PIER CAP -----M35
  - CLEAR COVER TO OUTER MOST STEEL SHALL BE AS FOLLOWS.  
 (i) FOR SUBSTRUCTURE ----- 50mm  
 (ii) FOR FOUNDATION ----- 75mm
  - TMT HIGH YIELD STRENGTH DEFORMED BARS SHALL BE OF GRADE DESIGNATION Fe-475 CONFORMING TO IS:1786 SHALL ONLY BE USED.
  - MINIMUM BOND LENGTH SHALL BE 42 x DIA OF BAR.
  - MINIMUM LAP LENGTH FOR REINFORCEMENT BAR SHALL BE 72 x DIA OF BAR. LAPS SHALL BE STAGGERED AND NOT MORE THAN 50% OF BARS SHALL BE LAPPED AT ANY ONE SECTION.
  - IN PIER SHAFT T-10 OPEN LINKS (OR S LOOPS) WITH HOOK PLACED AROUND THE VERTICAL BARS ARE PLACED AT THE RATE OF 4 LINKS IN ONE SQUARE METER.
  - L.L REPRESENTS LONGITUDINAL AXIS OF BRIDGE AND T.T REPRESENTS TRANSVERSE AXIS OF BRIDGE.
  - A IS THE DIMENSIONS OF THE BEARINGS WHICH IS TO BE FURNISHED BY THE MANUFACTURER.
  - D = DIA OF JACK.
- REFERENCE DRAWINGS:-**  
 (i) 1213/SMEC/LUDHIANA/20-190/G-01 (SHEET 1 OF 7 TO 7 OF 7)  
 (ii) 1213/SMEC/LUDHIANA/20-190/E-10 (SHEET 1 OF 2)



APPROVED FOR EXECUTION  
 ISSUED  
 Assistant Engineer Design (IP)  
 Chief Engineer Design (IP)  
 PUNJAB P.W.D. (B & R)

**CLIENT:** PUNJAB INFRASTRUCTURE DEVELOPMENT BOARD  
**CONSULTANT:** SMEC  
 300, BANGALORE ROAD, 1ST FLOOR, HARIYANA, INDIA - 122 002  
 Tel: 0121-689002, 689100

**PROJECT TITLE:** PREPARATION OF DETAILED PROJECT REPORT FOR UPGRADATION OF SOUTHERN BYE-PASS LUDHIANA

**DATE:** 01/05/2009  
**REV:** M.K.S. V.N.M. S.A.H.R.I.  
**DESIGN:** V.N.M. S.A.H.R.I.  
**CHECKED:** V.N.M. S.A.H.R.I.  
**APPROVED:** V.N.M. S.A.H.R.I.

**DETAILS OF REVISION:**

NO.	DATE	DESCRIPTION
1		

**SCALE:** AS SHOWN  
**SHEET SIZE:** A2  
**DPR:** DRW  
**NO. OF SHEETS:** 10  
**SHEET NO.:** 10

**DETAILED PROJECT REPORT DIMENSIONAL & REINFT. DETAILS OF PILE, PIER CAP, PIER & PIER CAP**  
 (SHEET 2 OF 2)  
 1213/SMEC/LUDHIANA/20-190/E-10  
 P.O.

