

LONG LAKE ROAD

14TH ST. NW TO

13TH ST. NW

PLAN SYMBOLS

RIGHT-OF-WAY LINE	----
CHAIN LINK FENCE	-----XC-----
WOODEN FENCE	-----
CATCH BASIN	□ CB
MONUMENT (STONE, CONCRETE, OR METAL)	□
APPROX. PROPOSED CONTOUR	-----
APPROX. EXISTING CONTOUR	-----
AREA TO BE REGRADED AS SPECIFIED BY OWNER	////

UTILITY SYMBOLS

POWER POLE LINE	○ ○
PEDESTAL (TELEPHONE, CABLE TERMINAL)	□ PED.
GAS MAIN	G
WATER MAIN	W
TELEPHONE CABLE IN CONDUIT	TV
BURIED TELEPHONE CABLE	T-BUR
SEWER, (SANITARY)	→
SEWER, (STORM)	→
SEWER MANHOLE	→
CATCH BASIN	□

CITY OF NEW BRIGHTON

CONSTRUCTION PLAN FOR STORM SEWER AND MISC. GRADING
LOCATED ON LONG LAKE ROAD FROM 14TH ST NW TO 13TH ST NW

STATE PROJ. NO. 147-020-26, 62-645-12
GROSS LENGTH 214.5 METERS
BRIDGES-LENGTH METERS
EXCEPTIONS-LENGTH 26.65 METERS
NET LENGTH 187.85 METERS
REF. POINT TO REF. POINT

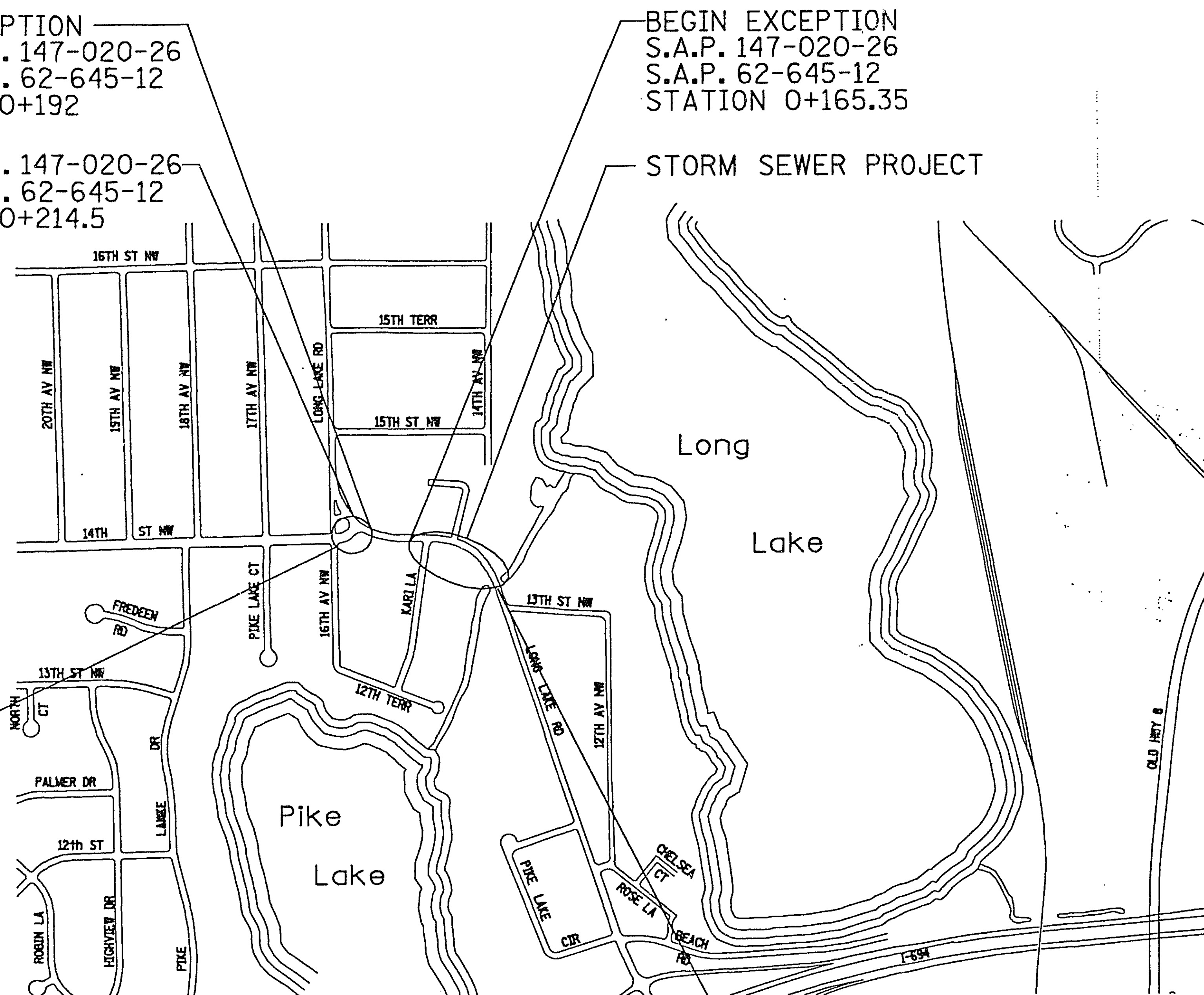
END EXCEPTION
END S.A.P. 147-020-26
END S.A.P. 62-645-12
STATION 0+192

END S.A.P. 147-020-26
END S.A.P. 62-645-12
STATION 0+214.5

BEGIN EXCEPTION
S.A.P. 147-020-26
S.A.P. 62-645-12
STATION 0+165.35

STORM SEWER PROJECT

GRADING PROJECT



NOTE:
THE EXACT LOCATION OF UNDERGROUND GAS, TELEPHONE, FIBEROPTIC, ELECTRIC, CABLE TV AND PIPE LINES ARE UNKNOWN. THE CONTRACTOR SHALL CONTACT GOPHER STATE ONE CALL BEFORE COMMENCING EXCAVATION.

ALL TRAFFIC CONTROL DEVICES AND SIGNING SHALL CONFORM TO THE MMUTCD, INCLUDING FIELD MANUAL FOR TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS, APRIL 1995.

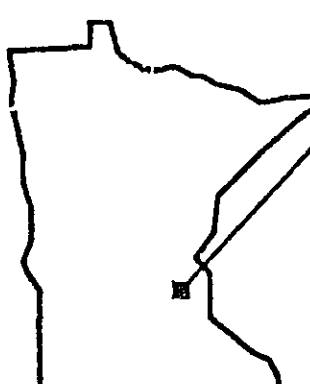
BEGIN S.A.P. 147-020-26
BEGIN S.A.P. 62-645-12
STATION 0+000

SCALES

PLAN	1:1000
PROFILE	1:1000
INDEX MAP	N.T.S.

DESIGN DESIGNATION

ADT (1998)	= 8200	Design Speed	= 50 km/h
ADT (2018)	= 10660	Based on STOPPING	= Sight Distance
DHV (Design Hr. Vol.)	=	Height of eye	= 1070 mm
D (Directional Distr.)	= %	Design Speed not achieved at:	=
T (Heavy Commercial)	= %	STA.	= TO STA. km/h
Stallometer 'R' Value	= 70	STA.	= TO STA. km/h



PROJECT LOCATION
COUNTY : RAMSEY
DISTRICT : STATE AID

FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL

STATE PROJ. NO. CHARGE IDENTIFIER



MINN. PROJ. NO.

GOVERNING SPECIFICATIONS

THE 1995 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION
"STANDARD SPECIFICATIONS FOR CONSTRUCTION"

LONG LAKE ROAD FLOOD RELIEF PROJECT
NEW BRIGHTON, MINNESOTA

INDEX

SHEET NO.	DESCRIPTION
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2	STATEMENT OF ESTIMATED QUANTITIES
3	ROAD RESTORATION PLAN AND SECTION
4	PLAN AND PROFILE
5	DETAILS
6	DETAILS
7	BARREL DETAILS
8	GRADING PLAN AND SECTION

THIS PLAN CONTAINS 8 SHEETS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE 6/15/98 REG. NO. 24678 ENGR. John S. Johnson

Barr
Engineering Company
8300 NORMAN CENTER DRIVE
MINNEAPOLIS, MINNESOTA

APPROVED Leslie Propper 6/15/98
CITY OF NEW BRIGHTON ENGINEER

APPROVED [Signature] 6/12/98
RAMSEY COUNTY ENGINEER

APPROVED [Signature] 6-18-98
METRO - ASSISTANT DIVISION ENGINEER - STATE AID; REVIEWED FOR COMPLIANCE WITH STATE AID RULES/POLICY

APPROVED [Signature] 6-18-98
APPROVED FOR STATE AID FUNDING; STATE AID ENGINEER

ASBUILT PLAN
CONFORMING TO
CONST. RECORDS
DATE 11-26-99

I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, OF THIS PLAN WERE MADE BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE REG. NO.

S.A.P. 147-020-26
S.A.P. 62-645-12
SHEET NO. 1 OF 8 SHEETS

STATEMENT OF ESTIMATED QUANTITIES

PARTICIPANT	ITEM NUMBER	ITEM DESCRIPTION	NOTE NUMBER	UNIT	RAMSEY COUNTY SAP 62-645-12				NEW BRIGHTON SAP 147-020-26			
					TOTAL		ROADWAY		STORM SEWER		ROADWAY	
					EST. QTY	FINAL QTY	EST. QTY	FINAL QTY	EST. QTY	FINAL QTY	EST. QTY	FINAL QTY
	2021.501	Mobilization		lump sum	1		0.5		0		0.5	
	2104.501	Remove RC Pipe Sewer		m	4.5		2.25		0		2.25	
	2104.501	Remove Concrete Curb and Gutter		m	60		30		0		30	
	2104.503	Remove Bituminous Pavement		m ²	2480		1240		0		1240	
	2104.503	Remove Concrete Sidewalk		m ²	73		36.5		0		36.5	
	2104.509	Remove Catch Basins		each	2		1		0		1	
	2104.509	Remove Manhole		each	1		0.5		0		0.5	
	2104.513	Sawing Bituminous Pavement		m	40		20		0		20	
	2105.609	Granular Borrow		+	315		157.5		0		157.5	
	2105.609	Topsoil Borrow		+	26		13		0		13	
	2211.503	Aggregate Base, Class 6 (CY)		m ³	210		105		0		105	
	2331.508	Type 41 Wearing Course Mixture		+	223		111.5		0		111.5	
	2331.510	Type 47 Binder Course Mixture		+	223		111.5		0		111.5	
	2331.514	Type 31 Base Course Mixture		+	536		268		0		268	
	2357.502	Bituminous Material for Tack Coat		L	397		198.5		0		198.5	
	2411.507	Concrete Slab, Special #1	(1)	each	1		0.5		0		0.5	
	2411.507	Concrete Slab, Special #2	(2)	each	1		0.5		0		0.5	
	2412.511	2 100 mm x 900 mm Precast Concrete Box Culvert		m	16		8		0		8	
	2503.521	1 825 mm Span RC Pipe-Arch Sewer, Class 2		m	39		0		19.5		0	
	2503.521	1 450 mm Span RC Pipe-Arch Sewer, Class 2		m	25		0		12.5		0	
	2503.541	1 500 mm RC Pipe Sewer, Design M3006G Class 2		m	38		0		19		0	
	2503.602	Connection at Existing RC Box Culvert		each	1		0		0.5		0	
	2503.602	1 500 mm RC Pipe Sewer T-5 Degree Bends		each	3		0		1.5		0	
	2503.602	1 450 mm RC Pipe Arch w/Blockouts for Existing Pipe		each	1		0		0.5		0	
	2503.602	2 100 mm x 900 mm Precast Box Culvert w/End Cap		each	1		0		0.5		0	
	2503.602	1 450 mm RC Pipe Arch w/Precast 600 mm Riser and Cover-Neenah R-1576	(3)	each	1		0		0.5		0	
	2503.604	Polystyrene Insulation		m ²	9		0		4.5		0	
	2506.501	Construct Drainage Structure, Design Special #1	(4)	m	14.5		0		7.25		0	
	2506.502	Construct Drainage Structure, Design Special #2	(5)	each	1		0		0.5		0	
	2506.502	Construct Drainage Structure, Design Special #3	(6)	each	1		0		0.5		0	
	2506.502	Construct Drainage Structure, Design 3000 MA020G	(7)	each	1		0		0.5		0	
	2506.502	Construct Drainage Structure, Design M3136A w/ CB	(8)	each	2		0		1		0	
	2506.502	Construct Drainage Structure, Design M3136A w/ CB	(9)	each	2		0		1		0	
	2506.602	Connect into Existing Storm Sewer at Long Lake Road	(10)	each	1		0		0.5		0	
	2521.501	100 mm Concrete Walk		m ²	73		36.5		0		36.5	
	2531.501	Concrete Curb and Gutter, Design B624		m	60		30		0		30	
	2575.505	Sodding, Type Salt Resistant		m ²	260		130		0		130	

Notes:

- (1) 300 mm C.I.P. Concrete Distribution Slab at Existing 1 500 mm x 3 000 mm Box Culvert
- (2) 150 mm C.I.P. Concrete Distribution Slab at Trench Drain
- (3) M.H. 2
- (4) Trench Drain
- (5) C.B. 1
- (6) C.B. 2
- (7) M.H. 1
- (8) 1.83 m Vane Drain
- (9) 3.65 m Vane Drain
- (10) Near M.H. 2

B.M. DISK #9047 ELEV. = 265.399 m
47.29 m LT OF STA. 0+197.632

RAMSEY CO. MONUMENT ELEV. = 266.237 m
E OF 14TH STREET NW AND 16TH STREET NW

BASIS FOR ESTIMATED QUANTITIES

2331.508 TYPE 41 WEARING COURSE MIXTURE	60kg/m ² /25 mm
2331.510 TYPE 47 BINDER COURSE MIXTURE	60kg/m ² /25 mm
2331.514 TYPE 31 BASE COURSE MIXTURE	60kg/m ² /25 mm
2357.502 BITUMINOUS MATERIAL FOR TACK COAT	0.16L/m ²

STRUCTURE	STATION	DIST.	DIRECTION
STS MH 2	0+144.01	10.232	LT
CB 1	0+118.61	8.61	LT
CB 2	0+116.47	8.04	RT
STS MH 1	0+73.22	1.43	LT

MNDOT STANDARD PLATES	
THE FOLLOWING STANDARD PLATE AS APPROVED BY THE FHWA SHALL APPLY TO THIS PROJECT	
PLATE NUMBER	DESCRIPTION
M107OK	Reinforced Panel Over Culverts
M300OL	Reinforced Concrete Pipe
M3006G	Gasket Joint for R.C. Pipe
M3014J	Reinforced Concrete Pipe Arch
M3136A	Slotted Vane Drain
M4009H	Manhole or Catch Basin
M4010H	Concrete Short Cone and Adjusting Ring
M4011E	Precast Concrete Base
M4020G	Manhole or Catch Basin Cover
M4101D	Ring Casting for Manhole or Catch Basin
M4108F	Adjusting Rings
M4110F	Cover Casting for Manhole
M4129G	Catch Basin Frame Casting
M4154B	Catch Basin Grate Casting
M4160D	Curb Box Casting for Catch Basin
M4180J	Manhole or Catch Basin Step
M7035K	Concrete Walk & Curb Returns at Entrances
M7036D	Pedestrian Curb Ramp
M7100G	Concrete Curb and Gutter
M7111J	Installation of Catch Basin Castings
M8000I	Standard Barricades

SI (MODERN METRIC) CONVERSION FACTORS

Quantity	When you know—▶	Multiply By	To Find ▼	Symbol
Length	inch	25.4	millimeter	mm
	foot	0.3048	meter	m
	yard	0.9144	meter	m
	mile	1.609344	kilometer	km
Area	square inch	645.16	square millimeter	mm ²
	square foot	0.092903	square meter	m ²
	square yard	0.83612736	square meter	m ²
	acre	0.4047	hectare	ha
	square mile	2.590	square kilometer	km ²
Volume	fluid ounce	29.57	milliliter	mL
	gallon	3.7854	liter	L
	cubic foot	0.028317	cubic meter	m ³
	cubic yard	0.764555	cubic meter	m ³
Mass	ounce	28.35	gram	g
	pound	0.453592	kilogram	kg
	short ton	0.907185	metric ton	t
Force & Pressure or Stress	poundforce (lbf)	4.4482	newton	N
	lbf per sq. in.	6.89476	kilopascal	kPa
	lbf per sq. ft.	47.8803	pascal	Pa
	↑ To Find	Divide By	◀ When you know	

NOTE: When converting State Plane Coordinates or elevations use the U.S. Survey Foot conversion factor (0.3048006096) to obtain required accuracy.

ASBUILT PLAN
CONFORMING TO
CONST. RECORDS

DONE BY: *MR*
DATE: 11-23-99

S.A.P. 147-020-26

S.A.P. 62-645-12

BARR PROJECT No.
2362508KLC011
CLIENT PROJECT No.

SHEET No.
2 OF 8
REV. No.
XX

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
1	JOH			7/14/98	QUANTITY OF T-5 DEGREE BENDS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A duly REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

John J. Barr
JJB
REG. NO. 24678

CLIENT	CONSTRUCTION	RELEASED TO/FOR	DATE RELEASED

Barr
Engineering Company

8300 NORMAN CENTER DRIVE
MINNEAPOLIS, MINNESOTA

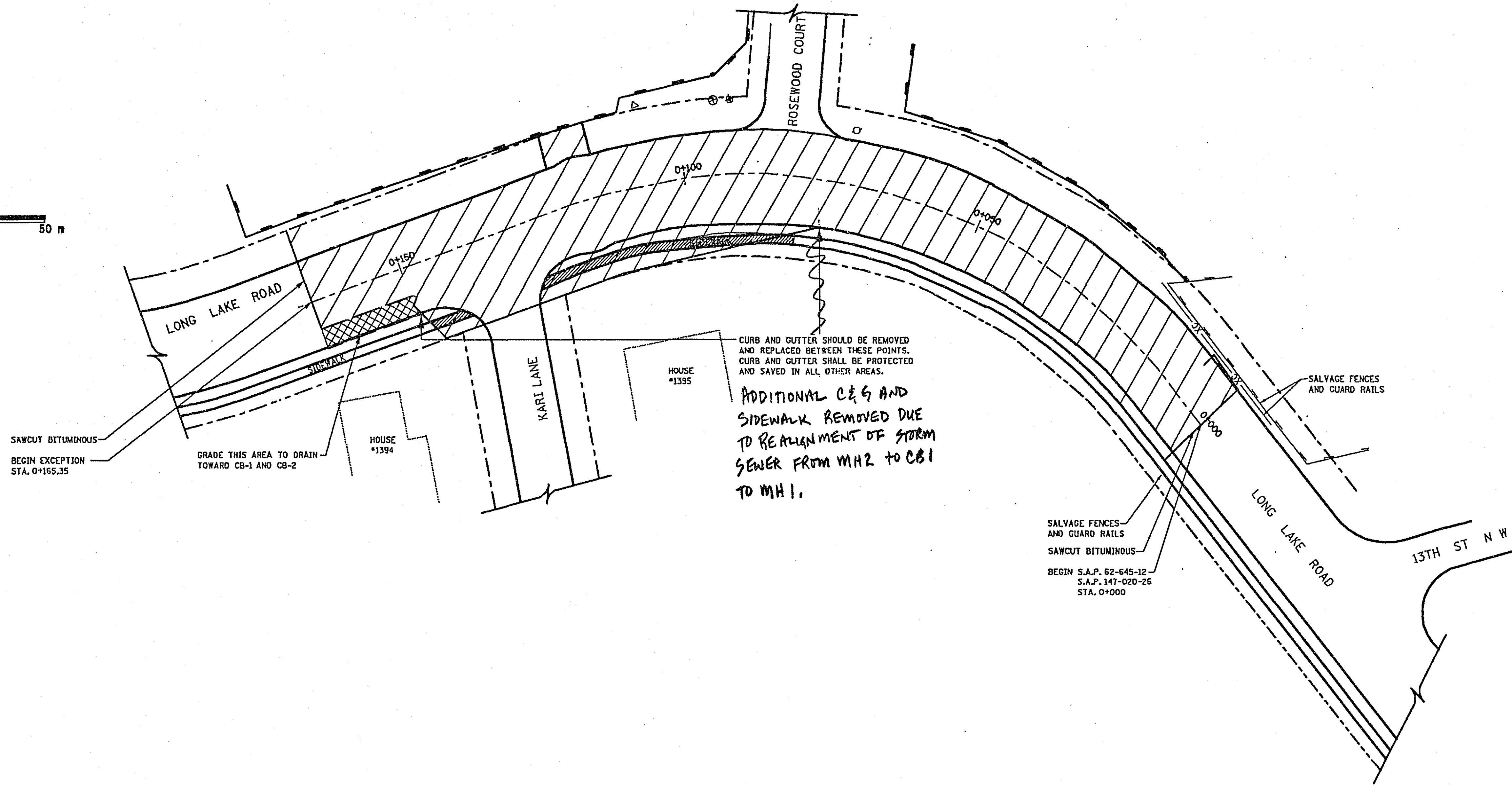
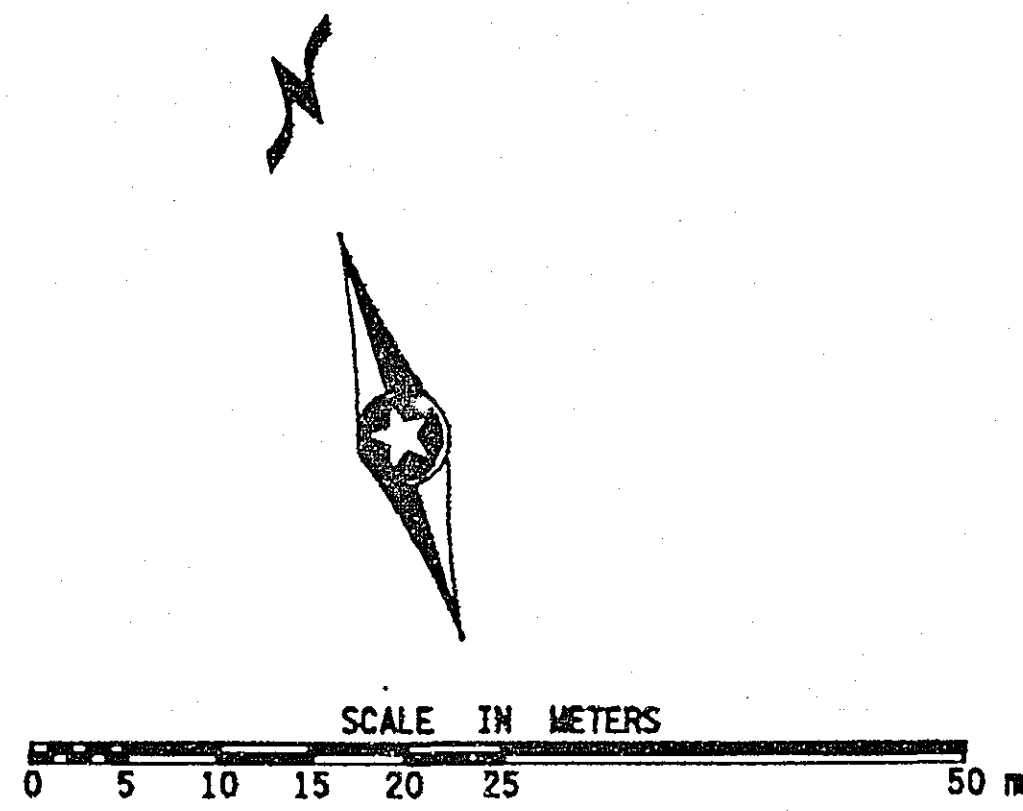
Scale	AS SHOWN
Date	02/03/98
Drawn	DMD
Checked	
Designed	
Approved	

LONG LAKE ROAD FLOOD RELIEF PROJECT
NEW BRIGHTON, MINNESOTA

STATEMENT OF ESTIMATED QUANTITIES

28 - 156

PLOTTED AND/OR REVISED:



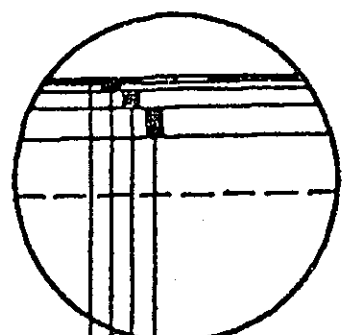
LEGEND

- CONSTRUCTION LIMITS
- 100 mm CONCRETE SIDEWALK TO BE REMOVED AND REPLACED

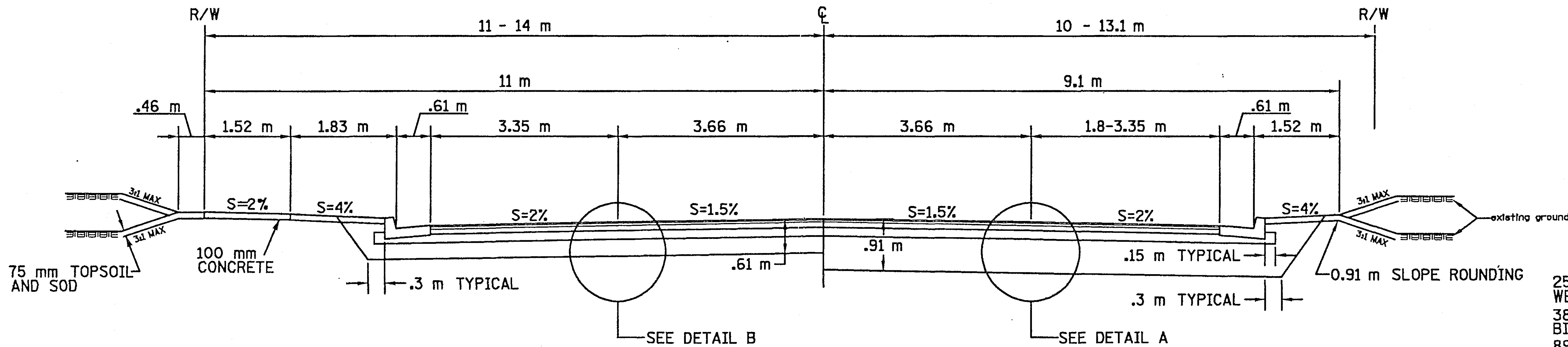
NOTE:

ROADWAY SHALL BE RESTRIPTED BY OTHERS.
DISTURBED AREAS IN CONSTRUCTION LIMITS SHALL BE RESODDED.

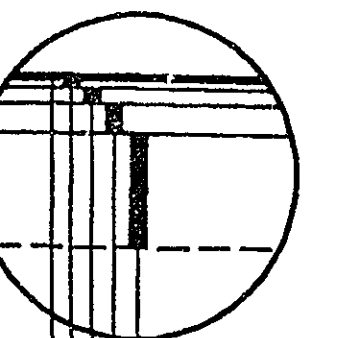
DETAIL B-PROPOSED PAVEMENT THICKNESSES



- 150 mm AGGREGATE CLASS 6
- 90 mm PLANT MIXED BITUMINOUS BASE COURSE SPEC. 2331 TYPE 31
- 37.5 mm PLANT MIXED BITUMINOUS BINDER COURSE SPEC. 2331 TYPE 47
- 37.5 mm PLANT MIXED BITUMINOUS WEARING COURSE SPEC. 2331 TYPE 41



DETAIL A- EXISTING PAVEMENT THICKNESSES



- 25 mm PLANT MIXED BITUMINOUS WEARING COURSE
- 38 mm PLANT MIXED BITUMINOUS BINDER COURSE
- 89 mm PLANT MIXED BITUMINOUS BASE COURSE
- 150 mm AGGREGATE CLASS 6
- 300 mm SUBGRADE CORRECTION BETWEEN STA. 0+000 AND 0+070 AND 600 mm BETWEEN STA. 0+070 AND 0+163.35

ASBUILT PLAN

CONFORMING TO
CONST. RECORDS

DONE BY: *MR*
DATE: 11-23-99

NO.	BY	CHK.	APP.	DATE	REVISION	DESCRIPTION

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A duly registered PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.
DATE: 11/23/99 REG. NO. 24678

CLIENT	NO.	DATE
CONSTRUCTION		
RELEASED TO/FOR		
DATE RELEASED		

Barr
Engineering Company

Scale	AS SHOWN
Date	02/03/98
Drawn	DMD
Checked	
Designed	
Approved	

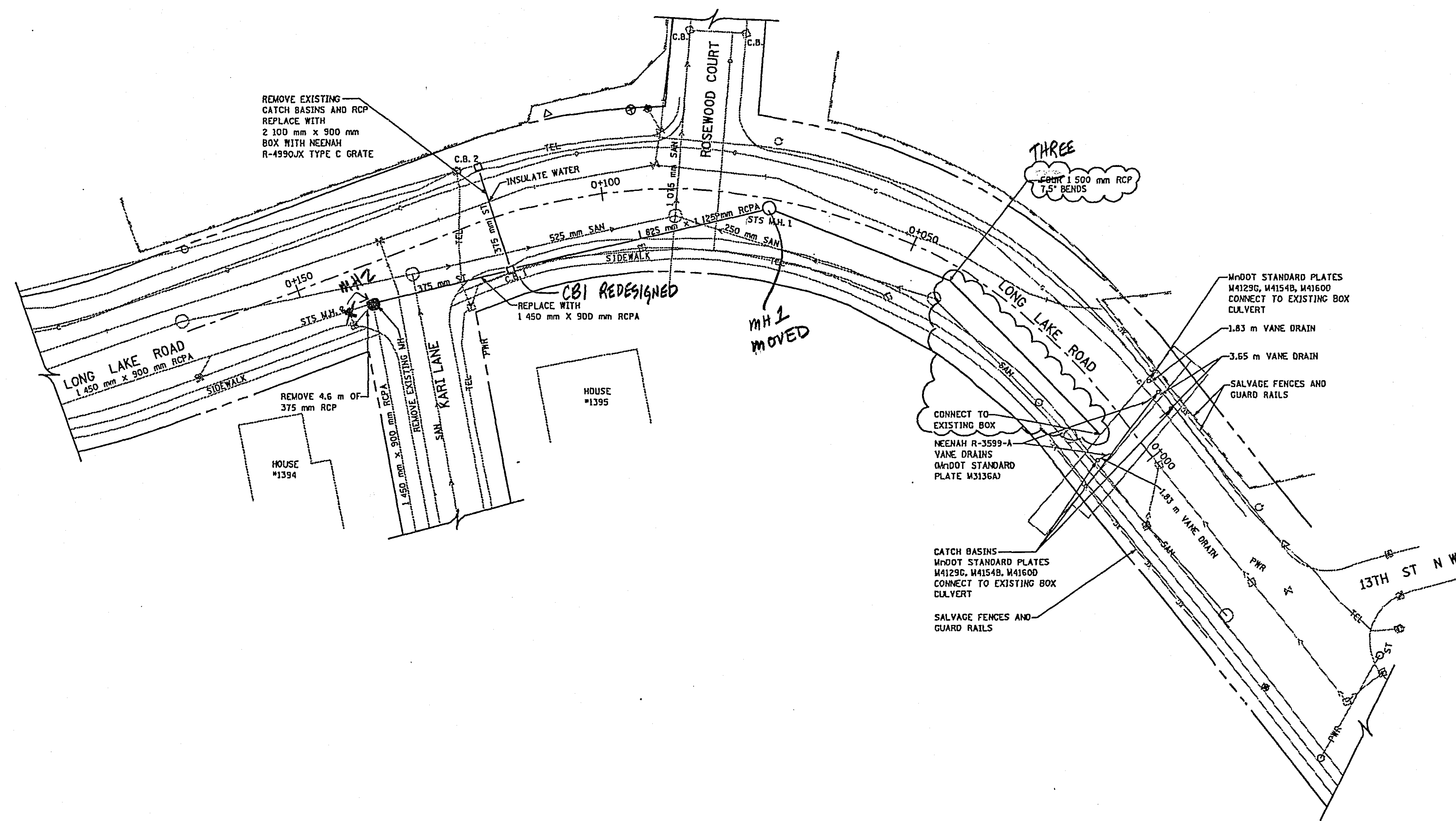
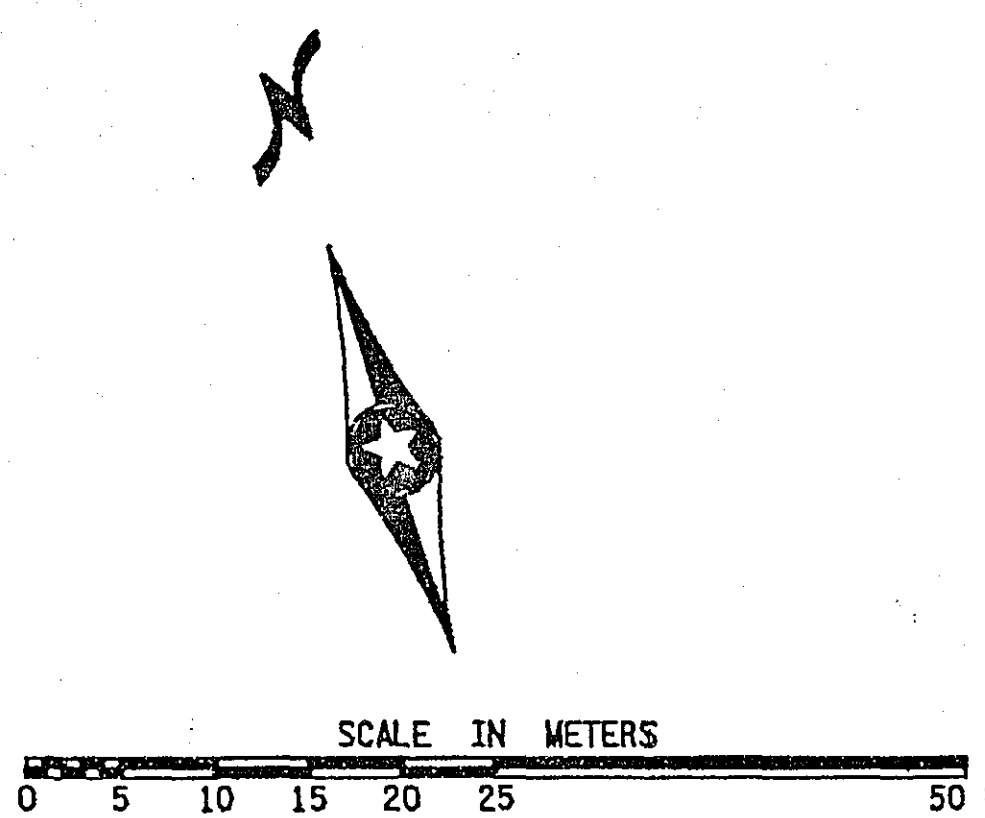
LONG LAKE ROAD FLOOD RELIEF PROJECT
NEW BRIGHTON, MINNESOTA

ROAD RESTORATION
PLAN AND SECTION

28-156

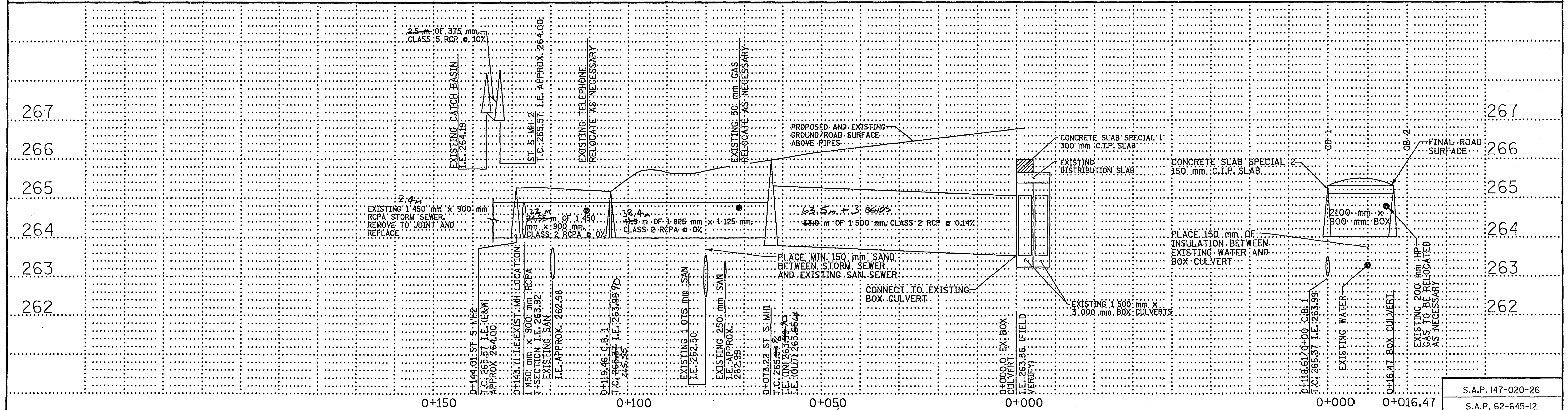
S.A.P. 147-020-26
S.A.P. 62-645-12
BARR PROJECT No. 2362508KLCOII
CLIENT PROJECT No.
SHEET No. 3 OF 8
REV. No. XX

PLOTTED AND/OR REVISED:



ASBUILT PLAN
CONFORMING TO
CONST. RECORDS
DONE BY: *ML*
DATE: 11-23-99

NOTE: M41296 = 602A FRAME CASTING
M4154B = 616 GRATE CASTING
M41600 = 823A CURB BOX



1. I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DAILY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		DATE: 11/15/99 REG. NO. 24618	
2. I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DAILY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		DATE: 11/15/99 REG. NO. 24618	
3. I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DAILY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		DATE: 11/15/99 REG. NO. 24618	
4. I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DAILY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		DATE: 11/15/99 REG. NO. 24618	
5. I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DAILY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		DATE: 11/15/99 REG. NO. 24618	
6. I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DAILY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		DATE: 11/15/99 REG. NO. 24618	
7. I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DAILY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		DATE: 11/15/99 REG. NO. 24618	
8. I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DAILY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		DATE: 11/15/99 REG. NO. 24618	
9. I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DAILY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		DATE: 11/15/99 REG. NO. 24618	
10. I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DAILY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.		DATE: 11/15/99 REG. NO. 24618	

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
1	JOH			07/14/98	ADD 2 BENDS, NEW CONNECTION LOCATION
2					
3					
4					
5					
6					
7					
8					
9					
10					

CLIENT	AS SHOWN
DATE	02/03/98
OWN	DMD
CHECKED	KLC
DESIGNED	JOH
APPROVED	

RELEASED TO/FOR	DATE RELEASED
A B C O I 2 3	

Barr Engineering Company	
8300 NORMAN CENTER DRIVE	
MINNEAPOLIS, MINNESOTA	

LONG LAKE ROAD FLOOD RELIEF PROJECT	
NEW BRIGHTON, MINNESOTA	

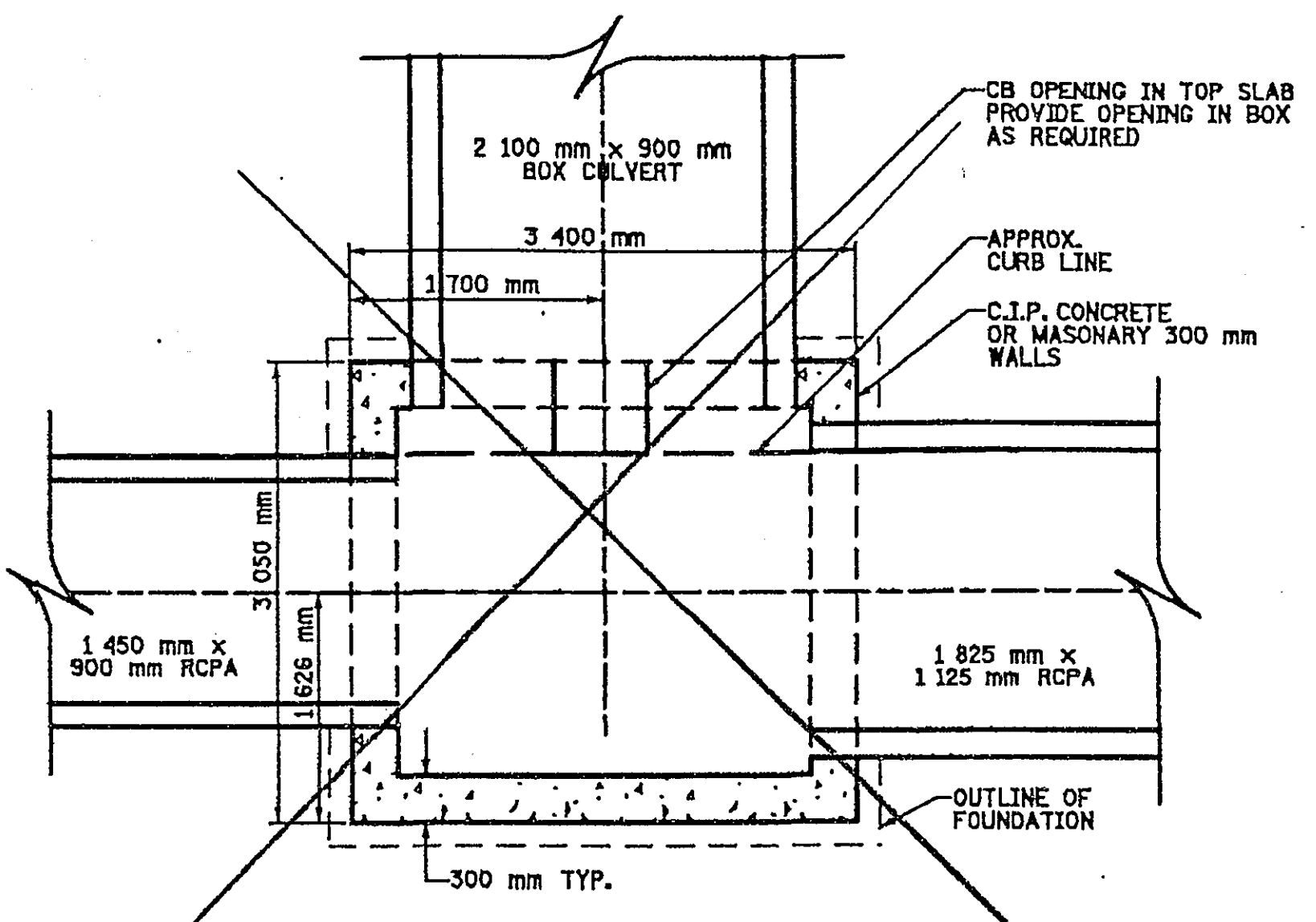
PLAN AND PROFILE	
28-156	

S.A.P. 147-020-26	
S.A.P. 62-645-12	
BARR PROJECT NO. 2362508KLC011	
CLIENT PROJECT NO.	
SHEET No. 4 OF 8	REV. No. XX

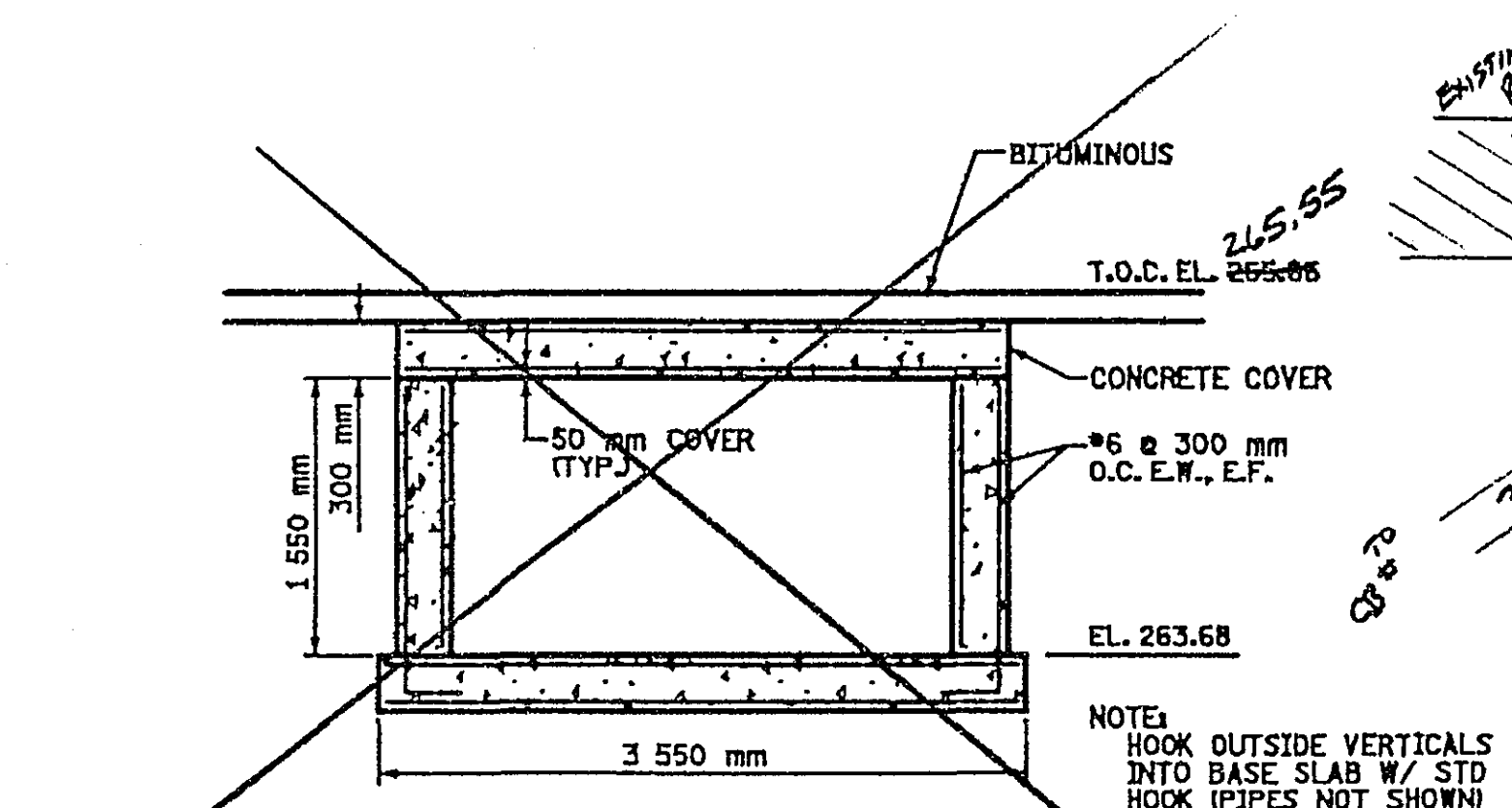
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SHEET 15.DGN

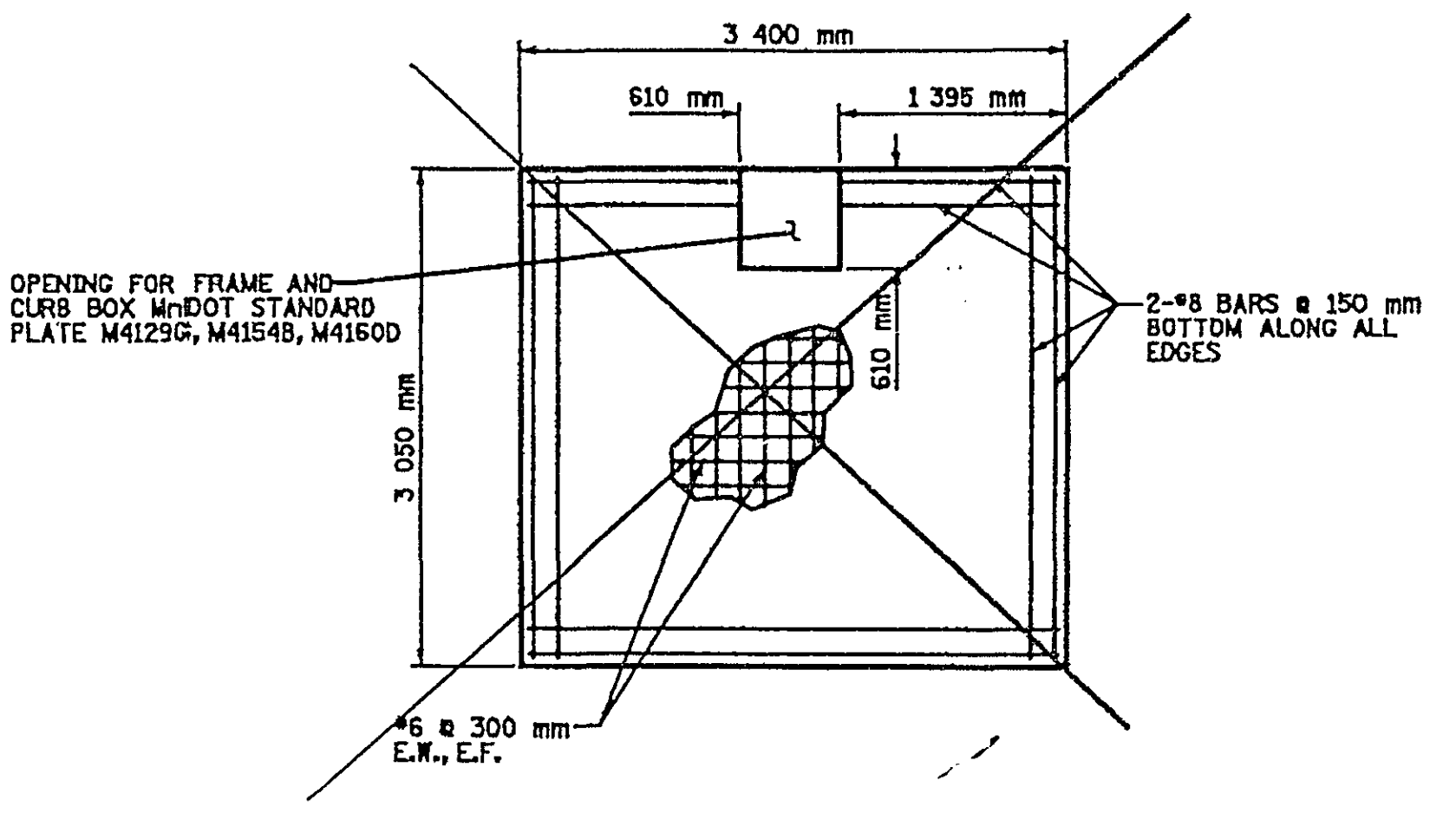
PLOT NAME: DATE: MAY 20, 1998



CATCH BASIN NO. 1
PLAN VIEW
SCALE 1:100

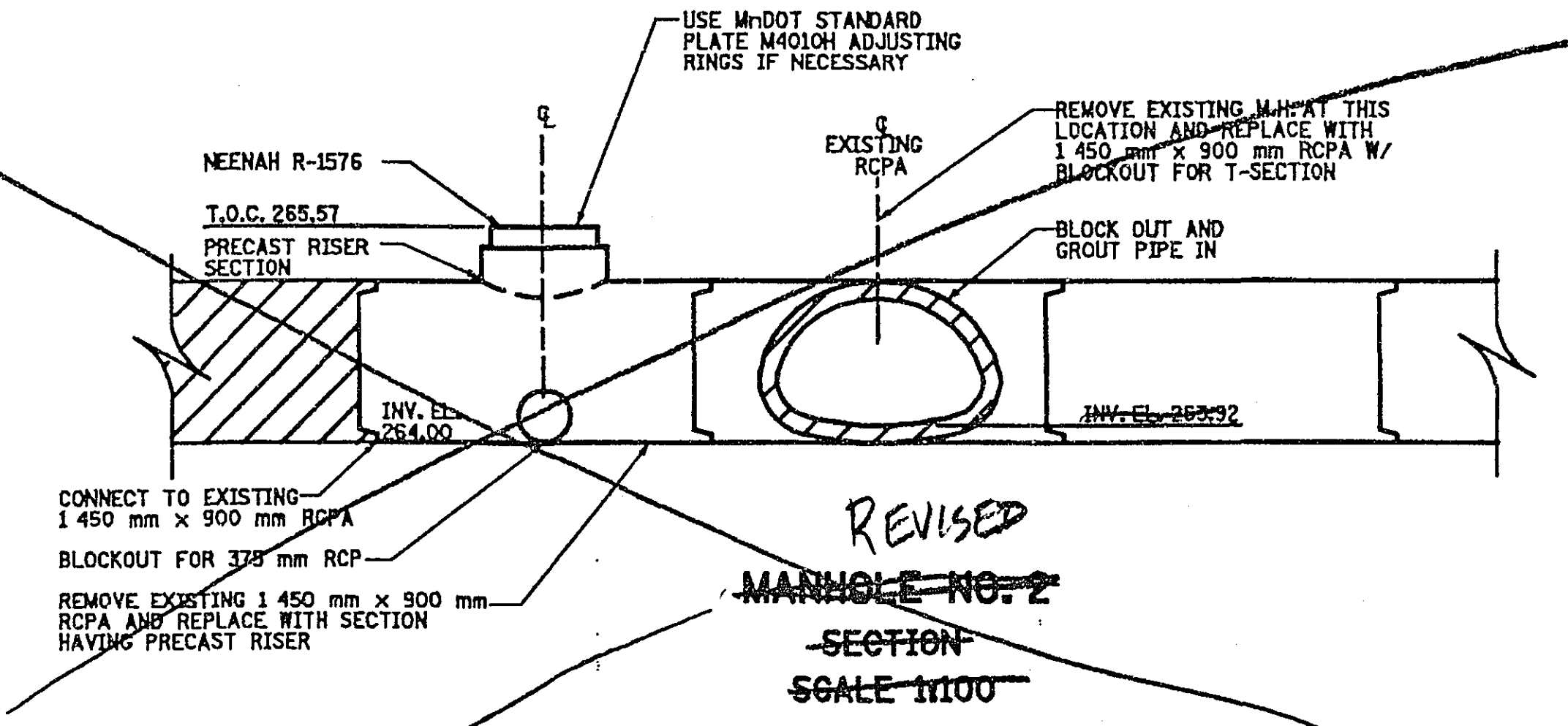


CATCH BASIN NO. 1
WALL SECTION REINFORCING
SCALE 1:100

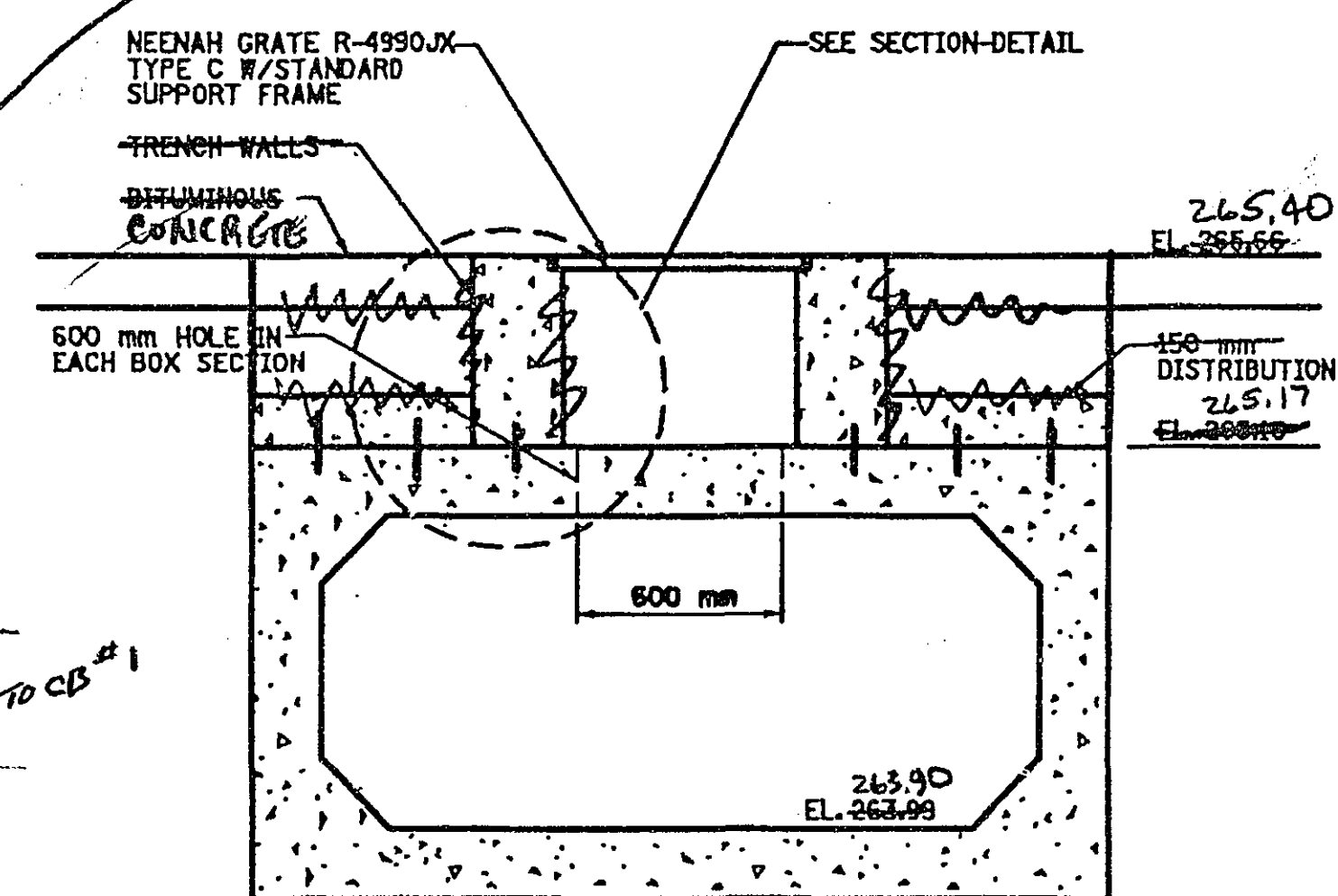


CATCH BASIN NO. 1
PLAN-TOP SLAB LAYOUT
SCALE 1:100

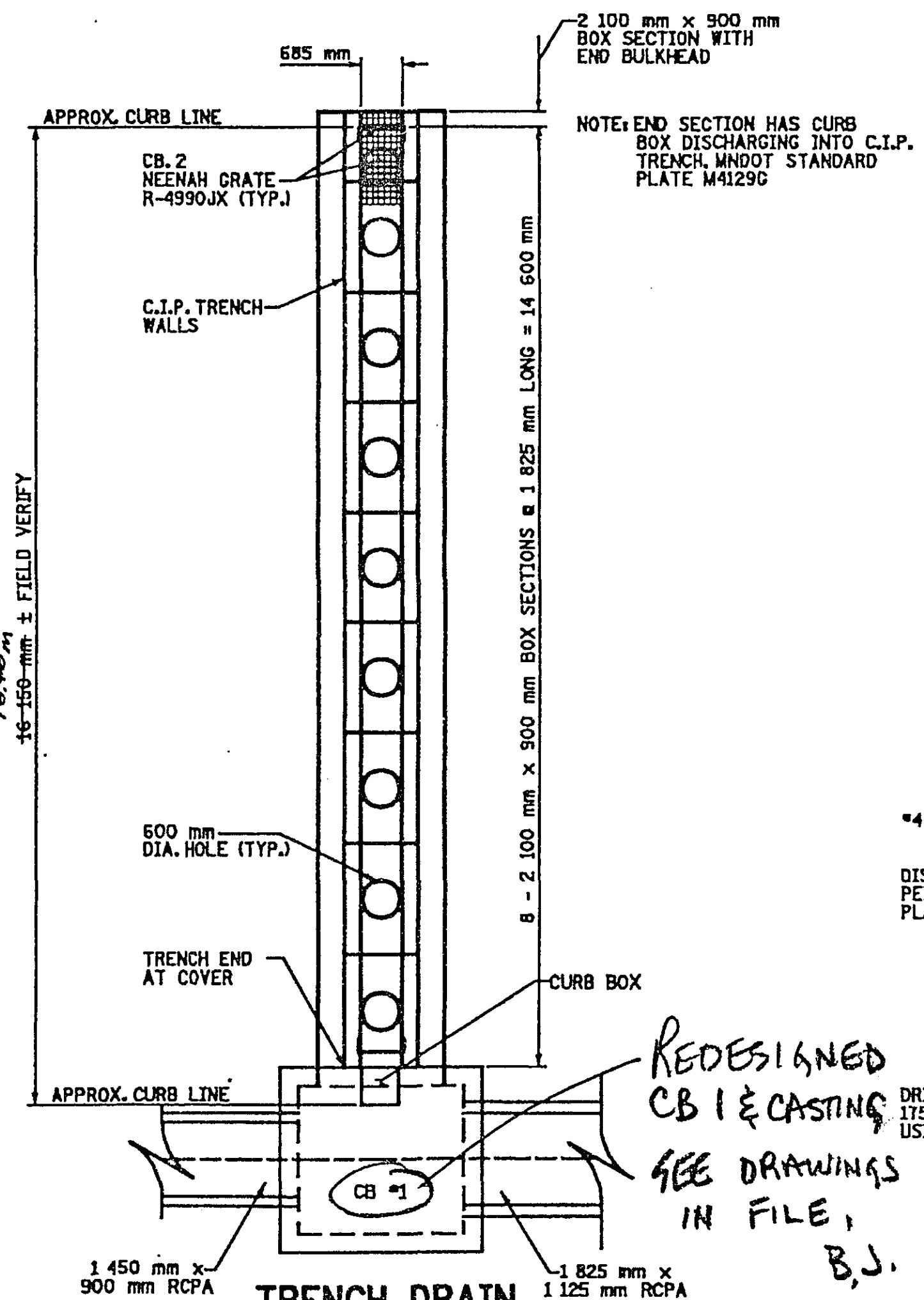
CATCH BASIN NO. 1
WAS REDESIGNED
SEE DRAWINGS IN FILE B.J.



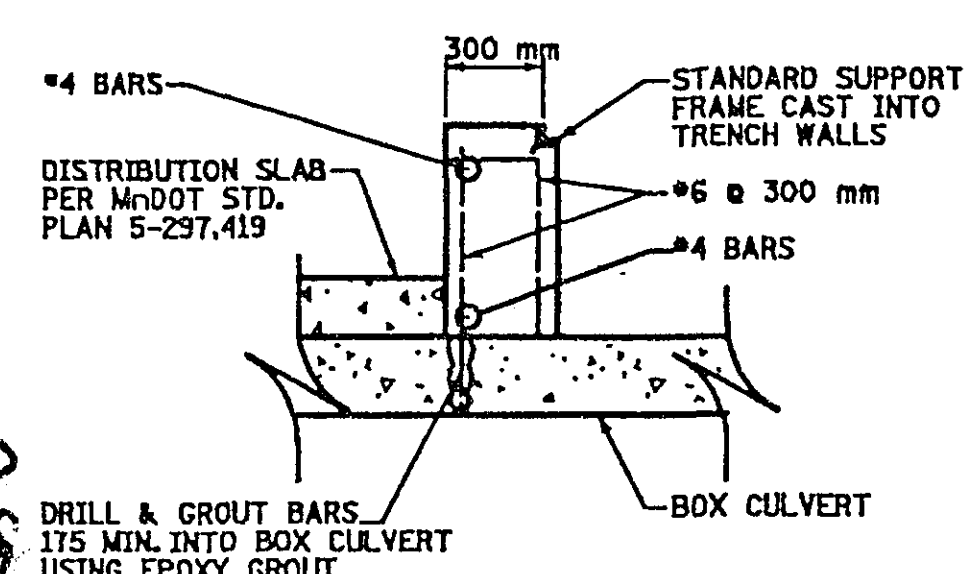
REVISED
MANHOLE NO. 2
SCALE 1:100



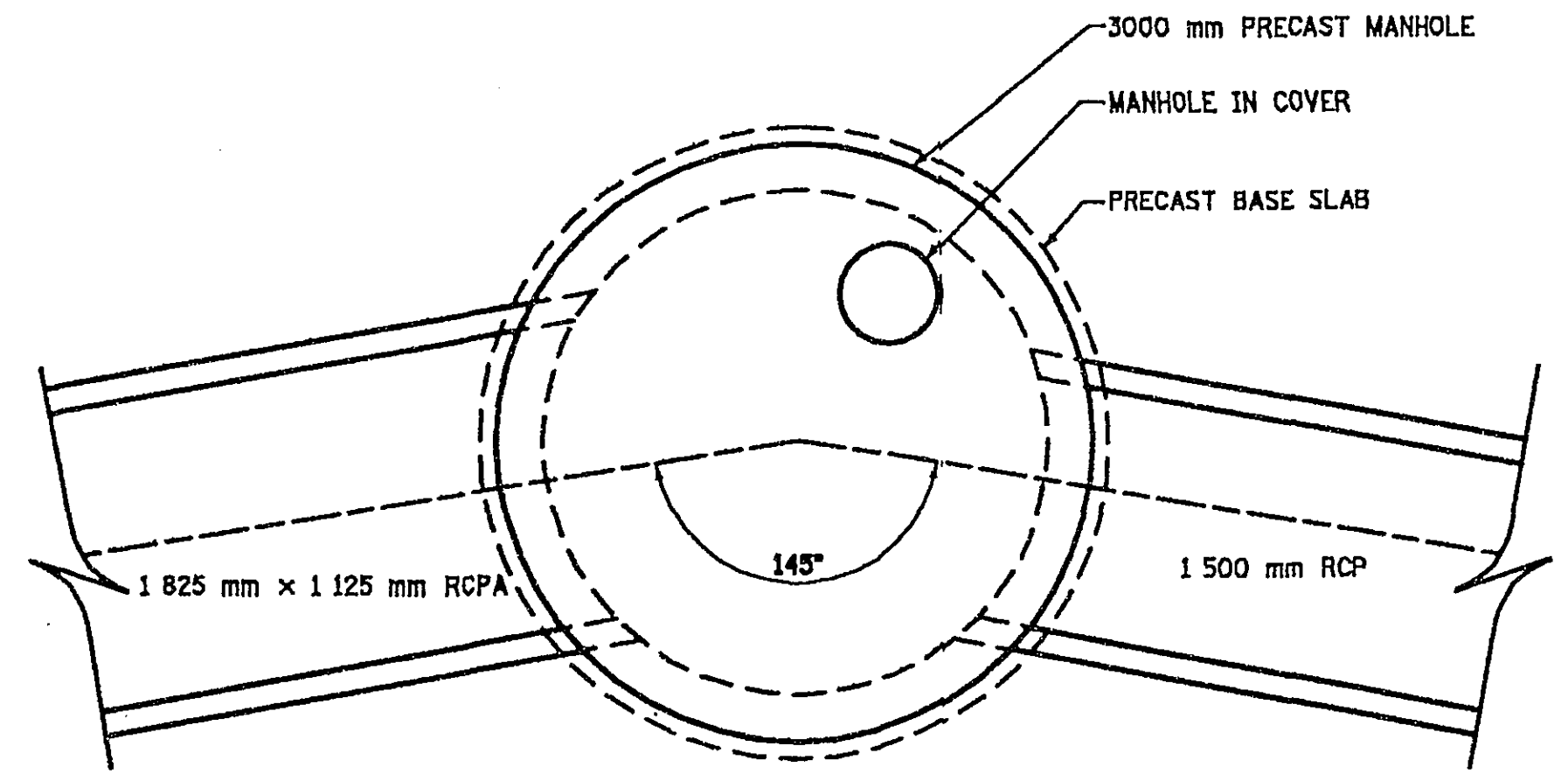
TRENCH DRAIN
OVER 2,100 mm x 900 mm BOX CULVERT
SECTION
SCALE 1:50



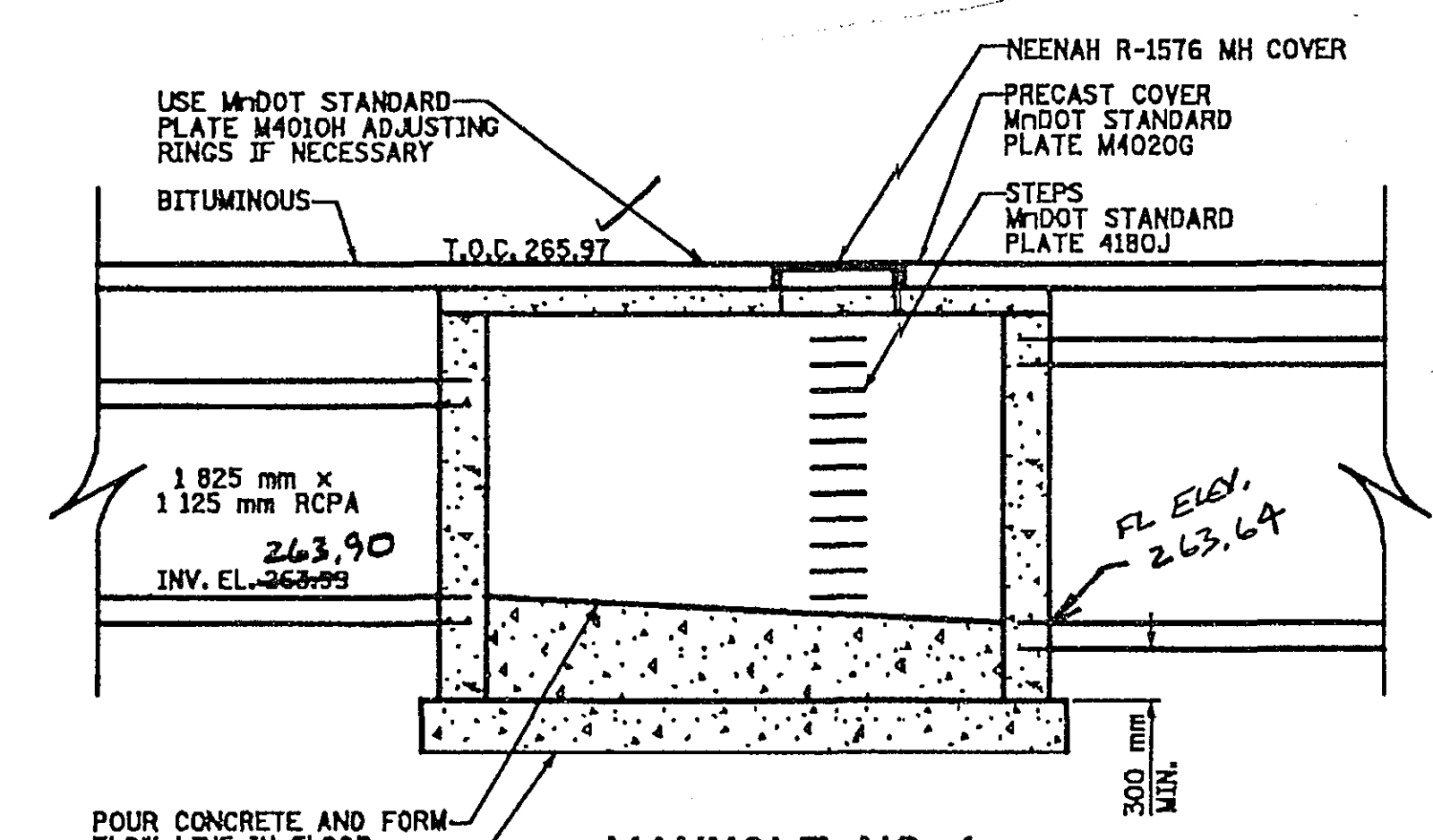
TRENCH DRAIN
WALL
PLAN VIEW
SCALE 1:200



TRENCH DRAIN WALL
SECTION-DETAIL
SCALE 1:50



MANHOLE NO. 1
MNDOT STANDARD PLATE
DESIGN 3000-M4020G
PLAN VIEW
SCALE 1:100



MANHOLE NO. 1
MNDOT STANDARD PLATE
DESIGN 3000-M4020G
SECTION
SCALE 1:100

ASBUILT PLAN
CONFORMING TO
CONST. RECORDS
DONE BY: MR
DATE: 11-23-99

28-156

NO.	BY	CHK.	APP.	DATE	REVISION DESCRIPTION
1					
2					
3					
4					
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8					
9					
10					

Barr
Engineering Company
8300 NORMAN CENTER DRIVE
MINNEAPOLIS, MINNESOTA

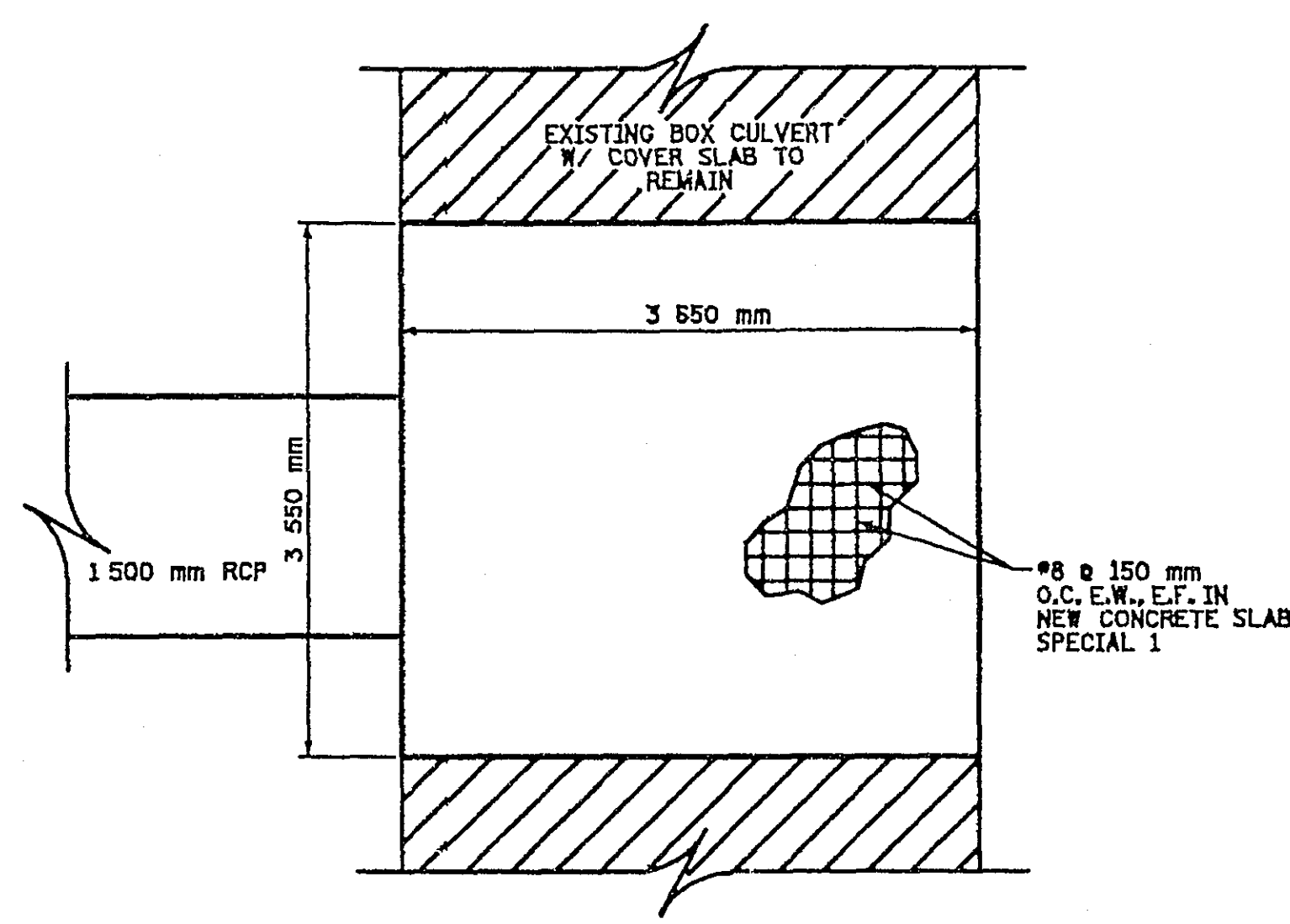
Scale	AS SHOWN
Date	02/03/98
Drawn	LSO
Checked	
Designed	
Approved	

LONG LAKE ROAD FLOOD RELIEF PROJECT
NEW BRIGHTON, MINNESOTA

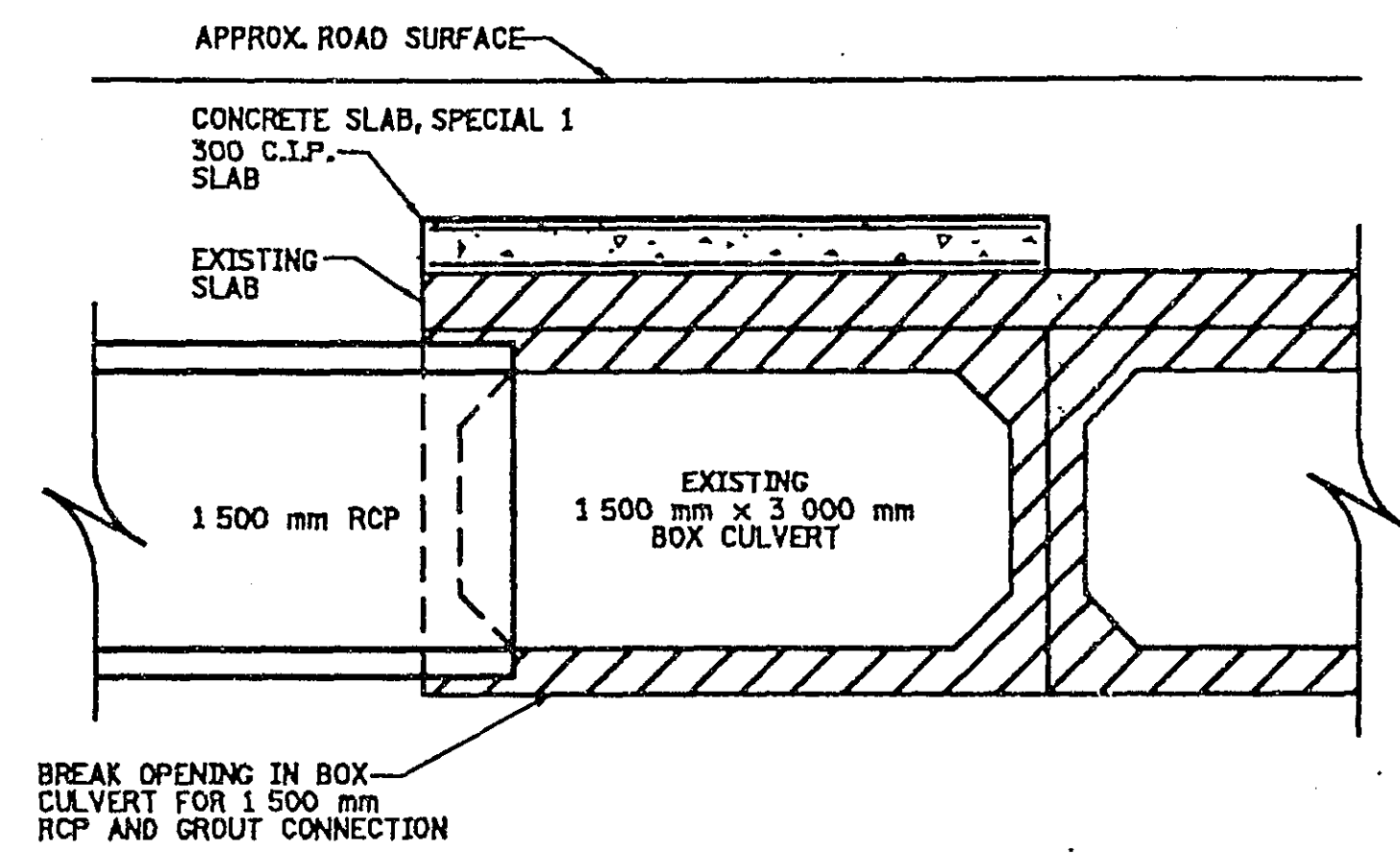
DETAILS

S.A.P. 147-020-26
S.A.P. 62-645-12
BARR PROJECT No. 2362508KLC01
CLIENT PROJECT No.
SHEET No. 5 OF 8
REV. No. XX

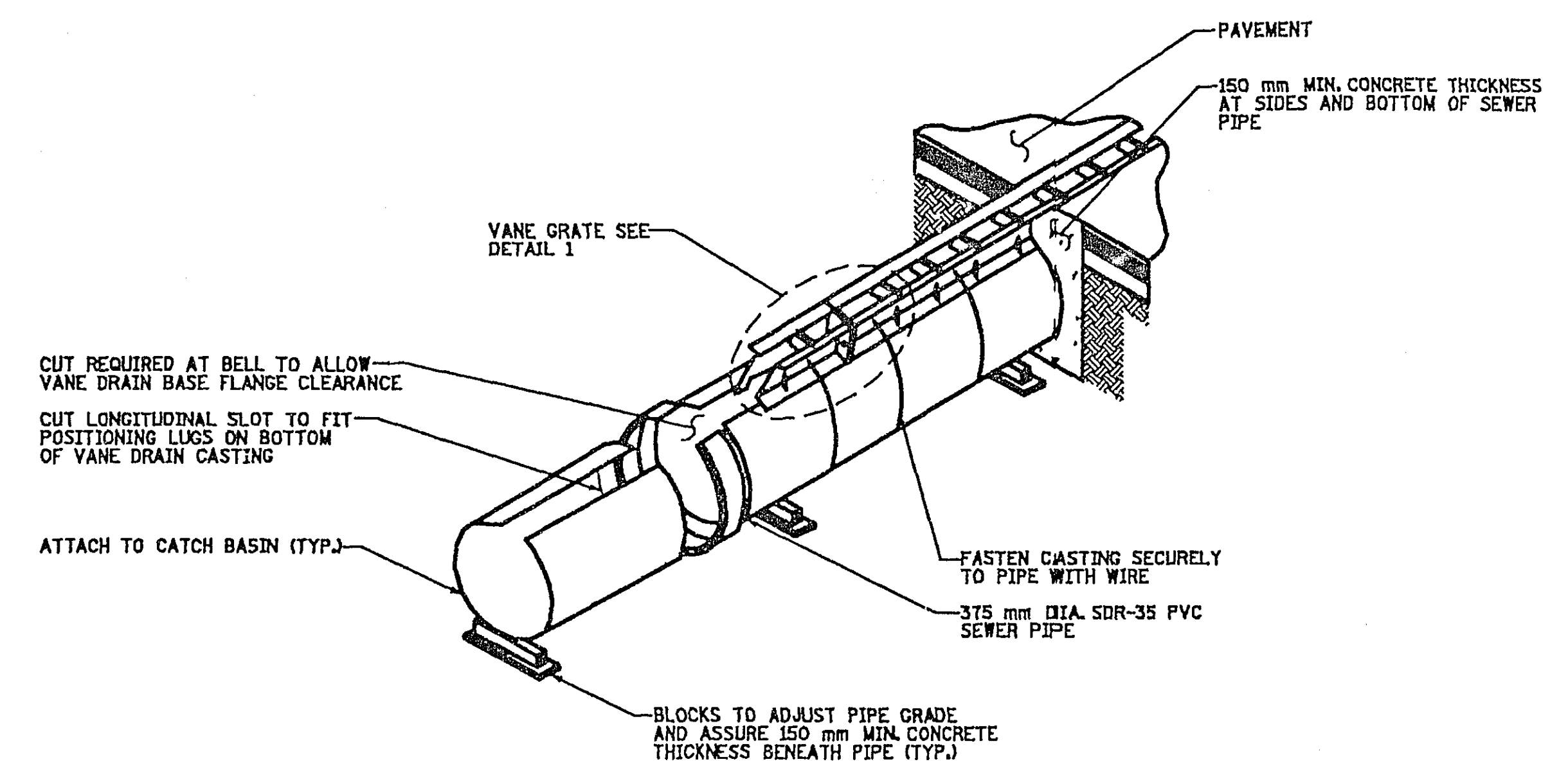
PLOTTED AND/OR REVISED:



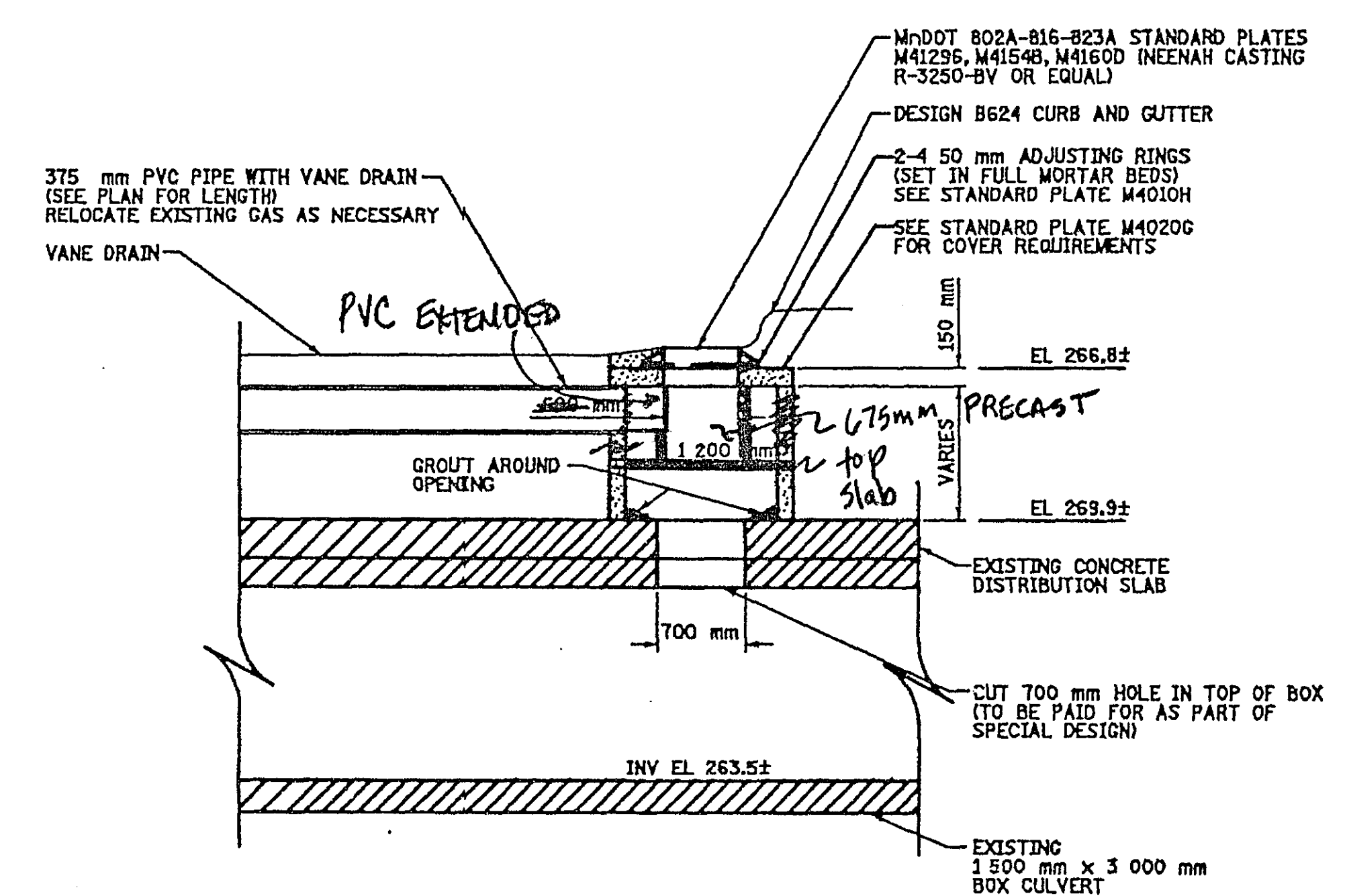
CONNECTION AT EXISTING
1 500 mm x 3 000 mm BOX CULVERT
PLAN VIEW
SCALE 1:100



CONNECTION AT EXISTING
1 500 mm x 3 000 mm BOX CULVERT
SECTION
SCALE 1:100

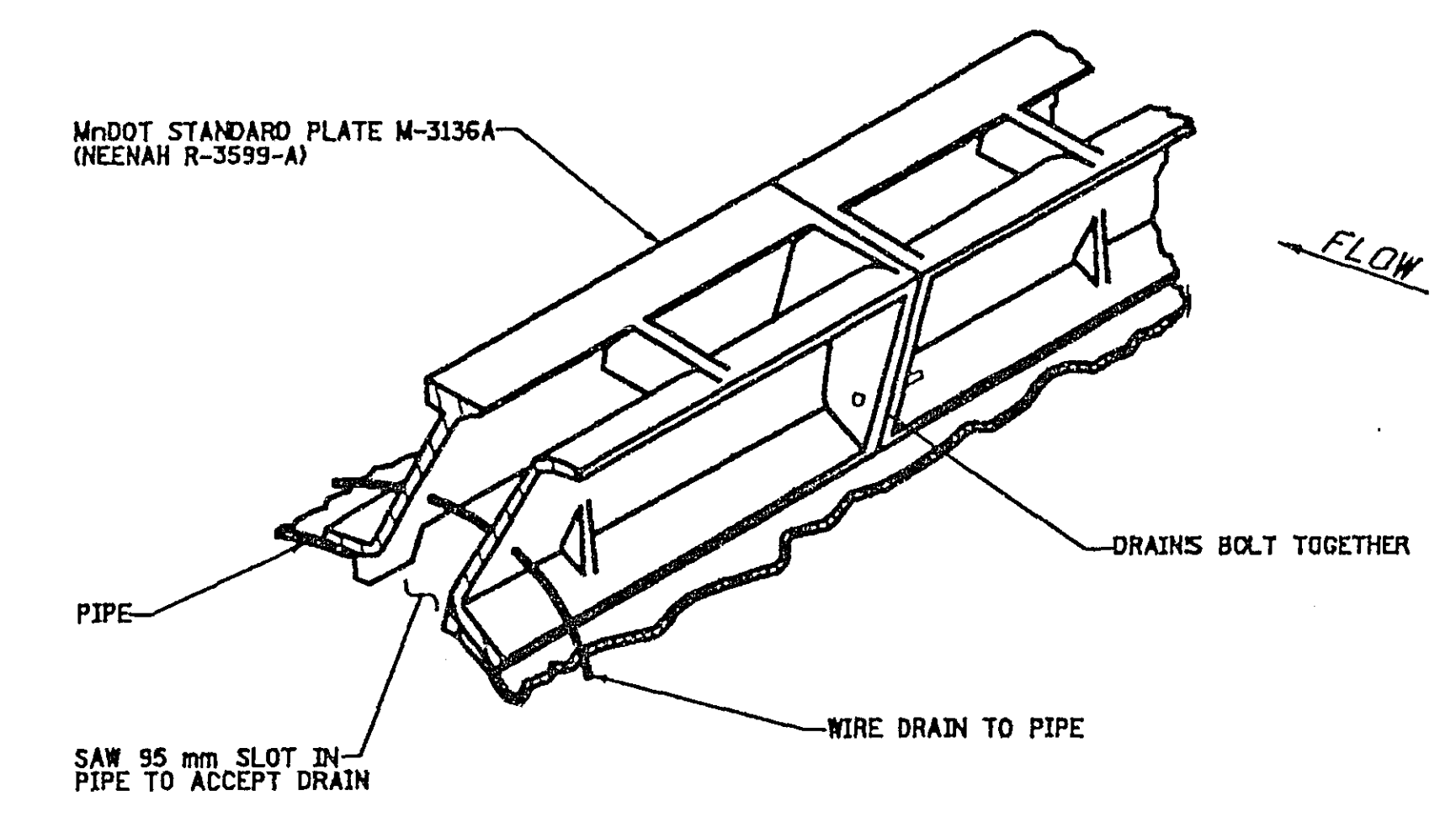


SLOTTED VANE DRAIN
MnDOT STANDARD
PLATE M3136A
SECTION
SCALE N.T.S.



TYPICAL VANE DRAIN CATCH BASIN
CONNECTION TO BOX CULVERT
SCALE 1:100

SEE DRAWINGS IN FILE
FOR FIELD CHANGES
B.J.



SLOTTED VANE DRAIN
MnDOT STANDARD
PLATE M3136A
DETAIL 1
SCALE N.T.S.

ASBUILT PLAN
CONFORMING TO
CONST. RECORDS
DONE BY: MR
DATE: 11-23-99

S.A.P. 147-020-26
S.A.P. 62-645-12
BARR PROJECT No. 2362508KLC011
CLIENT PROJECT No.
SHEET No. 6 OF 8
REV. No. XX

28-156

DETAILS

LONG LAKE ROAD FLOOD RELIEF PROJECT
NEW BRIGHTON, MINNESOTA

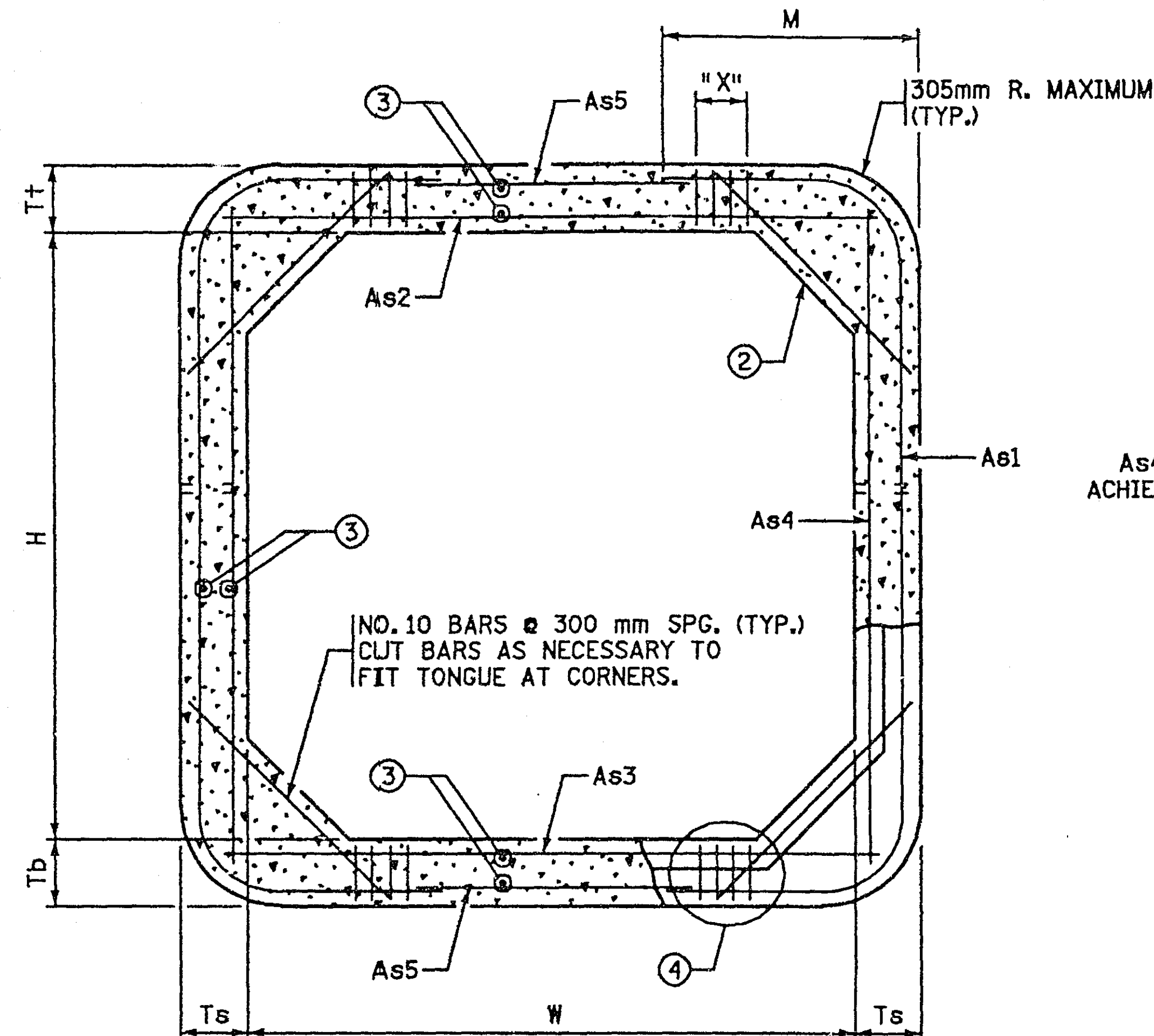
Barr
Engineering Company
8900 NORMAN CENTER DRIVE
MINNEAPOLIS, MINNESOTA

CLIENT	DATE	SCALE	BY	CHK.	APP.	DATE
CONSTRUCTION						
RELEASED TO/FOR	A	B	C	D	E	F
DATE RELEASED	1	2	3			

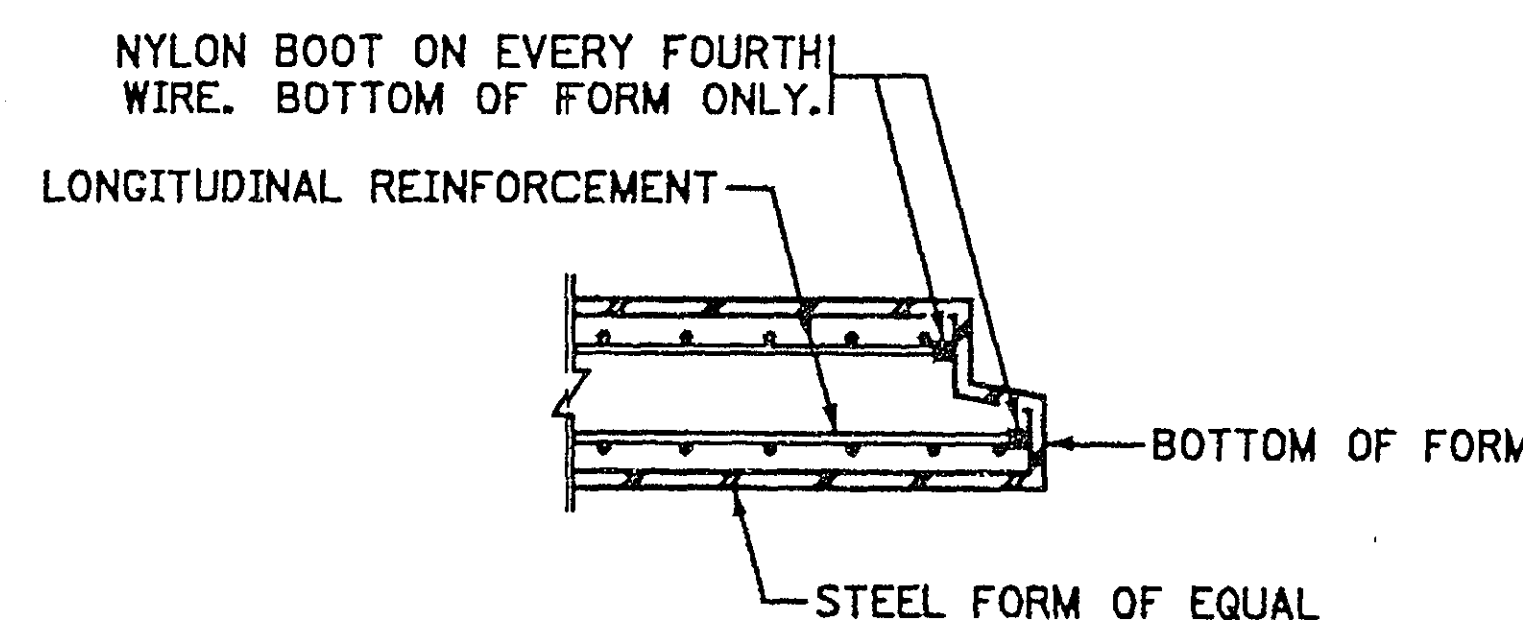
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA
DATE: 11/17/98 REG. NO. 24678

NO.	BY	CHK.	APP.	DATE	REVISION	DESCRIPTION

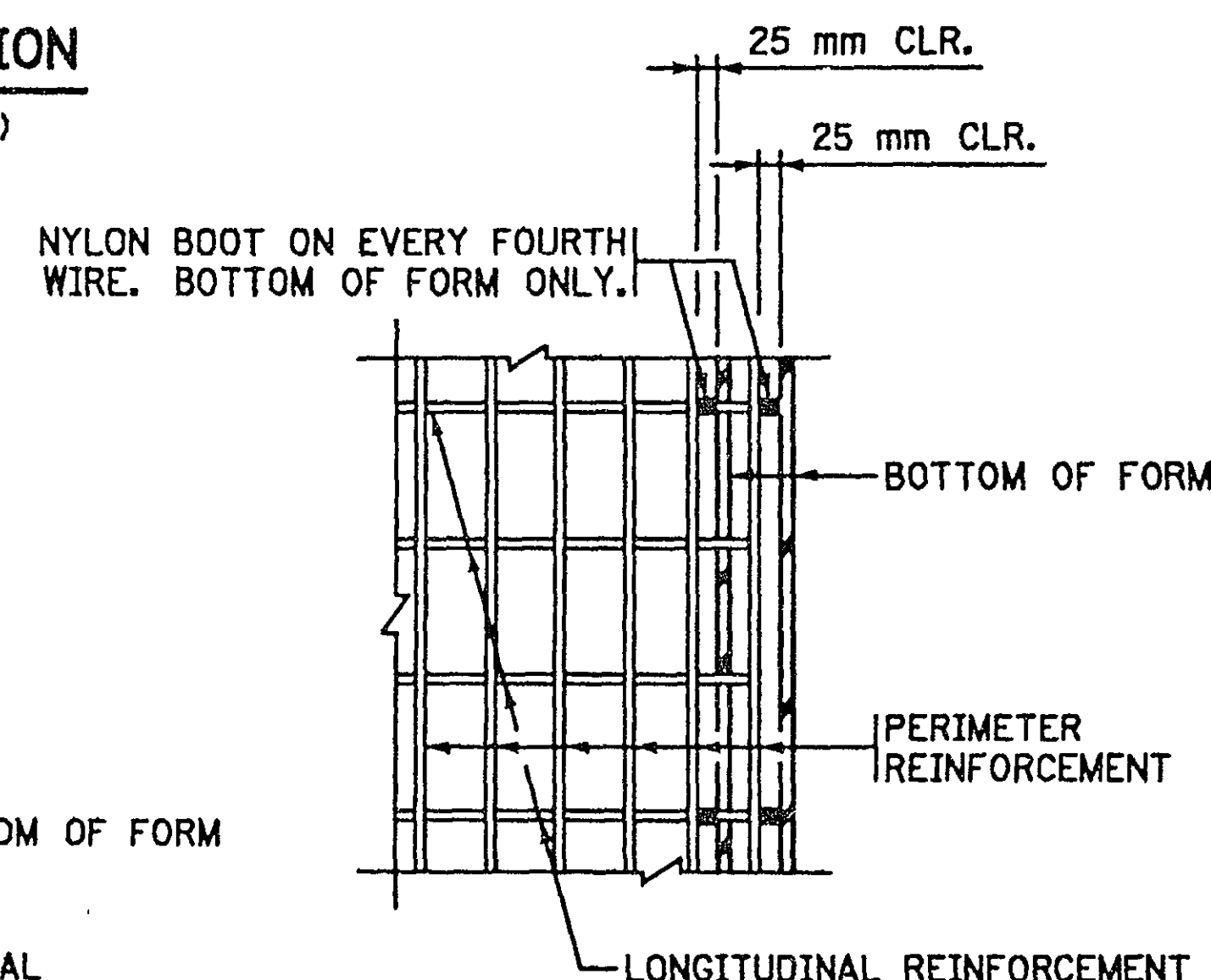
PLOT NAME: SHEET16.DGN
DATE: MAY 20, 1998



TRANSVERSE BARREL SECTION
(BAR REINFORCEMENT OPTION SHOWN)



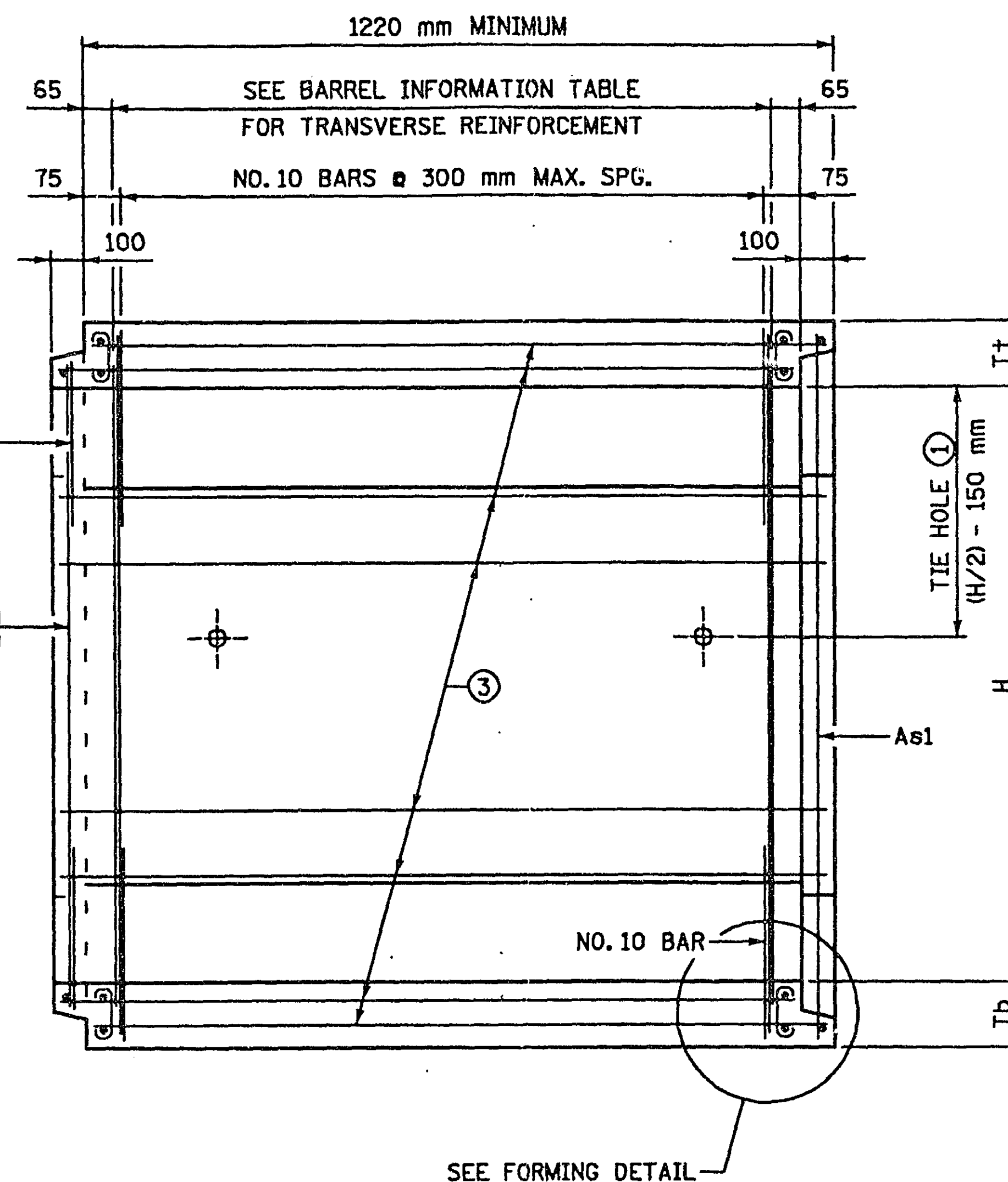
FORMING DETAIL SECTION



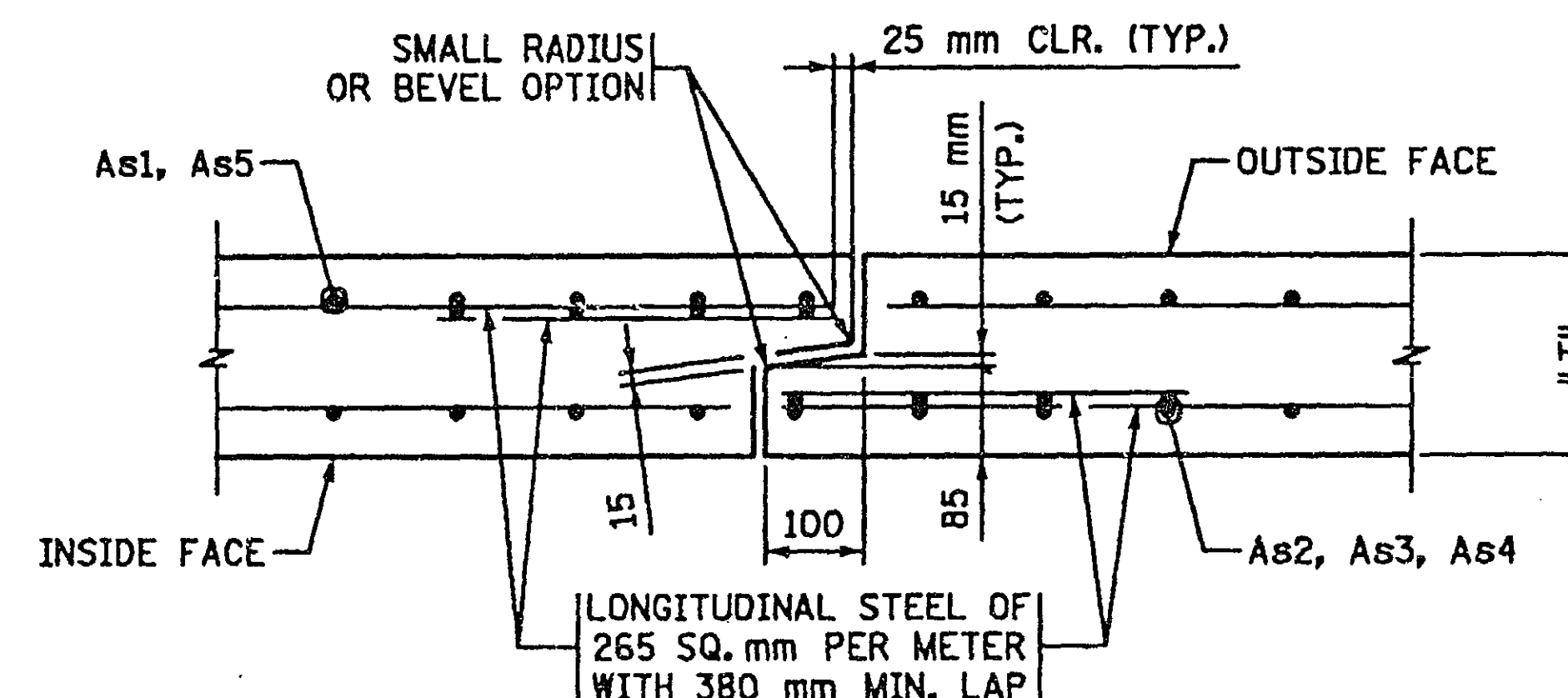
FORMING DETAIL PLAN

NO. 10 BAR
CUT AS NECESSARY TO
FIT TONGUE AT CORNERS.

As4, CUT AS NECESSARY TO
ACHIEVE COVER REQUIREMENTS.



LONGITUDINAL BARREL SECTION
(BAR REINFORCEMENT OPTION SHOWN.)



TONGUE AND GROOVE JOINT DETAIL

CONSTRUCTION NOTES:

CULVERTS TO BE CONSTRUCTED AS PER SPEC. 2412 EXCEPT AS NOTED.

FILL HEIGHTS OF LESS THAN 600 MILLIMETERS REQUIRE A DISTRIBUTION SLAB.

THE STEEL FABRIC, SHEAR REINFORCEMENT AND REINFORCEMENT BARS SHALL CONFORM TO APPLICABLE REQUIREMENTS OF AASHTO M259.

40 MILLIMETERS MINIMUM AND 50 MILLIMETERS MAXIMUM CONCRETE COVER ON ALL REINFORCEMENT, INCLUDING SHEAR REINFORCEMENT, EXCEPT FOR TONGUE AND GROOVE DETAIL.

ANY OF THE FOLLOWING COMBINATIONS OF STEEL REINFORCEMENT MAY BE USED:

- (a) 1 OR 2 LAYERS OF MESH, OR
- (b) 1 LAYER OF MESH AND 1 LAYER OF REINFORCEMENT BARS, OR
- (c) 1 LAYER OF REINFORCEMENT BARS.

THE REINFORCEMENT SHALL BE DEVELOPED IN ACCORDANCE WITH AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES". IF BAR REINFORCEMENT IS SUBSTITUTED FOR WIRE MESH, THE AREAS OF REINFORCEMENT SHALL BE INCREASED BY 8%.

THE MAXIMUM SIZE OF REINFORCEMENT BARS SHALL BE NO. 19. THE MAXIMUM MESH SIZE SHALL BE 15 MILLIMETERS DIAMETER PER LAYER (MAXIMUM OF 2 LAYERS).

THE SPACING CENTER TO CENTER OF THE TRANSVERSE WIRES SHALL NOT BE LESS THAN 50 MILLIMETERS NOR MORE THAN 100 MILLIMETERS. THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 200 MILLIMETERS.

WELDING WILL NOT BE ALLOWED ON REINFORCEMENT BARS OR STEEL FABRIC, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE FABRIC IS ACCEPTABLE.

WHEN REINFORCEMENT IS CUT, ADDITIONAL REINFORCEMENT SHALL BE ADDED ON BOTH SIDES OF THE CUT MEMBER TO REPLACE OR EXCEED THE CUT STEEL.

CONCRETE SHALL BE MIX NO. 3W36 WITH NO CALCIUM CHLORIDE ALLOWED.

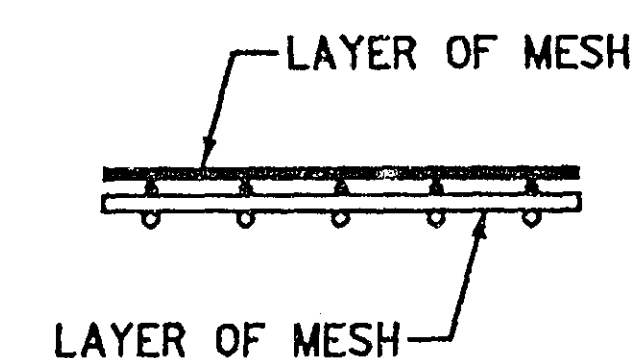
① CULVERT TIES ARE TO BE 25 MILLIMETER DIAMETER RODS. SEE STANDARD PLATE NO. M3145 FOR CONNECTION DETAILS.

② HAUNCH SIZE AS FOLLOWS:
1830 AND 2440 MILLIMETER WIDTHS - 150 TO 305 MILLIMETERS
3050 MILLIMETER WIDTH - 250 TO 305 MILLIMETERS
3660 MILLIMETER WIDTH - 305 MILLIMETERS

③ MINIMUM LONGITUDINAL STEEL SHALL BE 130 SQ. MILLIMETERS/METER.

④ SEE STANDARD PLATE NO. M3007 FOR SHEAR REINFORCEMENT OPTIONS. THE MAXIMUM SHEAR REINFORCEMENT SPACING IN THE LONGITUDINAL DIRECTION SHALL BE 150 MILLIMETERS.

SHOP DRAWING APPROVAL PER SPEC. 3238.2A IS REQUIRED.



FABRIC LAYER DETAIL

WHEN MORE THAN ONE LAYER OF STEEL FABRIC IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, THE WIRES OF THE STEEL FABRIC SHALL BE PLACED AS SHOWN.

ASBUILT PLAN
CONFORMING TO
CONST. RECORDS
DONE BY: *MR*
DATE: 11-23-99

BARREL INFORMATION

LOCATION	SIZE	f'c (MPa)	OVER- FILL LIMITS (mm)	DIMENSIONS					MASS (kg/m)	STEEL FABRIC REINFORCEMENT										SHEAR REINFORCEMENT TOP AND BOTTOM OF BARREL ④		
				W	H	Tt	Tb	Ts		As1		As2		As3		As4		As5		AREA (mm ² /m)	MAX. SPG. (mm)	X (mm)
				(mm)	(mm)	(mm)	(mm)	(mm)		AREA (mm ² /m)	LENGTH (mm)	AREA (mm ² /m)	LENGTH (mm)	AREA (mm ² /m)	LENGTH (mm)	AREA (mm ² /m)	LENGTH (mm)	AREA (mm ² /m)	LENGTH (mm)			
ALL	2125X 900	35	610	2125	900	325	250	200	4150	975	2700	950	2300	600	2300	510	1100	600	1550			

28-156

APPROVED: SEPTEMBER 19, 1996
Donald P. Fleming
STATE BRIDGE ENGINEER

S.A.P. 147-020-26

S.A.P. 62-645-12

Barr
Engineering Company
3300 NORMAN CENTER DRIVE
MINNEAPOLIS, MINNESOTA

STATE PROJ. NO. _____ (T.H.) STA. + _____

FIG. 5-395.101M (2 of 2)

CERTIFIED BY: *John S. Barr*
PROFESSIONAL ENGINEER
REG. NO. 24678
JAN 15, 1998

TITLE:

BARREL DETAILS
(SPECIAL DESIGNS)

DES: _____ DR: _____ APPROVED: _____
CHK: _____ CHK: _____
SHEET NO. 7 OF 8 SHEETS

BRIDGE NO. _____

