

MARSHALL CO.

GRADE AND PAVE
NHSX-30-5(166)--3H-64

LETTING DATE
01-15-02

METRIC STANDARD ROAD PLANS

105-4
09-27-94

The following Standard Road Plans shall be considered applicable to construction work on this project.

NUMBER	DATE	NUMBER	DATE	NUMBER	DATE
RA-68(1)	4/30/96	RF-30A	3/28/95	RP-1	4/28/1998
RA-68(2)	4/30/96	RF-30B	1/12/1999	RP-2	10/3/2000
RA-68(3)	10/02/01	RF-31	10/28/1997	RP-3	4/28/1998
RB-3	1/12/99	RF-32	3/28/1995	RS-1	10/27/1998
RC-7	4/25/00	RF-41	10/31/1995	RS-2	10/27/1998
RC-8A	4/25/00	RF-42	3/28/1995	RS-3	6/6/1995
RC-8B	4/25/00	RH-22	1/12/1999	RS-12	4/30/1996
RC-9	4/27/99	RH-37D	4/3/2001	RS-13	4/30/1996
RE-3A	10/3/00	RH-47C	2/11/2000	RS-26A	10/28/1997
RE-3B	12/8/95	RH-50	4/27/1999	RV-4	4/25/2000
RF-1	10/3/00	RH-51	10/3/2000	RV-5	4/25/2000
RF-2	6/6/95	RH-53	4/3/2001		
RF-3	10/3/00	RH-55	4/3/2001		
RF-5	10/3/00	RL-1A	10/3/2000		
RF-13	10/28/97	RL-1B	10/3/2000		
RF-14	4/25/00	RL-2A	10/3/2000		
RF-19B	12/13/94	RL-4	9/21/1999		
RF-19C	10/3/00	RL-7	12/13/1994		
RF-19E	10/3/00	RL-9	10/3/2000		
RF-26	6/6/95				



Iowa Department of Transportation

Highway Division

PLANS OF PROPOSED IMPROVEMENT ON THE

PRIMARY ROAD SYSTEM MARSHALL COUNTY GRADE AND PAVE

FROM 4.8 KM W. OF LEGRAND TO MARSHALL AND TAMA CO. LINE

SCALES: As Noted

The Iowa Department of Transportation Standard Specifications for Highway and Bridge Construction, series of 2001, plus current supplemental specifications and special provisions shall apply to construction work on this project.

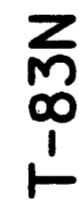
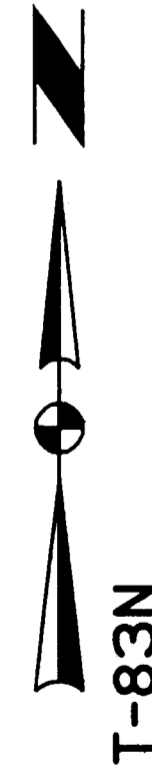
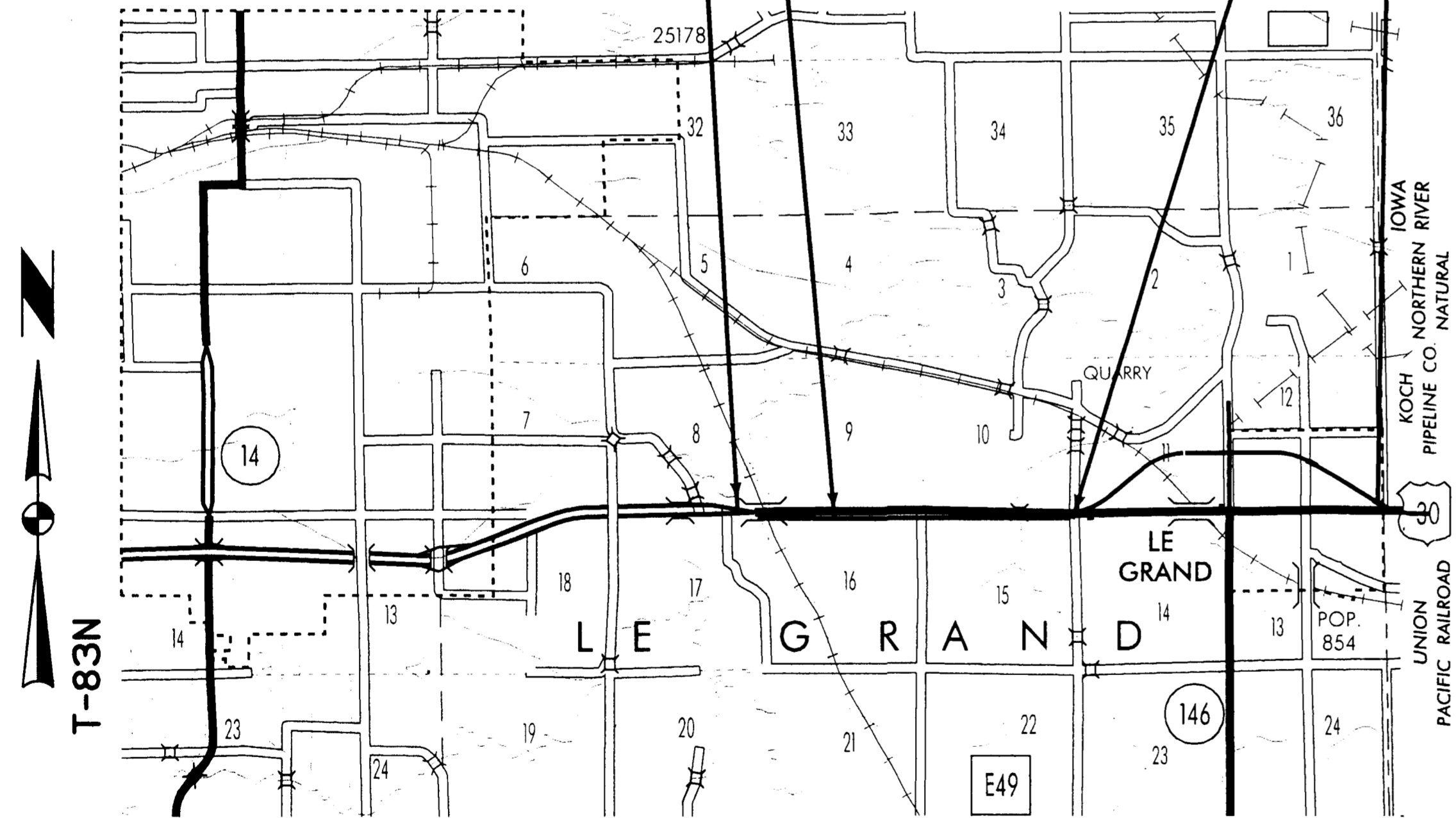
Value Engineering Saves. Refer to Standard Notation 203-4 on Sheet C.04

Equation
STA. 1126+00 (WB) BK=
STA. 4126+00 (EB) BK=
STA. 26+00 AH

STA. 1119+00 WB
STA. 4121+28 EB
BEGIN PROJECT
M.P. 188.55

Equation
Sta 47+94.217 BK =
Sta 45+53.693 AH

STA. 92+50
END PROJECT
M.P. 192.56



PROJECT LENGTH SUMMARY

105-1
09-27-94

DIV.	LOCATION	m	km
1	Sta 4121+28.22 to Sta 4126+00	471.8	0.47
	Sta 26+00 R1 to Sta 47+94.217 R1	2,194.2	2.19
	Sta EQ. 47+94.217BK-45+53.693AH	0.0	0.0
	Sta 45+53.693 R2 to 90+00 R2	4,446.3	4.45
	Total Length of Project	7,112.3	7.11

INDEX OF SHEETS

105-3
09-27-94

NO.	DESCRIPTION
A.01	Title Sheet
A.02	Location Map
A.03	Legend and Symbol Sheet
B.01-B.09	Typical Cross Sections
C.01-C.12	Estimate of Quantities and General Information
D.01-D.12	Mainline Plan & Profile Sheets
E.01-E.14	Sideroad Plan & Profile Sheets
F.01-F.07	Detour Plan & Profile Sheets
G.01-G.06	Benchmark & Reference Information
J.01-J.05	Final Pavement Markings
K.01-K.10	Interchange Geometric Staking, Jointing & Edge Profiles
L.01-L.07	Intersection Geometric Staking, Jointing & Edge Profiles
M.01-M.04	Bid Quantity & Design Sheet for Sanitary Sewer
M.05	Storm Sewer Sheets
Q.01-Q.26	Soils Sheets
R.01-R.03	Wetland Mitigation Sheets
T.01-T.08	Tabulation of Earthwork Quantities
U.01-U.06	500 Series, Modified Standards and Special Details
V.01-V.07	Bridge and RCB Situation Plans
V.08-V.09	Bid Quantities & Design Sheet for RCB
W.01-W152	Mainline Cross Sections
X.01-X.47	Sideroad Cross Sections at M.L. Sta. 322+ (60th Ave)
Y.01-Y.47	Ramp Cross Sections
Z.01-Z.27	Borrow/Wetlands Cross Sections

DESIGN DATA RURAL

2001 AADT 9560 V.P.D.
 2021 AADT 12,850 V.P.D.
 2021 DHV 1380 V.P.H.
 TRUCKS 8 %
 Total
 Design ESALs 9,920,190

REVISIONS

Form 520003 12-97

I hereby certify that this project was constructed in accordance with the contract documents, the "as-built" plans were prepared under my supervision, and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

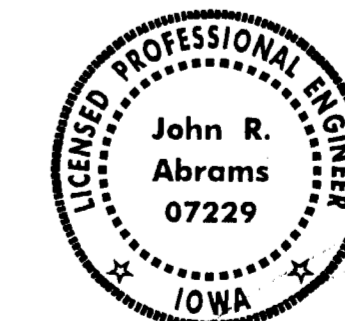
Douglas J. McDonald 4-20-2009
Project Engineer Date

My license renewal date is December 31, 2010

2002 TOM KUETER CONST. J. BRES
Year Contractor Project Inspector

INDEX OF SEALS

SHEET NO.	NAME	TYPE
A.01	John R. Abrams	Primary Signature Block
C.09	David R. Claman	Hyd. Signature Block
C.11	Robert L. Stanley	Geotech. Signature Block
M.01	H. Robert Veenstra Jr.	Sanitary Sewer Signature Block
V.08	Gordon Port	R.C.B. Signature Block

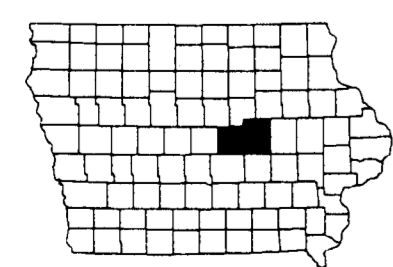


I hereby certify that this plan was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

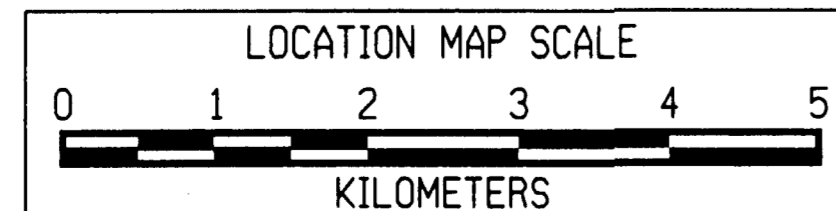
Signature *John R. Abrams* Date
Printed or Typed Name

My license renewal date is December 31, 20 02



Pages or sheets covered by this seal: A01-A03, B01-B09, C01-C08, D01-D12
E01-E14, F01-F07, G01-G06, J01-J05, K01-K10, L01-L07, M05, R01-R03, T01-T08
U01-U06, V01-V07, W01-W152, X01-X47, Y01-Y47, Z01-Z27



128
BIC



* 200 *

Proposed Roadway 
 Existing Roadway 

Permanent Paving
 Sta. 24+60 R1 to 47+30 R1

Grading of Proposed U.S. 30 and Grading and Paving of (T-37/IA 146), grading and granular surfacing of 235th street and Johnson's Drive
 Sta. 51+35 R2 to 84+00 R1

Permanent Paving
 Sta. 88+74.91 R2 to 92+50 R2

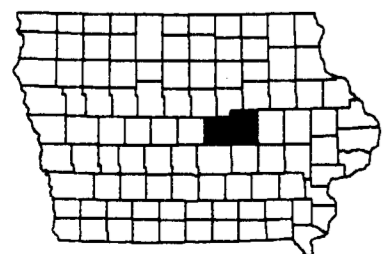


Temporary Tie-in not used for this project
 Sta. 4121+28.22 to 4124+60.00

Temporary Tie-in not used for this project
 Sta. 2047+30 to 2052+99.55

Temporary Tie-in not used for this project
 Sta. 2085+53.34 to 2088+74.91

Project Work Overview
 Marshall / Tama - U.S. 30



STANDARD SYMBOLS

	Interstate Highway Symbol		Fire Hydrant		Guardrail (Beam or Cable)
	U.S. Highway Symbol		Water Hydrant (Rural)		Guard Post (one or two)
	Iowa Highway Symbol		Septic Tank		Guard Post (over two)
	County Road Highway Symbol		Cistern		Filler Pipe
	Evergreen Tree		L.P. Gas Tank (No Footing)		Gas Valve
	Deciduous Tree		Underground Storage Tank		Water Valve
	Fruit Tree		Latrine		Speed Limit Sign
	Shrub (Bushes)		Luminaire		Mile Marker Post
	Timber		Traffic Signal		Sign
	Hedge		Traffic Signal with Luminaire		Water Hook Up
	Stump		Telephone Pedestal		Radio Tower
	Swamp		Television Pedestal		Electric Box
	Rock Outcrop		Telephone Pole		Traffic Signal Control Box
	Broken Concrete		Telephone Pole (Second Company)		Rail Road Signal Control Box
	Revetment (Rip Rap)		Telephone Pole (Third Company)		Telephone Switch Box
	Cemetery		Telephone Pole (Fourth Company)		
	Grave		Telephone Pole (Fifth Company)		
	Cave		Power Pole		
	Sink Hole		Power Pole (Second Company)		
	Board Fence		Power Pole (Third Company)		
	Chain Link Fence		Power Pole (Fourth Company)		
	Barbwire Fence		Power Pole (Fifth Company)		
	Security Fence		Electrical Highline Tower (Metal or Concrete)		
	Woven Fence		Telephone Riser Pole		
	Barbwire and Woven Fence		Power Riser Pole		
	Terrace		Telegraph Pole		
	Earth Dam or Dike (Existing)		Satellite TV Dish		
	Earth Dam or Dike (Proposed)		Existing Water Line		
	Tile Outlet		Existing Water Line (Second Company)		
	Edge of Water		Existing Sanitary Sewer Line		
	Existing Drainage		Existing Telephone Line		
	Proposed Drainage		Existing Telephone Line (Second Company)		
	Right of Way Rail or Lot Corner		Existing Fiber Optics Telephone Line		
	Concrete Monument		Existing Storm Sewer Line		
	Well		Existing Gas Line		
	Windmill		Existing High Pressure Gas Line		
	Beehive Intake		Existing Gas Line (Second Company)		
	Existing Intake		Existing High Pressure Gas Line (Second Company)		
	Proposed Intake		Existing Power Line		
	Existing Utility Access (Manhole)		Existing Power Line (Second Company)		
	Proposed Utility Access (Manhole)		Cable Television Line		

UTILITY LEGEND

GTE
Eleventh Avenue
Grinnell, IA 50112-0330

Central Iowa Water
2051 South 24th Ave. West
Newton, IA 50208-8928

McLead USA Telecom. Services
3600 109th Street
Urbandale, IA 50322

IES Utilities
1284 XE Pl.
Boone, IA 50036

US West Communications
2103 E. University
Des Moines, IA 50317-5252

MWR
3rd Ave. SE
Town Center Suite 500
Cedar Rapids, IA 52401

Marshall County
Rural Electric Coop
2908 South Central Street
Marshalltown, IA 50158

RIGHT OF WAY LEGEND

- Proposed Right of Way
- Existing Right of Way
- Existing and Proposed Right of Way
- Easement and Existing Right of Way
- Borrow
- Easement (Temporary)
- Easement
- Excess
- Property Line
- Access Control

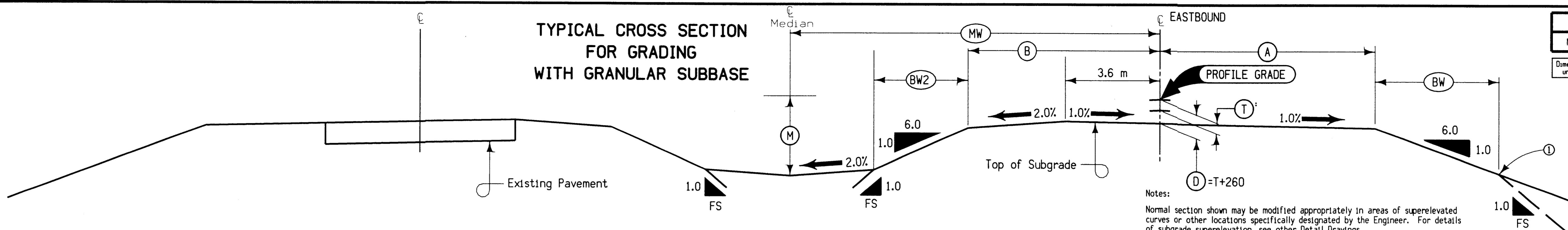
CONVENTIONAL SIGNS

- Station Reference Point Survey Line
- Section Corner
- Proposed Profile Grade
- Railroad
- Existing Proposed Field Tile
- Existing Proposed Culverts
- Stream

Legend And Symbol Information Sheet

(Symbols are Typical Only, actual size may vary)

TYPICAL CROSS SECTION FOR GRADING WITH GRANULAR SUBBASE

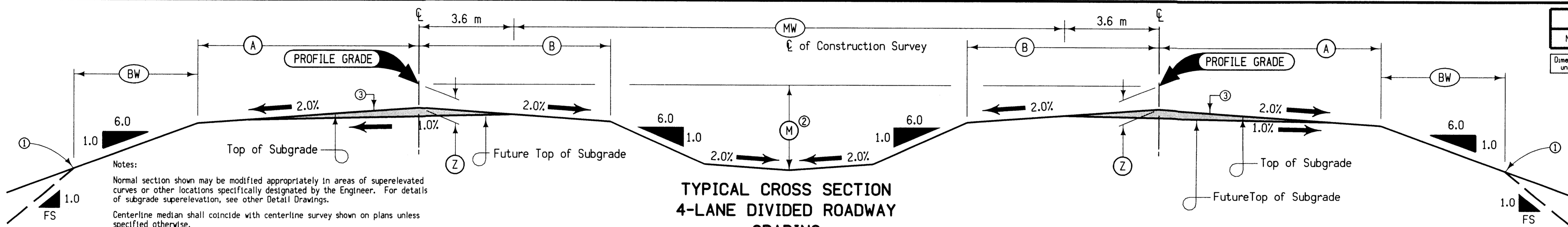


5103
Modified
Dimensions in mm unless noted.

LOCATION		A	B	MW	T	D	M	BW	BW2	SLOPE
ROAD IDENTIFICATION	STATION TO STATION	m	m	m	mm	m	m	m	m	FS
U.S. 30 EB	4124+60 4126+00 EQ.	9.7	8.5	Vari	260	520	Vari	4.94	Vari	3
U.S. 30 EB	26+00 EQ. 47+30	9.7	8.5	Vari	260	520	Vari	4.94	Vari	3
U.S. 30 EB	88+74.910 92+50	9.7	8.5	Vari	260	520	Vari	4.94	Vari	3

Notes:
Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer. For details of subgrade superelevation, see other Detail Drawings.
Centerline median shall coincide with centerline survey shown on plans unless specified otherwise.
For typical cross sections of ditches and backslopes for roadway in cut, refer to other detail drawings within the plans.
① Refer to Detail Project Plan and Cross Sections for specific locations of foreslope change.
② Design depth of median ditch.

TYPICAL CROSS SECTION 4-LANE DIVIDED ROADWAY GRADING



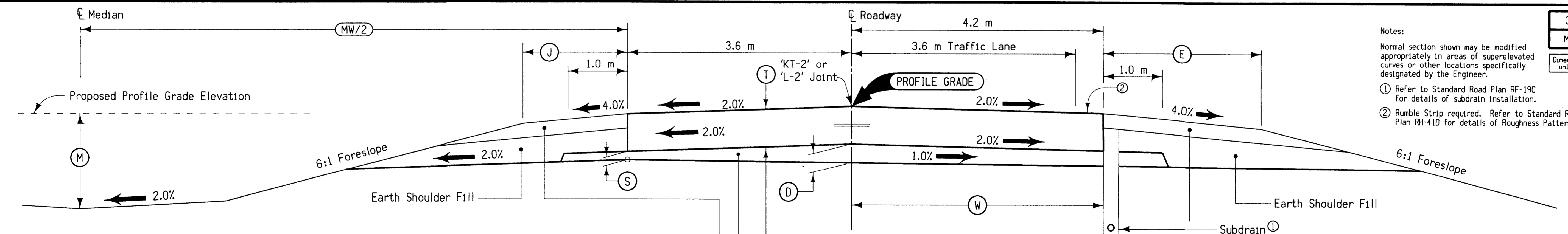
5104
Modified
Dimensions in mm unless noted.

LOCATION		A	B	MW	Z	M	BW	SLOPE
ROAD IDENTIFICATION	STATION TO STATION	m	m	m	mm	m	m	FS
U.S. 30 EBL & WBL	51+35 R2 84+00 R2	9.7	8.5	28.0	415	1.2	4.94	3

Notes:
Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer. For details of subgrade superelevation, see other Detail Drawings.
Centerline median shall coincide with centerline survey shown on plans unless specified otherwise.
① Refer to Detail Project Plan and Cross Sections for specific locations of foreslope change.
② Median Ditch is measured from Profile Grade at centerline of pavement.
③ The constructed top of subgrade shall not be more than 40 millimeters above the top of subgrade shown above.
④ Design depth of median ditch.

Notes:
Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.
① Refer to Standard Road Plan RF-19C for details of subdrain installation.
② Rumble Strip required. Refer to Standard Road Plan RH-41D for details of Roughness Pattern.

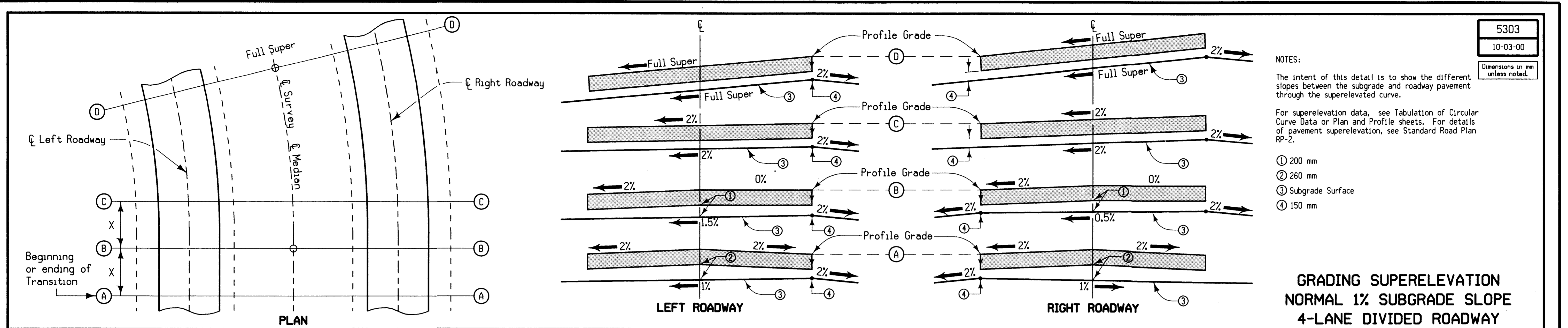
3217A
Modified
Dimensions in mm unless noted.



LOCATION		T	S	D	E	J	MW	M	W
ROAD IDENTIFICATION	STATION TO STATION	mm	mm	mm	m	m	m	m	m
U.S. 30 EB	4124+60 4126+00 EQ.	260	150	260	2.4	1.8	Vari.	Vari.	4.2
U.S. 30 EB	26+00 EQ. 47+30	260	150	260	2.4	1.8	Vari.	Vari.	4.2
U.S. 30 EB	88+74.910 92+50	260	150	260	2.4	1.8	Vari.	Vari.	4.2

PCC Pavement Class "C", Refer to Standard Road Plan RH-53.
Granular Subbase
Granular Shoulder. Refer to Typical Drawing 7110.

TYPICAL CROSS SECTION 4-LANE DIVIDED ROADWAY PCC PAVING WITH GRANULAR SHOULDERS

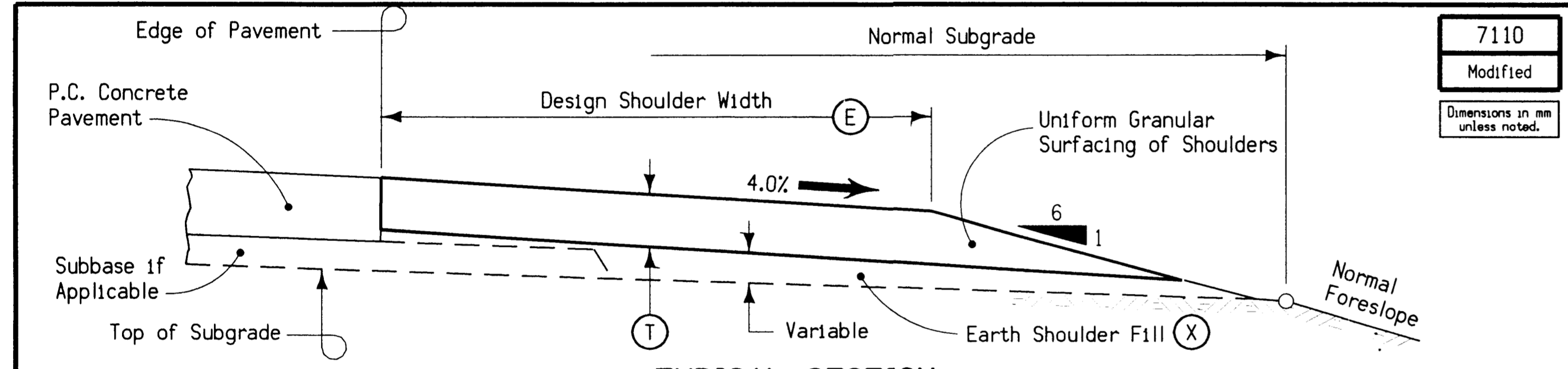


5303
10-03-00
Dimensions in mm unless noted.

NOTES:
The intent of this detail is to show the different slopes between the subgrade and roadway pavement through the super-elevated curve.
For super-elevation data, see Tabulation of Circular Curve Data or Plan and Profile sheets. For details of pavement super-elevation, see Standard Road Plan RP-2.

① 200 mm
② 260 mm
③ Subgrade Surface
④ 150 mm

**GRADING SUPERELEVATION
NORMAL 1% SUBGRADE SLOPE
4-LANE DIVIDED ROADWAY**

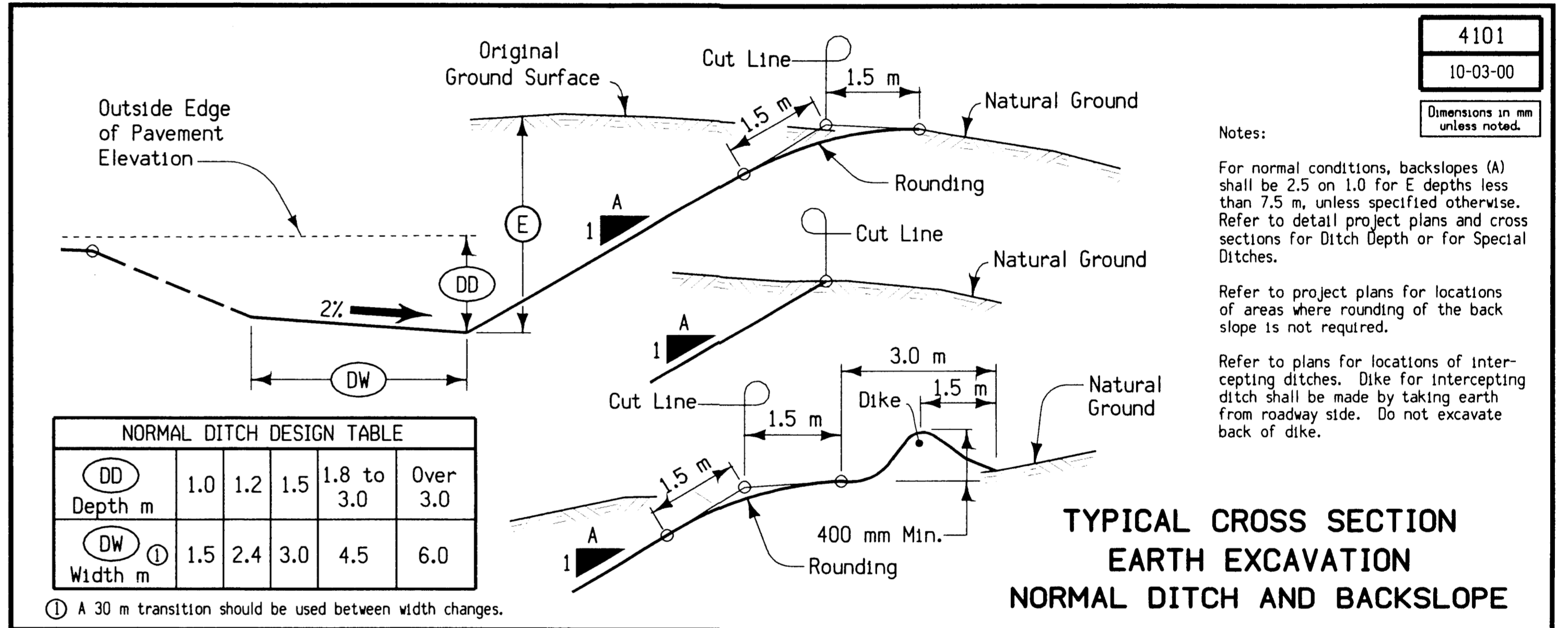


**TYPICAL SECTION
TYPE 'A' OR 'B' GRANULAR SHOULDER
Adjacent to PCC Pavement**

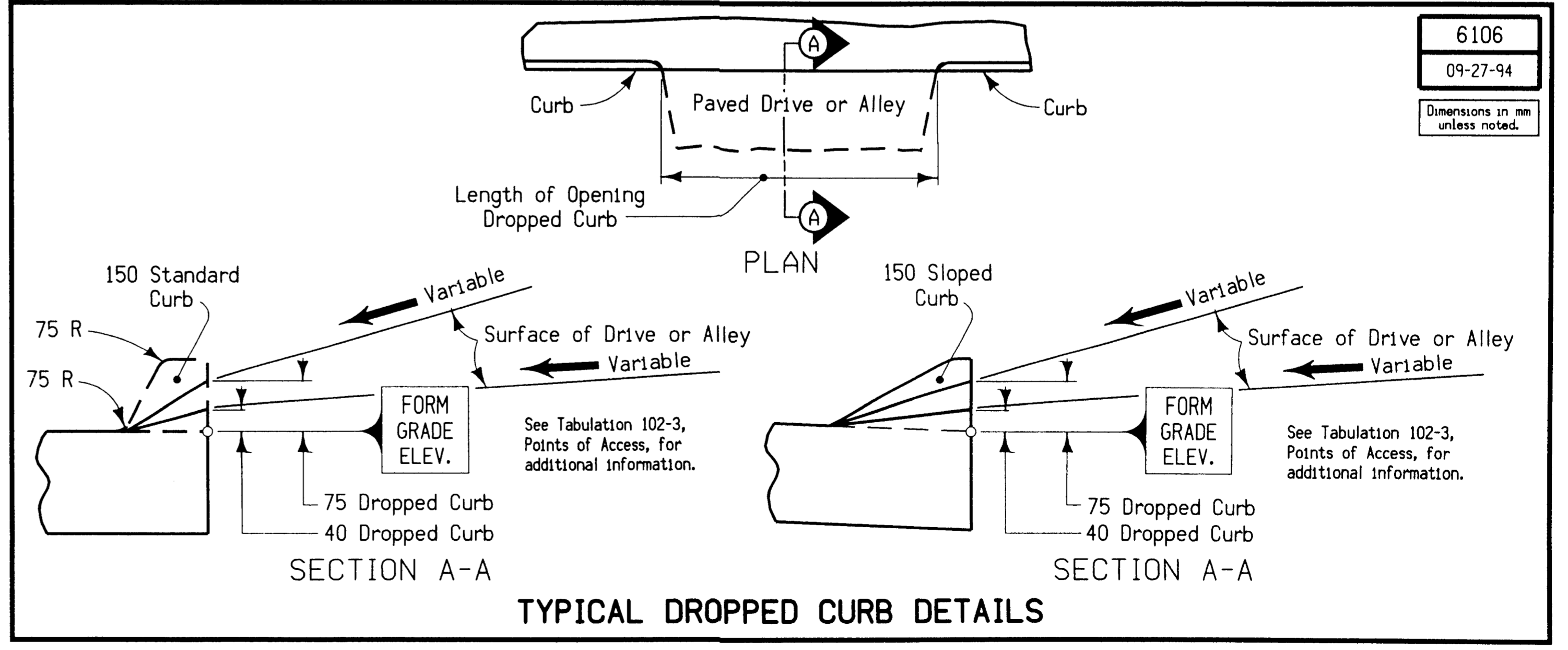
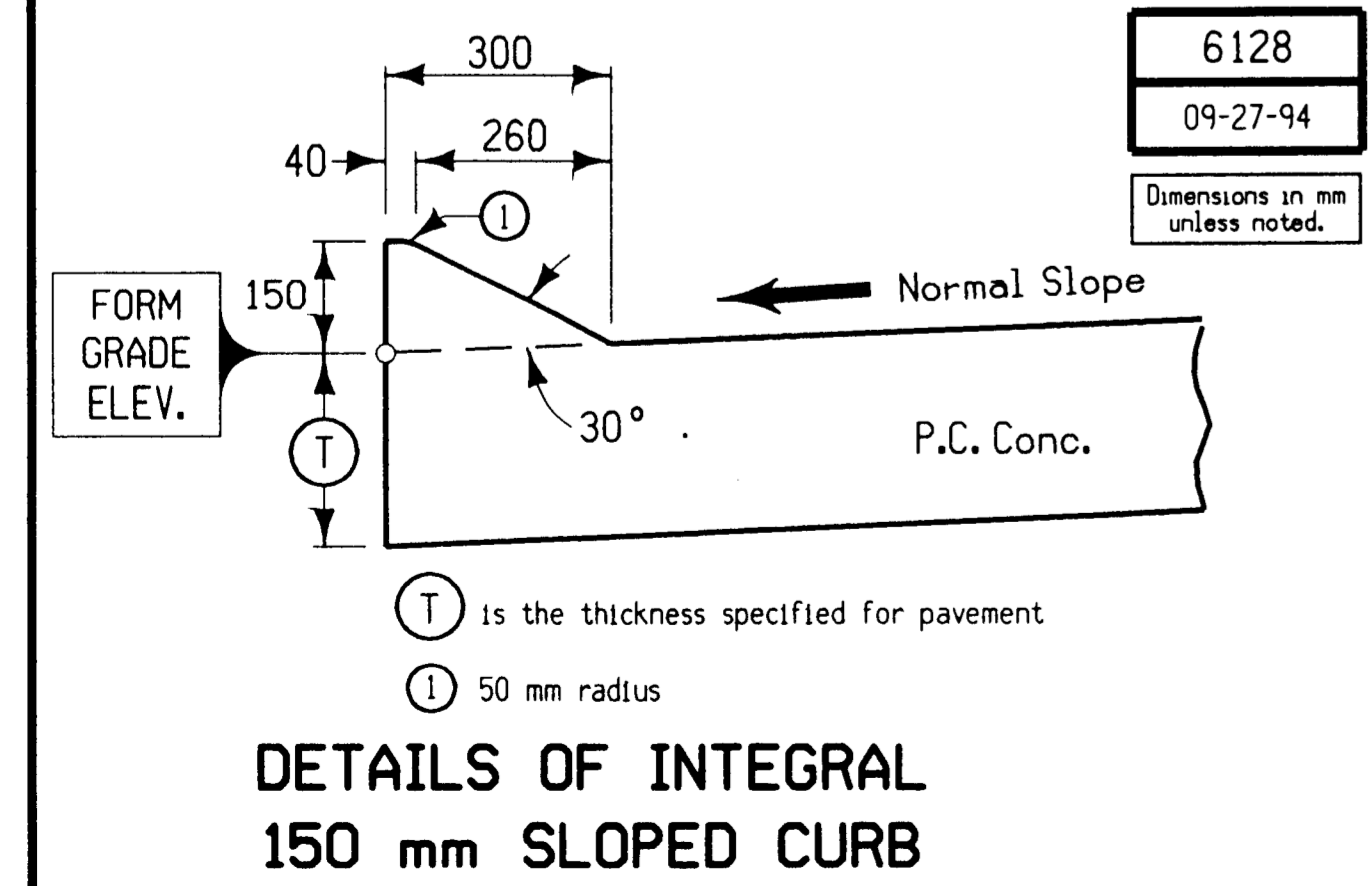
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Dimensions in mm unless noted.

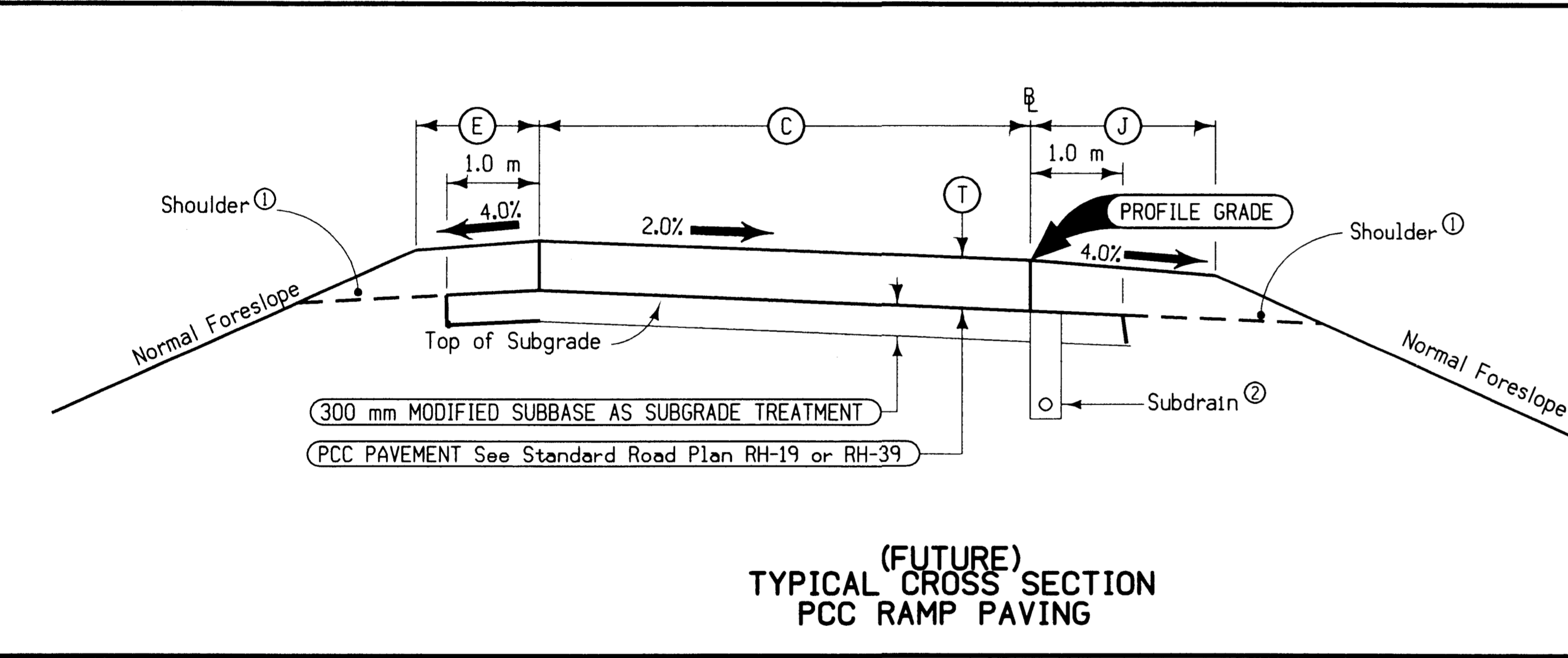
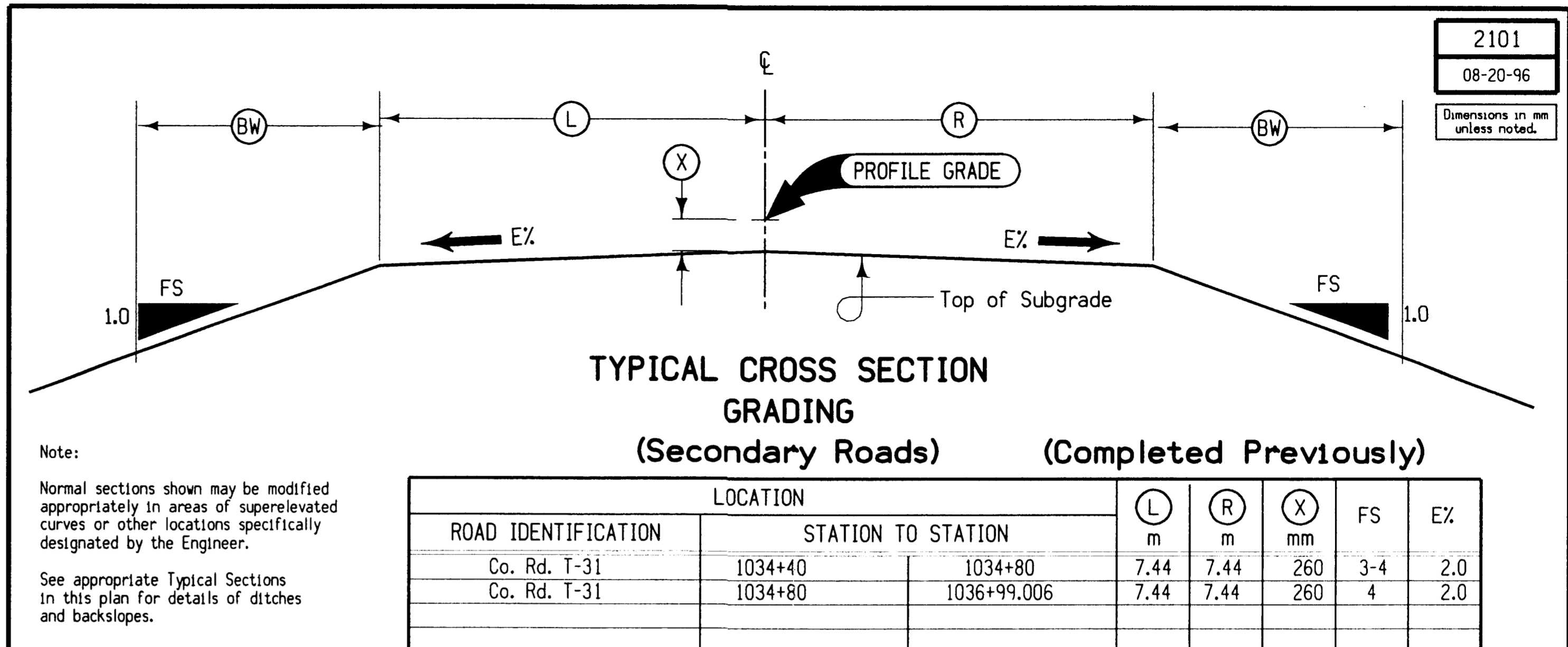
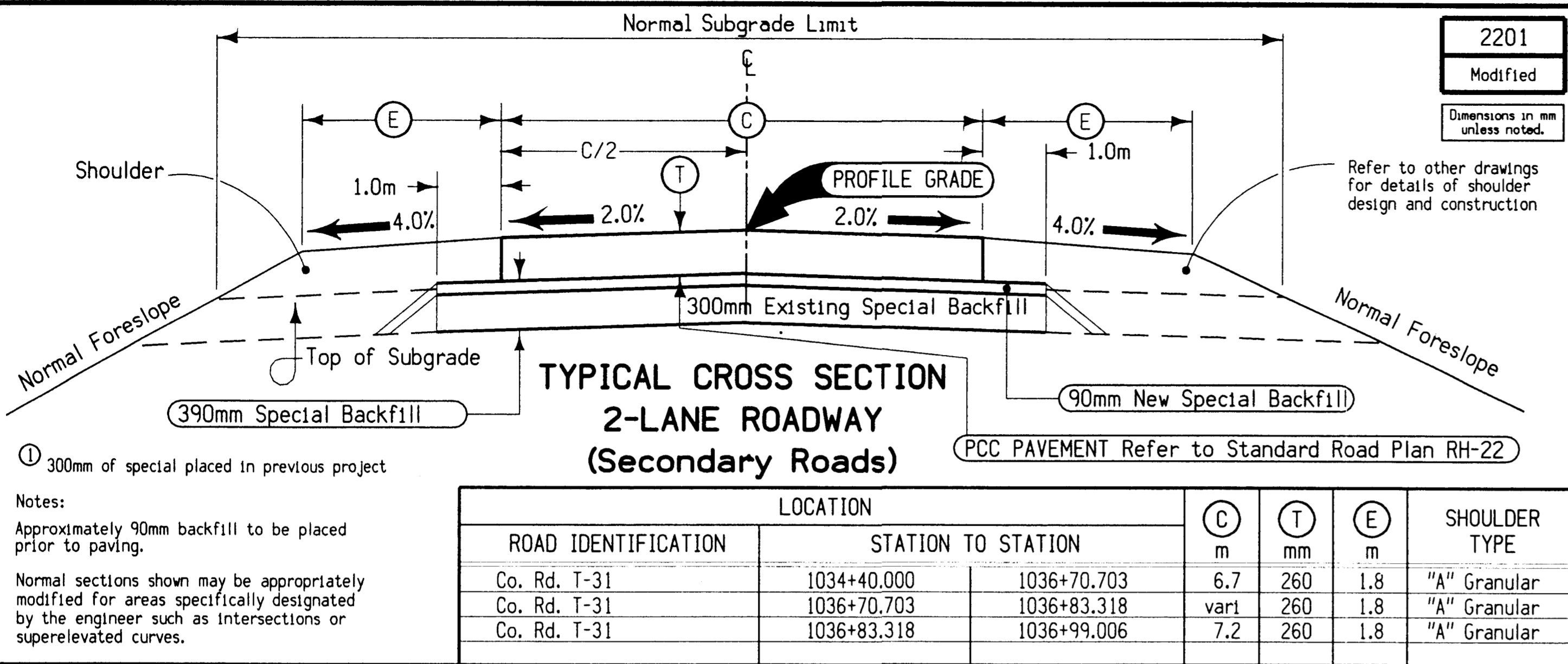
ROAD IDENTIFICATION		STATION TO STATION		E	T	SIDE	X
		LOCATION		m	mm		m ³
U.S. 30 Detour	EB	4121+28.22	4124+60	0.6	150	Rt	14.32
U.S. 30 Detour	EB	4123+00	4124+60	0.6	150	Lt	14.32
U.S. 30	EB	24+60	47+30	2.4	150	Out	124.4
U.S. 30	EB	24+60	47+30	1.8	150	In	92.7
U.S. 30 Detour	EB	2047+30	2052+99.55	0.6	150	Rt	14.32
U.S. 30 Detour	EB	2047+30	2051+60	0.6	150	Lt	14.32
Co. Rd. T-31		1034+40	1036+99.006	1.8	150	Lt&Rt	135.9
U.S. 30 Detour	EB	2083+81.05	2088+74.91	0.6	150	Rt	14.32
U.S. 30 Detour	EB	2085+50.00	2088+74.91	0.6	150	Lt	14.32
U.S. 30	EB	88+74.91	92+50	2.4	150	Out	124.4
U.S. 30	EB	88+74.91	92+50	1.8	150	In	92.7
Co. Rd. T-37/IA146		1464+00.00	1477+15.85	1.8	150	Lt	94.3
Co. Rd. T-37/IA146		1465+20.00	1477+15.85	1.8	150	Rt	94.3

Note:
Earth Shoulder fill requires approximately X cubic meters of excavation, including 40% for shrinkage, per station.
See Standard Road Plan RH-370 for construction requirements.



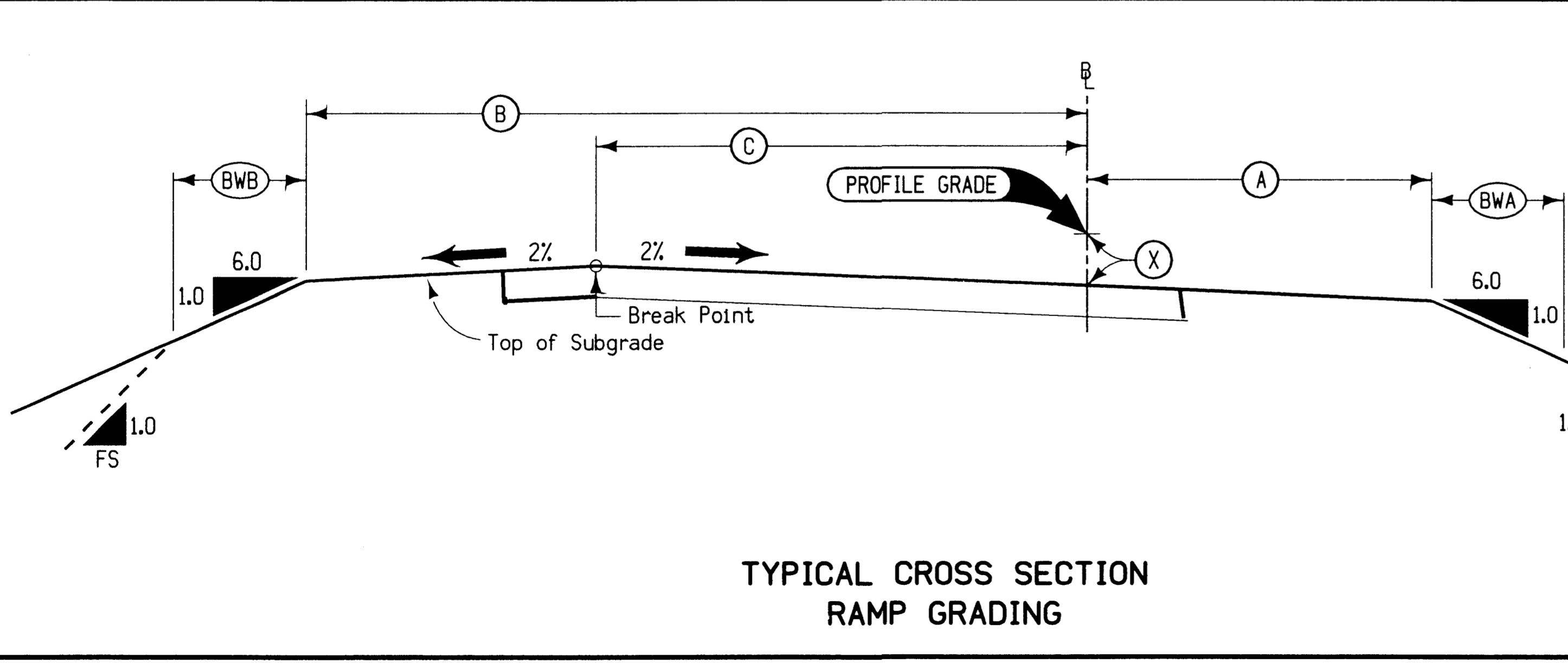
**TYPICAL CROSS SECTION
EARTH EXCAVATION
NORMAL DITCH AND BACKSLOPE**





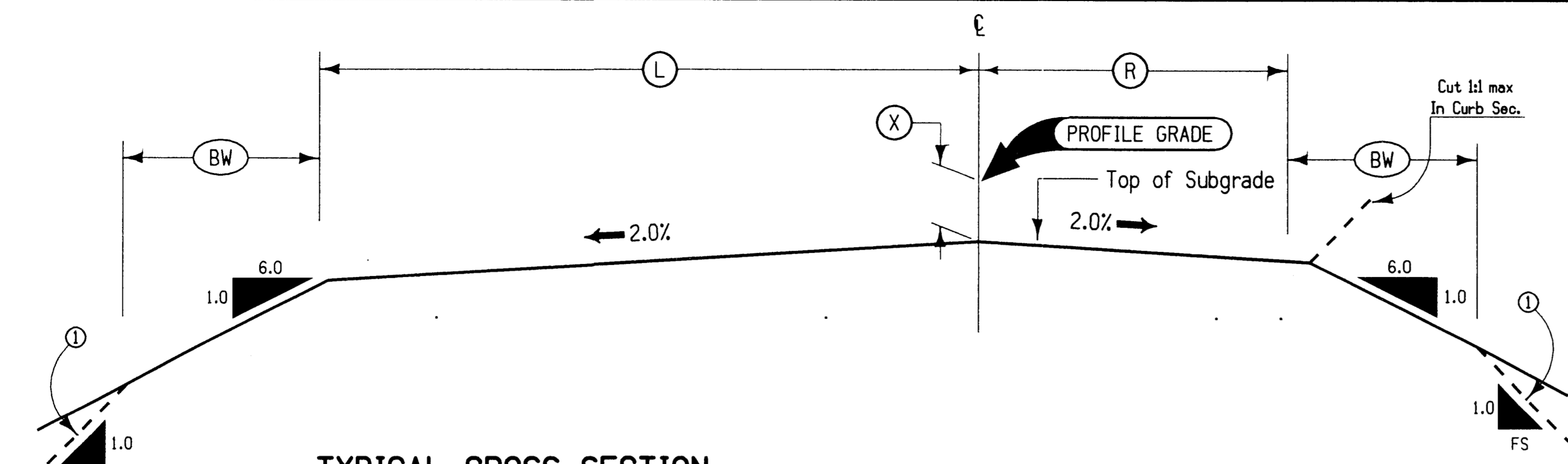
2503
Modified
Dimensions in mm unless noted.

LOCATION		DIMENSIONS				SHOULDER TYPE
INTERCHANGE	RAMP	T	C	E	J	
		mm	m	m	m	
IA 146	A, B	260	4.8	1.2	1.8	Granular
IA 146	C, D	260	4.8	1.2	1.8	Granular



2512A
Modified
Dimensions in mm unless noted.

LOCATION		DIMENSIONS						
INTERCHANGE	RAMP	A	B	C	X	FS	BWB	BWA
		m	m	m	mm		m	m
IA 146	A, B	4.90	9.18	4.8	410	3	6.12	5.60
IA 146	C, D	4.90	9.18	4.8	410	3	6.12	5.60



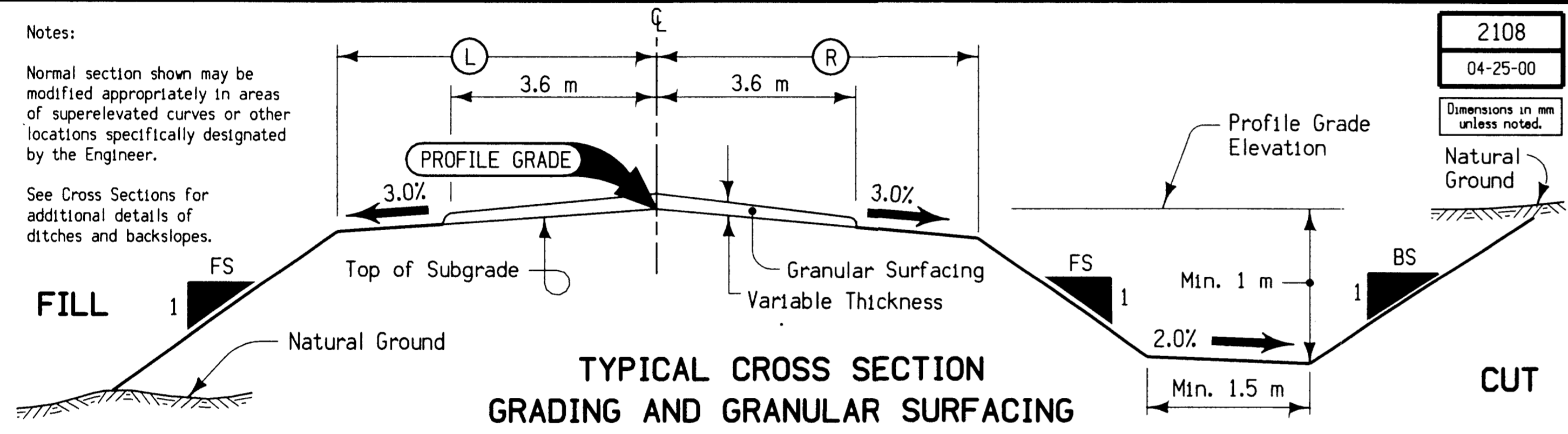
ROAD IDENTIFICATION	LOCATION		L m	R m	SUBGRADE SLOPE L or R	X mm	BW m	FS
	STATION TO STATION							
IA 146	1462+40	1464+00	13.04	5.2	2.0	410	4.96	3.0
IA 146	1464+00	1465+20	13.89	5.2	2.0	410	4.96	3.0
IA 146	1465+20	1469+08	13.89	9.09	2.0	410	4.96	3.0
IA 146	1469+08	1472+40.011	13.89+8.25	9.09+8.25	2.0	410	4.96	3.0
IA 146	1472+40.011	1477+15.847	8.25	8.25	2.0	260	5.78	3.0

Notes:
Normal sections shown will be modified appropriately in areas of super-elevated curves or other areas designated by the Engineer. See Typical Drawing 2114.
See appropriate Typical Sections in this plan for details of ditches and backslopes.

TYPICAL CROSS SECTION
2-LANE ROADWAY
GRADING

① Refer to Detail Project Plan and Cross Section for specific location of foreslope change.

Subgrade Slope Transition, shall take place within a distance of 15 meters.

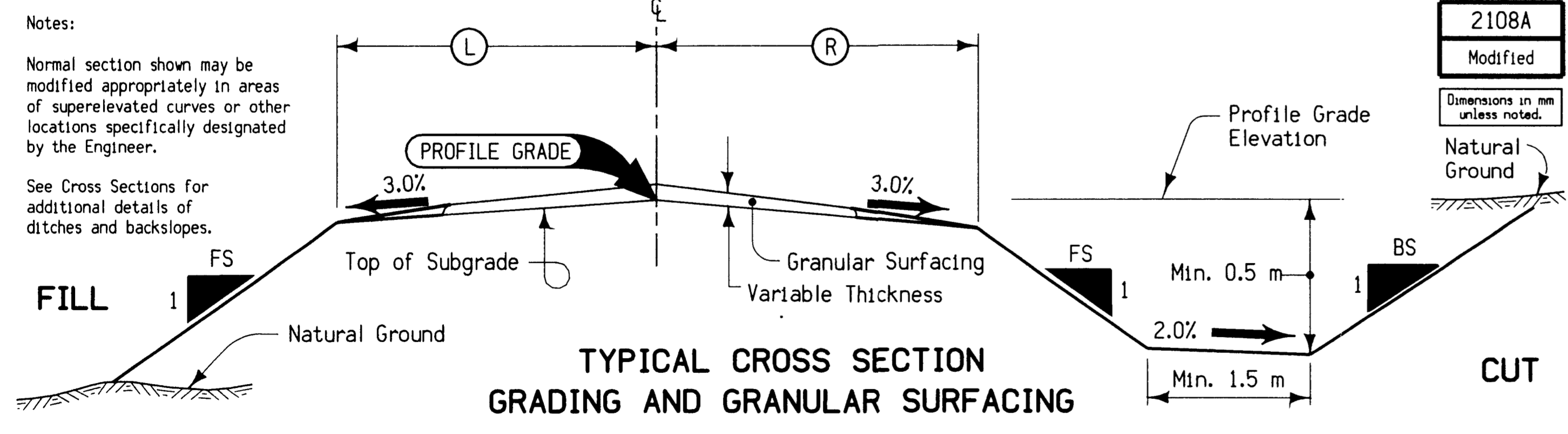


Notes:
Normal section shown may be modified appropriately in areas of super-elevated curves or other locations specifically designated by the Engineer.
See Cross Sections for additional details of ditches and backslopes.

Granular Surfacing shall be placed as follows:
Stage 1 (Grading) Design application rate is 1245 Mg/km.
Stage 2 (Paving) Design application rate is 250 Mg/km.

TYPICAL CROSS SECTION
GRADING AND GRANULAR SURFACING

ROAD IDENTIFICATION	LOCATION		DIMENSIONS		SLOPES		
	STATION TO STATION		L m	R m	FS	BS	
SR Rt IA 146/T-37	1469+80	9000+91.442	9008+98.392	4.3	4.3	3	2.5
SR Rt 89+43 ("AA" Ave)	5089+24.64	5089+07.00	5089+07.00	4.3	4.3	3	2.5

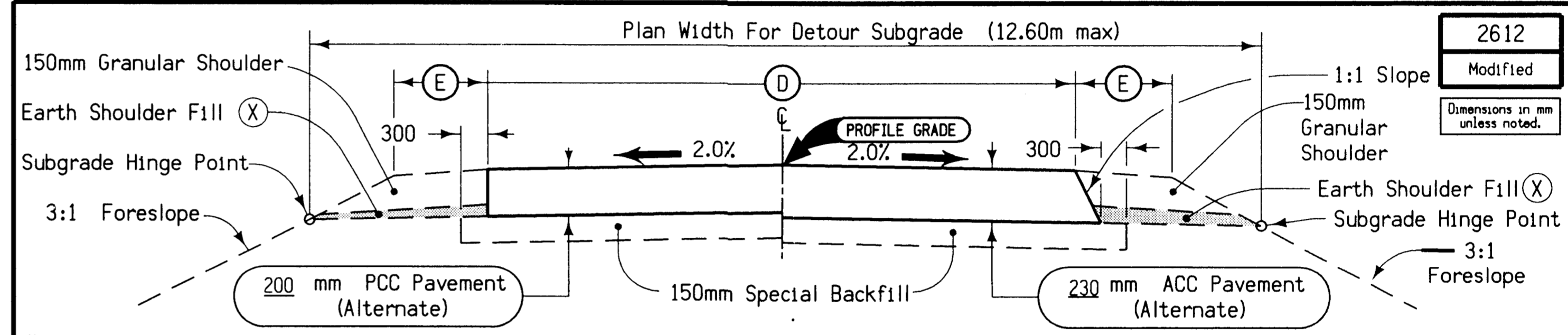


Notes:
Normal section shown may be modified appropriately in areas of super-elevated curves or other locations specifically designated by the Engineer.
See Cross Sections for additional details of ditches and backslopes.

Granular Surfacing shall be placed as follows:
Stage 1 (Grading) Design application rate is 850 Mg/km.
Stage 2 (Paving) Design application rate is 200 Mg/km.

TYPICAL CROSS SECTION
GRADING AND GRANULAR SURFACING

ROAD IDENTIFICATION	LOCATION		DIMENSIONS		SLOPES		
	STATION TO STATION		L m	R m	FS	BS	
Driveway Lt IA 146/T-37	1469+80	1300+00.00	1304+25.24	2.5	2.5	3	2.5



Notes:
Details indicated hereon illustrate the general requirements for the construction of a paved detour section where the pavement may be constructed as either of two types at the option of the contractor.
The P.C. Concrete option shall be constructed in conformance with current specifications for Class "A" P.C. Concrete Pavement. Transverse joints, center tie bars and sealing of the center longitudinal joint are not required.
The Asphalt Cement Concrete option shall be constructed in conformance with current specifications for Type "B" Asphalt Cement Concrete Base (Class 1), an approved commercial mix or a mix of higher quality.

TYPICAL CROSS SECTION
DETOUR PAVEMENT ALTERNATES

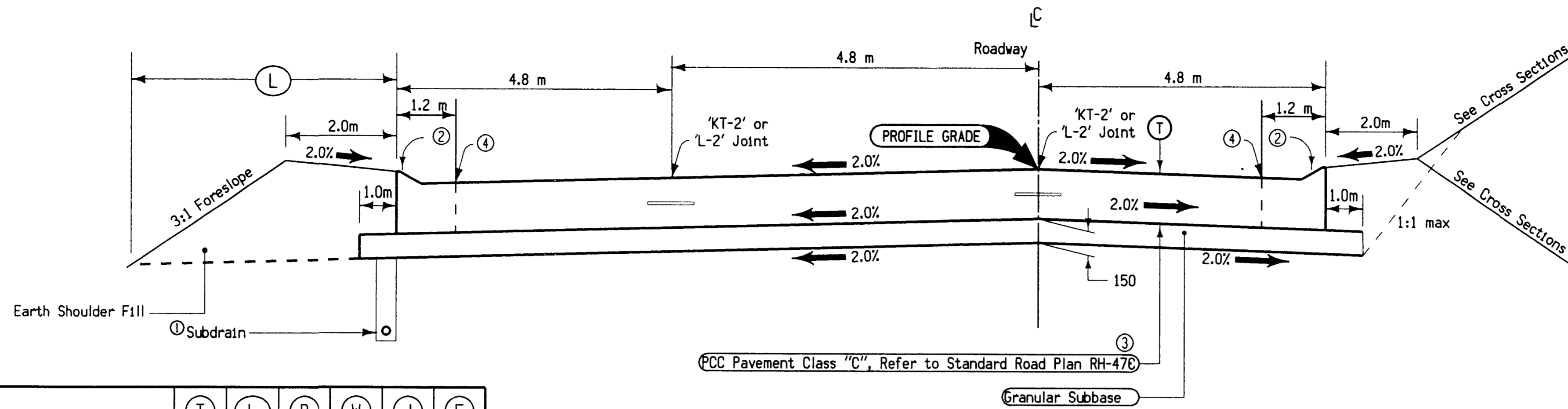
STATION TO STATION	LOCATION		D Meters	E Meters	GRANULAR SHOULDER, TYPE "A"		X ① m ³ ②
					① Mg	②	
4121+28.22	4122+12.54	4122+12.54	1.8	0.6	38.94	14.32	
4122+12.54	4122+93.92	4122+93.92	1.8-8.4	0.6	38.94	14.32	
4122+93.92	4124+60.00	4124+60.00	8.4	0.6	38.94	14.32	
2047+30.00	2051+59.676	2051+59.676	8.4	0.6	38.94	14.32	
2051+59.676	2052+99.55	2052+99.55	8.4-0.6	0.6	38.94	14.32	
2083+81.05	2085+53.338	2085+53.338	0.6-8.4	0.6	38.94	14.32	
2085+53.338	2088+74.91	2088+74.91	8.4	0.6	38.94	14.32	
1461+89.000	1462+40.000	1462+40.000	6.3	0.6	38.94	14.32	

The price bid for "Detour Pavement" in square meters will be considered full compensation for building the Detour Pavement as detailed hereon.
Earth Shoulder Fill requires approximately X cubic meters of excavation; including 40% for shrinkage.
① Per shoulder per station. See Typ. 7110 for additional info.
② Quantities Calculated Assuming Asphalt Pavement

Notes:

Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

- ① Refer to Standard Road Plan RF-19C for details of subdrain installation.
- ② See Detail 6128 for curb detail
- ③ RH-47C is for reference only. This typical supercedes all dimensions on the standard
- ④ KT-2 joint required only if shoulder not paved with adjacent lane



3217B

Modified

Dimensions in mm unless noted.

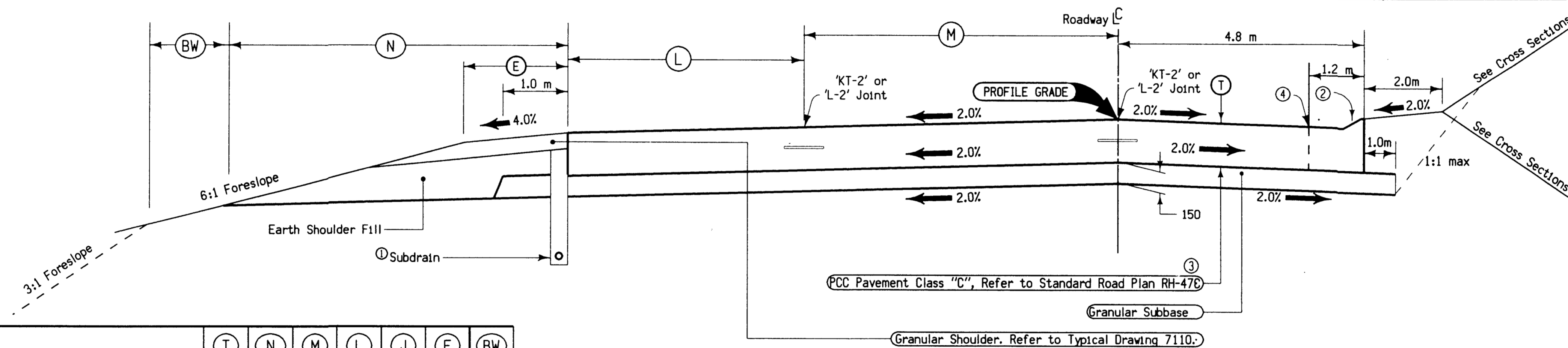
LOCATION		T	L	B	W	J	E
ROAD IDENTIFICATION	STATION TO STATION	mm	m	m	m	m	m
IA 146/T-37	1462+40 1464+00	260	4.04	-	-	-	-

**TYPICAL CROSS SECTION
2-LANE DIVIDED ROADWAY
PCC PAVING
WITH CURBS**

Notes:

Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

- ① Refer to Standard Road Plan RF-19C for details of subdrain installation.
- ② See Detail 6128 for curb detail
- ③ RH-47C is for reference only. This typical supercedes all dimensions on the standard
- ④ KT-2 joint required only if shoulder not paved with adjacent lane



3217C

Modified

Dimensions in mm unless noted.

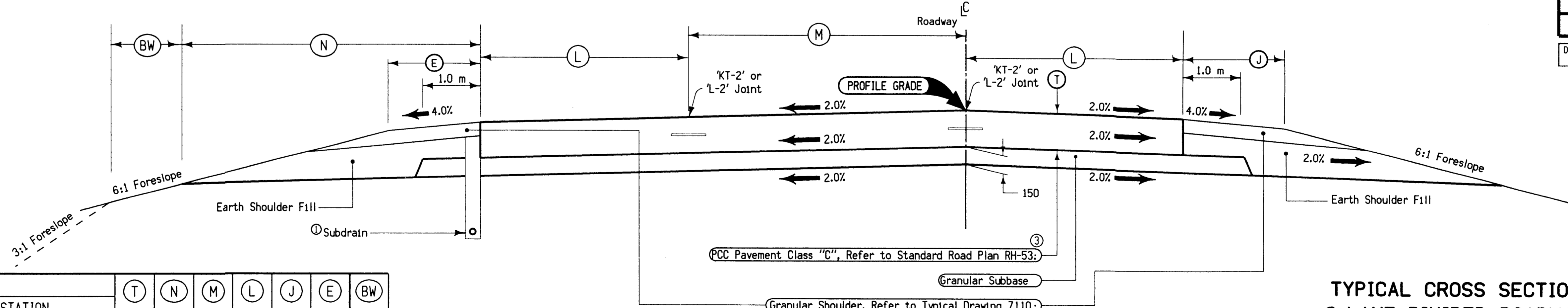
LOCATION		T	N	M	L	J	E	BW
ROAD IDENTIFICATION	STATION TO STATION	mm	m	m	m	m	m	m
IA 146/T-37	1464+00 1465+20	260	4.89	4.8	4.2	-	1.8	4.93

**TYPICAL CROSS SECTION
2-LANE DIVIDED ROADWAY
PCC PAVING
WITH GRANULAR SHOULDERS**

Notes:

Normal section shown may be modified appropriately in areas of superelevated curves or other locations specifically designated by the Engineer.

- ① Refer to Standard Road Plan RF-19C for details of subdrain installation.
- ② No Subdrains will be required in this station range
- ③ RH-53 is for reference only. This typical supercedes all dimensions on the standard



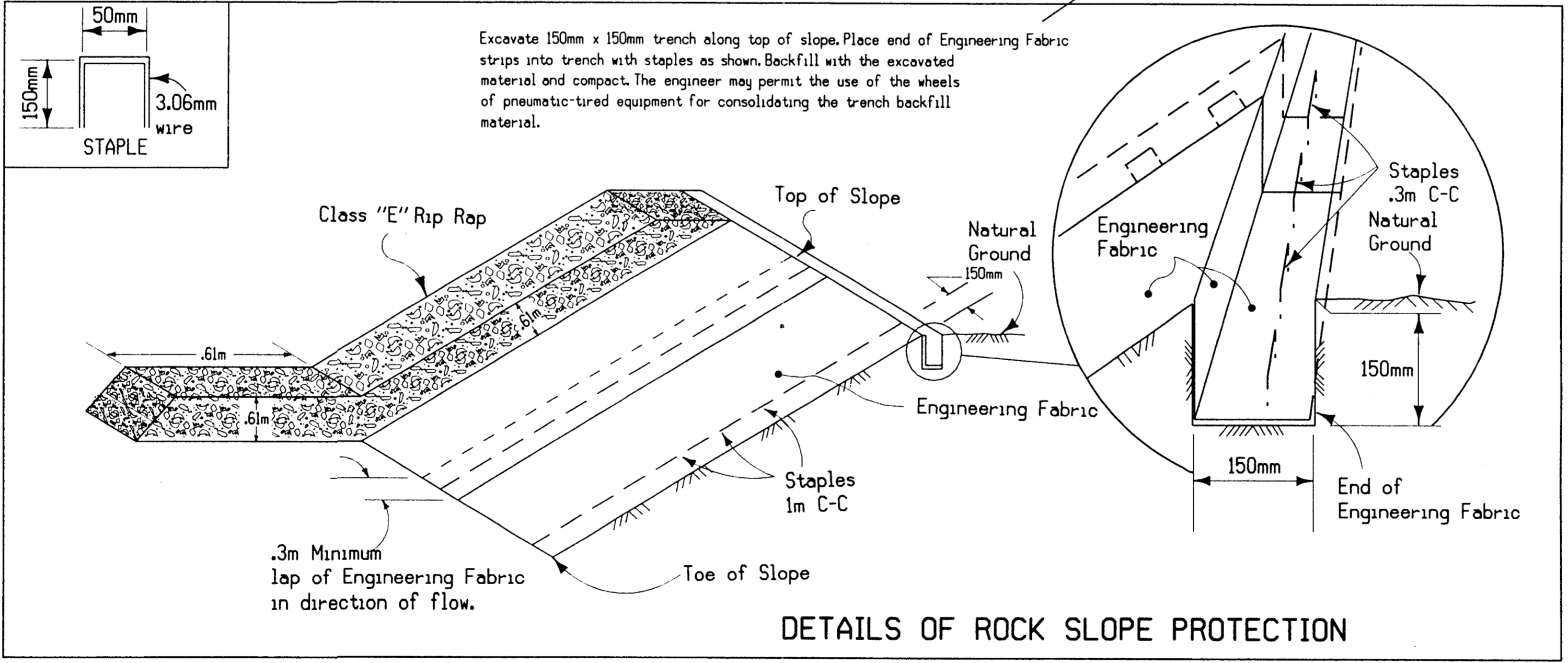
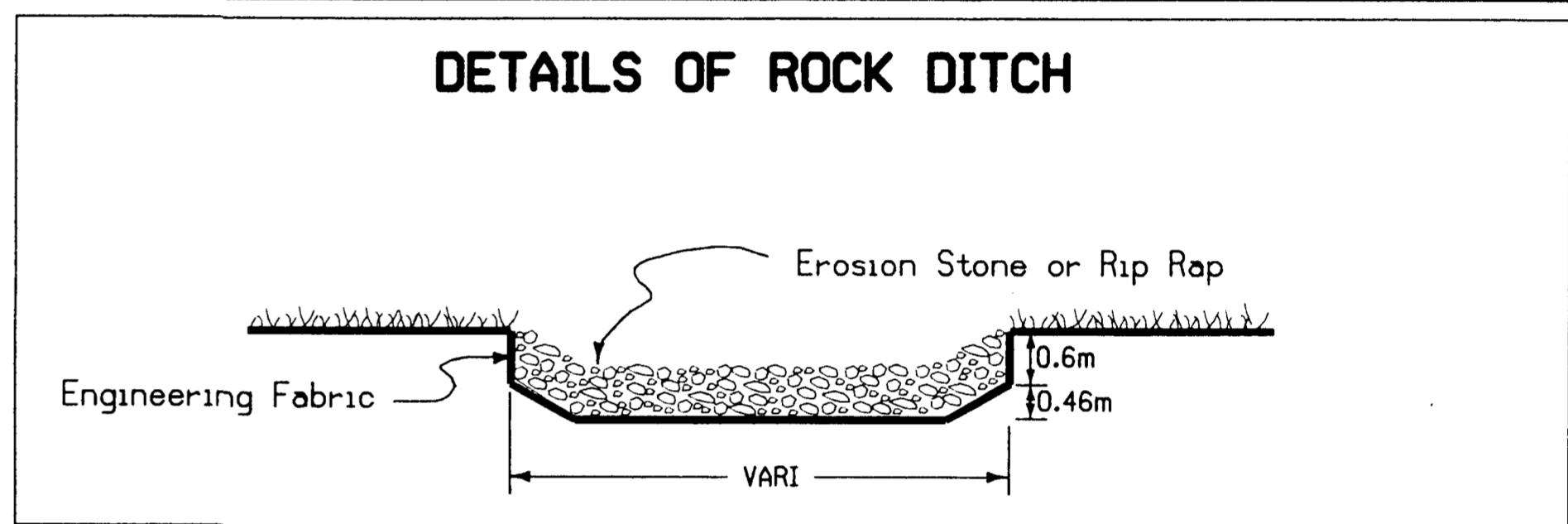
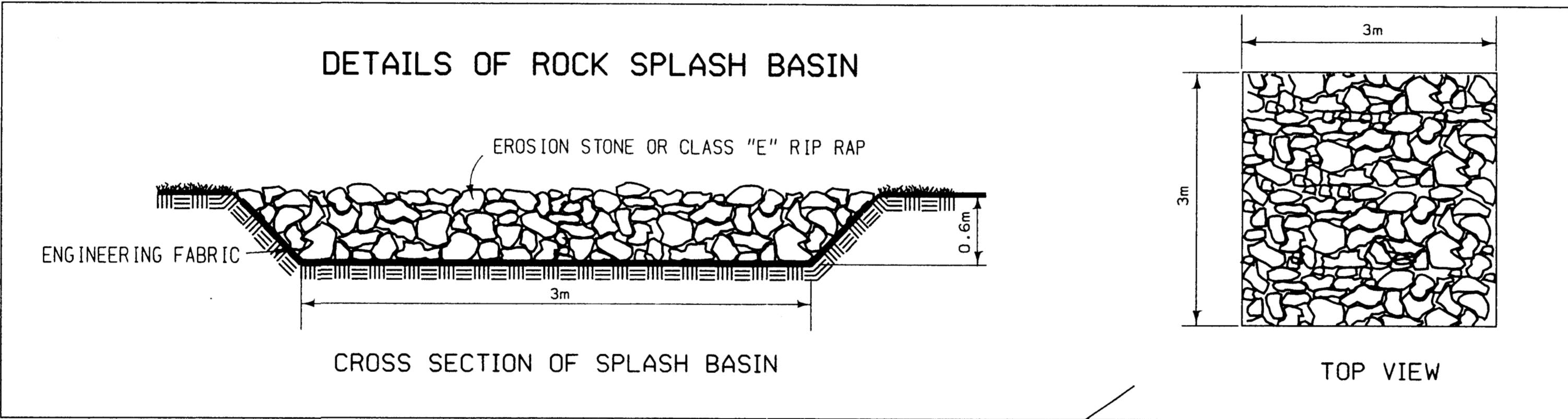
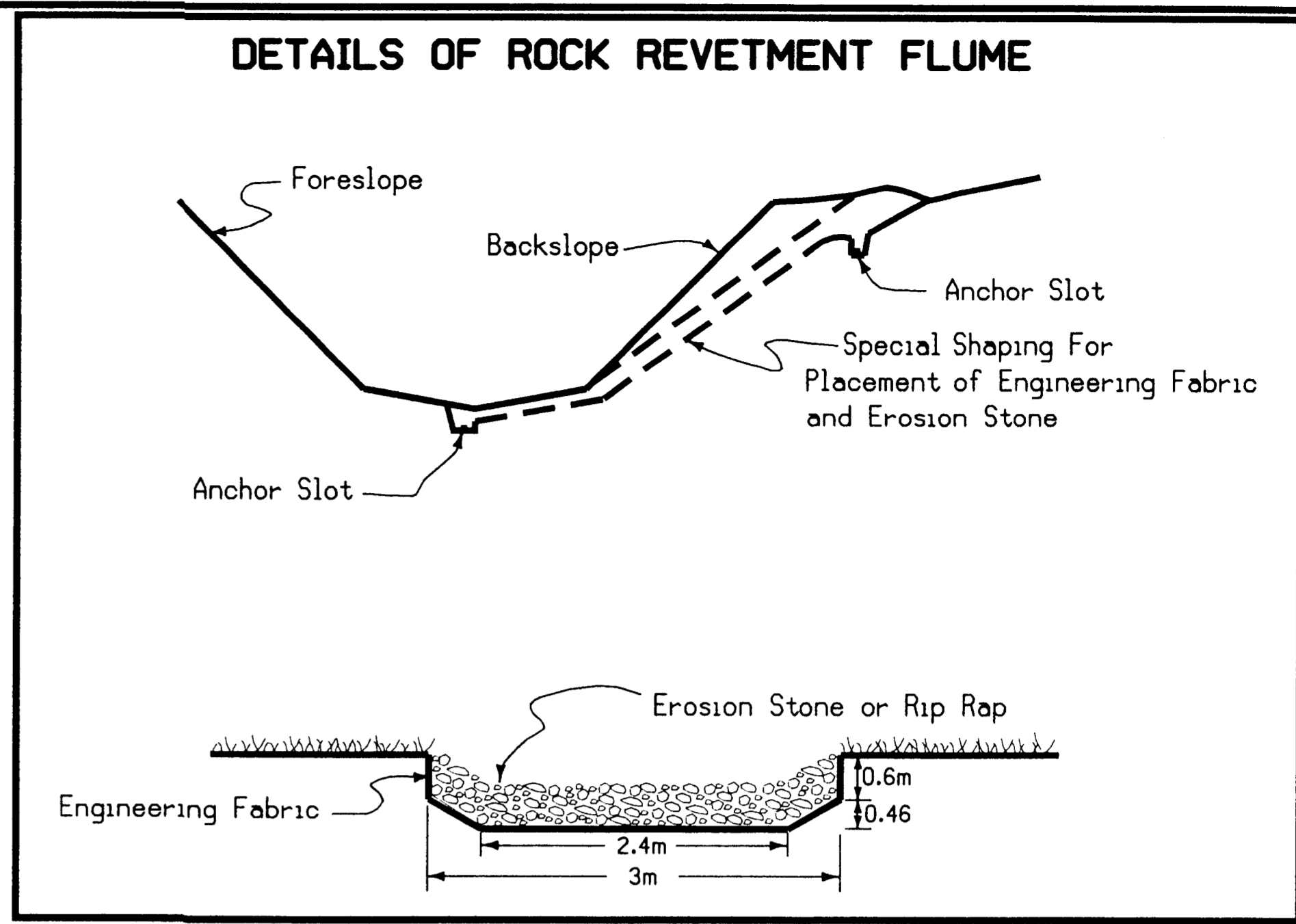
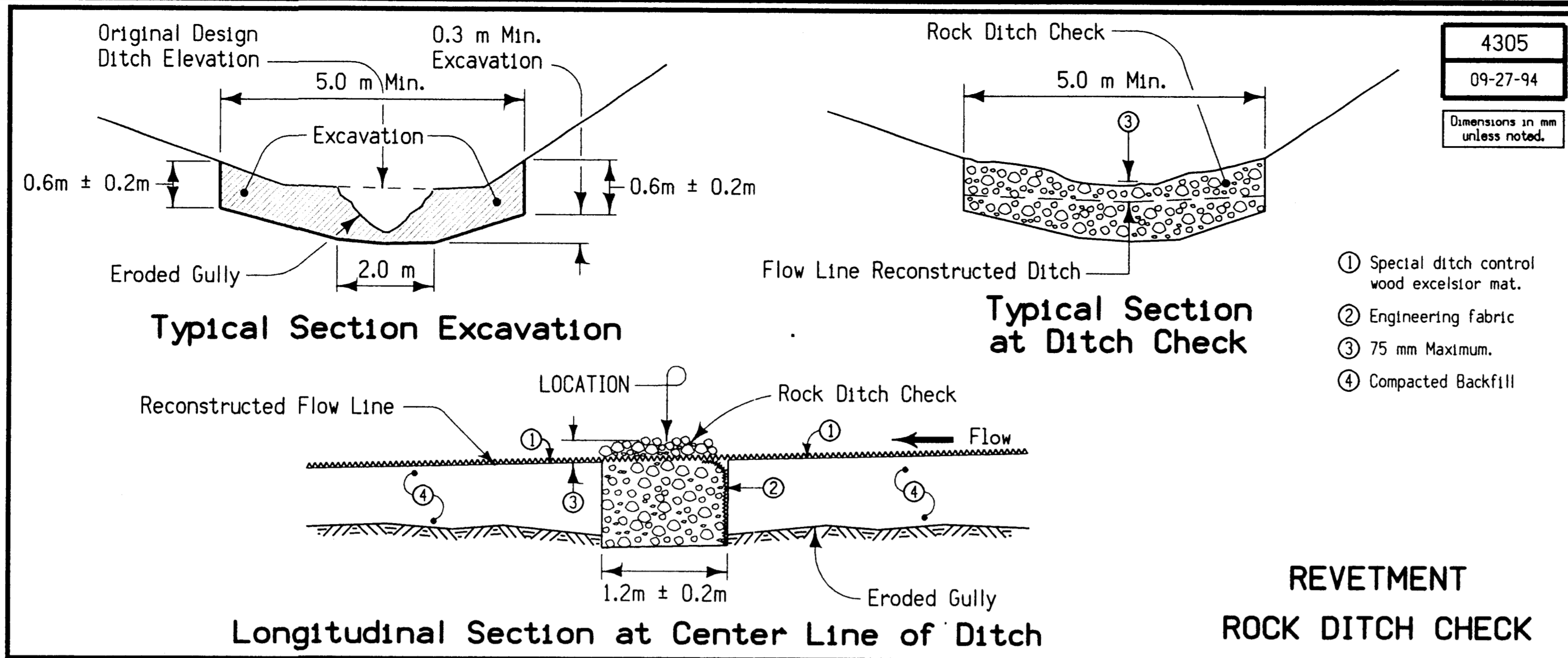
3217D

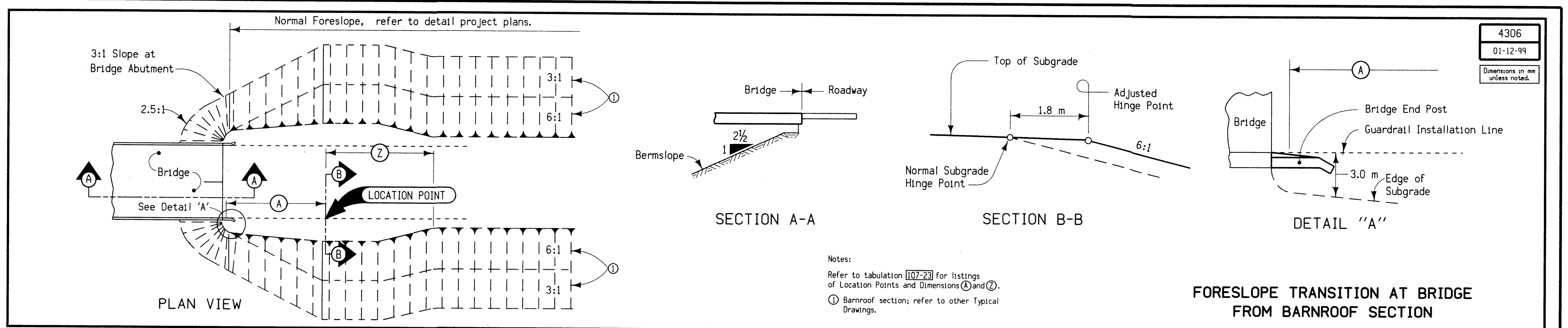
Modified

Dimensions in mm unless noted.

LOCATION		T	N	M	L	J	E	BW
ROAD IDENTIFICATION	STATION TO STATION	mm	m	m	m	m	m	m
IA 146/T-37	1465+20 1469+08	260	4.89	4.8	4.2	1.8	1.8	4.93
IA 146/T-37	1469+08 1472+40.011	260	4.89	4.8-0	4.2-3.35	1.8	1.8	4.93
IA 146/T-37 ②	1472+40.011 1477+15.847	260	4.89	0.0	3.35	1.8	1.8	5.78

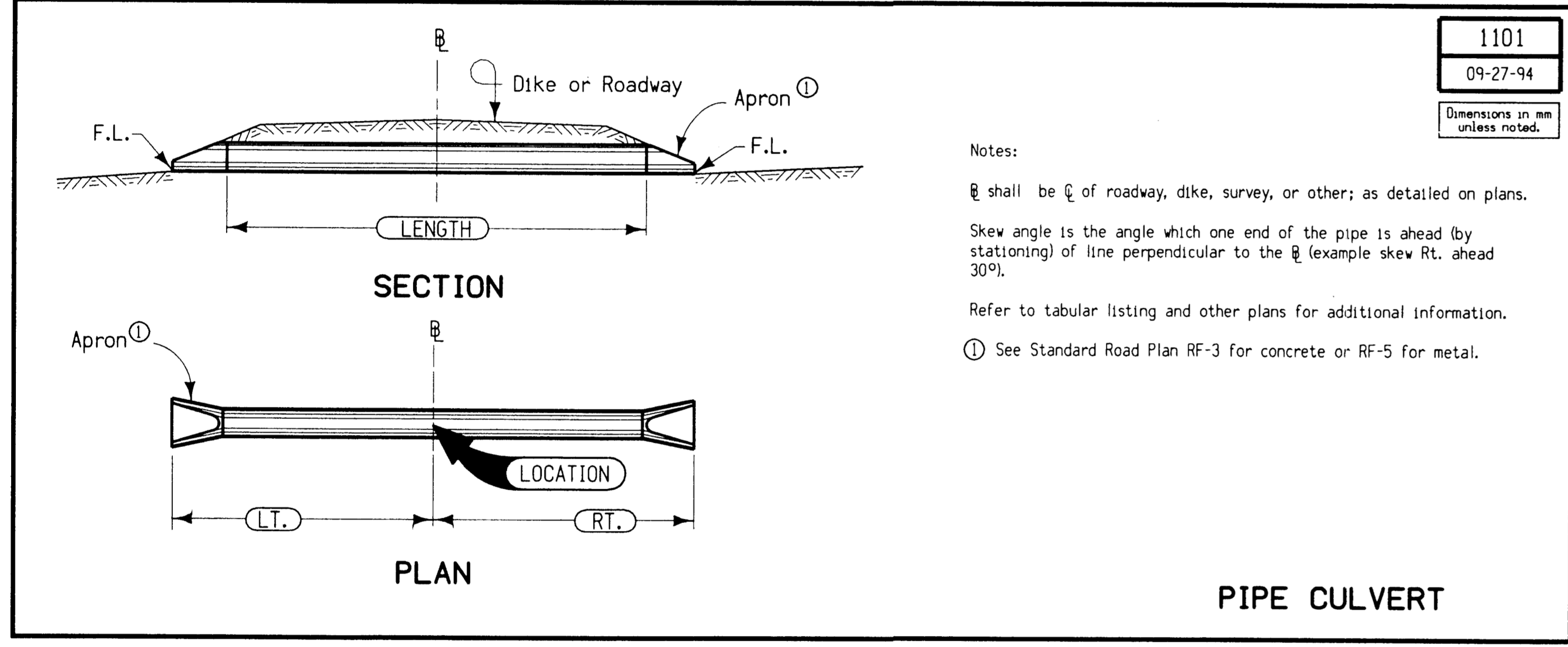
**TYPICAL CROSS SECTION
2-LANE DIVIDED ROADWAY
PCC PAVING
WITH GRANULAR SHOULDERS**





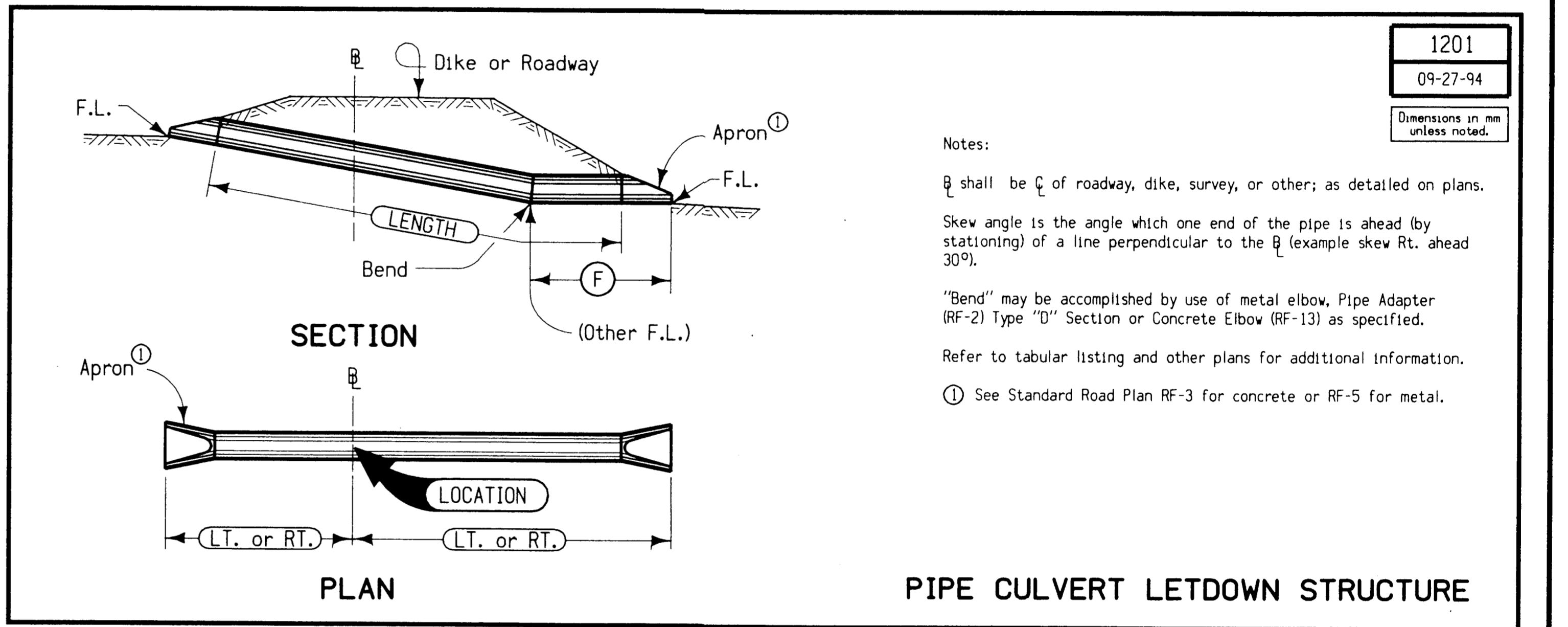
Notes:
 Refer to tabulation [107-23] for listings of Location Points and Dimensions (A) and (Z).
 ① Barnroof section; refer to other Typical Drawings.

FORESLOPE TRANSITION AT BRIDGE FROM BARNROOF SECTION



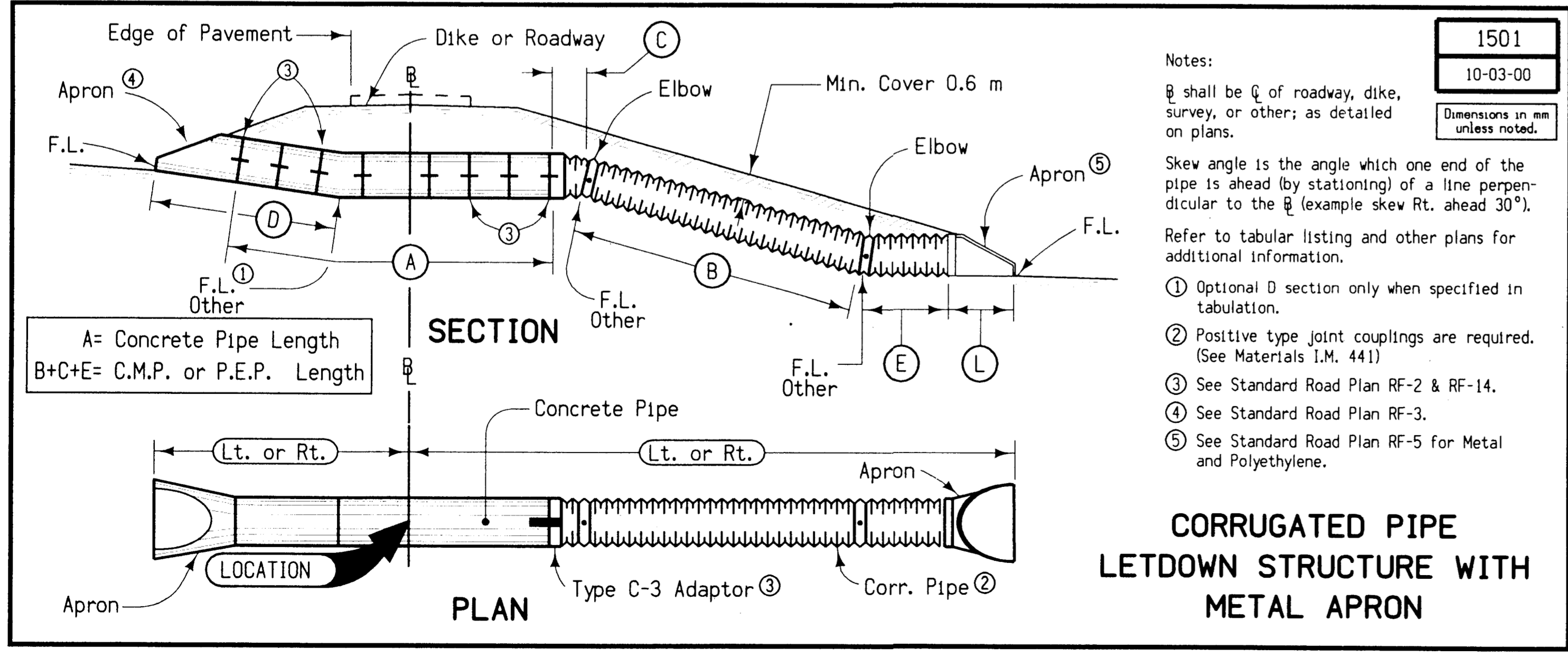
Notes:
 Ø shall be Ø of roadway, dike, survey, or other; as detailed on plans.
 Skew angle is the angle which one end of the pipe is ahead (by stationing) of a line perpendicular to the Ø (example skew Rt. ahead 30°).
 Refer to tabular listing and other plans for additional information.
 ① See Standard Road Plan RF-3 for concrete or RF-5 for metal.

PIPE CULVERT



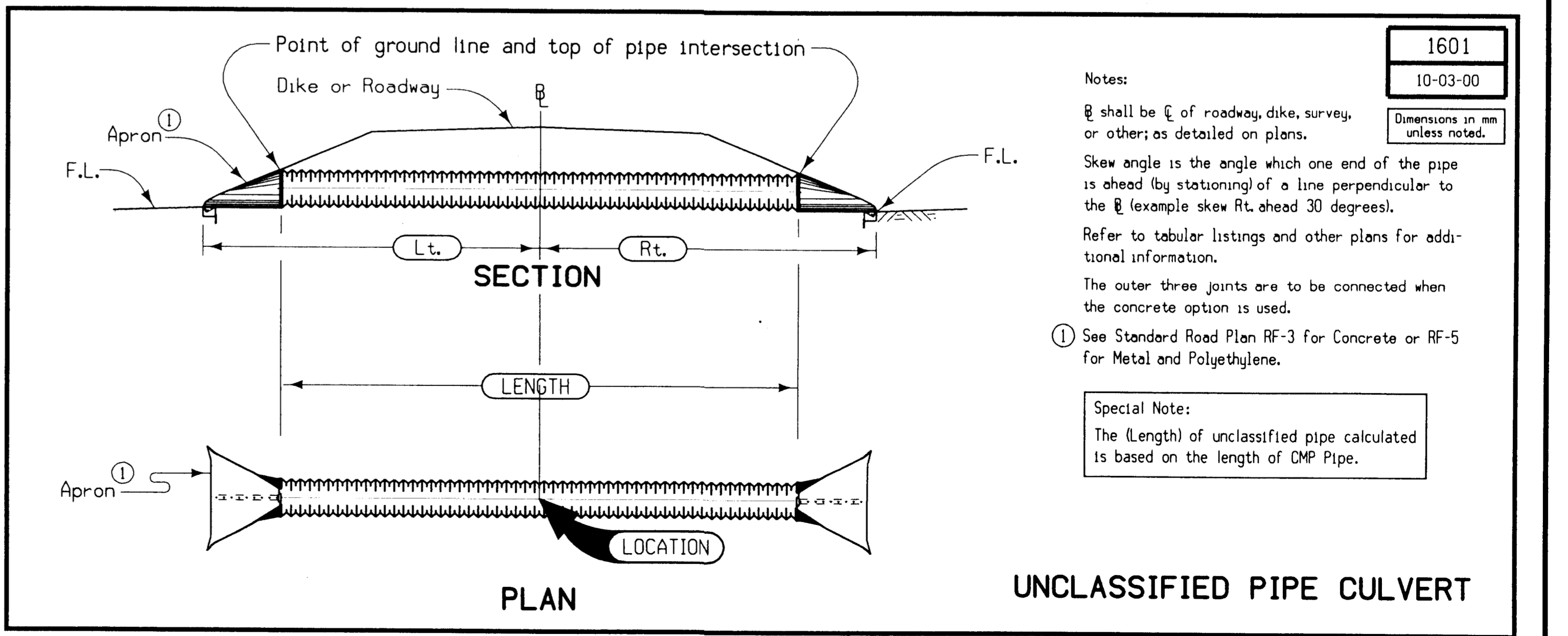
Notes:
 Ø shall be Ø of roadway, dike, survey, or other; as detailed on plans.
 Skew angle is the angle which one end of the pipe is ahead (by stationing) of a line perpendicular to the Ø (example skew Rt. ahead 30°).
 "Bend" may be accomplished by use of metal elbow, Pipe Adapter (RF-2) Type "D" Section or Concrete Elbow (RF-13) as specified.
 Refer to tabular listing and other plans for additional information.
 ① See Standard Road Plan RF-3 for concrete or RF-5 for metal.

PIPE CULVERT LETDOWN STRUCTURE



Notes:
 Ø shall be Ø of roadway, dike, survey, or other; as detailed on plans.
 Skew angle is the angle which one end of the pipe is ahead (by stationing) of a line perpendicular to the Ø (example skew Rt. ahead 30°).
 Refer to tabular listing and other plans for additional information.
 ① Optional D section only when specified in tabulation.
 ② Positive type joint couplings are required. (See Materials I.M. 441)
 ③ See Standard Road Plan RF-2 & RF-14.
 ④ See Standard Road Plan RF-3.
 ⑤ See Standard Road Plan RF-5 for Metal and Polyethylene.

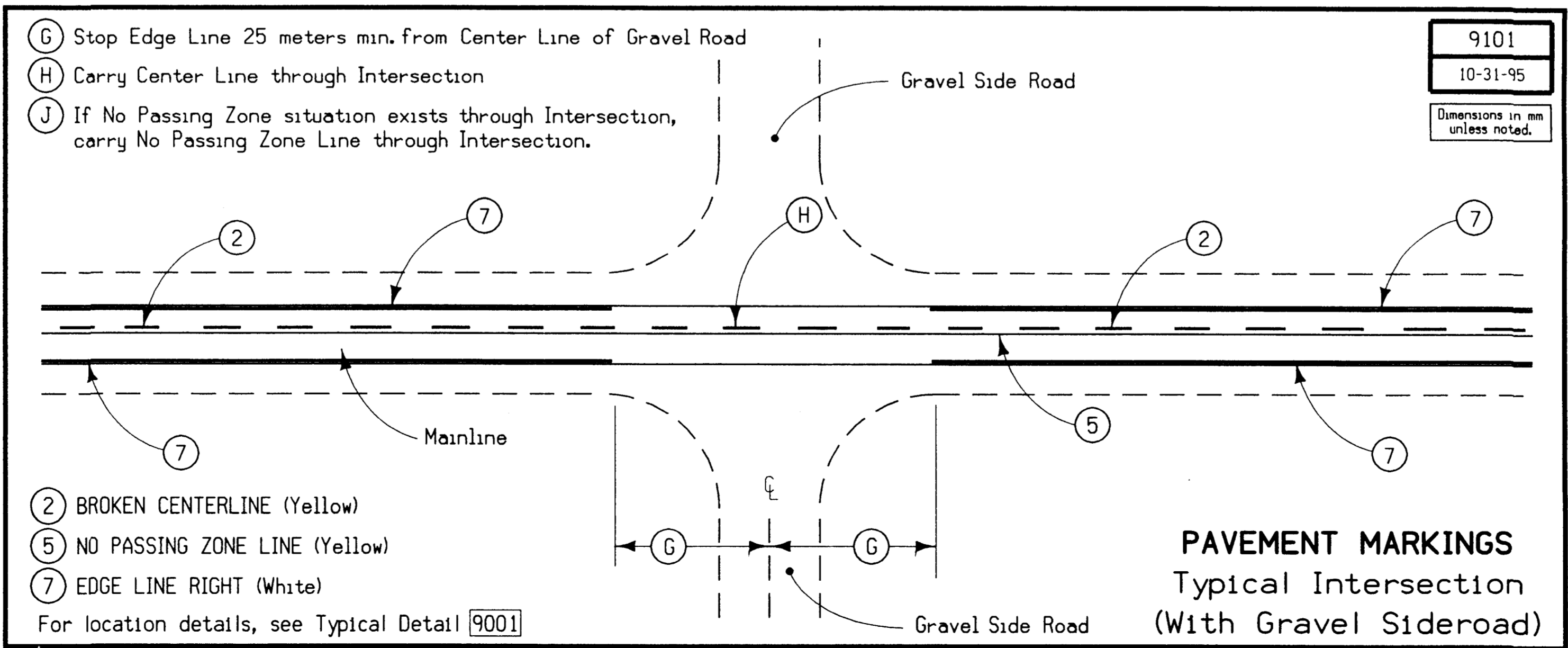
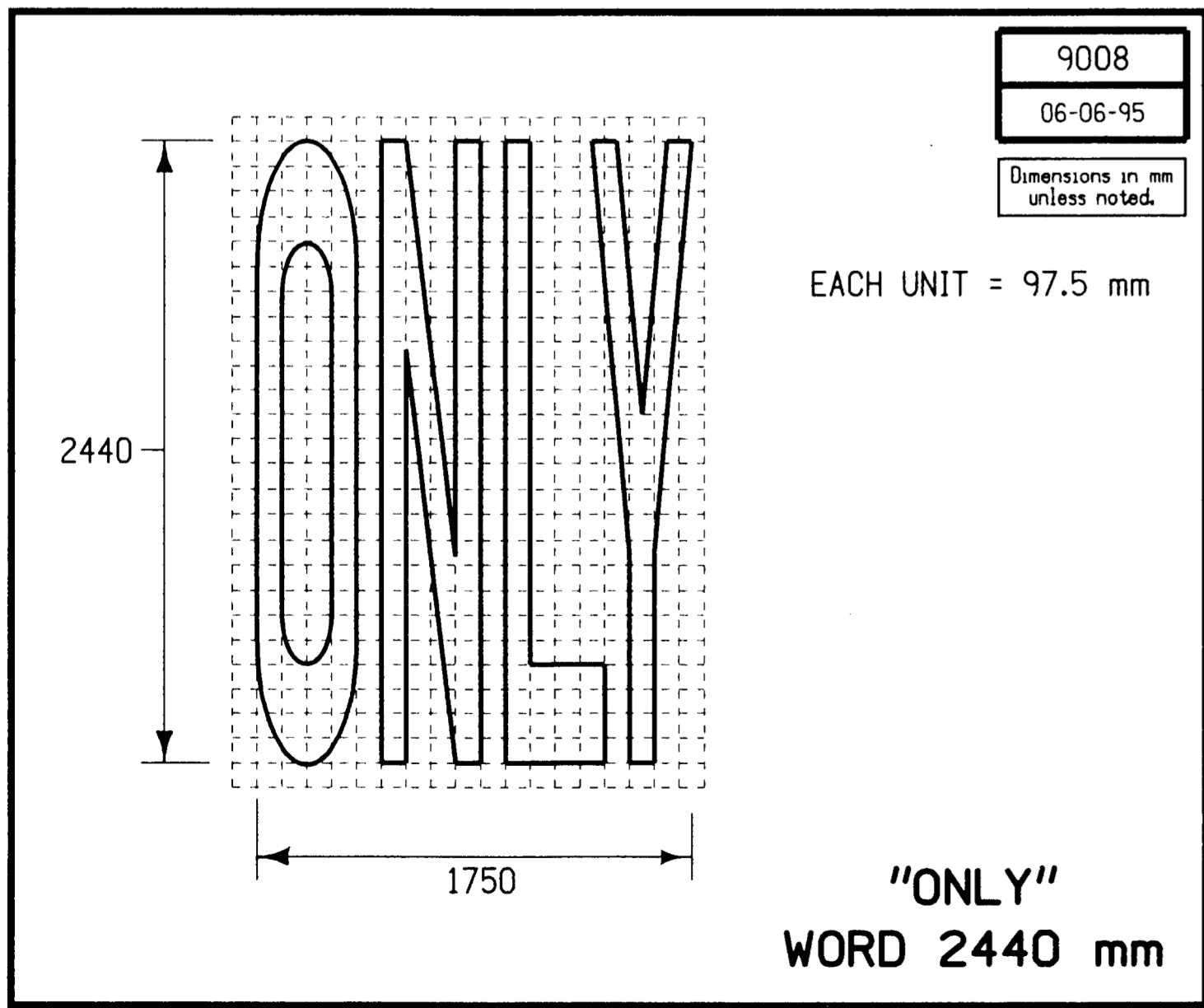
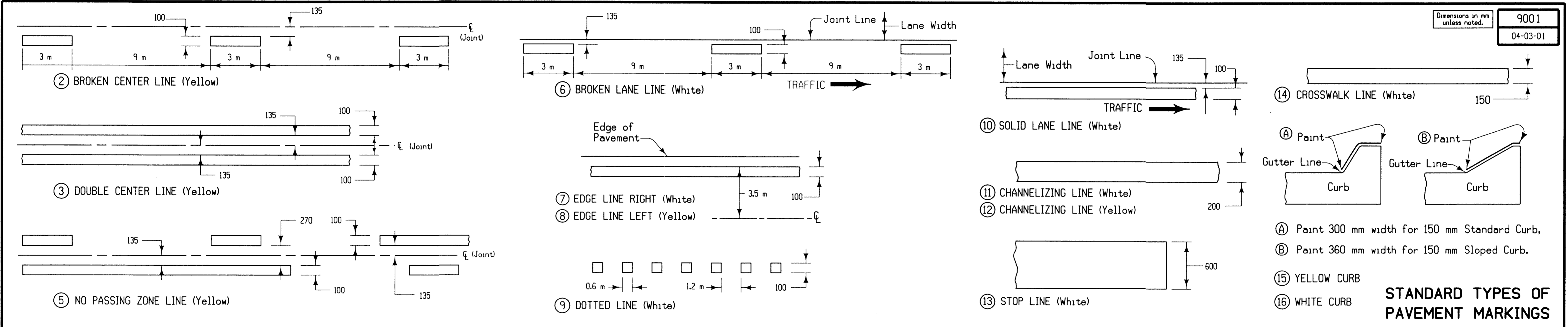
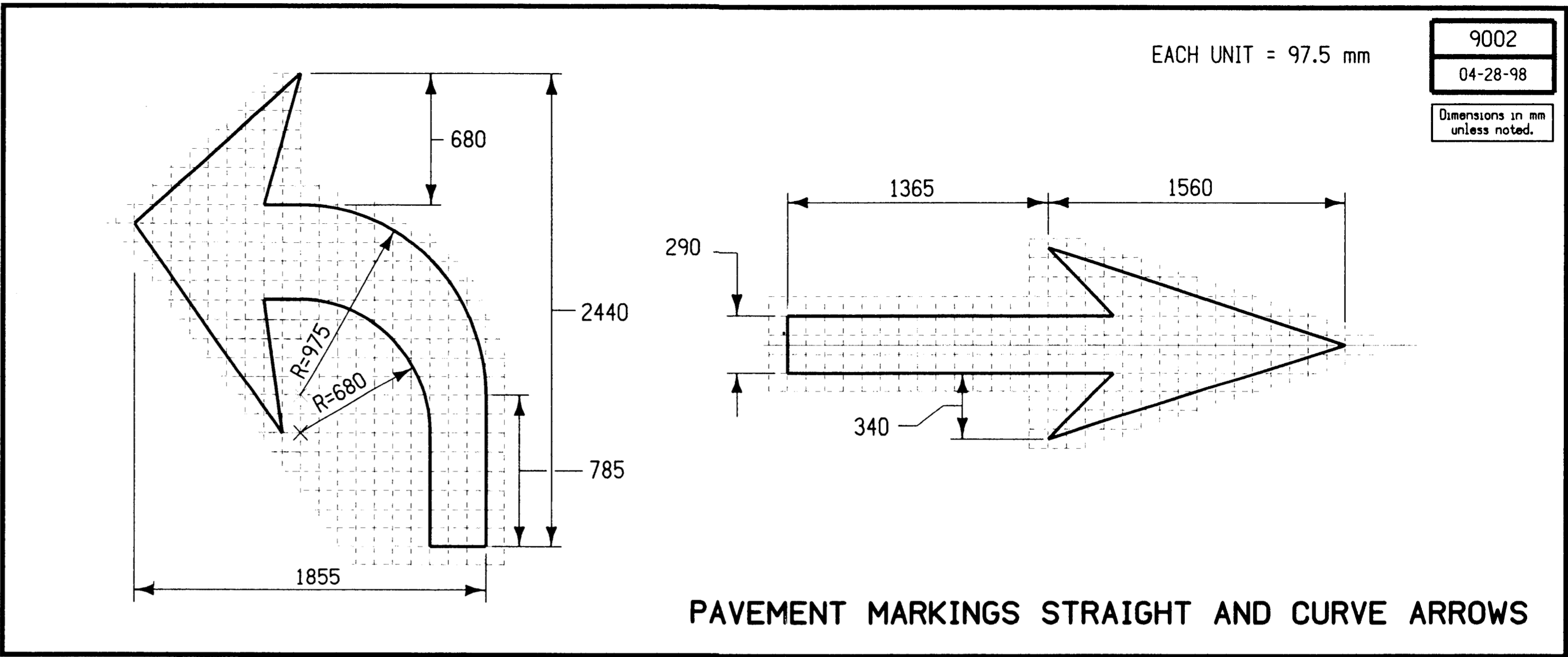
CORRUGATED PIPE LETDOWN STRUCTURE WITH METAL APRON

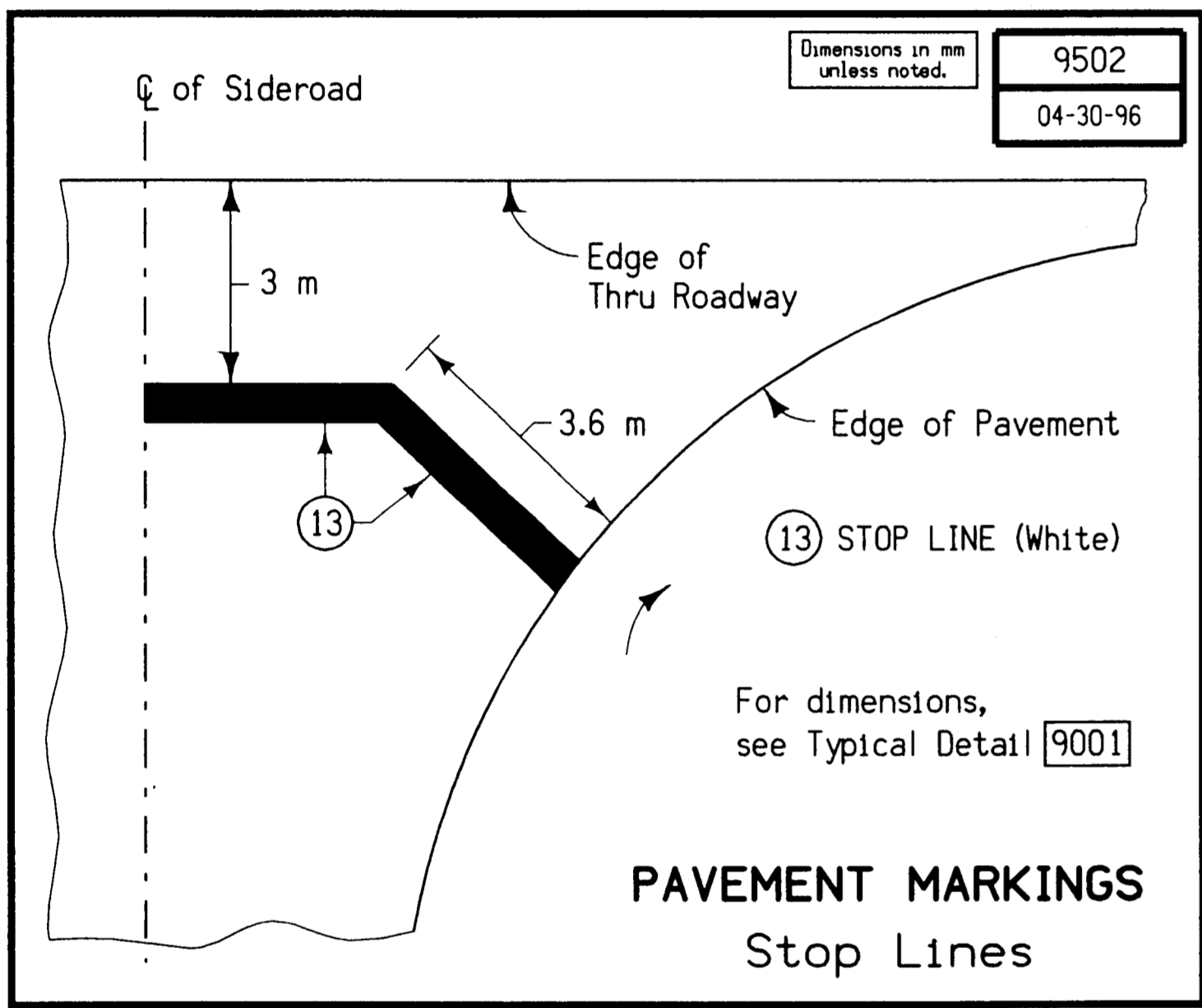
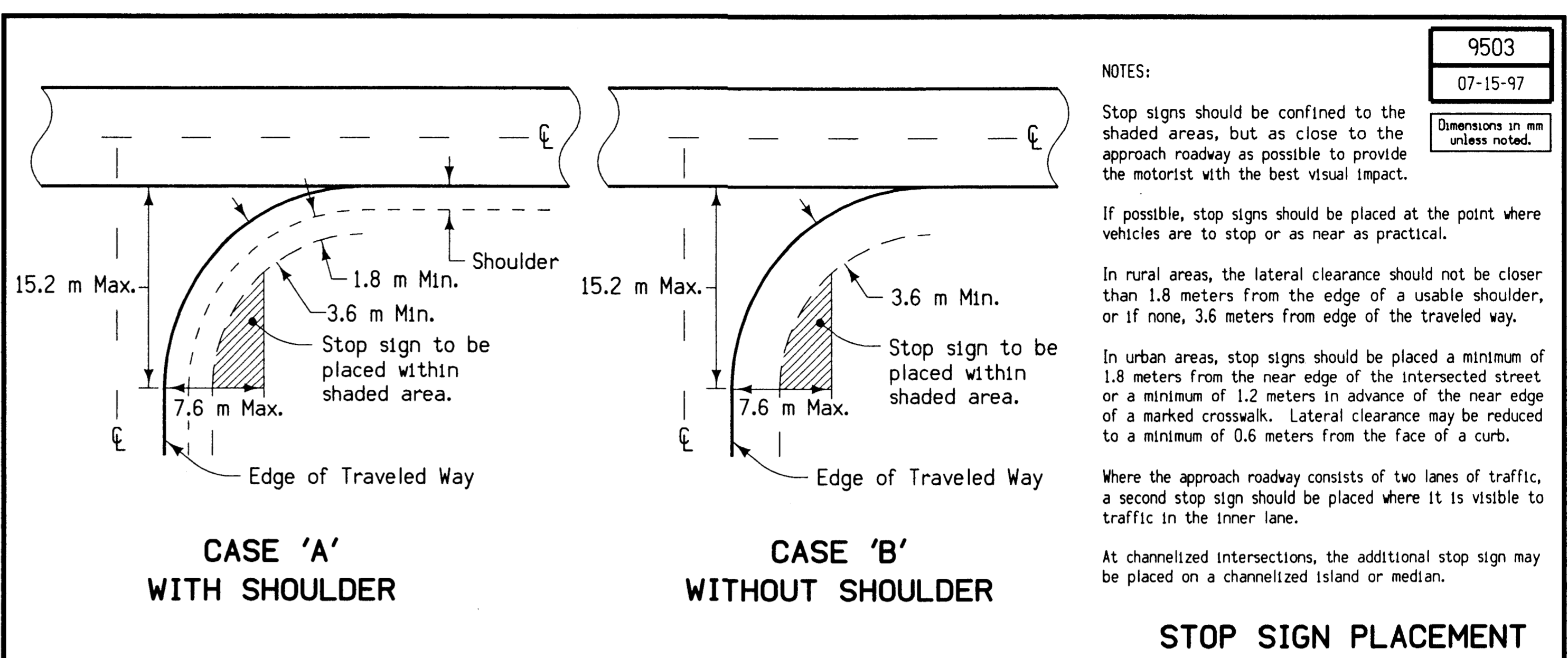
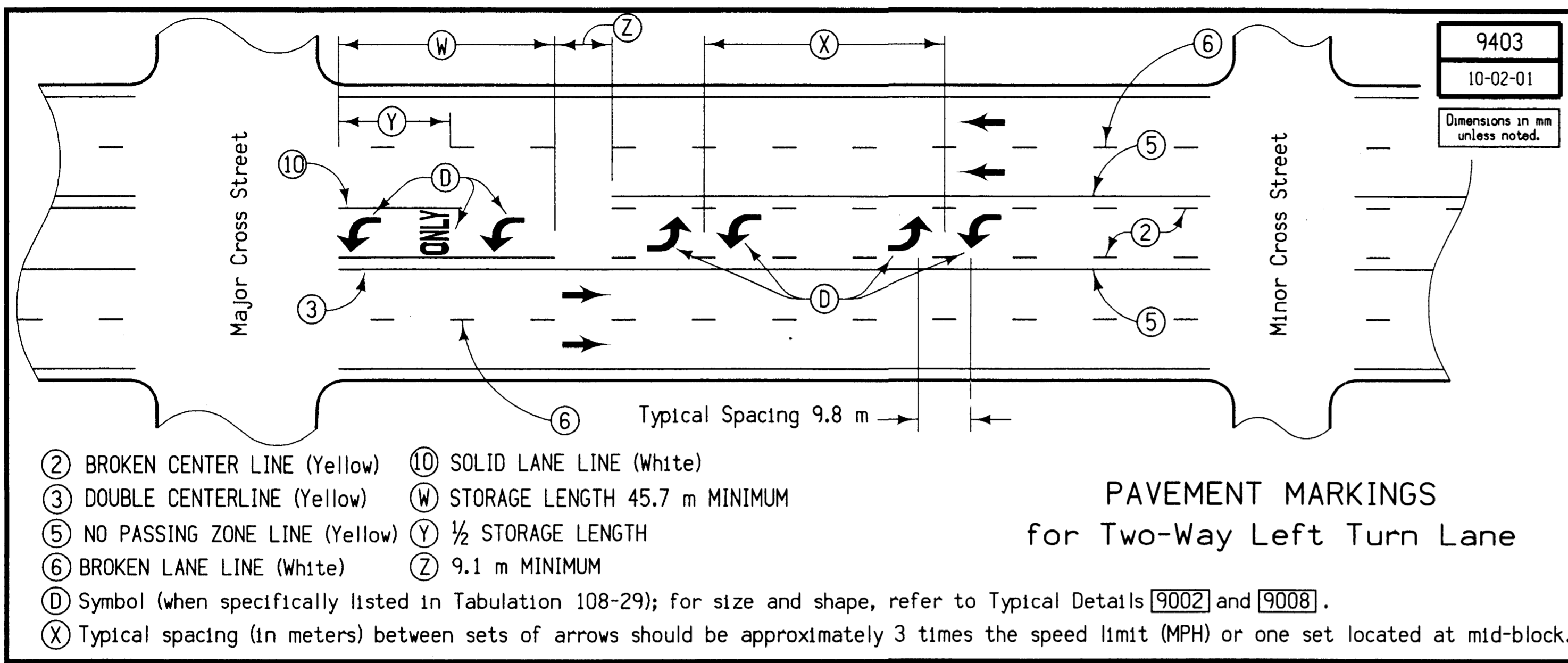


Notes:
 Ø shall be Ø of roadway, dike, survey, or other; as detailed on plans.
 Skew angle is the angle which one end of the pipe is ahead (by stationing) of a line perpendicular to the Ø (example skew Rt. ahead 30 degrees).
 Refer to tabular listings and other plans for additional information.
 The outer three joints are to be connected when the concrete option is used.
 ① See Standard Road Plan RF-3 for Concrete or RF-5 for Metal and Polyethylene.

Special Note:
 The (Length) of unclassified pipe calculated is based on the length of CMP Pipe.

UNCLASSIFIED PIPE CULVERT





ESTIMATED PROJECT QUANTITIES

100-1A
07-15-97

Table with columns: ITEM NO., ITEM CODE, ITEM, UNIT, TOTAL, AS BUILT QUAN. Rows include various construction items like CLEAR+GRUB, EXCAVATION, BACKFILL, etc.

ESTIMATED PROJECT QUANTITIES

100-1A
07-15-97

Table with columns: ITEM NO., ITEM CODE, ITEM, UNIT, TOTAL, AS BUILT QUAN. Rows include MOBILIZATION, SEAL WELL, FLAP GATE, etc. Includes an 'EXTRA WORK ORDERS' section at the bottom.

See Sheet C.02 & C.03 for estimate reference information
For Additional Bid Quantities and Reference Notes:
See Sheet M.02 for Sanitary Sewer at Sta. 83 + -
Sanitary Sewer Items are Paid for by the City of LeGrand
See Sheet V.08 for RCB on IA. 146

ESTIMATE REFERENCE INFORMATION

100-4
07-15-97

Data listed below is for informational purpose only and shall not constitute a basis for any extra work orders.

ITEM NO.	ITEM CODE	DESCRIPTION
1	2101--100100	CLEAR+GRUB
2	2101--100200	CLEAR+GRUB See Plan & Profile sheets for shaded areas.
3	2102--100100	CL 10 EXCAVATION ROWY+BORROW Includes 1,124,806 cu. m. suitable material to be used in the roadway fill. Also includes 600 m3 for tie-in grading from sta 88+74 to 92+20. 7,648 cu. m. for earth shoulder fill available from the borrows. No overhaul allowed for the shoulder fill and tie-in.
4	2102--100200	CL 10 EXCAVATION UNSUIT/UNSTABLE SOIL Includes 4,183 cu. m. for excavation at the wetland mitigation site. An additional 200 cu. m. is for repair of the existing berm at the mitigation site.
5	2102--120100	CL 12 EXCAVATION ROWY+BORROW
6	2102--120400	CL 12 EXCAVATION BOULDER/ROCK FRAGMENT For boulders encountered in excavation. Existing rip rap is not included.
7	2102--210000	INTERCEPT DITCH+FLUME See Tab 100-16 for location and details. Includes 100m for use at the engineer's direction
8	2102--220100	SELECTED BACKFILL MAT'L See Tab 103-3 for location and details.
9	2102--230200	SPECIAL BACKFILL MAT'L 225 m3 For tie-in to 30 from sta 88+74 to 92+50 1,773 m3 for detours, and 216 m3 for side roads.
10	2102--250000	LOCATING TILE LINE Estimated at twice the grading project length in meters.
11	2105--100100	TOPSOIL STRIP SALVAGE+SPREAD Includes 0 cu. m. unsuitable Type B material, 0 cu. m. unsuitable Type C material and 52,670 cu. m. Class 10 material to be reserved for topsoiling from roadway cut. Also includes 49,948 cu. m. Class 10 material from Borrows. See T sheets for availability and placement locations. As shown on the T Sheets there will be no topsoil placement past Main Line Sta 70+00 except on the borrow.
12	2107--100200	COMPACTION W/MOISTURE CONTROL See Tab 103-6 for information
13	2107--100400	COMPACT BACKFILL ADJ TO BRDG/CULV/STRUCT See Tab 104-4 for information.
14	2107--100500	GRANULAR MAT'L-BLANKET+SUBDRAIN See Tab 104-5c for information.
15	2107--200400	FIELD LABORATORY (QM-E)
16	2108--100000	OVERHAUL (STATION METER) All overhaul computed by mass diagram.
17	2111--100000	GRANULAR SUBBASE Includes 22,246 m2 for mainline, 18,665 m2 for the Side roads.
18	2115--100000	MODIFIED SUBBASE See Tab 103-3 & Typ. 2512A for locations & details.
19	2121--100100	GRANULAR SHLD TYPE A

ESTIMATE REFERENCE INFORMATION

100-4
07-15-97

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ITEM NO.	ITEM CODE	DESCRIPTION
20	2123--100100	EARTH SHLD FINISH Includes 5,370 Mg for mainline shoulders, 2,843 Mg for sideroads, and 1,167 Mg for detours. See Typical 7110 for locations & details.
21	2301--103260	STD/S-F PCC PAV'T CL C CL 3 260 MM Includes 20,631 M2 for mainline, and 17,411 M2 for sideroads. See Typical in the B Sheets for locations & details.
22	2303--600100	PCC PAV'T SAMPLE
23	2312--110100	GRANULAR SURF ON RD CL A CR STONE See Typical 2108 & 2108A for locations and details. Includes 1,026 Mg for sideroads and 319 MG for entrances.
24	2315--110100	DRIVEWAY SURF CL A CR STONE See Tab 102-3 for locations and details.
25	2399--100110	DETOUR PAV'T See Typical 2612 and "F" Sheets for locations and details. Includes 9465 sq. m. on US 30 and 400 sq. m. on Ia 146/T-37.
26	2401--100000	RMVL OF EXIST STRUCT See Tab 110-2 for details.
27	2402--120000	EXCAVATION CL 20 See Tab 104-3 for details.
28	2416--100600	CONC 1000 ROWY PIPE CULV 600 MM See Tab 104-3 and cross sections for locations and details. Requires RF-14, Type 3 connectors at all joints.
29	2416--100750	CONC 1000 ROWY PIPE CULV 750 MM See Tab 104-3 and cross sections for locations and details. Requires RF-14, Type 3 connectors at all joints.
30	2416--100900	CONC 1000 ROWY PIPE CULV 900 MM See Tab 104-3 and cross sections for locations and details. Requires RF-14, Type 3 connectors at all joints.
31	2416--101050	CONC 1000 ROWY PIPE CULV 1050 MM See Tab 104-3 and cross sections for locations and details. Requires RF-14, Type 3 connectors at all joints.
32	2416--110600	CONC 1500 ROWY PIPE CULV 600 MM See Tab 104-3 and cross sections for locations and details. Requires RF-14, Type 3 connectors at all joints.
33	2416--111050	CONC 1500 ROWY PIPE CULV 1050 MM See Tab 104-3 and cross sections for locations and details. Requires RF-14, Type 3 connectors at all joints.
34	2416--121200	CONC 1750 ROWY PIPE CULV 1200 MM See Tab 104-3 and cross sections for locations and details. Requires RF-14, Type 3 connectors at all joints.
35	2416--130920	CONC ARCH 1000 ROWY PIPE CULV 920X570 MM See Tab 104-3 and cross sections for locations and details. Requires RF-14, Type 3 connectors at all joints.

ESTIMATE REFERENCE INFORMATION

100-4
07-15-97

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ITEM NO.	ITEM CODE	DESCRIPTION
36	2416--200600	CONC PIPE ELBOW 600 MM 5 degrees. See Tab 104-3 and cross sections.
37	2416--240600	CONC PIPE APRON 600 MM See Tab 104-3 and cross sections for locations and details.
38	2416--240750	CONC PIPE APRON 750 MM See Tab 104-3 and cross sections for locations and details.
39	2416--240900	CONC PIPE APRON 900 MM See Tab 104-3 and cross sections for locations and details.
40	2416--241050	CONC PIPE APRON 1050 MM See Tab 104-3 and cross sections for locations and details.
41	2416--241200	CONC PIPE APRON 1200 MM See Tab 104-3 and cross sections for locations and details.
42	2416--260920	CONC ARCH APRON 920 X 570 MM See Tab 104-3 and cross sections for locations and details.
43	2416--320600	PIPE APRON GUARD (RF-26) 600 MM See Tab 104-3 for locations.
44	2416--320750	PIPE APRON GUARD (RF-26) 750 MM See Tab 104-3 for locations.
45	2416--320900	PIPE APRON GUARD (RF-26) 900 MM See Tab 104-3 for locations.
46	2416--340920	PIPE APRON GUARD 920 X 570 MM See Tab 104-3 for locations.
47	2417--060600	CMP ROWY CULV 600 MM See Tab 104-3 and cross sections for locations and details.
48	2417--280600	CMP ELBOW 600 MM See Tab 104-3 and cross sections for locations and details.
49	2418--200600	JACKED 1000 CONC ROWY PIPE CULV 600 MM See Tab 104-3 and cross sections for locations and details.
50	2418--401200	JACKED 1750 CONC ROWY PIPE CULV 1200 MM See Tab 104-3 and cross sections for locations and details.
51	2422--100450	UNCL ENT PIPE CULV 450 MM See Tab 102-3 for locations.
52	2422--200600	UNCL ROWY PIPE CULV 600 MM See Tab 104-3 and cross sections for locations and details.
53	2422--200750	UNCL ROWY PIPE CULV 750 MM See Tab 104-3 and cross sections for locations and details.
54	2422--300450	UNCL APRON 450 MM See Tab 102-3 and cross sections for locations and details.
55	2422--300600	UNCL APRON 600 MM See Tab 104-3 and cross sections for locations and details.
56	2422--300750	UNCL APRON 750 MM

ESTIMATE REFERENCE INFORMATION

100-4
07-15-97

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ITEM NO.	ITEM CODE	DESCRIPTION
57	2502--110250	250 MM STD SUBDRAIN CMP For Proposed locations See Tab 104-5C
58	2502--110300	300 MM STD SUBDRAIN CMP For Proposed locations See Tab 104-5C
59	2502--250100	LONGITUDINAL SUBDRAIN (SHLD) 100 MM See Tabs 104-5C and 104-9, & cross sections for locations and details.
60	2502--300195	SUBDRAIN OUTLET RF-19E See Tabs 104-5C and 104-9, & cross sections for locations and details.
61	2503--140375	CONC 1000 STORM SWR 375 MM See Tab 104-5B For location and details
62	2503--140450	CONC 1000 STORM SWR 450 MM See Tab 104-5B For location and details
63	2503--400680	INTAKE RA-68 See Tab 104-5A For location and details
64	2507--001500	REVTMENT CL E For construction of rock ditches, flumes, checks, or slope protection at various locations as directed by the engineer. Materials shall be a nominal 150mm (-80mm + 100mm) well graded stone as approved by the engineer. All necessary excavation and shaping to make a uniform flowline in the center of the ditch shall be incidental to this work. No additional compensation will be allowed. Refer to details. 230 MG will be used at the wetland mitigation site. 50MG will be used at the engineer's direction.
65	2507--002000	EROSION STONE For construction of rock ditches, flumes, checks, or slope protection at various locations as directed by the engineer. Materials shall be a nominal 150mm (-80mm + 100mm) well graded stone as approved by the engineer. All necessary excavation and shaping to provide uniform flowline in the center of the ditch shall be incidental to this work. No additional compensation will be allowed. Refer to details. 50 M2 for use at the direction of the engineer.
66	2507--004000	ENGINEERING FABRIC Engineering fabric shall be material as specified for embankment erosion control, Article 4196.01C. Material shall be measured in sq.m. of actual area covered. Refer to details. 200 m2 will be for use at the wetland mitigation site. 100 m2 will be for use at the direction of the engineer.
67	2510--001000	RMVL OF PAV'T Dispose per notes 213-1 & 213-7. See Tab 110-1 for locations and details.
68	2515--100200	PCC DRIVEWAY 200 MM See Tab 102-3 for locations and details.
69	2518--000100	SAFETY CLOSURE These barricades designated for use at sideroad closures, shall be left in place after project completion & become the property of the Iowa D.O.T. See Tab. 108-13A and Standard Road Plan RS-26A. Item includes maintaining 14 previously placed.

ESTIMATE REFERENCE INFORMATION

100-4
07-15-97

Data listed below is for informational purpose only and shall not constitute a basis for any extra work orders.

ITEM NO.	ITEM CODE	DESCRIPTION
70	2518--010310	PERMANENT RD CLOSURE (RURAL) RE-3A See tab 102-4 for location and details.
71	2518--100032	PERMANENT RD CLOSURE (URBAN) RE-3B See tab 102-4 for location and details.
72	2519--400000	SAFETY FENCE For surrounding of Arch. site on Johnson Mitigation Area. See "R" Sheets. Steel posts to be used and spaced a maximum of 5m apart. See Specification 2301.20 for additional information. The fence is to remain in place and become the property of the Contracting Authority when construction is complete.
73	2526--001000	CONSTRUCTION SURVEY
74	2527--101010	PAINTED PAV'T MARK WATERBORNE See Tab 108-22 for locations.
75	2527--104010	PAINTED SYMBOL+LEGEND WATERBORNE See Tab 108-29 for locations and type.
76	2528--101000	TRAFFIC CONTROL
77	2528--107000	FLAGGER
78	2533--100000	MOBILIZATION
79	2538--102000	SEAL WELL Parcel 22 Sta. 50+05 Rt. 2 meters Parcel 23 Sta. 50+84 Rt. 54 meters Parcel 110 Sta. 1473+65 Lt. 28 meters
80	2599--999915	FLAP GATE For Use at the wet land mitigation site. See Tab 104-3 for locaton and details. Neenah Automatic Gate R-5050-CF24, Armco Model 10C, or approved equivalent meeting ASTM A961
81	2599--999917	MONITORING WELL Monitor Well, Furnish and Install, shall be as shown in the R sheets, detail MS-2. Measurement and payment shall be made for each unit supplied and installed including all materials, labor and tools required with removal of all packing materials from the site.
82	2601--102050	NATIVE GRASS SEEDING The contractor shall furnish and apply an aquatic-labeled Glyphosate, such as "Rodeo", a non-selective systemicherbicide, and a aquatic-labeled surfactant, such as "Activate Plus", to all areas receiving seed mixes A and B. Application rate shall be 3.5 to 5.26 liters per hectare (3 to 4 1/2 pints per acre) of glyosphate, and a 90%nonionic surfactant. The initial application shall be applied to actively growing vegetation in April 2002. Subsequent applica- tions shall be made at a minimum of 10 day intervals until all areas are void of living vegetation. After complete kill of the vegetation, the area shall be mowed to a 7.62 cm height. One mowing prior to spraying may be necessary to remove dead debris. The herbicide shall be applied by a licensed certified pesticide applicator, Category 6 Right of Way. Herbicide shall be applied when wind conditions are 16.09 km/h or less. Any regrowth of vegetation or non-kill areas shall be retreated before seeding at the Contractor's expense. Apply seed with a Truax native grass drill that has a no-till attachment

ESTIMATE REFERENCE INFORMATION

100-4
07-15-97

Data listed below is for informational purpose only and shall not constitute a basis for any extra work orders.

ITEM NO.	ITEM CODE	DESCRIPTION
		or equivalent. Planting depth shall be approximately 3 mm. Contractor shall not apply seed in wet conditions that would cause the seed to be placed deeper than specified. Seed mixes are on sheet R.03. Seed origin shall be from Iowa or it's adjacent states. Seed shall be mixed prior to arriving on the project at a site designated by the Engineer. Seeding shall be accomplished prior to June 15, 2002. Seeded areas that are not excessively wet shall be mowed at a 15.27 cm height, in four week intervals, three times in 2002. Contractor shall contact the lawowner, Steve Johnson at 515-479-2487, prior to accessing the site for mowing. The contractor shall reseed any disturbed ground in the seeding areas that results from the contractors activity throughout the contract period. Herbicide, mowing, re- seeding and related activities shall be incidental to this item with no extra compensation allowed. Any repairs or reshaping of the berm shall be accomplished prior to spraying the existing vegetation.
83	2601--10300	STABILIZE CROP SEED+FERTILIZE Included for all rural areas of the right of way as designated by the Engineer. SEED MIXTURE (Rural) Spring--March 1 to May 20 Oats 72 kg per hectare Winter Rye 63 kg per hectare Red Clover 6 kg per hectare Timothy 6 kg per hectare Summer--May 21 to July 20 Oats 108 kg per hectare Annual Ryegrass 39 kg per hectare Red Clover 6 kg per hectare Timothy 6 kg per hectare Fall--July 21 to September 30 Oats 72 kg per hectare Winter Rye 125 kg per hectare Red Clover 6 kg per hectare Timothy 6 kg per hectare Fertilizer: Rate--500 kg of 13-13-13 or equivalent chemically combined commercial fertilizer per hectare.
84	2601--104200	MULCH Mulching: Areas disturbed but not seeded with stabilizing crop by September 30 shall be scarified to a 75 mm depth, fertilized and mulched. All mulch to be consolidated into soil with the mulch stabilizer.
85	2601--108140	SLOPE PROTECTION WOOD EXCEL MAT RC-14 Locations to be designated by the engineer. Shaping of eroded slopes will be incidental to this item. Refer to Std. Road Plan RC-14.
86	2601--109010	WATER Includes one watering of the special ditch control and slope protection, rate 20 L per sq. meter. Refer to article 2601.19 for schedule and procedure only. Additional watering (3) may be required at the discretion of the engineer subject to local weather conditions and will be paid for at the contract unit price
87	2602--000020	SILT FENCE See Tab 100-17 for locations. Includes an additional 25% for replacements as needed.
88	2602--000030	SILT FENCE-DITCH CHECK See Tab 100-18 for locations. Includes an additional 25% for replacements as needed.

ESTIMATE REFERENCE INFORMATION

100-4
07-15-97

Data listed below is for informational purpose only and shall not constitute a basis for any extra work orders.

ITEM NO.	ITEM CODE	DESCRIPTION
89	2602--000050	SILT BASIN Item is for placement and two (2) cleanouts each. Placement to be at inlet of 29 Roadway Pipes (Tab 104-3), 9 Entrance Pipes (Tab 102-3), and 3 RCB's (Tab 104-4).
90	2602--000090	CLEANOUT OF SILT FENCE See Tab 100-17 for locations. Includes an additional 100% for extra clean-outs.
91	2602--000100	CLEANOUT OF SILT FENCE - DITCH CHECK See Tab 100-18 for locations. Includes an additional 100% for extra clean-outs.
92	2610--000120	TREES, FURNISH AND INSTALL Furnish and install trees in the spring of 2002. Excavation dimensions of planting wells shall be 60.96 cm diameter minimum. Backfill shall be firmed around the roots by tamping, but vigorous tamping shall not be permitted. The contractor shall take care during backfilling to avoid damage to the roots. Contractor shall build a tree ledge for each tree with the soil excavated from the wetland. Trees shall be installed in the center of the tree ledge. See sheet R.03. The contractor shall furnish and apply mulch according to the follow: Mulch depth shall be 12.7 cm. Mulch width shall be a 2 m diameter circle with the tree located in the middle of the circle. Mulch shall be pulled back 1.27 cm - 2.54 cm from the plant trunk to allow air circulation. Fertilizer, watering, wrapping, staking and guying will not be required. Mulching, tree ledges, pruning and related activity shall be incidental to this item with no extra compensation allowed. The contractor shall be responsible for one repla-cement period.

09-27-94 203-1
Plan and profile sheets included in the project are for the purpose of alignment, location and specific directions for the work to be performed under this contract. Irrelevant data on these sheets is not to be considered a part of this contract.

04-03-01 203-2
During construction of this project, the contractor will be required to coordinate his operations with those of other contractors working within the same area. Other work in progress during the same period of the time will include construction of the following projects:

Project	Type of Work
NHSX-30-6(78)--3H-86	Grading & Paving Job
NHSX-30-5(161)--3H-64	RCB
NHSX-30-5(162)--3H-64	Bridge
NHSX-30-5(163)--3H-64	Bridge
NHSX-30-5(164)--3H-64	Bridge
NHSX-30-5(196)--3H-64	RCB
NHSX-30-5(197)--3H-64	RCB

07-15-97 203-4
The contractor is encouraged to take full advantage of specification 1105.15 - Value Engineering Incentive Proposal. A pamphlet and conceptual proposal form will be available at the preconstruction conference.

09-27-94 211-1
Pavement crossovers will be allowed on this project and overhaul has been estimated according to current specifications. The contractor will not be billed for crossovers located within areas which are designed for removal of pavement after cross hauling is completed.

09-27-94 212-2
Material listed within the plans as "unsuitable" is included in the template for class 10 excavation and is shown to indicate the location and distribution.

10-02-01 213-1
It shall be the contractor's responsibility to provide waste areas or disposal sites for excess material (excavated material or broken concrete) which is not desirable to be incorporated into the work involved on this project. These areas shall not impact wetlands or "Waters Of The U.S." No payment for overhaul will be allowed for material hauled to these sites. No material shall be placed within the right-of-way, unless specifically stated in the plans or approved by the engineer.

09-27-94 213-2
The contractor's attention is directed to the following consideration in regard to removal and replacement of topsoil in borrow areas:
Quantities estimated for topsoil are calculated on the basis of a uniform removal of topsoil to a depth of 0.3 meters. The material removed is to be spread uniformly to a minimum depth of 0.2 meters over the borrow area upon completion of excavation work.

09-27-94 213-3
All borrow areas, stockpile areas, haul roads and areas used for equipment on this project will require subsoil tillage to an average depth of 0.4 meters to 0.5 meters prior to placement of topsoil and/or stabilizing crop seeding. Such tillage shall be accomplished on maximum of one meter centers and at right angles to the finished slope of the borrow.

Equipment used to accomplish the tillage shall be equipped with an arrowhead-type shoe so as to provide lateral displacement and limit the movement of the subsoil to the surface. It shall be approved by the Engineer for the use intended. This work will be considered incidental to other work on the project and no payment will be allowed.

It is intended that following subsoil tillage, the area remains in a "loosened" condition. Additional compaction or the operation of heavy equipment, other than required for topsoil placement and shaping shall not be allowed on areas which have received subsoil tillage.

10-27-98 213-4
The contractor shall apply necessary moisture to the construction area and haul roads to prevent the spread of dust. Refer to Article 1107.07 of the current Standard Specifications for additional details.

10-02-01 213-7
Unless otherwise directed or authorized, all hot mix asphalt and other bituminous materials which are not specifically addressed or described in the plans shall become the property of the contractor.

The contractor, in accordance with current rules and regulations of the Iowa Department of Natural Resources, may:

1. With the approval of the Engineer, blend or otherwise process the material for use with shoulder or special backfill aggregate, for use on the project.
2. With the approval of the Engineer, place with material in areas designated by the Engineer as Soil Aggregate Subbase without extra charge.
3. Remove the material from the project and stockpile for the contractor's future use.

04-25-00 214-1
The roadbed shall be trimmed to within 15 millimeters of the final subgrade elevation. Trimmed material shall be placed in a windrow on either foreslope for use in earth shoulder fill after paving. No ponding of water shall be allowed by the stored material.

Trimming of material shall be included in excavation required for Earth Shoulder Construction. Granular surfacing material, if placed over the winter, is included in the trimmed volume.

09-27-94 221-2
Construction of Class "A" subbase beneath P.C. concrete pavement shall be done only where shown on project plans. Unless specifically identified on typical cross sections or other details, Class "A" subbase shall not be required for pavement areas outside the limits of normal roadway pavement. Added areas for turning lanes at intersections, paved median crossovers, etc. shall not require placement of Class "A" subbase.

09-27-94 221-3
Estimated quantity for new concrete pavement includes all integral curb, all street returns and special areas of repairs to connecting pavements.

09-27-94 221-4
In order to avoid any unnecessary surface breaks or premature spalling, the contractor is cautioned to exercise extreme care when performing any of the necessary saw cutting operations for the proposed pavement removal.

12-08-95 222-1
Special care shall be taken when forming at intersections so that the profiles and elevations shown on the cross sections, street return profile sheets, and staking diagram sheets are obtained. Short lengths of forms or flexible forms may be necessary at these locations.

09-27-94 232-4
Selective clearing will be required on this project.

Any trees outside of the construction limits shall be removed only by the approval of the engineer. This includes areas in divided medians and inside interchanges.

It will be necessary to clear along the right-of-way line to permit installation of fence. This clearing should be done so as soon as possible with trees cut off at the ground line.

Contractor shall not disturb native grass areas outside the construction limits.

09-27-94 232-5
The contractor shall not disturb desirable grass areas and desirable trees outside the construction limits. The contractor will not be permitted to park or service vehicles and equipment or use these areas for storage of materials. Storage, parking and service areas will be subject to the approval of the resident engineer.

09-27-94 232-8
The top 150 millimeters of the disturbed areas shall be free of rock and debris and shall be suitable for the establishment of vegetation, subject to the approval of the Engineer.

10-28-97 232-10
The contractor is expected to have materials, equipment, and labor available on a daily basis to install and maintain erosion control features on the project. This may involve seeding, silt fence, rock ditch checks, silt basins, or silt dikes.

09-27-94 241-1
Road contractor is to use due caution in working over and around all tile lines. Breaks in the tile line due to the contractor's carelessness are to be replaced at his expense without cost to the State of Iowa. Any tile lines broken or disturbed by our cut lines will be replaced as directed by the engineer in charge of construction and at the State of Iowa's expense.

07-15-97 241-2
Where indicated on the plans or when directed by the Engineer, existing sewer and drainage pipes which are to be abandoned in place shall be completely blocked with permanent bulkheads composed of either class X concrete or brick masonry. Salvaged brick may be used provided they are sound and meet the approval of the Engineer. This work shall be considered as incidental work and the cost of such blocking of abandoned sewers and drainage pipes shall be considered to be included in the contract price for other items.

09-27-94 251-1
The contractor shall be responsible to maintain access to individual properties during construction.

Relocated access shall be completed to individual properties prior to removal of existing access.

If the permanent access cannot be completed prior to removal of the existing access, the contractor shall provide and maintain an alternate access. Temporary Granular Surfacing will be paid for as a contract item or by extra work.

09-27-94 251-2
The contractor is hereby notified that removal of any existing traffic markers, warning devices or guardrail barriers shall be scheduled subject to the approval of the Engineer. The contractor may be required to place temporary warning devices at certain locations where replacement features are not installed the same day during which any such removals take place.

09-27-94 251-3
A plan for stage construction of local accesses which are required to remain open to traffic during construction shall be submitted by the contractor for approval by the engineer.

10-31-95 251-4
The centerline pavement marking shall always be placed on one side of the roadway except where a "No Passing Zone" line is used, at which point it is placed on the opposite side of the roadway. The centerline shall be placed on the same side of the roadway as to match existing markings near the project.

09-27-94 251-5
On all new or reconstructed pavements, the location of "NO PASSING" zone lines shall be located in the field. The locations of the proposed "NO PASSING" zone lines shown on the pavement marking tabulation is for estimating quantities only.

09-27-94 252-1
Blading and shaping as well as any other incidental work in preparation for any maintenance of temporary crossing or detours shall be considered incidental to other work on the project. Additional surfacing needed for temporary crossings or detours during construction shall be furnished and spread at contract price.

10-02-01 252-2
The detour(s) on this project have been designated to accommodate the Hot Mix Asphalt option. If the P.C. concrete option is utilized, "on-the-site" adjustments may be required as approved by the Engineer.

09-27-94 261-2
Before performing earthwork, tilling, or excavation within 91.4 meters of an existing pipeline, the contractor shall notify the pipeline company and the pipeline company shall mark the location of the pipeline as required by Section 479.47 of the Code of Iowa.

The contractor shall exercise all due caution when working in the vicinity of pipelines carrying combustible or toxic materials which are present on this project. Pipeline location shown on the plans represents the best information available at the time of plan preparation.

POLLUTION PREVENTION PLAN

110-12
09-27-94

The prime contractor shall be responsible for compliance and implementation of the Pollution Prevention Plan (PPP) for their entire contract. This responsibility shall be further shared with subcontractors whose work is a source of potential pollution as defined in this PPP.

1. SITE DESCRIPTION

This Pollution Prevention Plan (PPP) is for the construction of a 4-lane expressway facility on US 30 Marshall County from the 4.8km West of the Marshall & Tama Co. line to the Co. line.

The PPP covers approximately 113 hectares with an estimated 86 hectares being disturbed.

The PPP is located in an area of one soil association, (Tama-Muscatine) The estimated average SCS runoff curve number for this PPP after completion will be 66.

Refer to the Grading Plan (Marshall County NHS-30-5(136)--19-64 for locations of typical slopes, ditch grades, and major structural and non-structural controls. A copy of this plan will be on file at the project engineer's office. Runoff from this project work will flow into various unnamed ditches and waterways which flow into the Iowa River

POTENTIAL SOURCES OF POLLUTION:

Site sources of pollution generated as a result of this work relate to silts and sediment which may be transported as a result of a storm event. However, this PPP provides conveyance for other (non-project related) operations. These other operations have storm water runoff, the regulation of which is beyond the control of this PPP. Potentially this runoff can contain various pollutants related to site-specific land uses. Examples are:

Rural Agricultural Activities:

Runoff from agricultural land use can potentially contain chemicals including herbicides, pesticides, fungicides, and fertilizers.

Commercial and Industrial Activities:

Runoff from commercial, industrial, and commerce land use may contain constituents associated with the specific operation. Such operations are subject to potential leaks and spills which could be commingled with run-off from the facility. Pollutants associated with commercial and industrial activities are not readily available since they are typically proprietary.

2. CONTROLS

Prior to beginning grading, excavation or clearing and grubbing operations, silt fence shall be placed by the grading contractor along the perimeter of the areas to be disturbed at locations where runoff can move offsite. Vegetation in areas not needed for construction shall be preserved. As areas reach their final grade, additional silt fences, shale basins, streambed riffles, riprap, silt basins, intercepting ditches, sod flumes, letdowns, bridge end drains, and earth dikes shall be installed as specified in the plans and/or as required by the project engineer. This will include using silt fence as ditch checks and to protect intakes. Temporary stabilizing seeding shall be completed as the disturbed areas are constructed. If construction activity is not planned to occur in a disturbed area for at least 21 days, the area shall be stabilized by temporary seeding or mulching within 14 days. No more than 70,000 square meters of exposed erodible area is allowed in any one grading spread without permission of the project engineer. Other stabilizing methods shall be used outside the seeding period.

This work shall be done in accordance with Section 2525 of the Standard Specification. If the work involved is not applicable to any contract items, the work shall be paid for according to Article 1109.03 paragraph B.

POLLUTION PREVENTION PLAN

110-12
09-27-94

As the work progresses, additional erosion control items such as rock or sod flumes, ditch checks, subsurface drains, letdown structures, & other appropriate measures shall be installed by the paving or erosion control contractor as determined by the engineer after field investigation. The construction will be completed with the establishment of permanent perennial vegetation of all disturbed areas by the erosion control contractor.

3. OTHER CONTROLS

Contractor disposal of unused construction materials and construction material wastes shall comply with applicable state and local waste disposal, sanitary sewer, or septic system regulations. In the event of a conflict with other governmental laws, rules and regulations, the more restrictive laws, rules or regulations shall apply.

APPROVED STATE OR LOCAL PLANS:

During the course of this construction, it is possible that situations will arise where unknown materials will be encountered. When such situations are encountered, they will be handled according to all federal, state, and local regulations in effect at the time.

4. MAINTENANCE

The contractor is required to maintain all temporary erosion control measures in proper working order, including cleaning, repairing, or replacing them throughout the contract period. Cleaning of silt control devices shall begin when the features have lost 50% of their capacity.

5. INSPECTIONS

Inspections will be made jointly by the contractor and the contracting authority every seven calendar days and after each rain event that is 13mm or greater. The contractor shall immediately begin corrective action on all deficiencies found. The findings of this inspection shall be recorded in the project diary. This PPP may be revised based on the findings of the inspection. The contractor shall implement all revisions. All corrections shall be completed within 3 calendar days of the inspection.

6. NON-STORM DISCHARGES

This includes subsurface drains (i.e. longitudinal and standard subdrains), slope drains and bridge end drains. The velocity of the discharge from these features may be controlled by the use of patio blocks, Class A stone or erosion stone.

STAGING NOTES

108-26
09-27-94

Staging sequences listed below are suggestions only. The intent of this staging is to close Ia 146/T-37 after the 2002 school session is over and open to normal traffic before the Fall 2002 school session begins. It is suggested that when school is in session the contractor only use the RS-3 lane closures when the school buses are running. The Contractor will submit proposed staging sequencing to the Engineer for approval.

Stage 1:

1. Grade Mainline EB & WB from Sta. 51+50 to Sta. 84+00
2. Close Ia 146/T-37 and Grade & Pave from Sta. 1462+40 to Sta. 1477+16.
3. Grade & pave detour pavement on Ia 146/T-37 from Sta. 1461+87 to Sta. 1462+40 & open to traffic
4. Grade and granular surface 235th St and Johnson drive at Sta. 1469+80 (Ia 146)
5. Build berms for WB bridge left Sta. 21±

Stage 2:

1. Pave EB sections from Sta. 24+60 to Sta. 47+30 & Sta. 88+75 to Sta. 92+50
2. Grade & pave temporary detours right Sta. 23±, Sta. 48±, & Sta. 88± (Use RA-3 traffic control during work times and 2-lane operation during non-work times)
3. Pave County Road T-31 right Sta. 37+17 (US 30)
4. Complete all entrance connections to the new paved sections.

SECTION 404 PERMIT CONDITIONS

404PC
Special

1. Equipment for handling and conveying materials during construction shall be operated to prevent dumping or spilling the material into waterbodies, streams or wetlands except as approved herein.
2. Construction activities shall be conducted during low to normal flows and the Iowa Department of Transportation shall employ controls to reduce the erosiveness of land adjacent to surface waters and wetlands, including establishment and maintenance of the erosion controls during and after construction and revegetation of all disturbed areas upon project completion. The prime contractor shall be responsible for installation of all erosion control measures.
3. Care shall be taken to prevent any petroleum products, chemicals, or other deleterious materials from entering waterbodies, streams or wetlands.
4. All construction debris shall be disposed of on land in such a manner that it cannot enter a waterway or wetland.
5. Construction equipment, activities, and materials shall be kept out of the streams and wetlands to the maximum extent possible.
6. Temporary construction crossings, structures, and fills shall involve the least damaging and minimum amount of disturbance/impacts to waters of the state and appropriate measures must be taken to maintain near normal downstream flows and minimize flooding. Fills shall be placed in such a manner that the material will not be eroded by high flows. All temporary fills shall be completely removed to upland, non-wetland sites and the area restored to pre-project conditions within 30 days of the end of their use.
7. Clearing of vegetation, including trees located in or immediately adjacent to waters of the state, shall be limited to that which is absolutely necessary for construction of the project. All vegetation clearing material shall be removed to an upland, non-wetland disposal site.

TRAFFIC CONTROL PLAN

108-23
09-27-94

1. Traffic will be maintained on Present U.S. 30 at all times. County Road T-37\IA146 and 235th Street, will be closed as necessary when reconstructed. Access will be maintained in accordance with standard note 251-1.
2. When IA146 is closed traffic will be detoured.
3. Traffic control on this project shall be in accordance with Standard Road Plans shown on A.01 (Tab. 105-4). For additional complementary information, refer to Part VI of the Manual on Uniform Traffic Control Devices and to the current Standard Specifications.
4. All traffic control devices shall be furnished, erected, maintained and removed by the contractor.
5. Where possible, all post-mounted signs shall be placed at least 0.6 meter beyond the curb or edge of shoulder.
6. The location for storage of equipment by the contractor during nonworking hours shall be as approved by the Engineer in charge of construction.
7. Proposed sign spacing may be modified as approved by the Engineer to meet existing field conditions or to prevent obstruction of the motorist's view of permanent signing.
8. Permanent signing that conveys a message contrary to the message of the temporary signing and not applicable to the working conditions shall be covered by the contractor when directed by the Engineer.
9. Proposed changes in the traffic control plan shall be reviewed with the Office of Construction before changes are made.

LOCATIONS OF ROAD CLOSURE BARRICADES

102-4
10-03-00

Refer to Standard Road Plan RE-3A, RE-3B

No.	LOCATION	STANDARD ROAD PLAN	Ⓜ meters	REMARKS
	Station			
1	75+70 Rt	RE-3B	N/A	Culdesac in Next Proj.
2	75+70 Lt	RE-3A	N/A	

TABULATION OF SILT FENCES FOR DITCH CHECKS

100-18
09-27-94

LOCATION STATION	SIDE	m	REMARKS
51+50	Lt	6.0	Ditch Check
51+50	Rt	6.0	Ditch Check
51+80	Med	10.0	Ditch Check
52+13	Rt	8.0	Pipe Inlet
53+00	Med	6.0	Ditch Check
54+20	Med	6.0	Ditch Check
54+64.72	Rt	10.0	RCB Inlet
55+40	Med	16.0	Ditch Check
56+60	Med	10.0	Ditch Check
56+70	Lt	10.0	Ditch Check
56+70	Rt	10.0	Ditch Check
57+60	Lt	10.0	Ditch Check
57+80	Med	10.0	Ditch Check
57+80	Rt	6.0	Ditch Check
59+00	Med	10.0	Ditch Check
59+40	Med	6.0	Pipe Inlet
60+14	Lt	10.0	Pipe Inlet
60+20	Med	10.0	Ditch Check
61+23.25	Rt	16.0	RCB Inlet
61+40	Med	10.0	Ditch Check
62+00	Med	6.0	Pipe Inlet
62+60	Med	10.0	Ditch Check
63+80	Med	10.0	Ditch Check
65+00	Med	10.0	Ditch Check
66+20	Med	10.0	Ditch Check
67+40	Med	10.0	Ditch Check
68+60	Med	10.0	Ditch Check
68+60	Med	6.0	Pipe Inlet
69+80	Med	10.0	Ditch Check
71+00	Med	10.0	Ditch Check
72+00	Lt	6.0	Pipe Inlet
72+20	Med	10.0	Ditch Check
72+80	Lt	8.0	Ditch Check
73+40	Med	10.0	Ditch Check
73+80	Lt	8.0	Pipe Inlet
74+00	Lt	10.0	Ditch Check
74+20	Rt	10.0	Ditch Check
74+60	Med	10.0	Ditch Check
75+20	Lt	10.0	Ditch Check
75+40	Med	6.0	Pipe Inlet
75+80	Med	10.0	Ditch Check
76+00	Rt	10.0	Ditch Check
76+40	Lt	10.0	Ditch Check
76+60	Rt	10.0	Ditch Check
77+00	Med	10.0	Ditch Check
77+80	Lt	10.0	Ditch Check
77+80	Rt	10.0	Ditch Check
78+20	Med	10.0	Ditch Check
79+00	Lt	10.0	Ditch Check
79+00	Rt	10.0	Ditch Check
79+40	Med	10.0	Ditch Check
80+20	Lt	10.0	Ditch Check
80+20	Rt	10.0	Ditch Check
80+60	Med	10.0	Ditch Check
81+40	Rt	10.0	Ditch Check
81+80	Med	10.0	Ditch Check
82+60	Rt	10.0	Ditch Check
83+00	Med	10.0	Ditch Check
83+40	Med	6.0	Pipe Inlet
83+80	Rt	10.0	Ditch Check
84+20	Med	6.0	Ditch Check
85+00	Rt	10.0	Ditch Check
85+40	Med	10.0	Ditch Check
86+20	Rt	10.0	Ditch Check
86+60	Med	10.0	Ditch Check
87+20	Lt	10.0	Ditch Check
87+40	Rt	6.0	Ditch Check
87+80	Med	10.0	Ditch Check
88+40	Lt	10.0	Ditch Check
88+60	Med	6.0	Pipe Inlet
88+60	Rt	6.0	Ditch Check
89+00	Med	10.0	Ditch Check
89+20.25	Rt	16.0	RCB Inlet
89+40	Lt	10.0	Ditch Check
89+60	Rt	6.0	Ditch Check
89+60	Med	10.0	Ditch Check

TABULATION OF SILT FENCES FOR DITCH CHECKS

100-18
09-27-94

LOCATION STATION	SIDE	m	REMARKS
S.R. "F" Cul-de-sac			
1+15	Rt	6.0	Ditch Check
Drive 1			
1300+20	Lt	4.5	Ditch Check
1300+20	Rt	4.5	Ditch Check
1300+80	Lt	4.5	Ditch Check
1301+20	Rt	4.5	Ditch Check
1301+60	Rt	6.0	Pipe Inlet
1302+20	Lt	4.5	Ditch Check
1302+20	Rt	4.5	Ditch Check
1302+80	Rt	6.0	Pipe Inlet
1303+00	Lt	4.5	Ditch Check
1303+00	Rt	4.5	Ditch Check
1304+20	Lt	4.5	Ditch Check
1304+20	Rt	4.5	Ditch Check
S.R. "E"			
1464+40	Lt	4.5	Ditch Check
1465+20	Rt	4.5	Ditch Check
1465+60	Lt	4.5	Ditch Check
1465+60	Rt	16.0	RCB Inlet
1466+40	Rt	4.5	Ditch Check
1466+80	Lt	4.5	Ditch Check
1467+80	Rt	6.0	Ditch Check
1468+00	Lt	4.5	Ditch Check
1469+00	Rt	10.0	Pipe Inlet
1469+20	Lt	4.5	Ditch Check
1470+00	Lt	10.0	Ditch Check
1470+20	Rt	10.0	Ditch Check
1470+60	Rt	6.0	Ditch Check
1471+80	Rt	6.0	Ditch Check
1473+00	Lt	14.0	Ditch Check
1473+40	Rt	6.0	Ditch Check
1473+80	Lt	6.0	Pipe Inlet
1473+80	Rt	6.0	Pipe Inlet
1474+20	Rt	10.0	Ditch Check
1474+40	Lt	10.0	Ditch Check
1475+40	Lt	6.0	Ditch Check
1475+40	Rt	6.0	Ditch Check
1475+80	Rt	6.0	Pipe Inlet
1476+40	Lt	6.0	Ditch Check
1476+60	Rt	6.0	Pipe Inlet
1476+60	Rt	6.0	Ditch Check
Detour 1			
2047+80	Lt	10.0	Ditch Check
2047+80	Lt	6.0	Pipe Inlet
2049+00	Lt	6.0	Ditch Check
2049+00	Rt	6.0	Ditch Check
2049+20	Lt	6.0	Pipe Inlet
2049+40	Rt	6.0	Pipe Inlet
2050+20	Lt	6.0	Ditch Check
2050+20	Rt	6.0	Ditch Check
2051+40 (Ent.1 Detour)	Rt	6.0	Ditch Check
Detour2			
2085+00	Rt	6.0	Ditch Check
2086+20	Rt	6.0	Ditch Check
2087+00	Lt	10.0	Ditch Check
2087+40	Rt	6.0	Ditch Check
2088+20	Lt	6.0	Ditch Check
2088+60	Rt	6.0	Ditch Check
2088+60	Lt	6.0	Pipe Inlet
S.R. "C2"			
2253+23	Lt	4.5	Ditch Check
2253+23	Rt	4.5	Ditch Check
S.R. 1			
9001+15.5	Lt	4.5	Ditch Check
9001+15.5	Rt	4.5	Ditch Check
9002+00	Lt	6.0	Pipe Inlet
9002+00	Rt	6.0	Pipe Inlet
9002+20	Lt	4.5	Ditch Check
9002+20	Rt	4.5	Ditch Check
9003+40	Lt	4.5	Ditch Check
9003+40	Rt	4.5	Ditch Check
9004+42.35	Lt	6.0	Pipe Inlet
9004+60	Lt	4.5	Ditch Check
9004+60	Rt	4.5	Ditch Check
9005+20	Rt	4.5	Ditch Check

TABULATION OF SILT FENCES FOR DITCH CHECKS

100-18
09-27-94

LOCATION STATION	SIDE	m	REMARKS
9005+60	Lt	6.0	Pipe Inlet
9005+80	Lt	6.0	Ditch Check
9007+00	Lt	6.0	Ditch Check
9007+40	Rt	4.5	Ditch Check
9008+20	Lt	4.5	Ditch Check
9008+60	Rt	4.5	Ditch Check
9008+80	Rt	6.0	Pipe Inlet
9008+90.5	Lt	4.5	Ditch Check
9008+90.5	Rt	4.5	Ditch Check
Ramp B			
1567+80	Lt	6.0	Ditch Check
1567+80	Rt	6.0	Ditch Check
1569+00	Lt	6.0	Ditch Check
1569+00	Rt	6.0	Ditch Check
1570+20	Lt	6.0	Ditch Check
1570+20	Rt	6.0	Ditch Check
Ramp B			
2564+80	Lt	6.0	Ditch Check
2564+80	Rt	6.0	Ditch Check
2566+00	Lt	6.0	Ditch Check
2566+00	Rt	6.0	Ditch Check
2567+00	Lt	6.0	Pipe Inlet
2567+20	Rt	6.0	Ditch Check
2567+20	Lt	6.0	Ditch Check
Ramp C			
3565+60	Rt	6.0	Pipe Inlet
3566+00	Lt	10.0	Ditch Check
3567+20	Lt	10.0	Ditch Check
Ramp D			
4567+80	Lt	6.0	Ditch Check
4567+80	Rt	6.0	Ditch Check
4568+00	Lt	6.0	Pipe Inlet
4569+00	Lt	6.0	Ditch Check
4569+00	Rt	6.0	Ditch Check
4569+80	Rt	6.0	Ditch Check
4570+20	Lt	6.0	Ditch Check

TABULATION OF SILT FENCES

100-17
09-27-94

LOCATION		SIDE	LENGTH m	REMARKS
STATION TO STATION				
51+50	56+70	Lt	520	
51+40	56+70	Rt	530	
57+80	72+60	Lt	480	
58+00	74+00	Rt	600	
80+80	87+20	Lt	640	
89+40	89+80	Lt	40	
89+60	90+00	Med	40	

TABULATION OF SILT FENCES

100-17
09-27-94

LOCATION		SIDE	LENGTH m	REMARKS
STATION TO STATION				
Drive 1				
1301+00	1302+00	Lt	100	
1301+40	1302+00	Rt	60	
1302+60	1303+00	Lt	40	
1302+80	1303+00	Rt	20	
S.R. E				
1462+40	1464+20	Lt	180	
1462+40	1465+20	Rt	280	
1470+00	1472+00	Lt	200	
1472+40	1473+20	Lt	80	
1474+20	1475+40	Rt	120	
1476+40	1477+14.463	Lt	75	
Detour 1				
2047+40	2047+80	Lt	40	
2047+40	2049+00	Rt	160	
2051+40	2052+80	Rt	140	
Detour 2				
2084+00	2084+60	Rt	60	
2086+20	2086+80	Lt	60	
2088+20	2088+60	Lt	40	
S.R. 1				
9005+20	9007+20	Rt	200	
Ramp A				
1570+80	1570+80	Lt	140	
1571+00	1571+00	Rt	120	
Ramp B				
2563+40	2563+40	Lt	100	
2563+40	2563+40	Rt	60	
Ramp C				
3563+60	3563+60	Lt	260	
3563+60	3563+60	Rt	420	
Ramp D				
4569+80	4569+80	Lt	260	
4571+00	4571+00	Rt	140	

TABULATION OF INTERCEPTING DITCHES

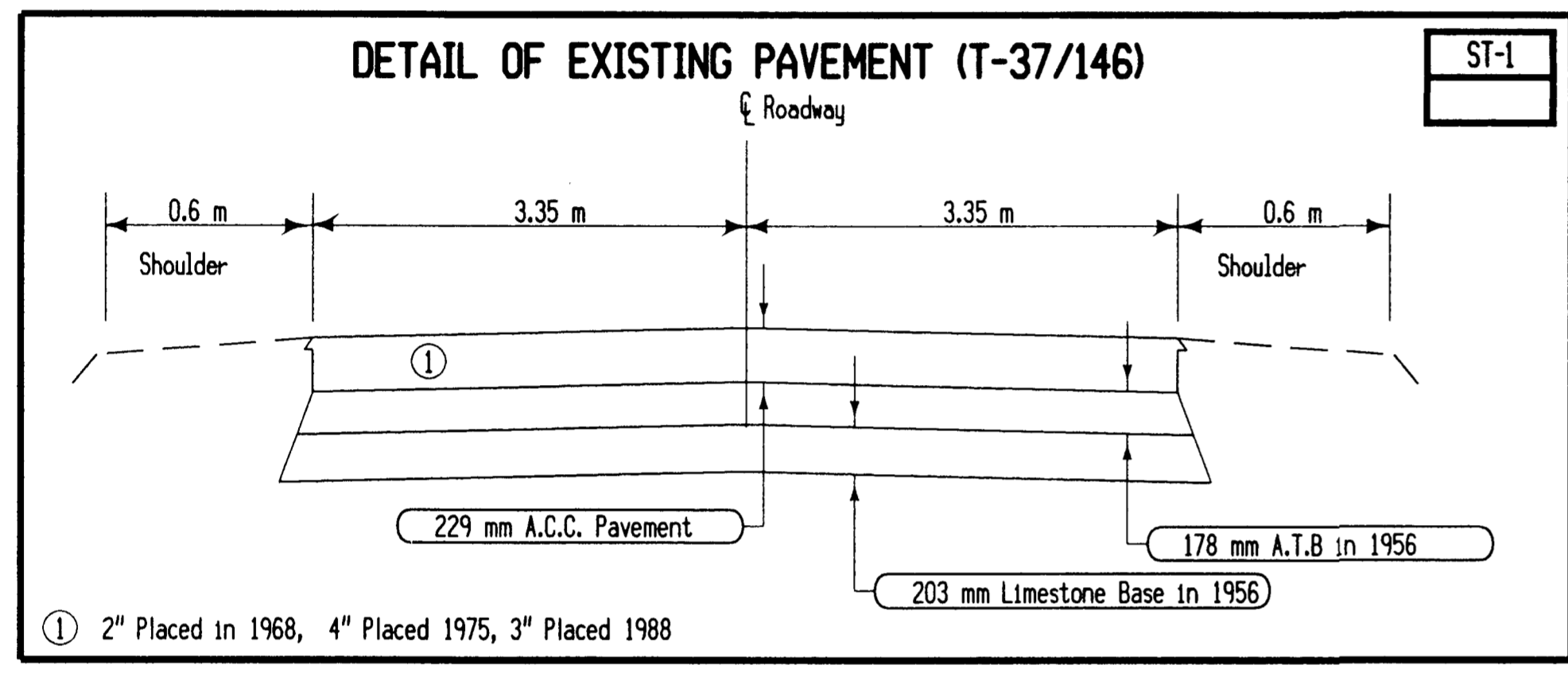
100-16
09-27-94

LOCATION		SIDE	LENGTH m	REMARKS
STATION TO STATION				
76+00	78+00	Lt	200	
76+40	80+00	Rt	360	
1567+80	1568+80	Lt	100	
2565+00	2565+80	Rt	80	
1467+40	1468+00	Lt	60	
1467+40	1468+00	Rt	60	
1468+80	1469+40	Rt	60	
1475+40	1476+40	Rt	100	

TABULATION OF EXISTING PAVEMENT								102-5 09-27-94
NO.	LOCATION	EXISTING PAVEMENT Type	COARSE AGGREGATE			PAVEMENT THICKNESS mm	REINFORCEMENT Type	DETAIL TYPICAL
			TYPE	SOURCE	DURABILITY CLASS			
1	1462+40-1477+15.8	H.M.A.	GRAVEL			229		ST-1

TABULATION OF SAFETY CLOSURES				108-13A 10-28-97
Refer to Section 2518 of the Standard Specifications				
STATION	CLOSURE TYPE		REMARKS	
	Road Qty.	Hazard Qty.		
24+50	1		In Place	
25+00	1		In Place	
28+40	1		In Place	
28+90	1		In Place	
32+75	1		In Place	
33+25	1		In Place	
36+90	1		In Place	
1034+33.00	1		In Place	
1036+86.00	1		In Place	
37+40	1		In Place	
41+90	1		In Place	
42+40	1		In Place	
44+90	1		In Place	
45+40	1		In Place	
46+40	1		In Place	
46+90	1		In Place	
47+00 R 2		1		
1462+40	1			
1466+67 Lt	1			
1466+67 Rt	1			
2567+00		1		
4568+00		1		
1468+77 Lt	1			
1468+77 Rt	1			
1477+15.85	1			
9001+10	1			
9008+90	1			
72+00		2		
73+80		2		
75+40		2		
88+40		1		
89+20	1			
89+70	1			

REMOVAL OF PAVEMENT					110-1 04-27-99
STATION TO STATION		PAVEMENT TYPE	AREA m ²	SAW CUT m*	REMARKS
1462+40	1477+15.85	H.M.A.	9,888	13.4	



REMOVAL OF EXISTING STRUCTURES			110-2 09-27-94
LOCATION	DESCRIPTION	DISPOSAL	
1465+84	1.8 X 3.0 X 12.1 R.C.B.	213-1	

TABULATION OF PAVEMENT MARKING SYMBOLS AND LEGENDS														108-29 04-28-96		
ROAD IDENTIFICATION	LOCATION		←	↶	→	↷	↸	↹	↻	→	X RR	STOP	AHEAD ONLY	SCHOOL XING	♿	REMARKS
	STATION	SIDE														
Ia. 146	1463+24		1													
	1463+53		1													
	1464+28		1													
	1465+03		1													

LIST OF SUBDRAIN WORK																	104-5Cm MODIFIED	
Refer to Standard Road Plans RF-3, RF-5, RF-19A, RF-19B, RF-19C, RF-19E, RF-19F and RF-22																		
NO.	LOCATION STATION	TYPE OF INSTALLATION	PIPE			APRONS			OUTLETS			CONNECTED PIPE JOINTS *		TRENCH DRAIN	GRANULAR MATERIAL	POROUS BACKFILL *	CLASS "A" CRUSHED STONE *	REMARKS
			CONCRETE, C.M.P., C.M.P. COATED, PLASTIC OR CLAY	DIA. mm	LENGTH m	RF-3 No.	RF-5 No.	RF-19E No.	RF-19F Type	RF-22 No.	Type	No.	Length m	Blanket m ³	Mg	Mg		
1	54+23	RF-19B Case 'A'	C.M.P. COATED	300	135													
2	54+30	RF-19B Case 'A'	C.M.P. COATED	250	135													
3	54+87	RF-19B Case 'A'	C.M.P. COATED	250	150													
4	1470+35	RF-19B Case 'A'	C.M.P. COATED	250	60													

- ① Refer to RB-3
- ② Refer to RL-7

POINTS OF ACCESS

102-3

10-03-00

Refer to Cross Sections

LOCATION		Type (A, B, or C)	LENGTH OF OPENING ①		W m	① ② PR m	PIPE CULVERT (RF-30A or RF-30B)				APRONS No.	DRIVEWAY SURFACE AREA		DRIVEWAY SURFACING MATERIAL Mg	REMARKS	
Station	Side		Case (1, 2, or 3)	40 mm Dropped Curb m			75 mm Dropped Curb m	Size				A.C.C. m ²	P.C.C. m ²			
								H m	450 mm m	600 mm m						m
22+80.00	Rt				7.2		Dry						10			
24+76	Rt/Med												20			
28+66.5	Rt/Med												20			
33+06.65	Rt/Med												30			
37+16	Med												10			
42+18	Rt/Med												30			
46+70.00	Rt				7.2		0.366	104-3					109			
46+70.00	Med				12								15			
89+40.00	Med				12		Dry						44			
1463+26.29	Lt		1	12	3.5	4	Dry				30					
1463+50.95	Rt		1	12	3.5	4	Dry						11			
1465+00.00	Rt		1	30	9	10	Dry						12			
1470+00.00	Rt				8.4		U.A.C.						8			
1473+25.26	Lt				4.8		Dry						24			
1473+74.08	Lt				5.5		0.431	14.69		2			27			
1473+84.24	Rt				5.5		0.431	21.08		2			26			
1475+79.69	Rt				5.5		0.498	16.43		2			70			
1476+64.84	Rt				5.5		0.517	17.12		2			29			
9002+00.00	Lt				5.5		0.28	11.63		2			18			
9002+00.00	Rt				5.5		0.28	11.63		2			18			
9004+42.00	Lt				5.5		0.3	11.8		2			25			
9005+00.00	Lt				5.5		0.34	20.30		2			25			
9007+90.00	Lt				5.5		Dry	11.58		2			30			
9008+85.00	Rt				5.5		0.31	11.64		2			19			
9008+97.00								17.00								
9008+87.00								13.00								
9001+45								7.14		2						
9001+40								1.83						Pipe Repair		

LIST OF INTAKES AND UTILITY ACCESSES

104-5A
09-27-94

LIST OF STORM SEWER PIPE

104-5B
09-27-94

NUMBER	LOCATION	TYPE OR STANDARD ROAD PLAN	FORM GRADE Elev.	BOTTOM WELL Elev.	NOTE	LINE NUMBER	LOCATION		CLASS "D"	PIPE DIAMETER mm	LENGTH OF LINE m	SLOPE %	FLOW LINES			GRANULAR BACKFILL Mg	PIPE PROFILE SHEET NO.	NOTE	
							From	To					INLET Elevation	OUTLET Elevation	OTHER Elevation				
1	Sta. 1463+98 Lt	RA-68	279.494	278.294	1a 146/T-37	L-1	1	1365.98	2	100	375	14.60	0.92	278.5	278.366			M.05	1a 146/T-37
2	Sta. 1463+98 Rt	RA-68	279.560	278.190	1a 146/T-37	L-2	2	1463+98	3	100	450	124.37	3.08	278.3	274.62			M.05	1a 146/T-37
3	Sta. 1465+18 Rt	RA-68	276.565	274.365	1a 146/T-37	L-3	3	Outlet 1465+35		100	450	11.57+ Apron	4.5	274.50	274.00			M.05	1a 146/T-37

TABULATION OF PAVEMENT MARKINGS

108-22
10-31-95

ROAD IDENTIFICATION		LOCATION		SIDE		LENGTH (m)																REMARKS
STATION TO STATION		L	R	②	③	⑤	⑥	⑦	⑧	⑨	⑩	⑪	⑫	⑬	⑭	⑮	⑯					
Ia. 146	1462+40 to 1470+66		X																			
Ia. 146	1462+40 to 1478+14.928		X	825.0																		
Ia. 146	1464+00 to 1478+14.928	X	X					2710.6														
Ia. 146	1465+45 to 1470+66		X										290.9									
Ia. 146	1470+66 to 1476+00		X		534.0																	
T-31	1034+40 to 1036+99.06			260				516.4						7.0								
LENGTH SUBTOTALS				1,085	534.0	1802.6		3,277					290.9	7.0								
QUANTITY FACTORS				.25	2	1	.25	1	1	.33	1	2	2	6	1.5							
TOTALS				271.25	1068.0	1802.6		3,277					581.8	42.0								

DESIGN TEAM **ABRAMS/SMITH**

METRIC

IOWA DOT * OFFICE OF DESIGN

MARSHALL

COUNTY

PROJECT NUMBER

NHSX-30-5(166)--3H-64

SHEET NUMBER

C.08

- ① Refer to Standard Road Plan RF-19C.
- ② Refer to Soils Sheets.
- ③ Refer to Standard Road Plan RL-15.

TABULATION OF LONGITUDINAL SUBDRAIN SHOULDER AND BACKSLOPE

104-9
10-02-01
*Not a bid item

Line No.	LOCATION				LONGITUDINAL SUBDRAIN						CMP SUBDRAIN OUTLET RF-19E or RF-22			POROUS BACKFILL*	CLASS "A" CRUSHED STONE*	REMARKS	
	Road or Lane Ident.	Station to Station		Side	Depth (D) m	SHOULDER ①		BACKSLOPE ②		BRIDGE BERM ③							
						Size	m	Size	m	Size	Type	Length m	Station				Size
1	EBL	24+00	24+099	LT	1.1	100	111.80					24+00	100	E	24.7	0.9	
2	EBL	25+002	26+50	LT	1.1	100	161.50					24+99	100	E		0.9	
3	EBL	26+50	28+015	LT	1.1	100	180.90					25+02	100	E	47.2	0.9	
4	EBL	28+015	29+075	LT	1.1	100	175.30					26+50	100	E		0.9	
5	EBL	29+075	31+030	LT	1.1	100	171.80					26+50	100	E	48.5	0.9	
6	EBL	31+030	32+078	LT	1.1	100	163.50					28+15	100	E		0.9	
7	EBL	32+082	33+071	LT	1.1	100	146.40					28+15	100	E	71.5	0.9	
8	EBL	33+023	34+060	LT	1.1	100	149.30					29+75	100	E		0.9	
9	EBL	34+060	36+000	LT	1.1	100	154.90					29+75	100	E		0.9	
10	EBL	36+000	36+098	LT	1.1	100	111.00					31+30	100	E		0.9	
11	EBL	37+042	38+095	LT	1.1	100	163.20					31+30	100	E	70.6	0.9	
12	EBL	38+095	40+045	LT	1.1	100	162.10					32+78	100	E		0.9	
13	EBL	40+045	41+097	LT	1.1	100	165.30					32+78	100	E	67.3	0.9	
14	EBL	42+003	43+050	LT	1.1	100	158.60					33+71	100	E		0.9	
15	EBL	43+050	44+097	LT	1.1	100	160.70					33+71	100	E	20.1	0.9	
16	EBL	45+003	46+020	LT	1.1	100	134.20					34+60	100	E		0.9	
17	EBL	46+020	47+040	LT	1.1	100	136.40					34+60	100	E	63.1	0.9	
18	EBL	89+060	90+042	LT	1.1	100	96.20					36+00	100	E		0.9	
19	EBL	90+042	92+000	RT	1.1	100	178.80					36+00	100	E	64.4	0.9	
20	EBL	92+000	93+009	RT	1.1	100	120.90					36+98	100	E		0.9	
												37+42	100	E	63.1	0.9	
												38+95	100	E		0.9	
												38+95	100	E	69.4	0.9	
												40+45	100	E		0.9	
												40+45	100	E	68.6	0.9	
												41+97	100	E		0.9	
												41+97	100	E	69.4	0.9	
												43+50	100	E		0.9	
												43+50	100	E	67.3	0.9	
												44+97	100	E		0.9	
												44+97	100	E	67.3	0.9	
												45+02	100	E		0.9	
												46+20	100	E		0.9	
												46+20	100	E	54.8	0.9	
												47+40	100	E		0.9	
												47+40	100	E	56	0.9	
												90+42					
												90+42	100	E	43.3	0.9	
												92+00	100	E		0.9	
												92+00	100	E	72.5	0.9	
												93+09	100	E		0.9	
																	Tie in to the existing drain at Sta. 92+50
21	146/T37	1462+039	1464+022	LT	1.1	100	189.90					1462+39	100	E	60.2	0.9	
22	146/T37	1464+022	1465+072	LT	1.1	100	163.60					1464+22	100	E		0.9	
23	146/T37	1465+072	1466+055	LT	1.1	100	97.90					1464+22	100	E	51.9	0.9	
24	146/T37	1464+083	1467+10	LT	1.1	100	37.50					1465+72	100	E		0.9	
25	146/T37	1467+10	1468+50	LT	1.1	100	156.30					1465+72	100	E	52.7	0.9	
26	146/T37	1468+50	1468+097	LT	1.1	100	65.80					1466+55	100	E		0.9	
27	146/T37	1469+002	1470+40	LT	1.1	100	155.00					1466+55	100	E	61	0.9	
28	146/T37	1470+40	1471+50	LT	1.1	100	126.50					1466+83	100	E		0.9	
29	146/T37	1471+50	1472+45	LT	1.1	100	110.90					1467+10	100	E		0.9	
30	146/T37	1472+51	1473+010	LT	1.1	100	72.90					1467+10	100	E	64.4	0.9	
31	146/T37	1473+010	1474+070	LT	1.1	100	174.30					1468+50	100	E		0.9	
32	146/T37	1474+070	1475+029	LT	1.1	100	79.30					1468+50	100	E	47.7	0.9	
33	146/T37	1475+029	1476+088	LT	1.1	100	179.20					1468+97	100	E		0.9	
34	146/T37	1465+028	1466+040	RT	1.1	120	136.70					1469+02	100	E	43.5	0.9	
												1470+40	100	E		0.9	
												1470+40	100	E	49.3	0.9	
												1471+50	100	E		0.9	
												1471+50	100	E	45.6	0.9	
												1472+45	100	E		0.9	
												1472+45	100	E	47.2	0.9	
												1473+10	100	E		0.9	
												1473+10	100	E	64.4	0.9	
												1474+70	100	E		0.9	
												1474+70	100	E	53.5	0.9	
												1475+29	100	E		0.9	
												1475+29	100	E	49.7	0.9	
												1476+88	100	E		0.9	
												1476+88	100	E		0.9	
												1465+28	100	E		0.9	
												1466+40	100	E		0.9	

TABULATION OF SETTLEMENT PLATES TO BE RECORDED

Refer to Standard Road Plan RL-6

103-5
09-27-94

NO.	LOCATION		REMARKS
	Station	Side	
1	60+79	WBL	
2	60+99	EBL	

GEOTECHNICAL DESIGN



I hereby certify that this plan was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Robert Stanley 9-20-01
Signature Date

Printed or Typed Name **Robert L. Stanley**

My license renewal date is December 31, 20 02.

Pages or sheets covered by this seal: **C.11-C.12, Q.01-Q26**

PROPOSED SUBGRADE TREATMENT

(For Additional Details see Soils Survey Sheet No. Q.01 to Q.26 .)

103-3
09-27-94

NO.	LOCATION		DESCRIPTION			TYPE		QUANTITY		POLYMER GRID m ²	AVAILABLE FROM		REMARKS
	Station to Station	Side	Depth	Width	Material + Shrink %		m ³	Mg	Quantity		Station to Station		
1	51+00 TO 55+50	WBL	0.75	9.8	CLAY LOAM & LOAM F+15 + %		3804		67,570	BORROW 'A'			
2	51+00 TO 55+50	EBL	0.75	9.8	CLAY LOAM & LOAM F+15 + %		3804		67,570	BORROW 'A'			
3	55+50 TO 59+74	WBL	0.75	9.8	CLAY LOAM & LOAM F+15 + %		3584		67,570	BORROW 'A'			
4	60+93.5 TO 62+50	WBL	0.75	Var1.	CLAY LOAM & LOAM F+15 + %		1910		71,590	BORROW 'B'			
5	55+50 TO 59+87.1	EBL	0.75	9.8	CLAY LOAM & LOAM F+15 + %		3695		67,570	BORROW 'A'			
6	61+06.6 TO 62+50	EBL	0.75	Var1.	CLAY LOAM & LOAM F+15 + %		1843		71,590	BORROW 'B'			
7	62+50 TO 67+13.8	WBL	0.75	Var1.	CLAY LOAM & LOAM F+15 + %		4510		71,590	BORROW 'B'	INCLUDE RAMP 'C' TAPER		
8	68+16.7 TO 69+50	WBL	0.75	9.8	CLAY LOAM & LOAM F+15 + %		1127		71,590	BORROW 'B'			
9	62+50 TO 67+13.5	EBL	0.75	Var1.	CLAY LOAM & LOAM F+15 + %		4770		71,590	BORROW 'B'	INCLUDE RAMP 'B' TAPER		
10	68+16.6 TO 69+50	EBL	0.75	9.8	CLAY LOAM & LOAM F+15 + %		1128		71,590	BORROW 'B'			
11	69+50 TO 75+50	WBL	0.75	Var1.	CLAY LOAM & LOAM F+15 + %		6284		71,590	BORROW 'B'	INCLUDE RAMP 'A' TAPER		
12	69+50 TO 75+50	EBL	0.75	Var1.	CLAY LOAM & LOAM F+15 + %		6939		71,590	BORROW 'B'	INCLUDE RAMP 'D' TAPER		
13	75+50 TO 79+50	WBL	Var1.	9.8	CLAY LOAM & LOAM F+15 + %		4457		71,590	BORROW 'B'			
14	75+50 TO 79+50	EBL	Var1.	Var1.	CLAY LOAM & LOAM F+15 + %		4751		71,590	BORROW 'B'			
15	79+50 TO 84+50	WBL	0.75	9.8	CLAY LOAM & LOAM F+15 + %		4226		71,590	BORROW 'B'			
16	79+50 TO 84+50	EBL	0.75	9.8	CLAY LOAM & LOAM F+15 + %		4226		71,590	BORROW 'B'			
17	1461+86.47 TO 1469+00	SIDE RD	0.6	Var1.	CLAY LOAM & LOAM F+15 + %		8278		71,590	BORROW 'B'	SIDE RD @ STA 67+/-		
18	1469+00 TO 1476+50	SIDE RD	0.6	Var1.	CLAY LOAM & LOAM F+15 + %		5343		71,590	BORROW 'B'	SIDE RD @ STA 67+/-		
19	1476+50 TO 1477+15.85	SIDE RD	0.6	8.7	CLAY LOAM & LOAM F+15 + %		395		71,590	BORROW 'B'	SIDE RD @ STA 67+/-		
20	1567+60 TO 1572+40	RAMP A	0.3	Var1.	MODIFIED SUBBASE		1108				RAMP A		
21	2563+30 TO 2567+36	RAMP B	0.3	Var1.	MODIFIED SUBBASE		963				RAMP B		
22	3562+30 TO 3567+93	RAMP C	0.3	Var1.	MODIFIED SUBBASE		1276				RAMP C		
23	4567+75 TO 4572+50	RAMP D	0.3	Var1.	MODIFIED SUBBASE		1094				RAMP D		

SHRINKAGE DATA

103-7
09-27-94

COUNTY: PROJECT:		DATE:	
STATION TO STATION	%	REMARKS	
MAINLINE & SIDE RAODS	30		
RAMPS 'B' & 'C'	30		
RAMPS 'A' & 'D'	0	ROCK IN RAMP CUT	
ENTIRE PROJECT	40	TOPSOIL	
		400 CM BOULDERS	
		THIS IS IN ADDITION TO	
		ROCK EXCAVATION QUANTITIES	

EMBANKMENT WITH MOISTURE CONTROL

103-6
09-27-94

Moisture content shall be within the limits of minus 3 and plus 3 percentage points of optimum for maximum density within the area described and listed below.

LOCATION	DEPTH	COMPACT	REMARKS
Station to Station	Lane	m	
Note: Moisture control is required for all fill placed at a level of more than 8 meters below profile grade at any location. This does include backfill for culverts, but excludes stability berms beyond the normal foreslope template line. This shall include but not be limited to the following locations			
Sta. 54+00 to 55+40	Both	Var1	51,135
Sta 59+40 tp Bridge Abut.	Both	Var1	36,903
Bridge Abut. To Sta. 62+60	Both	Var1	119,805

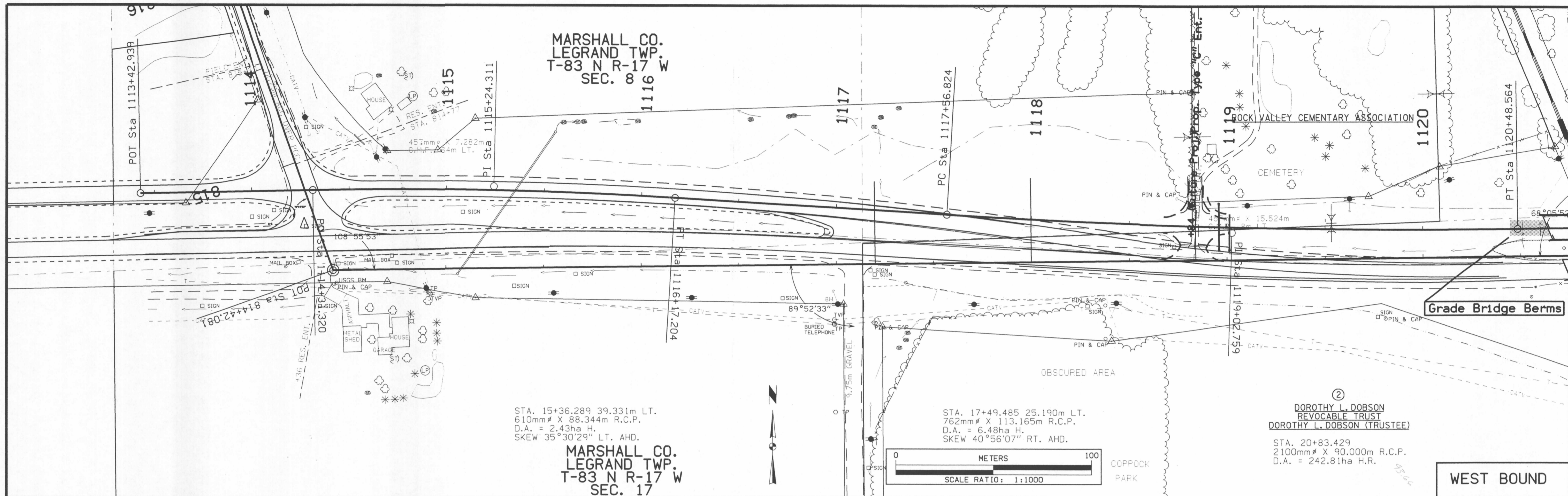
LIST OF SUBDRAIN WORK

Refer to Standard Road Plans RF-3, RF-5, RF-19A, RF-19B, RF-19C, RF-19E, RF-19F and RF-22

104-5C
07-15-97

*Not a bid item

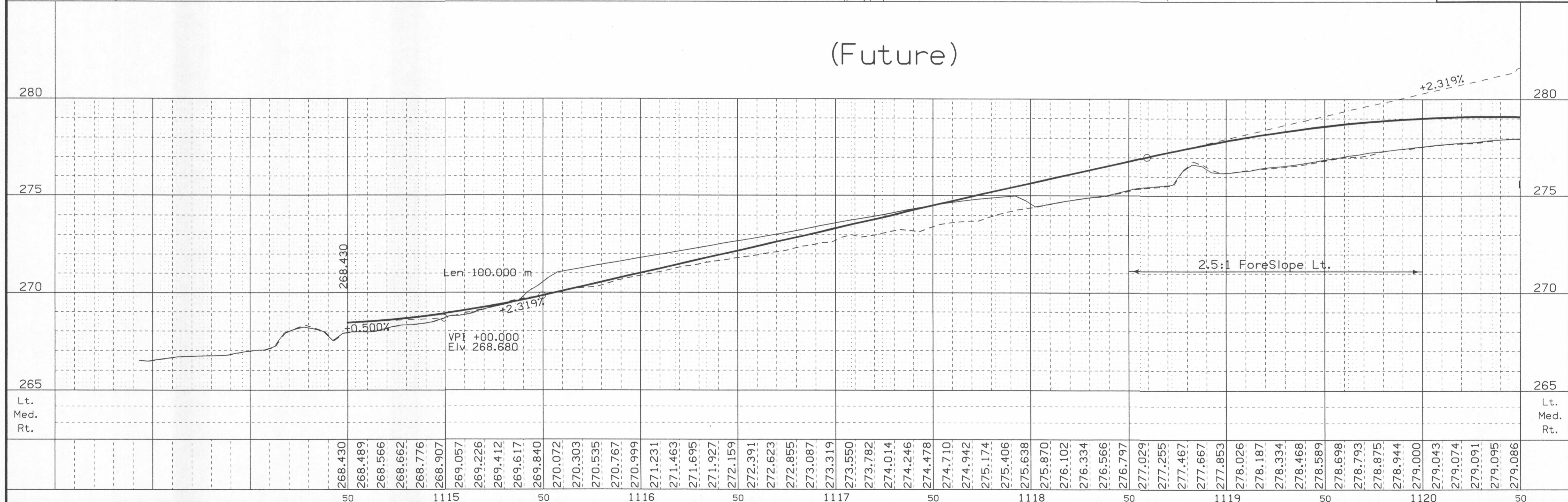
NO.	STATION	TYPE OF INSTALLATION	PIPE			APRONS			OUTLETS			CONNECTED PIPE JOINTS *		TRENCH DRAIN Length m	GRANULAR MATERIAL Blanket m ³	POROUS BACKFILL * Mg	CLASS "A" CRUSHED STONE * Mg	REMARKS
			CONCRETE, C.M.P., C.M.P. COATED, PLASTIC OR CLAY	DIA. mm	LENGTH m	RF-3 No.	RF-5 No.	RF-19E No.	RF-19F		RF-22 No.	Type	No.					
									Type	No.								
	STA 54+00 to STA 55+40													2,940			Lt. Side	
	STA 54+00 to STA 55+40													2,940			Rt. Side	
	STA 59+36 to STA 60+40													4,074			Lt. & Rt.	
	STA 60+40 to STA 62+65													8,778			Lt. & Rt.	



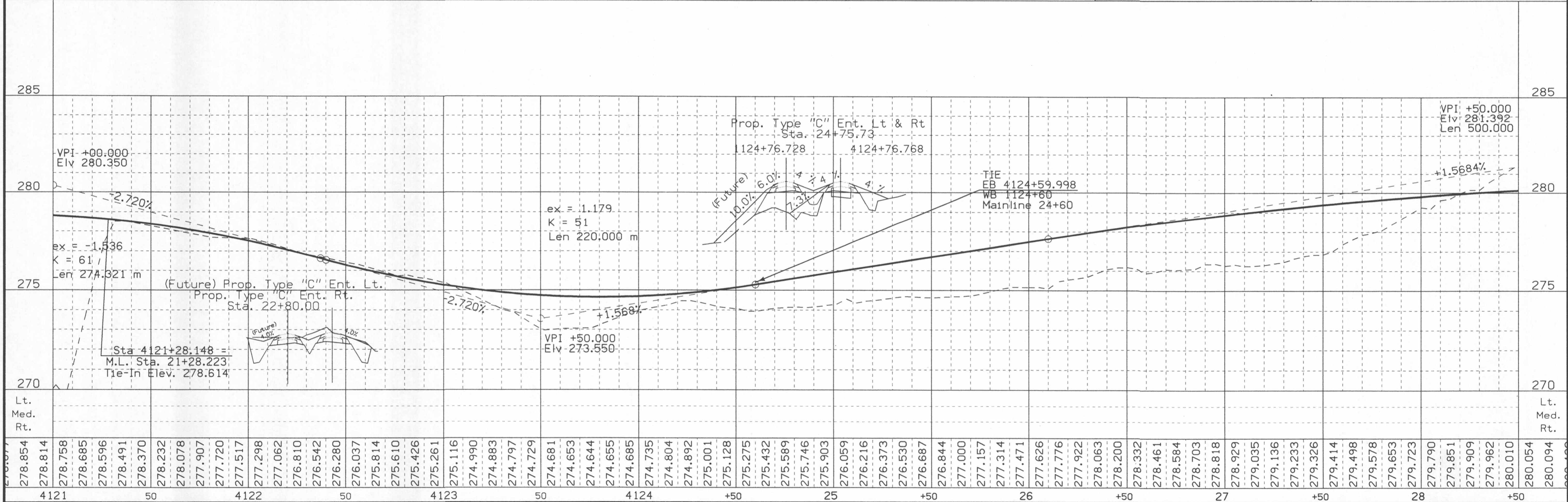
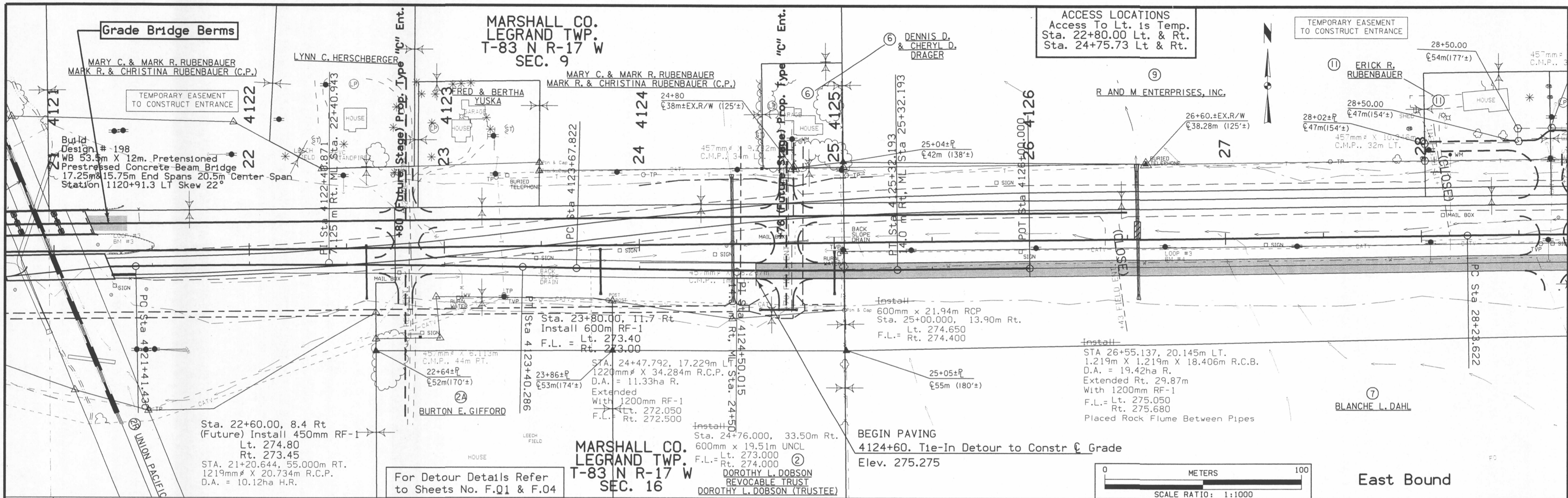
Grade Bridge Berms

WEST BOUND

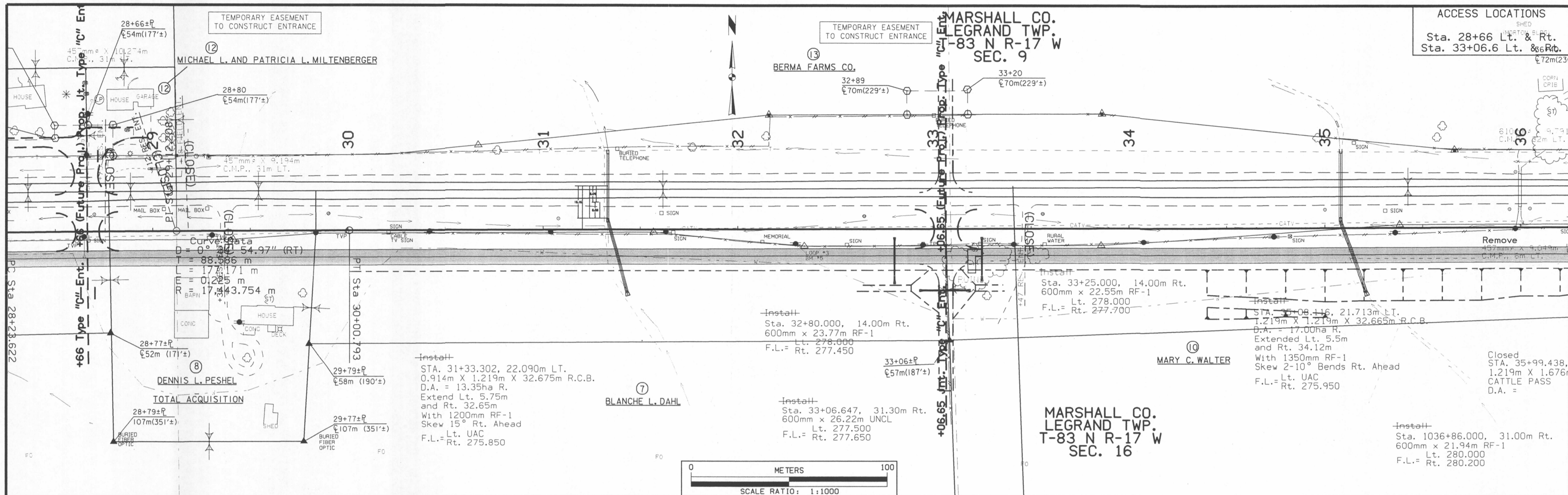
(Future)



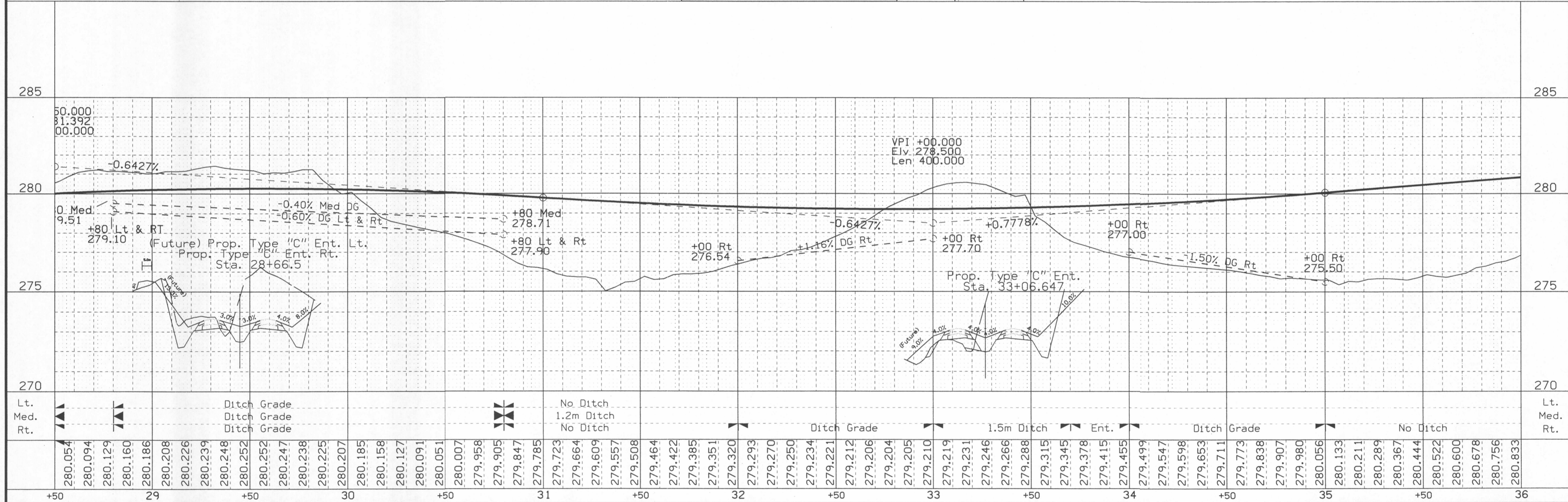
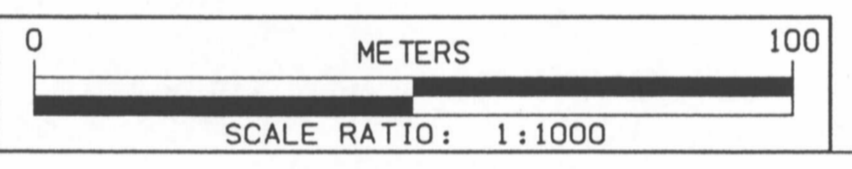
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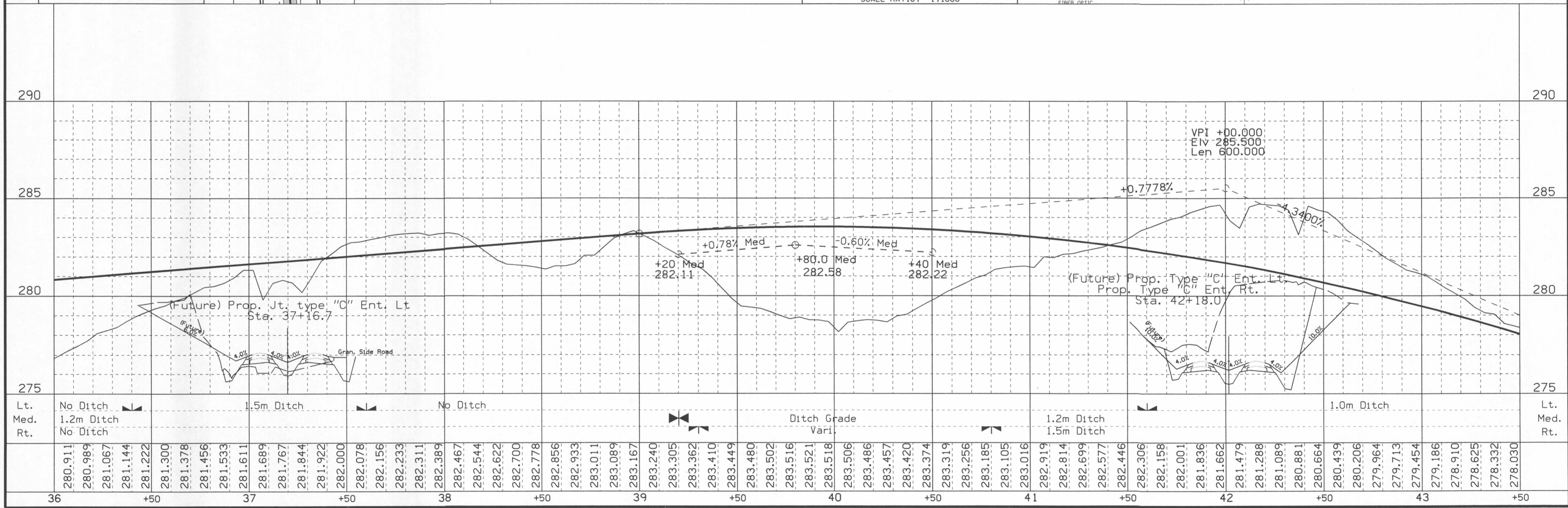
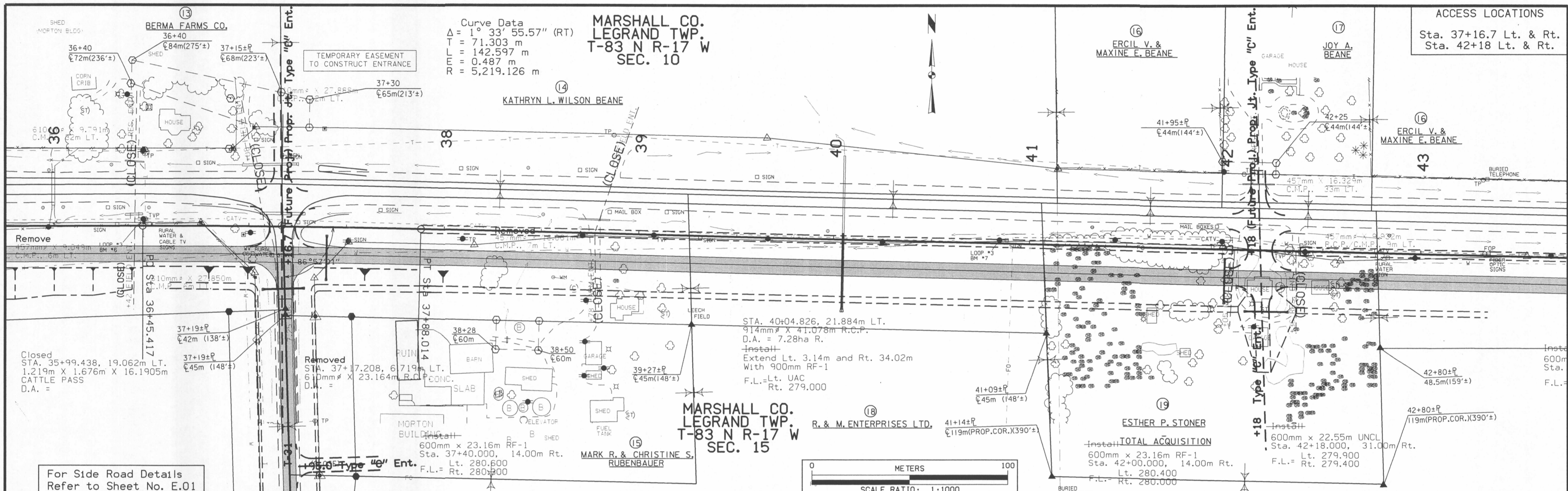
06-SEP-2001 06:35 bsmith2 Projects 64030030492 Destan K64030166.d02



ACCESS LOCATIONS
 Sta. 28+66 Lt. & Rt.
 Sta. 33+06.6 Lt. & Rt.



DESIGN TEAM	ABRAMS/SMITH	METRIC	IOWA DOT * OFFICE OF DESIGN	MARSHALL COUNTY	PROJECT NUMBER	NHSX-30-5(166)--3H-64	SHEET NUMBER	D.03
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DESIGN TEAM	ABRAMS/SMITH	METRIC	IOWA DOT * OFFICE OF DESIGN	MARSHALL COUNTY	PROJECT NUMBER	NHSX-30-5(166)--3H-64	SHEET NUMBER	D.04
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MARSHALL CO. LEGRAND TWP. T-83 N R-17 W SEC. 10

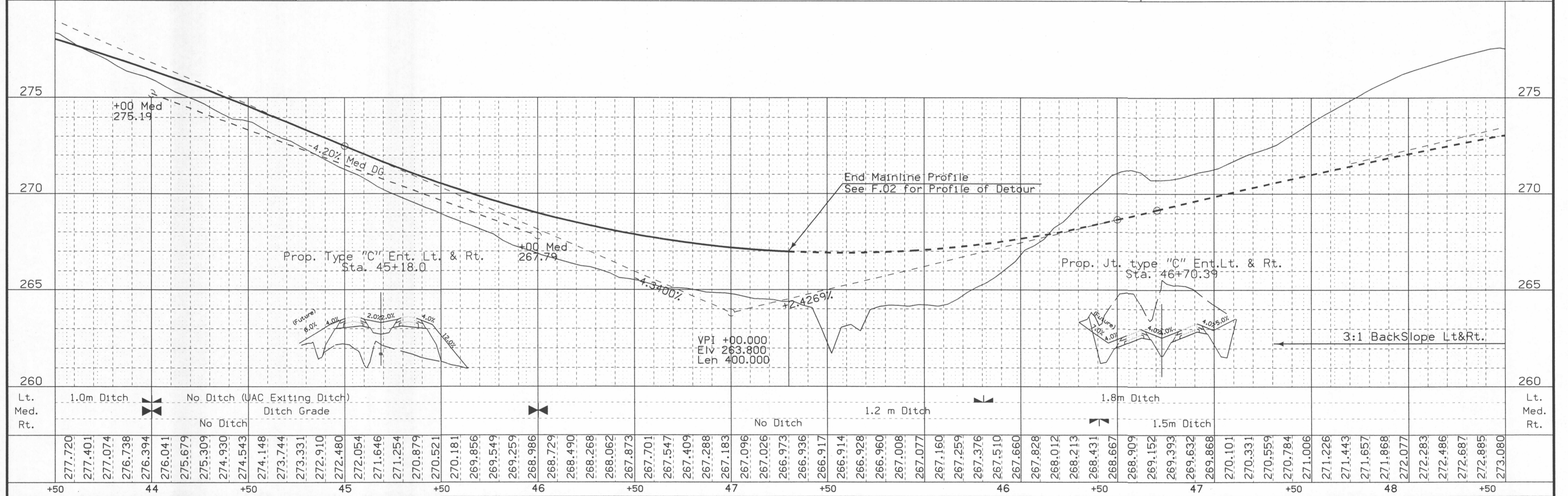
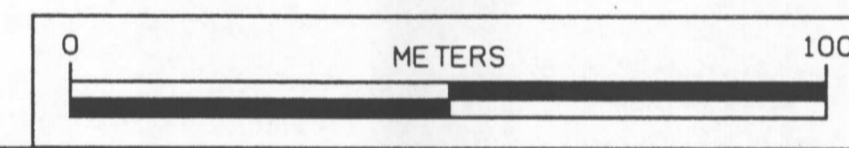
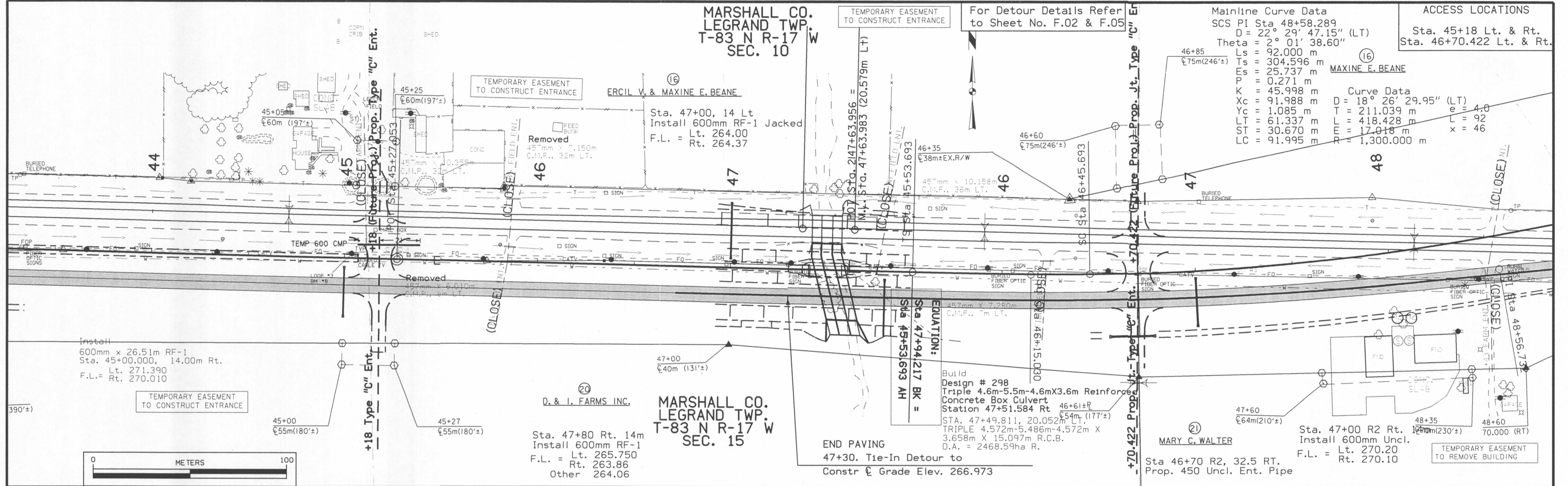
TEMPORARY EASEMENT TO CONSTRUCT ENTRANCE

For Detour Details Refer to Sheet No. F.02 & F.05

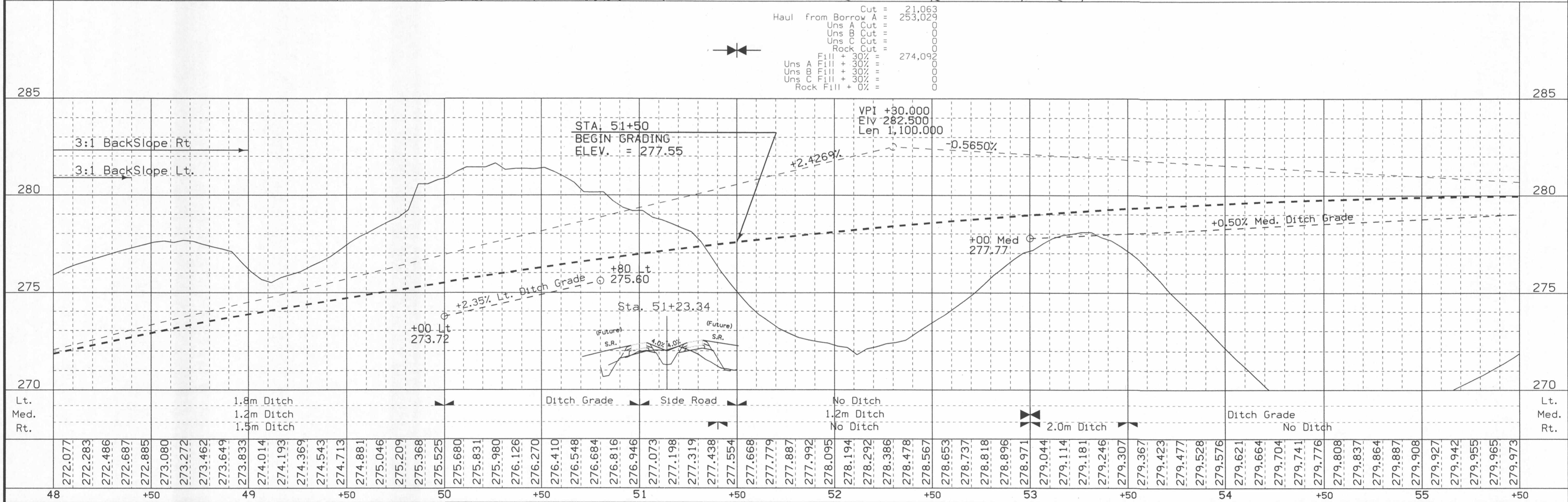
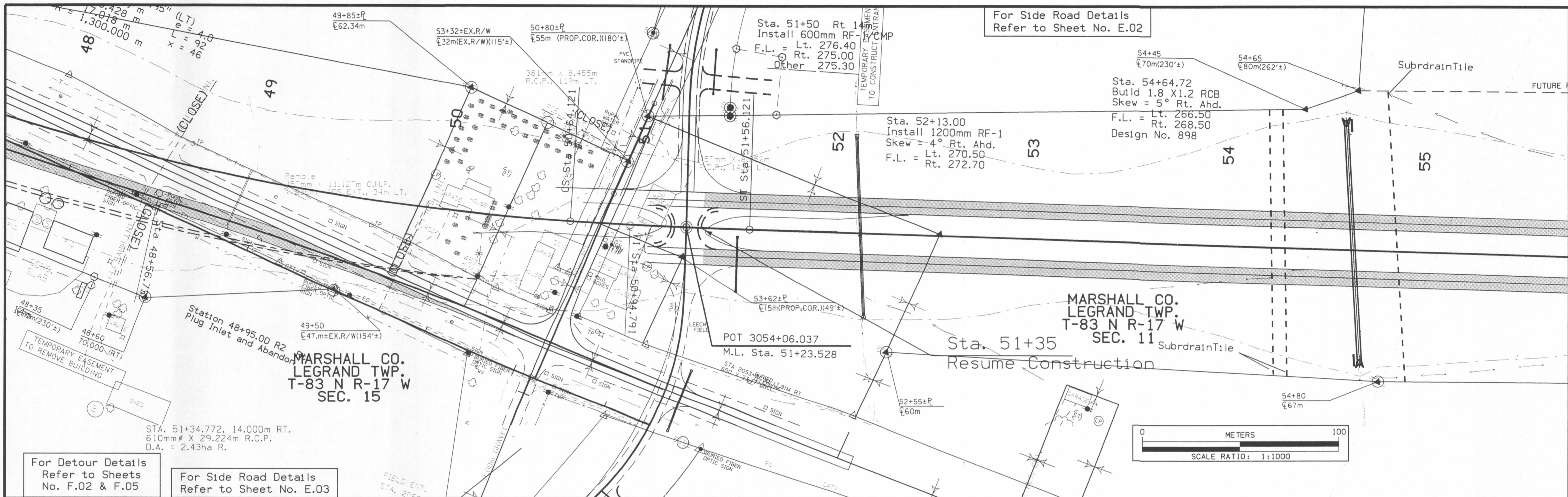
Mainline Curve Data
 SCS PI Sta 48+58.289
 D = 22° 29' 47.15" (LT)
 Theta = 2° 01' 38.60"
 Ls = 92.000 m
 Ts = 304.596 m
 Es = 25.737 m
 P = 0.271 m
 K = 45.998 m
 Xc = 91.988 m
 Yc = 1.085 m
 LT = 61.337 m
 ST = 30.670 m
 LC = 91.995 m

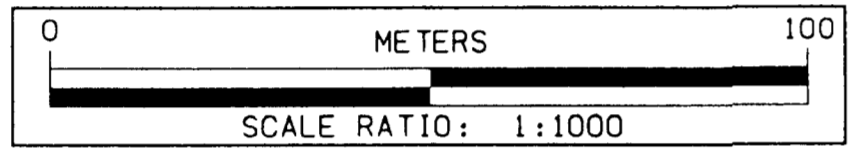
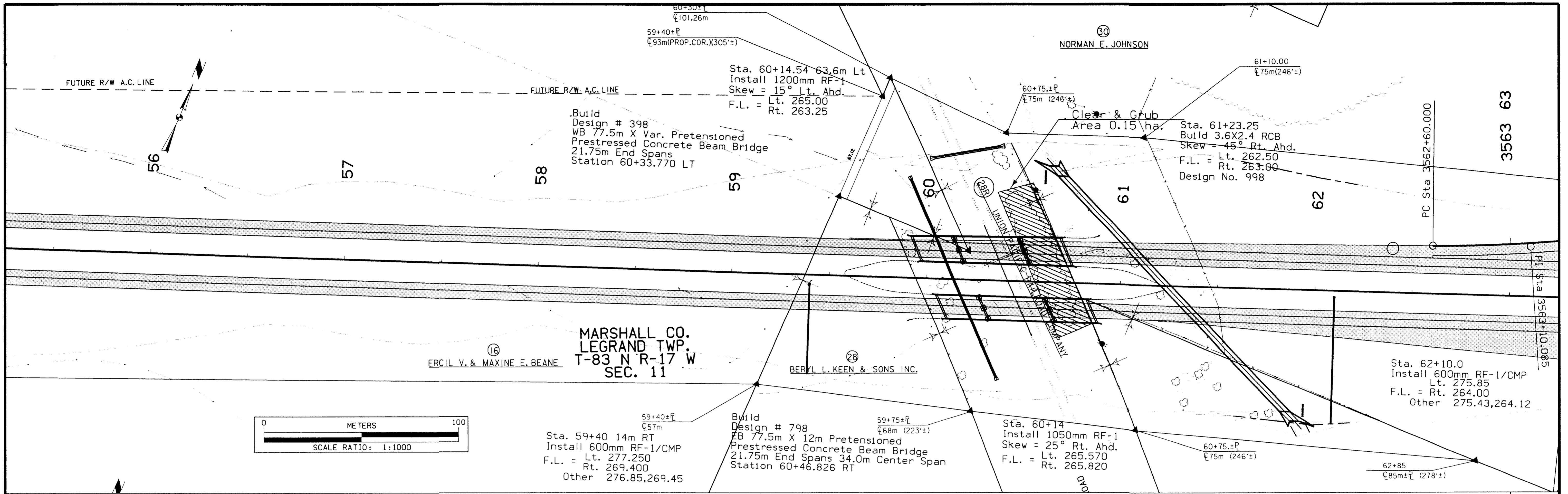
Curve Data
 D = 18° 26' 29.95" (LT)
 T = 211.039 m
 L = 92
 e = 4.0
 R = 1,300.000 m
 x = 46

ACCESS LOCATIONS
 Sta. 45+18 Lt. & Rt.
 Sta. 46+70.422 Lt. & Rt.



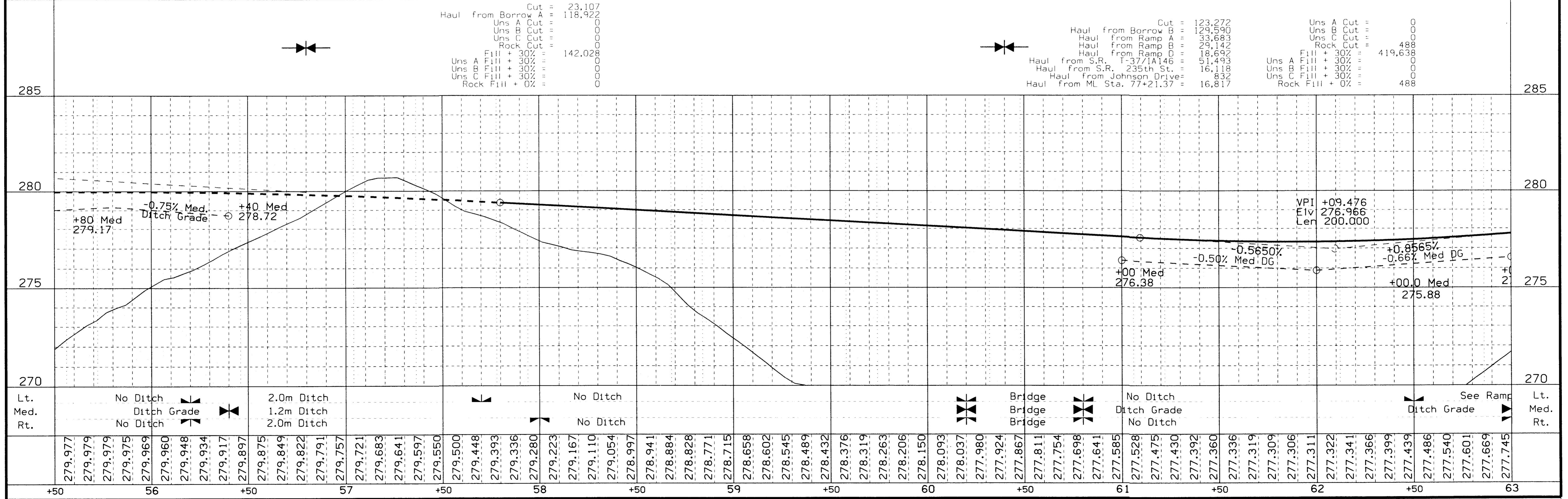
DESIGN TEAM	ABRAMS/SMITH	METRIC	IOWA DOT * OFFICE OF DESIGN	MARSHALL COUNTY	PROJECT NUMBER	NHSX-30-5(166)--3H-64	SHEET NUMBER	D.05
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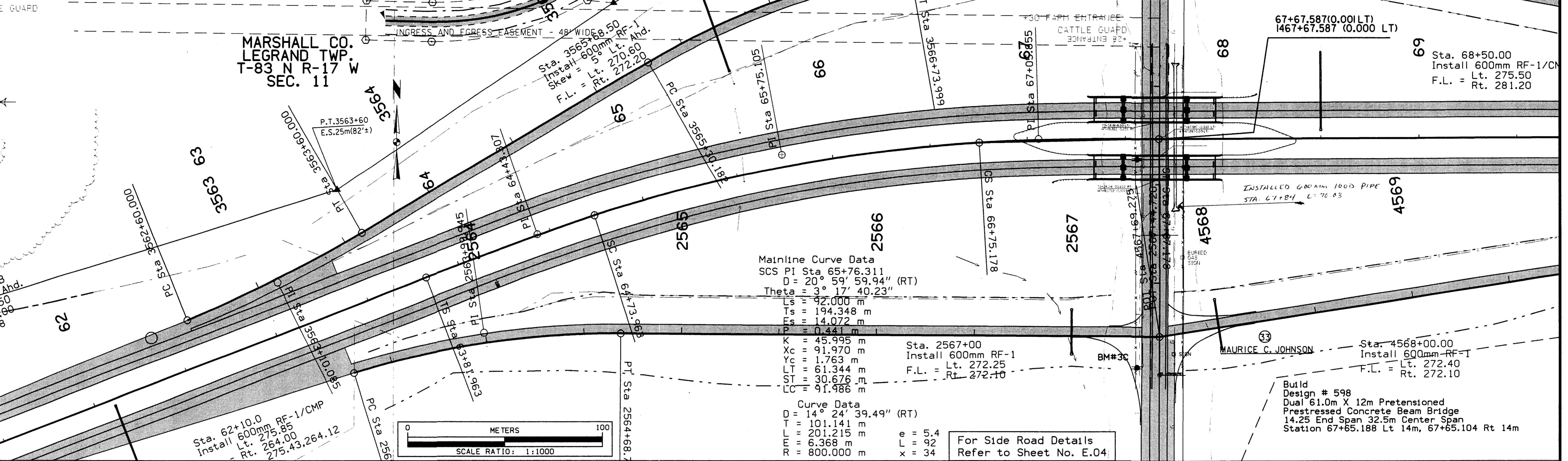
Cut	=	23.107
Haul from Borrow A	=	118.922
Uns A Cut	=	0
Uns B Cut	=	0
Uns C Cut	=	0
Rock Cut	=	0
Fill + 30%	=	142.028
Uns A Fill + 30%	=	0
Uns B Fill + 30%	=	0
Uns C Fill + 30%	=	0
Rock Fill + 0%	=	0

Cut	=	123.272
Haul from Borrow B	=	129.590
Haul from Ramp A	=	33.683
Haul from Ramp B	=	29.142
Haul from Ramp D	=	18.692
Haul from S.R. T-37/A146	=	51.493
Haul from S.R. 235th St.	=	16.118
Haul from Johnson Drive	=	832
Haul from ML Sta. 77+21.37	=	16,817
Uns A Cut	=	0
Uns B Cut	=	0
Uns C Cut	=	0
Rock Cut	=	488
Fill + 30%	=	419.638
Uns A Fill + 30%	=	0
Uns B Fill + 30%	=	0
Uns C Fill + 30%	=	0
Rock Fill + 0%	=	488

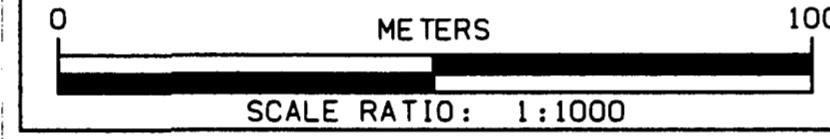


Lt.	No Ditch	2.0m Ditch	No Ditch	Bridge	No Ditch	See Ramp	Lt.																																																																				
Med.	Ditch Grade	1.2m Ditch	No Ditch	Bridge	Ditch Grade	Ditch Grade	Med.																																																																				
Rt.	No Ditch	2.0m Ditch	No Ditch	Bridge	No Ditch	No Ditch	Rt.																																																																				
	279.977	279.979	279.979	279.975	279.969	279.960	279.948	279.934	279.917	279.897	279.875	279.849	279.822	279.791	279.757	279.721	279.683	279.641	279.597	279.550	279.500	279.448	279.393	279.336	279.280	279.223	279.167	279.110	279.054	278.997	278.941	278.884	278.828	278.771	278.715	278.658	278.602	278.545	278.489	278.432	278.376	278.319	278.263	278.206	278.150	278.093	278.037	277.980	277.924	277.867	277.811	277.754	277.698	277.641	277.585	277.528	277.475	277.430	277.392	277.360	277.336	277.319	277.309	277.306	277.311	277.322	277.341	277.366	277.399	277.439	277.486	277.540	277.601	277.669	277.745
	+50		56		+50		57		+50		58		+50		59		+50		60		+50		61		+50		62		+50		63																																												

For Interchange Details
Refer to Sheets No. K.01 - K.10



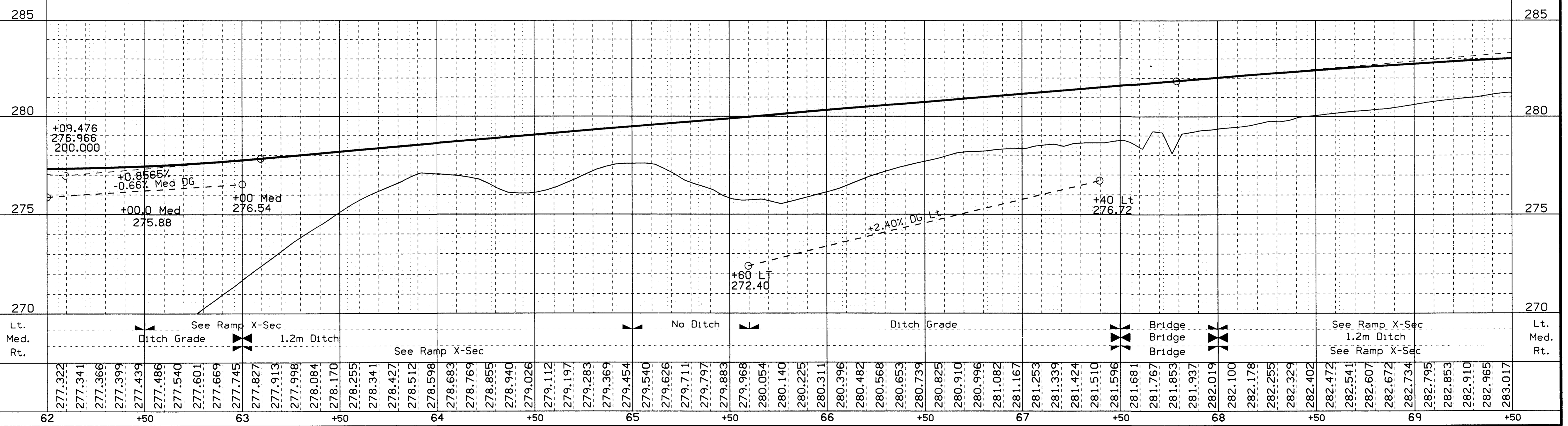
Sta. 62+10.0
Install 600mm RF-1/CMP
Lt. 275.85
Rt. 264.00, 264.12



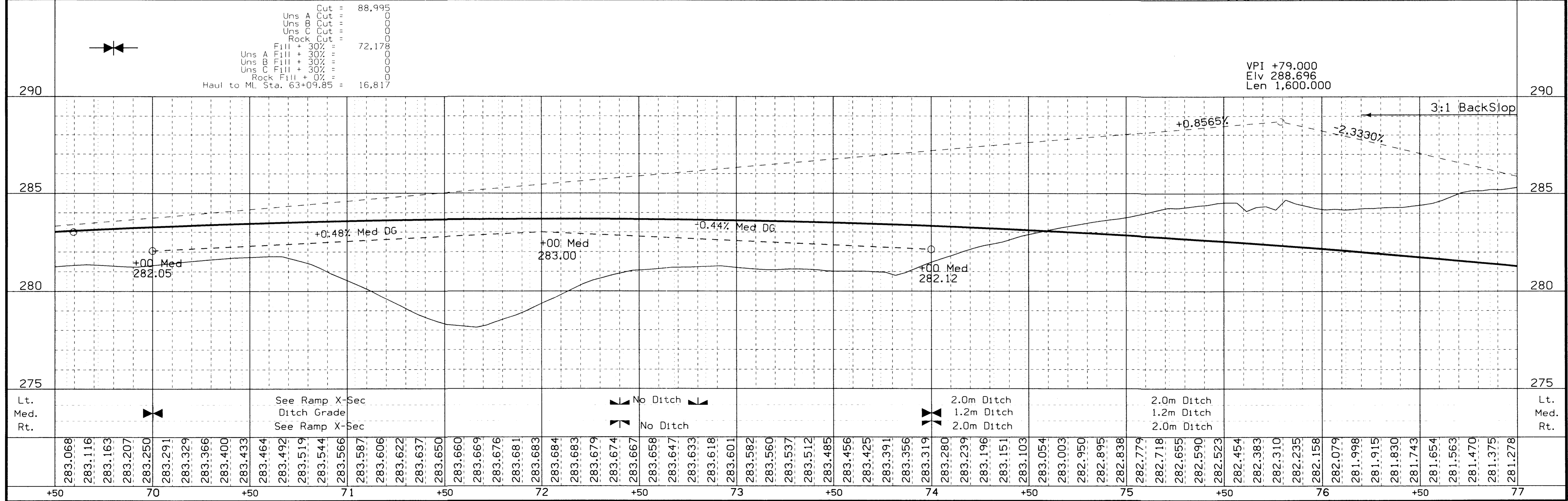
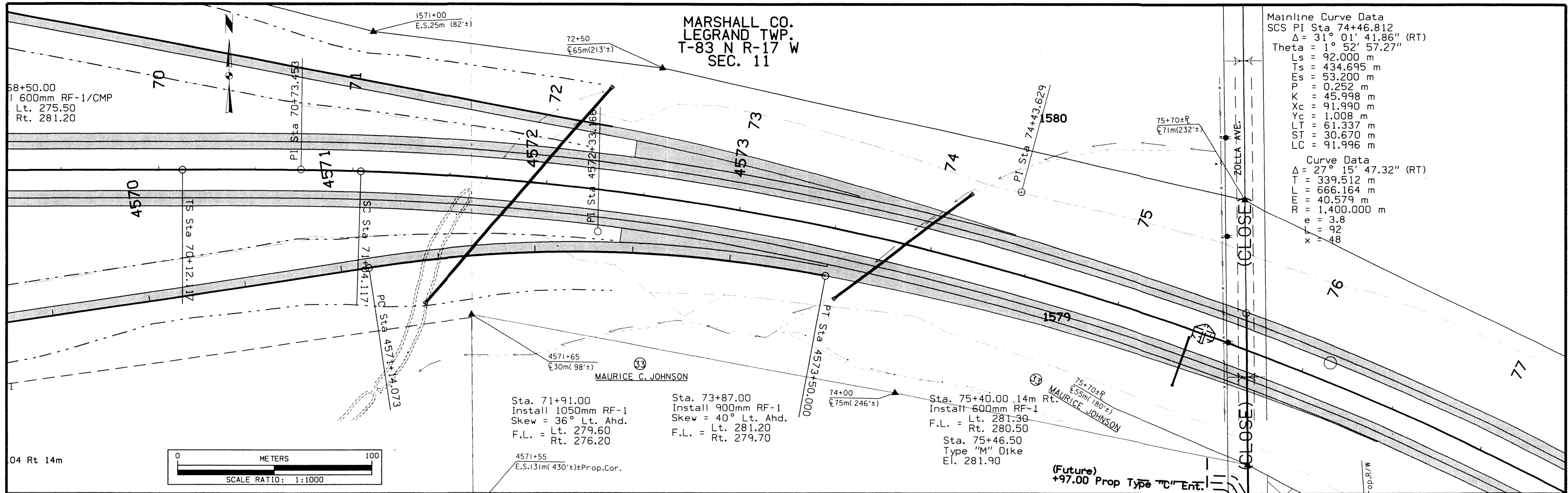
Station 2567+00
Install 600mm RF-1
Lt. 272.25
Rt. 272.10

Build Design # 598
Dual 61.0m X 12m Prestensioned
Prestressed Concrete Beam Bridge
14.25 End Span 32.5m Center Span
Station 67+65.188 Lt 14m, 67+65.104 Rt 14m

See Sheet D.07 & D.09 for Balance Information



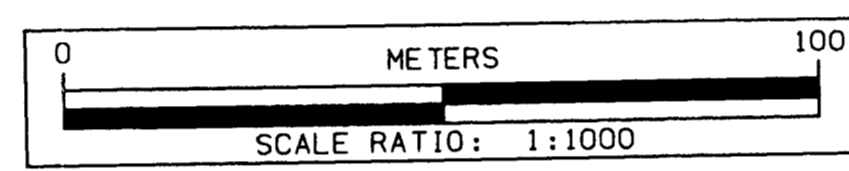
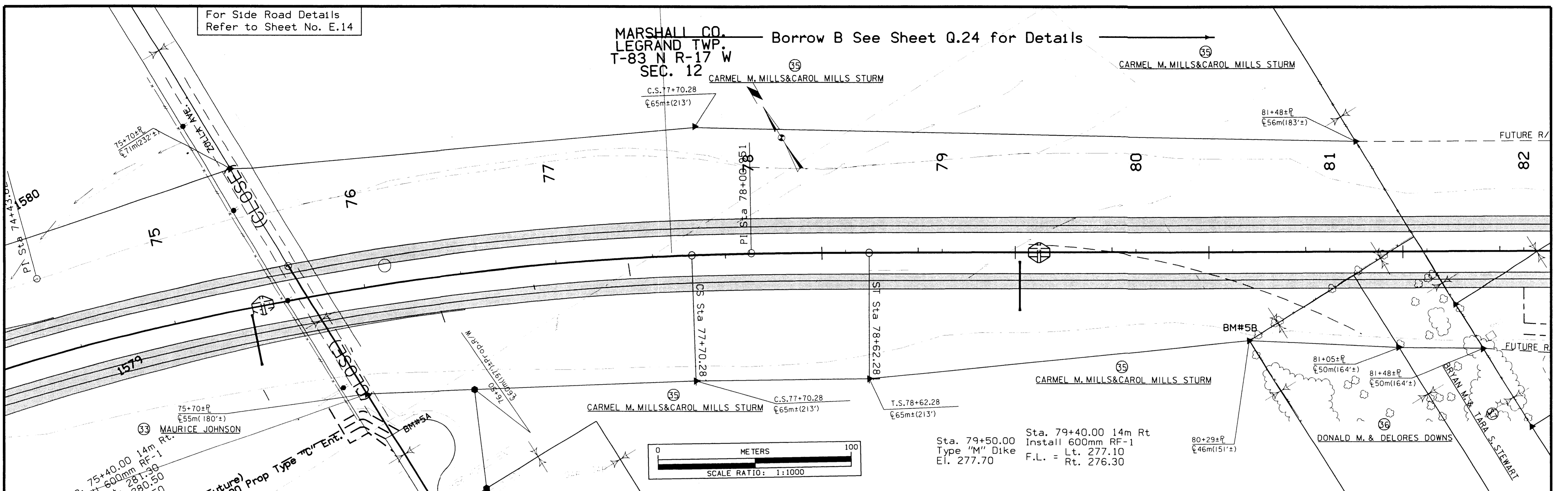
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For Side Road Details
Refer to Sheet No. E.14

MARSHALL CO.
LEGRAND TWP.
T-83 N R-17 W
SEC. 12

Borrow B See Sheet Q.24 for Details

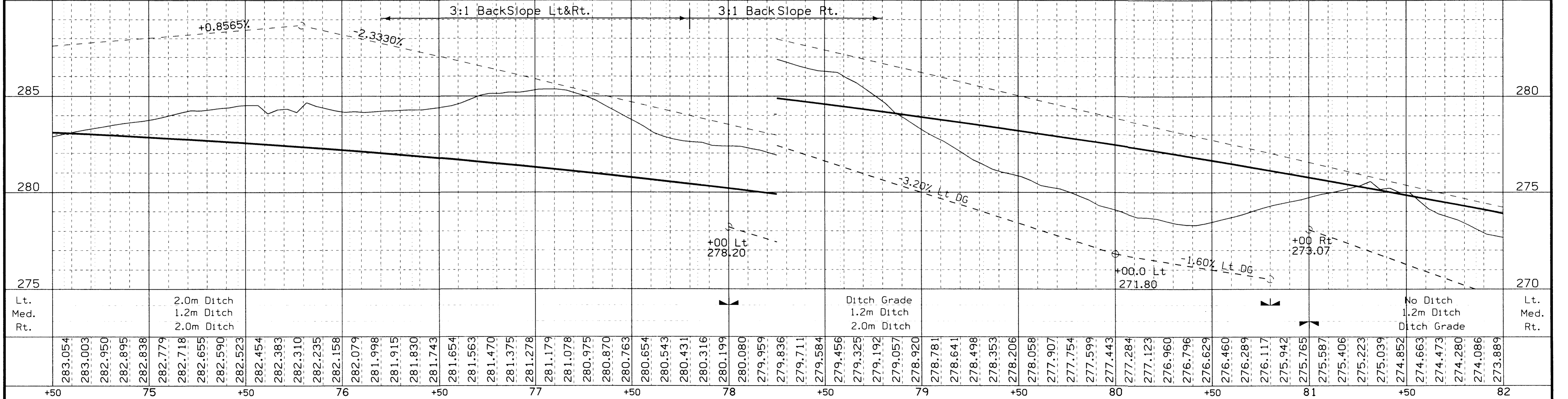


Sta. 79+50.00
Type "M" Dike
El. 277.70

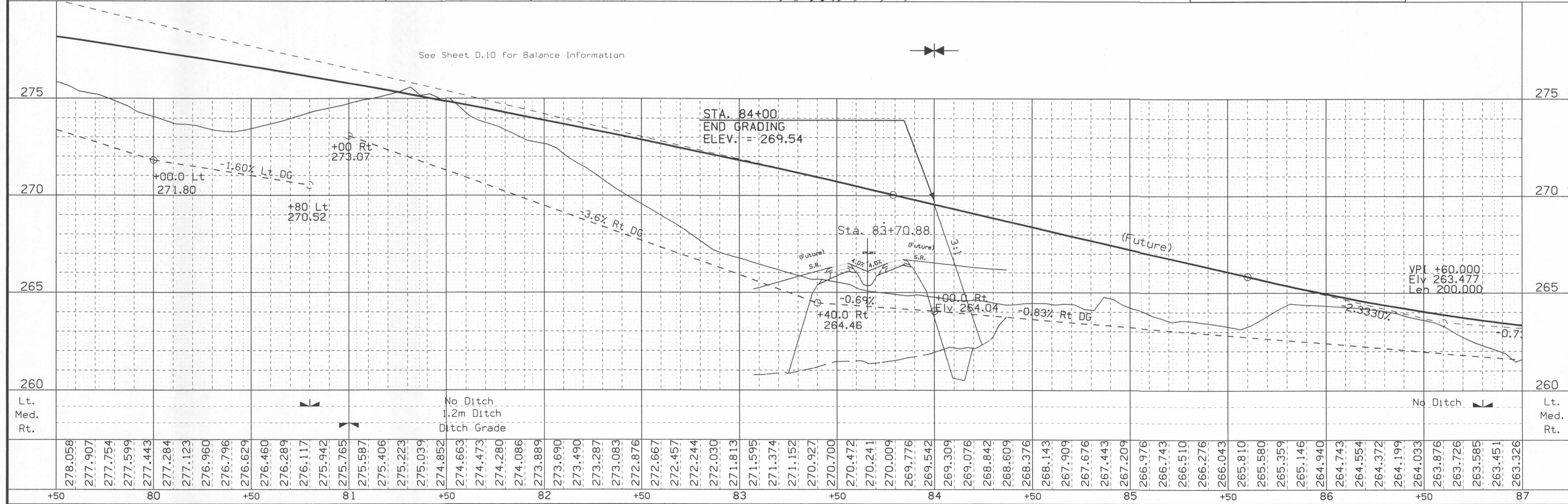
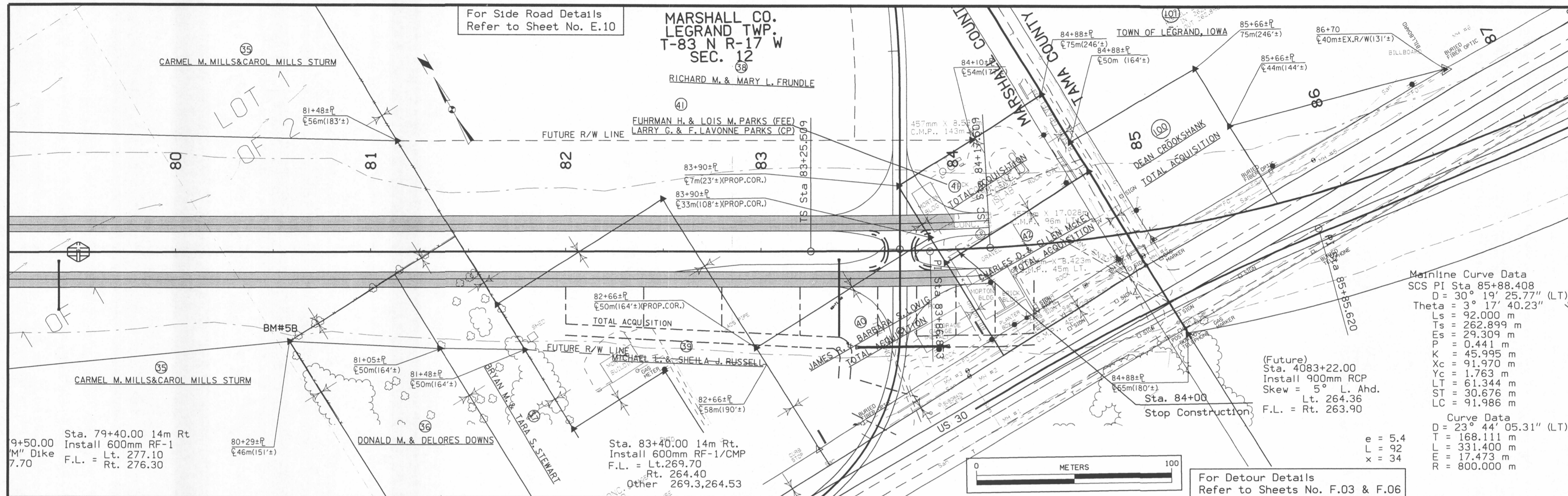
Sta. 79+40.00 14m Rt
Install 600mm RF-1
Lt. 277.10
F.L. = Rt. 276.30

Haul from Borrow B	=	45,069
Uns A Cut	=	39,826
Uns B Cut	=	0
Uns C Cut	=	0
Rock Cut	=	0
Fill + 30%	=	84,895
Uns A Fill + 30%	=	0
Uns B Fill + 30%	=	0
Uns C Fill + 30%	=	0
Rock Fill + 0%	=	0

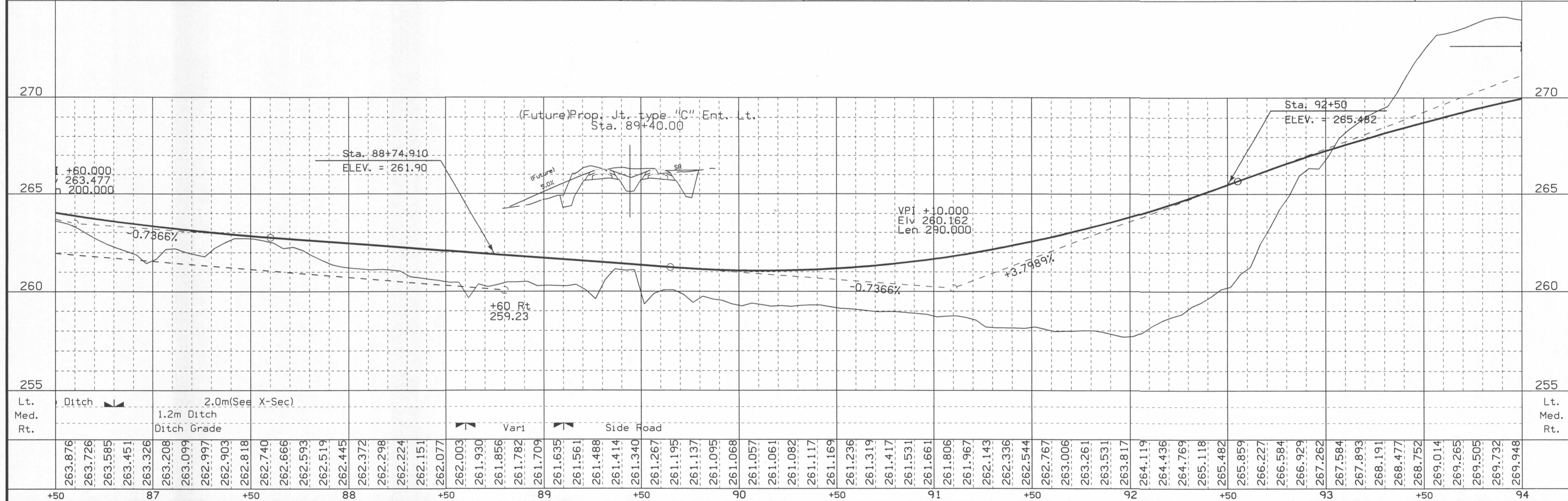
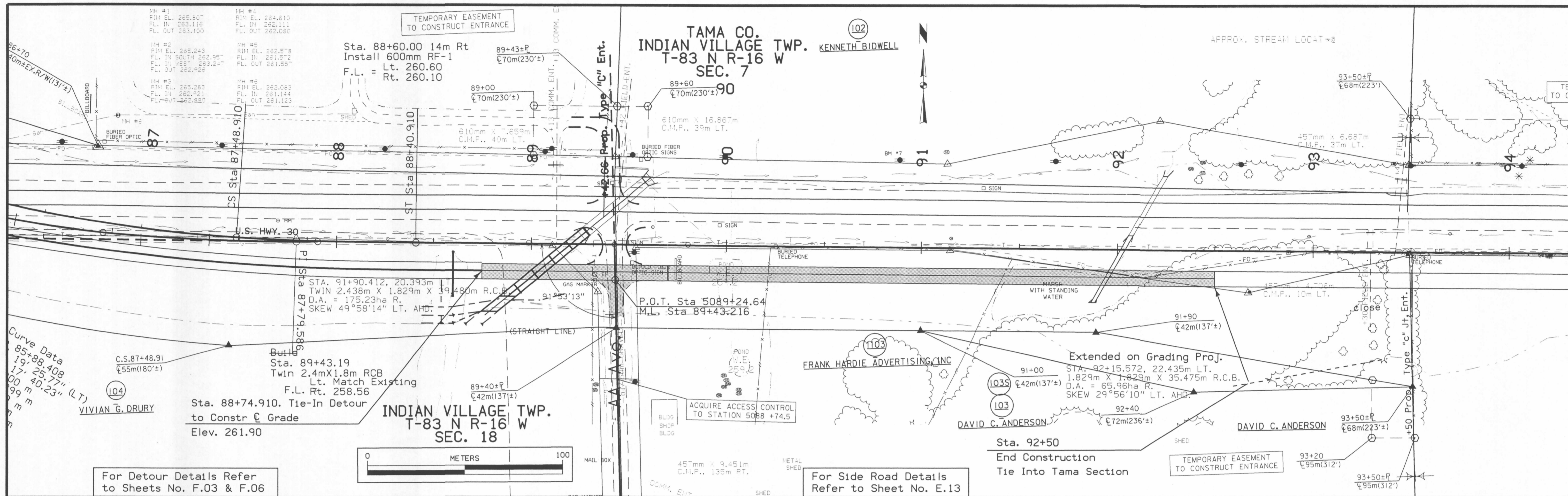
VPI +79.000
Elv 288.696
Len 1,600.000

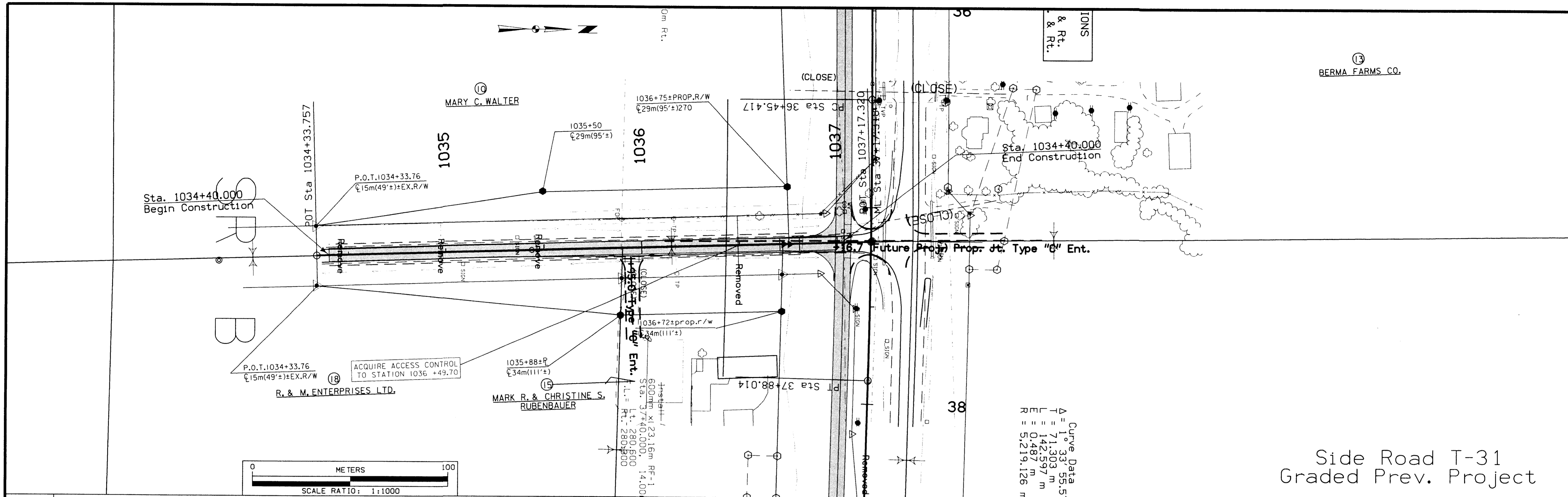


DESIGN TEAM	ABRAMS/SMITH	METRIC	IOWA DOT * OFFICE OF DESIGN	MARSHALL COUNTY	PROJECT NUMBER	NHSX-30-5(166)-3H-64	SHEET NUMBER	D.10
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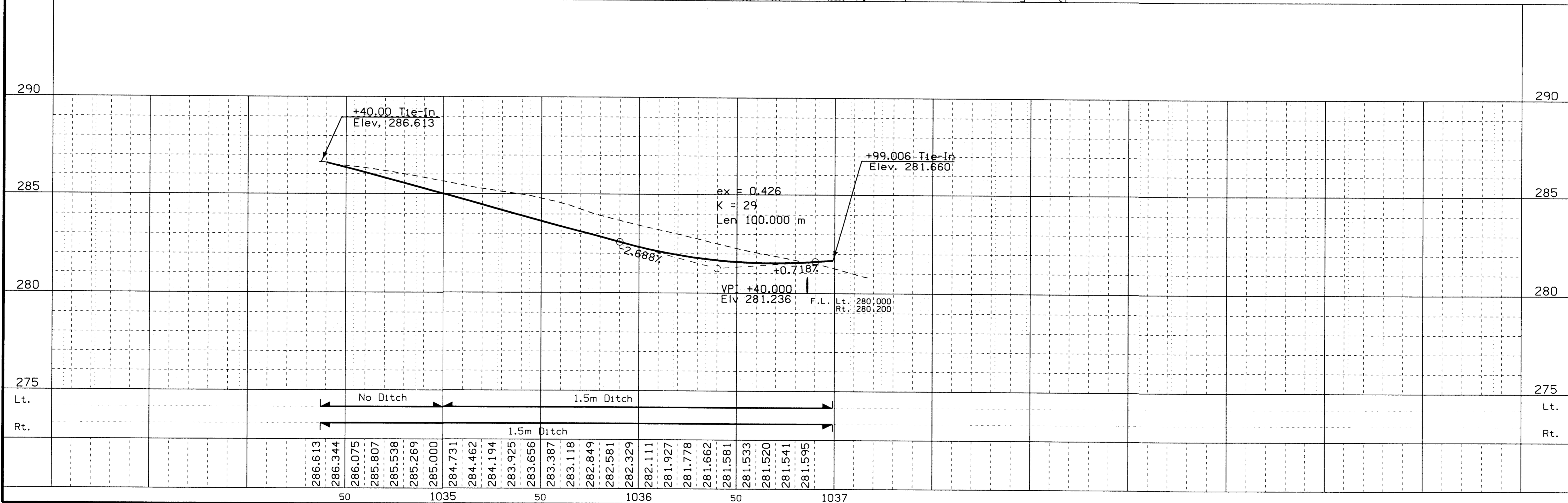


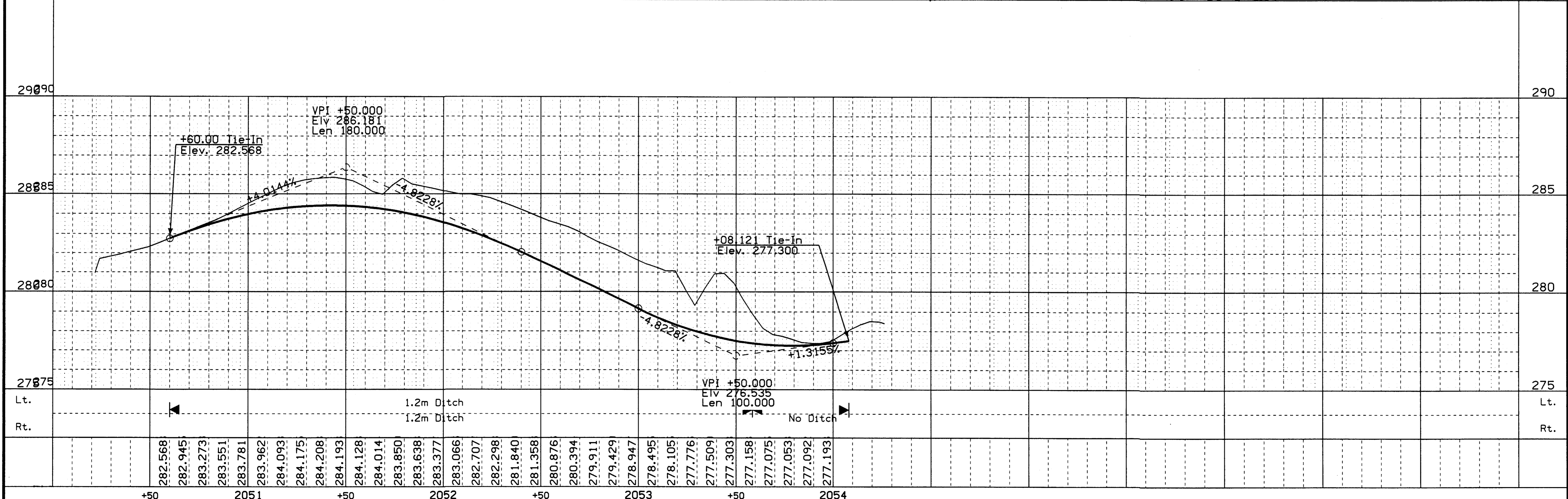
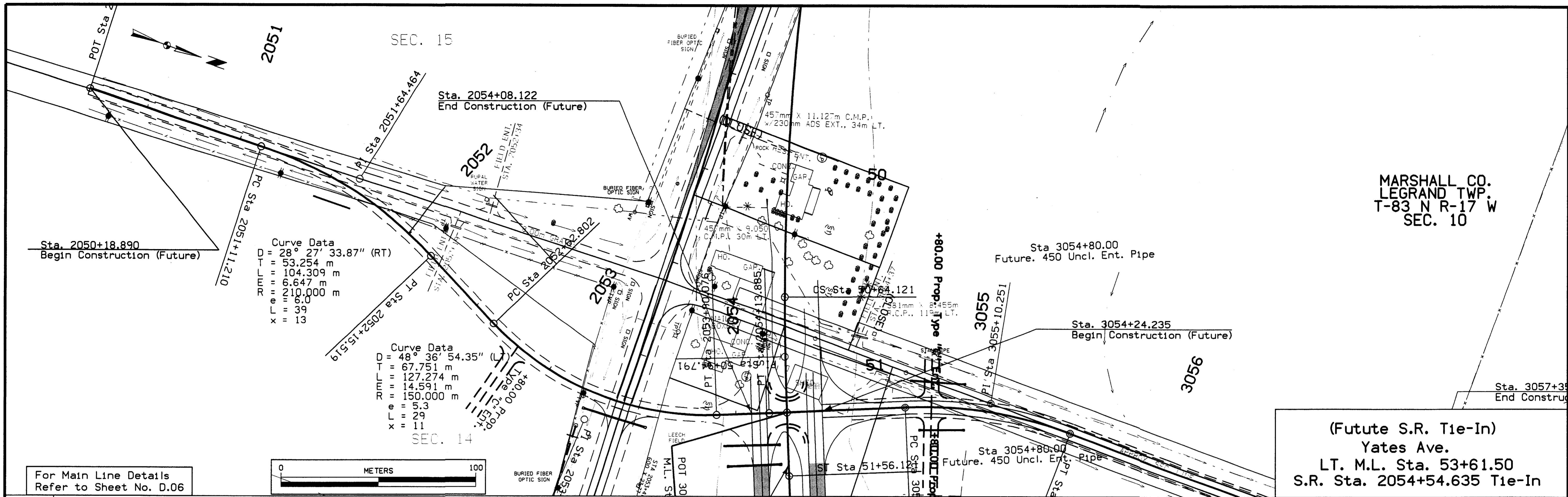
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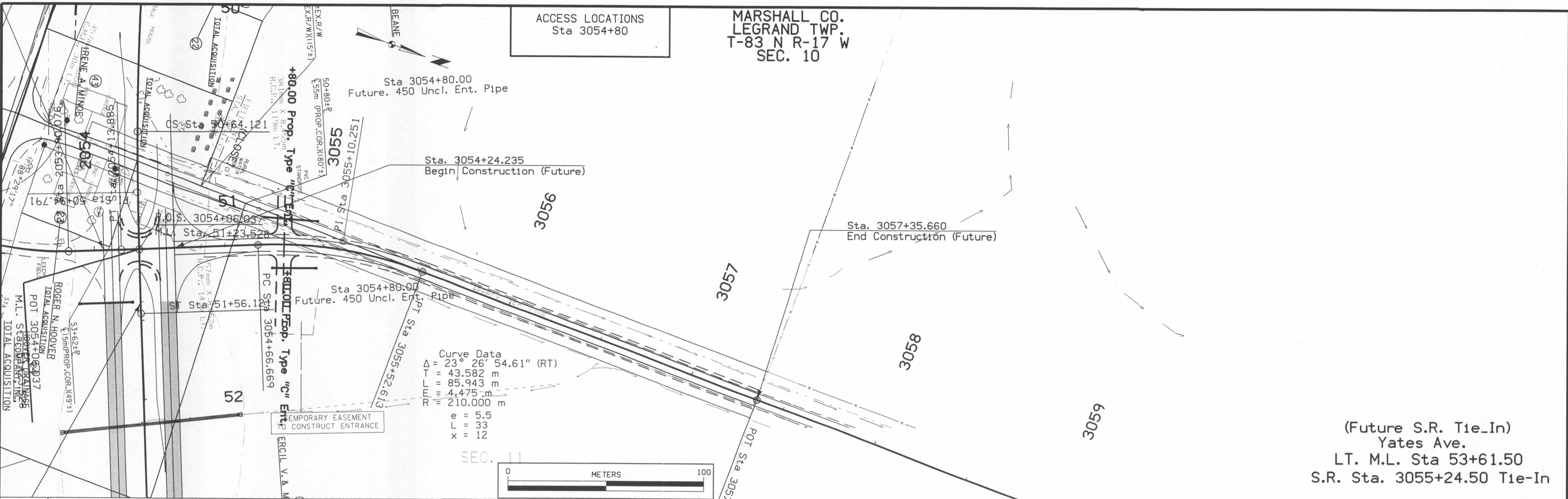


Side Road T-31
Graded Prev. Project

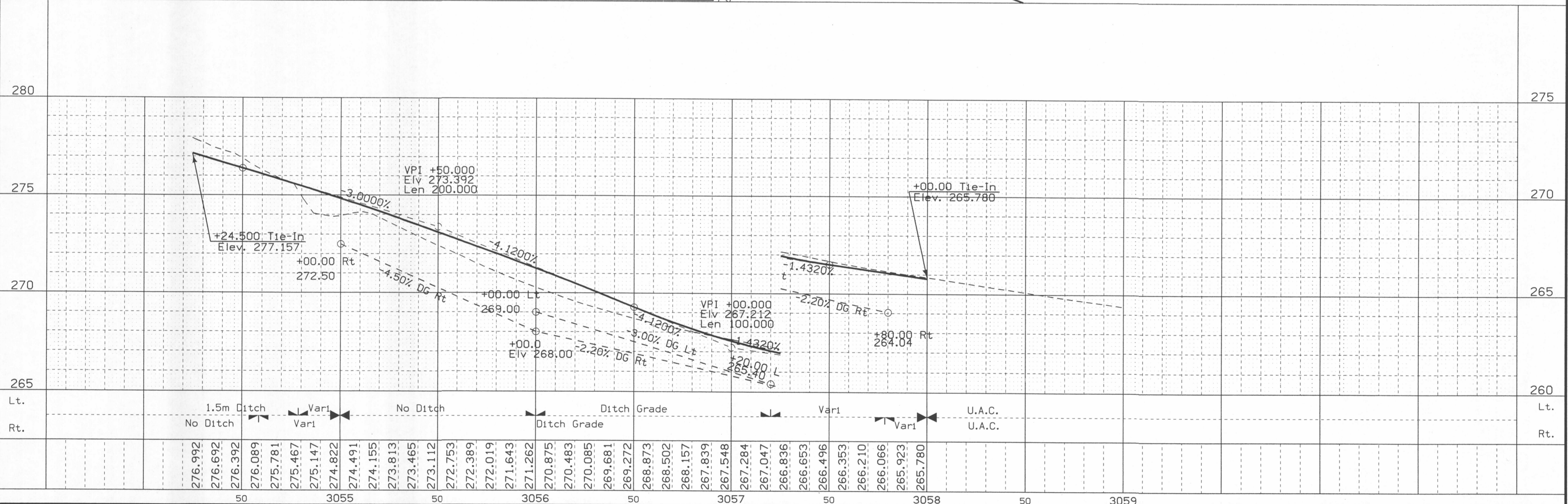




06-SEP-2001 07:00 bsmith2 \s\Projects\64030030492 Design\64030166.e02



(Future S.R. Tie-In)
 Yates Ave.
 LT. M.L. Sta 53+61.50
 S.R. Sta. 3055+24.50 Tie-In



DESIGN TEAM	ABRAMS/SMITH	METRIC	IOWA DOT * OFFICE OF DESIGN	MARSHALL COUNTY	PROJECT NUMBER	NHSX-30-5(166)--3H-64	SHEET NUMBER	E.03
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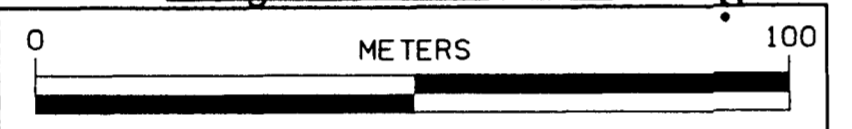
LEGRAND TWP.
T-83 N R-17 W
SEC. 11
Sta. 1461+86.467
Begin Temp. Tie-In

ACCESS LOCATIONS
Sta 1463+26.29 Lt
Sta 1463+50.00 Rt

ACCESS LOCATIONS
Sta 1465+00.0 Rt.
Sta 1466+67.0 Rt & Lt
Sta 1468+77.95 Rt & Lt

Curve Data
Δ = 5° 32' 07.88" (RT)
R = 79.768 m
L = 159.412 m
T = 1.925 m
M = 1.650,000 m
X = NC
Y = N/A
Z = N/A
E = 1464

Curve Data
Δ = 6° 58' 10.03" (LT)
R = 100.666 m
L = 201.082 m
T = 3.068 m
M = 1.650,000 m
X = NC
Y = N/A
Z = N/A
E = 1464



CHARLES M. & CATHERINE R. BLACK
EAST MARSHALL COMM. SCHOOL DISTR. (CP)

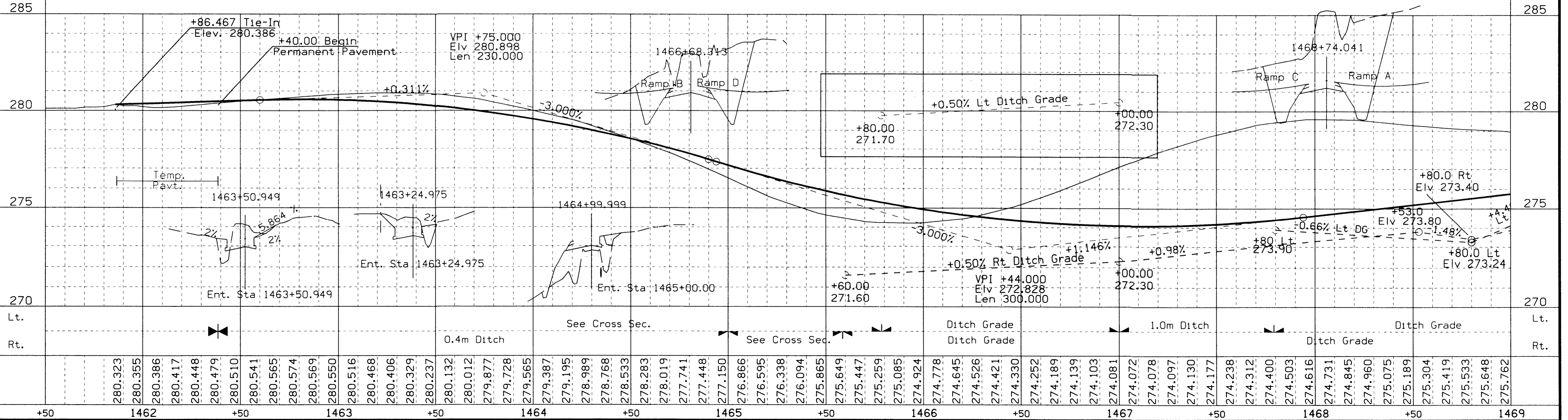
For Main Line Details
Refer to Sheet No. D.08

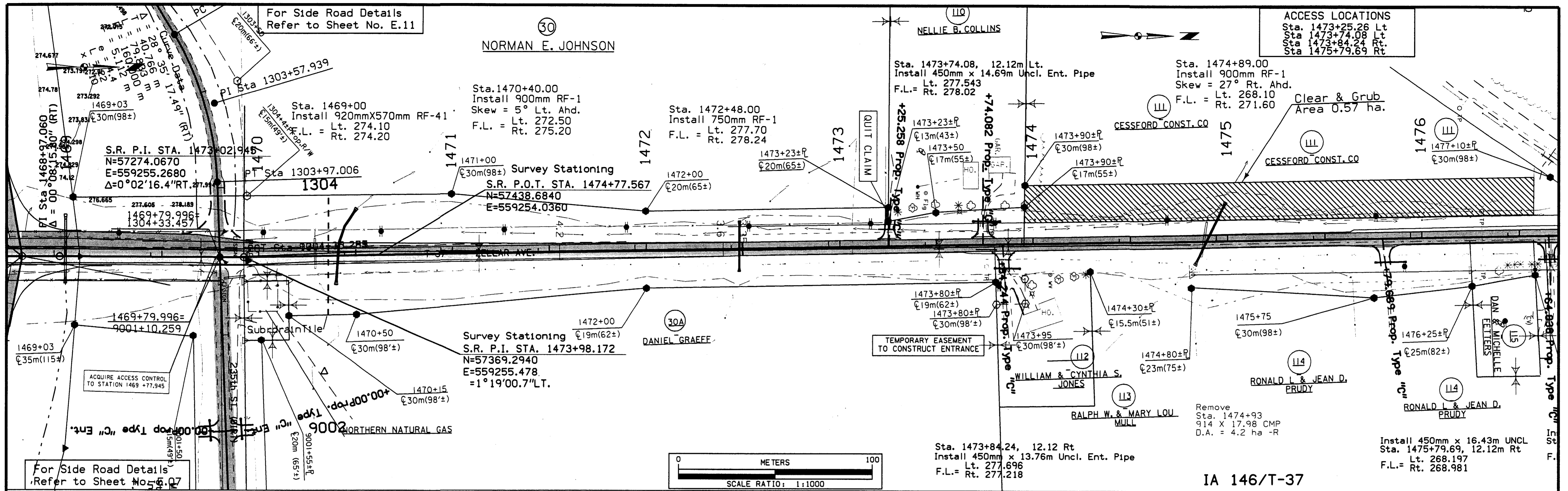
IA 146/T-37
Lt. & Rt M.L. Sta. 67+67.587
S.R. Sta. 1467+67.587 @ Int.

For Detour Pavement
Refer to Sheet No. F.07

For Storm Sewer Profiles
Refer to Sheet No. M.05

Uns A Cut = 10,208	Uns A Fill + 30% = 10,208	Uns A Cut = 51,492	Uns A Fill + 30% = -1
Uns B Cut = 0	Uns B Fill + 30% = 0	Uns B Cut = 0	Uns B Fill + 30% = 0
Uns C Cut = 0	Uns C Fill + 30% = 0	Uns C Cut = 0	Uns C Fill + 30% = 0
Rock Cut = 0	Rock Fill + 0% = 0	Rock Cut = 0	Rock Fill + 0% = 0
		Haul to ML Sta. 62+48.163	51,493

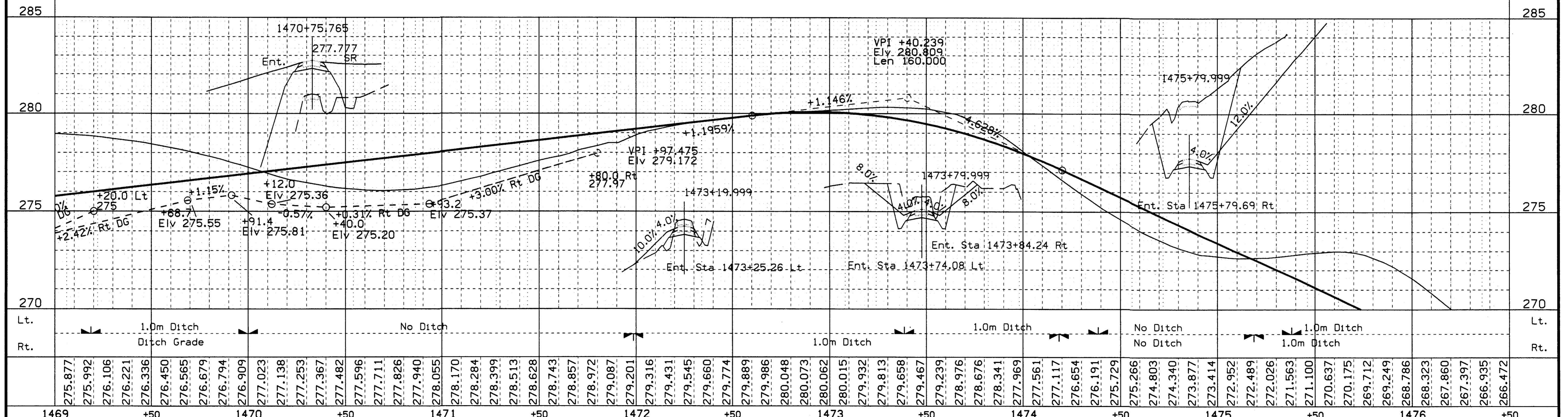




IA 146/T-37

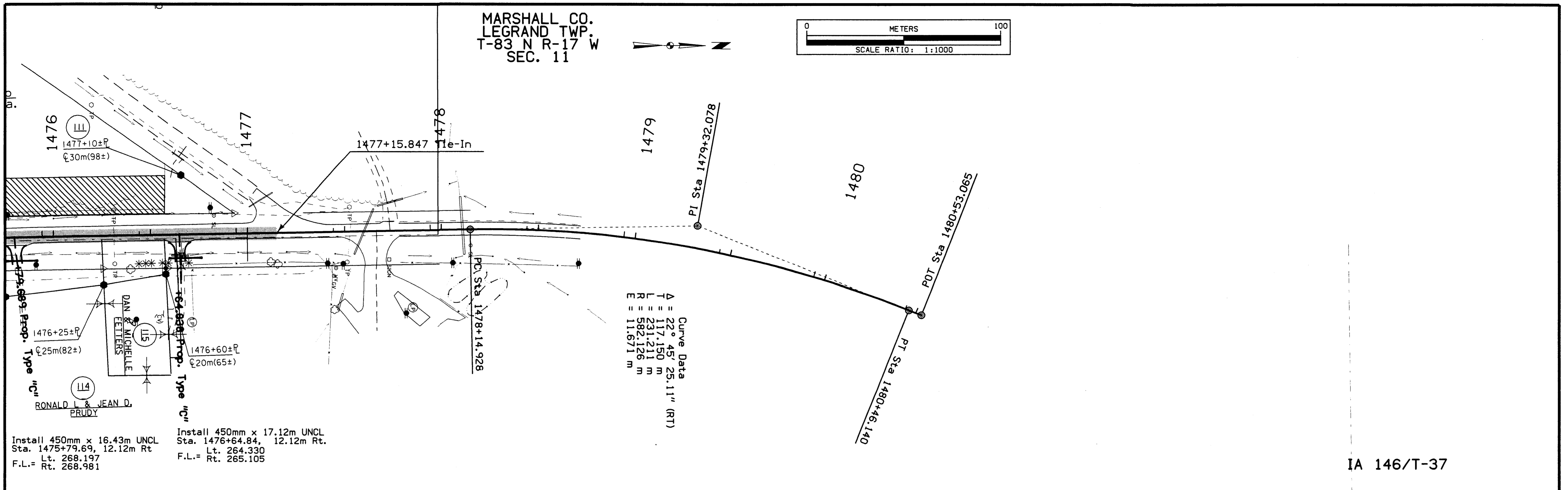
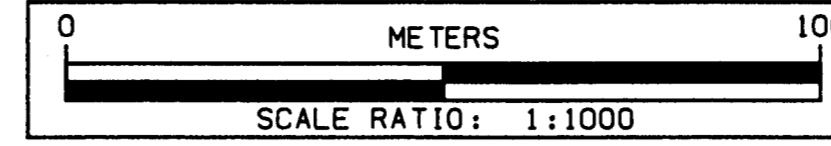
See Sheet E.04 for Balance Point

Uns	Cut	18,258	Uns	Fill	18,258
Uns	Cut	0	Uns	Fill	0
Uns	Cut	0	Uns	Fill	0
Rock	Cut	0	Rock	Fill	0



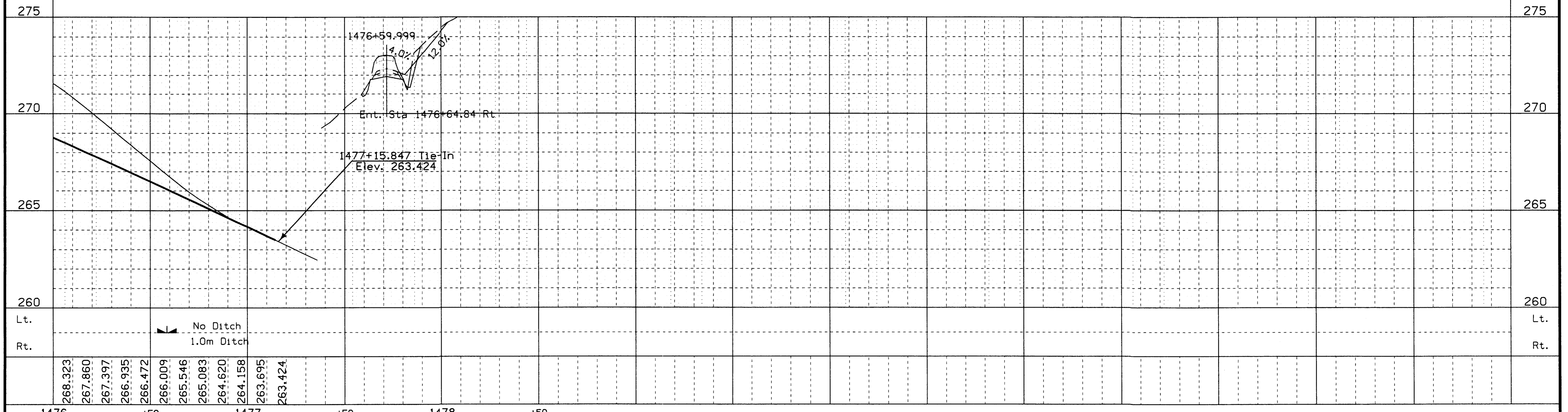
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MARSHALL CO.
LEGRAND TWP.
T-83 N R-17 W
SEC. 11

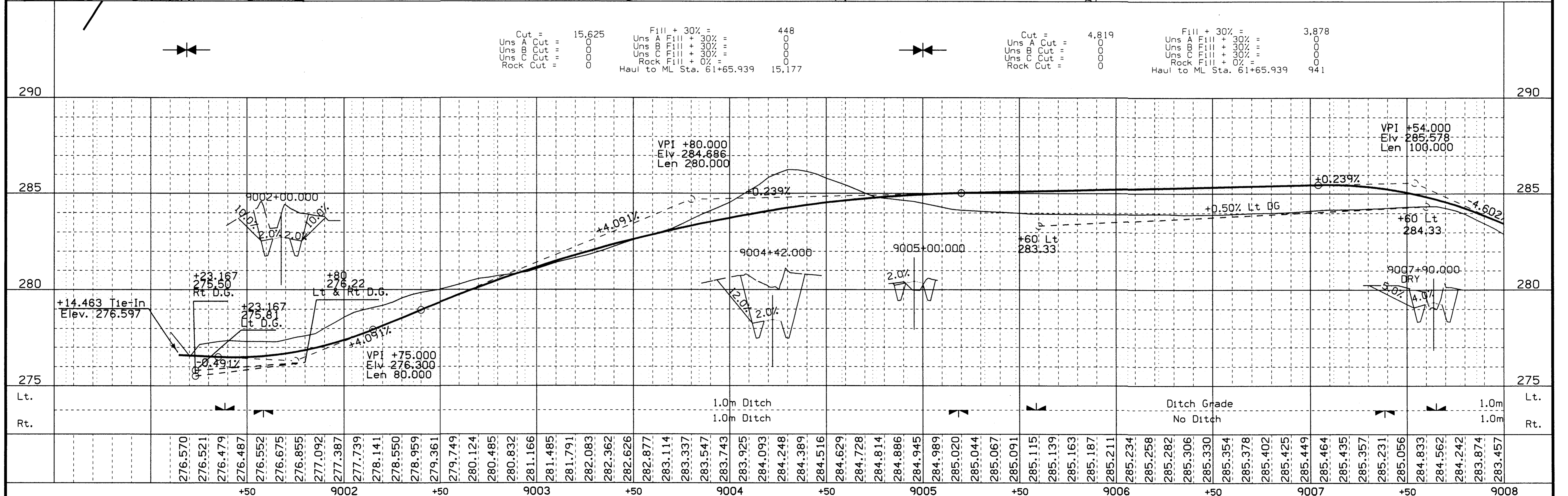
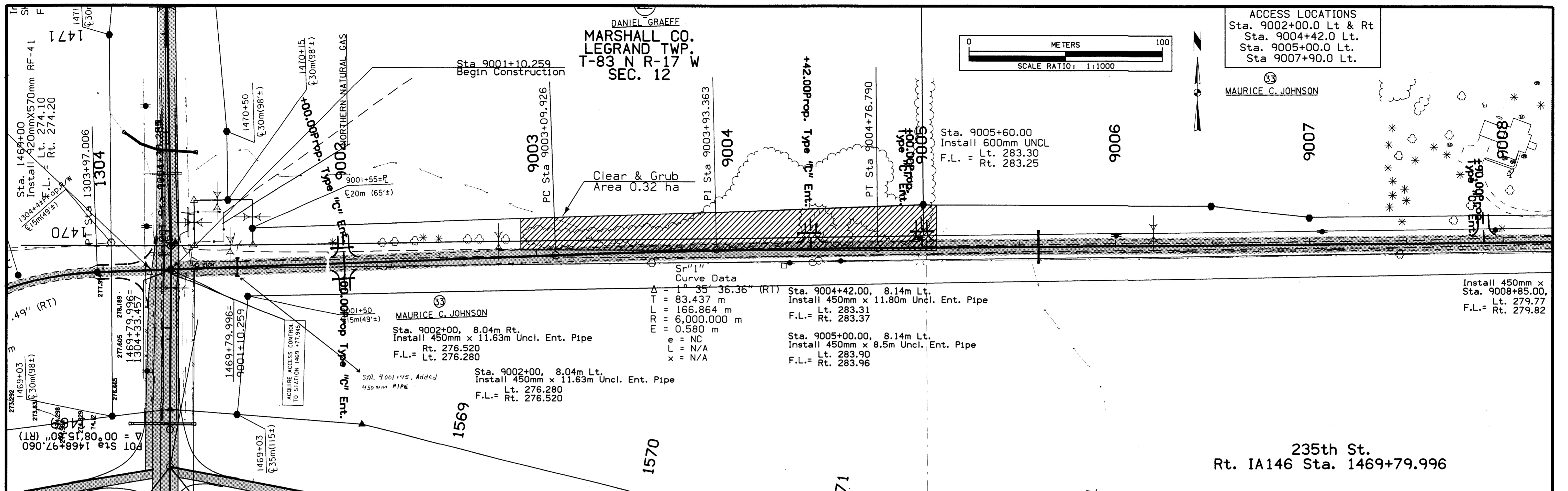


IA 146/T-37

See Sheet E.04 for Balance Point
and Sheet E.05 for Balance Information



1476	+50	1477	+50	1478	+50
DESIGN TEAM	ABRAMS/SMITH		METRIC	IOWA DOT * OFFICE OF DESIGN	
MARSHALL COUNTY			PROJECT NUMBER	NHSX-30-5(166)--3H-64	
SHEET NUMBER				E.06	



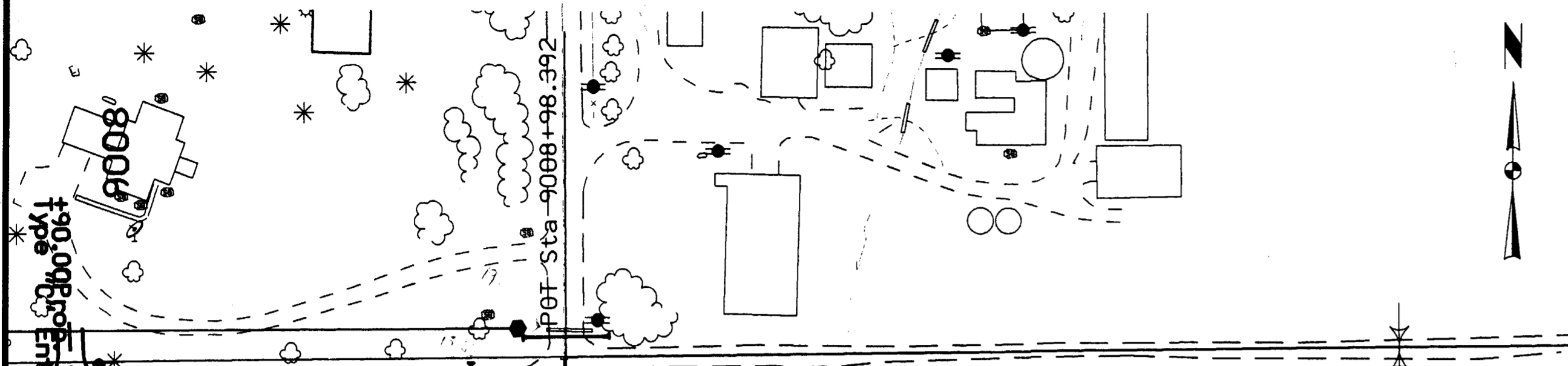
DESIGN TEAM	ABRAMS/SMITH	METRIC	IOWA DOT * OFFICE OF DESIGN	MARSHALL COUNTY	PROJECT NUMBER	NHSX-30-5(166)--3H-64	SHEET NUMBER	E.07
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MARSHALL CO.
LEGRAND TWP.
T-83 N R-17 W
SEC. 12

ACCESS LOCATIONS

Sta. 9008+85.0 Rt.

MAURICE C. JOHNSON



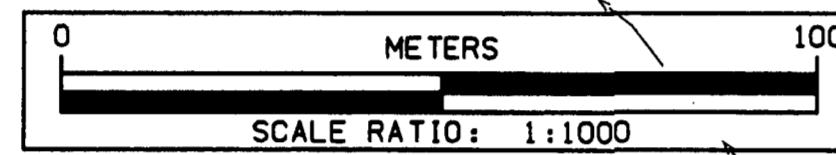
Install 450mm x 11.64m UNCL
Sta. 9008+85.00, 8.08m Rt.
Lt. 279.77
F.L.= Rt. 279.82

Installed 450mm, conc. RDWY PIPE
STA. 9008+99

INSTALLED 450mm, conc. RDWY PIPE
STA. 9008+81

MAURICE C. JOHNSON

Sta. 9008+94.379
End Construction

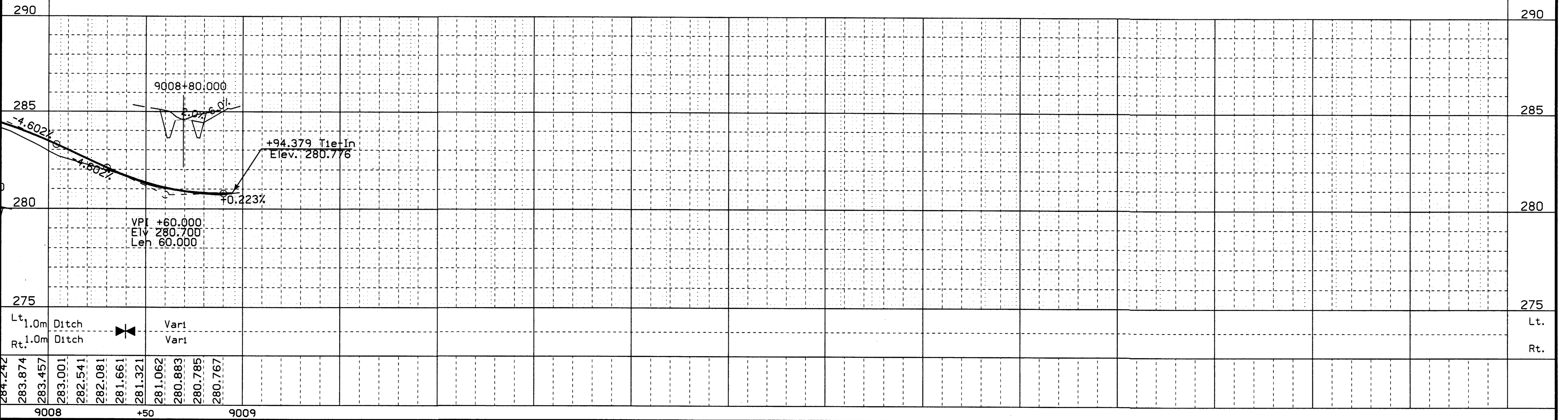


LOT 1

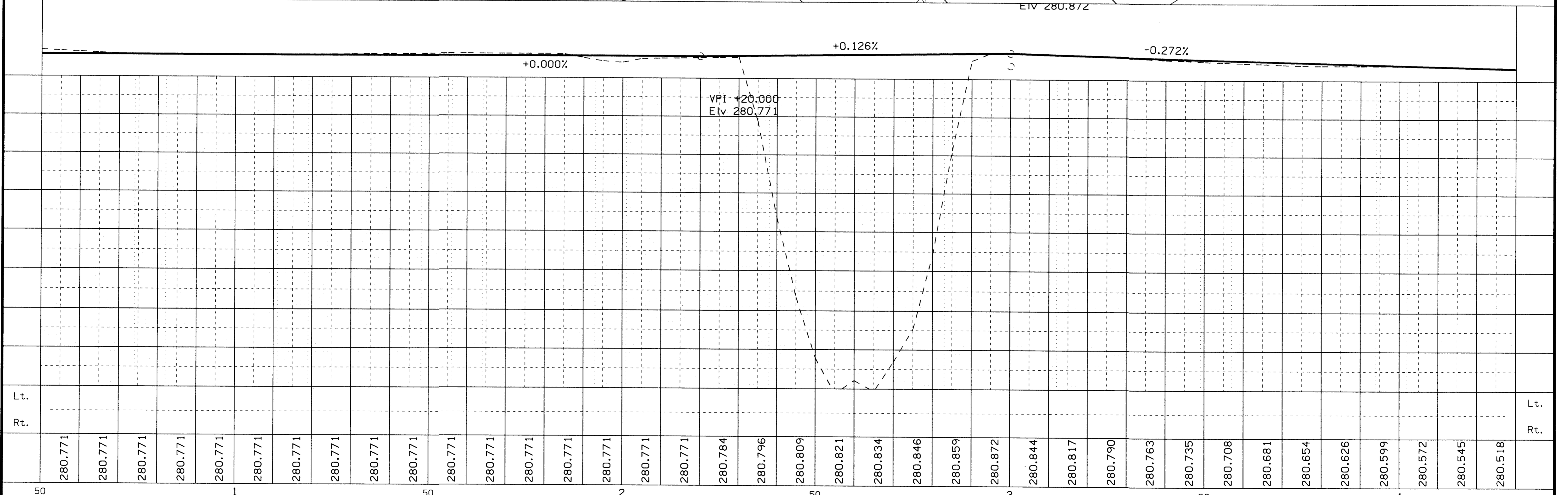
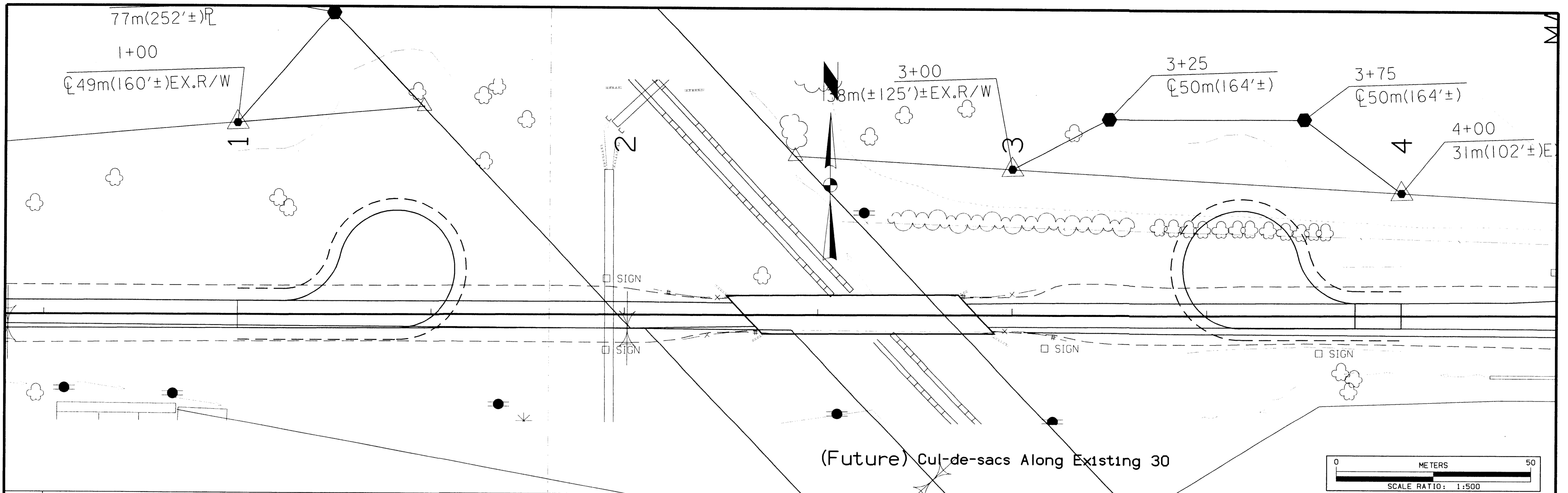
LOT 1

235th St.
Rt. IA146 Sta. 1469+79.99

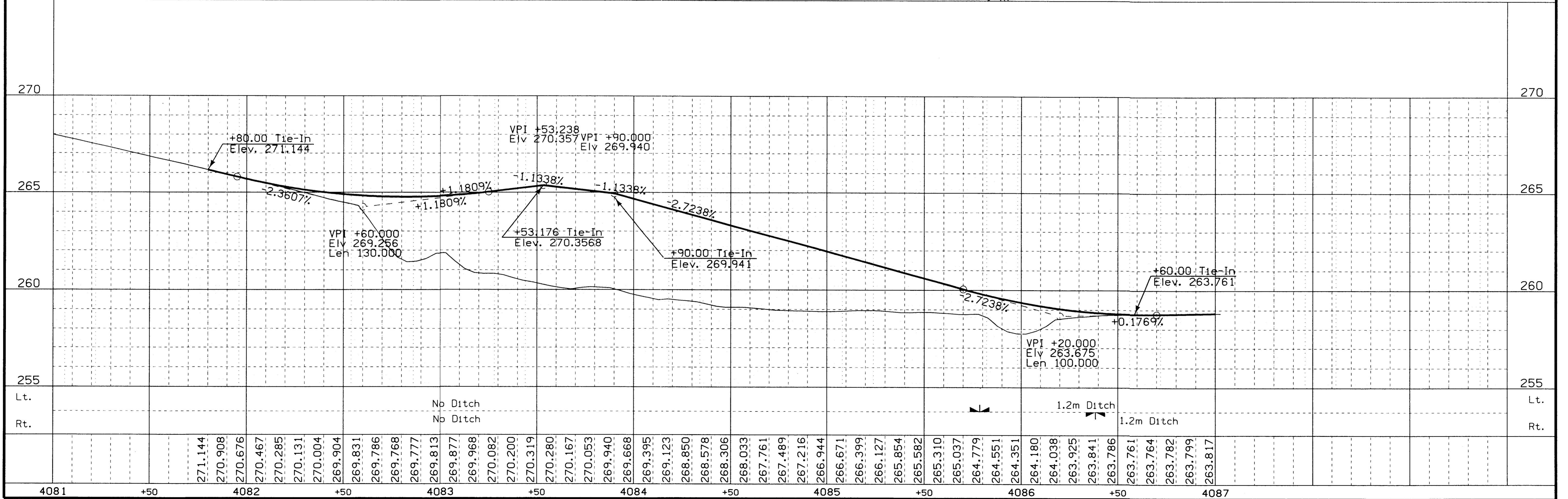
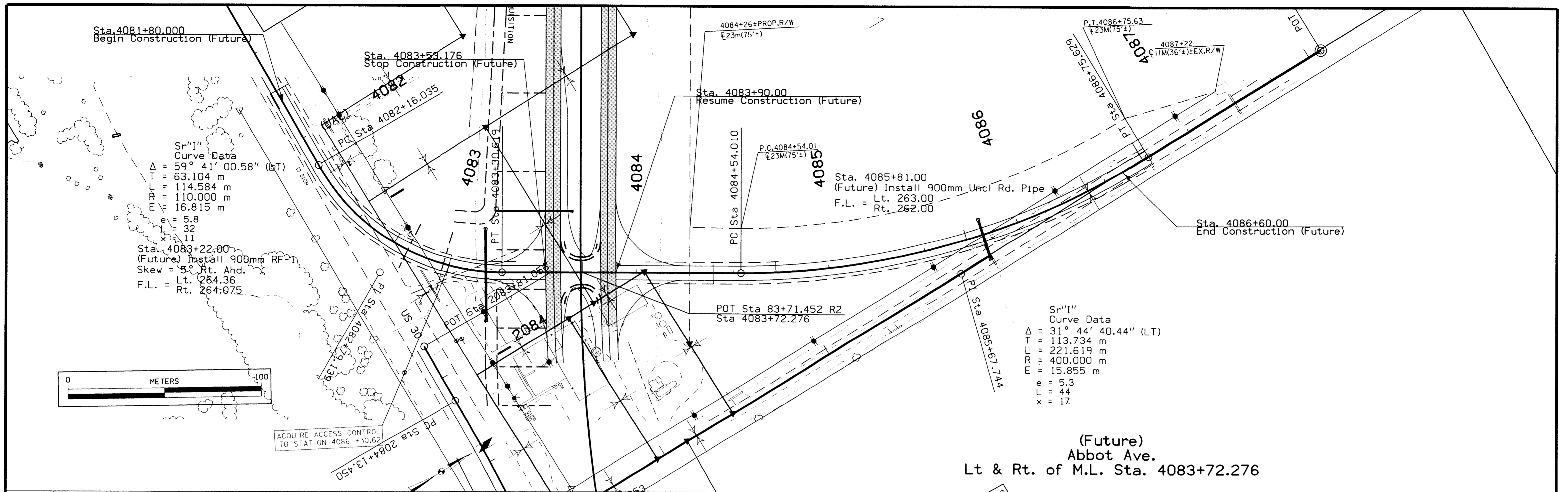
See Sheet E.07
for Balance and
Information



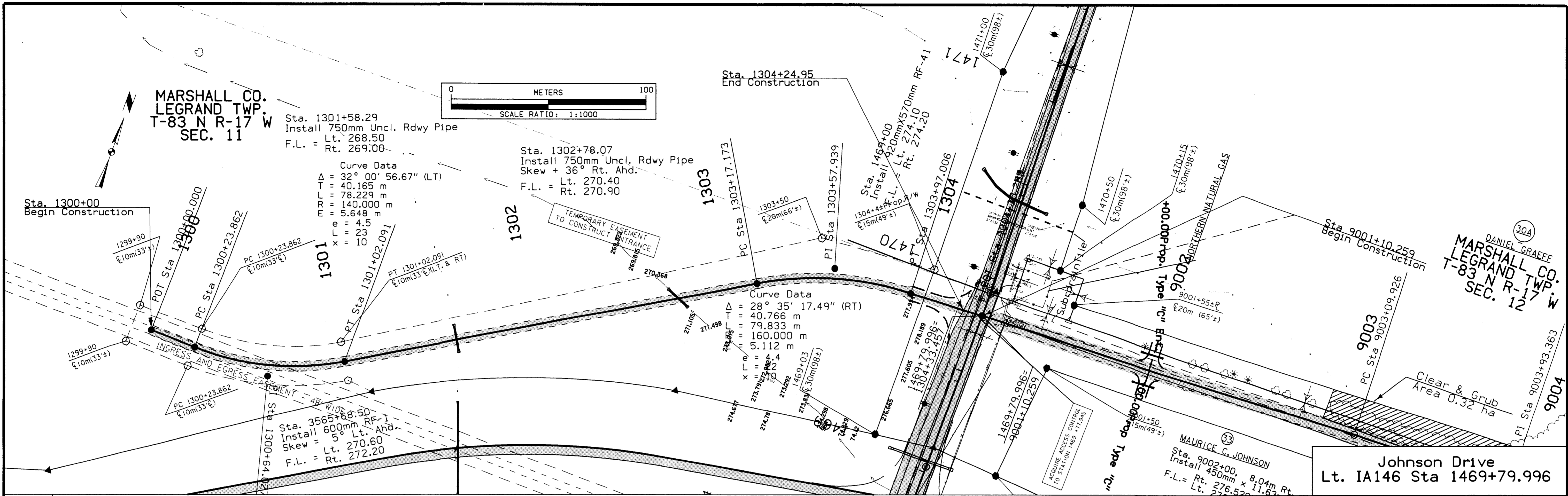
DESIGN TEAM	ABRAMS/SMITH	METRIC	IOWA DOT * OFFICE OF DESIGN	MARSHALL COUNTY	PROJECT NUMBER	NHSX-30-5(166)--3H-64	SHEET NUMBER	E.08
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RECEIVED 2009 10:39 bsmithc \Projects\24336\20492_Design\164\0166.E09



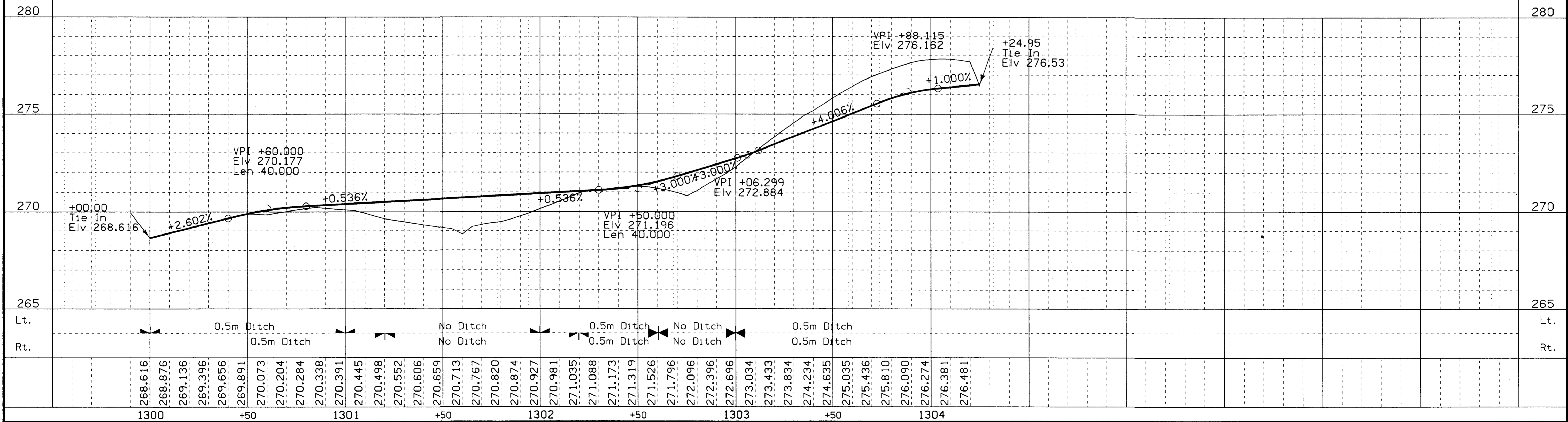
90-REF-0001 06/98 ksmith Projects 841 5000-92 Design 1 841 30166.dwg

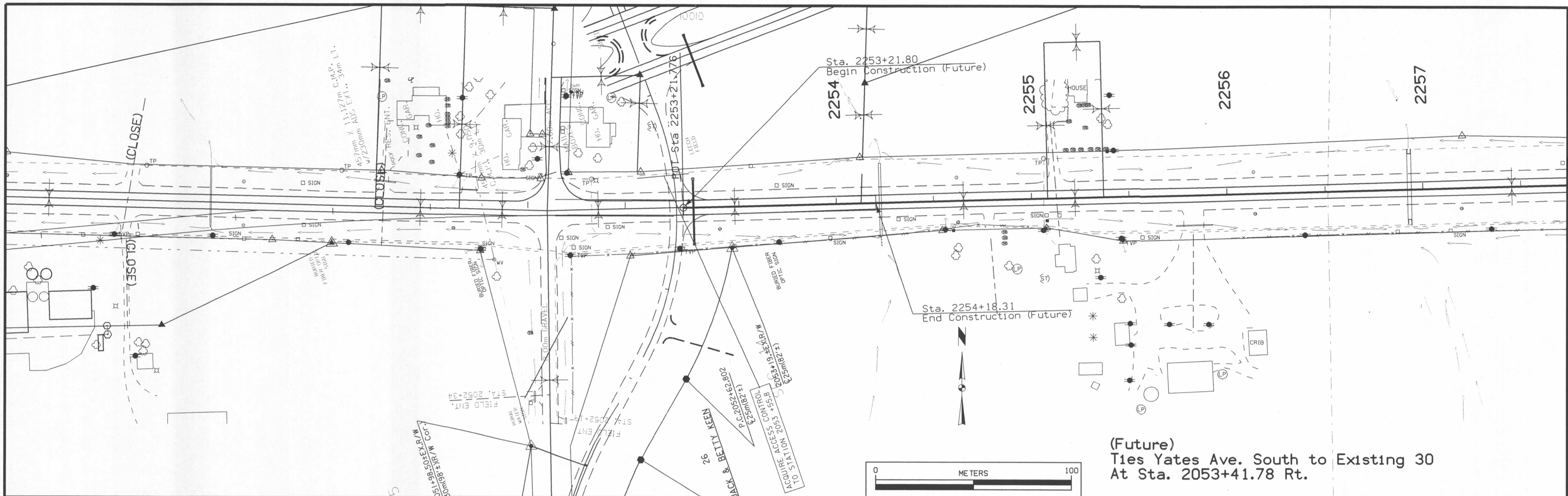


Cut	202	Fill + 30%	202
Uns A Cut	0	Uns A Fill + 30%	0
Uns B Cut	0	Uns B Fill + 30%	0
Uns C Cut	0	Uns C Fill + 30%	0
Rock Cut	0	Rock Fill + 0%	0

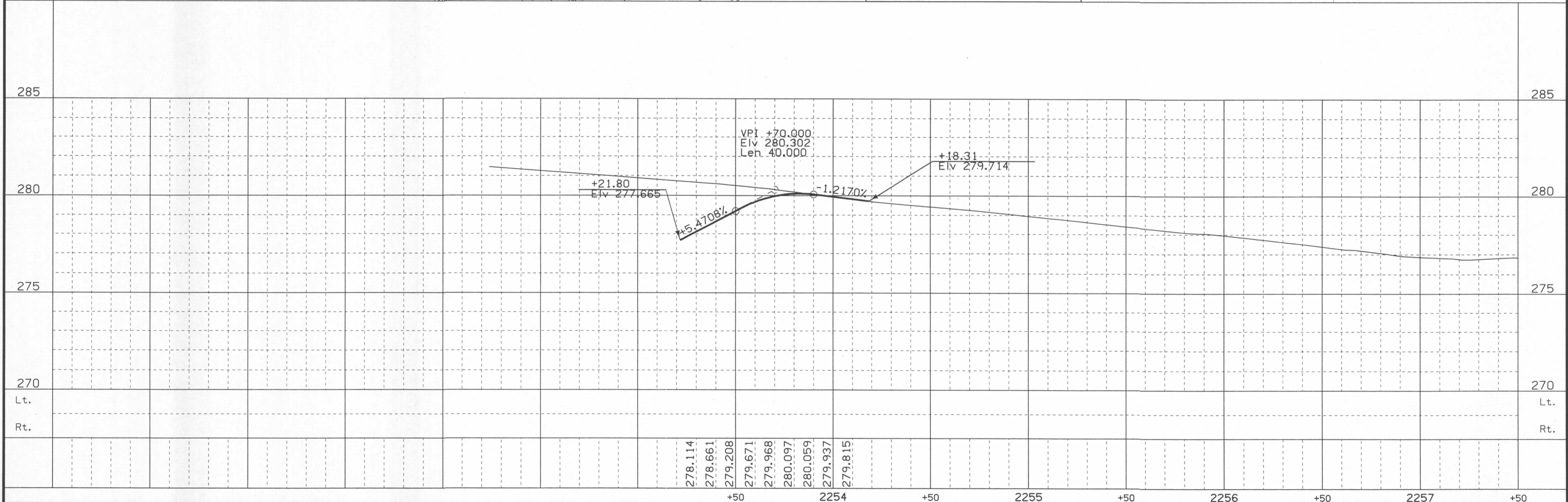
Cut	2,507	Fill + 30%	1,675
Uns A Cut	0	Uns A Fill + 30%	0
Uns B Cut	0	Uns B Fill + 30%	0
Uns C Cut	0	Uns C Fill + 30%	0
Rock Cut	0	Rock Fill + 0%	0

Haul to ML Sta. 61+64.934
832

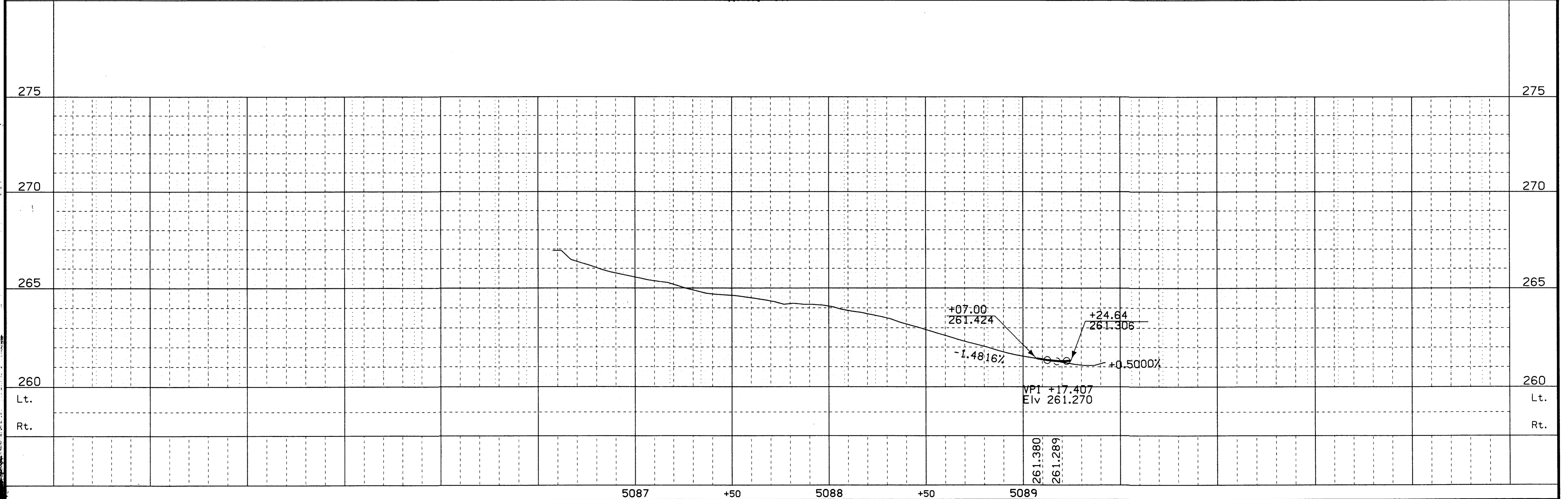
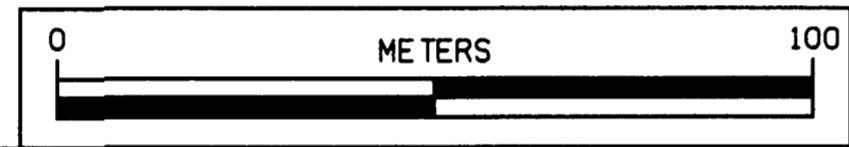
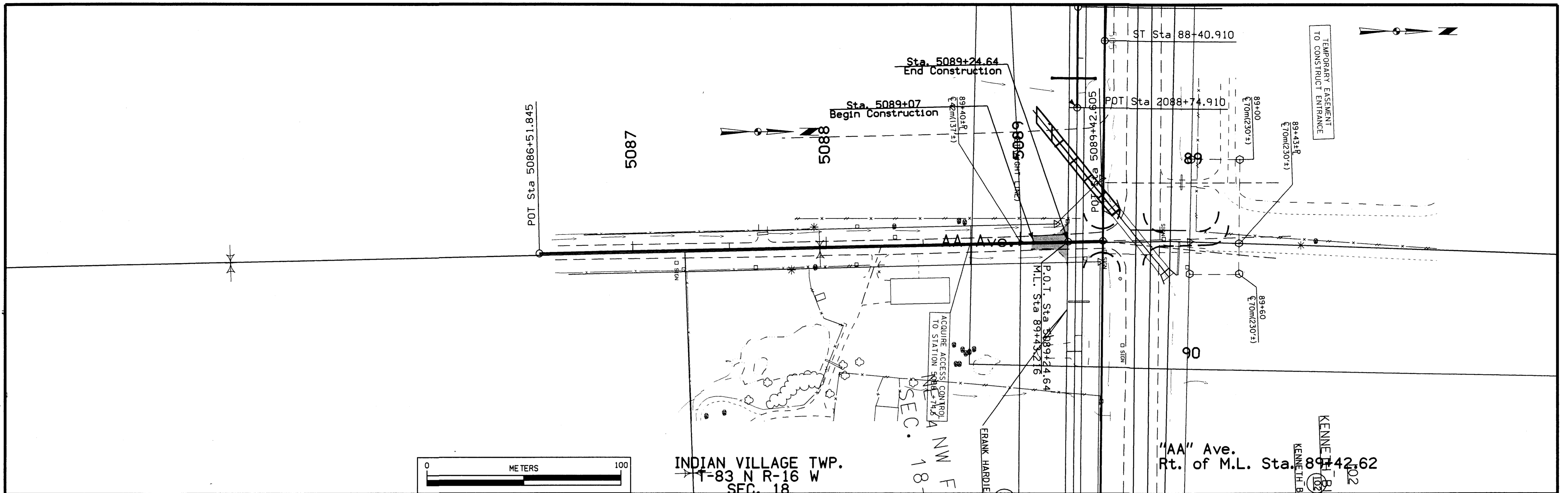




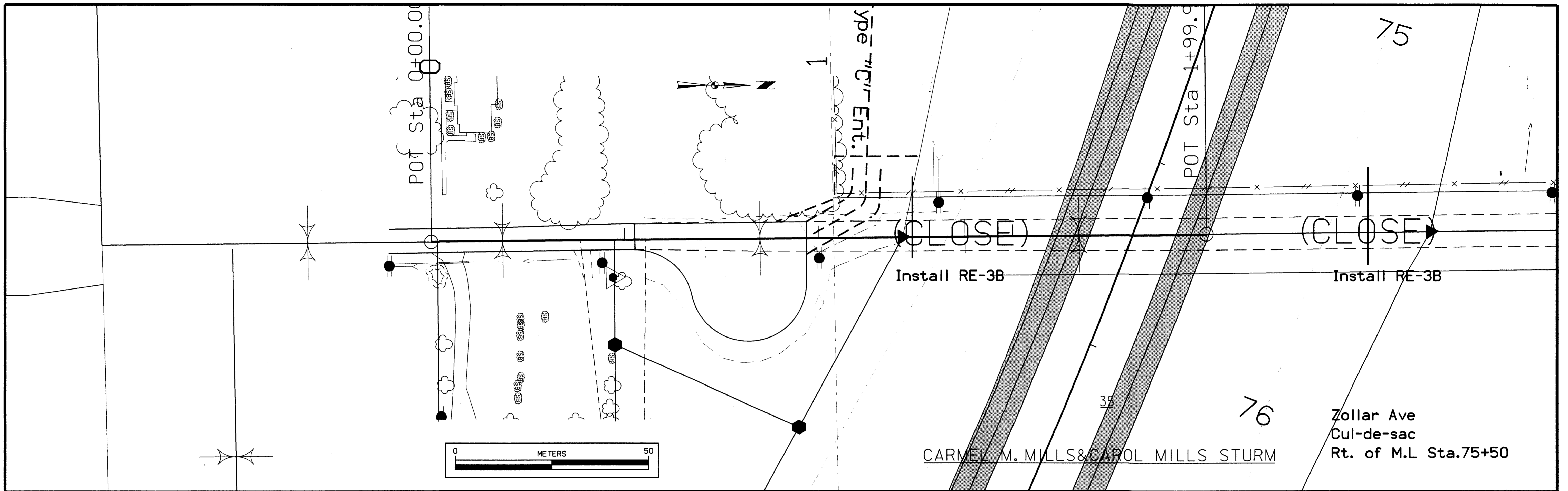
(Future)
Ties Yates Ave. South to Existing 30
At Sta. 2053+41.78 Rt.



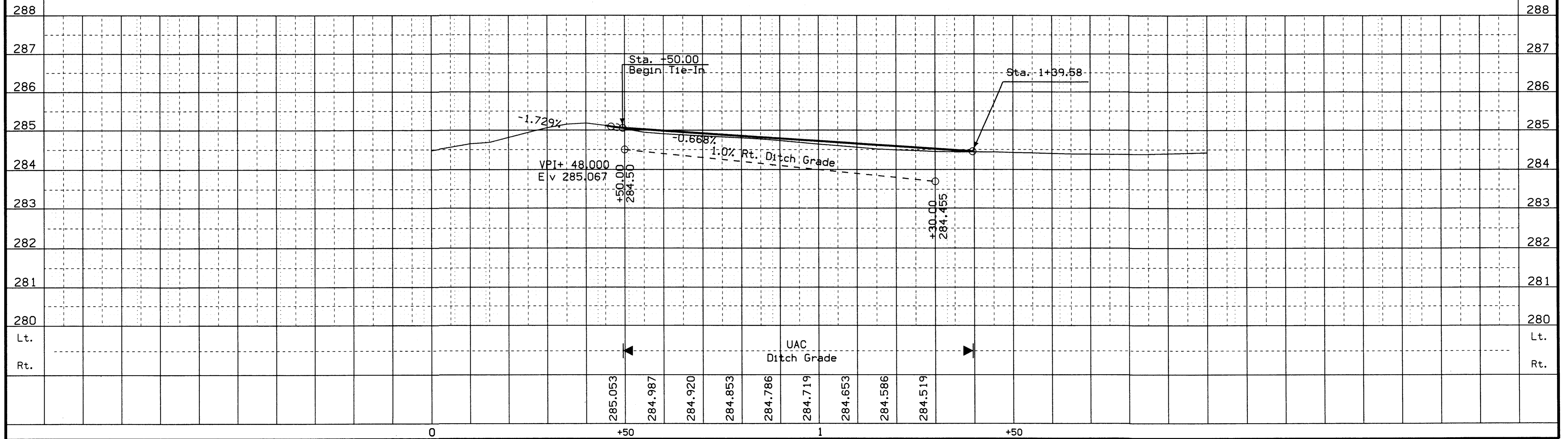
06-SEP-2001 06:56 bsmith2 Projects 64030030492 Design 64030166.e12



DESIGN TEAM	ABRAMS/SMITH	METRIC	IOWA DOT * OFFICE OF DESIGN	5087	+50	5088	+50	5089	MARSHALL COUNTY	PROJECT NUMBER	NHSX-30-5(166)--3H-64	SHEET NUMBER	E.13
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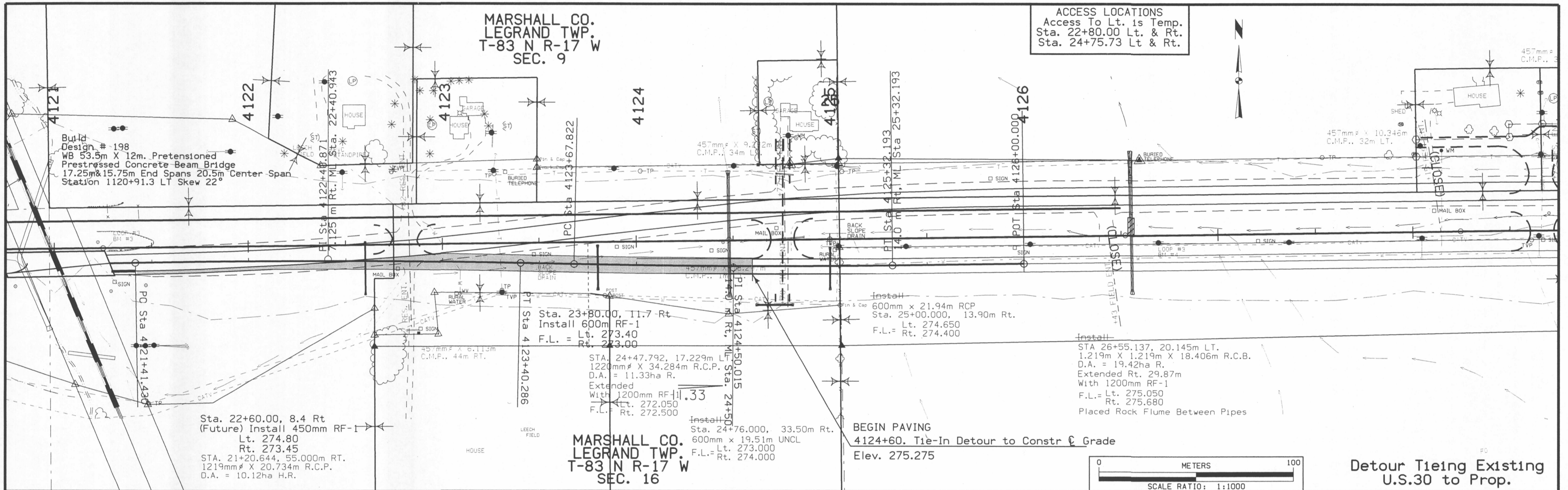


(Future)



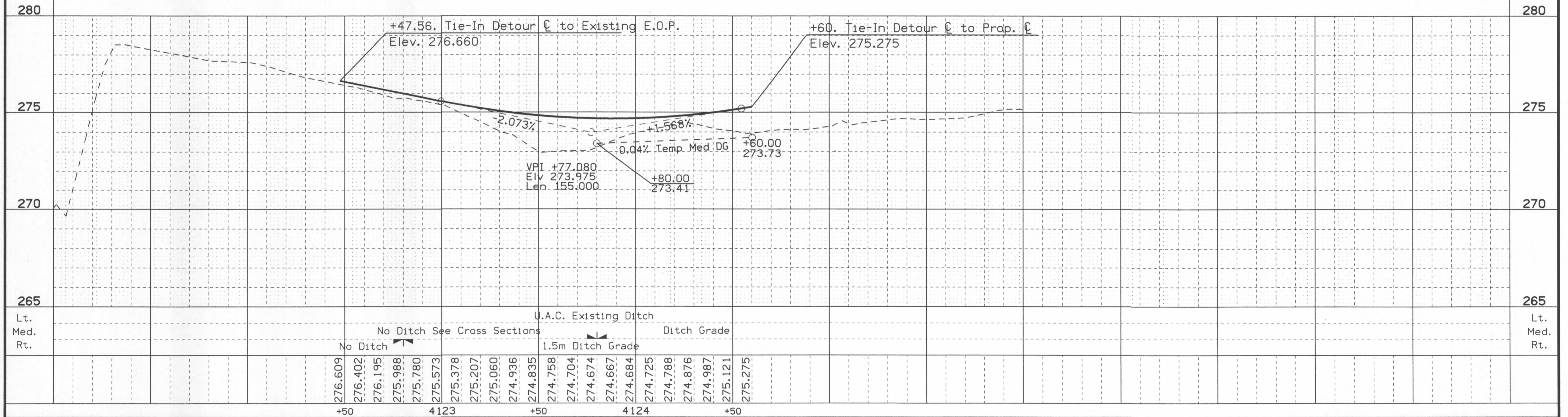
MARSHALL CO.
LEGRAND TWP.
T-83 N R-17 W
SEC. 9

ACCESS LOCATIONS
Access To Lt. is Temp.
Sta. 22+80.00 Lt. & Rt.
Sta. 24+75.73 Lt & Rt.

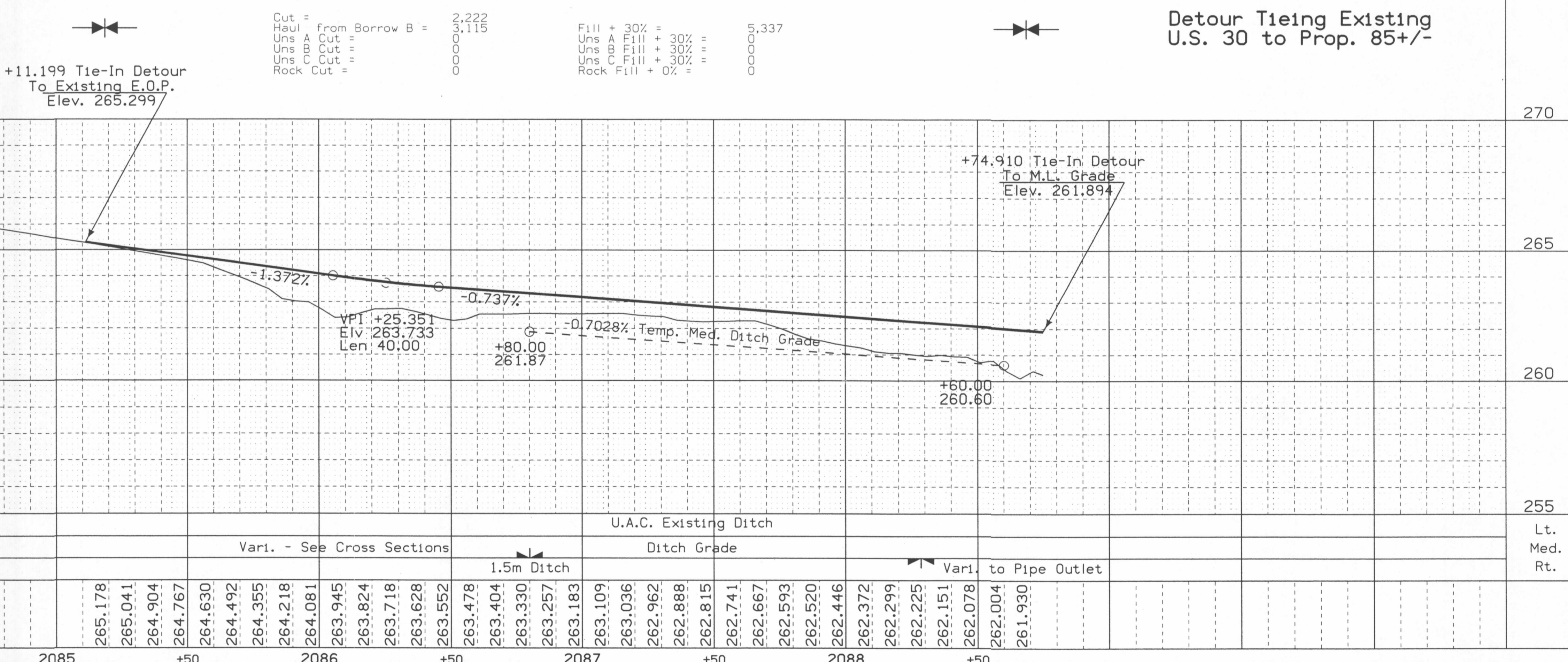
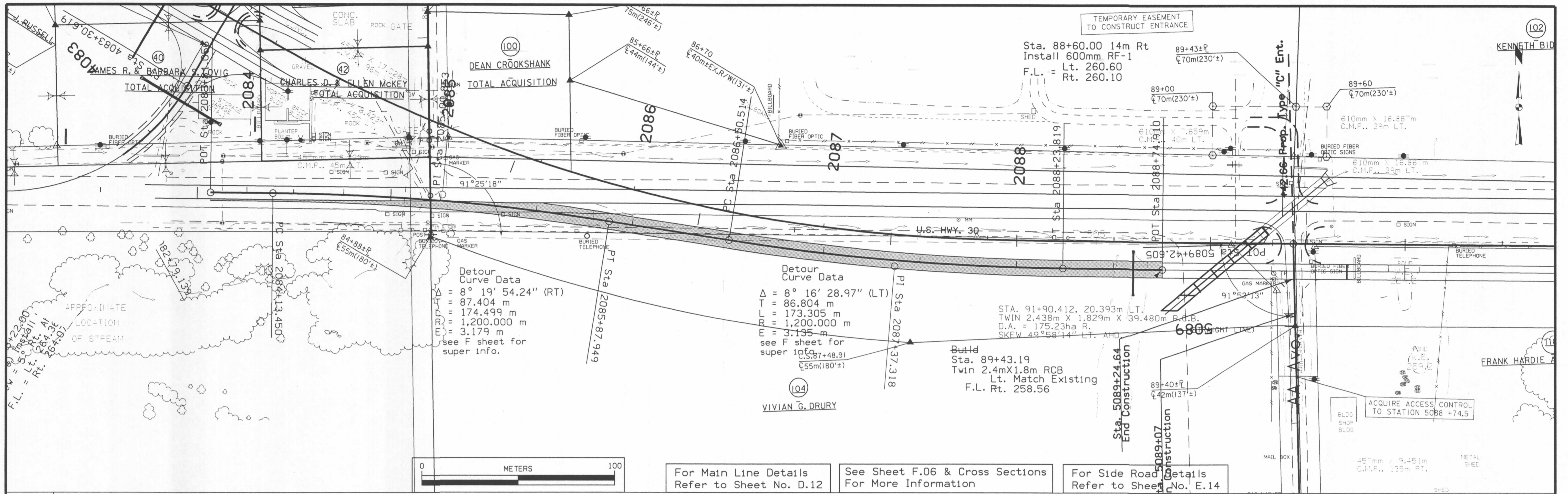


Detour Tieing Existing
U.S.30 to Prop.

Cut =	1,700	Fill + 30% =	5,837
Haul from Borrow B =	4,137	Uns A Fill + 30% =	
Uns A Cut =		Uns B Fill + 30% =	
Uns C Cut =		Uns C Fill + 30% =	
Rock Cut =	0	Rock Fill + 0% =	0

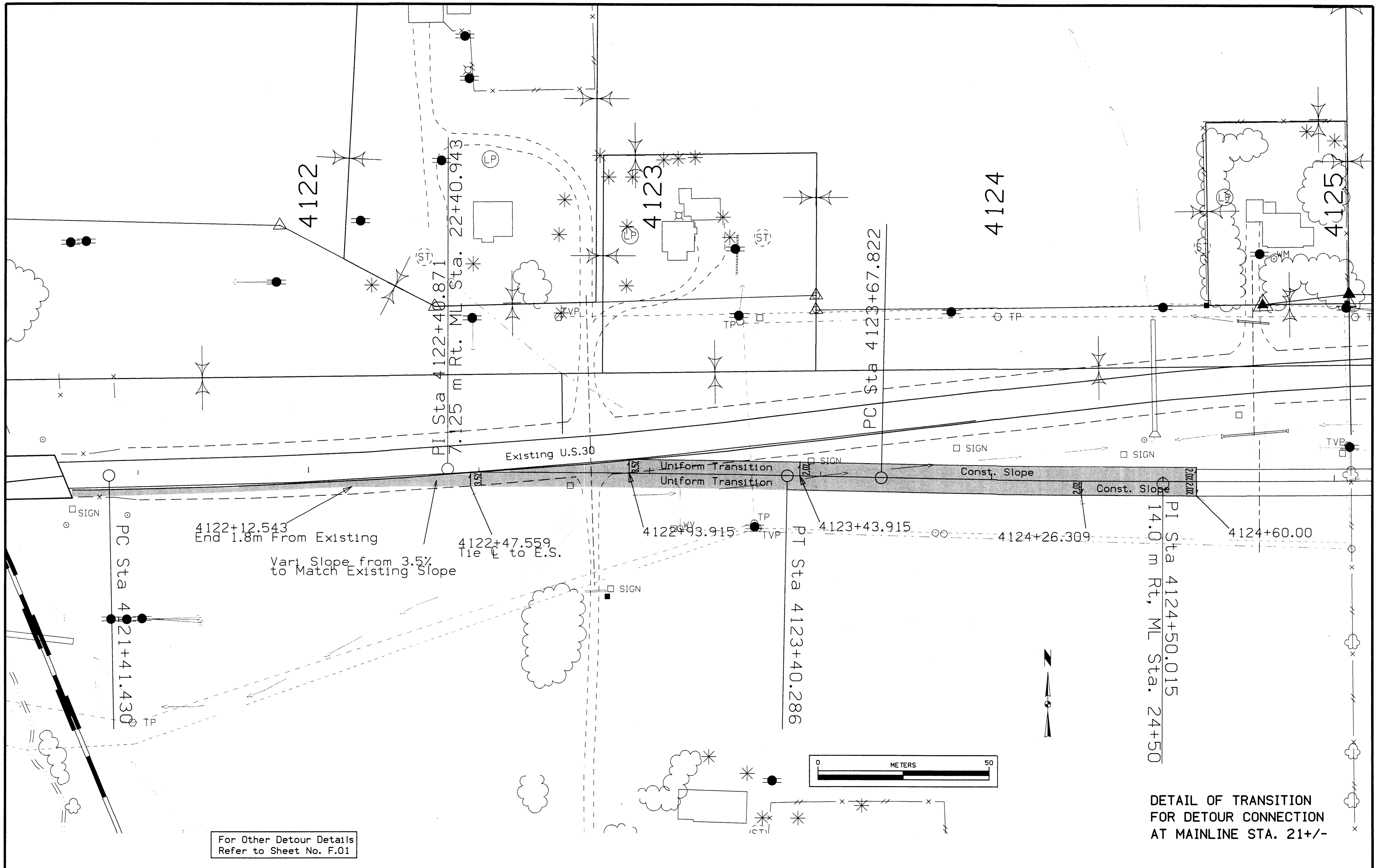


DESIGN TEAM	ABRAMS/SMITH	METRIC	IOWA DOT * OFFICE OF DESIGN	MARSHALL COUNTY	PROJECT NUMBER	NHSX-30-5(166)--3H-64	SHEET NUMBER	F.01
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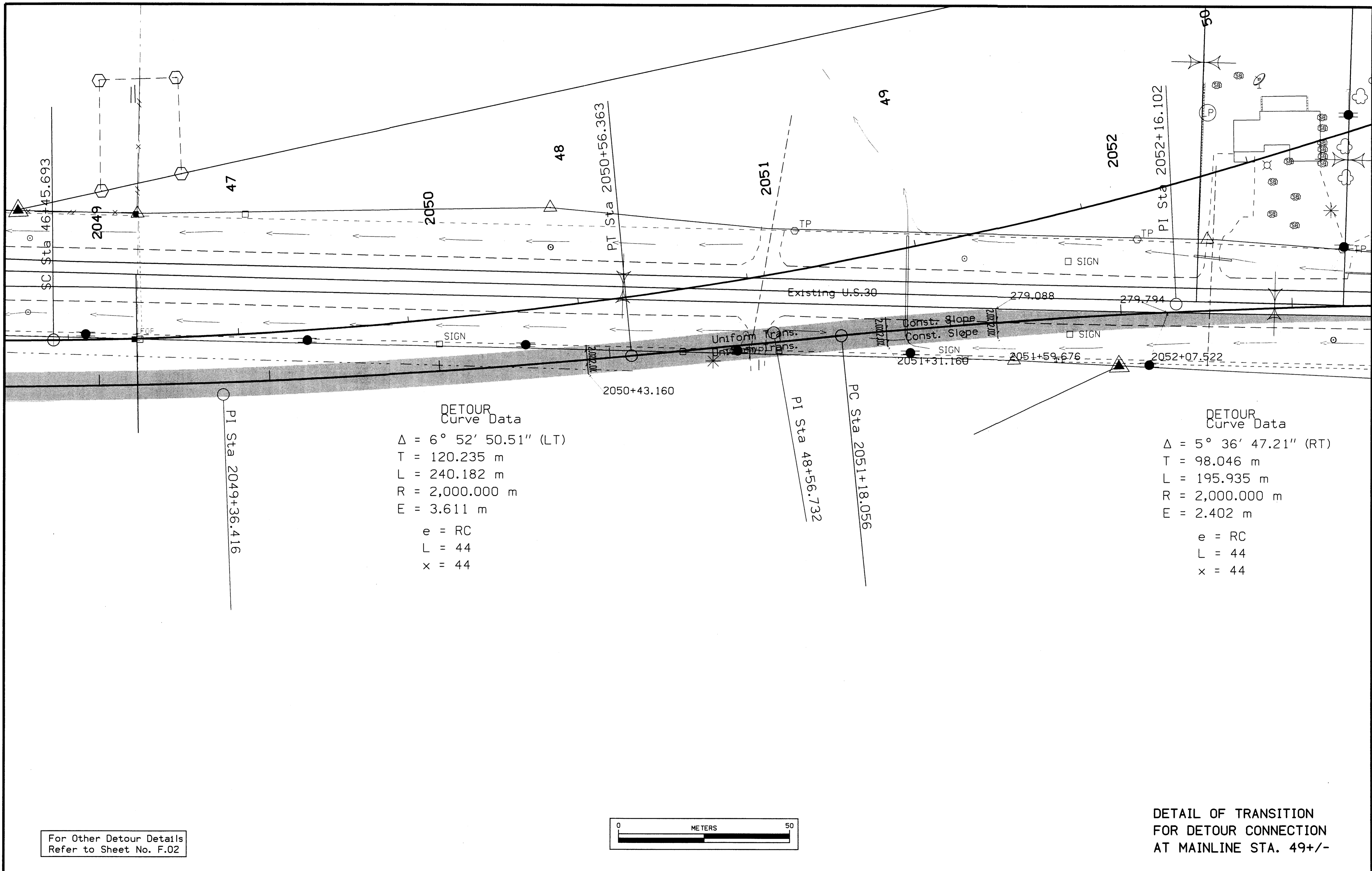
Cut = 2.222 Haul from Borrow B = 3.115 Uns A Cut = 0 Uns B Cut = 0 Uns C Cut = 0 Rock Cut = 0	Fill + 30% = 5.337 Uns A Fill + 30% = 0 Uns B Fill + 30% = 0 Uns C Fill + 30% = 0 Rock Fill + 0% = 0
--	--

19-SEP-2001 10:06 bsmth2 Projects 64030030-92 Design k64030166.F03



For Other Detour Details
Refer to Sheet No. F.01

DETAIL OF TRANSITION
FOR DETOUR CONNECTION
AT MAINLINE STA. 21+/-



DETOUR
Curve Data

$\Delta = 6^\circ 52' 50.51''$ (LT)

T = 120.235 m

L = 240.182 m

R = 2,000.000 m

E = 3.611 m

e = RC

L = 44

x = 44

DETOUR
Curve Data

$\Delta = 5^\circ 36' 47.21''$ (RT)

T = 98.046 m

L = 195.935 m

R = 2,000.000 m

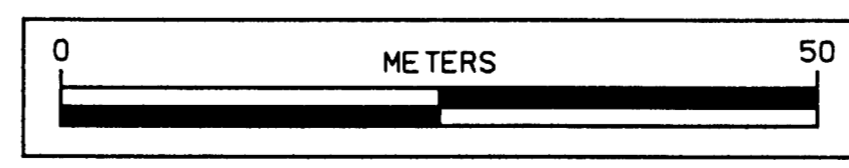
E = 2.402 m

e = RC

L = 44

x = 44

For Other Detour Details
Refer to Sheet No. F.02

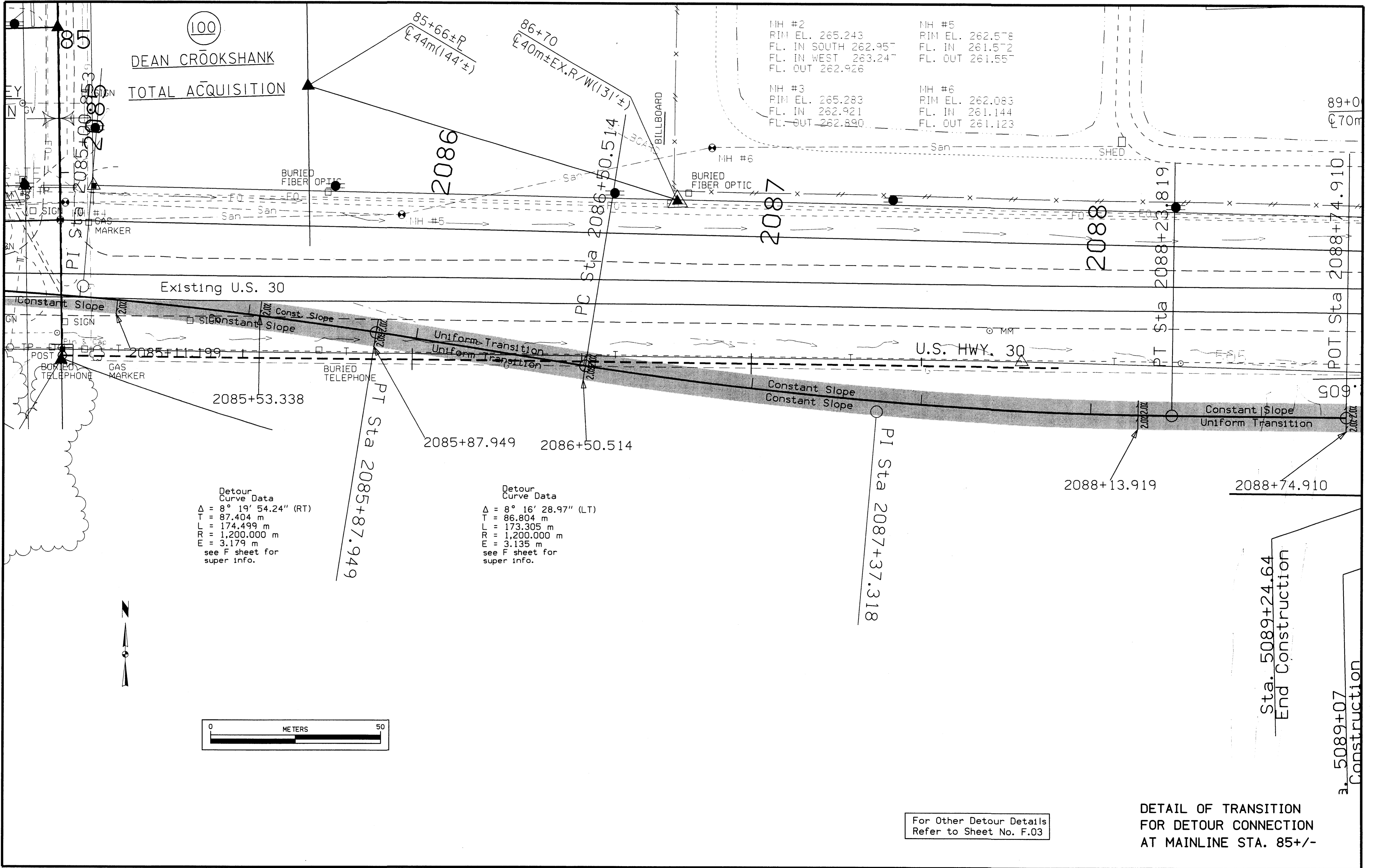


DETAIL OF TRANSITION
FOR DETOUR CONNECTION
AT MAINLINE STA. 49+/-

06-SEP-2001 07:21 bsmith2 Projects 64030030-R2 Design 64030166.F05

DEAN CROOKSHANK
TOTAL ACQUISITION

MH #2 RIM EL. 265.243 FL. IN SOUTH 262.957 FL. IN WEST 263.247 FL. OUT 262.926	MH #5 RIM EL. 262.578 FL. IN 261.572 FL. OUT 261.557
MH #3 RIM EL. 265.283 FL. IN 262.921 FL. OUT 262.890	MH #6 RIM EL. 262.083 FL. IN 261.144 FL. OUT 261.123



Detour
Curve Data
 $\Delta = 8^\circ 19' 54.24''$ (RT)
 T = 87.404 m
 L = 174.499 m
 R = 1,200.000 m
 E = 3.179 m
 see F sheet for
 super info.

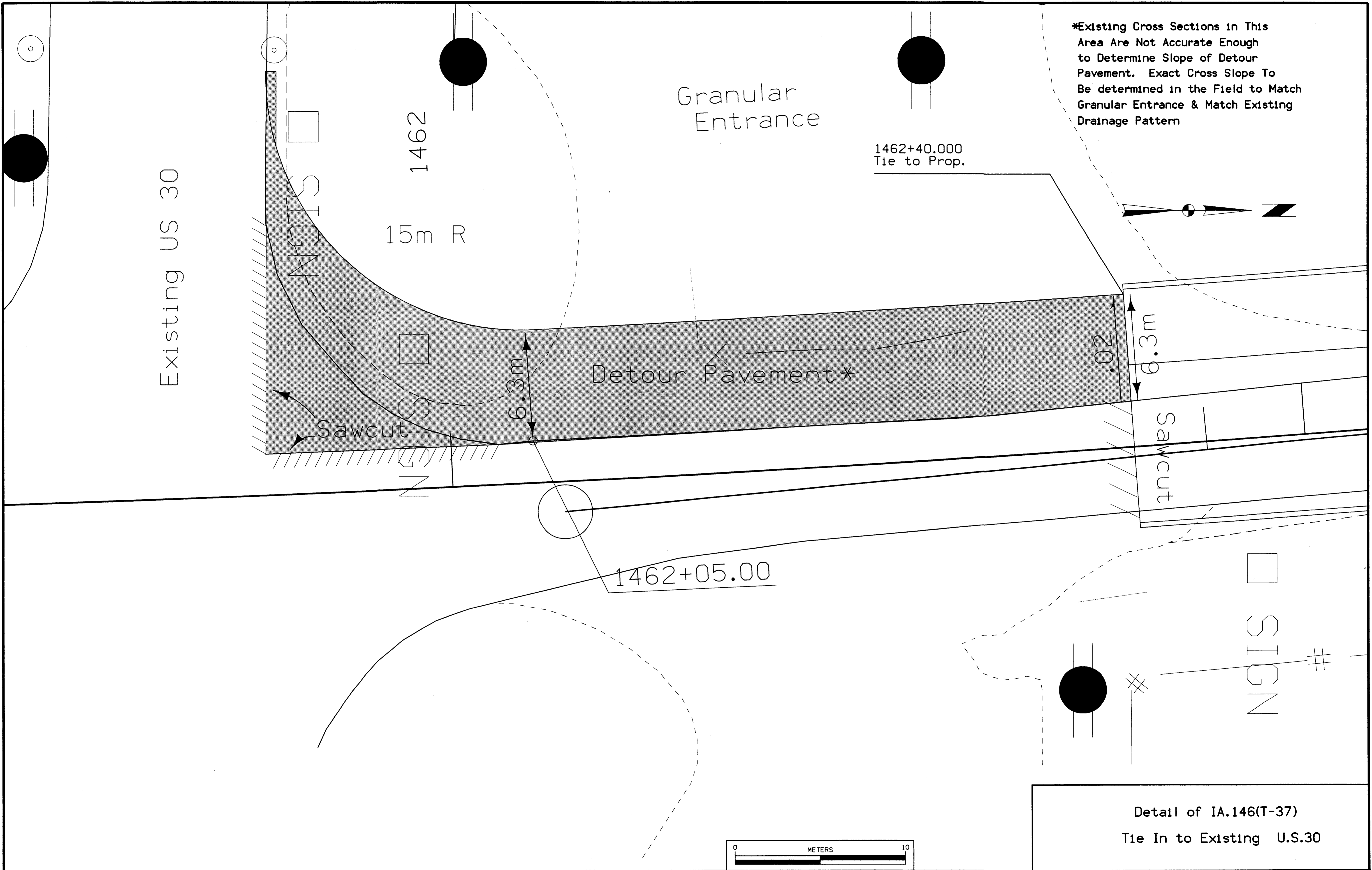
Detour
Curve Data
 $\Delta = 8^\circ 16' 28.97''$ (LT)
 T = 86.804 m
 L = 173.305 m
 R = 1,200.000 m
 E = 3.135 m
 see F sheet for
 super info.

For Other Detour Details
Refer to Sheet No. F.03

DETAIL OF TRANSITION
FOR DETOUR CONNECTION
AT MAINLINE STA. 85+/-

Sta. 5089+24.64
End Construction

Sta. 5089+07
Construction



Detail of IA.146(T-37)
Tie In to Existing U.S.30

10-SEP-2001 06:17 bsmith2 : Projects 64061280-PC Design 274030166.F07

LEGRAND BY-PASS
 U.S. HIGHWAY #30
 BENCH MARKS

BENCHMARK NO.	DESCRIPTION & LOCATION	ELEVATION
3	RR Spike in P. Pole, Sta. 59 + 83±, 8m Rt ☉	278.769
3A	RR Spike in 8" x 8" Fence Post, Sta. 63 + 97±, 13.2m Rt. ☉	268.612
3B	RR Spike in Newer Corner Post, Sta. 66 + 70, 14.4m Lt ☉	272.716
3C	RR Spike in P. Pole, Sta. 70 + 41.7, 3.2m Lt ☉	274.977
3D	RR Spike Corner Post, Sta. 74 + 47.5, 54m Rt ☉	276.934
5A	RR Spike in P. Pole, East Side, Gravel Road, Sta. 78 + 50, 44.5m Rt ☉	284.848
5B	RR Spike Fence Post, Sta. 83 + 25, 39.9m Rt ☉	277.574
6	Bridge Spike in P. Pole NW Corner Hwy. #30 & Marshall-Tama Co. Line Road Sta. 87 + 40, 10.0m Rt ☉	264.641

CGA CAPSAULE-CORNER ASSOC. P.M. 72004
 MARSHALL CO., IOWA

DESIGN TEAM ABRAMS/SMITH

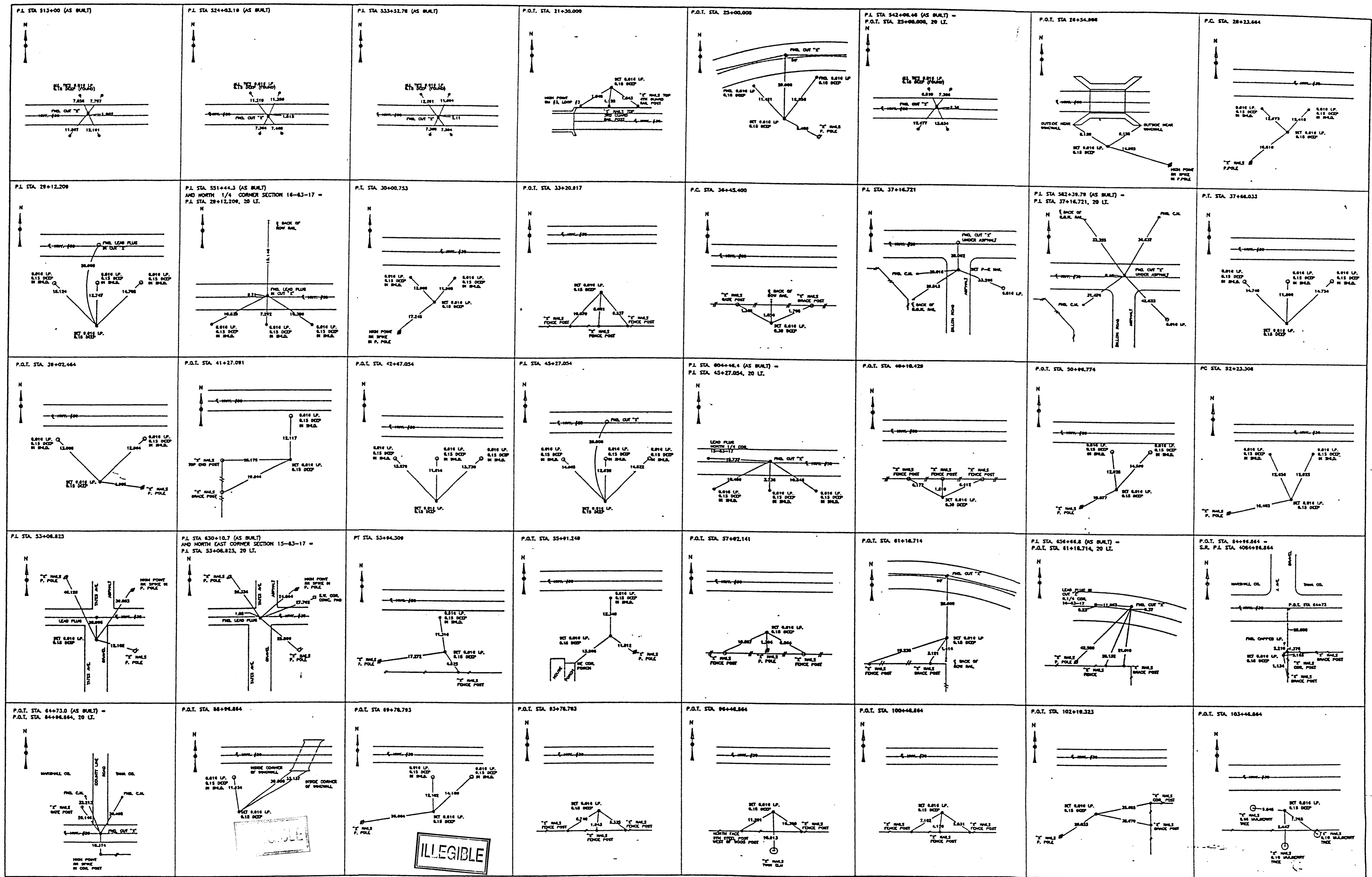
METRIC

IOWA DOT * OFFICE OF DESIGN

MARSHALL COUNTY

PROJECT NUMBER NHSX-30-5(166)--3H-64

SHEET NUMBER G.01



CGA CLAPSADLE-GARBER ASSOC.
MARSHALL TOWN, IOWA P.N. 72004

U.S. HIGHWAY 30
REFERENCE TIE SHEET

DESIGN TEAM ABRAMS/SMITH

METRIC

IOWA DOT * OFFICE OF DESIGN

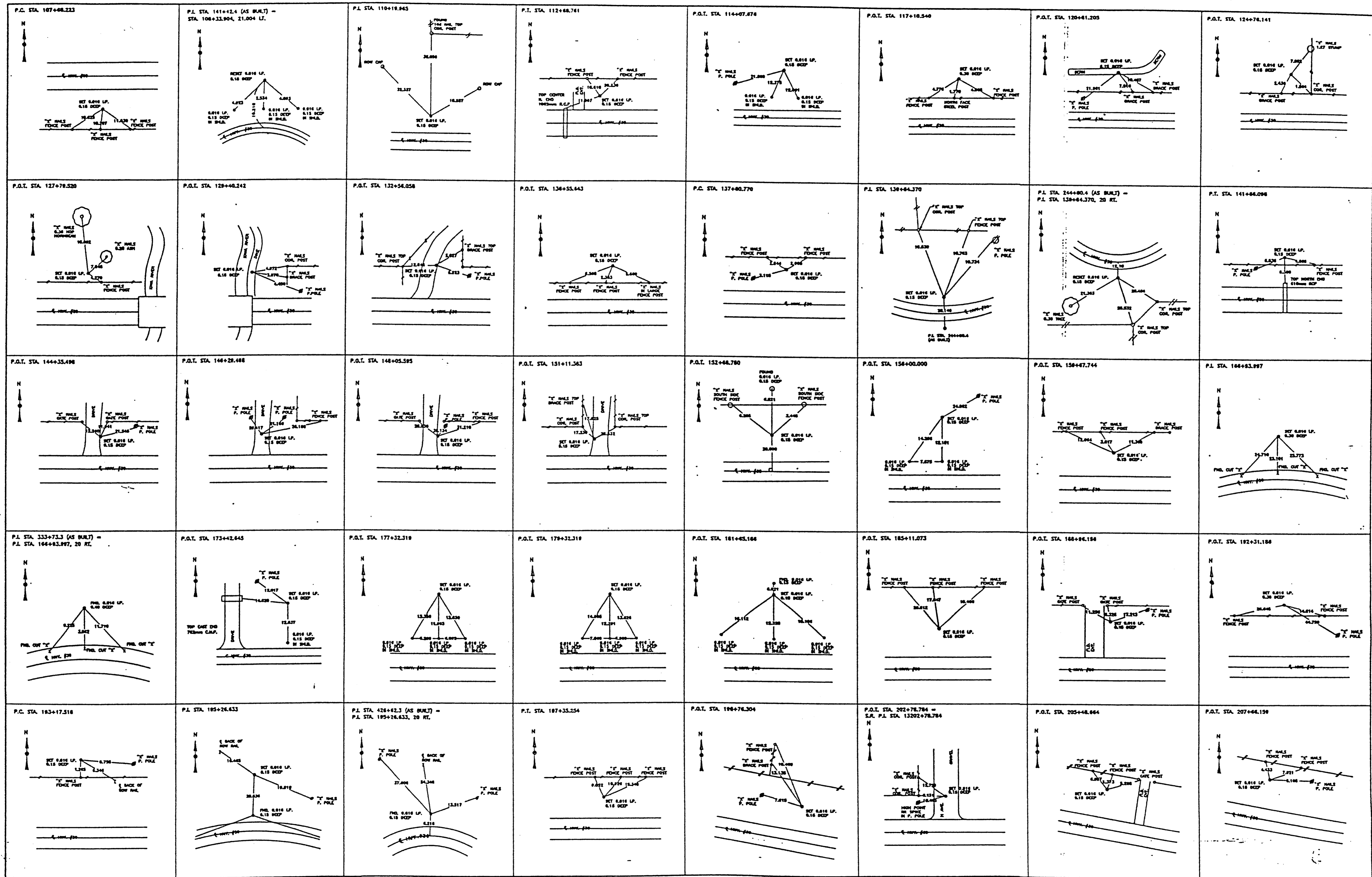
MARSHALL COUNTY

PROJECT NUMBER

NHSX-30-5(166)--3H-64

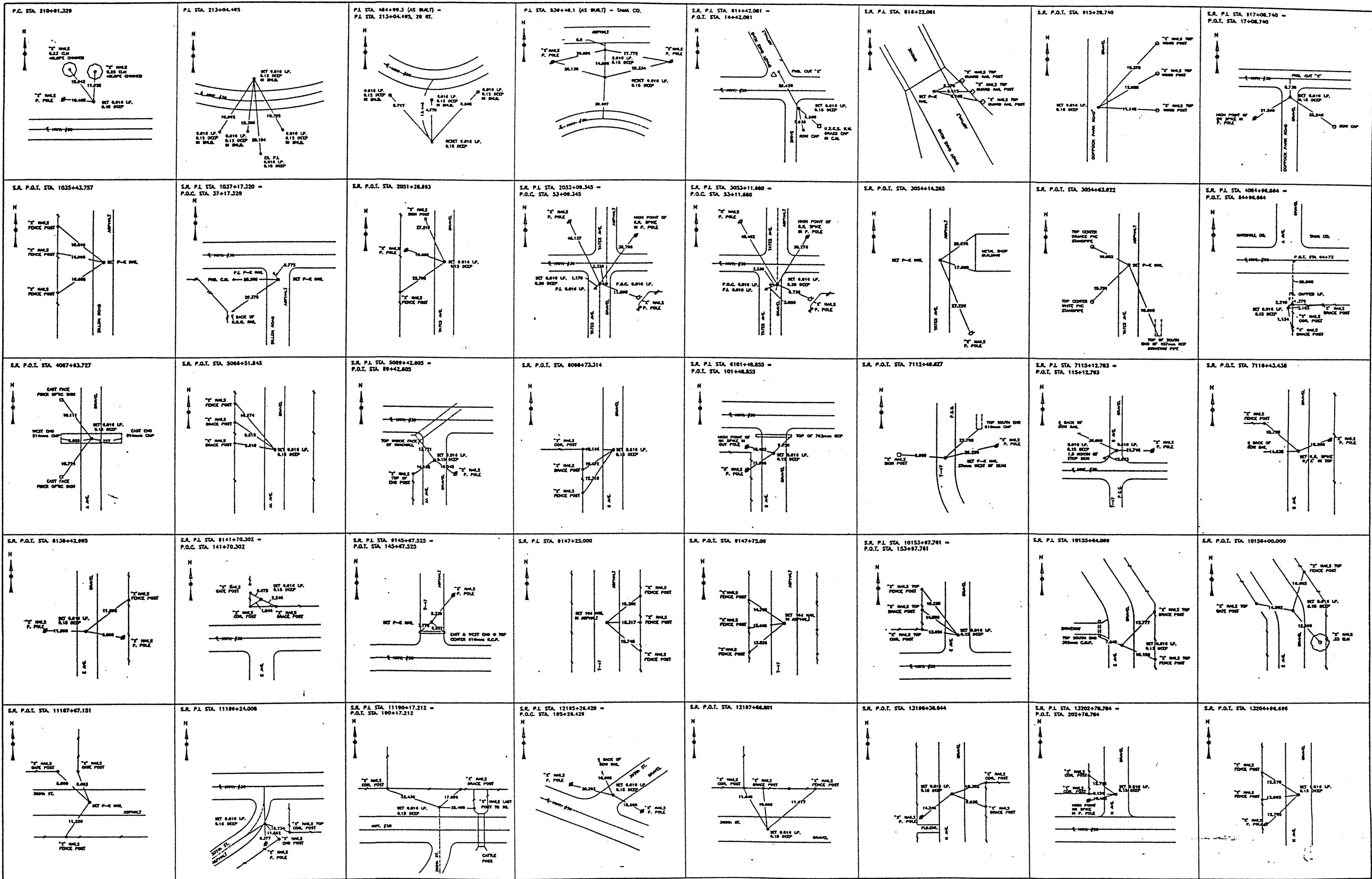
SHEET NUMBER

G.02



ILLEGIBLE

U.S. HIGHWAY 30 REFERENCE TIE SHEET



ILLEGIBLE

U.S. HIGHWAY 30
REFERENCE TIE SHEET

CGA CLAPSADLE-GARBER ASSOC.
MARSHALL TOWN, IOWA P.N. 72004

DESIGN TEAM ABRAMS/SMITH

METRIC

IOWA DOT * OFFICE OF DESIGN

MARSHALL

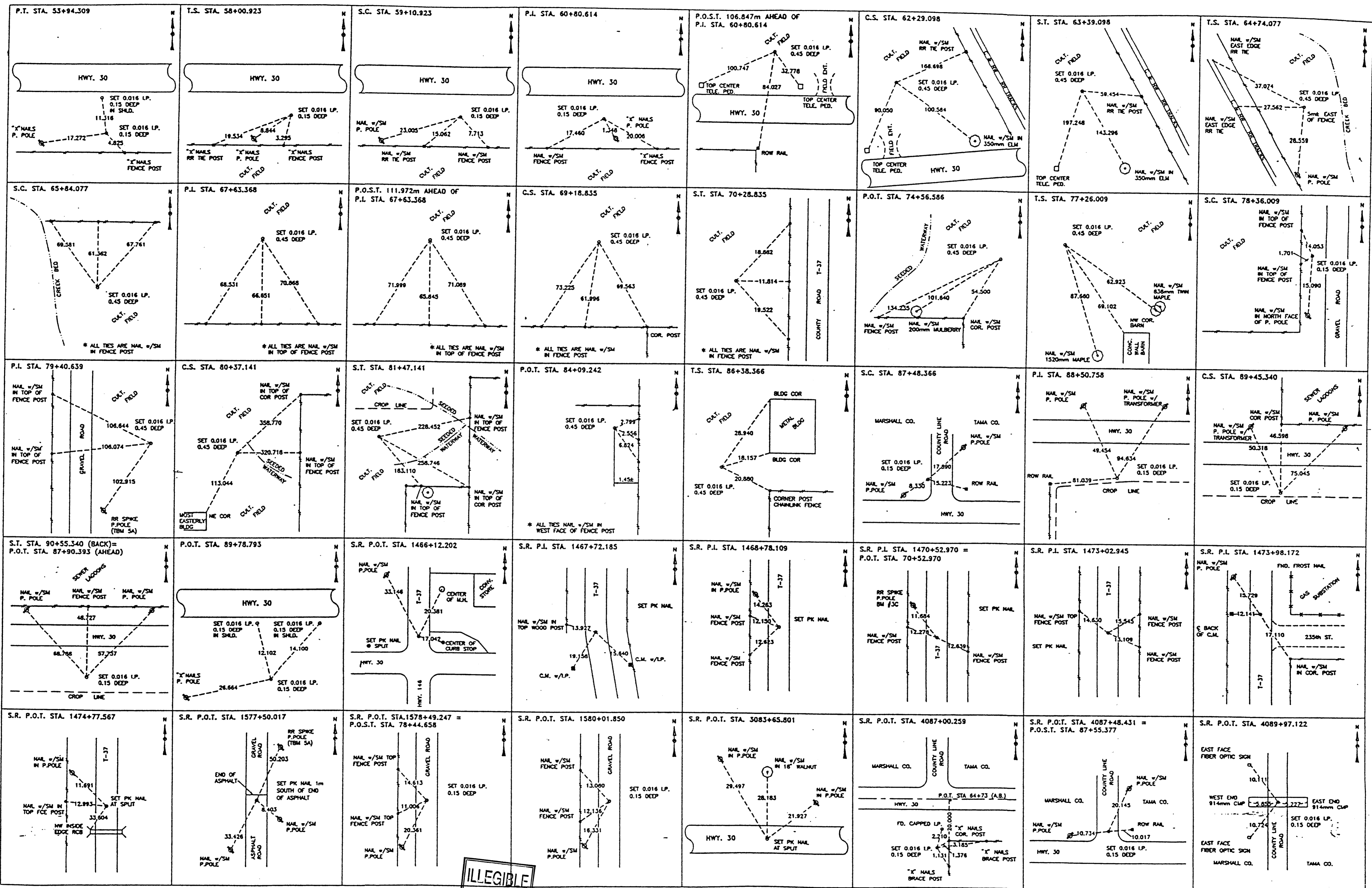
COUNTY

PROJECT NUMBER

NHSX-30-5(166)--3H-64

SHEET NUMBER

G.04



GENERAL INFORMATION

HORIZONTAL DATUM

THIS SURVEY IS ADDITIONAL INFORMATION FOR RELOCATION OF US # 30 LE GRAND BY - PASS. COORDINATES ARE IDENTICAL WITH CLAPSADDLE - GARBER SURVEY AND DISTRICT LAND SURVEYOR.

STATIONING FOR THIS SURVEY WAS OBTAINED FROM ST STA 53+96.592 AHEAD CONSTRUCTION LINE. THIS STATIONING WAS CARRIED EASTERLY TO EOP.

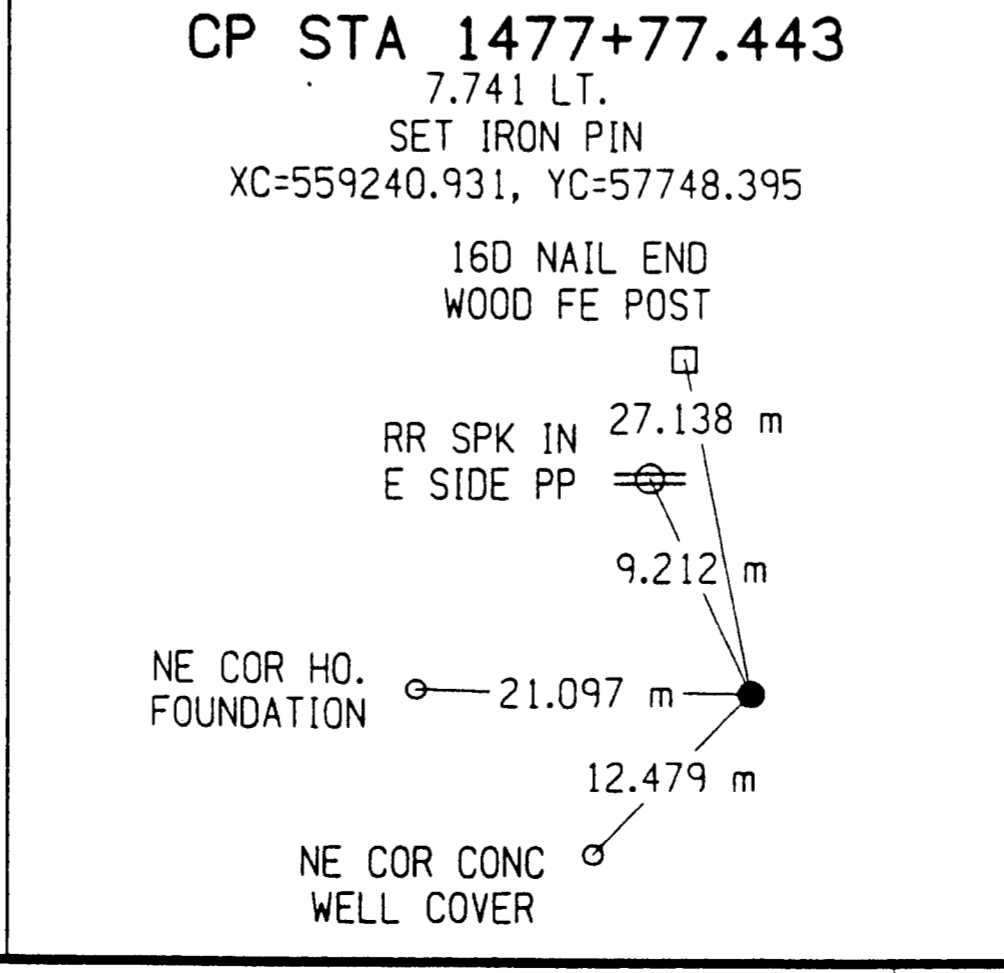
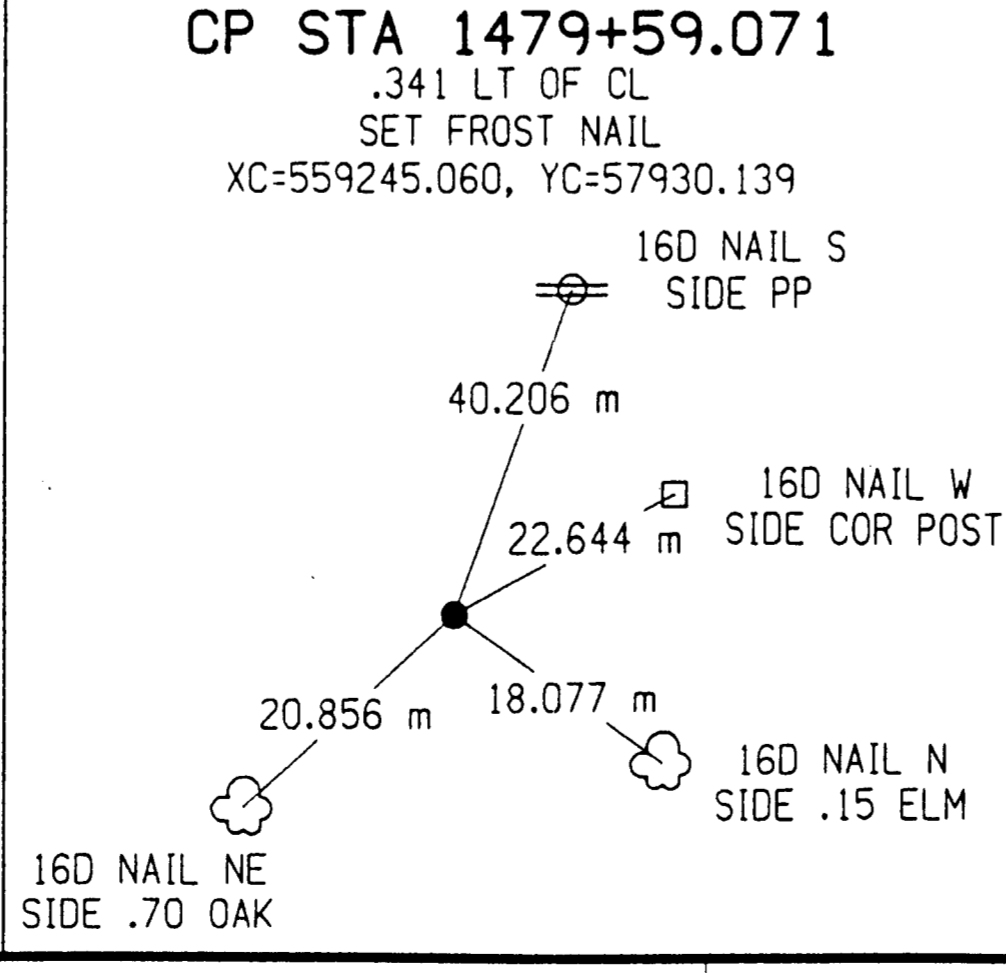
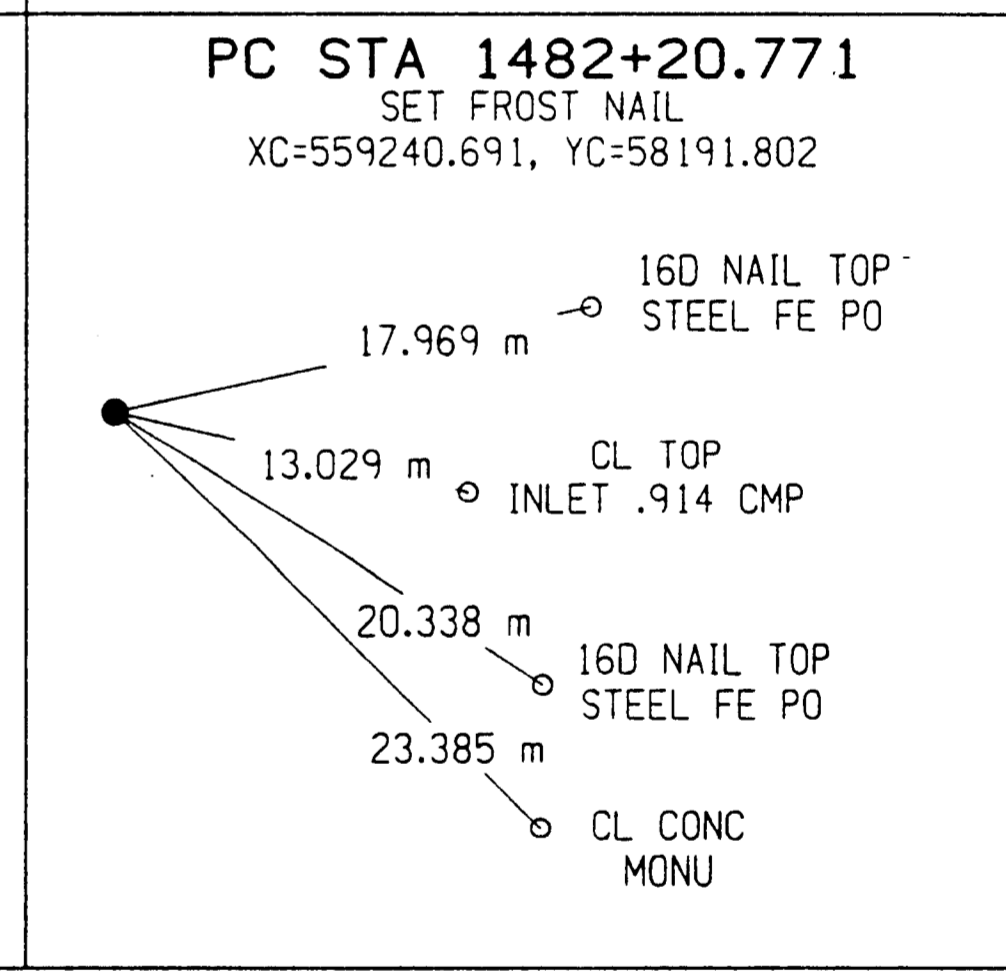
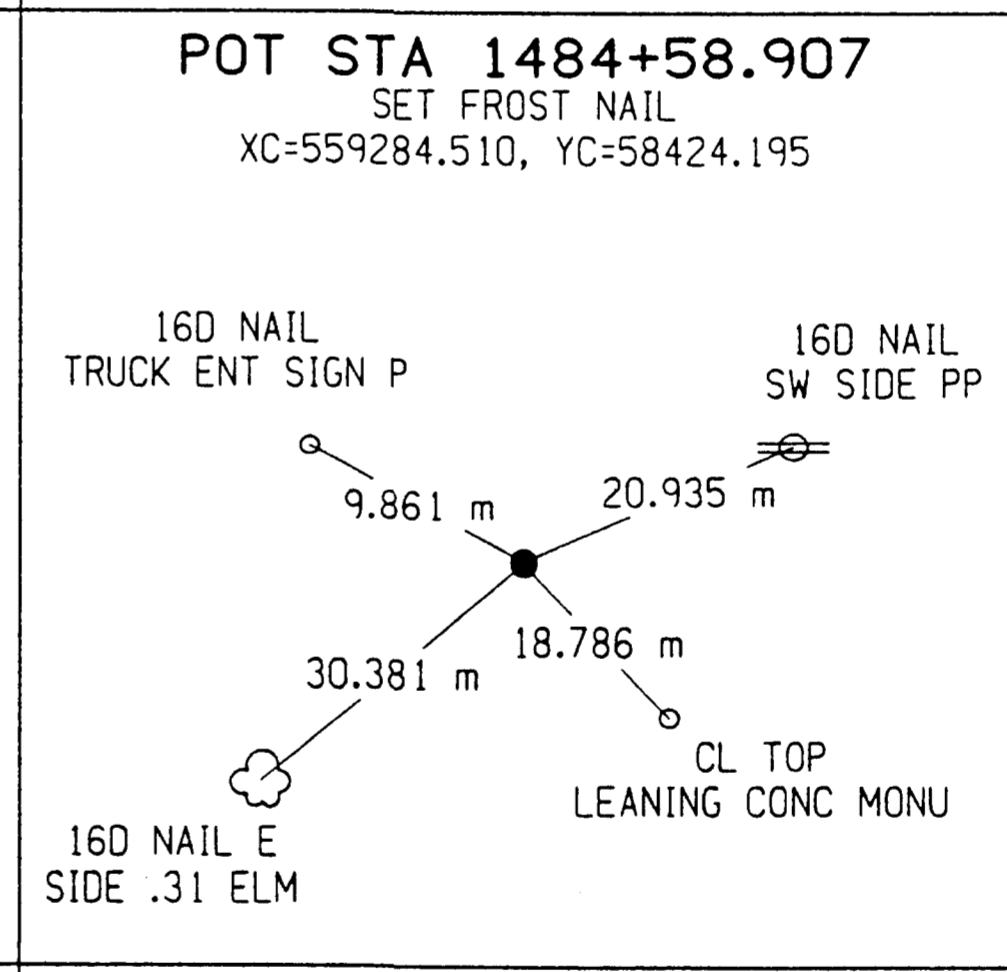
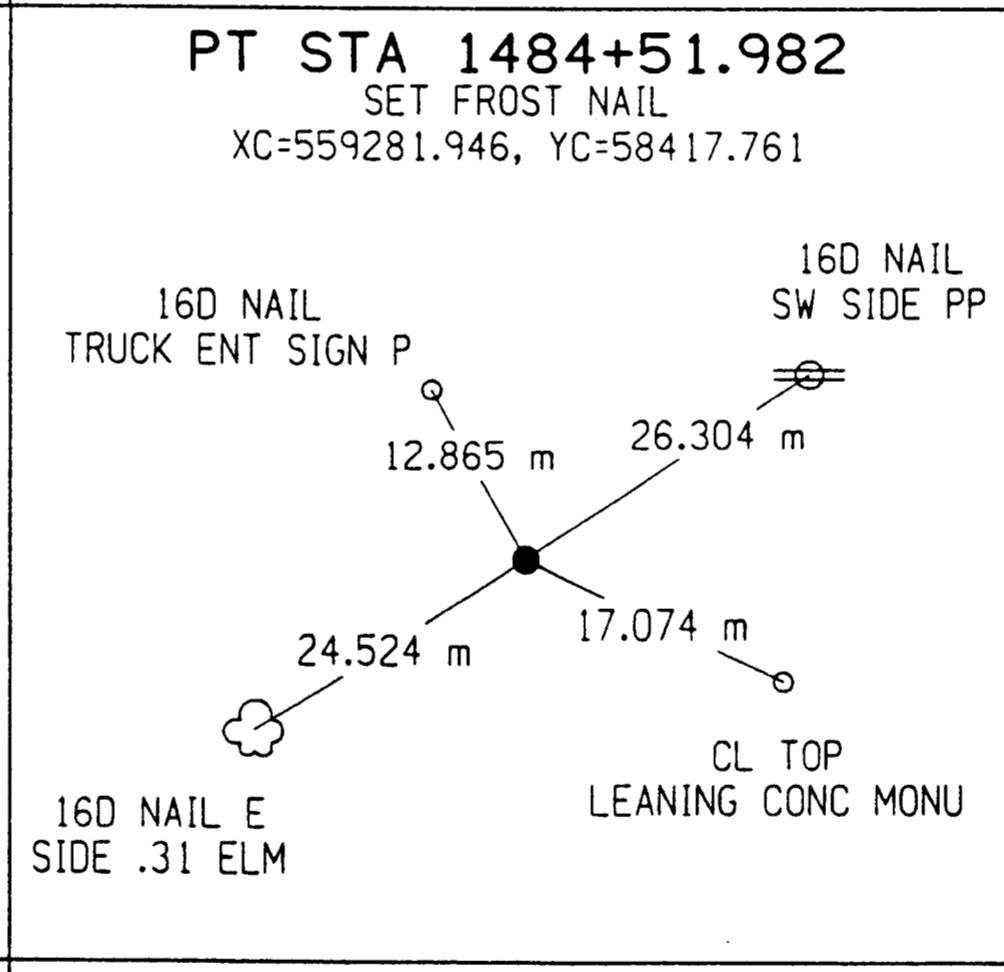
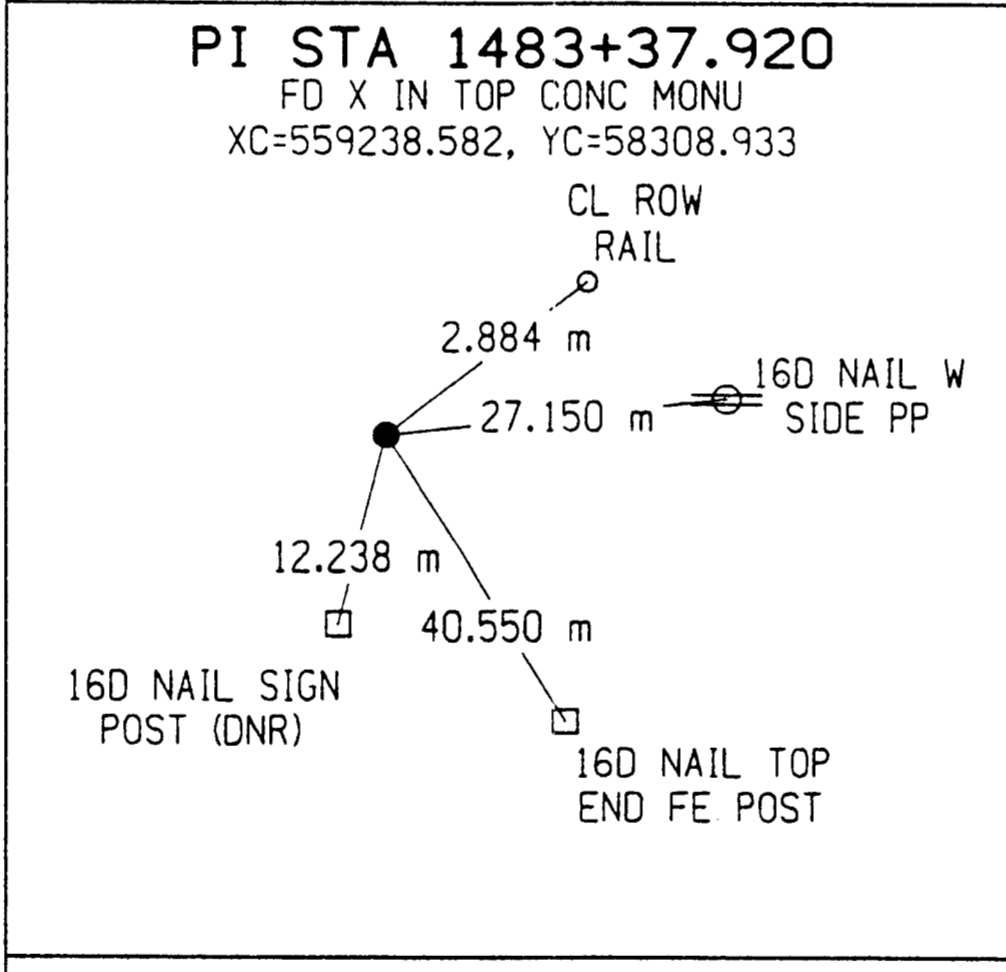
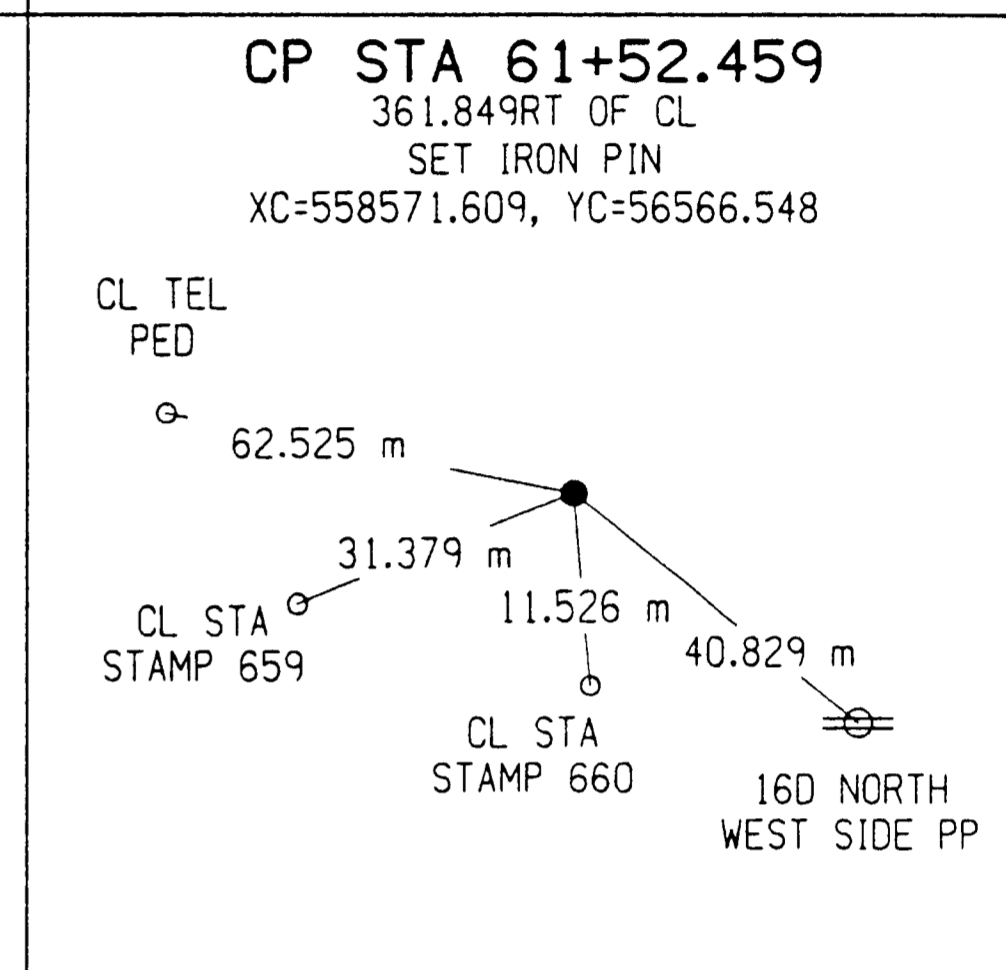
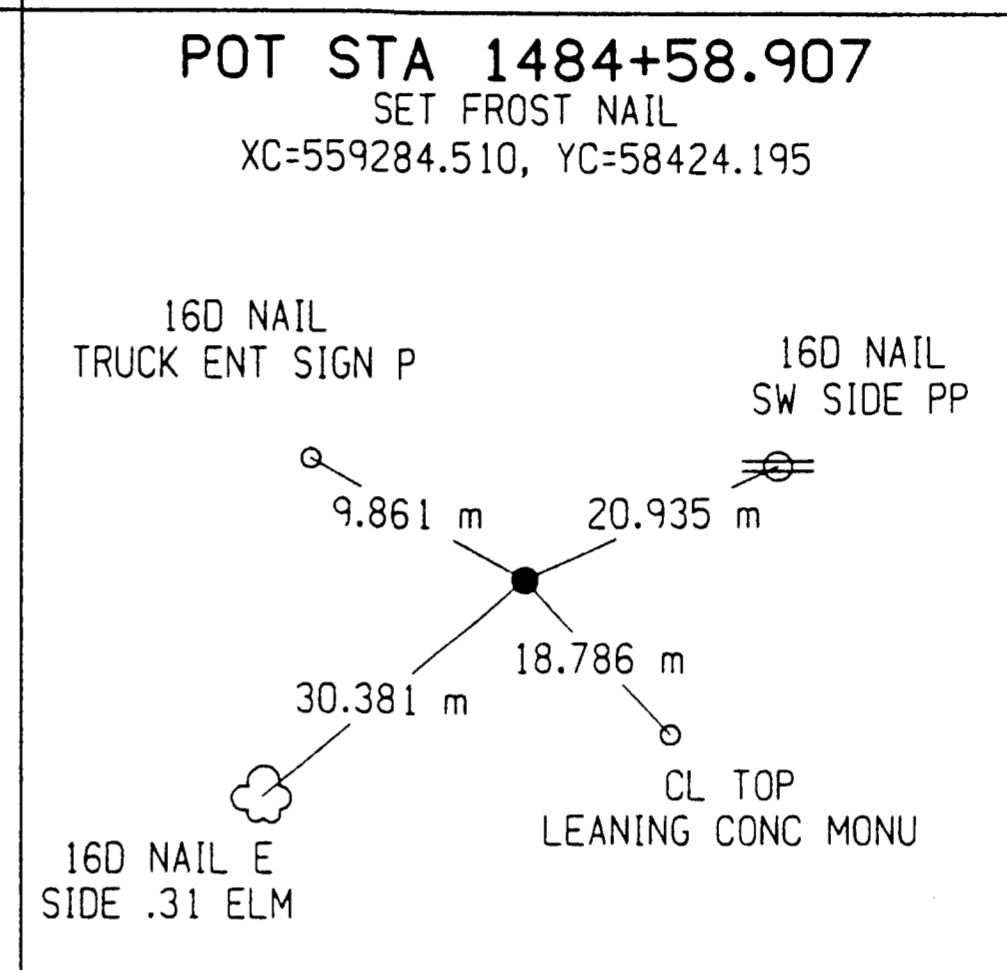
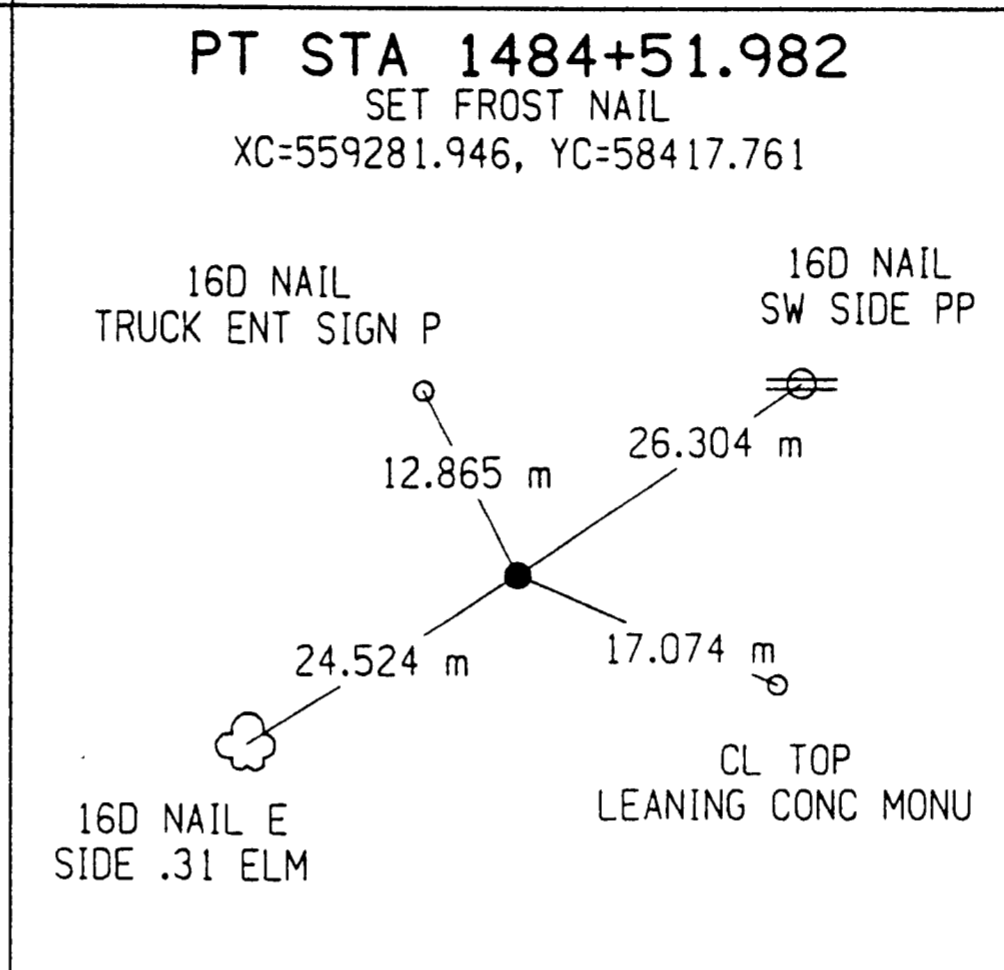
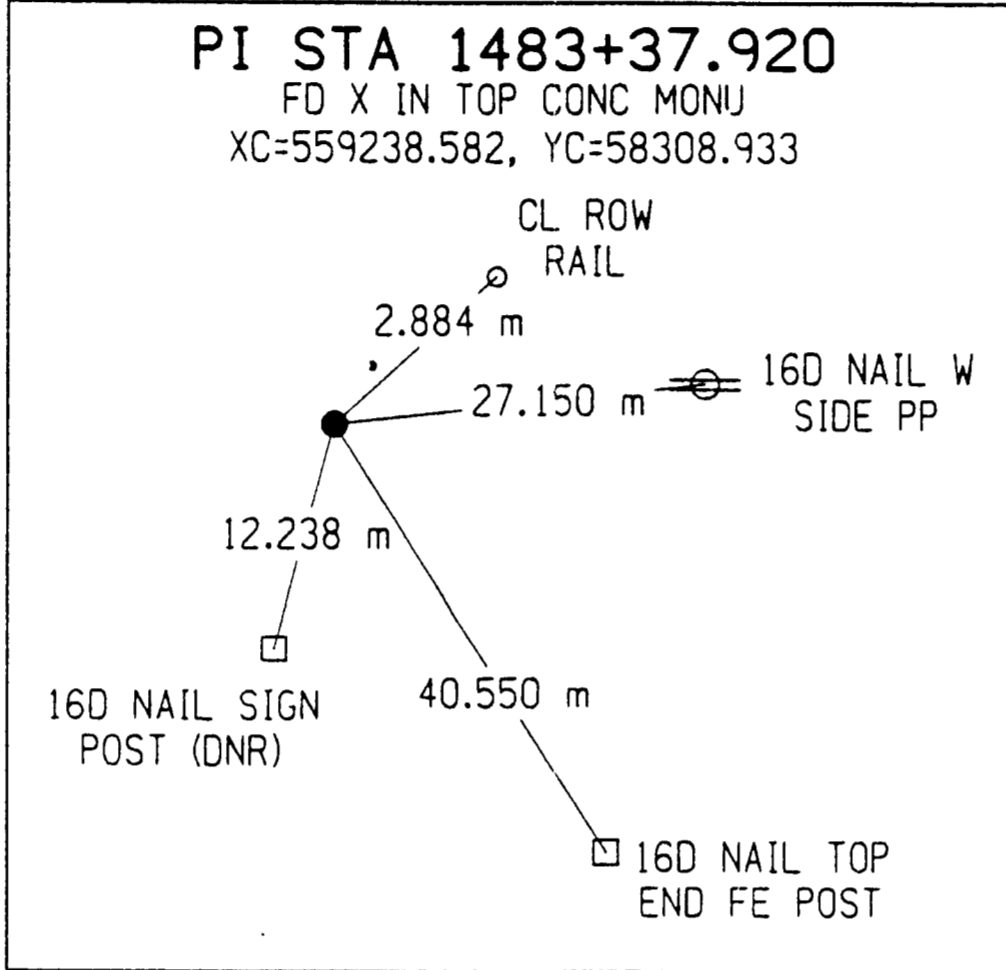
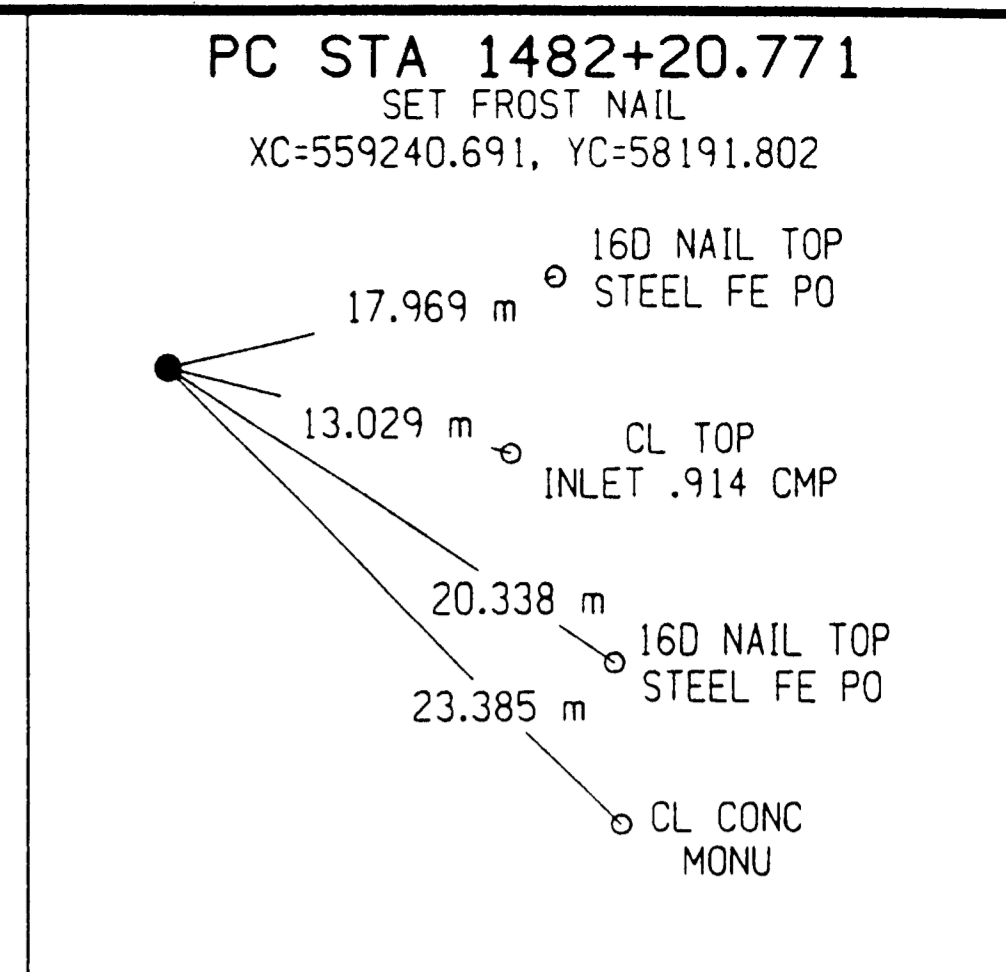
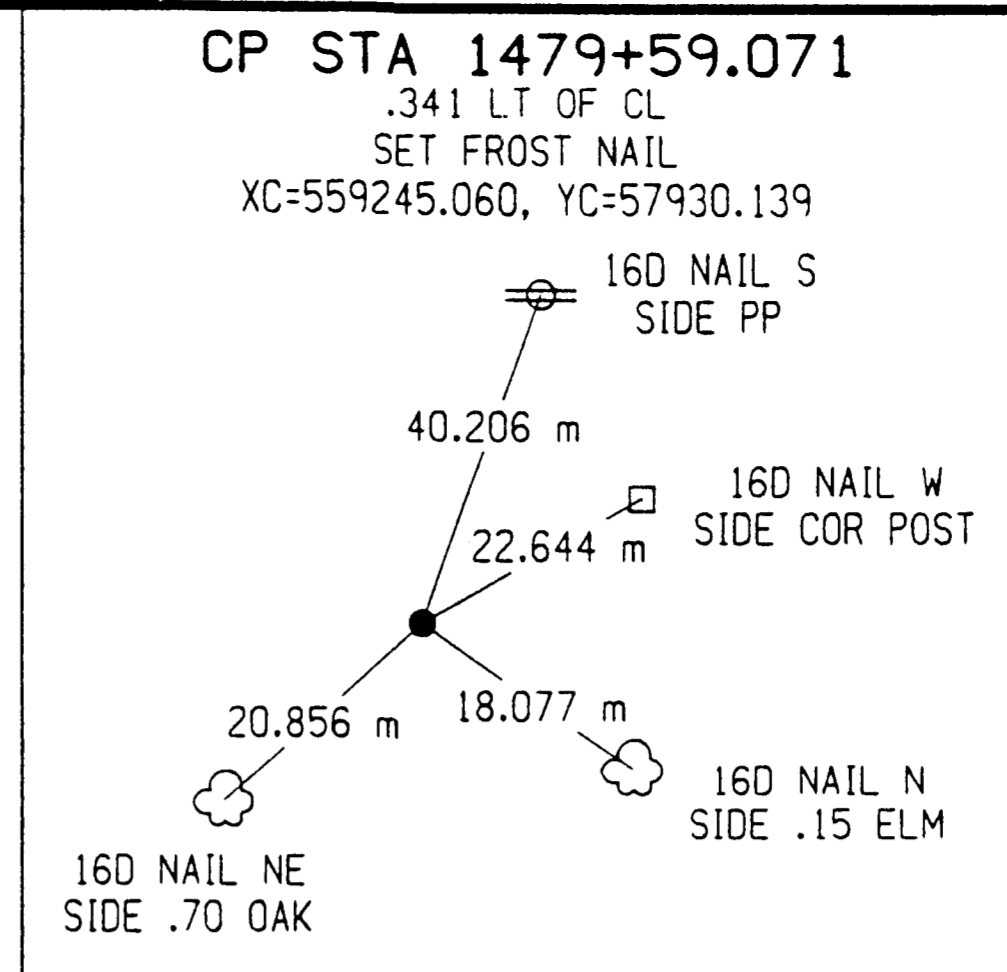
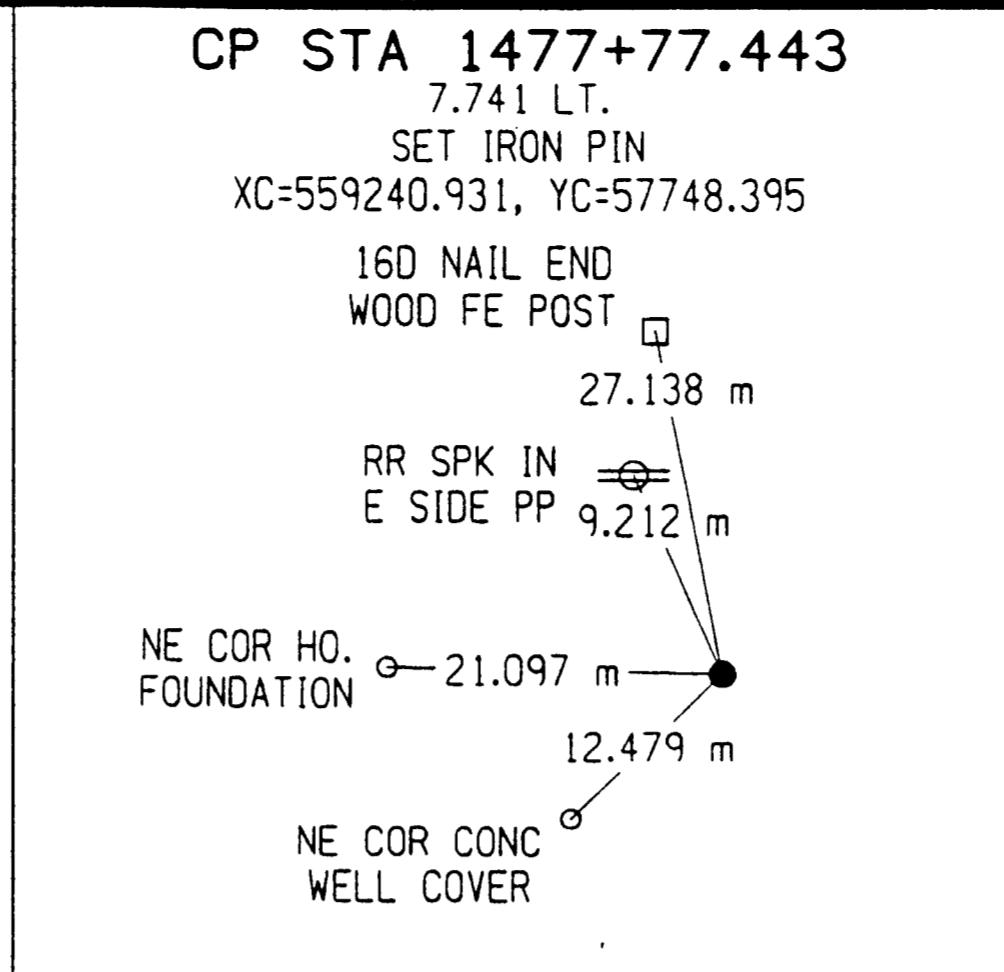
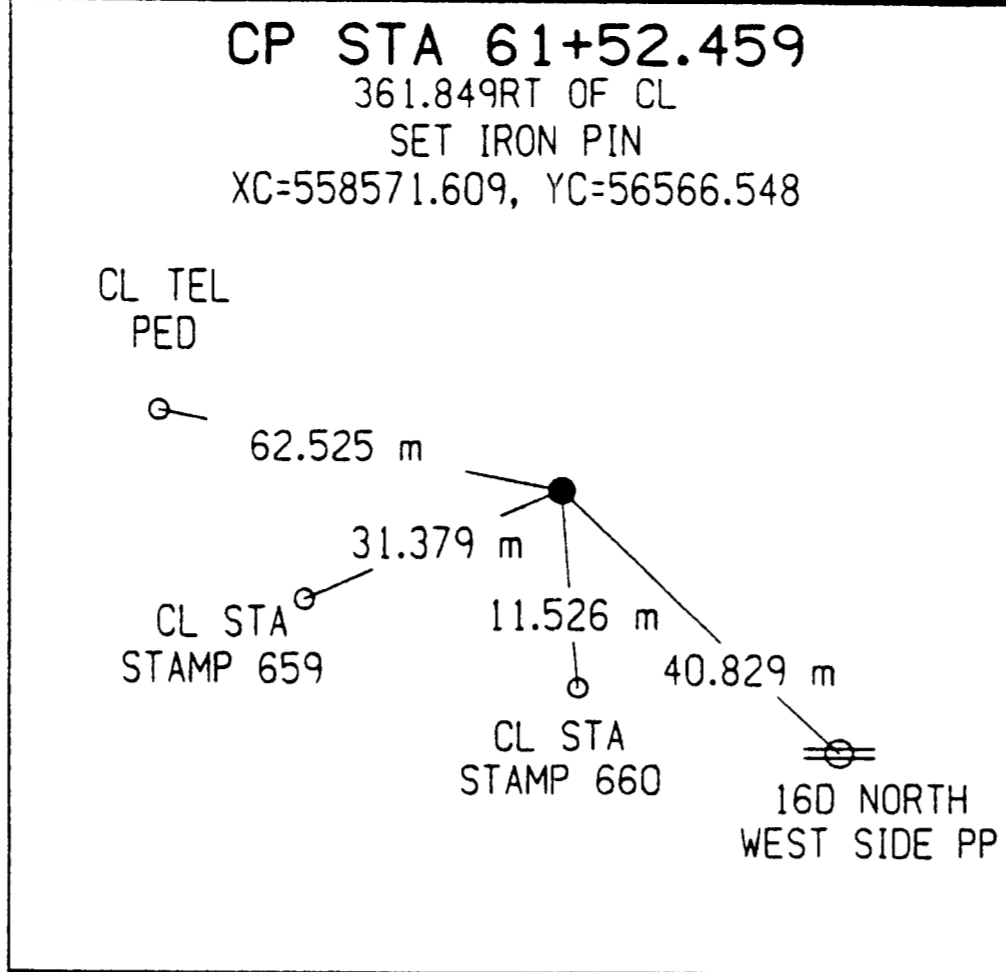
ST STA 53+96.592 THIS SURVEY =
ST STA 53+96.592 AHEAD CONSTRUCTION LINE.

VERTICAL DATUM

THIS DATUM PLANE IS IDENTICAL WITH CLAPSADDLE - GARBER SURVEY

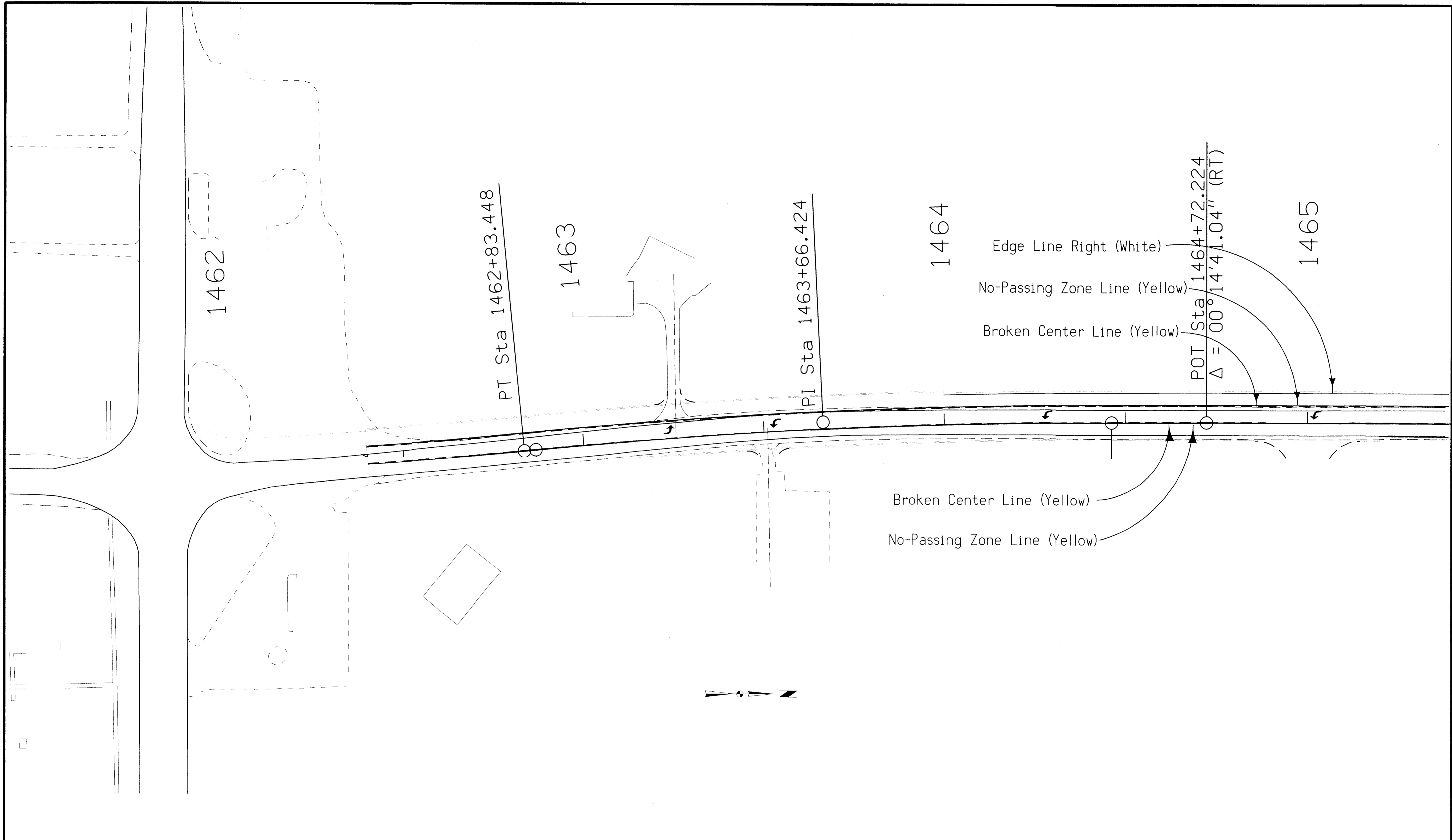
BM # 500 EL = 278.043 THIS SURVEY =
BM # 500 EL = 278.043 DAVID GUGE SIDEROAD SURVEY =
BM # 2 EL = 278.043 CLAPSADDLE - GARBER SURVEY

BENCHMARKS	ELEVATION
No. 602 Sta. 54+37.179 319.15 Lt. RR SPK. IN E. SIDE COR. POST = BM # 502 GUGE SR SURVEY-----	266.972
No. 500 Sta. 54+80.954 144.06 Rt. RR SPK. N. SIDE PO. POLE = BM # 2 CLAPSADDLE - GARBER SURVEY	278.043
No. 501 Sta. 59+23.004 307.31 Rt. RR SPK. IN PO. POLE = BM # 3 EL = 278.769	278.769
No. 502 Sta. 63+29.832 221.65 Rt. RR. SPK. IN 8"X8" FE. POST = BM # 3A EL = 268.612	268.612
No. 503 Sta. 65+83.606 106.63 Rt. RR. SPK. IN NEW COR. POST = BM # 3B EL = 272.716	272.716
No. 504 Sta. 69+86.958 114.77 Rt. FD RR SPK S SIDE PP RR. SPK. IN PO. POLE = BM 3C EL = 274.977	274.977
No. 505 Sta. 73+99.654 176.17 Rt. RR SPK. IN COR. POST = BM 3D CLAPSADDLE GARBER-----	276.934
No. 506 Sta. 78+59.654 87.36 Rt. RR. SPK. IN P. POLE-----	284.848
No. 509 Sta. 1472+22.239 11.28 Lt. SET RR SPK E SIDE PP @ENT-----	279.680
No. 510 Sta. 1474+34.475 5.24 Rt. FD X INLET HW .91X.91 RCB-----	275.673
No. 511 Sta. 1477+86.039 11.07 Lt. SET RR SPK E SIDE PP @ENT-----	280.305
No. 512 Sta. 1480+86.892 13.38 Lt. SET RR SPK E SIDE PP @RD-----	263.944



DETAILS OF REFERENCE INFORMATION

All References Plumb Distances
(unless otherwise noted)



1462

PT Sta 1462+83.448

1463

PI Sta 1463+66.424

1464

Edge Line Right (White)

No-Passing Zone Line (Yellow)

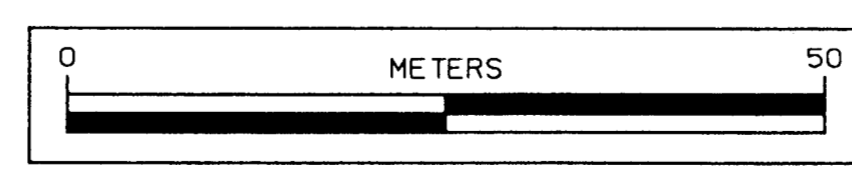
Broken Center Line (Yellow)

POT Sta 1464+72.224
 $\Delta = 00^\circ 14' 41.04''$ (RT)

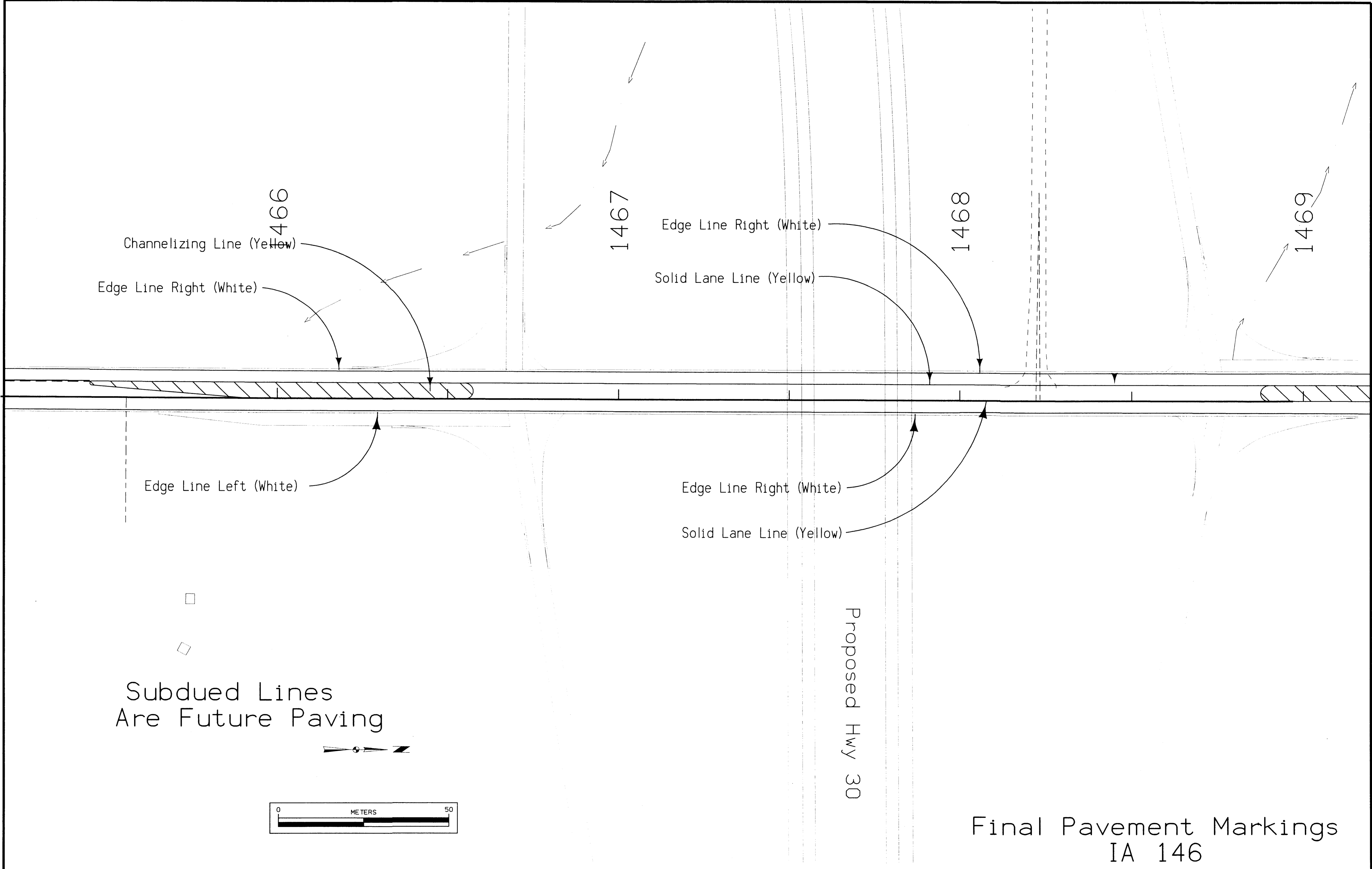
1465

Broken Center Line (Yellow)

No-Passing Zone Line (Yellow)



Final Pavement Markings
 IA 146



466
Channelizing Line (Yellow)
Edge Line Right (White)

1467

Edge Line Right (White)
Solid Lane Line (Yellow)

1468

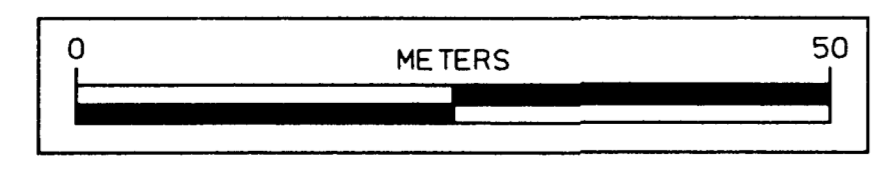
1469

Edge Line Left (White)

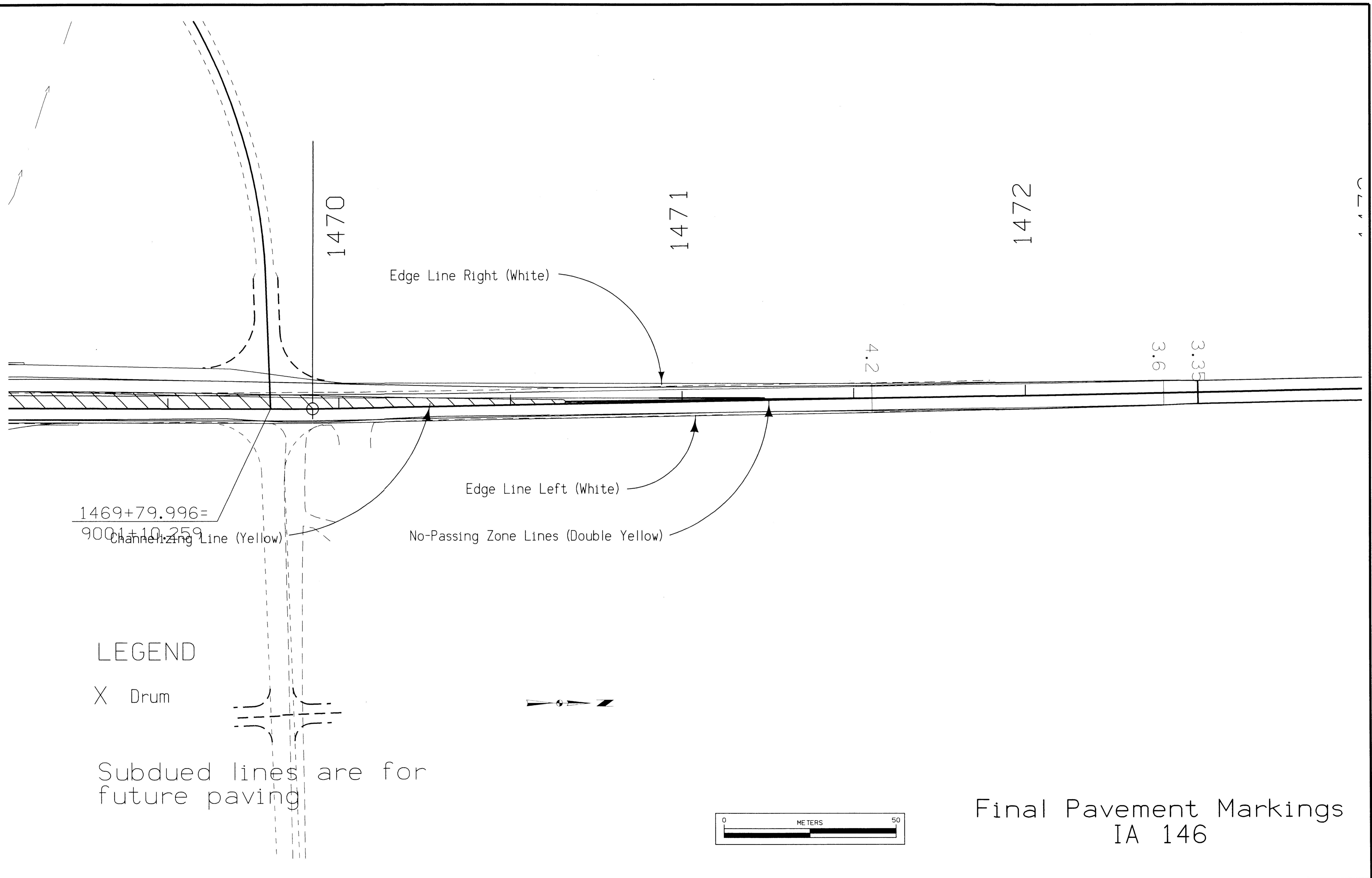
Edge Line Right (White)
Solid Lane Line (Yellow)

Subdued Lines
Are Future Paving

Proposed Hwy 30



Final Pavement Markings
IA 146



1473

1474

1475

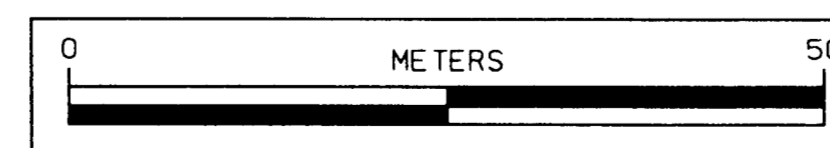
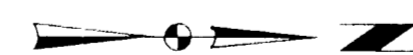
1476

Edge Line Right (White)

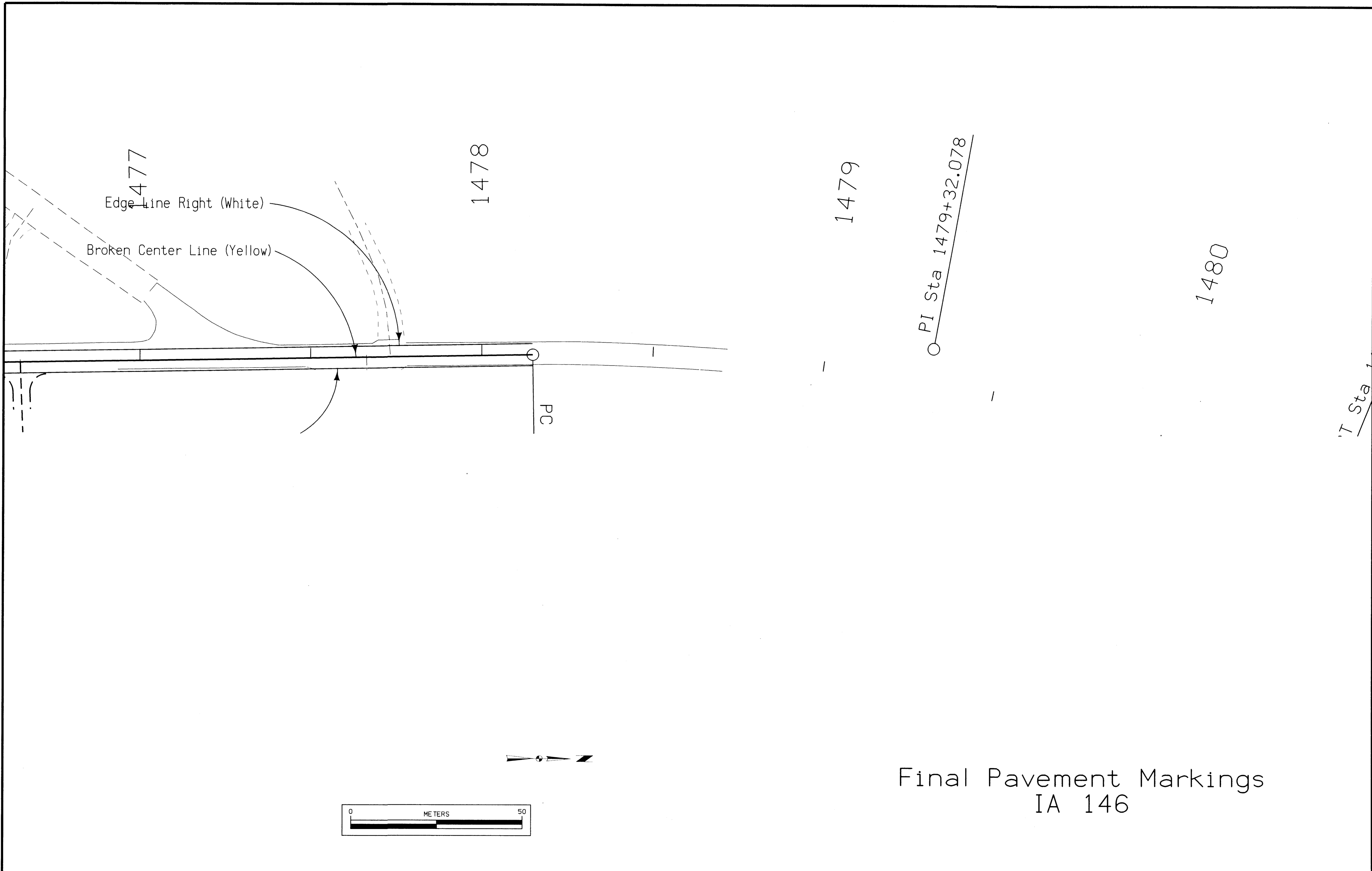
Edge Line Left (White)

No-Passing Zone Lines (Double Yellow)

Broken Center Line (Yellow)



Final Pavement Markings IA 146



Final Pavement Markings
IA 146

CIRCULAR CURVE COORDINATES

101-10A

07-15-97

NO.	P.C.		P.I.		P.T.	
	Station	Coordinates	Station	Coordinates	Station	Coordinates
C-1	3562+60.000	558756.627 57052.258	3563+10.085	558802.957 57071.285	3563+60.000	558846.107 57096.714
C-2	3565+30.182	558992.723 57183.118	3566+02.875	559055.350 57220.025	3566+74.000	559126.958 57232.537
B-1	2563+30.000	558842.276 57024.960	2563+99.945	558909.032 57045.838	2564+68.780	558978.976 57045.467
		X Y		X Y		X Y

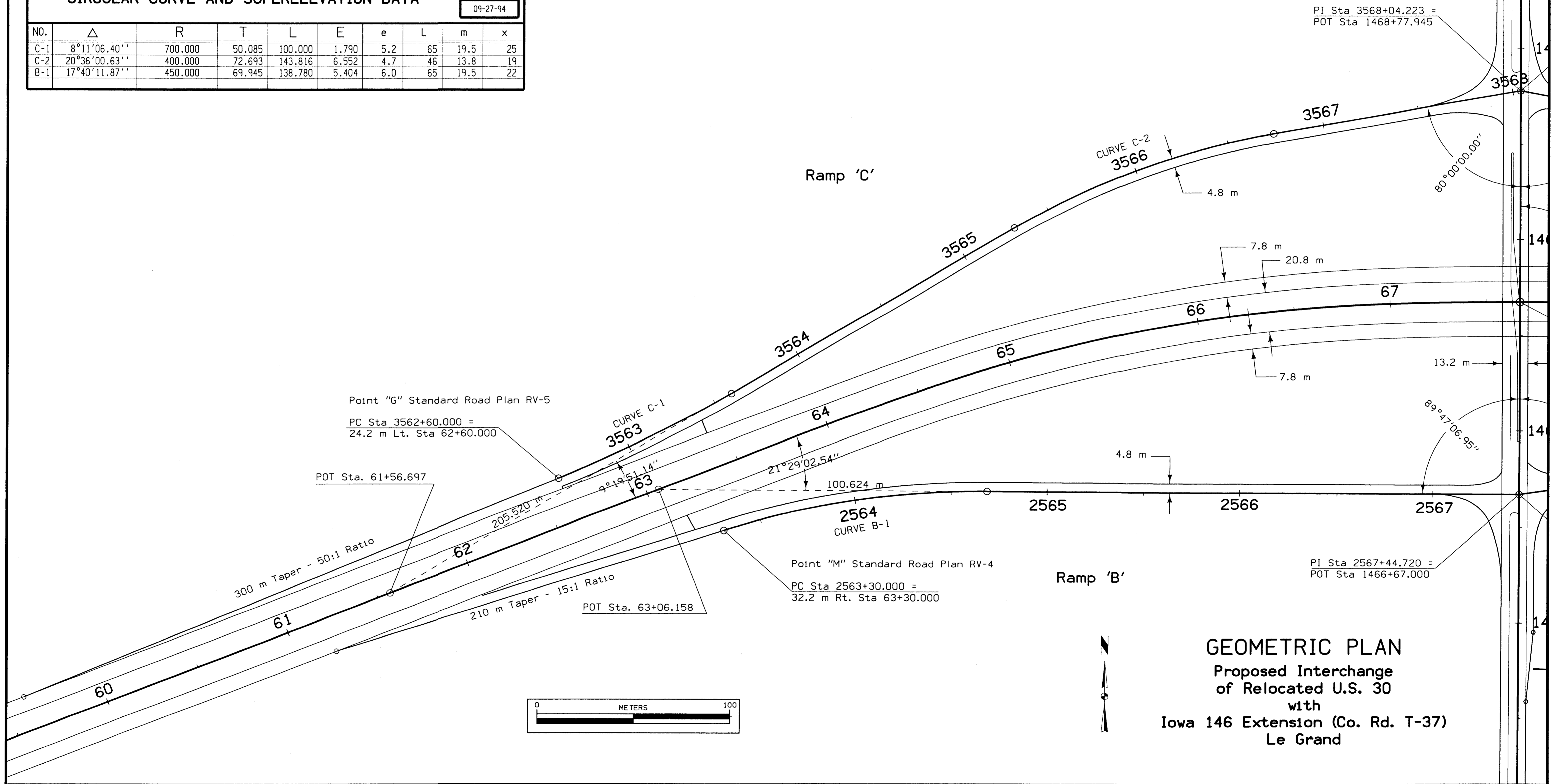
CIRCULAR CURVE AND SUPERELEVATION DATA

101-10B

09-27-94

NO.	Δ	R	T	L	E	e	L	m	x
C-1	8°11'06.40"	700.000	50.085	100.000	1.790	5.2	65	19.5	25
C-2	20°36'00.63"	400.000	72.693	143.816	6.552	4.7	46	13.8	19
B-1	17°40'11.87"	450.000	69.945	138.780	5.404	6.0	65	19.5	22

MARSHALL CO
LEGRAND TWP.
T-83 N R-17 W
SEC. 11



CIRCULAR CURVE COORDINATES

101-10A
07-15-97

NO.	P.C.		P.I.		P.T.	
	Station	Coordinates	Station	Coordinates	Station	Coordinates
D-1	4571+14.073	559595.751 X 57096.114 Y	4572+33.166	559713.476 X 57114.111 Y	4573+50.000	559830.529 X 57092.165 Y

CIRCULAR CURVE AND SUPERELEVATION DATA

101-10B
09-27-94

NO.	Δ	R	T	L	E	e	L	m	x
D-1	19°18'39.19"	700.000	119.093	235.927	10.059	5.2	65	19.5	25

MARSHALL CO
LEGRAND TWP.
T-83 N R-17 W
SEC. 11

Ramp 'A'

Point "M" Ramp 'A' Special Detail Sheet

PT Sta 1572+30.000 =
32.2 m Lt. Sta 72+30.000

4572 CURVE D-1

POST 195.646 m Ahead
of PC Sta 71+04.117

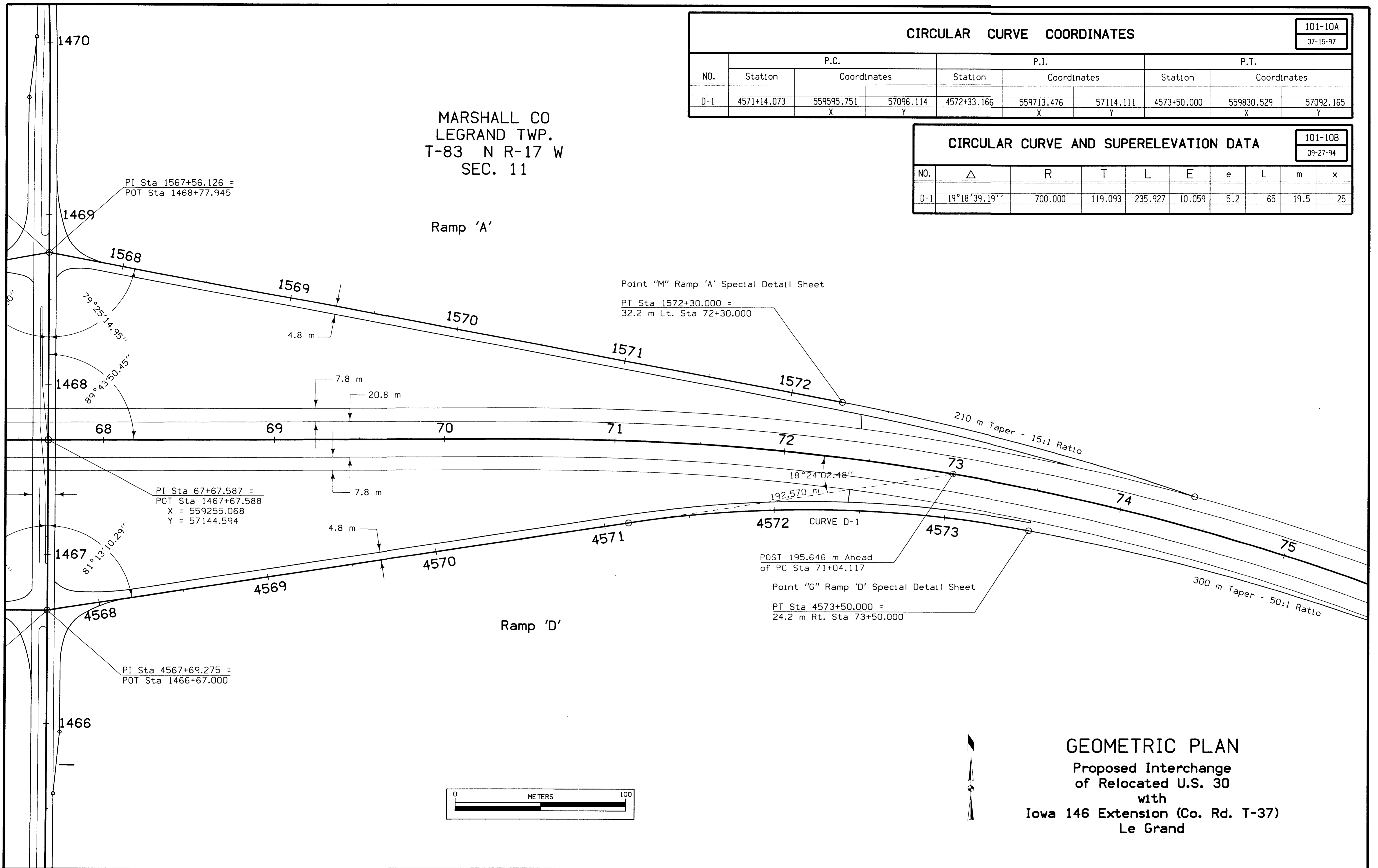
Point "G" Ramp 'D' Special Detail Sheet

PT Sta 4573+50.000 =
24.2 m Rt. Sta 73+50.000

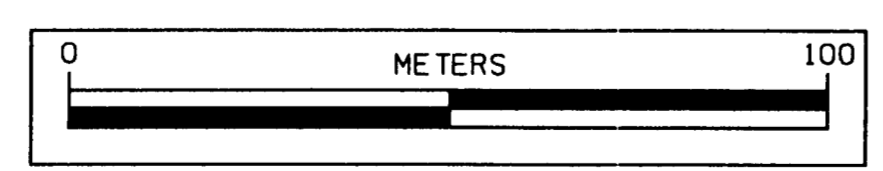
Ramp 'D'

210 m Taper - 15:1 Ratio

300 m Taper - 50:1 Ratio



GEOMETRIC PLAN
Proposed Interchange
of Relocated U.S. 30
with
Iowa 146 Extension (Co. Rd. T-37)
Le Grand

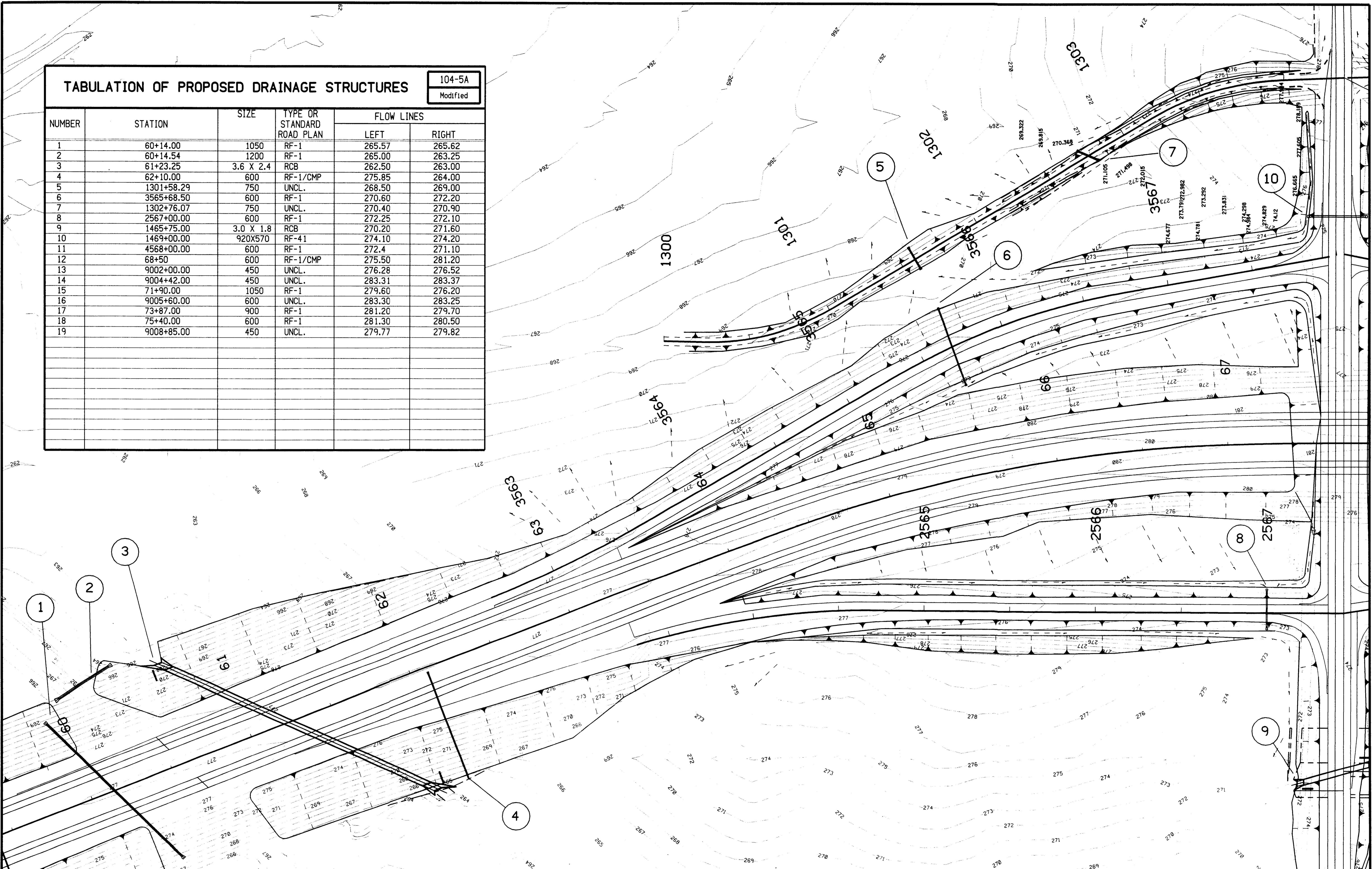


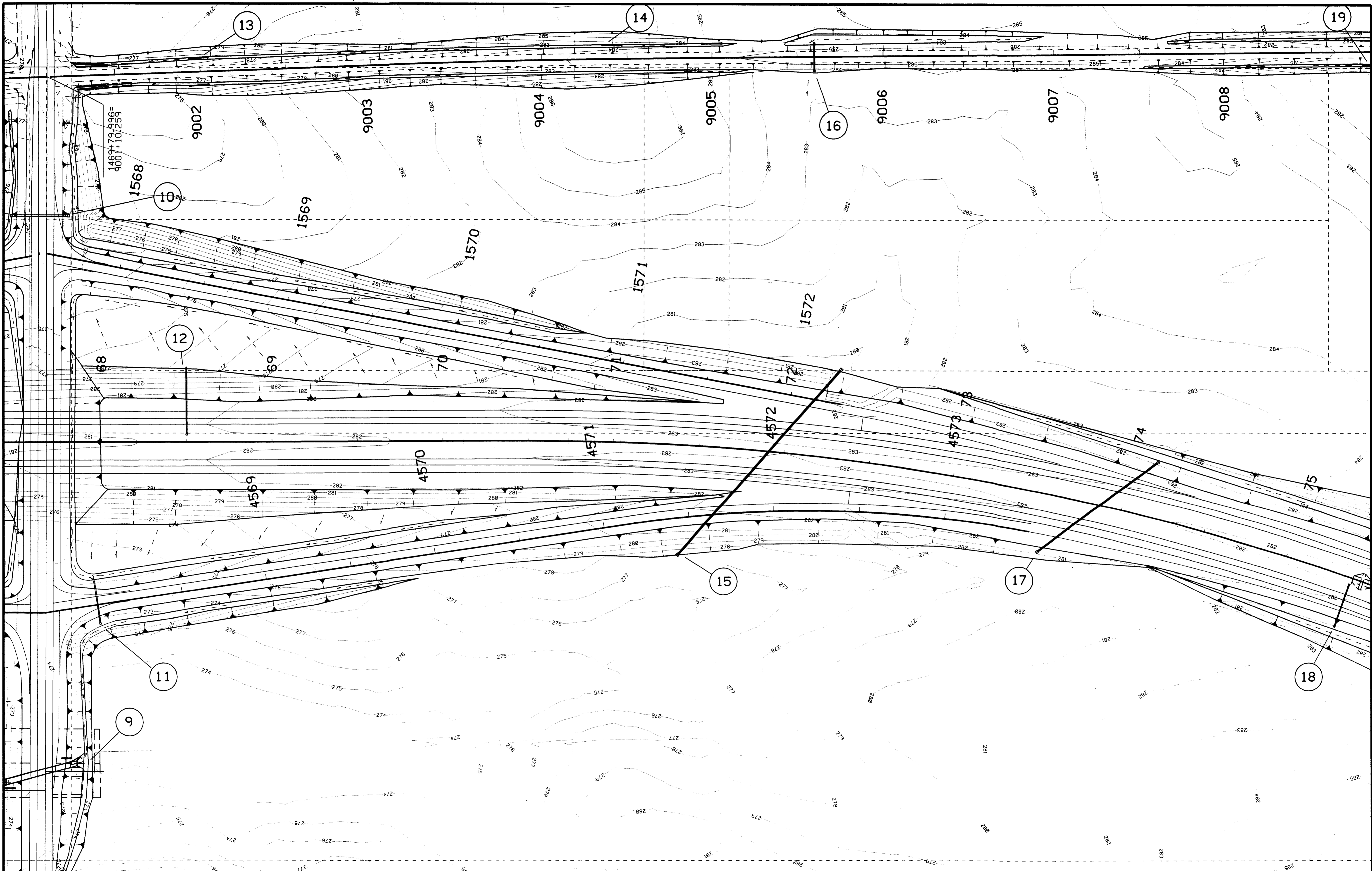
TABULATION OF PROPOSED DRAINAGE STRUCTURES

104-5A

Modified

NUMBER	STATION	SIZE	TYPE OR STANDARD ROAD PLAN	FLOW LINES	
				LEFT	RIGHT
1	60+14.00	1050	RF-1	265.57	265.62
2	60+14.54	1200	RF-1	265.00	263.25
3	61+23.25	3.6 X 2.4	RCB	262.50	263.00
4	62+10.00	600	RF-1/CMP	275.85	264.00
5	1301+58.29	750	UNCL.	268.50	269.00
6	3565+68.50	600	RF-1	270.60	272.20
7	1302+76.07	750	UNCL.	270.40	270.90
8	2567+00.00	600	RF-1	272.25	272.10
9	1465+75.00	3.0 X 1.8	RCB	270.20	271.60
10	1469+00.00	920X570	RF-41	274.10	274.20
11	4568+00.00	600	RF-1	272.4	271.10
12	68+50	600	RF-1/CMP	275.50	281.20
13	9002+00.00	450	UNCL.	276.28	276.52
14	9004+42.00	450	UNCL.	283.31	283.37
15	71+90.00	1050	RF-1	279.60	276.20
16	9005+60.00	600	UNCL.	283.30	283.25
17	73+87.00	900	RF-1	281.20	279.70
18	75+40.00	600	RF-1	281.30	280.50
19	9008+85.00	450	UNCL.	279.77	279.82





DESIGN TEAM ABRAMS/SMITH

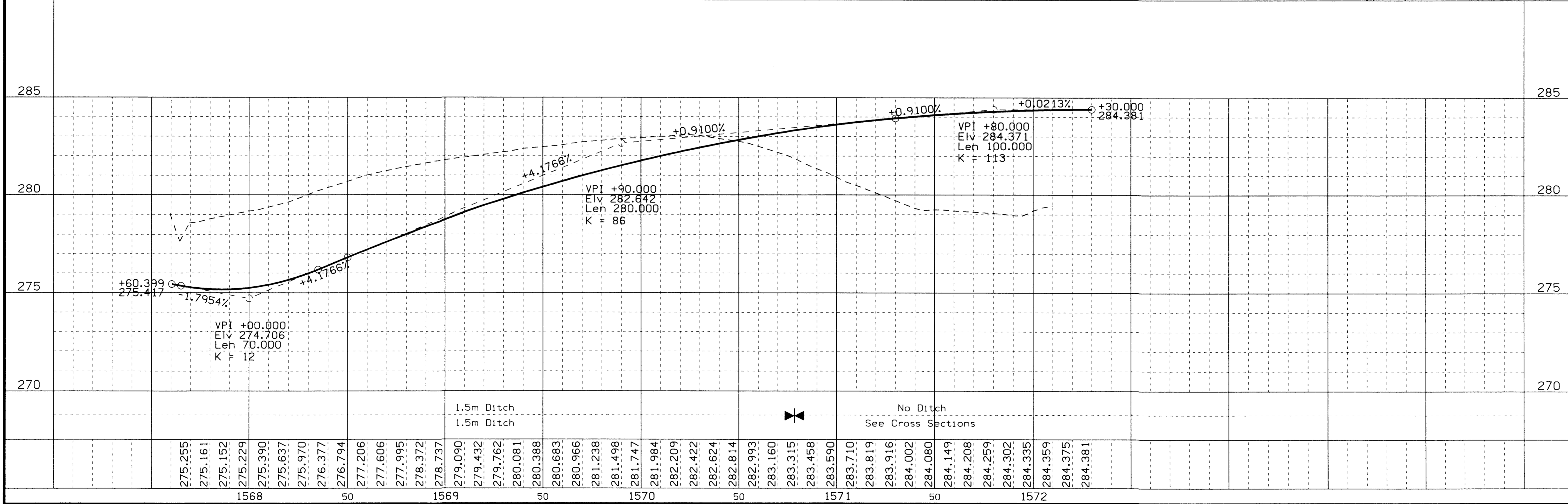
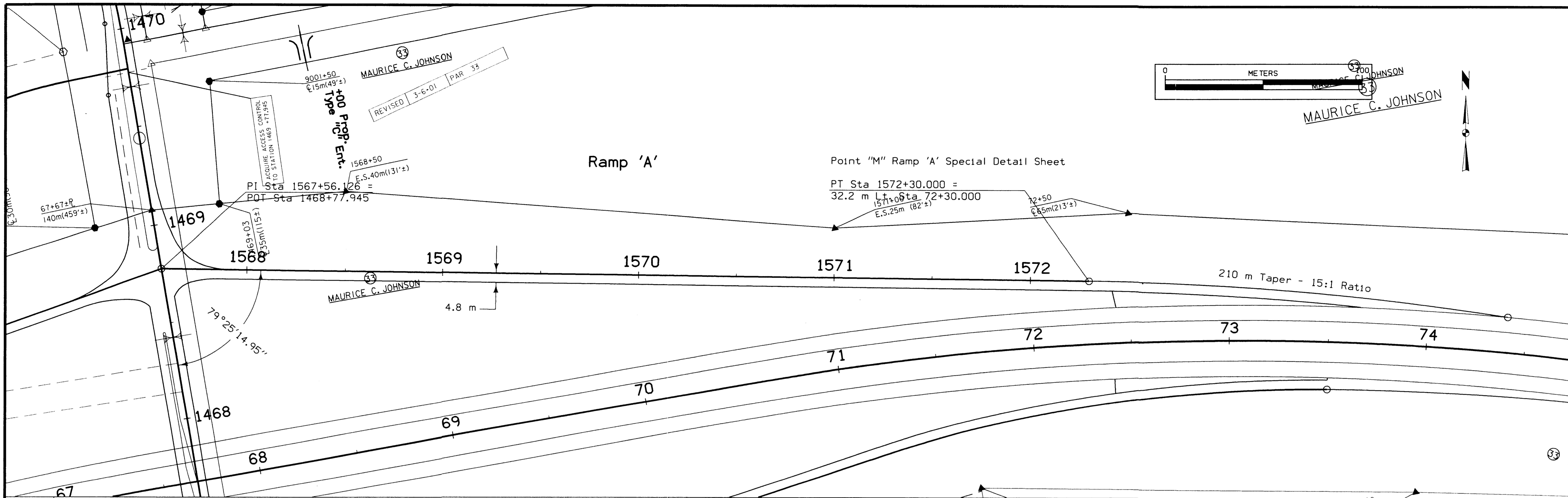
METRIC

IOWA DOT * OFFICE OF DESIGN

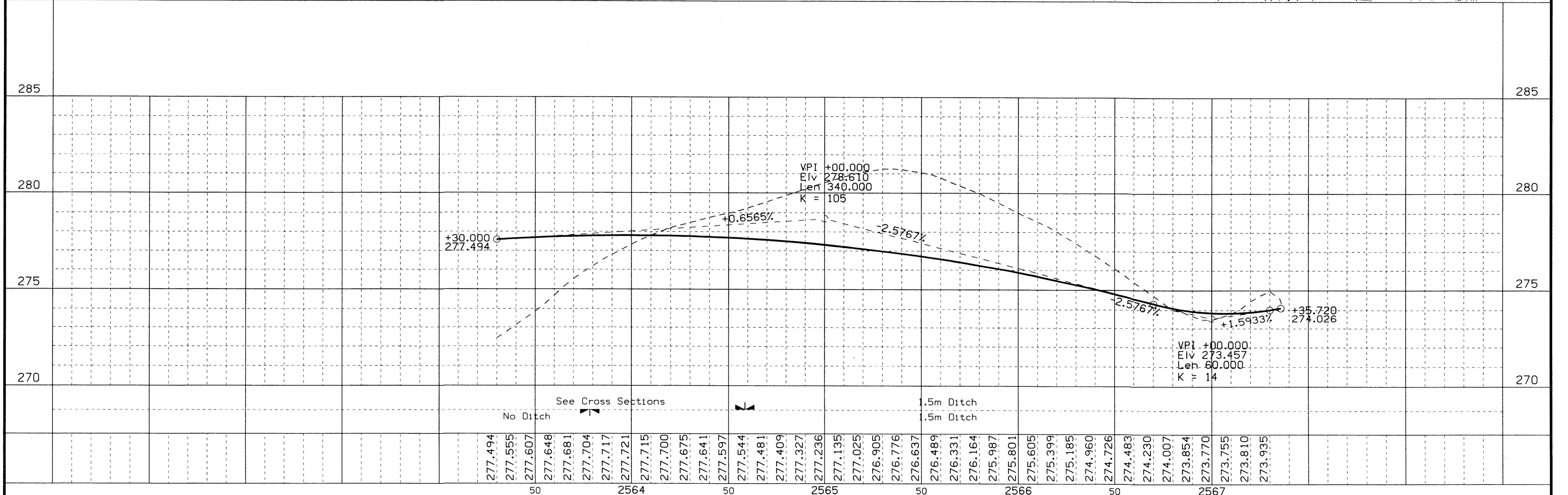
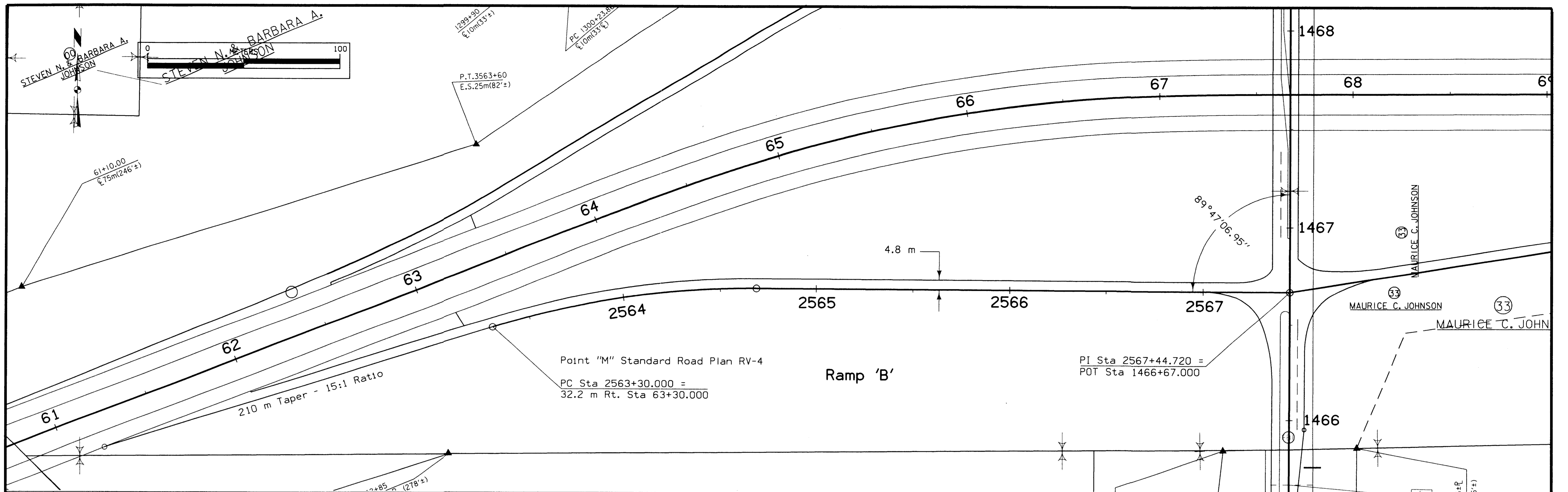
MARSHALL COUNTY

PROJECT NUMBER NHSX-30-5(166)--3H-64

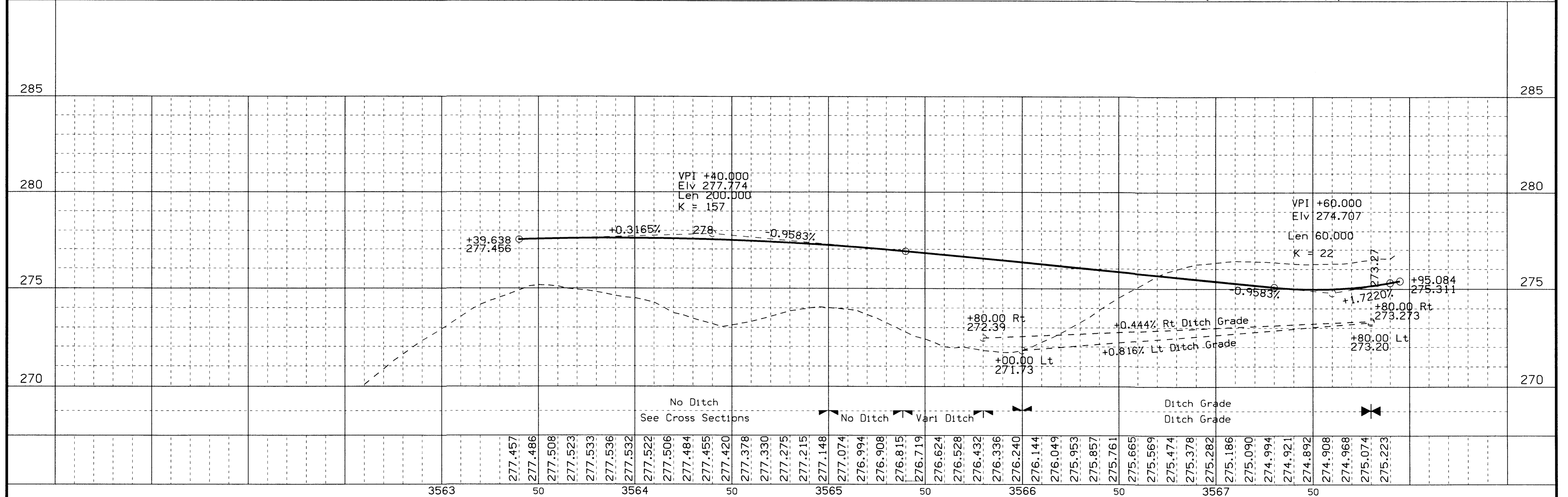
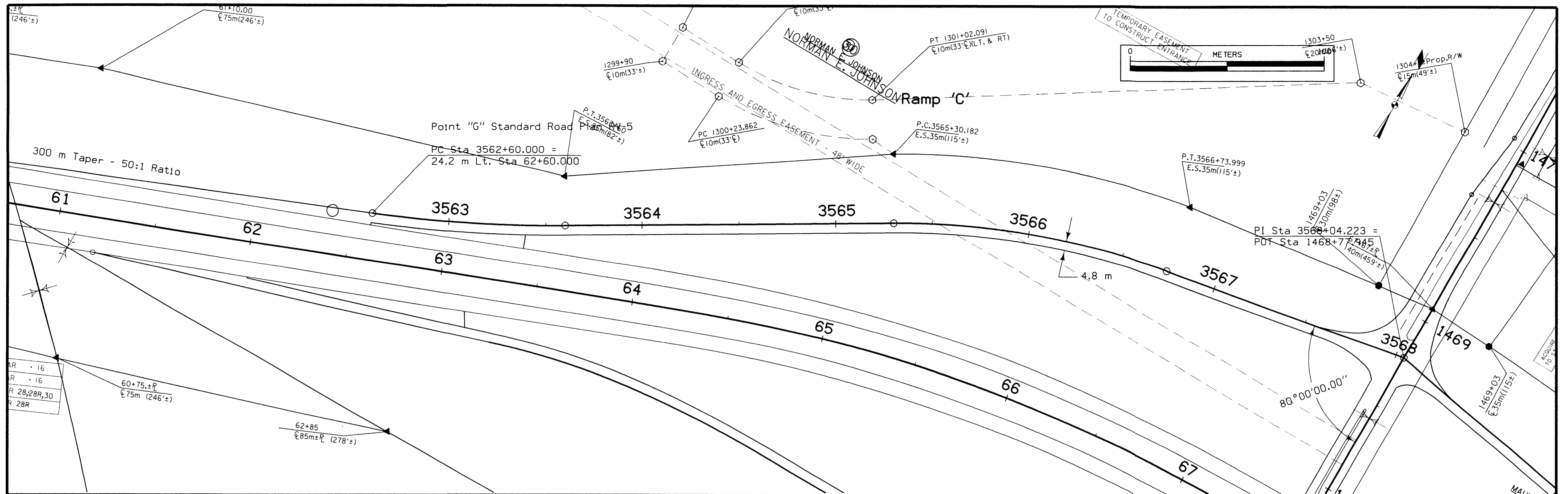
SHEET NUMBER K.04



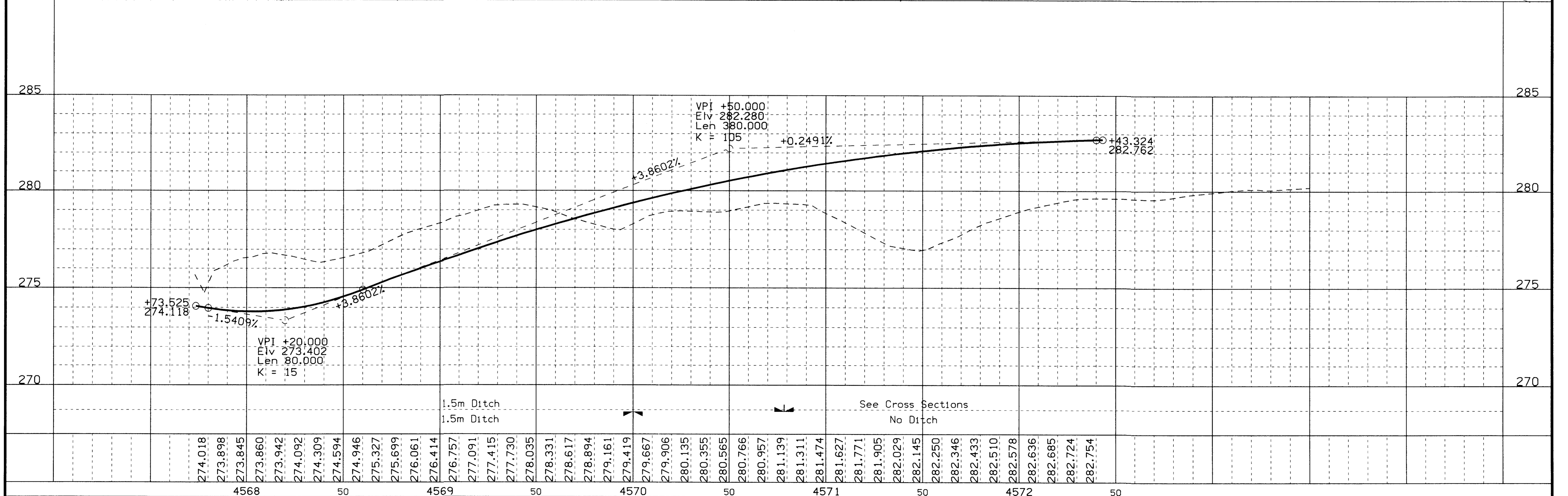
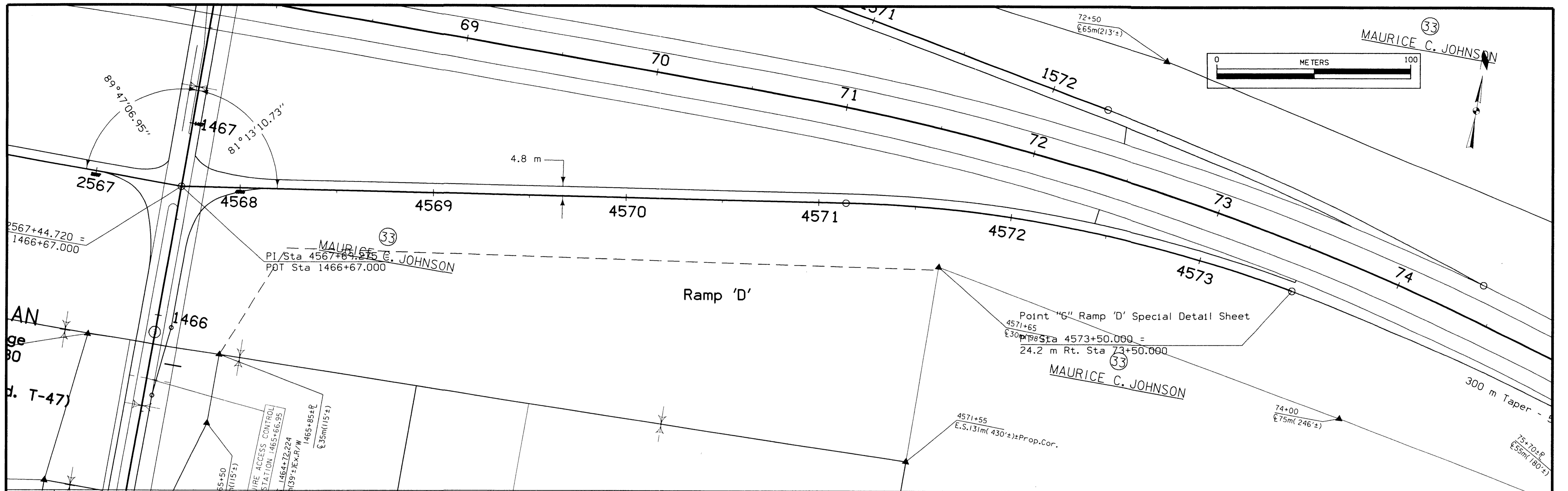
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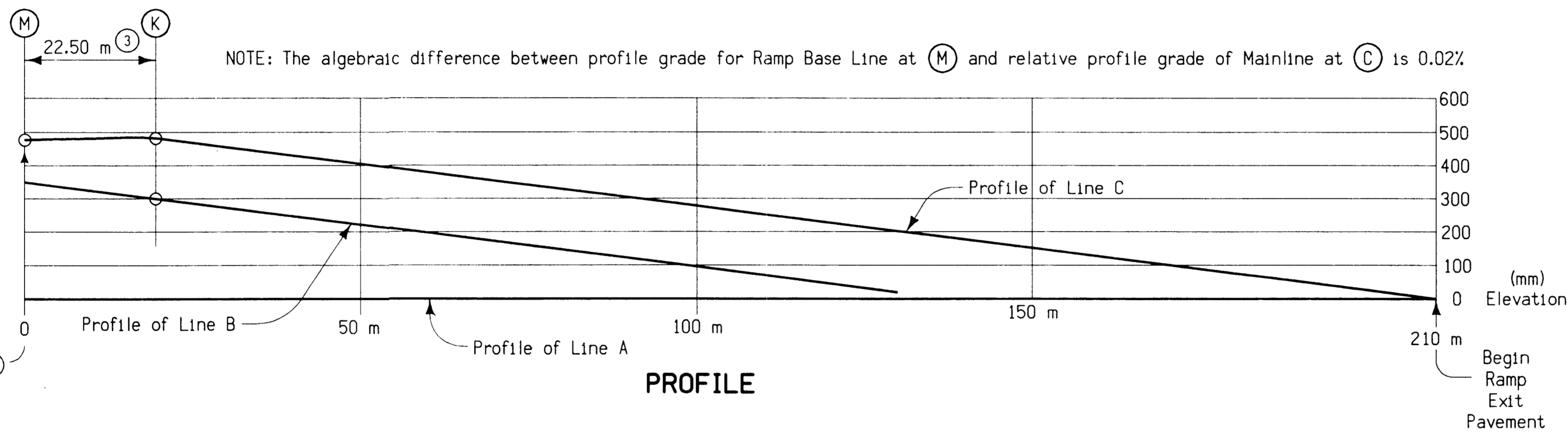
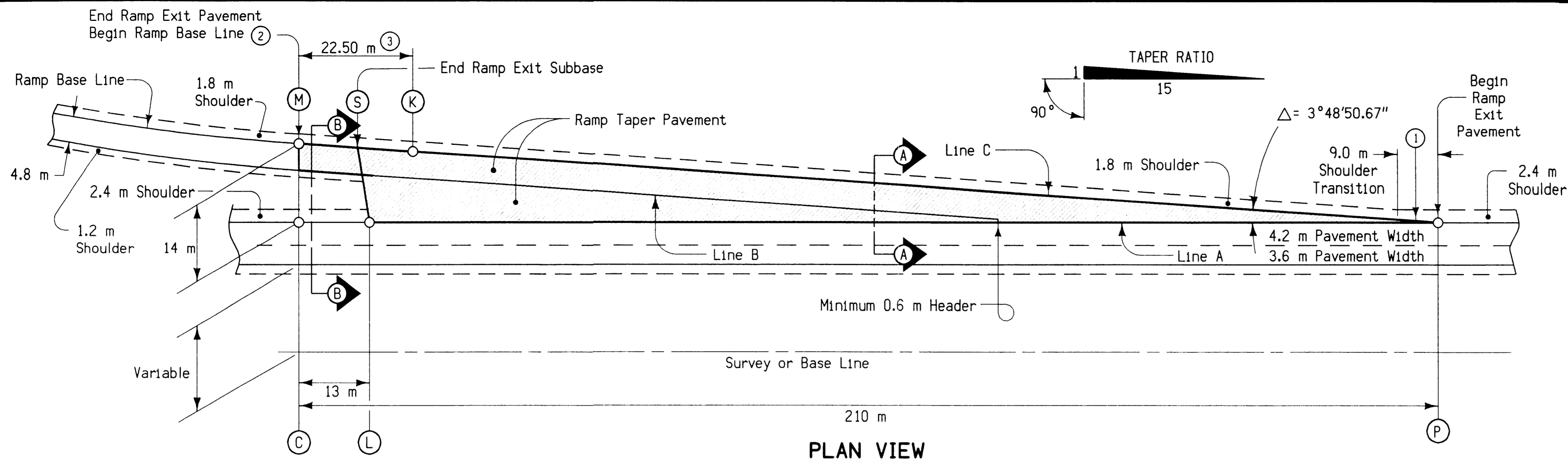


277.494	277.555	277.607	277.648	277.681	277.704	277.717	277.721	277.715	277.700	277.675	277.641	277.597	277.544	277.481	277.409	277.327	277.236	277.135	277.025	276.905	276.776	276.637	276.489	276.331	276.164	275.987	275.801	275.605	275.399	275.185	274.960	274.726	274.483	274.230	274.007	273.854	273.770	273.755	273.810	273.935
50					2564					50					2565					50					2566					50					2567					



DESIGN TEAM	ABRAMS/SMITH	METRIC	IOWA DOT * OFFICE OF DESIGN	MARSHALL COUNTY	PROJECT NUMBER	NHSX-30-5(166)--3H-64	SHEET NUMBER	K.07
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(C)

TABLE OF OFFSETS AND DROPS FOR 4.8 m RAMP TAPER																					Distance (m) From Point C Along Line A	
0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	0
14.000	13.333	12.667	12.000	11.333	10.667	10.000	9.333	8.667	8.000	7.333	6.667	6.000	5.333	4.667	4.000	3.333	2.667	2.000	1.333	0.667	0	Offset (m) From Line A To Line C
477	477	481	456	430	405	380	354	329	304	278	253	228	202	177	152	127	101	76	51	25	0	Rise (mm) From Line A To Line C

(M) NOTE: The elevations at edge of taper from BEGIN TAPER to POINT (S) are established by a constant 3.8% slope across the appropriate taper widths based on the Taper Ratio of 15:1, Drop = (0.038) x (Offset).

GENERAL NOTES:
This detail sheet shows ramp alignment and grade data for the ramp exit pavement.

Materials and methods of construction shall be in accordance with current Standard and Supplemental Specifications.

Ramp exit pavement shall be the same thickness as the mainline pavement. Ramp exit subbase for both A.C.C. and P.C.C. pavement shall be the same thickness as the mainline subbase.

Ramp exit pavement area shown by shaded area is 1345 square meters.

In order to assure proper drainage, any special shaping of exit area between lines A and B shall be accomplished by methods approved by the Engineer.

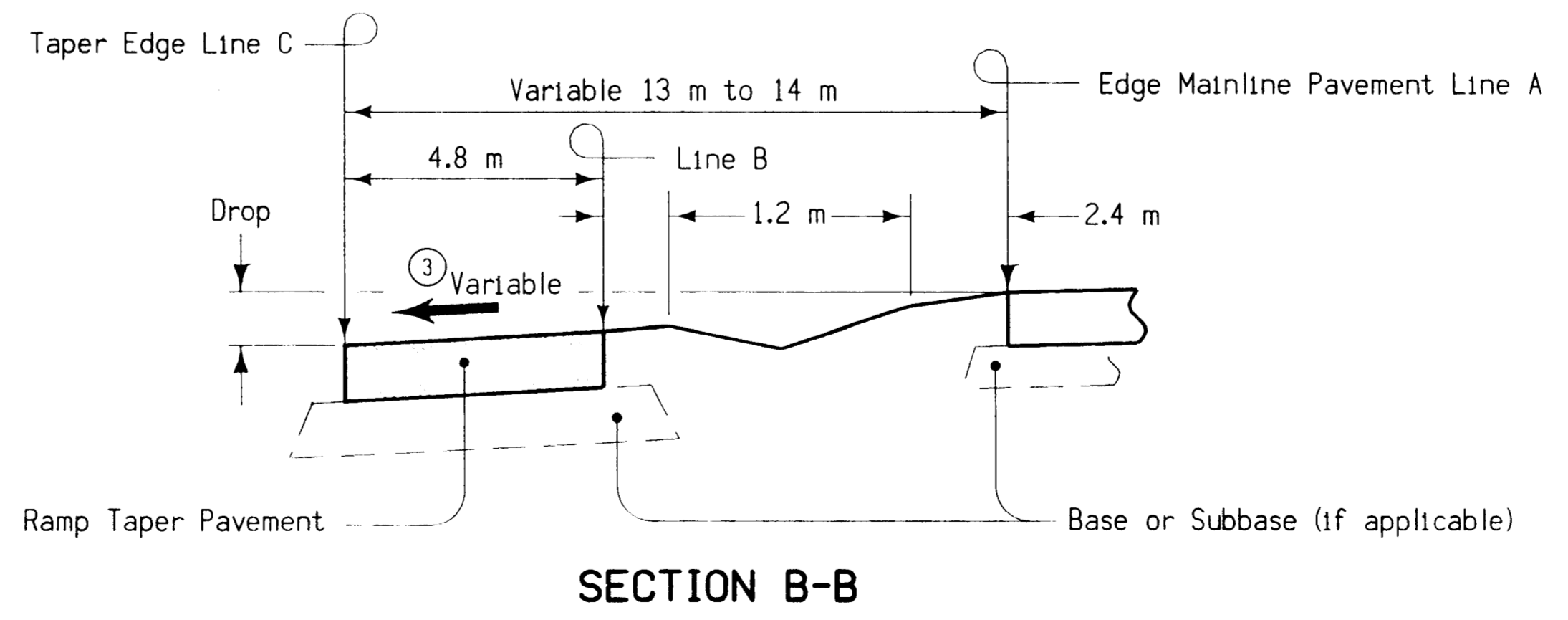
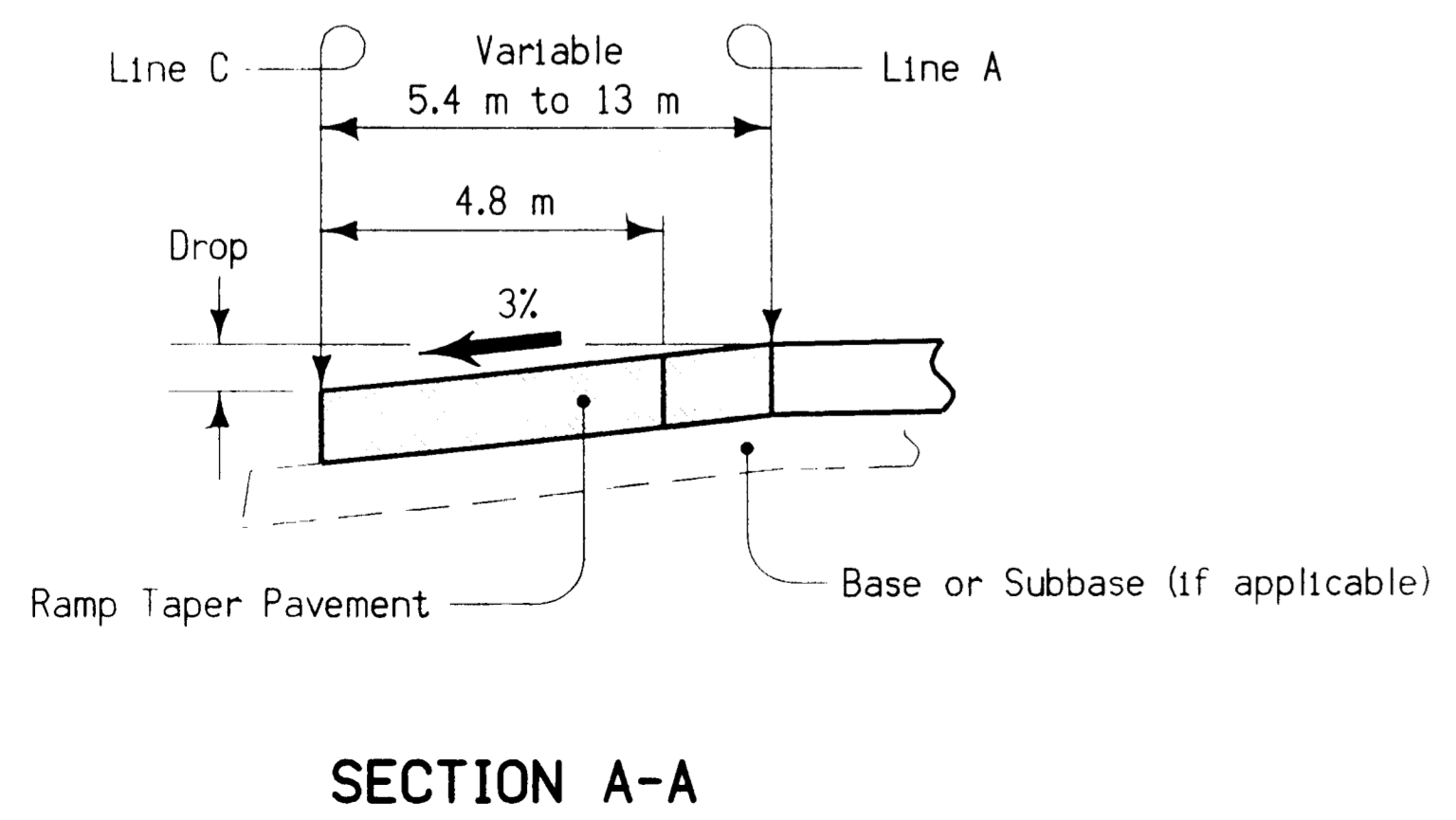
Refer to Detail Sheet 550-5 for jointing layout.

Refer to typical cross sections and appropriate Standard Road Plans for design details and requirements for shoulders.

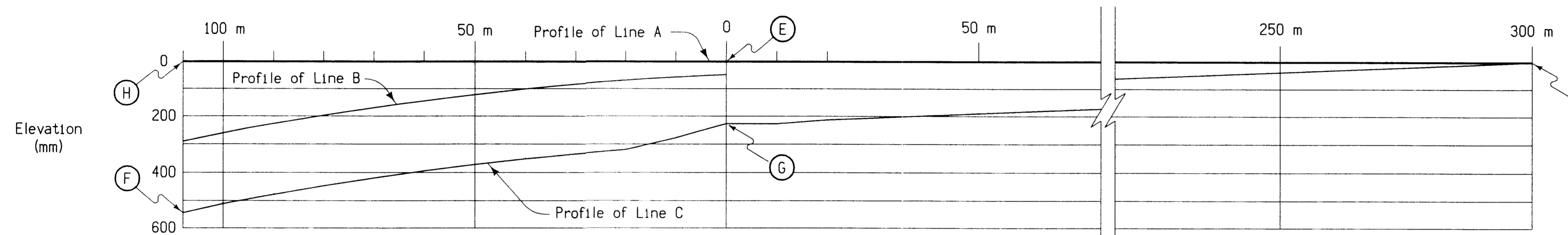
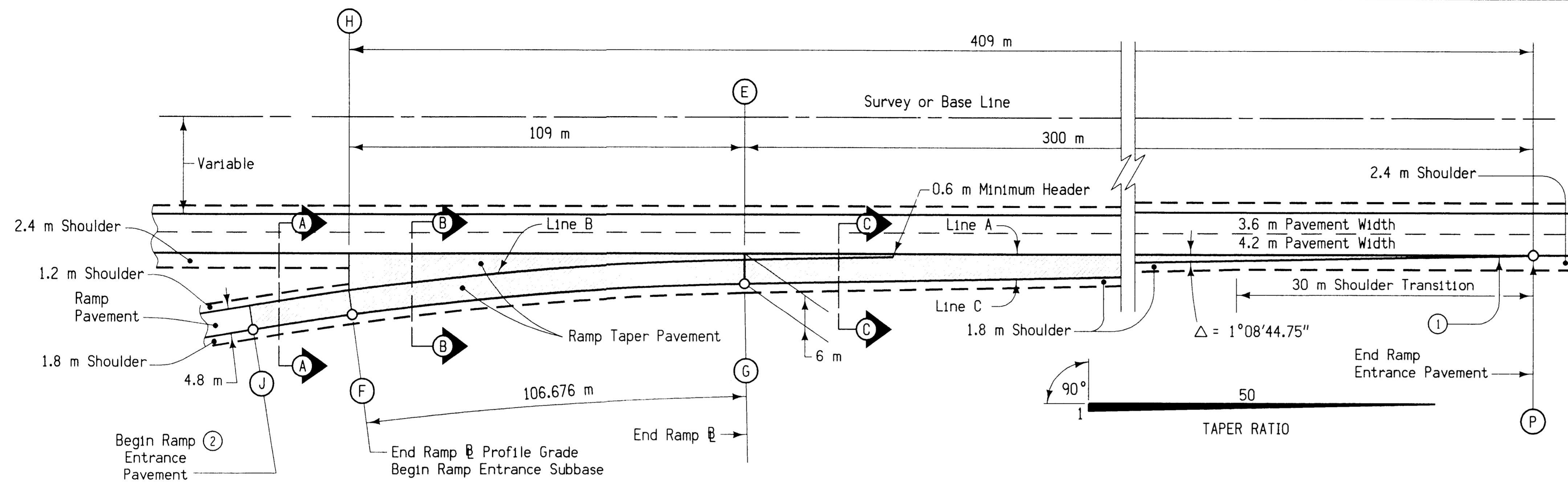
- ① For header construction details at the beginning of taper, refer to the appropriate Typical 7101, 7102, or 7120.
- ② Refer to detail project plans for ramp alignment and grade data.
- ③ The superelevation cross-slope rate of change is 0.05% per meter. Refer to Standard Road Plan RP-3 and detail project plans for superelevation transition requirements.

GENERAL REQUIREMENTS			
IDENTIFICATION		EQUIVALENT STATIONS	
INTERCHANGE	RAMP	(C)	(M)
Reloc. US 30 and Ia 146 at LeGrand	Ramp A	72+30	1572+30

All dimensions given in millimeters unless noted.



**RAMP 'A'
DECELERATION TAPER
FOR 4.8 m EXIT RAMP**



PROFILE

TABLE OF OFFSETS AND DROPS FOR 4.8 m RAMP TAPER

Distance From Point (E) Along Line A (m)	109	100	90	80	70	60	50	40	30	20	10	0	10	20	50	100	150	200	250	300																						
From Line A To Line B	Constant 4.00% Slope												3.80%																													
Offset (m)	7.343	6.533	5.696	4.927	4.225	3.590	3.023	2.523	2.091	1.726	1.429	1.200																														
Drop (mm)	294	261	228	197	169	144	121	101	84	69	57	46																														
From Line B To Line C	Constant 4.8 m Offset												Constant 5.20% Slope									4.60%		3.80%																		
Offset (m)	4.8																								4.8		4.8															
Drop (mm)	250	250	250	250	250	250	250	250	250	250	250	221	182																													
From Line A To Line C													Constant 3.80%									6.000		5.800		5.600		5.000		4.000		3.000		2.000		1.000		0.000				
Offset (m)																									6.000		5.800		5.600		5.000		4.000		3.000		2.000		1.000		0.000	
Drop (mm)	544	511	478	447	419	394	371	351	334	319	278	228	220	213	190	152	114	76	38	0																						
Distance From Point (G) Along Line C (m)	106.676	97.861	88.066	78.271	68.476	58.680	48.885	39.089	29.293	19.497	9.701	0.000																														

GENERAL NOTES:

This detail sheet shows ramp alignment and grade data for the ramp entrance pavement.

Materials and methods of construction shall be in accordance with current Standard and Supplemental Specifications.

Ramp entrance pavement shall be the same thickness as the mainline pavement. Ramp entrance subbase for both A.C.C. and P.C.C. pavement shall be the same thickness as the mainline subbase.

Ramp entrance pavement area shown by shaded area is 1663 square meters.

In order to assure proper drainage, any special shaping of entrance area between lines A and B shall be accomplished by methods approved by the Engineer.

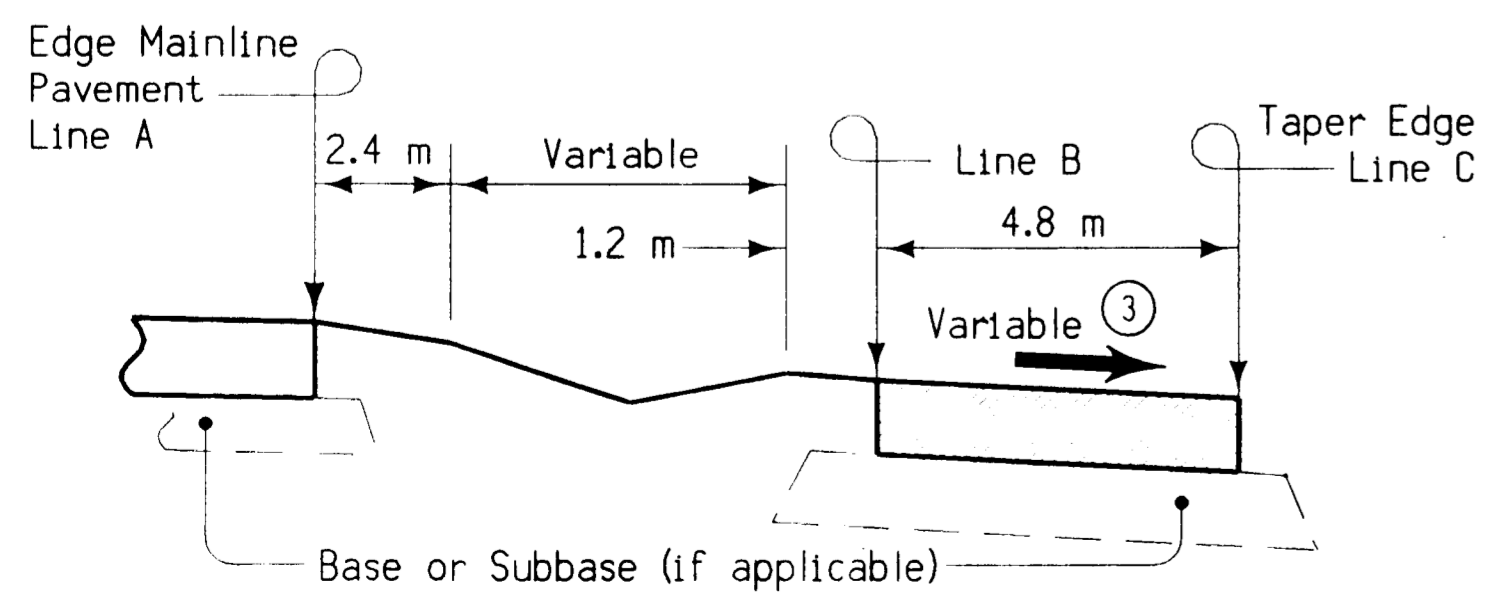
Refer to Detail Sheet 550-5 for jointing layout.

Refer to typical cross sections and appropriate Standard Road Plans for design details and requirements for shoulders.

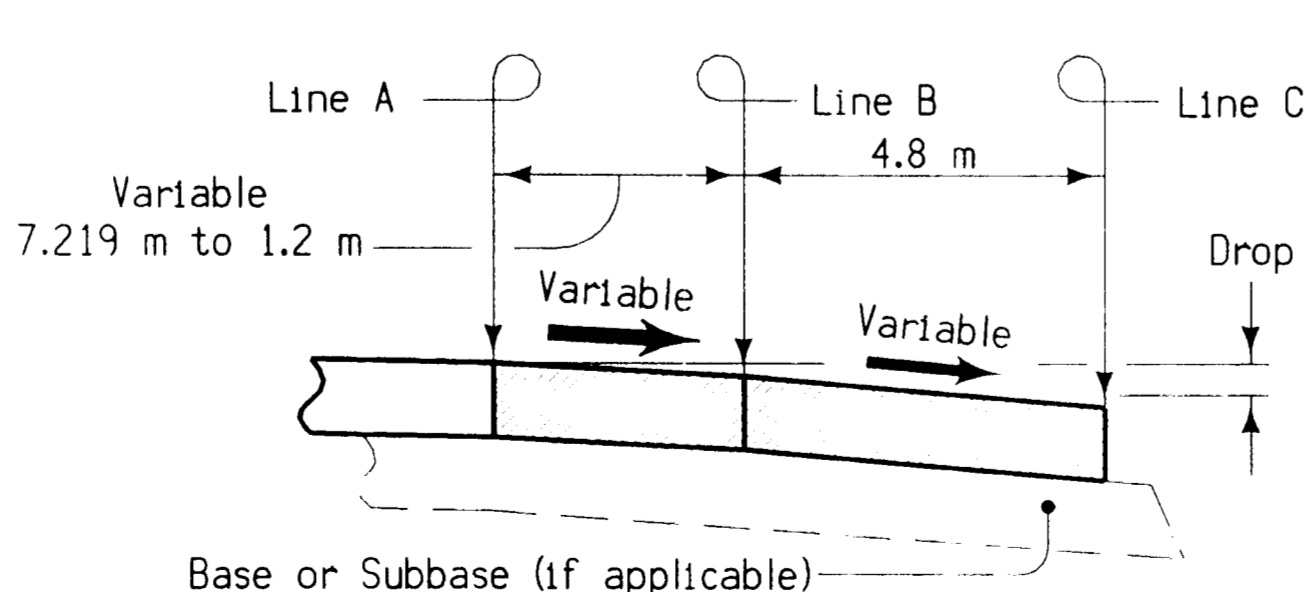
- ① For header construction details at the beginning of taper, refer to the appropriate Typical 7101, 7102, or 7120.
- ② Refer to detail project plans for ramp alignment, grade, profile and superelevation data.
- ③ The ramp pavement cross slope between point (J) and point (F) is determined by superelevation rotated about line "C". Refer to Standard Road Plan RP-3 and the project plans for superelevation transition requirements.

GENERAL REQUIREMENTS			
IDENTIFICATION		EQUIVALENT STATIONS	
INTERCHANGE	RAMP	(E)	(G)
Reloc. US 30 and Ia 146 at LeGrand	Ramp D	73+50	4573+50

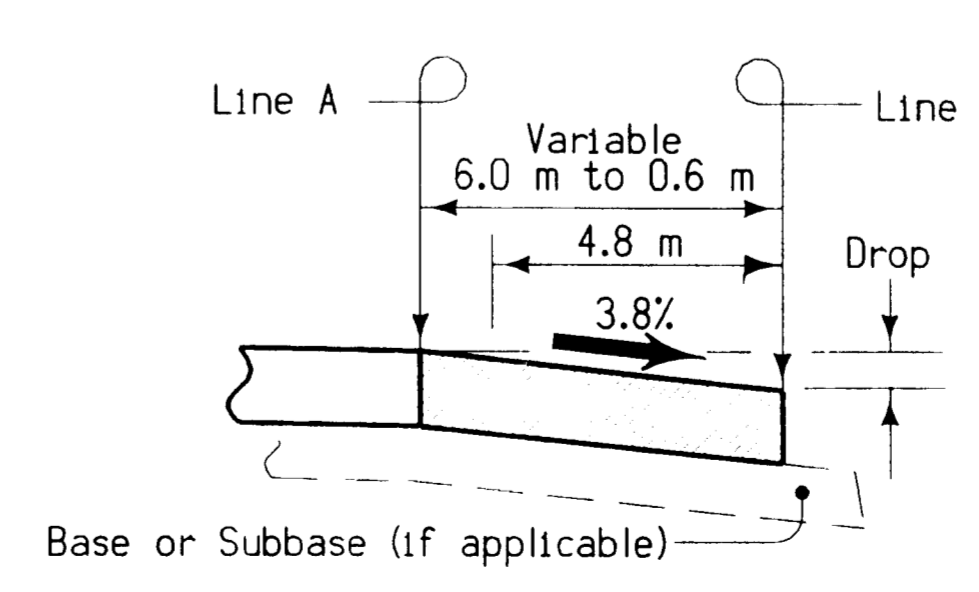
All dimensions given in millimeters unless noted.



SECTION A-A



SECTION B-B



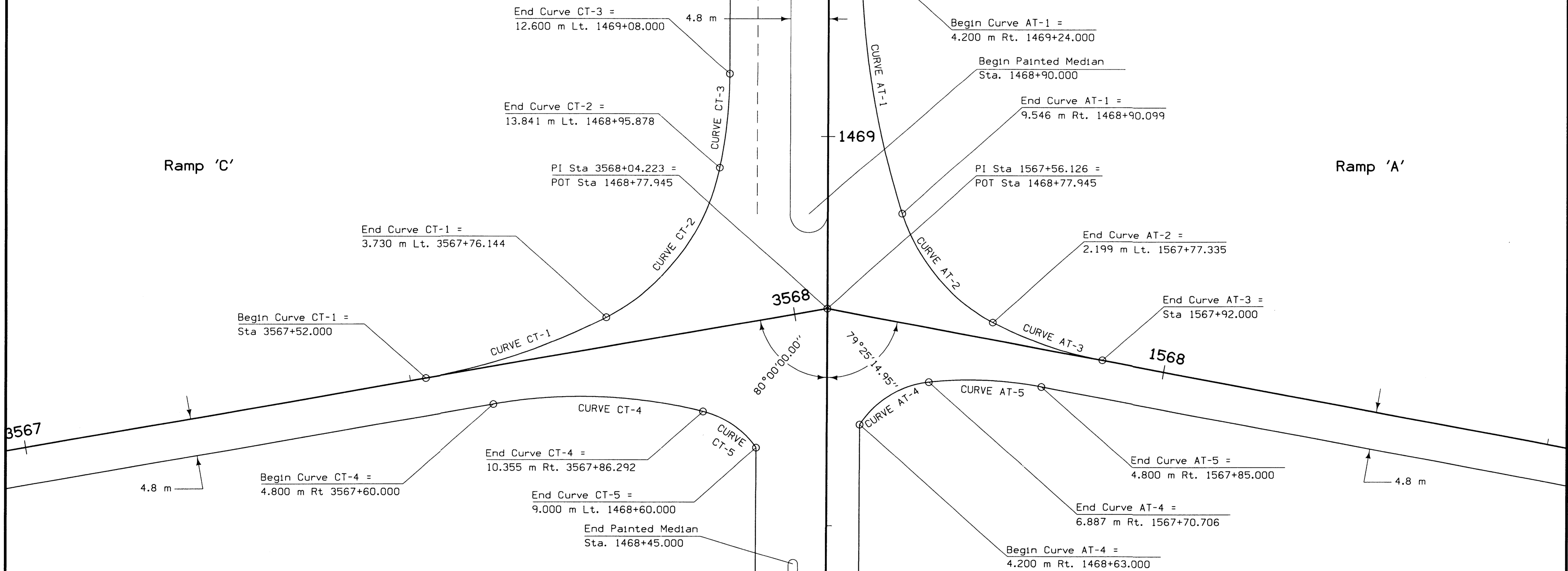
SECTION C-C

**RAMP 'D'
ACCELERATION TAPER
FOR 4.8 m ENTRANCE RAMP
(e max. = 6%)**

CIRCULAR CURVE DATA

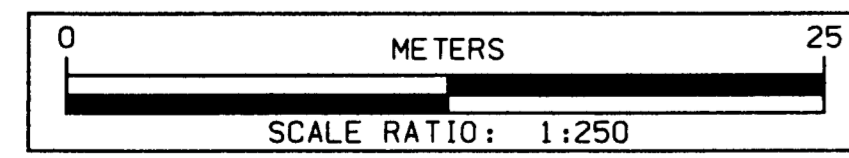
101-10C
09-27-94

NO.	Δ	R	T	L	E
CT-1	17°33'56.18"	80.000	12.360	24.526	0.949
CT-2	50°43'02.80"	28.000	13.271	24.785	2.986
CT-3	11°40'03.82"	60.000	6.130	12.218	0.312
CT-4	23°51'33.87"	65.000	13.733	27.068	1.435
CT-5	40°21'17.04"	12.000	4.410	8.452	0.785
AT-1	17°56'43.85"	110.000	17.369	34.453	1.363
AT-2	44°28'09.37"	24.000	9.811	18.627	1.928
AT-3	17°03'18.94"	50.000	7.497	14.884	0.559
AT-4	51°32'11.82"	12.000	5.793	10.794	1.325
AT-5	16°36'42.74"	50.000	7.300	14.497	0.530



Ramp 'C'

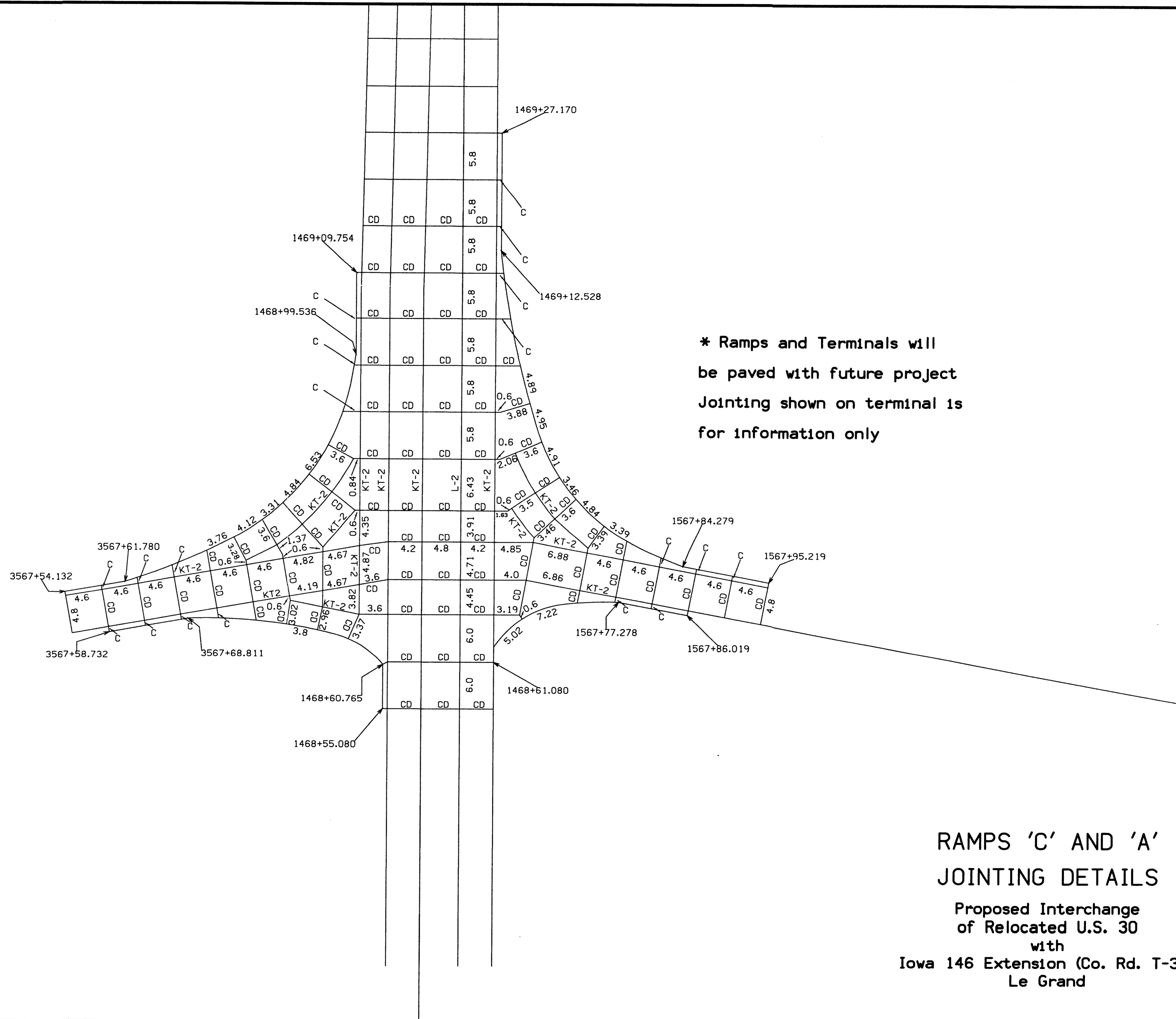
Ramp 'A'



**RAMPS 'C' AND 'A'
TERMINAL DETAILS**

Proposed Interchange
of Relocated U.S. 30
with
Iowa 146 Extension (Co. Rd. T-37)
Le Grand

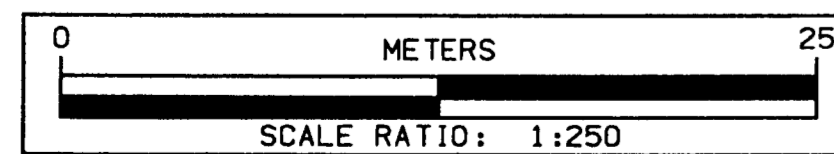
20-SEP-2001 14:13 bsmith2 \\projects\64030030492\Design\64030166.01



* Ramps and Terminals will
 be paved with future project
 Jointing shown on terminal is
 for information only

RAMPS 'C' AND 'A' JOINTING DETAILS

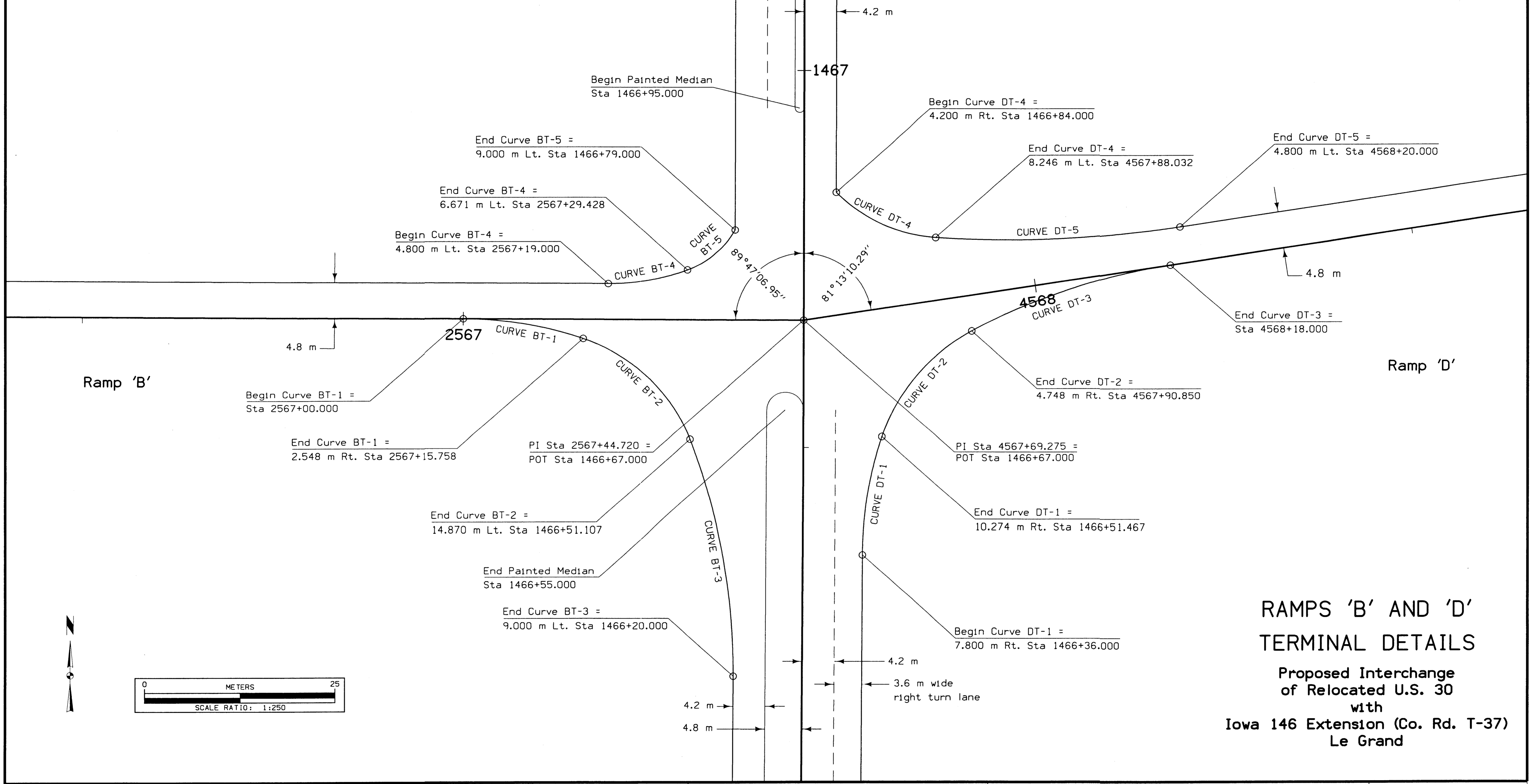
Proposed Interchange
 of Relocated U.S. 30
 with
 Iowa 146 Extension (Co. Rd. T-37)
 Le Grand



CIRCULAR CURVE DATA

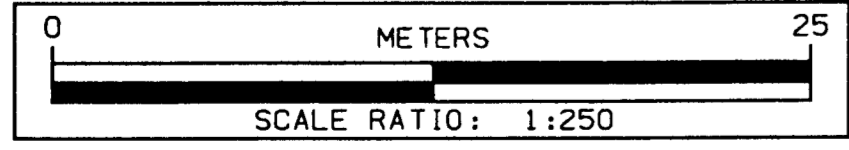
101-10C
09-27-94

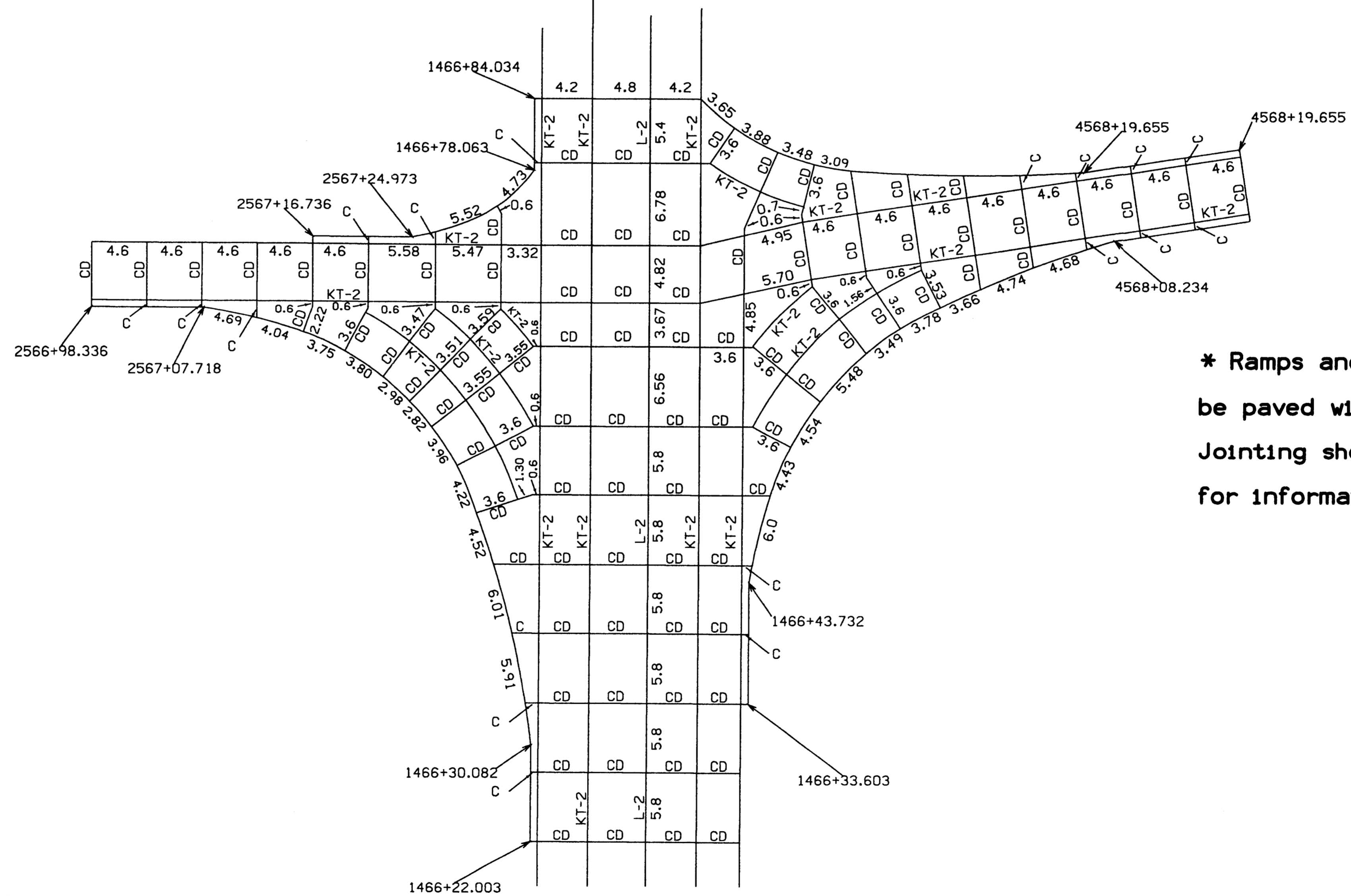
NO.	Δ	R	T	L	E
BT-1	18°22'15.11"	50.000	8.085	16.032	0.649
BT-2	50°07'59.26"	23.000	10.758	20.125	2.391
BT-3	21°26'15.04"	85.000	16.090	31.803	1.509
BT-4	20°20'27.64"	30.000	5.382	10.651	0.479
BT-5	39°54'13.63"	12.000	4.356	8.357	0.766
DT-1	18°03'13.37"	50.000	7.943	15.755	0.627
DT-2	43°10'15.61"	25.000	9.891	18.837	1.885
DT-3	19°50'18.85"	80.000	13.990	27.700	1.214
DT-4	42°09'08.40"	20.000	7.708	14.714	1.434
DT-5	12°18'18.31"	150.000	16.170	32.215	0.869



RAMPS 'B' AND 'D'
TERMINAL DETAILS

Proposed Interchange
of Relocated U.S. 30
with
Iowa 146 Extension (Co. Rd. T-37)
Le Grand

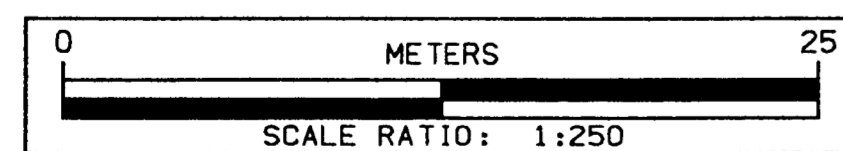




* Ramps and Terminals will be paved with future project
 Jointing shown on terminal is for information only

RAMPS 'B' AND 'D' JOINTING DETAILS

Proposed Interchange
 of Relocated U.S. 30
 with
 Iowa 146 Extension (Co. Rd. T-37)
 Le Grand



1. Pavement quantity is measured from Sta.
1036+83.318 to the edge of the through roadway

INTERSECTION PAVING REQUIREMENTS

101-12
09-27-94

TYPE	UNIT	AMOUNT	DESCRIPTION
Pavement	m ²	220	See Note No. 1
Island	m ²		
Curb	m		

37+00

1037+00

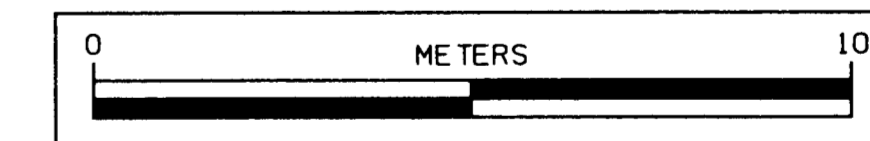
Curve 1

Curve 2

(0+23.017) 1036+84.804
-3.600 End Return
281.4989

1036+83.318
End Header

1036+83.318 (0+00.000)
3.600
281.4886

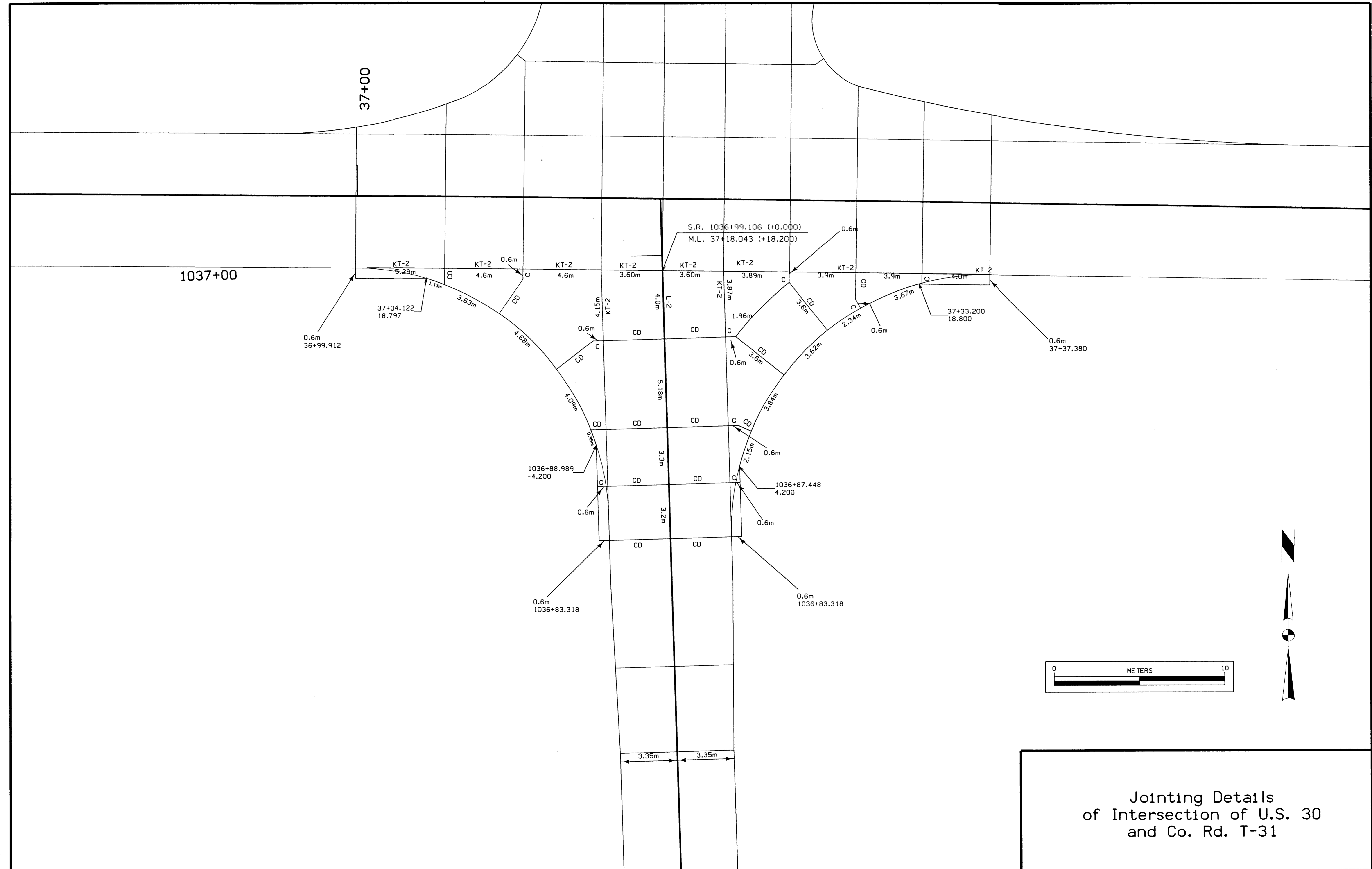


CIRCULAR CURVE DATA

101-10C
09-27-94

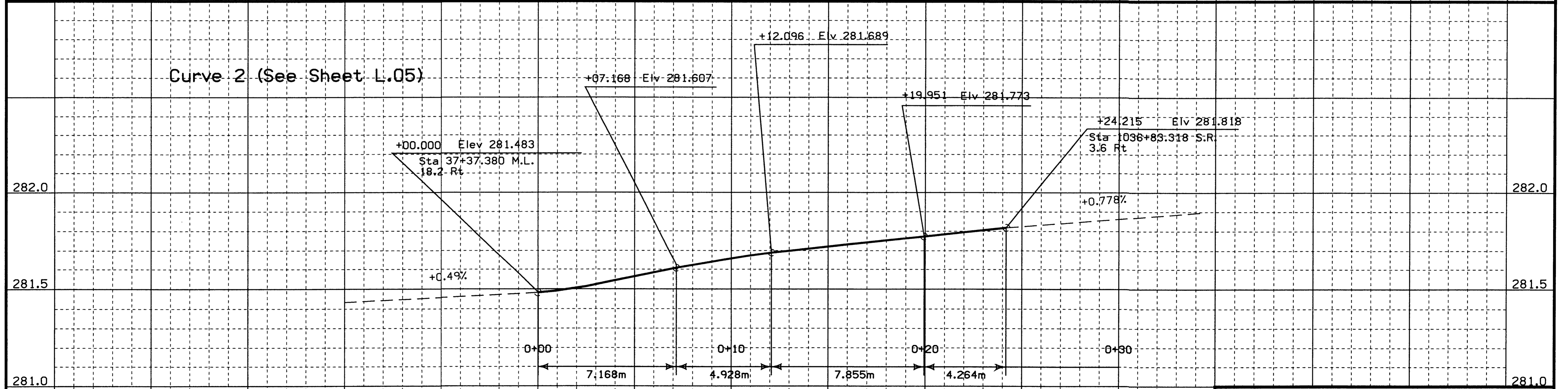
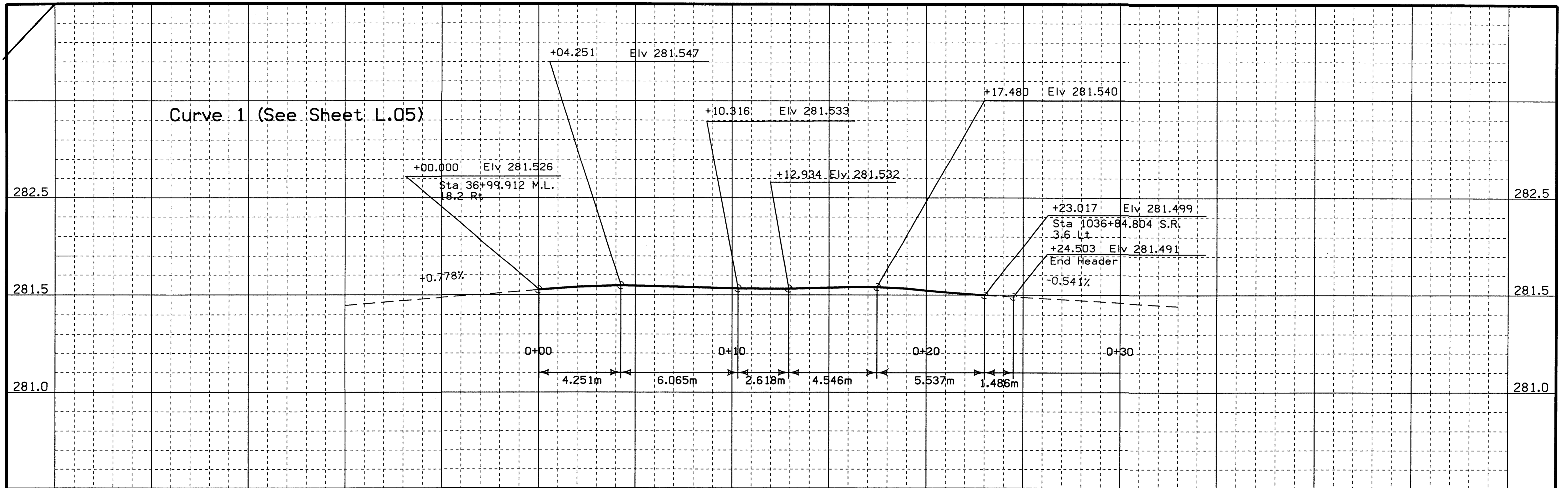
NO.	Δ	R	T	L	E
1	87°55'01.50"(RT)	15m	14.464m	23.017m	5.838m
2	92°29'37.89"(RT)	15m	15.668m	24.215m	6.690m

Geometric & Staking Details
of Intersection of U.S. 30
and Co. Rd. T-31



Jointing Details
 of Intersection of U.S. 30
 and Co. Rd. T-31

10/20/01 10:54
 6/20/02
 Project: 6403000-PE Design K&K 10/20/01



Edge Profile Details
Intersection of US 30
And Co. Rd. T-31

SANITARY SEWER CONSTRUCTION

GENERAL

Intent is to supplement sanitary sewer specifications in IDOT Metric Standard Specifications for Highway and Bridge Construction, Series 1995; information shown on sanitary sewer plans supercedes conflicting information found in IDOT Metric Standard Specifications for Highway and Bridge Construction, Series 1995.

Reference to percent maximum density: soil density not less than the stated percent of maximum density for soil as determined by ASTM D698 Moisture-Density Relations of Soils, using 5.5-lb. (2.49 kg) Rammer and 12-in. Drop (305 mm) (Standard Proctor Method).

Before installation, verify all measurements including: location of appurtenances and connections to existing sewers; elevations of existing sewers, type and location of joints on existing sewers at points of connection; outside diameter of existing sewers; make necessary field measurements to determine pipe laying lengths; work pipe into place without forcing or springing; details of existing pipe not guaranteed.

PRODUCTS

Provide new materials unless otherwise indicated.

Granular bedding material: sharp, clean crushed limestone in accordance with IDOT gradation No. 5, Class 2 durability or better; change in gradation may be authorized subject to local availability of materials at time of construction.

Ductile iron pipe (DI): ANSI A21.50 manufactured in accordance with ANSI A21.51; minimum thickness: Class 52, 2.41 MPa working pressure; mechanical joint with stainless steel hardware; coat inside of ductile iron pipe with standard cement lining and bituminous seal coating; ANSI A21.4 and AWWA C104; coat outside of pipe with standard coating; provide mechanical joint within 600 mm of utility access wall where ductile iron pipe extends into utility access; use for sanitary sewer pipe where shown on plans.

Fittings for ductile iron pipe: SSB/compact ductile iron, mechanical joint, AWWA C153 and ANSI A21.53, 2.41 MPa pressure rating, except as otherwise specified; coatings to be equivalent to ductile iron pipe specifications.

Wrap all ductile iron pipe with polyethylene film; comply with manufacturer's specifications; polyethylene film: 0.20 mm minimum thickness; black pigmentation; ANSI A21.5; polyethylene wrap is incidental to sewer construction.

Composite double wall plastic pipe (PVC truss pipe): manufactured in accordance with ASTM D2680, composite PVC thermoplastic double wall; gasketed joint: ASTM D2680; seal ends of pipe and fittings watertight and gas tight with solvent cement; use for sanitary sewer pipe where shown on plans.

Sanitary sewer utility access: conform to details on plans and IDOT Standard Road Plans; design for depth of bury shown on plans; diameter and thickness of base may be increased by Engineer due to poor foundation conditions; field verify existing sewers prior to manufacture of utility access bases.

Precast reinforced concrete utility access sections; 1.2 m dia.; ASTM C478M except use minimum wall thickness: 125 mm; one cage reinforcing, minimum circumferential reinforcement: 3.81 square centimeters per vertical meter of wall cross section; joints: use rubber ring gasket type, flexible O-ring gasket; conform with ASTM C443M; provide flexible watertight sewer connection integral with bottom barrel section of utility access; apply 300 mm wide heavy bitumastic coating on outside of utility access at joints around entire perimeter.

Utility access steps: copolymer polypropylene plastic; provide in all eccentric utility accesses spaced 400 mm on center; top step 250 mm below top of cone section; locate 90 degrees; from direction of flow.

Utility access frame and cover: IDOT RA-54, Type 2 for all sanitary sewer utility accesses.

INSTALLATION

Excavation:

Strip, salvage and spread topsoil to depth of 0.3 m in accordance with IDOT Section 2105; area of payment to include only that area disturbed by sewer construction and located outside of proposed roadway needs line.

Excavate all materials encountered to depth indicated or specified; comply with safety rules of state and federal governments.

Remove spoil not suitable for backfill; waste at disposal area approved by the Iowa Department of Transportation; removal is incidental to construction.

Where new work crosses existing utilities or utility services, excavate in advance of pipe laying; determine crossing arrangement including exact construction line and grade.

Minimum sewer shoring requirement: equivalent construction procedure to use of "sand box" to provide 2.4 m of vertical protection; provide stacked sand boxes as required to maintain construction within construction limits.

Keep width of trench as narrow as possible and still provide adequate room for backfill and jointing.

Keep sides of trench as nearly vertical as practicable; maintain vertical walls of excavation below top of pipe.

Excavate by hand; under tree roots 75 mm and larger; under and around utilities and where overhead clearance prevents use of machine.

Do all work in the dry; provide for handling of all surface water runoff and groundwater encountered during construction; lay no pipe on excessively wet soil; prevent surface water from flowing into excavation; remove water as it accumulates; dewatering operations are incidental to sewer construction.

Provide for flow around the section of sewer being worked on; Contractor will be required, if necessary, to provide bypass pumping to handle flows; Contractor shall provide adequate reserve pumps available on site for emergency use; Contractor shall be responsible for damages resulting from backups due to construction operations.

The volume of wastewater which may be encountered is unknown; bypassed flows shall be discharged into originating system downstream of work area; bidder shall be responsible for bypass pumping and shall thoroughly investigate needs and methods; handling and/or bypassing existing sewer flows is incidental to sewer construction.

Allow no more than 60 m of sewer trench to be open at one time; construct utility accesses as work progresses; do not leave trenches open more than 24 hours; protect all open trenches as required by governmental agencies.

Bedding:

Bedding for iron gravity sewer (DI) in open cut: lay pipe on 150 mm thick granular bedding material for full trench width; fill around haunches of pipe to 250 mm above bottom of pipe with granular bedding material for full trench width; compact all bedding material by vibration using equipment approved by pipe manufacturer; minimum trench width: 850 mm.

Bedding for composite double wall plastic pipe (PVC truss pipe): install in accordance with ASTM D2321; lay pipe on 150 mm thick granular bedding material for full trench width; fill around and over pipe with granular bedding material to minimum depth of 300 mm above top of pipe bell for full trench width; compact all bedding material by vibration using equipment approved by pipe manufacturer; do not drop pipe bedding material from equipment bucket more than 600 mm above pipe; minimum trench width: 850 mm.

Compact granular bedding material by rodding or slicing with shovel; provide bell holes at each pipe joint in granular bedding material; granular bedding material is incidental to sewer construction.

Trench excavated below required grade: backfill to proper elevation with granular bedding material at no additional cost.

Notify Engineer immediately when unstable material is encountered which may not provide a suitable foundation for pipe; remedial measures may be recommended if foundation is considered unsuitable for sewer construction.

Pipe Laying:

Carefully protect pipe joints from injury while handling and storing pipe; use no deformed, gouged or otherwise impaired joints; clean bell and spigot surface of dirt and foreign matter before jointing pipe; make joints in strict accordance with manufacturer's recommendations.

Make all necessary field measurements to accurately determine sewer make-up lengths or closures; begin at lowest point in line; lay groove or bell ends pointing upstream; keep pipe free of all dirt and foreign material; clean sewer if necessary to remove dirt and foreign material at no additional cost; provide a smooth and uniform invert; bear spigots against bell shoulders; pull joints together with equipment recommended by pipe manufacturer; do not use backhoe to push joints together.

Sanitary Sewer line and grade: provide, install and operate laser light equipment for line and grade control; provide and install detection equipment to constantly monitor laser light to prevent movement or drift of light from line and grade; check line and grade of each pipe with laser light; provide spot check with level instrument minimum 3 times per day; continuously check alignment of sewer by flashing light between utility accesses or between last piece of pipe laid and opening at downstream utility access; correct misalignment, displacement or otherwise defective sewer at no additional cost.

Sanitary Sewer Utility Access:

Secure frame and adjusting rings to upper section of utility access to prevent movement or entry of water: drill two 25 mm dia. holes through flange of IDOT RA-54, Type 2 frame and adjustment rings to accommodate two 13 mm dia. anchor bolts, equally spaced on 800 mm dia. circle; grout frame in place; securing frame and adjusting rings to upper section of utility access is incidental to construction.

Provide concrete adjusting rings on utility accesses as necessary to place cover at grade or to required elevation; provide two adjusting ring minimum; maximum height of utility access adjustment using adjusting rings: 300 mm; secure to upper utility access section; make joints with bituminous jointing material to prevent entry of water.

Backfilling:

Backfill trench and structures immediately after location of connections and appurtenances has been recorded and testing has been completed.

Use no large stones, large clods, organic matter, rubbish, frozen or unsuitable materials in backfill; backfill simultaneously on both sides of pipe and structures to prevent displacement.

Provide compacted backfill for all trenches; backfill above bedding material with excavated material in layers not to exceed 150 mm; moisten if required; compact to 95% maximum density with moisture content between -1% to +3% of optimum; hand place and carefully compact backfill less than 300 mm over top of pipe; backfilling sewer trench with moisture and density control is incidental to construction.

Fill upper 300 mm portion of trench with salvaged topsoil where construction area is to be seeded; shape trench backfill to original grades.

Testing:

Employ approved independent testing laboratory to show that construction materials comply with specifications; submit duplicate copies of reports by an independent laboratory showing compliance of construction materials with specifications.

Provide all samples required for laboratory tests; cost of all sewer testing including transportation charges on samples is incidental to sewer construction.

Incorporate no materials until laboratory tests have been furnished which show compliance.

All materials subject to sampling, testing, inspection and rejection at project site.

If test results do not meet those specified, make necessary corrections and repeat tests to demonstrate that test requirements are satisfied at no additional cost.

Provide soil tests necessary to determine optimum moisture-density relationship and the suitability of materials for compaction.

Provide compaction tests on all trench backfill: ASTM D698; 3 tests per 50 m of trench where compacted backfill is specified; at each location 2 tests at intermediate depths and 1 test at surface; provide all necessary excavations to allow compaction tests to be taken.

Allowable leakage in sanitary sewer: maximum allowable infiltration or exfiltration for any new sanitary sewer section, including all utility accesses is 188 liters per centimeter of pipe diameter per kilometer of pipe per day; utility accesses shall be tested separately.

Sanitary sewer leakage test: conduct all infiltration and exfiltration tests after backfill for sewer line and utility accesses is complete; test sewer lines by low pressure air testing: isolate and test all sections of pipe between utility accesses; install plugs in accordance with manufacturer's recommendations; allow no one in utility accesses during testing; wet line by flushing to produce consistent results; plug and brace all stoppers to resist test pressure; test duration for 375 mm dia. pipe is 7 minutes; the pressure holding time is based on an average holding pressure of 20.68 kPa gauge or a drop from 24.13 kPa to 17.24 kPa gauge; add air to the line segment being tested until the internal air pressure of the sewer line is raised to approximately 27.58 kPa gauge greater than the average back pressure of any groundwater that may be over the top of the pipe; at least 2 minutes shall be allowed for the air pressure to stabilize; when the pressure has stabilized and is at or above the starting test pressure of 24.13 kPa gauge, commence the test; record the drop in pressure for the test period; if the pressure has dropped more than 6.89 kPa gauge during the test period, the line is presumed to have failed; test may be discontinued when the prescribed test time has been completed, even though the 6.89 kPa gauge drop has not occurred.

In areas of known groundwater above the pipe section being tested, the total height of water in meters above the pipe shall be multiplied by 52.1 to establish the gauge pressure that will be added to all readings; for example, if the height of water is 2 meters then the added pressure will be 104.20 kPa gauge; this increases the 24.13 kPa gauge to 128.33 kPa gauge and the 17.24 kPa gauge to 121.44 kPa gauge; allowable drop and test duration remain the same.

Utility access vacuum test: test all utility accesses in accordance with ASTM C1244; plug all lift holes with non-shrink grout; temporarily plug all pipes entering utility access; place test head at top of utility access in accordance with the recommendations of the testing equipment manufacturer; a vacuum of 10" (254 mm) of mercury shall be drawn from utility access; turn off testing equipment and close testing equipment valves; measure and record time for vacuum to top to 9" (229 mm) of mercury; a passing test occurs when 9" (229 mm) of mercury is maintained longer than the following: minimum duration for utility access equal to or less than 3 meters in depth is 30 seconds; minimum duration for utility access greater than 3 meters in depth, but less than 7 meters in depth is 60 seconds; complete necessary repairs to utility accesses that fail test; repeat test until utility access passes test.


Television inspection of sanitary sewers: final inspection of completed project may be made by closed circuit system if sewer does not meet construction specifications and defects cannot be determined by standard procedures such as lamping, infiltration, exfiltration, vacuum and deflection testing; if defects are found by TV inspection, correct to conform to specifications; cost of televising, repair or reconstruction at expense of Contractor.

Provide deflection test 30 days after backfill of trench is completed for all plastic sanitary sewer lines; maximum allowable deflection: 5%; run rigid ball or mandrel without mechanical pulling device through sewer; diameter of ball or mandrel equal to 95% of inside pipe diameter.

Surface Restoration:

Fertilize, seed and mulch all areas in accordance with IDOT section 2601; area of payment to include only that area disturbed by sewer construction and located outside of proposed roadway needs line.

METRIC STANDARD ROAD PLANS					105-4
					09-27-94
The following Standard Road Plans shall be considered applicable to construction work on this project.					
NUMBER	DATE	NUMBER	DATE	NUMBER	DATE
RA-51	10-28-97				
RA-53	10-28-97				
RA-54	3-26-96				

	<p>I hereby certify that this plan was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p> <p style="text-align: right;"><i>H. Robert Veenstra Jr.</i> <i>Sept 18, 2001</i></p> <p>Signature _____ Date _____</p> <p>Printed or Typed Name <u>H. Robert Veenstra Jr.</u></p> <p>My license renewal date is December 31, 2002</p> <p>Pages or sheets covered by this seal: <u>M.01 - M.04</u></p>
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ESTIMATED PROJECT QUANTITIES - DIVISION 2

100-1A
07-15-97

ITEM NO.	ITEM CODE	ITEM	UNIT	TOTAL	AS BUILT QUAN.
1	2105--100100	TOPSOIL STRIP SALVAGE+SPREAD	M3	550	
2	2504--060375	DUCTILE IRON SAN SWR 375 MM	M	92.725	
3	2504--200375	PLASTIC SAN SWR 375 MM	M	193.697	
4	2504--420510	SAN SWR UTILITY ACCESS (PRECAST) (RA-51)	EACH	4	
5	2526--001000	CONSTRUCTION SURVEY	LS	1	
6	2533--100000	MOBILIZATION	LS	1	
7	2601--101100	SEED+FERTILIZE (RURAL)	HA	0.33	
8	2601--104200	MULCH	HA	0.33	

ESTIMATE REFERENCE INFORMATION - DIVISION 2

100-4A
07-15-97

Data listed below is for informational purposes only and shall not constitute a basis for any extra work orders.

ITEM NO.	ITEM CODE	DESCRIPTION
1	2105-100100	Includes area along new sewer route located outside of proposed roadway needs line disturbed by sewer construction; width of area to be stripped shall not exceed 2.5 times the depth of cut from existing surface to bottom of sewer pipe.
2	2504-060375	Includes excavation, disposal of unsuitable or excess excavation, dewatering, handling existing sewer flows, granular bedding, pipe, fittings, polyethylene wrap, compacted backfill with moisture and density control and testing.
3	2504-200375	Includes excavation, disposal of unsuitable or excess excavation, dewatering, handling existing sewer flows, granular bedding, pipe, fittings, compacted backfill with moisture and density control and testing.
4	2504-420510	Includes excavation, disposal of unsuitable or excess excavation, dewatering, handling existing sewer flows, precast concrete utility access, steps, adjustment rings, special invert shaping, frame and cover, anchoring of frame, waterproofing, compacted backfill with moisture and density control and testing.
5	2526-001000	Includes verification of existing utility elevations and locations and all staking for sanitary sewer construction.
6	2533-100000	Includes mobilization of labor, equipment and materials to project site for sewer construction.
7	2601-101100	Includes area along new sewer route located outside proposed roadway needs line disturbed by sewer construction.
8	2601-104200	Includes area along new sewer route located outside proposed roadway needs line disturbed by sewer construction.

LIST OF INTAKES AND UTILITY ACCESSSES

104-5A
09-27-94

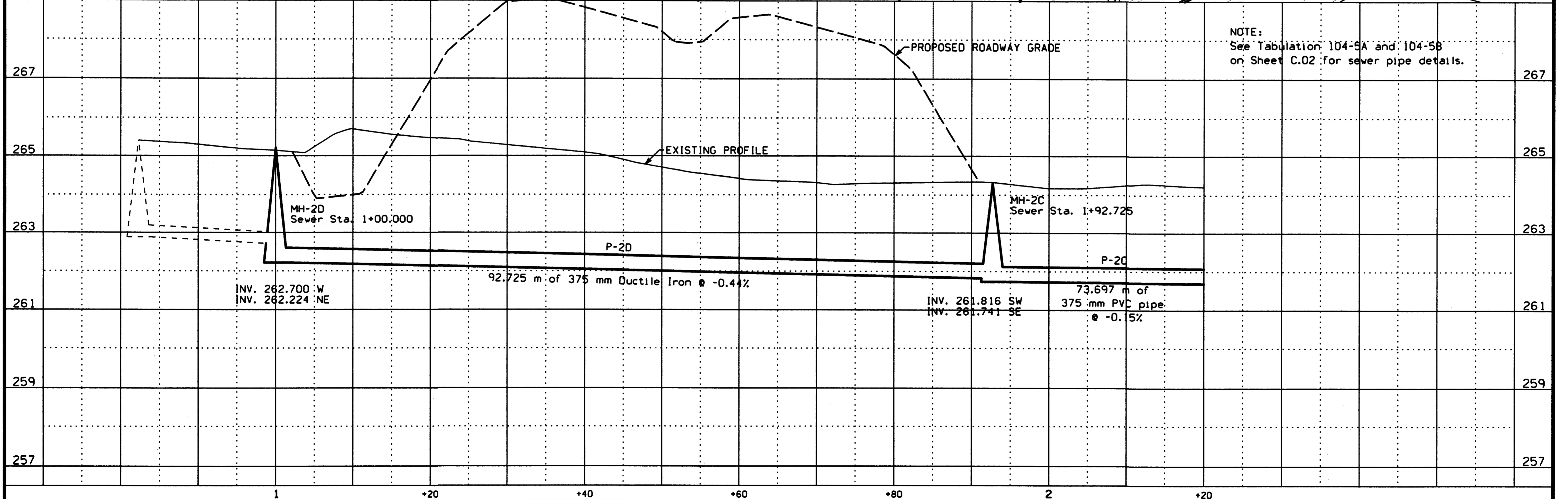
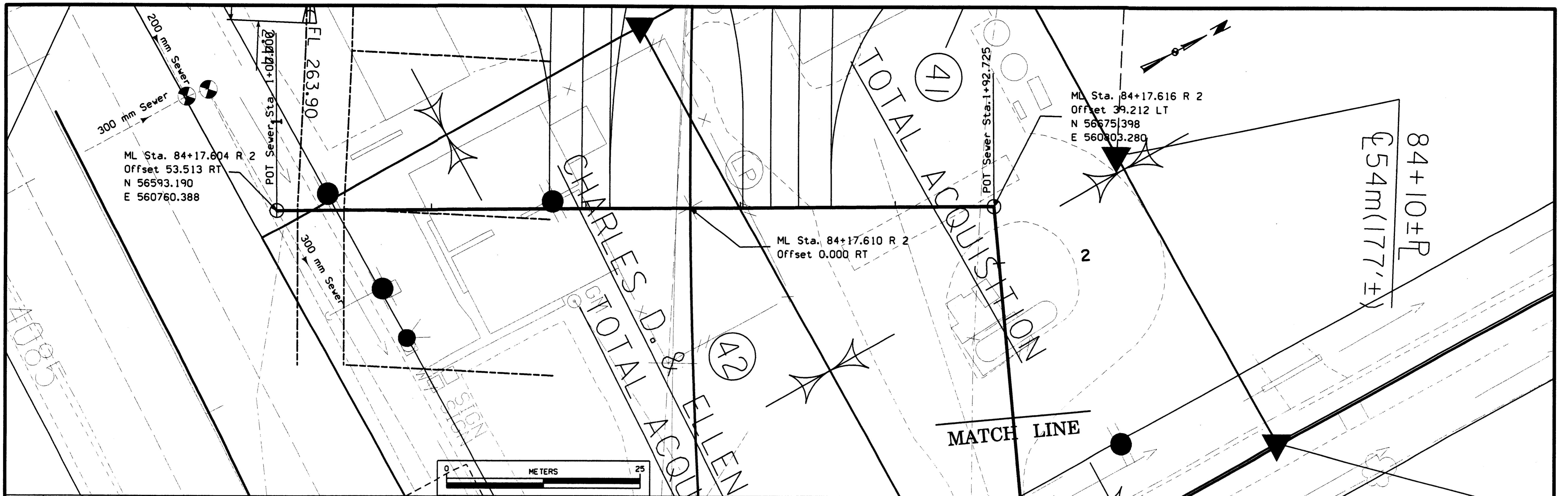
NUMBER	LOCATION	TYPE OR STANDARD ROAD PLAN	FORM GRADE Elev.	BOTTOM WELL Elev.	NOTE
2A	ML Sta. 86+20.609 R2 Offset 31.228 Lt.	RA-51	262.550	261.285	Flat top (1)
2B	ML Sta. 84+95.230 R2 Offset 41.976 Lt.	RA-51	264.330	261.515	Eccentric long cone (1)
2C	ML Sta. 84+17.616 R2 Offset 39.212 Lt.	RA-51	264.360	261.630	Eccentric long cone (1)
2D	ML Sta. 84+17.604 R2 Offset 53.513 Rt.	RA-51	265.212	261.115	Eccentric long cone (1)

(1) Frame and cover: RA-54 Type 2

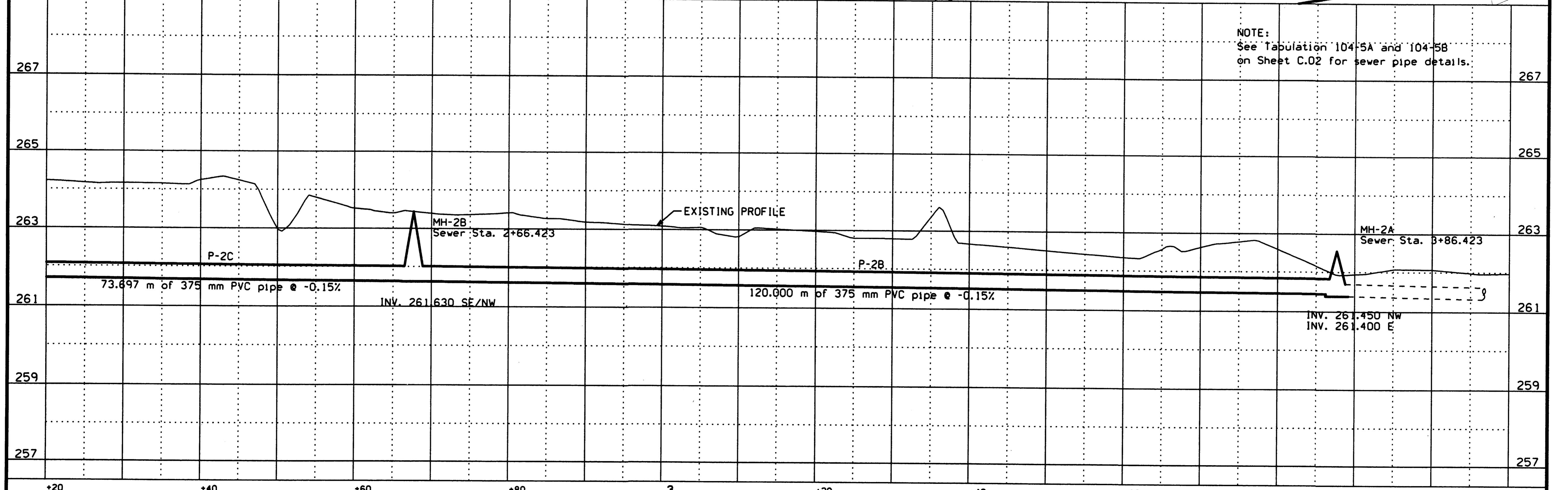
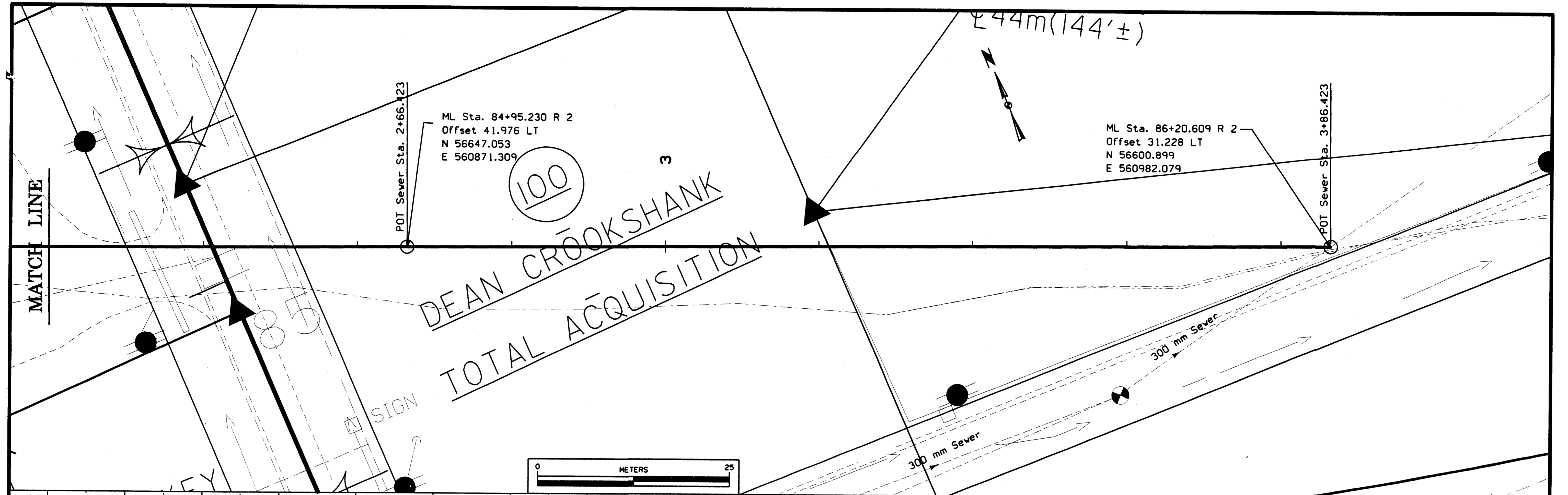
LIST OF SANITARY SEWER PIPE

104-5B
MODIFIED

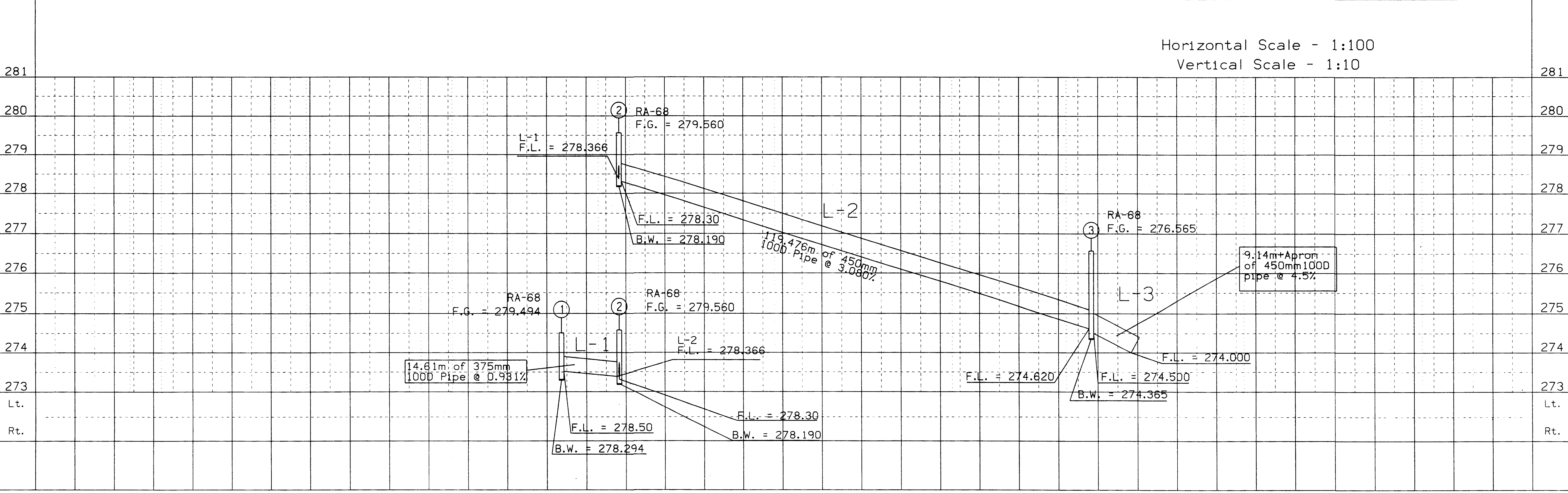
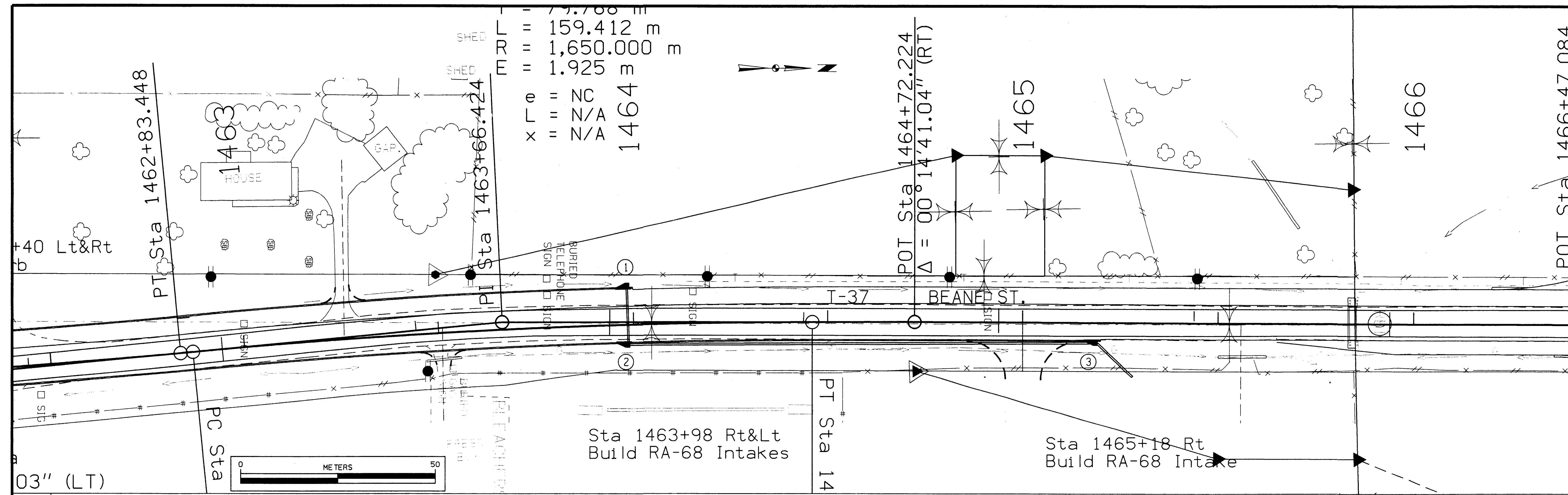
LINE NUMBER	LOCATION		TYPE	PIPE DIAMETER mm	LENGTH OF LINE m	SLOPE %	FLOW LINES			PIPE PROFILE SHEET NO.	NOTE
	From	To					INLET Elevation	OUTLET Elevation	OTHER Elevation		
P-2B	2B	2A	Plastic	375	120.000	-0.15	261.630	261.450		M.02	Verify existing pipe elevation and location
P-2C	2C	2B	Plastic	375	73.697	-0.15	261.741	261.630		M.01 & M.02	
P-2D	2D	2C	Ductile Iron	375	92.725	-0.44	262.224	261.816		M.01	Verify existing pipe elevation and location



Part 2 of 2
NHSX-30-5(166)

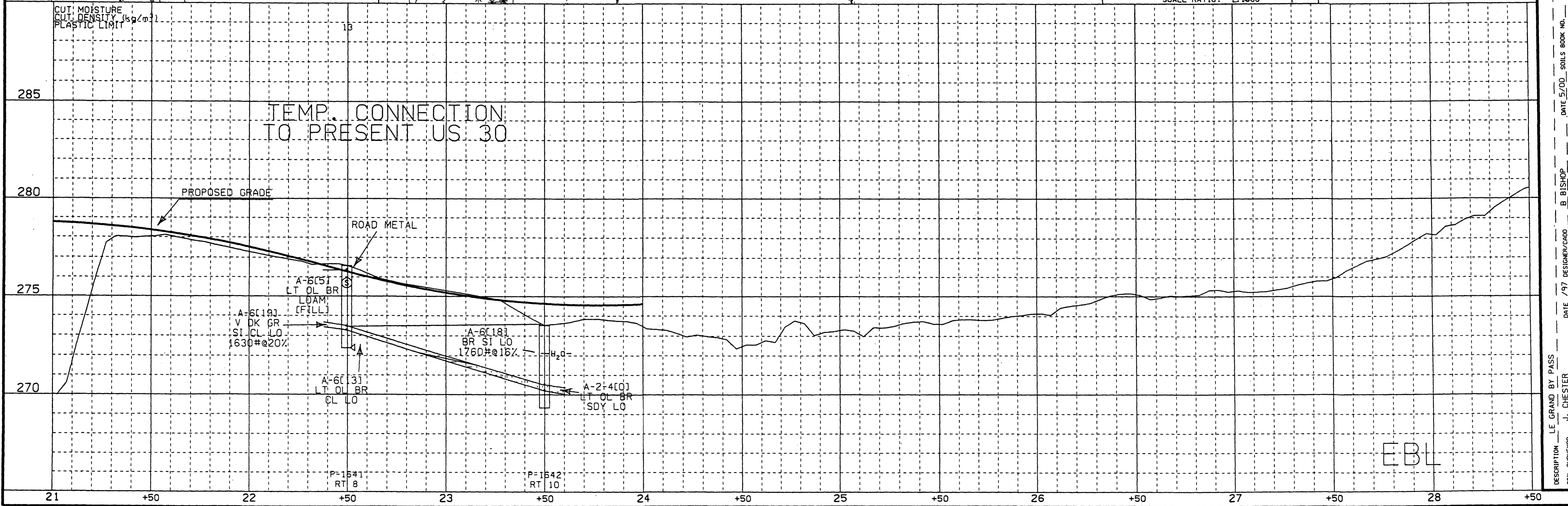
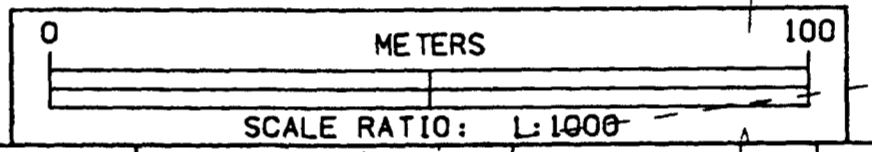
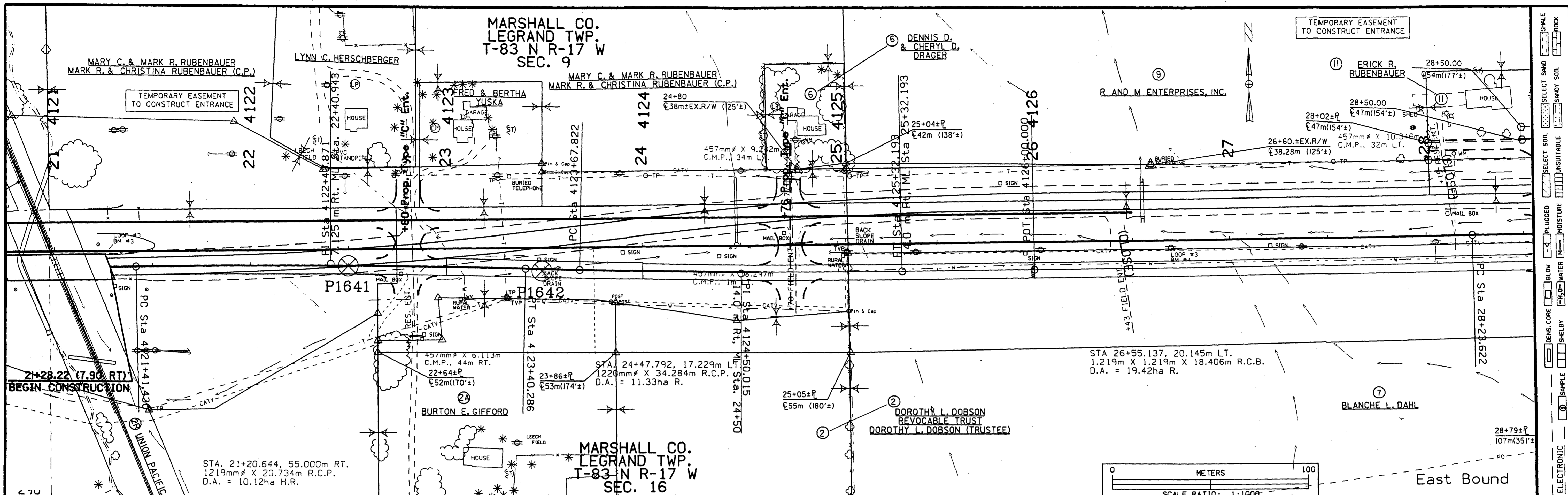


NOTE:
See Tabulation 104-5A and 104-5B
on Sheet C.02 for sewer pipe details.



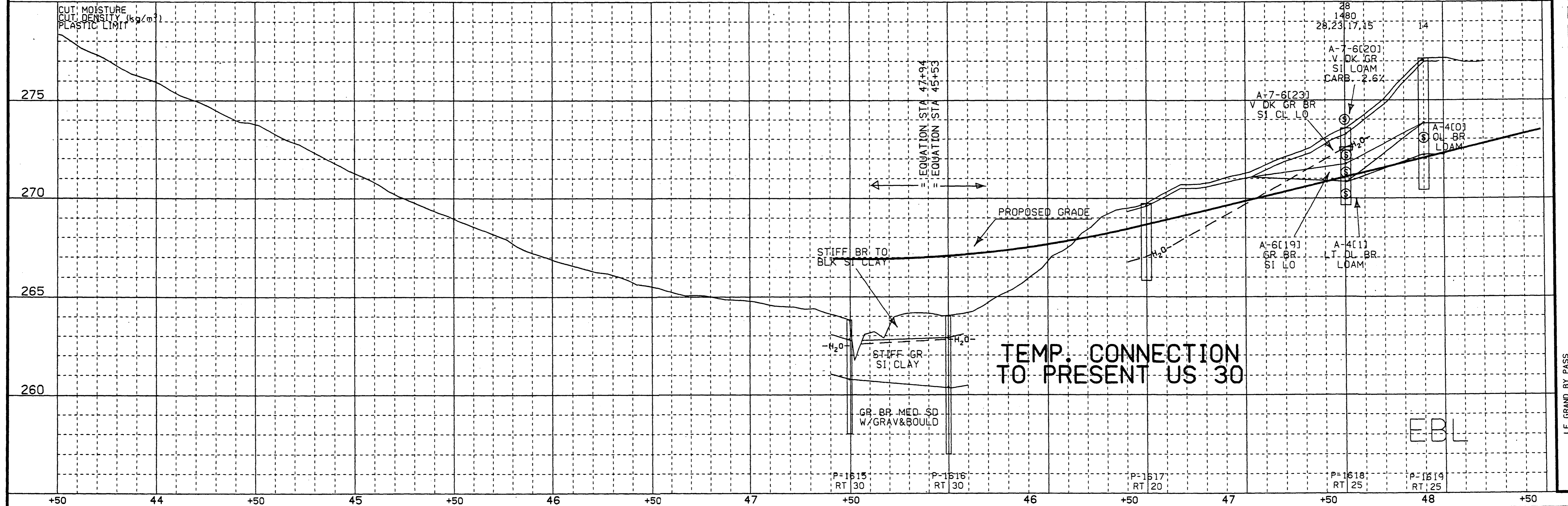
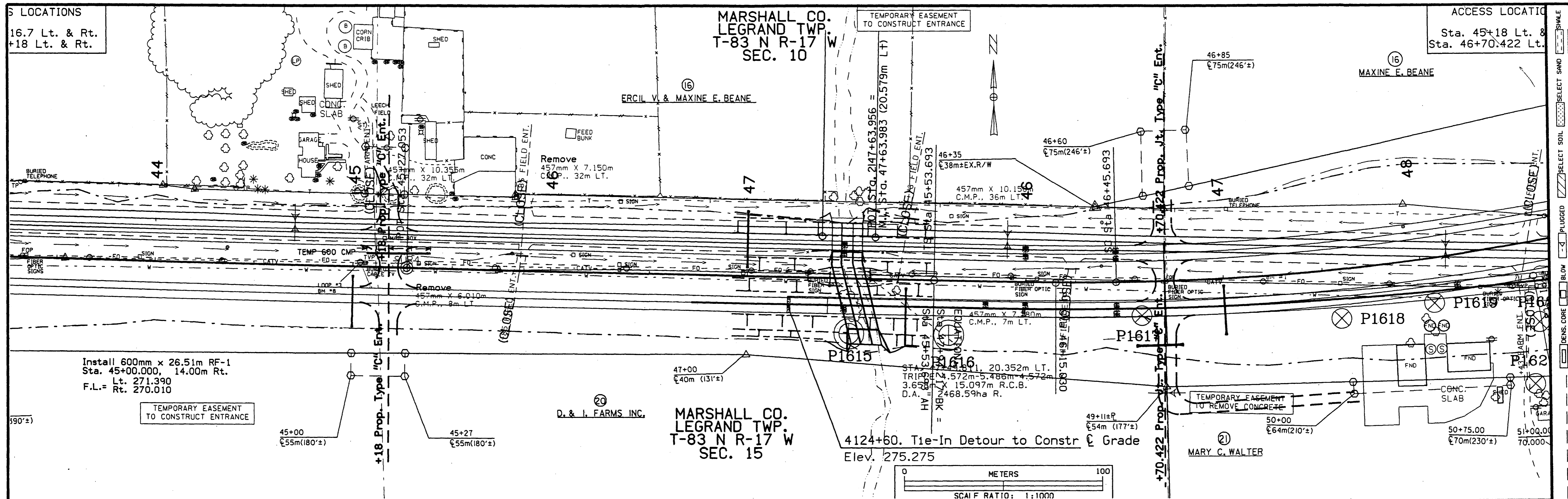
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LEGRAND TWP.
T-83 N R-17 W
SEC. 9

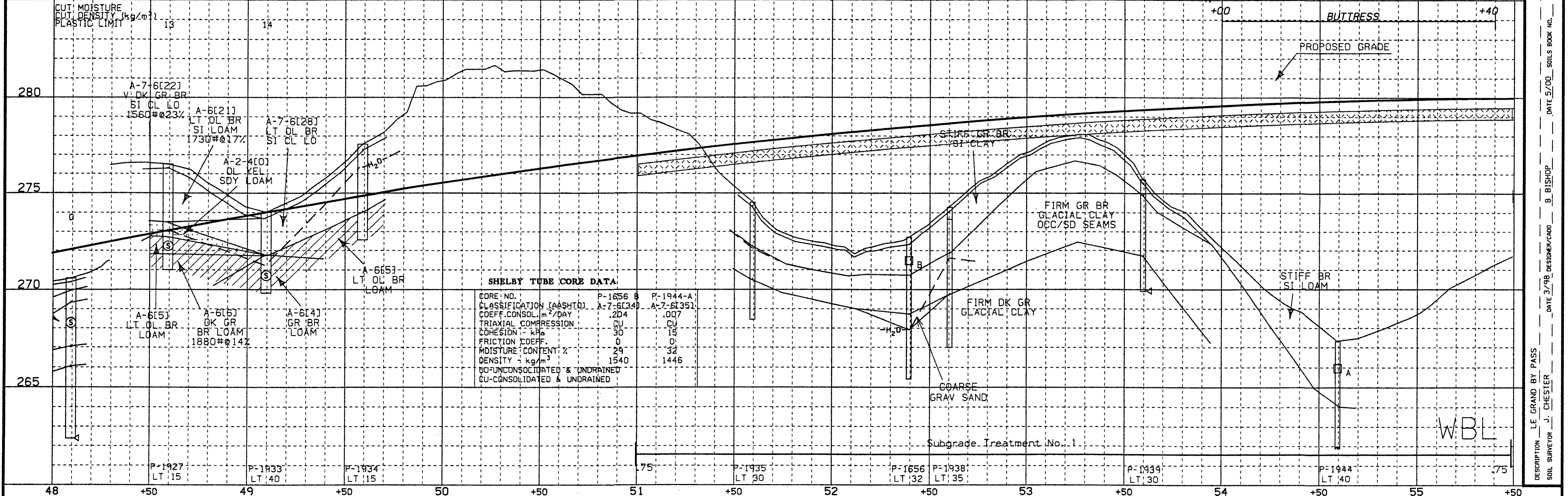
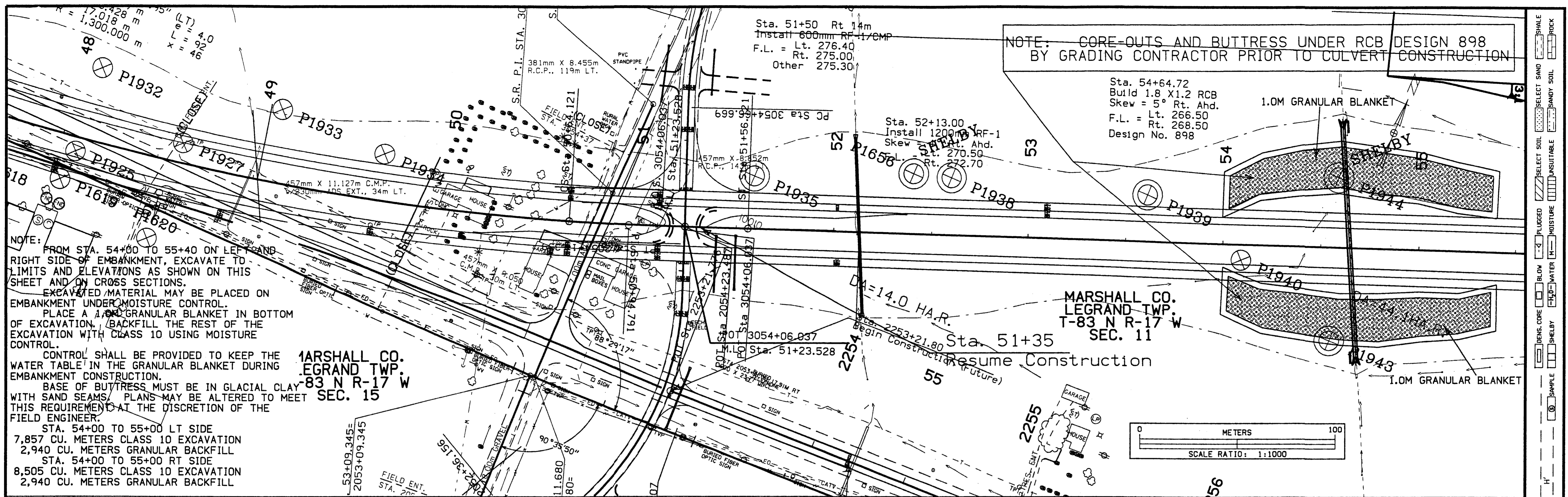
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LEGRAND TWP.
T-83 N R-17 W
SEC. 16



SHALE
 SANDY SOIL
 UNSUITABLE
 MOISTURE
 PLUGGED
 BLOW
 DENS. CORE
 SHELBY
 SAMPLE
 ELECTRONIC
 SOILS BOOK NO.
 DATE 5/00
 DESIGNER/CADD B. BISHOP
 SOIL SURVEYOR J. CHESTER
 DESCRIPTION LE GRAND BY PASS

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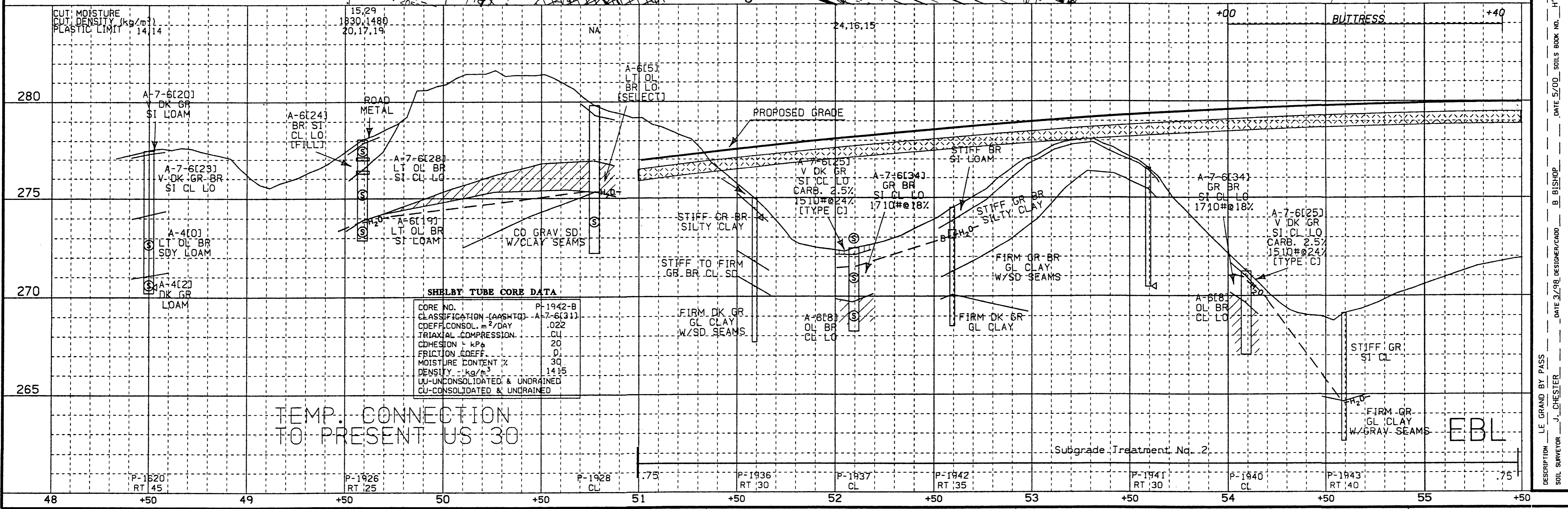
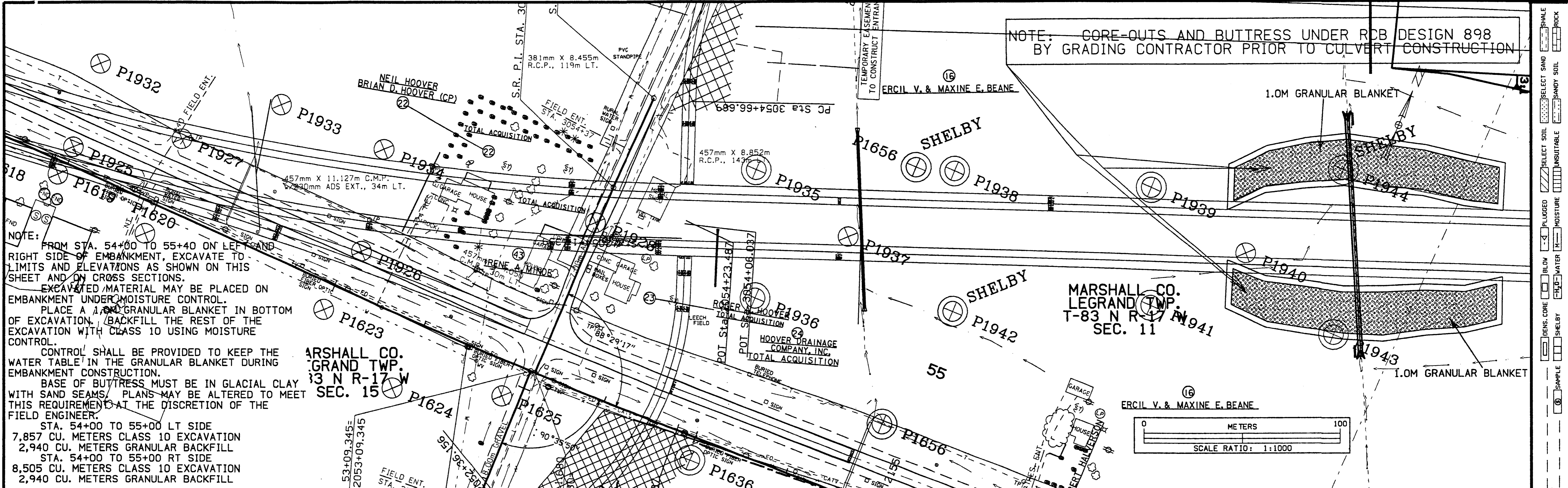


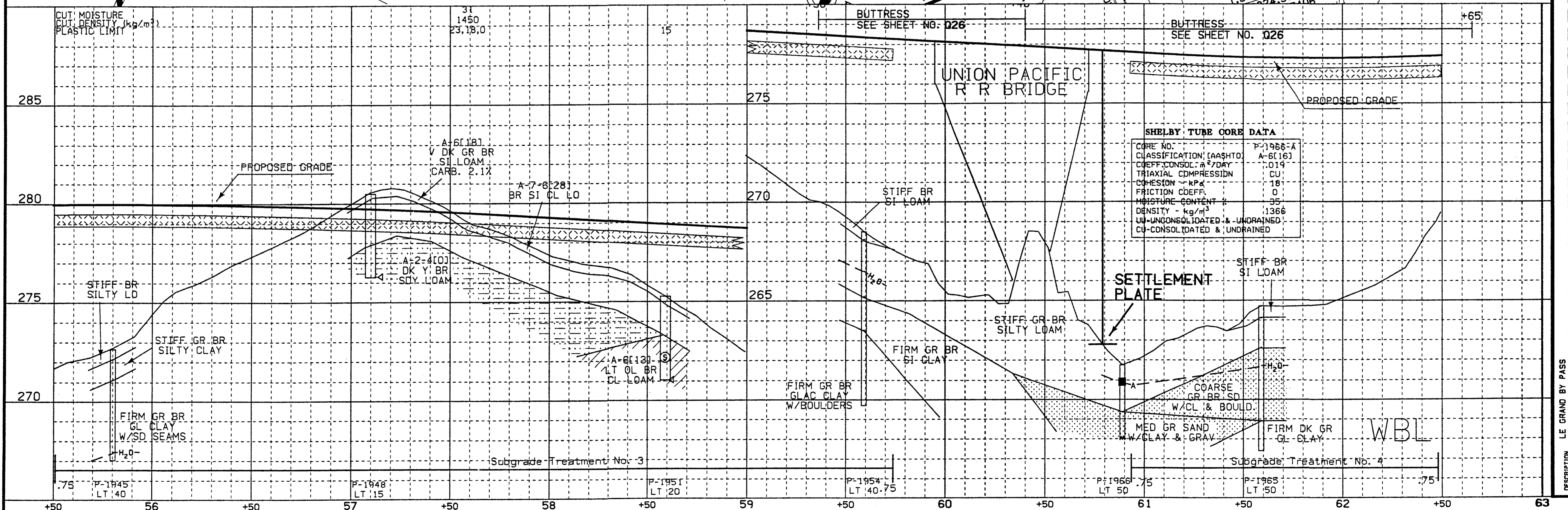
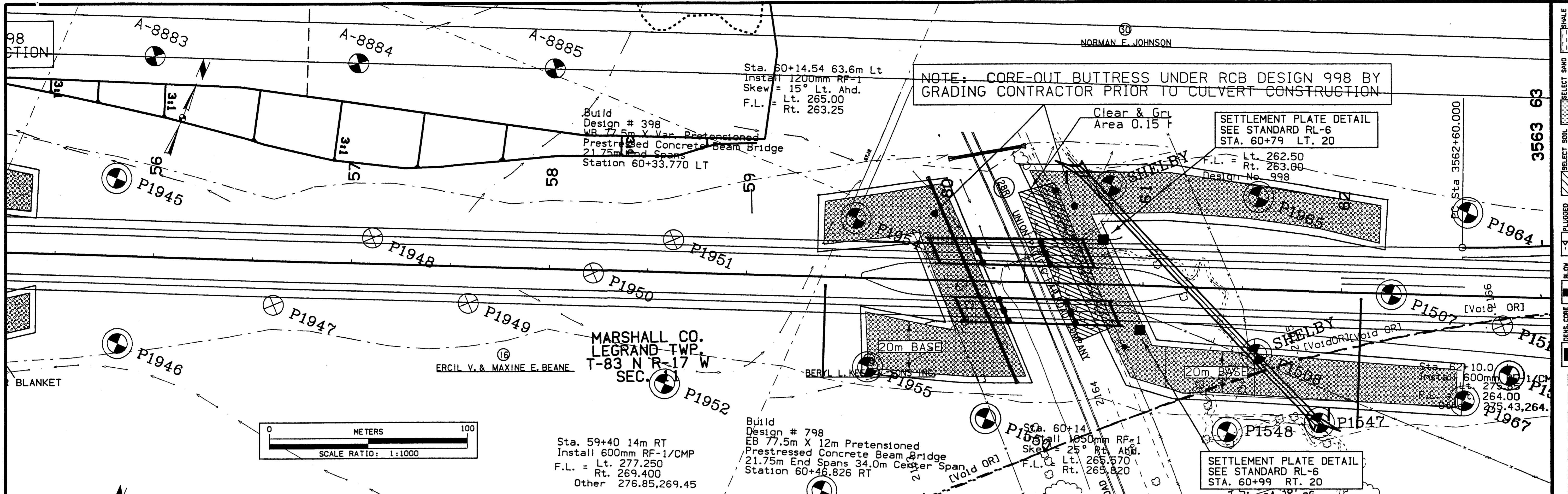


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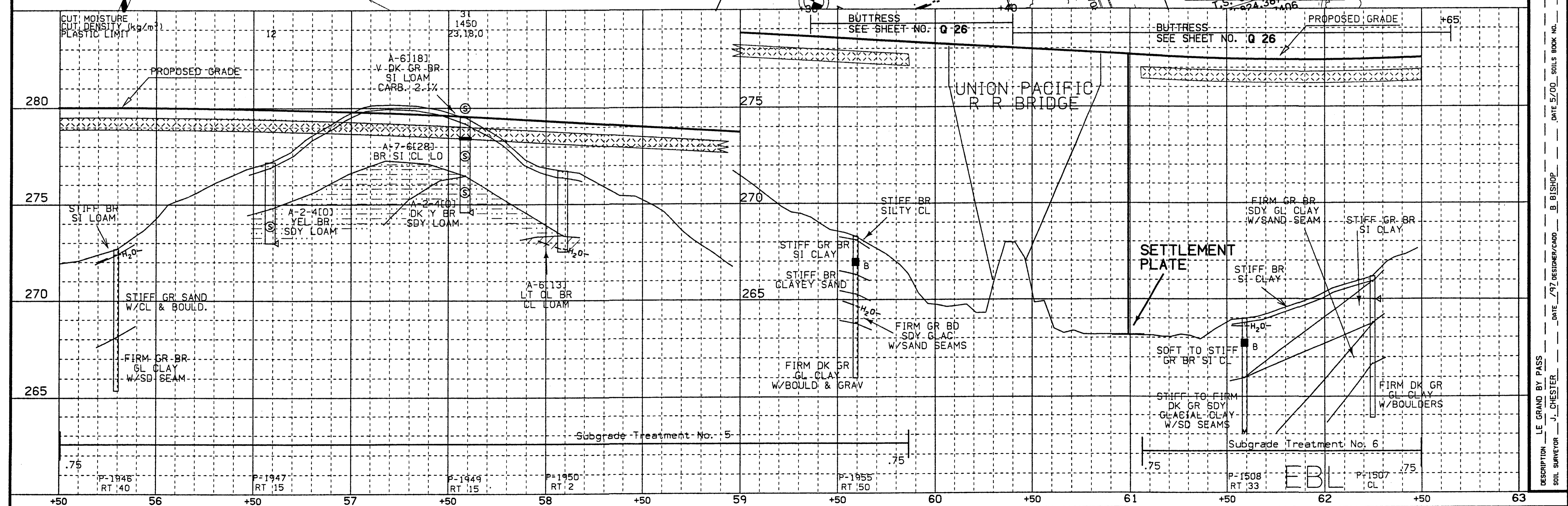
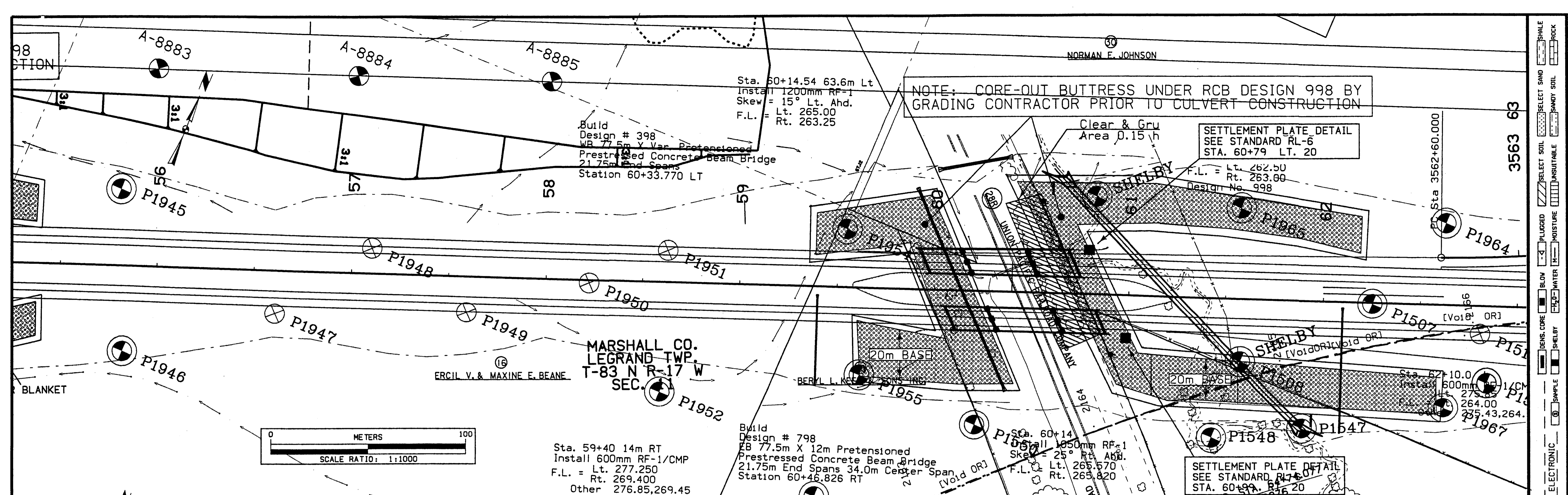
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CLASSIFICATION (AASHTO)	A-7-6(34)	A-7-6(35)
COEFF. CONSOL. m^2/day	.204	.007
TRIAxIAL COMPRESSION	CU	CU
COHESION - kPa	30	15
FRICTION COEFF.	0	0
MOISTURE CONTENT %	29	32
DENSITY - kg/m^3	1540	1446
UU-UNCONSOLIDATED & UNDRAINED		
CU-CONSOLIDATED & UNDRAINED		

SOIL SURVEYOR J. CHESTER DATE 3/98 DESIGNER/CADD B. BISHOP DATE 5/00 SOILS BOOK NO. H' SAMPLE UNSUITABLE SANDY SOIL SHALE ROCK

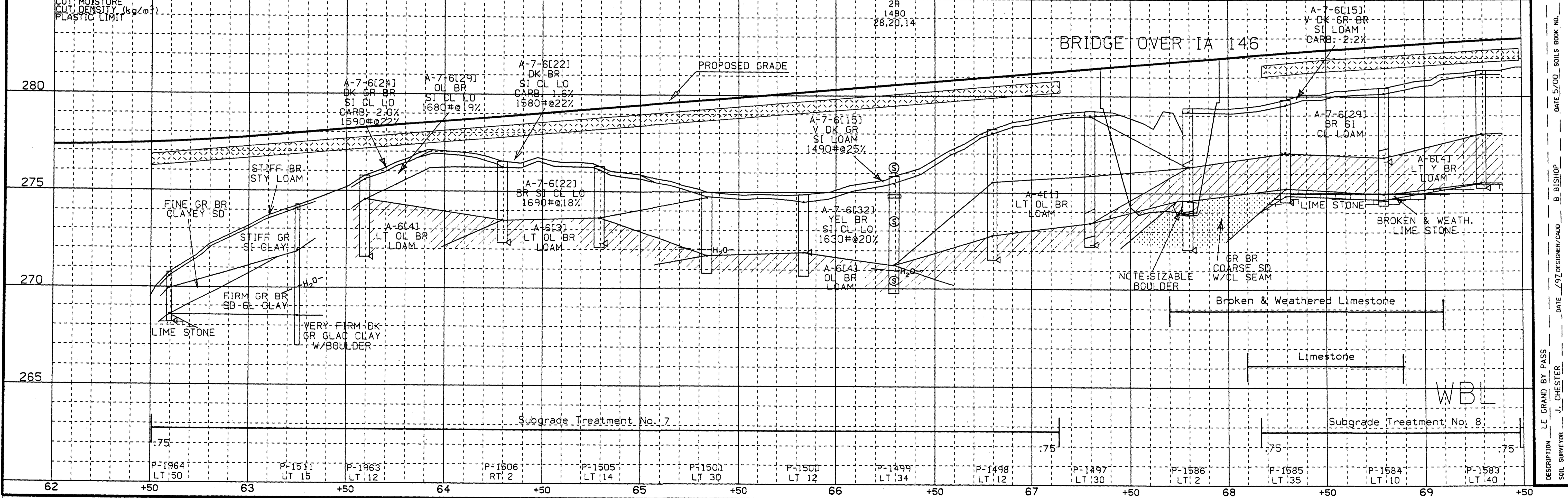
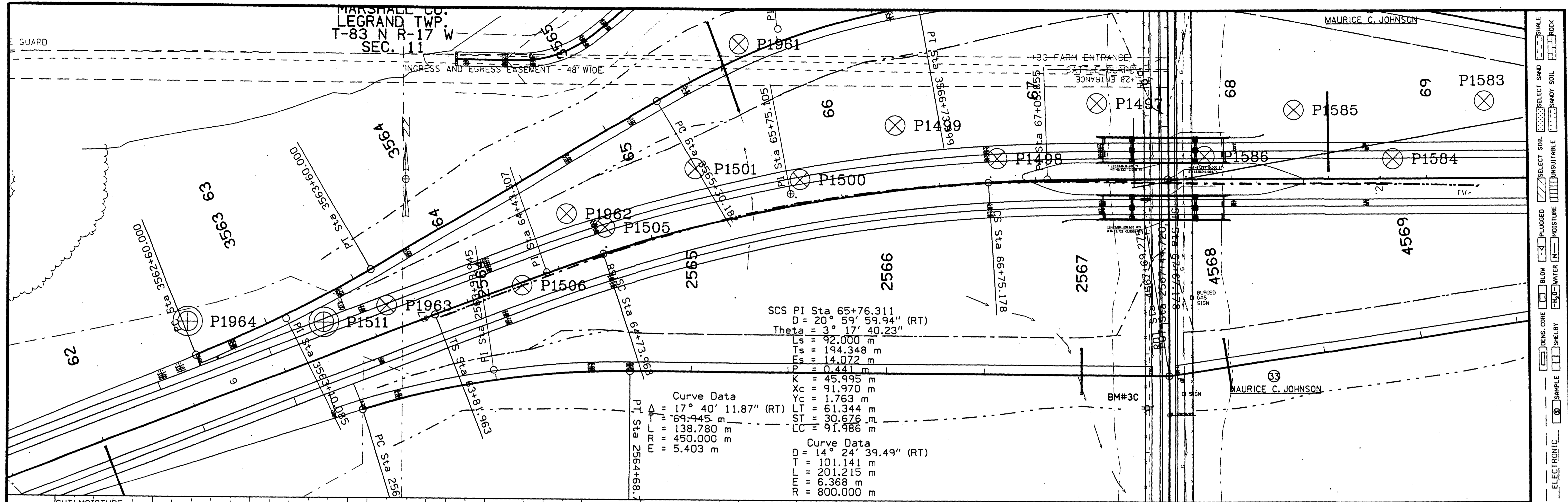




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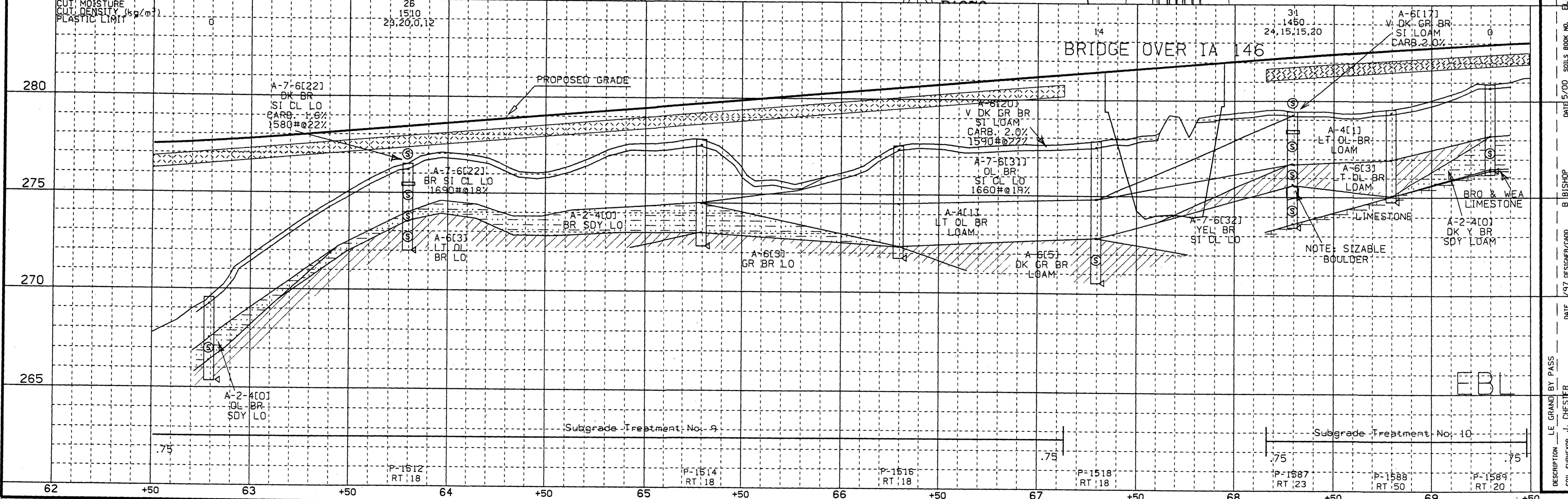
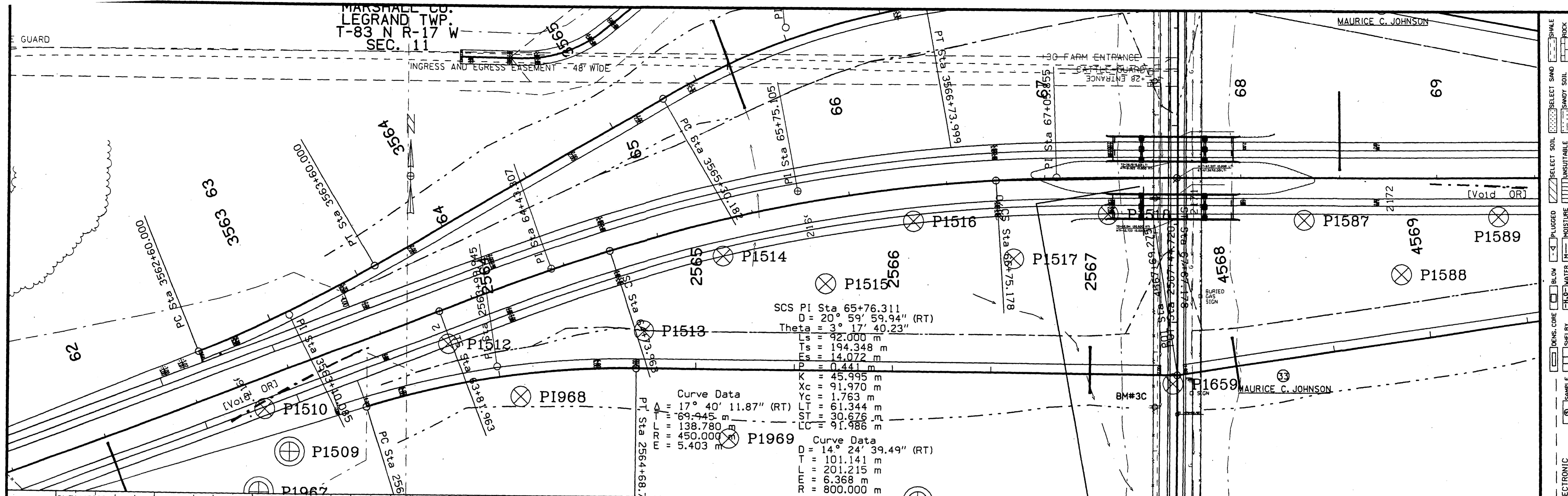


SOIL SURVEYOR J. CHESTER DATE /97 DESIGNER/CADD B. BISHOP DATE 5/00 SOILS BOOK NO. ELECTRONIC SAMPLE SHELBY DENS. CORE BLOW PLUGGED SELECT SOIL SELECT SAND SHALE ROCK



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MARSHALL CO.
LEGRAND TWP.
T-83 N R-17 W
SEC. 11

Mainline Curve Data
SCS PI Sta 74+46.812
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Theta = $1^\circ 52' 57.27''$
Ls = 92.000 m
Ts = 434.695 m
Es = 53.200 m
Pv = 0.252 m
Kk = 45.998 m
Xc = 91.990 m
Yc = 1.008 m
L1 = 61.337 m
L2 = 30.670 m
Lc = 91.996 m

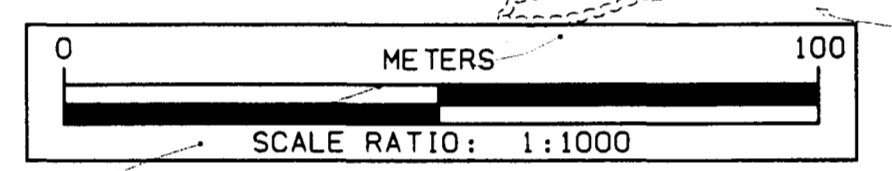
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l = 92
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1583
58+50.00
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Lt. 275.50
Rt. 281.20

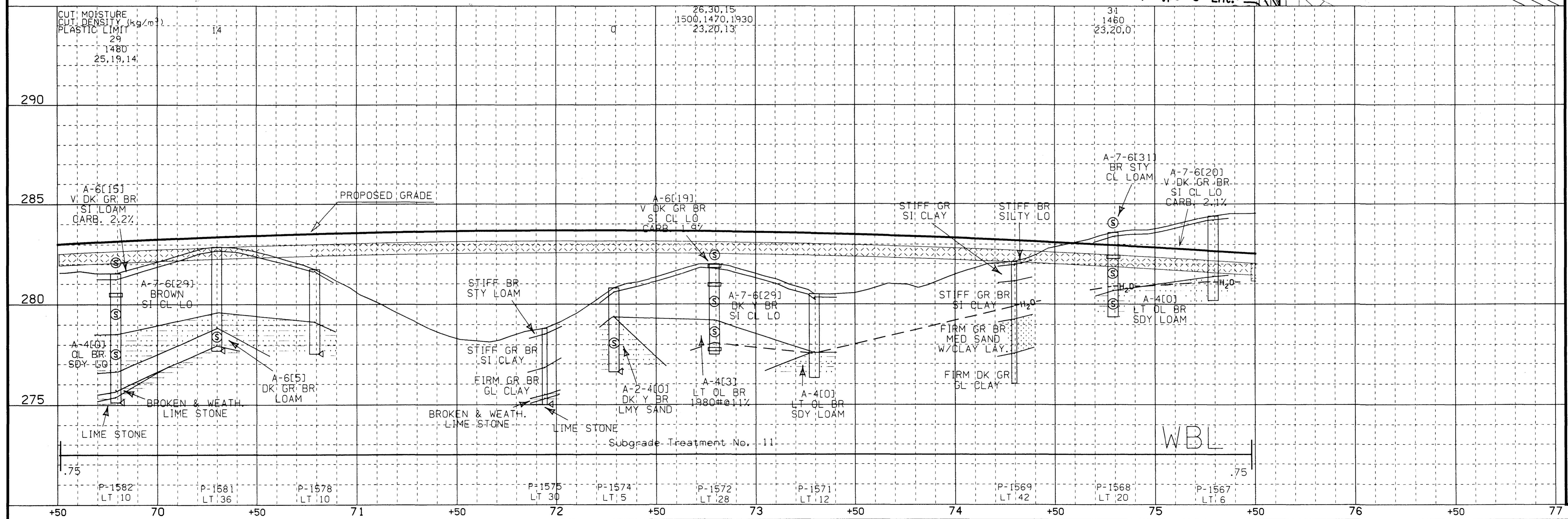
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Skew = 36° Lt. Ahd.
F.L. = Lt. 279.60
Rt. 276.20

Sta. 73+87.00
Install 900mm RF-1
Skew = 40° Lt. Ahd.
F.L. = Lt. 281.20
Rt. 279.70

Sta. 75+40.00 14m RC
Install 600mm RF-1
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Rt. 280.50
Sta. 75+46.50
Type "M" Dike
El. 281.90



04 Rt 14m



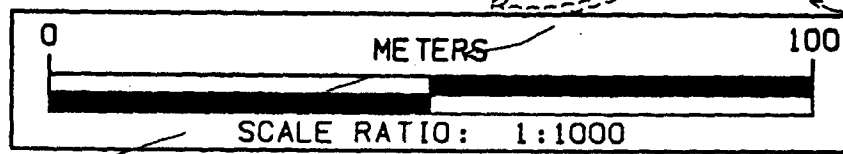
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SOIL SURVEYOR

MARSHALL CO.
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SEC. 11

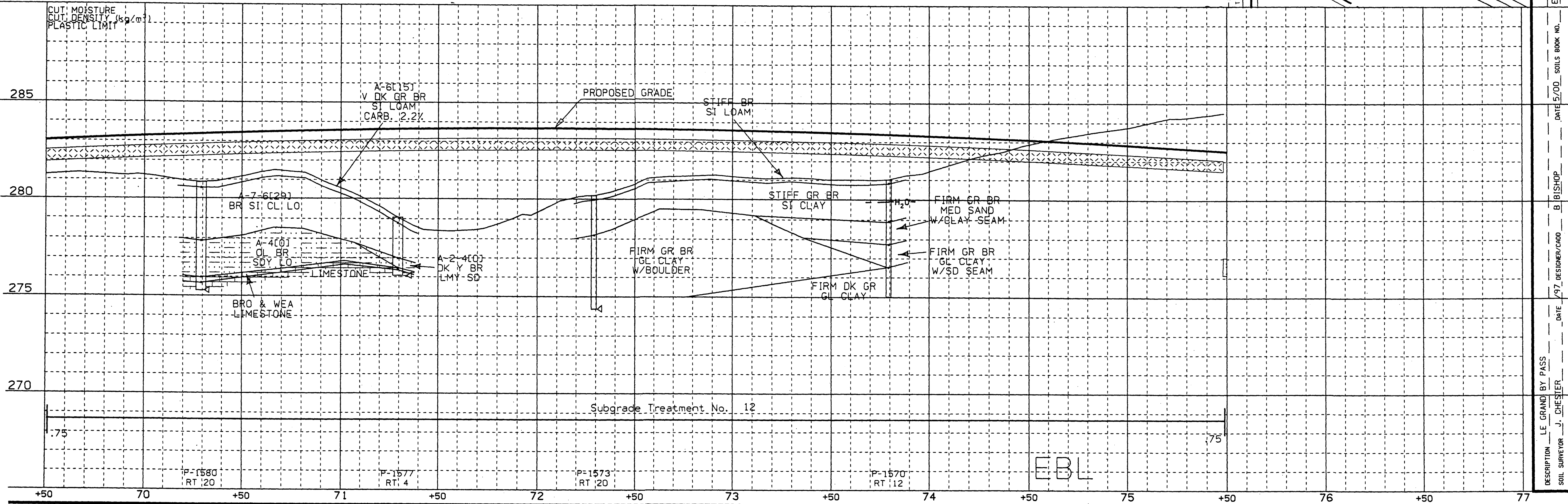
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 Es = 53.200 m
 P = 0.252 m
 K = 45.998 m
 Yc = 91.990 m
 Yc = 1.008 m
 LT = 61.337 m
 ST = 30.670 m
 LC = 91.996 m

Curve Data
 $\Delta = 27^\circ 15' 47.32''$ (RT)
 T = 339.512 m
 L = 666.164 m
 E = 40.579 m
 R = 1,400.000 m

Curve Data
 $19^\circ 18' 39.19''$ (RT)
 E = 119.093 m
 E = 235.927 m
 E = 700.000 m
 E = 10.059 m



- SHALE
- SELECT SAND
- SELECT SOIL
- UNSATURABLE
- MOISTURE
- PLUGGED
- BLow
- WATER
- DEMS CORE
- SHELBY
- SAMPLE
- ELECTRONIC
- SOILS BOOK NO.
- BISHOP
- DESIGNER/PAO
- DATE
- BY PASS
- CHESTER
- DATE
- SOIL SURVEYOR



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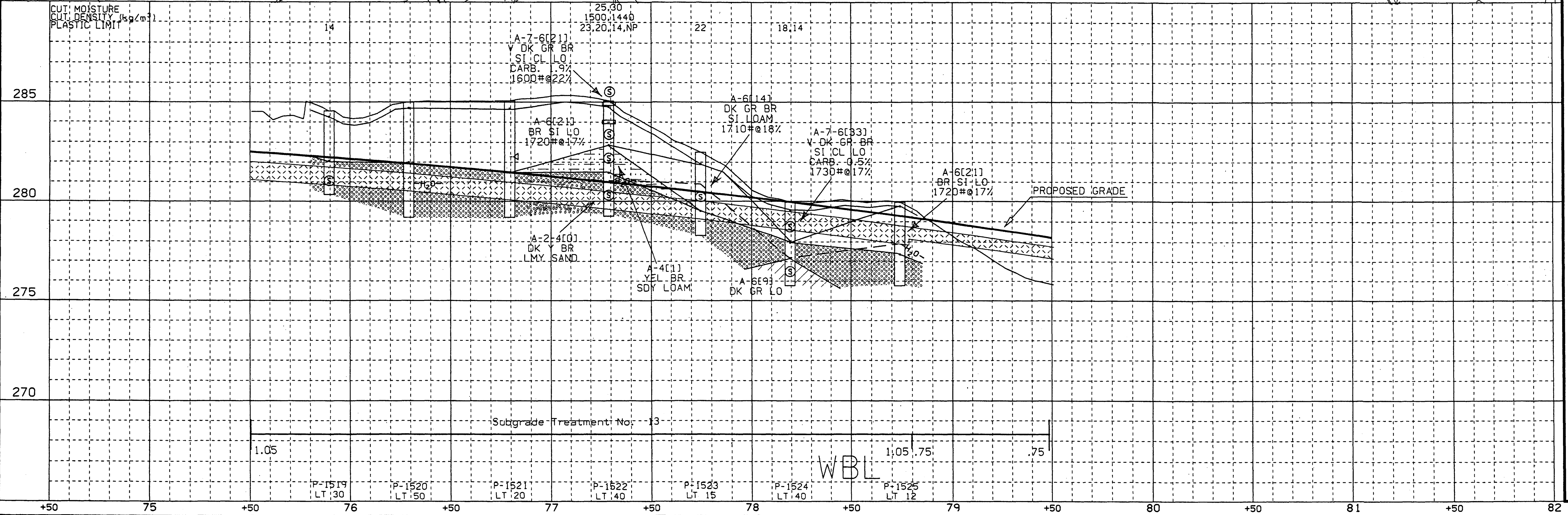
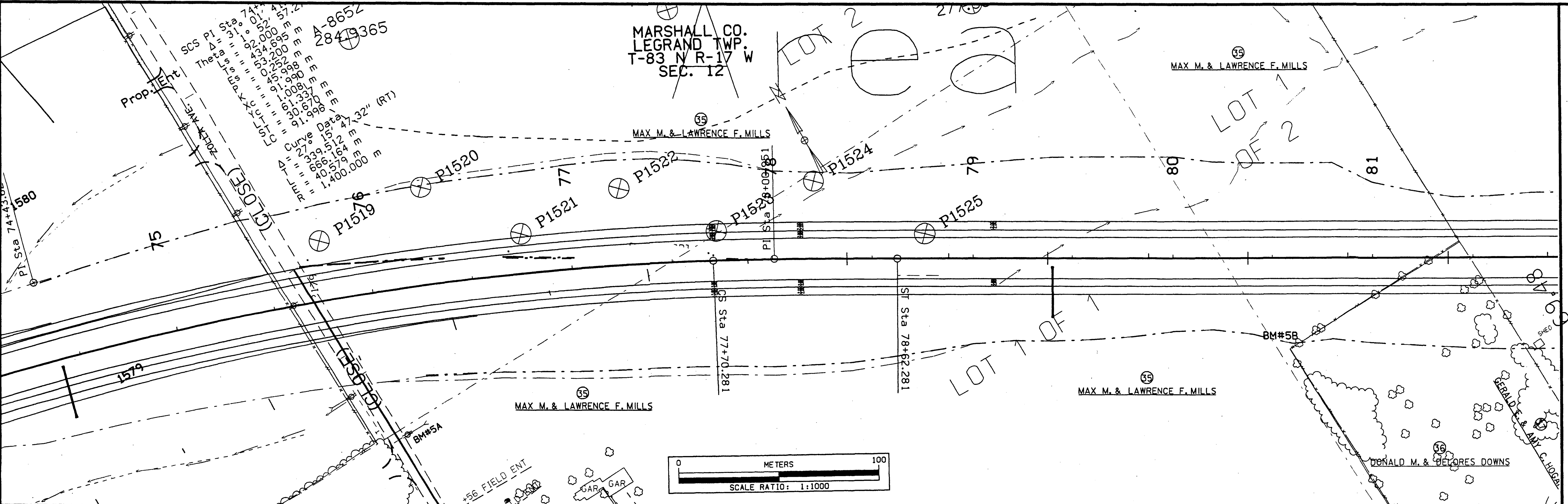
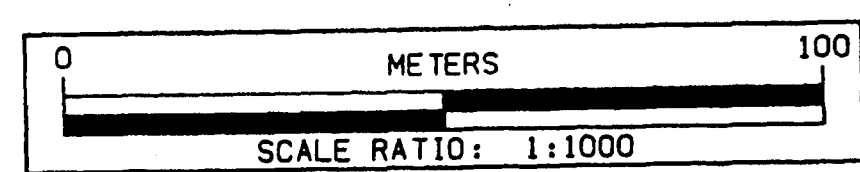
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LEGRAND TWP.
T-83 N R-17 W
SEC. 12

MAX M. & LAWRENCE F. MILLS

MAX M. & LAWRENCE F. MILLS

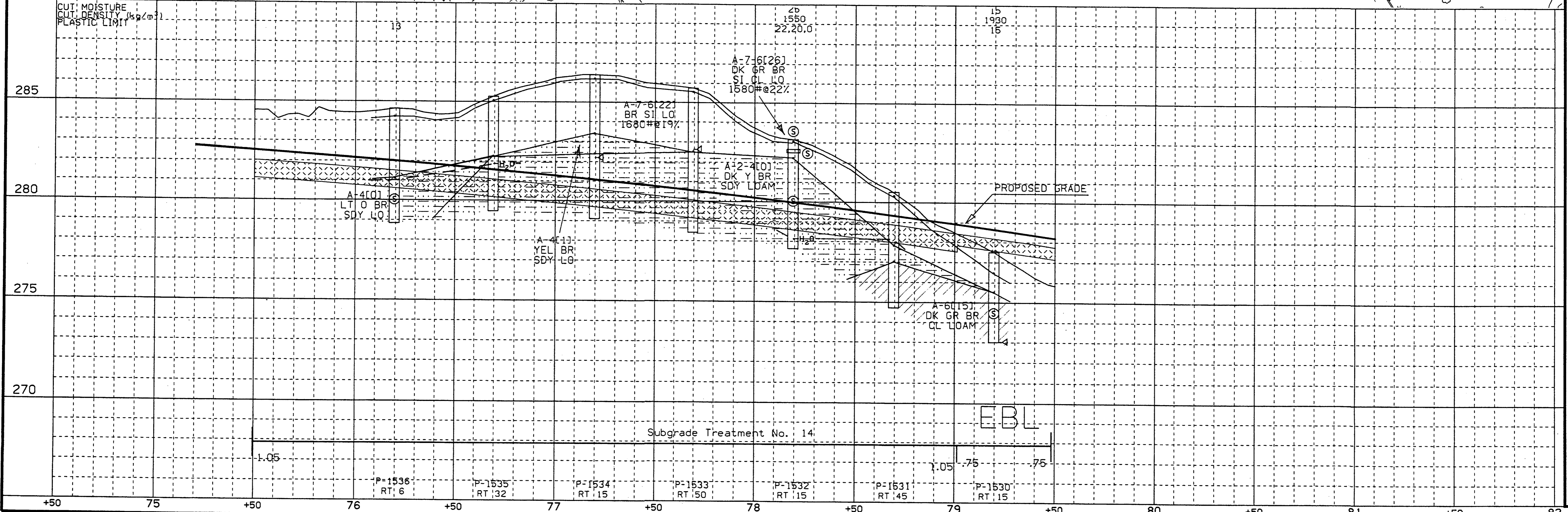
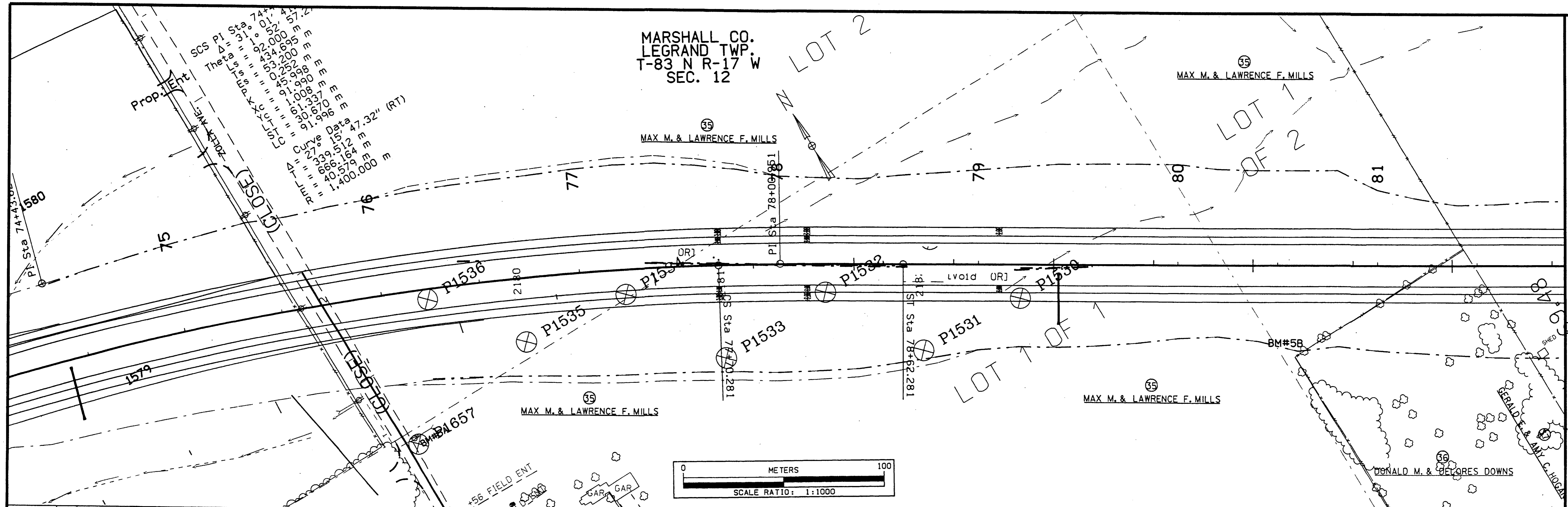
MAX M. & LAWRENCE F. MILLS

DONALD M. & DELORES DOWNS



SHALE
SELECT SAND
SANDY SOIL
SELECT SOIL
UNDESIRABLE
UNDESIRABLE
PLUGGED
MOISTURE
BLON
WATER
DENS. CORE
SHELBY
SAMPLE
DATE
DESIGNER/CADD
B. BISHOP
DATE
DESCRIPTION
LE GRAND BY PASS
SOIL SURVEYOR

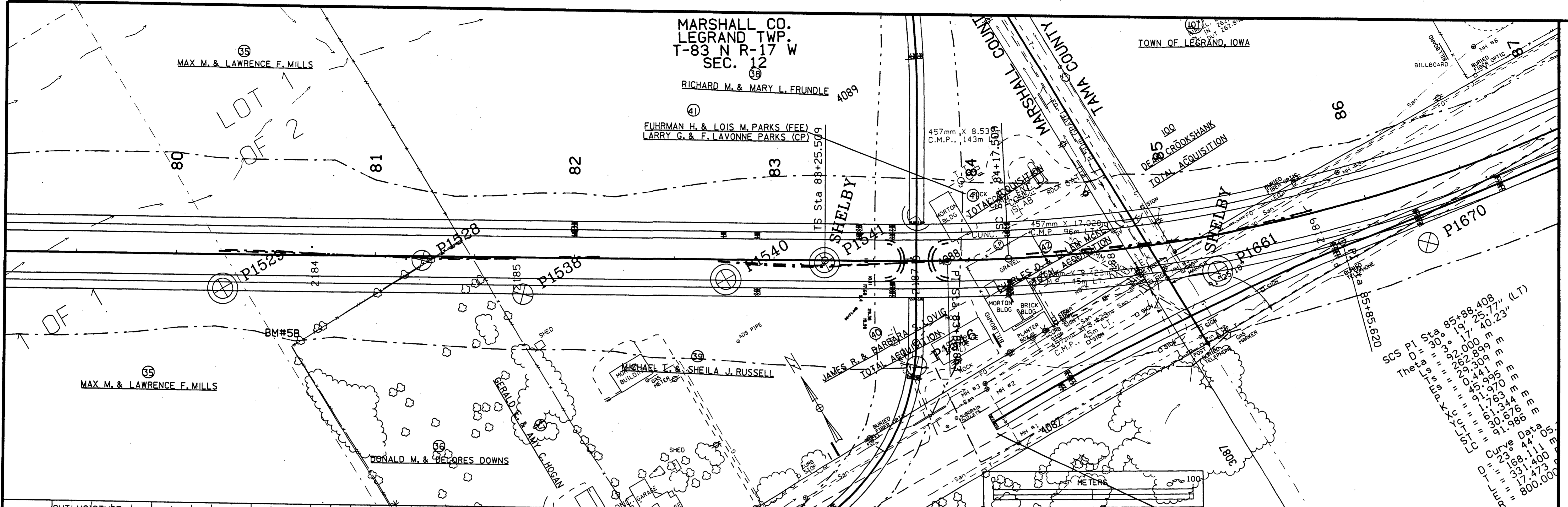
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LEGRAND TWP.
T-83 N R-17 W
SEC. 12



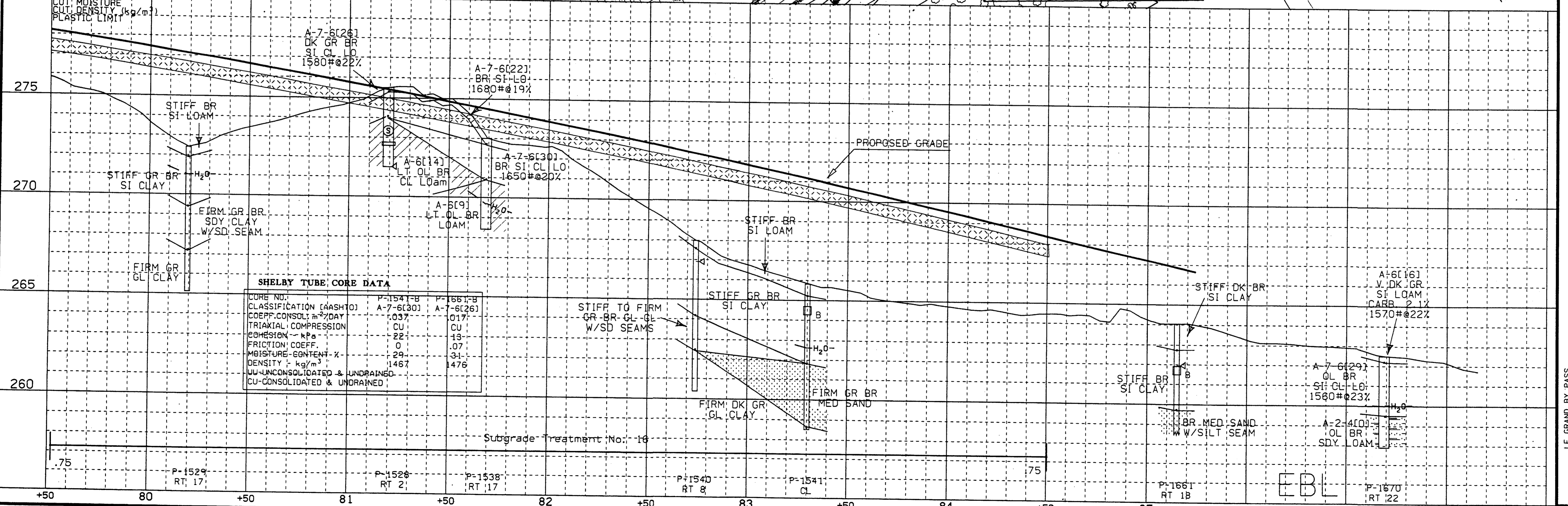
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SOIL SURVEYOR J. CHESTER
DATE /97 DESIGNER/CADD B. BISHOP
DATE 5/00 SOILS BOOK NO. ELECTRONIC
SAMPLE SHELBY
DENS. CORE
BLOW
WATER
MOISTURE
PLUGGED
SELECT SOIL
INSUITABLE
SANDY SOIL
SELECT SAND
SHALE
ROCK

MARSHALL CO.
LEGRAND TWP.
T-83 N R-17 W
SEC. 12

TOWN OF LEGRAND, IOWA



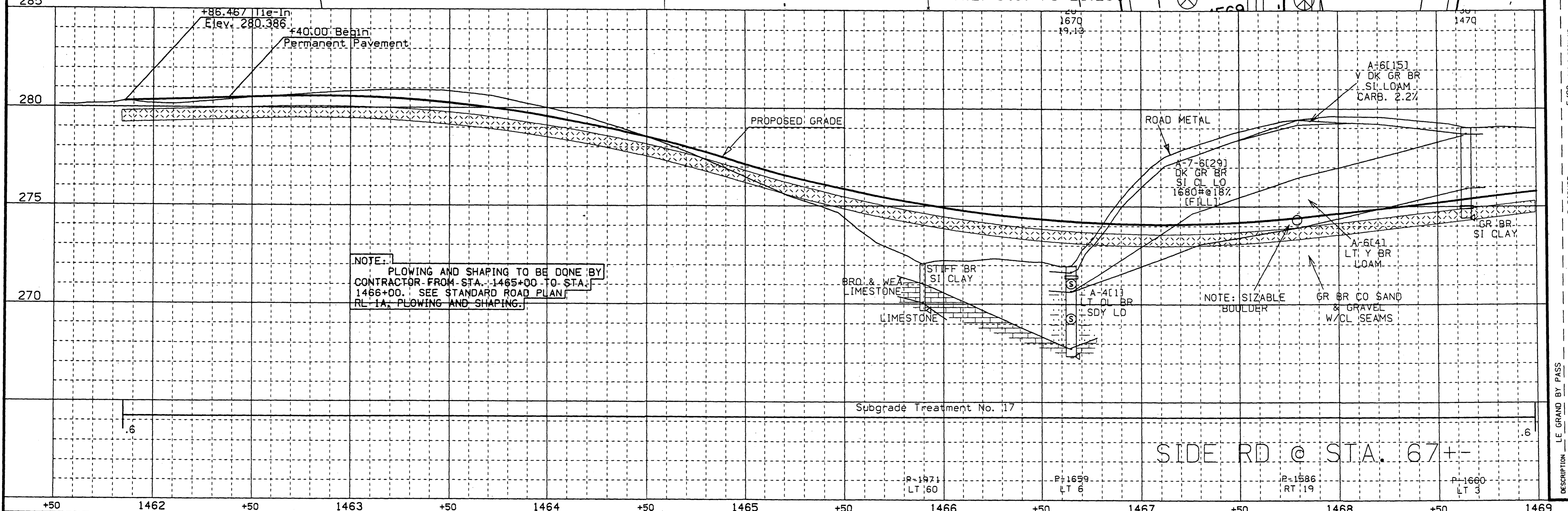
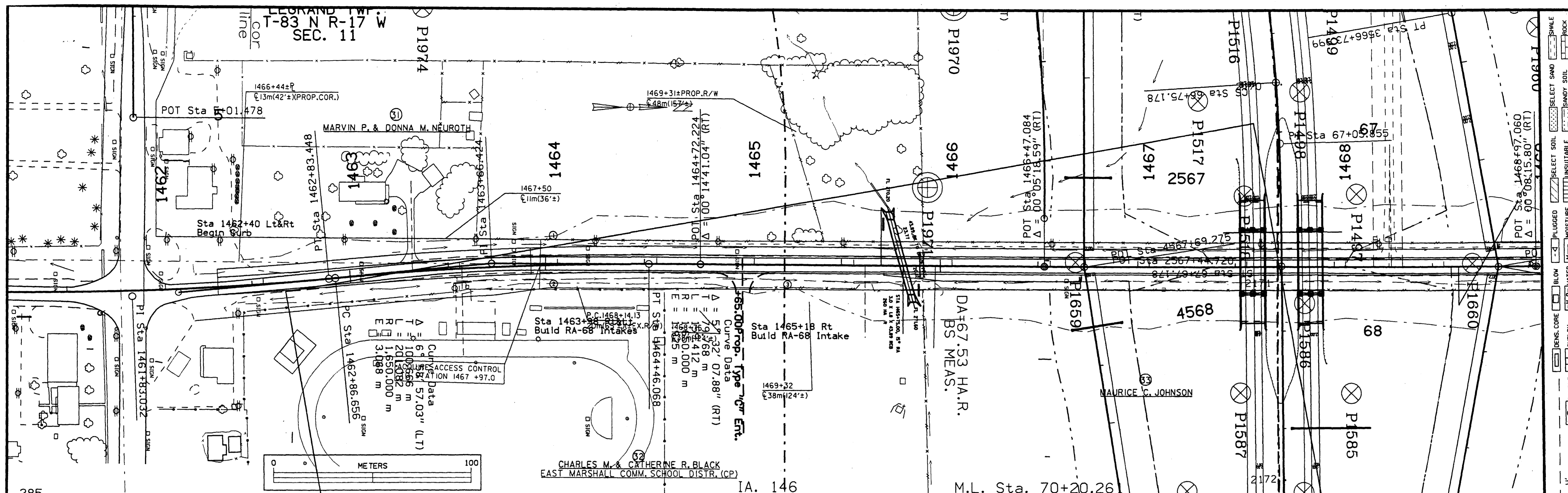
SCS PI Sta 85+88.408
D = 30.000 19.7 25.77" (LT)
Theta = 262.000 40.23"
L = 29.309 m
L = 45.441 m
L = 91.995 m
L = 161.334 m
L = 30.676 m
L = 91.988 m
L = 17.344 m
L = 44.051 m
L = 131.400 m
L = 17.473 m
L = 800.000 m



SHELBY TUBE CORE DATA

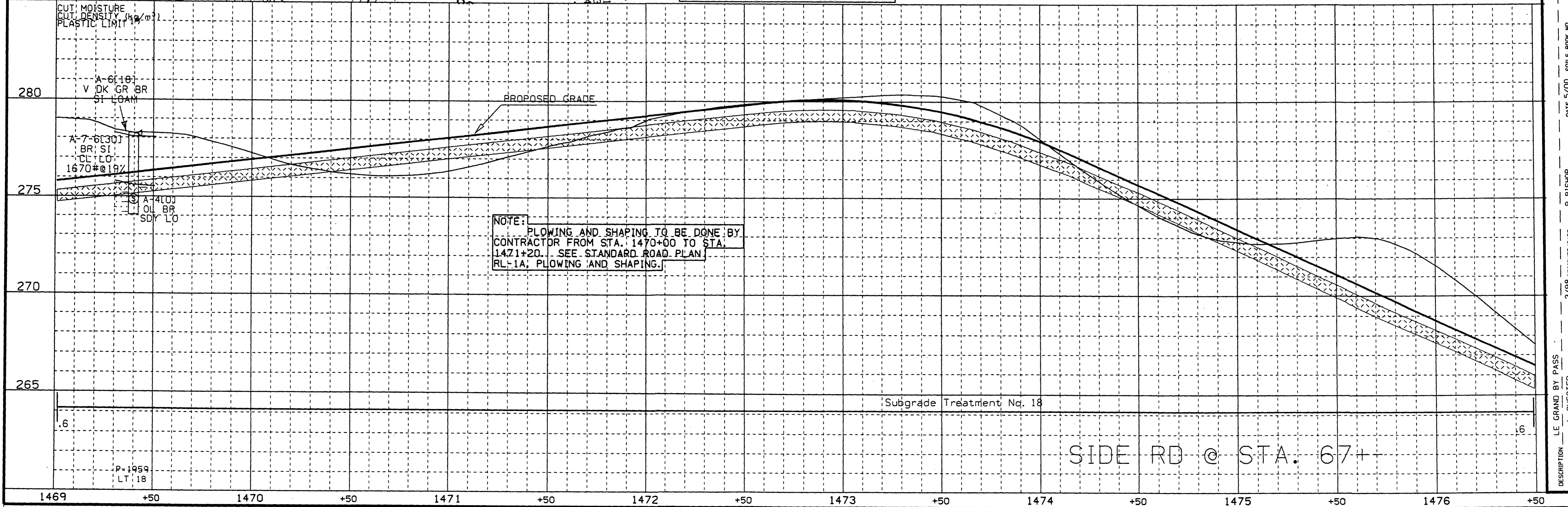
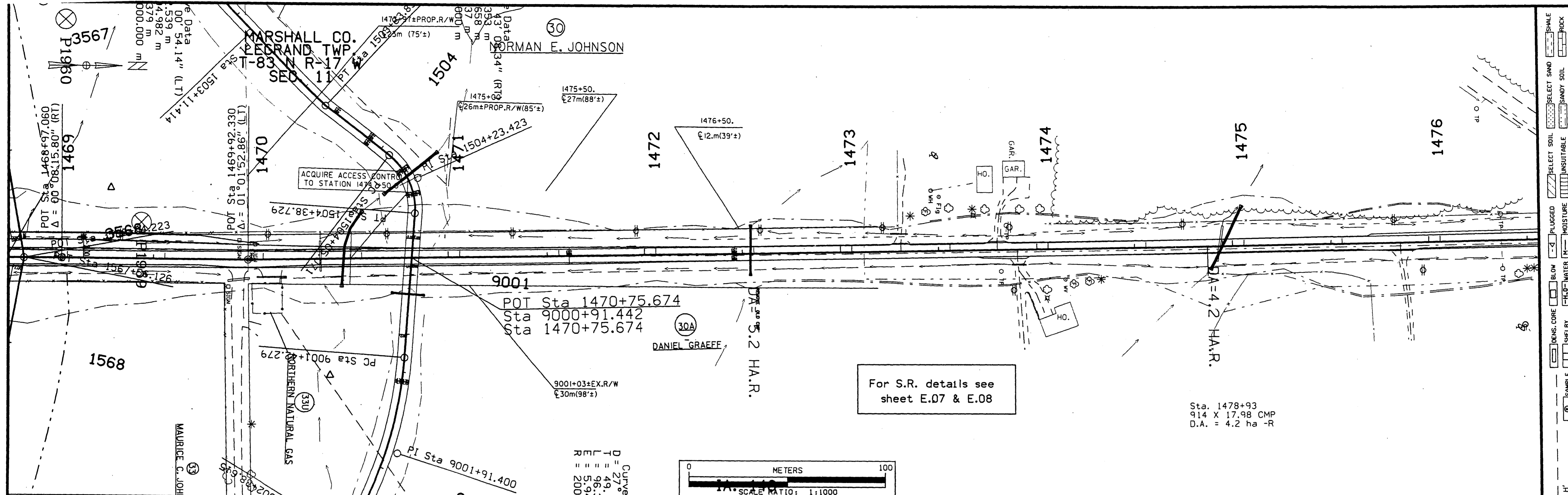
CORE NO.	P-1541-B	P-1551-B
CLASSIFICATION (AASHTO)	A-7-6(30)	A-7-6(26)
COEFF. CONSOL. m ² /DAY	0.037	0.017
TRIAxIAL COMPRESSION	CU	CU
COHESION - kPa	22	13
FRICTION COEFF.	0	0.07
MOISTURE CONTENT - %	29	31
DENSITY - kg/m ³	1467	1476
UU-UNCONSOLIDATED & UNDRAINED		
CU-CONSOLIDATED & UNDRAINED		

DESCRIPTION LE GRAND BY PASS
SOIL SURVEYOR J. CHESTER
DATE /97 DESIGNER/CADD B. BISHOP
DATE 5/00 SOILS BOOK NO. ELECTRONIC
SYMBOLS: SHALE, SAND, SANDY SOIL, UNSUITABLE, MOISTURE, PLUGGED, DENS. CORE, SHELBY, SAMPLE

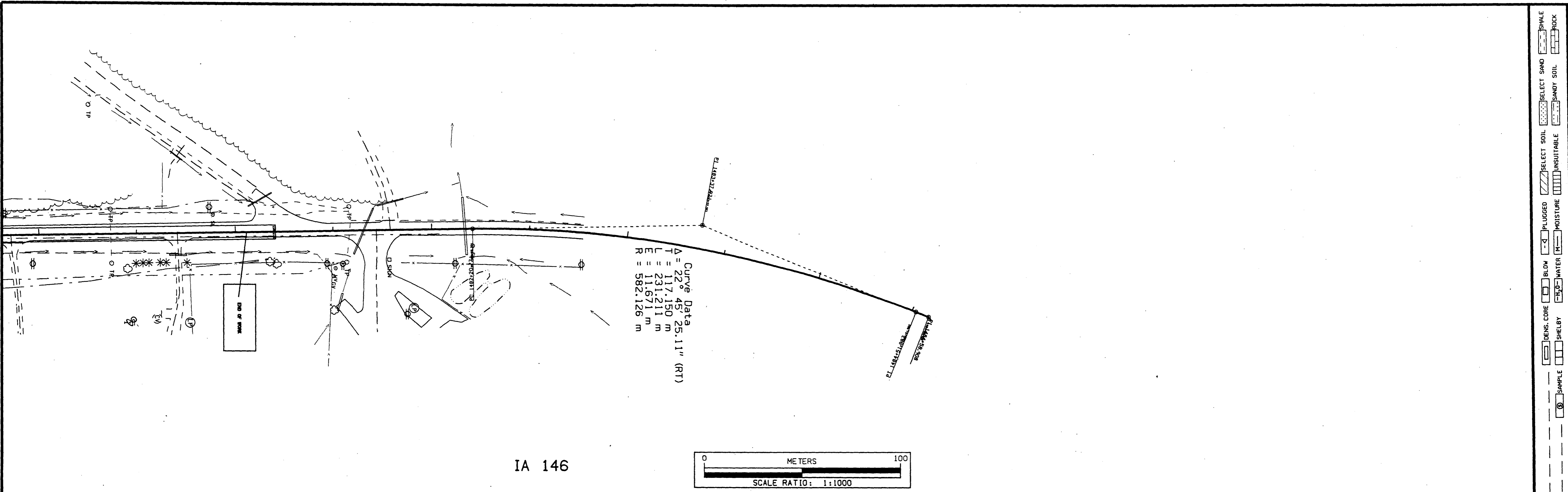


DESIGN TEAM	STANLEY/BISHOP	METRIC	IOWA DOT * OFFICE OF DESIGN	MARSHALL COUNTY	PROJECT NUMBER	NHSX-30-5(166)--19-64	SHEET NUMBER	Q.15
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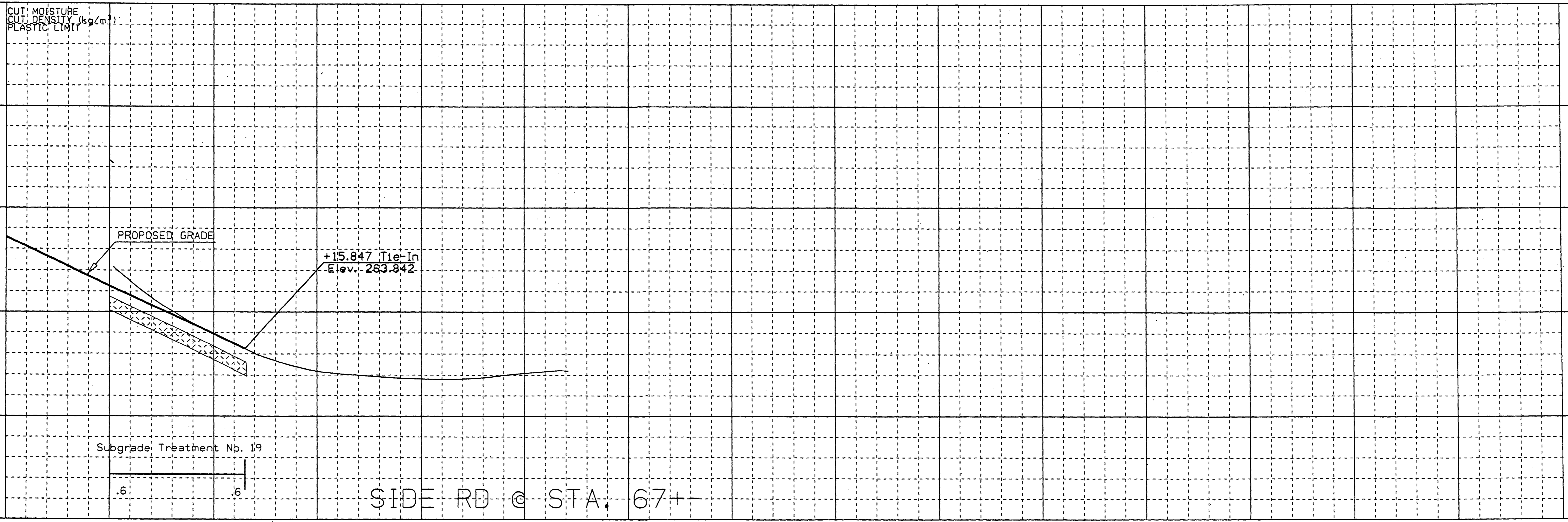
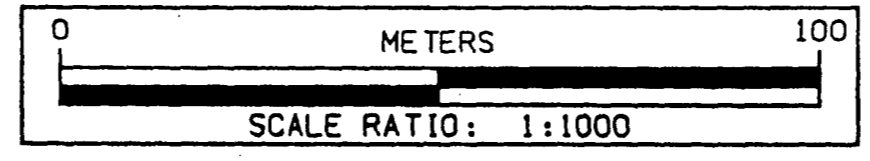
SOIL SURVEYOR J. CHESTER DATE 3/98 DESIGNER/CADD B. BISHOP DATE 5/00 SOILS BOOK NO. H
 SHALE SELECT SAND SELECT SOIL UNSUITABLE PLUGGED MOISTURE WATER BENS. CORE SHELBY SAMPLE



SHALE
SELECT SAND
SANDY SOIL
SELECT SOIL
UNSATURATED
PLUGGED
BLOW
DENS. CORE
SHELBY
SAMPLE
DATE 3/98 DESIGNER/CRD B. BISHOP
DATE 5/00 SOILS BOOK NO. 11
LE GRAND BY PASS
J. CHESTER
SOIL SURVEYOR



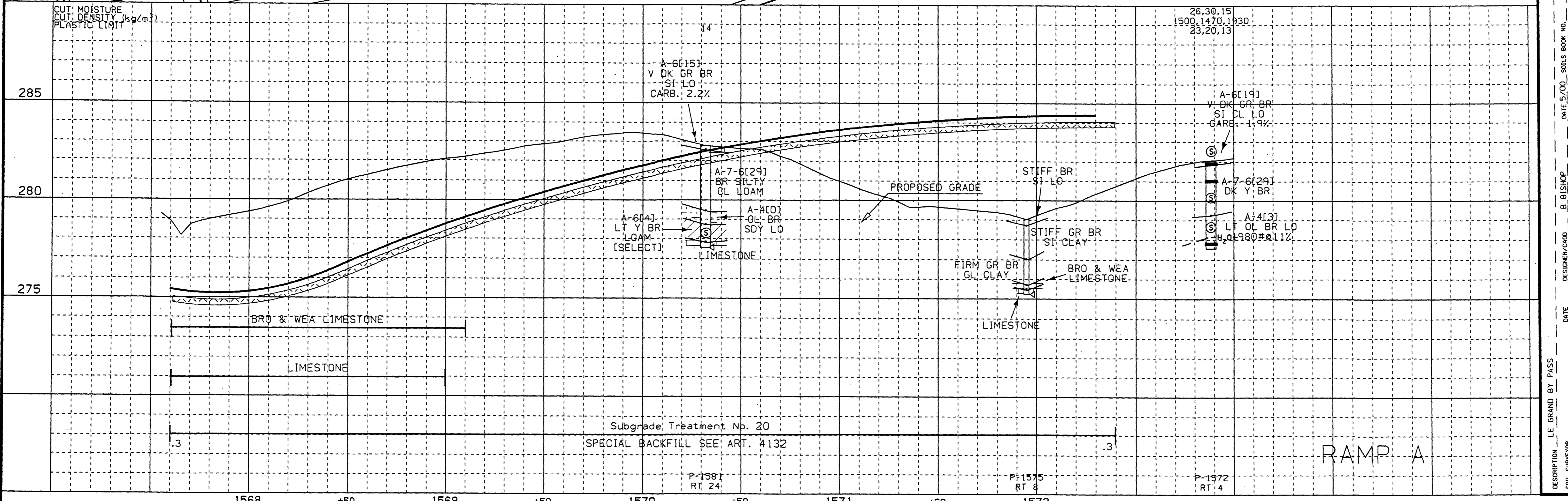
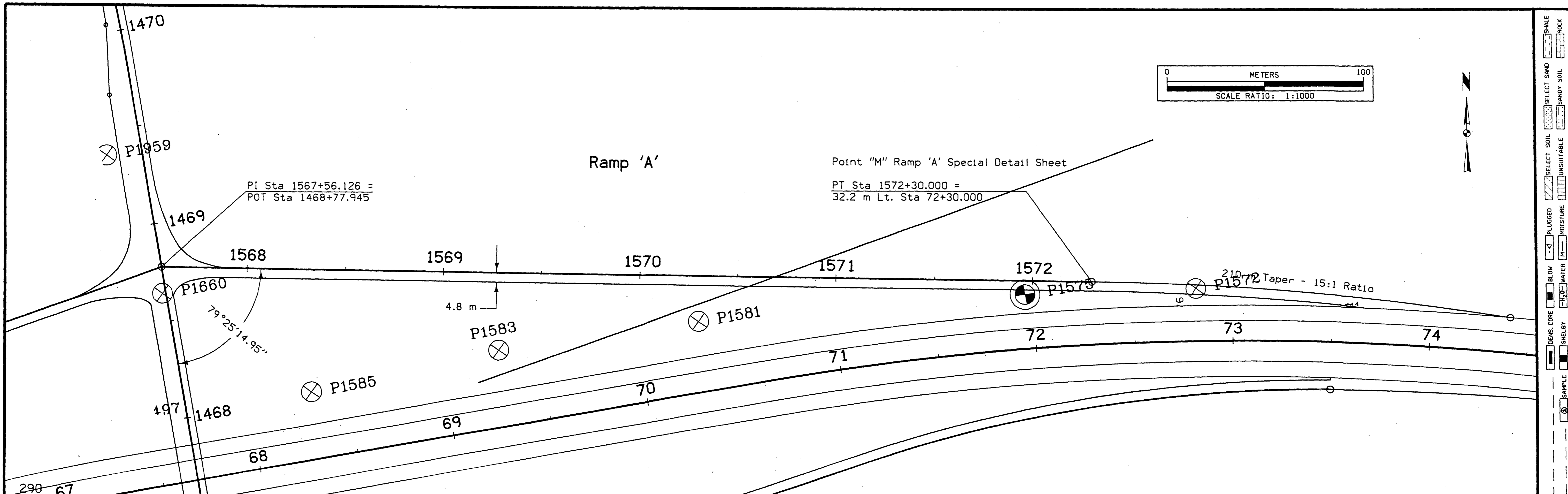
IA 146



SIDE RD @ STA. 67+

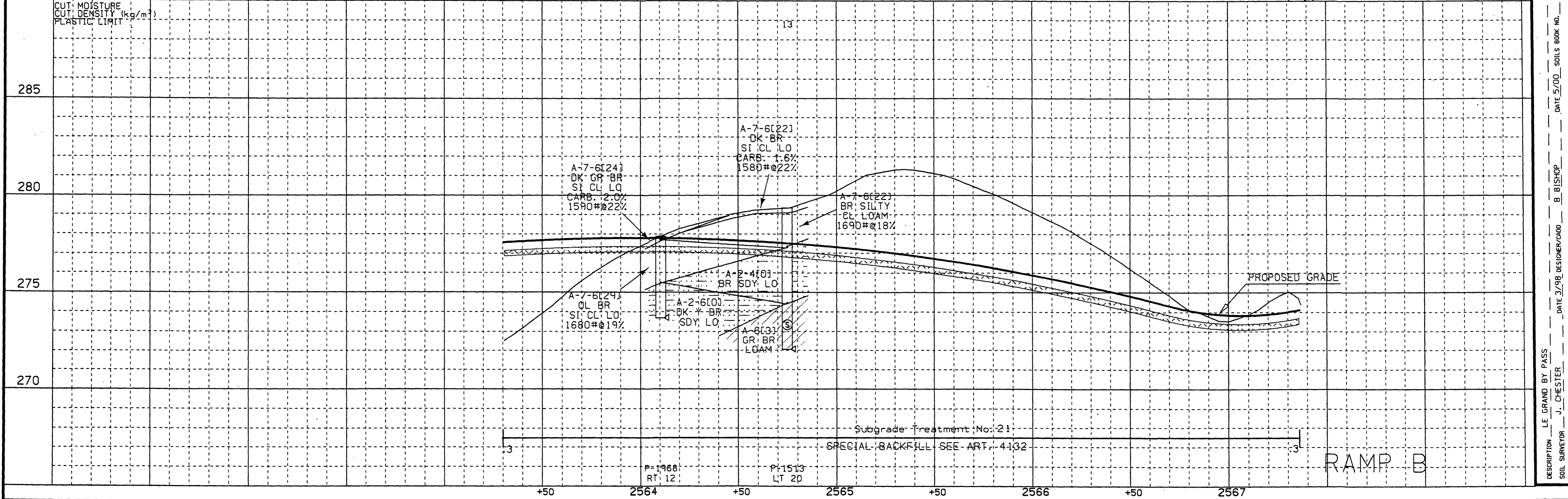
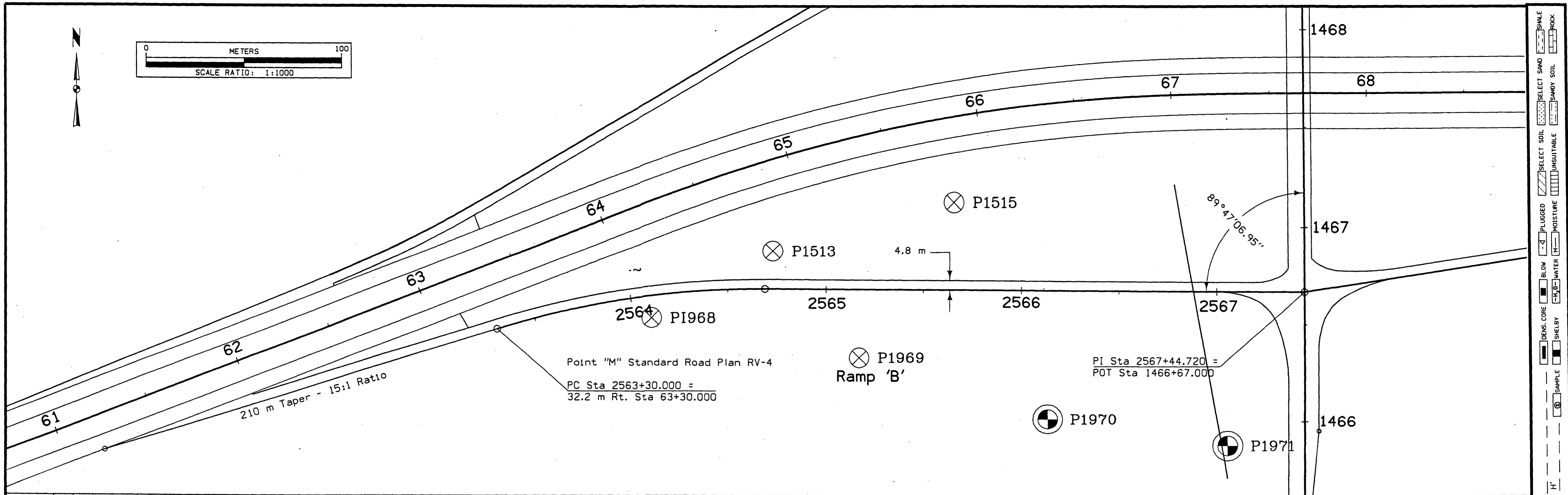
SHALE
ROCK
SELECT SAND
SELECT SOIL
UNSATURATED
SELECT SOIL
UNSATURATED
PLUGGED
UNSATURATED
MOISTURE
UNSATURATED
DENS. CORE
BLUM
SHELBY
SHELBY
SAMPLE
DATE
DESIGNER/CAO
B. BISHOP
LE GRAND BY PASS
SOIL SURVEYOR

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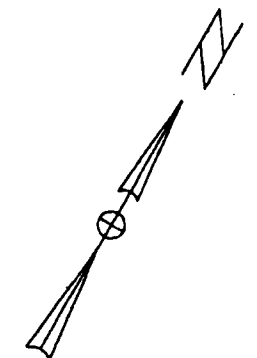
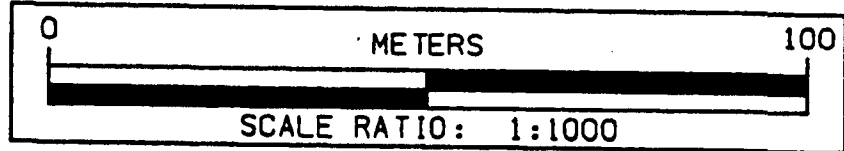
SELECT SAND
 SELECT SOIL
 SELECT SOIL
 UNSUITABLE
 PLUGGED
 MOISTURE
 BELOW
 WATER
 BENS. CORE
 SHELBY
 SAMPLE
 DATE 5/00 SOILS BOOK NO.
 DESIGNER/CAD B. BISHOP
 DATE
 LE GRAND BY PASS
 SOIL SURVEYOR

14-JUL-2000 09:06 wbishop s:\PROJECTS\64030030A92\Soils\64030166.018



SHALE
 SELECT SAND
 SANDY SOIL
 UNSUITABLE
 PLUGGED
 MOISTURE
 WATER
 DENS. CORE
 SHELBY
 SAMPLE
 DATE 5/00 SOILS BOOK NO. H
 DATE 3/98 DESIGNER/ROAD B. BISHOP
 LE GRAND BY PASS
 J. CHESTER
 SOIL SURVEYOR

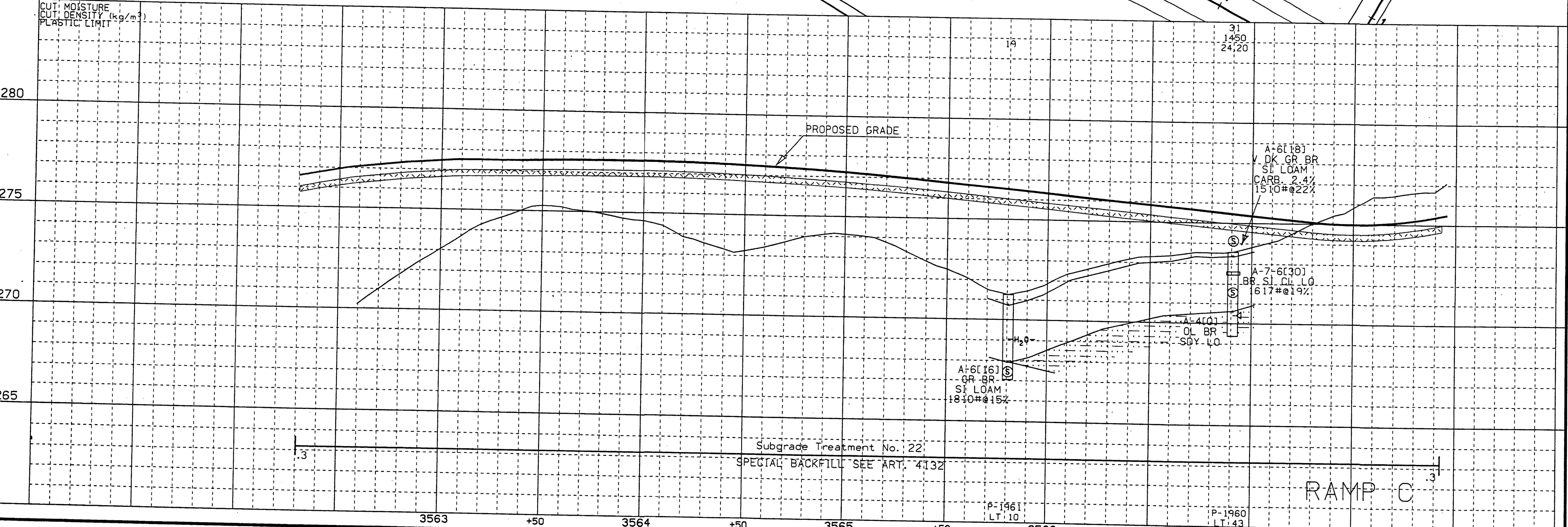
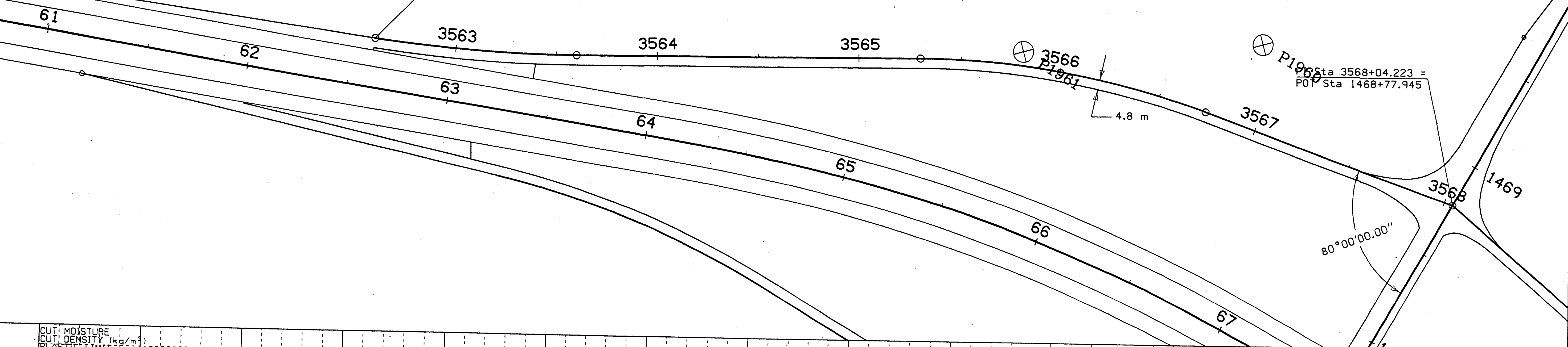
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Ramp 'C'

Point "G" Standard Road Plan RV-5
 PC Sta 3562+60.000 =
 24.2 m Lt. Sta 62+60.000

300 m Taper - 50:1 Ratio



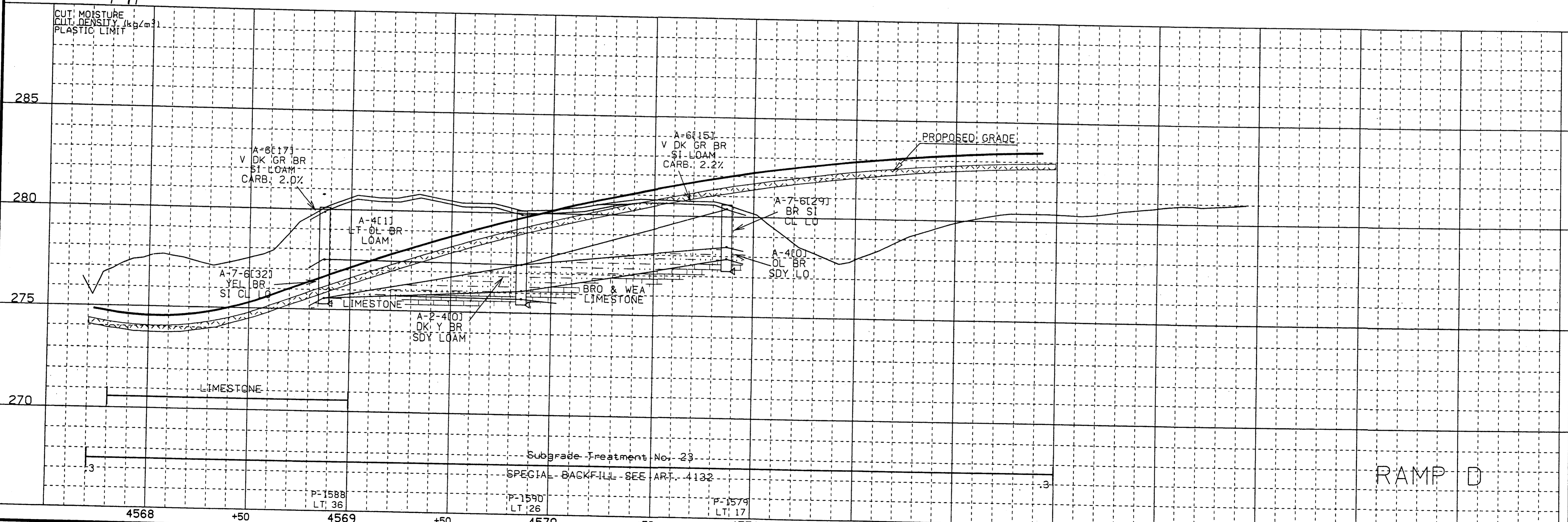
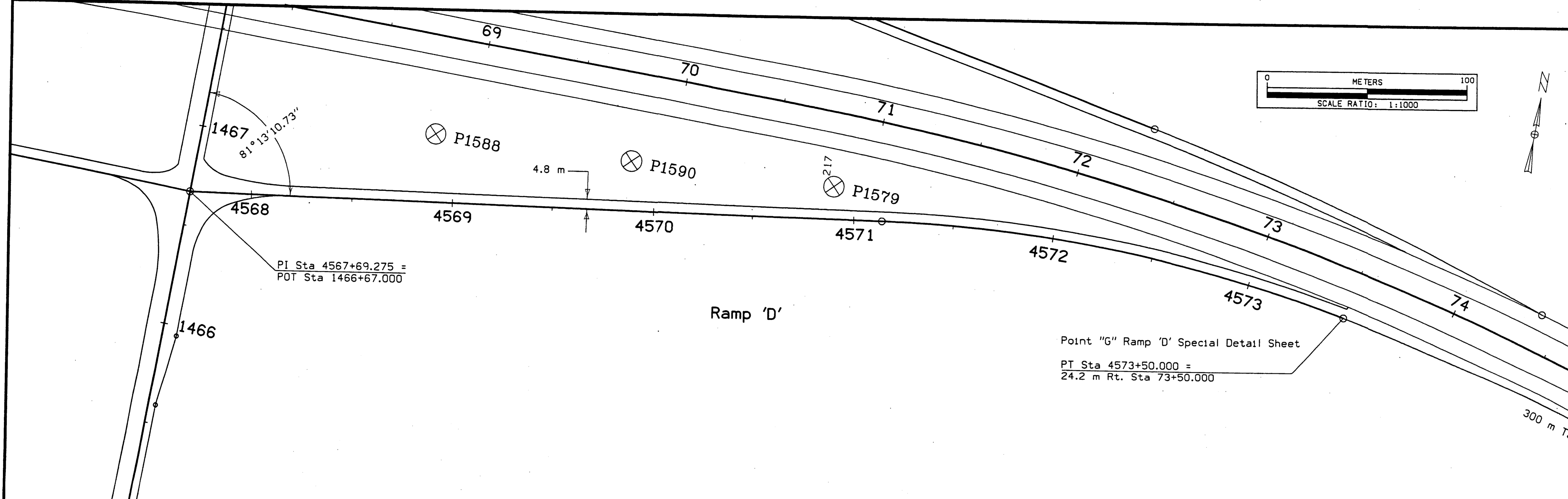
SHALE
 SELECT SAND
 SANDY SOIL
 UNSUITABLE
 PLUGGED
 MOISTURE
 WATER
 BLOW
 DENS. CORE
 SHELBY
 SAMPLE
 H'
 DATE 5/00 SOILS BOOK NO.
 B. BISHOP
 DATE 3/96 DESIGNER/COD
 LE GRAND BY PASS
 SOIL SURVEYOR J. CHESTER

DESIGN TEAM STANLEY/BISHOP

METRIC IOWA DOT * OFFICE OF DESIGN

MARSHALL COUNTY PROJECT NUMBER NHSX-30-5(166)-19-64

SHEET NUMBER Q20



SHALE
 SELECT SAND
 SANDY SOIL
 SELECT SOIL
 UNSUITABLE
 PLUGGED
 MOISTURE
 BLOW
 WATER
 DENS. CORE
 SHELBY
 SAMPLE
 DATE 3/98 DESIGNER/CADD B. BISHOP
 DATE 5/00 SOILS BOOK NO. H
 DESCRIPTION LE GRAND BY PASS
 SOIL SURVEYOR J. CHESTER

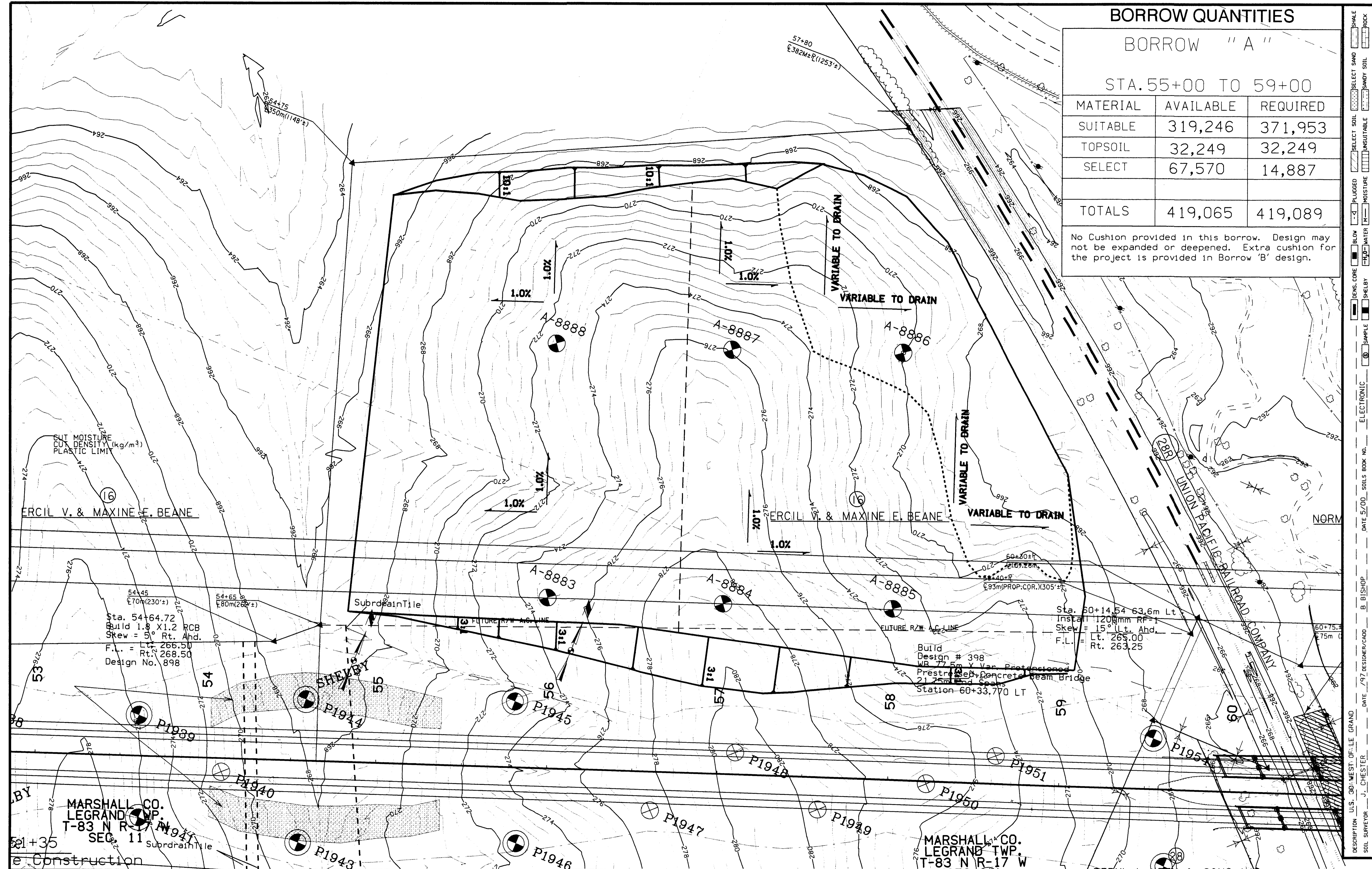
BORROW QUANTITIES

BORROW "A"

STA. 55+00 TO 59+00

MATERIAL	AVAILABLE	REQUIRED
SUITABLE	319,246	371,953
TOPSOIL	32,249	32,249
SELECT	67,570	14,887
TOTALS	419,065	419,089

No Cushion provided in this borrow. Design may not be expanded or deepened. Extra cushion for the project is provided in Borrow 'B' design.



DESCRIPTION U.S. 30 WEST OF L.E. GRAND
 SOIL SURVEYOR J. CHESTER DATE 7/97 DESIGNER/PAID B. BISHOP DATE 5/00 SOILS BOOK NO. ELECTRONIC SAMPLE SHELBLY MOISTURE PLUGGED BLOW UNSELECTED SAND SELECT SOIL UNSUITABLE SELECT SOIL SANDY SOIL ROCK

12-SEP-2001 05:23 bsm12z Projects 64150030-PL Design K64000166.022

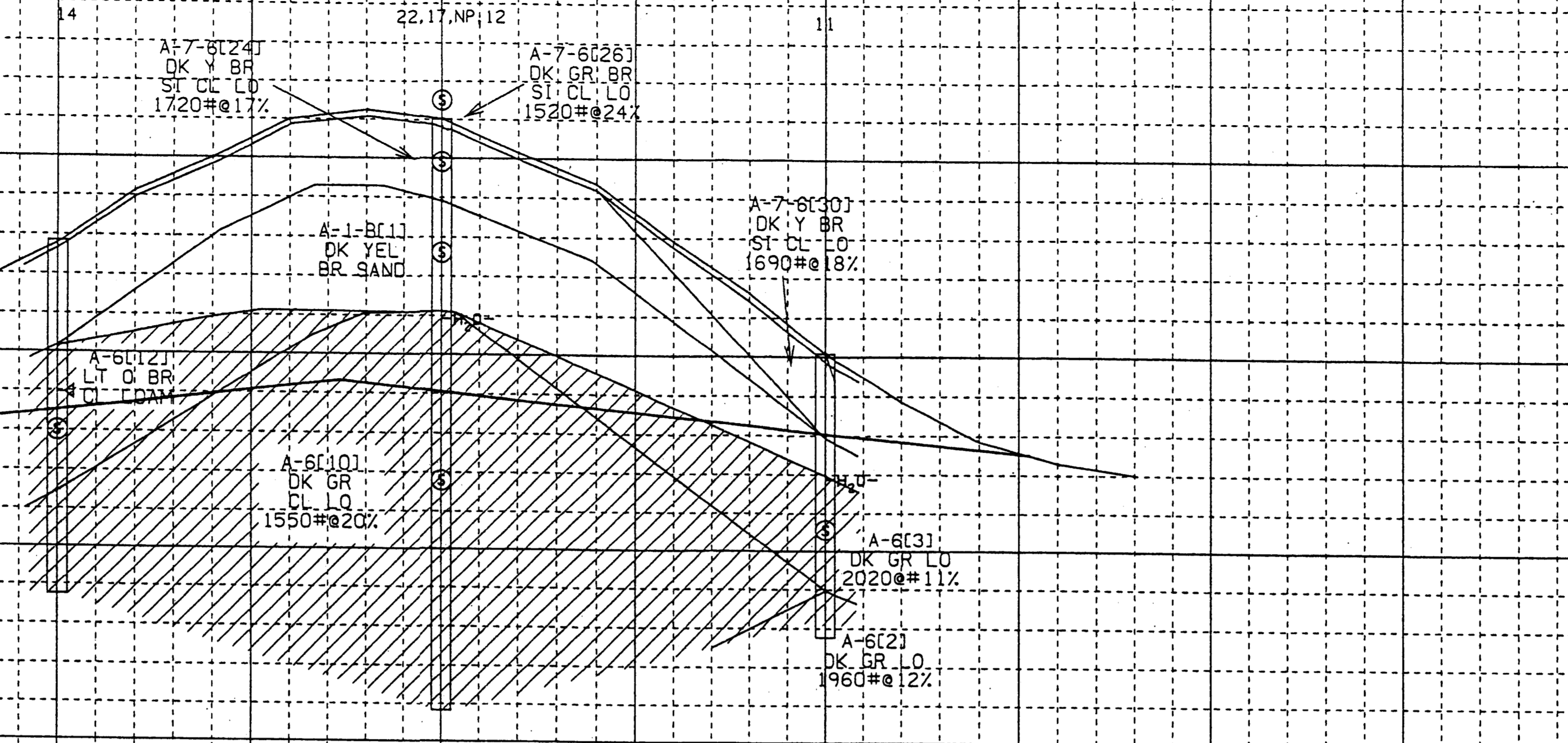
CUT MOISTURE
CUT DENSITY (kg/m³)
PLASTIC LIMIT

275 275

BORROW LIMITS

270 270

265



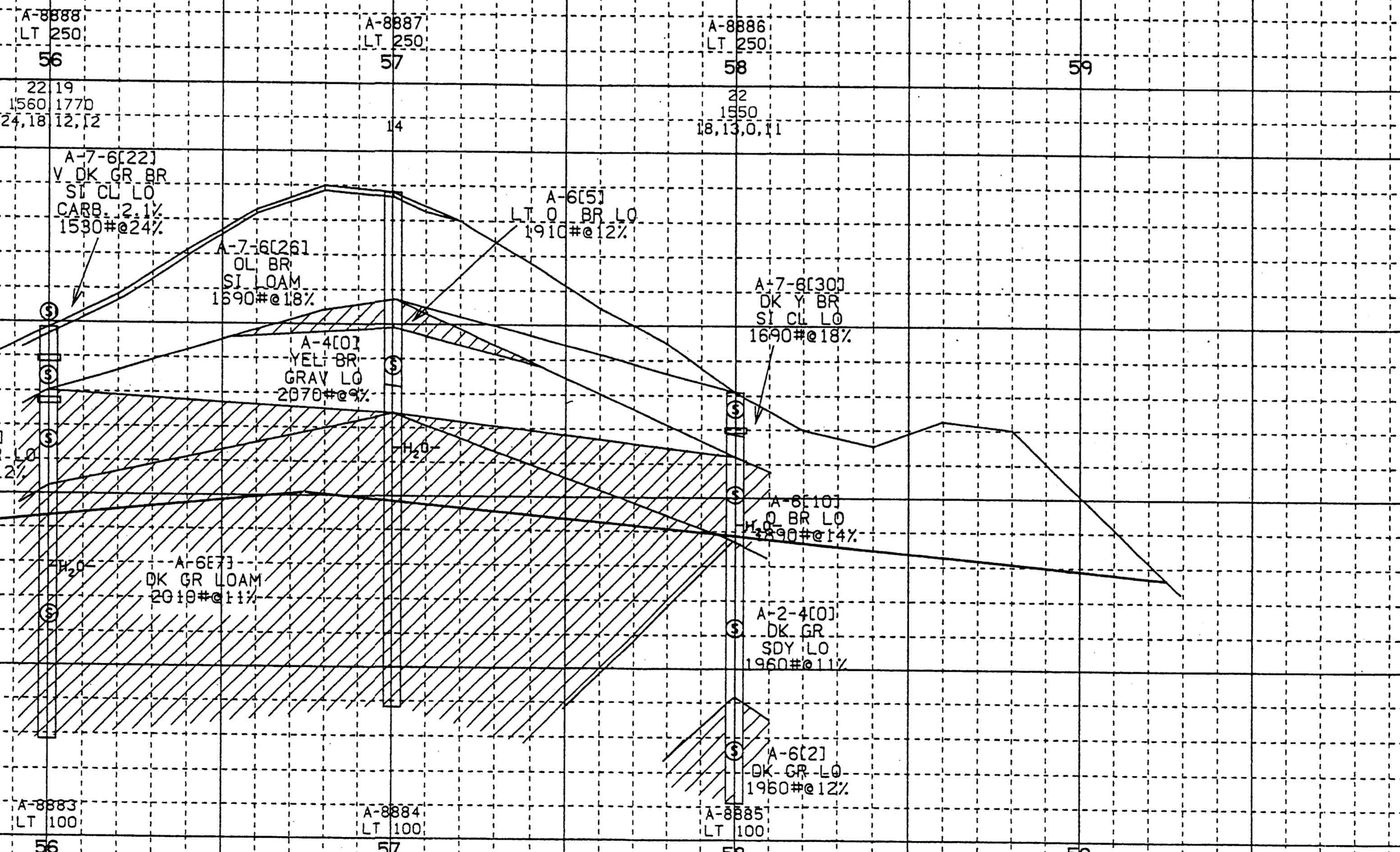
CUT MOISTURE
CUT DENSITY (kg/m³)
PLASTIC LIMIT

275 275

BORROW LIMITS

270 270

265



265

BORROW A

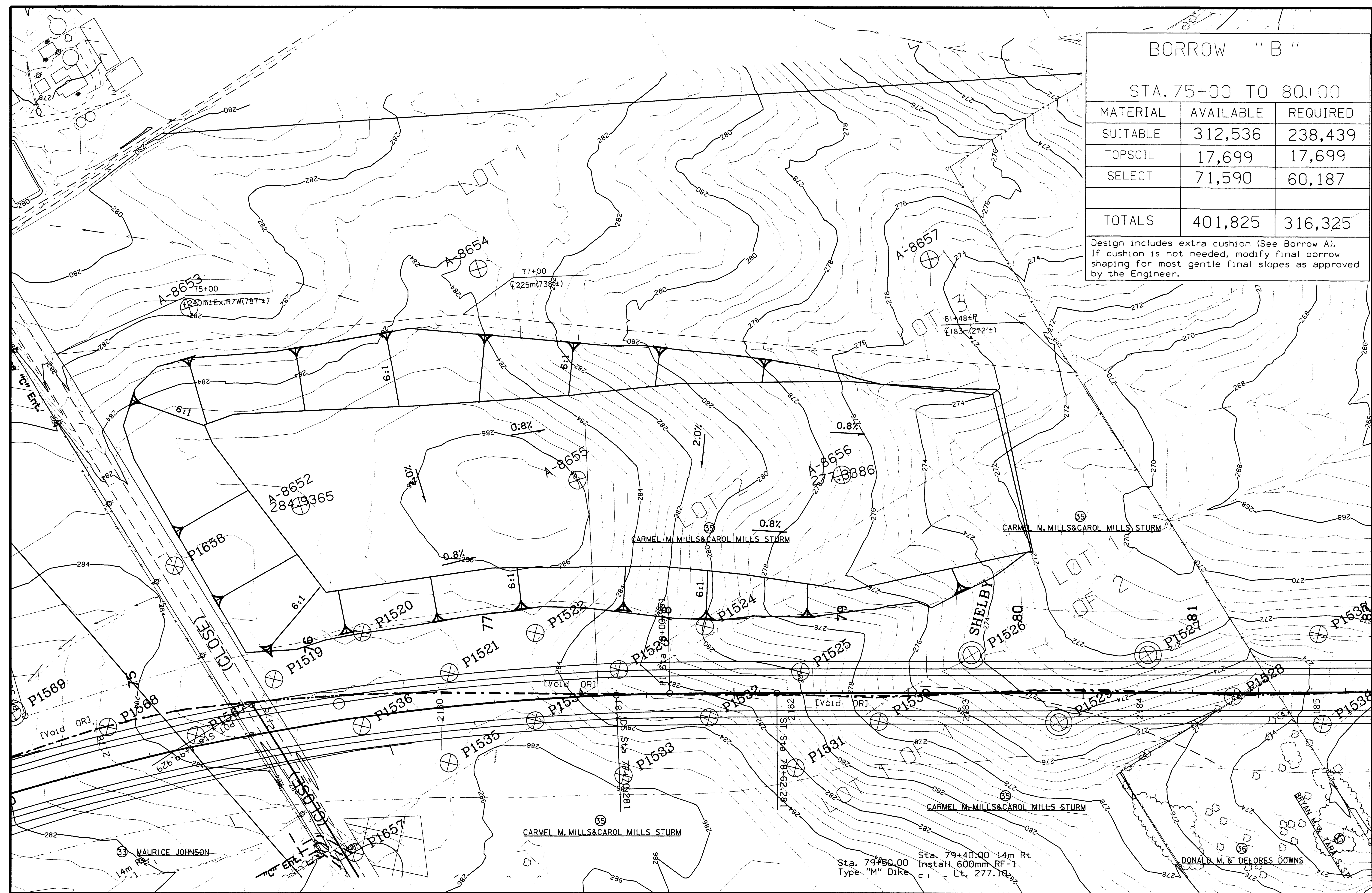
DESCRIPTION LE GRAND BY PASS
 SOIL SURVEYOR E SOUCEK
 DATE 4/00 DESIGNER/CAD B. BISHOP
 DATE 5/00 SOILS BOOK NO. E
 MOISTURE
 WATER
 BLOW
 PLUGGED
 UNSUITABLE
 SELECT SOIL
 SANDY SOIL
 SHALE
 ROCK

BORROW " B "

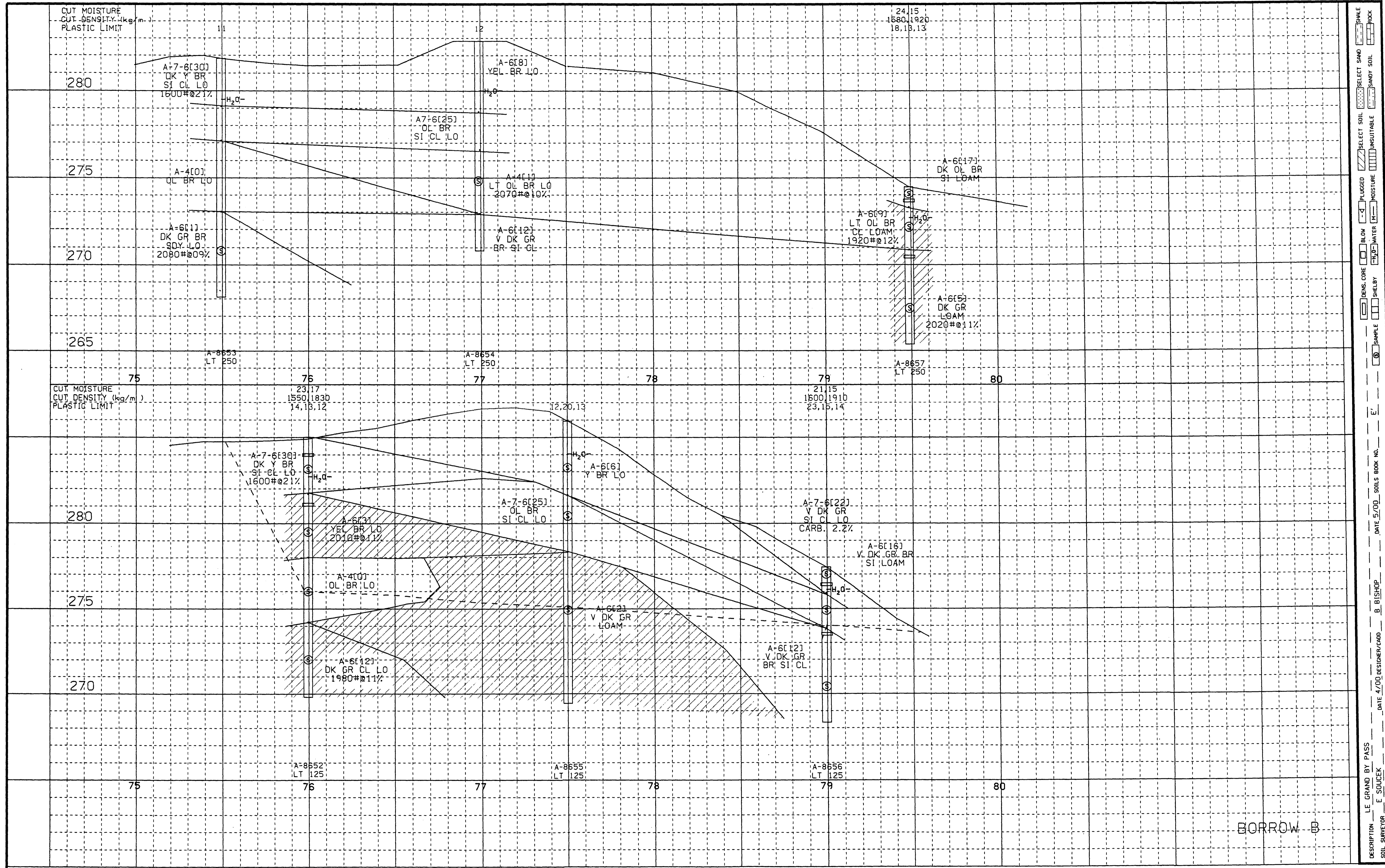
STA. 75+00 TO 80+00

MATERIAL	AVAILABLE	REQUIRED
SUITABLE	312,536	238,439
TOPSOIL	17,699	17,699
SELECT	71,590	60,187
TOTALS	401,825	316,325

Design includes extra cushion (See Borrow A).
 If cushion is not needed, modify final borrow
 shaping for most gentle final slopes as approved
 by the Engineer.



DESCRIPTION LE GRAND BY PASS
 SOIL SURVEYOR J. CHESTER DATE 7/97 DESIGNER/CADD B. BISHOP DATE 5/00 SOILS BOOK NO. ELECTRONIC
 SHALLOW CORE [Symbol] BLOW [Symbol] MOISTURE [Symbol] PLUGGED [Symbol] UNSUITABLE [Symbol] SELECT SOIL [Symbol] SANDY SOIL [Symbol] SHALE [Symbol] ROCK



SHALE
 ROCK
 SANDY SOIL
 UNSUITABLE
 MOISTURE
 WATER
 DENS. CORE
 SHELBY
 SAMPLE
 SOILS BOOK NO.
 DATE 5/00
 B. BISHOP
 DATE 4/00 DESIGNER/CARD
 E. SOUCEK
 LE GRAND BY PASS
 SOIL SURVEYOR

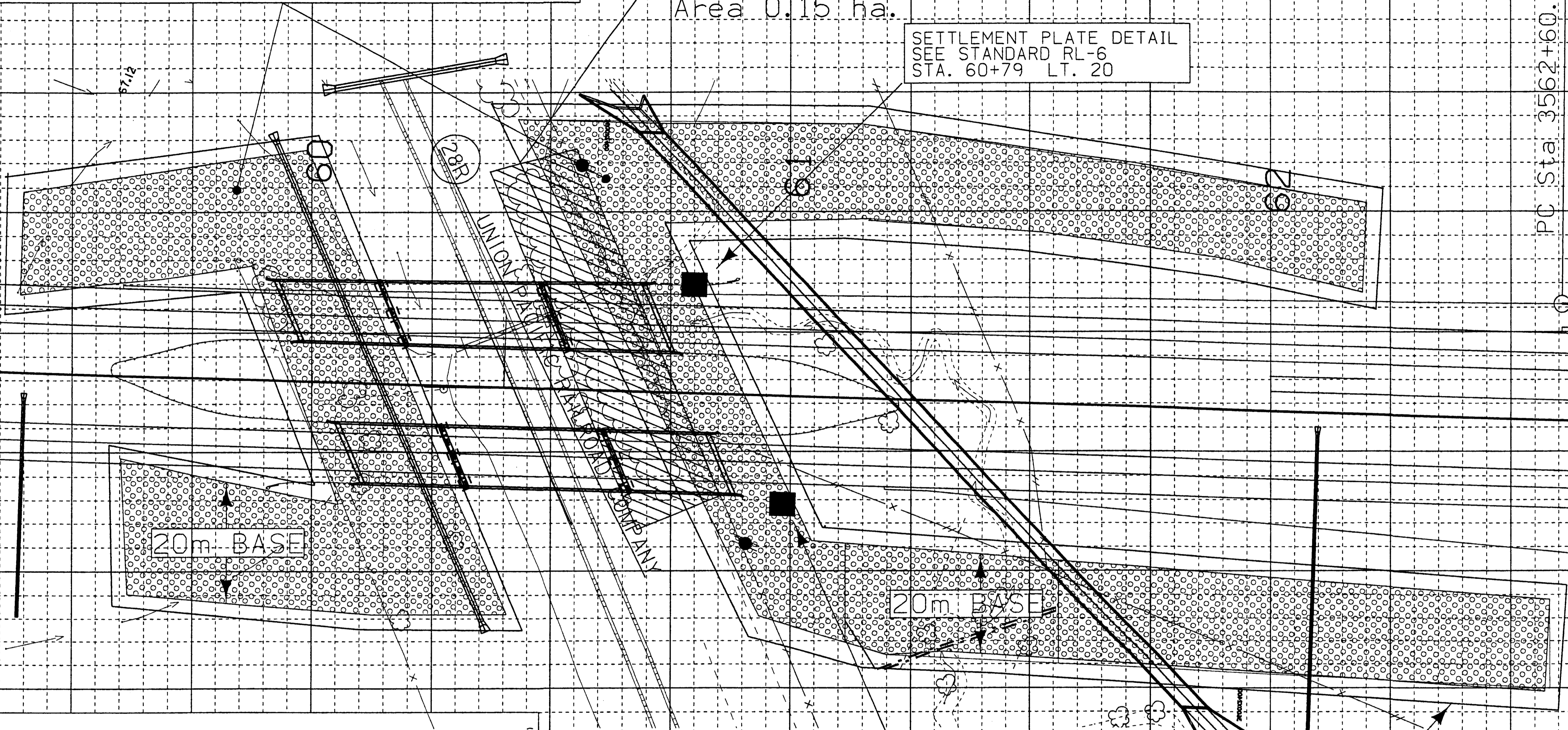
BORROW B

NOTE: CORE-OUT BUTTRESS UNDER RCB DESIGN 998 BY GRADING CONTRACTOR PRIOR TO CULVERT CONSTRUCTION

Clear & Grub Area 0.15 ha.

SETTLEMENT PLATE DETAIL
SEE STANDARD RL-6
STA. 60+79 LT. 20

PC Sta. 3562+60.000



NOTE:
FROM STA. 59+36± TO STA. 60+40± WEST ABUTMENT AND FROM STA. 60+40± EAST ABUTMENT TO STA. 62+65±. EXCAVATE TO LIMITS AND ELEVATIONS AS SHOWN ON THIS SHEET AND ON CROSS SECTIONS.
EXCAVATED MATERIAL MAY BE PLACED ON EMBANKMENT UNDER MOISTURE CONTROL.
PLACE A 1.0 METER GRANULAR BLANKET IN BOTTOM OF THE EXCAVATION. BACKFILL THE REST OF THE EXCAVATION WITH CLASS 10 USING MOISTURE CONTROL.
CONTROL SHALL BE PROVIDED TO KEEP WATER TABLE IN THE GRANULAR BLANKET DURING EMBANKMENT CONSTRUCTION.
DO NOT OPEN MORE THAN 1.5 METERS AT A TIME PARALLEL WITH UNION PACIFIC R.R. DO NOT LEAVE EXCAVATION OPEN OVERNIGHT.
BASE OF BUTTRESS MUST BE IN GLACIAL CLAY OR SAND. PLANS MAY BE ALTERED TO MEET THIS REQUIREMENT AT THE DISCRETION OF THE FIELD ENGINEER.

STA. 59+36 TO STA. 60+40
16,218 m3 OF CLASS 10 EXCAVATION
4,074 m3 OF GRANULAR BACKFILL

STA. 60+40 TO STA. 62+65
27,924 m3 OF CLASS 10 EXCAVATION
8,778 m3 OF GRANULAR BACKFILL

SETTLEMENT PLATE DETAIL
SEE STANDARD RL-6
STA. 60+99 RT. 20

LIMITS OF EXCAVATION

DESCRIPTION: LE GRAND BY PASS SOIL SURVEYOR J. CHESTER
DATE: 3/98 DESIGNER/CADD: B. BISHOP
DATE: 5/00 SOILS BOOK NO.:
H'
SAMPLE: @
DENS. CORE: [Symbol]
BLOW: [Symbol]
H₂O-WATER: [Symbol]
MOISTURE: [Symbol]
INSUITABLE: [Symbol]
SELECT SOIL: [Symbol]
SELECT SAND: [Symbol]
SANDY SOIL: [Symbol]
SHALE: [Symbol]
ROCK: [Symbol]



Proposed permanent easement boundary. (approximately 15.0 m. from outside base of berm).

Excavate to approximately 0.5m Below the existing elevation Slope away at 20:1.

Leave bottom of wetland rough to mimic natural wetlands.

Stockpile and replace top 300mm soil to provide seed source and organic material.

Attach flapgate on this end of pipe.

Install 600mm aluminized corrugated pipe with flapgate.

Shape and riprap embankment for approximately 10m on each side of the berm to provide emergency spillway.

Top of spillway should be approximately elevation 259.4 m (2 feet below top of berm).

Repair berm

Existing berm

Seed 15.0 m. buffer area with native prairie grasses and swamp white oak. See U Sheets for more information

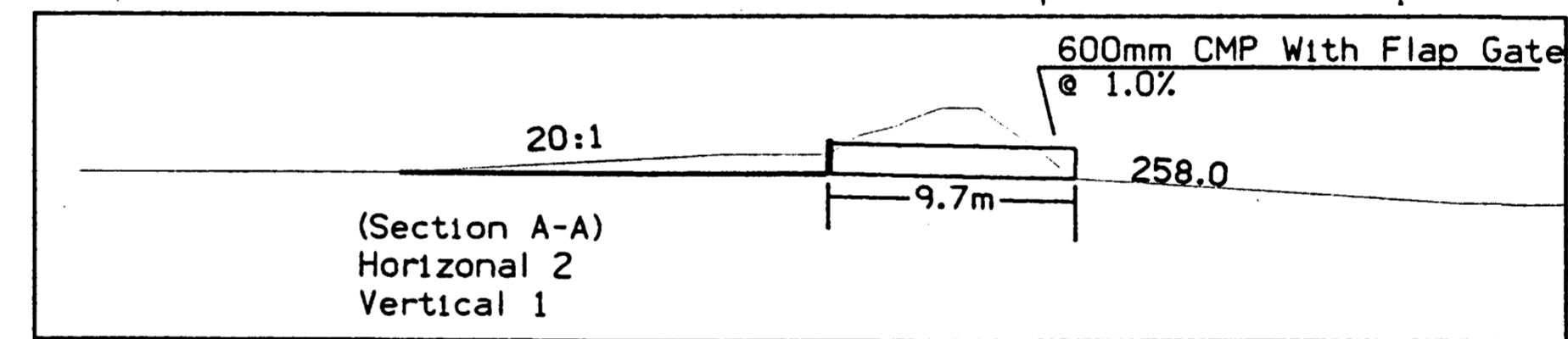
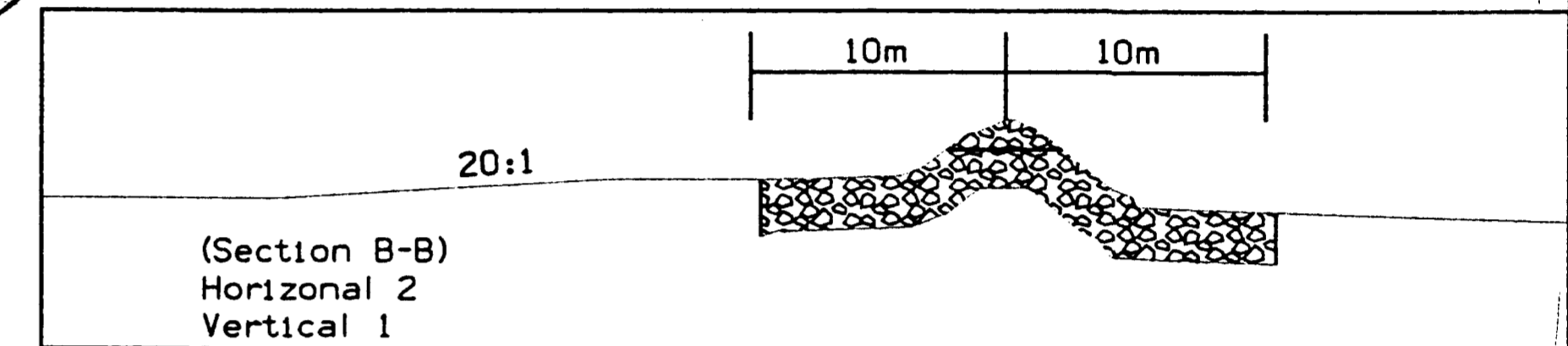
Safety Fence

Monitoring well

Do Not Disturb This Area Arch. Site

Allow upland drainage to flow onto site.

Monitoring well



Johnson Mitigation Site

NOTES:

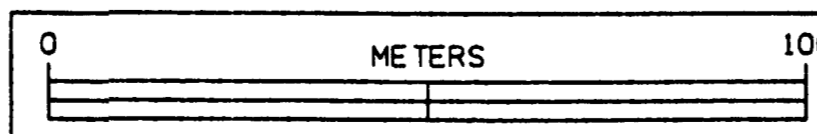
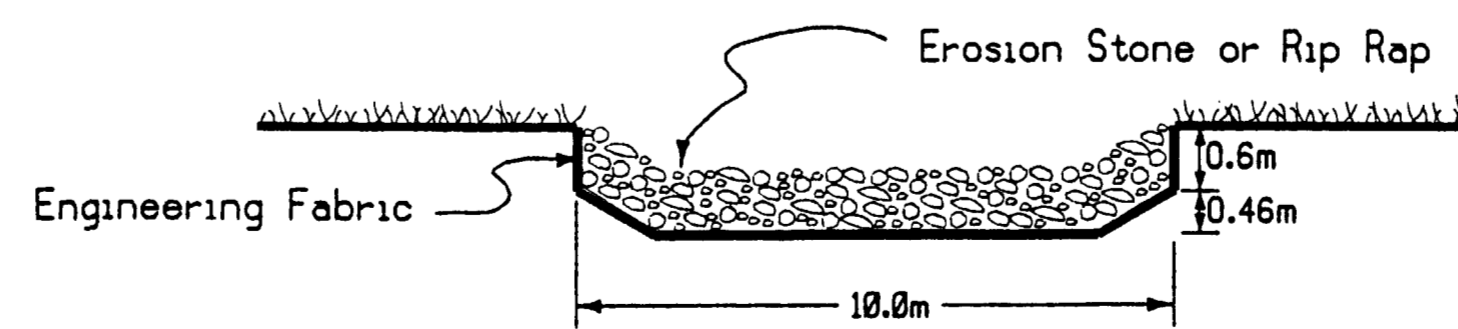
The objective is to restore approximately 5.67 HA of prior converted agricultural land primarily by increasing duration of inundation and saturation after flooding.

Duration of inundation will be increased by constructing a water control structure. Drainages also will provide hydrologic input.

Vegetation is expected to develop naturally from seed stored in the seed bank and by migration from surrounding sources.

Soil types are in the Vesser and Zook series, both hydric for this area.

DETAILS OF ROCK SPILLWAY

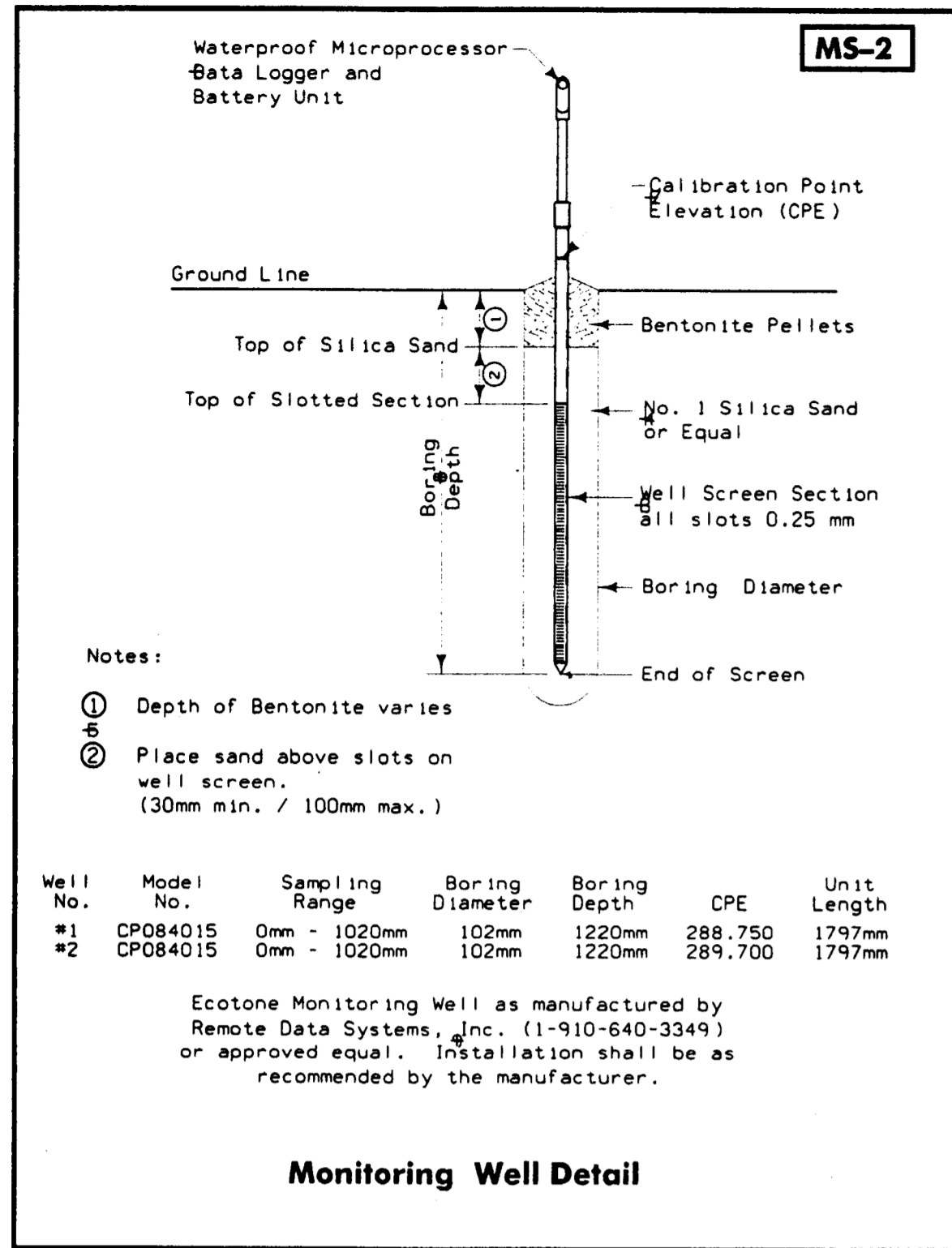


Cut= 4,183 cubic meters

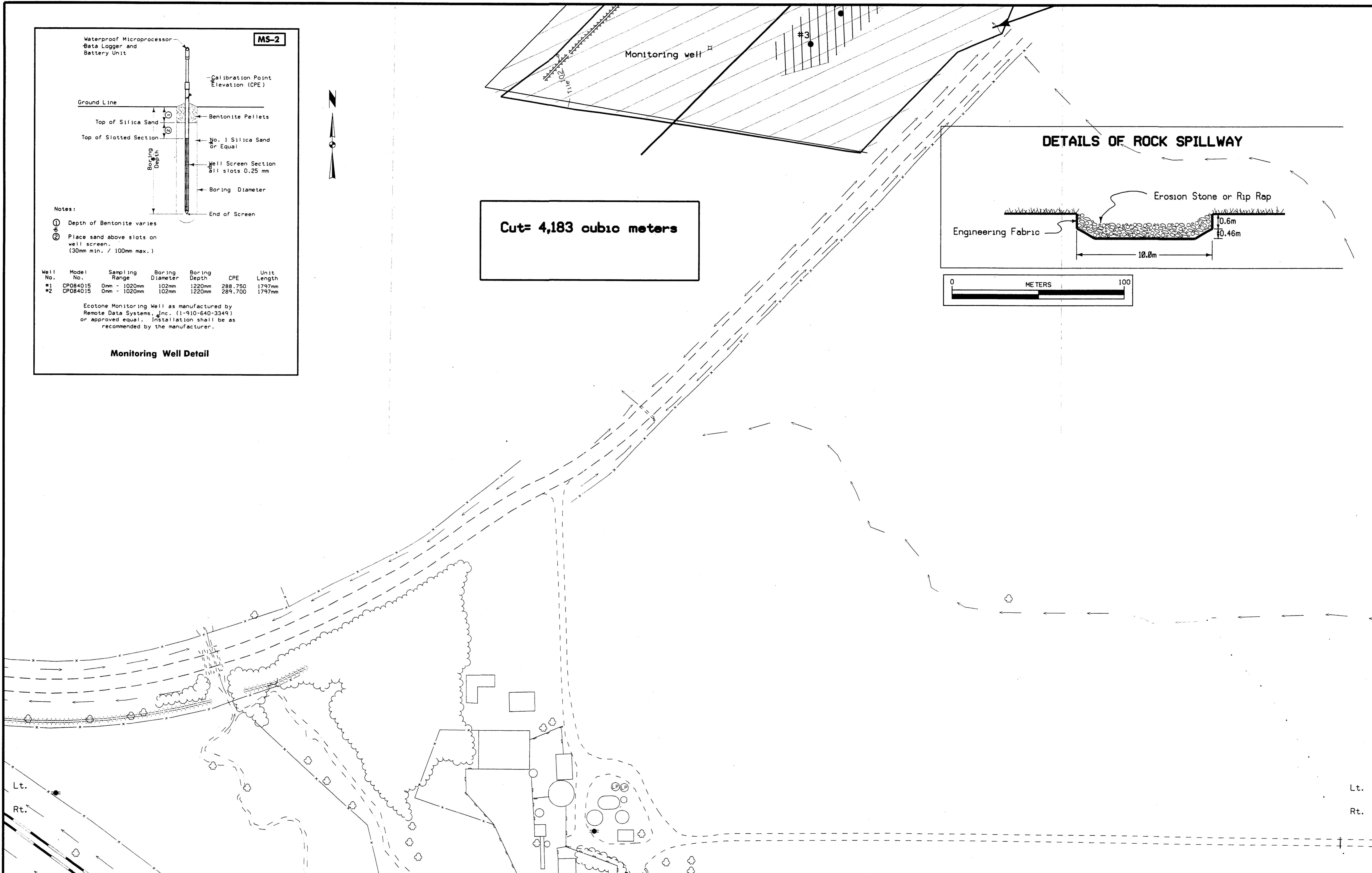
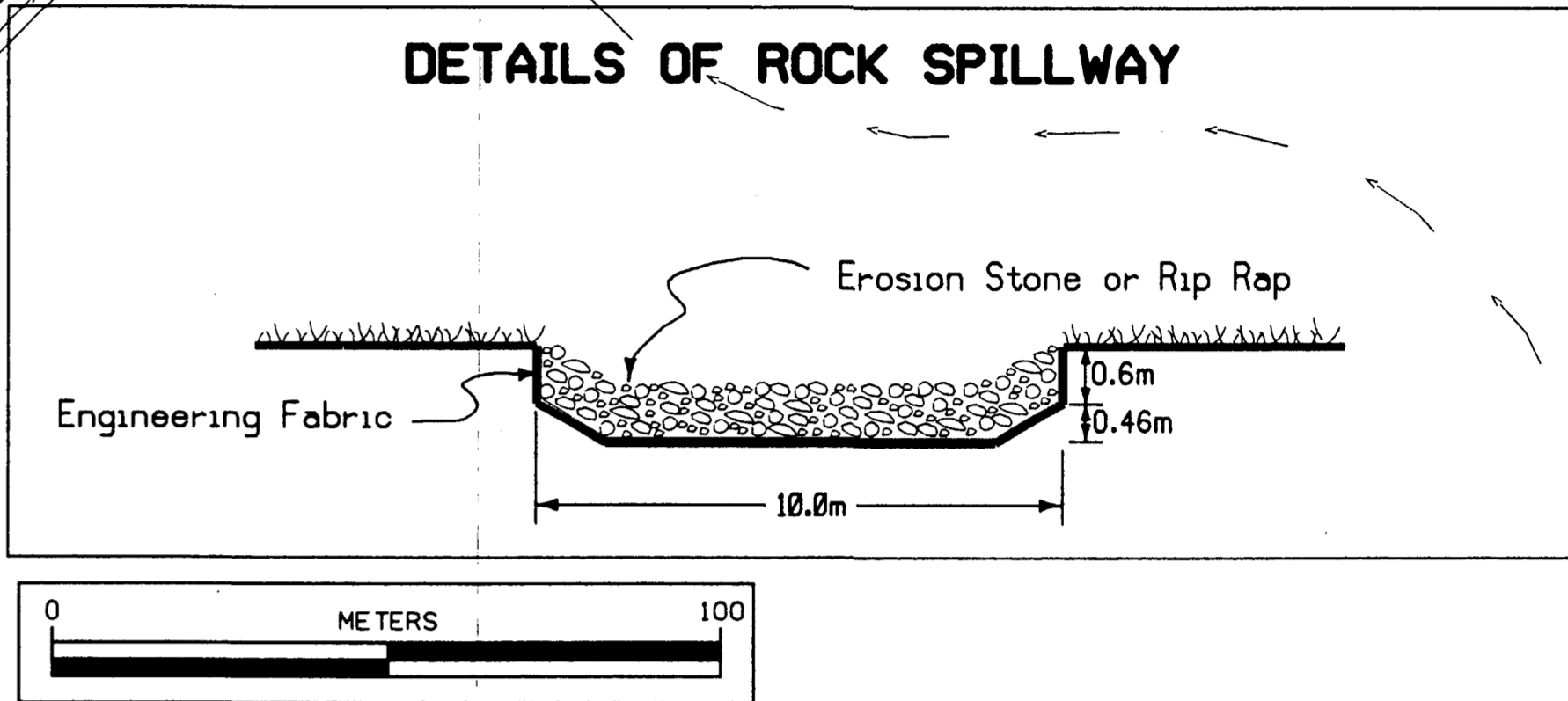
1474

1473

1472



Cut= 4,183 cubic meters





NOTES:

1. Trees next to the northwest easment shall be installed 5.0 meters inside of the easment line.
2. Trees shall planted on 2 meter diameter by .5 meter high ledge.
3. Mix A shall be seeded on top of the berm and on the side slopes.
4. Mix B shall seeded from the base of the berm to the permanent easment line, and 2 meters along the inside base of the berm.
5. Mulched area for the proposed trees shall not be seeded.

SEED MIX A - 0.405 Ha

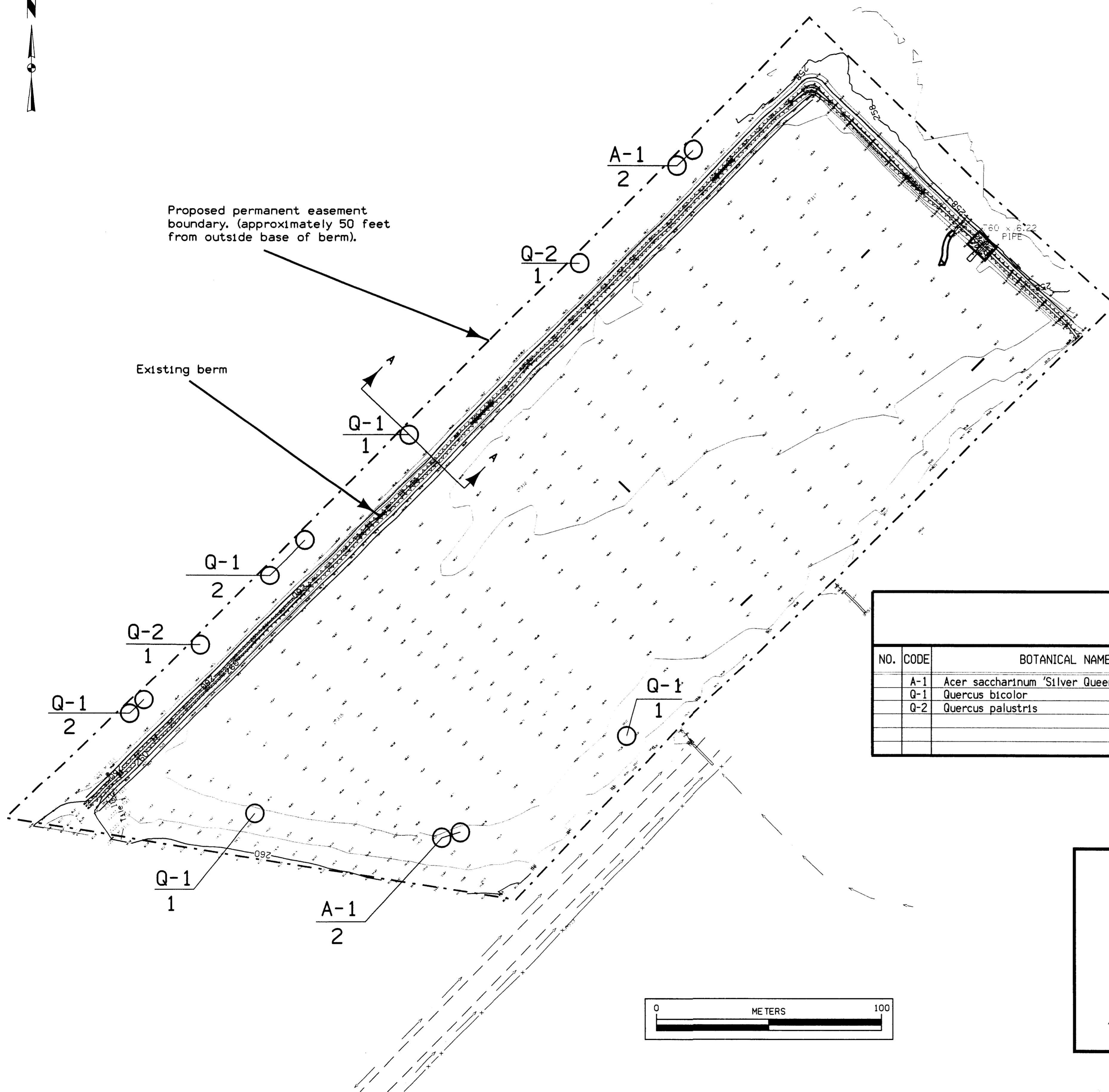
Rate Per Hectare

Little Bluestem (<i>Andropogon scoparius</i>)	2.27 kg PLS
Big Bluestem (<i>Andropogon gerardi</i>)	227 g. PLS
Indian Grass (<i>Sorghastrum nutans</i>)	227 g. PLS
Sideoats Grama (<i>Bouteloua gracilis</i>)	907 g. PLS
Sheep Fescue (<i>Festuca ovina</i>)	227 g. PLS
Partridge Pea (<i>Cassia fasciculata</i>)	57 g. PLS
New England Aster (<i>Aster novae-angliae</i>)	57 g. PLS
Blackeyed Susan (<i>Rudbeckia hirta</i>)	57 g. PLS
Purple Coneflower (<i>Echinacea purpurea</i>)	57 g. PLS

SEED MIX B - 1.01 Ha

Rate Per Hectare

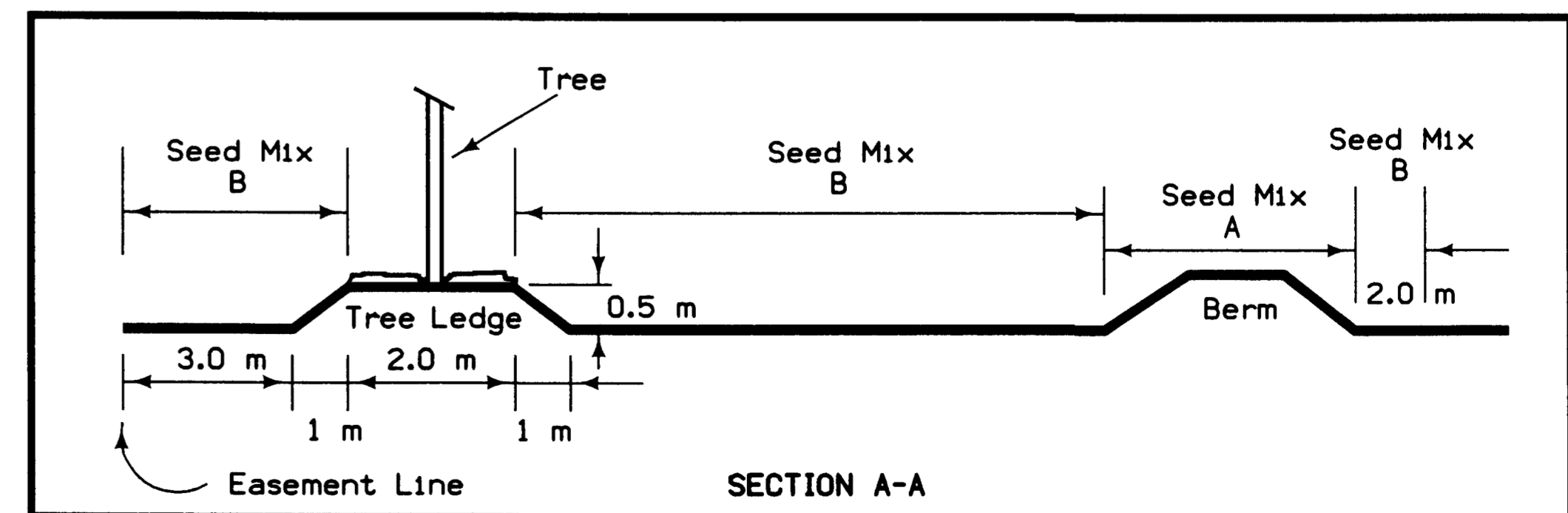
Big Bluestem (<i>Andropogon gerardi</i>)	2.27 kg PLS
Indian Grass (<i>Sorghastrum nutans</i>)	907 g. PLS
Switch Grass (<i>Panicum virgatum</i>)	454 g. PLS
Prairie Dropseed (<i>Sporobolus heterolepis</i>)	227 g. PLS
Prairie Cordgrass (<i>Spartina pectinata</i>)	227 g. PLS
Canada Wild Rye (<i>Elymus canadensis</i>)	227 g. PLS
Marsh Blazingstar (<i>Liatris spicata</i>)	57 g. PLS
Cardinal Flower (<i>Lobelia cardinalis</i>)	57 g. PLS
Yellow Coneflower (<i>Ratibida pinnata</i>)	57 g. PLS



PLANTING QUANTITIES LISTING

100-20
09-27-94

NO.	CODE	BOTANICAL NAMES	COMMON NAME	SIZE	UNIT	TOTAL	AS BUILT QUANTITIES
	A-1	<i>Acer saccharinum</i> 'Silver Queen'	Silver Queen Maple	40 mm Cal. BB	Each	4	
	Q-1	<i>Quercus bicolor</i>	Swamp White Oak	45 mm Cal. BB	Each	7	
	Q-2	<i>Quercus palustris</i>	Pin Oak	45 mm Cal. BB	Each	2	
							Note: All trees shall be branched.



TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Refer to Standard Road Plans RL-1A and RL-1B

STATION	TEMPLATE CUT	SUBGRADE TREATMENT +C	PLOWING AND SHAPING +C	ENTRANCE EARTH WORK +C	GRANULAR BLANKETS +C	TOPSOIL DRESSING +C	TOPSOIL DRESSING MATERIAL -C	SELECT SOIL -C	PAVEMENT REMOVAL -C	ROCK -C	ADJUSTED EARTH CUT SUITABLE	HARD ROCK UNADJUST TOTAL	HARD ROCK ADJUSTED TOTAL	B & W ROCK	ADJUSTED ROCK, B&W & SHALE TOTAL	TEMPLATE FILL	PLOWING AND SHAPING +F	ENTRANCE EARTH WORK +F	BRIDGE BERMS +F	GRANULAR BLANKETS +F	FILL FOR TOPSOIL DRESSING -F	ROCK FILL -F	SUBGRADE TREATMENT -F	ADJUSTED FILL	PERCENT SHRINK	ADJUSTED SUITABLE FILL + SHRINK
51+50.000						1	1									1364					29	73	1262	30	1641	
51+60.000						3	3									4352					136	294	3922	30	5099	
51+80.000						3	3									6101					169	294	5638	30	7329	
52+00.000						2	2									7171					189	294	6688	30	8694	
52+20.000						2	2									7142					188	294	6660	30	8658	
52+40.000						2	2									6003					172	294	5537	30	7198	
52+60.000						3	3									4134					145	294	3695	30	4804	
52+80.000						3	1				2					2242					114	294	1834	30	2384	
53+00.000	51	33				35					119					970					70	261	639	30	831	
53+20.000	68	33				46					147					761					62	261	438	30	569	
53+40.000	17					15					32					2035					103	294	1638	30	2129	
53+60.000					670	2					672					4711				447	151	294	4713	30	6127	
53+80.000					1925	2					1927					8185				1283	199	294	8975	30	11668	
54+00.000					2965	2					2967					12016				1977	249	294	13450	30	17484	
54+20.000					3545	2					3547					15598				2363	293	294	17374	30	22587	
54+40.000					3455	5					3460					35811				2303	629	587	36898	30	47968	
54+80.000					2980	2					2982					18022				1987	314	294	19401	30	25221	
55+00.000					2435	3					2438					16205				1623	301	294	17233	30	22403	
55+20.000					1865	3					1868					13923				1243	282	294	14590	30	18967	
55+40.000					790	3					793					11755				527	264	294	11724	30	15241	
55+60.000						3					3					9587					245	294	9048	30	11762	
55+80.000						2	1				1					7592					223	294	7075	30	9198	
56+00.000						3	2				1					5850					193	294	5363	30	6972	
56+20.000						3	3				3					4297					160	294	3843	30	4996	
56+40.000						3	3				3					2748					125	294	2329	30	3028	
56+60.000	122	44				55	117				104					1196				74	250	872	30	1134		
56+80.000	941	191				138	375				895					230				19	103	108	30	140		
57+00.000	2138	294				175	545				2062										-1		1	30	1	
57+20.000	2350	294				178	572				2250													30		
57+40.000	1401	242				156	480				1319					111				9	52	50	30	65		
57+60.000	395	112				94	249				352					509				40	182	287	30	373		
57+80.000	24	17				29	58				12					1259				84	277	898	30	1167		
58+00.000						3	3				3					2012					117	294	1601	30	2081	
58+20.000						3	3				3					2593					129	294	2170	30	2821	
58+40.000						3	3				3					3481					146	294	3041	30	3953	
58+60.000						3	3				3					5137					173	294	4670	30	6071	
58+80.000						3	3				3					7289					202	294	6793	30	8831	
59+00.000					3243	3	3				3243					9458				2432	227	294	11369	30	14780	
59+20.000					3243	3	3				3243					11713				2432	256	294	13595	30	17674	
59+40.000					3243	2	2				3243					14139				2432	287	296	15988	30	20785	
59+60.000					3243	3	3				3243					16511				2432	305	299	18339	30	23841	
59+80.000					3243	2	2				3243					17084				2432	366	223	18927	30	24605	
60+00.000						5	2				3					25000					1509	660	22831	30	29680	
60+20.000					4654	2	2				4654					21413				3188	354	260	23987	30	31183	
60+40.000					4654	2	2				4654					25079				3188	371	343	27553	30	35819	
60+60.000					4654						4654					4650				3188	68	28	7742	30	10065	
60+80.000					4654	2	2				4654					23962				3188	344	154	26652	30	34648	
61+00.000					4654	2	2				4654					24285				3188	350	381	26742	30	34765	
61+20.000					4654	2	2				4654					23128				3188	335	407	25574	30	33246	
61+23.250						2	2				2					21944					320	433	21191	30	27548	
61+40.000						2	2				2					20271					300	459	19512	30	25366	
61+60.000						2	2				2					18267					275	485	17507	30	22759	
61+80.000						2	2				2					16012					248	510	15254	30	19830	
62+00.000						2	2				2					13455					222	538	12695	30	16504	
62+20.000						2	2				2					10868					196	574	10098	30	13127	
62+40.000						3	3				3					8591					170	617	7804	30	10145	
62+60.000						1	1				1					5353					111	475	4767	30	6197	
62+80.000																2657					61	301	2295	30	2984	
63+00.000																1817					64	294	1459	30	1897	
63+20.000																1406					72	273	1061	30	1379	
63+40.000	8	20				8	32				4					1559					75	262	1222	30	1589	
63+60.000	84	34				25	68				75					2274					79	275	1920	30	2496	
63+80.000	182	18				36	64				172					2752					84	287	2381	30	3095	
64+00.000	337	6				48	67				324					2433					92	268	2073	30	2695	
64+20.000	734	27				69	127				703					1957					98	235	1624	30	2111	
64+40.000	1316	59				94	233				1236					2167					105	252	1810	30	2353	
64+60.000	1807	42				117	310				1656					1913					121	288	2854	30	3710	
64+80.000	2091	6				133	317				1913					3263					121	288	2854	30	3710	
65+00.000	2307					149	304				2152					4643					145	294	4204	30	5465	
65+20.000	2522					178	344				2356					5281					153	294	4834	30	6284	
65+40.000	2737					214	469				2482					5039					150	294	4595	30	5974	
65+60.000	3019					251	550				2720					4410					143	294	3973	30	5165	
65+80.000	3376					278	518				3136					3722					134	294	3294	30	4282	
66+00.000	3823					300	549				3574					3204					125	294	2785	30	3621	
66+20.000	4344					324	605				4063					2880					122	299	2459	30	3197	
66+40.000	4844																									

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Refer to Standard Road Plans RL-1A and RL-1B

10Z-3Q
04-25-00

Table with columns: STATION, TEMPLATE CUT, SUBGRADE TREATMENT, PLOWING AND SHAPING, ENTRNACE EARTH WORK, GRANULAR BLANKETS, TOPSOIL DRESSING, TOPSOIL DRESSING MATERIAL, SELECT SOIL, PAVEMENT REMOVAL, ROCK, ADJUSTED EARTH CUT SUITABLE, HARD ROCK UNADJUST TOTAL, HARD ROCK ADJUSTED TOTAL, B & W ROCK, ADJUSTED ROCK, B&W & SHALE TOTAL, TEMPLATE FILL, PLOWING AND SHAPING, ENTRNACE EARTH WORK, BRIDGE BERMS, GRANULAR BLANKETS, FILL FOR TOPSOIL DRESSING, ROCK FILL, SUBGRADE TREATMENT, ADJUSTED FILL, PERCENT SHRINK, ADJUSTED SUITABLE FILL + SHRINK. The table contains 30 columns and 100 rows of data, with summary values on the right side of the table.

Overhaul = 1,723,480 ST-M

+80.00

Overhaul = 292,316 ST-M

+60.00

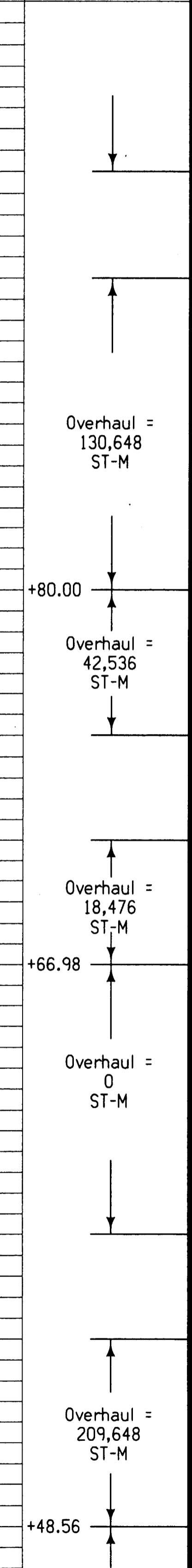
Overhaul = 280,335 ST-M

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Refer to Standard Road Plans RL-1A and RL-1B

107-30
04-25-00

STATION	TEMPLATE CUT	SUBGRADE TREATMENT +C	PLOWING AND SHAPING +C	ENTRANCE EARTH WORK +C	GRANULAR BLANKETS +C	TOPSOIL DRESSING +C	TOPSOIL DRESSING MATERIAL -C	SELECT SOIL -C	PAVEMENT REMOVAL -C	ROCK -C	ADJUSTED EARTH CUT SUITABLE	HARD ROCK UNADJUST TOTAL	HARD ROCK ADJUSTED TOTAL	B & W ROCK & SHALE TOTAL	ADJUSTED ROCK, B&W & SHALE TOTAL	TEMPLATE FILL	PLOWING AND SHAPING +F	ENTRANCE EARTH WORK +F	BRIDGE BERMS +F	GRANULAR BLANKETS +F	FILL FOR TOPSOIL DRESSING -F	ROCK FILL -F	SUBGRADE TREATMENT -F	ADJUSTED FILL	PERCENT SHRINK	ADJUSTED SUITABLE FILL + SHRINK					
82+60.000						92					155					4557							294	4263	30	5542					
82+80.000	247						93				193					5500							294	5206	30	6768					
83+00.000	286						99				202					5984							294	5690	30	7397					
83+20.000	301						101				213					6153							295	5858	30	7615					
83+40.000	314						98				222					6070							293	5777	30	7510					
83+60.000	320						54				110					3239							160	3079	30	4003					
83+70.878	164						45				101					2638							133	2505	30	3257					
83+80.000	146						99				253					5422							295	5127	30	6665					
84+00.000	352																								30						
1567+80.000																															
1568+00.000	3708	48				130	357			66	3463	19	19	47	66										30						
1568+20.000	3948	47				133	368			88	3672	36	36	52	88										30						
1568+40.000	3980	47				133	344			240	3576	145	145	95	240							-1	1	30	1						
1568+60.000	3821	47				128	334			225	3437	135	135	90	225										30						
1568+80.000	3515	47				122	326			40	3318	12	12	28	40										30						
1569+00.000	3146	47				116	336			22	2951	1	1	21	22										30						
1569+20.000	2775	47				111	332			8	2593			8	8						1			-1	30	-1					
1569+40.000	2491	47				109	351				2296														30						
1569+60.000	2243	47				107	363				2034														30						
1569+80.000	2008	47				105	345				1815														30						
1570+00.000	1816	47				105	313				1655														30						
1570+20.000	1558	47				102	302				1405														30						
1570+40.000	1130	47				96	283				990														30						
1570+60.000	545	32				85	210				452				25							1	15	9	30	12					
1570+80.000	113	9				48	88				82				270							24	175	38	30	43					
1571+00.000	1					9	9				1				825							55	167	47	556	30	723				
1571+20.000						1					1				1434							67	347	47	973	30	1265				
1571+40.000						1					1				1918							70		47	1801	30	2341				
1571+60.000						1					1				2169							69	47	2053	30	2669					
1571+80.000						1					1				2269							68	47	2154	30	2800					
1572+00.000						1					1				2366							69	47	2250	30	2925					
1572+20.000						1					1				2275							71	47	2157	30	2804					
2563+40.000						1					1				1582							54	47	1481	30	1925					
2563+60.000						1					1				848							39	47	762	30	991					
2563+80.000						1					1				253							16	34	203	30	264					
2564+00.000	48	13				24	44				41				253									11	3	30	4				
2564+20.000	356	36				53	122				323				14											30					
2564+40.000	881	47				71	182				817											-1		1	30	1					
2564+60.000	1408	47				88	202				1341															30					
2564+80.000	1956	47				97	207				1893											1		-1	30	-1					
2565+00.000	2615	47				106	225				2543															30					
2565+20.000	3285	47				114	222				3224															30					
2565+40.000	3754	47				119	231				3689											1		-1	30	-1					
2565+60.000	3863	47				121	266				3765															30					
2565+80.000	3593	47				119	269				3490															30					
2566+00.000	3173	47				116	248				3088															30					
2566+20.000	2739	47				112	243				2655															30					
2566+40.000	2225	47				108	255				2125											-1		1	30	1					
2566+60.000	1576	47				100	250				1473															30					
2566+80.000	905	47				90	220				822											-1		1	30	1					
2567+00.000	463	47				81	176				415															30	1				
2567+20.000	652	61				76	166				623															30	1				
3563+60.000						1					1				948							50	47	851	30	1106					
3563+80.000						2					2				1181							58	47	1076	30	1399					
3564+00.000						2					2				1543							70	47	1426	30	1854					
3564+20.000						2					2				2008											30					
3564+40.000						2					2				2179											30					
3564+60.000						2					2				1907											30					
3564+80.000						2					2				1555											30					
3565+00.000						3					3				1489											30					
3565+20.000						3					3				1822											30					
3565+40.000						8	10				9				2342											30					
3565+60.000	11					8	10				9				2342											30					
3565+80.000	13					16	20				9				2654											30					



TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Refer to Standard Road Plans RL-1A and RL-1B

10Z-30

04-25-00

STATION	TEMPLATE CUT	SUBGRADE TREAT-MENT +C	PLOWING AND SHAPING +C	ENTRANCE EARTH WORK +C	GRANULAR BLANKETS +C	TOPSOIL DRESSING +C	TOPSOIL DRESSING MATERIAL -C	SELECT SOIL -C	PAVEMENT REMOVAL -C	ROCK -C	ADJUSTED EARTH SUITABLE CUT	HARD ROCK UNADJUST TOTAL	HARD ROCK ADJUSTED TOTAL	B & W ROCK & SHALE TOTAL	ADJUSTED ROCK, B&W & SHALE TOTAL	TEMPLATE FILL	PLOWING AND SHAPING +F	ENTRANCE EARTH WORK +F	BRIDGE BERMS +F	GRANULAR BLANKETS +F	FILL FOR TOPSOIL DRESSING -F	ROCK FILL -F	SUBGRADE TREAT-MENT -F	ADJUSTED FILL	PERCENT SHRINK	ADJUSTED SUITABLE FILL + SHRINK	
3565+80.000	15					17	22				10					2497					114		47	2336	30	3037	
3566+00.000	48					34	57				25					1918					93		47	1778	30	2311	
3566+20.000	216					68	73				211					1086					65		47	974	30	1266	
3566+40.000	688	14				111	143				670					334					28		33	273	30	355	
3566+60.000	1442	37				141	265				1355					21					3		10	8	30	10	
3566+80.000	1988	47				139	303				1871														30		
3567+00.000	2117	47				128	291				2001														30		
3567+20.000	2069	47				119	284				1951														30		
3567+40.000	1976	47				114	297				1840														30		
3567+60.000	2014	49				118	296				1885										-1		1	30		1	
3567+80.000																									30		
4567+80.000	2273	59				99	262			39	2130	39	39		39										30		
4568+00.000	2651	53				100	256			76	2472	76	76		76						-1		1	30		1	
4568+19.993	2333	47				96	220			60	2196	60	60		60						1		-1	30		-1	
4568+40.000	2001	47				93	195			35	1911	35	35		35										30		
4568+60.000	2013	47				94	208			17	1929	17	17		17										30		
4568+80.000	2053	47				96	222			5	1969	5	5		5										30		
4569+00.000	2032	47				96	209				1966														30		
4569+20.000	1879	47				94	187				1833														30		
4569+40.000	1377	47				88	184				1328										1		-1	30		-1	
4569+60.000	653	41				74	154				614				23						4	13	6	30			
4569+80.000	212	17				51	82				198				132						19	83	30	30			
4570+00.000	150					40	45				145				184						24	113	47	30			
4570+20.000	128					36	42				122				264						29	23	47	165	30	215	
4570+40.000	80					30	33				77				415						40		47	328	30	426	
4570+60.000	55					27	29				53				502						45		47	410	30	533	
4570+80.000	22					12	13				21				812						24		47	741	30	963	
4571+00.000						1					1				1508						42		47	1419	30	1845	
4571+20.000						1					1				2248						84		47	2117	30	2752	
4571+40.000						1					1				2456						78		47	2331	30	3030	
4571+60.000						1					1				2086						65		47	1974	30	2566	
4571+80.000						1					1				1612						54		47	1511	30	1964	
4572+00.000						1					1				1290						51		47	1192	30	1550	
4572+20.000						2					2				1112						50		46	1016	30	1321	
4572+40.000																									30		
1462+40.000	97	193				3			34		259				108						43		4	61	30	79	
1462+60.000	114	181				3			34		264				154						46		16	92	30	120	
1462+80.000	145	178				4			35		292				188						52		19	117	30	152	
1462+99.996	181	183				4			35		333				190						55		14	121	30	157	
1463+19.996	65	47		15		4			9		122				34						10		1	23	30	30	
1463+24.975	205	137				12			26		328				101						27		8	66	30	86	
1463+39.996	139	95				8			19		223				73		10				17		11	55	30	72	
1463+50.949	118	78				7			16		187				56						12		9	35	30	46	
1463+59.997	226	171				2			34		365				163						36		26	101	30	131	
1463+79.998	202	162				2			34		332				202						40		35	127	30	165	
1463+99.999	183	153				11	12		35		300				241						44		41	156	30	203	
1464+19.999	157	147				18	25		35		262				252						45		43	164	30	213	
1464+39.999	107	143				19	26		35		208				240						41		49	150	30	195	
1464+59.999	55	135				19	24		35		150				275						41		57	177	30	230	
1464+80.000	24	102	101			17	24		35		185				419	101	55				48		88	439	30	571	
1464+99.999	25	43	192			21	27		20		234				715	192					60		147	700	30	910	
1465+20.000	68	5	160			34	49		3		215				1154	160					72		182	1060	30	1378	
1465+40.000	229		144			54	94				333				1312	144					71		183	1202	30	1563	
1465+60.000	235	2	142			55	102		1		331				1321	142					68		193	1202	30	1563	
1465+80.000	137	32	172			49	86		18		286				1141	172					62		185	1066	30	1386	
1466+00.000	187	101	105			58	89		35		327				642	105					43		125	579	30	753	
1466+20.000	465	169				86	163		35		522				230						19		57	154	30	200	
1466+40.000	1371	213				122	274		35		1397				19						2		13	4	30	5	
1466+60.000	898	94				50	108		15		919														30		
1466+68.313	1373	119				58	96		21		1433														30		
1466+80.000	2536	183				81	104		35		2661														30		
1467+00.000	2923	183				70	97		35		3044														30		
1467+20.000	3787	183				109	183		35		3861														30		
1467+39.999	4665	183				152	253		35		4712										1		-1	30		-1	
1467+60.000	4876	183				152	224		35		4952										1		-1	30		-1	
1467+80.000	4908	183				152	207		35		5001														30		
1468+00.000	4604	183				115	151		37		4714														30		

Overhaul = 0 ST-M

Overhaul = 72,760 ST-M

+20.00

Overhaul = 59,420 ST-M

Overhaul = 0 ST-M

+83.01

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Refer to Standard Road Plans RL-1A and RL-1B

10Z-30
04-25-00

STATION	TEMPLATE CUT	SUBGRADE TREATMENT +C	PLOWING AND SHAPING +C	ENTRANCE EARTH WORK +C	GRANULAR BLANKETS +C	TOPSOIL DRESSING +C	TOPSOIL DRESSING MATERIAL -C	SELECT SOIL -C	PAVEMENT REMOVAL -C	ROCK -C	ADJUSTED EARTH CUT SUITABLE	HARD ROCK UNADJUSTED TOTAL	HARD ROCK ADJUSTED TOTAL	B & W ROCK & SHALE TOTAL	ADJUSTED ROCK, B&W & SHALE TOTAL	TEMPLATE FILL	PLOWING AND SHAPING +F	ENTRANCE EARTH WORK +F	BRIDGE BERMS +F	GRANULAR BLANKETS +F	FILL FOR TOPSOIL DRESSING -F	ROCK FILL -F	SUBGRADE TREATMENT -F	ADJUSTED FILL	PERCENT SHRINK	ADJUSTED SUITABLE FILL + SHRINK													
1468+20.000						71	85		37		3898																												
1468+39.999	3766	183				79	118		37		3466																										30		
1468+60.000	2463	128				76	116		26		2525																										30		
1468+74.042	1138	61				44	68		11		1164																										30		
1468+80.000	3767	226				159	252		36		3864																										30		
1469+00.000	3284	204				134	201		35		3386											-1													30	1			
1469+20.000	2814	180				115	181		35		2893																										30		
1469+40.000	2156	176				97	150		35		2244																										30		
1469+60.000	1300	169				74	105		37		1401					2																					30		
1469+80.000	522	153	101			35	54		39		718					53	101	15						2													30		
1470+00.000	137	116	184			21	47		38		373					367	184							11	154										30	200			
1470+20.000	92	45	138			36	71		18		222					915	138							39	484											30	629		
1470+40.000	79		71			35	62				123					1258	71							101	895											30	1164		
1470+60.000	52		13			26	42				49					1109	13							139	1117											30	1452		
1470+75.765	13					6	11				8					320								106	949											30	1234		
1470+80.000	65					32	57				40					1529								28	272											30	354		
1471+00.000	44					29	49				24					1402								129	1308											30	1700		
1471+20.000	21					24	41				4					1093								126	1190											30	1547		
1471+40.000	49	5				28	46		4		32					734								125	894											30	1162		
1471+60.000	92	37				29	46		21		91					438								85	325											30	733		
1471+80.000	62	91				18	18		34		119					252								28	202											30	423		
1472+00.000	120	114				27	25		34		202					143								22	202											30	263		
1472+20.000	174	109				35	41		34		243					91								18	123											30	160		
1472+40.000	66	42				13	17		14		90					51								9	42											30	105		
1472+48.000	92	63				17	24		21		127					116								22	94											30	55		
1472+60.000	106	104				18	21		35		172					205								38	167											30	122		
1472+80.000	124	104				19	18		34		195					184								36	148												30	217	
1473+00.000	189	104				23	16		35		265					116		101						24	193											30	192		
1473+20.000	350	104				42	40		35		421					36								7	29											30	251		
1473+40.000	600	104				65	81		35		653					6								1	95											30	38		
1473+60.000	755	104			86	74	100		39		880													45	18											30	124		
1473+80.000	545	104				66	84		38		593					21								11	18											30	59		
1474+00.000	190	94				42	46		34		246					127								10	106											30	23		
1474+20.000	34	42				19	17		19		59					373								61	283												30	138	
1474+40.000	4	1				6	4		2		5					712								102	556												30	368	
1474+60.000						3					3					1107								77	926												30	723	
1474+80.000						1					1					631								49	540												30	1204	
1474+89.000																741								46	642												30	702	
1475+00.000	49	77				1			10		5					947								27	837												30	835	
1475+20.000						2			34		94					343								83	805												30	1088	
1475+40.000	401	104				35	49		35		456													38	305												30	397	
1475+60.000	1224	104				88	114		35		1267																										30	30	
1475+80.000	2126	104				111	150		41		2150							103						103													30	134	
1476+00.000	2251	104				112	162		43		2262																										30	30	
1476+20.000	1671	104				97	122		41		1709																										30	30	
1476+40.000	1051	104				77	77		41		1114																										30	30	
1476+60.000	564	104			60	53	73		43		665					13								68	30												30	88	
1476+80.000	266	104				32	45		22		335					81								50	30												30	65	
1477+00.000	130	104				18	8		21		223					187								141	30												30	183	
1477+14.464	85	76				17	3		48		127					120								97	30												30	126	
																																					30		
																																						30	
																																						30	
9001+15.495	227					34					261																										30		
9001+27.366	116					17					133																											30	
9001+33.589	117					17					134																											30	
9001+40.000	358					49					407																											30	
9001+60.000	84					11					95																											30	
9001+64.726	310					40					350</																												

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Refer to Standard Road Plans RL-1A and RL-1B

107-30
04-25-00

STATION	TEMPLATE CUT	SUBGRADE TREATMENT +C	PLOWING AND SHAPING +C	ENTRANCE EARTH WORK +C	GRANULAR BLANKETS +C	TOPSOIL DRESSING +C	TOPSOIL DRESSING MATERIAL -C	SELECT SOIL -C	PAVEMENT REMOVAL -C	ROCK -C	ADJUSTED EARTH CUT SUITABLE	HARD ROCK UNADJUSTED TOTAL	HARD ROCK ADJUSTED TOTAL	B & W ROCK & SHALE TOTAL	ADJUSTED ROCK, B&W & SHALE TOTAL	TEMPLATE FILL	PLOWING AND SHAPING +F	ENTRANCE EARTH WORK +F	BRIDGE BERMS +F	GRANULAR BLANKETS +F	FILL FOR TOPSOIL DRESSING -F	ROCK FILL -F	SUBGRADE TREATMENT -F	ADJUSTED FILL	PERCENT SHRINK	ADJUSTED SUITABLE FILL + SHRINK														
9004+60.000	702					78					780					1							1	30	1															
9004+80.000	321					61					382					30		83					113	30	147															
9005+00.000	104					41					145					110					5		105	30	137															
9005+20.000	37					24					61					183					12		171	30	222												+00.00			
9005+40.000	109					31					140					240					19		221	30	287															
9005+60.000	175					42					217					261					22		239	30	311															
9005+80.000	172					42					214					240					16		224	30	291															
9006+00.000	242					21					263					118					6		112	30	146															
9006+19.908	1										1					1							1	30	1															
9006+20.000	159					41					200					259					16		243	30	316															
9006+40.000	124					37					161					282					20		262	30	341															
9006+60.000	88					33					121					302					24		278	30	361															
9006+80.000	65					28					93					313					26		287	30	373												Overhaul = 360 ST-M			
9007+00.000	51					26					77					289					23		266	30	346															
9007+20.000	54					32					86					220					14		206	30	268															
9007+40.000	111					43					154					114					4		110	30	143															
9007+60.000	274				166	57					497					40		60					100	30	130															
9007+80.000	424					70					494					38							38	30	49															
9008+00.000	439					70					509					38							38	30	49															
9008+20.000	387					67					454					14							14	30	18															
9008+40.000	332					65					397					1							1	30	1															
9008+60.000	289				34	63					386					1		66					67	30	87															
9008+80.000	118					31					149					1							1	30	1															
9008+90.487																																								
1300+00.000																																								
1300+20.000	33										33					2							2	30	3															
1300+40.000	30										30					4							4	30	5															
1300+60.000	39										39					12							12	30	16															
1300+80.000	48										48					16							16	30	21															
1301+00.000	38										38					25							25	30	33															
1301+20.000	14										14					82							82	30	107															
1301+40.000																177							177	30	230															
1301+60.000																310							310	30	403															
1301+80.000																317							317	30	412															
1302+00.000																175							175	30	228															
1302+20.000	22										22					59							59	30	77															
1302+40.000	58										58					4							4	30	5															
1302+60.000	45										45					21							21	30	27															
1302+80.000	9										9					104							104	30	135															
1303+00.000	3										3					109							109	30	142															
1303+20.000	83										83					25							25	30	33															
1303+40.000	258										258																													
1303+60.000	426										426																													
1303+80.000	527										527																													
1304+00.000	558										558																													
1304+05.000	139										139																													
1304+10.000	135										135																													
1304+15.000	127										127																													
1304+20.000	117										117																													
4121+79.926	28										28							2000					2000	30	2600															
4121+99.926	29										29																													
4122+19.927	19										19					90							90	30	117															
4122+39.928	7	3									9					192						6	186	30	242															
4122+59.930	40	7									44					128						14	236	30	307															
4122+79.934	8	1									9					6						2	4	30	5															
4122+82.232	87	13									99					50						10	40	30	52															
4122+99.939	129	10									139					116						18	98	30	127															
4123+19.946	141	1									142					198						28	170	30	221															
4123+39.956	162										162					257						29	228	30	296															
4123+59.966	165										165					225						23	202	30	263															
4123+75.975	51										51					56			</																					

TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

Refer to Standard Road Plans RL-1A and RL-1B

STATION	TEMPLATE CUT	SUBGRADE TREATMENT +C	PLOWING AND SHAPING +C	ENTRANCE EARTH WORK +C	GRANULAR BLANKETS +C	TOPSOIL DRESSING +C	TOPSOIL DRESSING MATERIAL -C	SELECT SOIL -C	PAVEMENT REMOVAL -C	ROCK -C	ADJUSTED EARTH CUT SUITABLE	HARD ROCK UNADJUSTED TOTAL	HARD ROCK ADJUSTED TOTAL	B & W ROCK & SHALE TOTAL	ADJUSTED ROCK, B&W & SHALE TOTAL	TEMPLATE FILL	PLOWING AND SHAPING +F	ENTRANCE EARTH WORK +F	BRIDGE BERMS +F	GRANULAR BLANKETS +F	FILL FOR TOPSOIL DRESSING -F	ROCK FILL -F	SUBGRADE TREATMENT -F	ADJUSTED FILL	PERCENT SHRINK	ADJUSTED SUITABLE FILL + SHRINK			
2047+40.000																		284					284		369				
2047+60.000											2500												29	2471	30	3212			
2047+80.000											2618												29	2589	30	3366			
2048+00.000											2040												29	2011	30	2614			
2048+20.000											2095												29	2066	30	2686			
2048+40.000											1896												29	1867	30	2427			
2048+60.000	7										7												29	1281	30	1665			
2048+80.000	88										88												29	694	30	902			
2049+00.000	260	7									267												22	315	30	410			
2049+20.000	396	21									417												8	105	30	137			
2049+40.000	353	14									367												15	69	30	90			
2049+60.000	231										231												29	135	30	176			
2049+80.000	202										202												29	173	30	225			
2050+00.000	295	11									306												18	78	30	101			
2050+20.000	738	25									763												4	3	30	4			
2050+40.000	1185	29									1214														30				
2050+60.000	1244	29									1273														30				
2050+80.000	1312	29									1341														30				
2051+00.000	1249	29									1278														30				
2051+20.000	785	19									804												10	22	30	29			
2051+40.000	267	8									275												21	119	30	155			
2051+60.000	34	11									45												18	186	30	242			
2051+80.000	15	8									23												7	192	30	250			
2052+00.000	7	7									14													175	30	228			
2052+20.000	6	7									13													120	30	156			
2052+40.000	12										12													77	30	100			
2052+60.000	14										14													43	30	56			
2052+80.000	15										15													18	30	23			
2084+00.000																										30			
2084+20.000	88										88															30			
2084+40.000	88										88															30			
2084+60.000	78										78															30			
2084+80.000	81										81															30			
2085+00.000	94										94				3									3	30	4			
2085+20.000	76	9									85				19									19	30	25			
2085+40.000	40	17									57				53								3	50	30	65			
2085+60.000	25	15									40				93								11	82	30	107			
2085+80.000	19	11									30				139								17	122	30	159			
2086+00.000	24	3									27				194								26	168	30	218			
2086+20.000	28										28				255								29	226	30	294			
2086+40.000	34										34				293								29	264	30	343			
2086+60.000	60										60				274								29	245	30	319			
2086+80.000	87										87				202								29	173	30	225			
2087+00.000	141										141				131								29	102	30	133			
2087+20.000	208										208				100								29	71	30	92			
2087+40.000	258										258				96								29	67	30	87			
2087+60.000	280										280				122								29	93	30	121			
2087+80.000	232										232				180								29	151	30	196			
2088+00.000	120										120				284								29	255	30	332			
2088+20.000	44										44				385								29	356	30	463			
2088+40.000	36										36				396								29	367	30	477			
2088+60.000	26										26				559								29	1290	30	1677			
55+25.000																										30			
55+50.000	9377					1294	2274				8397				8						7		1	30	1				
55+75.000	17855					1347	2540	481			16181															30			
56+00.000	25687					1377	2463	3693			20908													-1	1	30	1		
56+25.000	33008					1407	2234	5553			26628													-1	1	30	1		
56+50.000	40341					1452	2282	5160			34351															30			
56+75.000	46553					1491	2255				45789															30			
57+00.000	49480					1522	2374				48628															30			
57+25.000	47509					1543	2563				46489															30			
57+50.000	40605					1560	2637				39528															30			
57+75.000	31878					1534	2496				30916															30			
58+00.000	22896					1464	2341				22019															-1	1	30	1

↑
Overhaul = 379,676 ST-M

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Overhaul = 19,049 ST-M

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Overhaul = 0 ST-M

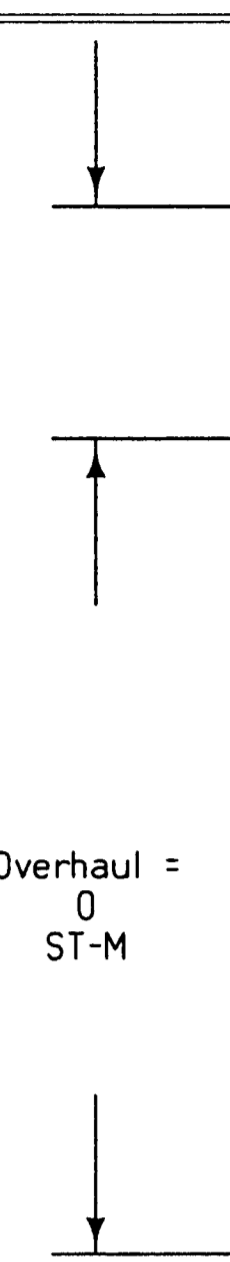
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TABULATION OF TEMPLATE QUANTITIES AND ADJUSTMENTS

10Z-30
04-25-00

Refer to Standard Road Plans RL-1A and RL-1B

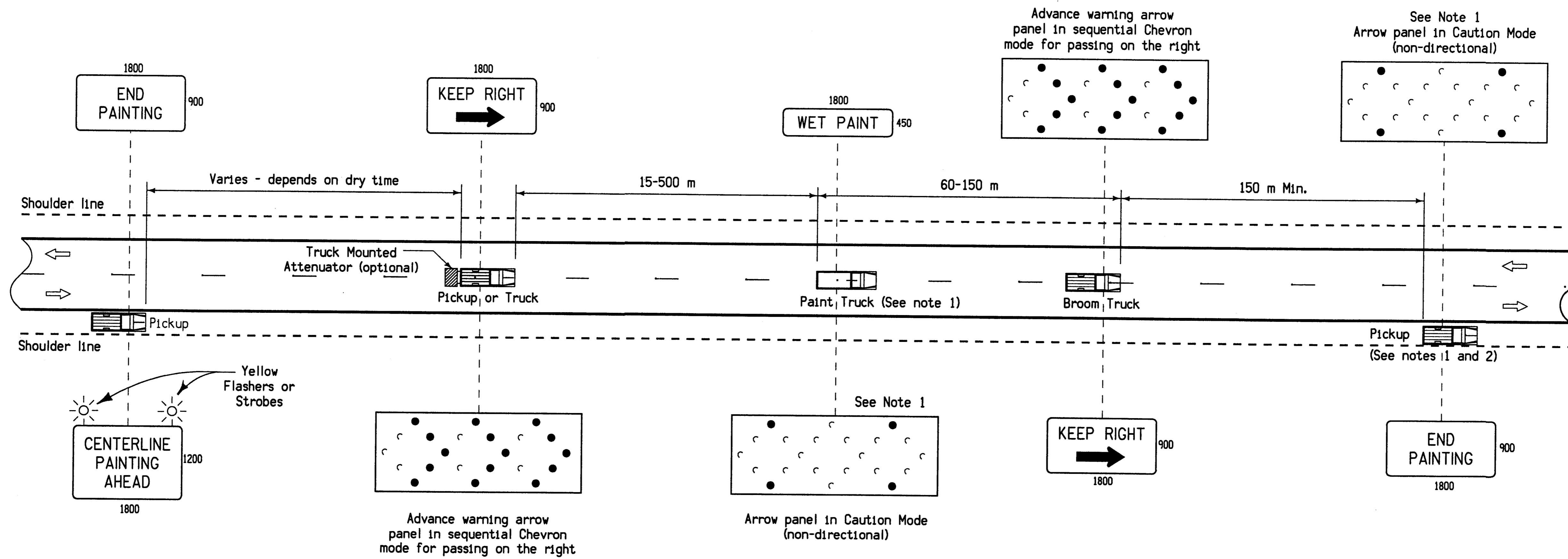
STATION	TEMPLATE CUT	SUBGRADE TREATMENT +C	PLOWING AND SHAPING +C	ENTRANCE EARTH WORK +C	GRANULAR BLANKETS +C	TOPSOIL DRESSING +C	TOPSOIL DRESSING MATERIAL -C	SELECT SOIL -C	PAVEMENT REMOVAL -C	ROCK -C	ADJUSTED EARTH CUT SUITABLE	HARD ROCK UNADJUSTED TOTAL	HARD ROCK ADJUSTED TOTAL	B & W ROCK & SHALE TOTAL	ADJUSTED ROCK B&W TOTAL	TEMPLATE FILL	PLOWING AND SHAPING +F	ENTRANCE EARTH WORK +F	BRIDGE BERMS +F	GRANULAR BLANKETS +F	FILL FOR TOPSOIL DRESSING -F	ROCK FILL -F	SUBGRADE TREATMENT -F	ADJUSTED FILL	PERCENT SHRINK	ADJUSTED SUITABLE FILL + SHRINK		
58+00.000						1365	2328				12546										1			-1	30	-1		
58+25.000	13509																											
58+50.000	7791					961	1645				7107															30		
58+75.000	6988					573	943				6618															30		
59+00.000	6159					539	874				5824															30		
75+50.000	14716					732	1010				14438															30		
75+75.000	25498					879	1354				25023															30		
76+00.000	31754					885	1544	2419			28676															30		
76+25.000	34403					889	1490	10946			22856															30		
76+50.000	35673					895	1456	9577			25535										-1			1	30	1		
76+75.000	37111					900	1404	7799			28808										1			-1	30	-1		
77+00.000	37979					882	1234	7705			29922													1	30	1		
77+25.000	36339					848	1175	7606			28406													-1	30	-1		
77+50.000	32435					816	1121	7376			24754															30		
77+75.000	27186					806	1004	5134			21854															30		
78+00.000	21340					790	969	1625			19536															30		
78+25.000	16855					771	913				16713															30		
78+50.000	13665					743	796				13612															30		
78+75.000	10691					718	714				10695														1	30	1	
79+00.000	7044					650	624				7070															30		
79+25.000	3646					500	465				3681															30		
79+50.000	1656					312	290				1678										1			-1	30	-1		
79+75.000	584					134	136				582															30		
80+00.000																												



18-SEP-2001 08:24 csm:thz Projects: 64030030-92 Design: 64030168.t02

FRONT FACING SIGNS

Direction of Marking →



REAR FACING SIGNS

GENERAL NOTES:

1. The arrow panel on the paint truck and the lead pickup should normally be in the caution mode. A yellow strobe or revolving light may be substituted for this arrow panel.
2. The lead pickup may be driven in the traveled lane.
3. All signs shall have an orange background with black legend.
4. Flagger(s) should be used at primary road junctions or as necessary to control traffic.
5. Arrow panels shall meet the requirements of a Type 'C' Arrow Display as specified in the MUTCD and current Standard and Supplemental Specifications.
6. Detail Sheet 520-41 may be used in place of this detail sheet.

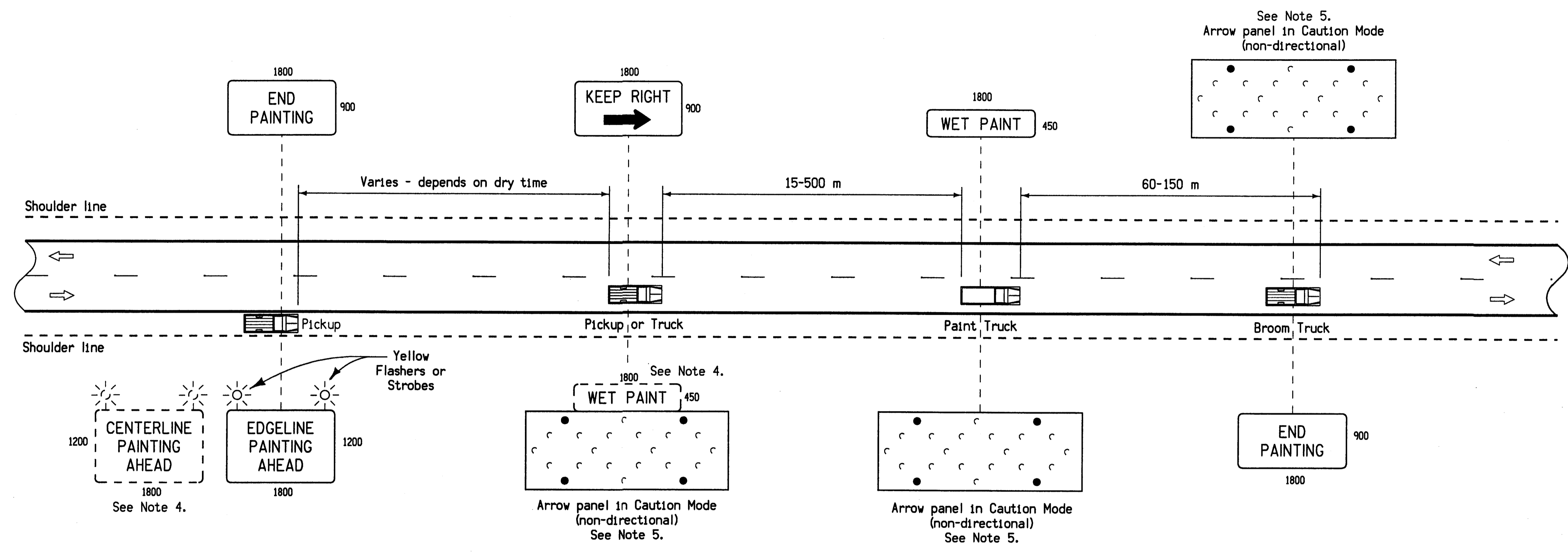
For Maintenance Use Only

All dimensions given in millimeters unless noted.

M	<i>Project Development Division</i>		
	DETAIL SHEET		520-40
	REVISION: Add note indicating "For Maintenance Use Only"		REVISION NO. 3 REVISION DATE 04-27-99
METRIC VERSION	TRAFFIC CONTROL FOR CENTERLINE MARKINGS ON TWO-LANE ROADWAYS		

FRONT FACING SIGNS

Direction of Marking →



REAR FACING SIGNS

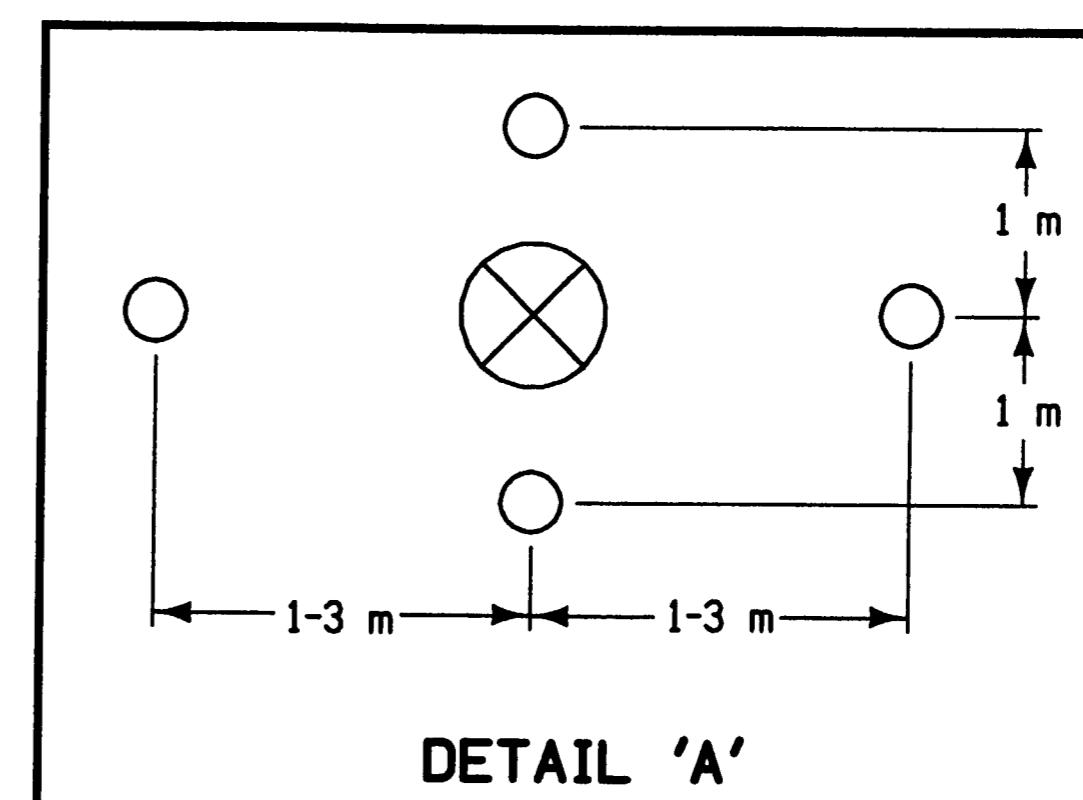
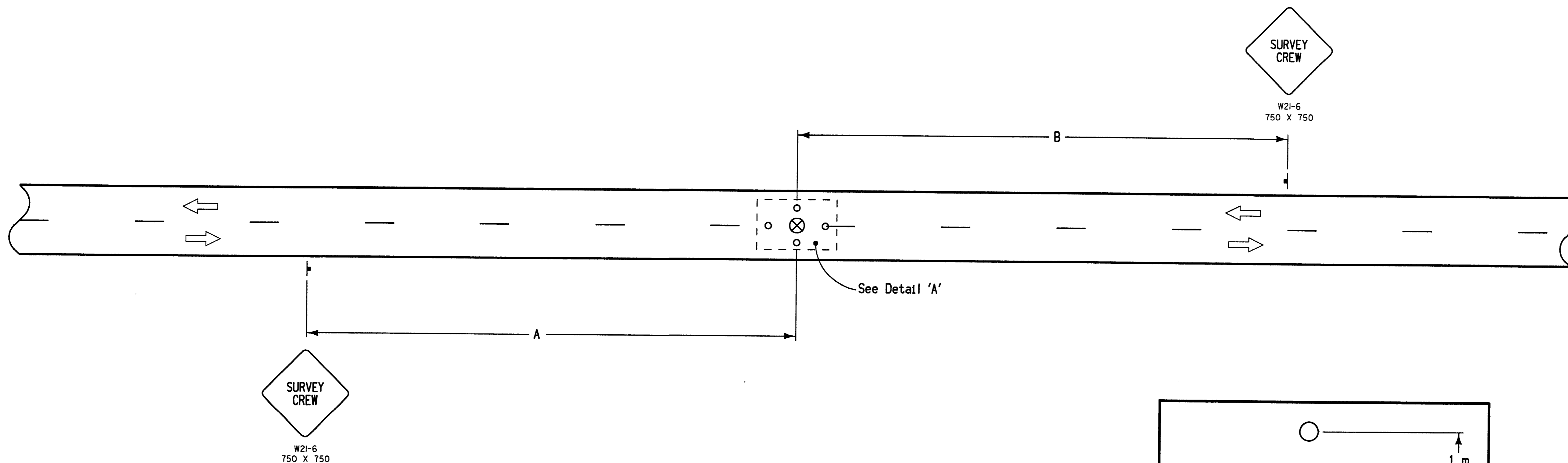
GENERAL NOTES:

1. All signs shall have an orange background with black legend.
2. Flagger(s) should be used at primary road junctions or as necessary to control traffic.
3. Arrow panels shall meet the requirements of a Type 'C' Arrow Display as specified in the MUTCD and current Standard and Supplemental Specifications.
4. This layout may be used to place centerline pavement markings. When used to paint centerline markings, the "EDGELINE PAINTING AHEAD" sign shall be changed to a "CENTERLINE PAINTING AHEAD" sign. A "WET PAINT" sign shall be mounted on the vehicle behind the paint truck.
5. A yellow strobe or revolving light may be substituted for this arrow panel.

All dimensions given in millimeters unless noted.

METRIC VERSION	<i>Project Development Division</i>	
	DETAIL SHEET	520-41
	REVISION: Add "CENTERLINE" to title block.....	REVISION NO. REVISION DATE 3 04-27-99
TRAFFIC CONTROL FOR EDGELINE AND CENTERLINE MARKINGS ON TWO-LANE ROADWAYS		

SPEED LIMIT	Approximate Spacing	
	'A' or 'B' Range (See Note 3)	'A' + 'B' Maximum
35 mph	150-900 m	1050 m
45 mph	210-900 m	1110 m
55 mph	300-900 m	1200 m



GENERAL NOTES:

1. This layout represents traffic control for survey instrument or other survey work that results in persons or equipment operating near the centerline of the roadway.
2. The position of the warning signs may be adjusted in the field to compensate for unusual alignment profile.
3. 'A' and 'B' distances are to remain as near minimum values as work permits. However, to be able to move the work area without moving the advance signing, 'A' and 'B' values may be varied within the limits of the Table. Maximum movement can be achieved by setting one 'A' or 'B' value at the minimum and the other value at its maximum.
4. An observer is required to warn workers in the traffic lane of approaching traffic.
5. When another person is required outside of the signing setup, (e.g. for a survey target) a separate signing setup may be necessary unless the traffic lane can be vacated to accommodate traffic.

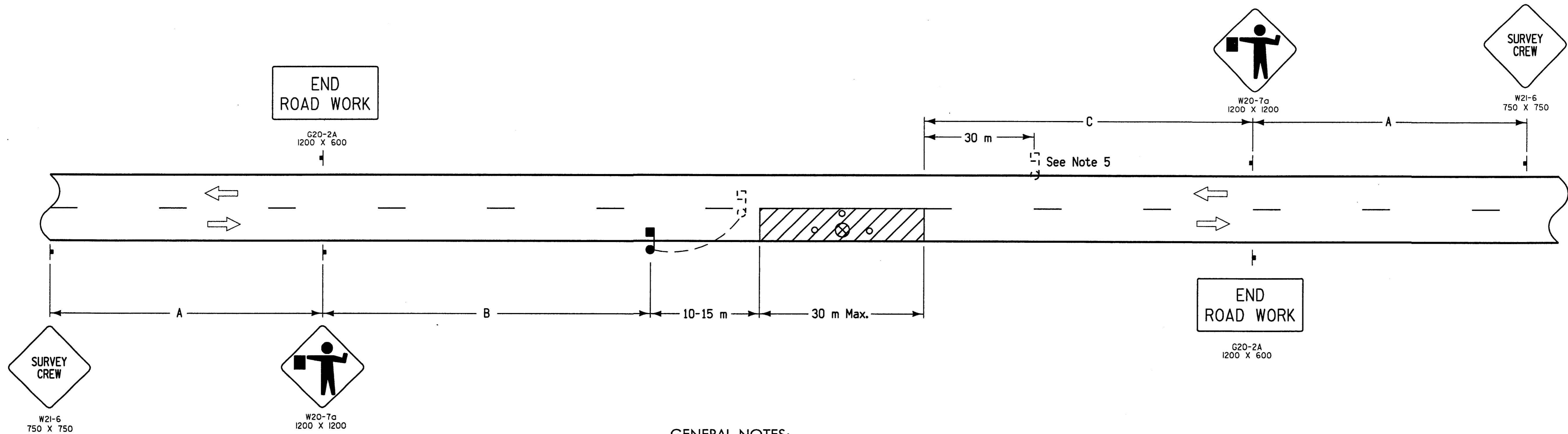
LEGEND

- † Traffic Sign
- ⊗ Instrument Person
- Cone (minimum 700 millimeters high)

All dimensions given in millimeters unless noted.

M METRIC VERSION	<i>Project Development Division</i>	
	DETAIL SHEET	520-48
	REVISION: Metric conversion of Detail Sheet 520-48. rev. (dated 5-10-88)	REVISION NO. New REVISION DATE 06-06-95
SIGNING LAYOUT FOR SURVEY INSTRUMENT WORK NEAR THE CENTERLINE		

SPEED LIMIT	Approximate Spacing		
	'A'	'B' or 'C' Range (See Note 2)	'B' + 'C' Maximum
35 mph	75 m	75-1000 m	1075 m
45 mph	105 m	105-1020 m	1125 m
55 mph	150 m	150-1070 m	1220 m



GENERAL NOTES:

1. This layout represents traffic control for survey instrument or other survey work that results in persons or equipment operating in the traffic lane.
2. The position of the warning signs may be adjusted in the field to compensate for unusual alignment profile.
3. Traffic in the open lane shall be allowed to flow freely. The flagger shall stop the first vehicle in the closed lane from the position shown, then cross the traffic lane to stop other vehicles.
4. Speed Limit refers to the legal speed limit in miles per hour before construction.
5. A second flagger shall be required:
 - a) if the flagger's view of approaching traffic in the open lane is less than 400 meters or the work site is in an area of restricted sight distance (such as a "No Passing" Zone); or
 - b) if excessive traffic delays are encountered.

6. "A" and "B" distances are to remain as near minimum values as work permits. However, to be able to move the work area without moving the advance signing, "A" and "B" values may be varied within the limits of the Table. Maximum movement can be achieved by setting one "A" or "B" value at the minimum and the other value at its maximum.
7. When another person is required outside of the signing setup (e.g. for a survey target), a separate signing setup may be necessary unless the traffic lane can be vacated to accommodate traffic.

All dimensions given in millimeters unless noted.

LEGEND

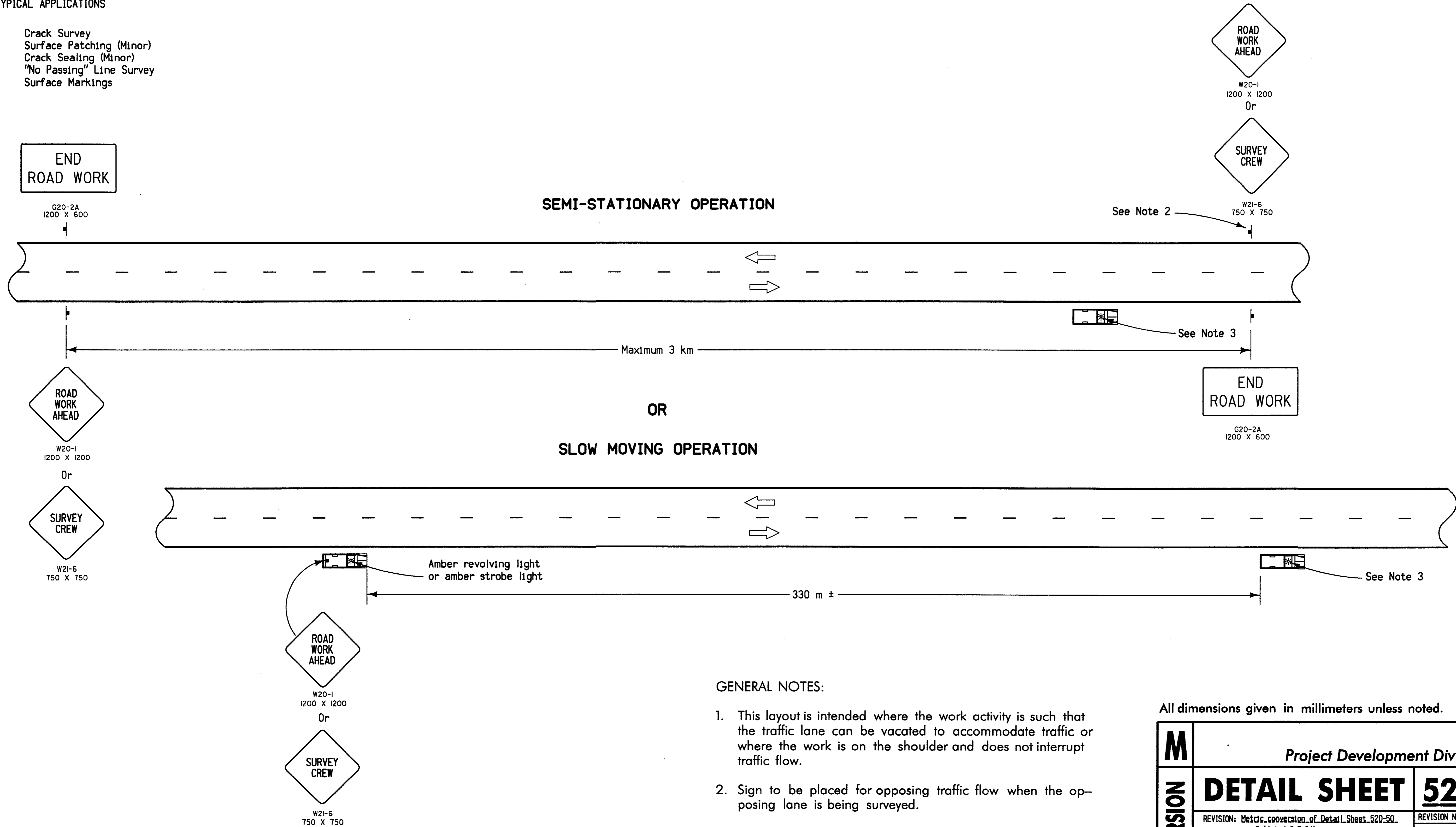
- † Traffic Sign
- ⊗ Instrument Person
- Cone (minimum 700 millimeters high)
- 🎵 Flagger with Stop/Slow Paddle
- ▨ Work Area

M METRIC VERSION	<i>Project Development Division</i>	
	DETAIL SHEET	520-49
	REVISION: Metric conversion of Detail Sheet 520-49, new, (dated 5-10-88).	REVISION NO. New REVISION DATE 06-06-95
SIGNING LAYOUT FOR SURVEY INSTRUMENT WORK REQUIRING LANE CLOSURE		

TWO-LANE ROADWAY

TYPICAL APPLICATIONS

Crack Survey
 Surface Patching (Minor)
 Crack Sealing (Minor)
 "No Passing" Line Survey
 Surface Markings



GENERAL NOTES:

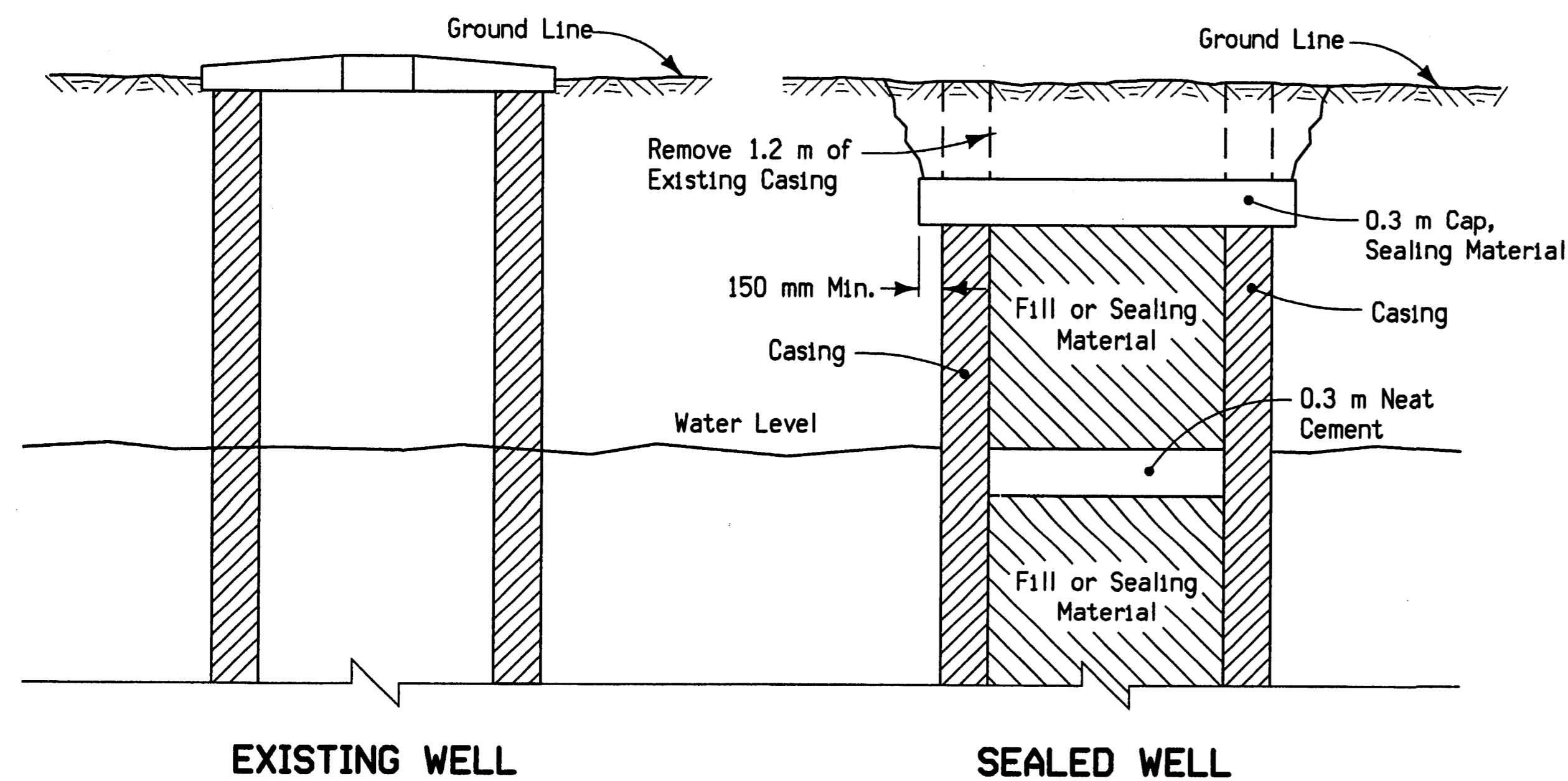
1. This layout is intended where the work activity is such that the traffic lane can be vacated to accommodate traffic or where the work is on the shoulder and does not interrupt traffic flow.
2. Sign to be placed for opposing traffic flow when the opposing lane is being surveyed.
3. Test equipment or work vehicle shall have an amber revolving light or amber strobe light. An observer is required to warn workers in the traffic lane of approaching traffic.
4. Work is not to interfere with traffic flow.

All dimensions given in millimeters unless noted.

M METRIC VERSION	<i>Project Development Division</i>		
	DETAIL SHEET		520-50
	REVISION: Metric conversion of Detail Sheet 520-50, No. 2 (dated 6-7-94)		REVISION NO. 2 REVISION DATE 06-06-95
TRAFFIC CONTROL LAYOUT FOR SLOW MOVING OPERATION WHERE WORK DOES NOT INTERFERE WITH TRAFFIC			

LEGEND

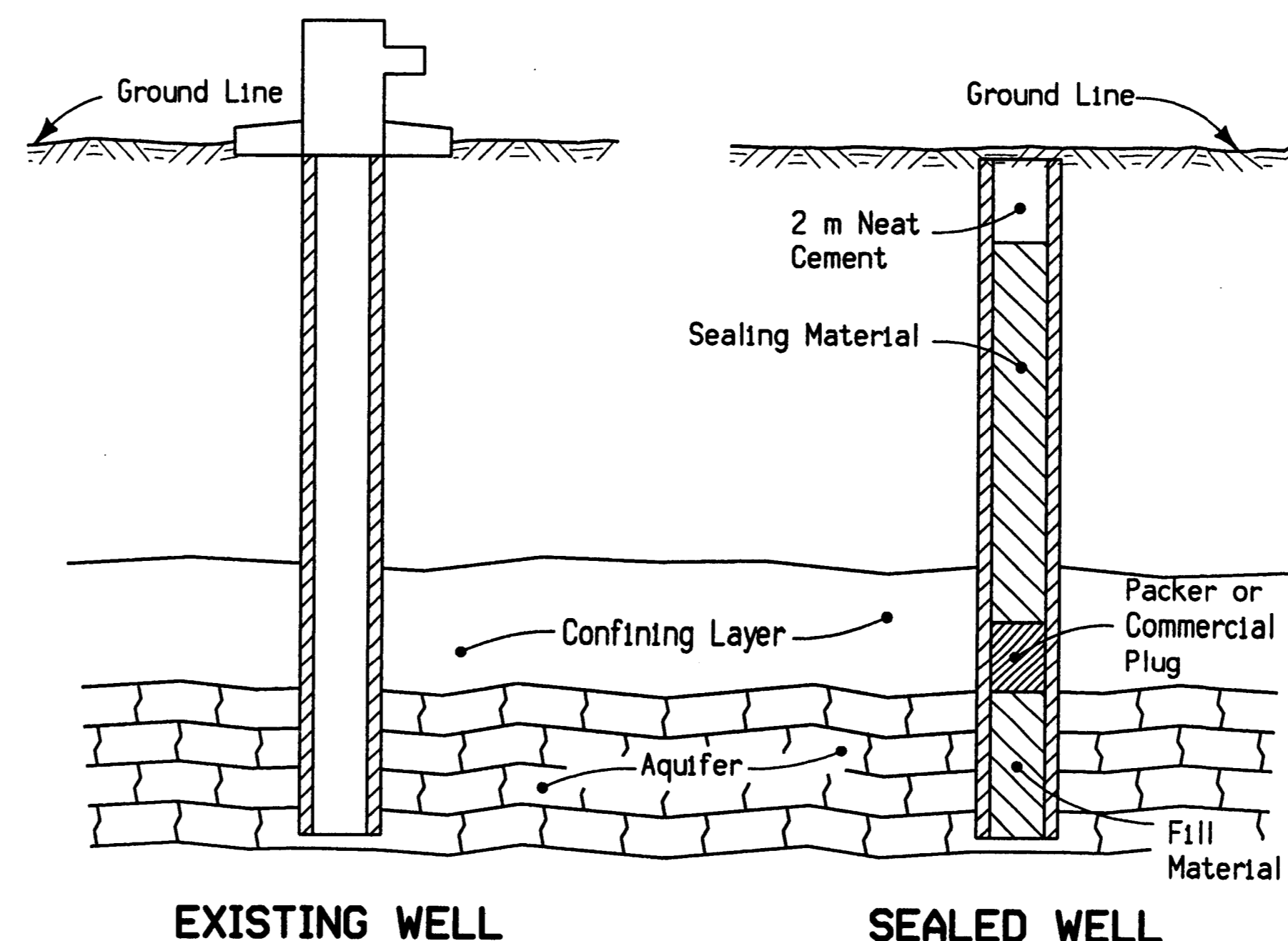
┆ Traffic Sign



EXISTING WELL

SEALED WELL

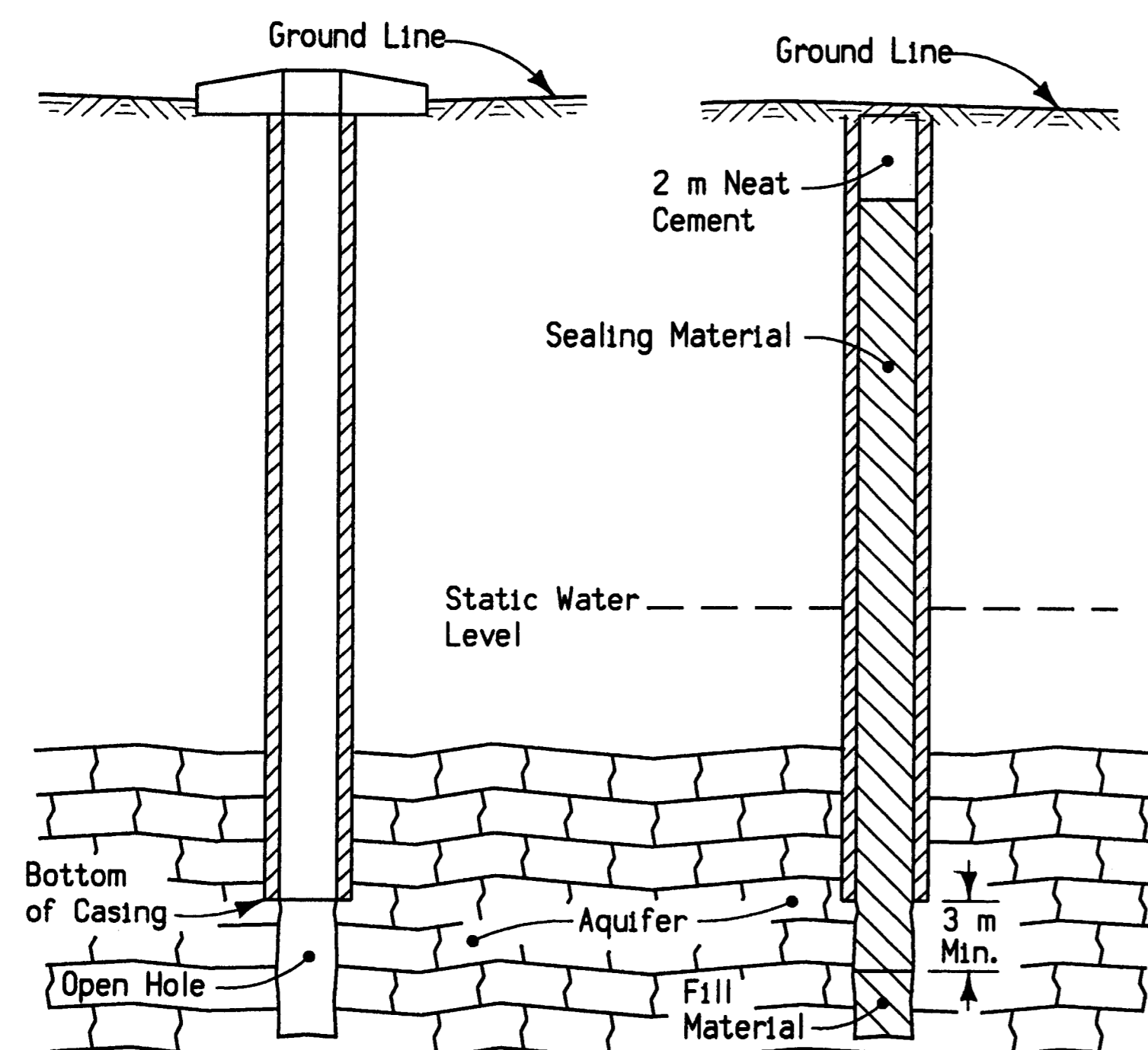
WELLS GREATER THAN 450 mm IN DIAMETER AND LESS THAN 30 m DEEP IN SOIL



EXISTING WELL

SEALED WELL

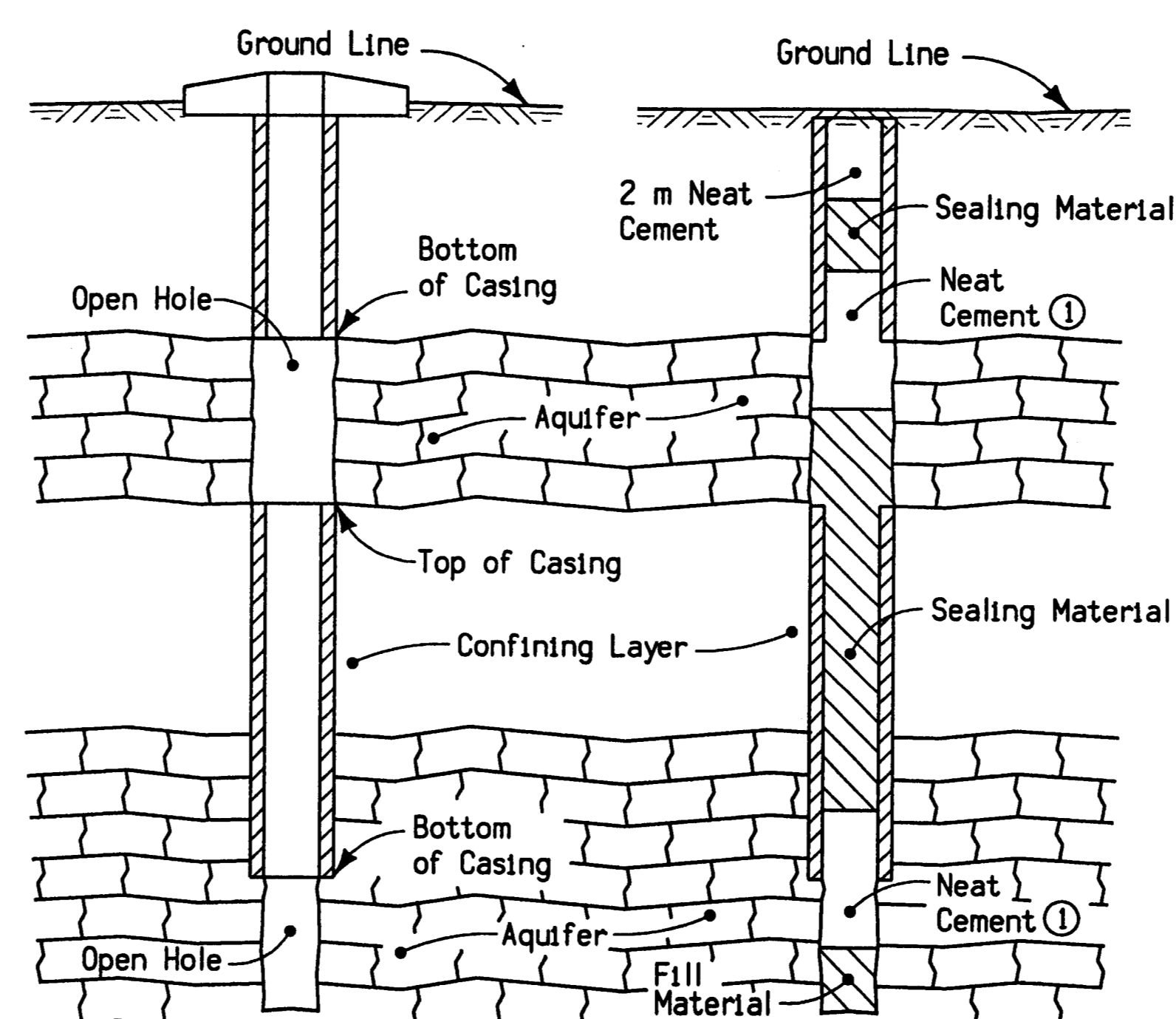
ARTESIAN WELLS



EXISTING WELL

SEALED WELL

One Producing Aquifer Class 2 Wells



EXISTING WELL

SEALED WELL

More Than One Producing Aquifer

WELLS LESS THAN 450 mm IN DIAMETER AND ALL WELLS IN BED ROCK

GENERAL NOTES:

Any well no longer in use shall be sealed. Details shown hereon are intended to depict the various standard methods used for sealing water wells. All materials and methods used shall be in accordance with Iowa Code Section 567, Chapter 39, Requirements for Plugging Abandoned Wells. Wells shall be sealed by a certified well contractor.

Approved Sealing Materials are: 1) Neat cement (1.7 kilograms cement per liter of water); 2) Graded bentonite, bentonite pellets or bentonite grout; 3) Sand cement grout (1 sack of cement/equal volume masonry sand /not more than 23 liters water); 4) Concrete.

Approved Fill Materials are: 1) sand, 2) pea gravel, 3) Class A, B or C Granular Surfacing Material, 4) agriculture lime. All materials shall be free of foreign matter and any toxic residue.

Regardless of the material used in the process, the sealing (filling) material should be introduced at the bottom of the well, or at the interval to be sealed (or filled) and placed progressively upward to the top of the well. All sealing materials shall be placed by the use of grout pipe, tremie pipe, cement bucket or dump bailer, in such a way as to avoid segregation or dilution of the sealing materials. Bentonite pellets or graded bentonite may be added as sealing material by pouring in place and agitating to avoid bridging.

Recommended Plugging Procedures: The entire well bore must be filled with one or a combination of the above materials. All obstructions must be removed from the well. For all (deep) wells, neat cement shall be placed from 3 meters below the bottom of the casing to 3 meters above the bottom of the casing or to the static water level, whichever is higher. For wells completed in multiple aquifers, this same procedure shall be re-used throughout subsequent aquifers. The upper portion of the well casing shall be cut off at least 1.2 meters below ground or construction level. The upper 2 meters of the remaining casing shall be plugged with neat cement.

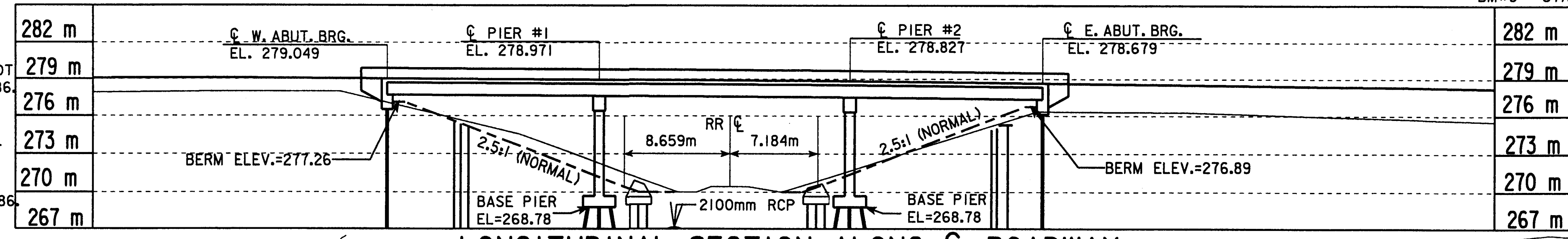
Price bid for "Sealing Wells" shall be considered full compensation for furnishing all material and work necessary to completely seal wells as detailed hereon as well as noted on detail project plans or as directed by the Engineer.

① Minimum thickness of 6 meters. Place a minimum of 3 meters above and below bottom of casing.

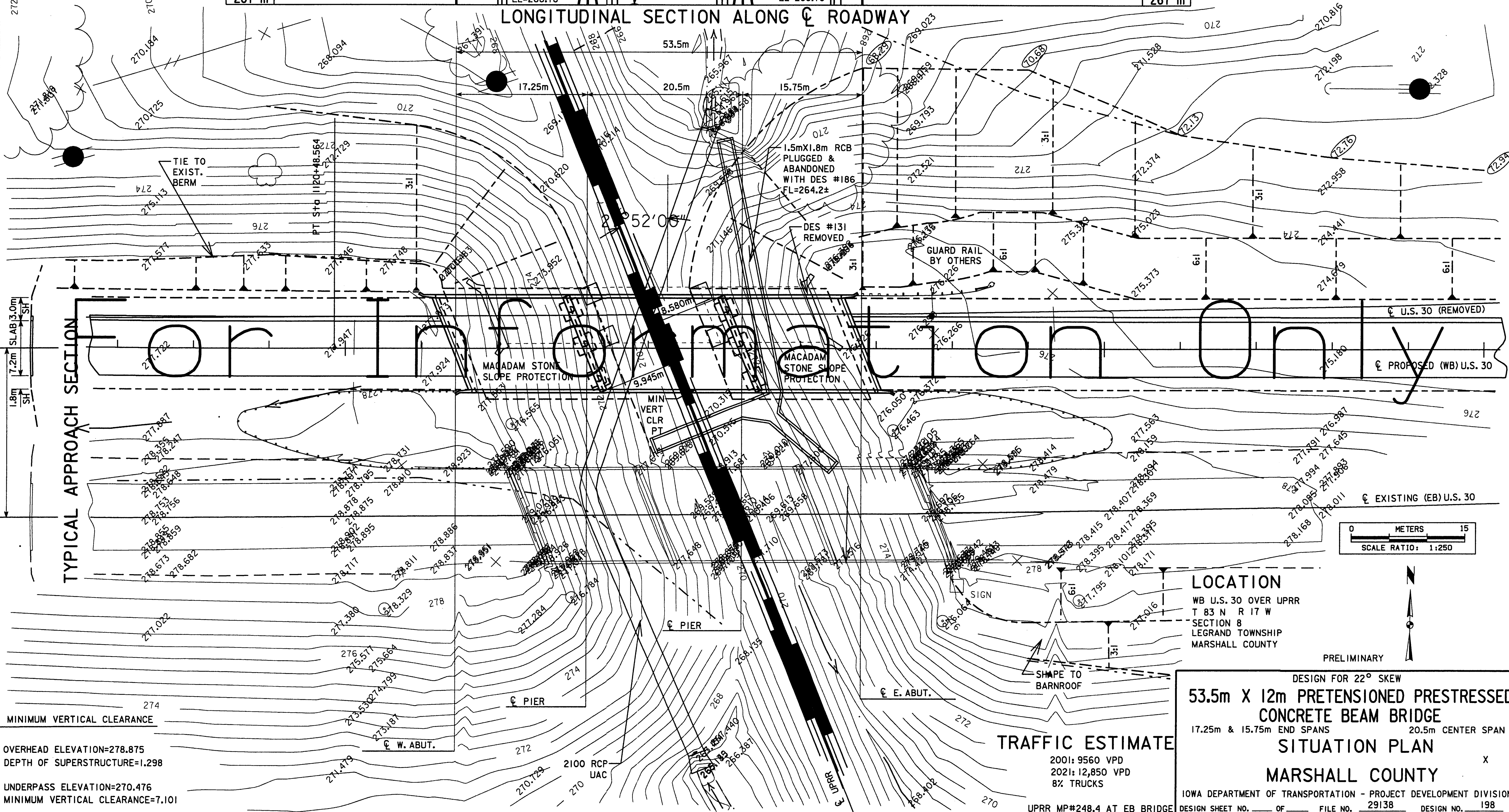
All dimensions given in millimeters unless noted.

M METRIC VERSION	Project Development Division		
	DETAIL SHEET		560-1
	REVISION: Revise general notes to conform with language to the Iowa Code.		REVISION NO. 4 REVISION DATE 10-31-95
DETAILS FOR SEALING WATER WELLS			

ALL STATIONS, ELEVATIONS, AND DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
 LOCATION OF DESIGN 131 IS APPROXIMATE. EXISTING BRIDGE WAS REMOVED TO ONE FOOT BELOW FINISHED GROUND LINE IN DESIGN 186.
 2100 RCP WAS INSTALLED WITH DESIGN 186. IT WAS INTENDED TO BE UAC WHEN U.S. 30 WAS FOUR-LANED. BATTER FOOTING PILES AT 6:1 (NOT 4:1) TO AVOID DAMAGING PIPE.
 BRIDGE BERMS WERE PLACED WITH DESIGN 186.



PROPOSED GRADE ON WB U.S. 30



OVERHEAD ELEVATION=278.875
 DEPTH OF SUPERSTRUCTURE=1.298
 UNDERPASS ELEVATION=270.476
 MINIMUM VERTICAL CLEARANCE=7.101

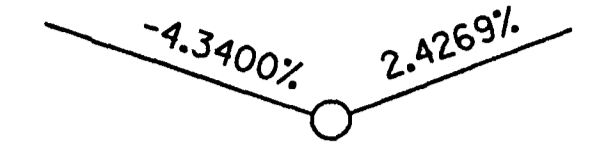
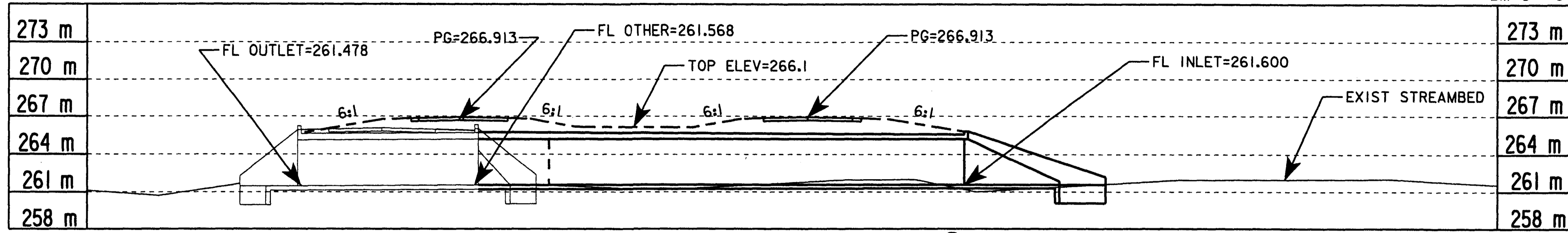
TRAFFIC ESTIMATE
 2001: 9560 VPD
 2021: 12,850 VPD
 8% TRUCKS

LOCATION
 WB U.S. 30 OVER UPRR
 T 83 N R 17 W
 SECTION 8
 LEGRAND TOWNSHIP
 MARSHALL COUNTY
 PRELIMINARY

DESIGN FOR 22° SKEW
53.5m X 12m PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGE
 17.25m & 15.75m END SPANS 20.5m CENTER SPAN
SITUATION PLAN
MARSHALL COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION
 DESIGN SHEET NO. _____ OF _____ FILE NO. 29138 DESIGN NO. 198

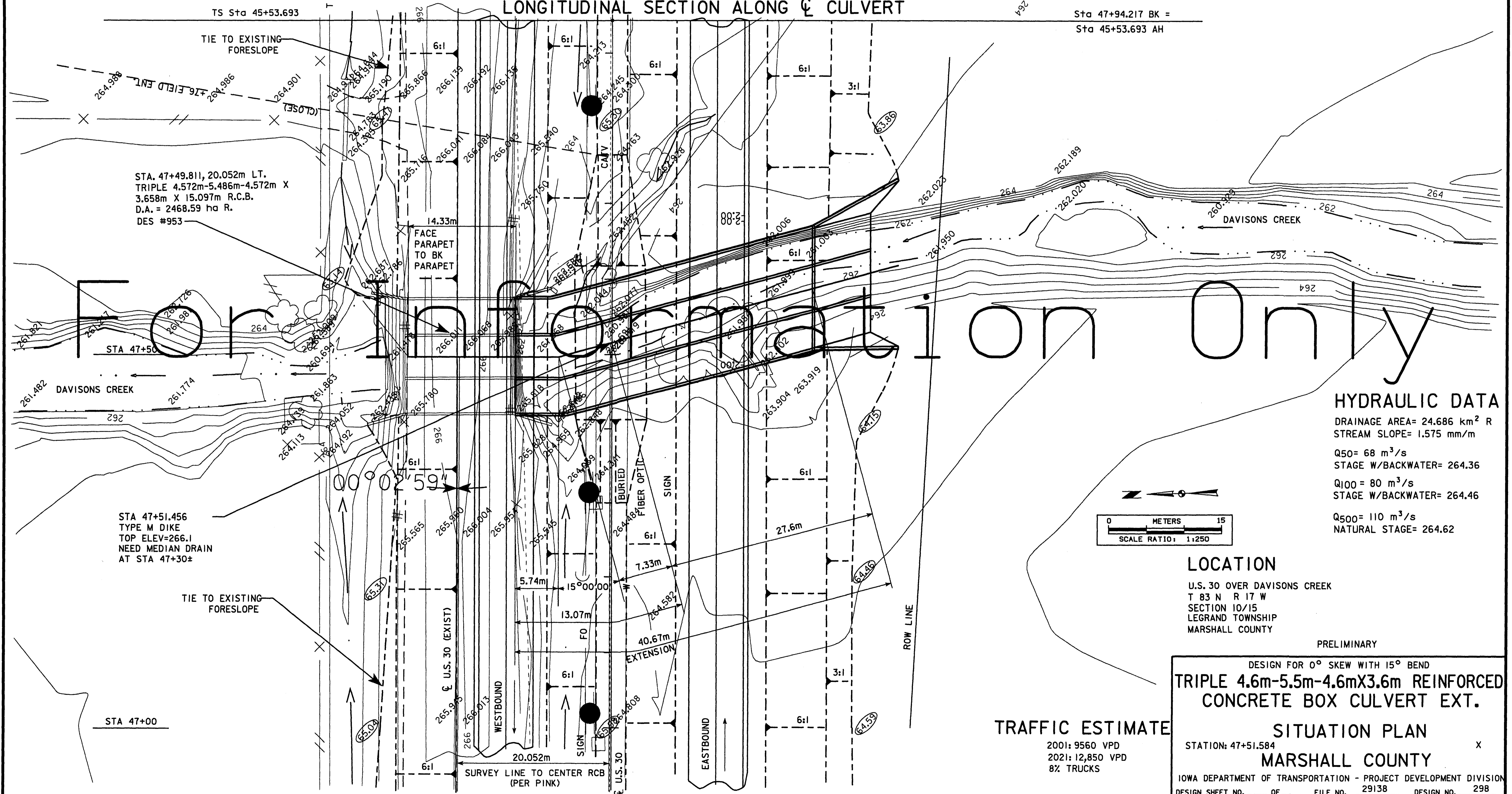
ALL STATIONS, ELEVATIONS, AND DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.

BM#3 - STA 59+83±, 8m RT (SURVEY) - RR SPIKE IN PPOLE - ELEV=278.769



PROPOSED GRADE ON U.S. 30

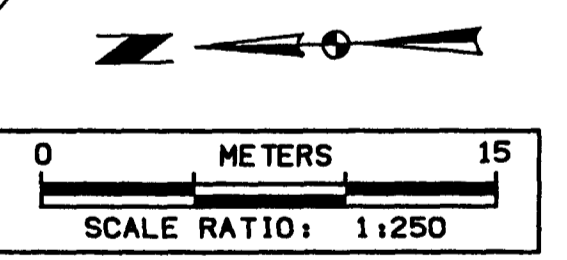
LONGITUDINAL SECTION ALONG CULVERT



STA. 47+49.811, 20.052m LT.
TRIPLE 4.572m-5.486m-4.572m X
3.658m X 15.097m R.C.B.
D.A. = 2468.59 ha R.
DES #953

STA 47+51.456
TYPE M DIKE
TOP ELEV=266.1
NEED MEDIAN DRAIN
AT STA 47+30±

HYDRAULIC DATA
DRAINAGE AREA= 24.686 km² R
STREAM SLOPE= 1.575 mm/m
Q50= 68 m³/s
STAGE W/BACKWATER= 264.36
Q100= 80 m³/s
STAGE W/BACKWATER= 264.46
Q500= 110 m³/s
NATURAL STAGE= 264.62



LOCATION

U.S. 30 OVER DAVISON'S CREEK
T 83 N R 17 W
SECTION 10/15
LEGRAND TOWNSHIP
MARSHALL COUNTY

PRELIMINARY

DESIGN FOR 0° SKEW WITH 15° BEND
**TRIPLE 4.6m-5.5m-4.6mX3.6m REINFORCED
CONCRETE BOX CULVERT EXT.**

TRAFFIC ESTIMATE

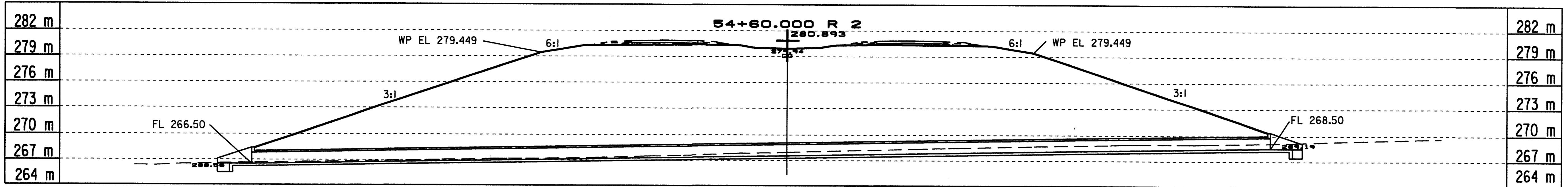
2001: 9560 VPD
2021: 12,850 VPD
8% TRUCKS

SITUATION PLAN

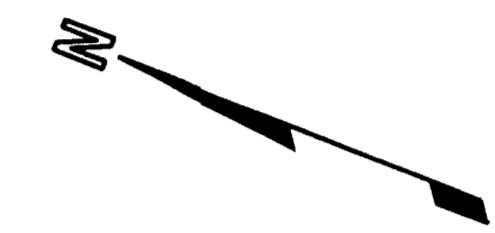
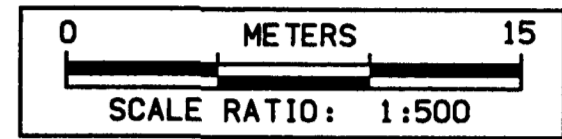
STATION: 47+51.584

MARSHALL COUNTY

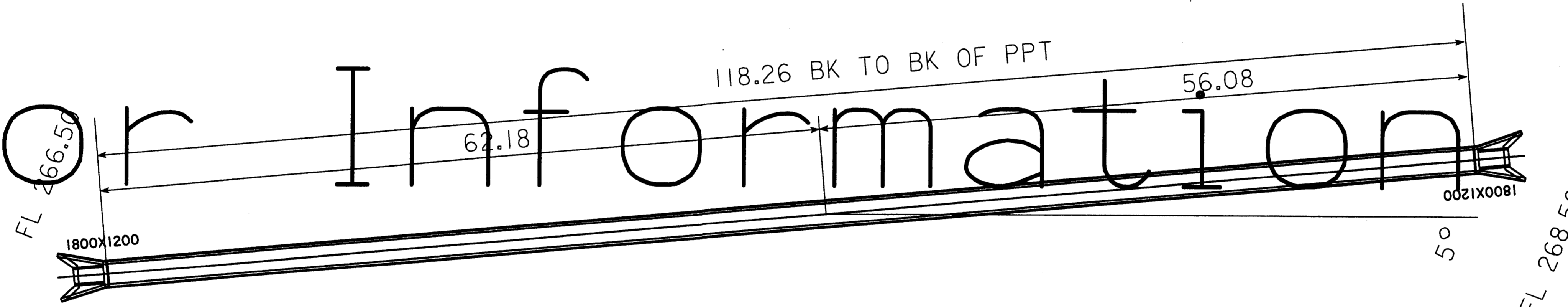
IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION
DESIGN SHEET NO. ___ OF ___ FILE NO. 29138 DESIGN NO. 298



LONGITUDINAL SECTION ALONG ϕ CULVERT



For Information Only



STA 54+64.72, 5° RA
1.80 X 1.20 X 118.26 RCB
44.1 HA R

LOCATION T 83 N R 17 W SECTION 11 LE GRAND TOWNSHIP
HYDRAULIC DATA DRAINAGE AREA= 44.1 HA R

PRELIMINARY

DESIGN FOR 5° SKEW RA
1.8 X 1.2 X 118.26 REINFORCED CONCRETE BOX CULVERT
SITUATION PLAN
STATION: 54+64.72 OR MARSHALL COUNTY X
IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION
DESIGN SHEET NO. _____ OF _____ FILE NO. 29138 DESIGN NO. 898

ALL DIMENSIONS ARE IN METERS

SITUATION PLAN

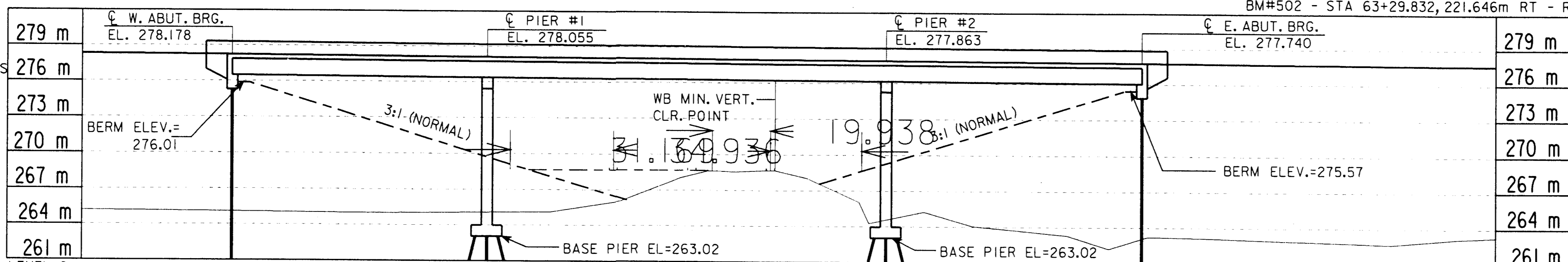
ALL STATIONS, ELEVATIONS, AND DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.

MINIMUM VERTICAL CLEARANCE-BOTH BRIDGES

OVERHEAD STATION=60+57.225
 OVERHEAD ELEVATION=277.826
 DEPTH OF SUPERSTRUCTURE=1.702
 UNDERPASS STATION=60+57.225, RT 20.6m
 UNDERPASS ELEVATION=268.89 (SURVEY)
 MINIMUM VERTICAL CLEARANCE=7.234

FINAL DESIGN NOTES -

AUTODIMENSIONING USED WHERE TEXT IS ON LEVEL 8.
 DIMENSIONS TO PIERS ARE MINIMUMS MEASURED PERPENDICULAR TO TRACK
 TRACKS ARE ON SLIGHT CURVE WITH NO SUPERELEVATION (SURVEY SHOTS).
 RAMP AT 3% CROSS SLOPE, INCLUDING THROUGH THE BRIDGE.
 PROPOSED FUTURE UPRR WORK IS ON LEVEL 9.



PI STA 62+09.476 VC = 200m
 PI ELEV 276.966

PROPOSED GRADE ON U.S. 30
 U.A.C. UPRR GRADE

DRAINAGE DESIGN NOTES -
 PLUG/ABANDON 762mm CMP AT STA 62+80.0, 11.63m LT.
 (SURVEY)=STA 60+42, 12.5m LT (CONSTRUCTION)
 JACK 1200mm (48") PIPE UNDER UPRR TRACKS BEYOND
 TOE OF BERM (CL + 75m LT±).
 DITCH TO CHANNEL WHICH CURRENTLY CROSSES CL AT
 STA 61+40± (O.R.). CHANNEL CHANGE WILL BE REQUIRED
 ON THIS CHANNEL.

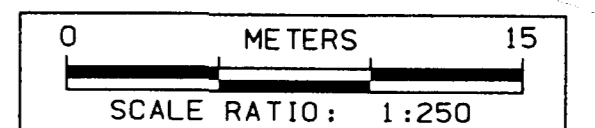
TYPICAL APPROACH SECTION

ROAD 3.0m SH
 1.8m SH
 1.4m SH
 6:1

or Information Only

MINIMUM VERTICAL CLEARANCE-WB BRIDGE

OVERHEAD STATION=60+43.790
 OVERHEAD ELEVATION=277.902
 DEPTH OF SUPERSTRUCTURE=1.678
 UNDERPASS STATION=60+43.790, LT 8.6m
 UNDERPASS ELEVATION=268.65 (SURVEY)
 MINIMUM VERTICAL CLEARANCE=7.574



LOCATION
 U.S. 30 OVER UPRR
 T 83 N R 17 W
 SECTION 11
 LEGRAND TOWNSHIP
 MARSHALL COUNTY
 PRELIMINARY

TRAFFIC ESTIMATE
 2001: 9560 VPD
 2021: 12,850 VPD
 8% TRUCKS

DESIGN FOR 25° SKEW
**WB 77.5m X VAR PRETENSIONED
 PRESTRESSED CONCRETE BEAM BRIDGE**
 21.75m END SPANS 34.0m CENTER SPAN

SITUATION PLAN
 STATION: 60+33.770 LT X

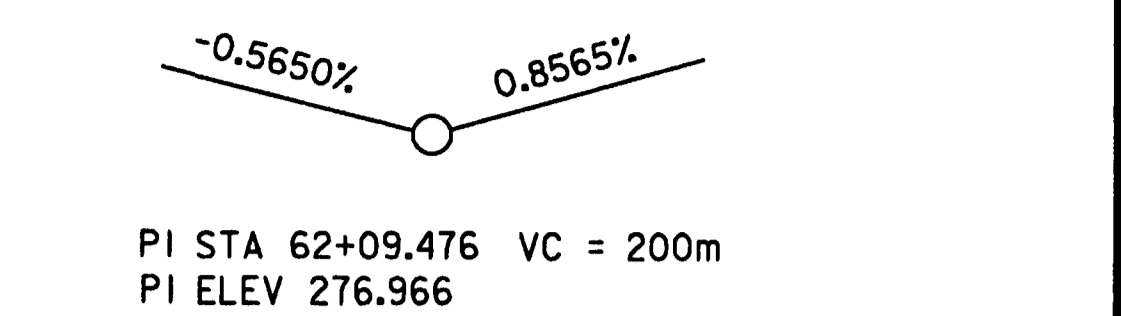
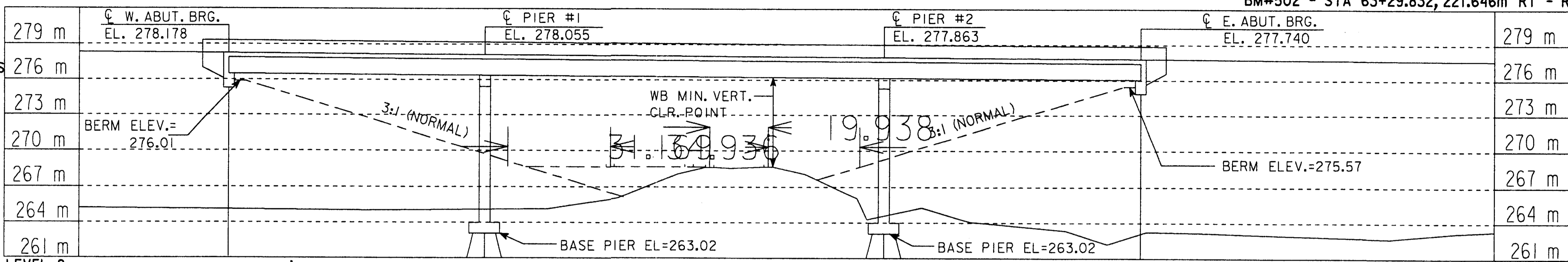
MARSHALL COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION
 DESIGN SHEET NO. _____ OF _____ FILE NO. 29138 DESIGN NO. 398

ALL STATIONS, ELEVATIONS, AND DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.

MINIMUM VERTICAL CLEARANCE-BOTH BRIDGES
 OVERHEAD STATION=60+57.225
 OVERHEAD ELEVATION=277.826
 DEPTH OF SUPERSTRUCTURE=1.702
 UNDERPASS STATION=60+57.225, RT 20.6m
 UNDERPASS ELEVATION=268.89 (SURVEY)
 MINIMUM VERTICAL CLEARANCE=7.234

FINAL DESIGN NOTES -
 AUTODIMENSIONING USED WHERE TEXT IS ON LEVEL 8.
 DIMENSIONS TO PIERS ARE MINIMUMS MEASURED PERPENDICULAR TO TRACK
 TRACKS ARE ON SLIGHT CURVE WITH NO SUPERELEVATION (SURVEY SHOTS).
 RAMP AT 3% CROSS SLOPE, INCLUDING THROUGH THE BRIDGE.
 PROPOSED FUTURE UPRR WORK IS ON LEVEL 9.

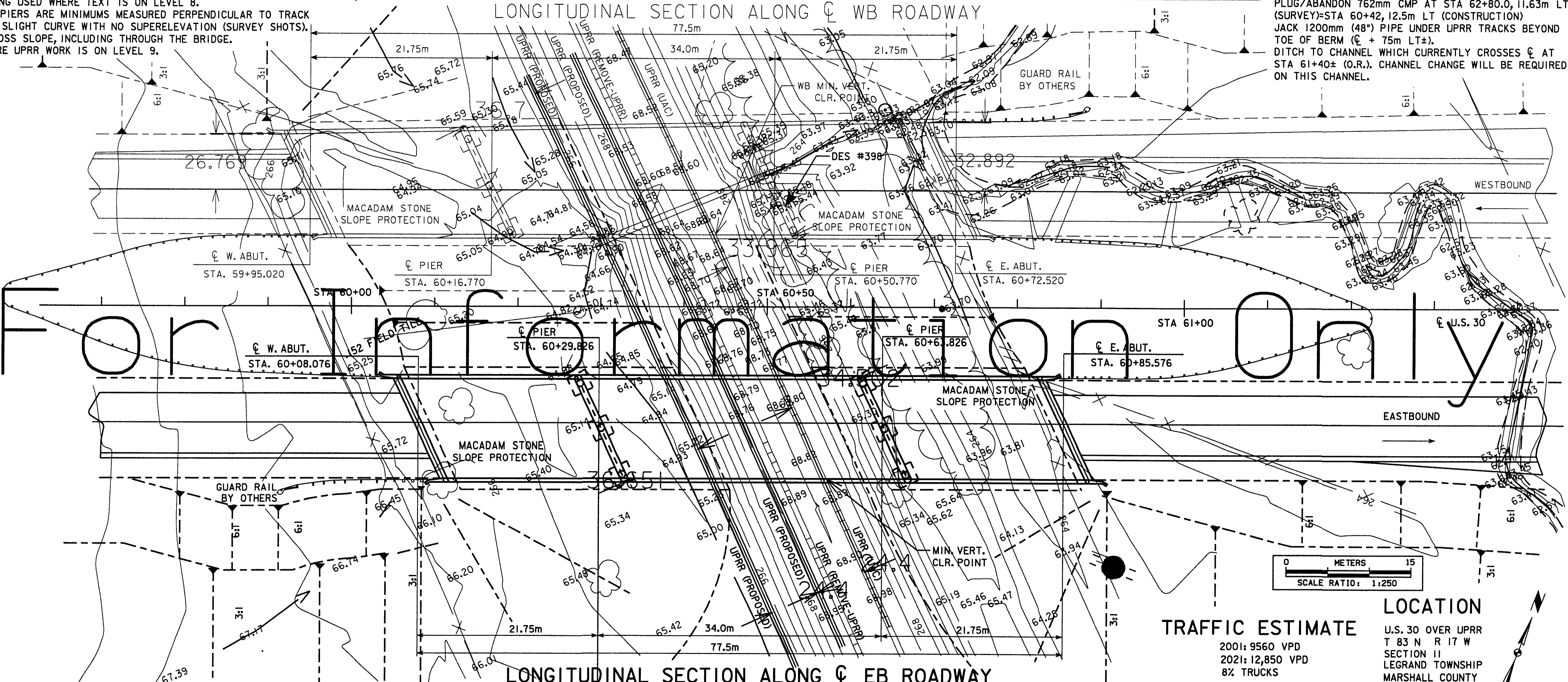
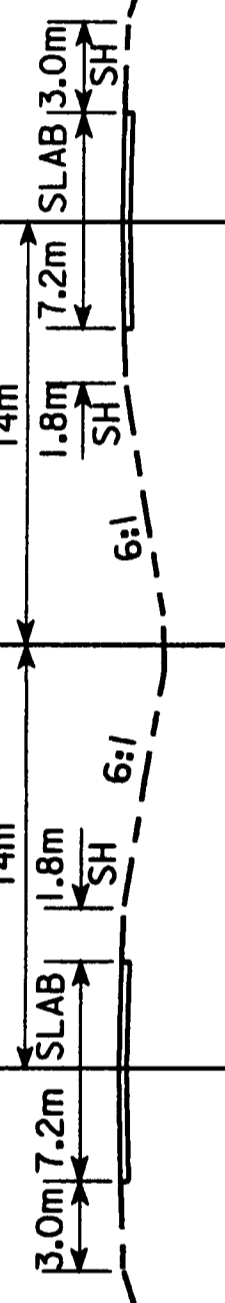
BM#502 - STA 63+29.832, 221.646m RT - RR SPIKE IN .203mX.203m (8"X8") FE POST - ELEV=268.612



PROPOSED GRADE ON U.S. 30
 U.A.C. UPRR GRADE

DRAINAGE DESIGN NOTES -
 PLUG/ABANDON 762mm CMP AT STA 62+80.0, 11.63m LT. (SURVEY)=STA 60+42, 12.5m LT (CONSTRUCTION)
 JACK 1200mm (48") PIPE UNDER UPRR TRACKS BEYOND TOE OF BERM (CL + 75m LT±).
 DITCH TO CHANNEL WHICH CURRENTLY CROSSES CL AT STA 61+40± (O.R.). CHANNEL CHANGE WILL BE REQUIRED ON THIS CHANNEL.

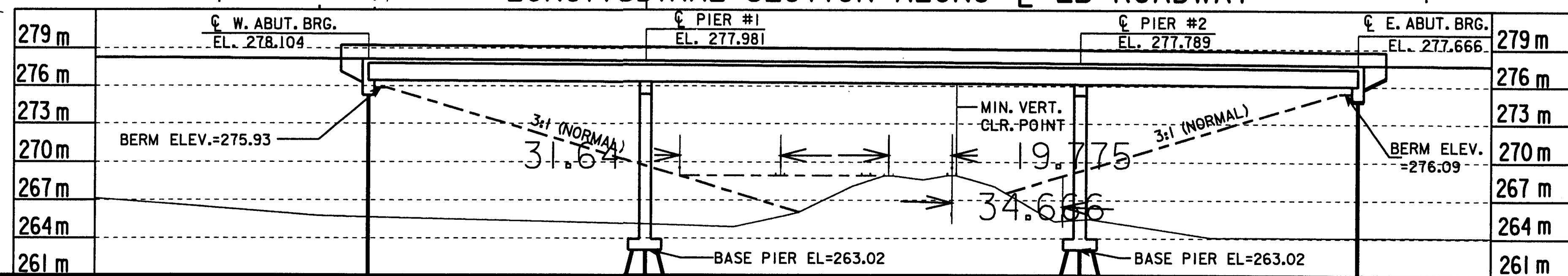
TYPICAL APPROACH SECTION



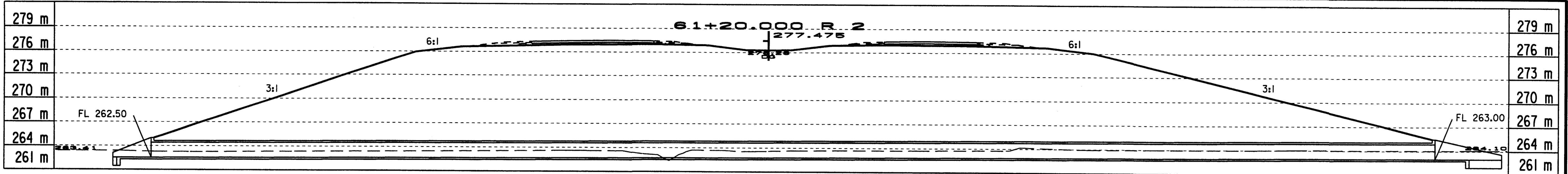
TRAFFIC ESTIMATE
 2001: 9560 VPD
 2021: 12,850 VPD
 8% TRUCKS

LOCATION
 U.S. 30 OVER UPRR
 T 83 N R 17 W
 SECTION II
 LEGRAND TOWNSHIP
 MARSHALL COUNTY

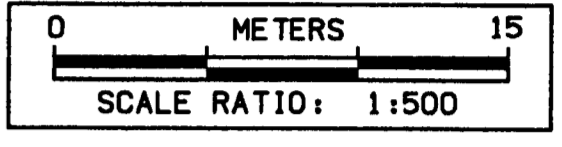
MINIMUM VERTICAL CLEARANCE-WB BRIDGE
 OVERHEAD STATION=60+43.790
 OVERHEAD ELEVATION=277.902
 DEPTH OF SUPERSTRUCTURE=1.678
 UNDERPASS STATION=60+43.790, LT 8.6m
 UNDERPASS ELEVATION=268.65 (SURVEY)
 MINIMUM VERTICAL CLEARANCE=7.574



PRELIMINARY
 DESIGN FOR 25° SKEW
**EB 77.5m X 12m PRETENSIONED
 PRESTRESSED CONCRETE BEAM BRIDGE**
 21.75m END SPANS 34.0m CENTER SPAN
SITUATION PLAN
 STATION: 60+46.826 RT X
MARSHALL COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION
 DESIGN SHEET NO. _____ OF _____ FILE NO. 29138 DESIGN NO. 798

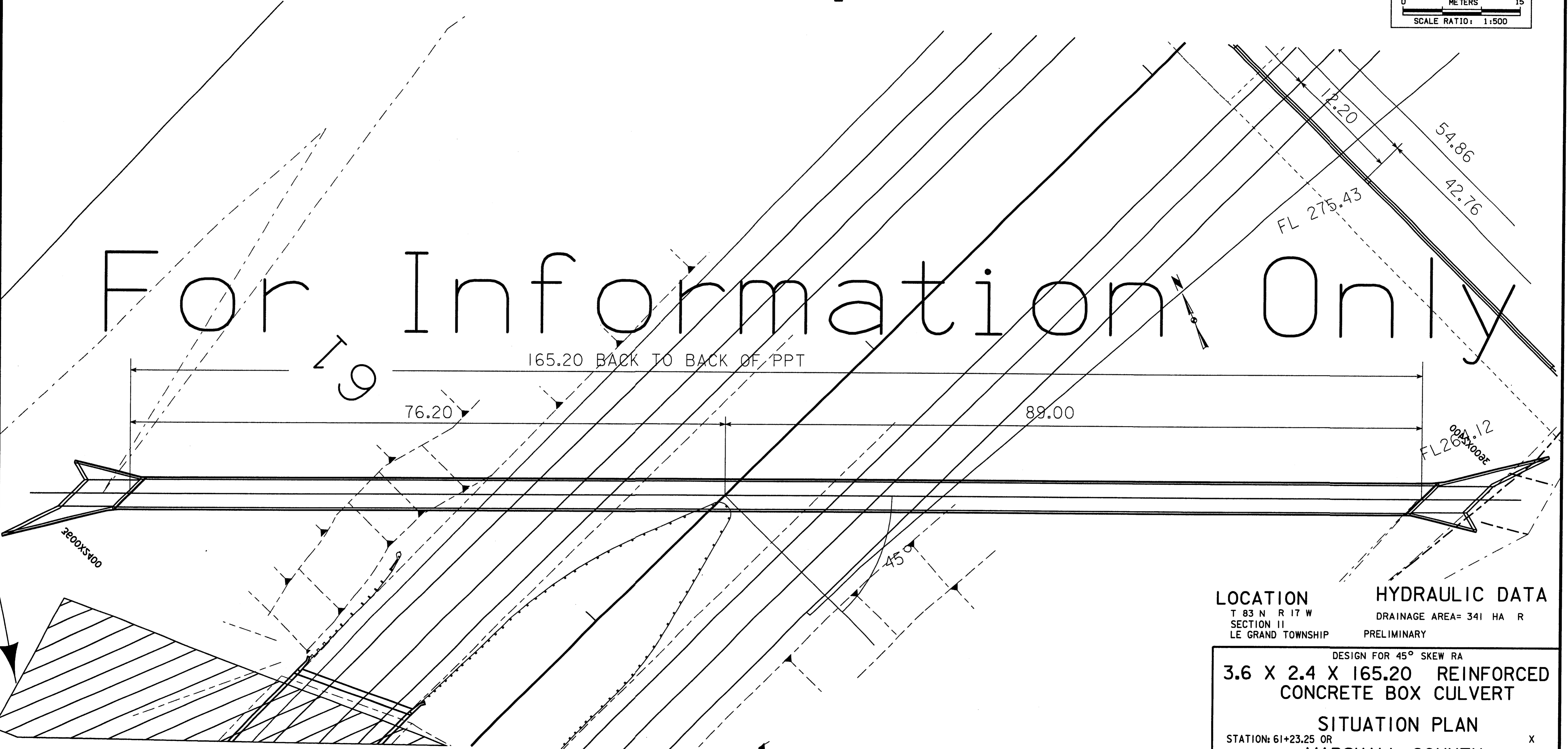


LONGITUDINAL SECTION ALONG ϕ CULVERT



For Information Only

165.20 BACK TO BACK OF PPT



LOCATION
 T 83 N R 17 W
 SECTION II
 LE GRAND TOWNSHIP

HYDRAULIC DATA
 DRAINAGE AREA= 341 HA R
 PRELIMINARY

DESIGN FOR 45° SKEW RA
**3.6 X 2.4 X 165.20 REINFORCED
 CONCRETE BOX CULVERT**

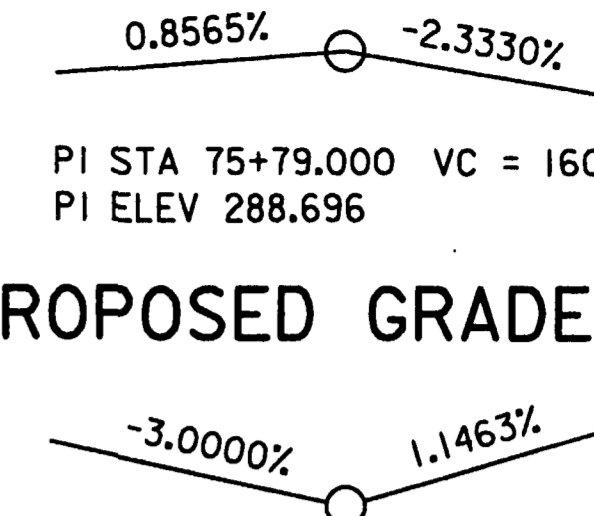
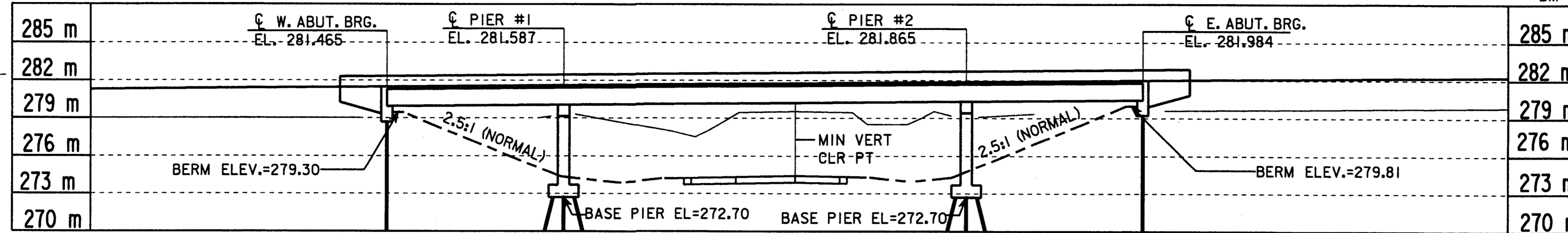
SITUATION PLAN
 STATION: 61+23.25 OR X
MARSHALL COUNTY

IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION
 DESIGN SHEET NO. 29138 OF FILE NO. 29138 DESIGN NO. 998

ALL DIMENSIONS ARE IN METERS

ALL STATIONS, ELEVATIONS, AND DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.

BM#3C - STA 70+41.7, 3.2m LT - RR SPIKE IN P POLE - ELEV=274.977



PROPOSED GRADE ON U.S. 30

PROPOSED GRADE ON IA 146

TRAFFIC ESTIMATE U.S. 30

2001: 9560 VPD
2021: 12,850 VPD
8% TRUCKS

2001: 3230 VPD
2021: 4340 VPD
7% TRUCKS

BRIDGES ARE PARTLY ON SPIRAL. BRIDGE C ARE ON LEVEL 3. STATIONING/GRADES AT ROAD C.

SPIRAL DATA SCS PI Sta 65+76.311

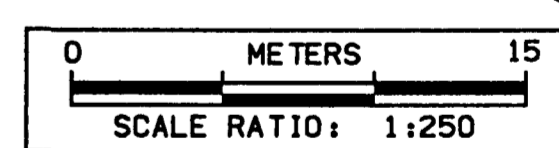
D = 20° 59' 59.94" (RT)
Os = 3° 17' 40.23"
Ls = 92.000 m
Ts = 194.348 m
Es = 14.072 m
P = 0.441 m
K = 45.995 m
Xc = 91.970 m
Yc = 1.763 m
LT = 61.344 m
ST = 30.676 m
LC = 91.986 m

LONGITUDINAL SECTION ALONG WB ROADWAY

LONGITUDINAL SECTION ALONG EB ROADWAY

TYPICAL APPROACH SECTION

Information Only



LOCATION

U.S. 30 OVER IA 146
T 83 N R 17 W
SECTION 11
LEGRAND TOWNSHIP
MARSHALL COUNTY

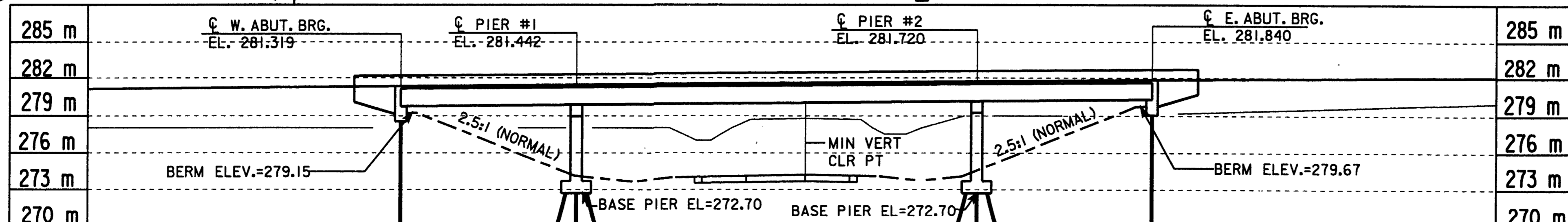
PRELIMINARY

MINIMUM VERTICAL CLEARANCE - WB

OVERHEAD STATION=67+67.624
OVERHEAD ELEVATION=281.747
DEPTH OF SUPERSTRUCTURE=1.642
UNDERPASS STATION=1467+76.149
UNDERPASS ELEVATION=274.365
MINIMUM VERTICAL CLEARANCE=5.740

MINIMUM VERTICAL CLEARANCE - EB

OVERHEAD STATION=67+67.490
OVERHEAD ELEVATION=281.745
DEPTH OF SUPERSTRUCTURE=1.846
UNDERPASS STATION=1467+46.948
UNDERPASS ELEVATION=274.161
MINIMUM VERTICAL CLEARANCE=5.738



DESIGN FOR 0° SKEW
DUAL 61.0m X 12m PRETENSIONED PRESTRESSED CONCRETE BEAM BRIDGES
14.25m END SPANS 32.5m CENTER SPAN
SITUATION PLAN
STATION: 67+65.188 LT 14m, 67+65.104 RT 14m
MARSHALL COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - PROJECT DEVELOPMENT DIVISION
DESIGN SHEET NO. _____ OF _____ FILE NO. 29138 DESIGN NO. 598

DESIGN TEAM ABRAMS/SMITH

METRIC

IOWA DOT * OFFICE OF DESIGN

MARSHALL COUNTY

PROJECT NUMBER NHSX-30-5(166)--3H-64

SHEET NUMBER V.07

GENERAL NOTES :

IT IS THE INTENT OF THIS DESIGN TO CONSTRUCT A ^{10 FT} ^{6 FT} ^{128.82 FT} ~~3.0 m X 1.8 m X 39.010 m~~ REINFORCED CONCRETE BOX CULVERT SKEWED 15° AT STATION 1465+75.00 (O.R.).
PRECAST

UTILITY COMPANIES AND MUNICIPALITIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN THE CONSTRUCTION LIMITS SHALL BE NOTIFIED BY THE CONTRACTOR OF THE CONSTRUCTION STARTING DATE.

THE RCB CULVERT SECTIONS ARE DESIGNED FOR MS18 LIVE LOAD AND EARTH FILLS OF 2100 mm. SEE BELOW

WHEN DE-WATERING PRESENTS A PROBLEM FOR PLACING THE CURTAIN WALLS AS DETAILED, ALTERNATE METHODS SUCH AS STEEL SHEET PILE AND PRECAST CONCRETE WALLS MAY BE APPROVED BUT AT NO ADDITIONAL COST. THE CULVERT CONTRACTOR IS TO SUBMIT TO THE ENGINEER FOR APPROVAL COMPLETE DRAWINGS OF THE PROPOSED CURTAIN WALL ALTERNATE BEFORE BEGINNING CONSTRUCTION.

THE CONTRACTOR IS ENCOURAGED TO TAKE FULL ADVANTAGE OF SPECIFICATION 1105.15 -- VALUE ENGINEERING INCENTIVE PROPOSAL. A PAMPHLET AND CONCEPTUAL PROPOSAL FORM WILL BE AVAILABLE AT THE PRECONSTRUCTION CONFERENCE.

THE CLASS 20 EXCAVATION QUANTITY IS BASED ON THE ASSUMPTION THAT AT THE START OF CULVERT CONSTRUCTION, THE EXISTING GROUNDLINE SHOWN ON THE "SITUATION PLAN" ON DESIGN SHEET 2 HAS REMAINED UNDISTURBED AND NO ROADWAY FILL HAS BEEN PLACED.

ALL ELEVATIONS ON THESE PLANS SHOWN IN METERS (m).

ALL STATIONS SHOWN IN METERS (m).

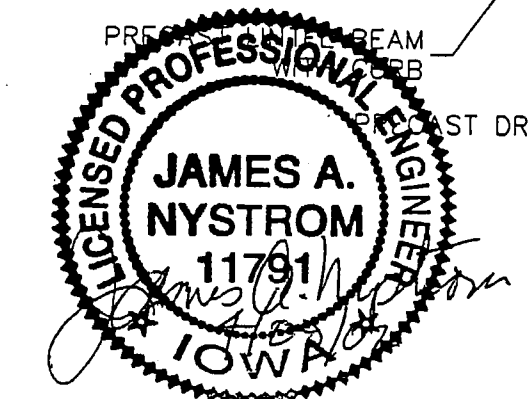
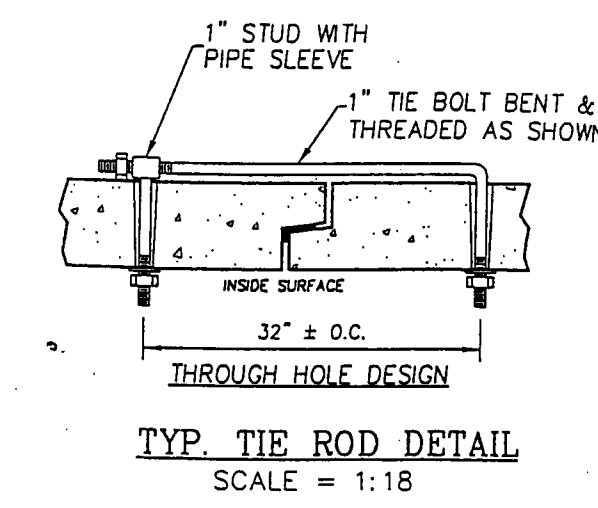
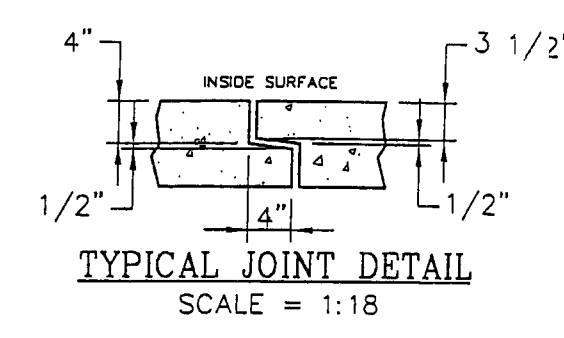
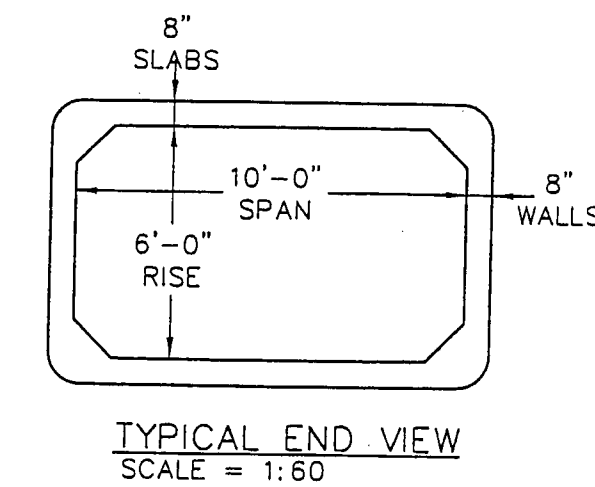
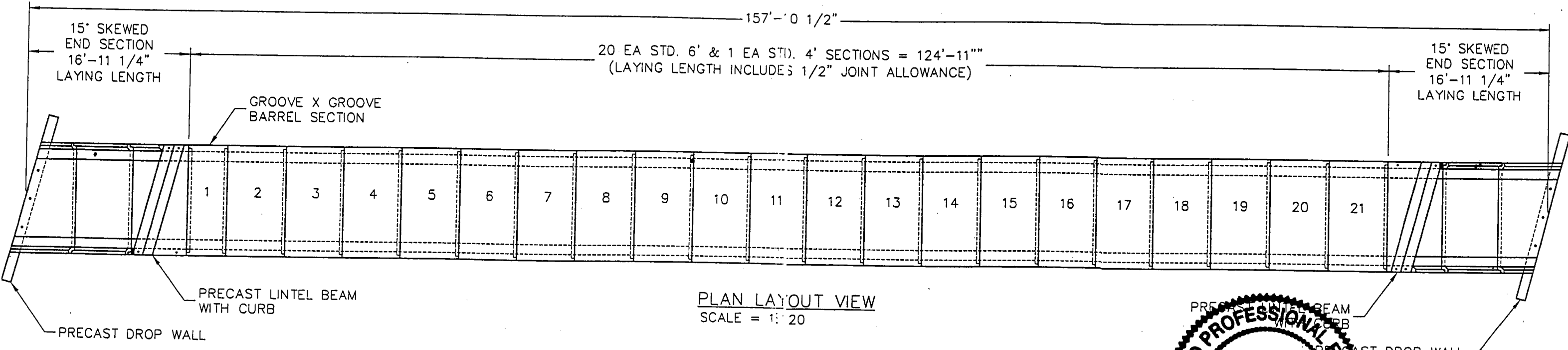
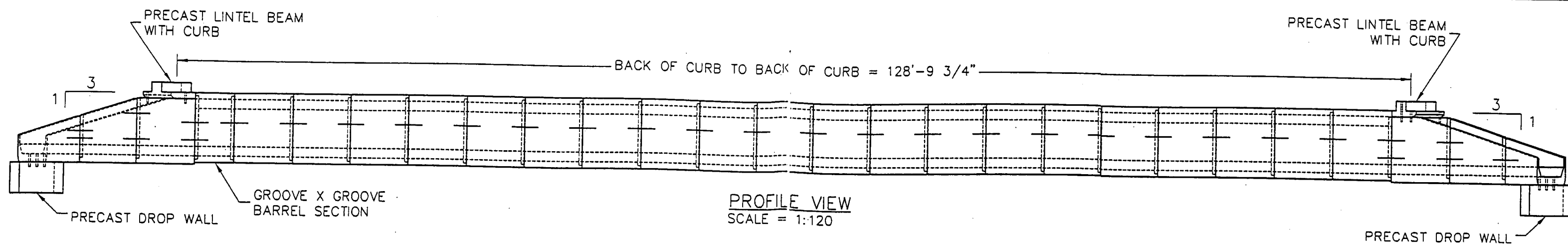
FOR DESIGN STRESSES, SPECIFICATIONS AND OTHER GENERAL NOTES, SEE STANDARD SHEET "MRCB-G1-95."

THIS PROJECT MEETS THE CRITERIA TO ALLOW THE POSSIBLE USE OF A PRECAST REINFORCED CONCRETE BOX, AT THIS LOCATION, IN LIEU OF THE CAST IN PLACE CULVERT SHOWN IN THESE PLANS. IF THE CONTRACTOR CHOOSES TO PURSUE THIS OPTION, A VALUE ENGINEERING PROPOSAL SHALL BE SUBMITTED AFTER THE CONTRACT IS AWARDED. THE PROPOSAL SHALL INCLUDE COMPLETE DETAILS OF THE DESIGN AS WELL AS THE REQUIREMENTS LISTED IN SECTION 1105.15 OF THE STANDARD SPECIFICATIONS.

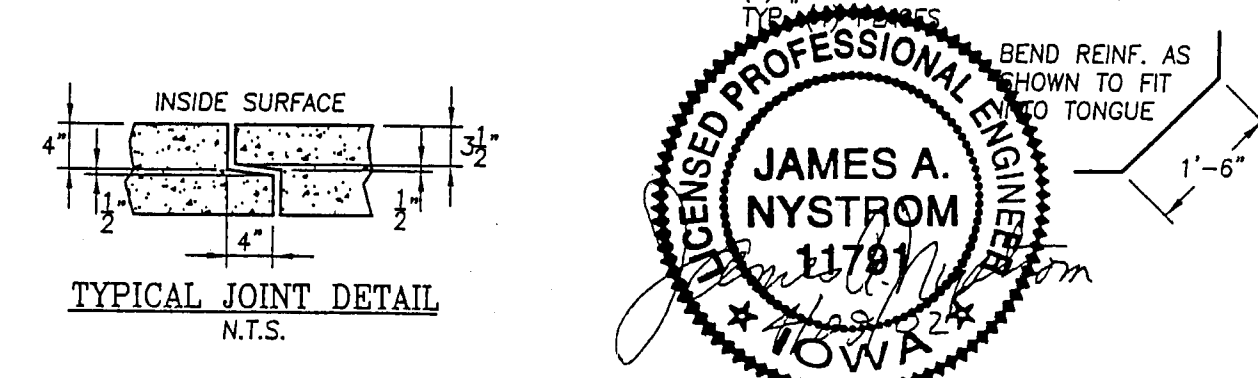
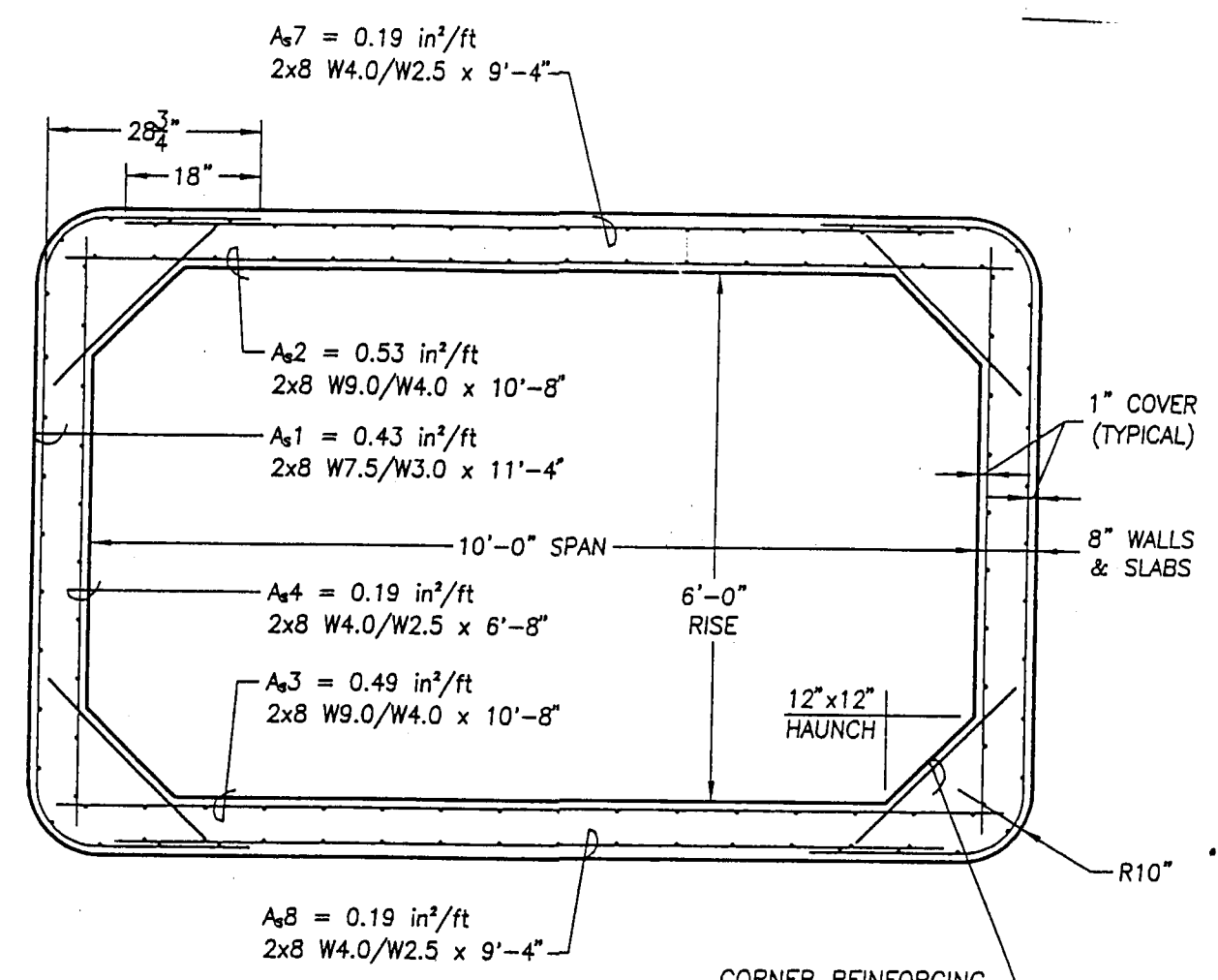
EXCESS CLASS 20 EXCAVATION MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED AT THE CONSTRUCTION SITE, AS DIRECTED BY THE ENGINEER.

ANY CHANNEL EXCAVATION BEYOND THE INLET OR THE OUTLET ENDS OF THE CULVERT IS TO BE DONE BY OTHERS AND IS NOT PART OF THIS CONTRACT

THE BID ITEM "REMOVAL OF EXISTING STRUCTURES" IS TO INCLUDE THE REMOVAL OF THE EXISTING CULVERT AND EXISTING PIPE. REMOVAL IS TO BE DONE BY THE CULVERT CONTRACTOR IN ACCORDANCE WITH SECTION 2401 OF THE STANDARD SPECIFICATIONS. THE CULVERT CONTRACTOR SHOULD NOTE THE TYPE OF STRUCTURES NOTED FOR REMOVAL IS UNKNOWN AND SHOULD BE VERIFIED AS TO THE TYPE OF STRUCTURE.

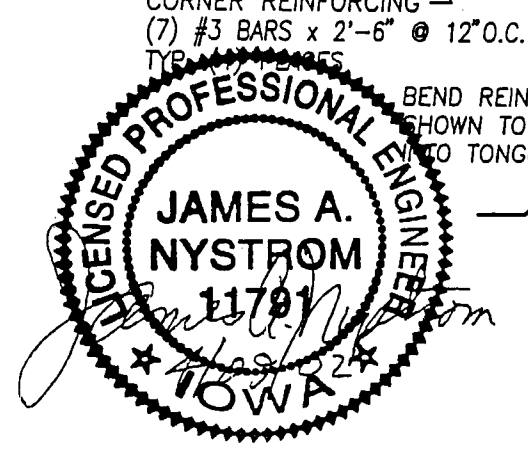


IOWA CONCRETE PRODUCTS CO WEST DES MOINES, IOWA	
SCALE: VARIES	REVISION: BY: DATE:
DATE: 02/25/02	LOCATION: MARSHALL COUNTY, IA
DRN: KD	R/S: 781035 KUTER CONSTRUCTION
ENGINEER: IOWA D.O.T.	
TITLE: MARSHALL NHSX-30-5(166)--3H-64 10' X 6' SCBC WITH 15° SKEW TYP. LAYOUT AND DETAILS	



DESIGN AND ANALYSIS IS PERFORMED ON ACPA "BOXCAR" COMPUTER PROGRAM, VERSION 2.00
DESIGN IS FOR HS-20 LIVE LOAD

CONCRETE STRENGTH $f'_c = 5,000$ PSI
REINF. YIELD STRENGTH $f_y = 65,000$ PSI
REINFORCING WEIGHT = 700 LBS.
PRODUCT WEIGHT = 11.1 TON / 6' SECT.



IOWA CONCRETE PRODUCTS CO. WEST DES MOINES, IOWA	
SCALE: 1/2" = 1'-0"	REVISION: BY: DATE:
DATE: 03/28/02	
DRN: KD	APVD: N
TITLE: 10'x6' PRECAST CONCRETE BOX CULVERT FOR 2'-10" FILL HEIGHT	

TRAFFIC CONTROL PLAN
NOTE: THE ROADWAY WILL BE CLOSED TO THRU TRAFFIC. REFER TO THE TRAFFIC CONTROL PLAN SHOWN ELSEWHERE IN THESE PLANS.

POLLUTION PREVENTION PLAN IS SHOWN ELSEWHERE IN THESE PLANS.

STANDARDS :
FOR DETAILS AND NOTES NOT SHOWN REFER TO THE FOLLOWING IOWA D.O.T. - HIGHWAY STANDARDS :

STANDARD	ISSUE DATE	LATEST REVISION
MRCB-G1-95	JULY 1995	12-5-96
MFWH 15-2-95	JULY 1995	1-1-98
MFWH 15-6-95	JULY 1995	
MFWH 15-7-95	JULY 1995	
MFWH 15-8-95	JULY 1995	1-1-98
MRCB 3000-1-95	JULY 1995	

DESIGN HISTORY AT THIS SITE

DES. NO.	TYPE OF WORK
1098	NEW CULVERT

STRUCTURAL DESIGN

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Gordon L. Port 9/28/01
Signature Date
Printed or Typed Name
My license renewal date is December 31, 2002

Pages or sheets covered by this seal: *Design Sheets 1 & 2 of 2.*

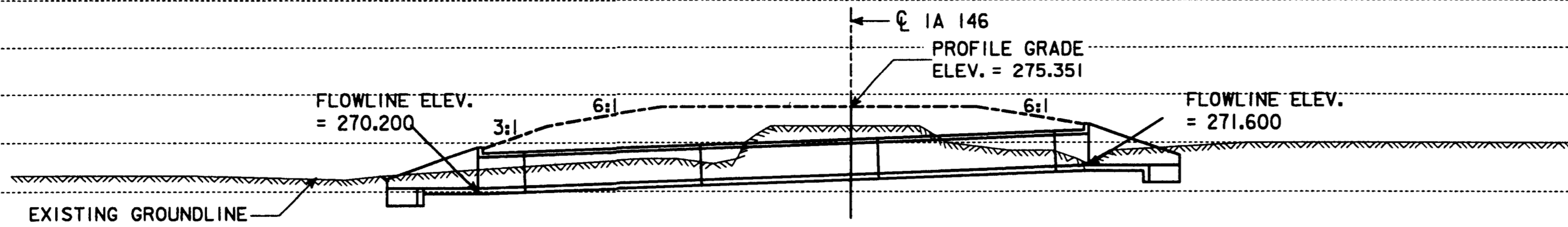
10 FT X 6 FT DESIGN FOR 15° SKEW RA PRECAST
3.0 m X 1.8 m X 39.010 m REINFORCED
CONCRETE BOX CULVERT

GENERAL NOTES AND QUANTITIES
STATION: 1465+75.00 APRIL 2001
MARSHALL COUNTY
IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
DESIGN SHEET NO. 1 OF 2 FILE NO. 29138 DESIGN NO. 1098

DESIGNED BY STEVE FISHER CHECKED BY DARWIN BACKOUS
DETAILED BY STEVE FISHER CADD FILE h641098.s01

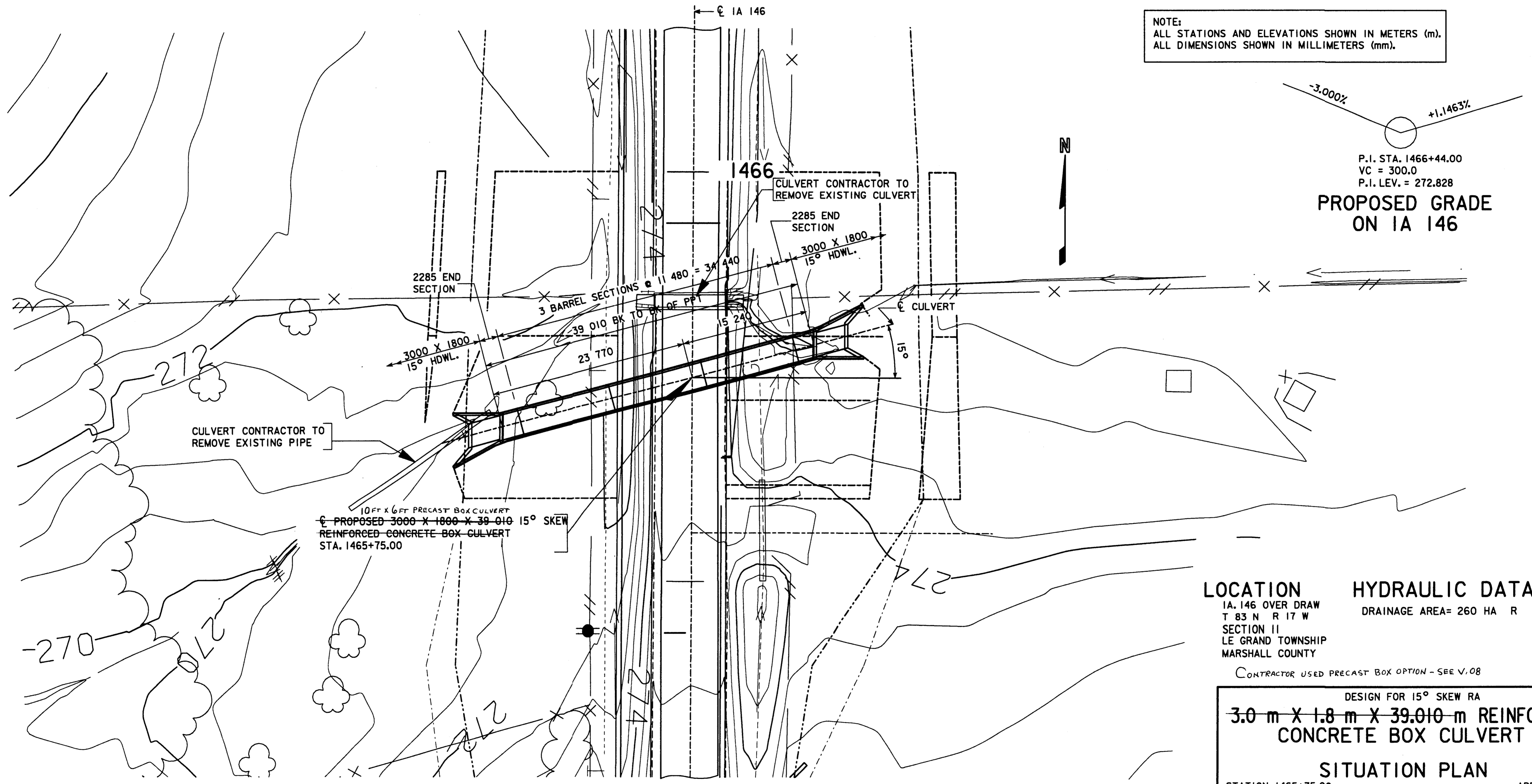
282		282
279		279
276		276
273		273
270		270
267		267

BENCHMARK NO. 509 STA. 1472+22.239 11.28
 LT. SET RR SPK E SIDE PP POINT ELEV. = 279.680



LONGITUDINAL SECTION ALONG CULVERT
 ANTICIPATED SETTLEMENT = .010 m

NOTE:
 ALL STATIONS AND ELEVATIONS SHOWN IN METERS (m).
 ALL DIMENSIONS SHOWN IN MILLIMETERS (mm).



P.I. STA. 1466+44.00
 VC = 300.0
 P.I. LEV. = 272.828
PROPOSED GRADE ON IA 146

LOCATION **HYDRAULIC DATA**
 IA. 146 OVER DRAW DRAINAGE AREA= 260 HA R
 T 83 N R 17 W
 SECTION II
 LE GRAND TOWNSHIP
 MARSHALL COUNTY
 CONTRACTOR USED PRECAST BOX OPTION - SEE V.08

DESIGN FOR 15° SKEW RA
3.0 m X 1.8 m X 39.010 m REINFORCED CONCRETE BOX CULVERT
SITUATION PLAN
 STATION: 1465+75.00 APRIL 2001
MARSHALL COUNTY
 IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION
 DESIGN SHEET NO. 2 OF 2 FILE NO. 29138 DESIGN NO. 1098

SITUATION PLAN

DESIGNED BY STEVE FISHER CHECKED BY DARWIN BACKOUS
 DETAILED BY STEVE FISHER CADD FILE h641098.s02

MARSHALL COUNTY PROJECT NUMBER NHSX-30-5(166)--3H-64 SHEET NUMBER V.09